B-1119(17)

Automation Organizer

WindO/I-NV2

User's Manual

Confirm that the delivered product is what you have ordered. Read this manual to make sure of correct operation.

SAFETY PRECAUTIONS

- Be certain to read this manual carefully before performing installation, wiring, or maintenance work, or operating the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F.
- The HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F has been manufactured with careful regard to quality. However, if you intend to use this product in applications where failure of this equipment may result in damage to property or injury, ensure that it used in conjunction with appropriate fail-safe backup equipment.
- In this manual, safety precautions are categorized in order of importance to Warning and Caution:

WARNING	Warning notices are used to emphasize that improper operation may cause severe personal injury or death.
CAUTION	Caution notices are used where inattention might cause personal injury or damage to equipment.

WARNING

- When using the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F in applications which require high level of safety, add a failsafe or backup functionality, and verify an adequate level of safety using the product specifications.
- Turn off the power to the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F before installation, removal, wiring, maintenance, and inspection of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F. Failure to turn power off may cause electrical shock or fire hazard.
- Special expertise is required to install, wire, configure, and operate the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F. People without such expertise must not use the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F.
- The HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F uses an LCD (liquid crystal display) as a display device. The liquid inside the LCD is harmful to the skin. If the LCD is broken and the liquid attaches to your skin or clothes, wash the liquid off using soap, and consult a doctor immediately.
- Emergency and interlocking circuits must be configured outside of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F. Also, connect the emergency stop switch (Direct opening action, Red switch) or the stop switch (Direct opening action, Gray switch) on the HG2S to the emergency stop circuit fixed to the machine in accordance with ISO13850/EN418.
- Do not use the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F's internal touch switches for an emergency circuit. If the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F failed, the external equipment connected to the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F will no longer be protected, and serious injury to operators and equipment damage may be caused.
- If an emergency stop switch is used for the HG2S, it should be secured and connected to the machine for fear of disconnecting easily.
- Connect the emergency stop switch or the stop switch and the enabling switch on the HG2S to function as either a category 0 or category 1 stop in accordance with IEC/EN60204-1 which applies to the HG2S.
- When the HG2S cable can be easily disconnected from the machine, use the HG2S with a stop switch so that the operator can easily notice that the HG2S is NOT an emergency stop device which always functions.

⚠ CAUTION

- Prevent the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F from falling while moving or transporting, otherwise damage or malfunction of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F will result.
- Use the product within the environmental limits given in the catalog and manual. Use of the product in high-temperature or high-humidity environments, or in locations where it is exposed to condensation, corrosive gas or large shock loads can create the risk of electrocution and fire.
- The HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F is designed for use in pollution degree 2. Use the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F in environments of pollution degree 2. (based on the IEC60664-1 rating)
- Install the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F according to the instructions. Improper installation will result in falling, failure, electrical shock, fire hazard, or malfunction of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F.
- Prevent metal fragments or wire chips from dropping inside the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F housing. Ingress of such fragments and chips may cause fire hazard, damage, and malfunction.
- Use a power supply of the rated value. Using a wrong power supply may cause fire hazard.
- The HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F uses "PS2 of EN61131" as DC power supply. (based on the IEC/EN61131 rating)
- Use wire of a proper size to meet the voltage and current requirements.
- When exporting the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F to Europe, use an EN60127 (IEC60127) approved fuse on the power line outside the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F.
- The D-sub connector on the end of the cable of the HG2S is not water- and dust-proof. If protection against water and dust is required, the user must implement a water-proof provision on the connector or replace the D-sub connector with a water-proof connector.
- When exporting the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/3F/4F to Europe, use an EU-approved circuit protector.
- Make sure of safety before starting and stopping the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F. Incorrect operation of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F may cause mechanical damage or accidents.
- Use the HG2G-S/-5S/-5F, HG3G/4G, HG3F/4F in a local area network if you download, upload or monitor the project data via the Ethernet port.
- The touch panel of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F is made of glass, and will break if exposed to excessive shock. Take due care when handling it.
- When more than one button is pressed at the same time, due to the detection characteristics of an analog type touch panel, only the gravity center of the pressed area is sensed and the unit assumes that only one button is pressed. Thus, don't operate the MICRO/I by pressing more than one button simultaneously.
- Although the screen will not be visible if the backlight burns out, the touch panel will remain functional. Incorrect touch panel operation will occur when operating the touch panel when the backlight appears to be turned off but is actually burnt out. Because such erroneous operation could result in damage, the touch panel should not be used after the backlight has burned out.
- Do not push hard or scratch the touch panel and protection sheet with a hard object such as a tool, because they are damaged easily.
- At temperatures over the rated operating temperature, the clock accuracy is affected. Adjust the clock before use.
- For applications which require clock accuracy, adjust the clock periodically.
- Do not install the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F in areas subjected to strong ultraviolet rays, since ultraviolet rays may impair the quality of the LCD.
- Do not attempt to disassemble, repair or modify the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F. This can create the risk of fire or electrocution.
- When disposing of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F, do so as an industrial waste.
- Do not switch off the power or pull out the Memory Card while it is being accessed, as this may result in destruction of the stored data. If the data on the Memory Card is corrupted, format the Memory Card.
- Be sure to confirm that the Memory Card Access lamp is not lit prior to turning the power off to the HG3G, HG2F/3F/4F or pulling out the Memory card. Refer to this manual for details.
- Do not switch off the power or pull out the SD Memory Card or the USB flash drive while it is being accessed, as this may result in destruction of the stored data. If the data on the SD Memory Card or the USB flash drive is corrupted, format the SD Memory Card or the USB flash drive.

Revision history

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April 2009:	Second Edition
August 2009:	Third Edition
November 2009:	Fourth Edition
July 2010:	Fifth Edition
September 2010:	Sixth Edition
January 2011:	Seventh Edition
June 2011:	Eighth Edition
December 2011:	Ninth Edition
February 2012:	Tenth Edition
April 2012:	Eleventh Edition
June 2012:	Twelfth Edition
June 2013:	Thirteenth Edition
December 2013:	Fourteenth Edition
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Caution

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- Please contact your vendor or IDEC Corporation with any problems regarding the operation of this product.

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This product adopts the font of Ryobi.

Preface

This manual describes MICRO/I operator interfaces (HG2G-S/-5S/-5F, HG3G/4G and HG1F/2F/2S/3F/4F) and WindO/I-NV2 general configuration software. The information includes drawing tools, setup procedures, and how to configure all MICRO/I operator interfaces.
This manual explains the operation and handling of the MICRO/I HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F. Please read it carefully and ensure that you fully understand the functions and performance of the MICRO/I HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F and the WindO/I-NV2 configuration software.

Read the following materials as necessary for your particular application.

References	Content
WindO/I-NV2 User's Manual (This document)	Describes the hardware specifications of the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F.
External Device Setup Manual (PDF)	Describes the connection procedures and available devices for various communication including the PLC-Link communication, O/I Link communication, and DM Link communication.
Downloader Manual (PDF)	The manual is described about Downloader software. Downloader is a software tool which operates independently from WindO/I-NV Series. It allows you to upload/download the recipe, Data Log, and project data (without viewing the content of the project).
WindO/I-NV2 Help	Describes the operating procedures. The user is allowed to view all manuals via Help.
Character Table (PDF)	A list of fonts can be used with the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F and WindO/I-NV2. For restrictions on using the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F, refer to Chapter 2 “1.2 Available Text” on page 2-5.

Symbols Used in this Manual

This manual uses the following symbols to facilitate explanation.

Symbols

	.....	Useful information relating to a function
	.....	Information that requires special attention. Failure to operate the product in accordance with the information provided can lead to serious injury or damage.
☞	.....	Indicates the chapter/page of related reference information.
OK	.....	Screen buttons are indicated by **bold** text or by using the actual graphic icon.
SHIFT, [A]	.....	Keyboard keys are indicated by the keyboard inscription in capital letters or enclosed in square brackets.
****	.....	Controls are indicated by **bold** text.

Abbreviations, Generic Terms, and Terminology Used in this Manual

Item	Description
HG2G-S	The name is short for MICRO/I HG2G-S*2**F-*.
HG2G-5S	The name is short for MICRO/I HG2G-5ST22*F-*.
HG2G-5F	The name is short for MICRO/I HG2G-5FT22TF-*.
HG3G	The name is short for MICRO/I HG3G-*JT22*F-*.
HG4G	The name is short for MICRO/I HG4G-CJT22*F-B.
HG1F	The name is short for MICRO/I HG1F-SB22*F-*.
HG2F	The name is short for MICRO/I HG2F-S**2V**.
HG2S	The name is short for MICRO/I HG2S-S**2H-*.
HG3F	The name is short for MICRO/I HG3F-FT22*F-*.
HG4F	The name is short for MICRO/I HG4F-JT22*F-*.
HG2G-S/-5S/-5F	The format used to refer to HG2G-S, HG2G-5S and HG2G-5F.
HG3G/4G	The format used to refer to HG3G and HG4G.
HG1F/2F/2S/3F/4F	The format used to refer to HG1F, HG2F, HG2S, HG3F and HG4F.
MICRO/I	Generic term used to refer to the HG2G-S/-5S/-5F, HG3G/4G, HG1F/2F/2S/3F/4F.
Host	Generic term used to refer to a PLC or micro computer that is connected to and communicates with the MICRO/I.
Device Address	Memory that is capable of storing values in unit of bits or words loaded on the MICRO/I and host device.
System Area	Device area that is pre-allocated for exchanging screen management, error information, and clock data between the MICRO/I and host device.
PLC Link Communication	A communication method that performs communication with the host device according to the setting of the screen and without a program.
DM Link Communication	A communication method that reads to or writes from the MICRO/I device from a computer or microcomputer board.
No Host	A method that is capable of operating the MICRO/I independently without connecting to host device.
User Communication	A communication method which performs communication with external devices such as barcode readers and inverters.
Host Communication	Generic term used to refer to PLC Link Communication and DM Link Communication.
Sub Host Communication	A communication method that performs communication with host device according to the set device list and without a program.
O/I Link	A connection format that enables connections of up to 16 units of MICRO/I with high-speed communication of 115200bps.
O/I Link Master	The MICRO/I unit that is directly connected to host device on the O/I Link network.
O/I Link Slave	The MICRO/I units that are not directly connected to host device on the O/I Link network.
WindO/I-NV2	Integrated configuration software application for creating projects of the MICRO/I.
Project	Data including image data required for operating the MICRO/I, which is created with WindO/I-NV2.
Manager	WindO/I-NV2 provides tools to manage pictures, text and script etc. With the Managers, you can create and manage them in your project.
Setup	Generic term used to refer to the common settings in the project.
Project Settings	Basic settings of operation in the Setup settings.
Alarm Log	A function where the MICRO/I collects log data of alarms.
Data Log	A function where the MICRO/I collects data of device addresses.
Script	A script is an executable list of commands created by a simple programming language.

Item	Description
Text Group	A group of 32 texts maximum for HG2G-S/-5S/-5F, HG3G/4G or 16 texts maximum for HG1F/2F/2S/3F/4F that is in order to dynamically switch the character displayed on the MICRO/I according to the value of the device.
Windows Font	Text fonts that can be displayed on the Windows OS on which the WindO/I-NV2 is running.
Stroke Font	A glyph's outline is defined by the vertices of individual strokes and stroke's profile. Scalable fonts scale easily without jagged edges. Under font settings, “Stroke” is a stroke-based font.
Maintenance Communication	Communications between the WindO/I-NV2 and MICRO/I using a dedicated protocol.
Device Monitor	A special Popup Screen on the MICRO/I on which value of the device can be displayed or changed.
Pass-Through	A function that enables maintenance of the host device via the MICRO/I.
System Screen	Pre-allocated screen dedicated for performing initial setting of the MICRO/I, self-diagnosis, and clearing the log data etc.
Memory Card	A term referring to either a CF or SD Memory Card.
Downloader	A software tool which operates independently from WindO/I-NV2.
NV Metafile	A graphic data file that integrates drawings created on the WindO/I-NV2 edit screen.
Window	Screens that are loaded on to the Base Screen, including Popup Screen and Device Monitor.
Drawings	Define as as non functional content (i.e. shape, picture, text).
Parts	Define as functional content (i.e. button, pilot lamp, commands, etc.)
Object	Define as combination of Drawings and Parts placed on WindO/I-NV2 edit screen.
Touch Switch	A part that operates a function by pressing parts that have been placed on the screen.
Standard Keypad	Keypad that is displayed when operating Numerical and Character Input parts when **Standard** is selected under **Type** in the **Keypad** menu for Numerical and Character Input parts.
Movie File List	It is a list of movie files that have been registered in the Multimedia Function settings. You cannot change the order when you play files.
Playlist	It is a custom list in which you need to register the movie files and then you can select from the list to play. You can change the number of files to play and the order.
Keep Device	Generic term for internal devices that are not reset when operation is started. Even after the power is turned off, the values are retained by the battery.

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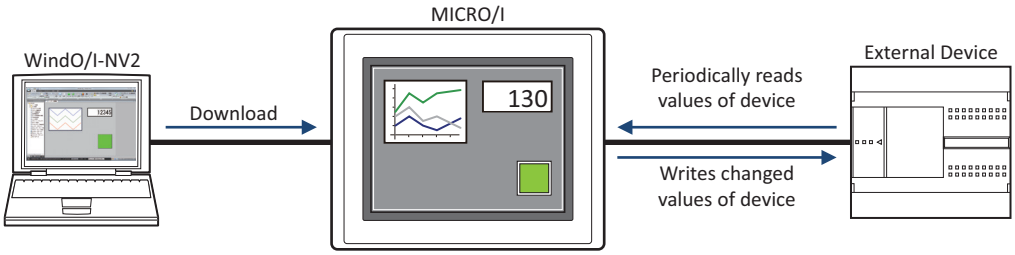
Chapter 1 System Composition

1 System Composition

There are two types of system compositions used in operating the MICRO/I: One that is configured for the operation, and the other that is used for creating projects required for performing operations. In creating projects, use the WindO/I-NV2, the dedicated configuration software application for the MICRO/I.

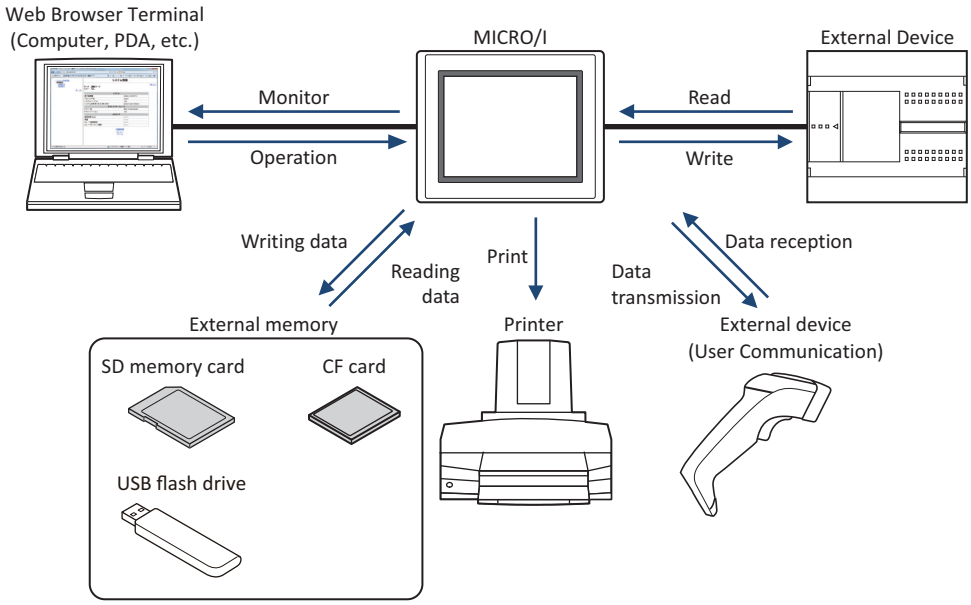


● MICRO/I

The MICRO/I is equipped with a high-brightness, color LCD with fast screen drawing speed, quick-response touch switches, and high-speed communications to provide a comfortable man-machine interface. It is designed to allow easy data read/write from/to PLC's, and does not burden the operator with issues relating to communications software.

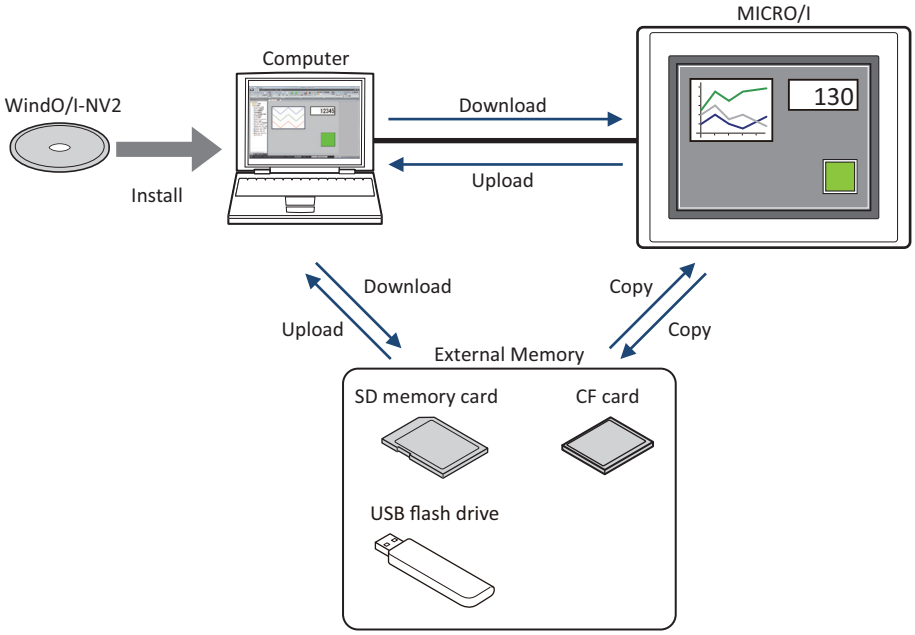
1.1 System Composition for the RUN operation

The MICRO/I can be operated in the following system configuration. Devices that can be connected vary depending on your MICRO/I model. Refer to the specifications of the model for the details.



1.2 System Composition for Creating Screens

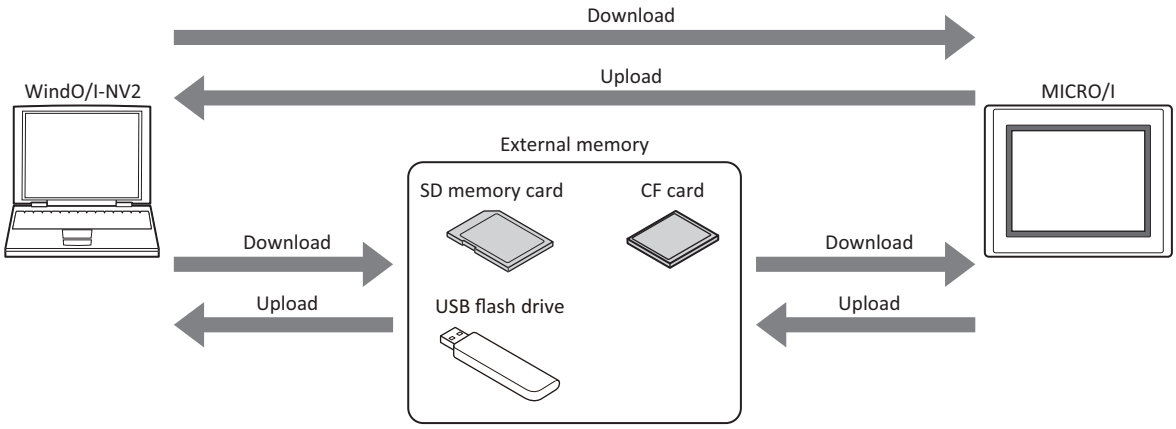
It is necessary to create and download a project to the MICRO/I for operating it. Use the WindO/I-NV2 to create a project. The project you have created can be downloaded to the MICRO/I by directly connecting it to the computer, or the project data can be downloaded to external memory, and then it can be copied from external memory to the HG2G-5F, HG3G/4G, HG2F/3F/4F equipped with the memory card interface or the USB interface.



2 About the WindO/I-NV2

WindO/I-NV2 is software that is exclusively designed for operation with the MICRO/I, for specifying settings and creating screens. The set of data made up of settings and created screens is called a project.

Using WindO/I-NV2, you create a project and then download it to the MICRO/I, to build the interface necessary for operation.



3 Operating Modes

The MICRO/I includes multiple modes, so you switch between modes as and when necessary. These modes are called operating modes. The functions and the operations and conditions for switching are as follows.

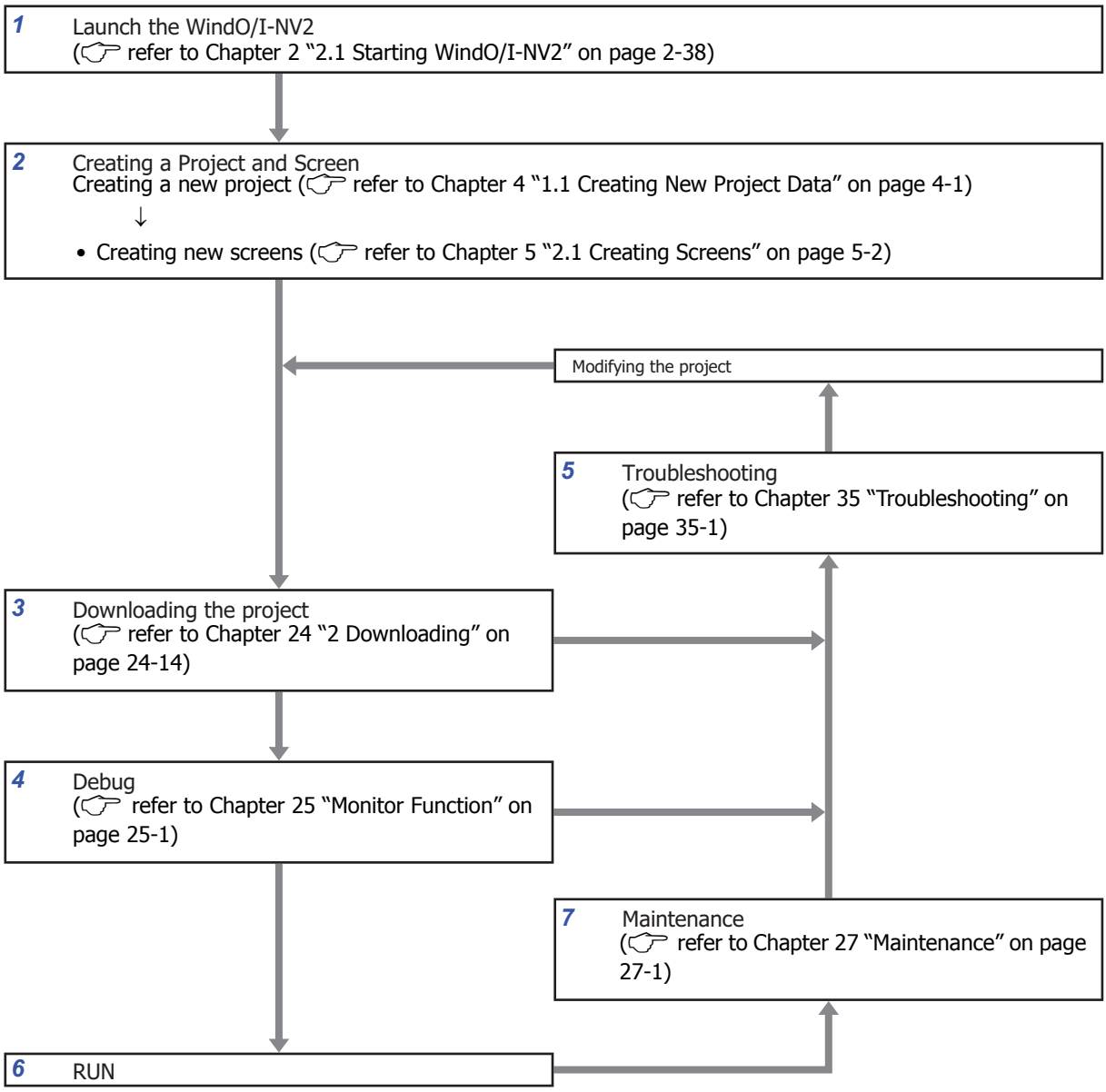
Mode	Functions	Conditions required for switching to the mode
Run Mode	This is the mode at the time of executing project data. The created screen is displayed.	• Turn ON the power to the MICRO/I. • Press [Run] on the Top Page of system mode or on the System Menu. • The download of the project data is completed.
System Mode	Perform initial settings, clock settings, self-diagnosis, etc. for the MICRO/I.	• Display the Maintenance Screen with the following methods and press [System Mode]. HG2G-S/-5S/-5F, HG3G/4G, HG1F: Press the upper-left corner of the MICRO/I screen for three seconds or more. HG2F/2S/3F/4F: Simultaneously press the upper-left and upper-right corners of the MICRO/I screen. • Using the screen switching button, multi-buttons, screen switch or multi commands, switch to the System Mode. • All data is cleared using WindO/I-NV2. • Write the System Area 1 Display screen number (address+0) to FFFFh.
Monitor Mode	Monitor Mode is used for monitoring values of devices using WindO/I-NV2. In this mode, the following message blinks on the bottom-left of the MICRO/I screen. HG2G-S/-5S/-5F, HG3G/4G: Monitor Mode HG1F/2F/2S/3F/4F: Debug Mode	On the WindO/I-NV2 **Online** tab, in the **Monitor** group, click **Start Monitor**.
Simulation Mode	This mode simulates the external device's device values. In this mode, the message "Simulation Mode" blinks on the bottom-left of the MICRO/I screen.	• Press the following buttons in System Mode. HG2G-S/-5S/-5F, HG3G/4G: [Simulate] on the Top Page HG1F/2F/2S/3F/4F: On the System Menu, [Debug], [Simulation], [Start] • While monitoring in WindO/I-NV2, on the [Online] tab, in the [Monitors] group, click [Start Simulation].
Data Transfer	Transferring data between a computer and the MICRO/I.	• Download project data. • Upload project data.

- When switched to System Mode, operation of the MICRO/I stops.
- To display the Maintenance Screen, the **Enable Maintenance** check box from the **System Settings** tab of the Project Settings dialog box must be checked.

For details about Maintenance Mode, refer to Chapter 33 "1 Maintenance Screen" on page 33-1.

4 Flow from Screen Creation and to Run Operation

The following flowchart describes the sequence of step from the screen creation for the MICRO/I to the Run operation.



1. Launch WindO/I-NV2

   Launch WindO/I-NV2.

2. Creating a Project and Screen

   Create a project and performing various settings.
   Create display screens.

3. Downloading the project

   Connect the computer to the MICRO/I using a USB cable, Ethernet cable or Serial cable and download the created project data to the internal memory of the MICRO/I.

4. Debug

   Using the monitor function, you can correct created project data while confirming actual actions.

5. Troubleshooting

   If there is a module or communication-related problem with the MICRO/I, or a problem with the screen, an appropriate message is displayed at the top of the screen.
   In addition, error information is saved to a special data register. By referring to this information and repeatedly correcting the project, downloading, and debugging, the project can be completed.

6. RUN

   Starting communication with the external device and execute various functions according to the project settings.

7. Maintenance

   The Web Server function*1 allows the user to remotely monitor or operate the state of the O/Is from the web browser. In addition, the saved data in the MICRO/I and files in External Memory can be uploaded to the computer.

*1 HG2G-5F, HG3G/4G, HG3F/4F only

Chapter 2 WindO/I-NV2 Features & Basic Operations

This chapter describes the minimum system requirements for WindO/I-NV2, how to start and exit it, and the configuration of its screens and menus.

1 WindO/I-NV2 Specifications

1.1 Available Data

● Data types

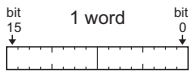
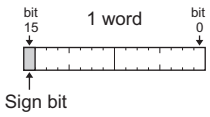
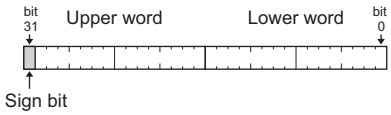
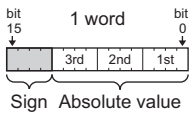
Data type is the format of the data related to the minimum and maximum values of data that can be processed by a part and handling of negative and real numbers.

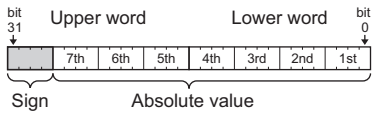
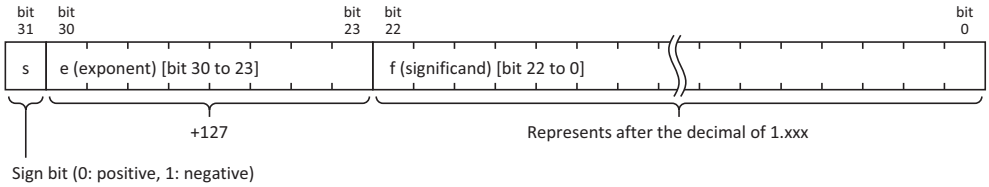
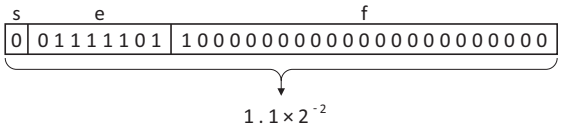
Data types and data ranges that can be used on the MICRO/I and WindO/I-NV2 are listed below.

Data type	Required word count	Processable data range
BIN16 (+)	1	0 to 65535
BIN16 (+/-)	1	-32768 to 32767
BIN32 (+)	2	0 to 4294967295
BIN32 (+/-)	2	-2147483648 to 2147483647
BCD4	1	-999 to 9999
BCD8	2	-9999999 to 99999999
float32	2	-3.4×10^{38} to -1.18×10^{-38}, 0 , 1.18×10^{-38} to 3.4×10^{38}

● Numeric value handling by data type

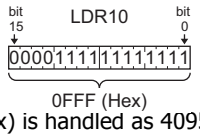
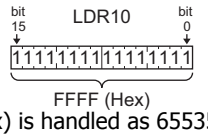
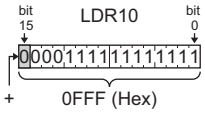
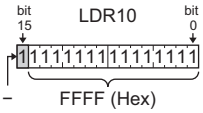
Data stored in devices is handled as described below.

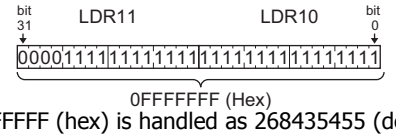
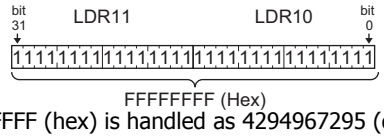
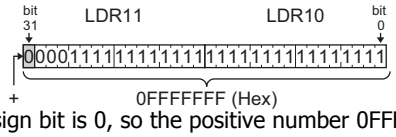
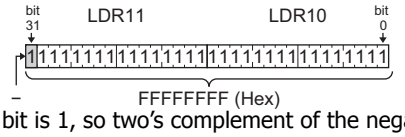
Data type	Data handling
BIN16 (+)	 Data is handled as an unsigned 16-bit integer.
BIN16 (+/-)	 Data is handled as an signed 16-bit integer. If the sign bit (bit 15) is 1, the value is two's complement.
BIN32 (+)	Handled as an unsigned 32-bit integer with the starting address as the lower word.
BIN32 (+/-)	 Handled as a signed 32-bit integer with the starting address as the lower word. If the sign bit (bit 31) is 1, the value is two's complement.
BCD4	 Data is handled as a four digit (16-bit) binary-coded decimal value. Each four bits from bit 0 to bit 11 is handled as the absolute value for the 1st to 3rd digit. Bit 12 to bit 15 is handled as the minus sign (-) when its value is F (hex) and it is handled as the absolute value for the 4th digit when 0 to 9 (hex).

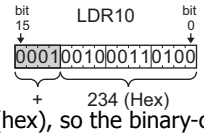
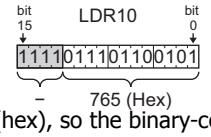
Data type	Data handling
BCD8	 Data is handled as an eight digit (32-bit) binary-coded decimal value. Each four bits from bit 0 to bit 27 is handled as the absolute value for the 1st to 7th digit. Bit 28 to bit 31 is handled as the minus sign (-) when its value is F (hex) and it is handled as the absolute value for the 8th digit when 0 to 9 (hex).
float32	Data is handled as a 32-bit floating-point real number. The number of significant digits is 6 digits. The floating-point type data format conforms to the IEEE (The Institute of Electrical and Electronics Engineers) standard for the single precision storage format as explained next. Single precision floating-point values in IEEE 754 (32 bits) Single precision floating-point values in IEEE 754 are expressed with a total of 32 bits (2 words) using 1 bit for the sign s, 8 bits for the exponent e, and 23 bits for the significand f. The sign bit indicates the sign of the expressed value (positive or negative). The exponent is an 8 bit signed integer with a value from -128 to 127.  Example:  If all bits are 0, the value is “0”.

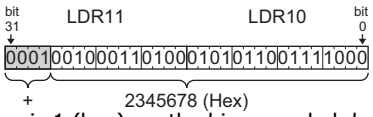
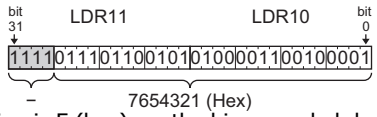
The internal representation of float32 is described here, but the data for float32 (floating-point real numbers) is handled with a special bit configuration, so do not directly access the bits.

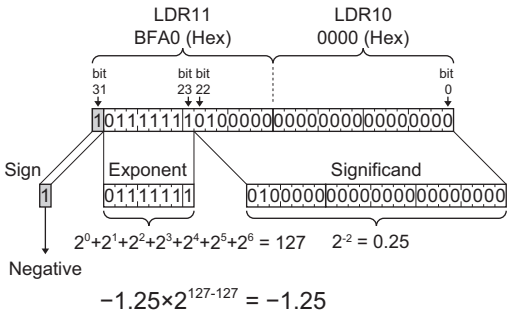
Example: Data handling

Data type	Storing 0FFF (hex) in LDR10	Storing FFFF (hex) in LDR10
BIN16 (+)	 0FFF (hex) is handled as 4095 (dec).	 FFFF (hex) is handled as 65535 (dec).
BIN16 (+/-)	 0FFF (hex) is handled as 4095 (dec).	 Sign bit is 1, so FFFF (hex) is two’s complement, handled as -1 (dec).

Data type	Storing 0FFF (hex) in LDR10, FFFF (hex) in LDR11	Storing FFFF (hex) in LDR10, FFFF (hex) in LDR11
BIN32 (+)	 0FFFFFFF (hex) is handled as 268435455 (dec).	 FFFFFFFF (hex) is handled as 4294967295 (dec).
BIN32 (+/-)	 The sign bit is 0, so the positive number 0FFFFFFF (hex) is handled as 268435455 (dec).	 Sign bit is 1, so two's complement of the negative number FFFFFFFF (hex), handled as -1 (dec).

Data type	Storing 1234 (hex) in LDR10	Storing F765 (hex) in LDR10
BCD4	 The sign is 1 (hex), so the binary-coded decimal value of the positive number 234 (hex), handled as 1234 (dec).	 The sign is F (hex), so the binary-coded decimal value of the negative number 765 (hex), handled as -765 (dec).

Data type	Storing 5678 (hex) in LDR10, 1234 (hex) in LDR11	Storing F765 (hex) in LDR10, 4321 (hex) in LDR11
BCD8	 The sign is 1 (hex), so the binary-coded decimal value of the positive number 2345678 (hex), handled as 12345678 (dec).	 The sign is F (hex), so the binary-coded decimal value of the negative number 7654321 (hex), handled as -7654321 (dec).

Data type	Storing 0000 (hex) in LDR10, BFA0 (hex) in LDR11
float32	

In the data types BIN32 (+), BIN32 (+/-), BCD8, and float32, two words (upper word and lower word) are used for a single value. The MICRO/I and host device communicate data in device addresses in one word units, so when the upper word and lower word are sent in separate packets, the value may have already changed when the data for both words is received, which may cause an unexpected result.

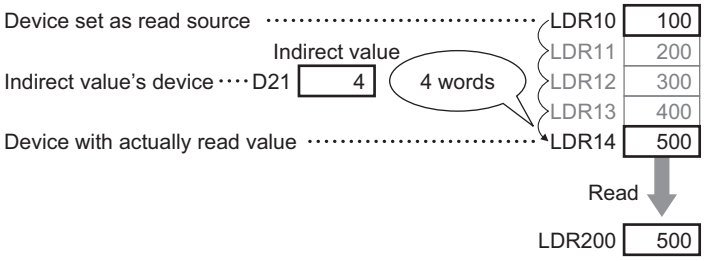
● Indirect Read and Indirect Write Settings

The indirect specification of a device address means to add a value (indirect value) to the address of the set device and use that address as the actual read source or write destination. You can change the read source or write destination address just by changing this indirect value.

Indirect read

Add the indirect value to the address of the device set as the read source and read the indirectly specified device value.

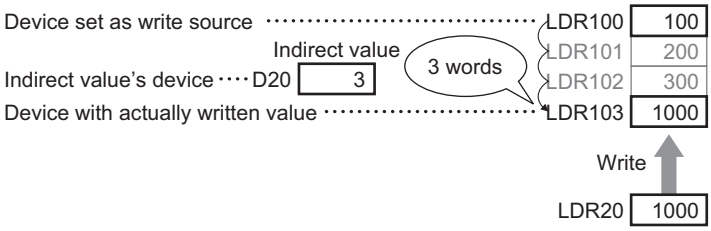
Example: To read an indirectly specified device value into LDR200
When the device set as the read source is LDR10 and the indirect value's device address is D21, if 4 (indirect value: 4) is set in D21, the device address of the value actually read is LDR14.



Indirect write

Add the indirect value to the address of the device set as the write destination and write to the indirectly specified device value.

Example: To write the value in LDR20 to an indirectly specified device
When the device set as the write destination is LDR100 and the indirect value's device address is D20, if 3 (indirect value: 3) is set in D20, the device address of the value actually written is LDR103.



Parts you can indirectly read and indirectly write

Part	Indirect read	Indirect write
Word Button	YES	YES
Multi-Button	YES	YES
Numerical Input	YES	YES
Character Input	YES	YES
Numerical Display	YES	NO
Word Write Command	YES	YES
Script Command	YES	YES
Multi-Command	YES	YES

- Enter the value for indirect values as the data type BIN16 (+). Indirect values can be set in the range of 0 to 32767. If you enter a value for the indirect value outside this range, the value before the indirect value changes is maintained when reading. When writing, "Device range error" is displayed.
  In scripts however, enter a value for the data type set in the script.
- For indirect device reading, decide the read source address after the indirect value changes and after the screen changes, and then read the device value. For host devices, communication to read the device value from a host device takes time, so if data is transfered or arithmetic operations are executed before the indirect read is finished, processing cannot be executed and the following error is displayed.

  Word Button, Word Write Command: Indirect device error

  Script Command: Script error

1.2 Available Text

● Font

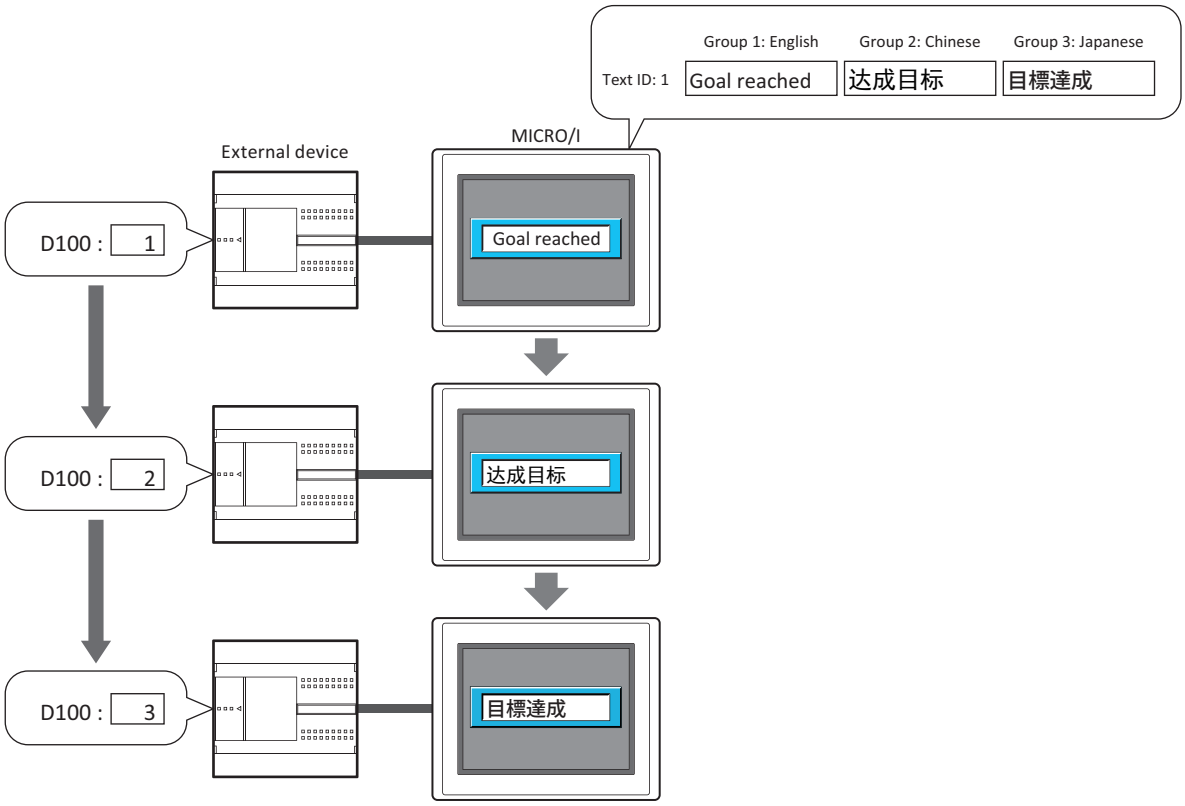
Supported Languages

The MICRO/I can display multiple fonts by installing them. In addition to the fonts installed on the MICRO/I, all Windows fonts displayed on your computer can be used on the display.

Font	Description
Fonts installed in the MICRO/I	Fonts to be pre-loaded on the MICRO/I. Japanese, European, Chinese, Korean, Taiwanese, Central European, Baltic and Cyrillic fonts can be installed on the MICRO/I. The installed fonts installed can be changed as needed using WindO/I-NV2, which helps save and efficiently operate the user capacity.
Windows Font	All fonts used on the computer can be displayed on the MICRO/I. The Windows fonts allow you to display expressive characters on the MICRO/I screen as needed. Windows fonts are downloaded as part of the project data.

In addition, the MICRO/I has a function that switches between two or more text groups dynamically. With this function, the registration text of buttons can be switched to different languages according to the conditions.

For details, refer to Chapter 19 "Text Group" on page 19-1.



Installed Fonts in the MICRO/I

Font Name		Code System	Language
Standard Fonts	Japanese	JIS 8-bit code JIS level-1 and level-2 kanji sets	Japanese
	English	ISO 8859-1 (Latin1)	Icelandic, Irish, Italian, English, Dutch, Swedish, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faeroese, French
	Stroke	ISO 8859-1 (Latin1)	Icelandic, Irish, Italian, English, Dutch, Swedish, Spanish, Danish, German, Norwegian, Portuguese, Finnish, Faeroese, French
	7-seg	ISO 8859-1 (Latin1)	Displays number 0 to 9, alphabet character A to F, and symbols such as asterisk, plus, minus, and period only
Optional Fonts	Japanese large font (first standard)	JIS level-1 kanji set	* Install this font to achieve a sharper display of enlarged JIS level-1 kanji set. Refer to "High-quality Fonts" on page 2-9.
	Japanese large font (second standard)	JIS level-2 kanji set	* Install this font to achieve a sharper display of enlarged JIS level-2 kanji set. Refer to "High-quality Fonts" on page 2-9.
	Chinese	GB2312	Chinese
	Korean	KSC5601	Korean
	Taiwanese	BIG5	Taiwanese
	European large font	ISO 8859-1 (Latin1)	* Install this font to achieve a sharper display of enlarged European fonts. Refer to "High-quality Fonts" on page 2-9.
	Central European	ANSI1250	Czech, Hungarian, Polish, Slovak, Slovene
	Baltic	ANSI1257	Estonian, Latvian, Lithuanian, Greenlandic, Lappish
	Cyrillic	ANSI1251	Bulgarian, Belarusian, Ukrainian, Serbian 2, Macedonian, Russian

- Japanese, European, Japanese large font (first standard), Chinese, and European large font are factory-installed in the HG2F/2S/3F/4F.
  Japanese, European, and European large font are factory-installed in the HG2G-S/-5S and HG1F.
  The standard fonts cannot be replaced; however, the optional fonts can be downloaded from the WindO/I-NV2.
- Only HG2G-5F, HG3G/4G Series supports Stroke, 7-seg under "Font".
- The MICRO/I displays the single-byte parts of Chinese, Taiwanese, and Korean with ISO 8859-1, and supports Hangul characters only in the double-byte part of Korean.

Available Fonts for Parts

Parts	Description	MICRO/I-installed Font*1	Windows Font
Buttons	Bit Button	YES	YES
	Word Button	YES	YES
	Goto Screen Button	YES	YES
	Print Button	YES	YES
	Key Button	YES	YES
	Keypad	YES	YES
	Selector Switch	YES	YES*3
Lamps	Pilot Lamp	YES	YES
	Multi-State Lamp	YES	YES
Data Displays	Numerical Input	YES	NO
	Character Input	YES	NO
	Message Display	YES	YES*2*3
	Message Switching Display	YES	YES*3
	Alarm List Display	YES	YES*3
	Alarm Log Display	YES	YES*3
	Numerical Display	YES	NO
	Calendar	YES	NO
Charts	Bar Chart	YES	YES*3
	Line Chart	YES	YES*3

*1 To use a MICRO/I-installed font, the font should be downloaded from the WindO/I-NV2 in advance. Depending on parts and part setting, to the use of Stroke, European Outline, or 7-seg under "Font" may not be possible. For details, refer to the section on Parts.

*2 Windows font can be used for fixed text only. Only the MICRO/I-installed font can be used for the read device data code for the Message Display.

*3 Windows font can be used only when the "Use Text Manager" is selected.

Font Size

Font Name		Code System	Size
Optional Fonts	Japanese large font (first standard)	JIS level-1 kanji set	477KB
	Japanese large font (second standard)	JIS level-2 kanji set	424KB
	Chinese	GB2312	238KB
	Korean	KSC5601	109KB
	Taiwanese	BIG5	422KB
	European large font	ISO 8859-1 (Latin1)	102KB
	Central European	ANSI1250	6KB
	Baltic	ANSI1257	6KB
	Cyrillic	ANSI1251	6KB

The download size of font data is adjusted in multiples of 128KB.
The download size of font data is 128KB when the font size is 0KB or 128KB and smaller.

Example: When downloading Japanese large font (level-1 kanji set), Chinese, and European large fonts:
(Factory-set status of the HG2F/2S/3F/4F.)

Font	Size
Japanese large font (first standard)	477KB
Chinese	238KB
European large font	102KB
Total size of the font data	817KB

Download size of font data	896KB (817KB is adjusted in multiples of 128KB.)

Example: When downloading Chinese and Korean fonts:

Font	Size
Chinese	238KB
Korean	109KB
Total size of the font data	347KB

Download size of font data	384KB (347KB is adjusted in multiples of 128KB.)

Example: When downloading all fonts:

Font	Size
Japanese large font (first standard)	477KB
Japanese large font (second standard)	424KB
Chinese	238KB
Korean	109KB
Taiwanese	422KB
European large font	102KB
Central European	6KB
Baltic	6KB
Cyrillic	6KB
Total size of the font data	1790KB

Download size of font data	1792KB (1790KB is adjusted in multiples of 128KB.)

Since the capacity of the HG1F is limited, it is impossible to download all the fonts at the same time.

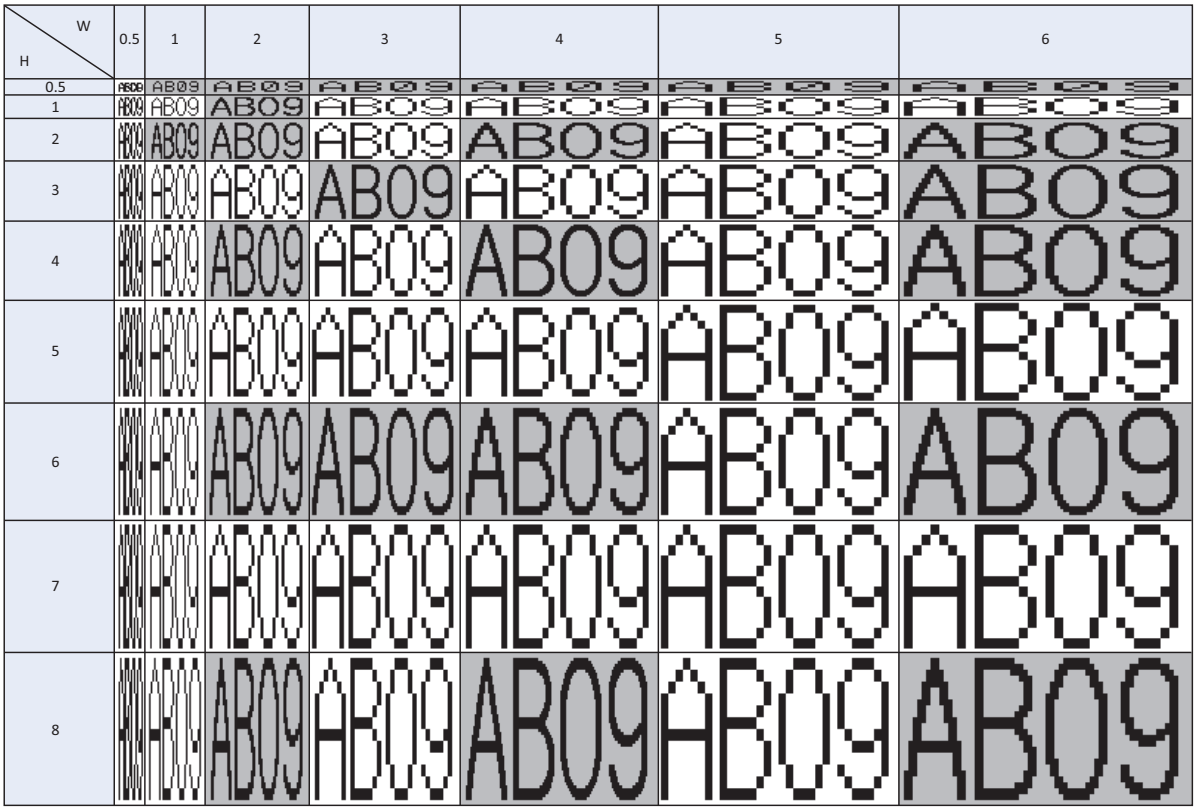
● High-quality Fonts

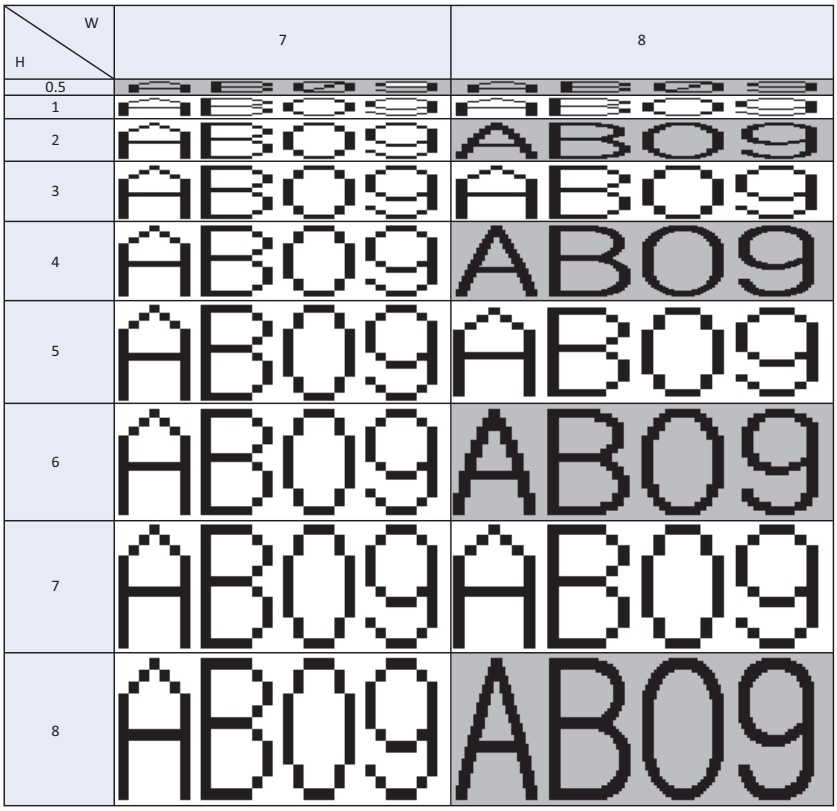
The high-quality fonts are the Japanese large fonts (first standard/second standard), and European fonts.

If you download high-quality fonts and select **Use large font** on the System tab in the Project Setting dialog box, the MICRO/I can replace some of the optional fonts with the high-quality fonts.

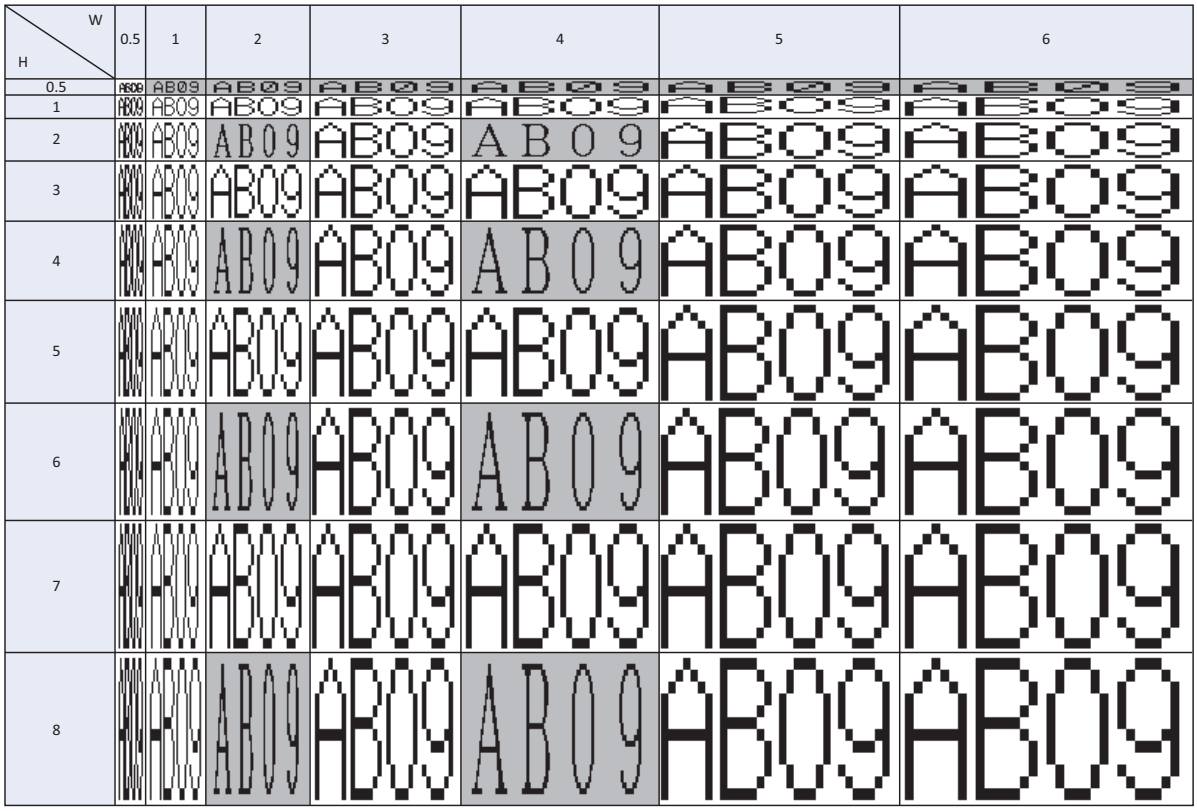
Scaled text with a background color is replaced and displayed with these fonts for a more attractive look.

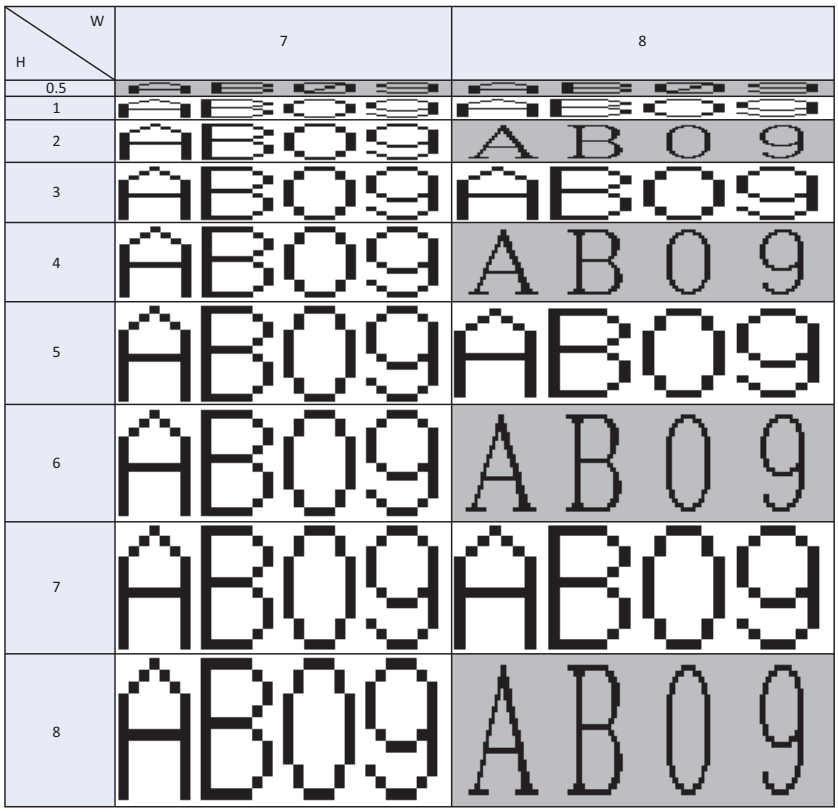
High-quality European Font Display (Size 8x16)



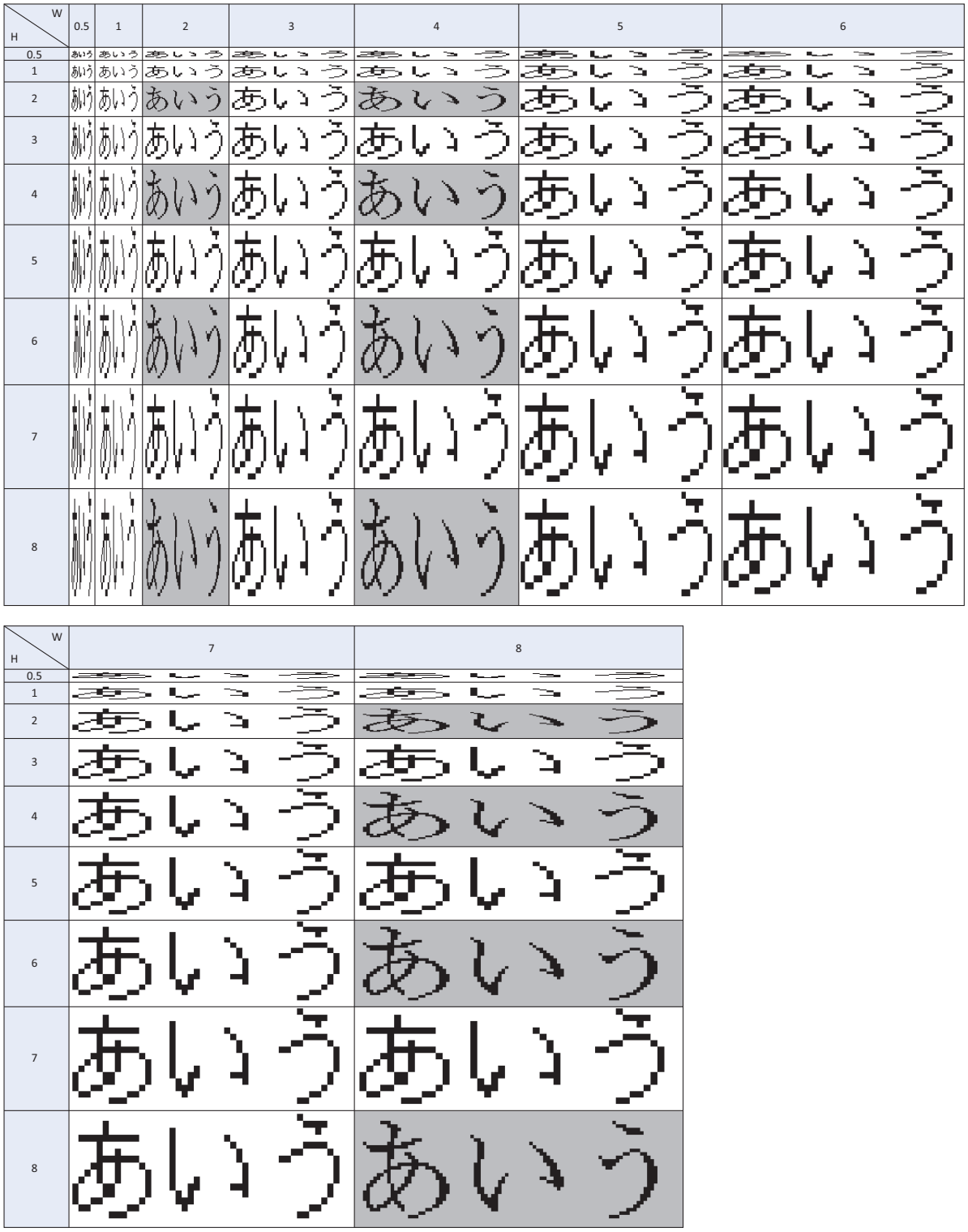


High-quality Japanese Font Display (Size 8x16)





High-quality Japanese Font Display (Size 16x16)



- When the high-quality fonts have not been downloaded into the operator interface, the standard fonts are used even if "Use large font" is selected.
- When the Character Input part display font size is 8x16, high-quality fonts are not displayed even if "Use large font" is selected.

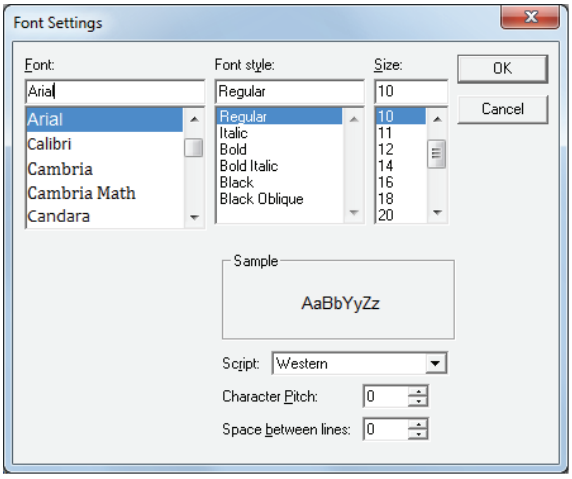
● Windows Font

Selecting Windows Font for the Font property gives you access to all of the fonts installed on your computer for use on Drawing Objects and Parts. This allows you to display fonts and languages that are not installed on the MICRO/I.

Windows Font Settings

Windows Font settings are made in the Font Settings dialog box.

1 Click the **Change** button in the **Windows Font** group on the properties dialog box for Drawing Objects, Parts, or on the Text Manager.



2 Set each item and click the **OK** button.

- **Font**
  Select the font to use.
- **Font style**
  Select italic, bold, or other style.
- **Size**
  Select the size of the text.
- **Sample**
  Shows a preview using the specified font.
- **Character Pitch**
  Specify character spacing from 0 to 100.
- **Space between lines**
  Specify line spacing from 0 to 100.
- **Script**
  Select the character set code.

- The right end of the text may have missing dots if **Font style** is set to **Italic**. You can remedy this by adding an extra space at the end of the line.
- An alternate font will be used if the Project Data uses a font that does not exist on the computer. This means that text will appear differently if the Project Data is opened on another computer.
- The same font may also appear differently for different OS versions.

Using Windows Fonts

This section describes how to use Windows Fonts.

Selecting Windows Font for the Font property for Draw Objects and Parts automatically disables these properties:

- Style: The style set under **Windows Font** will be used.
- Magnification: The width by height magnification will be set to 1 x 1. Note, **Magnification** can be selected on the Message Display, Message Switching Display, and Alarm List Display parts, but will not be reflected on the actual text displayed. To use scrolling on these parts, adjust the display area for text using the **Magnification** property.

To register and use a Windows Font in Text Manager

Applicable draw object	Text	
Applicable parts	Buttons	Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad, Selector Switch
	Lamps	Pilot Lamp, Multi-State Lamp
	Data Displays	Message Display, Message Switching Display, Alarm List Display, Alarm Log Display
	Charts	Bar Chart, Line Chart

1 Select the **Use Text Manager** check box on the Properties dialog box for Draw Objects and Parts.

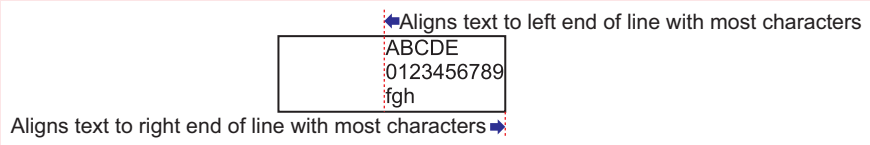
- The **Use Text Manager** check box may appear in different locations depending on the part. This table shows where to find this property:

Part	Location
Text	Properties of Text dialog box
Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Selector Switch, Pilot Lamp, Multi-State Lamp	Registration Text tab
Keypad	Properties of Keypad dialog box
Message Display	General tab
Message Switching Display	Message tab
Bar Chart, Line Chart	Label tab

- The Alarm List Display and Alarm Log Display parts are designed to use the text registered in the Text Manager so the **Use Text Manager** check box is not shown.

2 Specify the Text ID for the Windows Font set in Text Manager.

- Using the Text ID for the Windows Font set in Text Manager disables these settings in the Properties dialog box:
  - Align Text: Multiple lines of texrot are shown aligned center-left when **Center** is selected. Text is shown with right-indented left-aligned when **Right** is selected.
    With right-indented left-aligned formatting, the line containing the most number of characters is aligned on the right end while the other lines are aligned to the left end of that line.



  - Vertical Writing: Horizontal writing is used.
- The maximum number for the unit in the Numerical Input and Numerical Display parts is 4 characters. The fifth character and any characters beyond that will appear outside the part.
- In the Message Display, variable text "\@" appears as is.
- With the Alarm List Display and Alarm Log Display, line spacing is not automatically adjusted based on the size of the text. Adjust it using the **Line Spacing** property on the **Format** tab.
- If text containing a carriage return is used for a label on a Bar or Line Chart, or for an Alarm List Display or Alarm Log Display part, it will appear truncated after the carriage return if a non-Windows Font is used. The entire text, including the carriage return, is shown when using a Windows Font.
- When printing Alarm Logs, Text IDs set to a Windows Font will be printed using a font that exists on the MICRO/I.

To select a font in the Properties dialog box

Applicable draw object	Text	
Applicable parts	Buttons	Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Keypad
	Lamps	Pilot Lamp, Multi-State Lamp

Select **Windows** for **Font** on the Properties dialog box for a Draw Object or Part.

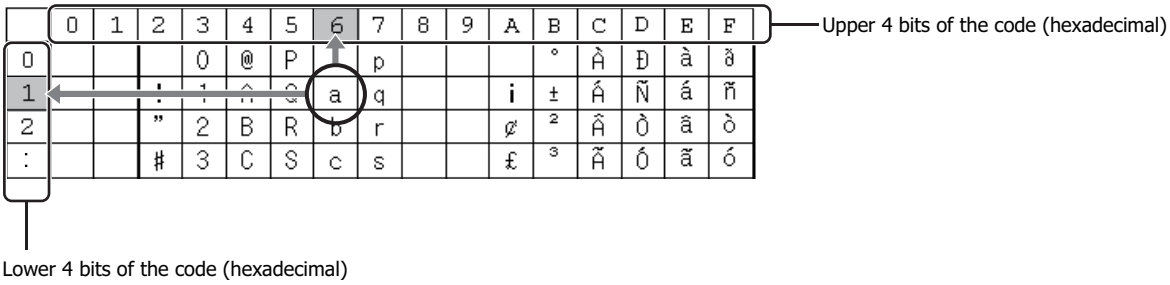
The **Font** property may appear in different locations depending on the part. This table shows where to find this property:

Part	Location
Text	Properties of Text dialog box
Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Pilot Lamp, Multi-State Lamp	Registration Text tab
Keypad	Properties of Keypad dialog box

● Character Code Table

Using the Character Code Table

Example: Finding the character code for the character “a” in the table.



The upper four bits of the code are hexadecimal 6.
The lower four bits of the code are hexadecimal 1.
Therefore, the character code for "a" is as follows.

"a": 61

Lower 4 bits

Upper 4 bits

For other fonts and two-byte characters, refer to the table of the relevant code system.
Japanese (two-byte characters): JIS first standard/second standard, Chinese: GB2312, Taiwanese: BIG5, Korean (Hangul character): KSC5601

European Font (ISO 8859-1)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			”	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}				½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ

Central European Font (ANSI 1250)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	Ŕ	Đ	ŕ	đ
1			!	1	A	Q	a	q		‘	ˇ	±	Á	Ń	á	ń
2			”	2	B	R	b	r	‚	’	˘	˛	Â	Ň	â	ň
3			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	ĺ	ő
6			&	6	F	V	f	v	†	–	¦	¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F			/	?	O	_	o		Ź	ź	Ż	ż	Ď	ß	ď	˙

Baltic Font (ANSI 1257)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	Ą	Š	ą	š
1			!	1	A	Q	a	q		`		±	Į	Ń	į	ń
2			”	2	B	R	b	r	‚	´	¢	²	Ā	Ņ	ā	ņ
3			#	3	C	S	c	s		‟	£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t	„	″	¤	´	Ä	Ō	ä	ō
5			%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	-	¦	¶	Ę	Ö	ę	ö
7			’	7	G	W	g	w	‡	–	§	·	Ē	×	ē	÷
8			(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A			*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B			+	;	K	[	k	{	‹	›	«	»	Ė	Ū	ė	ū
C			,	<	L	\	l	|			¬	¼	Ģ	Ü	ģ	ü
D			-	=	M	]	m	}	¨	¯	-	½	Ķ	Ż	ķ	ż
E			.	>	N	^	n	~	ˇ	˛	®	¾	Ī	Ž	ī	ž
F			/	?	O	_	o		˛		Æ	æ	Ļ	ß	ļ	˙

Cyrillic Font (ANSI 1251)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ђ	ђ		°	А	Р	а	р
1			!	1	A	Q	a	q	Ѓ	`	Ў	±	Б	С	б	с
2			”	2	B	R	b	r	‚	´	ў	І	В	Т	в	т
3			#	3	C	S	c	s	ѓ	‟	Ј	і	Г	У	г	у
4			$	4	D	T	d	t	„	″	¤	ґ	Д	Ф	д	ф
5			%	5	E	U	e	u	…	•	Ґ	µ	Е	Х	е	х
6			&	6	F	V	f	v	†	-	¦	¶	Ж	Ц	ж	ц
7			’	7	G	W	g	w	‡	–	§	·	З	Ч	з	ч
8			(	8	H	X	h	x	€		Ё	ё	И	Ш	и	ш
9			)	9	I	Y	i	y	‰	™	©	№	Й	Щ	й	щ
A			*	:	J	Z	j	z	Љ	љ	Є	є	К	Ъ	к	ъ
B			+	;	K	[	k	{	‹	›	«	»	Л	Ы	л	ы
C			,	<	L	\	l	|	Њ	њ	¬	ј	М	Ь	м	ь
D			-	=	M	]	m	}	Ќ	ќ	-	Ѕ	Н	Э	н	э
E			.	>	N	^	n	~	Ћ	ћ	®	ѕ	О	Ю	о	ю
F			/	?	O	_	o		Џ	џ	Ї	ї	П	Я	п	я

Japanese Font (JIS X0201)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				-	タ	ミ		
1			!	1	A	Q	a	q			。	ア	チ	ム		
2			"	2	B	R	b	r			「	イ	ツ	メ		
3			#	3	C	S	c	s			」	ウ	テ	モ		
4			$	4	D	T	d	t			、	エ	ト	ヤ		
5			%	5	E	U	e	u			・	オ	ナ	ユ		
6			&	6	F	V	f	v			ヲ	カ	ニ	ヨ		
7			'	7	G	W	g	w			ァ	キ	ヌ	ラ		
8			(	8	H	X	h	x			ィ	ク	ネ	リ		
9			)	9	I	Y	i	y			ゥ	ケ	ノ	ル		
A			*	:	J	Z	j	z			ェ	コ	ハ	レ		
B			+	;	K	[	k	{			ォ	サ	ヒ	ロ		
C			,	<	L	¥	l	|			ャ	シ	フ	ワ		
D			-	=	M	]	m	}			ュ	ス	ヘ	ン		
E			.	>	N	^	n	~			ョ	セ	ホ	゛		
F			/	?	O	_	o				ッ	ソ	マ	゜		

Control Codes

Refer to the following table when using control codes in User Communications.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DEL														
1	SOH	DCI														
2	STX	DC2														
3	ETX	DC3														
4	EOT	DC4														
5	ENQ	NAK														
6	ACK	SYN														
7	BEL	ETB														
8	BS	CAN														
9	HT	EM														
A	LF	SUB														
B	VT	ESC														
C	FF	FS														
D	CR	GS														
E	SO	RS														
F	SI	US														

1.3 Available Number of Colors

The available number of colors that can be used on the WindO/I-NV2 are listed below.

Model	Target	Number of colors
HG2G-5F, HG3G/4G	Picture Manager	65536 colors
	Drawing objects and Properties sheet	256 colors
HG2G-S/-5S, HG2F/2S/3F/4F	Picture Manager	256 colors
	Drawing objects and Properties sheet	256 colors
HG2G-S*1, HG1F/HG2F*1/HG2S*1	Picture Manager	16 colors
	Drawing objects and Properties sheet	16 colors

1.4 Available Image Files

The image file formats that can be displayed on the MICRO/I are as follows.

Model	File format	Description
HG2G-5F, HG3G/4G	JPEG	Supports JPEG files that conform to the JPEG standard (ISO/IEC 10918-1, ITU-T Recommendation T.81) that adopt baseline DCT coding. The JFIF extension specification is not supported.
	Bitmap	Supports monochrome bitmaps, 16-color bitmaps, 256-color bitmaps, and 24-bit bitmaps in which data is stored from the bottom up. Run-length encoding is only supported for 256-color bitmaps.
HG2G-S/-5S, HG1F/2F/2S/3F/4F	Proprietary format	All supported image files are converted into a dedicated file format for the HG2G-S/-5S and HG1F/2F/2S/3F/4F.

- The MICRO/I cannot handle image files that are larger than the size of the screen. Images that exceed the screen size are not displayed.
- The Numerical Input, Character Input, Message Display, Message Switching Display, Numerical Display, Calendar, and Meter cannot correctly display pictures that use a transparent color.
- IDEC recommends using bitmap image files when display speed is a priority. JPEG image files take more time to display on the MICRO/I than bitmap image files.

● About Picture Manager

Picture Manager is an application for managing pictures used for part diagrams and drawings.

- When saving, deleting, or reducing pictures, the following operations are displayed in Picture Manager.
  - On the **View** tab, in the **Workspace** group, click (Picture Manager).
  - Double click **Picture Manager** in the **Project** window.
- To set up the Picture from the Drawings, click on the editing screen where the Picture is positioned to display Picture Manager.
- If setting a graphic for a positioned object, display Picture Manager from the Properties dialog box.

If Picture Manager is displayed from the Properties dialog box of an object on the screen when setting the Picture, **Reduce**, **Delete**, and **Export** are disabled.

*1 Monochrome LCD models

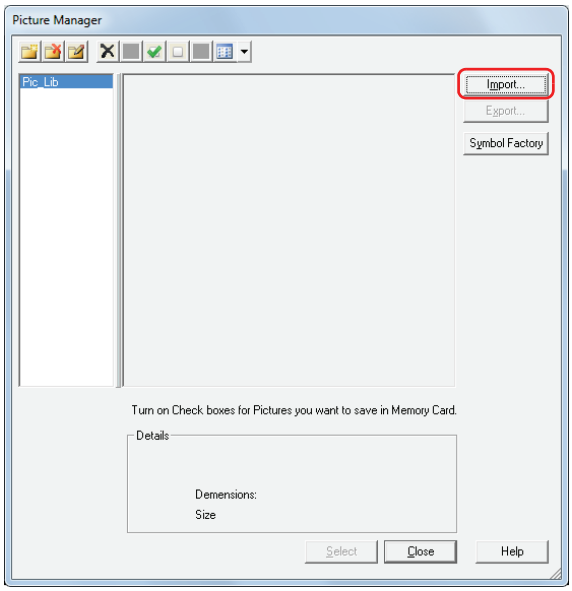
● Saving pictures in Picture Manager

This section describes how to save drawing objects in Picture Manager. Saved pictures can be used for part diagrams and drawings.

Saving image files

1 Click **Import** in Picture Manager.

The Open dialog box is displayed.



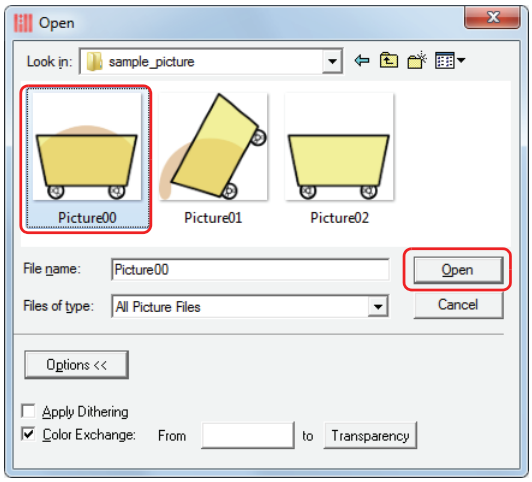
- When managing pictures by category, create a new category in the **Book List**, and select it. How to create new category is as follows.

  HG2G-5F, HG3G/4G: Click (New Book).

  HG2G-S/-5S, HG1F/2F/2S/3F/4F: Click ... next to **Book Name** drop-down list. The Book Maintenance dialog box is displayed. Enter the category name in **Book Name** and click **OK**.

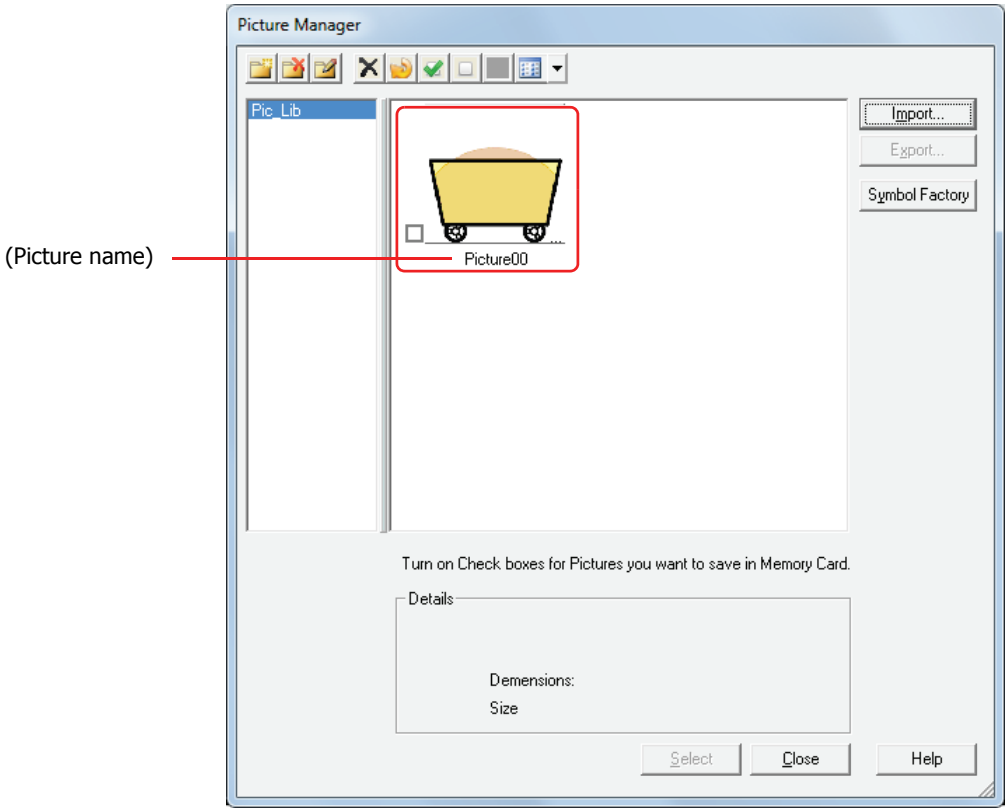
- For the HG2G-S/-5S and the HG1F/2F/2S/3F/4F, first select the **Import with color conversion** check box to exchange colors and the **Import with dithering** check box to use dithering, and then click **Import**. For details, refer to "For the HG2G-S/-5S, HG1F/2F/2S/3F/4F" on page 2-30.

2 Specify the image file, and then click **Open**.



For HG2G-5F, HG3G/4G Open dialog box, click **Options** to **Apply Dithering** or **Color Exchange**. Click **Options** to toggle between showing and hiding the items. For details, refer to "Open Dialog Box" on page 2-29.

The picture is saved in Picture Manager. The name of the image file becomes the picture name.

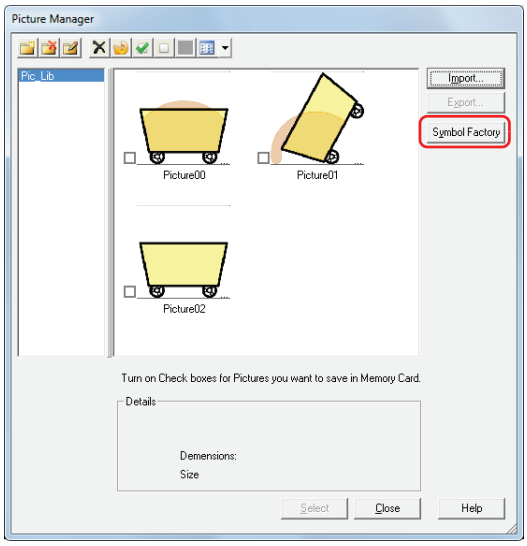


- When the file name contains a Unicode character, it cannot be imported.
- Even when the image is saved to a different category, if a picture of the same name is already saved in that category, a confirmation message to overwrite the file is displayed.
  - Click **Yes** to overwrite the image.
    After overwriting, the image is saved in the list of the selected category, and the previous image is deleted from the list.

    Example: The picture "Picture00" is saved in the category "Pic_Lib."
    If the picture "Picture00.bmp" is saved to the category "NewBook1," the new image "Picture00" is saved to "NewBook1," and the image named "Picture00" that was previously in "Pic_Lib" is deleted.
  - Click **No** to stop saving the picture.

Selecting pictures from Symbol Factory

1 Click **Symbol Factory** in Picture Manager.
Symbol Factory is displayed.

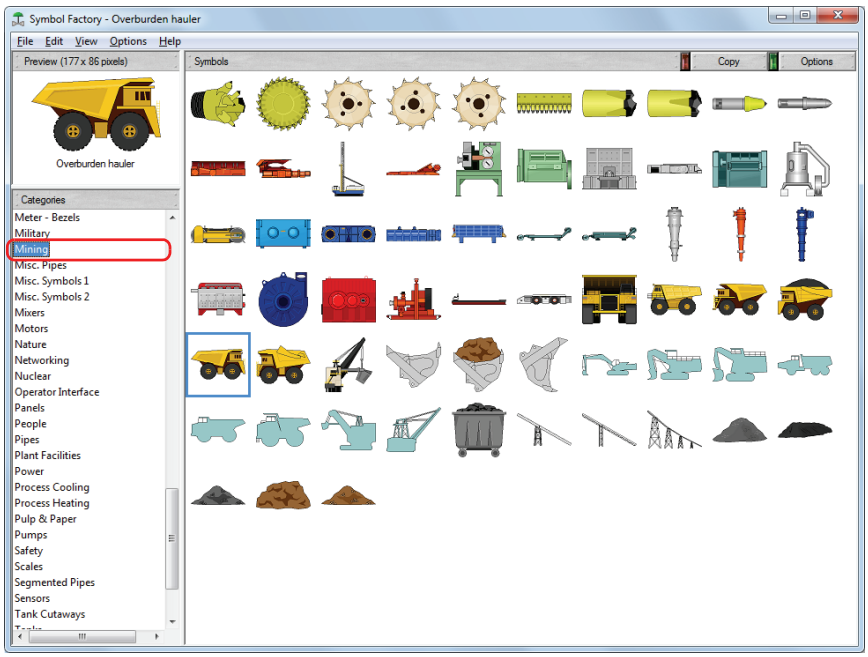


- When managing pictures by category, create a new category in the **Book List**, and select it. How to create new category is as follows.

  HG2G-5F, HG3G/4G: Click (New Book).

  HG2G-S/-5S, HG1F/2F/2S/3F/4F: Click ... next to **Book Name** drop-down list. The Book Maintenance dialog box is displayed. Enter the category name in **Book Name** and click **OK**.
- For the HG2G-S/-5S and the HG1F/2F/2S/3F/4F, first select the **Import with color conversion** check box to exchange colors and the **Import with dithering** check box to use dithering, and then click **Symbol Factory**. For details, refer to "For the HG2G-S/-5S, HG1F/2F/2S/3F/4F" on page 2-30.

2 Select a category of pictures from **Categories**.
A list showing pictures in the category selected from **Symbols** is displayed.

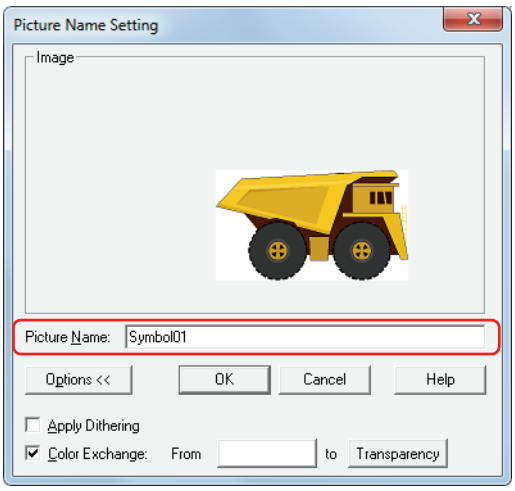


Click **Options** to display the Symbol Options dialog box, which can be used to modify fill color and background color, and to flip or rotate shapes. The settings made here are applied to all the pictures in Symbol Factory.

3 Select a picture from **Symbols**, and then click **Copy**.
The Picture Name Setting dialog box is displayed.

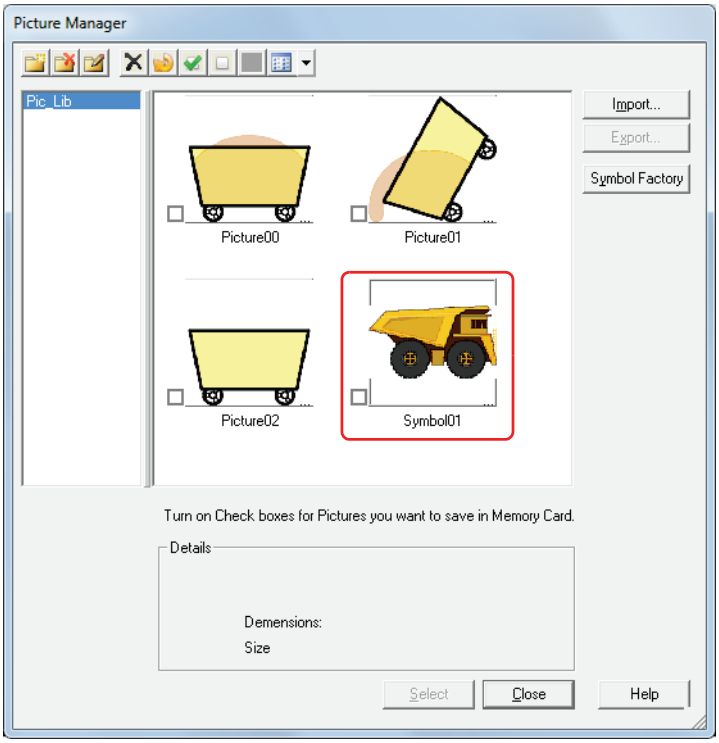
4 Enter the name of the graphic in **Picture Name**.
The maximum number is 256 characters.

You cannot use the following characters in the picture name.
\ / : , ; * ? " < > |



For HG2G-5F, HG3G/4G Open dialog box, click **Options** to **Apply Dithering** or **Color Exchange**. Click **Options** to toggle between showing and hiding the items. For details, refer to "Picture Name Setting dialog box" on page 2-36.

5 Click **OK**.
The picture is saved in Picture Manager.



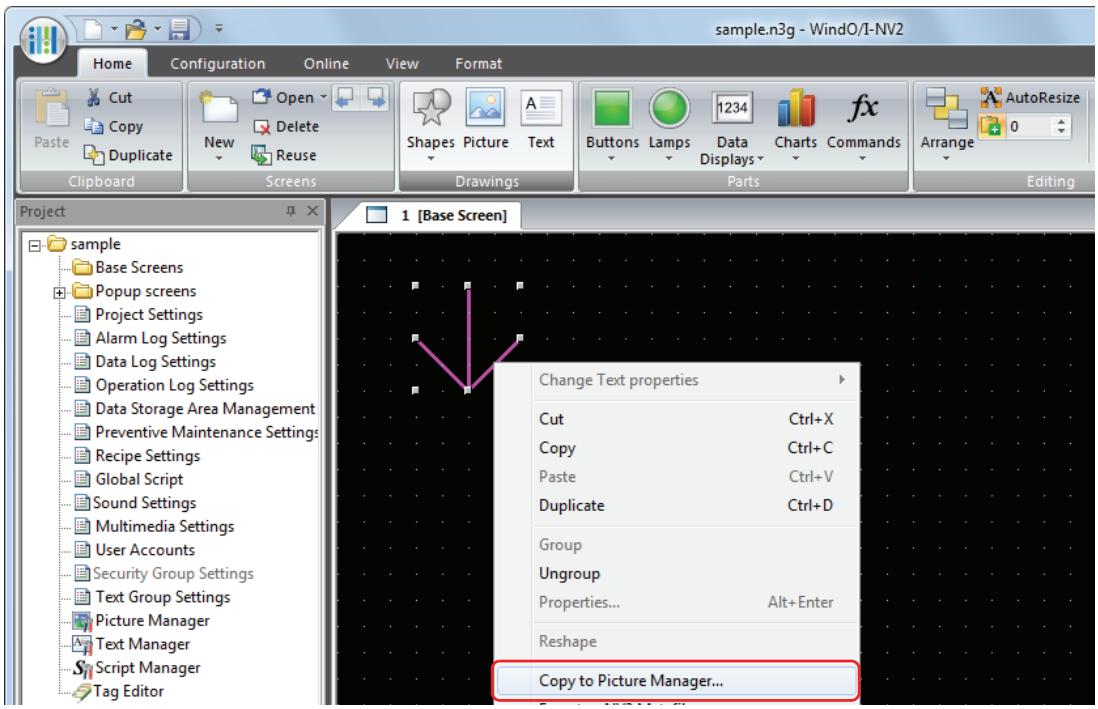
If a picture contains transparency or a picture is imported with the option of enabling the transparency, the transparency range is displayed in magenta (R: 255, G: 4, B: 255).

Saving drawing objects drawn on the editing screen

Drawing objects drawn on the editing screen are saved as pictures, in NMF (NV Metafile) format in Picture Manager.

1 Select and right-click the drawing object, then click **Copy to Picture Manager**.

The Picture Name Setting dialog box is displayed.



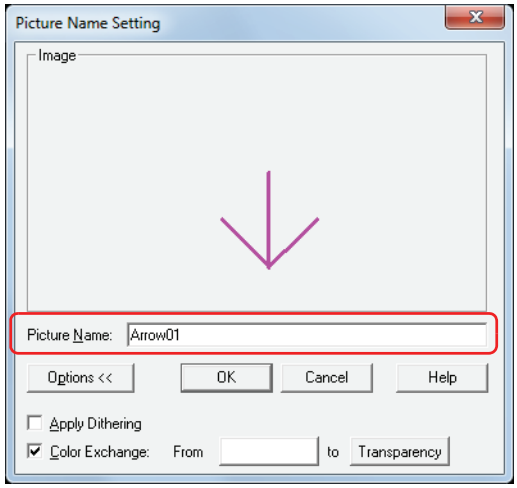
Grouped drawing objects can be saved to Picture Manager as a single picture.

2 Enter the name of the drawing object in **Picture Name**.

The maximum number is 256 characters.

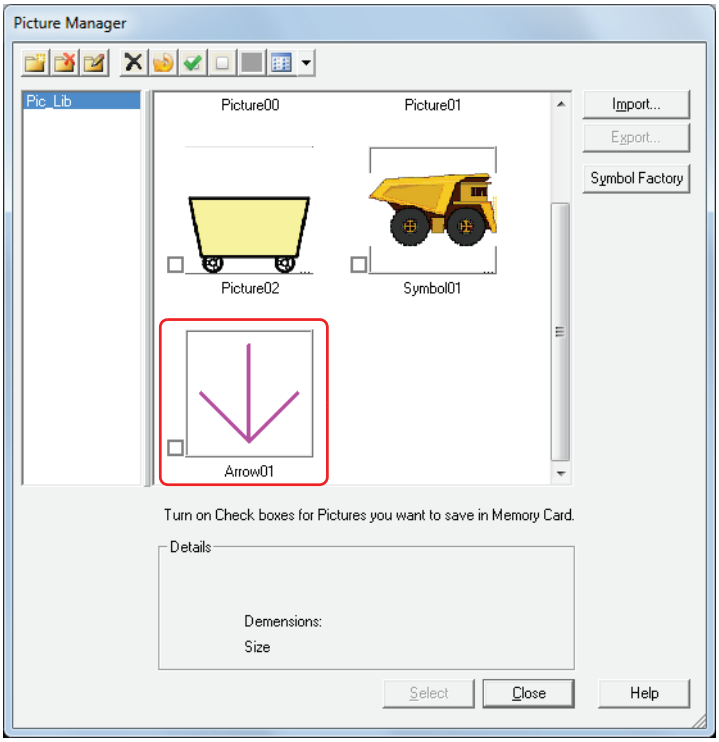
You cannot use the following characters in the picture name.

\ / : , ; * ? " < > |



For HG2G-5F, HG3G/4G Open dialog box, click **Options** to **Apply Dithering** or **Color Exchange**. Click **Options** to toggle between showing and hiding the items. For details, refer to "Picture Name Setting dialog box" on page 2-36.

3 Click **OK**.
The drawing object is saved in Picture Manager.



If a picture contains transparency or a picture is imported with the option of enabling the transparency, the transparency range is displayed in magenta (R: 255, G: 4, B: 255).

● Saving pictures as image files

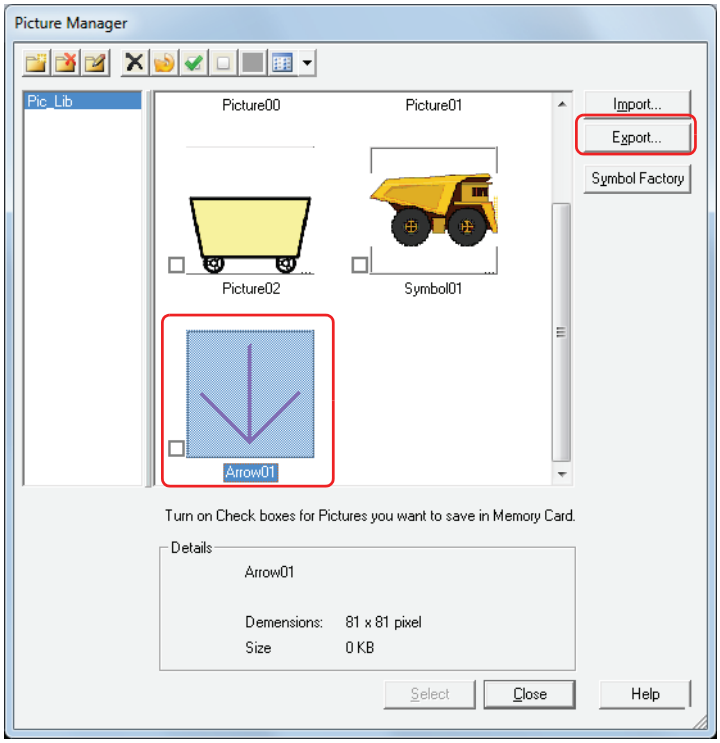
To use a picture saved in Picture Manager on another computer, save the picture as an image file.

1 Select a picture to export, and then click **Export**.

The Save As dialog box is displayed.

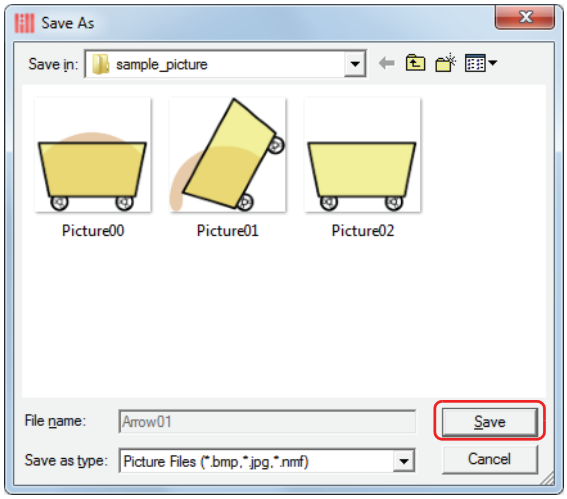
When Picture Manager is called from the Properties dialog box of an object arranged on the screen, **Export** is not enabled.

- To select multiple pictures, press and hold SHIFT or CTRL while you click the specific items.
- To save as an image file in NMF (NV Metafile) format, select and right-click the drawing object drawn on the editing screen, then click **Export as NV Metafile**.



2 Specify the save location in **Save in**, and then click **Save**.

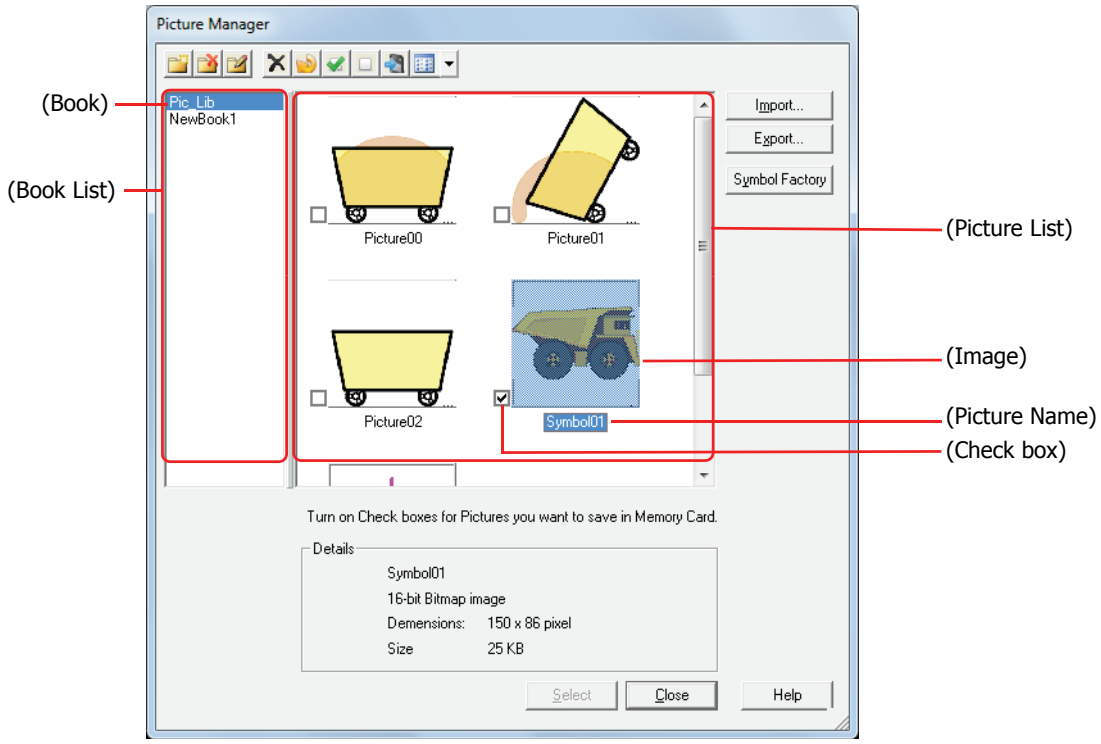
The picture name is entered as **File name**.



● Picture Manager

Pictures used in pictures of part diagrams and drawings are managed using Picture Manager.

For the HG2G-5F, HG3G/4G



■ **(New Book)**
Creates a new category in the **Book List**.
The default category name is "NewBook*n*" (*n*: Number).

■ **(Delete Book)**
Deletes a category from the **Book List**.

■ **(Rename Book)**
Changes the name of the category selected in the **Book List**. The maximum number is 256 characters.

> You cannot use the following characters in the category name.
> \ / : , ; * ? " < > |

■ **(Delete)**
Deletes the picture selected in the picture list. Pictures that are used in project or parts cannot be deleted.

■ **(Reduce)**
Deletes all the pictures not used in the project from the pictures saved in the picture list.

■ **(Check All)**
Selects all of the check boxes for the pictures registered to the picture list.

■ **(Reset)**
Clears all of the check boxes for the pictures registered to the picture list.

■ **(Write Picture Files to Memory Card)**
Saves the image files for the pictures selected with the check boxes to external memory.
Click this button to display the Select Memory Card Drive dialog box.

■ **(View)**
Change how items appear in the picture list. Click to select **Thumbnails** or **Details**.

(Book List)

Selects a category to save to when saving pictures.

When selecting a picture, select the category in which the arranged picture is saved.

The only default category is "Pic_Lib." To add a category, click (New Book).

(Book): The name of the category is displayed.

(Picture list)

The saved pictures are displayed as a list of images.

(Image): An image of the picture is displayed. If a picture contains transparency or a picture is imported with the option of enabling the transparency, the transparency range is displayed in magenta (R: 255, G: 4, B: 255).

(Picture Name): The name of the picture is displayed.

(Check box): Select this check box to save the picture data to external memory and use it.

Click (Write Picture Files to External Memory) to save the image files for the pictures selected with the check boxes to external memory.

When the picture data is saved to external memory, the amount of project data can be decreased, which allows you to save the internal memory on the MICRO/I. However, the display update rate of the pictures will become slower. To give priority to the display update rate, clear the check boxes.

Import

Save pictures in Picture Manager. Click this button to display the Open dialog box. For details, refer to "Saving image files" on page 2-20.

Supported file formats are as follows. When selecting images that are not in BMP (bitmap) or JPEG file format, the image is converted to a bitmap before saving.

- BMP (bitmap file)
- WMF (Windows Metafile)
- DXF and JPEG
- ICO (icon files)
- NMF (NV Metafile)

When saving image files in DXF format, take note of the following points.

- Compatible with AutoCAD Ver. 2.2 to 2002. Compatibility with AutoCAD LT97 is confirmed by IDEC.
- If TrueType fonts are used, there is no garbling of text when Japanese is included in files. SHX format is not supported.
- Errors may occur in conversion of coordinates, resulting in displacement of position. In addition, if an image is greatly reduced when resizing at the time of saving, lines in the picture may disappear.
- If either the height or width is set to 0 when saving, the aspect ratio is preserved with reference to the other dimension.

To save images in NMF format without conversion to bitmap file format, select and right-click the picture on the editing screen, and then click **Copy to Picture Manager** from the popup menu. For details, refer to "Saving drawing objects drawn on the editing screen" on page 2-24.

Export

Saves a picture selected in the picture list in BMP (bitmap), JPEG, or NMF (NV Metafile) file format, according to file type. Click this button to display the Save As dialog box. For details, refer to "Saving pictures as image files" on page 2-26.

Saved graphics can be saved using **Import**.

Symbol Factory

Display the Symbol Factory images. You can select an image provided by Symbol Factory on your project data. For details, refer to "Symbol Factory" on page 2-33.

■ **Details**
Displays detailed information about pictures selected in the picture list.

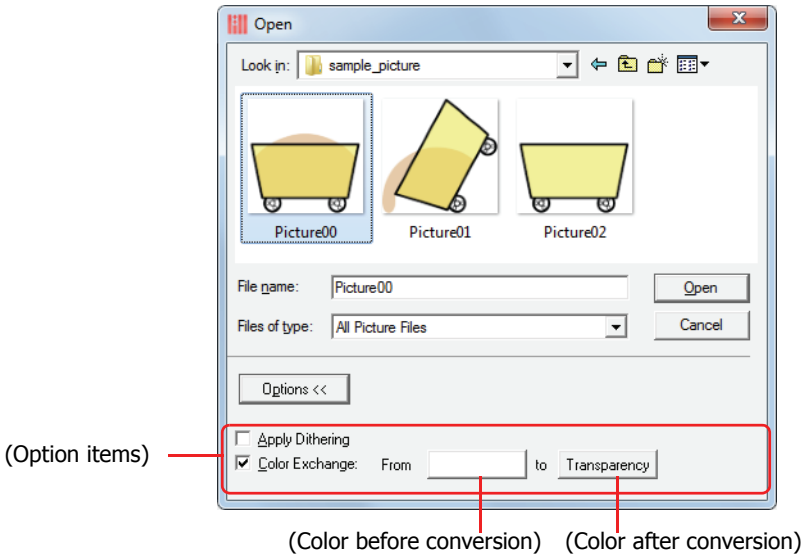
(Picture Name):	Displays the picture name.
(File Type):	Displays the file type.
Dimensions:	Displays the size of the picture (W×H) in pixels
Size:	Displays the size of the file (KB).

■ **Select**
Closes Picture Manager and sets the picture selected in the picture list.

■ **Close**
Closes Picture Manager.

Open Dialog Box

By clicking **Options**, you have the option to set the **Apply Dithering** and **Color Exchange** for the image to be registered in the Picture Manager.



■ **Options <<**
Toggles between showing and hiding the option items.

■ **Apply Dithering**
Selects this check box to perform dithering (error diffusion method) on images.
This function enables some images with tonal gradations and photo-like pictures to be rendered more beautifully when they are saved.

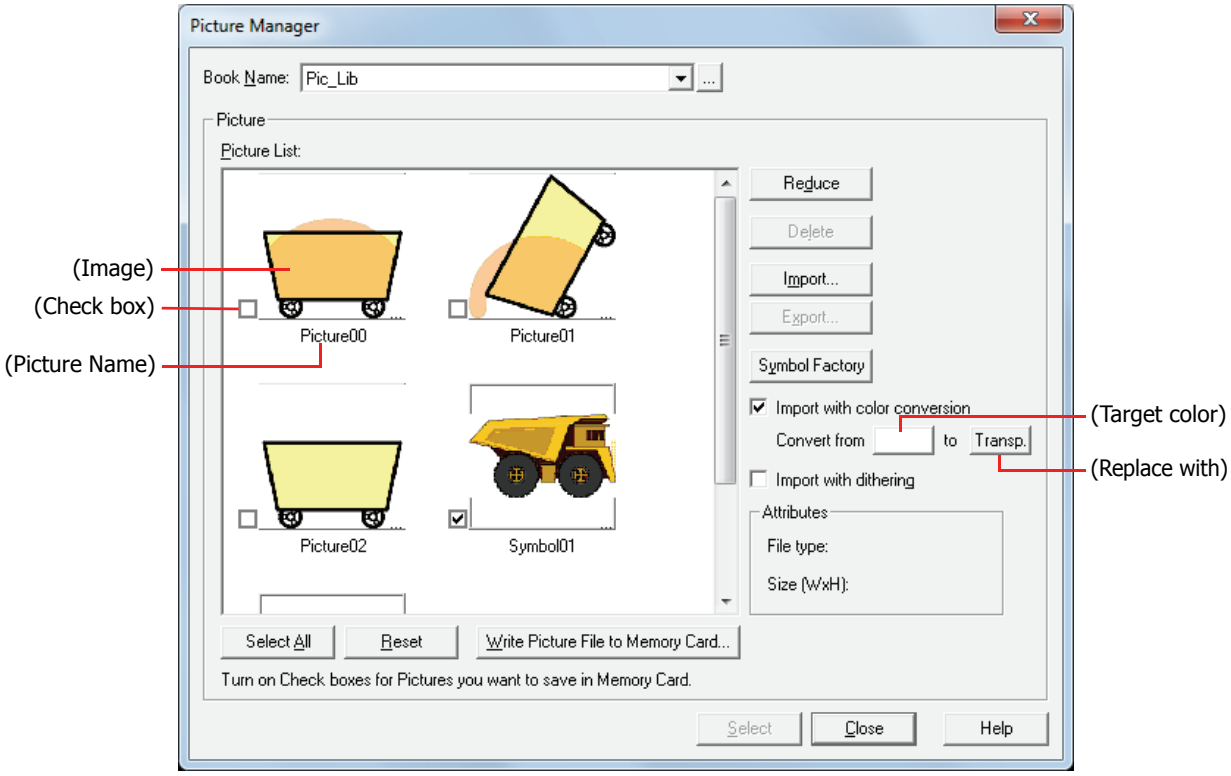
■ **Color Exchange**
Selects this check box to convert the color of the picture.

From: Specifies color before conversion. Click this button to display the Color Settings dialog box. Specify the color, and then click **OK**.

to: Selects the color after conversion (color: 256 colors, monochrome: 8 shades). Click this button to display the Color Palette. Select a color from the Color Palette. **Transparency** can also be selected.

> If a color conversion to transparent is done when the monitor used for WindO/I-NV2 is a 16-bit color or 256-color display, even colors other than the color specified in (Color before conversion) may appear transparent. However, on the MICRO/I they will appear normally.

For the HG2G-S/-5S, HG1F/2F/2S/3F/4F



■ **Book Name**

Selects a category to save to when saving pictures.

When selecting a picture, select the category in which the arranged picture is saved.

The default category is "Pic_Lib." To manage pictures by categories, create the category with the Book Maintenance dialog box. Click ... to display the Book Maintenance dialog box. For details, refer to "Book Maintenance Dialog Box" on page 2-32.

■ **Picture**

Picture List: The saved pictures are displayed as a list of images.

(Image): An image of the picture is displayed. If a picture contains transparency or a picture is imported with the option of enabling the transparency, the transparency range is displayed in magenta (R: 255, G: 4, B: 255).

(Check box): Select this check box to save the picture data to external memory and use it.

Click **Write Picture File to Memory Card** to save all the pictures selected with the check boxes to a single file on external memory.

(Picture Name): The name of the picture is displayed.

When the picture data is saved to external memory, the amount of project data can be decreased, which allows you to save the internal memory on the MICRO/I. However, the display update rate of the pictures will become slower. To give priority to the display update rate, clear the check boxes.

Reduce: Deletes all the pictures not used in the project from the pictures saved in the picture list.

Delete: Deletes the picture selected in the picture list. Pictures that are used in project or parts cannot be deleted.

Import: Save pictures in Picture Manager. Click this button to display the Open dialog box. For details, refer to "Saving image files" on page 2-20.

Supported file formats are as follows. When selecting images that are not in a bitmap file format, the image is converted to a bitmap before saving.

- BMP (bitmap file)
- WMF (Windows Metafile)
- DXF and JPEG
- ICO (icon files)
- NMF (NV Metafile)

When saving image files in DXF format, take note of the following points.

- Compatible with AutoCAD Ver. 2.2 to 2002. Compatibility with AutoCAD LT97 is confirmed by IDEC.
- If TrueType fonts are used, there is no garbling of text when Japanese is included in files. SHX format is not supported.
- Errors may occur in conversion of coordinates, resulting in displacement of position. In addition, if an image is greatly reduced when resizing at the time of saving, lines in the picture may disappear.
- If either the height or width is set to 0 when saving, the aspect ratio is preserved with reference to the other dimension.

To save images in NMF format without conversion to bitmap file format, select and right-click the picture on the editing screen, and then click **Copy to Picture Manager** from the popup menu. For details, refer to "Saving drawing objects drawn on the editing screen" on page 2-24.

Export: Saves a picture selected in the picture list in BMP (bitmap) or NMF (NV Metafile) format, according to file type. Click this button to display the Save As dialog box. For details, refer to "Saving pictures as image files" on page 2-26.

Saved graphics can be saved using **Import**.

Symbol Factory: Display the Symbol Factory images. You can select an image provided by Symbol Factory on your project data. For details, refer to "Symbol Factory" on page 2-33.

Import with color conversion: Select this check box to exchange a color when importing the picture.

(Target color): Specifies color before conversion. Click this button to display the Color Settings dialog box. Specify the color, and then click **OK**.

(Replace with): Selects the color after conversion (color: 256 colors, monochrome: 16 shades). Click this button to display the Color Palette. Select a color from the Color Palette.

To make the background color of the picture saved from Symbol Factory transparent, set (Color Before Conversion) and **Background Color** in the Symbol Options dialog box to R: 254, G: 254, B: 254.

When the monitor used for WindO/I-NV2 is a 16-bit color or 256-color display, there is a risk that one or more of the following phenemona occurs.

- When a color conversion to transparent is done, even colors other than the color specified in (Color Before Conversion) may appear transparent. However, on the MICRO/I they will appear normally.
- If converting a background color in Symbol Factory, an image that is copied to the clipboard may have its colors reduced to the number of colors displayed by the computer monitor. For this reason, the color setting will not match and the color conversion will not be performed.
  Save the image again after changing the background color to another color in Symbol Factory.
  For example, if the default color (R: 254, G: 254, B: 254) in (Color before conversion) is used, and **Background Color** in Symbol Options dialog box is set to R: 254, G: 254, B: 254, the number of monitor colors will match, even if it's 256, so the color conversion will be performed.

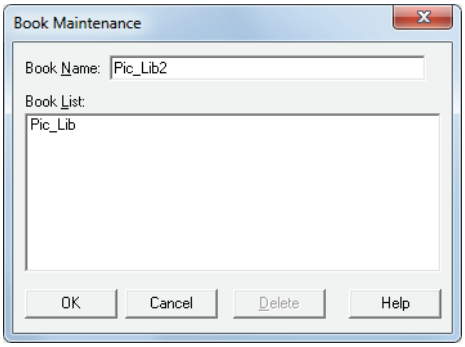
Import with dithering:	Select this check box to perform dithering (error diffusion method) when importing the picture. When importing pictures such as images with gradients and photos, they may be imported with better quality when this check box is selected rather than when it is cleared.
Attributes:	Displays detailed information about pictures selected in the picture list. File type: Displays the file type. Size (W x H): Displays the size of the picture (W×H) in pixels
Select All:	Selects all of the check boxes for the pictures registered to the picture list.
Reset:	Clears all of the check boxes for the pictures registered to the picture list.
Write Picture File to Memory Card:	Saves all the pictures selected with the check boxes to a single file in the memory card. Click this button to display the Select Memory Card Drive dialog box.

■ **Select**
Closes Picture Manager and sets the picture selected in the picture list.

■ **Close**
Closes Picture Manager.

Book Maintenance Dialog Box

Manage the categories where pictures are registered.



■ **Book Name**
Enter the name of the new category. The maximum number of characters is 256 characters.

You cannot use the following characters in the **Book Name**.
\ / : , ; * ? " < > |

■ **Book List**
Shows the list of existing categories.

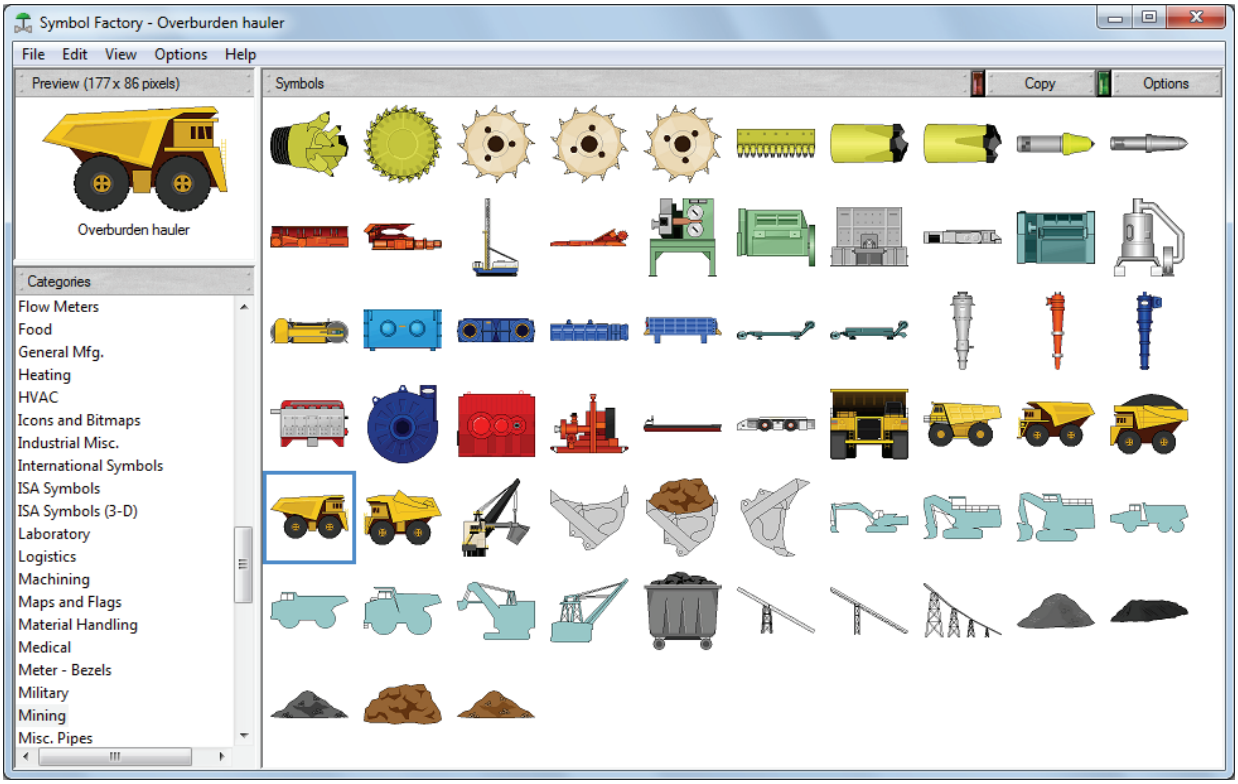
■ **Delete**
Deletes the category selected on the **Book List**.

■ **OK**
Creates the category entered in **Book Name** and closes the Book Maintenance dialog box.

■ **Cancel**
Cancels creating the category and closes the Book Maintenance dialog box.

Symbol Factory

Symbol Factory is an English-version library tool that offers 5,000 images.

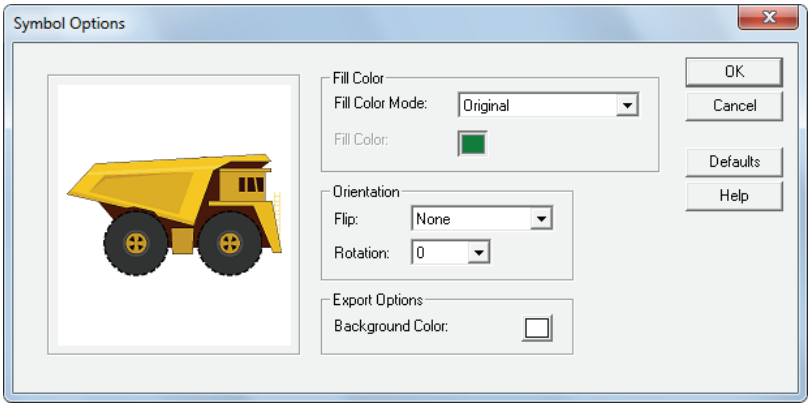


For details, see online help for Symbol Factory.

- **Preview**
  Image size (W×H in pixels) and preview of the picture are displayed.
- **Categories**
  The images supplied by Symbol Factory are divided into categories. Selects categories of pictures saved in Picture Manager.
- **Symbols**
  The pictures in the selected category are displayed in a list. Selects a picture saved in Picture Manager.
- **Copy**
  Copy a picture selected from the **Symbols** to Picture Manager. Click this button to display the Picture Name Setting dialog box.
- **Options**
  Modify the fill and background color and flip or rotate shapes. Click this button to display the Symbol Options dialog box.

Symbol Options Dialog Box

Modify the fill color and background color, and to flip or rotate shapes. The settings made here are applied to all the pictures in Symbol Factory.



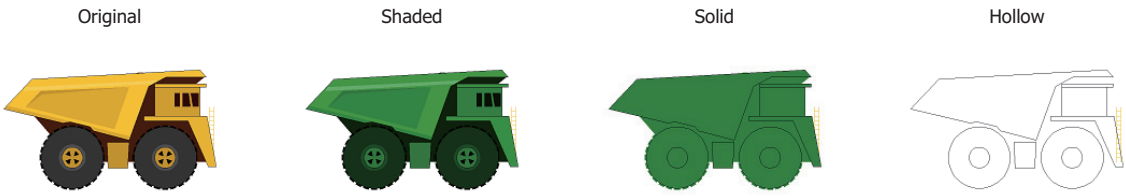
■ Fill Color

Fill Color Mode: Select from the following picture color conversion methods.

- Original: The color of the image is not changed.
- Shaded: The image filled with different shades of the color selected in **Fill Color** (for a 3D effect).
- Solid: The image is filled uniformly in the color selected in **Fill Color**.
- Hollow: All color is deleted.

Fill Color: Selects the color used for **Shaded** or **Solid** modes. Click this button to display the Color Settings dialog box. Select a color from the Color Palette.

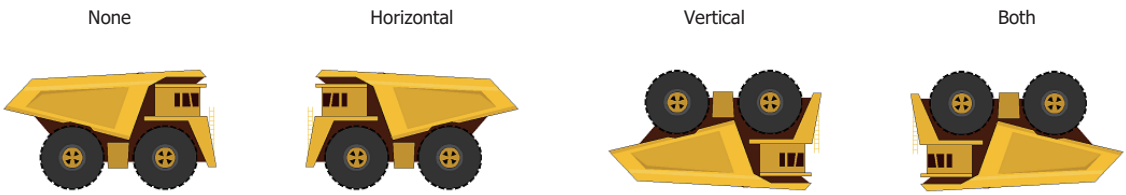
This option can only be set when **Shaded** or **Solid** are selected as the **Fill Color Mode**.



■ Orientation

Flip: Select from the following flipping methods.

- None: The image is not flipped.
- Horizontal: The image is flipped horizontally.
- Vertical The image is flipped vertically.
- Both The image is flipped both horizontally and vertically.



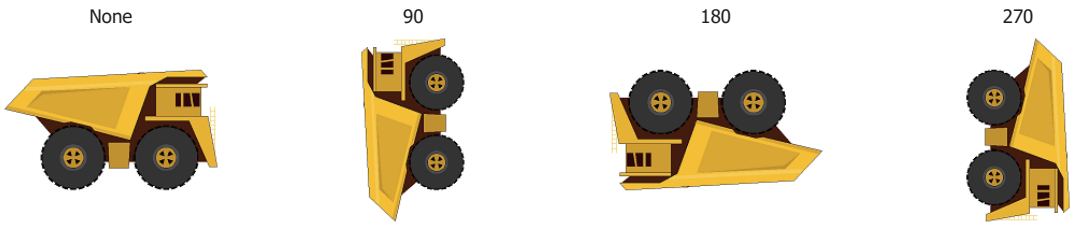
Rotation: Select from the following rotation methods.

0: The image is not rotated.

90: The image is rotated 90° counterclockwise.

180: The image is rotated 180° counterclockwise.

270: The image is rotated 270° counterclockwise.



- **Background Color**
  Selects the background color of the image when saving an image in Picture Manager or exporting an image using **Export Symbol** from the **File** menu. Click this button to display the Color Settings dialog box. Select a color from the Color Palette.

  When exporting an image in VML or SVG format by clicking **Export Symbol** from the **File** menu, this setting is not applied.

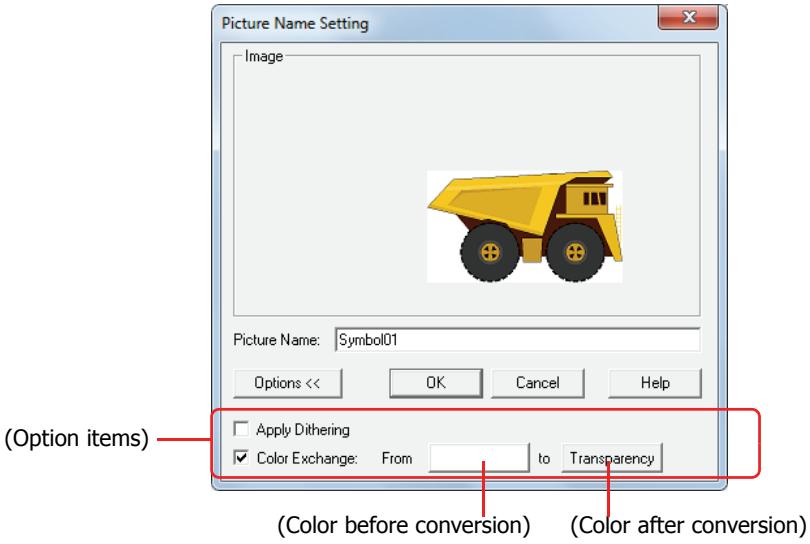
- **OK**
  Saves the setting to close the Symbol Options dialog box.

- **Cancel**
  Closes the Symbol Options dialog box without saving the setting.

- **Defaults**
  Set options are returned to their default values.

Picture Name Setting dialog box

Specifies a name for images saved in Picture Manager.



■ **Image**

An image of the picture is displayed.

■ **Picture name**

Enter a name for the picture. The maximum number is 256 characters.

> You cannot use the following characters in the picture name.
> \ / : , ; * ? " < > |

■ **Options <<**[*1]

Toggles between showing and hiding the option items.

■ **OK**

Saves the image in Picture Manager.

■ **Cancel**

Stops saving the image.

■ **Apply Dithering**[*1]

Select this check box to perform dithering (error diffusion method) on images.
This function enables some images with tonal gradations and photo-like pictures to be rendered more beautifully when they are saved.

■ **Color Exchange**[*1]

Select this check box to convert the color of the picture.

From: Specifies color before conversion. Click this button to display the Color Settings dialog box. Specify the color, and then click **OK**.

to: Selects the color after conversion (color: 256 colors, monochrome: 8 shades). Click this button to display the Color Palette. Select a color from the Color Palette. **Transparency** can also be selected.

> When the monitor used for WindO/I-NV2 is a 16-bit color or 256-color display, there is a risk that one or more of the following phenemona occurs.
> - When a color conversion to transparent is done, even colors other than the color specified in (Color Before Conversion) may appear transparent. However, on the MICRO/I they will appear normally.
> - If converting a background color in Symbol Factory, an image that is copied to the clipboard may have its colors reduced to the number of colors displayed by the computer monitor. For this reason, the color setting will not match and the color conversion will not be performed.
> Save the image again after changing the background color to another color in Symbol Factory.
> For example, if the default color (R: 254, G: 254, B: 254) in (Color before conversion) is used, and **Background Color** in Symbol Options dialog box is set to R: 254, G: 254, B: 254, the number of monitor colors will match, even if it's 256, so the color conversion will be performed.

> To make the background color of the picture saved from Symbol Factory transparent, set (Color Before Conversion) and **Background Color** in the Symbol Options dialog box to R: 254, G: 254, B: 254.

*1 HG2G-5F, HG3G/4G only

1.5 Available Sound Files

The sound file formats that can be played on the MICRO/I are as follows.

Item	Description
File format	Wave files (.wav)
Data format	PCM
Sampling rate	8 kHz to 44.1 kHz
Quantization bit rate	16-bit
Audio type	Mono or stereo
File size	Max. 512 KB

1.6 Available Movie Files

Movie files that meet the following specifications can be played with the MICRO/I:

Item	Description
File format	MP4 file (.mp4)
Movie	MPEG-4 Simple Profile
Audio	AAC-LC (Bit rate 32 kbps or less recommended)
Frame rate	30 fps or less (15 fps or less recommended)
Resolution	720 x 480 dots or less (640 x 480 dots or less recommended)
File size	64 Mbyte or less (32 Mbyte or less recommended)

The MICRO/I may not be able to play the formats above correctly depending on the minimum system requirements. In this situation, shrink the size of the file by lowering the frame rate or the resolution of the file or by lowering the bit rate of the audio. If audio is unnecessary, set to a file without sound.

2 Starting and Exiting WindO/I-NV2

2.1 Starting WindO/I-NV2

- **Windows 10**
  Click **Start**, click **All Apps**, click **IDEC Automation Organizer**, and then click **WindOI-NV2**.
- **Windows 8**
  On the **Start** screen tiles, click **WindOI-NV2**.
- **Windows 7**
  Click **Start**, click **Programs**, click **IDEC Automation Organizer**, and then click **WindOI-NV2**.

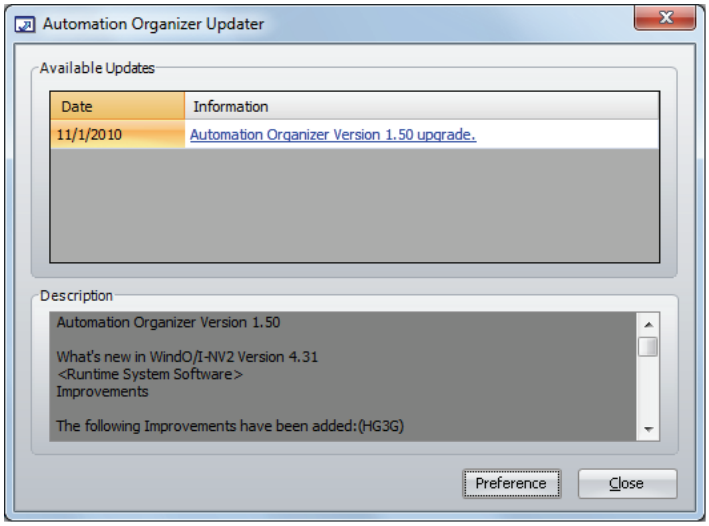
WindO/I-NV2 starts.

You can also start WindO/I-NV2 by double-clicking WindO/I-NV2 icon on the desktop.

● Automation Organizer Updater dialog box

Automation Organizer Updater dialog box is a feature that keeps WindO/I-NV2 up to date.

If a new version of Automation Organizer is released, the Automation Organizer Updater dialog box is displayed when WindO/I-NV2 starts.



In order to display the Automation Organizer Updater, your computer must be connected to the Internet.

■ Available Updates

Date	Shows the date the software was released.
Information	Shows the software's title and version. Click on this link to connect to IDEC's download site. The software can be updated by downloading and running the latest version.

■ Description

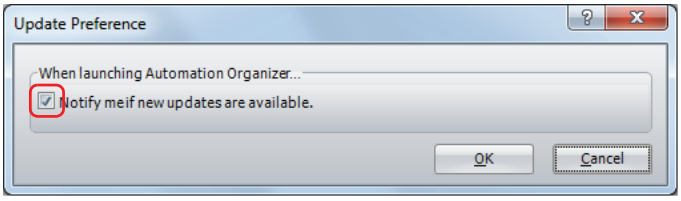
This area shows the details of the latest changes in the software.

■ Preference

The Update Preference dialog box is displayed when this button is clicked.

To update information when WindO/I-NV2 starts, check this check box.

The Automation Organizer Updater dialog box will be displayed when there is an update.

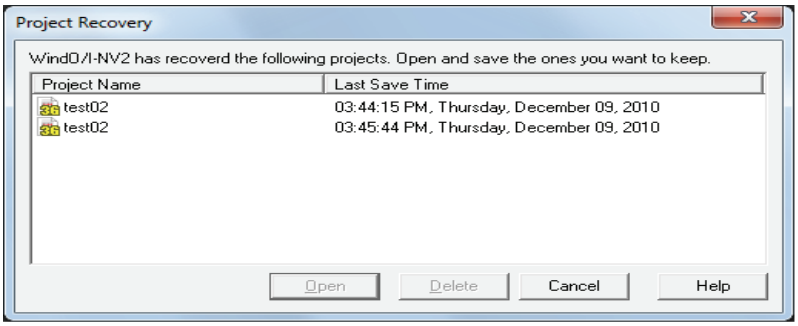


■ Close

Closes the Automation Organizer Updater dialog box and start WindO/I-NV2.

● Project Recovery dialog box

The Project Recovery dialog box is a feature to restore edited project data if your computer crashes while you were editing. With this feature, you can return crashed the project to its last-saved state and restore project data that was being edited. The Project Recovery dialog box is displayed if there is crashed project data when WindO/I-NV2 starts.



■ **(Recovery data list)**

This list shows recoverable data for a crashed project.

Project Name: Shows the project name.

Last Save Time: Shows the date and time when the data was last saved.

■ **Open**

Select the recovery data from the list and click this button to open the project data. The recovery data is deleted when the project data is saved.

■ **Delete**

Deletes the recovery data.

■ **Cancel**

Closes the Project Recovery dialog box.

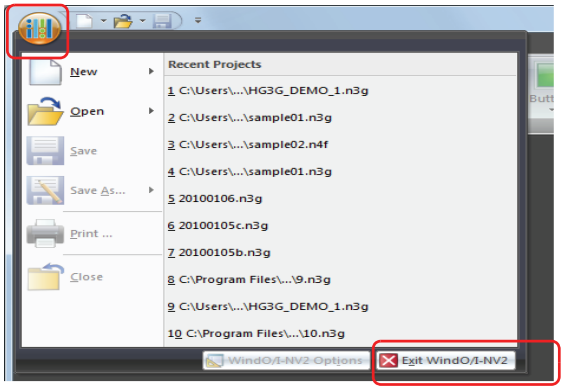
Recovery data is not deleted. The Project Recovery dialog box will be displayed again the next time WindO/I-NV2 starts.

If WindO/I-NV2 crashes in a state where you edit a screen and perform **Save Screens** after saving the project data, the screen is not saved in the project data. Select the recovery data with the Project Recovery dialog box and recover the project data.

2.2 Exiting WindO/I-NV2

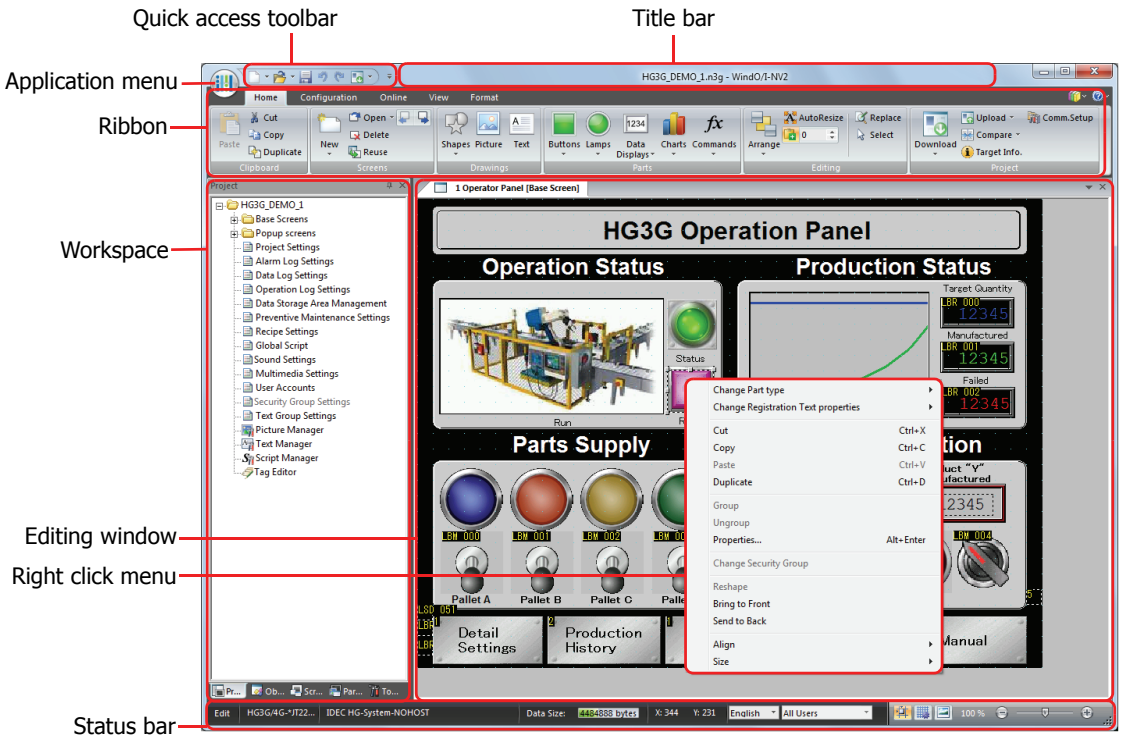
Click and then click **Exit WindO/I-NV2**.

WindO/I-NV2 ends.



3 Configuration & Functions

This section describes the names and functions that make up WindO/I-NV2.



- **Title bar**
  The title bar shows the name of the project being edited and the name of this software, "WindO/I-NV2".

- **Application menu**
  The application menu displays commands for handling project data such as commands for creating new project data, opening project data, and saving project data. For details, refer to "3.1 Application Menu Command List" on page 2-42.

- **Quick access toolbar**
  The quick access toolbar is an area where you can locate commands that you use frequently. You can customize this toolbar by adding or deleting buttons. For details, refer to "3.2 Quick Access Toolbar" on page 2-43.

- **Ribbon**
  The ribbon shows commands for creating project data and transferring data to the MICRO/I. Common commands are separated into their own tabs, so you can quickly execute. For details, refer to "3.3 Ribbon Command List" on page 2-46.

- **Workspace**
  The workspace is the area where the **Project** window, the **Object List** window, the **Screen List** window, the **Part List** window, and the **Toolbox** window are located. You can change the position and method for displaying windows in the workspace. For details, refer to "3.4 Windows Displayed in the Workspace" on page 2-54.

- **Editing window**
  The editing window is the area for editing Base Screens, Popup Screens, and Library Screens.

- **Right click menu**
  The right click menu is a popup menu that is displayed when right clicking the mouse on drawing objects and parts in a list. It displays context sensitive commands.

- **Status bar**
  The status bar shows information such as the O/I type, host I/F driver, project data size, and cursor position. You can change the items displayed on the status bar. For details, refer to "3.5 Status Bar" on page 2-58.

3.1 Application Menu Command List

Commands that can be executed from the application button are listed below.

Command		Description
New	Interactive Quick Start	Creates project data by configuring settings displayed in dialog boxes step by step.
	From Templates	Creates project data using templates provided with WindO/I-NV2.
Open	WindO/I-NV2 Project	Opens project data that has already been created.
	Previous Format Project	Opens project data that was created with WindO/I-NV2 Ver. 2.7 or earlier.
	Other Formats	Opens project data uploaded from a MICRO/I with Downloader and project data saved in the Downloader format.
Save		Saves the project data being edited.
Save As	WindO/I-NV2 Project	Saves the project data being edited with a new name.
	Other Formats	Converts the project data being edited to data that can be used with Downloader and saves it.
Print		Prints the contents of the project data being edited.
Close		Closes the project data being edited.
Recent Projects		Shows the list of recently used project data, up to a maximum of ten items.
WindO/I-NV2 Options		Customizes WindO/I-NV2 and configures the work environment.
Exit WindO/I-NV2		Exits WindO/I-NV2.

3.2 Quick Access Toolbar

● Quick access toolbar buttons and menus

Click on a quick access toolbar button or click on ▼ to the right of a button and then click on the displayed command to execute that command.

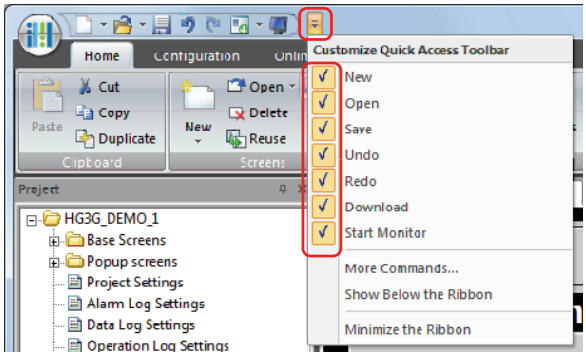
● Customizing the quick access toolbar

If you click the (Customize Quick Access Toolbar) button, the Customize Quick Access Toolbar menu is displayed.

You can change the quick access toolbar to any desired settings.

■ **Changing the buttons displayed on the quick access toolbar**

Check only the buttons you wish to display on the quick access toolbar.

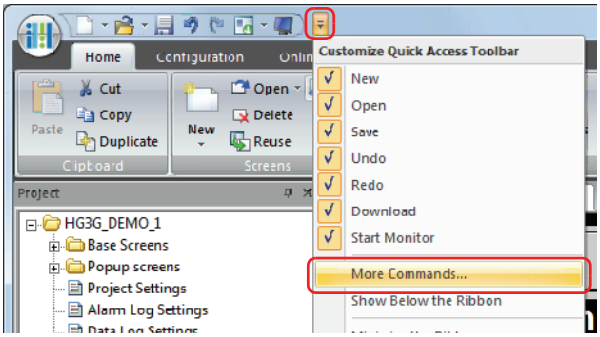


■ **More Commands**

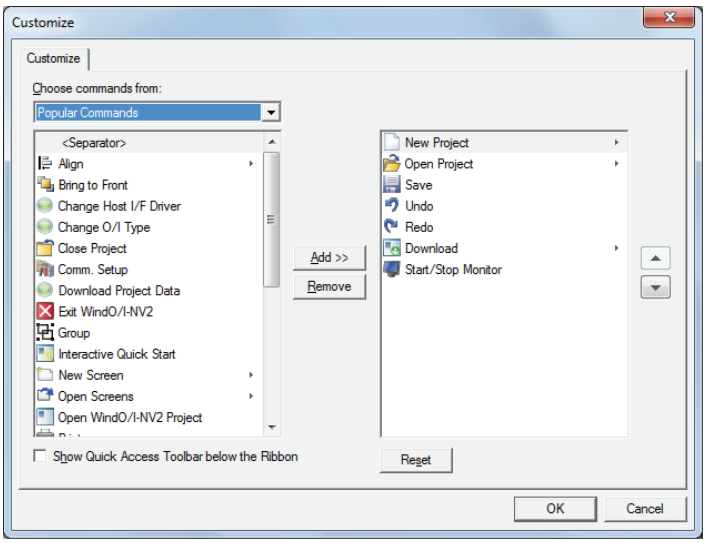
You can add or delete quick access toolbar commands.

1 Click the button on the quick access toolbar and then click **More Commands**.

The Customize dialog box is displayed.



2 Add or delete commands.



To add a command

1 Select the command to add in **Choose commands from**.
2 Click on the command to add from the list and then click the **Add>>** button.
The command is added.

To delete a command

Click the command to delete and then click the **Remove** button.

The command is deleted.

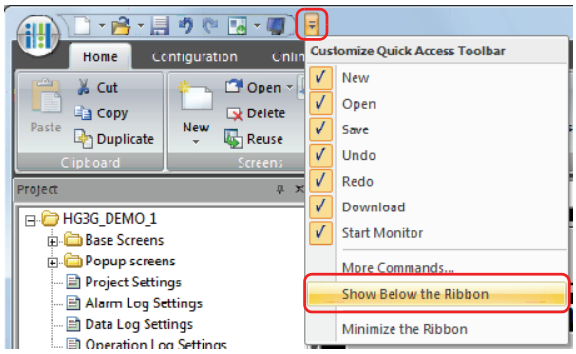
If you right click a command on the quick access toolbar and click **Remove from Quick Access Toolbar**, that quick access toolbar command can be deleted.

- To change the order of the commands, click a command and then click the ▲ button or the ▼ button.
- To return to the quick access toolbar to its default settings, click the **Reset** button.

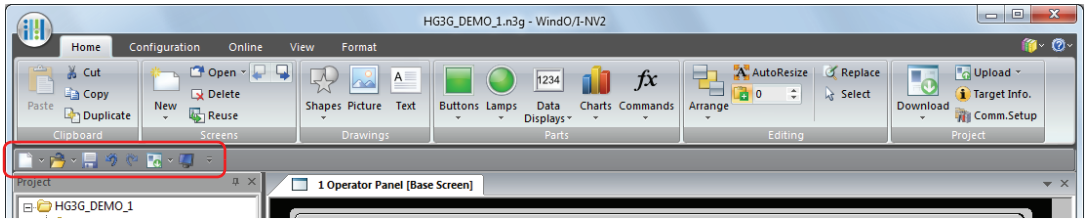
■ Show Below the Ribbon

You can change the position of the quick access toolbar to be located below the ribbon.

Click the button on the quick access toolbar and then click **Show Below the Ribbon**.



The quick access toolbar moves below the ribbon.



You can also change the quick access toolbar display position to be below the ribbon with the following methods.

- Right click the quick access toolbar or the ribbon and then click **Show Quick Access Toolbar Below the Ribbon**.
- Select the **Show Quick Access Toolbar below the Ribbon** check box on the Customize dialog box.

To return the quick access toolbar to its original position, click the button and then click **Show Above the Ribbon**.

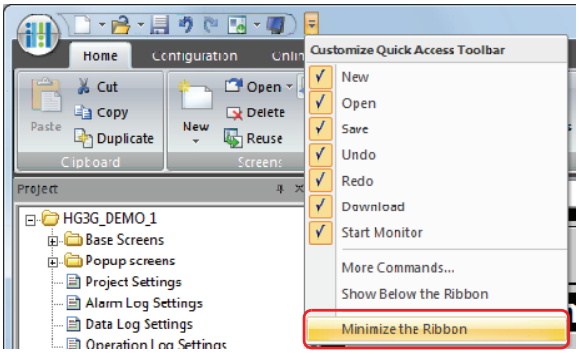
You can also return the quick access toolbar to its original position with the following methods.

- Right click the quick access toolbar or the ribbon and then click **Show Quick Access Toolbar Above the Ribbon**.
- Select the **Show Quick Access Toolbar below the Ribbon** check box on the Customize dialog box.

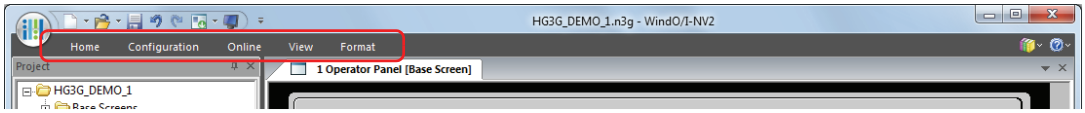
Minimize the Ribbon

You can change the format of the ribbon to be displayed only as tabs.

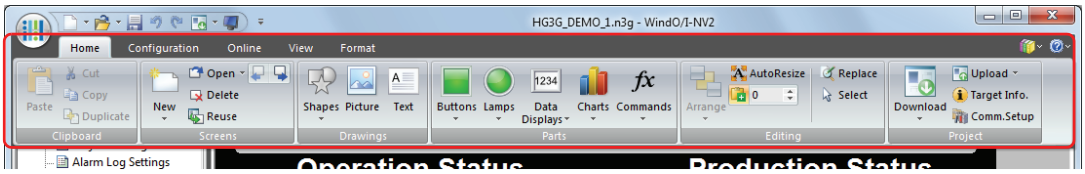
Click the button on the quick access toolbar and then check **Minimize the Ribbon**.



The ribbon is displayed as only tabs.



Click on a tab to display its commands.



To return the ribbon to its original state, click the button and then click on the **Minimize the Ribbon** to remove the check mark.

You can also change the ribbon to be displayed as only tabs with the following methods.

- Right click the quick access toolbar or the ribbon and then click **Minimize the Ribbon**.
- Double click a tab.

3.3 Ribbon Command List

● Home

Home is where basic operations are performed such as creating a new screen, editing, and downloading project data.

■ Clipboard

Command	Description
Paste	Pastes the contents of the clipboard.
Cut	Cuts the selected object from the editing window and copies it to the clipboard.
Copy	Copies the selected object to the clipboard.
Duplicate	Duplicates the selected object.

■ Screens

Command		Description
New	Base Screen	Adds a new Base Screen.
	Popup Screen	Adds a new Popup Screen.
	Library Screen	Creates a new Library Screen.
Open	Base Screen	Opens a Base Screen that has already been created.
	Popup Screen	Opens a Popup Screen that has already been created.
	Library Screen	Opens a Library Screen that has already been created.
Open Previous Screen		Opens a screen number before the currently selected screen.
Open Next Screen		Opens a screen number after the currently selected screen.
Delete		Deletes the selected screen.
Reuse		Copies another project's screens.

■ Drawings

Command		Description
Shapes	Line	Draws a line.
	Polyline	Draws a polyline.
	Polygon	Draws a polygon.
	Rectangle	Draws a rectangle.
	Circle/Ellipse	Draws a circle or ellipse.
	Arc	Draws an arc.
	Pie	Draws a pie.
	Equilateral Polygons	Draws equilateral polygons (equilateral triangle, equilateral diamond, equilateral pentagon, equilateral hexagon, equilateral octagon).
	Fill	Fills the region with the same color as the fill start point with the specified color and pattern.
Picture		Inserts a picture.
Text		Inserts text.

■ **Parts**

Command		Description
Buttons	Bit Button	Inserts a Bit Button.
	Word Button	Inserts a Word Button.
	Goto Screen Button	Inserts a Goto Screen Button.
	Print Button	Inserts a Print Button.
	Key Button	Inserts a Key Button.
	Multi-Button	Inserts a Multi-Button.
	Keypad	Inserts a Keypad.
	Selector Switch	Inserts a Selector Switch.
	Potentiometer	Inserts a Potentiometer.
Lamps	Pilot Lamp	Inserts a Pilot Lamp.
	Multi-State Lamp	Inserts a Multi-State Lamp.
Data Displays	Numerical Input	Inserts a Numerical Input.
	Character Input	Inserts a Character Input.
	Picture Display	Inserts a Picture Display.
	Video Display	Inserts a Video Display.
	Message Display	Inserts a Message Display.
	Message Switching Display	Inserts a Message Switching Display.
	Alarm List Display	Inserts an Alarm List Display.
	Alarm Log Display	Inserts an Alarm Log Display.
	Numerical Display	Inserts a Numerical Display.
	Calendar	Inserts a Calendar.
Charts	Bar Chart	Inserts a Bar Chart.
	Line Chart	Inserts a Line Chart.
	Pie Chart	Inserts a Pie Chart.
	Meter	Inserts a Meter.
Commands	Bit Write Command	Inserts a Bit Write Command.
	Word Write Command	Inserts a Word Write Command.
	Goto Screen Command	Inserts a Goto Screen Command.
	Print Command	Inserts a Print Command.
	Script Command	Inserts a Script Command.
	Multi-Command	Inserts a Multi-Command.
	Timer	Inserts a Timer.

Editing

Command			Description
Arrange	Bring to Front		Moves the selected object to the front.
	Send to Back		Moves the selected object to the back.
	Group		Groups multiple objects.
	Ungroup		Cancels the group.
	Align	Align Left	Aligns selected objects to the left.
		Align Center	Aligns selected objects to the center.
		Align Right	Aligns selected objects to the right.
		Align Top	Aligns selected objects to the top.
		Align Middle	Aligns selected objects to the middle.
		Align Bottom	Aligns selected objects to the bottom.
		Make Horizontal Spacing Equal	Aligns selected objects to be equally spaced horizontally.
		Make Vertical Spacing Equal	Aligns selected objects to be equally spaced vertically.
	Rotate	Rotate Right 90°	Rotates selected drawing objects 90° to the right.
		Rotate Left 90°	Rotates selected drawing objects 90° to the left.
		Flip Vertical	Flips selected drawing objects vertically.
		Flip Horizontal	Flips selected drawing objects horizontally.
Replace			Automatically replaces a specified device address with a separate device address.
Select			Selects objects in the editing window.
AutoResize			Automatically changes the text size to the object's size and display region.
Increment Address			Enables or disables the increment address function. A specific value is added to the value of the object's device address when pasting and duplicating parts.

Project

Command		Description
Download	Project Data	Downloads project data to the MICRO/I.
	Data to Memory Card	Stops the MICRO/I and then downloads files to the memory card inserted in the MICRO/I. The MICRO/I resumes running when files have finished downloading.
	Data to Memory Card while running	Downloads files to the memory card inserted in the MICRO/I without stopping it.
Upload	Project Data	Uploads project data from the MICRO/I.
	Stored Data in Memory Card	Uploads data from the Memory Card Folder for the currently running project.
Compare	Compare Projects	Compares the screen data and scripts in an existing project with the project data currently being edited and displays the results of that comparison.
	Re-verify	Updates the comparison results to the most latest state.
Target Info.		Displays version information for the MICRO/I system software and project information.
Comm.Setup		Configures the communication target and communication conditions between the target and the MICRO/I or between the computer and the MICRO/I.

● Configuration

Configuration is where you configure the system settings for the MICRO/I that will use the project data being edited.

■ System Setup

Command	Description
Project	Configures MICRO/I operations and functions.
Alarm Log	Configures the alarm log.
Data Log	Configures the data log.
Operation Log	Configures the operation log.
Data Storage Area	Changes the allocation of the data storage area.
Preventive Maintenance	Configures the preventative maintenance function.
Recipe	Configures recipes.
Text Group	Configures text groups.
Global Script	Configures one global script.
Sound	Configures the sound function.
Multimedia	Configures the multimedia function.

■ Protect

Command	Description
User Accounts	Configures security function, user accounts, and passwords.

● Online

Online is where you download created project data and files to the MICRO/I, where you upload data from the MICRO/I, and where you perform monitoring.

■ Transfer

Command		Description
Download	Project Data	Downloads project data to the MICRO/I.
	Data to Memory Card	Stops the MICRO/I and then downloads files to the memory card inserted in the MICRO/I. The MICRO/I resumes running when files have finished downloading.
	Data to Memory Card while running	Downloads files to the memory card inserted in the MICRO/I without stopping it.
Upload	Project Data	Uploads project data from the MICRO/I.
	Stored Data in Memory Card	Uploads data from the Memory Card Folder for the currently running project.

■ Touch Screen

Command		Description
Target Info.		Displays version information for the MICRO/I system software and project information.
Clear	All	Clears all of the data stored in the internal memory on the MICRO/I.
	Alarm Log Data	Clears all of the alarm log data stored in the internal memory on the MICRO/I.
	Data Log Data	Clears all of the data log data stored in the internal memory on the MICRO/I.
	Operation Log Data	Clears all of the operation log data stored in the internal memory on the MICRO/I.
	Data of all Device Addresses	Clears the data of all device addresses.
	Stored Data in Memory Card	Clears data saved to the memory card inserted in the MICRO/I.
Format		Formats the memory card inserted in the MICRO/I.

Monitors

Command		Description
Start/Stop Monitor		Connects the MICRO/I to the host device and starts monitoring. This command also stops monitoring.
Start/Stop Simulation		Starts a simulation with the MICRO/I disconnected from the host. This command also stops the simulation.
Screens		Shows or hides the Screen Monitor window.
Object List		Displays a device value in a popup and emphasizes the object that is satisfying the trigger condition in the object list or script editor.
Custom		Shows or hides the Custom Monitor window.
Batch		Shows or hides the Batch Monitor window.
Hosts		Shows or hides the Host Monitor window during 1:N communication.
Back		Returns to the Base Screen that was displayed immediately before the screen was changed.
Forward		Advances to the Base Screen that was displayed immediately before the screen was changed with the **Back** command.
Go to Screen	First Screen	Switches to the Base Screen with the smallest screen number in the project data.
	Previous Screen	Switches to the Base Screen with a screen number one smaller than the Base Screen currently displayed. If the screen numbers are not consecutive numbers, this command switches to the closest number.
	Screen Number	Switches to the Base Screen with a specified number.
	Next Screen	Switches to the Base Screen with a screen number one larger than the Base Screen currently displayed. If the screen numbers are not consecutive numbers, this command switches to the closest number.
	Last Screen	Switches to the Base Screen with the largest screen number in the project data.
Open Current Screens		Opens a monitored screen in the editing window.

Communication

Command	Description
Setup	Configures the communication target and communication conditions between the target and the MICRO/I or between the computer and the MICRO/I.

● View

View is where you can switch the workspace display and display the Tag Editor, Screen Diagram, and various managers.

You can configure the items displayed in the editing window.

■ Workspace

Command	Description
Toolbox	Shows the **Toolbox** window. This window displays Parts and Drawings.
Project Window	Shows the **Project** window. This window displays the saved screens and project related information.
Screen List	Shows the **Screen List** window. The window displays the screens saved in the project as thumbnails.
Object List	Shows the **Object List** window. This window displays all of the graphics and parts placed in an editing screen.
Part List	Shows the **Part List** window. This window displays the list of part images.
Tag Editor	Shows the Tag Editor. This window displays the list of registered device address, tag name, and comments.
Screen Diagram	Shows the Screen Diagram. This window displays the Overlapping Screen information, and the screen numbers and titles of the screens linked by the Goto Screen Button, the Goto Screen Command, the Numerical Input, the Character Input, the Alarm List Display and the Alarm Log Display.
Comparison Result	Shows the **Comparison Result** window. This window displays the results of that comparison of projects.
Picture Manager	Shows the Picture Manager. Manages the registered images for project use.
Text Manager	Shows the Text Manager. Manages registered text which can be used for Text, Part objects, title of Popup Screen, messages with Alarm List Display and Alarm Log Display.
Script Manager	Shows the Script Manager. Manages registered scripts for project use.
Protocol Manager	Shows the Protocol Manager. Manages protocols created.

■ Show/Hide

Command		Description
Part Name		Shows or hides drawing object names and part names.
Device Address		Shows or hides device addresses and tag names.
Trigger Condition		Shows or hides trigger conditions.
Commands		Shows or hides the dotted frame for commands.
Popup Screen		Shows or hides a Popup Screen's number, display frame, and the part name of the part calling that Popup Screen.
Overlay Screens		Shows or hides the configured overlay screens.
Security Group	Display	Shows or hides the display security group set for parts.
	Input	Shows or hides the input security group set for parts.
Gridlines		Shows or hides the gridlines in the editing window.
CC Frame		Shows or hides the CC Frame.

Screens

Command		Description
Focus Order		Changes the order to move the focus with Numerical Input and Character Input.
State	Reset	Returns the displayed images to the default images.
	ON/OFF State	Switches between the ON image and the OFF image for buttons and lamps.
	Previous State	Changes the image for the displayed part to the previous state.
	State Number	Changes the image for the displayed part to the image for the part with the specified number.
	Next State	Changes the image for the displayed part to the next state.
	Text Group	Changes the displayed text to the text of the specified text group.
	Active User	Displays only the parts that correspond to the specified user.

Zoom

Command	Description
Zoom	Changes the magnification of the editing window.

Window

Command	Description
Close All	Closes all editing windows.

Format

Format is where you change the style of drawing objects, arrange objects, and change their size.

Shape Style

Command	Description
1 dot	Sets the line width to one dot.
2 dots	Sets the line width to two dots.
3 dots	Sets the line width to three dots.
5 dots	Sets the line width to five dots.
Solid	Sets the line to solid.
Dot	Sets the line to dotted.
Dash	Sets the line to dashes.
Long Dash	Sets the line to long dashes.
Long Dash Dot	Sets the line to long dash dot.
Long Dash Dot Dot	Sets the line to long dash dot dot.
Pattern	Changes the pattern.
Foreground Color	Changes the pattern's foreground color.
Background Color	Changes the pattern's background color.

Text Style

Command	Description
Regular	Sets the text style to regular.
Bold	Sets the text style to bold.
Shadow	Gives the text a shadow.
Text Color	Changes the text color.
Text Background Color	Displays the text as if it were highlighted with a highlighter.
Shadow Color	Changes the color of the shadow added to text given a shadow.

Arrange

Command	Description
X-coordinate	Changes the X-coordinate of the selected object.
Y-coordinate	Changes the Y-coordinate of the selected object.
Bring to Front	Moves selected object to the front.
Send to Back	Moves selected object to the back.
Group	Groups selected objects so they can be handled as a single object.
Ungroup	Restores a grouped object to its individual objects.
Rotate Right 90°	Rotates selected objects right 90°.
Rotate Left 90°	Rotates selected objects left 90°.
Flip Vertical	Vertically flips selected objects.
Flip Horizontal	Horizontally flips selected objects.
Align Left	Aligns selected objects to the left.
Align Center	Aligns selected objects to the center.
Align Right	Aligns selected objects to the right.
Align Top	Aligns selected objects to the top.
Align Middle	Aligns selected objects to the middle.
Align Bottom	Aligns selected objects to the bottom.
Make Horizontal Spacing Equal	Arranges selected objects to be equally spaced horizontally.
Make Vertical Spacing Equal	Arranges selected objects to be equally spaced vertically.

Size

Command	Description
Width	Changes the width of the selected object.
Height	Changes the height of the selected object.
Make Same Width	Makes the selected objects a uniform width.
Make Same Height	Makes the selected objects a uniform height.

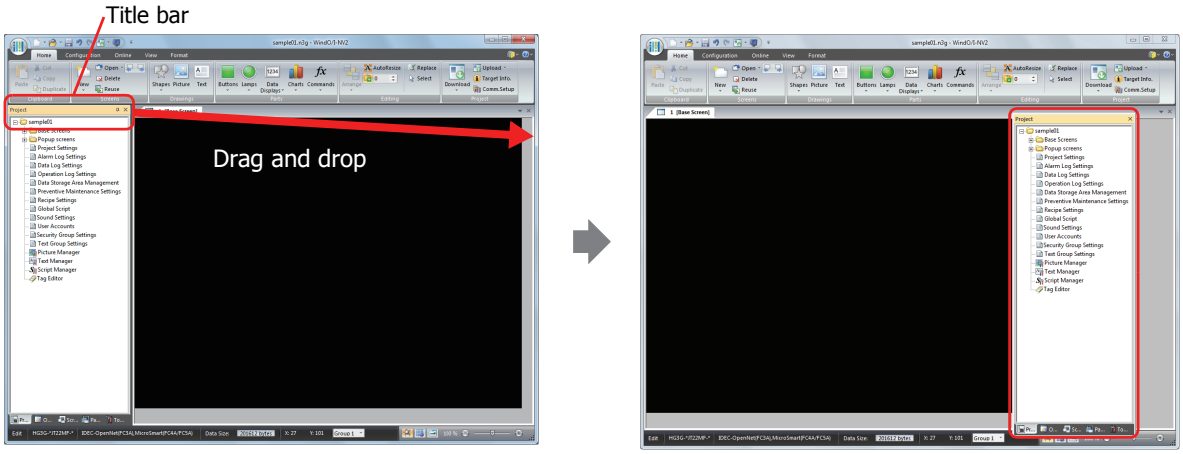
3.4 Windows Displayed in the Workspace

● Changing the position of windows

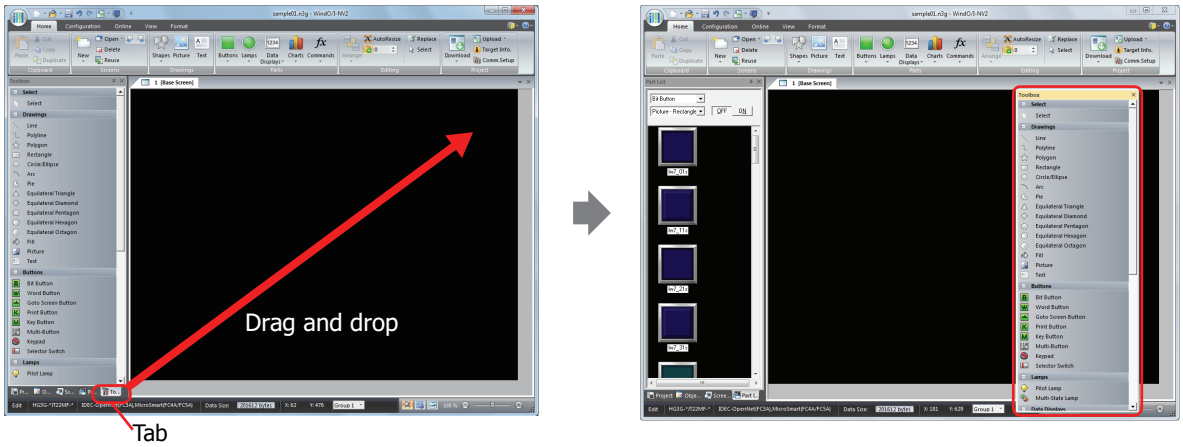
Disabling docking

You can change the display position of the window by dragging and dropping the title bar of the window or its tab to disable docking. Windows that are not docked are called floating windows.

- If you drag the title bar of the workspace window, you can move all the docked windows together.



- If you drag the tab of a workspace window, you can move just the selected window.

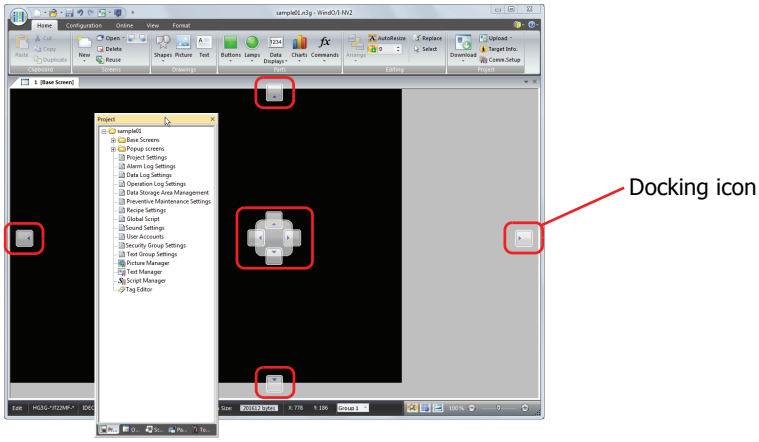


Docking windows

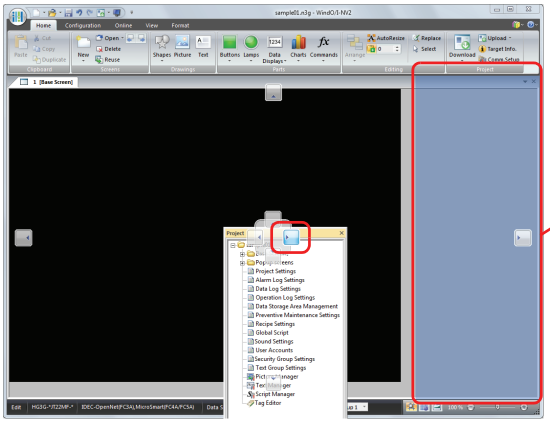
You can dock a floating window to WindO/I-NV2's left, right, top, or bottom frame or a separate window.

1 Drag the window's title bar or tab.

The (Docking) icon is displayed.

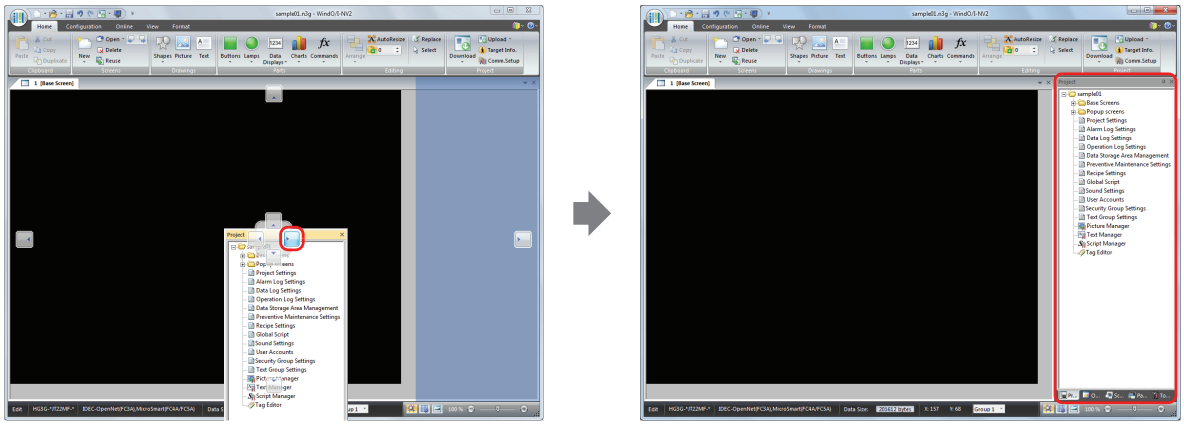


When the mouse cursor gets close to a (Docking) icon while dragging the title bar or tab, the (Docking) icon turns blue and the location to dock the window is displayed.

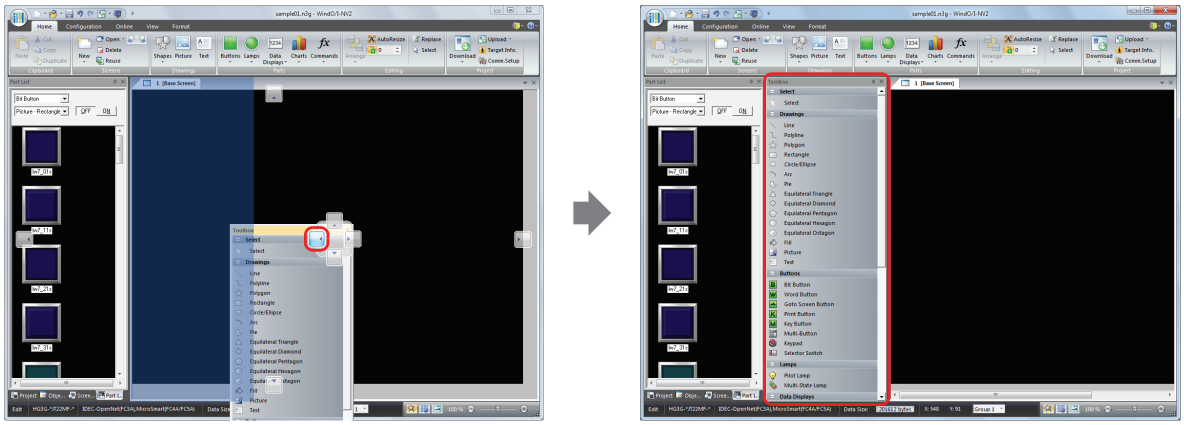


2 Drop the title bar or tab on the (Docking) icon to dock that window to WindO/I-NV2's left, right, top, or bottom frame or a separate window.

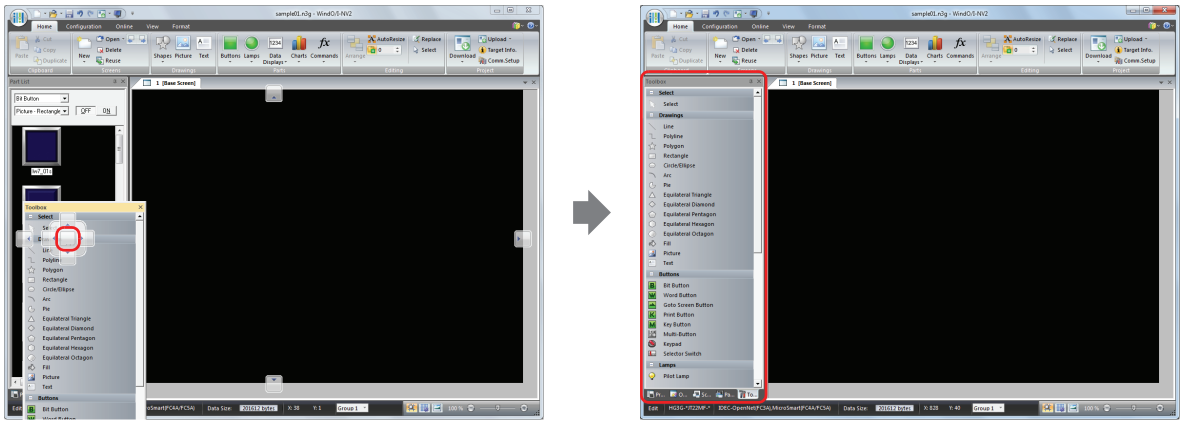
- If the workspace window is dropped on the icon, it is docked to WindO/I-NV2's left, right, top, or bottom frame.



- If a floating window is dropped on the (Docking) icon, it is docked to WindO/I-NV2's left, right, top, or bottom frame or a docked window.



- If you put the mouse cursor on another window while dragging a floating windows title bar, the (Docking) icon is displayed. Drop the title bar on the (Docking) icon to dock the floating window to that window. Change the displayed window with the tabs.



● Changing the display method of windows

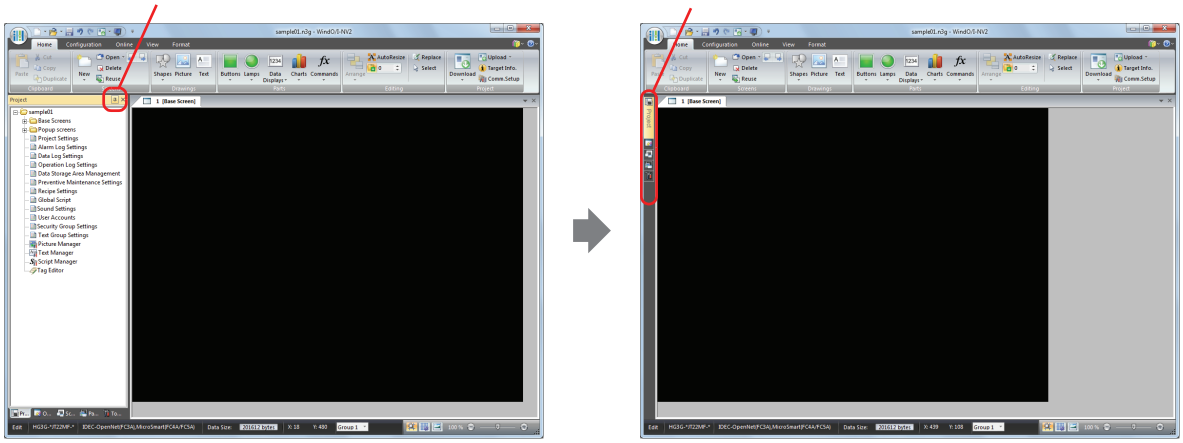
Auto Hide

If the workspace window is docked, you can change the window to automatically hide and show only its tabs.

Click the (Auto Hide) icon to change the window to show only its tabs.

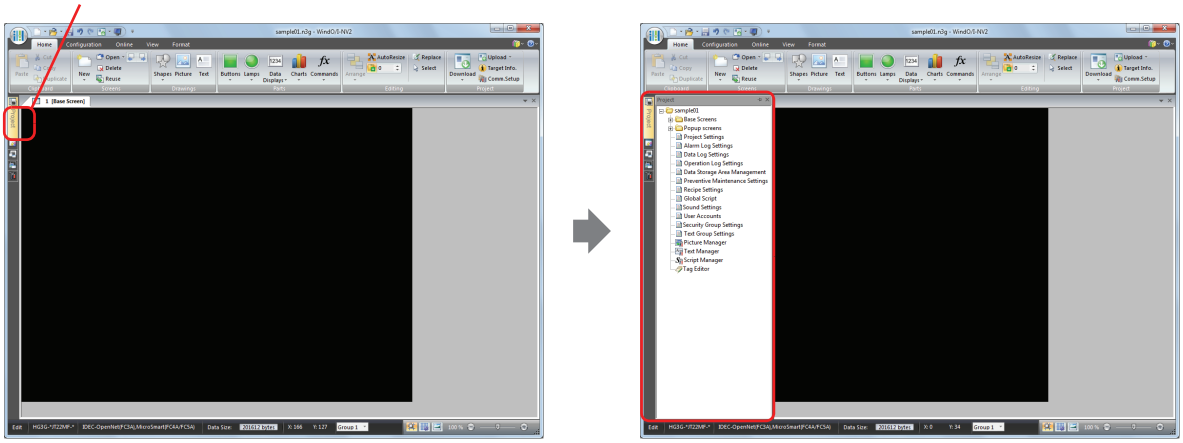
Auto Hide icon

Tabs



The window is displayed when you bring the mouse cursor close to the tabs.

Mouse cursor

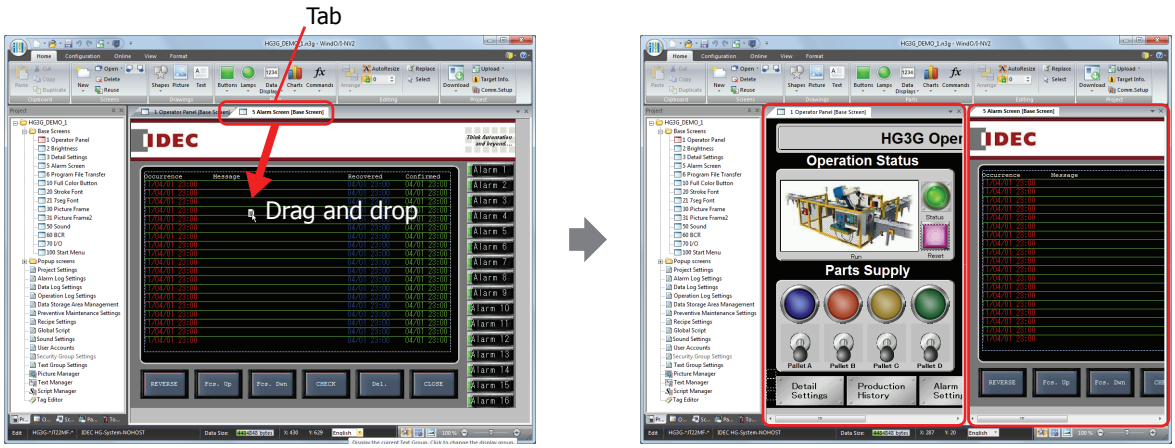


- Click (Auto Hide) to secure the window in place.
- Click (Close) to close the window.

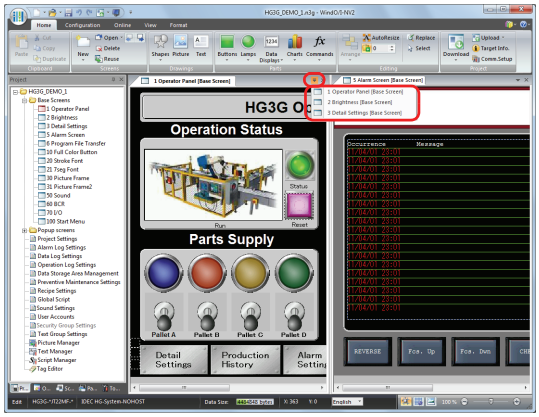
Display the editing windows side by side

When multiple editing windows are open, you can display those windows side by side.

Drag the tab of the editing window to display side by side and drop it where the icon is displayed.
The editing windows are displayed side by side.

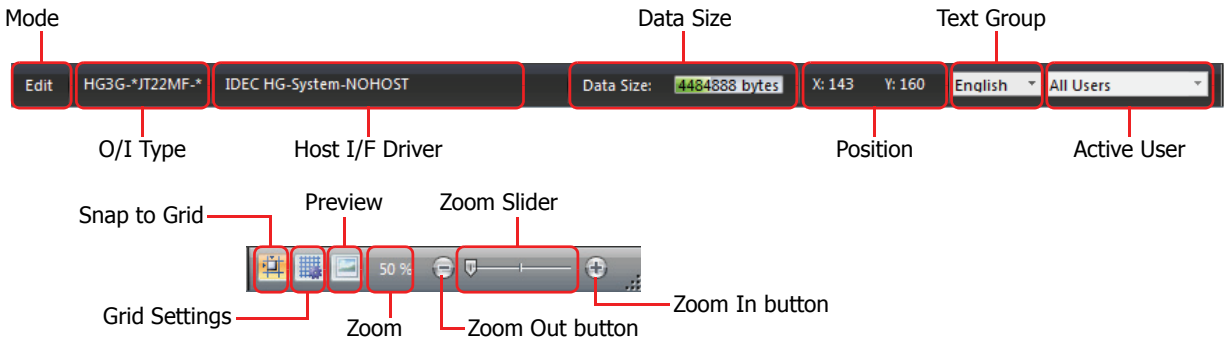


- You can change the active editing windows by clicking on or (Active Files) and selecting the editing window.



- Click (Close) to close the active editing window.

3.5 Status Bar



● Status bar items

■ **Mode**
This section of the status bar shows WindO/I-NV2's current mode.

■ **O/I Type**
This section of the status bar shows the MICRO/I type set in the project data being edited.

■ **Host I/F Driver**
This section of the status bar shows the host I/F driver set in the project data being edited.

■ **Data Size**
This section of the status bar shows the download data file size for the project data being edited.
When you save the project, the display is updated with the latest information.

■ **Position**
This section of the status bar shows the X- and Y-coordinates of the mouse cursor in the editing window.

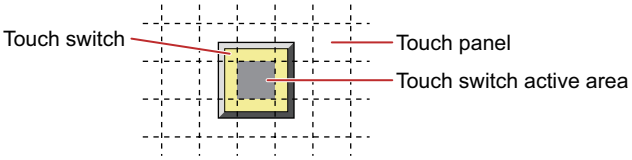
■ **Text Group**
This section of the status bar shows the current text group. The text displayed in the editing window changes according to the displayed text group.
To change the text group, click ▼ and select the text group.

■ **Active User**
This section of the status bar shows the active user. You can hide or show objects in the editing window according to the security group of the displayed user.
To change the active user, click ▼ and select the user.

Snap to Grid

Click to align objects to the grid.

For the HG2F/2S/3F/4F, if a touch switch does not entirely encompass a touch panel, the button will not function.

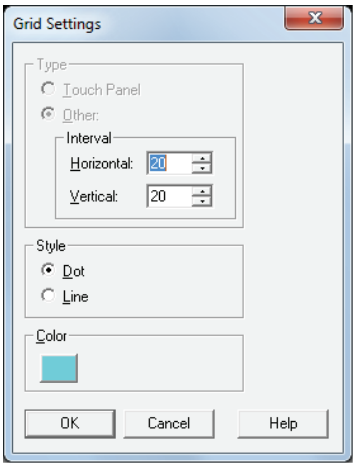


When placing a touch switch that is 40x40 dots or smaller on the screen, arrange it so that it entirely encompasses one or more touch panels.

Grid Settings

You can change the style and spacing of the grid displayed in the editing window.

Click to display the Grid Settings dialog box. Configure the items and click the **OK** button.

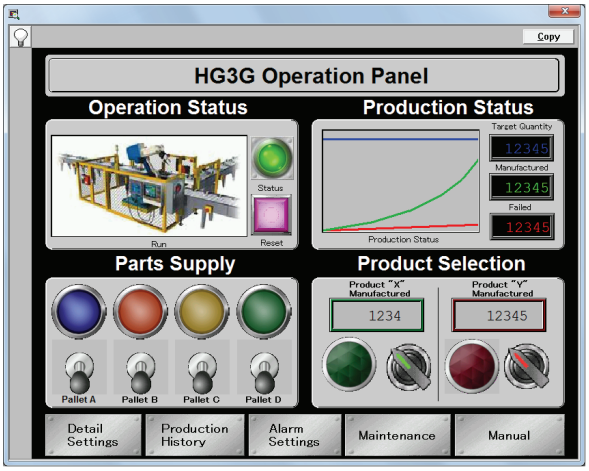


Type:	Selects the type of grid.	
	Touch Panel:	Aligns the grid to the touch panels.
	Other:	Aligns the grid to the specified spacing.
		Enter the spacing for the grid in **Horizontal** and **Vertical**.
Style:	Select the grid style with **Dot** or **Line**.	
Color:	Select the grid color (color: 256 colors, monochrome: 16 shades).	
	Click this button to open the color palette. Select the color with the color palette.	

■ **Preview**

You can preview an edited screen.

Click to open the preview window.



Click the button to switch between the OFF image and ON image for buttons and lamps.

You can save the image displayed in the preview window as a bitmap image file by clicking the **Copy** button.

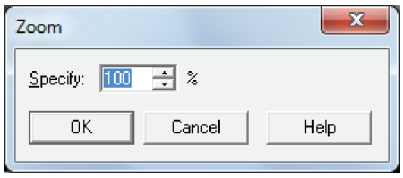
> The preview display and the actual screen displayed on the MICRO/I may differ.
> For example, the image for overlay screens in the preview display is always shown in front. However, when drawing objects and parts overlap on the actual screen, parts are always shown in front irregardless of the order of overlay screens.

■ **Zoom**

Zoom shows the magnification of the editing window.

You can zoom in and zoom out by specifying the magnification.

1. Click **Zoom** on the status bar.
   The Zoom dialog box is displayed.
2. Specifying the zoom magnification (50% to 400%) and click **OK**.



> You can also specify the zoom magnification by dragging the zoom slider or clicking the button and the button.

● Customizing the status bar

You can change the commands displayed on the status bar.

Right click the status bar and check only the commands you wish to display on the status bar.

4 Customizing WindO/I-NV2

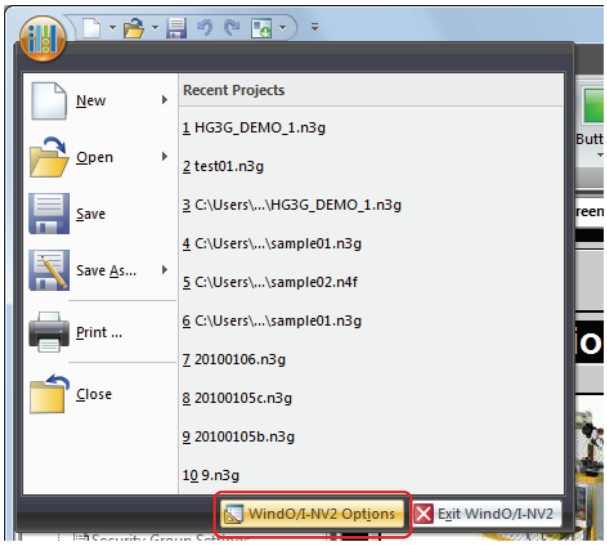
4.1 Configuring the Work Environment

You can configure WindO/I-NV2 settings such as mode and options when editing screens, the path when selecting files, and the path for automatic backups. The settings configured here are saved even when you exit WindO/I-NV2.

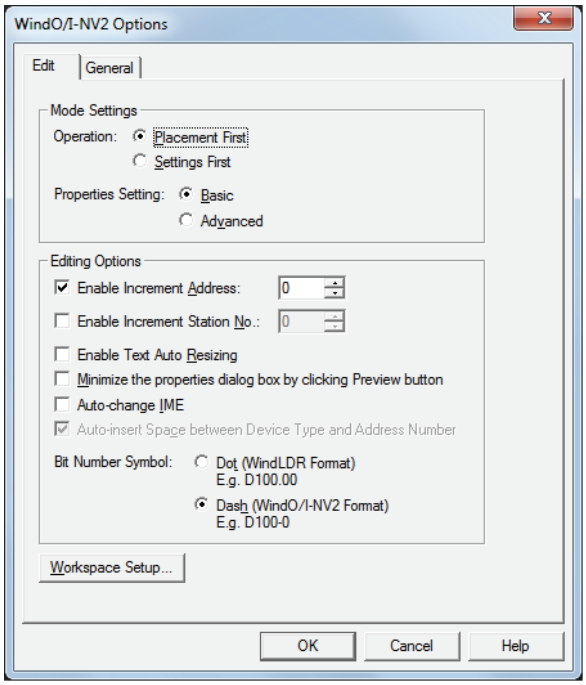
The procedure for configuring the work environment is shown below.

1 Click and then click **WindO/I-NV2 Options**.

The WindO/I-NV2 Options dialog box is displayed.



2 Change the settings on each tab as desired.



● **Edit** tab

■ Mode Settings

When placing a part on the screen, select whether or not to display the part's Properties dialog box.

Placement First: The part's Properties dialog box is not displayed. This mode is for placing the parts on the screen and finishing the screen's design first.

Settings First: Displays the part's Properties dialog box. This mode is for creating the screen while configuring the Properties for the parts.

■ Properties Setting

Select whether or not to display the Properties dialog box for parts in the Advanced mode.

Basic: Displays the Properties dialog box in Basic mode to use only basic functions.

Advanced: Displays the Properties dialog box in Advanced mode so that all functions can be used.

> You can also change the mode by clicking on the **Advanced** button and the **Basic** button in the Properties dialog box for parts.

■ Enable Increment Address

When copying or duplicating parts, select this check box to add a specified value (-999 to 999) to the device address set for the original part before pasting it to the screen.

■ Enable Increment Station No.

When copying or duplicating parts, Select this check box to add a specified value (-999 to 999) to the device station number set for the original part before pasting it to the screen.

This option can only be configured if the host I/F driver **Connection** is **1:N Communication**.

■ Enable Text Auto Resizing

Select this box to automatically change the text size according to a change in part size.

■ Minimize the Properties dialog box by clicking Preview button

Select this box to minimize an object's Properties dialog box when you click the **Preview** button on its properties dialog box.

■ Auto-change IME

Select this box to enter characters other than alphanumeric characters using the input method editor (IME) in text boxes for entering device addresses.

> You cannot enter full-width characters in text boxes that only accept alphanumeric input, even if the IME is enabled.
>
> Select this box to use full-width characters in tag names in the device address settings.

■ Bit Number Symbol

Select the separator for addresses and bits. When manually entering device address, you can enter either separator, but they will be displayed using the symbol selected here.

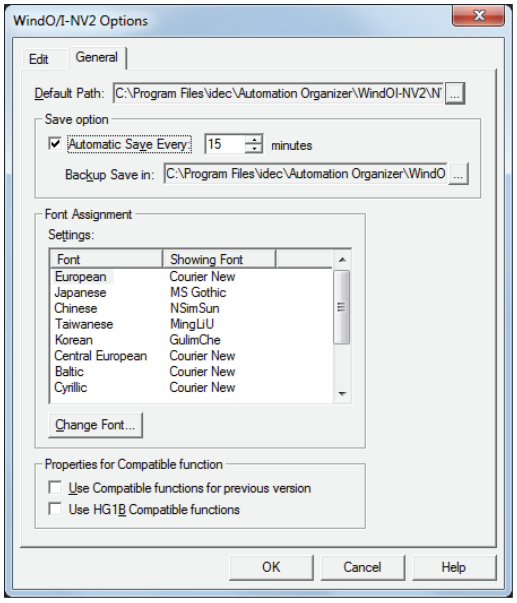
Dot (WindLDR Format): Separates the address and bit with a dot.
Example: D100.00

Dash (WindO/I-NV2 Format): Separates the address and bit with a dash.
Example: D100-0

■ Workspace Setup

Displays the Workspace Setup dialog box. You can configure items displayed in the workspace window. For details, refer to "4.2 Customizing the Workspace" on page 2-64.

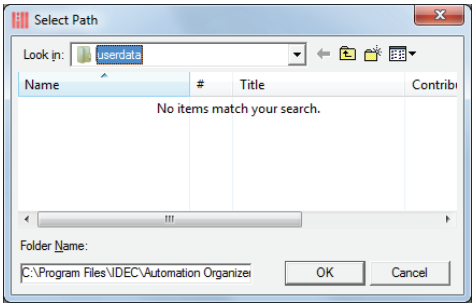
● General tab



■ Default Path

Specifies the path when saving project data and opening files.

Click ... to display the Select Path dialog box. Select the folder and click the **OK** button.

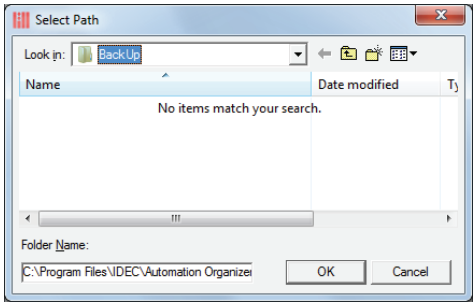


■ Save option

Automatic Save Every: Select this check box to automatically backup the project data at regular intervals (1 to 120 minutes).

Backup Save in: Specifies the location to save the backup data.

Click ... to display the Select Path dialog box. Select a folder and click the **OK** button.



Backup data is deleted when the project data is closed.

■ **Font Assignment**

This option specifies the text font in the Properties dialog box for objects to display in text boxes and messages to display on the screen.

Select a **Font** in **Settings** and click the **Change Font** button to display the Font Settings dialog box. Select the font to use and click the **OK** button.

Font Assignment configures the fonts displayed in WindO/I-NV2. Fonts displayed on the MICRO/I are not changed. To display the same font on the MICRO/I as the font displayed in WindO/I-NV2, select Windows Font in the Properties dialog box for objects or Font setting in the Text Manager.

For details, refer to "Windows Font" on page 2-12.

■ **Properties for Compatible function**

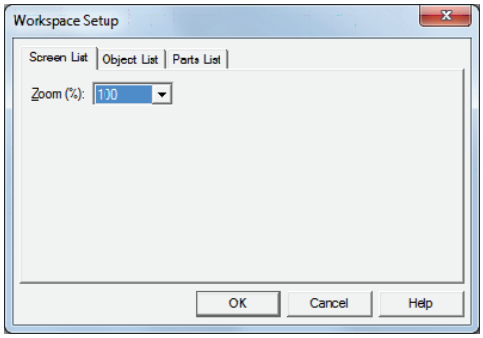
Use Compatible functions from previous version:	Select this box to enable functions from previous versions. For details, refer to Chapter 4 "3.16 Compatible Tab" on page 4-64.
Use HG1B Compatible functions:	Select this box to enable previous functions (HG1B). For details, refer to Chapter 4 "3.16 Compatible Tab" on page 4-64.

4.2 Customizing the Workspace

You can change the windows that are displayed in the workspace with the Workspace Setup dialog box.

● **Screen List** tab

This tab changes the **Screen List** window display.



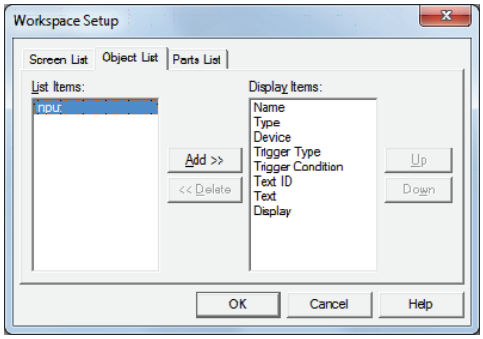
■ **Zoom**

Select the zoom magnification for the thumbnails displayed in the **Screen List** window from the following.

100, **125**, **150**, **175**, **200**, **250**, **300**, **350**, **400**

● **Object List** tab

This tab changes the items displayed in the **Object List** window.



■ **List Items**

Shows the list of items that can be displayed in the **Object List** window.

■ **Add**

Adds an item to **Display Items**.

Select an item in **List Items** and click this button to add it to **Display Items**.

■ **Delete**
Deletes an item from **Display Items**.
Select an item in **Display Items** and click this button.

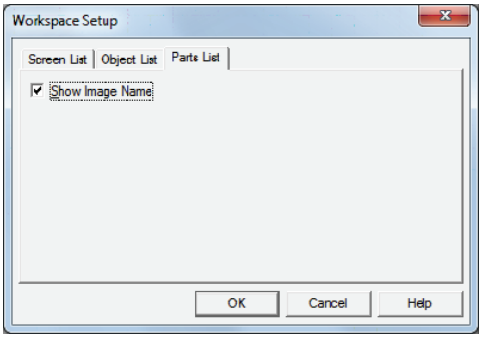
■ **Display Items**
Shows the list of items that are displayed in the **Object List** window.

■ **Up**
Shifts the selected item upward in the **Display Items** list.

■ **Down**
Shifts the selected item downward in the **Display Items** list.

● **Parts List** tab

This tab changes the items displayed in the **Part List** window.



■ **Show Image Name**
Select this box to display the image name for parts in the **Part List** window.

5 WindO/I-NV2 Common Operations and Settings

This section describes common settings when creating project data.

5.1 Device Address Settings

Device addresses are memory on the MICRO/I and connected devices (host devices) that can store values in bit or word units.

By setting device addresses to parts and functions, you can control the screen display and operation of parts.

Device addresses are specified by combining the device type and address in the following formats.

Dot (WindLDR Format): [Device type][Address] . [Bit]

Dash (WindO/I-NV2 Format): [Device type][Address] - [Bit]

Address and bit separator

The device address can be directly entered or it can be set with the Device Address Settings dialog box.

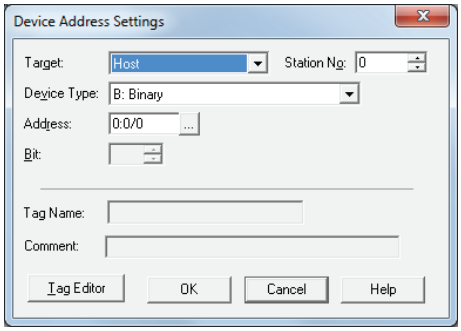
● Direct entry

Enter a device address with the keyboard following the basic format.

To enter the bit (0 to 15) for a word device, enter the address, the bit separator "." or "-", and the bit. You can enter the address with either separator, but it is displayed according to the **Bit Number Symbol** setting. **Bit Number Symbol** is set on the **Edit** tab of the WindO/I-NV2 Options dialog box.

● Specifying a device address with the Device Address Settings dialog box

To display the Device Address Settings dialog box, click ... to the right of the text box for setting the device address. Use this dialog box to set the device address.



■ **Target**

Select the device that includes the device address to set from **Internal** or **Host**.

■ **Station No**

Specify the station number for the connected device (host device). The range that can be specified differs according to the host I/F driver selected.

This option can only be set when **1:N Communication** is selected on the **Connection** of the Select Host I/F Driver dialog box or the Change Host I/F Driver dialog box.

■ **Device Type**

Select the device type.

The list only shows device types that can be used.

■ **Address**

Specify the address. The range that can be set differs according to the device type selected.

■ **Bit**

Specify the bit (0 to 15) of the word device when a word device is selected in **Device**.

■ **Tag Name**

Shows the tag names configured for the selected device address.

■ **Comment**

Shows the comments configured for the selected device address.

■ Tag Editor

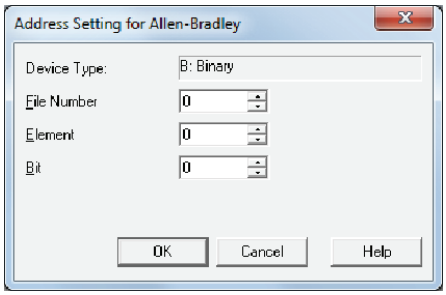
Opens the Tag Editor.

With the Tag Editor, you can display the list of device addresses used in the project data being edited and configure tag names and comments for device addresses.

> Tag names and comments configured in the Tag Editor can be used in WindLDR and WindCFG.

Allen-Bradley address settings

When **Allen-Bradley** is selected in **Expression of Device Address Format** on the Select Host I/F Driver dialog box or the Change Host I/F Driver dialog box, ... is displayed to the right of **Address** on the Device Address Settings dialog box. Click this button to display the Address Setting for Allen-Bradley dialog box. With this dialog box, you can easily enter the device address following Allen-Bradley PLC address notation.



Device Type: Shows the device type selected in the Device Address Settings.

For the other settings, see the External Device Setup Manual.

5.2 Setting Conditional Expressions

Specify conditional expressions with **Condition** on the **Trigger Condition** tab.
Conditional expressions are specified by combining data and operators using the following basic format.

[Data] [Operator] [Data]

Directly enter the conditional expression or specify it with the Trigger Conditions Settings dialog box.

● Direct entry

Enter the conditional expression with the keyboard.

- There is no limit on data or operators. However, the maximum number is 480 characters.

[Data] [Operator] [Data]
to
[Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] ... (within 480 characters)

- To enter a device address for data, always enclose it with "[" and "]".
  Example: [LDR 100] == 10
- To flip bits, enter "~" before the data.
- Parentheses "(" and ")" can be used.

([Data] [Operator] [Data]) [Operator] ([Data] [Operator] [Data])

- Operator priority is the same as scripts. For details, refer to Chapter 20 "6.4 About the Priority of the Operator" on page 20-55.

● Configuring conditional expressions with the Trigger Condition Settings dialog box

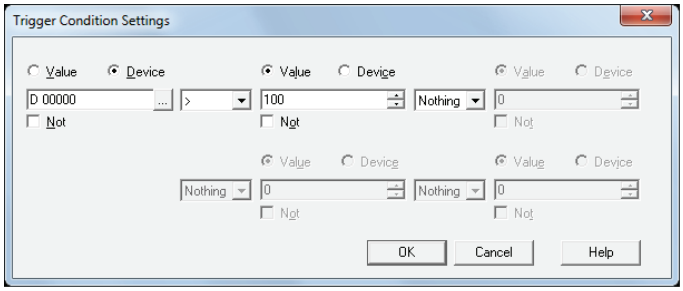
You can easily configure a basic conditional expression using the Trigger Condition Settings dialog box.

- Up to a maximum of five items of data can be used.

[Data] [Operator] [Data]
to
[Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data]

- To flip the bits in data, select the **Not** check box.
- Operator priority is the same as scripts. For details, refer to Chapter 20 "6.4 About the Priority of the Operator" on page 20-55.

1. Click the **Condition** button to display the Trigger Condition Settings dialog box.



2. Click **Value** or **Device** and enter a value or device address.
   To flip the bits in data, select the **Not** box.
3. Select the operator.
4. Click the next **Value** or **Device** and enter a value or device address.
   To flip the bits in data, select the **Not** box.
5. Repeat steps 3 and 4 for the necessary number of conditions.

If you display the Trigger Condition Settings dialog box after directly entering a conditional expression, that expression will be reflected in the dialog box. However, if you entered an expression that cannot be reflected, the portion of the expression that could not be reflected is deleted when you click the **OK** button and close the Trigger Condition Settings dialog box.

● Data and operations that can be configured

Data

You can specify these types and values of data for conditional expressions.

Item	Description
Value	Set a constant number as data. The range that can be set differs according to the selected data type. For details, refer to "Data types" on page 2-1.
Device	Set a device address for a bit device or a word device that stores the value to be handled as data.

Operators

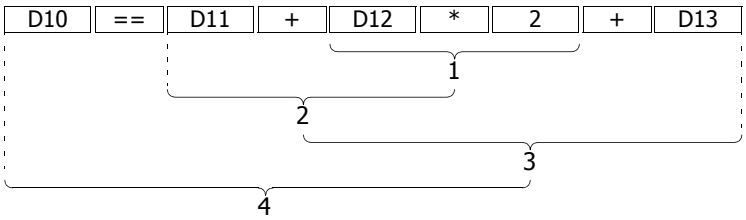
Specify the type of arithmetic operation to execute on the data. (In the table below, [a] indicates the operator's left-hand number, [b] indicates the right-hand number.)

Operator		Details		Supported device	
				Bit device	Word device
Arithmetic operators	+	Addition	Adds [a] and [b].	NO	YES
	-	Subtraction	Subtracts [b] from [a].	NO	YES
	*	Multiplication	Multiplies [a] and [b].	NO	YES
	/	Division	Divides [a] by [b].	NO	YES
	%	Modulo	Calculates the remainder after dividing [a] by [b].	NO	YES
Relational operators*1	==	Equal to	Compares if [a] is equal to [b].	YES	YES
	!=	Not equal to	Compares if [a] is not equal to [b].	YES	YES
	>=	Greater than or equal to	Compares if [a] is equal or greater than [b].	NO	YES
	<=	Less than or equal to	Compares if [a] is equal or less than [b].	NO	YES
	>	Greater than	Compares if [a] is greater than [b].	NO	YES
	<	Less than	Compares if [a] is less than [b].	NO	YES
Bitwise operators	&	Bitwise AND	Calculates the logical product (AND) of each bit in [a] and [b].	YES	YES
	|	Bitwise OR	Calculates the logical sum (OR) of each bit in [a] and [b].	YES	YES
	^	Bitwise XOR (exclusive OR)	Calculates the exclusive logical sum (XOR) of each bit of [a] and [b].	YES	YES
	~	Bitwise NOT	Flips the logic of each bits of [a]. For word device and fixed values, 0 will be 65535 and 65535 will be 0. For bit device, 0 will be 1, and 1 will be 0.	YES	YES
	<<	Left shift	Shifts each bit of [a] to left for [b] bit(s).	YES	YES
	>>	Right shift	Shifts each bit of [a] to right for [b] bit(s).	YES	YES
Logical operators*1	&&	Logical AND	Calculates the logical product (AND) of a conditional expression and a conditional expression.	NO	YES
	||	Logical OR	Calculates the logical sum (OR) of a conditional expression and a conditional expression.	NO	YES

- You cannot select logical operators in the Trigger Condition Settings dialog box.
- You cannot mix bit devices and word devices in a conditional expression.

As a basic rule, conditional expressions are calculated in order from the left, but when multiple arithmetic operations are combined, they are calculated according to the operator priority.

For [D 10] == [D 11] + [D 12] * 2 + [D 13], the expression is calculated in the following order.



For the operator priority, refer to Chapter 20 "6.4 About the Priority of the Operator" on page 20-55.

*1 1 if satisfied, 0 if not satisfied.

● Setting and operation examples

Settings		Action
Direct entry	**Trigger Condition Settings dialog box**	
[M 0] == [M 1]	Data: M0 Op.: == Data: M1	The condition is satisfied if the values of M0 and M1 are equal.
[M 0] == [M 1] & [M 2]	Data: M0 Op.: == Data: M1 Op.: & Data: M2	The condition is satisfied if the result of the AND operation on M1 and M2 is equal to M0.
[M 0] == ~[M 1]	Data: M0 Op.: & Data: M1 ☑Not	The condition is satisfied if the result of flipping the bits in M1 is equal to M0.
1234 == [D 0]	Data: 1234 Op.: == Data: D0	The condition is satisfied if the value of D0 equals 1234.
100 <= [D 0] + [D 1] + [D 2] + [D 3]	Data: 100 Op.: <= Data: D0 Op.: + Data: D1 Op.: + Data: D2 Op.: + Data: D3	The condition is satisfied if the result of adding the values of D0 through D3 is 100 or greater.
0 != [D 0] % 10	Data: 0 Op.: != Data: D0 Op.: % Data: 10	The condition is satisfied if the value of the remainder after D0 is divided by 10 does not equal 0 (the value of D10 cannot be entirely divided by 10).
[D 0] == ~[D 1] & ~[D 2] & [D 3] &[D 4]	Data: D0 Op.: == Data: D1 ☑Not Op.: & Data: D2 ☑Not Op.: & Data: D3 Op.: & Data: D4	The condition is satisfied if the logical AND operation on the flipped bits of D1, the flipped bits of D2, the value of D3, and the value of D4 is equal to D0.
[D 10] + [D 11] == [D 12] + [D 13]	Data: D10 Op.: + Data: D11 Op.: == Data: D12 Op.: + Data: D13	The condition is satisfied if the result of adding the values of D12 and D13 is equal to the result of adding the values D10 and D11.
[D 10] == [D 11] + [D 12] * 2 + [D 13]	Data: D10 Op.: == Data: D11 Op.: + Data: D12 Op.: * Data: 2 Op.: + Data: D13	The condition is satisfied if the result of adding the values of D11, D12 multiplied by two, and D13 is equal to the value of D10.
100 <= [D 0] + [D 1] + [D 2] + [D 3] + [D 4] + [D 5] + [D 6] + [D 7]	(This expression cannot be configured in the Trigger Condition Settings dialog box because it has over 6 items of data.)	The condition is satisfied if the result of adding the values of D0 through D7 is 100 or greater.
1 == ([M 0] && [M 1]) || ([M 2] && [M 3])	(This expression cannot be configured on the Trigger Condition Settings dialog box because it uses logical operators and it contains parentheses "(" and ")".)	The condition is satisfied if the logical OR operation on the result of the logical AND operation on M0 and M1 and the result of the logical AND operation on M2 and M3 is equal to 1.
[LDR 10] + [LDR 11] == [LDR 12] * ([LDR 13] + [LDR 14])	(This expression cannot be configured on the Trigger Condition Settings dialog box because it mixes bitwise operators and logical operators or it contains parentheses "(" and ")".)	The condition is satisfied if the result of multiplying the value of LDR12 by the result of adding the values of LDR13 and LDR14 is equal to the result of adding the values of LDR10 and LDR11.

Chapter 3 Communication

This chapter describes the communication between the MICRO/I and the external device.

1 PLC Link Communication

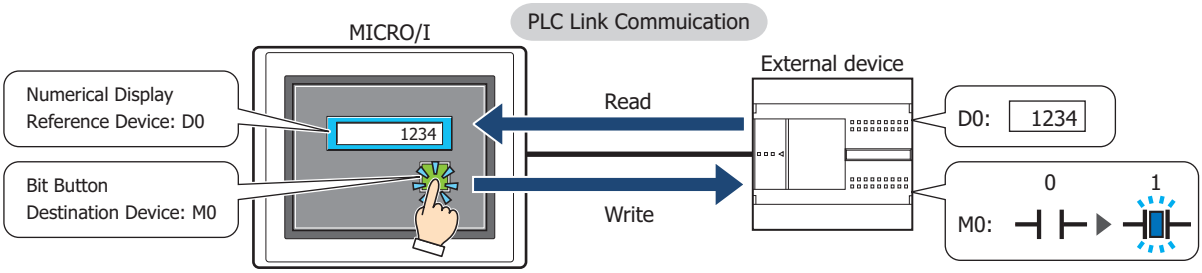
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Overview

PLC Link Communication refers to the communiation protocol used for communication with the MICRO/I, via the CPU Unit*1 or PLC Link Unit*1 Programming Port of the external device connected to the MICRO/I.

The MICRO/I continuously reads the value of device of external devices on the currently displayed screen, and external devices (such as relays and registers) on the screens are updated with the latest data at all times.

When a button is pressed or a command is executed in the MICRO/I screen, the value is written to the external device.



For details regarding the PLC Link Communication, refer to Chapter 1 "PLC Link Communication" and Chapter 2 "Connection to a PLC" in the "External Device Setup Manual".

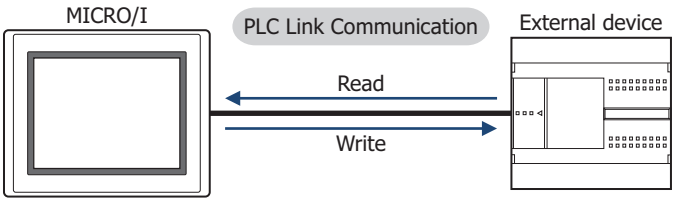
*1 Unit names vary based on the manufacturer of the external device.

● PLC Link Connection Types

There are two basic types of connections. 1:1 Communication, where an external device is connected to a MICRO/I; and 1:N Communication, where multiple external devices are connected to a MICRO/I.

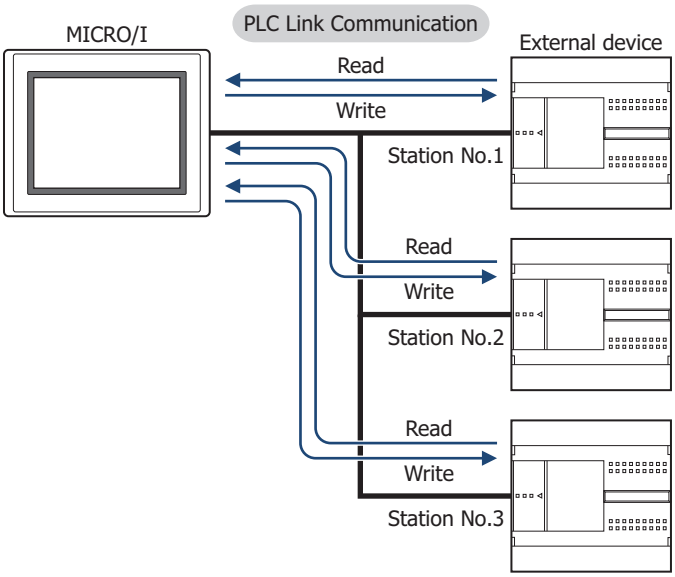
■ **1:1 Communication**

The MICRO/I is connected to a single external device.



■ **1:N Communication**

The MICRO/I is connected to multiple external devices.



1.2 PLC Link Communication Settings

The external devices connected to the MICRO/I and connection types are selected on the Select Host I/F Driver dialog box, or the Change Host I/F Driver dialog box.

- When creating new project data by following displayed dialog boxes and configuring settings step by step, by clicking , and then clicking **New**, the Select Host I/F Driver dialog box is displayed. For details, refer to Chapter 4 "Create new project data by using the interactive quick start" on page 4-1.
- Click **Host I/F Driver** on the status bar to display the Change Host I/F Driver dialog box. For details, refer to Chapter 4 "Changing Host I/F Drivers" on page 4-22.

Specify **Manufacturer** and **Protocol** for each CPU Unit*1 or each PLC Link Unit*1 of the external device. For details regarding the correspondence model, refer to the "External Device Setup Manual."

*1 Unit names vary based on the manufacturer of the external device.

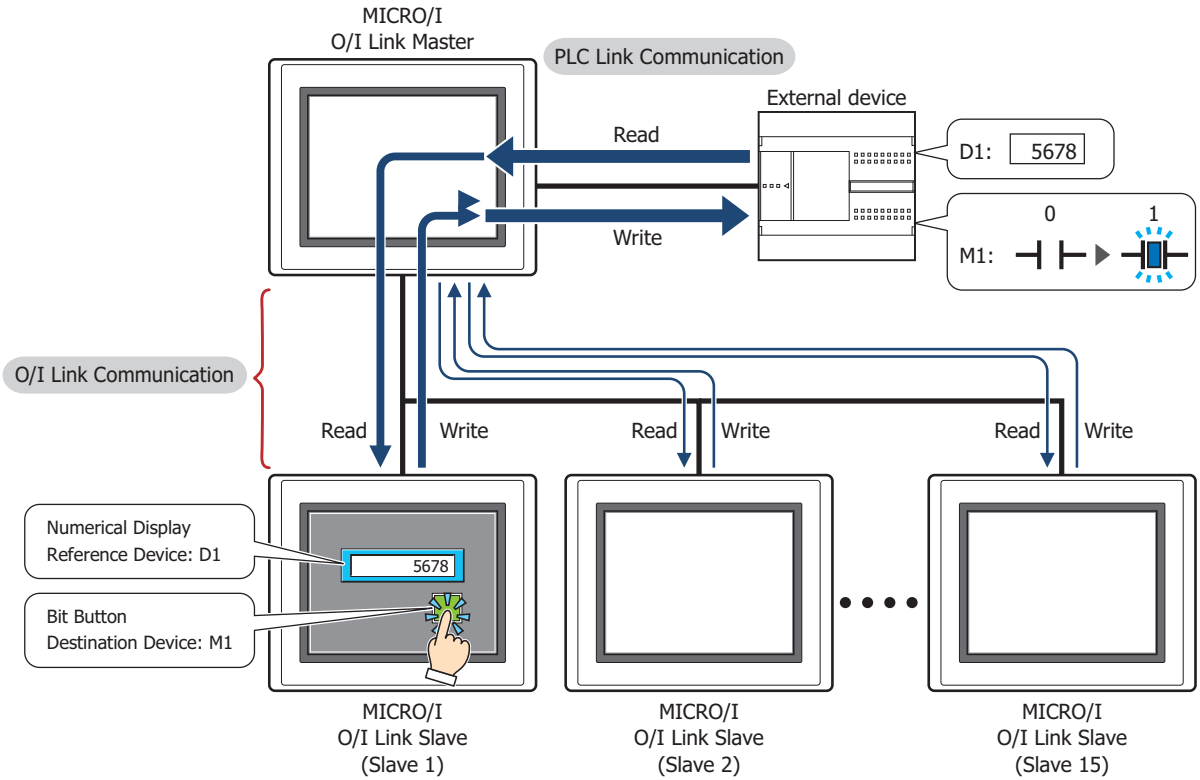
2 O/I Link Communication

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Overview

O/I Link Communication is a protocol for communication between Master and Slave, where a MICRO/I connected to the external device is configured as a Master and multiple MICRO/I (Slaves) communicate with the external device via the Master.

The Master MICRO/I unit communicates with the external device by means of PLC Link Communication. The Master MICRO/I is called an O/I Link Master and a slave MICRO/I connected to the O/I Link Master is called an O/I Link Slave. A maximum of 15 O/I Link Slaves can be connected to an O/I Link Master.



- The HG2G-S/-5S/-5F, the HG3G/4G, and the HG1F/2F/2S/3F/4F have different O/I Link Communication, therefore they can not be connected on the same O/I Link Communication.
- The HG2S can only be used as a slave in O/I Link Communication.
- For details regarding the O/I Link Communication, refer to Chapter 3 "O/I Link Communication" in the "External Device Setup Manual".

- O/I Link Communication is not available when selecting the HG2G-5S USB interface (**Serial 2** in **Interface Configuration** under **Communication Interface** tab on the Project Settings dialog box).
- The HG1F cannot simultaneously use Serial Interface 2 and the O/I Link Interface. The interface to use is set in the Project Settings dialog box on the **Communication Interface** tab.
- The HG1F cannot use the O/I Link Interface when in the following states.
  - The maintenance cable is connected to Serial Interface 2.
  - In the Project Settings dialog box, on the **Host I/F Driver** tab, the **Enable Pass-Through** check box is selected.

2.2 O/I Link Communication Settings

These settings are configured under the **O/I Link** tab on the Project Settings dialog box. The Project Settings dialog box can also be accessed using the following methods.

- Click **Project** on the **Configuration** tab.
- Double click **Project Settings** in the **Project** window.

The O/I Link Communication Settings can only be configured when **O/I Link Master** or **O/I Link Slave** is selected in **Protocol** under **Interface Settings** on the **Communication Interface** tab. For details, refer to Chapter 4 "3.6 O/I Link Tab" on page 4-50.

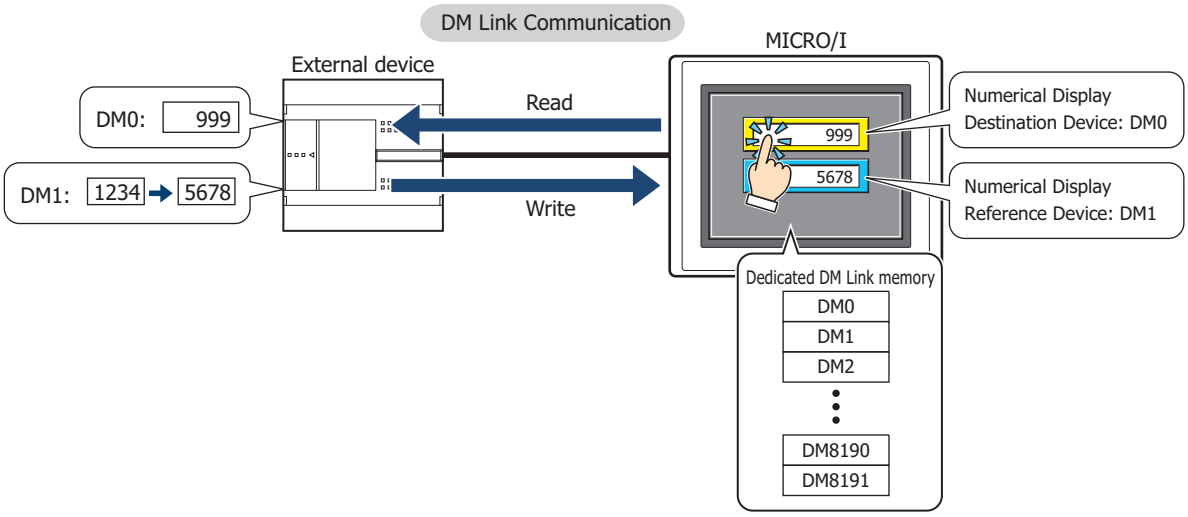
3 DM Link Communication

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

3.1 Overview

DM Link Communication reads and writes value to external devices using the MICRO/I's dedicated DM Link memory. The device type of dedicated DM Link memory is DM.

This method uses a dedicated IDEC protocol, so a communication program is required in the external device.



For details regarding the DM Link Communication, refer to Chapter 4 "DM Link Communication" in the "External Device Setup Manual".

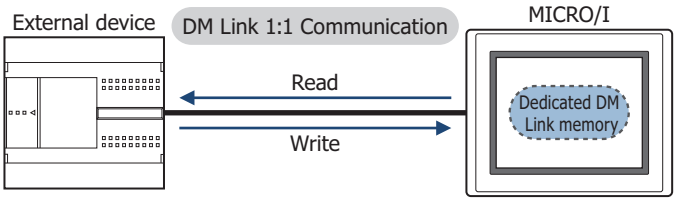
● Communication Methods

Over the serial interface, when one external device is communicating with one MICRO/I using this communication method it is called DM Link 1:1 communication, and when one external device is communicating with multiple MICRO/I units, it is called DM Link 1:N communication. When external devices and the MICRO/I are communicating using DM Link communication over the Ethernet interface (UDP protocol), it is called DM Link Ethernet (UDP) communication*1.

■ DM Link 1:1 Communication

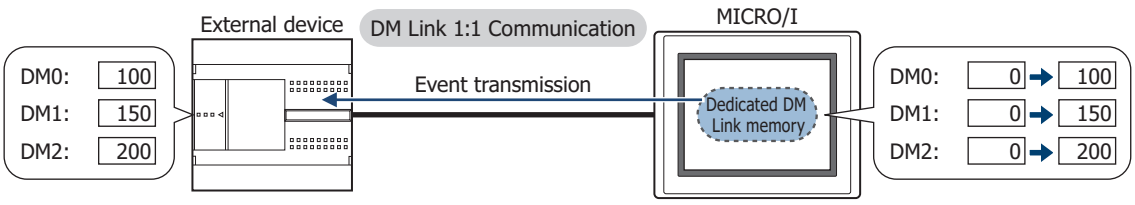
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The external device is connected to a single MICRO/I by using a serial interface.



The Event Transmission function from the MICRO/I can be used with DM Link 1:1 Communication.

The Event Transmission function is a function that works as follows. When value in the dedicated DM Link memory of the MICRO/I is changed, the data is transmitted from the MICRO/I to the external device.

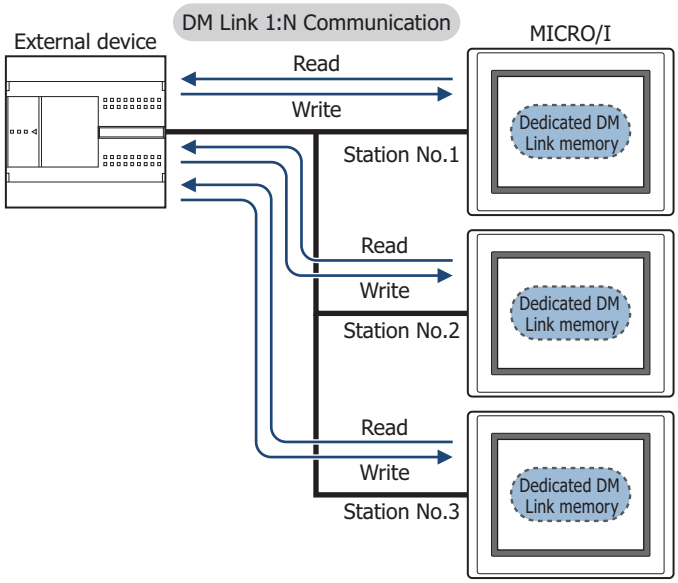


*1 HG4G/3G, HG2G-5F only

DM Link 1:N Communication

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The external device is connected to multiple MICRO/I by using a serial interface.

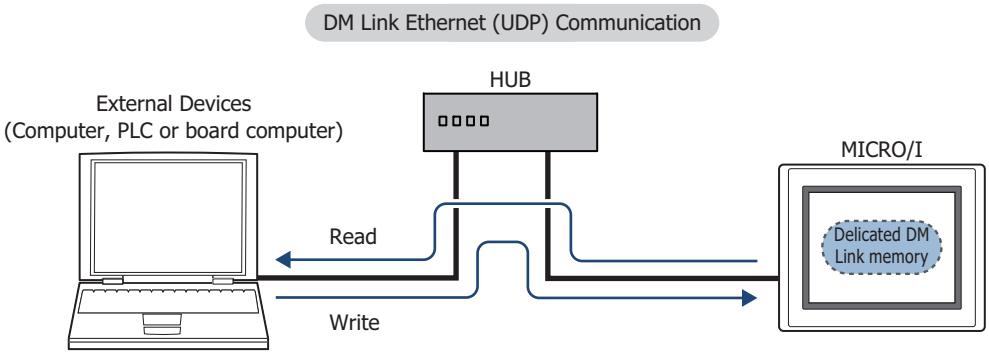


The Event Transmission function cannot be used with DM Link 1:N Communication.

DM Link Ethernet (UDP) Communication

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The external device is connected to multiple MICRO/I by using the Ethernet interface (UDP protocol).



- The Event Transmission function cannot be used with DM Link Ethernet (UDP) communication.
- In DM Link Ethernet (UDP) Communication, when a Response is returned from the MICRO/I to a command source, the Response can also be returned to specified addresses (IP Address, Port Number) at the same time. For details, refer to Chapter 4 "DM Link Communication" in the "External Device Setup Manual".

3.2 DM Link Communication Settings

DM Link Communication settings are selected on the Select Host I/F Driver dialog box, or the Change Host I/F Driver dialog box.

- When creating new project data by following displayed dialog boxes and configuring settings step by step, by clicking , and then clicking **New**, the Select Host I/F Driver dialog box is displayed. For details, refer to Chapter 4 "Create new project data by using the interactive quick start" on page 4-1.
- Click **Host I/F Driver** on the status bar to display the Change Host I/F Driver dialog box. For details, refer to Chapter 4 "Changing Host I/F Drivers" on page 4-22.

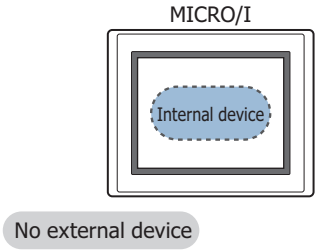
Select **IDEC HG System** in **Manufacturer**, and then select **DM Link (1:1)** or **DM Link (1:N)** in **Protocol**.

4 No Host

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Overview

In this case, there is no communication with an external device, so the MICRO/I operates as a standalone unit. It is only possible to operate the MICRO/I with relays and registers.



4.2 No Host Settings

No Host settings are selected on the Select Host I/F Driver dialog box, or the Change Host I/F Driver dialog box.

- When creating new project data by following displayed dialog boxes and configuring settings step by step, by clicking , and then clicking **New**, the Select Host I/F Driver dialog box is displayed. For details, refer to Chapter 4 "Create new project data by using the interactive quick start" on page 4-1.
- Click **Host I/F Driver** on the status bar to display the Change Host I/F Driver dialog box. For details, refer to Chapter 4 "Changing Host I/F Drivers" on page 4-22.

Select **IDEC HG System** in **Manufacturer**, and then select **No Host** in **Protocol**.

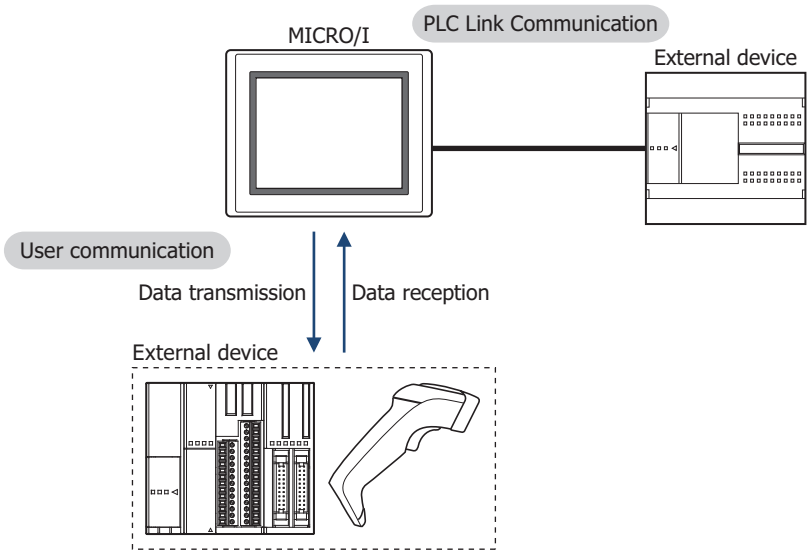
5 User Communication

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

5.1 Overview

User Communication allows you to develop a communication protocol to transmit and receive data from an external device, such as a barcode reader.

User Communication is supported up to three interfaces of the MICRO/I, either serial, Ethernet, or USB interfaces.



- When the serial interface connecting external devices is RS485, a maximum of 31 external devices can be connected. However, carefully check the specifications including the command settings and error processing and verify whether or not multiple external devices is possible and if so how many number of external devices may be supported.
- User communication cannot be used with the HG2G-5S USB interface (**Serial 2** in **Interface Configuration** under **Communication Interface** tab on the Project Settings dialog box).
- The HG1F cannot simultaneously use Serial Interface 2 and the O/I Link Interface. The interface to use is set in the Project Settings dialog box on the **Communication Interface** tab.
- The HG1F cannot use the O/I Link Interface when in the following states.
  - The maintenance cable is connected to Serial Interface 2.
  - In the Project Settings dialog box, on the **Host I/F Driver** tab, the **Enable Pass-Through** check box is selected.

- Flow Control setting is **None**.
- When using user communication via the HG2F/3F/4F O/I Link Interface, the settings are as follows.
  - Data bits: 8 bits
  - Stop bits: 1 bit
  - Parity: None
- Half-duplex communication with the HG1F/2F/2S/3F/4F.
- For the HG2G-S/-5S/-5F and the HG3G/4G, the maximum size of sent data and the maximum size of received data is 1,500 bytes.
  For the HG1F/2F/2S/3F/4F, the maximum size of sent data is 200 bytes and the maximum size of received data is 500 bytes.

5.2 User Communication Settings Procedure

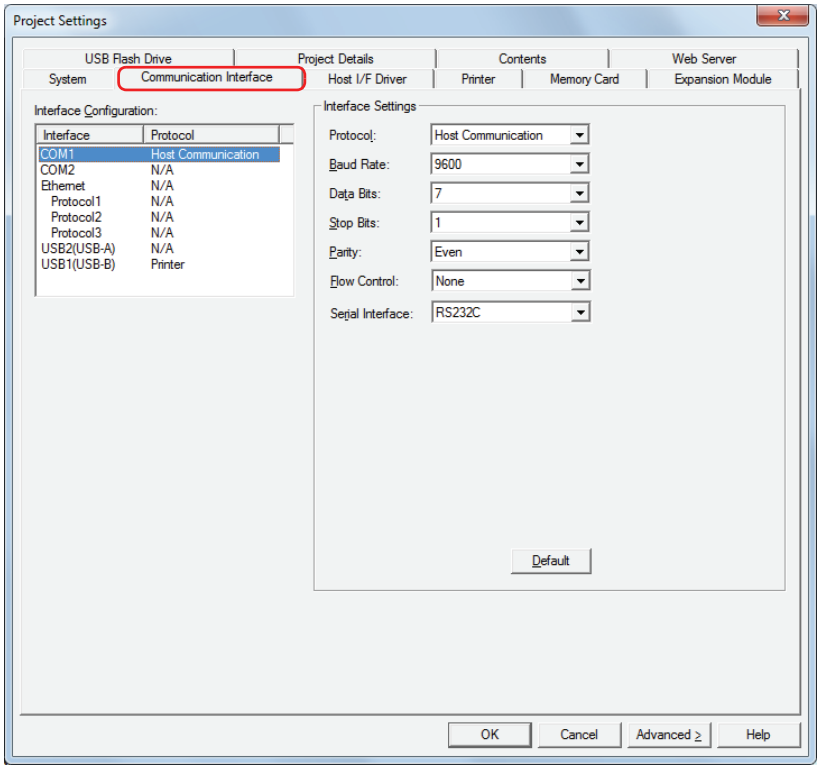
This section describes the procedure for setting user communication.

● Setting user communication for a communication interface

1 On the **Configuration** tab, in the **System Setup** group, click **Project**.

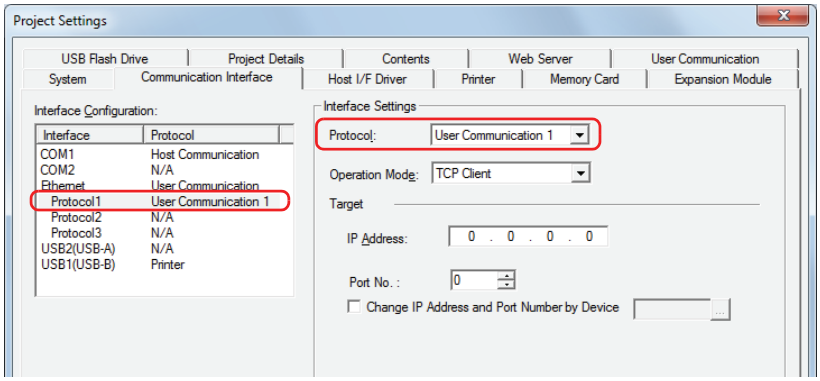
The Project Settings dialog box is displayed.

2 Click the **Communication Interface** tab.



3 Select the interface for user communication under **Interface Configuration**, and then select the user communication in **Protocol** under **Interface Settings**.

The **User Communication** tab is displayed.



4 Specify the items for **Interface Settings**.

The settings vary based on the MICRO/I model and interface.

■ **HG2G-5F, HG3G/4G**

- Serial Interface

  ☞ For details, refer to Chapter 4 "When COM1 or COM2 is selected under Interface Configuration" on page 4-39.

- Ethernet Interface

  ☞ For details, refer to Chapter 4 "When Protocol1, Protocol2, or Protocol3 is selected for Ethernet under Interface Configuration" on page 4-41.

- USB Interface

  ☞ For details, refer to Chapter 4 "When USB2(USB-A) is selected under Interface Configuration" on page 4-42.

■ **HG2G-S/-5S, HG1F/2F/2S/3F/4F**

- Serial Interface 1

  ☞ For details, refer to Chapter 4 "When SERIAL 1 is selected under Interface Configuration" on page 4-42.

- Serial Interface 2*1

  ☞ For details, refer to Chapter 4 "When SERIAL 2 is selected under Interface Configuration" on page 4-43.

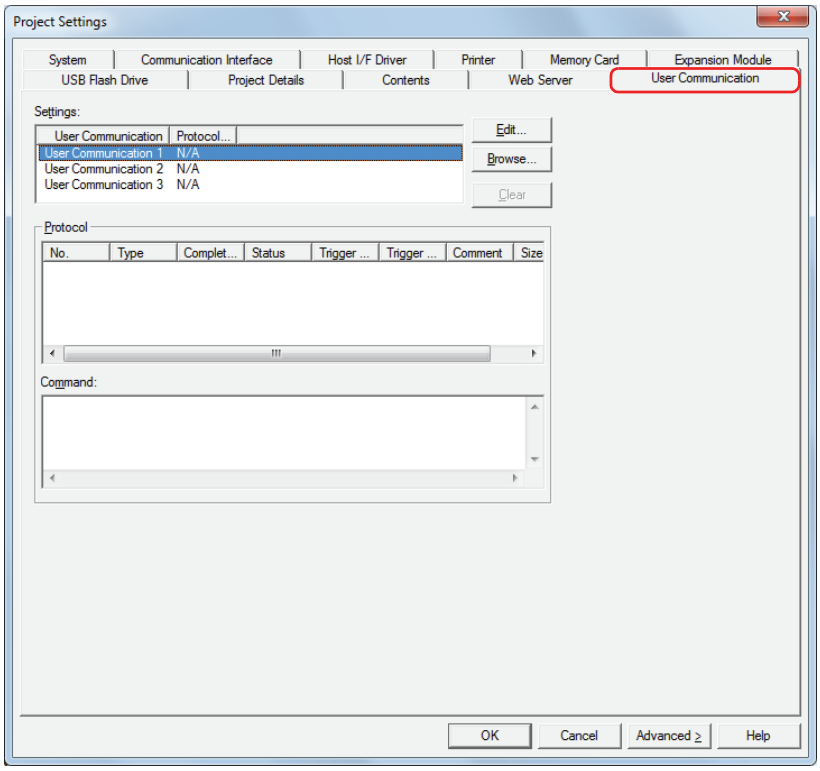
- O/I Link Interface

  ☞ For details, refer to Chapter 4 "When O/I Link is selected under Interface Configuration" on page 4-44.

- Ethernet Interface*2

  ☞ For details, refer to Chapter 4 "When Protocol1, Protocol2, or Protocol3 is selected for Ethernet under Interface Configuration" on page 4-41.

5 Click the **User Communication** tab.

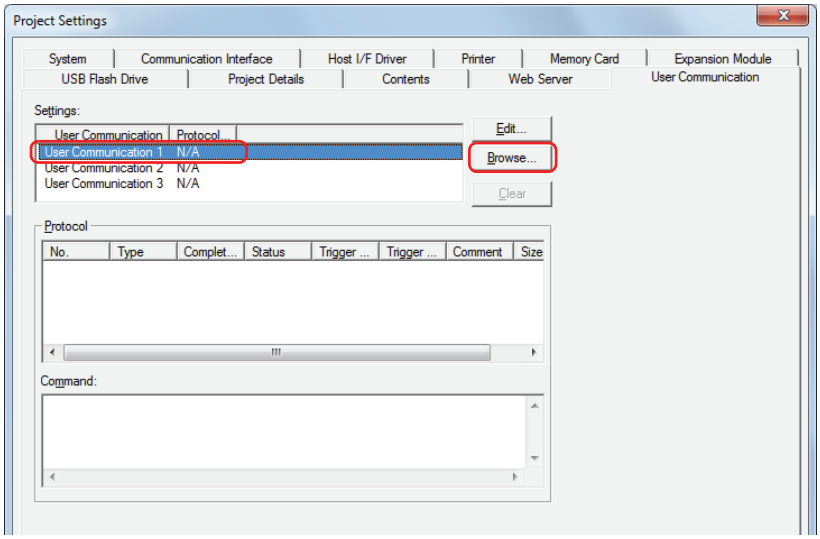


*1 HG2G-S, HG1F/2F/2S/3F/4F only
*2 HG2G-S/-5S Ethernet interface equipped models only

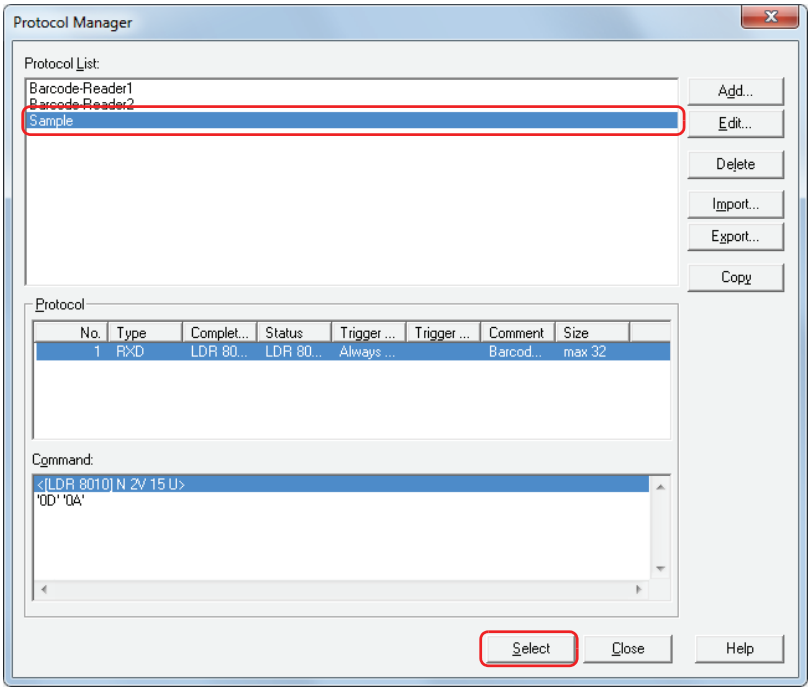
6 Select the user communication under **Settings**, and then click **Browse**.

Select the user communication configured on the **Communication Interface** tab.

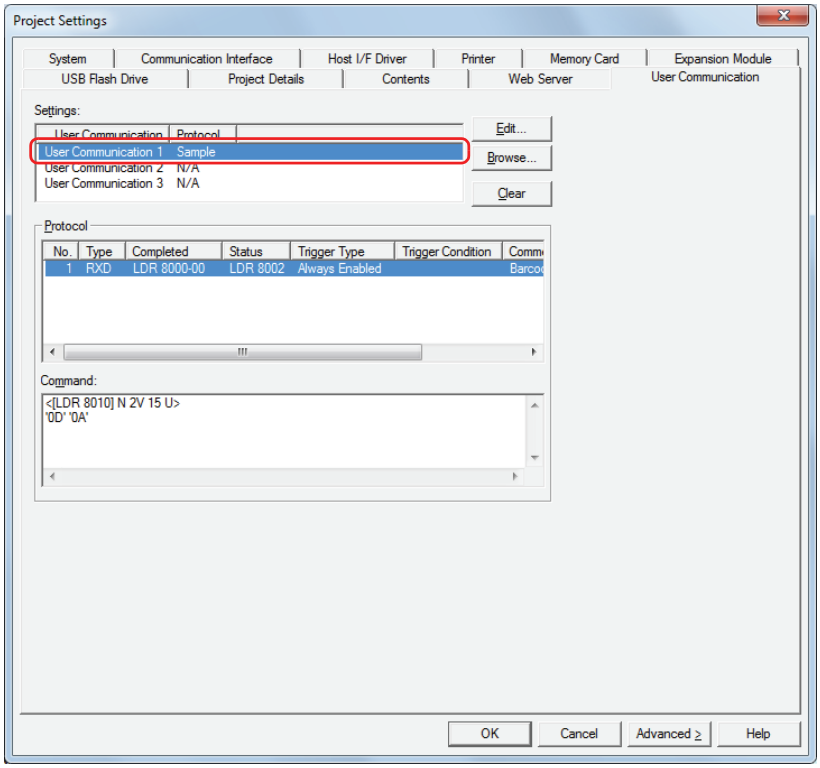
Protocol Manager is displayed.



7 Select the user communication protocol under **Protocol List**, and then click **Select**.



The name of the configured user communication protocol set on the **User Communication** tab in the Project Settings dialog box is displayed in **Protocol Name** under **Settings**, and the protocol settings are displayed under **Protocol**. In addition, the command settings selected under **Protocol** are displayed under **Command**.



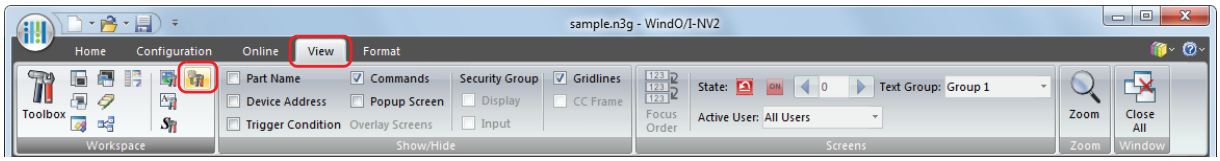
8 Click **OK**.

This concludes configuring user communication for communication interfaces.

● Creating a New User Communication Protocol

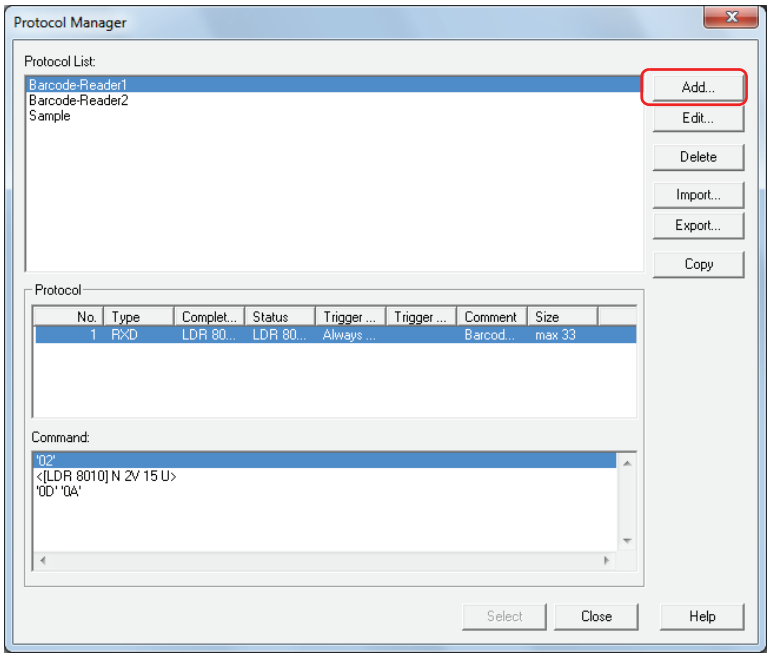
1 On the **View** tab, in the **Workspace** group, click (Protocol Manager).

Protocol Manager is displayed.



2 Click **Add**.

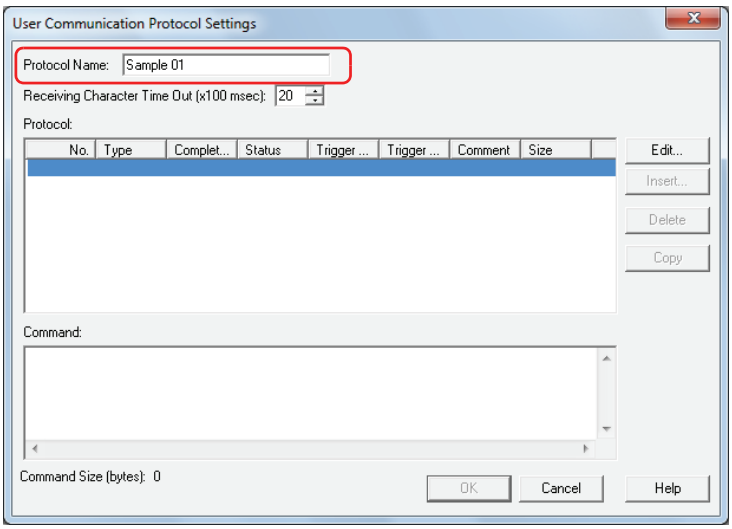
The User Communication Protocol Settings dialog box is displayed.



3 Enter the name of the user communication protocol in the **Protocol Name**.

The maximum number for protocol name is 40 characters.

> You cannot use the following characters in the protocol name.
> \ / : , ; * ? " < > |



4 Set the time out (0 to 255) from when 1 frame of data has been received to when the next frame of data starts to be received in **Receiving Character Time Out (x100 msec)**.

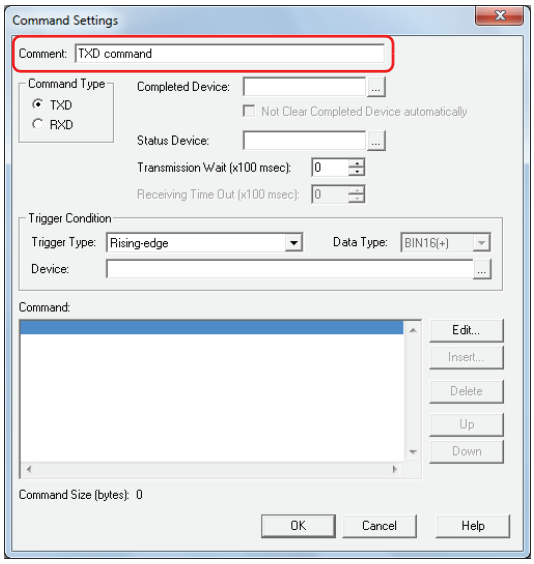
A frame refers to a data string from the beginning to the end of a command. These setting items are used only with receive command.

5 Click **Edit**.

The Command Settings dialog box is displayed.

6 Set Transmission (TXD) command.
Enter a comment for transmission command in **Comment**.

The maximum number is 40 characters.



7 Select **TXD** in **Command Type**.

Specify the transmitted data to the external device connected to the MICRO/I and the conditions for transmitting data.

8 Specify the bit device or bit of the word device for reporting that data transmission was successfully completed in **Completed Device**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

9 Specify the destination word device for the transmitted data size and error information in **Status Device**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

10 Set the wait time (0 to 255) from when the trigger condition is satisfied to when the data is transmitted in **Transmission Wait (x100 msec)**.

11 Select the condition to transmit data in **Trigger Type** under **Trigger Condition** from the following.

■ **Rising-edge**
Data is transmitted when the value of device changes from 0 to 1.
Specify the bit device or bit of the word device as the condition.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Falling-edge**
Data is transmitted when the value of device changes from 1 to 0.
Specify the bit device or bit of the word device as the condition.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Satisfy the condition**

Data is transmitted when condition changes from not satisfied to satisfied.

Specify the conditional expression in **Condition** and select the data type handled by the conditional expression in **Data Type**.

Click ... to display the Trigger Condition Settings dialog box. For the conditional expressions configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

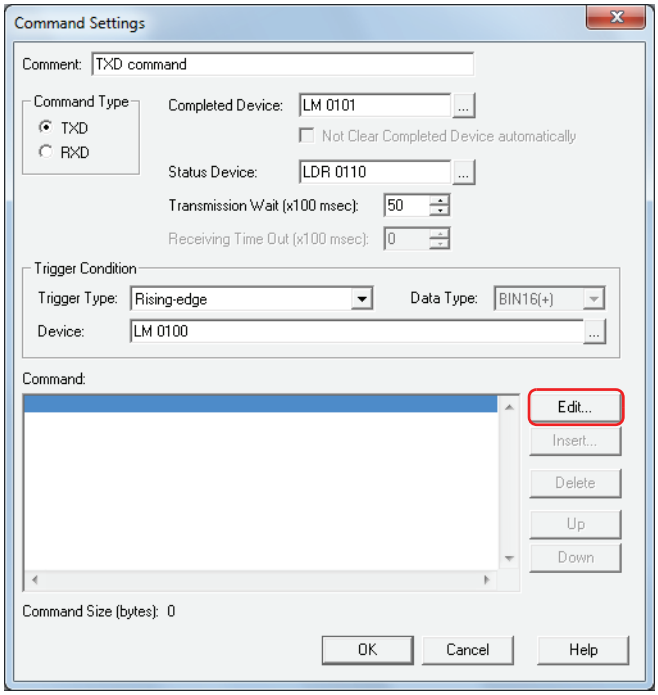
■ **Fixed Period**

Data is transmitted at a fixed time interval.

Set the time interval between data transmissions as 1 to 3600 (seconds) in **Period (sec)**.

12 Set data for transmission command.
Click **Edit**.

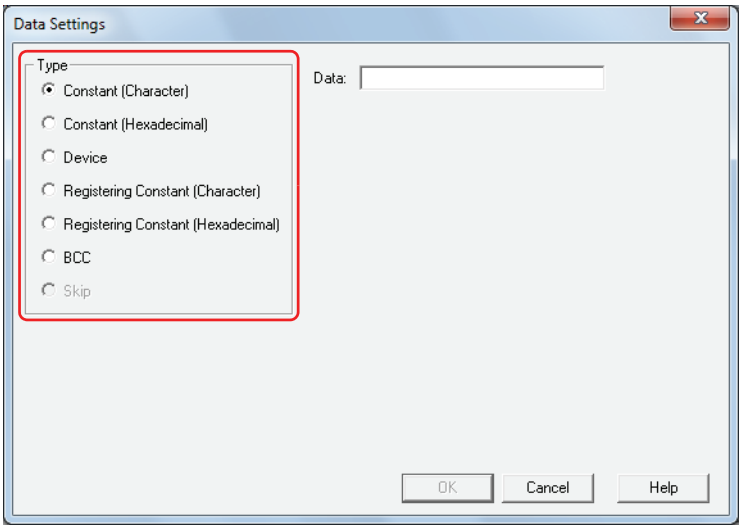
The Data Settings dialog box is displayed.



13 Select data type in **Type**.

Data setting items are displayed.

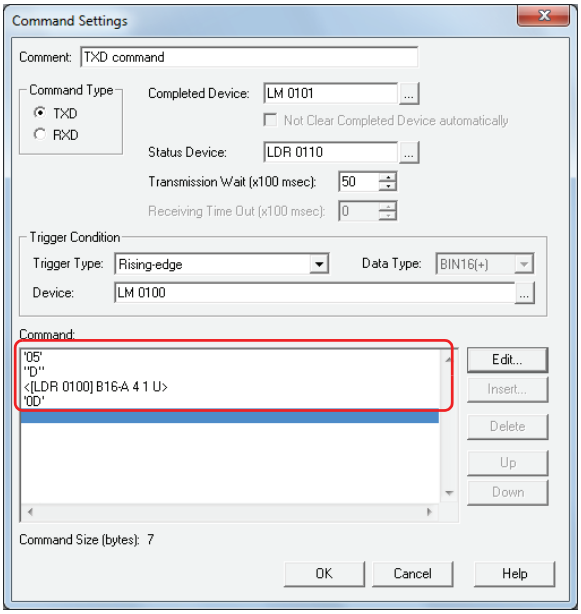
For details on transmission command, refer to "Transmission (TXD) Command" on page 3-39.



14 Set the data, and then click **OK**.

The data configured in **Command** is displayed.

15 Repeat steps *12* through *14* to set all the data for the transmission command.

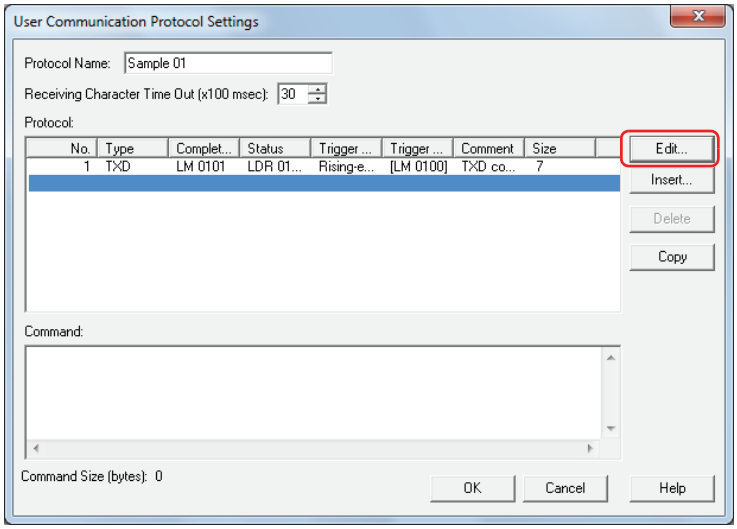


The data are displayed in **Command** in the order they were set. To change the order of data, select data, and then click **Up** or **Down** to shift it.

16 Click **OK**.

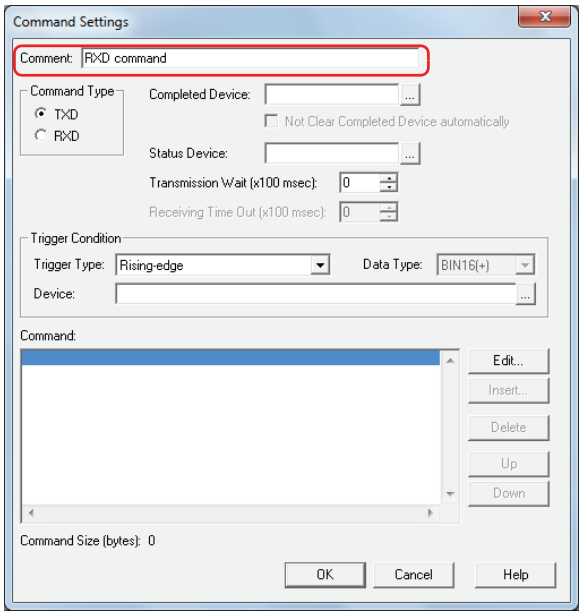
The transmission command configured under **Protocol** is displayed.

17 Specify Receive (RXD) command.
Click **Edit**.



18 Specify Receive (RXD) command.
Enter a comment for receive command in **Comment**.

The maximum number is 40 characters.



19 Select **RXD** in **Command Type**.

Define the data configuration for received data from the external device.

20 Specify the bit device or bit of the word device for reporting that data receiving was successfully completed in **Completed Device**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

If the value of Completed Device automatically is not set to 0 after it is set to 1, select the **Not Clear Completed Device automatically** check box.

21 Specify the destination word device for the received data size and error information in **Status Device**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

22 Select the condition for being ready to receive data in **Trigger Type** under **Trigger Condition** from the following.

■ **Always Enabled**
The device is always ready to receive data. Proceed to step *24*.

■ **While ON**
Ready to receive data when the value of device is 1.
Specify the bit device or bit of the word device as the condition.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **While OFF**
Ready to receive data when the value of device is 0.
Specify the bit device or bit of the word device as the condition.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **While satisfying the condition**

Ready to receive data while a condition is satisfied.

Specify the conditional expression in **Condition** and select the type of data handled by the conditional expression in **Data Type**.

Click ... to display the Trigger Condition Settings dialog box. For the conditional expressions configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

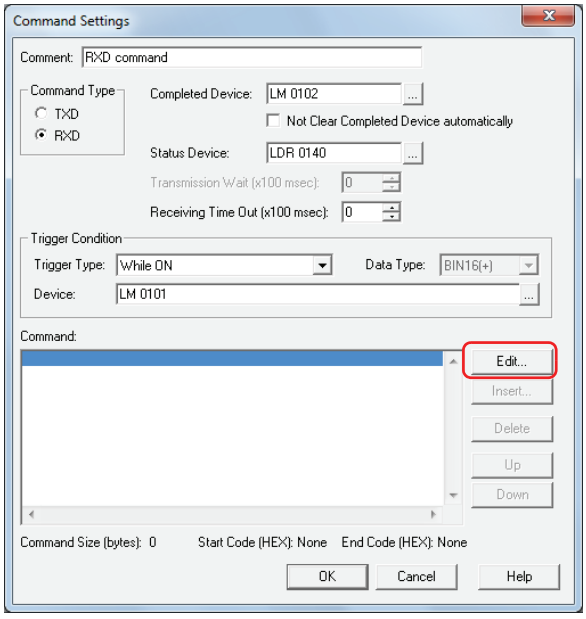
For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

23 Set the time out (0 to 255) from when the trigger condition is satisfied in **Receiving Time Out (x100 msec)** to when 1 frame of data has been received.

A frame refers to a data string from the beginning to the end of a command.

24 Set data for receive command.
Click **Edit**.

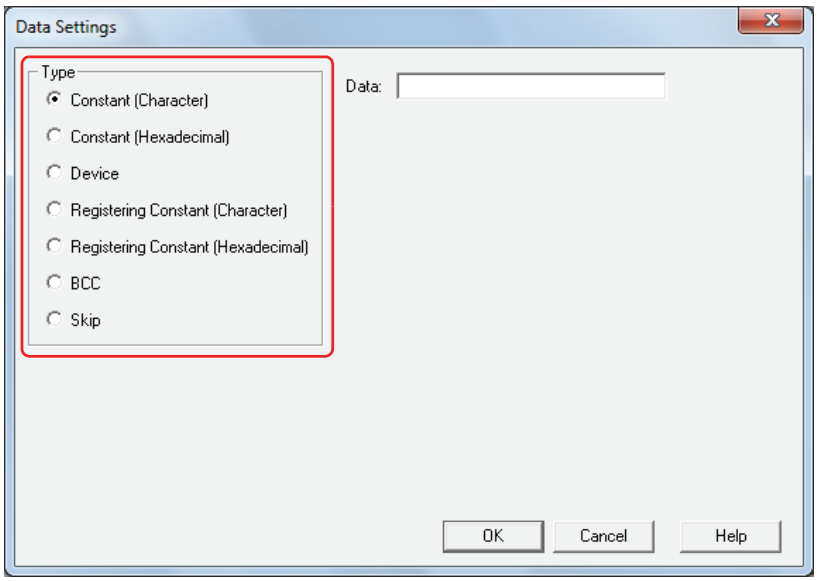
The Data Settings dialog box is displayed.



25 Select data type in **Type**.

Data setting items are displayed.

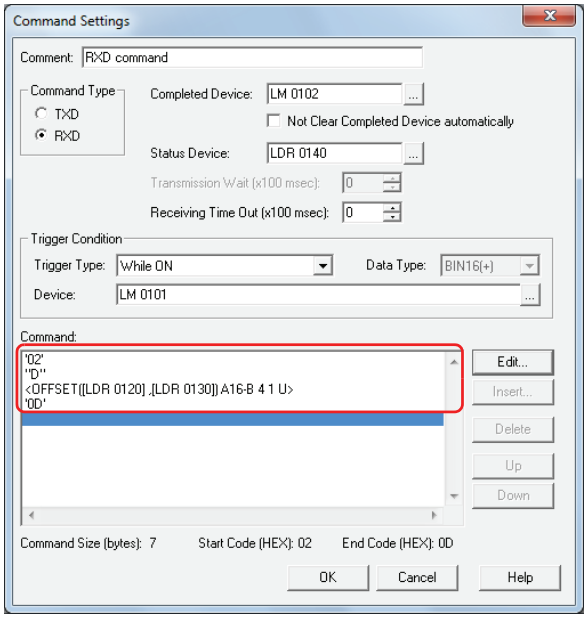
For details on receive command, refer to "Receive (RXD) Command" on page 3-52.



26 Specify the data, and then click **OK**.

The data configured in **Command** on the Command Settings dialog box is displayed.

27 Repeat steps *24* through *26* to specify all the data for the receive command.



The data are displayed in **Command** in the order they were set. To change the order of data, select data, and then click **Up** or **Down** to shift it.

28 Click **OK**.

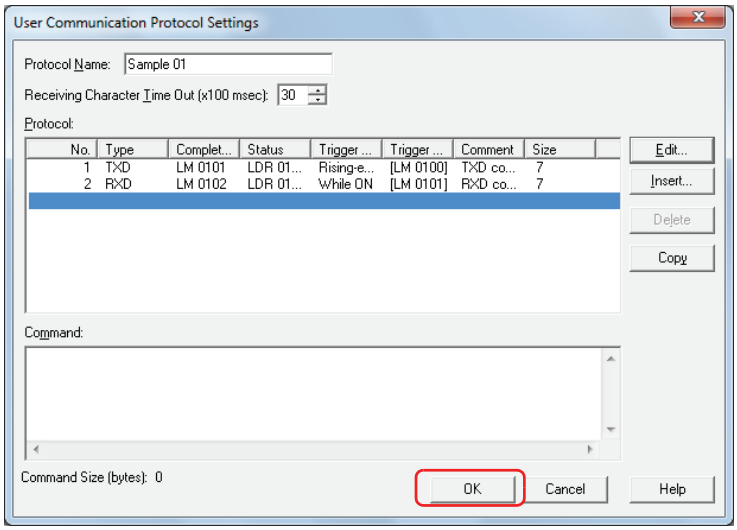
The receive command configured in **Protocol** on the User Communication Protocol Settings dialog box is displayed.

To add a transmission command, repeat steps *5* through *16*.

To add a receive command, repeat steps *17* through *28*.

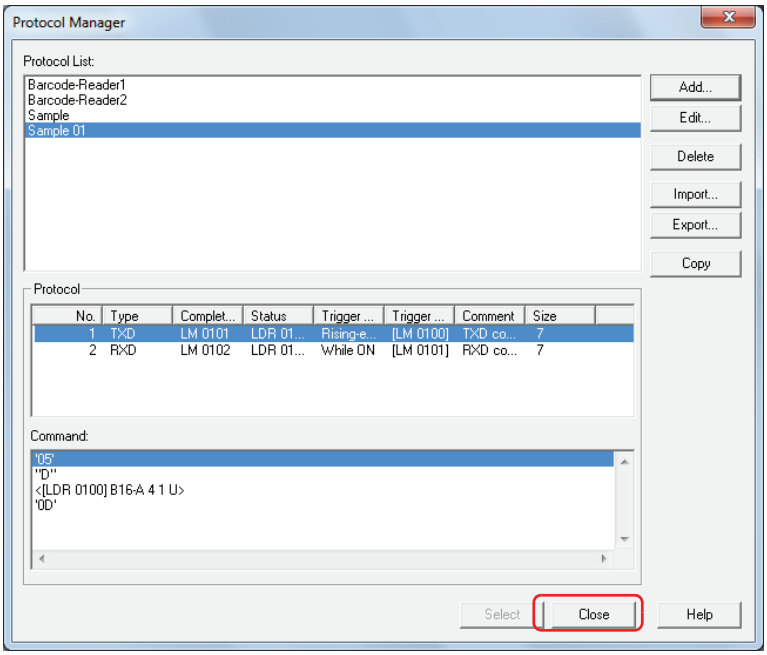
29 Configure all commands, click **OK**.

User communication protocols are registered in **Protocol List** on Protocol Manager.



30 Click **Close**.

This concludes registering user communication protocol.



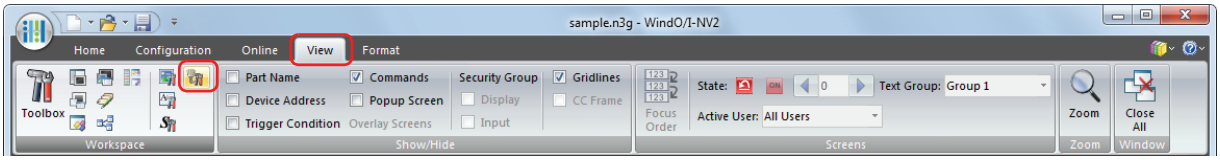
● Using registered user communication protocol on another computer

Saving registered user communication protocol as a file

To use the user communication protocol registered in Protocol Manager on another computer, save it as a file.

1 On the **View** tab, in the **Workspace** group, click (Protocol Manager).

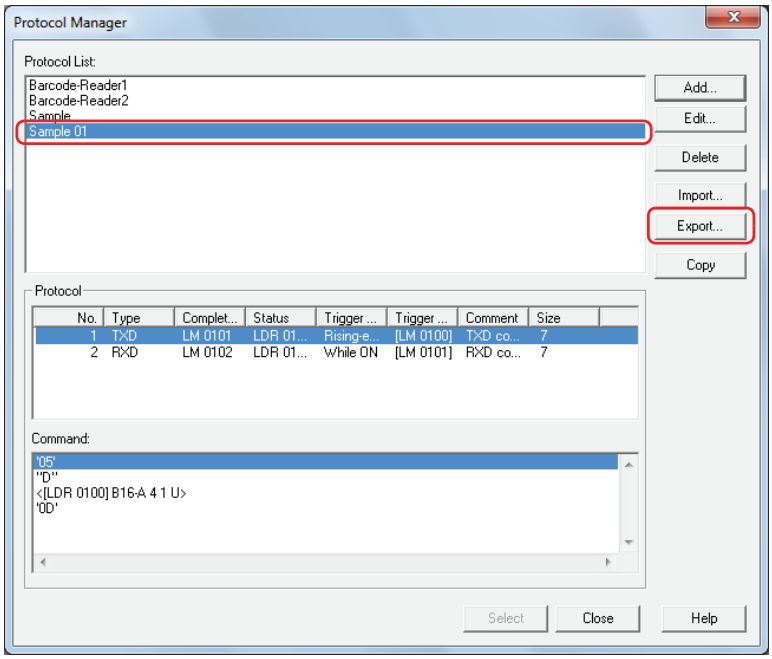
Protocol Manager is displayed.



2 Select the user communication protocol in **Protocol List**, and then click **Export**.

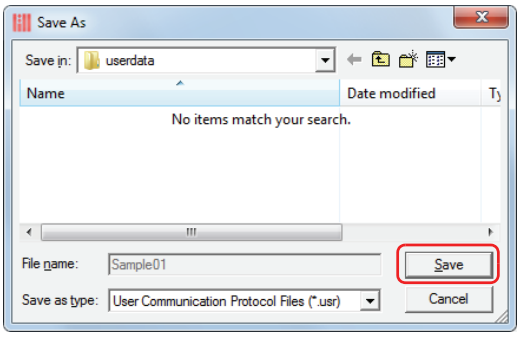
The Save As dialog box is displayed.

> To select multiple user communication protocols, press and hold SHIFT or CTRL while you click the specific items.



3 Specify **Save in**, and then click **Save**.

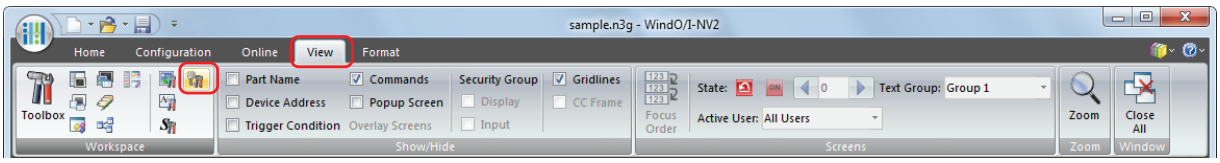
The name of the saved file will be the name of the protocol.



Importing user communication protocol

1 On the **View** tab, in the **Workspace** group, click (Protocol Manager).

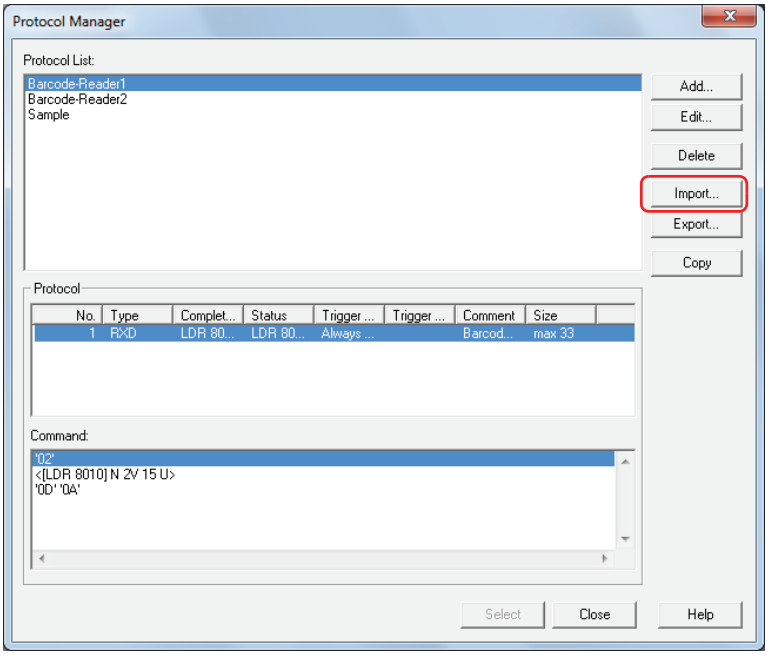
Protocol Manager is displayed.



2 On Protocol Manager, click **Import**.

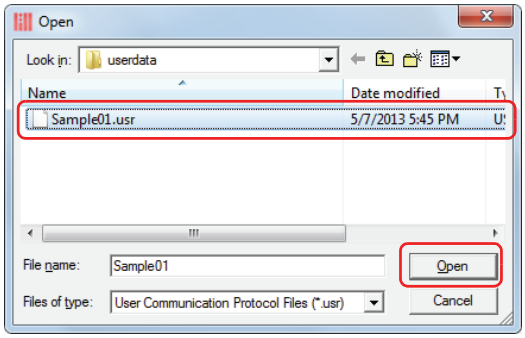
The Open dialog box is displayed.

To select multiple user communication protocols, press and hold SHIFT or CTRL while you click the specific items.



3 Specify the user communication protocol file, and then click **Open**.

The user communication protocol is registered in Protocol Manager. The name of the user communication protocol file is set as the name of the protocol.

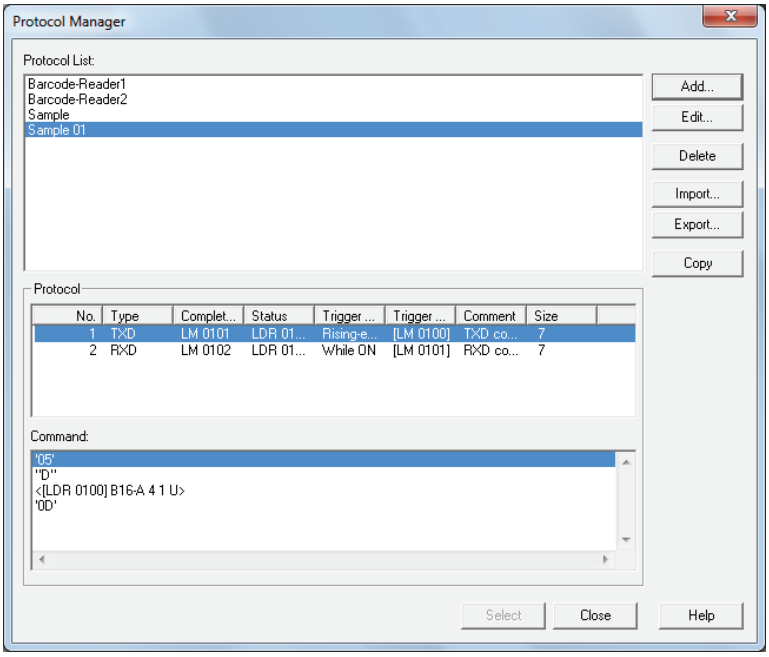


When a user communication protocol file with the protocol name already exists, a confirmation message is displayed.

- Click **Overwrite** to overwrite the existing user communication protocol.
- Click **Rename** to display the Protocol File Name Settings dialog box. Enter a new name for **Protocol File Name**, and then click **OK** to add the user communication protocol with the protocol name entered for **Protocol File Name**. For details, refer to "Protocol File Name Setting Dialog Box" on page 3-27.
- Click **Cancel** to stop importing the user communication protocol.

5.3 Protocol Manager

The protocol for user communication is collectively managed in Protocol Manager.



■ **Protocol List**

Displays a list of registered user communication protocols and sample protocols provided by WindO/I-NV2.

> The barcode reader protocols such as Barcode-Reader1, Barcode-Reader2, and Barcode-Reader3 are supplied as samples with WindO/I-NV2.

■ **Add**

Adds user communication protocols to the Protocol List.

Click this button to display the User Communication Protocol Settings dialog box. Specify the user communication protocol to be registered in the User Communication Protocol Settings dialog box. For details, refer to "User Communication Protocol Settings Dialog Box" on page 3-25.

■ **Edit**

Changes the selected user communication protocol.

Click this button to display the User Communication Protocol Settings dialog box. Change the user communication protocol in the User Communication Protocol Settings dialog box. For details, refer to "User Communication Protocol Settings Dialog Box" on page 3-25.

■ **Delete**

Deletes the selected user communication protocol.

■ **Import**

Imports a saved user communication protocol file. Click this button to display the Open dialog box. For details, refer to "Importing user communication protocol" on page 3-22.

■ **Export**

Export and saves a selected user communication protocol as a file.

Click this button to display the Save As dialog box. For details, refer to "Saving registered user communication protocol as a file" on page 3-21.

Saved user communication protocols can be imported using **Import**.

■ **Copy**

Copies the selected user communication protocol.

Click this button to display the Protocol File Name Settings dialog box. For details, refer to "Protocol File Name Setting Dialog Box" on page 3-27.

Protocol

The command settings for the user communication protocol selected in the Protocol List are displayed.

No.: Shows the number for managing command settings. Double clicking the cell displays the Command Settings dialog box.

Type: Shows the type of command. Double clicking the cell displays the Command Settings dialog box.

Completed: Shows the device for reporting when transmission or receiving of data is successfully completed. Double clicking the cell displays the Command Settings dialog box.

Status: Shows the destination device for the transmitted or received data size and error information. Double clicking the cell displays the Command Settings dialog box.

Trigger Type: Shows the trigger type for data transmission or being ready to receive data. Double clicking the cell displays the Command Settings dialog box.

Condition: Shows the condition of trigger type for data transmission or being ready to receive data. The displayed content varies based on **Trigger Type**.

Always Enabled: Trigger conditions are not necessary, so nothing is displayed.

Rising-edge, **Falling-edge**, **While ON**, or **While OFF**:

Shows the bit device as the condition. Double clicking the cell displays the Command Settings dialog box.

While satisfying the condition or **Satisfy the condition**:

Shows the conditional expression.

Fixed Period: Shows the period.

Comment: Shows the command comment. Double clicking the cell displays the Command Settings dialog box.

Size: Shows the command data size in bytes. Double clicking the cell displays the Command Settings dialog box.

Command

Shows a list of command settings for the selected user communication protocol. Double clicking the line displays the Data Settings dialog box.

Select

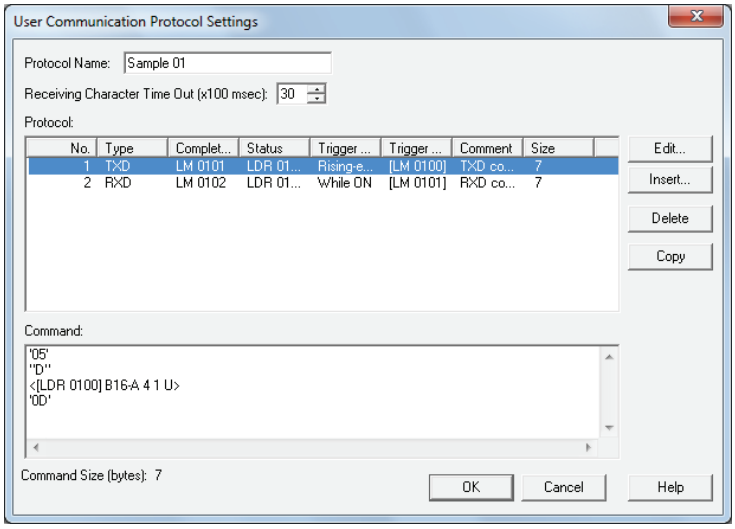
The highlighted user communication protocol in the protocol list is selected and Protocol Manager is closed.

Close

Close Protocol Manager.

● User Communication Protocol Settings Dialog Box

The command for user communication protocol is collectively managed in the User Communication Protocol Settings dialog box.



■ Protocol Name

Enter the name of the user communication protocol. The maximum number for protocol name is 40 characters.

> You cannot use the following characters in the protocol name.
> \ / : , ; * ? " < > |

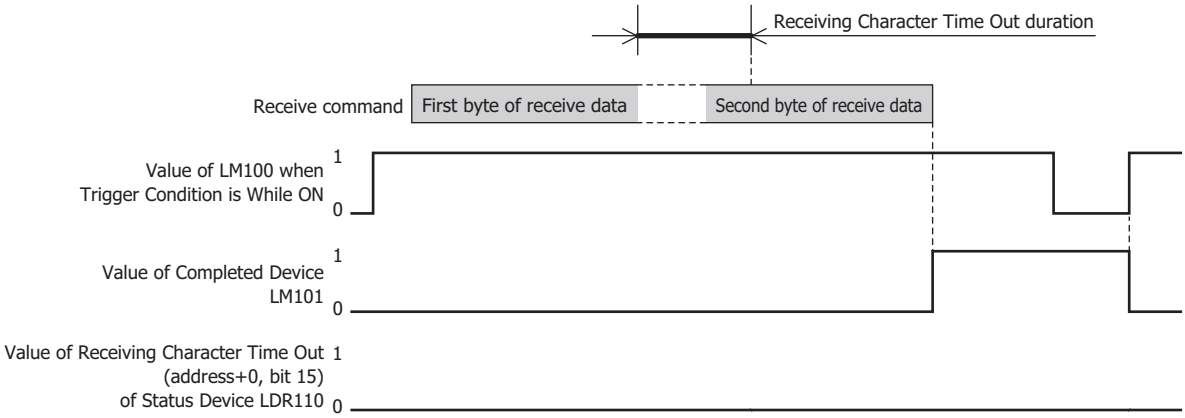
■ Receiving Character Time Out (x100 msec)

Specify the time out value (0 to 255) from when 1 frame of data has been received to when the next frame of data starts to be received. A frame refers to a data string from the beginning to the end of a command. If the Receiving Character Time Out is set to 0, it is not monitored. These setting items are used only with receive command.

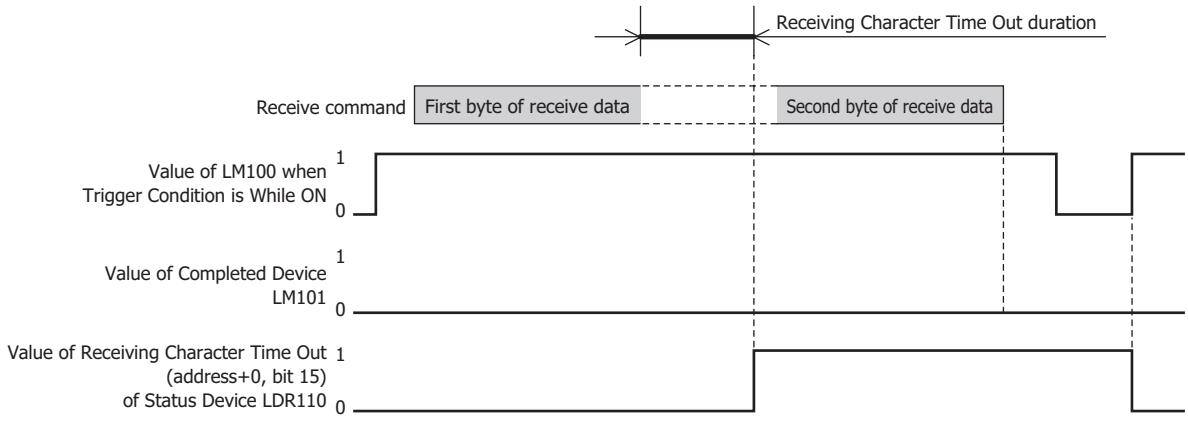
Example: When the received data (1 frame) is 2 bytes, **While** ON is selected as **Trigger Type** in **Trigger Condition** and LM100 is set to **Device**, LM101 is set to **Completed Device**, and LDR110 is set to **Status Device**

The data of second byte starts to be received before exceeding the Receiving Character Time Out duration after the data of first byte is received, and the values of the Completed Device and Status Device when receiving of the data has been successfully completed are as follows.

- The value of the Completed Device LM101 changes to 1.
  When the **Not Clear Completed Device automatically** check box is not selected, when the value of the Trigger Condition device LM100 changes from 0 to 1, the value of the Completed Device LM101 changes to 0.
  When the **Not Clear Completed Device automatically** check box is selected, the value of Completed Device LM101 remains 1, so set 0 if necessary.
- The value of the Receiving Character Time Out (address+0, bit 15) of the Status Device LDR110 remains 0.



When the Receiving Character Time Out duration exceeds until the data of second byte starts to be received after the data of first byte is received, the value of the Receiving Character Time Out (address+0, bit 15) of the Status Device LDR110 changes to 1 and the Completed Device LM101 remains 0. In addition, when the value of the Trigger Condition device LM100 changes from 0 to 1, the value of LDR110 (address +0, bit 15) changes to 0.



■ **Protocol**

Displays a list of command settings for the user communication protocol selected during editing. The maximum amount that can be configured is 32 commands per protocol.

No.: Shows the number for managing command settings. Double clicking the cell displays the Command Settings dialog box.

Type: Shows the type of command. Double clicking the cell displays the Command Settings dialog box.

Completed: Shows the device for reporting when transmission or receiving of data is successfully completed. Double clicking the cell displays the Device Address Settings dialog box.

Status: Shows the destination device for the transmitted or received data size and error information. Double clicking the cell displays the Device Address Settings dialog box.

Trigger Type: Shows the trigger type for data transmission or being ready to receive data. Double clicking the cell displays the Command Settings dialog box.

Condition: Shows the condition of trigger type for data transmission or being ready to receive data. The displayed content varies based on **Trigger Type**.

Always Enabled: Trigger conditions are not necessary, so nothing is displayed.

Rising-edge, **Falling-edge**, **While ON**, or **While OFF**:

Shows the bit device as the condition. Double clicking the cell displays the Command Settings dialog box.

While satisfying the condition or **Satisfy the condition**:

Shows the conditional expression.

Fixed Period: Shows the period.

Comment: Shows the command comment. Double clicking the cell displays the Command Settings dialog box.

Size: Shows the command data size in bytes. Double clicking the cell displays the Command Settings dialog box.

■ **Edit**

Adds or changes commands.

To add a command, select an empty line for the protocol, and then click this button. To change a command, select a command for the protocol, and then click this button. For details, refer to "Command Settings Dialog Box" on page 3-28.

■ **Insert**

Inserts a command in the selected position of the protocol.

Click this button to insert a command. The command at the insertion position shift down 1 line. When 32 commands are already set, you cannot insert a command. For details, refer to "Command Settings Dialog Box" on page 3-28.

■ **Delete**

Deletes the selected command.

■ **Copy**

Copies the selected command.

Click this button to copy the selected command and add it to the end of the Protocol List.

■ **Command**

Displays data of the command selected in the protocol. Double clicking the line displays the Data Settings dialog box.

■ **Copy to Protocol Manager**

Copies a user communication protocol during editing and copies it to Protocol Manager.

Click this button to copy the user communication protocol and add it to the Protocol List of Protocol Manager.

This is enabled only when the User Communication Protocol Settings dialog box under the **User Communication** tab on the Project Settings dialog box is displayed.

When a protocol of the same name has already been saved, an overwrite confirmation message is displayed.

Click **Overwrite** to overwrite the existing protocol.

Click **Rename** to display the Protocol File Name Settings dialog box. Enter a new protocol name, and then click **OK** to save the protocol.

Click **Cancel** to stop saving the protocol.

The User Communication Protocol Settings dialog box under the **User Communication** tab on the Project Settings dialog box can be displayed in the following ways.

- Click **Edit**.
- Click **Browse**, and then click **Add** or **Edit** in Protocol Manager.

■ **OK**

Adds or changes the user communication protocol and closes the User Communication Protocol Settings dialog box.

When a protocol of the same name has already been saved, an overwrite confirmation message is displayed.

Click **Overwrite** to overwrite the existing protocol.

Click **Rename** to display the Protocol File Name Settings dialog box. Enter a new protocol name, and then click **OK** to save the protocol.

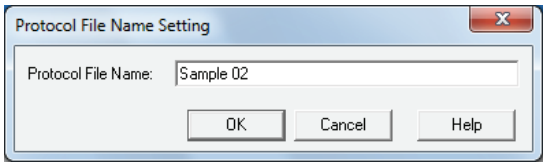
Click **Cancel** to stop saving the protocol.

■ **Cancel**

Closes the User Communication Protocol Settings dialog box, without adding or changing the user communication protocol.

Protocol File Name Setting Dialog Box

Specify the name of a user communication protocol.



■ **Protocol File Name**

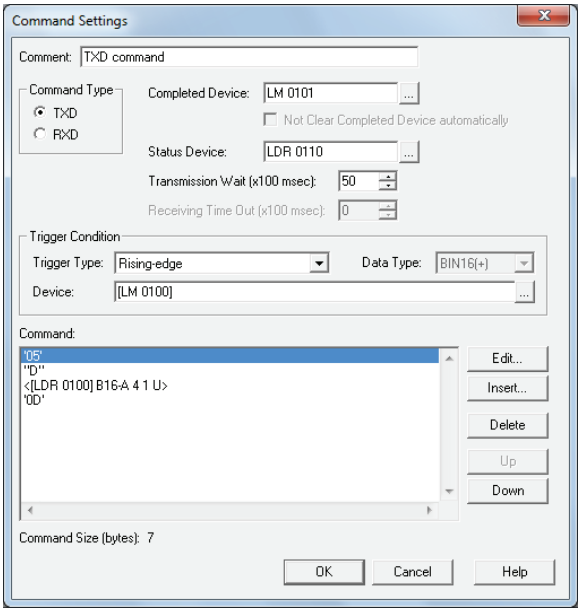
Enter the name of the user communication protocol. The maximum number for protocol name is 40 characters.

You cannot use the following characters in the protocol name.

\ / : , ; * ? " < > |

● Command Settings Dialog Box

Specify the command details for user communication protocol.



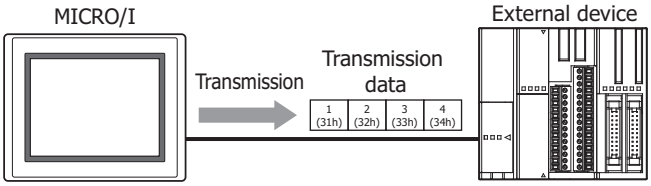
■ Comment

Enter a comment for a command. The maximum number is 40 characters.

■ Command Type

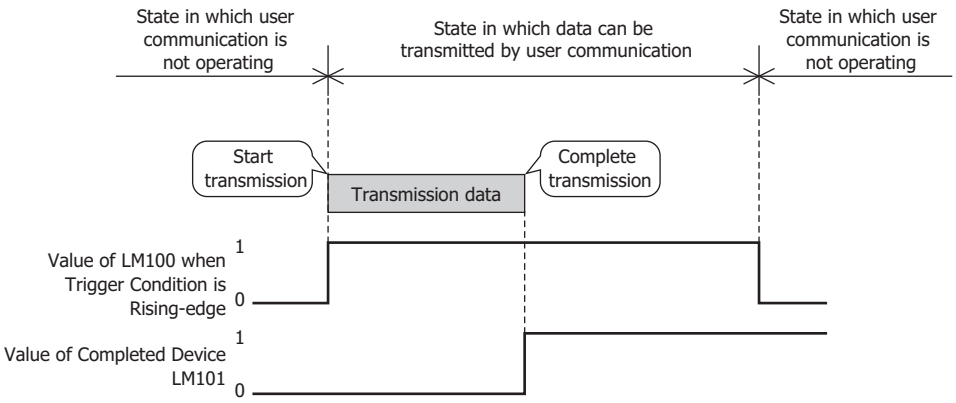
Select the type of communication command from the following items.

TXD: A command for data transmission from the MICRO/I to an external device.

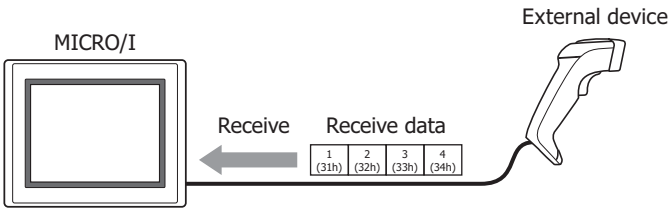


Processing of transmission command is as follows.

Example: When **Trigger Type** in **Trigger Condition** is **Rising-edge**, **Device** is LM100 and **Completed Device** is LM101
When the value of the Trigger Condition device LM100 changes to 1, data is transmitted by user communication from the MICRO/I to the external device. When data transmission is successfully completed, the value of the Completed Device LM101 changes to 1.

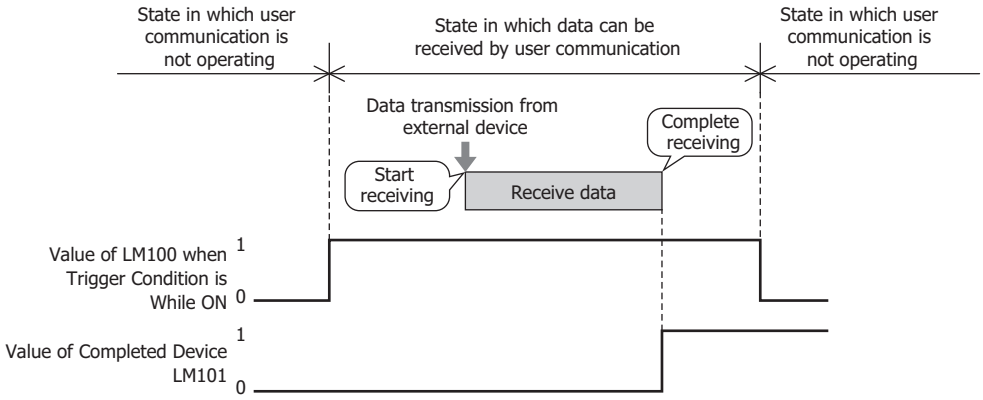


RXD: A command for analyzing and processing data received by the MICRO/I from an external device.



Processing of receive command is as follows.

Example: When **Trigger Type** in **Trigger Condition** is **While ON**, **Device** is LM100 and **Completed Device** is LM101
When the value of the Trigger Condition device LM100 changes to 1, data can be received (ready to receive) by user communication, so when data is transmitted from the external device, the MICRO/I starts to receive the data. When data receiving is successfully completed, the value of the Completed Device LM101 changes to 1.



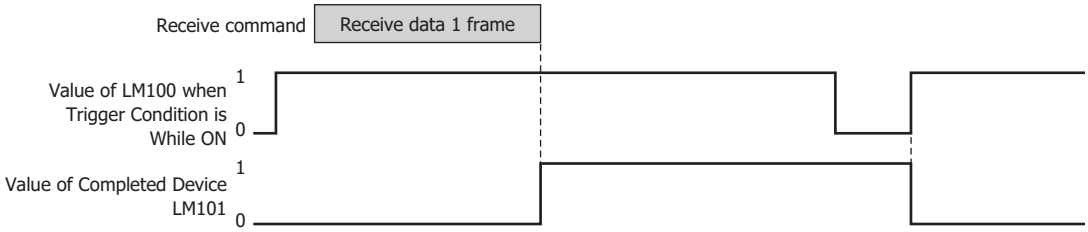
■ **Completed Device**

Specify the bit device or bit of the word device for reporting that data transmission or receiving was successfully completed. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When **Trigger Type** in **Trigger Condition** is **While ON**, **Device** is LM100 and **Completed Device** is LM101

When data receiving is successfully completed, the value of the Completed Device LM101 changes to 1. When the value of the Trigger Condition device LM100 changes from 0 to 1, the value of the Completed Device LM101 changes to 0.

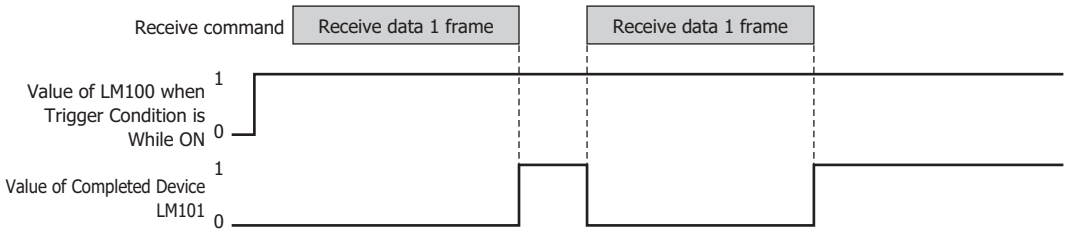


■ **Not Clear Completed Device automatically**

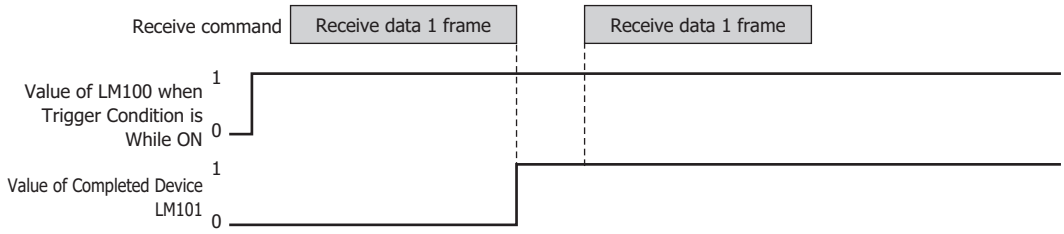
Select this check box when the value of the Completed Device is not set to 0 automatically after it changes to 1. This can be configured when **RXD** is selected in **Command Type**.

Example: When **Trigger Type** in **Trigger Condition** is **While ON**, **Device** is LM100 and **Completed Device** is LM101

When the **Not Clear Completed Device automatically** check box is not selected:
When data receiving is successfully completed, the value of the Completed Device LM101 changes to 1.
When the first data of the next frame is received, the value of the Completed Device LM101 changes to 0.



When the **Not Clear Completed Device automatically** check box is selected:
When data receiving is successfully completed, the value of the Completed Device LM101 is set to 1. Even after the first data of the next frame is received, the value of the Completed Device LM101 does not change to 0.



Status Device

Specify the destination word device for the transmitted or received data size and error information. Error information and command data size is stored at the beginning of the configured device address. When data transmission or receiving has not successfully completed, the value of each bit changes to 1. The bits of the Status Device changes to 0 when the trigger condition is satisfied and they are not changed to 0 automatically. When **Always Enabled** is selected in **Trigger Condition** of receive command, the value of the Status Device is kept as long as a Clear command is not executed.

You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When LDR110 is configured as **Status Device**

(Starting address) +0	LDR110	← Error information and time out information
+1	LDR111	← Transmitted or received data size (bytes)

When **TXD** is selected as **Command Type**:

Address	Bit	Function	Cause	Solution
+0	0	BCC Error	• The Calculation Start Position and Calculation End Position are not stored in 1 frame. • The Calculation End Position is set before Calculation Start Position.	Change the Calculation Start Position and Calculation End Position settings.
			• When Calculation Type is **Modbus ASCII (LCR)**, the data size from Calculation Start Position to Calculation End Position is odd bytes. • The data contains data other than ASCII (30h to 39h, 41h to 46h) data.	Change the Calculation Start Position and Calculation End Position settings and the transmission data.
	1, 2	Reserved		
	3	Registering Constant Data Error	When data type is **Registering Constant (Character)** or **Registering Constant (Hexadecimal)**, the value of the Index Device does not match the Index No. of the registered Registering Constant.	Change the data stored in the Index Device.
	4	Reserved		
	5	Use Reference Device Data Error	When data type is **Device** and the **Use Reference** check box is selected, the device address in which the value of the Reference Device is stored as offset has exceeded the valid range.	Change the value stored in the Reference Device.
	6	Device Data Variable Specification Error	When data type is **Device**, the **Variable** check box is selected and **Device** is selected, the value of device is negative or exceeds the setting (number of bytes x number of words).	Change the value of device to a positive value or to a value that does not exceed the setting (number of bytes x number of words).
	7	Transmission Command Abandon Error	When transmitting data after the Trigger Condition is satisfied, the command with the same Command No. was transmitting data or transmission (transmission is not completed).	Increase the time interval for starting transmission.
	8 to 15	Reserved		

Address	Function	Description
+1	Transmission Data Size (bytes)	Stores the size of transmission data.

When the Error Information bit changes to 1, data is not transmitted, and the Transmission Completed Device does not change to 1.

When **RXD** is selected as **Command Type**:

Address	Bit	Function	Cause	Solution
+0	0	BCC error	The BCC that calculated the receive data did not match the BCC that is appended to the receive data.	Check the transmission data from the external device.
			• The Calculation Start Position and Calculation End Position are not stored in 1 frame. • The Calculation End Position is set before Calculation Start Position.	Change the Calculation Start Position and Calculation End Position settings.
			• When Calculation Type is **Modbus ASCII (LCR)**, the data size from Calculation Start Position to Calculation End Position is odd bytes. • The data contains data other than ASCII (30h to 39h, 41h to 46h) data.	Change the Calculation Start Position and Calculation End Position settings and the transmission data from the external device.
	1	Received Data Size Error	• When data type is **Device** and the **Variable** check box is selected, 1 frame of process is completed before one of **Constant (Character)**, **Constant (Hexadecimal)**, **Registering Constant (Character)**, **Registering Constant (Hexadecimal)**, **BCC**, or **Skip** is processed. • When data type is **Device** and the **Variable** check box is not selected, the receive data size of the receive data does not match that of the specified receive command.	Check the transmission data from the external device.
	2	Registering Constant Data Error	The **Constant (Character)** or **Constant (Hexadecimal)** set up with the receive command does not match the receive data.	Check the transmission data from the external device.
	3	Registering Constant Error	No data matches the registered setting of the Registering Constant data.	Check the transmission data from the external device.
	4	Device Data Conversion Error	• When data type is **Device** and **Conversion Type** is **ASCII (HEX) to Binary**, a code other than **0** to **9** or **A** to **F** receives as data. • When data type is **Device** and **Conversion Type** is **ASCII (DEC) to Binary**, a code other than **0** to **9** receives as data. Or the converted data exceeds 65535.	Check the transmission data from the external device.
	5	Device Data Reference Device Error	When data type is **Device** and the **Use Reference** check box is selected, the device address in which the value of the Reference Device is stored as offset has exceeded the valid range. Or the number of words setting of the device is beyond the range of device address for which data is stored.	Change the value of the Reference Device or the change the number of words.
	6	Terminal Code of Receive Data Miscompare Error	In the receive command whose trigger condition is being satisfied, the start code matches while the terminal code does not match.	Check the transmission data from the external device.
	7	Device Storing Error	In the multiple Receive (RXD) Commands processing, the number of the same-time stored devices which is sum of the number of the stored device of **Device** and the number of the index device of **Registering Constant (Character)** or **Registering Constant (Hexadecimal)**, is over 800 words.	Change settings so that the total number of devices used for storage at one time does not exceed 800 words. Change settings so that the trigger conditions for several receive commands are not satisfied, to reduce the number of receive commands that are processed.
	8 to 13	Reserved		
	14	Receiving Time Out	1 frame of data is not received even when the preset Receiving Time Out duration has passed after the Trigger Condition is satisfied.	Check the transmission data from the external device.
	15	Receiving Character Time Out	While 1 frame of data is being received, even after the time out period—the specified time interval between receiving data (from when 1 frame of data has been received to when the next frame of data starts to be received)—has elapsed, the next frame of data does not start to be received.	Check the transmission data from the external device.

Address	Function	Description
+1	Receive Data Size (bytes)	Stores the size of receive data.

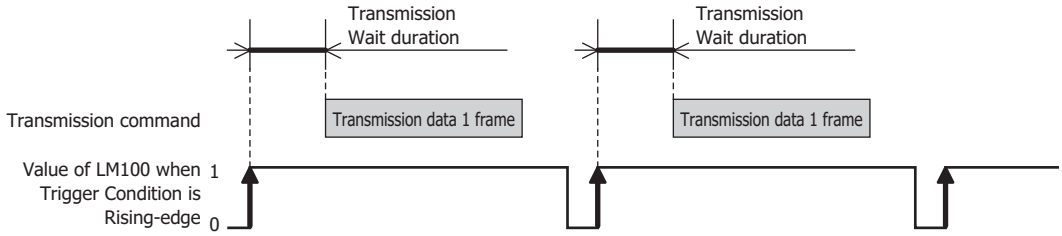
After the Receiving Character Time Out duration has elapsed, the receive data is analyzed. When the Error Information bit changes to 1, data is not received, and the Receiving Completed Device does not change to 1.

■ **Transmission Wait (x100 msec)**

Specify the wait time (0 to 255) from when the trigger condition is satisfied to when the data is transmitted. This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box.

After the Transmission Wait duration has elapsed from when the trigger condition is satisfied, transmission starts.

Example: When **Trigger Type** in **Trigger Condition** is **Rising-edge** and **Device** is LM100



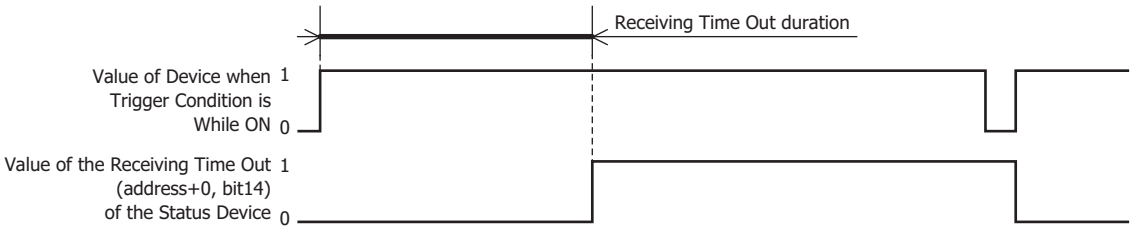
■ **Receiving Time Out (x100 msec)**

Set the time out (0 to 255) from when the trigger condition is satisfied to when 1 frame of data has been received. A frame refers to a data string from the beginning to the end of a command. If the Receiving Character Time Out is set to 0, it is not monitored.

This can be configured only when **RXD** is selected in **Command Type**, and **While ON**, **While OFF**, or **While satisfying the condition** is selected in **Trigger Type**.

When 1 frame of data could not be received, even though the Receiving Time Out duration has elapsed from when the trigger condition is satisfied, the value of the Receiving Time Out of the Status Device (address+0, bit 14) changes to 1. When the Receiving Time Out duration elapses, the value of the Completed Device does not change to 1, and the receive data is not processed.

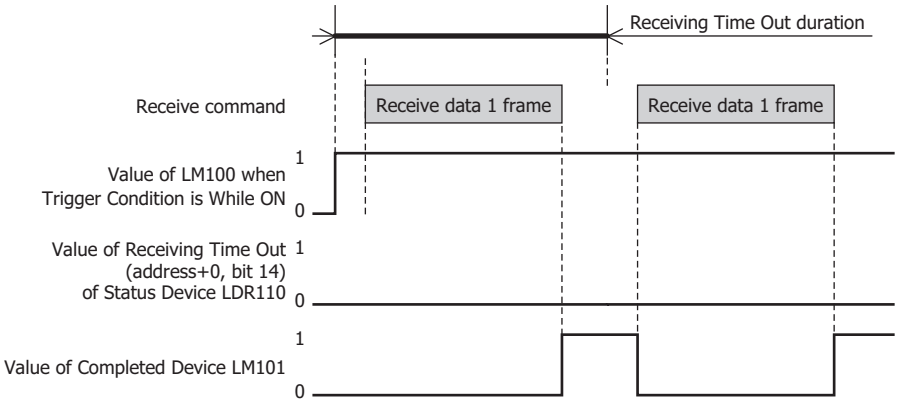
When the trigger condition again changes from not satisfied to satisfied, the value of the Receiving Time Out of the Status Device (address+0, bit 14) changes to 0. When the value of this bit is not 0, the Receiving Time Out cannot be detected.



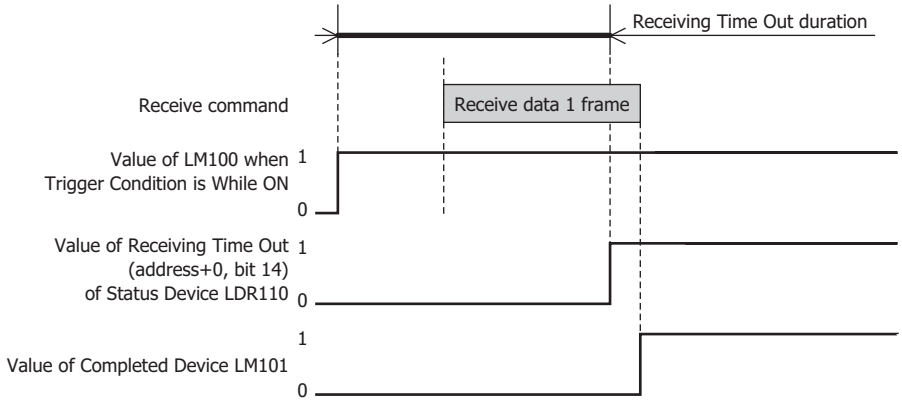
Example: When **Trigger Type** in **Trigger Condition** is **While ON**, **Device** is LM100, **Status Device** is LDR110, **Completed Device** is LM101 and the **Not Clear Completed Device automatically** check box is not selected

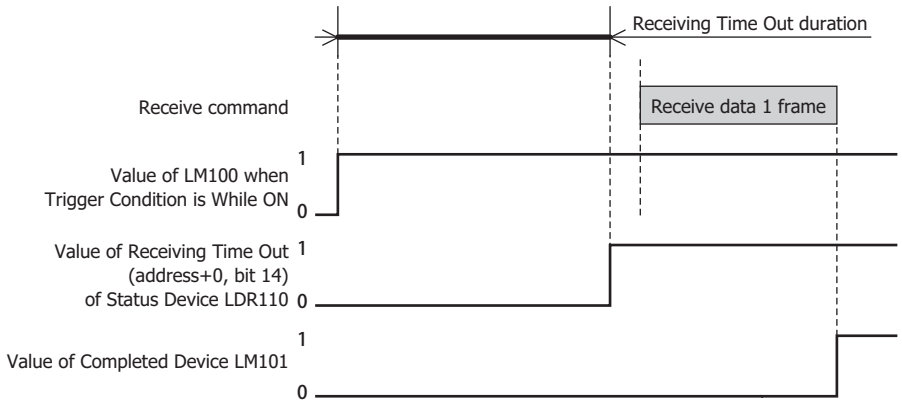
When **Status Device** is LDR110, error information and time out information is stored in each bit of LDR110.

When receiving of 1 frame of data is completed before the Receiving Time Out duration has elapsed from when the trigger condition is satisfied, the value of the Receiving Time Out of the Status Device LDR110 (address+0, bit 14) remains 0.



When receiving of 1 frame of data could not be completed by the time the Receiving Time Out duration elapses from when the trigger condition is satisfied, the value of the Receiving Time Out of the Status Device LDR110 (address+0, bit 14) changes to 1.





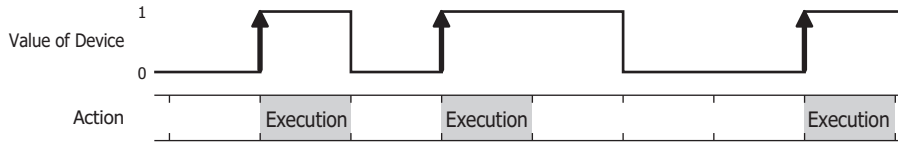
■ Trigger Condition

Set the trigger conditions for transmission or receiving of data.

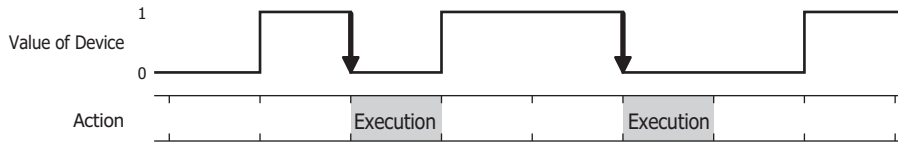
When **TXD** is selected as **Command Type**:

Trigger Type: A condition for data transmission is selected from the following.

Rising-edge: Data is transmitted when the value of device changes from 0 to 1.

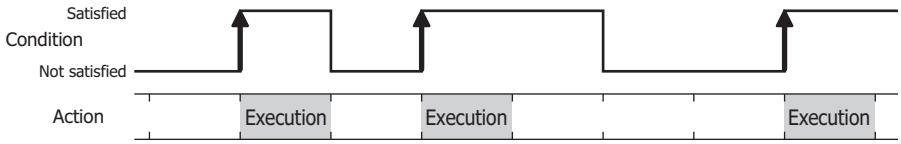


Falling-edge: Data is transmitted when the value of device changes from 1 to 0.

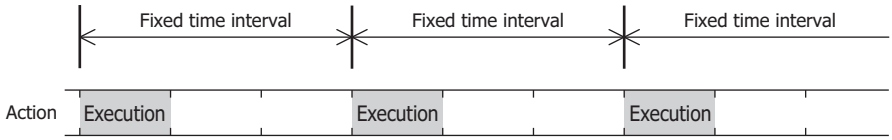


Satisfy the condition:

Data is transmitted when the condition changes from not satisfied to satisfied.



Fixed Period: Data is transmitted at a fixed time interval.



Data Type: Select the data type handled by the conditional expression.
Can only be set if **Satisfy the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as condition. You can only specify the internal device.
Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Sets the condition formula.
Can only be set if **Satisfy the condition** is selected as **Trigger Type**.

Click ... to display the Trigger Condition Settings dialog box. For the conditional expressions configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

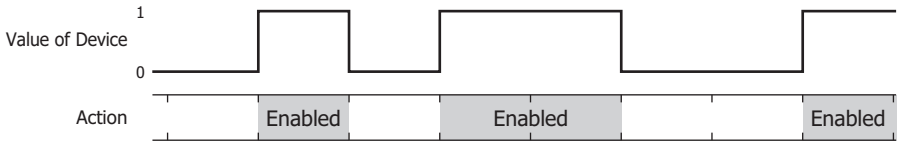
Period (sec): Specify the period for command execution from 1 to 3600 (seconds).
This is enabled only when **Fixed Period** is selected in **Trigger Type**.

When **RXD** is selected as **Command Type**:

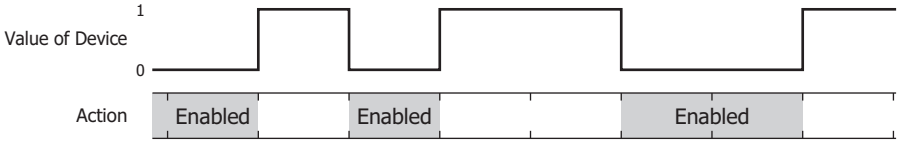
Trigger Type: Selects the condition to be ready to receive data from the following.

Always Enabled: The MICRO/I is always ready to receive data.

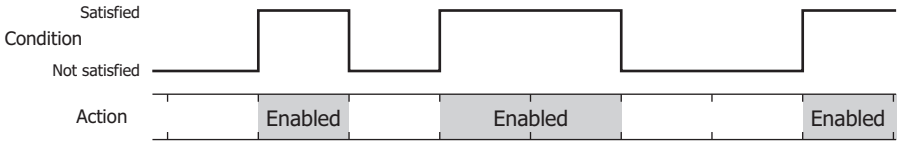
While ON: Ready to receive data when the value of device is 1.



While OFF: Ready to receive data when the value of device is 0.



While satisfying the condition:
Ready to receive data while the condition is satisfied.



Data Type: Select the data type handled by the conditional expression.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as condition. You can only specify the internal device.
Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Sets the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the Trigger Condition Settings dialog box. For the conditional expressions configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Command

Shows a list of command data. Double clicking the line displays the Data Settings dialog box.

For details, refer to "Data Settings Dialog Box" on page 3-38. The maximum amount that can be configured is 32 commands per protocol.

The content displayed in lists varies based on the type of command.

Constant (Character): Displays the specified data enclosed in " ".

"Data"

Example: "1234"

Constant (Hexadecimal): Displays the specified data with each byte value enclosed in ' '.

'Data of the first byte' 'Data of the second byte' 'Data of the third byte' 'Data of the forth byte'

Example: '31' '32' '33' '34'

Device: Displays the specified data enclosed by < >, in the following order.

<Device Conversion Type Number of bytes Variable Words Storage Method of data>

- Device: Displays the device address enclosed by [ ]
  When the **Use Reference Device** check box is selected, displays as OFFSET([Device], [Reference Device])
- Number of bytes: Displays the number of bytes of the transmitted or received data.
- Conversion Type: Display the conversion methods for values of devices as follows.
  B16-A: When **Binary (HEX)** to **ASCII** is selected
  B10-A: When **Binary (DEC)** to **ASCII** is selected
  N: When **No Conversion** is selected
- Variable: When the **Variable** check box is selected, variables are displayed as follows.
  V00: When **NULL (00h)** is selected for transmission command
  V [Device]: When **Device** is selected for transmission command
  V: In the case of receive command
- Words: Displays the number of word devices for transmitting or receiving data.
- Storage Method of data: Displays the handling method for value of read device as follows.
  U: When **from Upper byte** is selected
  L: When **from Lower byte** is selected

Example: <OFFSET([LDR0100], [LDR0300]) N 2V[LDR0200] 2 U>

Registering Constant (Character):

Displays the specified data enclosed in << >>.

<<Index No. of No. 1: Data of No. 1 Index No. of No. 2: Data of No. 2 ... Index No. of No. N: Data of No. N Index Device>> (N = 1 to 100)

- Data: Displays the data enclosed by " "
- Index Device: Displays the device address enclosed by [ ]

Example: <<1:"123" 2 :"456" 3 :"789" [LDR0100]>>

Registering Constant (Hexadecimal):

Displays the specified data enclosed in << >>.

<<Index No. of No. 1: Data of No. 1 Index No. of No. 2: Data of No. 2 ... Index No. of No. N: Data of No. N Index Device>> (N = 1 to 100)

- Data: Displays the data enclosed by ' '
- Index Device: Displays the device address enclosed by [ ]

Example: <<1:'313233' 2:'343536' 3 :'373839' [LDR0100]>>

BCC: Displays the specified data enclosed in BCC ( ).

BCC(Calculation Start Position Calculation End Position Calculation Type Conversion Type Number of bytes)

Calculation Start Position:

Displays the data position where the BCC calculation starts.

Calculation End Position:

Displays the data position where the BCC calculation ends.

Calculation Type: Display the methods to calculate the data between the Calculation Start Position and Calculation End Position as follows.

XOR: When **XOR** is selected

ADD: When **ADD** is selected

ADD2: When **ADD (2's Complement)** is selected

Conversion Type: Display the conversion methods for values of devices as follows.

B16-A: When **Binary (HEX)** to **ASCII** is selected

N: When **No Conversion** is selected

Number of bytes: Displays the number of bytes of the transmitted or received data.

Example: BCC(2 1 XOR N 2)

Skip: Displays the specified data enclosed in Skip( ).

Skip(Number of bytes)

Example: Skip(2)

Edit Add or change data.

To add data, select an empty line in the Command, and then click this button. To change data, select data in the Command, and then click this button. For details, refer to "Data Settings Dialog Box" on page 3-38.

Insert Insert data at the position of the selected command.

Click this button to display the Data Settings dialog box. And specify the data. The data at the insertion point shifts down by 1 item. When 32 data items are already set, you cannot insert data.

Delete Deletes the selected data.

Up Shifts the selected data upward in the command.

Down Shifts the selected data downward in the command.

■ Command Size

Displays the data size of a configured command.

The calculation method for command size varies based on the type selected in **Command Type** on the Command Settings dialog box. The command size calculation methods are as follows.

TXD: Number of bytes for Constant Data + Number of bytes for a data of Registering Constant + Number of bytes of BCC + Number of bytes of Device x Words of Device

RXD: Number of bytes for Constant Data + Number of bytes for a data of Registering Constant + Number of bytes of BCC + Number of bytes of Skip + Number of bytes of Device x Words of Device

■ OK

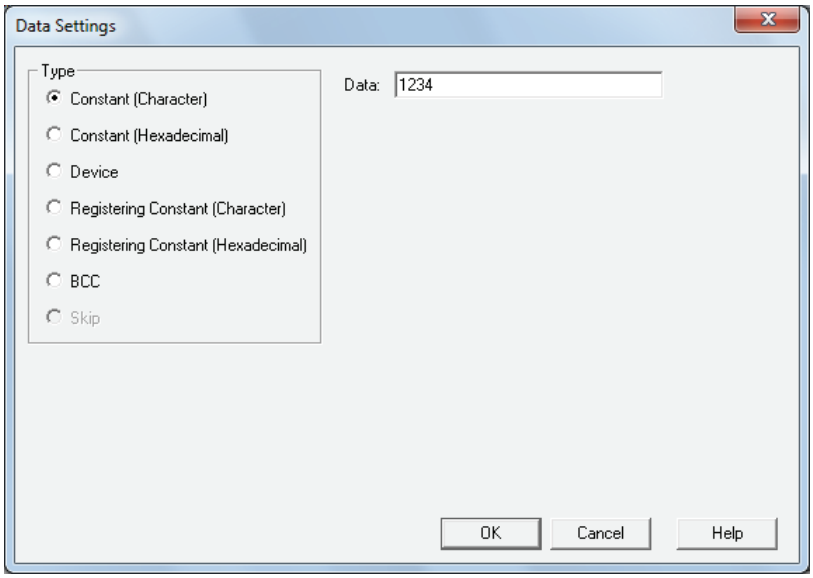
Save the settings.

■ Cancel

Cancel the saving of settings.

● Data Settings Dialog Box

Specify the transmitted or received data by a command.



■ Type

Selects data types from the following items.

Constant (Character), **Constant (Hexadecimal)**, **Device**, **Registering Constant (Character)**, **Registering Constant (Hexadecimal)**, **BCC**, **Skip**

Skip can only be configured when **RXD** is selected in **Command Type** on the Command Settings dialog box.

Setting item varies based on the selection in **Command Type** on the Command Settings dialog box.

When **TXD** is selected, refer to "Transmission (TXD) Command" on page 3-39.

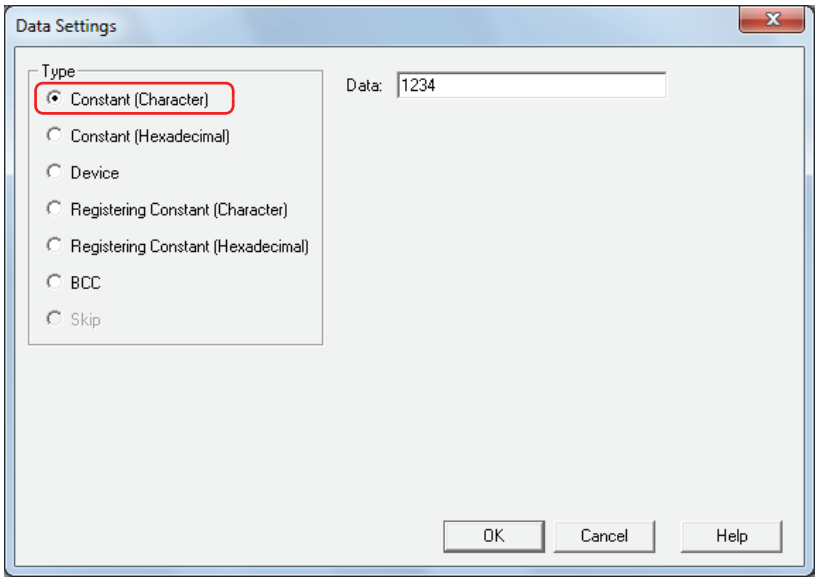
When **RXD** is selected, refer to "Receive (RXD) Command" on page 3-52.

● Transmission (TXD) Command

Constant (Character)

The character data is sent without being converted.

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **Constant (Character)** is selected under **Type** on the Data Settings dialog box.



■ Data

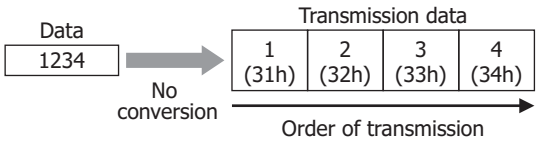
Enter character data to be transmitted. The size of a single-byte character is one byte and that of a double-byte character is two bytes.

HG2G-S/-5S/-5F, HG3G/4G:	1 to 1,500 bytes
HG1F/2F/2S/3F/4F:	1 to 200 bytes

Example: Constant (Character) for transmission command data

Item	Setting
Data	1234

When the trigger condition is satisfied, the character data is transmitted in the following order.

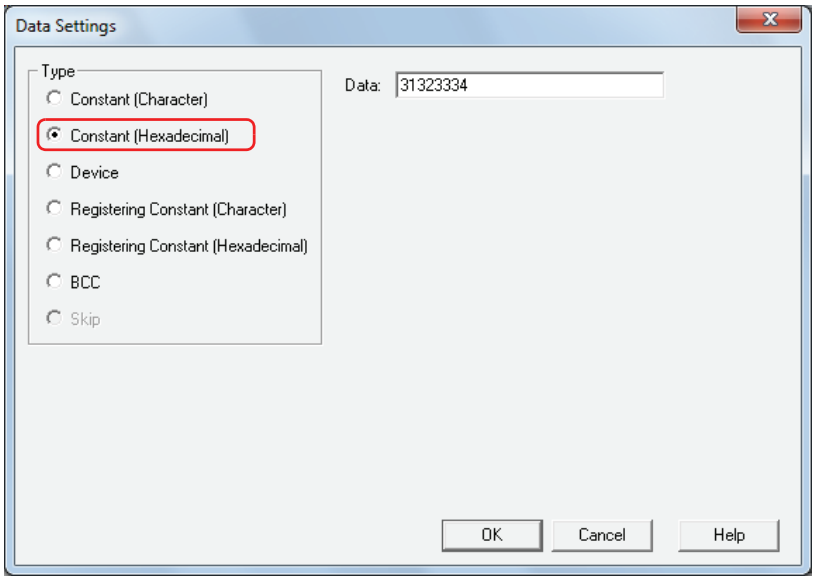


Constant (Hexadecimal)

The hexadecimal data is sent without being converted.

Use this setting to send a control code of ASCII data (00h to 1Fh).

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **Constant (Hexadecimal)** is selected under **Type** on the Data Settings dialog box.



■ **Data**

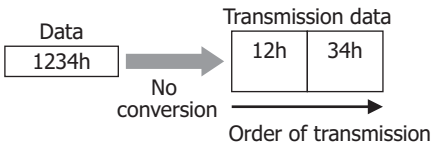
Enter hexadecimal data to be transmitted.

HG2G-S/-5S/-5F, HG3G/4G:	1 to 1,500 bytes
HG1F/2F/2S/3F/4F:	1 to 200 bytes

Example: Constant (Hexadecimal) for transmission command data

Item	Setting
Data	1234

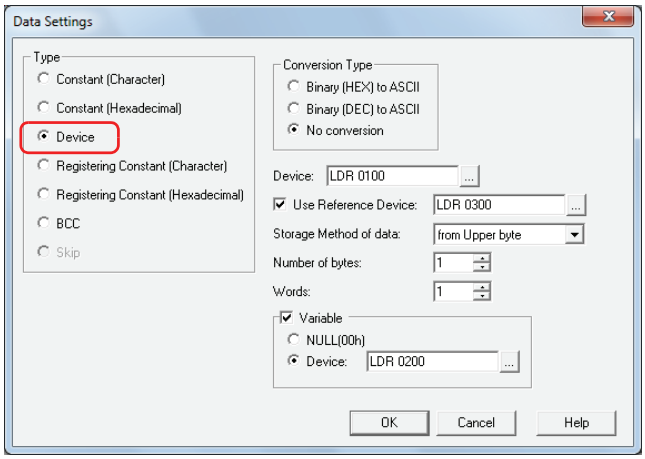
When the trigger condition is satisfied, 1234h is transmitted in the order 12h and 34h.



Device

The value of device is either not converted or converted to ASCII and then sent as data with the specified size.

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **Device** is selected under **Type** on the Data Settings dialog box.



■ **Conversion Type:**

Select the conversion rule for the value of device from the following.

Binary (HEX) to ASCII:	Considers the value of device as binary-coded hexadecimal number and converts it to ASCII data.
Binary (DEC) to ASCII:	Considers the value of device as binary-coded decimal number and converts it to ASCII data.
No Conversion:	No conversion is performed.

■ **Device**

Specify the source word device for transmitted data. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Use Reference Device**

To change the source word device for transmitted data according to values of device, select this check box and specify a device. This can be configured only when **No Conversion** is selected under **Conversion Type**. You can only specify an internal device.

For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Storage Method of data**

Select the handling method for the value of read device. This can be configured only when **No Conversion** is selected under **Conversion Type**.

from Upper byte: Value of devices are read from the upper byte.

from Lower byte: Value of devices are read from the lower byte.

■ **Number of bytes**

Specify the number of bytes of transmitted data. The number of bytes that can be specified varies based on the setting under **Conversion Type**.

Binary (HEX) to ASCII:	1 to 4
Binary (DEC) to ASCII:	1 to 5
No Conversion:	1 to 2

■ **Words**

Specify the number of word devices (1 to 99) of transmitted data.

Variable

Select this check box to change the transmitted data size according to conditions. This can be configured only when **No Conversion** is selected under **Conversion Type**. When the check box is not selected, the amount of data (bytes) transmitted is data (bytes) for Number of bytes x Words.

NULL (00h): Send the data from the start data of the value of device up to 00 (hexadecimal). Data 00 will not be sent. This setting is effective for sending only the character data section of character data having 00 (hexadecimal) as the last data.

Device: Specify a word device to which a number of bytes is applied for transmitted data.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

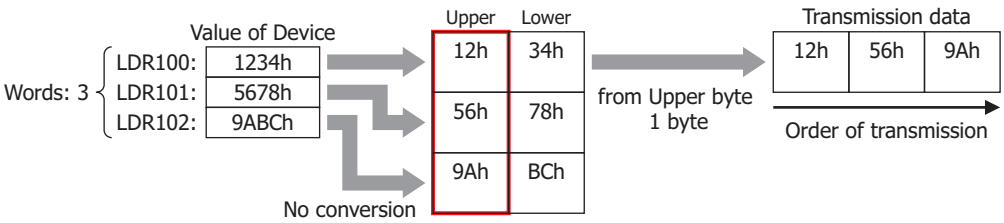
When the value of device exceeds Number of bytes x Words, or when it is negative, the Device Data Variable Specification Error (address+0, bit 6) of the Status Device changes to 1, and transmission does not occur.

Examples: Device for transmission command data

Example 1

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Upper byte
Number of bytes	1
Words	3
Variable	OFF

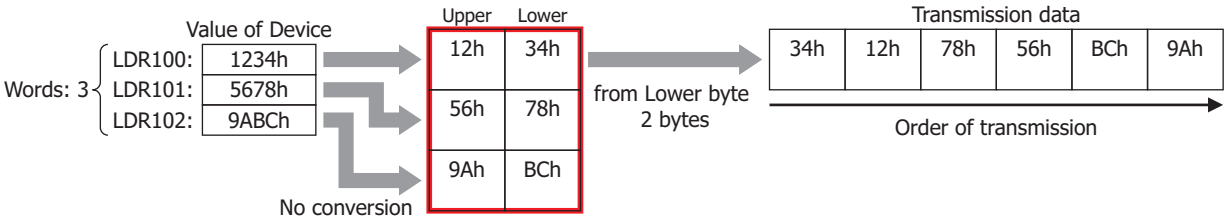
When the trigger condition is satisfied, the value of device is read and data is transmitted in the following order.



Example 2

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Lower byte
Number of bytes	2
Words	3
Variable	OFF

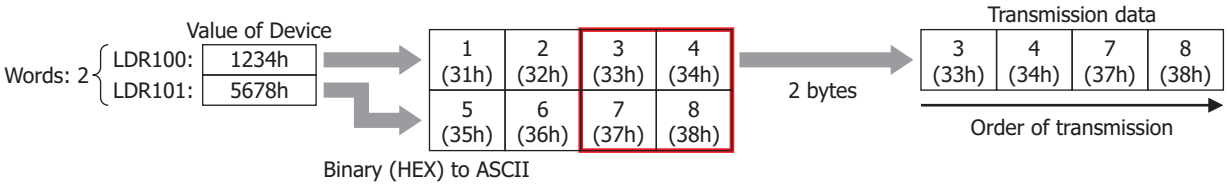
When the trigger condition is satisfied, the value of device is read and data is transmitted in the following order.



Example 3

Item	Setting
Conversion Type	Binary (HEX) to ASCII
Device	LDR100
Use Reference Device	OFF
Number of bytes	2
Words	2
Variable	OFF

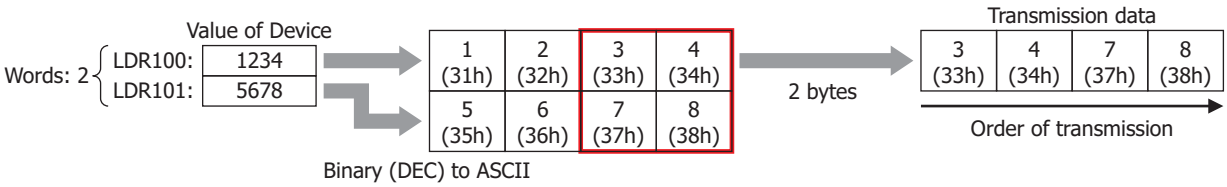
When the trigger condition is satisfied, the value of device is read, and data is converted to ASCII and transmitted in the following order.



Example 4

Item	Setting
Conversion Type	Binary (DEC) to ASCII
Device	LDR100
Use Reference Device	OFF
Number of bytes	2
Words	2
Variable	OFF

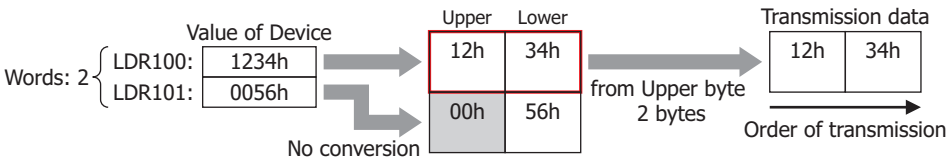
When the trigger condition is satisfied, the value of device is read, and data is converted to ASCII and transmitted in the following order.



Example 5

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Upper byte
Number of bytes	2
Words	2
Variable	ON, NULL

When the trigger condition is satisfied, the value of device is read and data is transmitted in the following order.



Example 6

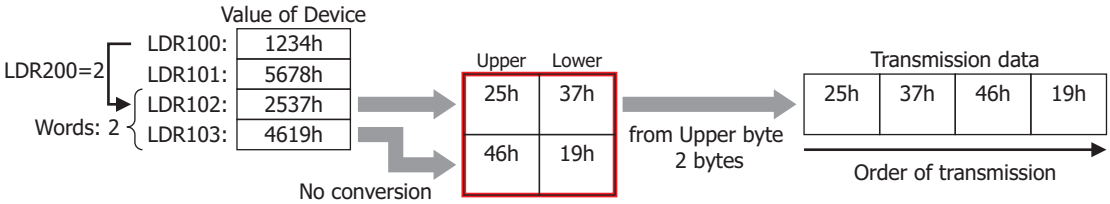
Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Lower byte
Number of bytes	2
Words	2
Variable	ON, Device: LDR200

When the trigger condition is satisfied, the value of device is read and data is transmitted in the following order.
When the LDR200 value is 3

Example 7

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	ON, Device: LDR200
Storage Method of data	from Upper byte
Words	2
Variable	OFF

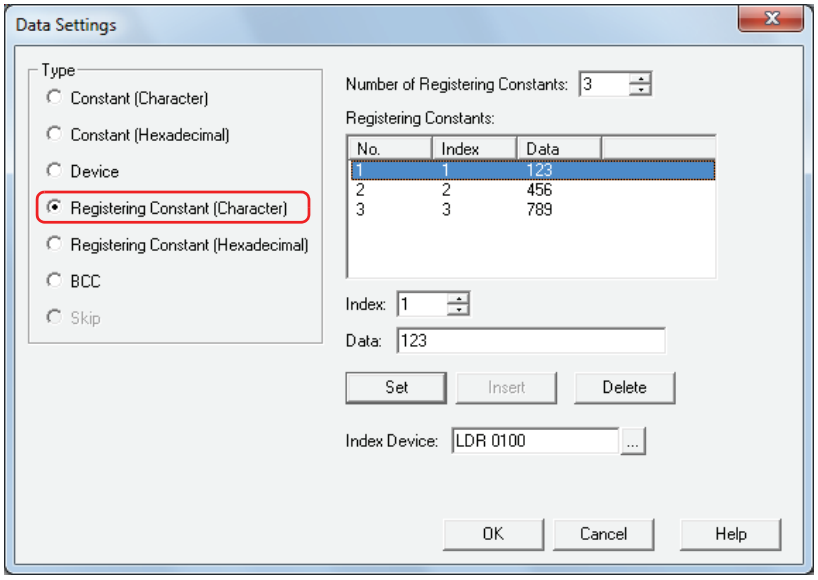
When the trigger condition is satisfied, the value of device is read and data is transmitted in the following order.
When the LDR200 value is 2



Registering Constant (Character)

From the registered character data, character data according to the value of device is read and transmitted.

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **Registering Constant (Character)** is selected under **Type** on the Data Settings dialog box.



■ **Number of Registering Constants**

Specify the number of data of the registered character data (1 to 100).

■ **Registering Constants**

No.:	Shows the ID No. (1 to 100) of the character data.
Index:	Shows the Index No. of the character data.
Data:	Shows the character data.

■ **Index**

Specify the Index No. (0 to 65535) of the character data.

■ **Data**

Enter the character data (1 to 1500 bytes) to be registered. The size of a single-byte character is one byte and that of a double-byte character is two bytes.

The character data of different size or the same data with a different number cannot be registered.

■ **Set**

Register the **Index** and **Data** settings to the list. When a number that is already registered is selected, it is overwritten with the new setting.

■ **Insert**

Insert a character data setting to the selected number in the list.

Click this button to insert the **Index** and **Data** setting. The settings at the insertion point shift down 1 line. Settings cannot be inserted when all numbers are already set.

■ **Delete**

Delete the selected settings from the list.

■ **Index Device**

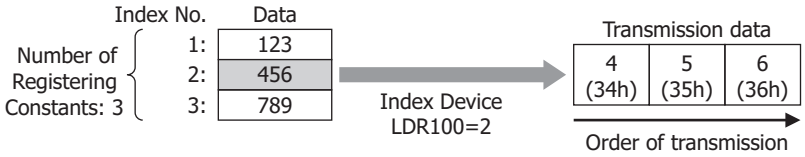
Specify the source word device to serve as the Index No. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: Transmission command for Registering Constant (Character) data

Item	Setting
Number of Registering Constants	3
Registering Constants	Index No. 1: 123
	Index No. 2: 456
	Index No. 3: 789
Index Device	LDR100

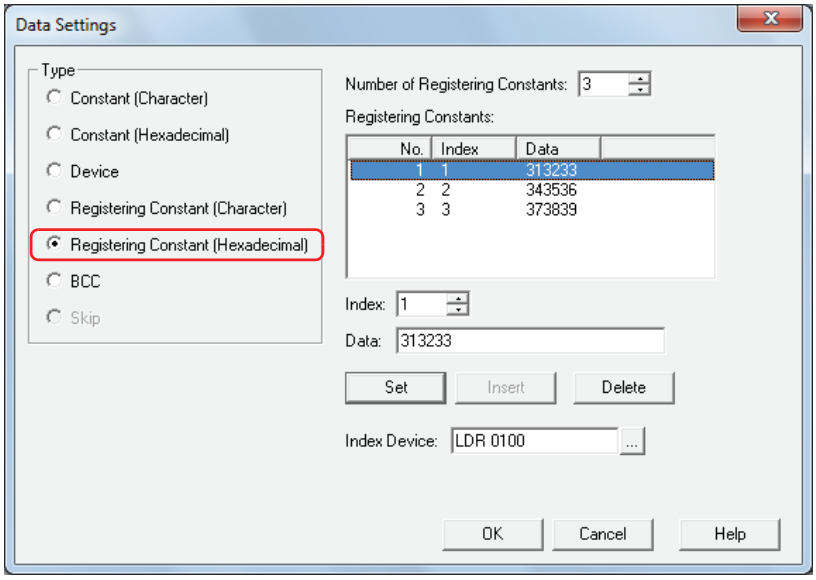
When the trigger condition is satisfied, the data of the Index No. according to the value of device is transmitted.
When the LDR100 value is 2



Registering Constant (Hexadecimal)

From the registered hexadecimal data, the hexadecimal data according to the value of device is read and transmitted.

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **Registering Constant (Hexadecimal)** is selected under **Type** on the Data Settings dialog box.



■ **Number of Registering Constants**

Specify the number of data of the registered hexadecimal data (1 to 100).

■ **Registering Constants**

No.:	Shows the ID No. (1 to 100) of the hexadecimal data.
Index:	Shows the Index No. of the hexadecimal data.
Data:	Shows the hexadecimal data.

■ **Index**

Specify the Index No. (0 to 65535) of the hexadecimal data.

■ **Data**

Enter the hexadecimal data (1 to 1500 bytes) to be registered.

The data of different size or the same data with a different number cannot be registered.

■ **Set**

Register the **Index** and **Data** settings to the list. When a number that is already registered is selected, it is overwritten with the new setting.

■ **Insert**

Insert a hexadecimal data setting to the selected number in the list.

Click this button to insert the **Index** and **Data** setting. The settings at the insertion point shift down one line. Settings cannot be inserted when all numbers are already set.

■ **Delete**

Delete the selected settings from the list.

■ **Index Device**

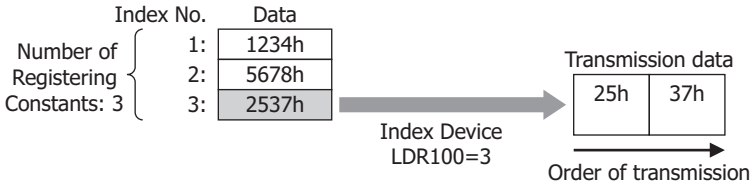
Specify the source word device to serve as the Index No. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: Transmission command for Registering Constant (Hexadecimal) data

Item	Setting
Number of Registering Constants	3
Registering Constants	Index No. 1: 1234
	Index No. 2: 5678
	Index No. 3: 2537
Index Device	LDR100

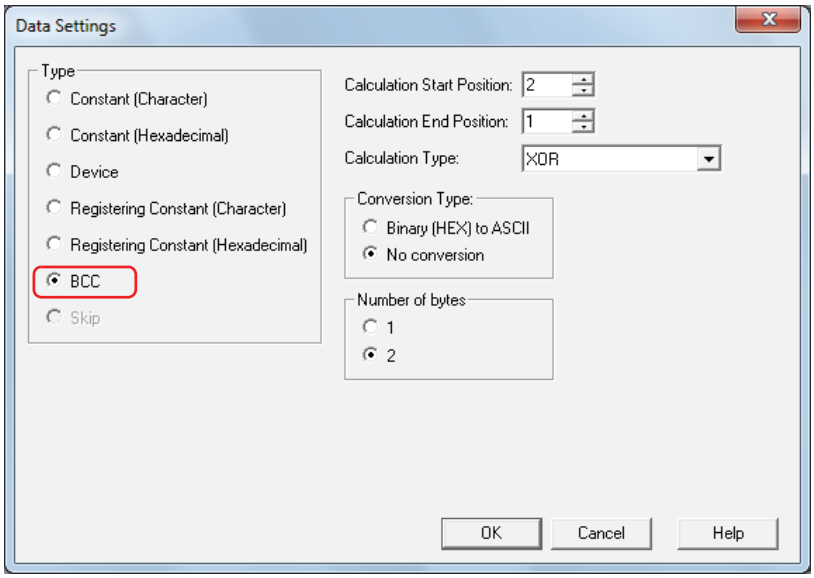
When the trigger condition is satisfied, the data of the Index No. according to the value of device is transmitted.
When the LDR100 value is 3



BCC (Block Check Code)

A BCC for the transmission data is automatically calculated and appended to the transmission data at an arbitrary position and transmitted.

This can be configured only when **TXD** is selected in **Command Type** on the Command Settings dialog box, and **BCC** is selected under **Type** on the Data Settings dialog box.



■ Calculation Start Position

Specify the position of transmission data at which BCC calculation starts (1 to 15). The position is counted backwards, with the first position of the transmission data taken as 1.

Calculation Start Position:	(1)	(2)	(3)	(4)	(5)	(6)		
Transmission data:	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)

■ Calculation End Position

Specify the position of transmission data at which BCC calculation ends (0 to 15). The position is counted forwards, with the data position before the BCC taken as 0.

Transmission data:	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)
Calculation End Position:	(5)	(4)	(3)	(2)	(1)	(0)		

■ Calculation Type

Select the method to calculate the data between the Calculation Start Position and Calculation End Position.

XOR: Calculates the data with exclusive logical add.

ADD: Calculates the data using addition.

ADD (2's Complement): Calculates the data using addition, inverts the bit and adds one.

Modbus ASCII (LCR): Calculation is performed according to the following procedure. Conversion Type: Binary (HEX) to ASCII, Number of bytes: 2

1. Convert the ASCII characters between Calculation Start Position and Calculation End Position into 1-byte hexadecimal data for each set of two characters.
   Example: 37h, 35h→75h
2. Calculate the sum of the data obtained in step 1.
3. Invert the bit of the result of step 2 and add one. (2's complement)
4. Convert the lower one byte data of the result of step 3 into ASCII characters.
   Example: 75h→37h, 35h

Modbus RTU (CRC): CRC-16 (Generating polynomial:$x^{16}+x^{15}+x^{2}+1$) is calculated according to the following procedure. Conversion Type: No Conversion, Number of bytes: 2

1. Obtain an exclusive OR (XOR) of 1 byte data at Calculation Start Position and FFFFh.
2. If the least significant bit of the result of step 1 is 0, shift to the right by one bit. If the bit is 1, shift to the right by 1 bit and obtain XOR of the result and the value (A001h).
3. Repeat step 2 to shift 8 times.
4. Obtain XOR of the next one byte of data and the result of step 3.
5. Repeat steps 2 through 4 until the data at Calculation End Position is processed.
6. Send the result of step 5 in the order of the lower byte and upper byte.
   Example: 1234h→34h, 12h

■ Conversion Type

After calculating the data using the specified calculation type, select the type of conversion for the data from the following.

Binary (HEX) to ASCII	Considers the data as binary-coded hexadecimal number and converts it to ASCII data.
No conversion:	No conversion is performed.

■ Number of bytes

After converting according to the specifed conversion type, select **1** or **2** for the number of bytes for transmission data.

Example: BCC for transmission command data

This example describes the case of transmitting the BCC calculation result from the following transmission data as BCC data.

STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)

- Calculation Start Position and Calculation End Position
  When Calculation Start Position is 2 and Calculation End Position is 1: Calculates the range **1234**.

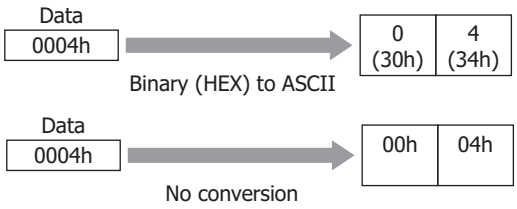
Calculation Start Position:	(1)	(2)	(3)	(4)	(5)	(6)		
	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)
Calculation End Position:	(5)	(4)	(3)	(2)	(1)	(0)		

Data used for BCC calculation

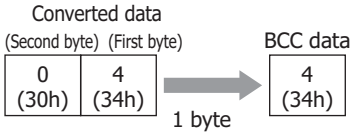
- Calculation Type

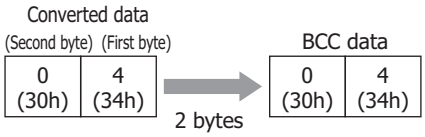
XOR:	31h^32h^33h^34h^=04h
ADD:	31h+32h+33h+34h=CAh
ADD (2's Complement):	Inverts the bit of CAh+1=36h
Modbus ASCII (LCR):	**BA** → 42h, 41h
Modbus RTU (CRC):	BA30h → BAh, 30h

- Conversion Type
  When the BCC calculation result is **0004h**, the converted data is as follows.

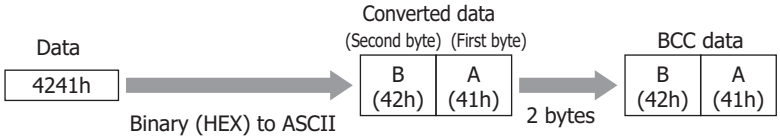


- Bytes and BCC data
  When the converted data is **3034h**, the data appended to the transmission data is as follows.

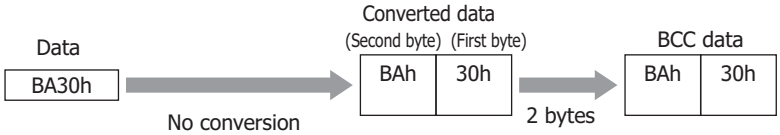




- When Calculation Type is **Modbus ASCII (LCR)**
  When the BCC calculation result is **4241h** after **Binary (HEX) to ASCII** conversion the resulting two bytes of data is appended to the transmission data.



- When Calculation Type is **Modbus RTU (CRC)**
  When the BCC calculation result is **BA30h** with no conversion the two bytes of data is appended to the transmission data.

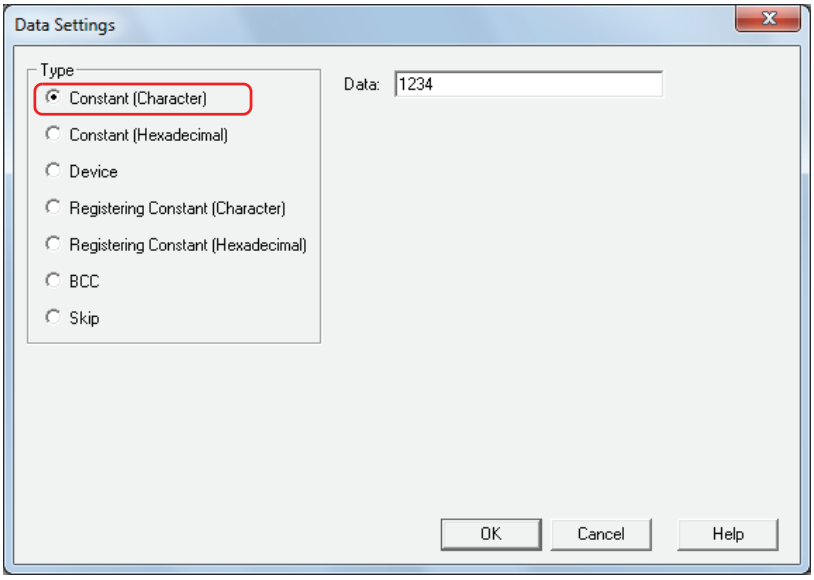


● Receive (RXD) Command

Constant (Character)

The received data is considered as character data and compared with the data specified without being converted.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Constant (Character)** is selected under **Type** on the Data Settings dialog box.



■ Data

Enter character data designated to be received. The size of a single-byte character is one byte and that of a double-byte character is two bytes.

HG2G-S/-5S/-5F, HG3G/4G:	1 to 1,500 bytes
HG1F/2F/2S/3F/4F:	1 to 500 bytes

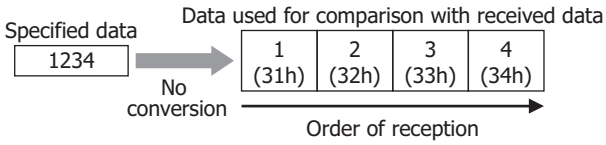
When a Constant (Character) is set at the beginning of a command, the first one byte is recognized as the start code. When a Constant (Character) is set at the end of a command, the last one byte is recognized as the terminal code.

For details, refer to "Start Code and Terminal Code" on page 3-68.

Example: Constant (Character) for receive command data

Item	Setting
Data	1234

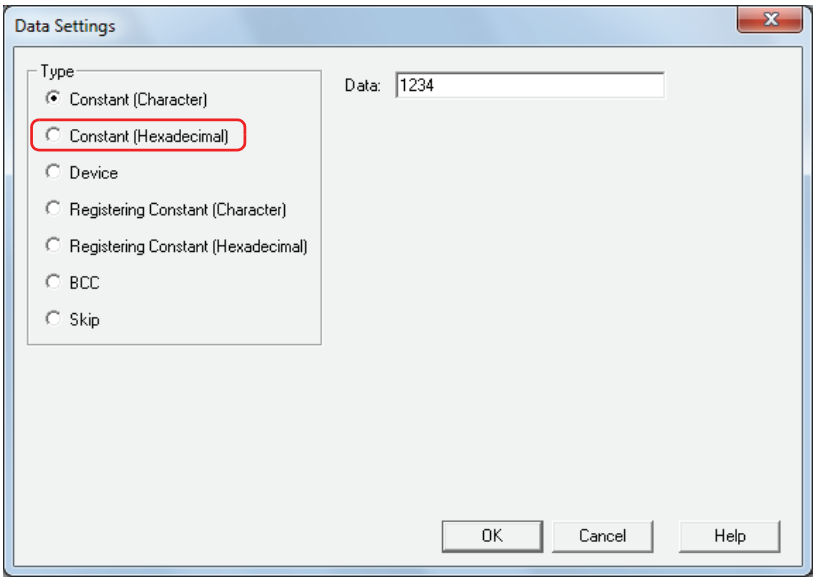
When the trigger condition is satisfied, the received data is compared with the following data.



Constant (Hexadecimal)

The received data is considered as hexadecimal data and compared with the data specified without being converted. Use this setting to receive a control code of ASCII data (00h to 1Fh).

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Constant (Hexadecimal)** is selected under **Type** on the Data Settings dialog box.



■ **Data**

Enter hexadecimal data designated to be received.

HG2G-S/-5S/-5F, HG3G/4G:	1 to 1,500 bytes
HG1F/2F/2S/3F/4F:	1 to 500 bytes

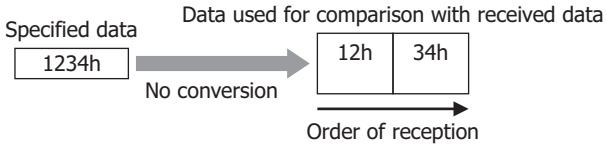
When a Constant (Character) is set at the beginning of a command, the first one byte is recognized as the start code. When a Constant (Character) is set at the end of a command, the last one byte is recognized as the terminal code.

For details, refer to "Start Code and Terminal Code" on page 3-68.

Example: Constant (Hexadecimal) for receive command data

Item	Setting
Data	1234

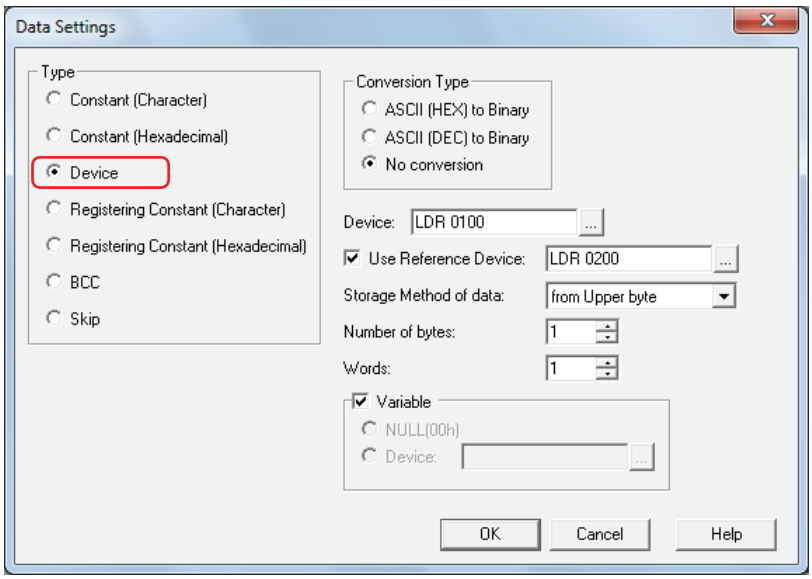
When the trigger condition is satisfied, the received data is compared with the following data.



Device

From the received data, data of the specified size is unconverted, or converted to binary format, and stored in the device.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Device** is selected under **Type** on the Data Settings dialog box.



■ **Conversion Type**

Select conversion processing for the received data from the following.

ASCII (HEX) to Binary:	Considers the received data as a hexadecimal number and converts it to binary data.
ASCII (DEC) to Binary:	Considers the received data as a decimal number and converts it to binary data.
No conversion:	No conversion is performed.

■ **Device**

Specify the word device for storing the received data. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Use Reference Device**

To change the word device for storing the received data according to values of devices, select this check box and specify a device. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Storage Method of data**

Select the handling method for received data. This can be configured only when **No Conversion** is selected under **Conversion Type**.

from Upper byte: Values of devices are stored from the upper byte.

from Lower byte: Values of devices are stored from the lower byte.

■ **Number of bytes**

Specify the received data size to be stored per word. The number of bytes to be specified varies based on **Conversion Type**.

ASCII (HEX) to Binary:	1 to 4
ASCII (DEC) to Binary:	1 to 5
No Conversion:	1 to 2

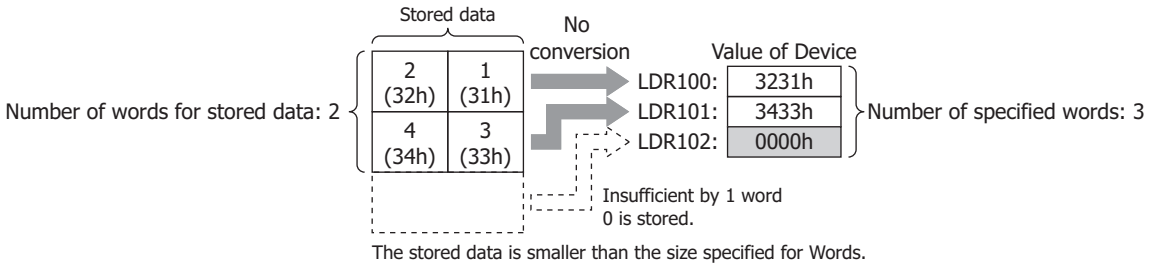
■ **Words**

Specify the number of word devices (1 to 250) for storing the received data.

■ **Variable**

Select this check box to store data up to either **Constant (Character)** data, or **Constant (Hexadecimal)** data from the beginning of the received data in a device. Stores data of the size specified under **Words**.

When the stored data is smaller than the size specified under **Words**, the values of all remaining devices will stored 0.



When the check box is not selected, the amount of data (bytes) stored is Number of bytes x Number of words.

When the **Variable** check box is selected, observe the following points.

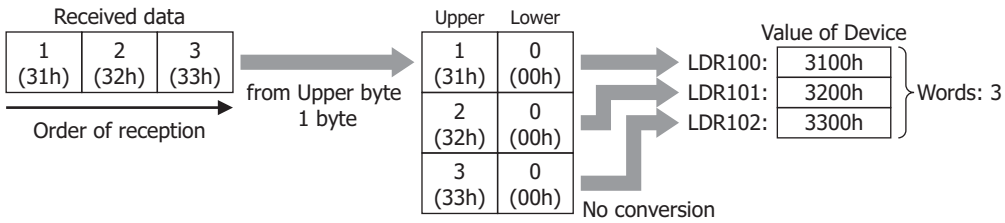
- When data is set expect for the end of a command, set **Constant (Character)** data or **Constant (Hexadecimal)** data following **Device** data.
- When there is no data stored in the device, all of the values of devices specified under **Words** will be 0.
- The maximum amount of the received data stored in the device is Number of bytes x Number of words.

Examples: Device for receive command data

Example 1

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Upper byte
Number of bytes	1
Words	3
Variable	OFF

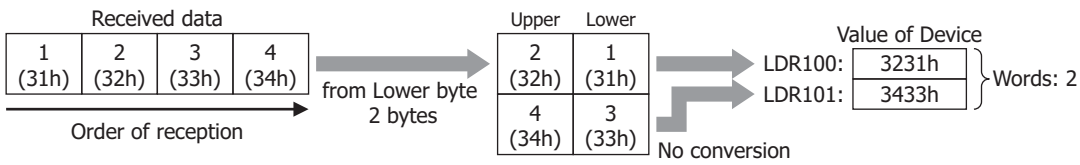
When the trigger condition is satisfied, the received data is stored in devices in the following order.



Example 2

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Lower byte
Number of bytes	2
Words	2
Variable	OFF

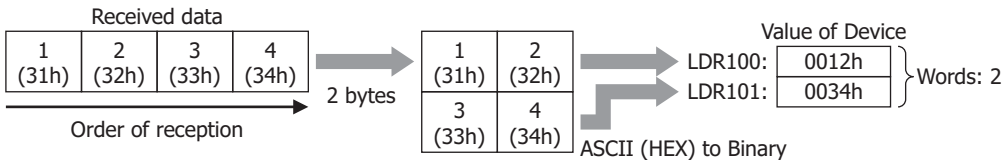
When the trigger condition is satisfied, the received data is stored in devices in the following order.



Example 3

Item	Setting
Conversion Type	ASCII (HEX) to Binary
Device	LDR100
Use Reference Device	OFF
Number of bytes	2
Words	2
Variable	OFF

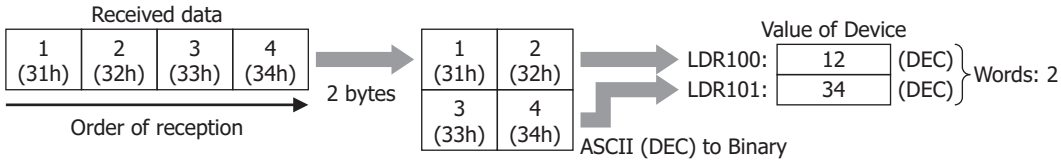
When the trigger condition is satisfied, the received data is stored in devices in the following order.



Example 4

Item	Setting
Conversion Type	ASCII (DEC) to Binary
Device	LDR100
Use Reference Device	OFF
Number of bytes	2
Words	2
Variable	OFF

When the trigger condition is satisfied, the received data is stored in devices in the following order.

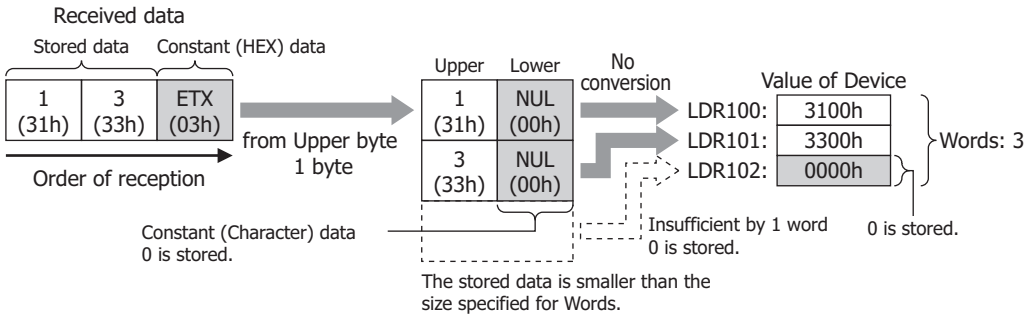


Example 5

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Upper byte
Number of bytes	1
Words	3
Variable	ON

When the trigger condition is satisfied, the received data is stored in devices in the following order.

Data from the beginning of the received data to **Constant (Hexadecimal)** data is stored in the device. **Constant (Hexadecimal)** data is not stored.

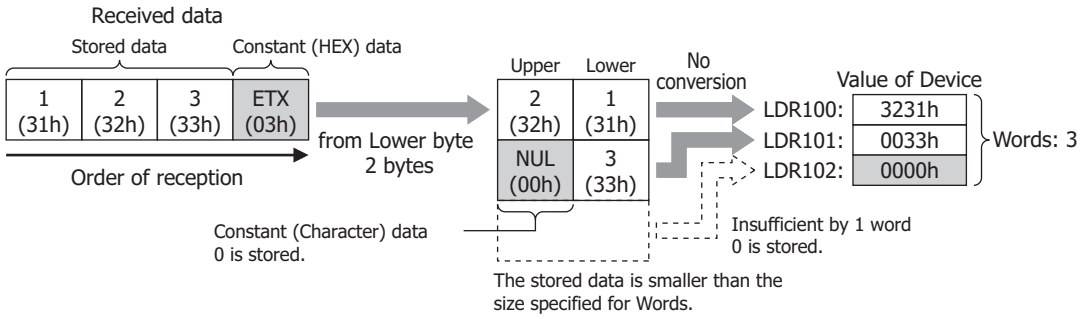


Example 6

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	OFF
Storage Method of data	from Lower byte
Number of bytes	2
Words	3
Variable	ON

When the trigger condition is satisfied, the received data is stored in devices in the following order.

Data from the beginning of the received data to **Constant (Hexadecimal)** data is stored in the device. **Constant (Hexadecimal)** data is not stored.

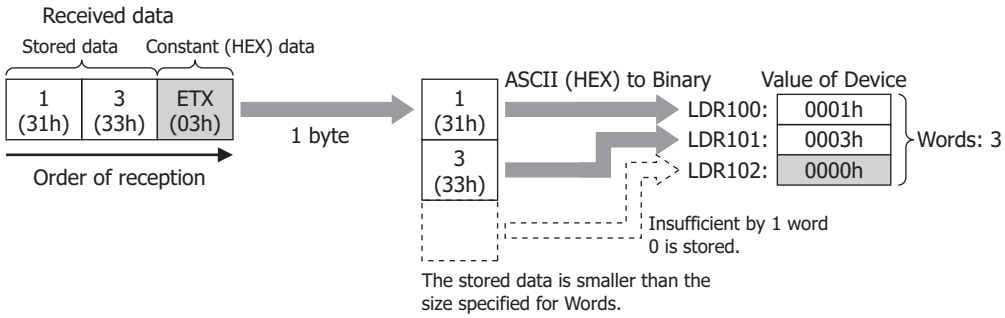


Example 7

Item	Setting
Conversion Type	ASCII (HEX) to Binary
Device	LDR100
Use Reference Device	OFF
Number of bytes	1
Words	3
Variable	ON

When the trigger condition is satisfied, the received data is stored in devices in the following order.

Data from the beginning of the received data to **Constant (Hexadecimal)** data is stored in the device. **Constant (Hexadecimal)** data is not stored.

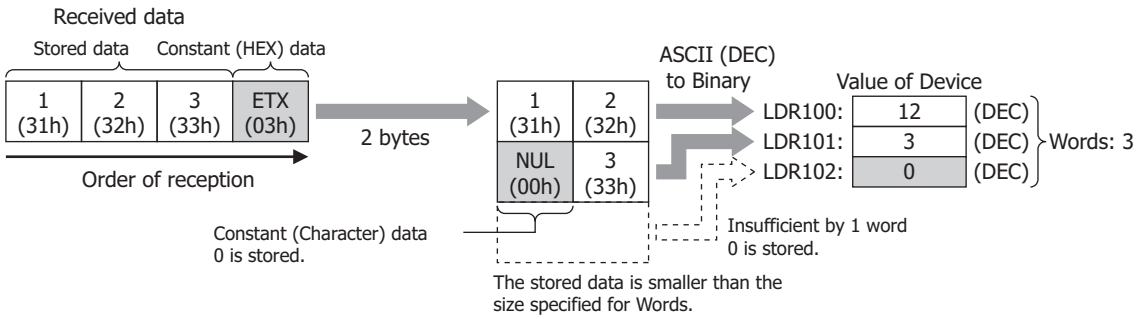


Example 8

Item	Setting
Conversion Type	ASCII (DEC) to Binary
Device	LDR100
Use Reference Device	OFF
Number of bytes	2
Words	3
Variable	ON

When the trigger condition is satisfied, the received data is stored in devices in the following order.

Data from the beginning of the received data to **Constant (Hexadecimal)** data is stored in the device. **Constant (Hexadecimal)** data is not stored.

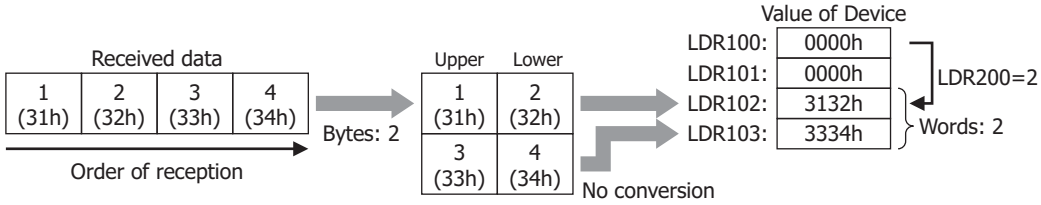


Example 9

Item	Setting
Conversion Type	No Conversion
Device	LDR100
Use Reference Device	ON, Device: LDR200
Storage Method of data	from Upper byte
Words	2
Variable	OFF

When the trigger condition is satisfied, the received data is stored in devices in the following order.

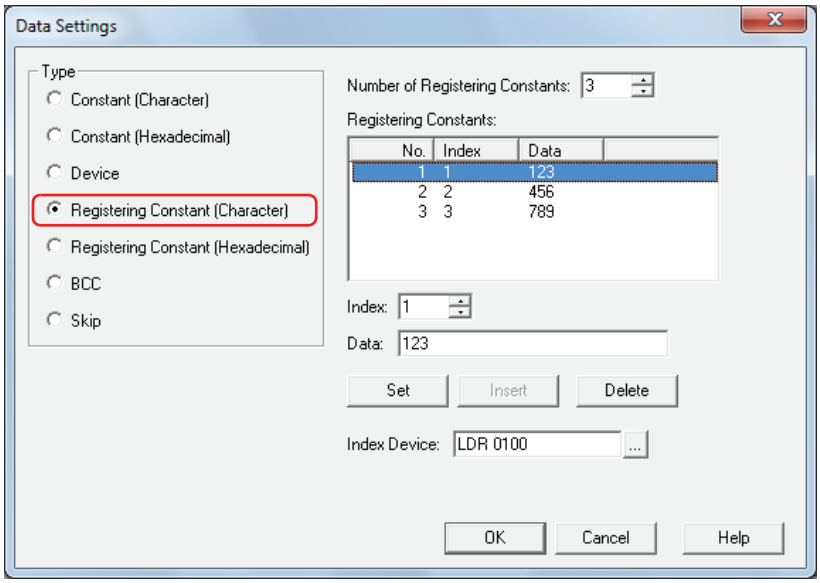
When the LDR200 value is 2



Registering Constant (Character)

The received data is compared with the registered character data and the number of the matching character data is stored in the device.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Registering Constant (Character)** is selected under **Type** on the Data Settings dialog box.



■ **Number of Registering Constants**

Specify the number of data of the registered character data (1 to 100).

■ **Registering Constants**

No.:	Shows the ID No. (1 to 100) of the character data.
Index:	Shows the Index No. of the character data.
Data:	Shows the character data.

■ **Index**

Specify the Index No. (0 to 65535) of the character data.

■ **Data**

Enter the character data (1 to 1500 bytes) to be registered. The size of a single-byte character is one byte and that of a double-byte character is two bytes.

The character data of different size or the same data with a different number cannot be registered.

■ **Set**

Register the **Index** and **Data** settings to the list. When a number that is already registered is selected, it is overwritten with the new setting.

■ **Insert**

Insert a character data setting to the selected number in the list.

Click this button to insert the **Index** and **Data** setting. The settings at the insertion point shift down 1 line. Settings cannot be inserted when all numbers are already set.

■ **Delete**

Delete the selected settings from the list.

■ **Index Device**

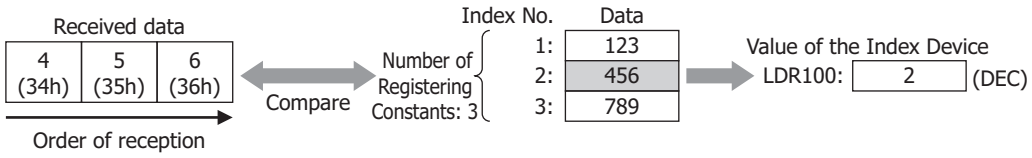
Specify the word device for storing the Index No. of the character data matching the received data. You can only specify an internal device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: Registering Constant (Character) for receive command data

Item	Setting
Number of Registering Constants	3
Registering Constants	Index No. 1: 123
	Index No. 2: 456
	Index No. 3: 789
Index Device	LDR100

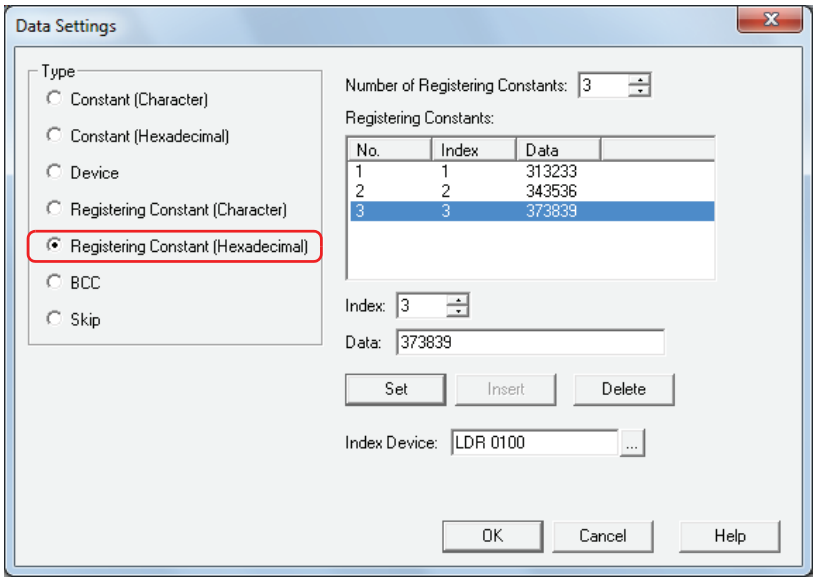
When the trigger condition is satisfied, the received data is compared with the registered data, and the value of the Index No. 2 of the matching data is stored in Index Device LDR100.



Registering Constant (Hexadecimal)

The received data is compared with the registered hexadecimal data and the number of the matching hexadecimal data is stored in the device.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Registering Constant (Hexadecimal)** is selected under **Type** on the Data Settings dialog box.



■ **Number of Registering Constants**

Specify the number of data of the registered hexadecimal data (1 to 100).

■ **Registering Constants**

No.:	Shows the ID No. (1 to 100) of the hexadecimal data.
Index:	Shows the Index No. of the hexadecimal data.
Data:	Shows the hexadecimal data.

■ **Index**

Specify the Index No. (0 to 65535) of the hexadecimal data.

■ **Data**

Enter the hexadecimal data (1 to 1500 bytes) to be registered.

The hexadecimal data of different size or the same data with a different number cannot be registered.

■ **Set**

Register the **Index** and **Data** settings to the list. When a number that is already registered is selected, it is overwritten with the new setting.

■ **Insert**

Insert a hexadecimal data setting to the selected number in the list.

Click this button to insert the **Index** and **Data** setting. The settings at the insertion point shift down 1 line. Settings cannot be inserted when all numbers are already set.

■ **Delete**

Delete the selected settings from the list.

■ **Index Device**

Specify the word device for storing the Index No. of the hexadecimal data matching the received data. You can only specify an internal device.

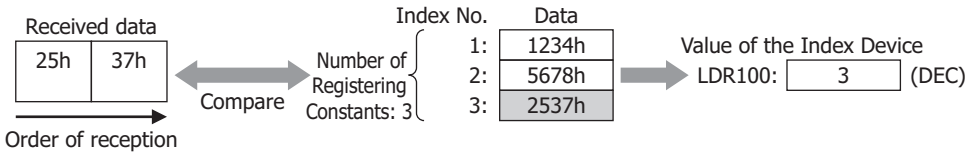
Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: Registering Constant (Hexadecimal) for receive command data

Item	Setting
Number of Registering Constants	3
Registering Constants	Index No. 1: 1234
	Index No. 2: 5678
	Index No. 3: 2537
Index Device	LDR100

When the trigger condition is satisfied, the received data is compared with the registered hexadecimal data, and the value of the Index No. 2 of the matching data is stored in Index Device LDR100.

When the LDR100 value is 3



Example of applying Registering Constant

When the same device address is specified for the Index Device for **Registering Constant (Character)** data or **Registering Constant (Hexadecimal)** data and for **Use Reference Device** for **Device** data, the data storage destination for each unit of received data can be changed.

Data type	Item	Setting
Constant (Hexadecimal)	Data	02
Registering Constant (Character)	Number of Registering Constants	2
	Registering Constant	Index No. 1: AA
		Index No. 2: BB
	Index Device	LDR100
Device	Conversion Type	No Conversion
	Device	LDR100
	Use Reference Device	ON, Device: LDR200
	Storage Method for Data	from Upper byte
	Bytes	2
	Words	2
	Variable	OFF
Constant (Hexadecimal)	Data	0D

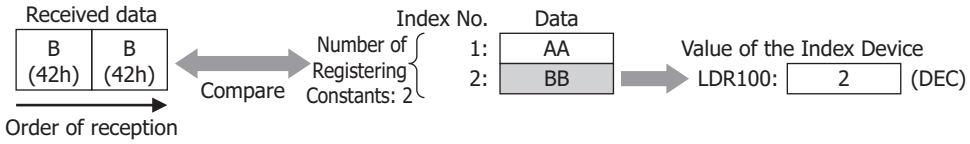
When the following commands are received

STX (02h)	B (42h)	B (42h)	1 (31h)	2 (32h)	CR (0Dh)

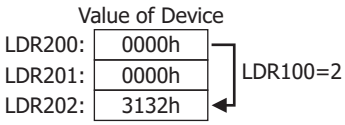
- The first 1 byte is taken as the start code. **Constant (Hexadecimal)** data is not stored.

STX (02h)

- The received data is compared with the registered data, and the value of the Index No. 2 (DEC) of the matching data is stored in Index Device LDR100.



- Since the Indirect Device LDR100 of **Device** of the receive command data is 2 (DEC), the data is stored in the device LDR202, which is offset by +2.

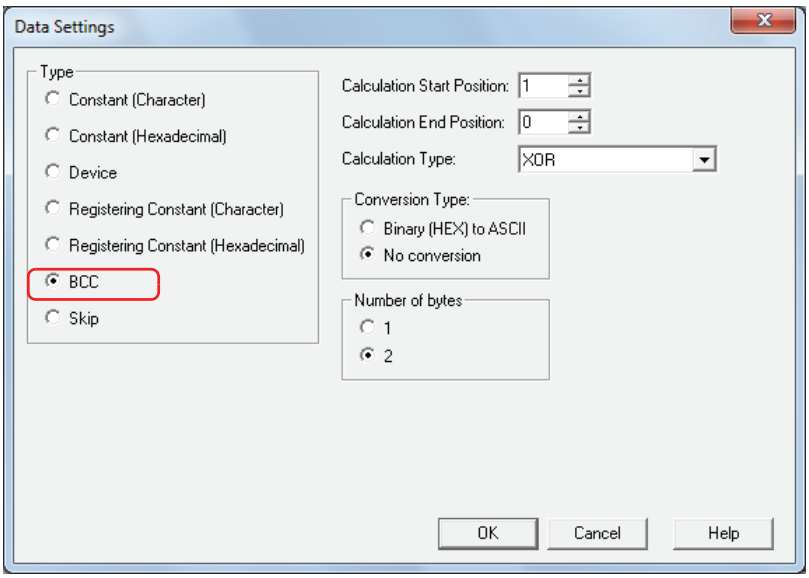


- The last 1 byte is taken as the terminal code. **Constant (Hexadecimal)** data is not stored.

BCC (Block Check Code)

The BCC comparison data is automatically calculated from the receive data and compared with the BCC part of the receive data.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **BCC** is selected under **Type** on the Data Settings dialog box.



■ Calculation Start Position

Specify the position (1 to 15) in the receive data where BCC calculation starts. The position is counted backwards, with the first position of the receive data taken as 1.

Calculation Start Position:	(1)	(2)	(3)	(4)	(5)	(6)		
Receive data:	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)

■ Calculation End Position

Specify the position (0 to 15) in the receive data where BCC calculation ends. The position is counted forwards, with the data position before the BCC taken as 0.

Receive data:	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)
Calculation End Position:	(5)	(4)	(3)	(2)	(1)	(0)		

■ Calculation Type

Select the method to calculate the data between the Calculation Start Position and Calculation End Position.

XOR: Calculates the data with exclusive logical add.

ADD: Calculates the data using addition.

ADD (2's Complement): Calculates the data using addition, inverts the bit and adds one.

Modbus ASCII (LCR): Calculation is performed according to the following procedure. Conversion Type: Binary (HEX) to ASCII, Number of bytes: 2

1. Convert the ASCII characters between Calculation Start Position and Calculation End Position into 1-byte hexadecimal data for each set of two characters.
   Example: 37h, 35h → 75h
2. Calculate the sum of the data obtained in step 1.
3. Invert the bit of the result of step 2 and add one. (2's complement)
4. Convert the lower one byte data of the result of step 3 into ASCII characters.
   Example: 75h → 37h, 35h

Modbus RTU (CRC): CRC-16 (Generating polynomial:$x^{16}+x^{15}+x^{2}+1$) is calculated according to the following procedure. Conversion Type: No Conversion, Number of bytes: 2

1. Obtain an exclusive OR (XOR) of 1 byte data at Calculation Start Position and FFFFh.
2. If the least significant bit of the result of step 1 is 0, shift to the right by one bit. If the bit is 1, shift to the right by 1 bit and obtain XOR of the result and the value (A001h).
3. Repeat step 2 to shift 8 times.
4. Obtain XOR of the next one byte of data and the result of step 3.
5. Repeat steps 2 through 4 until the data at Calculation End Position is processed.
6. Compare the result of step 5 in the order of the lower byte and upper byte.
   Example: 1234h → 34h, 12h

■ Conversion Type

After calculating the data using the specified calculation type, select the type of conversion for the data from the following.

Binary (HEX) to ASCII: Considers the data as binary-coded hexadecimal number and converts it to ASCII data.

No conversion: No conversion is performed.

■ Number of bytes

After converting according to the specified conversion type, select **1** or **2** for the number of bytes for comparison data.

Example: BCC for receive command data

This example describes the case of comparing the BCC calculation result for the following receive data with the BCC part of the receive data.

STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)

- Calculation Start Position and Calculation End Position
  When Calculation Start Position is 2 and Calculation End Position is 1: Calculates the range **1234**.

Calculation Start Position:	(1)	(2)	(3)	(4)	(5)	(6)		
	STX (02h)	1 (31h)	2 (32h)	3 (33h)	4 (34h)	5 (35h)	BCC	CR (0Dh)
Calculation End Position:	(5)	(4)	(3)	(2)	(1)	(0)		

Data used for BCC calculation

- Calculation Type

XOR: 31h^32h^33h^34h^=04h

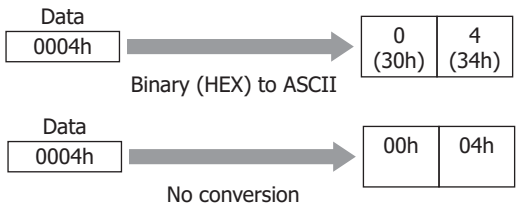
ADD: 31h+32h+33h+34h=CAh

ADD (2's Complement): Inverts the bit of CAh+1=36h

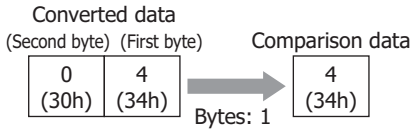
Modbus ASCII (LCR): **BA**→42h, 41h

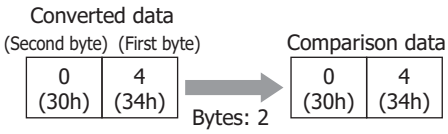
Modbus RTU (CRC): BA30h→BAh, 30h

- Conversion Type
  When the BCC calculation result is **0004h**, the converted data is as follows.

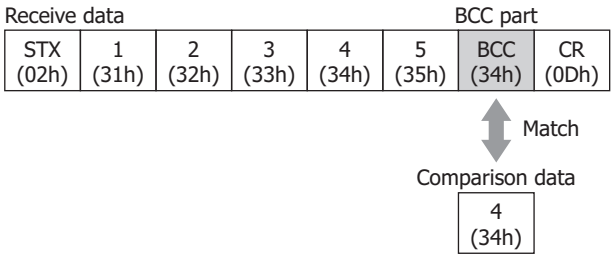


- Number of bytes and comparison data
  When the converted data is **3034h**, the data used for comparison with the BCC part of the receive data is as follows.

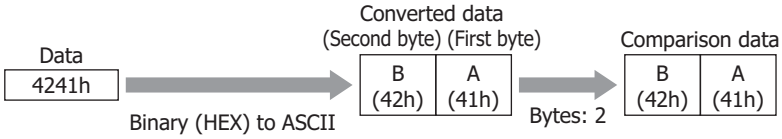




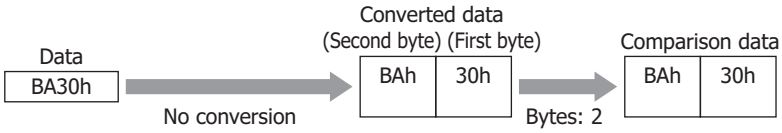
- BCC data comparison
  The comparison data is compared with the BCC part of the receive data.
  In the following receive data, when the comparison data is the 1-byte 34h, there is a match since the BCC part data is 34h.
  When there is no match, the BCC Error (address+0, bit 0) of the Status Device changes to 1.



- When the calculation type is **Modbus ASCII (LCR)**
  When the BCC calculation result is **4241h** after **Binary (HEX) to ASCII** conversion the resulting two bytes of data is used for comparison with the BCC part of the receive data.



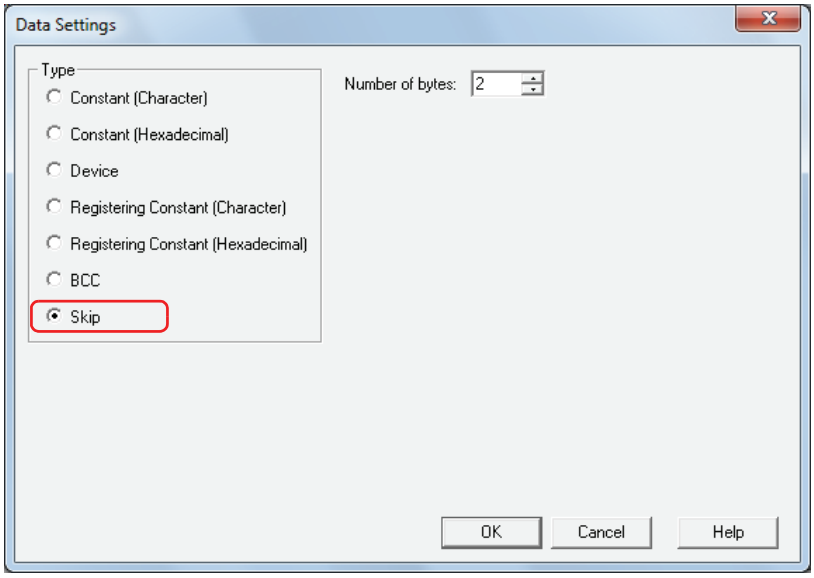
- When the calculation type is **Modbus RTU (CRC)**
  When the BCC calculation result is **BA30h** with no conversion the two bytes of data is used for comparison with the BCC part of the receive data.



Skip

The data with the specified number of bytes in the receive data will be ignored.

This can be configured only when **RXD** is selected in **Command Type** on the Command Settings dialog box, and **Skip** is selected under **Type** on the Data Settings dialog box.



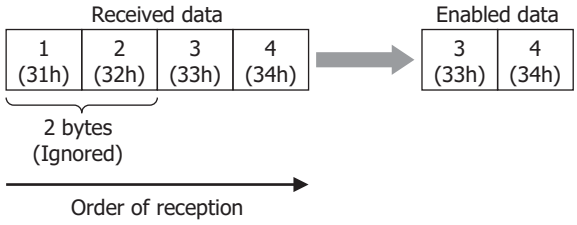
■ **Number of bytes**

Specify the number of bytes (1 to 249) of receive data to be ignored.

Example: Skip for receive command data

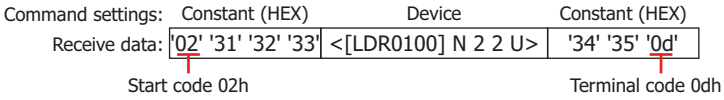
Item	Setting
Number of bytes	2

In the received four byte data (1 (31h), 2 (32h), 3 (33h), 4 (34h)), only the data for 3 (33h) and 4 (34h) is received and the two bytes of 1 (31h) and 2 (32h) are discarded.



● Start Code and Terminal Code

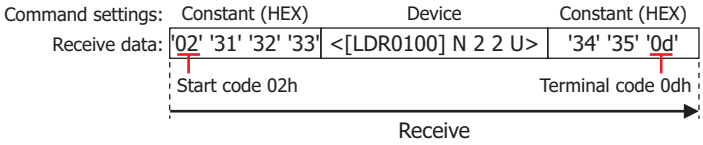
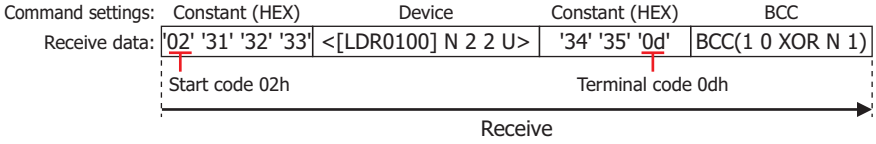
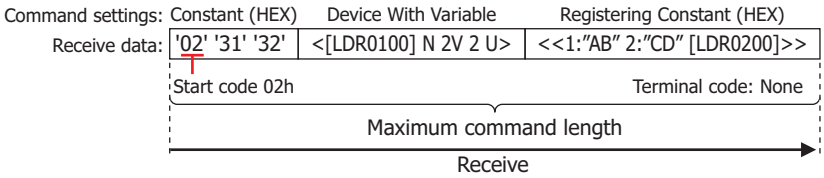
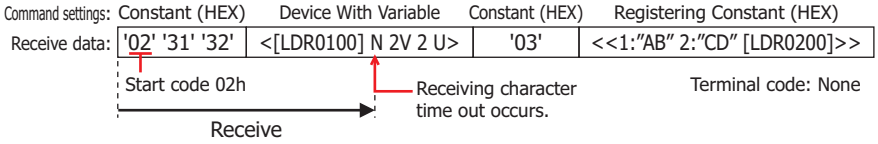
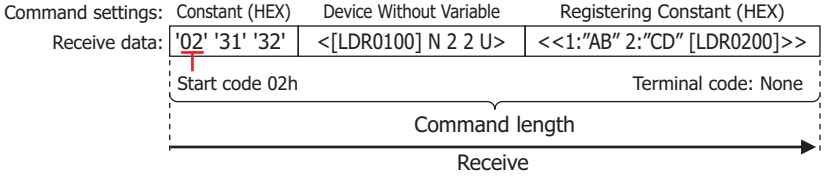
A start code starts data reception and a terminal code judges the terminal of data reception. A start code and a terminal code can be configured for either **Constant (Character)** or **Constant (Hexadecimal)** settings for receive command. The first 1 byte of the constant is recognized as the start code and the last 1 byte as the terminal code.

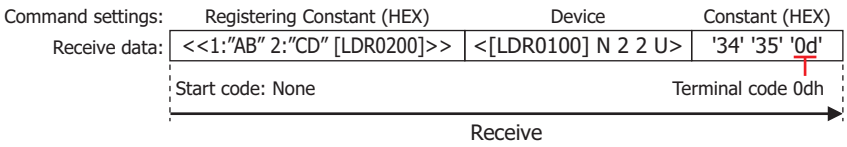
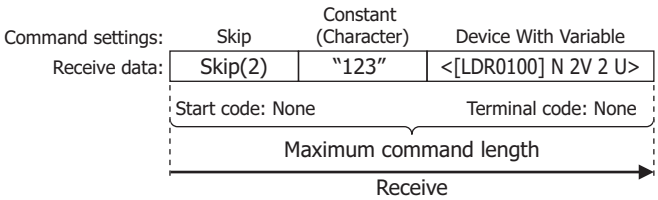
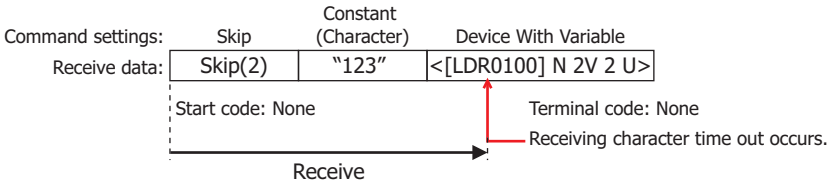
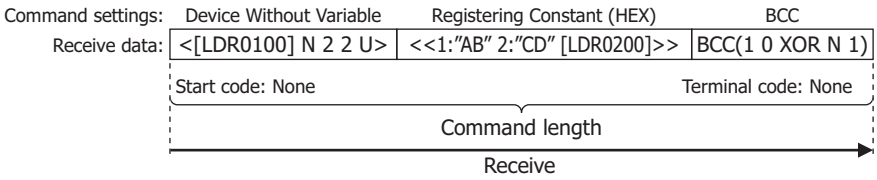


Code 00h to 7Fh can be set when **Data Length** under **Interface Settings** is 7 bits, and 00h to FFh when the data length is 8 bits. **Data Length** is configured under the **Communication Interface** tab on the Project Settings dialog box.

The procedure for terminal of data reception varies whether or not the receive data contains a start code and a terminal code, and whether the **Variable** check box for **Device** for receive command data is selected.

In the following description, **With Variable** indicates that the **Variable** check box for **Device** for receive command data is selected and **Without Variable** indicates that the **Variable** check box is not selected. Also, when there are multiple **Device** set for receive command data, and at least 1 command has the **Variable** check box selected, this corresponds to **With Variable**.

Start code	Terminal code	Variable	Description of the procedure for terminal of data reception
Set	Set	Set Not set	Reception is started with the start code and terminated with the terminal code.  When the terminal code is followed by BCC, the data including the number of bytes of BCC is received. 
Set	Not set	Set	Reception is started with the start code and the data is received according to the maximum command length.  Reception is terminated when the Receiving Character Time Out occurs. 
		Not set	Reception is started with the start code and the data is received according to the length of the command. 

Start code	Terminal code	Variable	Description of the procedure for terminal of data reception
Not set	Set	Set Not set	Reception is started from the beginning and terminated with the terminal code. 
Not set	Not set	Set	Reception is started from the beginning and the data is received according to the maximum command length.  Reception is terminated when the Receiving Character Time Out occurs. 
		Not set	Reception is started from the beginning and terminated when the data is received according to the length of the command. 

- When trigger conditions are satisfied for two or more receive commands for which both start code and terminal code are set, all commands are analyzed and processed for receive processing. Since commands with and without errors may be mixed depending on the results of data reception analysis of each command, take extra caution regarding error handling.
- While the trigger condition is satisfied for a receive command for which either a start code or terminal code is not set, only this command is processed for data reception when the trigger condition of another command is being satisfied. When two or more commands exist for which either start code or terminal code is not set, the command with the biggest number for managing the protocol is processed.
- When a start code of the receive command for which a start code is set cannot be received, all of the receive data is ignored and abandoned. No error occurs.
- When start code is received with a receive command for which start code and terminal code are set, the data reception is completed after the maximum number of bytes received in case of continuous reception of data that does not match the terminal code of all receive command in which the trigger conditions is satisfied.

5.4 Example of User Communication Settings

This section describes examples of user communication settings and command operations.

● Example 1

This section describes an example of user communication protocol settings for creating the following commands and command operations.

- Transmission command for transmitting data using Constant (Hexadecimal), Constant (Character), Device, Constant (Hexadecimal) command settings when the trigger condition device changes to 1
- Receive command for receiving, processing, and storing data in devices, using Constant (Hexadecimal), Constant (Character), Device, Constant (Hexadecimal) command settings, for data transmitted from an external device, when the trigger condition device is 1

■ User Communication Settings dialog box settings

Item	Setting
Protocol Name	Sample 1
Receiving Character Time Out	30 (×100 msec)

■ Transmission command: Command Settings dialog box settings

Item	Setting	
Comment	TXD command	
Command Type	TXD	
Completed Device	LM101	
Status Device	LDR110	
Transmission Wait	50 (×100 msec)	
Trigger Condition	While ON, Device: LM100	
Command Data Settings dialog box settings	Constant (Hexadecimal)	'05'
	Constant (Character)	"D"
	Device	Conversion Type: Binary (DEC) to ASCII, Number of bytes: 4, Words: 1 Device: LDR100
	Constant (Hexadecimal)	'0D'

Operation for transmission command

1. Write a value of 100 (DEC) to LDR100 of transmission command data **Device**.
2. Change the trigger condition LM100 from 0 to 1 to start command transmission.

   After the transmission wait duration (five seconds), the transmission data is sent. The transmission data is as follows.

Command settings:	Constant (HEX)	Constant (Character)	Device				Constant (HEX)
Transmission data:	EQN (05h)	D (44h)	0 (30h)	1 (31h)	0 (30h)	0 (30h)	CR (0Dh)

- When data transmission is successfully completed, the Completed Device LM101 changes to 1.
- When the value of each bit of address+0 for Status Device LDR110 is 0, transmission is completed without an error.

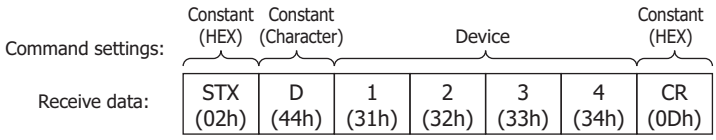
■ Receive command: Command Settings dialog box settings

Item	Setting	
Comment	RXD command	
Command Type	Receive	
Completed Device	LM102	
Not Clear Completed Device automatically	No	
Status Device	LDR130	
Receiving Time Out	0 (No Receive Time Out)	
Trigger Condition	While ON, Device: LM101	
Command Data Settings dialog box settings	Constant (Hexadecimal)	'02'
	Constant (Character)	"D"
	Device	Conversion Type: ASCII (HEX) to Binary, Number of bytes: 4, Words: 1 Device: LDR120, Reference Device: LDR100
	Constant (Hexadecimal)	'0D'

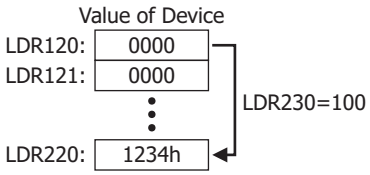
Operation for receive command

1. When data transmission of the transmission command is completed, the value of LM101 changes to 1, and since the same device is specified for the trigger condition user communication becomes ready for receiving.
2. Data is transmitted from the external device and the transmitted data is received and processed.

   The receive data is as follows.



Since a value of 100 is written to LDR100 at the time of transmission, the data is stored in device LDR220, which corresponds to an offset of +100 from LDR120.



- When data reception is successfully completed, the Completed Device LM102 changes to 1.
- When the value of each bit of address+0 of Status Device LDR130 is 0, reception is completed without an error.

● Example 2

This section describes an example of user communication protocol settings for creating the following commands and command operations.

- Transmission command for transmitting data using Constant (Hexadecimal), Registering Constant (Character), Device, BCC, Constant (Hexadecimal) command settings when the trigger condition device changes to 1
- Receive command for receiving, processing, and storing data in devices, using Constant (Hexadecimal), Registering Constant (Character), Skip, Device, BCC, Constant (Hexadecimal) command settings, for data transmitted from an external device, when the trigger condition device is 1

■ User Communication Settings dialog box settings

Item	Setting
Protocol Name	Sample 2
Receiving Character Time Out	30 (×100 msec)

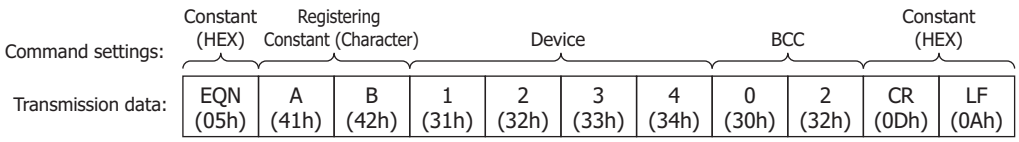
■ Transmission command: Command Settings dialog box settings

Item	Setting	
Comment	TXD command	
Command Type	Transmit	
Completed Device	LM201	
Status Device	LDR220	
Transmission Wait	0 (×100 msec)	
Trigger Condition	While ON, LM200	
Command Data Settings dialog box settings	Constant (Hexadecimal)	'05'
	Registering Constant (Character)	10: "AB", 20: "CD", Index Device: LDR200
	Device	No Conversion, from Upper byte, Number of bytes: 2, Words: 2 Device: LDR210
	BCC	Start Calculation Position: 1, End Calculation Position: 0, XOR, Binary (HEX) to ASCII, 2 bytes
	Constant (Hexadecimal)	'0D0A'

Operation for transmission command

1. Write a value of 10 (DEC) to LDR200 for **Registering Constant (Character)** for transmission command data.
   AB is selected.

2. Write a value of 3132h to LDR210 and 3334h to LDR211 for **Device** for transmission command data.
3. Change the trigger condition LM200 from 0 to 1 to start command transmission.
   The transmission data is as follows.



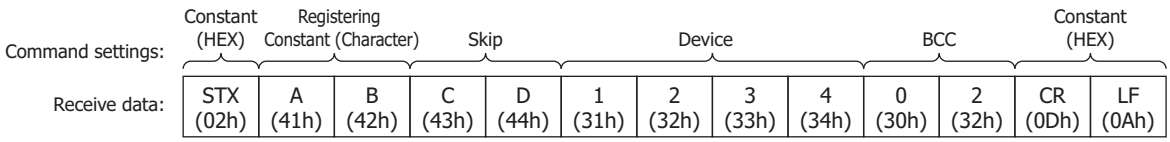
- When data transmission is successfully completed, the Completed Device LM201 changes to 1.
- When the value of each bit of address+0 for Status Device LDR220 is 0, transmission is completed without an error.

■ Receive command: Command Settings dialog box settings

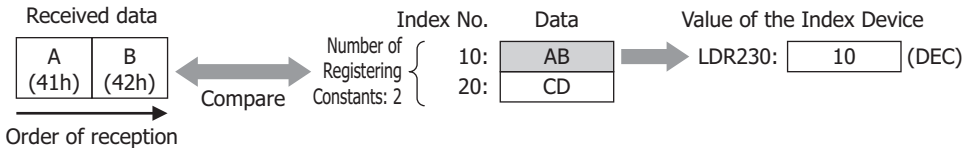
Item	Setting	
Comment	RXD command	
Command Type	Receive	
Completed Device	LM203	
Not Clear Completed Device automatically	No	
Status Device	LDR260	
Receiving Time Out	0 (No Receive Time Out)	
Trigger Condition	While ON, Device: LM202	
Command Data Settings dialog box settings	Constant (Hexadecimal)	'02'
	Registering Constant (Character)	10: "AB", 20: "CD", Index Device: LDR230
	Skip	2 bytes
	Device	Conversion Type: No Conversion, from Upper byte, Number of bytes: 2, Words: 2 Device: LDR240, Reference Device: LDR230
	BCC	Calculation Start Position: 1 Calculation End Position: 0, XOR Binary (HEX) to ASCII, 2 bytes
	Constant (Hexadecimal)	'0D"0A'

Operation for receive command

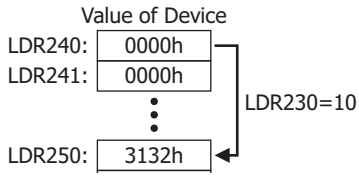
1. Change the trigger condition LM202 from 0 to 1 to be ready for receiving user communication.
2. Data is transmitted from the external device and the transmitted data is received and processed.
   The receive data is as follows.



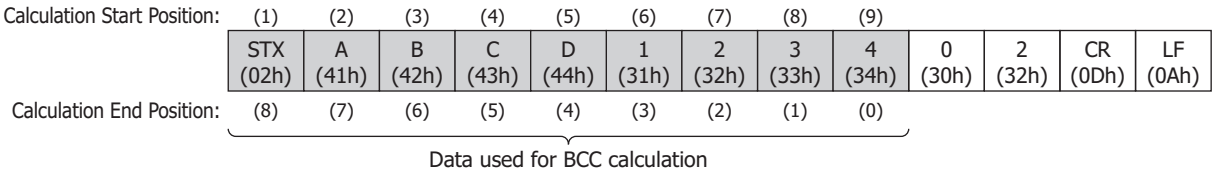
- The receive data is compared with the character data, and the value of the matching Index No. (10 (DEC)) is stored in Index Device LDR230.



- The 2 bytes (specified with **Skip**) of the receive command data 43h and 44h are ignored.
- Since the Reference Device LDR 230 of **Device** of the receive command data is 10 (DEC), the data is stored in the device LDR250 and LDR251, which is offset by +10.

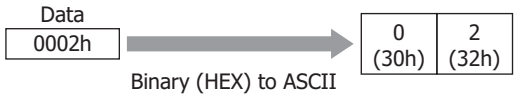


- **[STX] ABCD1234** is calculated with **BCC** of receive command data and compared with 3032h.
  - When Calculation Start Position is 1 and Calculation End Position is 0: Calculates the range **STX ABCD1234**.

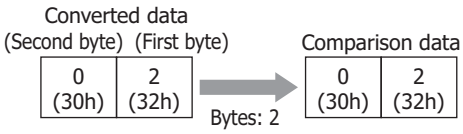


  - The BCC calculation type is **XOR**.
    02h^41h^42h^43h^44h^31h^32h^33h^34h^=02h

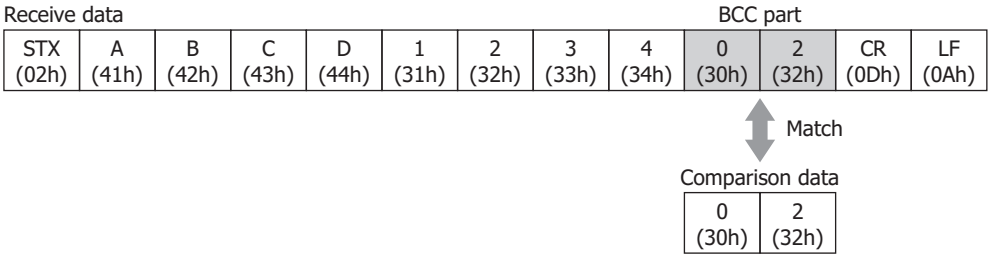
- When the BCC calculation result is **0002h**, the converted data will be **3032h**.



- When the converted data is **3032h**, the data for comparison with the BCC part of the receive data will be **3032h**.



- The comparison data is compared with the BCC part of the receive data.
  In the following receive data, when the comparison data is the 2-byte 3032h, there is a match since the BCC part data is 3032h.
  When there is no match, the BCC Error (address+0, bit 0) of Status Device changes to 1.



- When data reception is successfully completed, the Completed Device LM203 changes to 1.
- When the value of each bit of address+0 for Status Device LDR250 is 0, transmission is completed without an error.

5.5 Compatible USB Barcode Readers

The following USB barcode readers can be used with the MICRO/I:

Manufacturer	Type Number
IDEC DATALOGIC	QD2130*1

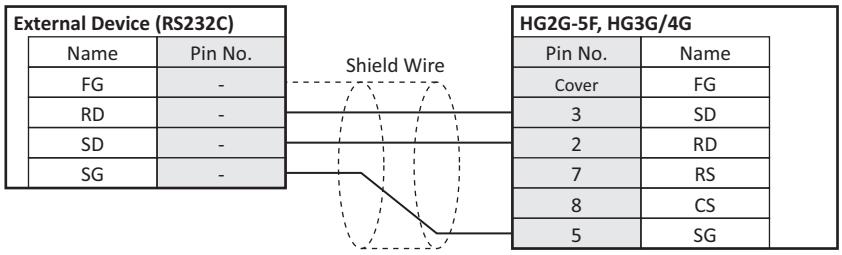
- Set "USB-KBD(Keyboard)" to the interface settings of USB barcode reader.
- The MICRO/I handles the new line code as 0x0A.

5.6 Connection Diagram for User Communication

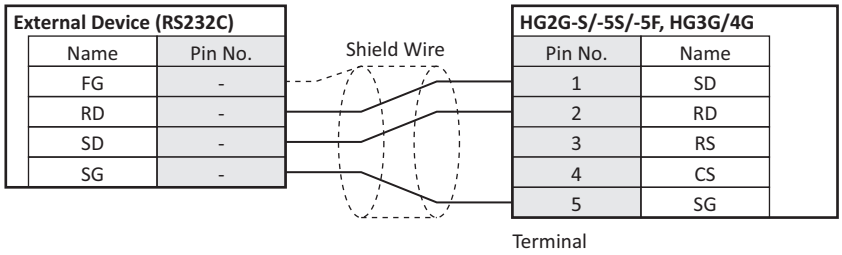
When connecting an external device to the MICRO/I via user communication, refer to the following connection diagram.

■ Serial interface (RS232C)

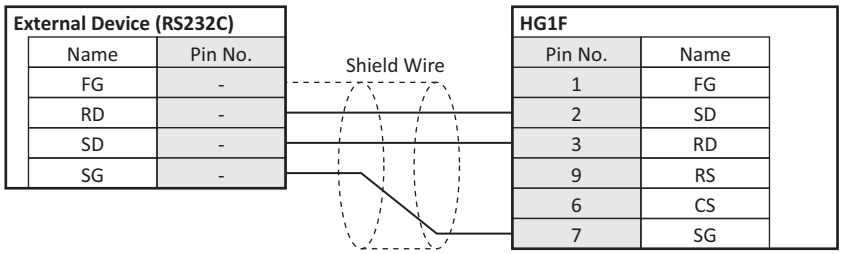
HG2G-5F, HG3G/4G (Connector)



HG2G-S/-5S/-5F, HG3G/4G (Terminal)

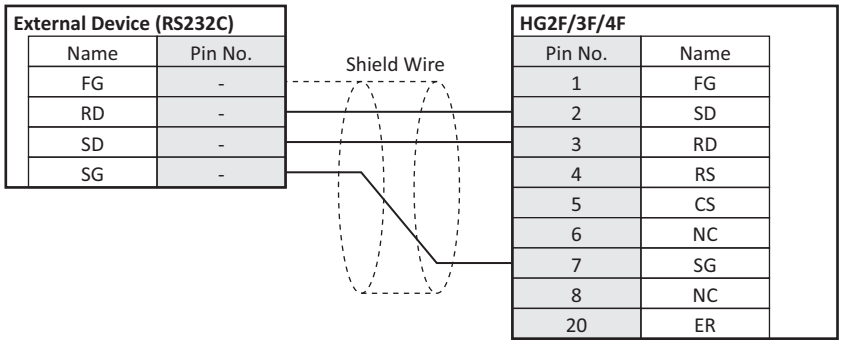


HG1F (Connector)



D-sub, 9P connector socket type

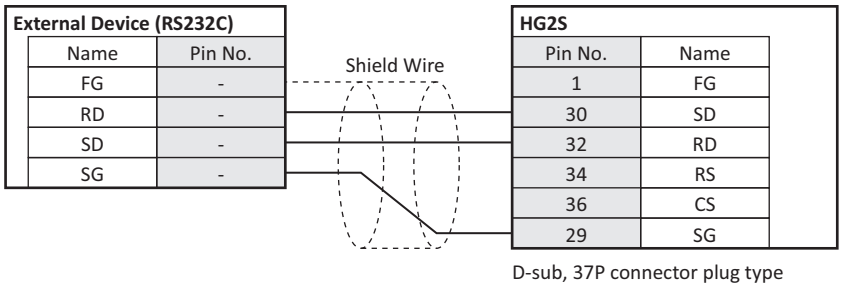
HG2F/3F/4F (Connector)



D-sub, 25P connector socket type

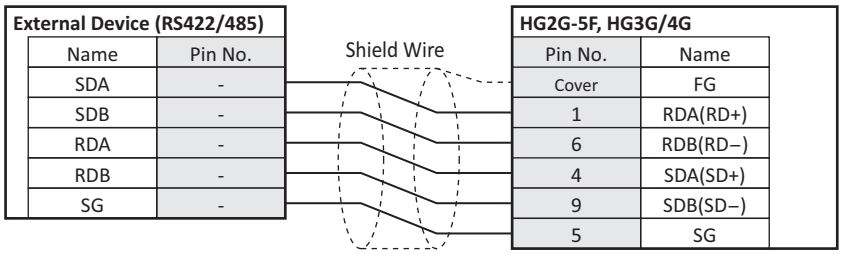
*1 in selected country only

HG2S (Connector)

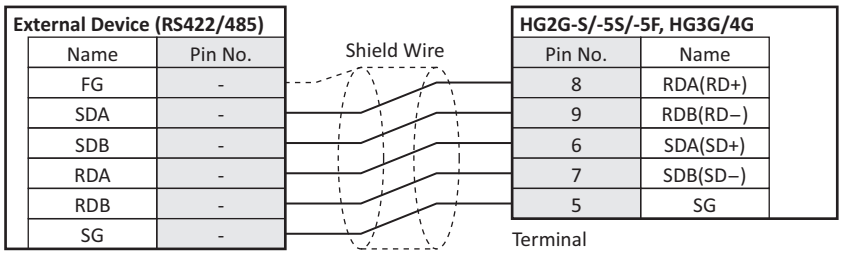


■ Serial Interface 1 (RS422/485)

HG2G-5F, HG3G/4G (Connector)

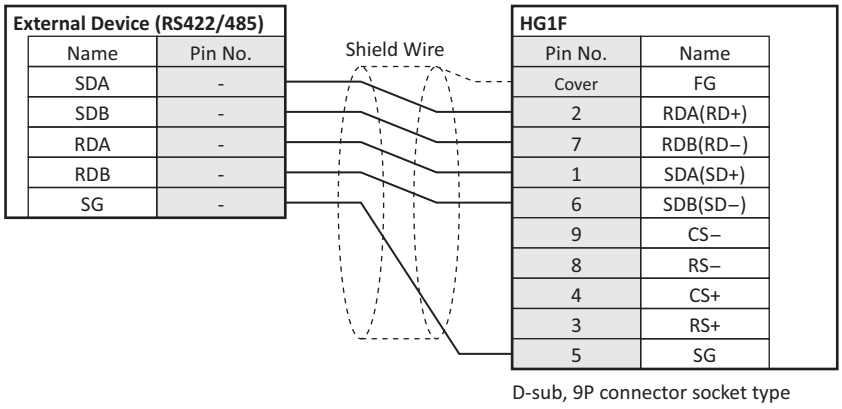


HG2G-S/-5S/-5F, HG3G/4G (Terminal)

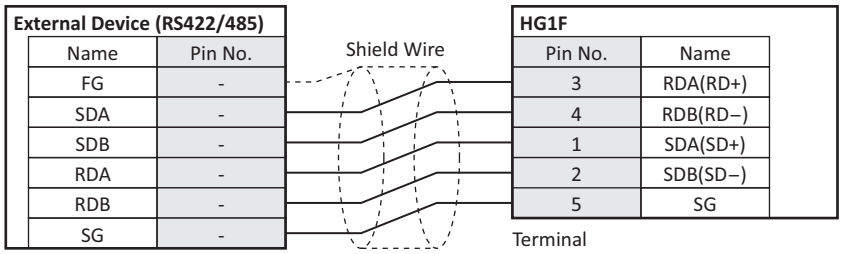


There is no pin number corresponding to TERM for the HG2G-S/-5S/-5F and the HG3G/4G. When a termination resistor is necessary, use the terminating resistor selector switch. For the terminating resistor selector switch, refer to Chapter 1 "3 Important Points Regarding Wiring" in the "External Device Setup Manual".

HG1F (Connector)

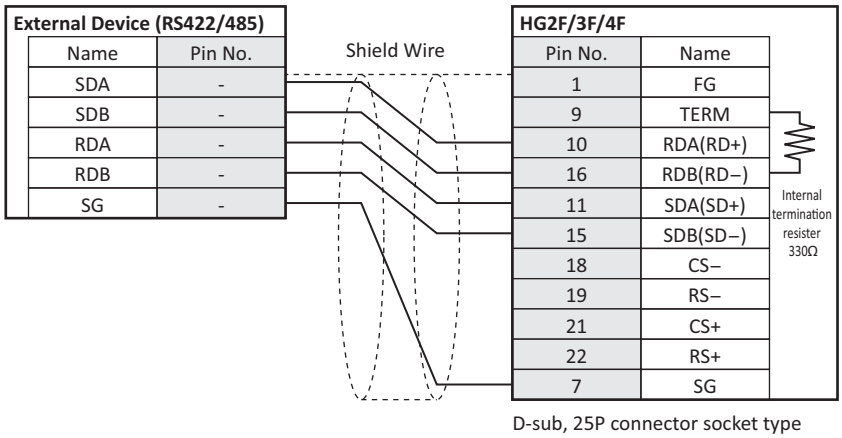


HG1F (Terminal)

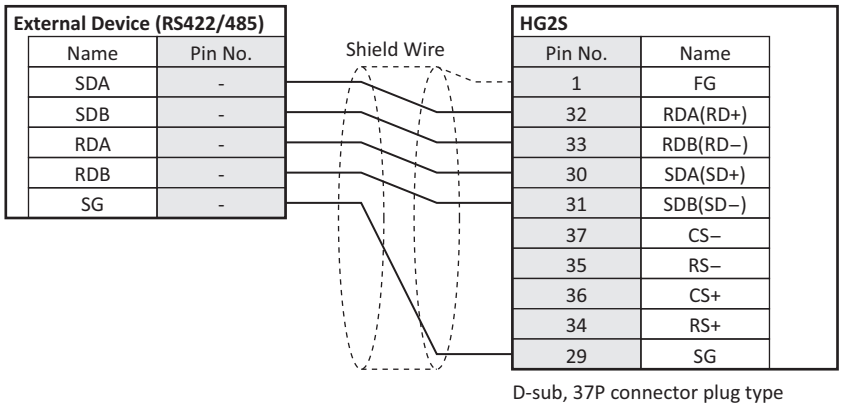


There is no pin number corresponding to TERM for the HG1F. When a termination resistor is necessary, use the terminating resistor selector switch. For the terminating resistor selector switch, refer to Chapter 1 "3 Important Points Regarding Wiring" in the "External Device Setup Manual".

HG2F/3F/4F (Connector)



HG2S (Connector)



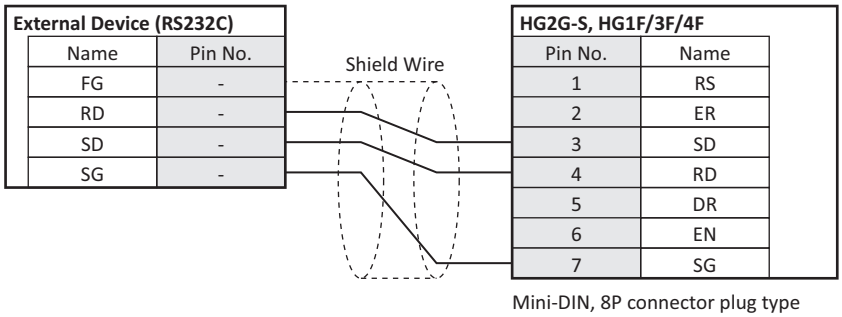
There is no pin number corresponding to TERM for the HG2S. When a termination resistor is necessary, use the communication switch. For the communication switch, refer to Chapter 1 "3 Important Points Regarding Wiring" in the "External Device Setup Manual".

Serial interface 2

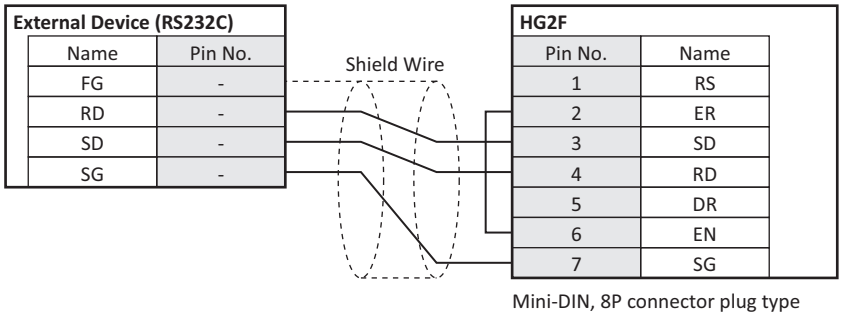
HG2G-5F, HG3G/4G (Terminal)

Refer to "Serial interface (RS232C)" on page 3-75 and "Serial Interface 1 (RS422/485)" on page 3-76 about the connection diagram of the Serial Interface 2 on the HG2G-5F, HG3G/4G.

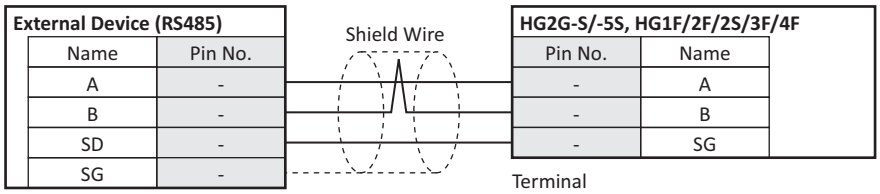
HG2G-S, HG1F/3F/4F (Connector)



HG2F (Connector)



O/I Link Interface



6 Sub Host Communication

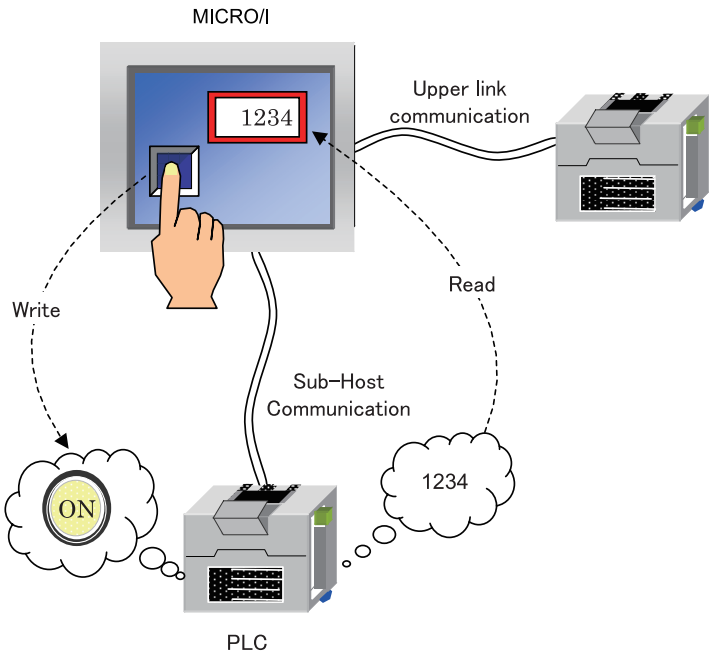
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

6.1 Overview

Like PLC link communication, Sub Host Communication is a communication method for reading and writing data from and to devices such as relays (e.g., PLCs) and registers. The basic functions of Sub Host Communication are the same as with PLC link communication. Sub Host Communication performs communication via programming ports on PLC link units (the unit name depends on PLC model) and CPU units or other serial ports. Using Sub Host Communication with PLC Link Communication makes it possible to communicate with two PLCs without making a communication program in the PLC.

6.2 Operation

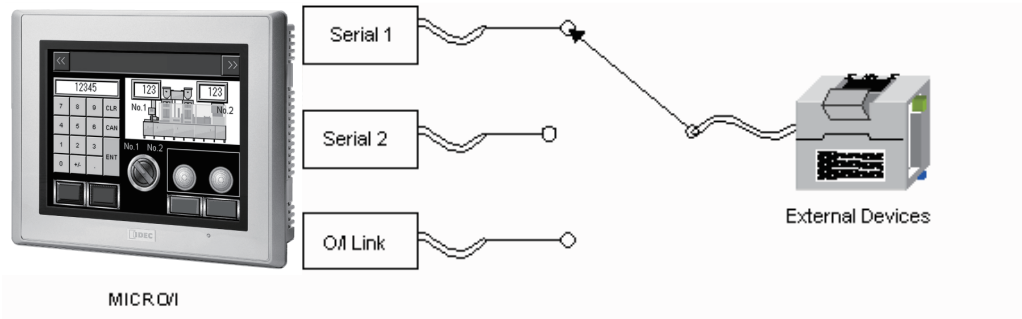
The MICRO/I can use the sub-host communication method to read and write host device data. To read and write host device data, assign host device addresses to the HG link register (LLR), which is a HG internal decide. The MICRO/I can read and write data from and to the assigned host device via the LLR.



- Sub Host Communication cannot be used with the HG2G-5S USB interface (**Serial 2** in **Interface Configuration** under **Communication Interface** tab on the Project Settings dialog box).
- The HG1F cannot simultaneously use Serial Interface 2 and the O/I Link Interface. The interface to use is set in the Project Settings dialog box on the **Communication Interface** tab.
- The HG1F cannot use the O/I Link Interface when in the following states.
  - The maintenance cable is connected to Serial Interface 2.
  - In the Project Settings dialog box, on the **Host I/F Driver** tab, the **Enable Pass-Through** check box is selected.

6.3 Specifications of the Sub Host Communication

The MICRO/I supports communication with external devices that comply with the Sub Host communication specifications via the serial interface or the O/I link interface.



- Serial I/F1, serial I/F2, or O/I link can be used for Sub Host Communication. Two or more interfaces cannot be used at the same time.
- With the HG2F/2S/3F/4F, the Data Bits, Stop Bits, and Parity settings for the O/I Link I/F are fixed to “8 bits”, “1 bit”, and “None” respectively.
- For HG1F, the Serial I/F 2 and the O/I Link I/F can not be used at the same time.
- For HG1F, O/I Link communication stops while the maintenance cable is connected to the Serial I/F 2.
- For HG1F, the O/I Link Interface cannot be used for a communication when “Enable Pass-Through” is selected.

6.4 Basic Flow from Setting the WindO/I-NV2 to Sub Host Communication

The following flowchart describes the series of operational procedures from setting the WindO/I-NV2 to Sub Host Communication operation.

1. Setting the Communication Interface
   Specify the interface for the Sub Host Communication and communication condition of the port.
   (Configure the settings in [Configuration] - [System Setup] - [Project] - [Communication Interface] on the WindO/I-NV2.)

↓

2. Setting the Sub Host Communication Protocol
   Specify the desired protocol setting for the Sub Host Communication.
   (Configure the settings in [Configuration] - [System Setup] - [Project] - [Sub Host Communication]. Select the protocol to be used (PLC to be connected) in the [Protocol].)

↓

3. Setting the Device Address Assignment to LLR
   Assign any device address for the selected protocol (PLC) to LLR (from 0 to 63).

↓

4. Downloading the Project
   Download the project data where LLR's are used as switches and lamps.

↓

5. Operation
   Set the system to the RUN mode and perform operation of WindO/I-NV2.

- Refer to the Help of the WindO/I-NV2 for details about the setting procedures.
- If the setting is other than "No Host" at the time of setting up the Sub Host Communication to Serial 1, the O/I Link should be set to "O/I Link Slave".

6.5 Selecting the Protocol

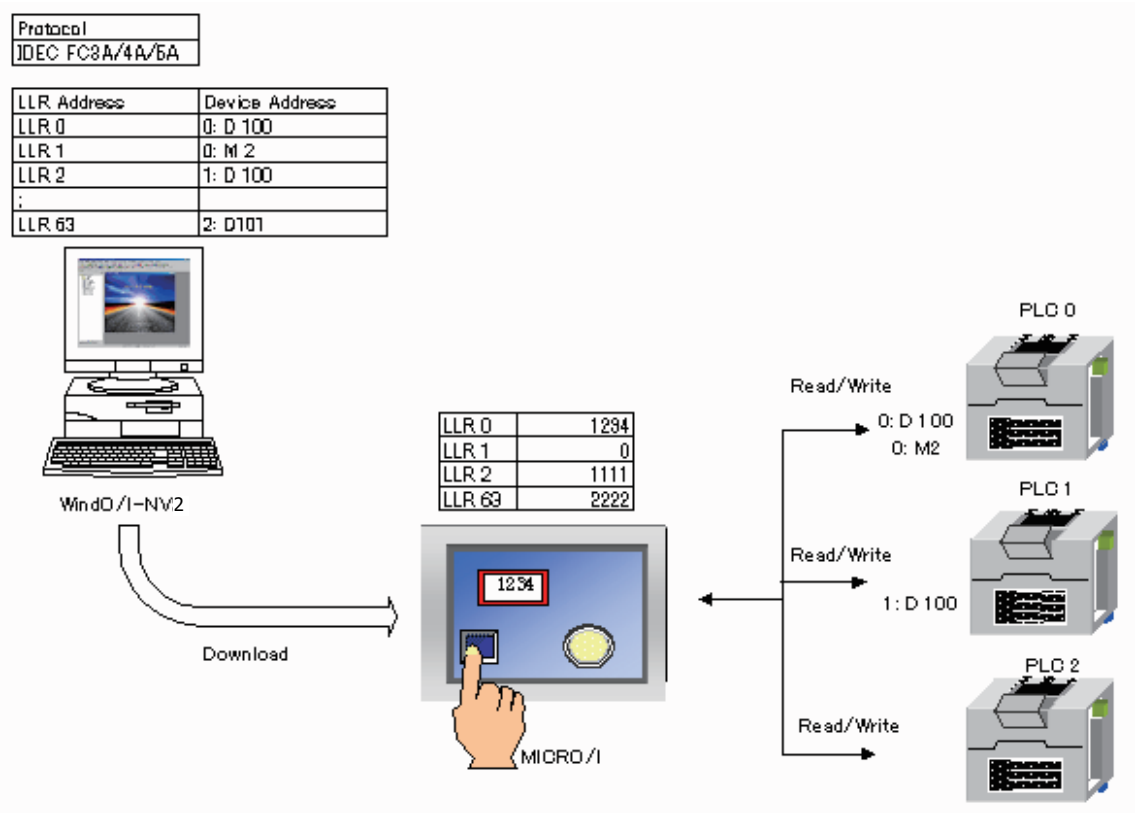
The table below lists the protocols that can be selected in sub-host communication.

Protocol name	Corresponding host I/F driver
IDEC MicroSmart	Manufacturer: IDEC Corporation Host I/F driver name: OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485)
Modbus RTU Master	Manufacturer: Modicon Host I/F driver name: Modbus RTU Master

For the devices that can be used by each protocol, communication cable connection, and usable devices, see Chapter 2 "Connection to a PLC" in the "External Device Setup Manual" (PDF) and "5 User Communication" on page 3-8.

6.6 Setting Internal Device LLR Assignment

To control external devices in sub-host communication, use an LLR (HG link register), which is a MICRO/I internal register. Assign external device addresses to LLR addresses 0 to 63. When a read or write request is issued to the LLR, MICRO/I reads or writes data from or to the assigned external device addresses and reflects the execution result in the LLR.



Don't use the frequent write operation for LLR which is caused by a script and a word command. It may make the reading data operation too much slow.

Refer to the Help of the WindO/I-NV2 for details about the setting procedures.

6.7 Error information

This setting is for monitoring all error information and for controlling Sub-Host Communication.

● Monitor the error information of all Station No.s

This is the error information of all station numbers. Select the destination device with Device Manager.

Bit	15–8	7	6	5	4	3	2	1	0
Function	Reserved	Error Log for Writing	Error Log for Reading	Reserved	Current Error	Reserved	Finish 1st reading	Initialize	Reserved
Read/ Write		R	R		R		R	R/W	

- Bit 1: Clear
  Clear all error information about Sub-Host Communication when the value is change to 1.
  This bit is changed to 0 after clear. Error information for each station number is also cleared.

- Bit 2: Finish 1st reading
  This bit is changed to 1 when all devices in Sub-Host communication are read.

- Bit 4: Current error
  This bit is changed to 1 while the communication error is occurred in any devices.
  This bit is changed to 0 after the communication error is recovered.

- Bit 6: Error Log for reading
  This bit is changed to 1 when the reading error has occurred in some devices.
  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

- Bit 7: Error Log for writing
  This bit is changed to 1 when the writing error has occurred in some devices.
  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

● Monitor the error information of each Station No.

These settings are for monitoring error information and control of each station number. To select a Device Address for error information, go to the Device Manager. 256 word devices from top device set in Device Manager are used. Each device is assigned to each station number of PLC.

Bit	15–8	7	6	5	4	3	2	1	0
Function	Reserved	Error Log for Writing	Error Log for Reading	Reserved	Current Error	Reserved	Finish 1st reading	Reserved	Connection
Read/ Write		R	R		R		R		R/W

- Bit 0: Connection
  When this bit is 1, MICRO/I connect with each station. When this is 0, MICRO/I does not connect the station number.
  Default value is 1 when the station number is used.

- Bit 2: Finish 1st read
  The value is changed to 1 when all devices assigned to the station number is read.

- Bit 4: Current error
  This bit is changed to 1 while the communication error is occurred in any devices.
  This bit is changed to 0 after the communication error is recovered.

- Bit 6: Error Log for reading
  This bit is changed to 1 when the reading error has occurred in any devices.
  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

- Bit 7: Error Log for writing
  This bit is changed to 1 when the writing error has occurred in some devices.
  This bit keeps 1 even if the communication error is recovered. This is changed 0 when clear bit is turn on.

● Keep running with skipping the Station No. of communication error

When this setting is enabled, skip the station number error has occurred and connect with next station number.
MICRO/I retry communication with the error station number after other station number.
When this setting is disabled, retry communication with same station number until recover from the error.

Chapter 4 Project Settings

The settings and screen data required to run the MICRO/I are contained in a data structure called a Project. You must create a project using WindO/I-NV2 before creating the screens and configuring the settings for the MICRO/I. This chapter describes the various settings required to create a project.

1 Creating and Manipulating WindO/I-NV2 Project Data

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

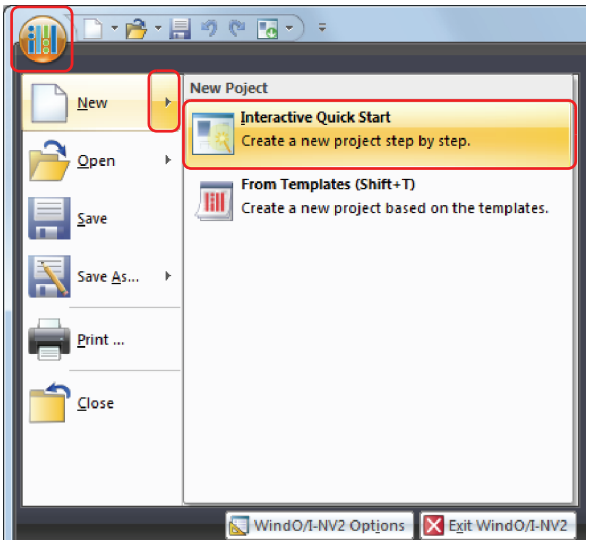
1.1 Creating New Project Data

● Create new project data by using the interactive quick start

You can create project data by following displayed dialog boxes and configuring settings step by step.

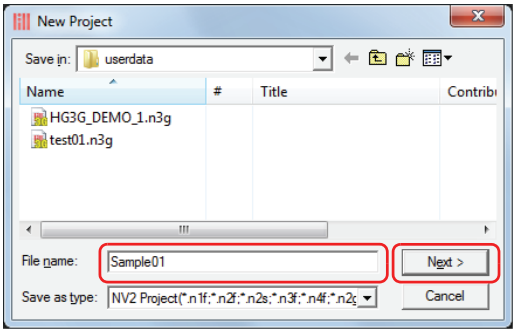
1 Click , then click ▶ to the right of **New**, and then click **Interactive Quick Start**.

A **New Project** dialog box is displayed.



2 Enter the project name and then click **Next**.

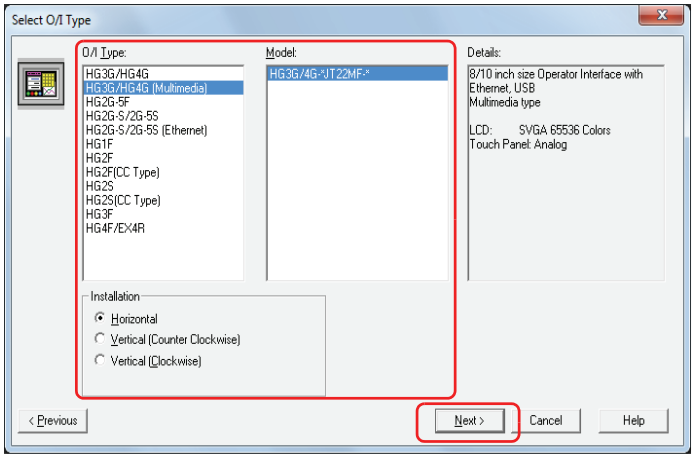
The **Select O/I Type** dialog box is displayed.



- You cannot use the following characters in the project name.
  . \ / : * ? " < > |
- You cannot create project data in read-only folders or in WindO/I-NV2's working folders (temporary folders that start with "~").

3 Select **O/I Type**, **Model**, and **Installation**, and then click **Next**.

The **Select Host I/F Driver** dialog box is displayed.



■ **O/I Type**

Select the MICRO/I type.

■ **Model**

A list of model numbers associated with the selected MICRO/I is displayed. Select the model number to use.

■ **Installation**[*1]

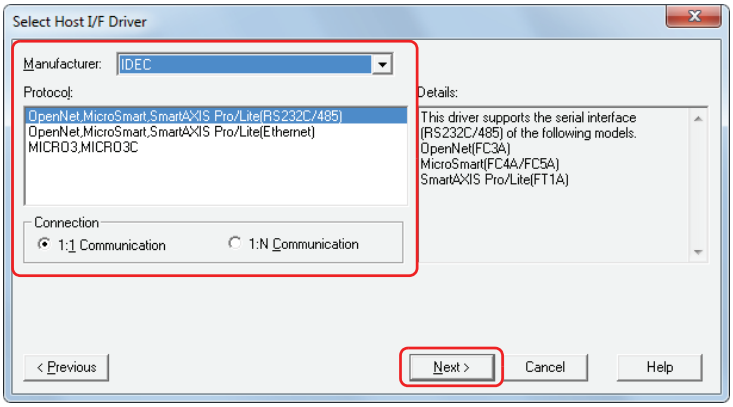
Select the MICRO/I installation direction from the following options.

Horizontal, **Vertical (Counter Clockwise)**, **Vertical (Clockwise)**[*2], **Horizontal (Flip)**[*3]

You can return to the **New Project** dialog box and change its setting by clicking **Previous**.

4 Select **Manufacturer**, **Protocol**, and **Connection** and then click **Next**.

The **Project Settings** dialog box is displayed.



■ **Manufacturer**

Select the manufacturer name of the host device used.

■ **Protocol**

Shows the host I/F driver list for the select manufacturer. Select the host I/F driver to use.

*1 HG2G-5F, HG3G/4G, HG1F only
*2 HG2G-5F, HG3G/4G only
*3 HG2G-S/5S only

■ **Connection**

Select the connection according to the number of host devices.

1:1 Communication: The MICRO/I is connected to a single host device.

1:N Communication: The MICRO/I is connected to multiple host devices.

■ **Expression of Device Address Format**

Select the format for the device address.

Allen-Bradley: Enter device addresses in the Allen-Bradley format.
Example: B 10:123/5

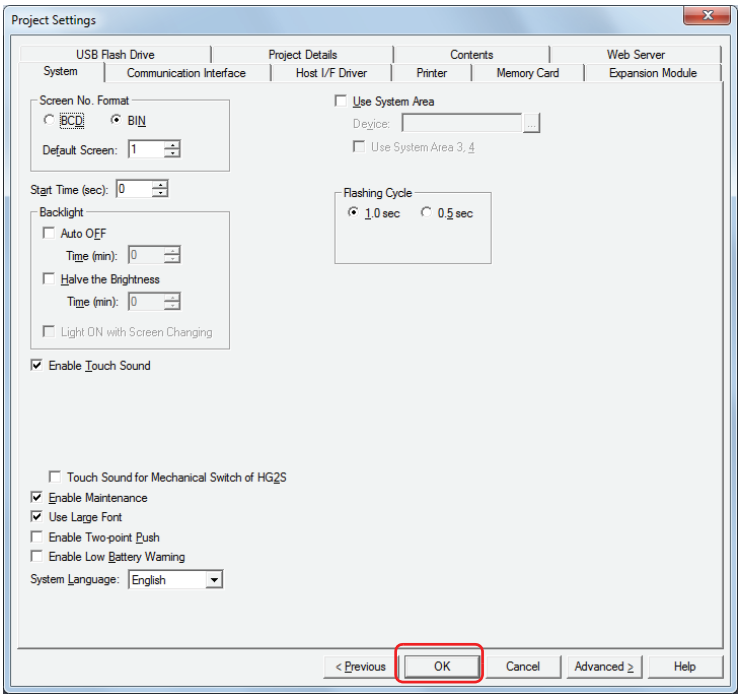
WindO/I-NV2: Enter device addresses in the WindO/I-NV2 format.
Example: B 1012305

This option can only be configured when **Allen-Bradley** is selected for **Manufacturer**.

You can return to the **Select O/I Type** dialog box and change its settings by clicking **Previous**.

5 Configure the settings on each tab as necessary and then click **OK**.

For details about the **Project Settings** dialog box, refer to "3 Project Settings Dialog Box" on page 4-26.



- The **Project Settings** dialog box can also be accessed using the following methods.
  - Click **Project** on the **Configuration** tab
  - Double click **Project Settings** in the **Project** window
- You can return to the **Select Host I/F Driver** dialog box and change its settings by clicking **Previous**.

This concludes creating project data.

Next you will create a screen. For details, refer to Chapter 5 "3.1 Base Screen Settings" on page 5-15.

Project data can also be created by the following method.

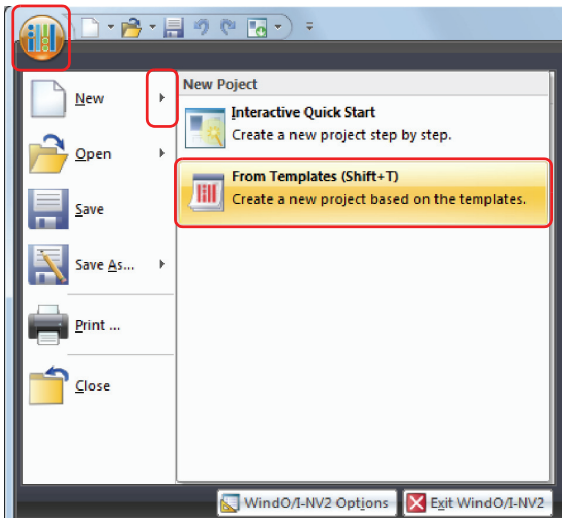
Click , then click **New**, and then enter a project name in the **New Project** dialog box.

● Creating new project data using a template

You can create project data using the templates provided with in WindO/I-NV2.

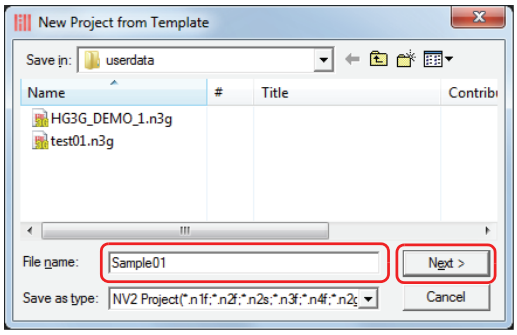
1 Click , then click ▶ to the right of **New**, and then click **From Templates**.

The **New Project from Template** dialog box is displayed.



2 Enter the project name and then click **Next**.

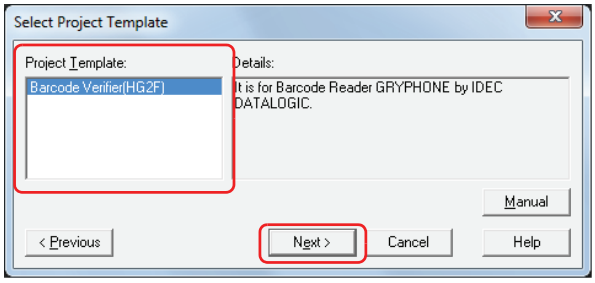
The **Select Project Template** dialog box is displayed.



- You cannot use the following characters in the project name.
  . \ / : * ? " < > |
- You cannot create project data in read-only folders or in WindO/I-NV2's working folders (temporary folders that start with "~").

3 Select a template under **Project Template** and then click **Next**.

The **Open Screens** dialog box is displayed.



- If you click **Manual**, the Project Template manual opens.
- You can return to the **New Project from Template** dialog box and change its setting by clicking **Previous**.

This concludes creating project data.

Next you will open a screen. For details, refer to Chapter 5 "2.2 Opening Screens" on page 5-3.

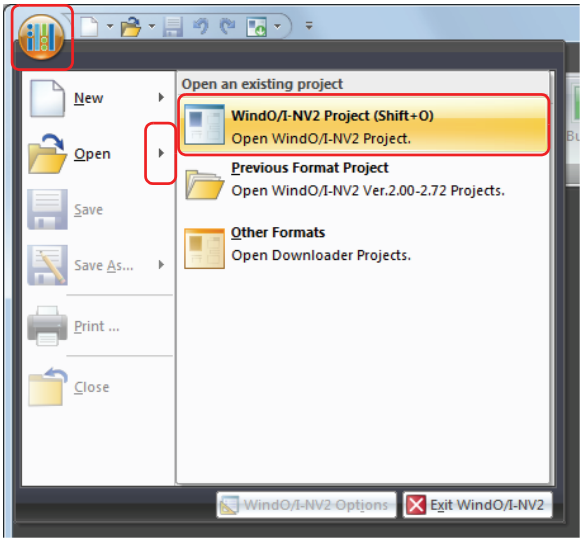
1.2 Opening Project Data

● Opening project data

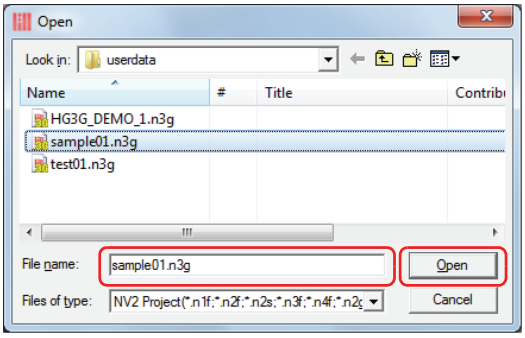
You can open project data that has already been created.

1 Click , then click ▶ to the right of **Open**, and then click **WindO/I-NV2 Project**.

The **Open** dialog box is displayed.



2 Select the file and click **Open**.



If a password has been configured for the project data, the Enter Password screen will be displayed.

HG2G-S/-5S/-5F, HG3G/4G: The password to enter varies based on the check box setting of the **Use Password to open a Project** found under the **Options** tab in the **Security** dialog box.
When this check box is checked, enter the password for **Use Password to open a Project**.
When this check box is unchecked, enter the password for the user account assigned to the Administrator security group.

HG1F/2F/2S/3F/4F: Enter the password for the user account assigned to the Administrator security group.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Next you will open a screen. For details, refer to Chapter 5 "2.2 Opening Screens" on page 5-3.

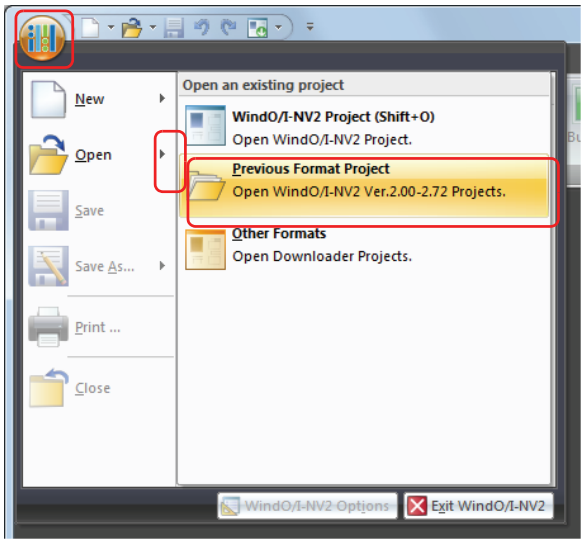
Project data can also be opened by the following methods.

- Click , then click **Open**, and then select the project data in the displayed **Open** dialog box
- Click and then click project data on the **Recent Projects** list

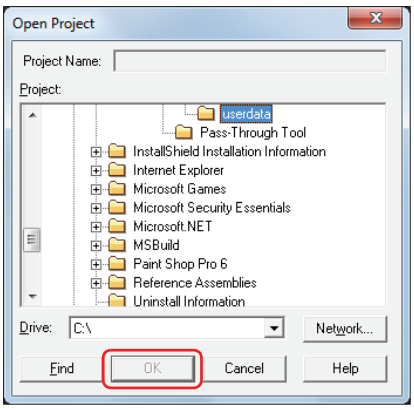
● Opening project data in a previous format

You can open project data that was created with WindO/I-NV2 Ver. 2.7 or earlier.
Project data in the previous format is a folder composed of multiple files.

1 Click , then click ▶ to the right of **Open**, and then click **Previous Format Project**.
Select the project data with the **Open Project** dialog box.



2 Select the file and click **OK**.
A conversion confirmation message is displayed.



■ Project Name

Shows the project name for the selected project data.

■ Project

Specify the folder where the project data is saved.

■ Drive

Specify the drive assigned to the hard drive, memory card, or USB Flash Drive.

■ Network

Displays the **Map Network Drive** dialog box. This dialog box allows you to specify a drive on the network.

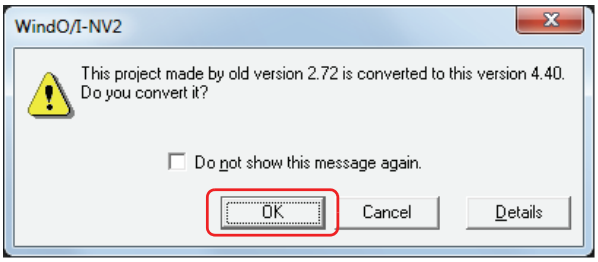
■ Find

Searches for project data in the specified folder.

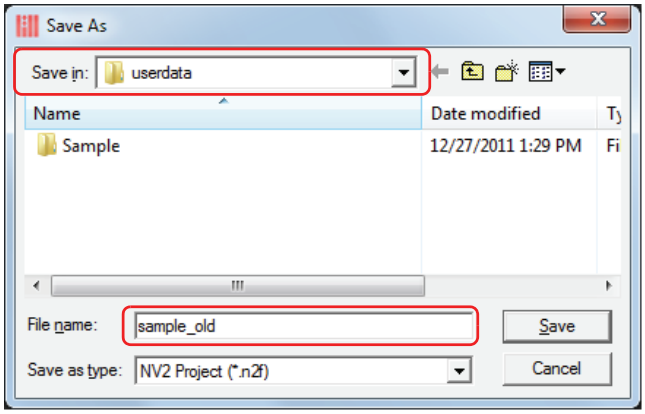
3 Click **OK**.

The **Save As** dialog box is displayed.

Click **Cancel** to stop converting the project data in the previous format and close this message.



4 Specify the location to save the converted project data and enter the project name.



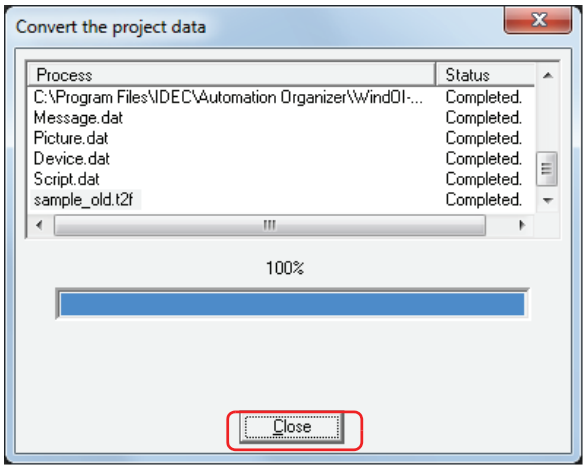
- You cannot use the following characters in the project name.
  . \ / : * ? " < > |
- You cannot create project data in read-only folders or in WindO/I-NV2's working folders (temporary folders that begin with "~").

5 Click **Save**.

The **Convert the project data** dialog box is displayed and the data conversion process for the project data in the previous format begins.

When the data conversion process ends, **Close** is displayed.

6 Click **Close**.



Next, open a screen. For details, refer to Chapter 5 "2.2 Opening Screens" on page 5-3.

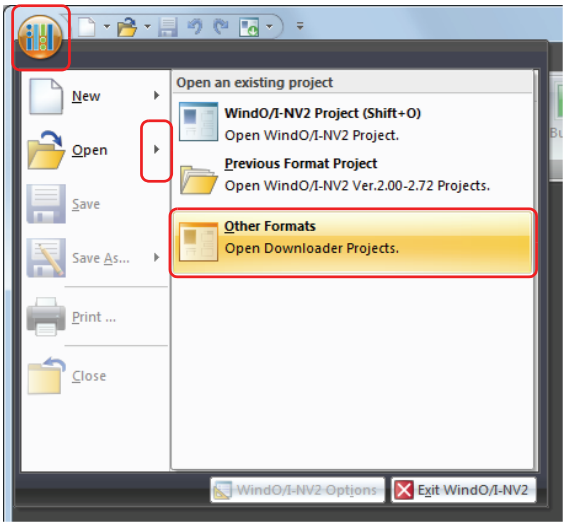
● Opening project data for Downloader

You can convert project data uploaded from the MICRO/I with Downloader to data that can be used in WindO/I-NV2 and open it.

For details about Downloader, see the Downloader manual.

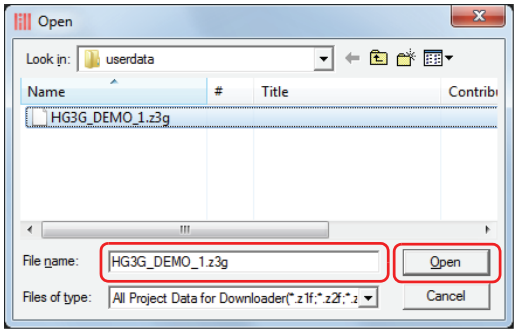
1 Click , then click ▶ to the right of **Open**, and then click **Other Formats**.

The **Open** dialog box is displayed.



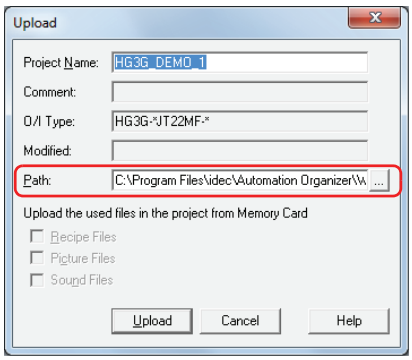
2 Select the file and then click **Open**.

The **Upload** dialog box is displayed.



Using the **Upload** dialog box, convert project data for Downloader to data that can be used in WindO/I-NV2.

3 Click ... and specify a location to save the project data converted into data that can be edited in WindO/I-NV2.



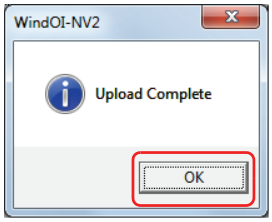
4 Click **Upload**.

The **Upload** dialog box is displayed and the data conversion process begins.

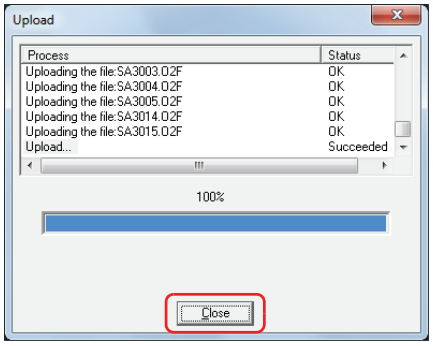
When the data conversion process ends, a completion message is displayed.

5 Click **OK**.

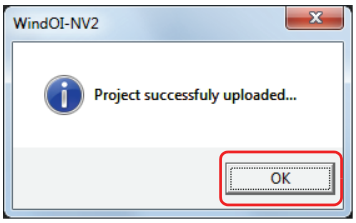
You are returned to the **Upload** dialog box.



6 Click **Close**.



7 Click **OK**.



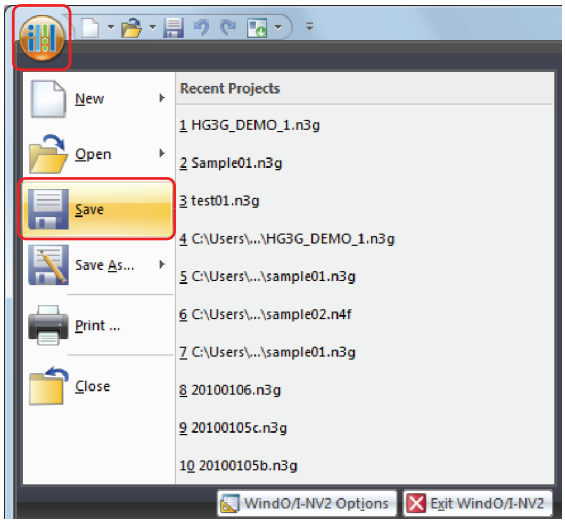
Next you will open a screen. For details, refer to Chapter 5 "2.2 Opening Screens" on page 5-3.

1.3 Saving Project Data

● Saving project data

You can save the project data being edited.

Click and then click **Save**.

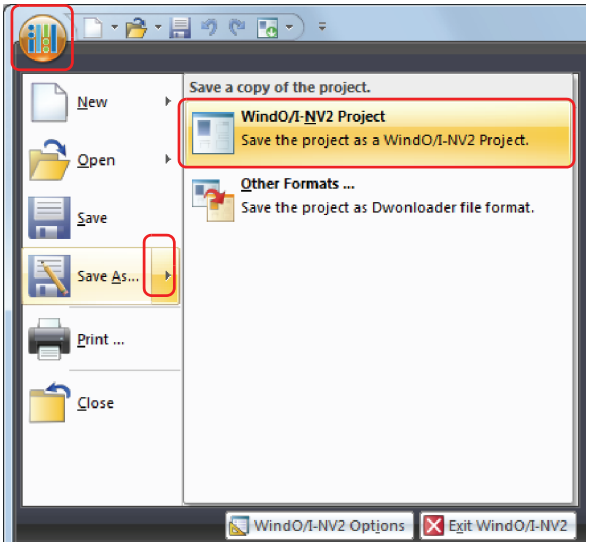


● Saving project data with a different name

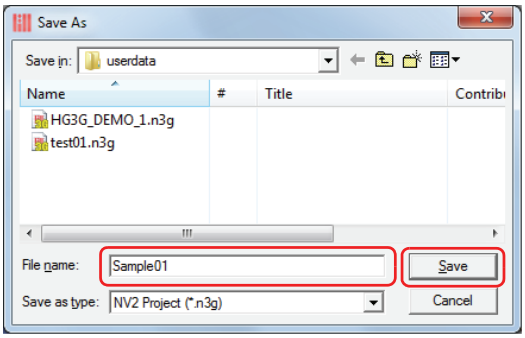
You can save the project data being edited with a different name.

1 Click , then click ▶ to the right of **Save As**, and then click **WindO/I-NV2 Project**.

The **Save As** dialog box is displayed.



2 Enter the project name and click **Save**.

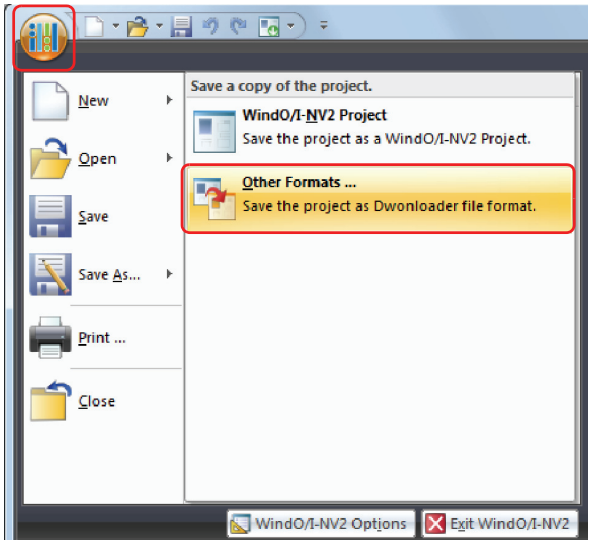


- You cannot use the following characters in the project name.
  . \ / : * ? " < > |
- You cannot create project data in read-only folders or in WindO/I-NV2's working folders (temporary folders that start with "~").

● Saving project data as project data for Downloader

You can convert the project data being edited to data that can be used with Downloader and save it.
For details about Downloader, see the Downloader manual.

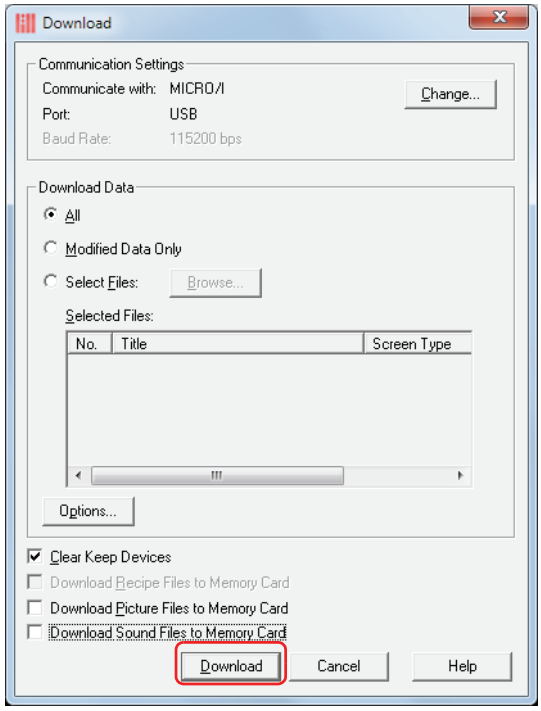
1 Click , then click ▶ to the right of **Save As**, and then click **Other Formats**.
The **Save As Project Data for Downloader** dialog box is displayed.



2 Check **Communication Settings** and click **Download**.

The communication speed and port used when communicating with the MICRO/I using Downloader are configured here.

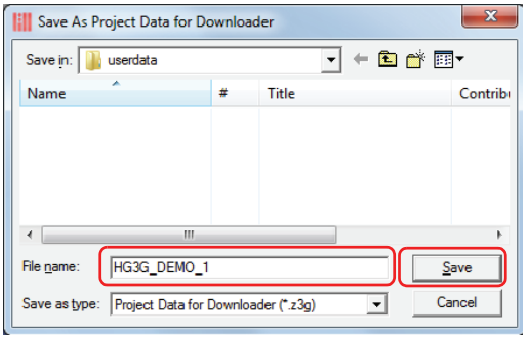
To change **Communication Settings**, click **Change** to display the **Communication Settings** dialog box. Change **Communicate with**, **Port**, and **Baud Rate**. For details, refer to Chapter 24 "1 Communicating with the MICRO/I" on page 24-1.



Using the **Download Project** dialog box, convert the WindO/I-NV's project data to data that can be used with Downloader.

3 Enter project name and then click **Save**.

A download confirmation message is displayed.

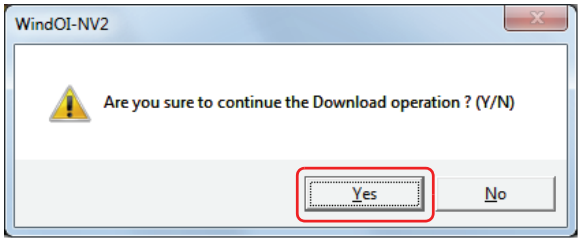


- You cannot use the following characters in the project name.
  . \ / : * ? " < > |
- You cannot create project data in read-only folders or in WindO/I-NV2's working folders (temporary folders that start with "~").

4 Click **Yes**.

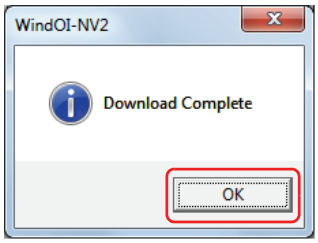
The **Download Project** dialog box is displayed and the data conversion process begins.

When the data conversion and saving process ends, a completion message is displayed.

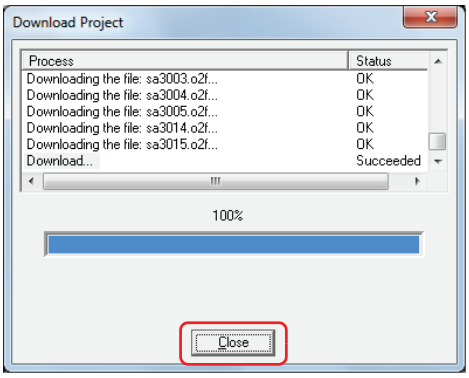


5 Click **OK**.

You are returned to the **Download Project** dialog box.



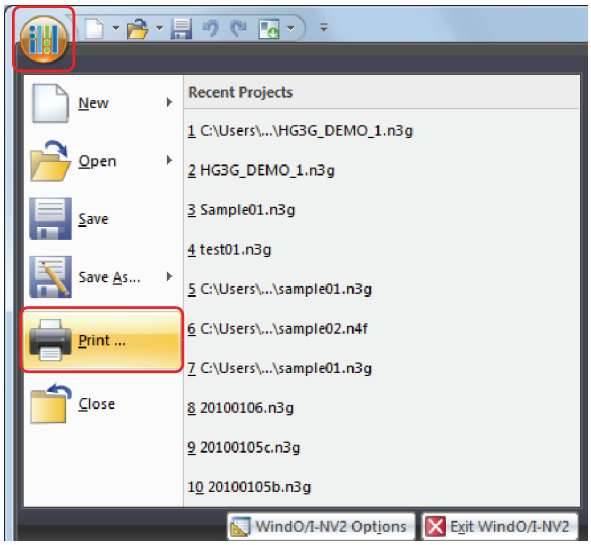
6 Click **Close**.



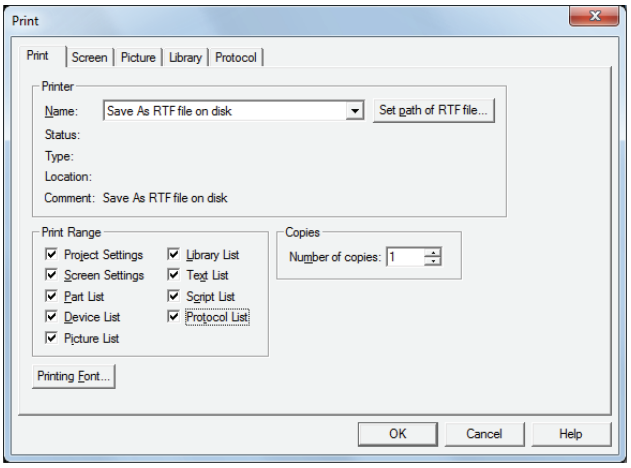
1.4 Printing Project Data

You can print the settings for the project data being edited and its screen images.

1 Click and then click **Print**.
The **Print** dialog box is displayed.



2 Change the settings on each tab as necessary.



● **Print** Tab

■ Printer

Name: Select a printer connected to the computer or **Save As RTF file on disk**.
You can output an RTF-formatted file by selecting **Save As RTF file on disk**.

Set path of RTF file: When outputting an RTF-formatted file, click this button to display the **Save As** dialog box. Specify the saved location, file name, and then click **OK**.

Status: Shows the current status of the printer.

Type: Shows the manufacturer and model of the printer.

Location: Shows the destination port or the location to save the file.

Comment: Shows a comment entered in the printer's properties dialog box.

■ Print Range

Select the items you wish to print.

Project Settings: Prints the project settings.

Screen Settings: Prints the screen settings, a list of the parts on the screen, and a screen image. The details are configured on the Screen tab.

Part List: Prints the settings for all parts used in the project.

Device List: Prints the settings for all devices used in the project.

Picture List: Prints the images and settings for drawing objects registered in the Picture Manager. The details are configured on the Picture tab.

Library List: Prints the settings and images for Library Screens. The details are configured on the Library tab.

Text List: Prints all the text registered in the Text Manager.

Script List Prints all the scripts registered in the Script Manager.

Protocol List: Prints the settings for protocols registered in the Protocol Manager. The details are configured on the Protocol tab.

When the following items are selected, their tabs are displayed.

Item	Reference
Screen Settings	"Screen Tab" on page 4-16
Picture List	"Picture Tab" on page 4-17
Library List	"Library Tab" on page 4-18
Protocol List	"Protocol Tab" on page 4-19

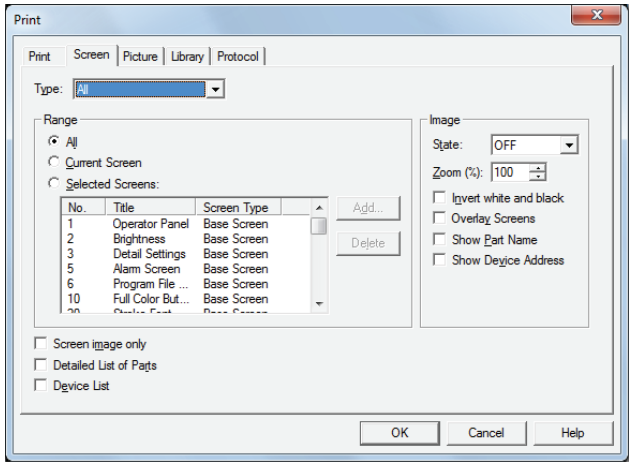
■ Copies

Number of copies: Enter the number of copies to print (1 to 100).

■ Printing Font

Displays the **Font** dialog box. You can change the font used when printing.

● **Screen** Tab



■ **Type**

Select the screens to print from the following items.

All, **Base Screen**, **Popup Screen**

■ **Range**

Select the screens to print from the selected type of screen.

All:	Prints all the screens.
Current Screen:	Prints the selected editing window screen.
Selected Screens:	Prints the selected screens. The selected screens are displayed in a list.
	Add: Adds a screen to the list. Click **Add** to display the **Open Screens** dialog box. Select **Screen Type**, select the screen in **Screen List**, and then click **OK** to add the screen to the list.
	Delete: Deletes the screen from the list. Select the screen in the list and click **Delete**.

■ **Image**

State:	Changes the state of the parts for printing. Select the state from the following items. **OFF**, **ON**, **ON**, **OFF (Both)**
Zoom:	Prints the screen image at the specified magnification (20% to 400%).
Invert white and black:	Select this to print the screen by inverting the colors so white is black and black is white.
Overlay Screens:	Select this to print the screen by displaying overlay screens.
Show Part Name:	Select this to print the screen by displaying part names.
Show Device Address:	Select this to print the screen by displaying device addresses.

■ **Screen image only**

Prints only the screen type, number, and screen image.

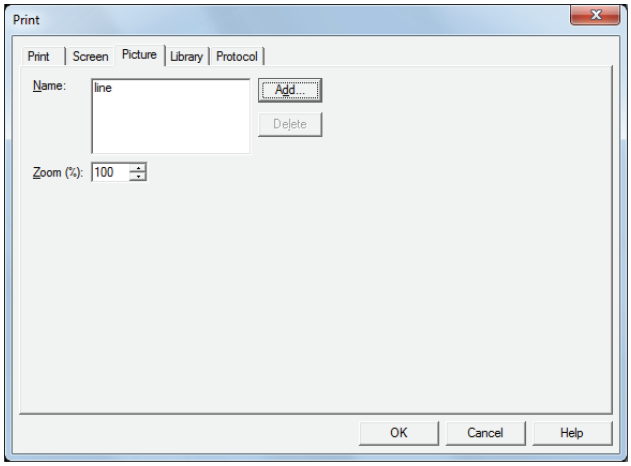
■ **Detailed List of Parts**

Prints part settings for each screen. This can only be selected when **Screen image only** is cleared.

■ **Device List**

Prints device settings for each address. This can only be selected when **Screen image only** is cleared.

● **Picture** Tab

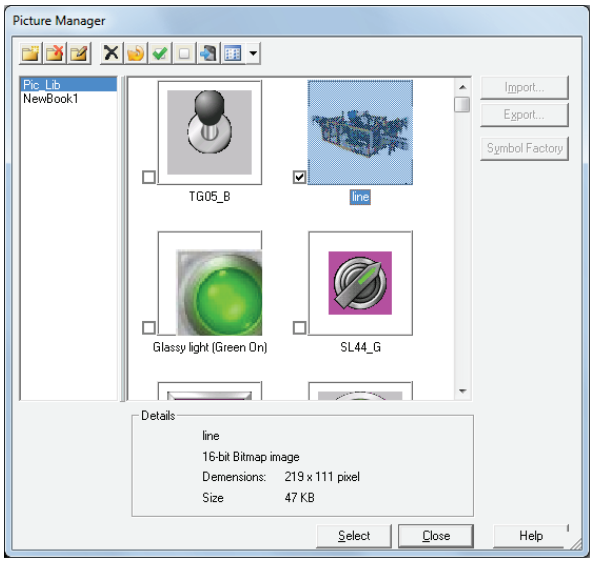


■ **Name**

Shows a list of selected drawing object names.

Add: Adds a drawing object to the list.

Click this button to display the Picture Manager. Select a drawing object and then click **Select** to add it to the list.



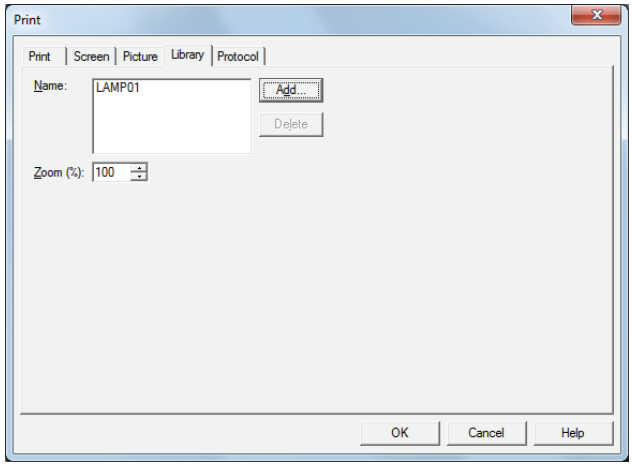
Delete: Deletes a drawing object from the list.

Select the drawing object name and click this button.

■ **Zoom**

Prints the drawing object at the specified magnification (20% to 400%).

● **Library** Tab

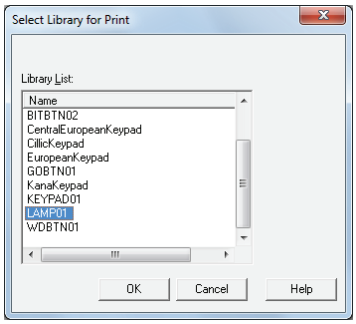


■ **Name**

Shows a list of selected library names.

Add: Adds a library to the list.

Click this button to display the **Select Library for Print** dialog box. Select a library and then click **OK** to add it to the list.



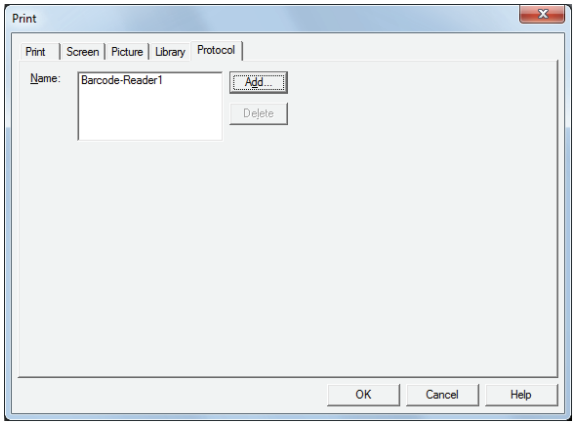
Delete: Deletes a library from the list.

Select a library name and click this button.

■ **Zoom**

Prints the library image at the specified magnification (20% to 400%).

● **Protocol** Tab

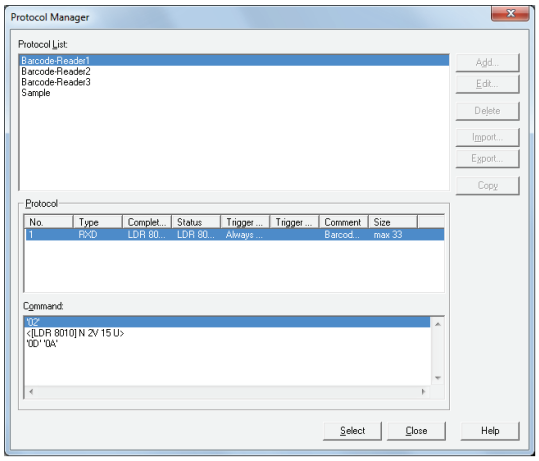


■ **Name**

Shows a list of selected protocol names.

Add: Adds a protocol to the list.

Click this button to display the Protocol Manager. Select a protocol and then click **Select** to add it to the list.



Delete: Deletes a protocol from the list.

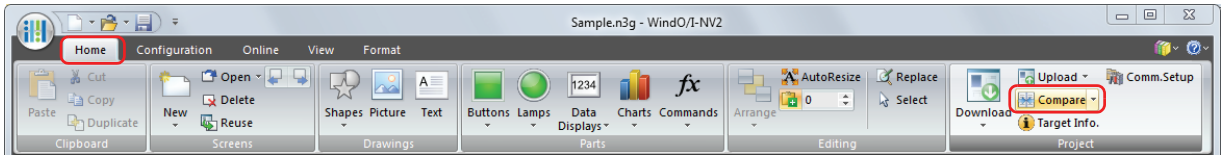
Select a protocol name and click this button.

1.5 Comparing Project Data

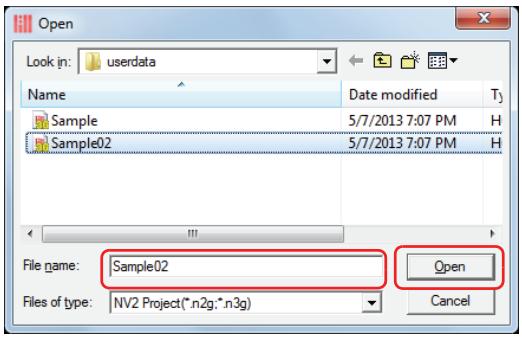
Compares project data during editing with the screens and scripts of saved projects.

1 On the **Home** tab, in the **Project** group, click **Compare**.

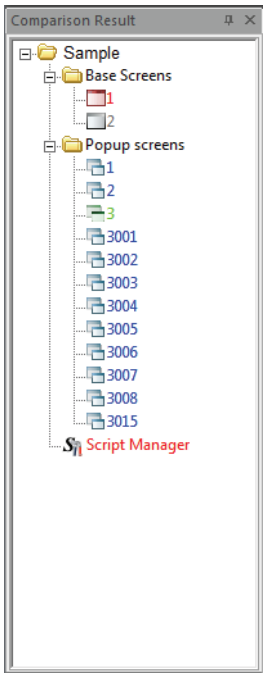
The Open dialog box is displayed.



2 Select a file to compare with, then click **Open**.



The **Comparison Result** window is displayed.



Comparison results are displayed using colored text.

Blue: Complete match

Red: Different content

Green: Only saved in the open project

Gray: Only saved in the comparison project

To compare with the comparison project data again, click the arrow to the right of **Compare** from the **Project** group of the **Home** tab, then click **Recompare**.

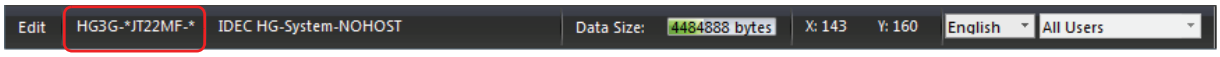
1.6 Changing Project Settings

● Changing O/I Type

This section describes how to change the O/I type set in the project data being edited.

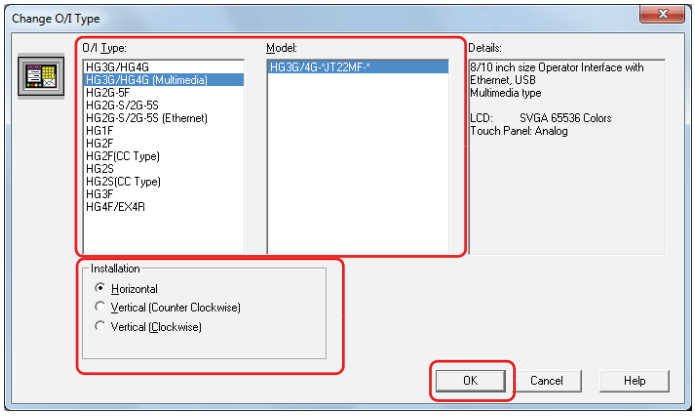
1 Click **Change O/I Type** on the status bar.

The **Change O/I Type** dialog box is displayed.



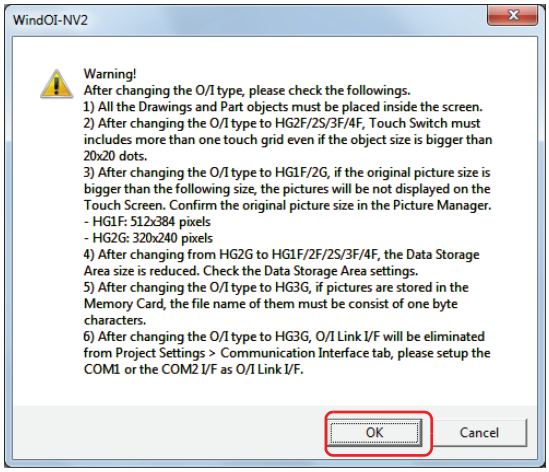
2 Select **O/I Type**, **Model**, and **Installation**, and then click **OK**.

A confirmation message is displayed.



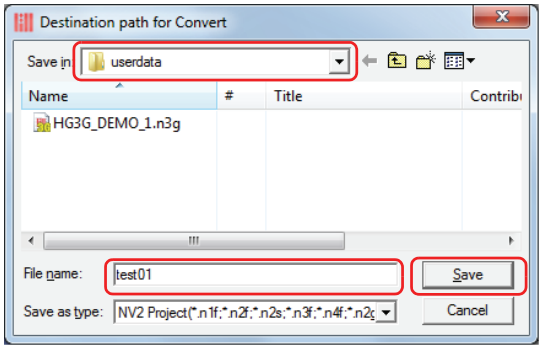
3 Check the message and click **OK**.

The **Destination path for Convert** dialog box is displayed.



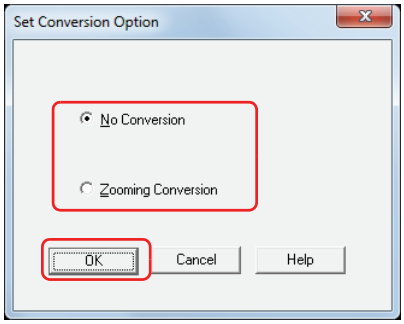
4 Specify the save location and file name, and then click **Save**.

The Set Conversion Option dialog box is displayed. However, when converting to the HG1F/2F/2S/3F/4F, proceed to step *6*.

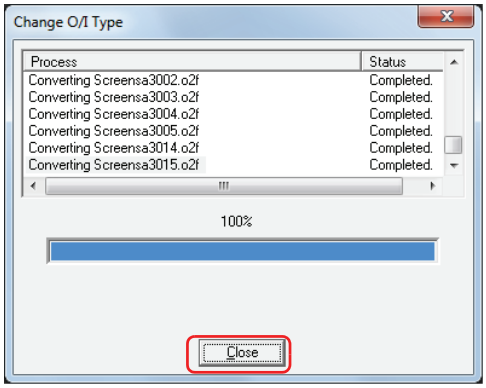


5 Select the conversion option, and then click **OK**.

The data conversion process begins.



6 When the data is finished being converted, click **Close**.



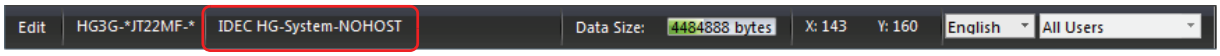
- Color settings (color data) are not converted.
- If the Popup Screen size is larger than the Base Screen size after the O/I type is changed, the Popup Screen size is changed to the same size as the Base Screen.
- You cannot change the O/I type from HG2G-S/-5S/-5F, HG3G/4G to HG1F/2F/2S/3F/4F.

● Changing Host I/F Drivers

This section describes how to change the host I/F driver set in the project data being edited.

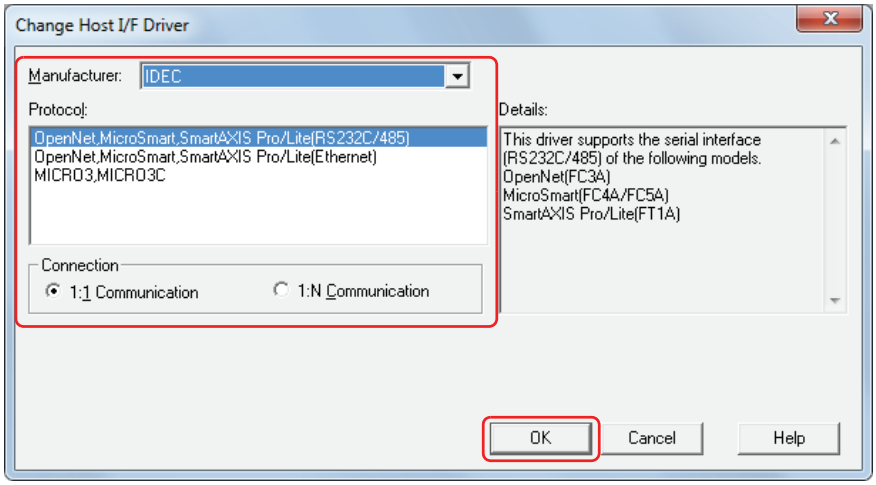
1 Click **Change Host I/F Driver** on the status bar.

The **Change Host I/F Driver** dialog box is displayed.



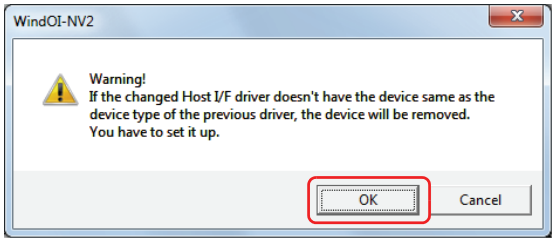
2 Select **Manufacturer**, **Protocol**, and **Connection**, and then click **OK**

The confirmation message is displayed.



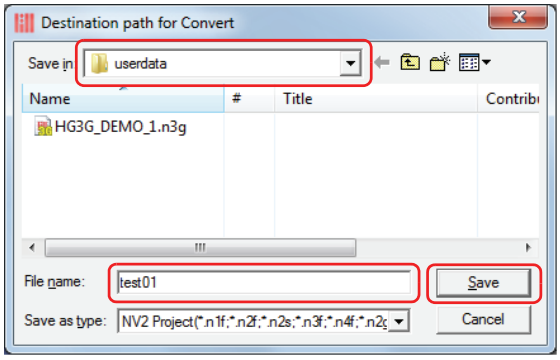
3 Check the message and click **OK**.

The **Destination path for Convert** dialog box is displayed.

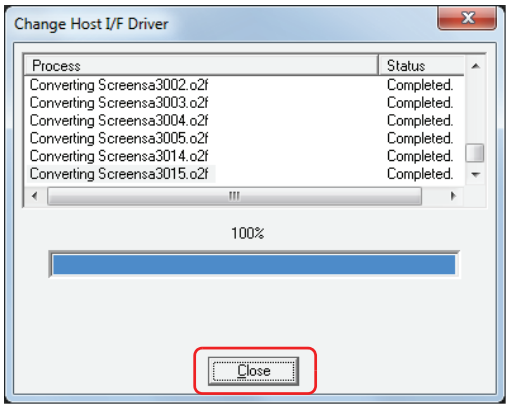


4 Specify the saved location and file name, and then click **Save**.

The data conversion process begins.



5 When the data is finished being converted, click **Close**.

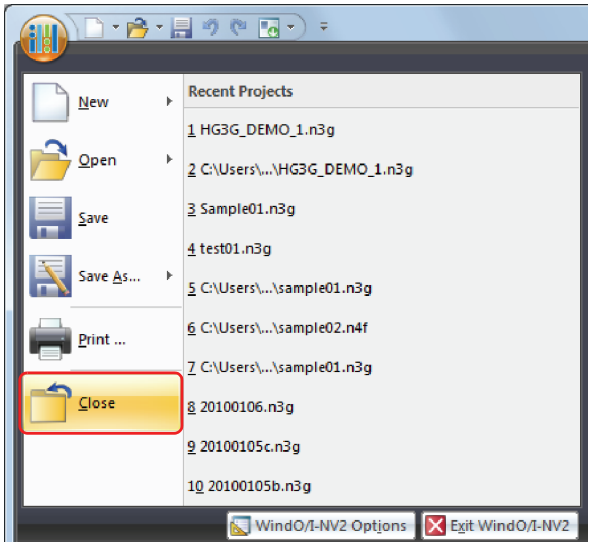


If there are no devices that correspond to the host device used in the current project data after changing the host I/F driver, the items set with those devices are blank.

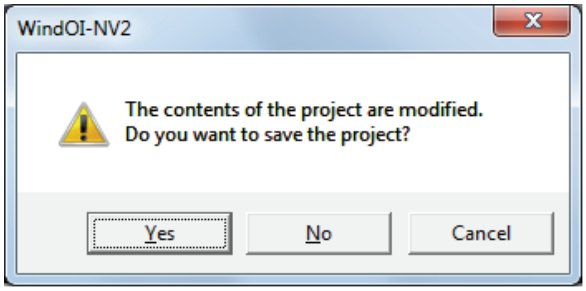
1.7 Closing Project Data

You can close the project data being edited.

Click and then click **Close**.



If the project data being edited has not been saved, a confirmation message for saving the project data is displayed.



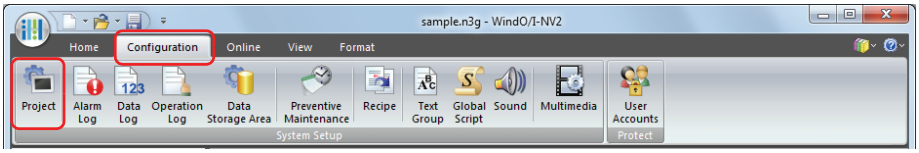
- Click **Yes** to save the project data and close it.
- Click **No** to close the project data without saving changes.
- Click **Cancel** to return to the editing screen without saving the project data.

2 Project Settings Configuration Procedure

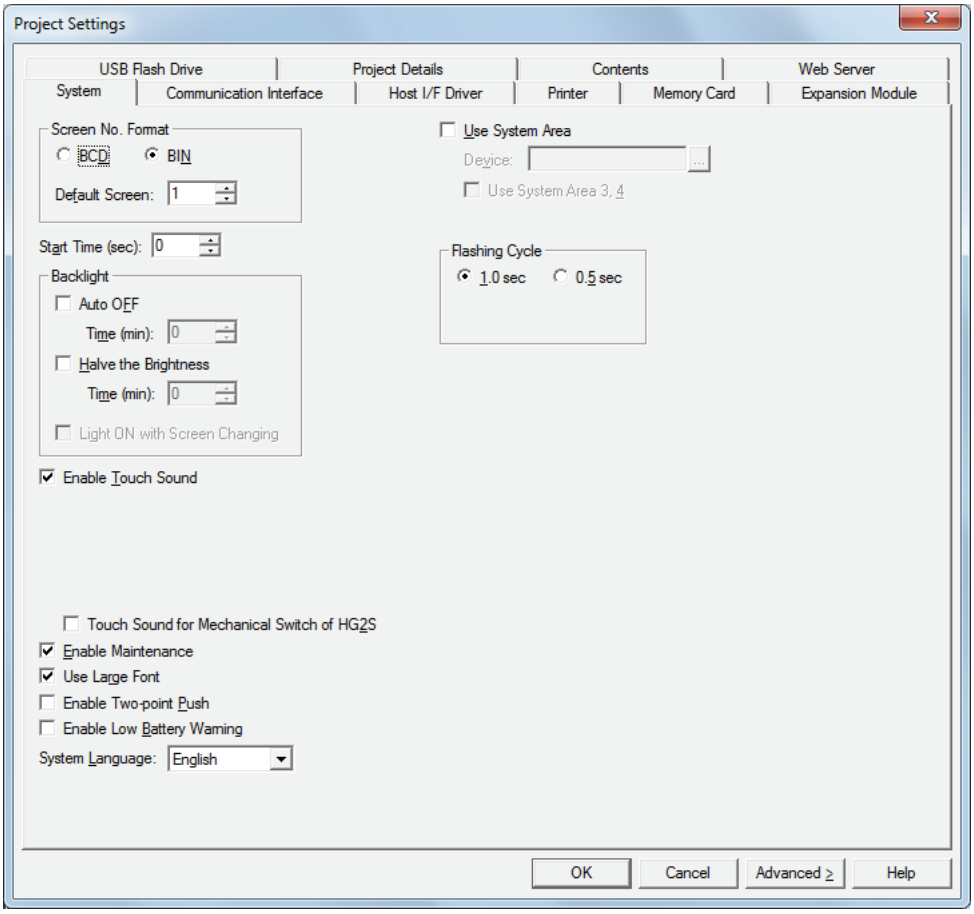
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Project Settings** dialog box is used to configure MICRO/I operations and functions for the project overall. This section describes the configuration procedure for project settings.

1 On the **Configuration** tab, in the **System Setup** group, click **Project**.
The **Project Settings** dialog box is displayed.



2 Change the settings on each tab as necessary.



3 Project Settings Dialog Box

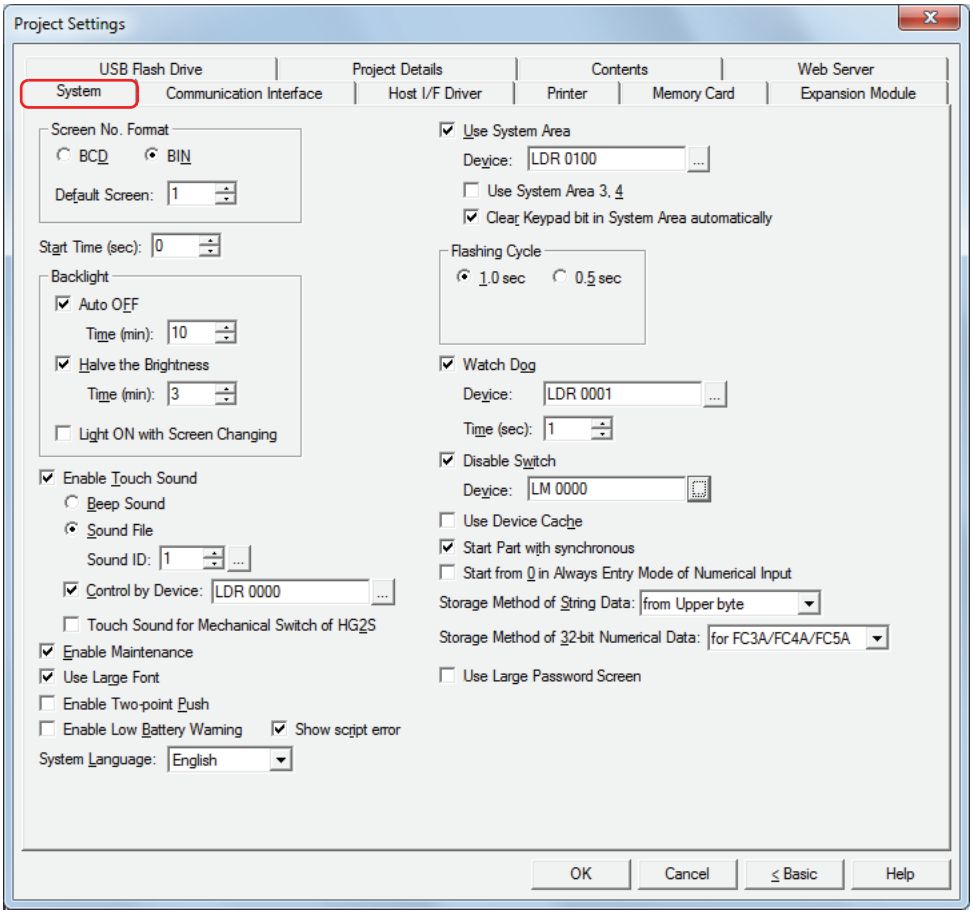
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the **Project Settings** dialog box.

3.1 System Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **System** tab is used to configure MICRO/I operations for the project data overall.



■ Screen No. Format

Selects the type of data to use for the System Area 1 Display screen number (address+0) as **BCD** or **BIN**.

Default Screen: Specifies the screen number of the base screen to display first when the MICRO/I is turned on (0 to 3000). When 0 is specified, the MICRO/I is in the screen waiting state. Write a screen number to System Area 1 Display screen number (address+0) or specify the default screen number from 1 to 3000.

■ Start Time (sec)

Specifies the time from when the MICRO/I power is turned on until communications start with the host (0 to 9999 seconds).

Backlight

These options configure the backlight control function.

Auto OFF: Select this check box to turn off the backlight when the MICRO/I is unused for an extended period of time. To turn on the backlight, touch the screen or write 1 to System Area 1 Backlight auto off bit (address+1, bit 5) or System Area 1 Backlight bit (address+1, bit 0).

Time (min): Specifies the time from when the MICRO/I is last used to when the backlight is turned off.

Halve the Brightness: Select this check box to lower the backlight brightness when the MICRO/I is unused for an extended period of time. To return to the backlight to its original brightness, touch the screen or write 1 to System Area 1 Backlight bit (address+1, bit 0).

Time (min): Specifies the time from when the MICRO/I is last used to when the backlight brightness is lowered.

Light ON with Screen Changing:

When the backlight is turned off or when the backlight brightness has been lowered with the backlight control function, select this check box to turn on the backlight or restore the backlight brightness when the screen is switched.

This option can only be configured when the **Auto OFF** check box or the **Halve the Brightness** check is selected.

Enable Touch Sound

Select this check box to play a sound when the screen is pressed.

(Touch sound)*1: These options select the touch sound.

These options can only be configured when **Enable Touch Sound** is selected.

Beep Sound: Plays a beep (electronic sound).

Sound File: Plays a sound file.

Sound ID: Configures the sound file to play as the touch sound.

Click ... to display the **Sound Settings** dialog box. For the sound file configuration procedure, refer to Chapter 21 "To play a sound file as a touch sound instead of a beep." on page 21-3.

Control by Device*1: When **Beep Sound** is selected, select this check box to control the touch sound with a device value. When **Sound File** is selected, the touch sound cannot be controlled with a device value, even if this check box is selected.

This option can only be configured when **Enable Touch Sound** is selected.

(Device): Specifies the word device that controls the touch sound.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The control over a touch sound with a device value is as follows.

0: Do not play the touch sound.

1: Play the touch sound.

2: Play a shortened touch sound.

Touch Sound for Mechanical Switch of HG2S: Select this check box to play the touch sound when an HG2S mechanical switch is pressed.

This option can only be configured when **Enable Touch Sound** is selected.

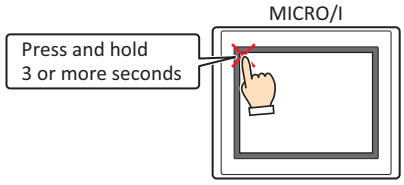
*1 Advanced mode only

Enable Maintenance

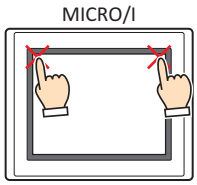
Select this check box to display the maintenance screen during operation. The methods for displaying the maintenance screen are as follows.

HG2G-S/-5S/-5F, HG3G/4G, HG1F: Press the upper-left corner of the MICRO/I screen for three seconds or more.

If the base screen is switched before three seconds have elapsed, the load operation for the maintenance screen will be canceled. Please press the screen again.



HG2F/2S/3F/4F: Simultaneously press the upper-left and upper-right corners of the MICRO/I screen.



Use Large Font

Select this check box to display text on the MICRO/I in high-quality fonts. The **Japanese** or **European** font is replaced with the high-quality fonts depending on the magnification.

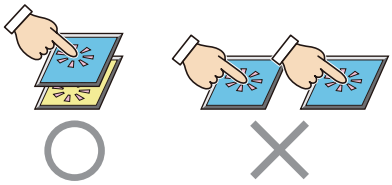
To use high-quality fonts, the fonts must be downloaded to the MICRO/I at the same time as the project. To download fonts, click **Options** in the **Download** dialog box to display the **Options** dialog box. Select the **Download additional fonts** check box, select the check boxes of the high-quality fonts to use (Japanese large font (First standard), Japanese large font (Second standard), European large font), and then click **OK**.

For details on high-quality fonts, refer to Chapter 2 "High-quality Fonts" on page 2-9.

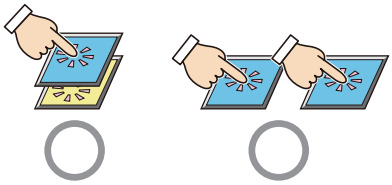
Enable Two-point Push

Select this check box to enable two-point push for touch switches. When two-point push is enabled, the bottom switch and the switch above it operate in order.

On an analog touch panel, this function operates two overlapping switches when the two are pressed. This is not a function to simultaneously operate two touch switches when they are both pressed.



On the HG2F/2S/3F/4F, two switches can be turned on simultaneously.



On the HG2S with CC switches, two-point push for touch switches is not possible when a CC switch is pressed.

Enable Low Battery Warning

Select this check box to display a warning when the backup battery is dead.

On the HG2G-S/5S/5F, the HG3G/4G, and the HG1F, this option also displays a warning when it is time to replace the battery. The HG2G-5ST22VF-* does not have a backup battery, so this function cannot be used.

Show script error*1*2

Select this check box to display an error message on the screen when a script error occurs.

> Script error information is saved to the HG special registers (LSD 52 and LSD 53). For details, refer to Chapter 20 "1.4 Script Error" on page 20-4.

System Language

Selects the display language for the Maintenance screen, System Menu screen, Device Monitor, Adjust Brightness screen*3, Contrast Adjust screen*4, and Adjust Back Light screen*5 as **English** or **Japanese**.
For details, refer to Chapter 33 "1 Maintenance Screen" on page 33-1.

Use System Area

The System Area is an area of predetermined devices to control the screen and communicate error information and time information between the MICRO/I and the host. Select this check box to use the System Area. For details, refer to "System Area" on page 4-32.

Device: Specifies the word device to use as the System Area. The System Area is allocated starting from the configured device address.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use System Area 3, 4: Select this check box to use System Area 3 and 4.

Clear Keypad bit in System Area automatically*1: Select this check box to automatically set the System Area 2 numerical input setting and character input setting bits to 0 after they have been set to 1.
The System Area 2 bits cleared by this function are as follows.
Numerical input setting complete (address+3, bit 0)
Numerical input setting cancel (address+3, bit 1)
Character input setting complete (address+3, bit 5)
Character input setting complete (address+3, bit 6)

Flashing Cycle

Selects the cycle when flashing (displaying a drawing object by switching it on and off at a fixed interval) drawings and parts as **1.0 sec** or **0.5 sec**.

Watch Dog*1

Select this check box to monitor on the host side whether or not the MICRO/I and the host are communicating by writing a set value (00FF (hex)) at a fixed interval.

Device: Specifies the word device to write the value.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Time (sec): Specifies the interval to write the value (1 to 65535).

Disable Switch*1

Select this check box to enable and disable touch switches with a device value.
Touch switches are enabled when the device value is 1. They are disabled when the device value is 0.

Device: Specifies the bit device or bit of the word device that is read to enable or disable touch switches.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

> On the HG2S, when the enabling switch contact is configured as the device, the touch switches are only enabled when the enabling switch is on.

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only
*3 HG2G-5S/-5F, HG3G/4G only
*4 HG2G-S, HG1F/2F/2S only
*5 HG3F/4F only

■ Use Device Cache*1

Select this check box to execute processing by reading all the host device values configured for a screen when switching the base screen or when displaying a popup screen.

On the HG1F/2F/2S/3F/4F, when operating parts in order from the top to the bottom of the **Object List**, if a value is written to a host device from a part, the host device can be handled as an internal device so that written value is immediately reflected. However, since processing is executed by reading all device values including the host devices, part operations and the communication time for O/I link communication may become significantly slower. This option is not normally used.

On the HG2G-S/-5S/-5F and the HG3G/4G, written values are reflected regardless of this option.

■ Start Part with synchronous*1

Select this check box to operate commands and HG special relays LSM1, LSM2, LSM3, and LSM5 after reading all the values of the host devices configured on the screen.

When this check box is cleared, all processing is immediately executed when the screen is displayed.

■ Start from 0 in Always Entry Mode of Numerical Input*1

Select this check box to display 0 when a Numerical Input that has the **Always Entry Mode** check box selected on the **General** tab is displayed on the screen. When this check box is cleared, the device value is displayed.

This option is reflected for all Numerical Inputs configured in the project.

■ Storage Method of String Data*1

Selects the handling method for text entered with the Character Input and device values read by the Message Display.

from Upper byte: Device values are read from and written to the upper order byte.

Example: When the text ABCDE is entered with the Character Input and written to the destination device LDR 100

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 41 (hex)	'B' = 42 (hex)
LDR 101	'C' = 43 (hex)	'D' = 44 (hex)
LDR 102	'E' = 45 (hex)	0

NULL terminating character

from Lower byte: Device values are read from and written to the lower order byte.

Example: When the text ABCDE is entered with the Character Input and written to the destination device LDR 100

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'B' = 42 (hex)	'A' = 41 (hex)
LDR 101	'D' = 44 (hex)	'C' = 43 (hex)
LDR 102	0	'E' = 45 (hex)

NULL terminating character

When handling strings, 0 is written to the device as the NULL terminating character and treated as the end of the string.

*1 Advanced mode only

■ Storage Method of 32-bit Numerical Data*1

Selects the handling method for device values when **BIN32(+)**, **BIN32(+/-)**, **BCD8**, or **float32** is selected for **Data Type** from the following.

from Upper word: Device values are read from and written to the upper order word.

Example: When **Data Type** for the Numerical Input is **BIN32(+)** and the numerical value 12345678 (hex) was entered and written to destination device LDR 100

Device	Stored value	
LDR 100	1234 (hex)	Upper word
LDR 101	5678 (hex)	Lower word

from Lower word: Device values are read from and written to the lower order word.

Example: When **Data Type** for the Numerical Input is **BIN32(+)** and the numerical value 12345678 (hex) was entered and written to destination device LDR 100

Device	Stored value	
LDR 100	5678 (hex)	Upper word
LDR 101	1234 (hex)	Lower word

for FC3A/FC4A/FC5A: The byte order varies based on device type.

This option can only be configured when the host I/F driver **Manufacturer** is **IDEC** and **Protocol** is **OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485)**.

- Device types handled as from upper word
  Data Register, Timer (Current), Counter (Current), Timer (Preset), Counter (Preset), Special Data Register, Internal Device
- Device types handled as from lower word
  Input (Word), Output (Word), Internal Relay (Word), Link Register, Special Internal Relay (Word), Shift Register (Word)

■ Use Large Password Screen*1

Select this check box to display the Password Screen at a large size.

*1 Advanced mode only

● System Area

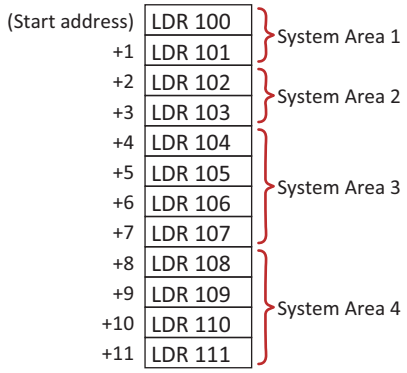
Overview

The area of predetermined devices to control the screen and communicate error information and time information between the MICRO/I and the host is called the System Area.
The System Area on the MICRO/I is as follows.

System Area	Number of word addresses	User Access
System Area 1	2	Read and write
System Area 2	2	Write
System Area 3	4	Read
System Area 4	4	Write

To use System Area 1 and 2, select the **Use System Area** check box on the **Project Settings** dialog box. To use System Area 3 and 4, select the **Use System Area 3, 4** check box.
Specify the word device to use as the System Area in **Device** to allocate the System Area starting at the configured device address.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Example: When **Device** is configured as LDR 100



System Area 1

This area configures the MICRO/I display, beep, and clearing bits.

Address	Bit	Function	Description
+0	0 to 15	Display screen number	This bit stores the number of the screen being displayed. Write a value to this bit to change the screen to that number. Immediately after the power is turned on, the value configured by **Default Screen** in the **Project Settings** dialog box is stored here. If the screen number does not exist in the project data, an error message (No screen data) is displayed. However, when 0 is written to this bit, the screen is not switched and no error message is displayed.
+1	0	Backlight	This bit stores the illumination state of the backlight. Write a value to this bit to change the state. 0: Off Turns the backlight off. 1: On Turns the backlight on.
	1	Flash display (1 sec. cycle)	This bit stores the screen flash state (1 sec. cycle). Write a value to this bit to change the state. This bit is 0 immediately after the power is turned on. 0: Do not flash Stop flashing the screen and turn it on. 1: Flash Flashes the screen in one second intervals. When flash display (1 sec. cycle) (address+1, bit 1) and flash display (0.5 sec. cycle) (address+1, bit 2) are both 1, the screen flashes at one second intervals.

Address	Bit	Function	Description
+1	2	Flash display (0.5 sec. cycle)	This bit stores the screen flash state (0.5 sec. cycle). Write a value to this bit to change the state. This bit is 0 immediately after the power is turned on. 0: Do not flash Stop flashing the screen and turn it on. 1: Flash Flashes the screen in 0.5 second intervals. When flash display (1 sec. cycle) (address+1, bit 1) and flash display (0.5 sec. cycle) (address+1, bit 2) are both 1, the screen flashes at one second intervals.
	3 to 4	Reserved	
	5	Backlight auto off	This bit stores whether or not the function to automatically turn off the backlight is enabled when the **Auto OFF** check box is selected under **Backlight** in the **Project Settings** dialog box. Write a value to this bit to change the state. This bit is 0 immediately after the power is turned on. 0: Enabled Automatically turns off the backlight when the MICRO/I is unused for an extended period of time. 1: Disabled Does not automatically turn off the backlight when the MICRO/I is unused for an extended period of time. The backlight turns on if the value changes to 1 when the backlight is off.
	6	Beep	This bit stores the beep state. Write a value to this bit to change the state. This bit is 0 immediately after the power is turned on. 0: Stop Stops continuous beeping. 1: Beep Starts continuous beeping.
	7	Screen display	This bit stores the screen display state. Write a value to this bit to change the state. 0: Hide Hides the screen when the backlight is on. 1: Show Displays the screen.
	8	Reserved	
	9	Clear error	Write 1 to this bit to clear the error information bit (System Area 2, address+2). This bit automatically changes to 0 when processing is finished.
	10	Numerical input setting clear	Write 1 to this bit to clear the numerical input setting complete bit (System Area 2 address+3, bit 0) and the numerical input setting cancel bit (System Area 2 address+3, bit 1). This bit automatically changes to 0 when processing is finished.
	11	Character input setting clear	Write 1 to this bit to clear the character input setting complete bit (System Area 2 address+3, bit 5) and the character input setting cancel bit (System Area 2 address+3, bit 6). This bit automatically changes to 0 when processing is finished.
	12 to 15	Reserved	

System Area 2

This area stores MICRO/I states and error information. These bits are 0 immediately after the power is turned on.

Address	Bit	Function	Description
+2	0 to 2	Reserved	
	3	Host communication error	This bit changes to 1 when a communication error occurs in host communication using Serial Interface 1 (SIO1).
	4	Reserved	
	5	Arithmetic error	This bit changes to 1 when executing the following arithmetic operations. • A value other than 0 to 9 is used when the data type is **BCD4** or **BCD8** • Dividing by zero • When there is an inconsistency in the bar chart maximum, minimum, or origin setting, or the full range is 0 • When there is an inconsistency in the line chart maximum, minimum, or origin setting, or the full range is 0
	6	Device range error	This bit changes to 1 when writing a value to a device that falls outside its range or when exceeding the restrictions on the number of configured devices.
	7	Clock IC error	This bit changes to 1 when the MICRO/I internal clock stops.
	8	Memory card access error*1	This bit changes to 1 when an error occurs when the memory card inserted in the MICRO/I is accessed.
	9	Printing timeout error*2	This bit changes to 1 when a printing error occurs when data is output to the printer connected to the MICRO/I.
	10	Script error	This bit changes to 1 when an error occurs during script execution. Error details are stored in HG special registers LSD 52 and LSD 53. For details, refer to Chapter 20 "1.4 Script Error" on page 20-4.
	11	Reserved	
	12	Replace battery error	This bit changes to 1 when it is time to replace the backup battery. The HG2G-5ST22VF-* does not have a backup battery, so this bit is normally 1.
	13	Replace battery error (low battery)	This bit changes to 1 when the backup battery is low. The HG2G-5ST22VF-* does not have a backup battery, so this bit is normally 1.
	14	Backup data error	This bit changes to 1 when the backup battery is dead or low and the data sampled by the log functions and values in the HG keep registers and HG keep relays disappears. The HG2G-5ST22VF-* does not have a backup battery, so this bit is normally 1.
	15	Reserved	
+3	0	Numerical input setting complete	This bit changes to 1 when finished entering a numerical value with the Numerical Input. This bit changes to 0 when entering a numerical value or when entering a numerical value has been canceled. Write 1 to numerical input setting clear (address+1, bit 10) to clear this bit.
	1	Numerical input setting cancel	This bit changes to 1 when entering a numerical value with the Numerical Input was canceled. This bit changes to 0 when entering a numerical value or when entering a numerical value has been completed. Write 1 to numerical input setting clear (address+1, bit 10) to clear this bit.
	2	Backlight auto off running	The value of this bit changes to 1 when **Auto OFF** is configured and the backlight was turned off by this function. To configure **Auto OFF**, select the **Auto OFF** check box under **Backlight** in the **Project Settings** dialog box. This bit automatically changes to 0 when the backlight turns on.

*1 This is applicable for models with the memory card interface only.
*2 HG2G-5F, HG3G/4G, HG1F/2F/2S/3F/4F only

Address	Bit	Function	Description
+3	3	Printing	This bit changes to 1 when sending output to the printer. This bit automatically changes to 0 when finished sending output.
	4	Transferring recipe	This bit changes to 1 when transferring recipe data. This bit automatically changes to 0 when the transfer is finished.
	5	Character input setting complete	This bit changes to 1 when finished entering text with the Character Input. This bit changes to 0 when entering text or when entering text has been canceled. Write 1 to character input setting clear (address+1, bit 11) to clear this bit.
	6	Character input setting cancel	This bit changes to 1 when entering text with the Character Input is canceled. This bit changes to 0 when entering text or when entering text has been completed. Write 1 to character input setting clear (address+1, bit 11) to clear this bit.
	7 to 15	Reserved	

System Area 3

This area is for changing the MICRO/I internal clock data.

Address	Bit	Function	Description
+4	0 to 7	Clock data **Month**	Enter **Month** (01 to 12) as a 2 digit BCD.
	8 to 15	Clock data **Year**	Enter **Year** (00 to 99) as a 2 digit BCD.
+5	0 to 7	Clock data **Hour**	Enter **Hour** (00 to 23) as a 2 digit BCD.
	8 to 15	Clock data **Day**	Enter **Day** (01 to 31) as a 2 digit BCD.
+6	0 to 7	Clock data **Second**	Enter **Second** (00 to 59) as a 2 digit BCD.
	8 to 15	Clock data **Minute**	Enter **Minute** (00 to 59) as a 2 digit BCD.
+7	0 to 14	Reserved	Enter 0 in the reserved area.
	15	Update	Write 1 to this bit to write the entered data (address+4 to +6, bits 0 to 15) to the MICRO/I internal clock data.

When the value of the update bit (address+7, bit 15) becomes 1, the clock data is updated as a whole. Year, month, day, hour, minute, and second cannot be set individually.

System Area 4

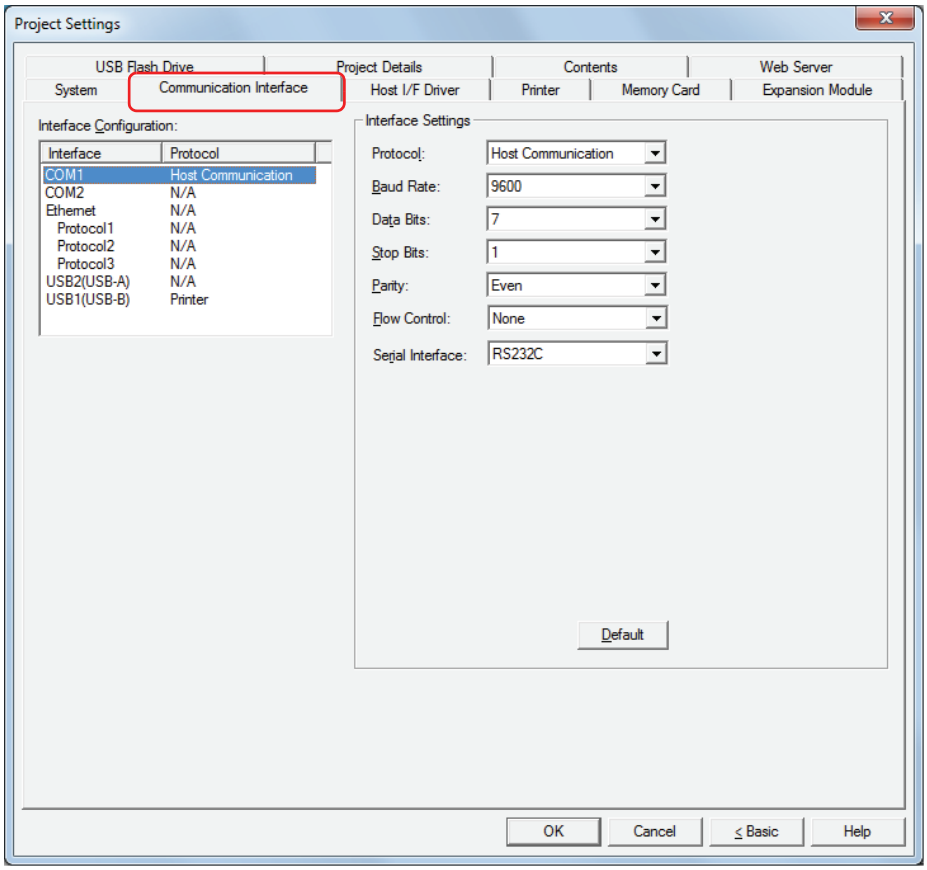
This area reads the MICRO/I internal clock data in one minute intervals.

Address	Bit	Function	Description
+8	0 to 7	Clock data **Month**	These bits store the current **Month** (01 to 12) value as a 2 digit BCD.
	8 to 15	Clock data **Year**	These bits store the current **Year** (00 to 99) value as a 2 digit BCD.
+9	0 to 7	Clock data **Hour**	These bits store the current **Hour** (00 to 23) value as a 2 digit BCD.
	8 to 15	Clock data **Day**	These bits store the current **Day** (01 to 31) value as a 2 digit BCD.
+10	0 to 7	Reserved	
	8 to 15	Clock data **Minute**	These bits store the current MICRO/I clock data **Minute** (00 to 59).
+11	0 to 3	Clock data **Day of Week**	These bits store the current **Day of Week** value as a 2 digit BCD. The relationship between the day of the week and the value is as follows. 00: Sunday 01: Monday 02: Tuesday 03: Wednesday 04: Thursday 05: Friday 06: Saturday
	4 to 15	Reserved	

3.2 Communication Interface Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Communication Interface** tab is used to configure the functions used by the MICRO/I communication interfaces.



Interface Configuration

Interface Configuration lists the communication interfaces and protocols to use. Select the appropriate **Interface** (COM1, COM2, etc.) to switch **Interface Settings** to the items that can be configured for that communication interface.

The items displayed in **Interface** vary based on the model. The supported protocols for each communication interface are as follows.

HG2G-5F, HG3G/4G

Item	Communication Interface	Protocol						
		Host Communication	O/I Link Master	O/I Link Slave	User Communication 1 to 3	Sub Host Communication	Printer	Maintenance Communication
COM1	Serial Interface (COM1)	YES	YES	YES	YES	YES	NO	NO
COM2	Serial Interface (COM2)	YES	YES	YES	YES	YES	NO	NO
Ethernet	Ethernet Interface (LAN)	YES	NO	NO	YES	NO	NO	YES
USB2 (USB-A)	USB Interface (USB2) Type A	NO	NO	NO	YES	NO	NO	NO
USB1 (USB-B)	USB Interface (USB1) Mini-B	NO	NO	NO	NO	NO	YES	YES

HG2G-S/-5S

Item	Communication Interface	Protocol						
		Host Communication	O/I Link Master	O/I Link Slave	User Communication 1 to 3	Sub Host Communication	Printer	Maintenance Communication
SERIAL 1	Serial Interface 1	YES	NO	YES	YES	YES	NO	NO
SERIAL 2	Serial Interface 2	NO	NO	NO	YES*1	YES	NO	YES
	USB Interface	NO	NO	NO	NO	NO	NO	YES*2
O/I Link	O/I Link Interface	NO	YES	YES	YES	YES	NO	NO
Ethernet	Ethernet Interface	YES	NO	NO	YES*3	NO	NO	YES

HG1F/2F/2S/3F/4F

Item	Communication Interface	Protocol						
		Host Communication	O/I Link Master	O/I Link Slave	User Communication 1 to 3	Sub Host Communication	Printer	Maintenance Communication
SERIAL 1	Serial Interface 1	YES	NO	YES	YES	YES	NO	NO
SERIAL 2	Serial Interface 2	NO	NO	NO	YES	YES	YES	YES
USB	USB Interface	NO	NO	NO	NO	NO	YES*4	YES
O/I Link	O/I Link Interface	NO	YES	YES	YES	YES	NO	NO
Ethernet	Ethernet Interface	YES	NO	NO	NO	NO	NO	YES
Parallel	Parallel Interface	NO	NO	NO	NO	NO	YES	NO

Functions Available with the Serial Interface

The following functions can be used with MICRO/I models equipped with the serial interface.

- Online
  ☞ Refer to Chapter 24 "Online Function" on page 24-1.
- Debug
  ☞ Refer to Chapter 25 "Monitor Function" on page 25-1.
- Printer connection
  ☞ Refer to Chapter 31 "Printer" on page 31-1.
- Barcode reader connection
  ☞ Refer to Chapter 3 "5 User Communication" on page 3-8.

The functions that can be used with the serial interface vary based on the MICRO/I model.

MICRO/I functions	HG2G-S	HG2G-5S	HG2G-5F HG3G/4G	HG1F/2F/2S/3F/4F
Online	YES	YES	YES	YES
Debug	YES	YES	YES	YES
Printer connection	NO	NO	NO	YES
Barcode reader connection	YES	YES	YES	YES

*1 HG2G-S only
*2 HG2G-5S only
*3 This is applicable for models with Ethernet Interface only.
*4 HG2F only

Functions Available with the Ethernet Interface

The following functions can be used with MICRO/I models equipped with the Ethernet interface.

- Online
  ☞ Refer to Chapter 24 "Online Function" on page 24-1.
- Debug
  ☞ Refer to Chapter 25 "Monitor Function" on page 25-1.
- Web Server
  ☞ Refer to Chapter 27 "1 Web Server Function (HG2G-5F, HG3G/4G)" on page 27-1.
  Refer to Chapter 27 "2 Web Server Function (HG3F/4F)" on page 27-12.

The functions that can be used with the Ethernet interface vary based on the MICRO/I model.

MICRO/I functions	HG2G-S/-5S	HG2G-5F HG3G/4G	HG3F/4F
Online	YES	YES	YES
Debug	YES	YES	YES
Web Server	NO	YES	YES

Functions Available with the USB Interface

The following functions can be used with MICRO/I models equipped with a USB interface.

- Online
  ☞ Refer to Chapter 24 "Online Function" on page 24-1.
- Debug
  ☞ Refer to Chapter 25 "Monitor Function" on page 25-1.
- Printer connection
  ☞ Refer to Chapter 31 "Printer" on page 31-1.
- Barcode reader connection
  ☞ Refer to Chapter 3 "5 User Communication" on page 3-8.

The functions that can be used with the USB interface vary based on the MICRO/I model.

MICRO/I functions	HG2G-5S	HG2G-5F HG3G/4G	HG2F
Online	YES	YES	YES
Debug	YES	YES	YES
Printer connection	NO	YES	YES
Barcode reader connection	NO	YES	NO

Interface Settings

The items that can be configured vary based on the communication interface selected under **Interface Configuration**.

When COM1 or COM2 is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol to use with the serial interface COM1 or the serial interface COM2 from the following.
N/A, **Host Communication**, **O/I Link Master**, **O/I Link Slave**, **User Communication 1**, **User Communication 2**, **User Communication 3**, **Sub Host Communication**
Host Communication can only be configured when **COM2** is selected for **Interface** under **Interface Configuration**.
This communication interface is not used when **N/A** is selected.

Baud Rate: Selects the communication speed with the host from the following.
1200, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**, **187500**
The baud rate that can be configured varies based on **Protocol**.

Data Bits: Selects the data length as **7** or **8**.
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Stop Bits: Selects the stop bits as **1** or **2**.
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Parity: Selects the parity from the following.
None, **Odd**, **Even**
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Flow Control: Selects the flow control method as **None** or **ER** according to the host being used.
This option can only be configured when **Host Communication** or **Sub Host Communication** is selected for **Protocol**.

Serial Interface: Selects the standard for the serial interface to use from the following.
RS232C, **RS422/485 2-wire**, **RS422/485 4-wire**
RS422/485 4-wire can only be configured when **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

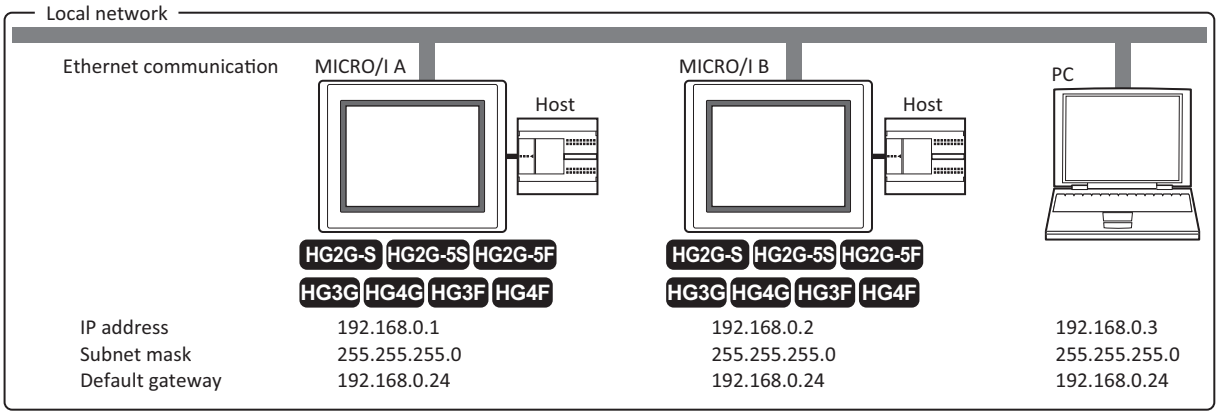
When Ethernet is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Example: To communicate with two MICRO/Is and a PC via Ethernet

Set MICRO/I A, MICRO/I B, and the PC all to the same values: subnet mask **255.255.255.0**, default gateway **192.168.0.24**.

Set the IP addresses to values that do not conflict: MICRO/I A IP address **192.168.0.1**, MICRO/I B IP address **192.168.0.2**, PC IP address **192.168.0.3**.



The IP address, subnet mask, and default gateway values shown above are only examples.
These values must be set based on your local network environment.

Protocol:	**N/A** or **Host Communication**. Varies based on the driver selected for **Protocol**.
IP Address:	Specifies the IP address. (Default: 0.0.0.0) The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255. When connecting multiple devices to the same network, make sure to assign each device a unique IP address.
Subnet Mask:	Specifies the subnet mask. (Default: 0.0.0.0) The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255. This value must be the same for all devices.
Default Gateway:	Specifies the default gateway. (Default: 0.0.0.0) The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255. Set this value when using a router. Leave the value blank when not required.
Forbid Maintenance Communication:	Select this check box to prohibit access from a web browser terminal and to prohibit maintenance communication via Ethernet communication.
Forbid Web Server function*5:	Select this check box to prohibit access from a web browser terminal. The HG3F/4F web page (home page) cannot be displayed even when accessing the MICRO/I from a web browser terminal.

About Networking Terminology

IP Address:	The number allocated to identify devices connected to an IP network such as the Internet or an intranet. The IP address is the address of each individual device on a network.
Subnet Mask:	The subnet mask is used to indicate the position of the division between the network address portion and the host address portion of an IP address.
Default Gateway:	The device such as a computer or a router that represents the gateway used when accessing devices outside the network to which the device belongs.

*5 HG3F/4F only

When Protocol1, Protocol2, or Protocol3 is selected for Ethernet under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the user communication to configure for the selected protocol from the following.
User Communication 1, **User Communication 2**, **User Communication 3**

Operation Mode:

Selects the operation mode when performing user communication with the Ethernet interface.

TCP Client: The MICRO/I operates as a TCP/IP client and the host operates as a TCP server. The MICRO/I connects to the TCP server and sends and receives data.

TCP Server: The MICRO/I operates as a TCP/IP server and the host operates as a TCP client. The MICRO/I creates a listening port as a TCP server and waits for connections from TCP clients. After a connection, it sends and receives data with the TCP client.

UDP: The MICRO/I operates as a UDP server and client.
The MICRO/I sends data to the host's listening port. The host also sends data to the MICRO/I's listening port and that data is received by the MICRO/I.

Target: Configures the IP address and port number for the host.
These options can only be configured when **TCP Client** or **UDP** is selected for **Operation Mode**.

IP Address: Specifies the IP address for the target.
The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.
When connecting multiple devices to the same network, make sure to assign each device a unique IP address.

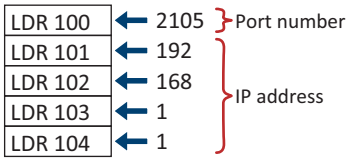
Port No.: Specifies the port number for the target (0 to 65535).

Change IP Address and Port Number by Device:

Select this check box and specify a word device to change the target's IP address and port number during operation. You can only specify an internal device. During the start of operation, the MICRO/I writes the values configured by **IP Address** and **Port No.** to this device. After the start of operation, the device value is read and the target is changed.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When **IP Address** is set to 192.168.1.1, **Port No.** is 2105, and the device is LDR 100



MICRO/I: Configures the MICRO/I listening port number.
These options can only be configured when **TCP Server** or **UDP** is selected for **Operation Mode**.

Port No. Specifies the MICRO/I listening port number (0 to 65535).
The port numbers that cannot be used are as follows.

- Port numbers already used by the MICRO/I: port number 2537 (for maintenance communication), 2538 (for pass-through), 2101 (for FC4A direct connection pass-through)
- When **MODBUS/TCP Server** is selected for **Protocol**, **Port Number** on the displayed **Host Port Extension** tab
- **Port No.** on the **Web Server** tab when configured for remote control with the Web Server function

- The connection status for TCP clients and the TCP server can be checked with the value of the HG special registers (LSD). The connection is disconnected when 0. The connection is connected when 1.

  LSD67-0: Connection status for User Communication 1 set to Ethernet interface

  LSD67-1: Connection status for User Communication 2 set to Ethernet interface

  LSD67-2: Connection status for User Communication 3 set to Ethernet interface

- To forcibly disconnect the connection with TCP clients and the TCP server, set the value of the HG special registers (LSD) from 0 to 1.

  LSD68-0: User Communication 1 set to Ethernet interface

  LSD68-1: User Communication 2 set to Ethernet interface

  LSD68-2: User Communication 3 set to Ethernet interface

- When using the MICRO/I as UDP, the MICRO/I cannot automatically identify and reply to the host's IP address and port number. UDP broadcasting is also not supported.
- For TCP client and TCP server, make a 1:1 connection between the MICRO/I and the host for one user communication setting.
- When the **Change IP Address and Port Number by Device** check box is selected, the changed IP address and port number are reflected when data is next sent.

When USB2(USB-A) is selected under Interface Configuration

HG2G-S HG2G-5S **HG2G-5F** **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by the USB interface (USB2) Type A from the following.
N/A, **User Communication 1**, **User Communication 2**, **User Communication 3**
This communication interface is not used when **N/A** is selected.

When USB1(USB-B) is selected under Interface Configuration

HG2G-S HG2G-5S **HG2G-5F** **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by the USB interface (USB1) Mini-B as **N/A** or **Printer**.
This communication interface is not used when **N/A** is selected.

When SERIAL 1 is selected under Interface Configuration

HG2G-S **HG2G-5S** HG2G-5F HG3G HG4G **HG1F** **HG2F** **HG2S** **HG3F** **HG4F**

Protocol: Selects the protocol used by Serial Interface 1 from the following.
N/A, **Host Communication**, **O/I Link Master**, **O/I Link Slave**, **User Communication 1**, **User Communication 2**, **User Communication 3**, **Sub Host Communication**
This communication interface is not used when **N/A** is selected.

Baud Rate: Selects the communication speed with the host from the following.
1200, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**
The baud rate that can be configured varies based on **Protocol**.

Data Bits: Selects the data length as **7** or **8**.
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Stop Bits: Selects the stop bits as **1** or **2**.
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Parity: Selects the parity from the following.
None, **Odd**, **Even**
This option can only be configured when **Host Communication**, **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

Flow Control: Selects the flow control method as **None** or **ER** according to the host being used.
This option can only be configured when **Host Communication** is selected for **Protocol**.

Serial Interface: Selects the standard for the serial interface to use from the following.
RS232C, **RS422/485 2-wire**, **RS422/485 4-wire**
RS422/485 4-wire can only be configured when **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected for **Protocol**.

When SERIAL 2 is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by Serial Interface 2 from the following.
N/A, **Printer**[*1], **User Communication 1**[*2], **User Communication 2**[*2], **User Communication 3**[*2], **Sub Host Communication**
This communication interface is not used when **N/A** is selected.

Baud Rate: Selects the communication speed with the host from the following.
1200, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**

Data Bits: Selects the data length as **7** or **8**.

Stop Bits: Selects the stop bits as **1** or **2**.

Parity: Selects the parity from the following.
None, **Odd**, **Even**

When the **Enable Pass-Through** check box is selected on the **Host I/F Driver** tab, only the Maintenance Communication function can be used with Serial Interface 2.

The HG1F cannot simultaneously use Serial Interface 2 and the O/I Link Interface. Configure the interface to use under **Interface Configuration**.

When USB is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by the USB Interface as **N/A** or **Printer**.
This communication interface is not used when **N/A** is selected.

The HG2G-5S USB interface is for Maintenance Communication only.

*1 HG1F/2F/2S/3F/4F only
*2 HG2G-S, HG1F/2F/2S/3F/4F only

When O/I Link is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by the O/I Link interface from the following.

N/A, **O/I Link Master**, **O/I Link Slave**, **User Communication 1**, **User Communication 2**, **User Communication 3**, **Sub Host Communication**

The protocols that can be configured vary based on Protocol set to **Serial 2** in **Interface** under **Interface Configuration**.

This communication interface is not used when **N/A** is selected.

Baud Rate: Selects the communication speed with the host from the following.

1200, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**

The baud rate that can be configured differs depending on **Protocol**.

- Flow Control setting is **None**.
- With the HG2F/3F/4F, when **User Communication 1**, **User Communication 2**, **User Communication 3**, or **Sub Host Communication** is selected from **Protocol**, the settings are as follows.
  - Data bits: 8 bits
  - Stop bits: 1 bit
  - Parity: None

- The HG1F cannot simultaneously use Serial Interface 2 and the O/I Link Interface. Configure the interface to use under **Interface Configuration**.
- The HG1F cannot use the O/I Link Interface under the following conditions.
  - The maintenance cable is connected to Serial Interface 2
  - The **Enable Pass-Through** check box on the **Host I/F Driver** tab is selected

When Parallel is selected under Interface Configuration

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Protocol: Selects the protocol used by the Parallel Interface as **N/A** or **Printer**.
This communication interface is not used when **N/A** is selected.

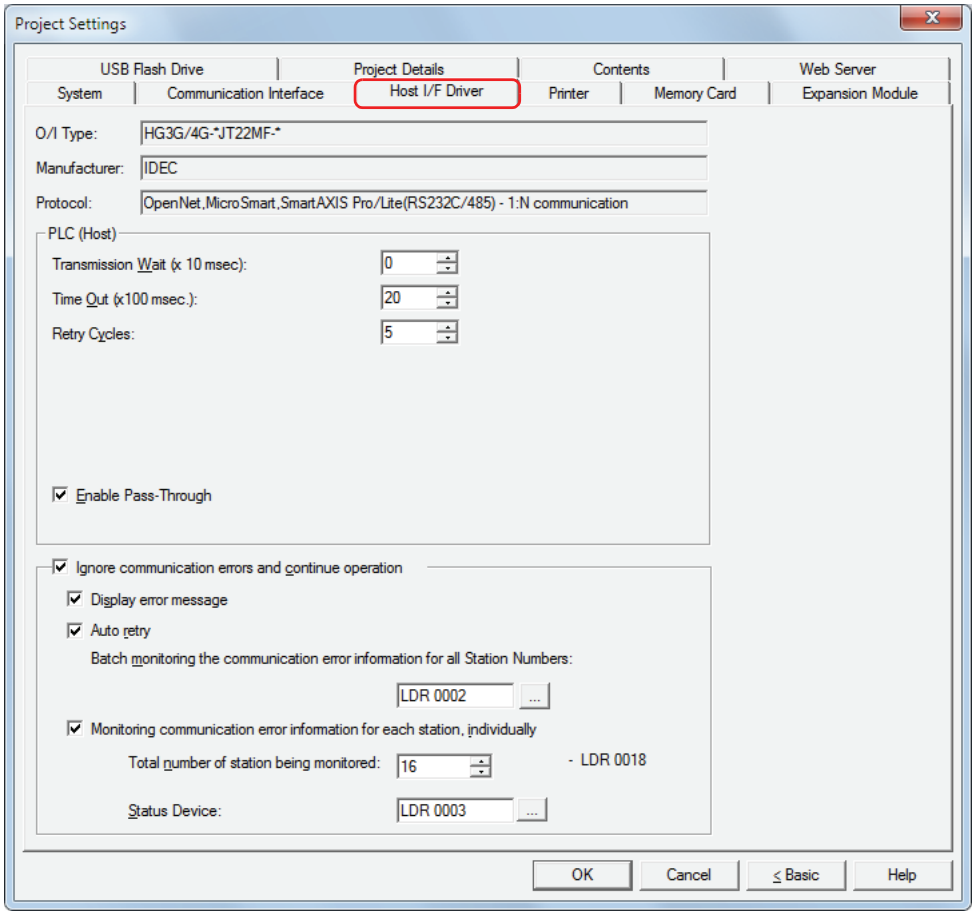
Default

Returns the configured values to their default values.

3.3 Host I/F Driver Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Host I/F Driver** tab is used to configure the host I/F driver for the host configured in the current project data.



- **O/I Type**
  Shows the MICRO/I model configured in the current project data.

- **Manufacturer**
  Shows the host manufacturer configured in the current project data.

- **Protocol**
  Shows the host I/F driver name configured in the current project data.

- **PLC (Host)**
  These options configure the host I/F driver to use. For details, refer to the External Device Setup Manual.

Transmission Wait (x 10 msec):	Specifies the transmission interval for communication commands (0 to 255).
Time Out (x 100 msec):	Specifies the time to wait for a response from the host (1 to 255).
Retry Cycles:	Specifies the number of times to execute a reconnection when the MICRO/I cannot communicate with the host. When the number of reconnect attempts reaches the number of times set here, a communication error is displayed.
Enable Pass-Through:	Select this check box to use the Pass-Through function. This option is only displayed for models that can use the Pass-Through function. For details, refer to Chapter 26 "2 Correspondence model Pass-Through" on page 26-2.

The Pass-Through Tool is required to use the Pass-Through function on the HG2G-S/-5S/-5F and the HG3G/4G when using a version of WindLDR before Ver. 6.01, another company's PLC programming software, or a host other than an IDEC host.

Ignore communication errors and continue operation*1

Select this check box to continue MICRO/I operation even when a communication error occurs.

This option is only displayed when the host I/F driver **Connection** is **1:N Communication**.

Display error message: Select this check box to display an error message (host communication error) when a communication error occurs and operation continues. **Ack** is displayed on the error message (host communication error).

When the **Ignore communication errors and continue operation** check box is cleared, **Ack** is not displayed on the error message.

Auto retry: Select this check box to automatically retry communication from the MICRO/I to the station number where the communication error occurred when a communication error occurs and operation continues.

All other communication stops while retrying.

To manually retry communication, clear the **Auto retry** check box.

To retry all station numbers, write 1 in bit 1 (initialize) of the device address configured by **Batch monitoring the communication error information for all Station Numbers**.

To individually retry communication, write 1 in bit 0 (connection setting) of the device address configured by **Monitoring communication error information for each station, individually**.

Batch monitoring the communication error information for all Station Numbers:

Specifies the device that stores communication error information for all station numbers. Only an HG internal register can be configured for this option.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The information stored as error information is as follows. For details, refer to the External Device Setup Manual.

- Initialization
- Conditions under which the error occurred
- Read error history
- Write error history

Monitoring communication error information for each station, individually:

Select this check box to store the error information for each station number in devices.

Total number of station being monitored: Specifies the number of station numbers for external devices.

Status Device: Specifies the device that stores communication error information for each station number. Only an HG internal register can be configured for this option.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This error information utilizes a maximum of 256 devices. Use caution so that the used addresses do not overlap with other addresses.

The information stored as error information is as follows. For details, refer to the External Device Setup Manual.

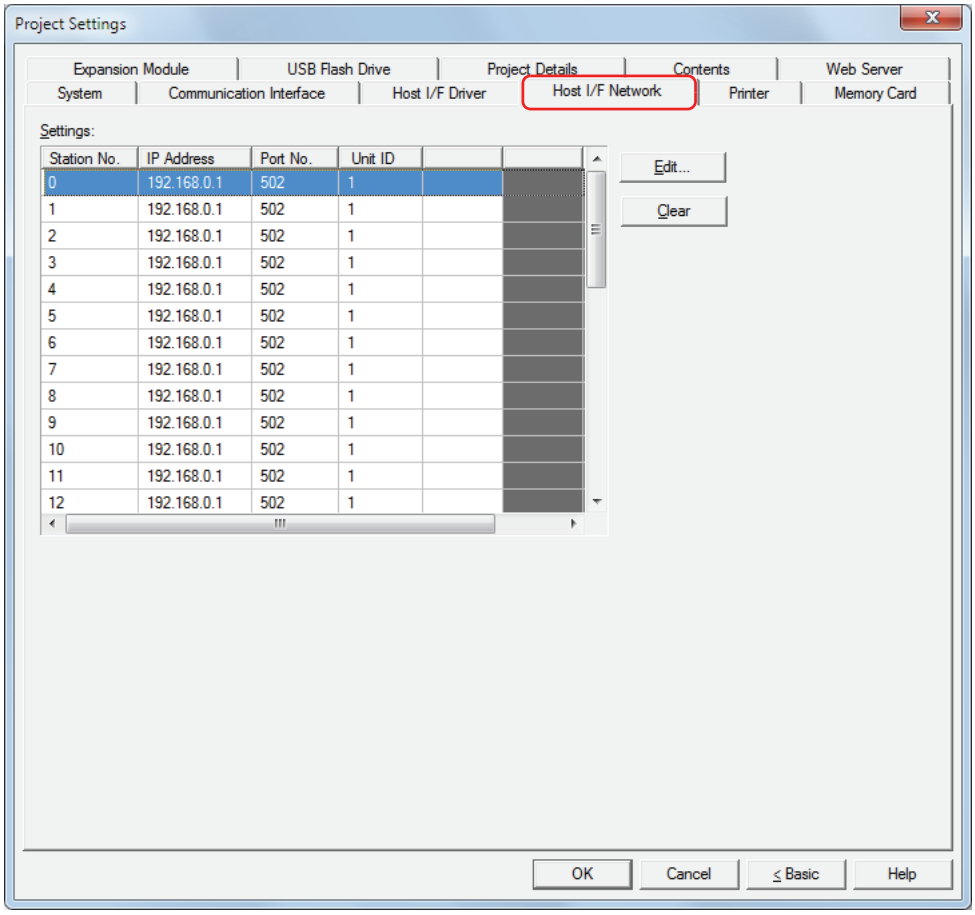
- Connection settings
- Conditions under which the error occurred
- Read error history
- Write error history

*1 HG2G-5F, HG3G/4G only

3.4 Host I/F Network Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Host I/F Network** tab is used to configure the information for hosts connected by Ethernet communication. This tab is displayed when a host I/F driver is selected that supports Ethernet communication.



■ Settings

Edits the settings for the devices.

Station No.: Shows the station number of host. Double clicking the cell displays the **Host I/F Network Settings** dialog box.

IP Address: Shows the IP address of the host. (Default: 192.168.0.1)
Double clicking the cell allows you to specify the host's IP address.
The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.
When connecting multiple devices to the same network, make sure to assign each device a unique IP address.

Port No.: Shows the port number of host. (Default: 2101)
Double clicking the cell allows you to specify the host's port number (0 to 65535).

■ Edit

Configures the IP address and port number for the selected station number. Select a station number and click this button to display the **Host I/F Network Settings** dialog box.

■ Clear

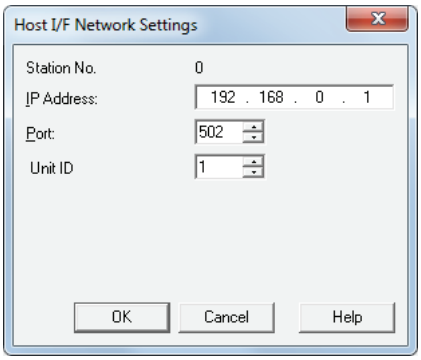
Returns the settings for the selected station number to the defaults.

You can change the IP address of the station numbers for the hosts using the System menu. In the System menu, press **Initial Setting**, **Com. I/F**, **Host I/F Network** in order.

● Host I/F Network Settings Dialog Box

To communicate with an external device via Ethernet communication, specify the Ethernet settings for the destination external device (IP address, port number). The settings other than **IP Address** and **Port** vary based on the external device. For details, refer to the External Device Setup Manual.

Example: **MODBUS/TCP Client** is selected for **Host I/F Driver**



■ IP Address

Specifies the IP address of the destination external device.

The format is "xxx.xxx.xxx.xxx". "xxx" stands for a numeric value from 0 to 255.

When connecting multiple devices to the same network, make sure to assign each device a unique IP address.

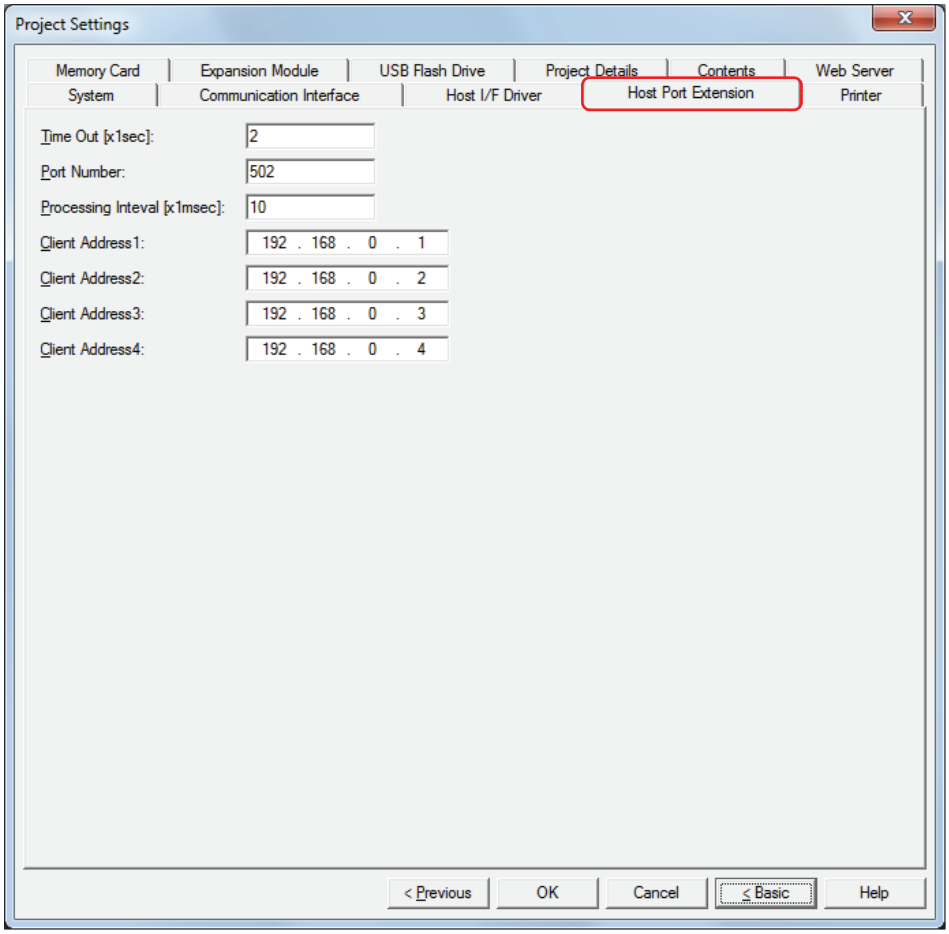
■ Port

Specifies the port number (0 to 65,535) of the destination external device.

3.5 Host Port Extension Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

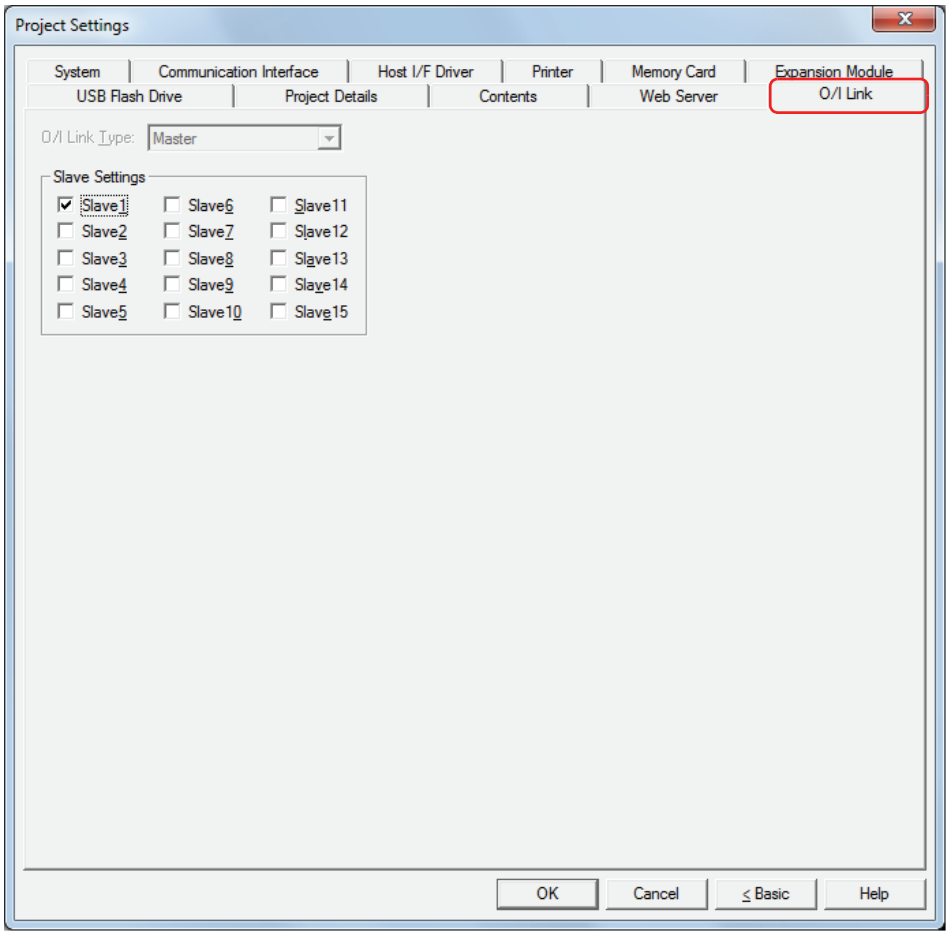
The **Host Port Extension** tab is used to configure the host I/F extension settings. These settings vary based on the host. This tab is displayed when host I/F extension settings are required. For details, refer to the External Device Setup Manual.



3.6 O/I Link Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **O/I Link** tab configures the slave stations to connect to when the MICRO/I is used as the O/I Link communication master. It configures the O/I link station when the MICRO/I is used as a slave. For details, refer to Chapter 3 "2 O/I Link Communication" on page 3-3. These options can only be configured when **O/I Link Master** or **O/I Link Slave** is selected for **Protocol** under **Interface Settings** on the **Communication Interface** tab.



■ **O/I Link Type**

Selects the slave station (Slave1 to Slave15).

This option can only be configured when **O/I Link Slave** is selected for **Protocol** under **Interface Settings** on the **Communication Interface** tab.

■ **Slave Settings**

Select the check boxes for the slave stations to connect to.

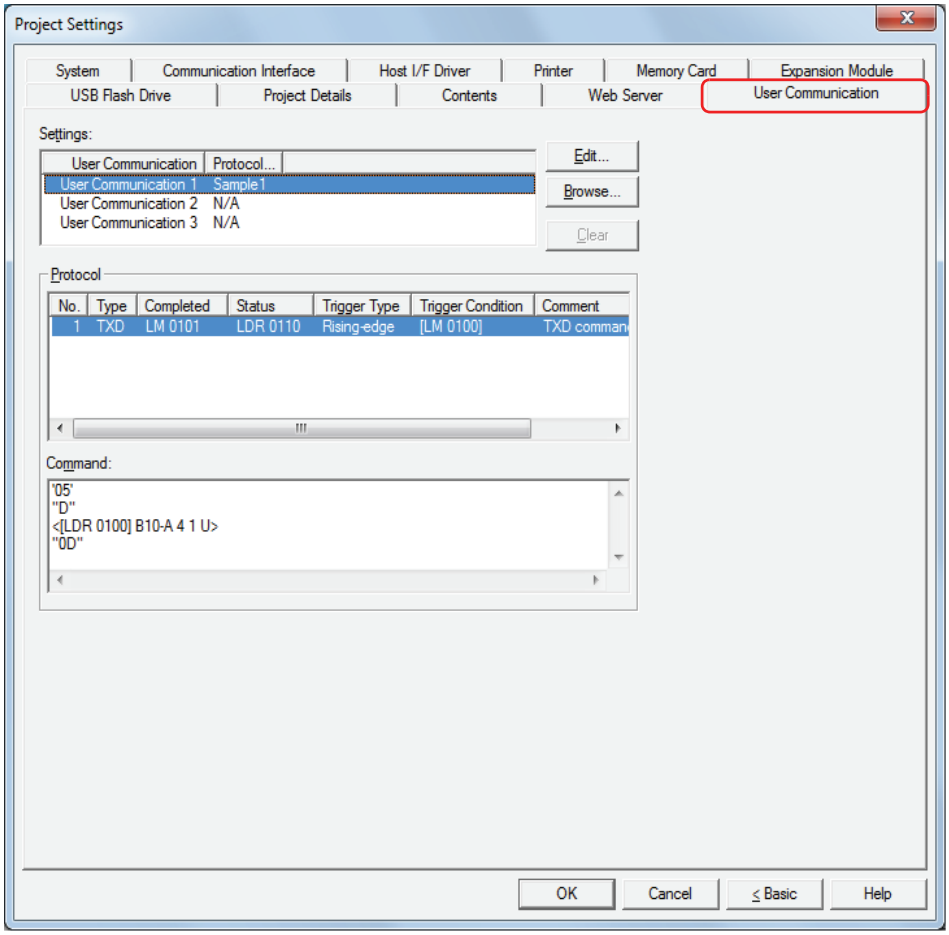
This option can only be configured when **O/I Link Master** is selected for **Protocol** under **Interface Settings** on the **Communication Interface** tab.

The slave stations to connect to when the MICRO/I is used as an O/I link communication master are enabled after the project is downloaded. The slave station number when the MICRO/I is used as a slave is also enabled after the project is downloaded.

3.7 User Communication Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **User Communication** tab is used to configure communication with external devices such as barcode readers. For details, refer to Chapter 3 "5 User Communication" on page 3-8. This option can only be configured when **User Communication 1**, **User Communication 2**, or **User Communication 3** is selected for **Protocol** under **Interface Settings** on the **Communication Interface** tab.



■ Settings

Edits the user communication settings. You can use up to three user communication settings.

User Communication:	Shows the user communication number.
Protocol Name:	Shows **Protocol Name** configured in the **User Communication Protocol Settings** dialog box.

■ Edit

Registers or changes the selected user communication settings. Select a user communication number and click this button to display the **User Communication Protocol Settings** dialog box. For details, refer to Chapter 3 "User Communication Protocol Settings Dialog Box" on page 3-25.

■ Browse

Selects a protocol to use as user communication with Protocol Manager. Click this button to display Protocol Manager. For details, refer to Chapter 3 "5.3 Protocol Manager" on page 3-23.

■ Clear

Deletes the protocol set to user communication in **Settings**.

■ **Protocol**

Shows the protocol defined as the selected user communication. For details, refer to Chapter 3 "Command Settings Dialog Box" on page 3-28.

No.:	Shows the number for managing the protocol settings. Double clicking the cell displays the **Command Settings** dialog box.
Type:	Shows the type of command. Double clicking the cell displays the **Command Settings** dialog box.
Completed:	Shows the send/receive complete report device. Double clicking the cell displays the **Command Settings** dialog box.
Status:	Shows the destination device for the send/receive size and error information. Double clicking the cell displays the **Command Settings** dialog box.
Trigger Type:	Shows the trigger type to transmit or receive data. Double clicking the cell displays the **Command Settings** dialog box.
Trigger Condition:	The displayed content varies based on **Trigger Type**.
	Rising-edge, **Falling-edge**, **While ON**, or **While OFF**: Shows the bit device that is the condition. Double clicking the cell displays the **Command Settings** dialog box.
	While satisfying the condition or **Satisfy the condition**: Shows the conditional expression.
	Fixed Period: Shows the period in seconds.
Comment:	Shows the command comment. Double clicking the cell displays the **Command Settings** dialog box.
Size:	Shows the command size in bytes. Double clicking the cell displays the **Command Settings** dialog box.

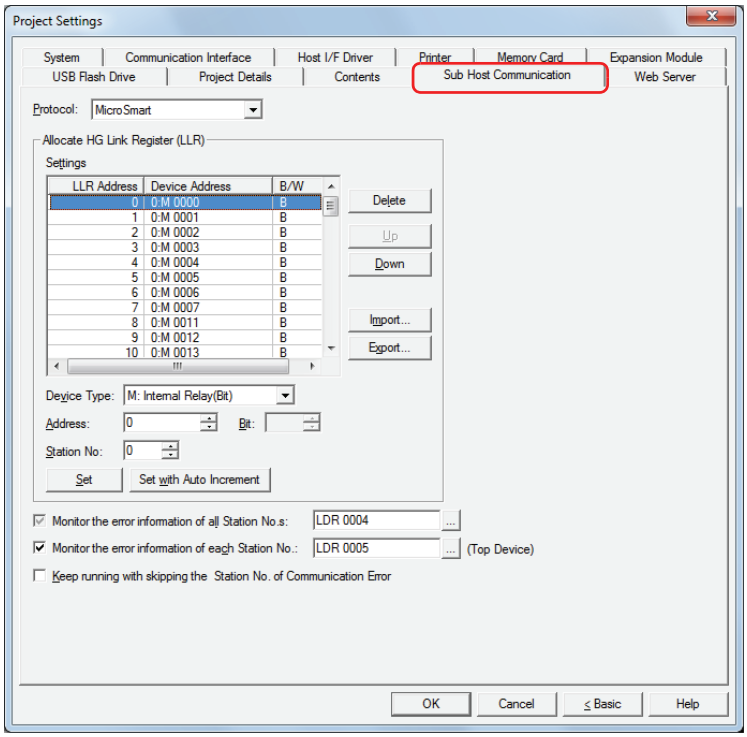
■ **Command**

Shows the command settings for the selected protocol. Double clicking the cell displays the **Data Settings** dialog box. For details, refer to Chapter 3 "Data Settings Dialog Box" on page 3-38.

3.8 Sub Host Communication Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Sub Host Communication** tab is used to configure the sub host communication protocol and HG link register (LLR) addresses to use. For details, refer to Chapter 3 "6 Sub Host Communication" on page 3-79. This option can only be configured when **Sub Host Communication** is selected for **Protocol** under **Interface Settings** on the **Communication Interface** tab.



Protocol

Selects the protocol to use in sub host communication as **MicroSmart** or **Modbus RTU Master**.

Allocate HG Link Register (LLR)

Settings: Lists the device addresses allocated to HG link registers (LLR).

- LLR Address: Shows the LLR addresses (LLR 0 to LLR 63).
- Device Address: Shows the device addresses allocated to LLR addresses.
- B/W: Shows the device type.
  B: Bit device
  W: Word device
  BWORD: Bit in word device

Device Type: Selects the device type of the device address to allocate to the HG link register (LLR). Only device types that can be used are shown.

Address: Specifies the device address to allocate to the HG link register (LLR). The range that can be set varies based on the selected device type.

Bit: Specifies the bit in a word device (0 to 15). This option can only be configured when a word device is selected for **Device Type**.

Station No.: Specifies the station number for the host of the device address to allocate to the HG link register (LLR). The range that can be specified varies based on the selected host I/F driver. This option can only be configured when **1:N Communication** is selected under **Connection** in the **Select Host I/F Driver** dialog box or the **Change Host I/F Driver** dialog box.

Set: Allocates the device address to the HG link register (LLR). When a device address is already allocated to an LLR address, the allocated device address can be changed. Select an LLR address and click **Set** to allocate the settings configured by **Device Type**, **Address**, **Bit**, and **Station No.** to the HG link register (LLR).

Set with Auto Increment:	Allocates sequential device addresses from the device address configured by **Device Type**, **Address**, **Bit**, and **Station No.** to the HG link registers (LLR) after the selected LLR address.
Delete:	Deletes the device address allocated to the HG link register (LLR) from the list. Select the LLR address on the list and click **Delete**.
Up:	Shifts the device address allocated to the selected HG link register (LLR) up in the list.
Down:	Shifts the device address allocated to the selected HG link register (LLR) down in the list.
Import:	Displays the **Open** dialog box. Select a file with exported device addresses (CSV file) and click **Open** to collectively overwrite the LLR addresses under **Settings** with the device addresses in the selected file.
Export:	Displays the **Save As** dialog box. Select the location to save the file, enter a file name, and then click **Save** to save the device address details as a CSV file.

■ Monitor the error information of all Station No.s

Select this check box to monitor the error information of all external devices that are being communicated with using sub host communication.

For details, refer to Chapter 3 "Monitor the error information of all Station No.s" on page 3-83.

(Destination device):	Specifies the word device to write the error information to. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Monitor the error information of each Station No.:

Select this check box to monitor the error information for each external device that is being communicated with using sub host communication.

The information for each station is stored starting with the allocated internal device and utilizes 256 words of addresses.

The station numbers are allocated with the starting address as number 0, up to number 255.

For details, refer to Chapter 3 "Monitor the error information of each Station No." on page 3-84.

(Top device):	Specifies the word device to write the error information to. This option uses 64 words of addresses starting with the configured device address. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Keep running with skipping the Station No. of Communication Error

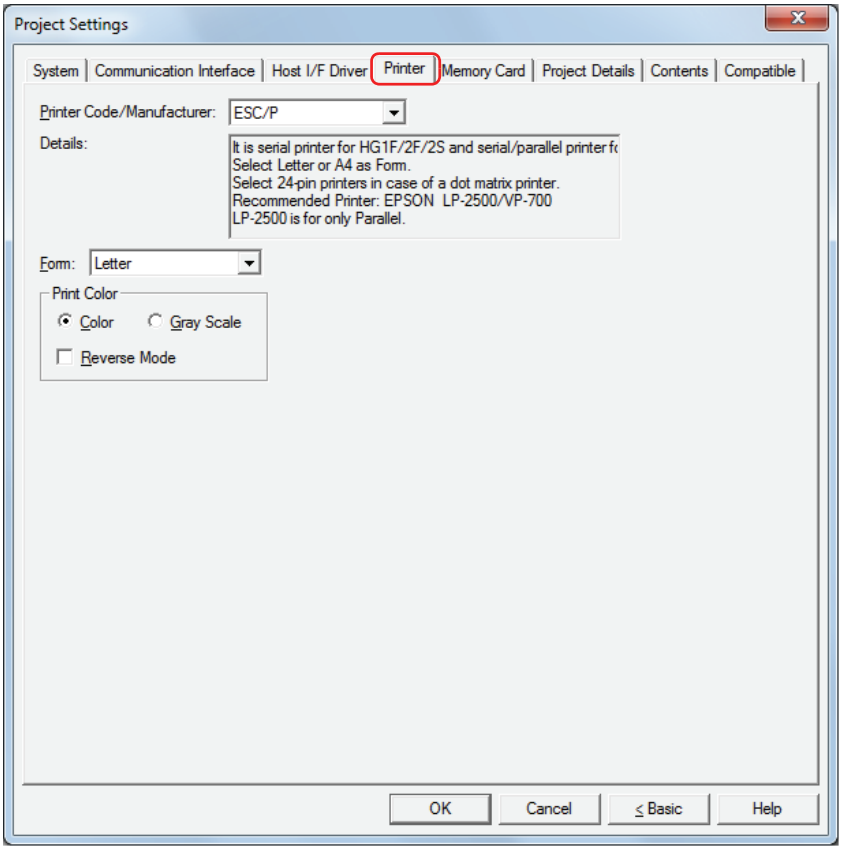
Select this check box to temporarily stop communication with the station number where the communication error occurred and connect to the next station number.

For details, refer to Chapter 3 "Keep running with skipping the Station No. of communication error" on page 3-84.

3.9 Printer Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Printer** tab is used to configure the printer that is connected to the MICRO/I.



■ **Printer Code/Manufacturer**

Selects the printer control commands. For details on the printer control commands and printers that can be used, refer to Chapter 31 "1.4 Supported Printers" on page 31-3.

HG2G-5F, HG3G/4G:	**PictBridge**
HG1F/2F/2S/3F/4F:	**ESC/P**, **PC-PR**, **PCL**, **SII**, **ESC/P Raster**

■ **Details**

Shows the primary printers that support the selected printer control commands.

■ **Form**

Selects the paper size to output from the following. When the O/I type is the HG2G-5F or the HG3G/4G, this option is configured on the printer side.

Letter, **A4**, **Receipt(60 mm width)**[*1], **Receipt(112 mm width)**[*1]

■ **Print Color**

Selects the color when printing as **Color** or **Gray Scale**. When the O/I type is the HG2G-5F or the HG3G/4G, this option is configured on the printer side.

Reverse Mode: Select this check box to reverse only black or white when printing. When **Color** is selected, this option is disabled, even when selected.

*1 HG1F/2F/2S/3F/4F only

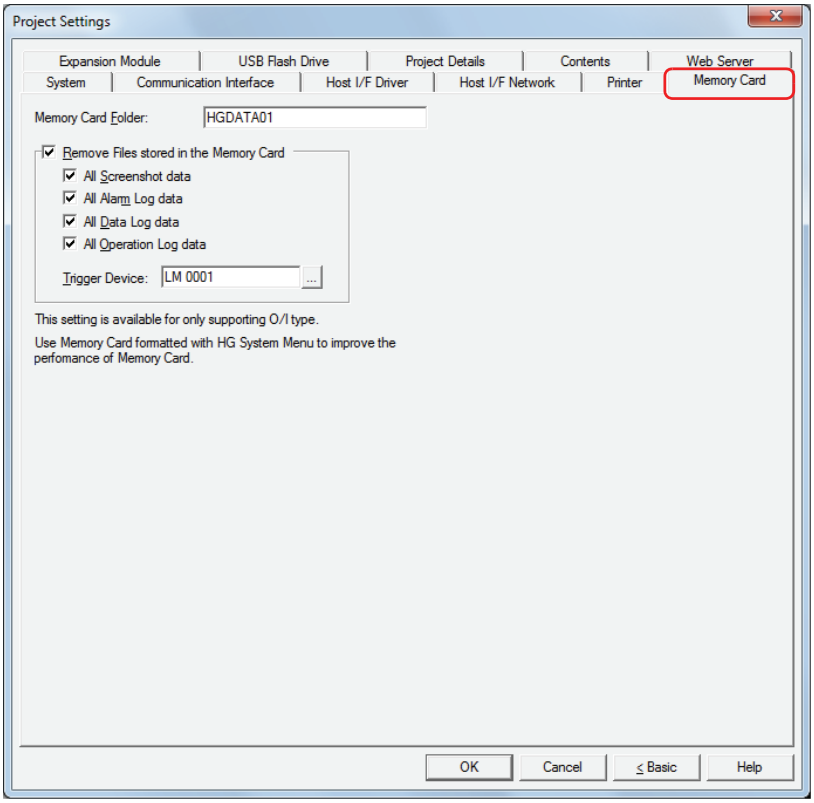
Some functions may not be available depending the **Printer Code/Manufacturer** selection.

- Color printing is not supported when **PCL** is selected. The page is not ejected when the Print Button part is used or when **Cancel Printing** was selected during printing. Eject the page using the printer controls before continuing. Otherwise, printing will resume from where it was canceled.
- When **SII** is selected, pages are printed in monochrome regardless of whether **Color** or **Gray Scale** is selected under **Print Color**.
- When **ESC/P** is selected, a 24-pin dot matrix printer can be used. 9-pin dot matrix printers are not supported. ESC/P control commands including ESC/P2 and ESC/Page are also supported.
- When **PictBridge** is selected, the color cannot be configured. To print in monochrome, configure the print color on the printer that is used. When the edge of the data is not printed, enable **No Trimming** and **Bordered** in the printer's settings.
- When connecting the HG2G-5F or the HG3G/4G to a printer, an error may occur on the printer side as an unsupported device. However, data is sent that satisfies the PictBridge standard when printing, so the data can be printed correctly.

3.10 Memory Card Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Memory Card** tab is used to configure the destination folder on the memory card inserted in the MICRO/I.



Memory Card Folder

Enter the folder name for the folder to use on the MICRO/I within 8 alphanumeric characters using upper-case alphabetic characters (A to Z) and numbers (0 to 9). The default memory card folder name is "HGDATA01" .
All the data sampled with the log functions is saved in this memory card folder. For details on the memory card, refer to Chapter 30 "1 Memory Cards" on page 30-1.

- You cannot use the following characters in the folder name.
  . \ / : * ? " < > |
- After operation starts, the folders created in the memory card folder and the file names cannot be changed.

Remove Files stored in the Memory Card

Select this check box to erase the files saved in the memory card folder.

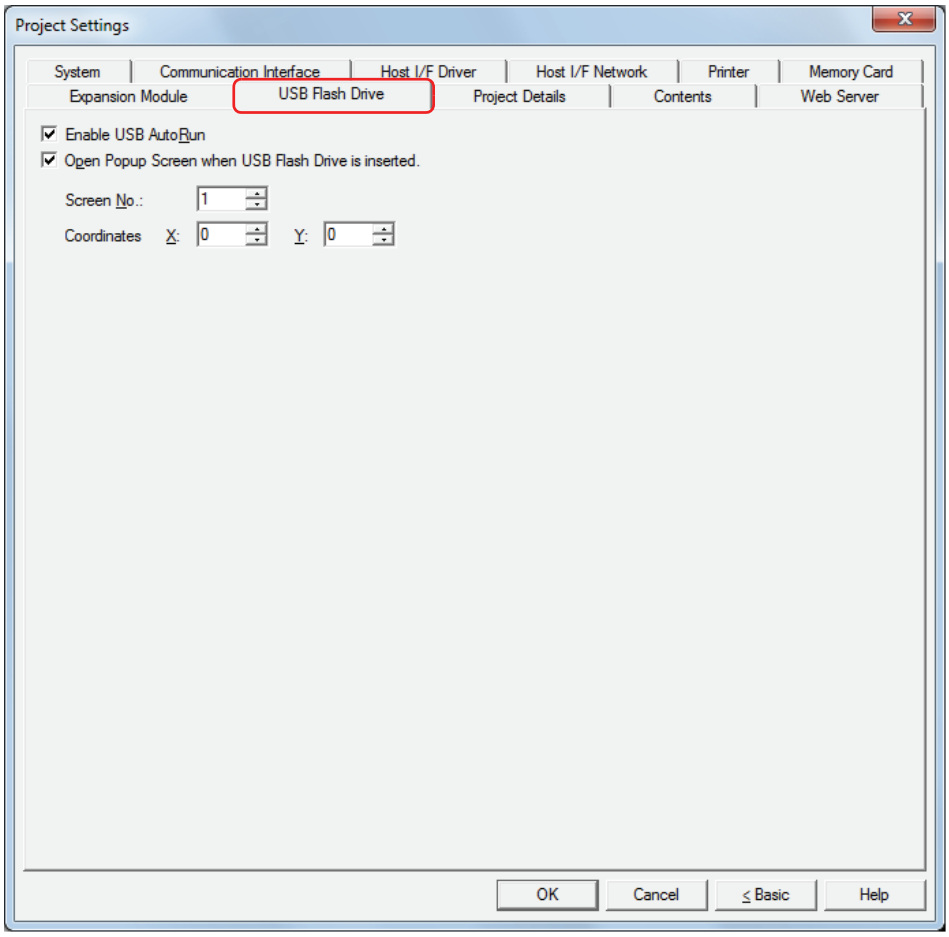
All Screenshot data:	Select this check box to erase all the screenshots in the "CAPTURE" folder.
All Alarm Log data:	Select this check box to erase all the Alarm Log data saved in folder. The folder name varies based on the model. HG2G-5F, HG3G/4G: ALARMLOG HG2F/3F/4F: ALARM
All Data Log data:	Select this check box to erase all the Data Log data saved in folder. The folder name varies based on the model. HG2G-5F, HG3G/4G: DATALOG HG2F/3F/4F: LOG
All Operation Log data*1:	Select this check box to erase all the Operation Log data saved in the "OPERATIONLOG" folder.
Trigger Device:	Specifies the bit device or bit of the word device to serve as condition to delete the files. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only

3.11 USB Flash Drive Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **USB Flash Drive** tag is used to configure the functions for a USB flash drive inserted in the MICRO/I. For details on USB flash drives, refer to Chapter 30 "2 USB Flash Drives" on page 30-25.



■ Enable USB Autorun

Select this check box to enable the USB Autorun function.

The USB Autorun function automatically displays a menu screen from which the user can execute predefined commands when a USB flash drive is inserted in the MICRO/I.

■ Open Popup Screen when USB Flash Drive is inserted

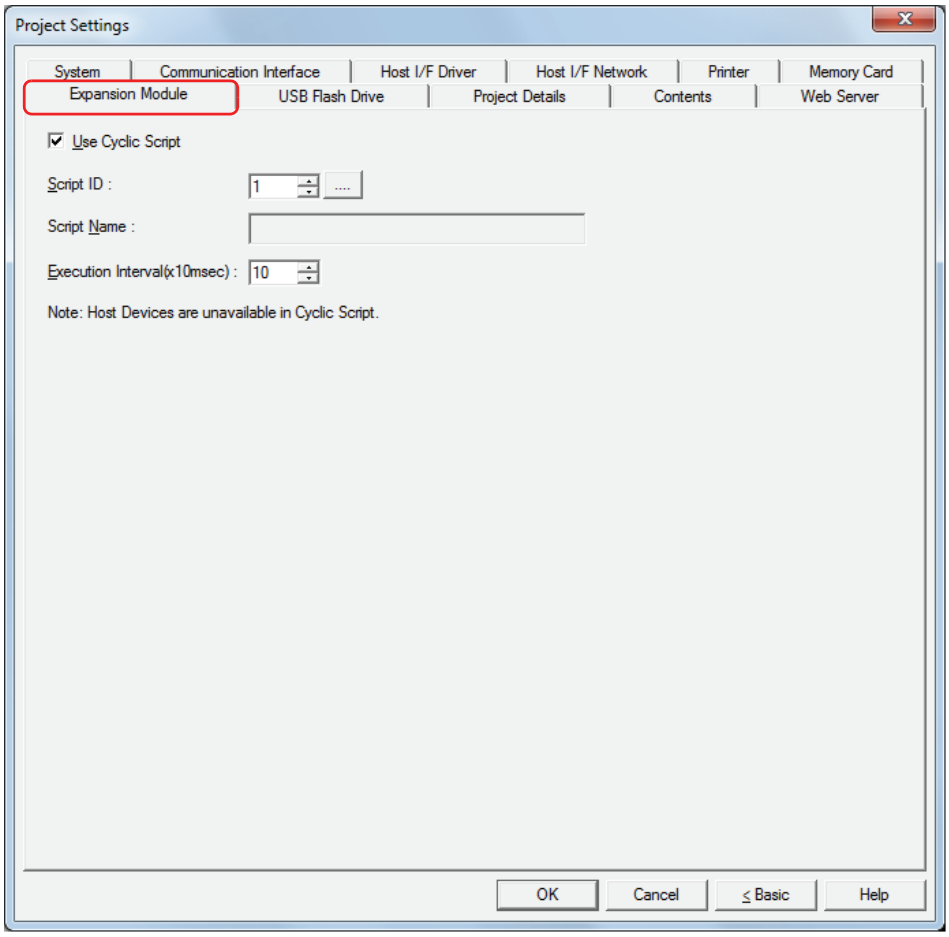
Select this check box to display a popup screen when a USB flash drive is inserted in the MICRO/I.

Screen No.:	Specifies the popup screen number (1 to 3015) to display when a USB flash drive is inserted in the MICRO/I.
Coordinates X, Y:	Specifies the coordinates to display the popup screen. With the upper-left corner of the screen as the origin, the X and Y coordinates are the upper-left corner of the popup screen. The units and range for the display coordinates are as follows. HG2G-5F, HG3G/4G: Specify the coordinates in 1 dot units. X: 0 to (base screen horizontal size - 1) Y: 0 to (base screen vertical size - 1)

3.12 Expansion Module Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Expansion Module** tab is used to configure input and output expansion modules attached to the MICRO/I. For details on expansion modules, refer to Chapter 29 "Expansion Modules" on page 29-1.



- **Use Cyclic Script**

  A Cyclic Script is a script with a trigger condition that is a fixed interval (10 ms increments). When a script is specified as a Cyclic Script, it executes at the specified fixed interval independent of the scan time of the screen (processing time for parts on the screen).

  Select this check box to use a Cyclic Script. Only one Cyclic Script can be configured for the project.

- **Script ID**

  Specify the script ID to use (1 to 32000) as the Cyclic Script.

  Click ... to display Script Manager. Select a script from the script list. For details, refer to Chapter 20 "2.2 Script Manager" on page 20-7.

- **Script Name**

  Displays the name of the script specified with **Script ID**.

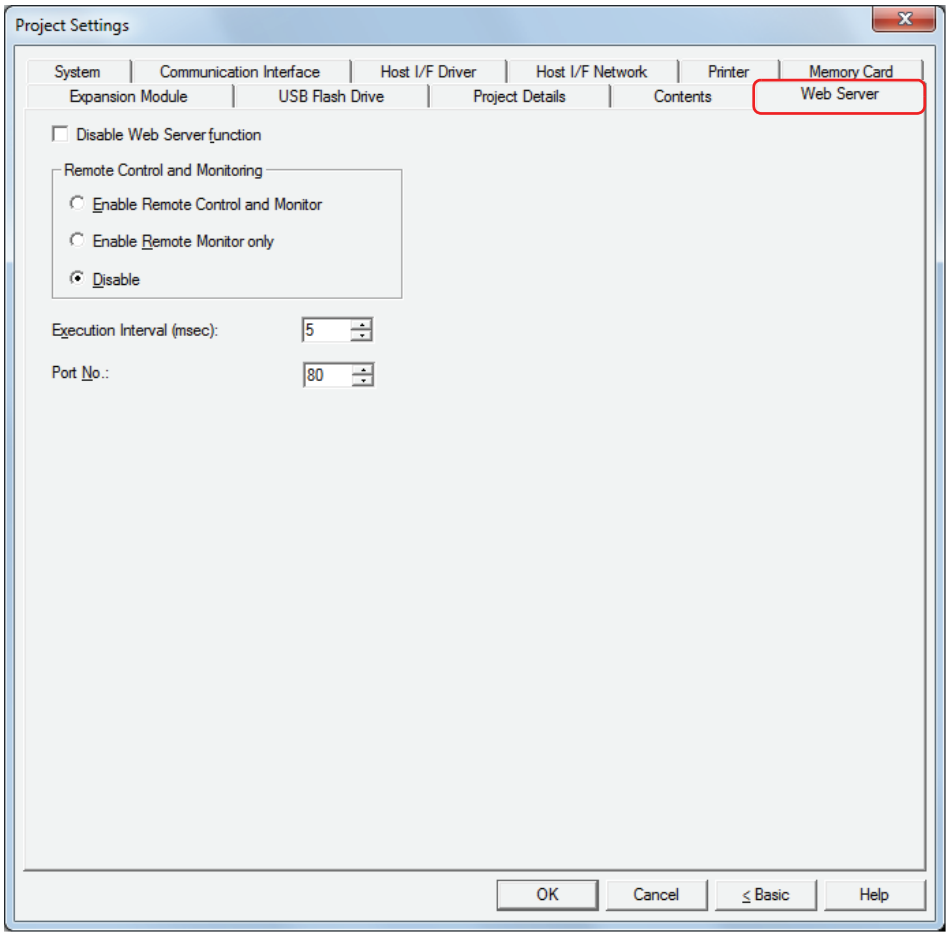
- **Execution Interval(x 10msec)**

  Specifies the interval to execute the script as 10 to 1000 (10 ms increments).

3.13 Web Server Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Web Server** tab configures the MICRO/I's Web Server function. For details, refer to Chapter 27 "1 Web Server Function (HG2G-5F, HG3G/4G)" on page 27-1.



Disable Web Server function

Select this check box to prohibit access from a web browser terminal.

When accessing the MICRO/I from a web browser terminal, not only is remote control and remote monitoring not displayed, but the detailed system information page is also not displayed.

Remote Control and Monitoring

Select the functions allowed when accessing the MICRO/I from a web browser terminal from the following.

Enable Remote Control and Monitor:	Displays a screenshot of the screen displayed on the MICRO/I. You can also control the MICRO/I being monitored by clicking on the displayed screenshot.
Enable Remote Monitor only:	Displays a screenshot of the screen displayed on the MICRO/I.
Disable:	Displays only the detailed system information page.

Execution Interval (msec)

Specifies the interval (0 to 5,000 ms) for the MICRO/I to return data. The load that the remote control function and the remote monitoring function place on MICRO/I operation can be reduced by increasing this value. However, the display update speed in the web browser will become slower.

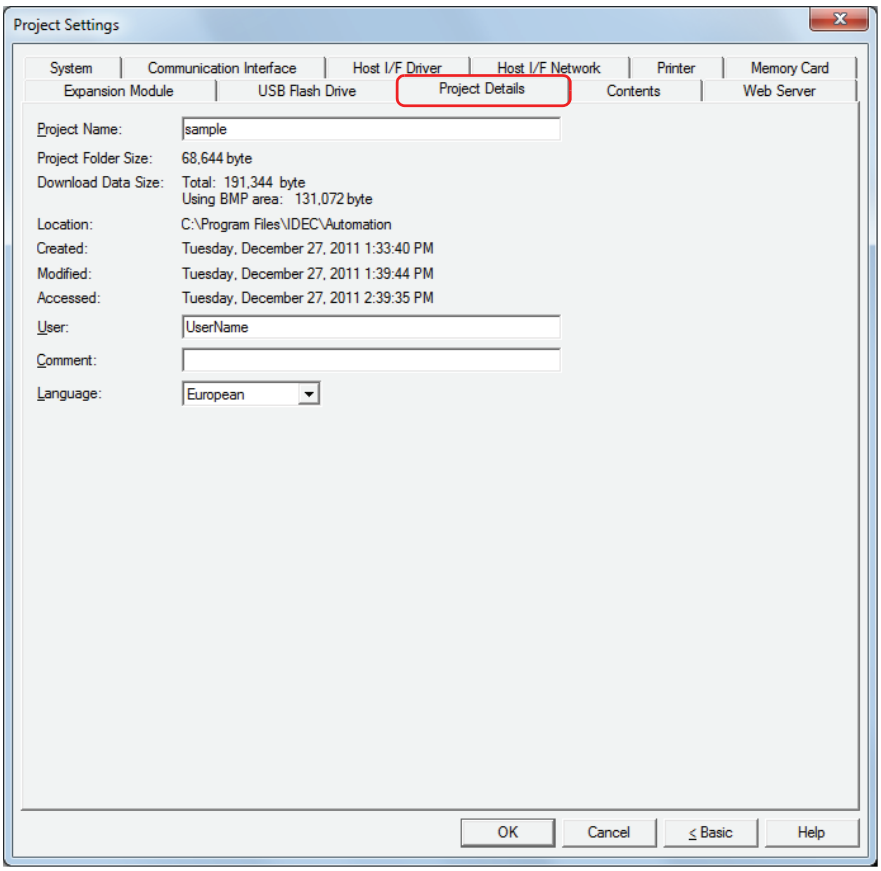
Port No.

Specifies the port number to use for the Web Server function (0 to 65,535).

3.14 Project Details Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Project Details** tab displays and configures project data information.



- **Project Name**
  Shows the current project name. To change the project name, enter a new project name. The maximum number is 50 characters.

  You cannot use the following characters in the project name.
  . \ / : * ? " < > |

- **Project Folder Size**
  Shows the total size of the current project data.

- **Download Data Size**
  Shows the total size of the data and the total size of only the image files when the current project data is downloaded.

- **Location**
  Shows the save location for the current project data.

- **Created**
  Shows the date and time the current project data was created.

- **Modified**
  Shows the date and time the current project data was last saved.

- **Accessed**
  Shows the date and time the current project data was opened.

- **User**
  Enter the name of the creator. The maximum number is 40 characters.

- **Comment**
  Enter a comment for the project data. The maximum number is 40 characters.

Language

Selects the language to use for the system information from the following. This option is also reflected in the project name displayed in the system information on the MICRO/I's System Menu screen.

European, **Japanese**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**

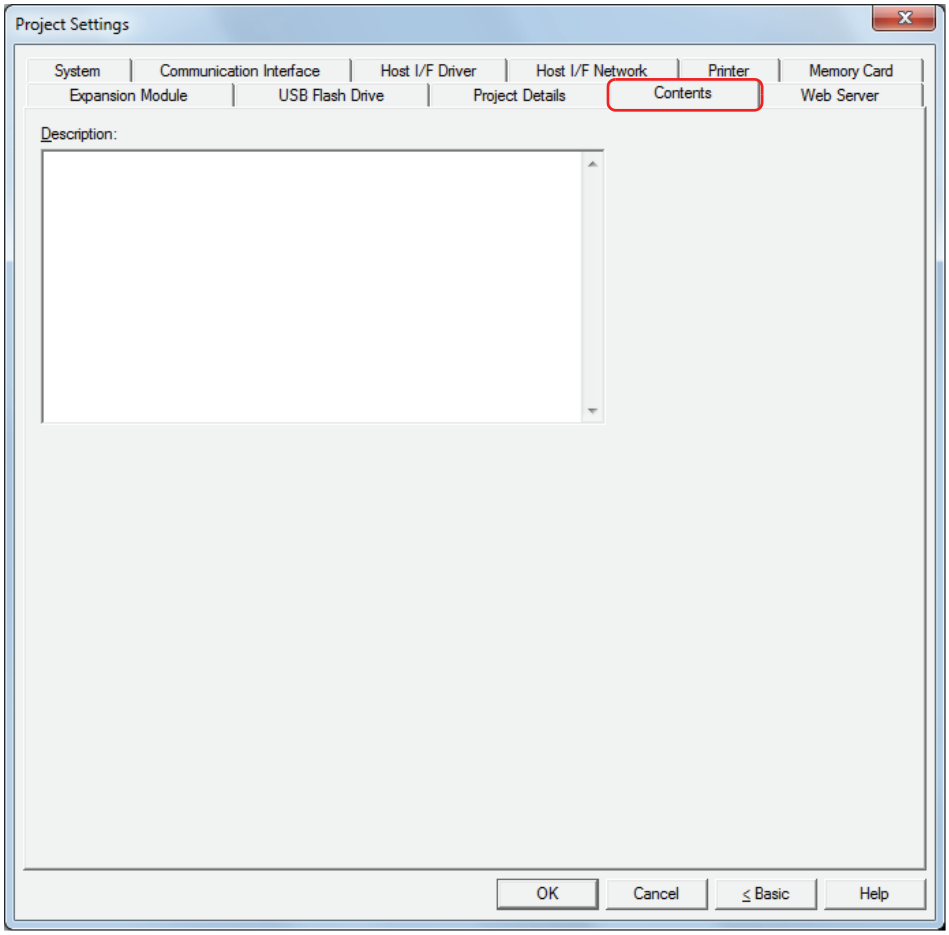
The display type for dates and times varies based on the selected language.

Japanese: YYYY/MM/DD HH:MM:SS
European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

3.15 Contents Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Contents** tab is used to enter a comment for the project data.



■ **Description**

Enter a comment for the project data. The maximum number is 511 characters. A newline is counted as two characters.

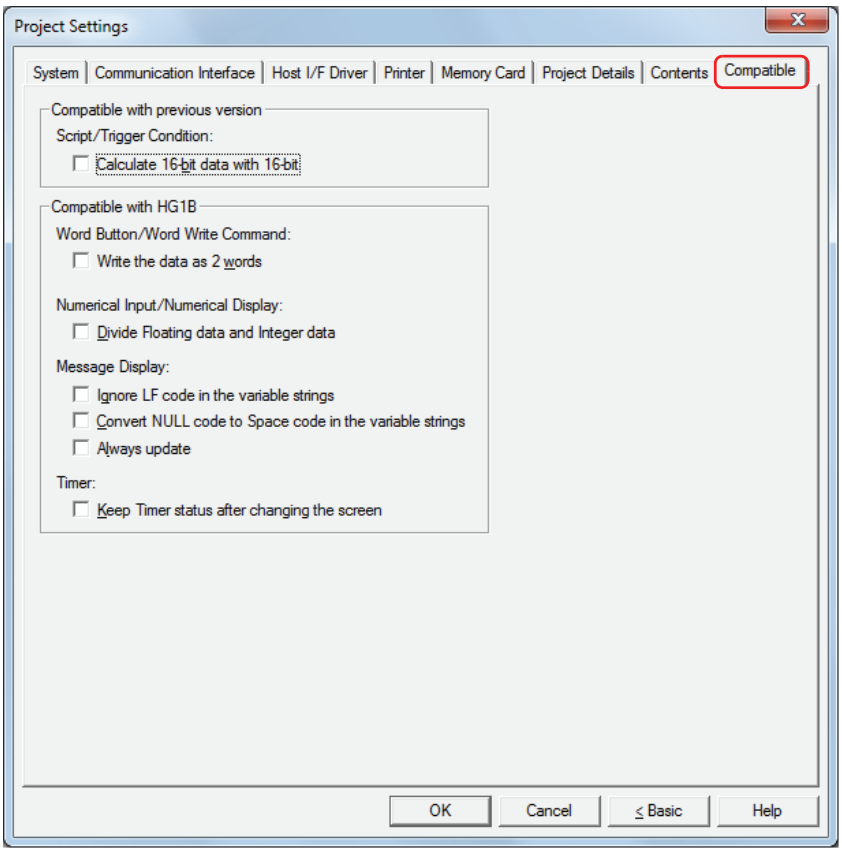
The content in **Description** is erased when the project is uploaded.

3.16 Compatible Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Compatible** tab is used to enable the functions in previous versions of WindO/I-NV2 and older MICRO/I series (HG1B).

This tab is only displayed when the **Use Compatible functions for previous version** check box or the **Use HG1B Compatible functions** check box is selected in the **WindO/I-NV2 Options** dialog box, on the **General** tab, under **Properties for Compatible function**.



Compatible with previous version

This option is only displayed when the **Use Compatible functions for previous version** check box is selected in the **WindO/I-NV2 Options** dialog box, on the **General** tab, under **Properties for Compatible function**.

Script/Trigger Condition:

Calculate 16-bit data with 16-bit:	Select this check box to calculate arithmetic operations (+, -, *, /, modulo) as 16-bit data when **BIN16(+)**, **BIN16(+/-)**, or **BCD4** is selected for **Data Type**. Data that exceeds 16 bits is lost. Clear this check box to calculate as 32 bits. No data will be lost.

Compatible with HG1B

These options are only displayed when the **Use HG1B Compatible functions** check box is selected in the **WindO/I-NV2 Options** dialog box, on the **General** tab, under **Properties for Compatible function**.

Word Button/Word Write Command:

Write the data as 2 words:	Select this check box to write the calculated result of arithmetic operations (+, -, *, /) as two words when **BIN16(+)** or **BIN16(+/-)** is selected for **Data Type**. For +, -, *, /, the calculated result is written in two words as a 32-bit numeric value. For "/" (division), the quotient data is written in the first word, and the remainder data is written in the second word. Clear this check box to write the result of arithmetic operations as one word.

Numerical Input/Numerical Display:

Divide Floating data and Integer data:	Select this check box to read and display the decimal portion of data and the integer portion of data from different device addresses when **BCD4** or **BCD8** is selected for **Data Type**.

Message Display:

Ignore LF code in the variable strings:	Select this check box to display messages by ignoring the linefeed code LF (0Ah) when displaying text according to device values. Clear this check box to display messages with line breaks using the linefeed code LF (0Ah).
Convert NULL code to Space code in the variable strings:	Select this check box to display messages by converting the NULL terminating code (00h) to a space (20h) when displaying text according to device values. Clear this check box to terminate messages with the NULL terminating code (00h).
Always update:	Select this check box to update the Message Display whenever the trigger condition is satisfied.

Timer:

Keep Timer status after changing the screen:	Select this check box to continue the timer count when switching the base screen or when displaying a popup screen.

4 Project Restrictions

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Download Restrictions

Project Data Size

The size of the project data that can be downloaded to the MICRO/I is as follows.

MICRO/I	Project data size
HG2G-S/-5S	Approx. 2 MB max (including additional fonts)
HG2G-5F, HG3G/4G	Approx. 12 MB max (including additional fonts)
HG1F	Approx. 1 MB max (including additional fonts)
HG2F/2S	Approx. 2 MB max (including additional fonts)
HG3F/4F	Approx. 6 MB max (including additional fonts)

- To check the project data size, on the **Home** tab, in the **Project** group, click **Target Info.** The **Target Information** dialog box is displayed. The project data size can be checked with **Memory Space (byte)** under **Target Runtime Information**.
- The project data size varies based on the fonts downloaded to the MICRO/I. For details, refer to Chapter 2 " Font Size" on page 2-8.

Number of Parts

The number of parts that can be downloaded to the MICRO/I are as follows.

Parts	Number of parts
Total number of Bit Buttons, Word Buttons, Goto Screen Buttons, Key Buttons	32,000 parts max
Selector switches	200 parts max

4.2 Maximum Number of External Devices

Data Log Settings

A maximum of 128 external devices can be used in the Data Log settings.

Even if the same device address is used in multiple device settings, the number of used devices is counted as 1 device for each device setting.

Global Script

The maximum number of external device addresses which can be used as a trigger condition and in scripts executed as Global Script are as follows:

HG2G-S/-5S/-5F, HG3G/4G:	Total 256 devices
HG1F/2F/3F/4F:	Total 65 devices (Script: 64 devices, Trigger Condition: one device)

If the same device address is used in multiple device settings, the number of used devices is counted as 1. It is not counted as 1 device per device setting.

Scripts

The number of external device addresses which can be used in the script are as follows:

Item	Number of devices
Destination external devices	Max. 64 Devices
Source external devices	Max. 64 Devices

- If the same device address is used in multiple device settings, the number of used devices is counted as 1. It is not counted as 1 device per device setting.
- For HG2G-S/-5S/-5F, HG3G/4G Global Script, the maximum number of source external device addresses which can be used as a trigger condition and in scripts executed as Global Script is 256.

Chapter 5 Screen

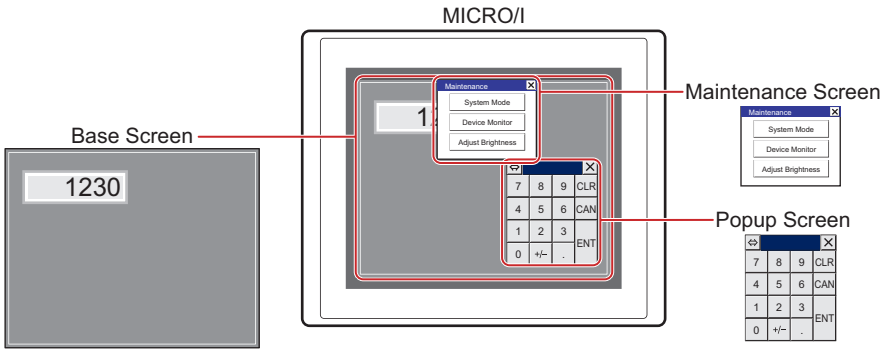
This chapter gives an overview of the MICRO/I screen and describes how to create setup and operate the screen.

1 Screen Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Screen Types

The types of screens offered by the MICRO/I and screens that can be created with the WindO/I-NV2 are given below.



Screen Type		Screen No.	Description
Screens that can be created with the WindO/I-NV2	Base Screen	1 to 3000	The screen that is displayed when the MICRO/I is in Run Mode. This screen places drawing objects and parts on the base and creates a screen that is displayed on the MICRO/I.
	Popup Screen	1 to 3015	The Popup Screen that is displayed on the Base Screen when the MICRO/I is in Run Mode. The size and coordinates of the screen can be specified and this screen can also be moved on the Base Screen. A Popup Screen for the standard Keypad*1 will automatically be created in screen numbers 3001 to 3015.
	Library Screen	–	The screen that registers often used drawing objects and parts to the set WindO/I-NV2. References the registered screen while the project is being edited and can copy and appropriate drawing objects and parts from the screen. This screen is not included in project data.
The screen provided by the MICRO/I	Maintenance Screen	–	Using the screen that is displayed when the MICRO/I is in Run Mode, you can switch from Run Mode to System Mode and load a screen to adjust device monitor and screen brightness. For details, refer to Chapter 33 "1 Maintenance Screen" on page 33-1.

1.2 Screen Size

The screen size differs depending on the MICRO/I model selected. The size of the MICRO/I screen is equal the size of the Base Screen.

Model	Screen Size (W x H)
HG1F	300 x 100 dots
HG2G-S/-5S, HG2F/2S	320 x 240 dots
HG2G-5F, HG3F	640 x 480 dots
HG3G/4G, HG4F	800 x 600 dots

*1 The Keypad that is displayed when operating Numerical and Character Input parts when **Standard** is selected under **Type** in the **Keypad** menu for Numerical and Character Input parts.

2 Creating and Manipulating WindO/I-NV2 Screens

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

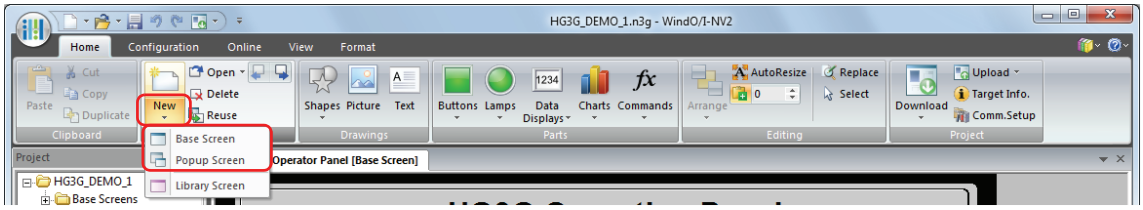
2.1 Creating Screens

This section describes how to create Base Screens and Popup Screens.

● Creating a screen

1. On the **Home** tab, in the **Screens** group, click ▼ under **New**.
2. Click **Base Screen** or **Popup Screen**.

   The **Screen Properties** dialog box is displayed.



To edit the properties for a Base Screen or Popup Screen that has already been created, double click an area in the editing window with no objects.

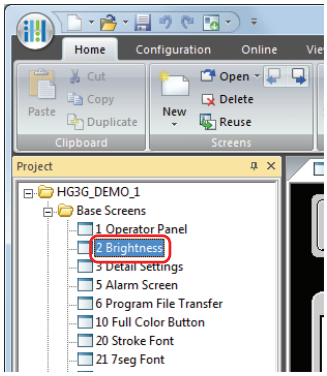
3. Change the settings on each tab as necessary and click the **OK** button.

2.2 Opening Screens

● Opening a screen

You can open a single screen that has already been created.

Double click the screen to open in the **Project** window.



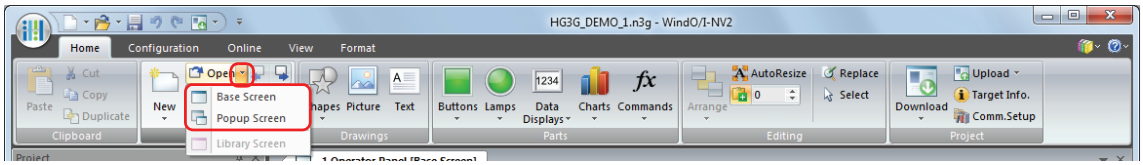
If you right click a screen in the **Project** window and then click **Open Screens**, the **Open Screens** dialog box is displayed.

● Opening specific screens

You can open multiple screens as a group.

1. On the **Home** tab, in the **Screens** group, click ▼ to the right of **Open**.
2. Click the **Base Screen** or the **Popup Screen**.

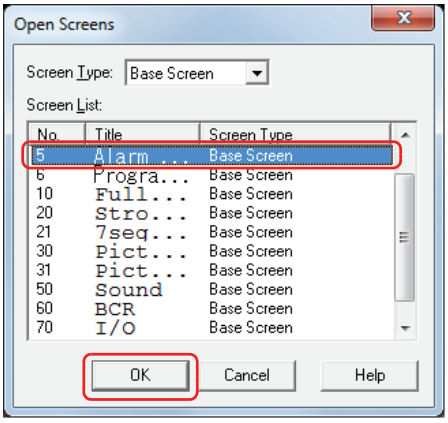
   The **Open Screens** dialog box is displayed.



If you right click a screen folder in the **Project** window and then click **Open Screens**, the **Open Screens** dialog box is displayed.

3. Click the screens to open in **Screen List** and then click the **OK** button.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



■ **Screen Type**

Select the type of screen to open from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

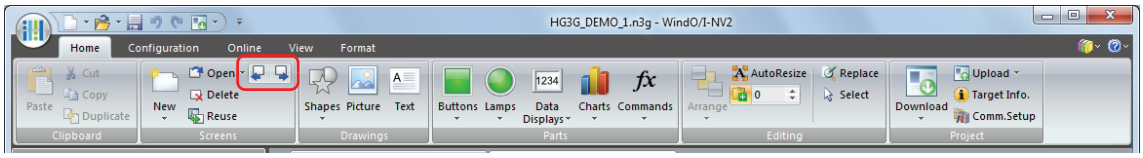
■ **Screen List**

This list shows screens that have already been created.

● Opening the previous or next screen

You can open the screen with the previous screen number or the next screen number of the screen displayed in the active editing window.

To open the screen with the previous screen number, click the (Open Previous Screen) button in the **Screens** group on the **Home** tab. To open the screen with the next screen number, click the (Open Next Screen) button.

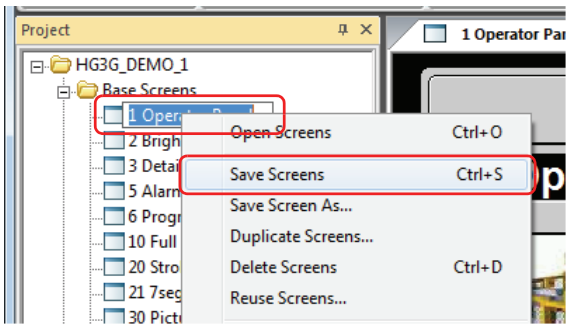


2.3 Saving Screens

● Saving a screen

You can save a single screen.

Right click the screen to save in the **Project** window and click **Save Screens**.

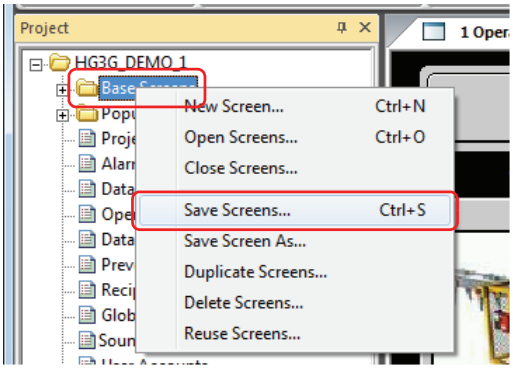


● Saving only specific screens

You can save multiple screens as a group.

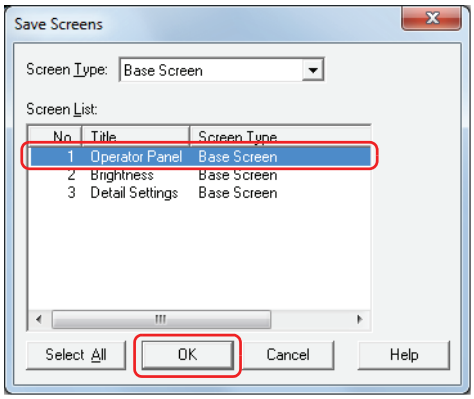
1 Right click a screen folder in the **Project** window and click **Save Screens**.

The **Save Screens** dialog box is displayed.



2 Click the screens to save in **Screen List** and then click the **OK** button.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



■ **Screen Type**

Select the type of screen to save from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

■ **Screen List**

This list shows the screens being edited.

■ **Select All**

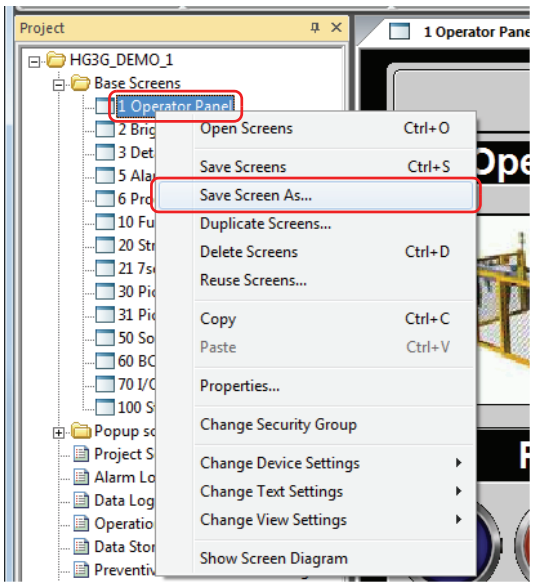
Selects all the screens displayed in **Screen List**.

● Saving a screen with a different screen number

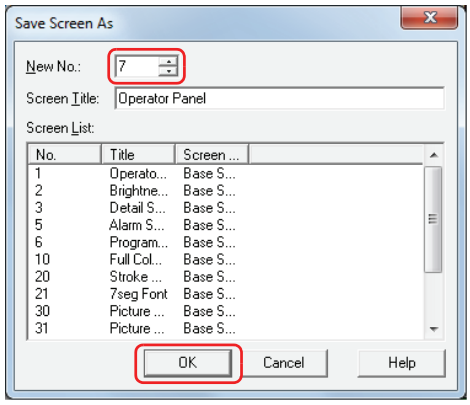
You can save the screen being edited with a different screen number.

1 Right click a screen in the **Project** window and then click **Save Screen As**.

The **Save Screen As** dialog box is displayed.



2 Specify the screen number after saving and click the **OK** button.



■ New No.

Specify the screen number (Base Screen: 1 to 3000, Popup Screen: 1 to 3015) after saving.

■ Screen Title

Enter or change the screen title. Maximum number is 40 characters.

■ Screen List

This list shows screens that have already been created.

If you specify an existing screen number and then click the **OK** button, an overwrite confirmation message is displayed.

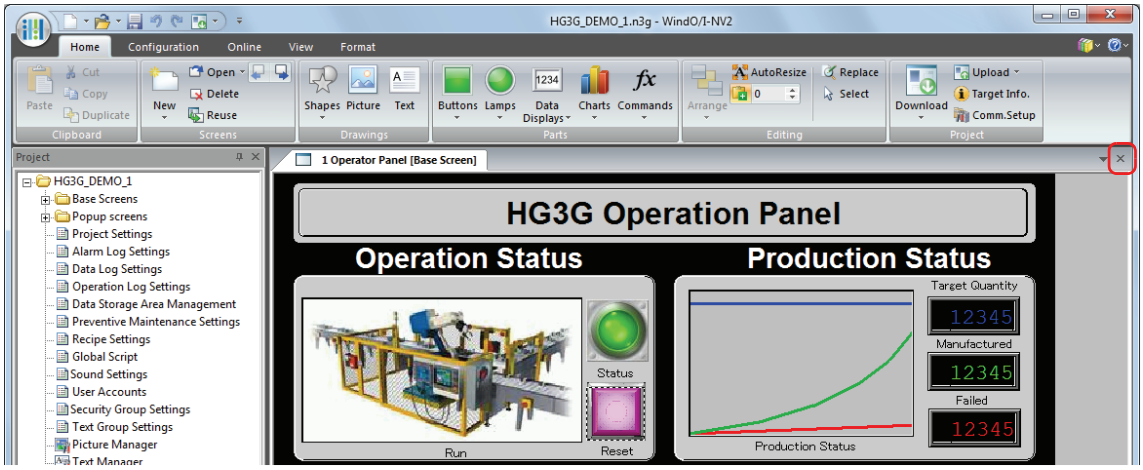
- Click the **Yes** button to overwrite the screen.
- Click the **No** button to return to the editing window without saving the screen.

2.4 Closing Screens

● Closing the displayed screen

You can close the active editing window.

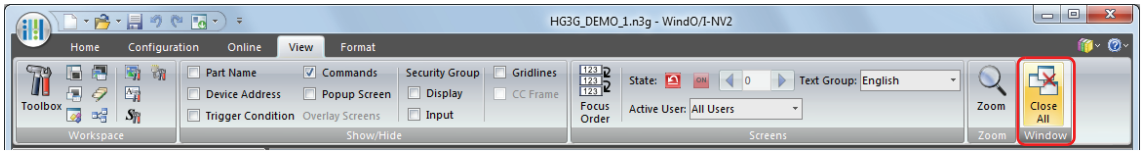
Click ✕ in the upper-right of the editing window.



● Closing all screens

You can close all the editing windows.

On the **View** tab, in the **Window** group, click **Close All**.

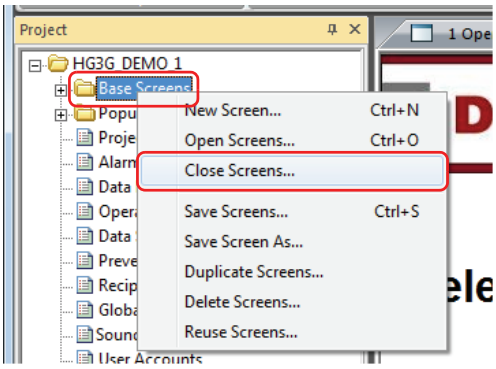


● Closing a specific screen

You can close multiple editing windows as a group.

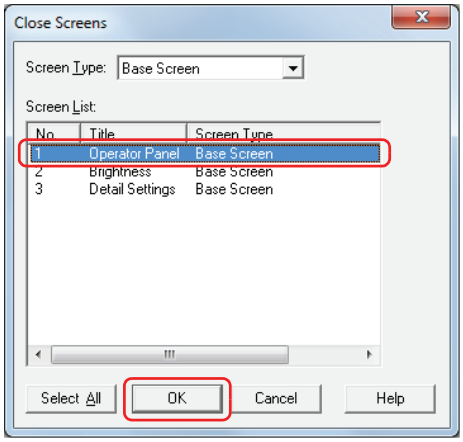
1 Right click a screen folder in the **Project** window and click **Close Screens**.

The **Close Screens** dialog box is displayed.



2 Click the screens to close in **Screen List** and click the **OK** button.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



■ **Screen Type**

Select the type of screen to close from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

■ **Screen List**

This list shows the screens being edited.

■ **Select All**

Selects all the screens displayed in **Screen List**.

If you specify an unsaved screen and then click the **OK** button, a save confirmation message is displayed.

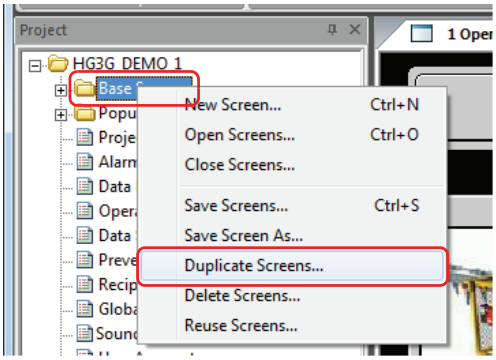
- Click the **Yes** button to save the screen and close it.
- Click the **No** button to close the screen without saving the changes.
- Click the **Cancel** button to return to the editing window without saving the screen.

2.5 Duplicating Screens

You can copy a screen that has already been created to create a new screen.

1 Right click a screen folder or screen in the **Project** window and click **Duplicate Screens**.

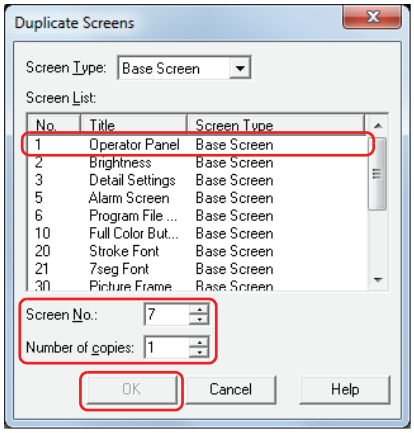
The **Duplicate Screens** dialog box is displayed.



2 Select the screens to copy in **Screen List**.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.

3 Specify **Screen No.** for the new screen and the **Number of copies** to duplicate and then click the **OK** button.



■ **Screen Type**

Select the type of screen to duplicate from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

■ **Screen List**

This list shows screens that have already been created.

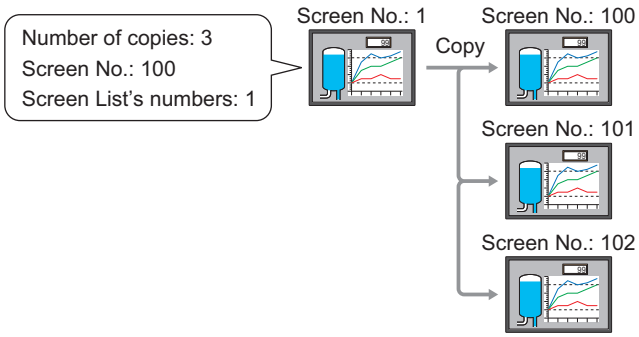
■ **Screen No.**

Specify the screen number (Base Screen: 1 to 3000, Popup Screen: 1 to 3015) for the new screen.

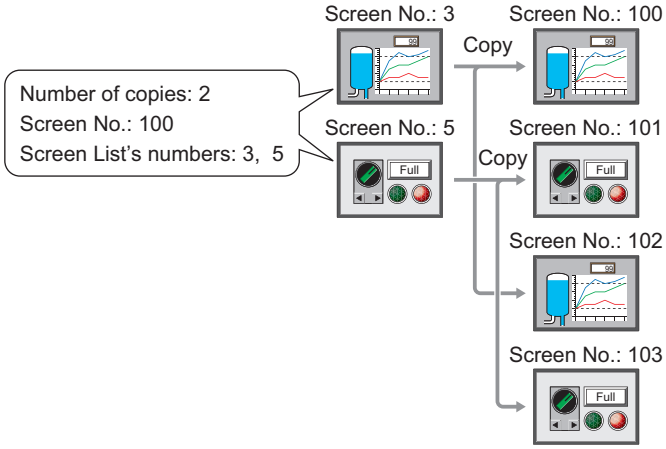
■ **Number of copies**

Specify the number of screens to copy (Base Screen: 1 to 2999, Popup Screen: 1 to 3014).

- If multiple screens are selected in **Screen List** or if the **Number of copies** is 2 or more, consecutive screen numbers are added to the screens starting with the number specified in **Screen No.**.
  Example: When a screen with screen number of **1** is selected in **Screen List**, the **Number of copies** is **3**, and **Screen No.** is **100** is selected, then the screen numbers after duplication are "100", "101", "102".



  Example: When screens with screen numbers **3** and **5** are selected in **Screen List**, the **Number of copies** is **2**, and **Screen No.** is **100** is selected, then the screen numbers after duplication are "100" and "102" for the screens duplicated from screen number **3** and "101" and "103" for the screens duplicated from screen number **5**.



- If a screen number already exists after copying and you click the **OK** button on the **Duplicate Screens** dialog box, an overwrite confirmation message is displayed.
  - Click the **Yes** button to overwrite the screen with the number displayed in the confirmation message.
  - Click the **Yes To All** button to overwrite all the screens.
  - Click the **No** button to display the next confirmation message without copying the screen with the number displayed in the confirmation message.
  - Click the **Cancel** button to stop copying screens and return to the editing window.

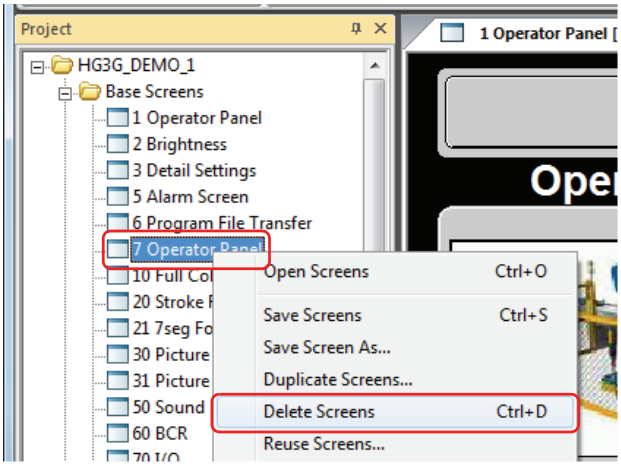
2.6 Deleting Screens

● Deleting a screen

You can delete a single screen.

1 Right click the screen to delete in the **Project** window and click **Delete Screens**.

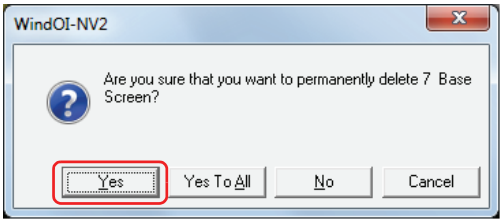
A delete confirmation message is displayed.



2 Click the **Yes** button.

The screen is deleted.

Click the **No** button or the **Cancel** button to return to the editing window without deleting the screen.

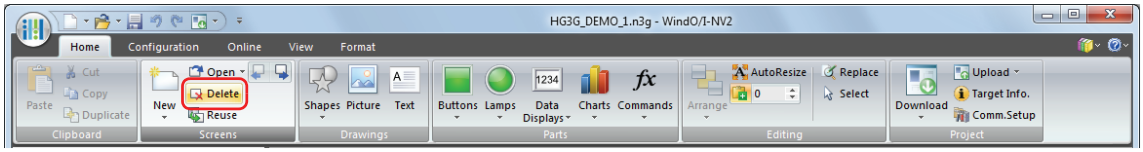


● Deleting specific screens

You can delete multiple screens as a group.

1 On the **Home** tab, in the **Screens** group, click **Delete**.

The **Delete Screens** dialog box is displayed.

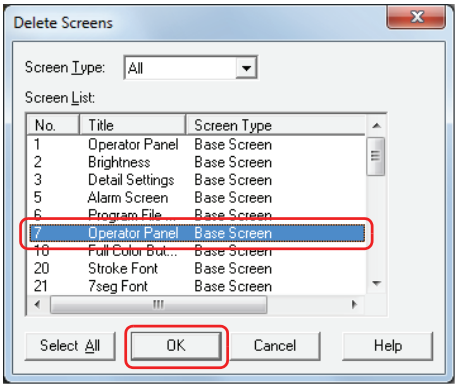


If you right click a screen folder in the **Project** window and click **Delete Screens**, the **Delete Screens** dialog box is displayed.

2 Click the screens to delete in **Screen List** and click the **OK** button.

A delete confirmation message is displayed.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



■ **Screen Type**

Select the type of screen to delete from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

■ **Screen List**

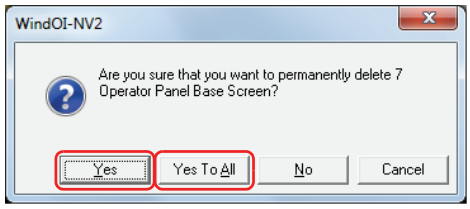
This list shows screens that have already been created.

■ **Select All button**

Selects all the screens displayed in **Screen List**.

3 Click the **Yes** button or the **Yes To All** button.

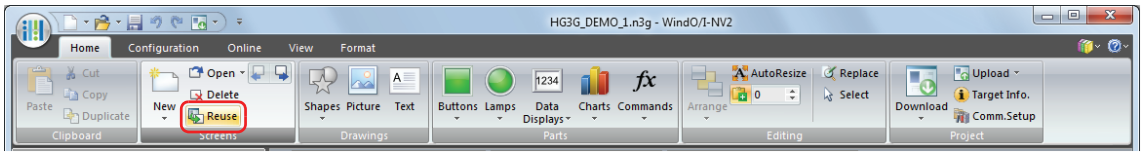
- Click the **Yes** button to delete the screen with the number displayed in the confirmation message. When deleting multiple screens, the next message to confirm deleting a screen is displayed.
- Click the **Yes To All** button to delete all the screens without displaying the confirmation message.
- Click the **No** button to display the next message to confirm deleting a screen without deleting the screen with the number displayed in the confirmation message. You will return to the editing window when finished confirming all the screens.
- Click the **Cancel** button to stop deleting screens and return to the editing window.



2.7 Reusing Screens

You can copy screens from other project data.

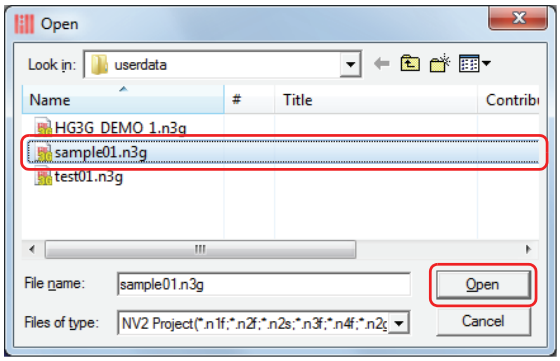
1 On the **Home** tab, in the **Screens** group, click **Reuse**.



If you right click a screen folder or screen in the **Project** window and click **Reuse Screens**, the **Open** dialog box is displayed.

2 Select project data that includes the screens to copy and click **OK**.

The **Open Screens** dialog box is displayed.



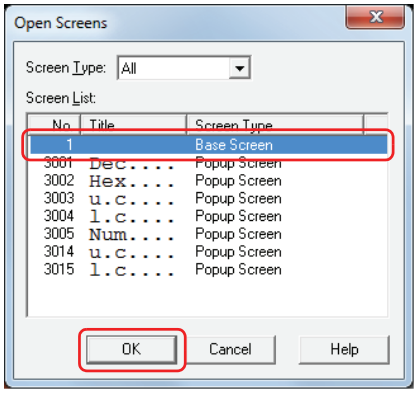
If a password has been configured for the project data, the Password Screen will be displayed.

HG2G-S/-5S/-5F, HG3G/4G:	The password to enter varies based on the check box setting of the **Use Password to open a Project** found under the **Options** tab in the **Security** dialog box. When this check box is checked, enter the password for **Use Password to open a Project**. When this check box is unchecked, enter the password for the user account assigned to the Administrator security group.
HG1F/2F/2S/3F/4F:	Enter the password for the user account assigned to the Administrator security group.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3 Click the screens to copy in **Screen List** and click the **OK** button.

To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



■ **Screen Type**

Select the type of screen to copy from the following items. The selected screen type is displayed in **Screen List**.

All, **Base Screen**, **Popup Screen**

■ **Screen List**

This list shows screens included in the source project data.

If the screen number of the screen to copy, a picture included in the screen, a text ID, or a script ID already exists in the project data being edited, an overwrite message is displayed.

- Click the **Yes** button to overwrite the item displayed in the confirmation message. If there are multiple redundant items, a confirmation message is displayed for each of those items.
- Click the **Yes To All** button to overwrite all of the picture numbers, pictures, text IDs, and script IDs.
- Click **No** and a dialog box opens for each setting. Change the item to a unique screen number or ID and click the **OK** button.
- Click the **Cancel** button to stop overwriting the displayed in the confirmation message. If there are multiple redundant items, a confirmation message is displayed for each of those items.

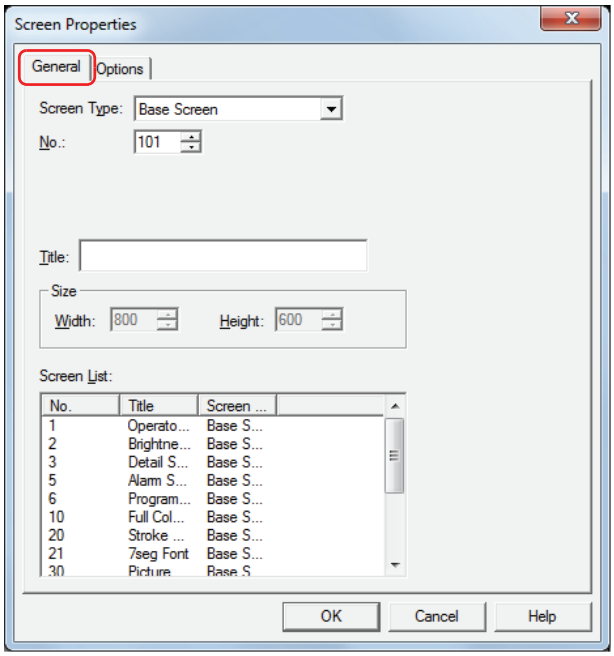
3 Base Screen

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The screen that is displayed when the MICRO/I is in Run Mode. This screen places drawing objects and parts on the base and creates a screen that is displayed on the MICRO/I.

3.1 Base Screen Settings

● **General** Tab



■ **Screen Type**
Select **Base Screen** as the screen type.
You can only select the screen type when creating a new screen.

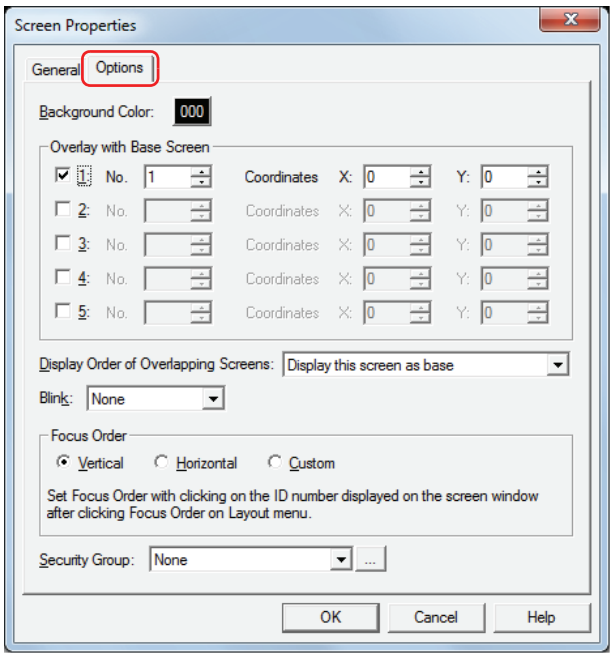
■ **No.**
Enter the Base Screen's screen number (1 to 3000).

■ **Title**
Enter the Base Screen's title. Maximum number is 40 characters.

■ **Size**
Shows the screen size. You cannot change the size of Base Screens.

■ **Screen List**
This list shows screens that have already been created. It is only displayed when creating a new screen.

● **Options** Tab



■ **Background Color**

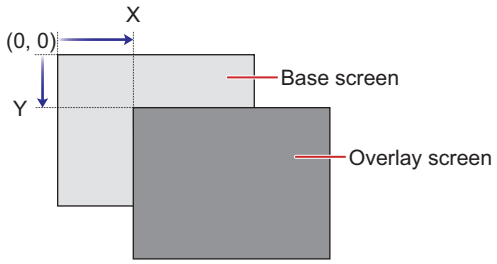
Select the screen's background color (color: 256 colors, monochrome: 16 colors). Click this button to open the color palette. Select color with the color palette.

When **Overlay with Base Screen** is configured, the background color for the Base Screen specified as the background is displayed.

■ **Overlay with Base Screen**

Configure this section to display the Base Screen by overlaying screens.

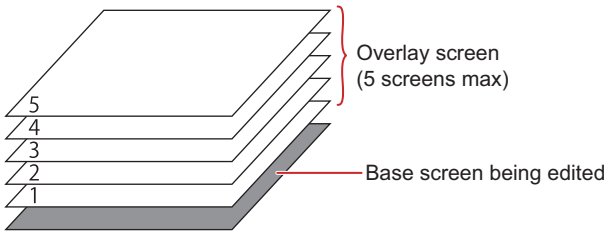
1 to 5:	Select these to display the Base Screen by overlaying screens.
No.:	Enter the overlay screen's screen number (1 to 3000).
Coordinates X, Y:	Specify the display location of the overlay screen in coordinates. The coordinates can be set in the range (Screen size - 1 dot). The origin is the upper-left corner of the screen and the X- and Y-coordinates correspond to the upper-left corner of the overlay window.



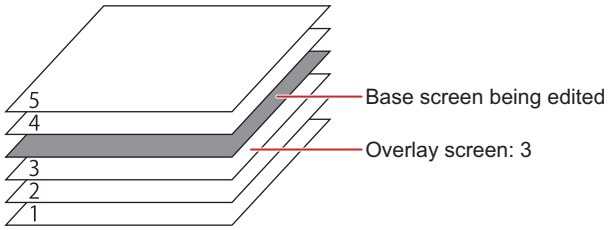
Display the Order of Overlapping Screens

You can select the display order of the Base Screen and the overlay screens.

Example: To display the Base Screen being edited as the background



Example: To display the Base Screen being edited above overlay screen: 3



Blink

Select one of the following items as the setting when the screen is blinking.

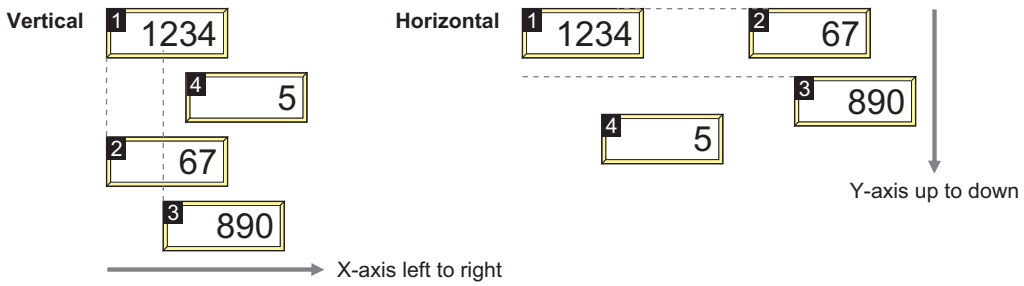
None:	Displays the screen.
Blink (1 sec cycle):	The screen display is blinked in one second intervals.
Blink (0.5 sec cycle):	The screen display is blinked in half second intervals.
Backlight OFF:	Turns off the backlight until the screen is touched or until bit 0 or bit 7 is set to 1 in the system area 1's address + 1.

Focus Order

Sets the focus order for Numerical Input and Character Input. The focus order is the order the focus moves between Numerical Input or Character Input when the user presses the **ENT** key. Text can be input in Numerical Input or Character Input that has focus. The focus order number starts from 0.

Vertical:	The focus moves vertically from top to bottom.
Horizontal:	The focus moves horizontally from left to right.
Custom:	Sets the desired order for moving the focus. On the **View** tab, in the **Screens** group, click **Focus Order**, and then click the parts in the order to move the focus.

The focus moves in the following order when Numerical Input and Character Input on the screen is not aligned to the left or top.



■ **Security Group**

Select the security group to restrict the screen display.

This option can only be set when **Use Security functions** is selected. The **Use Security functions** check box is set on **General** tab in the **Security** dialog box.

None:	Any user can open this screen.
Administrator, Operator, Reader, (Created security group):	Only a selected user can open this screen.

Click ... to display the **Security Group Settings** dialog box. If you create a security group in the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

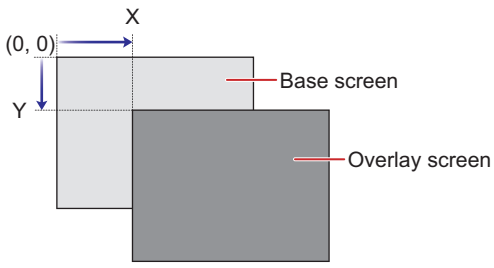
For details about the security function, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3.2 Displaying Layered Base Screens

It is possible to layer and display multiple Base Screens. The coordinates and display order for layered screens can be set on the screen that will serve as the base. A maximum of 5 layered screens can be displayed.

■ Coordinates

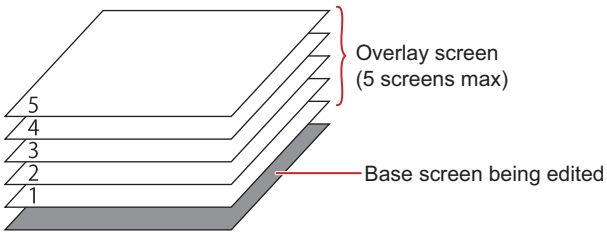
Using the upper-left corner of the screen as the origin, the upper-left area of the layered screen become the X and Y coordinates.



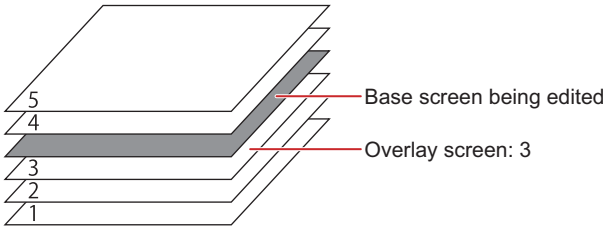
■ Display Order

This allows you to select the order of display for the screen that will serve as the base and layered screens.

Example: Displaying a Base Screen that is currently being edited as the bottom most layer

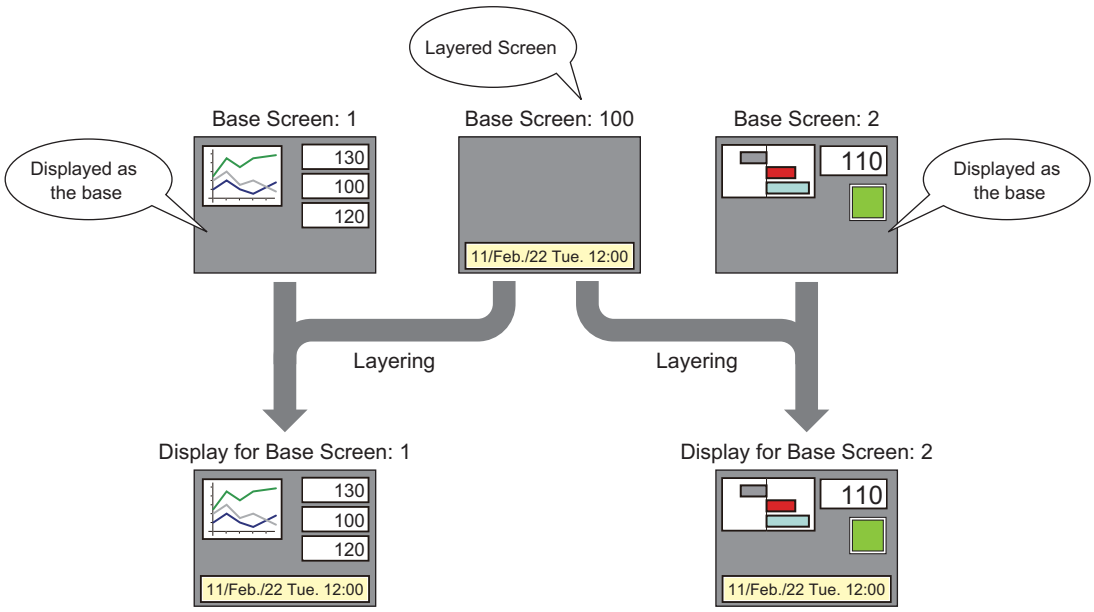


Example: Displaying a Base Screen currently being edited on the layered screen: 3.

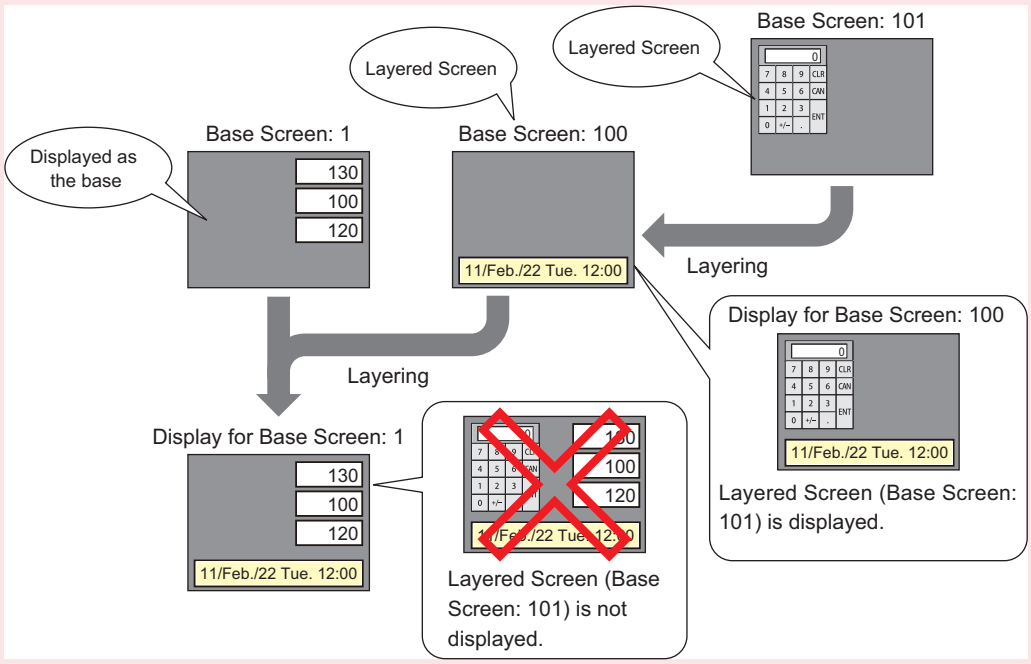


For details about how to configure these settings, refer to "3.1 Base Screen Settings" on page 5-15.

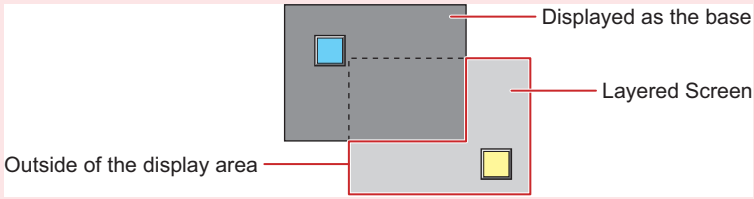
Example: When Base Screen: 100 which has a clock placed in it, is used as a layered screen, Base Screen:1 which is displayed as the base and Base Screen: 2 will be displayed as follows:



- Layered screens that have been set as layered screens will not be displayed on the screen that is displayed as the base.
  Example: Layering and displaying Base Screen: 100 on Base Screen: 1
  Layering and displaying Base Screen: 101 on Base Screen: 100



- Drawing objects and parts from layered screens may not display properly when placed outside of the displayed area.



3.3 Operating When Drawing Objects and Parts Overlap

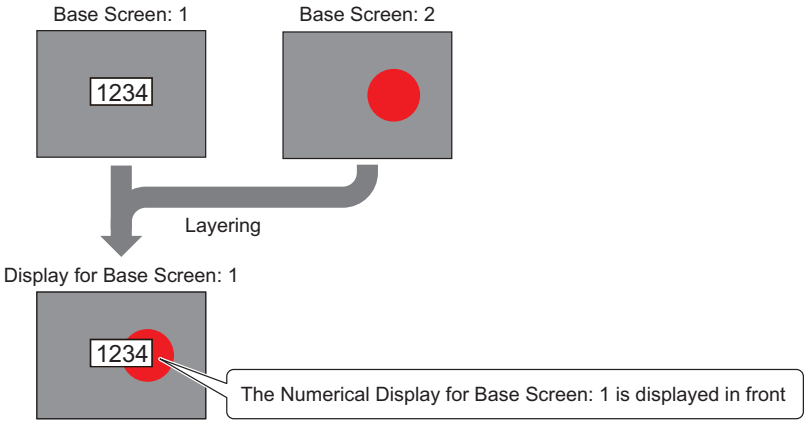
Place drawing objects and parts or parts with other parts so that they do not overlap.

When drawing objects and parts are placed or the screens are layered, if the drawing objects and parts have overlapped , the following behaviors will occur.

● When Drawing Objects and Parts Overlap

The parts will always be displayed on the foremost layer.

Example: A case where Base Screen: 2 is layered with base: 1 as the bottom most layer, and the Numerical Display belonging to Base Screen: 1 and a drawing object belonging to Base Screen: 2 overlap.



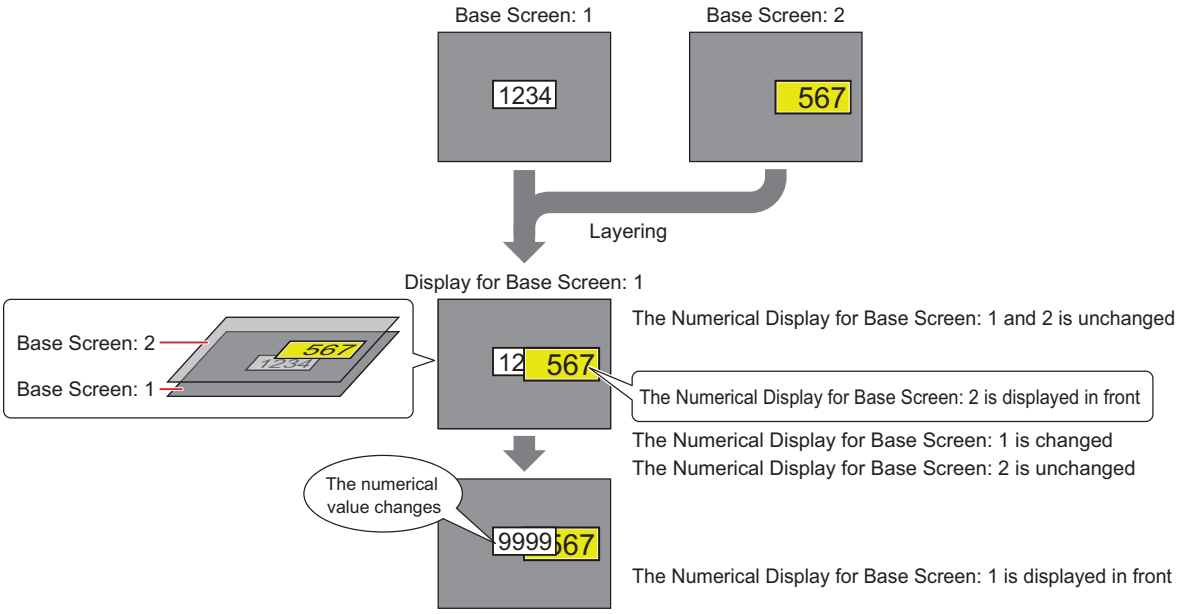
● When Parts Overlap

The behavior of overlapped parts will differ depending on the model selected and part types.

Model	Parts	Action
HG2G-5F, HG3G/4G	Selector Switch, Potentiometer, Alarm List Display, Alarm Log Display, Bar Chart, Line Chart, Pie Chart	Displayed in front
	Bit Button, Word Button, Goto Screen Button, Print Button, Key Button, Multi-Button, Pilot Lamp, Multi-State Lamp, Numerical Input, Character Input, Message Display, Message Switching Display, Numerical Display, Calendar, Meter	Not displayed in front
HG2G-S/-5S HG1F/2F/2S/3F/4F	All parts	Displayed in front

The following behaviors will occur when data or updated parts are displayed in front.

Example: A case where using the HG2G-S/-5S, Base Screen: 2 is layered with base: 1 as the bottom most layer, and the Numerical Display belonging to Base Screen: 1 and Numerical Display belonging to Base Screen: 2 overlap.

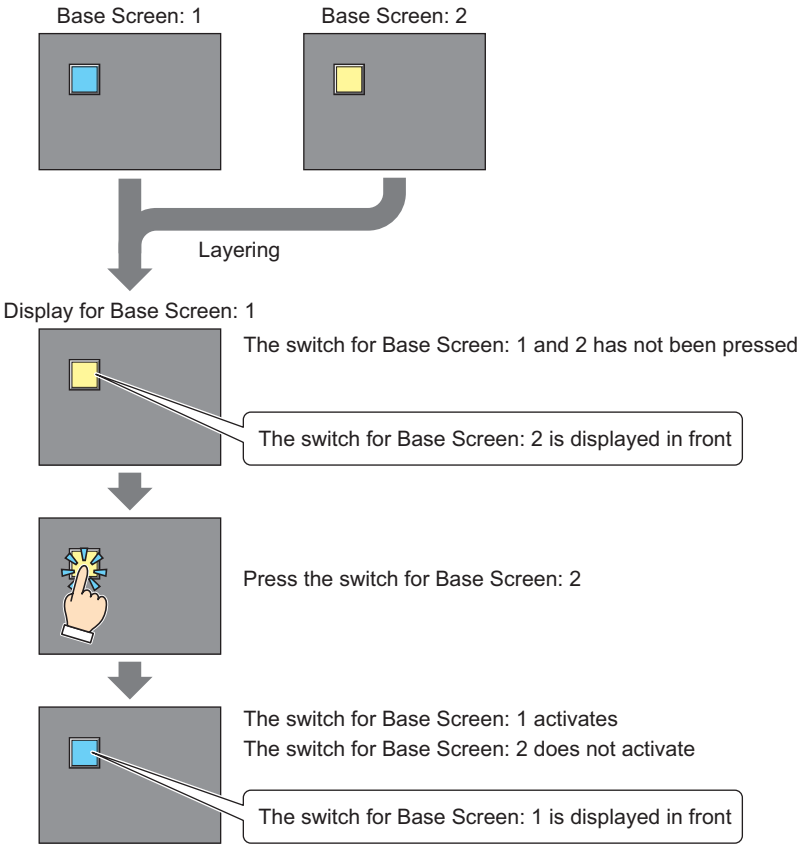


For the Message Display, Message Switching Display, and Alarm List Display, when the **Scroll** check box is selected on the **Format** tab, the display is not correctly displayed when a part overlaps it.

● When touch switches have overlapped*1

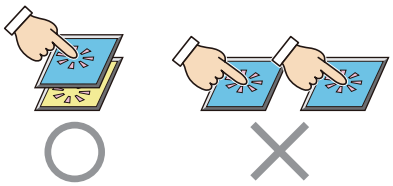
Pressing the touch switch activates the touch switch of the bottom most Base Screen and displays it in front.

Example: A case where Base Screen: 2 is layered with base: 1 as the bottom most layer (Touch switch two-point push: disabled)



When touch switch two-point push is enabled, the touch switches will be activated and the display will be updated in order starting from the switch located one layer above the bottom-most switch. Touch switch two-point push is selecting the check box labeled **Enable Two-point Push** under the **System** tab in the **Project Settings** dialog box.

The touch switch two-point push is a function performed on the analog touch panel that activates both switches when two overlapped touch switches have been pressed. There is no function that activates both switches simultaneously when two switches have been pressed.



*1 HG2G-S/-5S, HG1F/2F/2S/3F/4F only

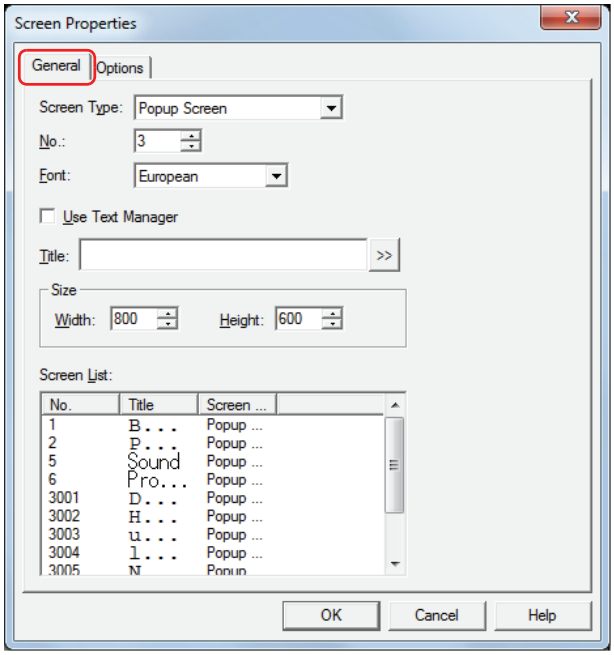
4 Popup Screen

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The Popup Screen that is displayed on the Base Screen when the MICRO/I is in Run Mode. The size and coordinates of the screen can be specified and this screen can also be moved on the Base Screen.

4.1 Popup Screen Settings

● **General** Tab



■ **Screen Type**

Select **Popup Screen** for the screen type.

You can only select the screen type when creating a new screen.

■ **No.**

Enter the Popup Screen's screen number (1 to 3015).

However, screen numbers 3001 to 3015 are Popup Screens for standard Keypads for Numerical Input and Character Input.

■ **Font**

Select the font to use for the title from the following choices:

Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**

This option can only be selected when **Use Text Manager** is cleared.

■ **Use Text Manager**

Select this to use text registered in the Text Manager for the screen title.

However, the text color is white, not the color set in the Text Manager.

■ **Text ID**

Specify the Text Manager ID number (1 to 32000) to use text registered in the Text Manager. Click ... to display the Text Manager.

This option can only be set when **Use Text Manager** is selected.

Title

Enter the Popup Screen's title. Maximum number is 40 characters. This title is displayed in the Popup Screen's title bar. This option can only be entered when **Use Text Manager** is cleared.

To enter Unicode text, click the [>>] button to display the **Unicode Input** dialog box. Enter the text in the **Unicode Input** dialog box and then click the **OK** button.

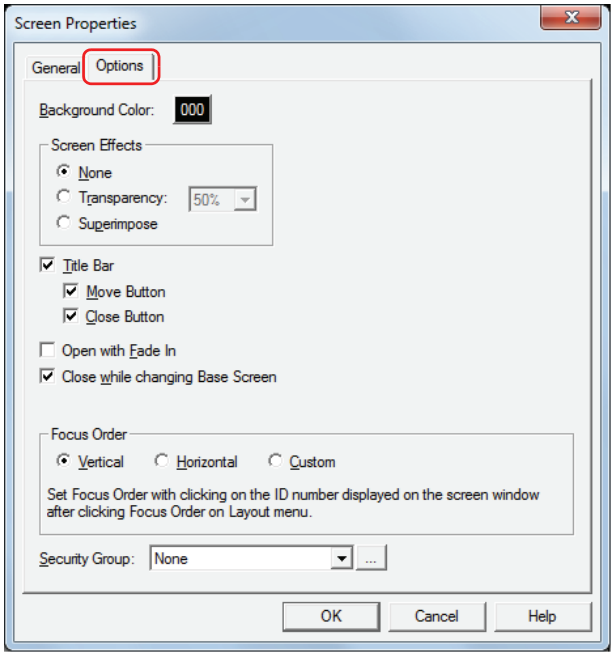
Size

Width, Height: Specify the width (40 dots to Base Screen width) and the height (40 dots to Base Screen height) of the Popup Screen.

Screen List

This list shows screens that have already been created. It is only displayed when creating a new screen.

● **Options** Tab



Background Color

Select the screen's background color (color: 256 colors, monochrome: 16 colors). Click this button to open the color palette. Select the color with the color palette.

Screen Effects*1

None: Displays the Popup Screen's background with the color specified in **Background Color**.

Transparency: Displays the Popup Screen's background as transparent. The amount of transparency can be selected from **10%** to **90%** in 10% increments.

Superimpose: Displays the Popup Screen's background as completely transparent. The screen underneath the Popup Screen can be seen.

If you select **Superimpose**, the buttons underneath the Popup Screen set to superimpose are active.

If **Superimpose** is selected in **Screen Effects**, magenta (R:255, G:4, B:255) is treated as the transparent color. If you place pictures on a Popup Screen set to superimpose that use this color, those areas are completely transparent.

*1 HG2G-5F, HG3G/4G only

■ **Superimpose**[*2]
Displays the Popup Screen's background as completely transparent. The screen underneath the popup screen can be seen.

If you select **Superimpose**, the buttons underneath the Popup Screen set to superimpose are active.

■ **Title Bar**
Select this to display the title bar on the Popup Screen. The text set in **Title** on the **General** tab is displayed in the title bar.
The title bar is not displayed if superimpose is set.

Move Button: Select this to display the ☐ or ⇔ (Move) button on the title bar.

Close Button: Select this to display the ☒ (Close) button on the title bar.

■ **Open with Fade In**[*1]
When opening a Popup Screen, select this to gradually fade in the popup screen from nothing to the transparency specified in **Transparency**.

■ **Close while changing Base Screen**
Select this to close the displayed popup screen when changing the Base Screen.

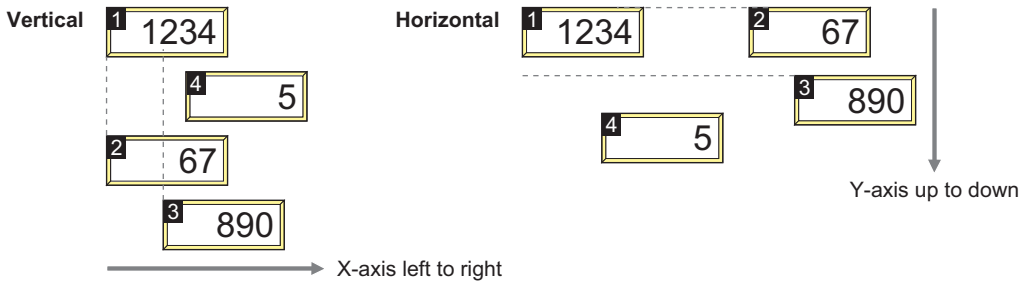
■ **Focus Order**
Sets the focus order for Numerical Input and Character Input. The focus order is the order the focus moves between Numerical Input or Character Input when the user presses the **ENT** key. Text can be input in Numerical Input or Character Input that has focus. The focus order number starts from 0.

Vertical: The focus moves vertically from top to bottom.

Horizontal: The focus moves horizontally from left to right.

Custom: Sets the desired order for moving the focus.
On the **View** tab, in the **Screens** group, click **Focus Order**, and then click the parts in the order to move the focus.

The focus moves in the following order when Numerical Input and Character Input on the screen is not aligned to the left or top.



*1 HG2G-5F, HG3G/4G only
*2 HG2G-S/-5S, HG1F/2F/2S/3F/4F only

Security Group

Select a security group to restrict displaying the screen.

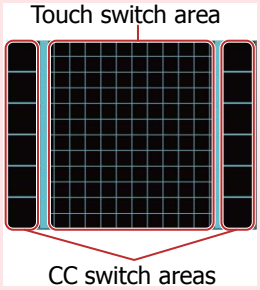
This option can only be set when **Use Security functions** is selected. The **Use Security functions** check box is set on **General** tab in the **Security** dialog box.

None:	Any user can open this screen.
Administrator, Operator, Reader, (Created security group):	Only selected users can open this screen.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

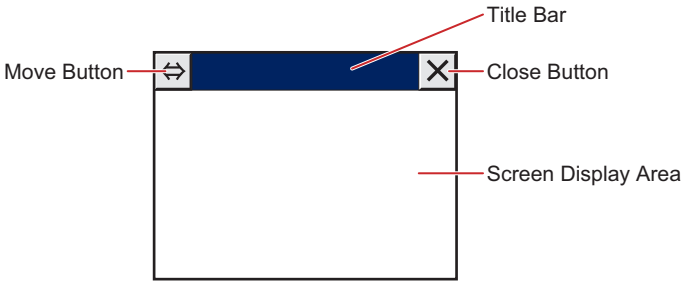
For details about the security function, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

- On the HG2S with CC switches, buttons placed on the screen may not correctly operate depending on the display position of the Popup Screen. This is because the touch grid pattern for the HG2S with CC switches differs between the area with the CC switches and the center area.



  Adjust the display position of the Popup Screen so that its buttons are displayed in touch switch areas.
- Configure the Popup Screen as described below to place buttons in the CC switch area.
  - Make the size of the Popup Screen the same as the Base Screen.
  - Clear the **Title Bar**.
  - Set the display position for the button (Goto Screen Button or Multi-Button) to display the Popup Screen to X=0, Y=0.

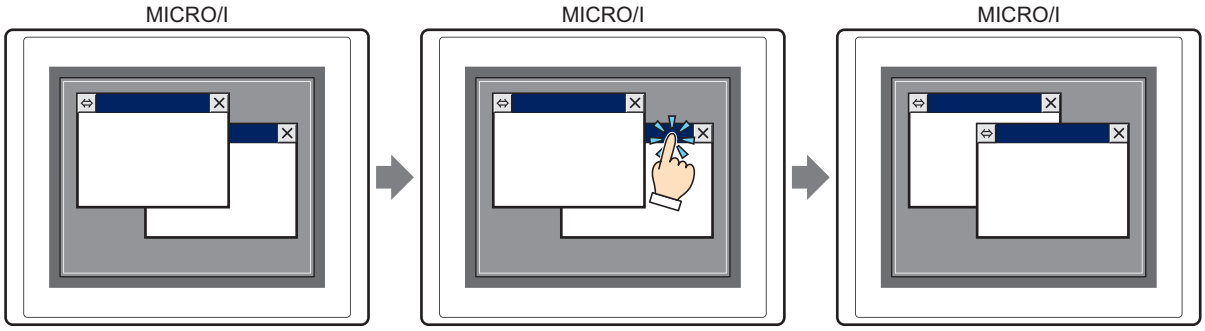
4.2 Popup Screen Configuration



■ Title Bar

Displays buttons and the title of the Popup Screen.

Pressing the title bar of the screen allows you to move the screen to the front.



When there is a title bar on the popup screen, touch switches that are within 20 dots of the title bar will not respond.

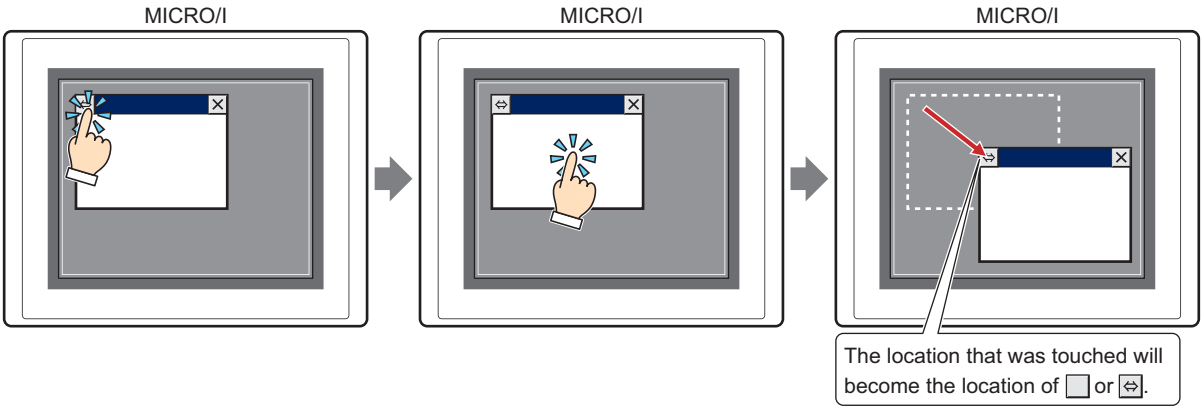
■ ☐ or ⇔ (Move) Button

Moves the Popup Screen.

1 Press ☐ or ⇔

2 Touch the position where the screen will be moved to

3 The screen will move the position that was touched

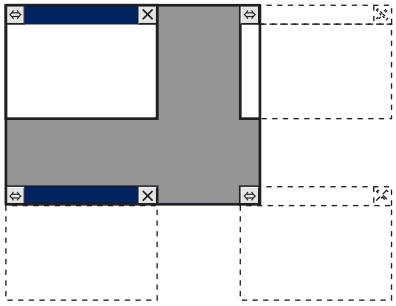


The button will differ depending on the model selected.

HG2G-S/-5S/-5F, HG3G/4G: ☐

HG1F/2F/2S/3F/4F: ⇔

- The Popup Screen can be moved in the range where the ☐ or ⇔ button can be displayed.



- The moving distance for the Popup Screen will differ depending on the model selected.
  HG2F/2S/3F/4F: 20 dot units
  HG2G-S/-5S/-5F, HG3G/4G and HG1F: 1 dot unit

■ ☒ (Close) Button

Closes the Popup Screen.

■ Screen Display Area

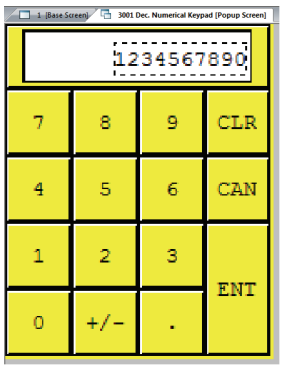
The area where drawing objects and parts are placed.

4.3 Standard Keypad Popup Screen

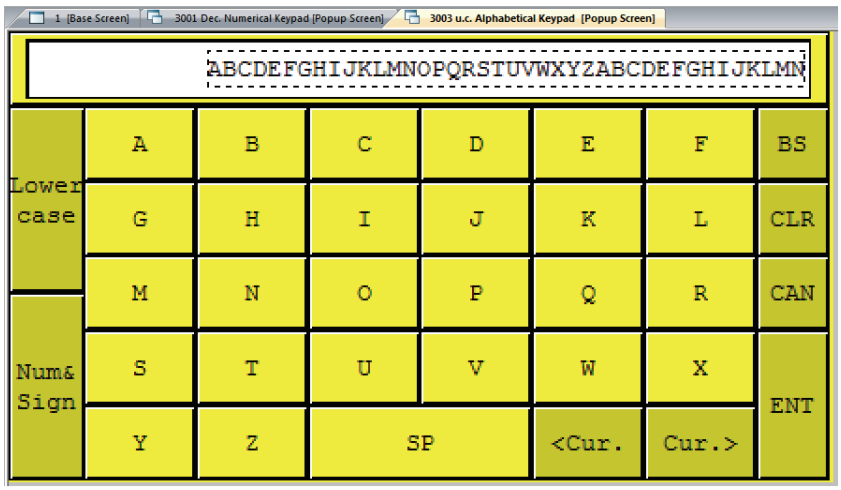
A Popup Screen that places a regular Keypad used for Numerical and Character Input on screen numbers 3001 to 3015 with the WindO/I-NV2.

Example: HG2G-5F, HG3G/4G

Decimal (Number Value) Keypad



Uppercase (Alphabet) Keypad



- The Keypad Popup Screen will differ depending on the model selected.
- The Keypad Popup Screen can also place drawing objects and parts in the same manner as Popup Screen numbers 1 to 3000.
- Screen numbers 3001 to 3015 are screen numbers that are empty when a new project has been created and are handled as normal Popup Screens.
- Deleting a Keypad Popup Screen and recreating a new Popup Screen of the same screen number will place the same Keypad.

5 Screen Restrictions

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Follow the rules below, otherwise text and messages on the MICRO/I may not be displayed or may be partially missing.

Popup screen title:	Make shorter than the title bar
Text on drawings:	Make smaller than the text area
Text and messages used in parts:	Make smaller than the size of the parts

5.1 Screen Number Restrictions

The number of screens and layered screens that can be created in a single project and the number of Popup Screens that can be displayed on the Base Screen are as follows:

Base Screen

Item	Number of screens
Number of screens that can be created	Max. 3,000 screens
Number of layered screens	Max. 5 screens

Popup Screen

Item	Number of screens
Number of screens that can be created	Max. 3,015 screens
Number of screens that can be displayed on the Base Screen	Max. 3 screens (Including the Device Monitor*1)

5.2 Maximum Number of Parts

Number of Parts That Can be Placed on a Single Screen

Screen	Number of Parts
Base Screen	Max. 960 parts
Popup Screen	Max. 480 parts

Number of Parts That Can be Displayed on a Single Screen

In addition to the currently displayed Base Screen, this includes layered screens and currently displayed Popup Screens.

Parts	Number of Parts
Alarm List Display, Alarm Log Display	1 part for either
Numerical Inputs and Character Inputs in a constant state of input	1 part for either
Potentiometer	Max. 32 parts
Numerical Input	Max. 255 parts
Character Input	Max. 255 parts
Video Display	Max. 1 part

*1 The maintenance screen is not included.

5.3 Maximum Number of Host Devices

The number of write-destination devices for usable host devices and the number of read-source devices from the host device differ depending on the screen type.

■ Base Screen (Includes Layered Screens)

Host device	Number of Devices
Write-destination Device	Max. 512 devices
Read-source Devices	Max. 256 devices

■ Popup Screen

Host device	Number of Devices	
	HG2G-S/-5S/-5F, HG3G/4G	HG1F/2F/2S/3F/4F
Write-destination Device	Max. 128 devices	Max. 128 devices
Read-source Devices	Max. 256 devices	Max. 64 devices

If the same device address is used in multiple device settings, the used number of devices will be counted as 1 device. It will not be counted as 1 point per device setting.

5.4 Vertical Installation Restrictions

The HG2G-5F, HG3G/4G and HG1F can be installed and displayed vertically. However, even if you choose for them to be installed and displayed vertically, the next screen will be the same as horizontal installation and display.

- System Mode
- Maintenance Screen*1
- Adjust Contrast Screen*1
- Password Screen*1

When the HG1F is installed and displayed vertically, the Bar Chart and Device Monitor cannot be used.

*1 HG1F only

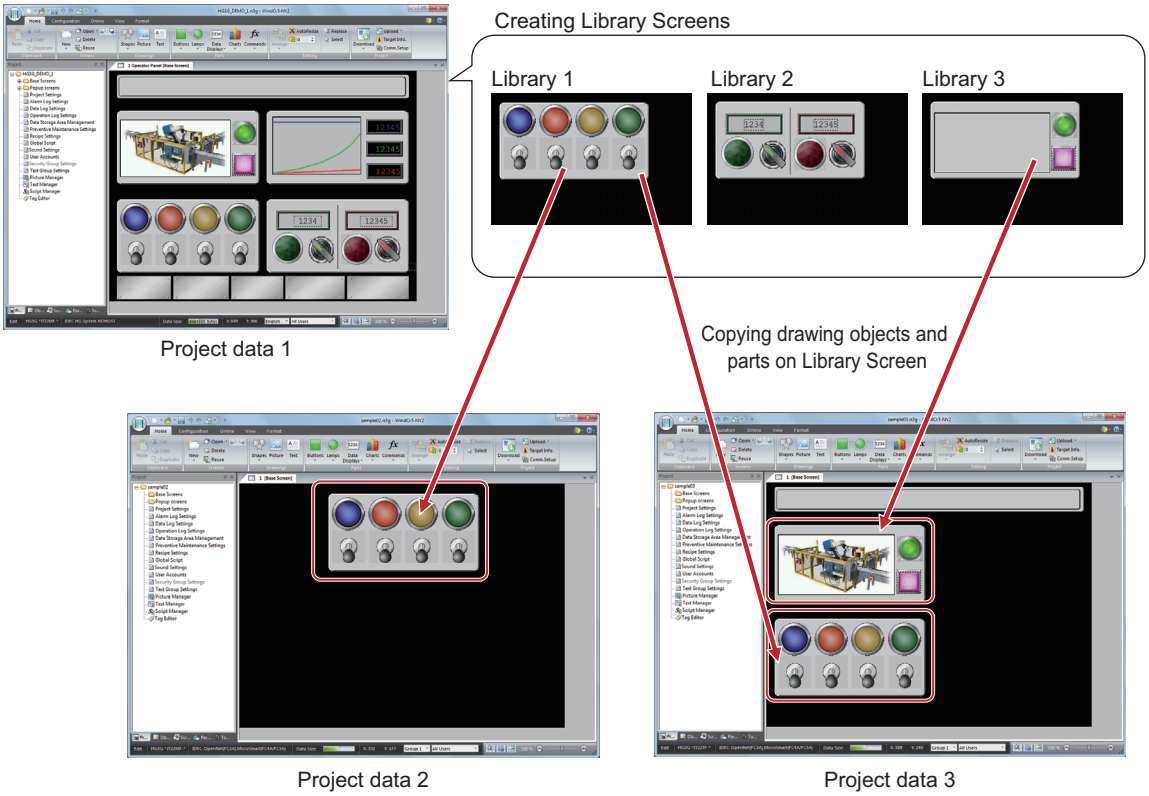
6 Using Library Screens

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

6.1 What You Can Do with Library Screens

A Library Screen is a screen where you can register frequently used drawing objects, parts, and operations in WindO/I-NV2. These screens can be accessed while editing project data. You can quickly create screens by using Library Screens.

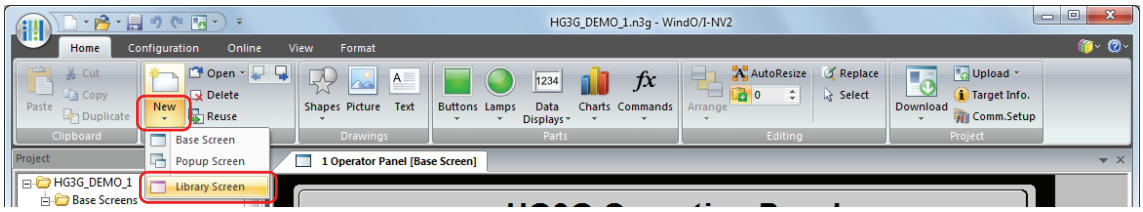
To copy Library Screens to other computers and use them as common Library Screens, use the import and export functions.



6.2 Creating a Library Screen

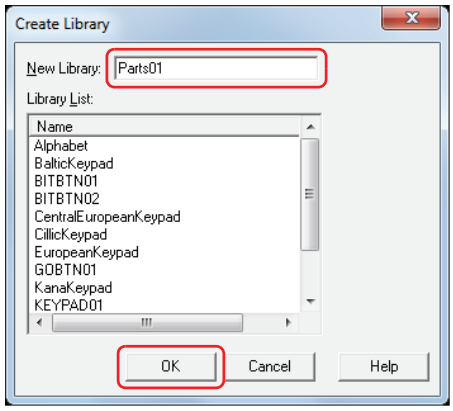
1. On the **Home** tab, in the **Screens** group, click ▼ under **New**.
2. Click the **Library Screen**.

   The **Create Library** dialog box is displayed.



3. Enter a name in **New Library** and then click the **OK** button.

   The Library Screen is displayed.



■ New Library

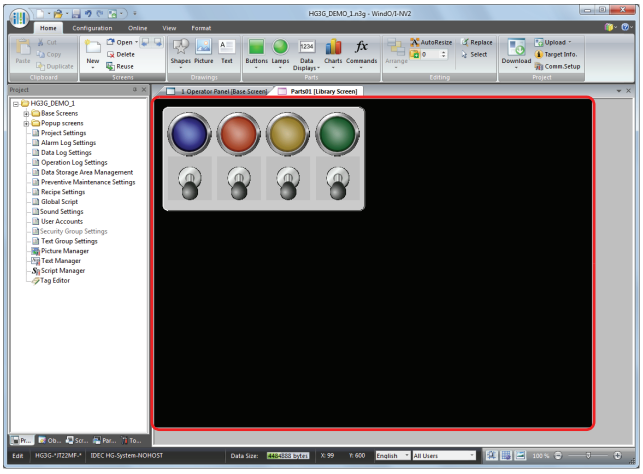
Enter the name for the Library Screen. Maximum number is 40 characters.

> You cannot use the following characters in the library name.
> . \ / : * ? " < > |

■ Library List

This list displays the registered Library Screens.

4. Configure parts and drawing objects in the Library Screen and create the screen.



5. When you are finished creating the Library Screen, click ✕ in the upper right of the screen.

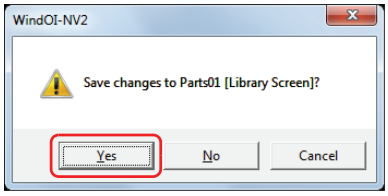
   A save confirmation message is displayed.

6 Click the **Yes** button.

This saves the Library Screen and then closes it.

Click the **No** button to close the Library Screen without saving it.

Click the **Cancel** button to return to the editing window without saving the Library Screen.



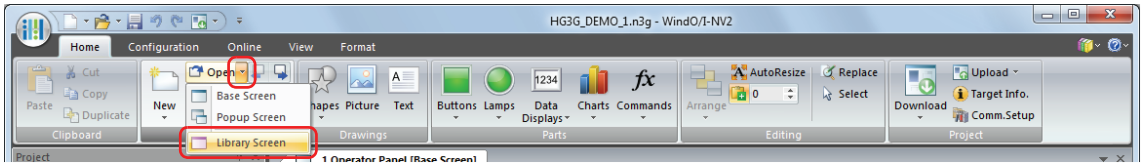
6.3 Using a Library Screen

Open a registered Library Screen to use for creating a Base Screen or Popup Screen.

1 On the **Home** tab, in the **Screens** group, click ▼ to the right of **Open**.

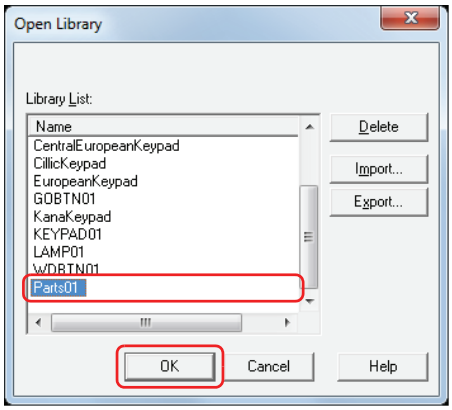
2 Click the **Library Screen**.

The **Open Library** dialog box is displayed.



3 Select the Library Screen and then click the **OK** button.

> To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



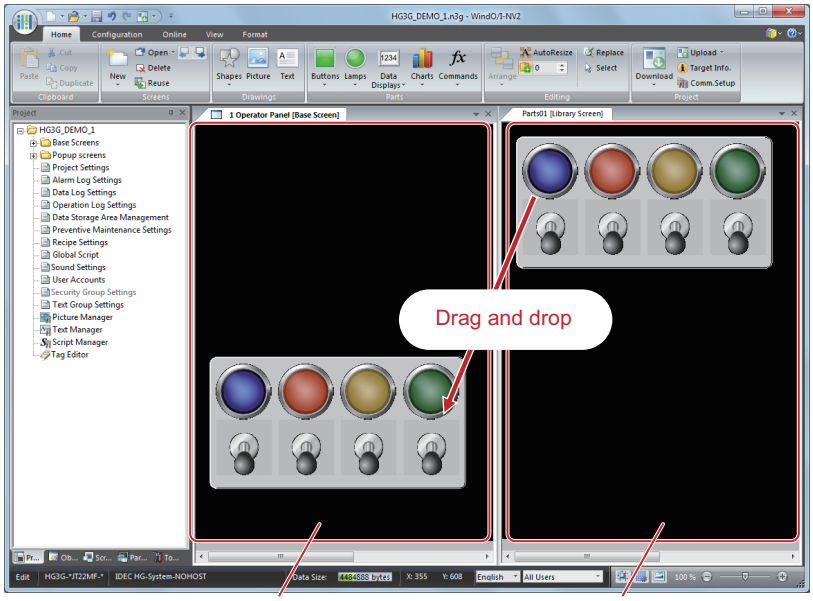
■ **Library List**
This list displays registered Library Screens.

■ **Delete**
Deletes the Library Screen selected in **Library List**.

■ **Import**
Imports an exported Library Screen.

■ **Export**
Exports the Library Screen selected in **Library List**.

4 Drag and drop or copy and paste objects to use from the Library Screen to the screen being edited.



Editing screen Library screen

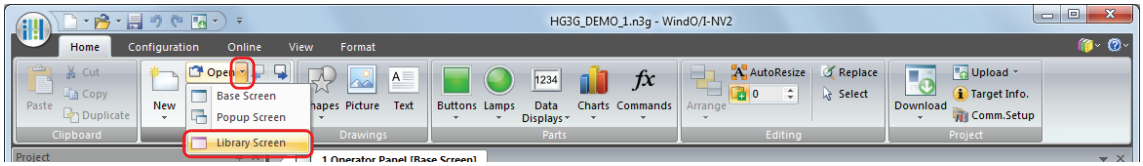
You can re-edit objects placed on the edited screen from the Library Screen.

6.4 Deleting Library Screens

You can delete multiple Library Screens as a group.

1. On the **Home** tab, in the **Screens** group, click ▼ to the right of **Open**.
2. Click the **Library Screen**.

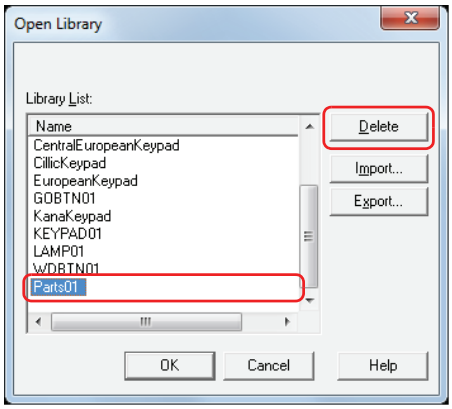
   The **Open Library** dialog box is displayed.



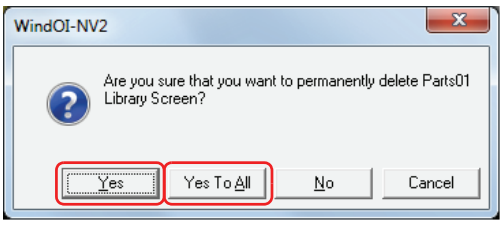
3. Select the Library Screen to delete in **Library List** and then click the **Delete** button.

   A delete confirmation message is displayed.

> To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



4. Click the **Yes** button or the **Yes To All** button.
   - Click the **Yes** button to delete the Library Screen with the library name displayed in the confirmation message. When deleting multiple Library Screens, the next message to confirm deleting a Library Screen is displayed.
   - Click the **Yes To All** button to delete all the Library Screens without displaying the confirmation message.
   - Click the **No** button to display the next message to confirm deleting a Library Screen without deleting the Library Screen with the library name displayed in the confirmation message. You will return to the editing window when finished confirming all the Library Screens.
   - Click the **Cancel** button to stop deleting Library Screens and return to the editing window.

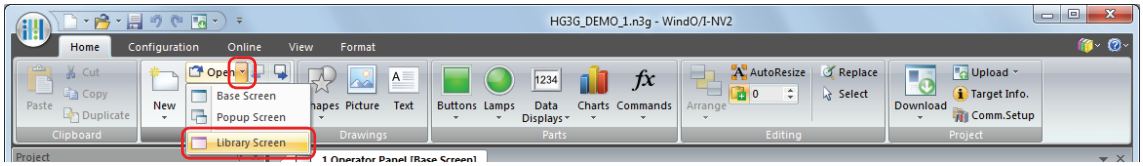


6.5 Exporting Library Screens

To use created Library Screens on another computer, export those Library Screens.

1. On the **Home** tab, in the **Screens** group, click ▼ to the right of **Open**.
2. Click the **Library Screen**.

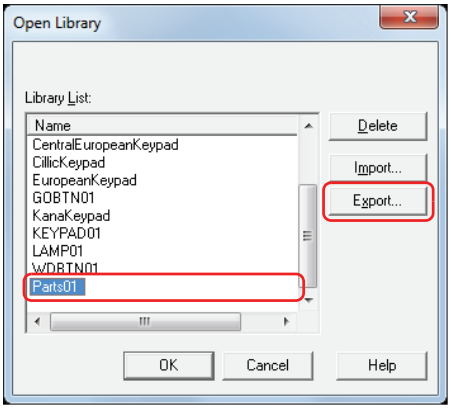
   The **Open Library** dialog box is displayed.



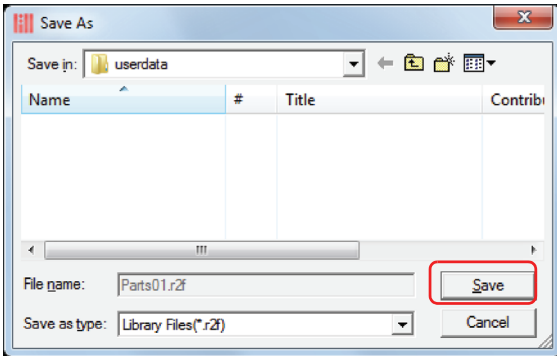
3. Select the Library Screens to export in **Library List** and then click the **Export** button.

   The **Save As** dialog box is displayed.

> To select multiple screens, Shift key + click the specific screens or Ctrl key + click the specific screens.



4. Specify **Save in** and click the **Save** button.



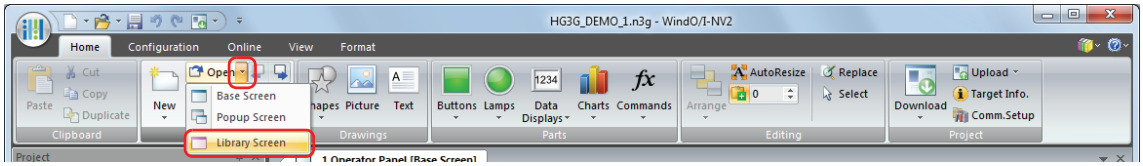
6.6 Importing Library Screens

To use Library Screens created on another computer, import those exported Library Screens into WindO/I-NV2.

1 On the **Home** tab, in the **Screens** group, click ▼ to the right of **Open**.

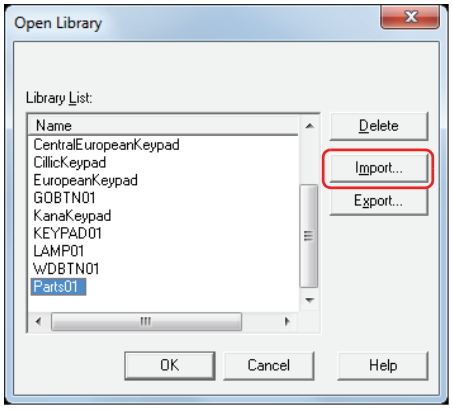
2 Click the **Library Screen**.

The **Open Library** dialog box is displayed.



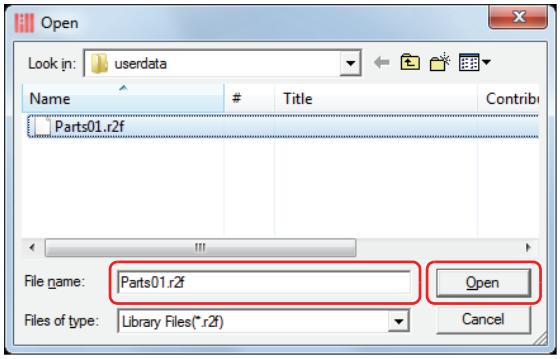
3 Click the **Import** button.

The **Open** dialog box is displayed.



4 Select a Library Screen file (*.r2f) and click the **Open** button.

The imported Library Screen is displayed in **Library List**.



Chapter 6 Drawings and Parts

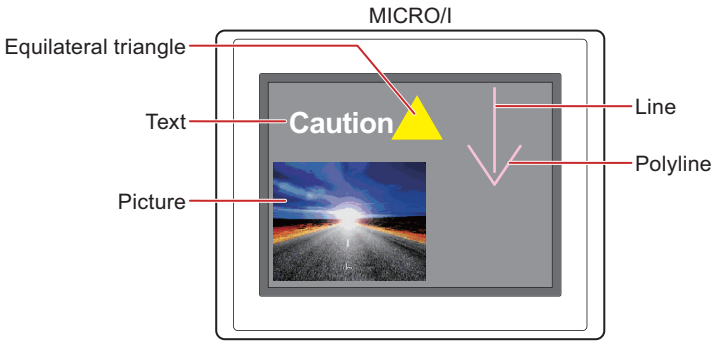
This chapter contains an overview of drawings and parts that are used when creating a screen and a description of the types of drawings and parts.

1 Overview

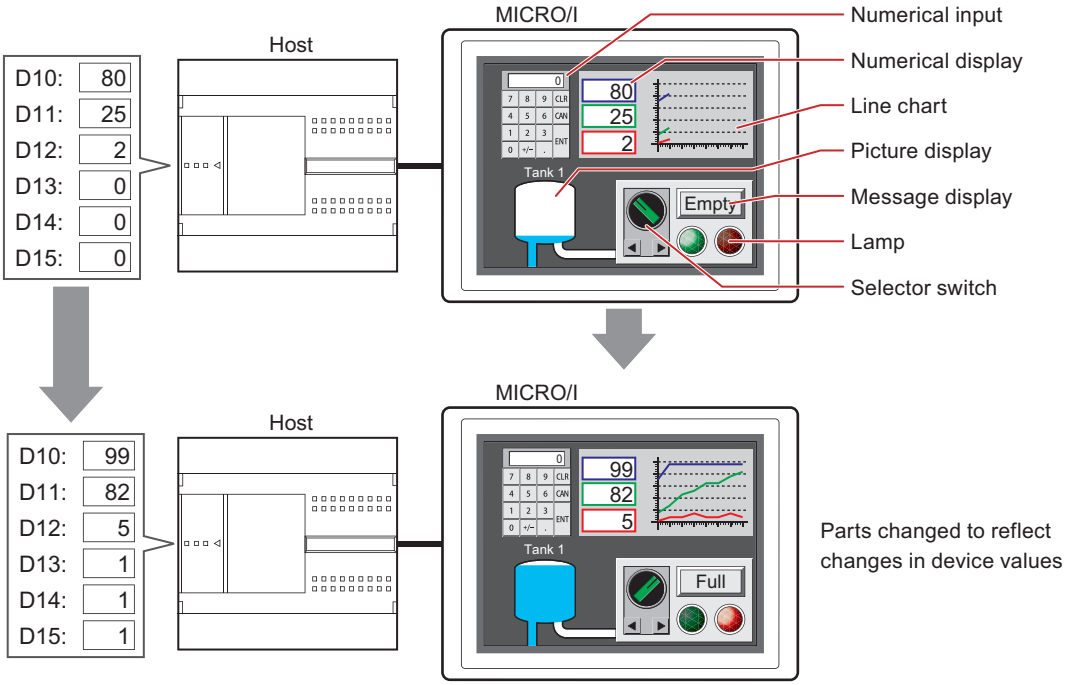
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Drawings and parts are used by placing them on base screens and popup screens.

Drawings include objects such as straight lines, polygons, circles, pictures, and static text.



Parts are objects that generate a variety of events when triggered by a change in device values or by touch.



2 Drawing objects

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the drawing objects that can be drawn in WindO/I-NV2.

2.1 Shapes

Shapes		Function
Basic Shapes	Line	Draws a line.
	Polyline	Draws a polyline.
	Polygon	Draws an object that connects two or more vertices with straight lines.
	Rectangle	Draws a rectangle.
	Circle/Ellipse	Draws a circle or ellipse.
	Arc	Draws an elliptical arc.
	Pie	Draws a pie.
Equilateral Polygon		Draws a equilateral polygon. (triangle, diamond, pentagon, hexagon, or octagon)
Paint		Paints the closed region of the drawing object.

2.2 Picture

Loads drawing objects that are registered in the Picture Manager onto the edit screen.

2.3 Text

Draws text. The maximum number is 3,737 characters.
Loads text that is registered in the Text Manager.

3 Part Types

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the parts that can be used on the MICRO/I.

3.1 Buttons

Part	Description
Bit Button	Writes a 0 or 1 to a bit device.
Word Button	Writes a value to a word device. Can be used to indirectly specify the destination address or to perform operations on the written value.
Goto Screen Button	Switches to another screen or displays a window.
Print Button	Outputs a screenshot to a printer or a memory card.
Key Button	Performs a variety of functions including uploading and downloading, copying files, and operating other parts.
Multi-Button	Executes multiple commands at once.
Keypad	A part comprised of Key Buttons. Enters numbers and characters into numerical or character input parts.
Selector Switch	Writes a 0 or 1 to a bit device. This is an exclusive control that only writes a single value as 1 and all other values as 0.
Potentiometer	Writes a value selected by pressing a slider button to a word device.

3.2 Lamps

Part	Description
Pilot Lamp	Displays images. Switches the displayed image according to the value of a bit device.
Multi-State Lamp	Displays images. Switches the displayed image according to the value of a word device.

3.3 Data Displays

Part	Description
Numerical Input	Uses either a Keypad or Key Button to write entered numbers.
Character Input	Uses either a Keypad or Key Button to write the character code for entered characters.
Picture Display	Displays images. Switches, moves or enlarges/reduces the displayed image according to the value of a word device, the bit status within a word device or at a fixed period.
Video Display	Displays images and plays movie files.
Message Display	Loads fixed text strings and word device values as character codes and displays them on the screen.
Message Switching Display	Switches the displayed fixed text string according to the value of a word device or the bit status within a word device.
Alarm List Display	Switches the displayed fixed text string according to the value of a device. Can display alarms and multiple fixed text strings.
Alarm Log Display	Displays the alarm log stored in the internal memory of the MICRO/I.
Numerical Display	Displays the numerical in the specified format.
Calendar	Displays the date and time using the MICRO/I's calendar data.

3.4 Charts

Part	Description
Bar Chart	Displays device values in a Bar Chart.
Line Chart	Displays data logs and device values in a Line Chart.
Pie Chart	Displays device values in a Pie Chart.
Meter	Displays device values using a needle gauge.

3.5 Commands

Part	Description
Bit Write Command	Writes a 0 or 1 to a bit device when certain trigger conditions are satisfied.
Word Write Command	Writes a value to a word device when certain trigger conditions are satisfied. Can be used to indirectly specify the destination address or to perform operations on the written value.
Goto Screen Command	Switches to another screen or displays a window when certain trigger conditions are satisfied.
Print Command	Outputs a screenshot to a printer or a memory card when certain trigger conditions are satisfied.
Script Command	Executes a script when certain trigger conditions are satisfied.
Multi-Command	Executes multiple commands at once when certain trigger conditions are satisfied.
Timer	Starts a countdown when certain trigger conditions are satisfied, and writes 1 to an internal device (HG timer relay LTC) after the set time has elapsed.

Chapter 7 Drawings

This chapter describes the procedures for drawing with shapes and the procedures for configuring pictures and text.

1 Shapes

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

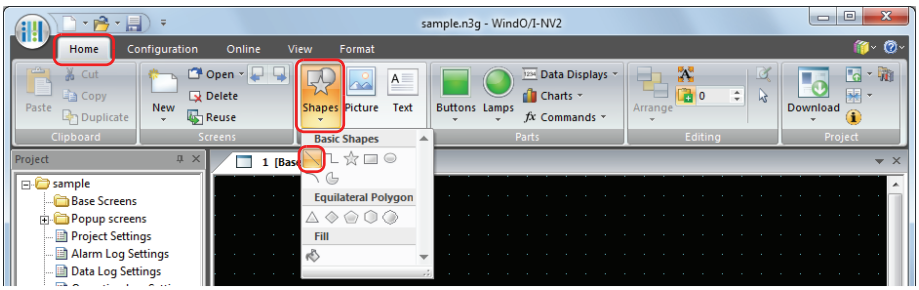
1.1 Line

● Line Drawing Procedure

This section describes the procedure for drawing lines.

1 On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Line) under **Basic Shapes**.

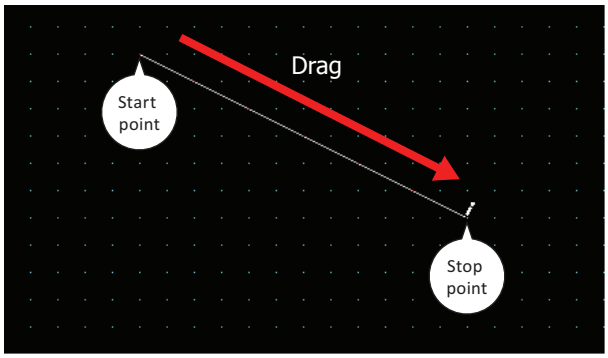
The mouse cursor changes to (pencil).



2 Click and hold the mouse button at the location (start point) to start drawing the line on the edit screen.

3 Drag the mouse to the stop point location.

A line is drawn that connects the start point and stop point.

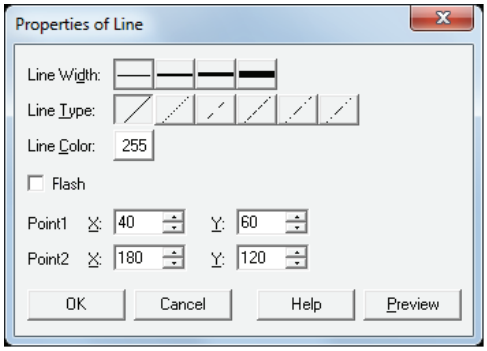


To change the style of the drawn line, perform one of the following operations.

- Double click the line to open the Properties dialog box
- Select the line and select the style with **Shape Style** on the **Format** tab
- Select the line and right click to display the popup menu

● Properties of Line Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the line from the following.

1 dot, **2 dots**, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the line from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** or **2 dots** is selected for **Line Width**.

■ Line Color

Selects the line color for the line (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

■ Flash

Select this check box to make the line flash.

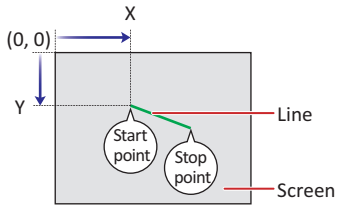
The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

■ Point1, Point2

X, Y: Specifies the start point and stop point of the line in coordinates.
The upper-left corner of the screen is the origin.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)



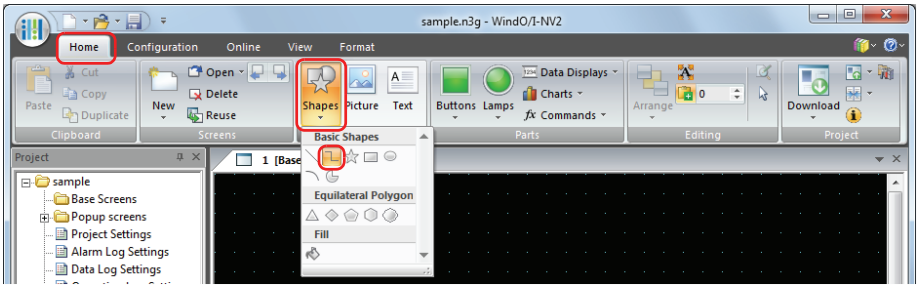
1.2 Polyline

● Polyline Drawing Procedure

This section describes the procedure for drawing polylines.

1. On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Polyline) under **Basic Shapes**.

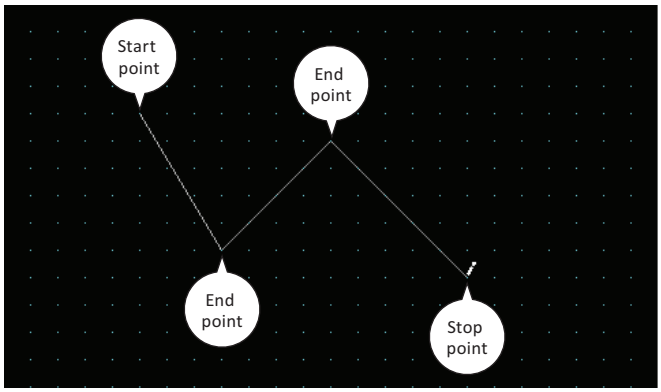
   The mouse cursor changes to (pencil).



2. Click at the location (start point) to start drawing the polyline on the edit screen.
3. Click the end point locations in order.

   A line is drawn that connects the start point and the various end point locations in the order that they were created.
4. Double click at the stop point location.

   A line is drawn that connects the last end point and the stop point.

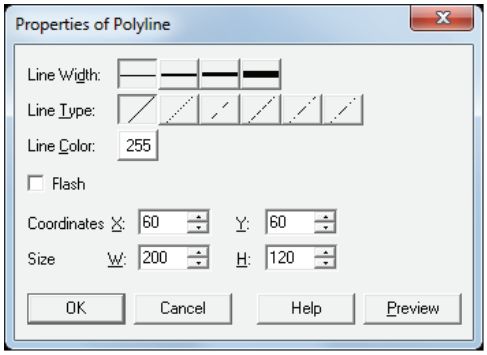


The maximum number of end points in a polyline, including the start point and the stop point, is 300 points.

- To change the style of the drawn polyline, perform one of the following operations.
  - Double click the polyline to open the Properties dialog box
  - Select the polyline and select the style with **Shape Style** on the **Format** tab
  - Select the polyline and right click to display the popup menu
- To change the start point, end points, or the stop point of the drawn polyline, select the polyline and right click on it, then click **Reshape**. is displayed on the polyline. Drag to the desired location. Double click the edit screen or press the Esc key to finish changing the shape.

● Properties of Polyline Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the polyline from the following.

1 dot, **2 dots**, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the polyline from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** or **2 dots** is selected for **Line Width**.

■ Line Color

Selects the line color for the polyline (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

■ Flash

Select this check box to make the polyline flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

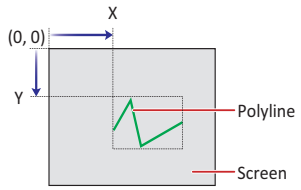
■ Coordinates

X, Y: Specifies the display position of the polyline in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the polyline is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

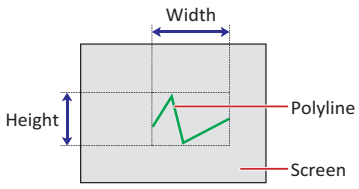


■ Size

W, H: Specifies the size of the polyline in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



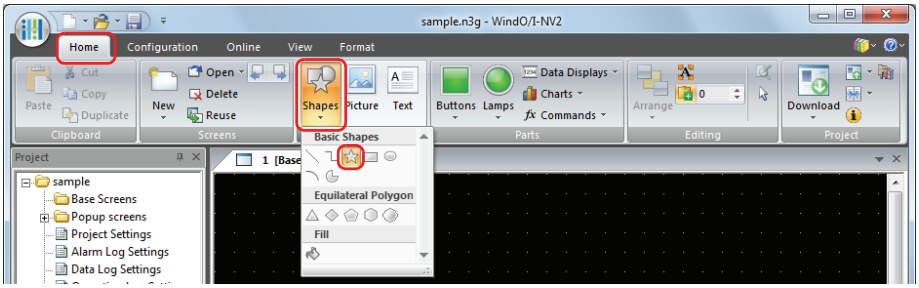
1.3 Polygon

● Polygon Drawing Procedure

This section describes the procedure for drawing polygons.

1. On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Polygon) under **Basic Shapes**.

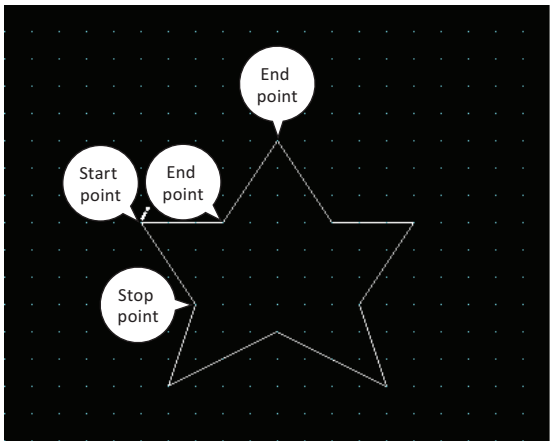
   The mouse cursor changes to (pencil).



2. Click at the location (start point) to start drawing the polygon on the edit screen.
3. Click the end point locations in order.

   A line is drawn that connects the start point and the various end point locations in the order that they were created.
4. Double click at the stop point location.

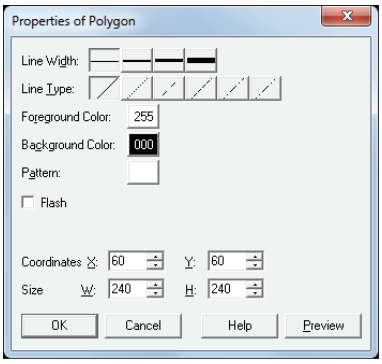
   A polygon is drawn with the start point and stop point connected.



- To change the style of the drawn polygon, perform one of the following operations.
  - Double click the polygon to open the Properties dialog box
  - Select the polygon and select the style with **Shape Style** on the **Format** tab
  - Select the polygon and right click to display the popup menu
- To change the start point, end points, or the stop point of the drawn polygon, select the polygon and right click on it, then click **Reshape**. is displayed on the polygon. Drag to the desired location. Double click the edit screen or press the Esc key to finish changing the shape.

● Properties of Polygon Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the polygon from the following.

1 dot, **2 dots**, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the polygon from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** or **2 dots** is selected for **Line Width**.

■ Foreground Color, Background Color

Selects the foreground color and the background color to use for the polygon (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern for the polygon.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Flash

Select this check box to make the polygon flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

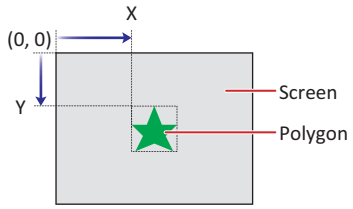
■ Coordinates

X, Y: Specifies the display position of the polygon in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the polygon is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

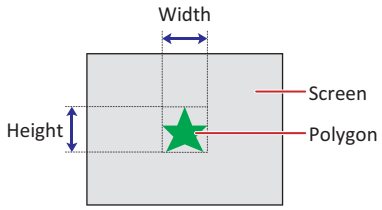


Size

W, H: Specifies the size of the polygon in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



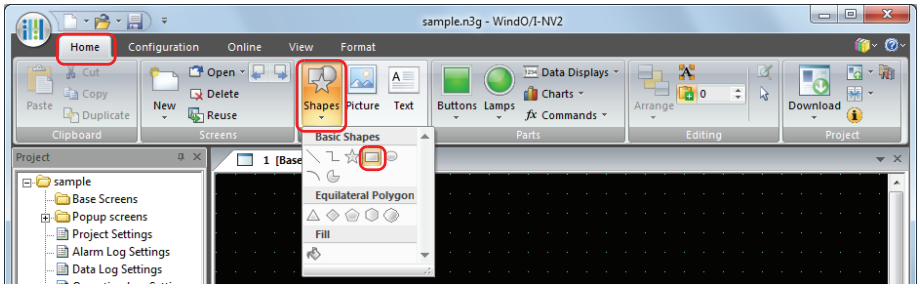
1.4 Rectangle

● Rectangle Drawing Procedure

This section describes the procedure for drawing rectangles.

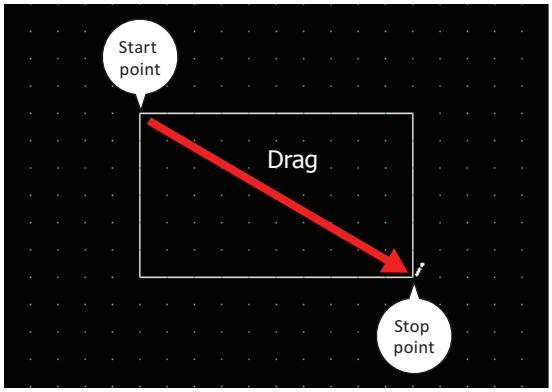
1. On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Rectangle) under **Basic Shapes**.

   The mouse cursor changes to (pencil).



2. Click and hold the mouse button at the location (start point) to start drawing the rectangle on the edit screen.
3. Drag the mouse to the stop point location so that location becomes the opposite angle of the rectangle.

   A rectangle is drawn with the start point and stop point set to opposite angles.

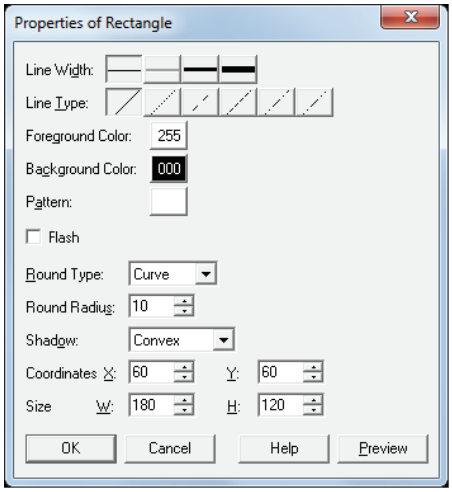


To change the style of the drawn rectangle, perform one of the following operations.

- Double click the rectangle to open the Properties dialog box
- Select the rectangle and select the style with **Shape Style** on the **Format** tab
- Select the rectangle and right click to display the popup menu

● Properties of Rectangle Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the rectangle from the following.

1 dot, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the rectangle from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** is selected for **Line Width**.

■ Foreground Color, Background Color

Selects the foreground color and the background color to use for the rectangle (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern for the rectangle.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Flash

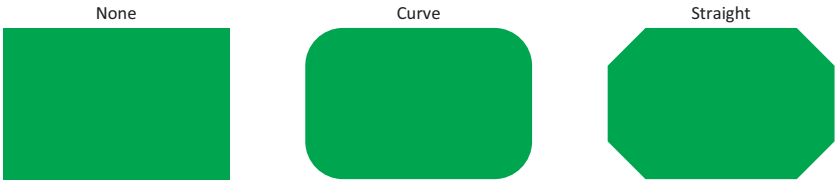
Select this check box to make the rectangle flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

■ Round Type

Selects the style of the rectangle's corners from the following.

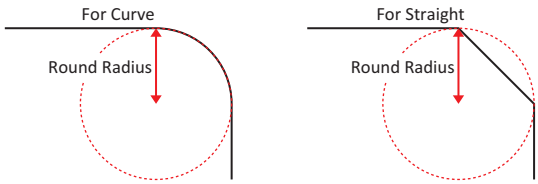
None, **Curve**, **Straight**



Round Radius

Specifies the rounding radius (1 to 200). However, the range that can be configured is where round radius x 2 is a value smaller than **Size W** and **Size H**.

This option can only be configured when **Curve** or **Straight** is selected for **Round Type**.

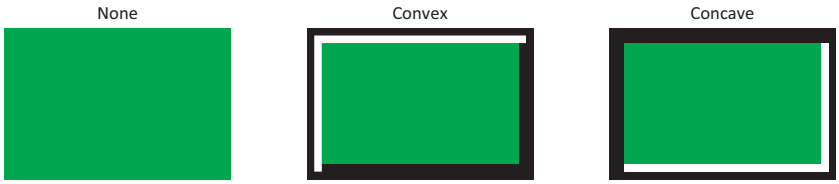


Shadow

Selects the style of shadow attached to the rectangle from the following. This option draws the rectangle in a three-dimensional manner.

None, **Convex**, **Concave**

This option can only be configured when **1 dot** is selected for **Line Width** and **Solid** is selected for **Line Type**.



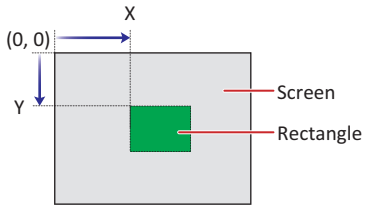
Coordinates

X, Y: Specifies the display position of the rectangle in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

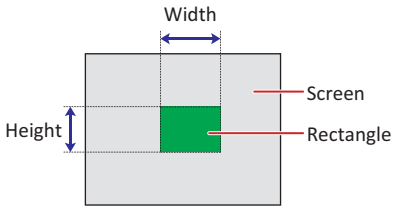


Size

W, H: Specifies the size of the rectangle in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



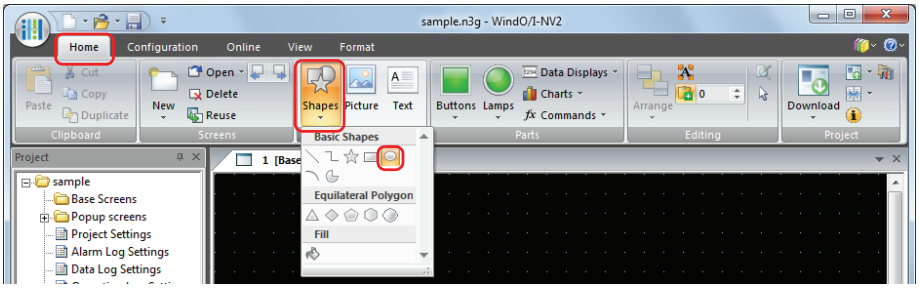
1.5 Circle/Ellipse

● Circle/Ellipse Drawing Procedure

This section describes the procedure for drawing circles and ellipses.

1 On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Circle/Ellipse) under **Basic Shapes**.

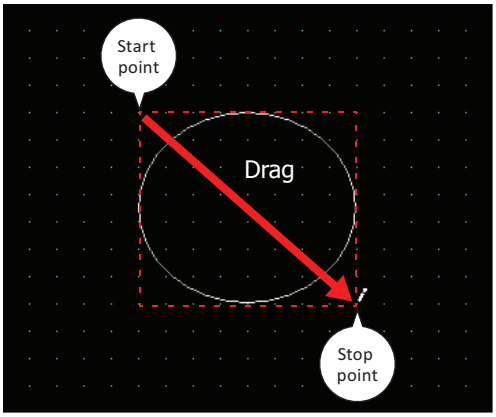
The mouse cursor changes to (pencil).



2 Click and hold the mouse button at the location (start point) to start drawing the circle or ellipse on the edit screen.

3 Drag the mouse to the stop point location so that location becomes the opposite angle of the rectangle.

A circle or ellipse is drawn that inscribes the rectangle made from the opposite angles of the start point and the stop point.

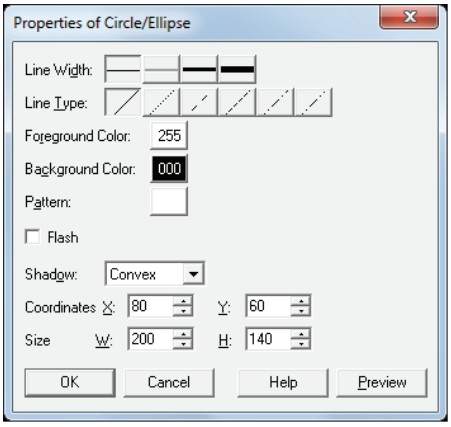


To change the style of the drawn circle or ellipse, perform one of the following operations.

- Double click the circle or ellipse to open the Properties dialog box
- Select the circle or ellipse and select the style with **Shape Style** on the **Format** tab
- Select the circle or ellipse and right click to display the popup menu

● Properties of Circle/Ellipse Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the circle or ellipse from the following.

1 dot, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the circle or ellipse from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** is selected for **Line Width**.

■ Foreground Color, Background Color

Selects the foreground color and the background color to use for the circle or ellipse (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern for the circle or ellipse.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Flash

Select this check box to make the circle or ellipse flash.

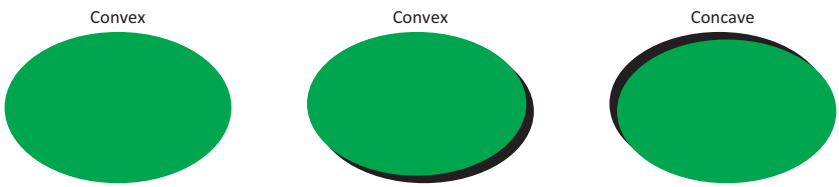
The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

■ Shadow

Selects the style of shadow attached to the circle or ellipse from the following. This option draws the circle or ellipse in a three-dimensional manner.

None, **Convex**, **Concave**

This option can only be configured when **1 dot** is selected for **Line Width** and **Solid** is selected for **Line Type**.



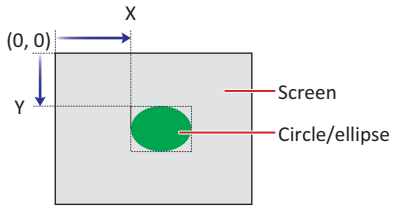
Coordinates

X, Y: Specifies the display position of the circle or ellipse in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the circle or ellipse is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

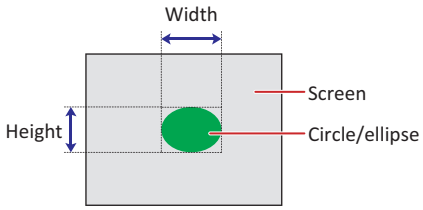


Size

W, H: Specifies the size of the circle or ellipse in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



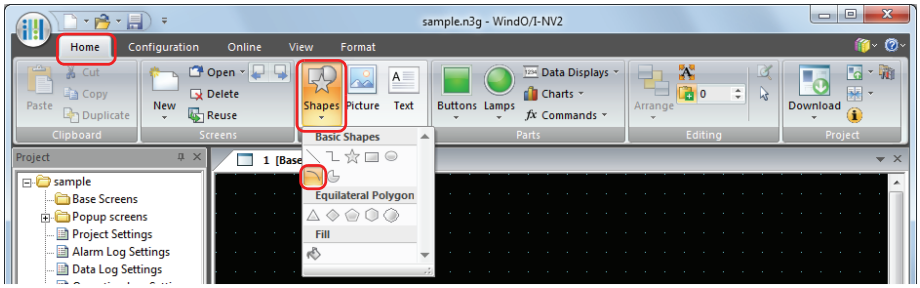
1.6 Arc

● Arc Drawing Procedure

This section describes the procedure for drawing arcs.

1 On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Arc) under **Basic Shapes**.

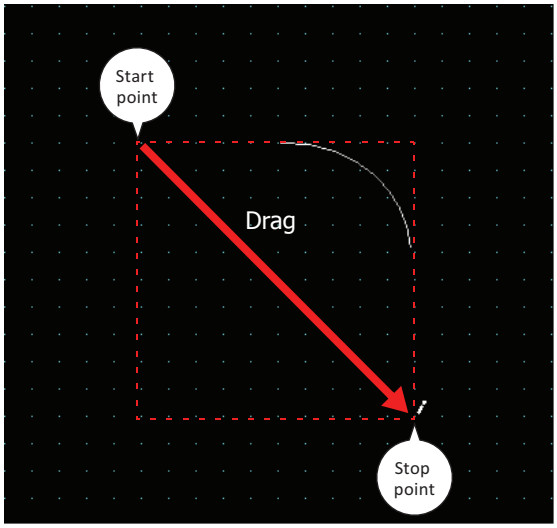
The mouse cursor changes to (pencil).



2 Click and hold the mouse button at the location (start point) to start drawing the arc on the edit screen.

3 Drag the mouse to the stop point location so that location becomes the opposite angle of the rectangle.

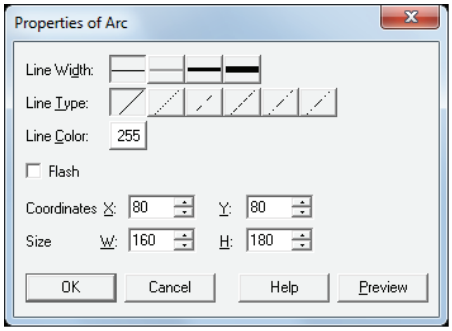
An arc is drawn that inscribes the rectangle made from the opposite angles of the start point and the stop point.



- To change the style of the drawn arc, perform one of the following operations.
  - Double click the arc to open the Properties dialog box
  - Select the arc and select the style with **Shape Style** on the **Format** tab
  - Select the arc and right click to display the popup menu
- To change the start point or the stop point of the drawn arc, select the arc and right click on it, then click **Reshape**. is displayed on the arc. Drag to the desired location. Double click the edit screen or press the Esc key to finish changing the shape.

● Properties of Arc Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the arc from the following.

1 dot, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the arc from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** is selected for **Line Width**.

■ Line Color

Selects the line color for the arc (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

■ Flash

Select this check box to make the arc flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

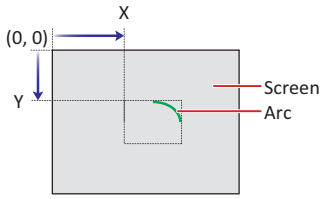
■ Coordinates

X, Y: Specifies the display position of the arc in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the arc is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

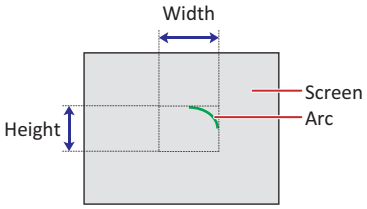


■ Size

W, H: Specifies the size of the arc in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



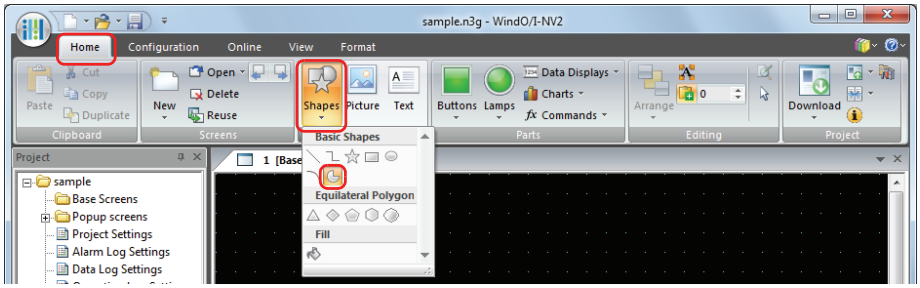
1.7 Pie

● Pie Drawing Procedure

This section describes the procedure for drawing pies.

1. On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Pie) under **Basic Shapes**.

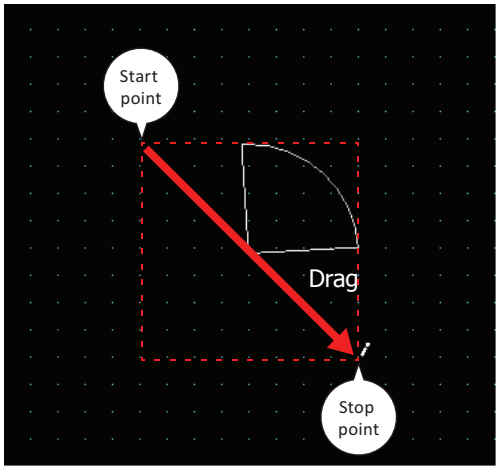
   The mouse cursor changes to (pencil).



2. Click and hold the mouse button at the location (start point) to start drawing the pie on the edit screen.

3. Drag the mouse to the stop point location so that location becomes the opposite angle of the rectangle.

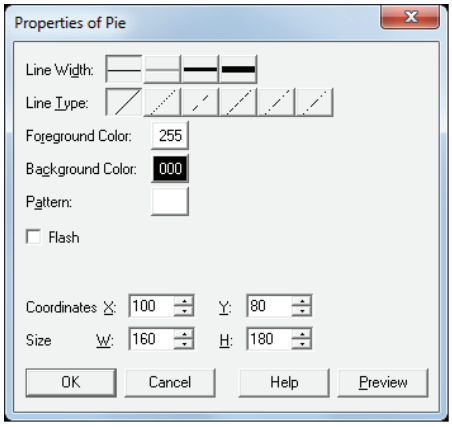
   A pie is drawn that inscribes the rectangle made from the opposite angles of the start point and the stop point.



- To change the style of the drawn pie, perform one of the following operations.
  - Double click the pie to open the Properties dialog box
  - Select the pie and select the style with **Shape Style** on the **Format** tab
  - Select the pie and right click to display the popup menu
- To change the central angle of the drawn pie, select the pie and right click on it, then click **Reshape**. is displayed on the pie. Drag to the desired location. Double click the edit screen or press the Esc key to finish changing the shape.

● Properties of Pie Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the pie from the following.

1 dot, **3 dots**, **5 dots**

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the pie from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** is selected for **Line Width**.

■ Foreground Color, Background Color

Selects the foreground color and the background color to use for the pie (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern for the pie.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Flash

Select this check box to make the pie flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

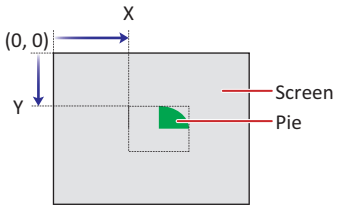
■ Coordinates

X, Y: Specifies the display position of the pie in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the circle with the same center as the pie is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

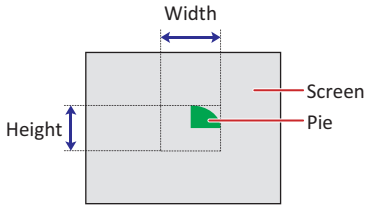


Size

W, H: Specifies the size of the pie in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



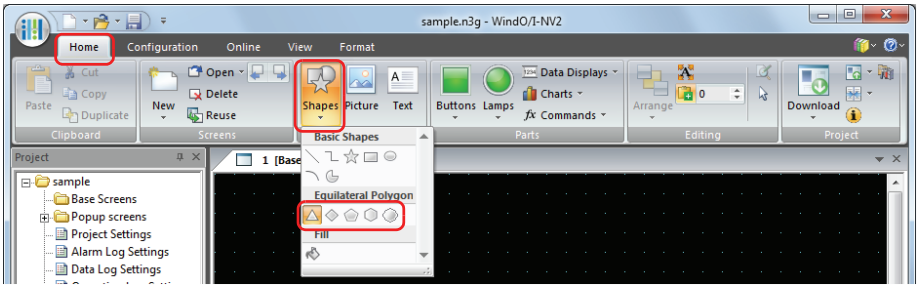
1.8 Equilateral Polygons

● Equilateral Polygons Drawing Procedure

This section describes the procedure to draw equilateral polygons (equilateral triangle, equilateral diamond, equilateral pentagon, equilateral hexagon, equilateral octagon).

1 On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Equilateral Triangle), (Equilateral Diamond), (Equilateral Pentagon), (Equilateral Hexagon), or (Equilateral Octagon) under **Equilateral Polygons**.

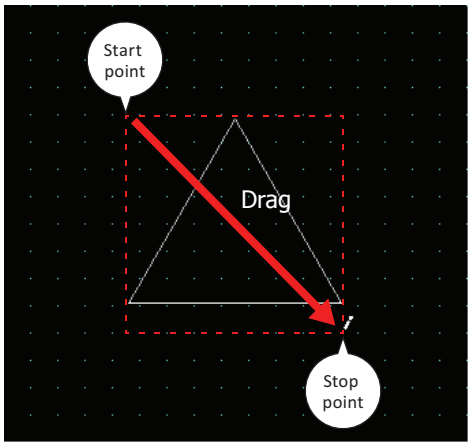
The mouse cursor changes to (pencil).



2 Click and hold the mouse button at the location (start point) on the edit screen to start drawing the square that will circumscribe the equilateral polygon.

3 Drag the mouse to the stop point location so that location becomes the opposite angle of the square.

An equilateral polygon is drawn that inscribes the square made from the opposite angles of the start point and the stop point.

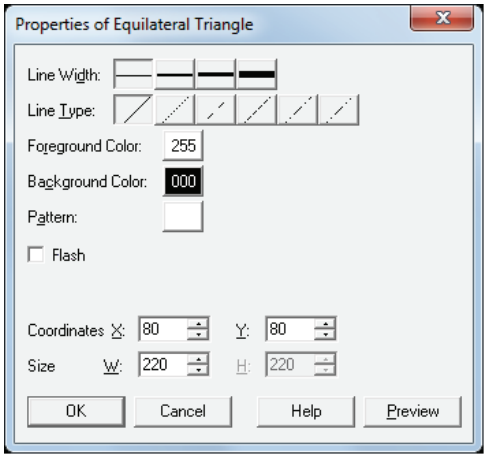


To change the style of the drawn square, perform one of the following operations.

- Double click the square to open the Properties dialog box
- Select the square and select the style with **Shape Style** on the **Format** tab
- Select the square and right click to display the popup menu

● Properties of Equilateral Polygon Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Line Width

Selects the line width for the equilateral polygon from the following.

1 dot, **2 dots**, **3 dots**, **5** dots

3 dots and **5 dots** can only be configured when **Solid** is selected for **Line Type**.

■ Line Type

Selects the line type for the equilateral polygon from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Dot, **Dash**, **Long Dash**, **Long Dash Dot**, and **Long Dash Dot Dot** can only be configured when **1 dot** or **2 dots** is selected for **Line Width**.

■ Foreground Color, Background Color

Selects the foreground color and the background color to use for the equilateral polygon (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern for the equilateral polygon.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Flash

Select this check box to make the equilateral polygon flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

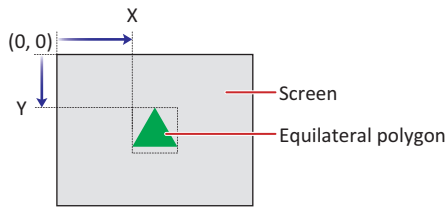
■ Coordinates

X, Y: Specifies the display position of the equilateral polygon in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the square that circumscribes the equilateral polygon is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

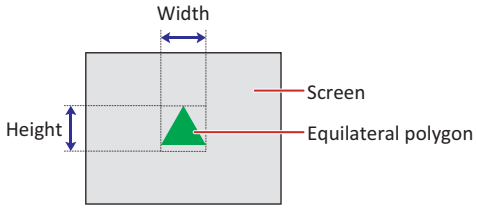


Size

W, H: Specifies the size of the equilateral polygon in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



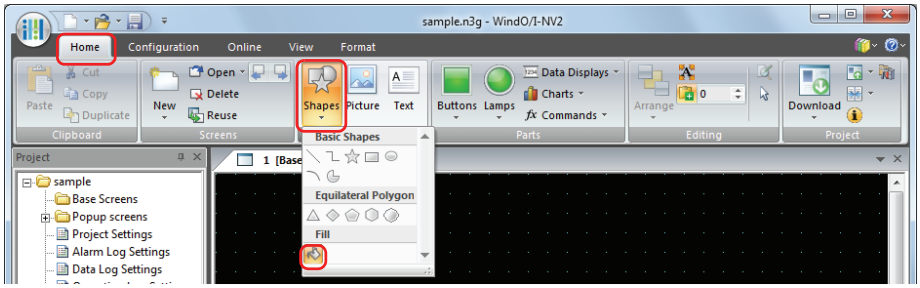
1.9 Fill

● Fill Configuration Procedure

This section describes the fill configuration procedure.

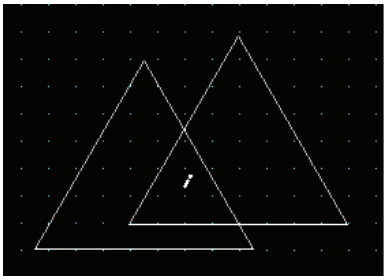
1 On the **Home** tab, in the **Drawings** group, click **Shapes**, and then click (Fill) under **Fill**.

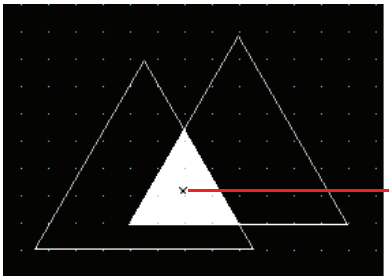
The mouse cursor changes to (pencil).



2 Click on a section where multiple shapes overlap on the edit screen.

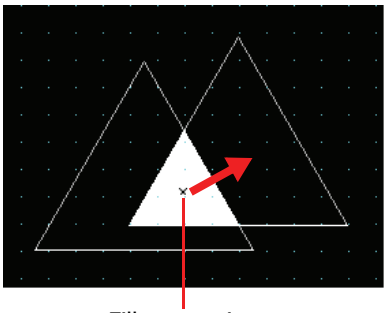
The section where multiple shapes overlap is filled with the **Foreground Color**, **Background Color**, and **Pattern** of the shape last drawn or the shape that last had its style changed. The clicked location is the fill start point.



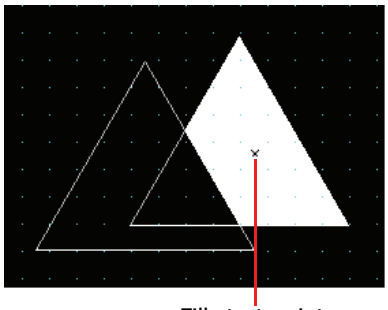


Fill start point

- To change the fill style, perform one of the following operations.
  - Double click the fill start point to open the Properties dialog box
  - Select the fill start point and select the style with **Shape Style** on the **Format** tab
  - Select the fill start point and right click to display the popup menu
- If you move the fill start point, the closed region where it was moved to is filled.



Fill start point

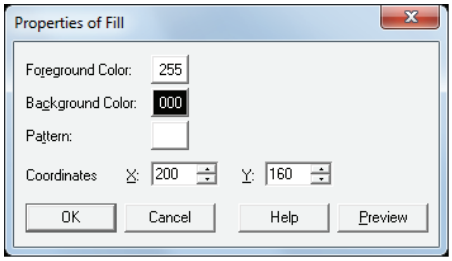


Fill start point

- To select the fill start point, click on the edit screen or select Fill on the **Object List** window.

● Properties of Fill Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Foreground Color, Background Color

Selects the foreground color and the background color to fill with (color: 256 colors, monochrome: 16 shades).

Click either button to display the Color Palette. Select a color from the Color Palette.

■ Pattern

Selects the pattern to fill with.

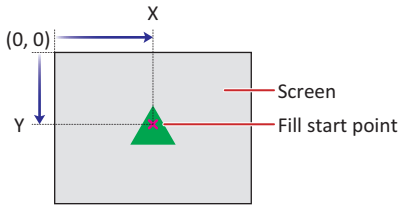
Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Coordinates

X, Y: Specifies the display position of the fill start position in coordinates.
The upper-left corner of the screen is the origin.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)



2 Picture

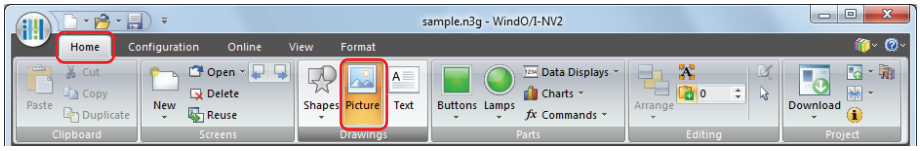
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Picture Configuration Procedure

This section describes the picture configuration procedure.

1 On the **Home** tab, in the **Drawings** group, click **Picture**.

The mouse cursor changes to + (picture).

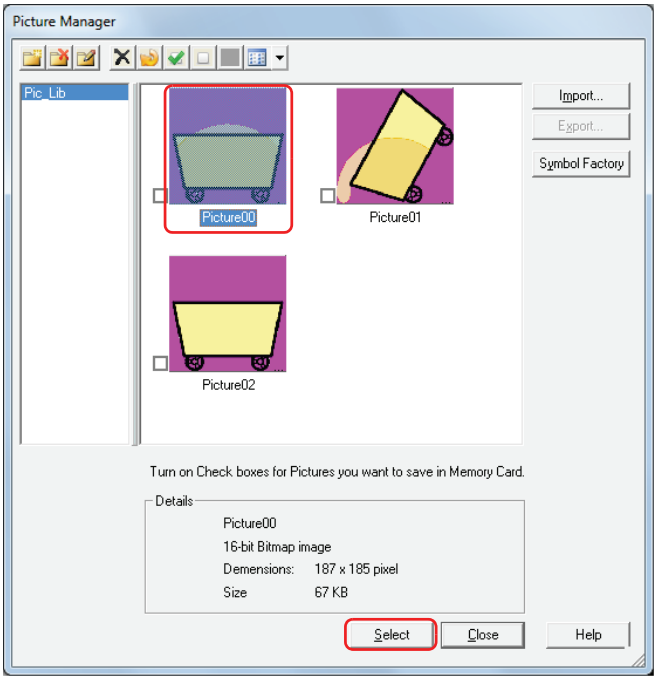


2 Click the location on the edit screen to place the picture.

Picture Manager is displayed.

3 Select a picture and click **Select**.

The selected picture is placed on the screen.

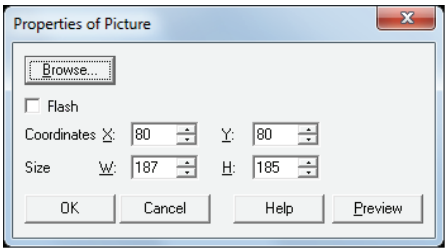


To change the picture that was placed on the screen, perform one of the following operations.

- Double click the picture to open the Properties dialog box, then click **Browse**
- Replace the picture in Picture Manager

2.2 Properties of Picture Dialog Box

This section describes items and buttons in the Properties dialog box.



■ Browse

Changes the picture placed on the screen. Click this button to display Picture Manager.

■ Flash

Select this check box to make the picture flash.

The flash interval is specified with **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

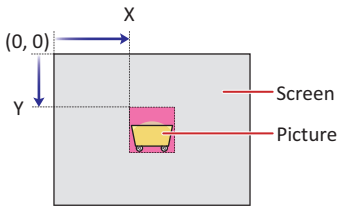
■ Coordinates

X, Y: Specifies the display position of the picture in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the picture is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

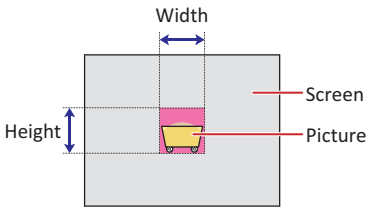


■ Size

W, H: Specifies the size of the picture in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



3 Text

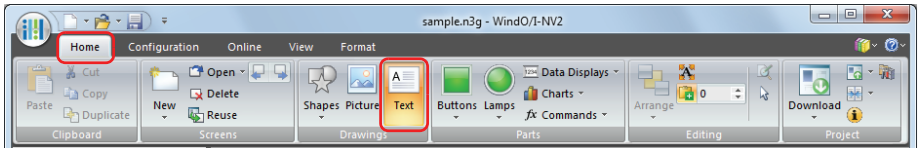
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

3.1 Text Configuration Procedure

This section describes the configuration procedure for text.

1 On the **Home** tab, in the **Drawings** group, click **Text**.

The mouse cursor changes to +A (text).

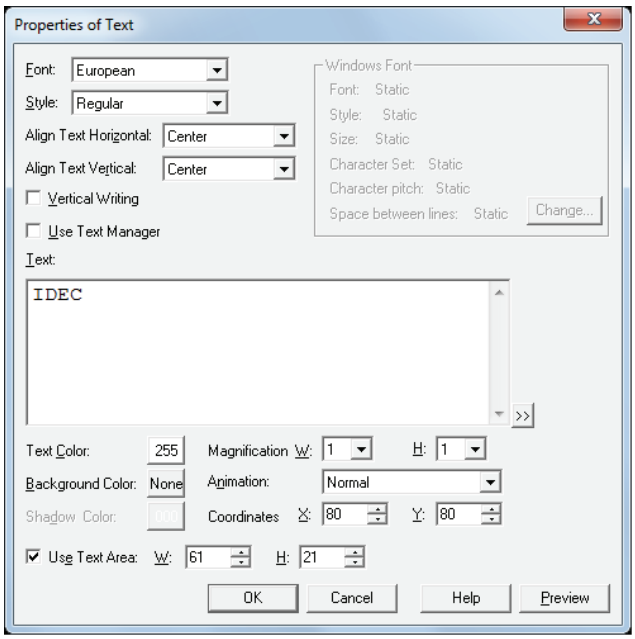


2 Click the location on the edit screen to place the text.

The Properties of Text dialog box is displayed.

3 Enter the text to display in **Text** and configure the options as necessary.

The maximum number is 3737 characters.



4 Click **OK**.

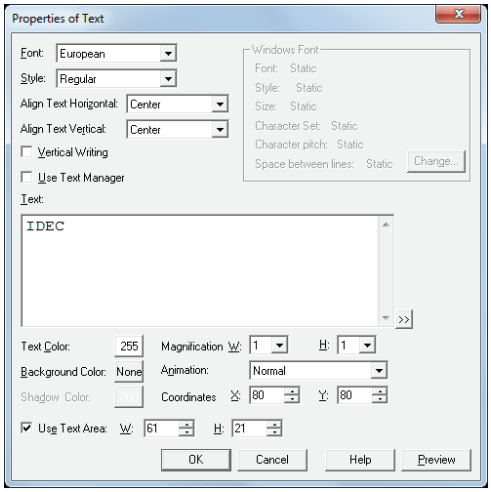
The text is placed on the screen.

To change the style of the text placed on the screen, perform one of the following operations. You can change the entered text in the Properties dialog box.

- Double click the text to open the Properties dialog box
- Select the text and select the style with **Text Style** on the **Format** tab
- Select the text and right click to display the popup menu

3.2 Properties of Text dialog box

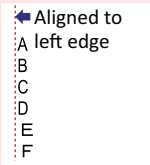
This section describes items and buttons in the Properties dialog box.



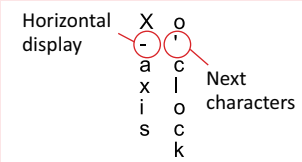
- **Font**
  Selects the font to use to display text from the following.
  Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
  This option can only be configured if the **Use Text Manager** check box is cleared.
- **Style**
  Selects the style of text from the following.
  Regular, **Bold**, **Shadow**
  This option can only be configured when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.
- **Align Text Vertical**
  Selects text alignment in the vertical direction.
  Top, **Center**, **Bottom**
  Top when the **Vertical Writing** check box is selected.
  For details, refer to Appendix "5 Text Alignment" on page A-5.
- **Align Text Horizontal**
  Selects text alignment in the horizontal direction.
  Left, **Center**, **Right**, **Center-Left**
  For details, refer to Appendix "5 Text Alignment" on page A-5.
- **Vertical Writing**
  Select this check box to display text vertically.
  This option can only be configured when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

When the **Vertical Writing** check box is selected, take care about the following points. This is applicable for installations of Windows that support East Asian characters.

- When there is a mixture of double-byte and single-byte characters, the half-width characters are left-aligned.



- Dashes are displayed horizontally. Symbols representing voiced and semi-voiced sounds of single-byte characters are shown as follows.



■ **Windows Font**

Configures the font to use as the Windows Font.

Select **Windows** for **Font** to display the current settings. To change the settings, click the **Change** button to display the **Font Settings** dialog box.

This option can only be configured if the **Use Text Manager** check box is cleared.

For details, refer to Chapter 2 "Windows Font" on page 2-12.

■ **Use Text Manager**

Select this check box to use text registered in Text Manager.

■ **Text ID**

Specifies the Text Manager ID number (1 to 32000) when using text registered in Text Manager.

Click ... to display Text Manager.

This option can only be configured when the **Use Text Manager** check box is selected.

■ **Text**

Enter the text to display. The maximum number is 3737 characters.

The characters that can be entered vary based on the font selected by **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

This option can only be configured if the **Use Text Manager** check box is cleared.

- To enter Unicode characters, click the >> button to display the **Unicode Input** dialog box. Enter the characters in the **Unicode Input** dialog box and click **OK**.
- A newline is counted as two characters.

■ **Text Color**

Selects the color for the displayed text (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

■ **Magnification**

W, H: Selects the zoom factor for characters (0.5, 1 to 8[*1]).

This option can only be configured when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ **Size**

Specifies the character size (8 to 128).

This option can only be configured when **Stroke** is selected for **Font**.

■ **Background Color**

Selects the background color for the text (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

■ **Animation**

Selects whether or not to make the text flash.

Normal: The text does not flash.

Flash: The text flashes.

■ **Shadow Color**

Selects the shadow color for the text (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

This option can only be configured when **Shadow** is selected for **Style**.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

Coordinates

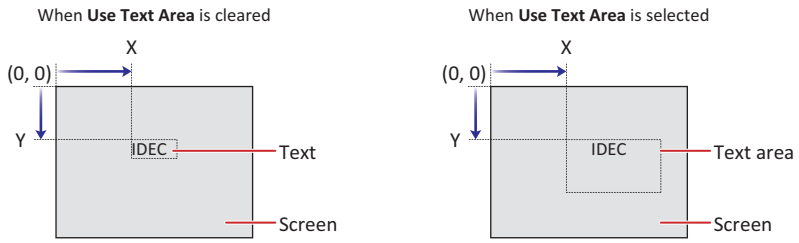
X, Y: Specifies the display position of the text or the text area in coordinates.

With the upper-left corner of the screen as the origin, the upper-left corner of the rectangle that circumscribes the text or the upper-left corner of the text area is the X and Y coordinates.

When the **Use Text Area** check box is cleared, the coordinates are for the text. When the **Use Text Area** check box is selected, the coordinates are for the text area.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)



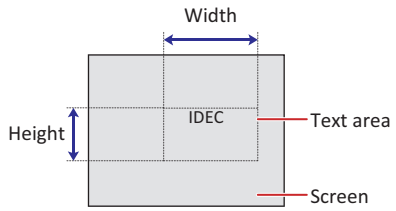
Use Text Area

Select this check box to specify a text area and adjust the display position of the text with the specified text area.

W, H: Specifies the size of the text area in width and height.

W: 1 to (base screen horizontal size)

H: 1 to (base screen vertical size)



Chapter 8 Buttons

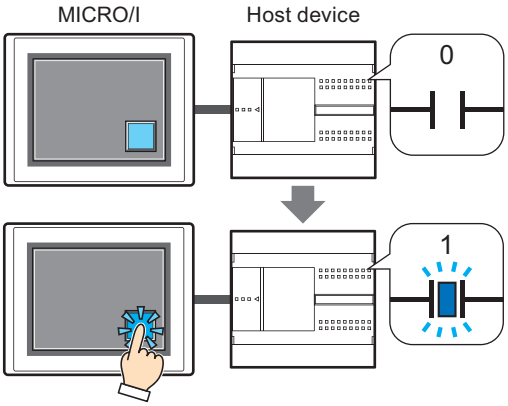
This chapter describes the setup for the button parts and related MICRO/I operations.

1 Bit Button

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

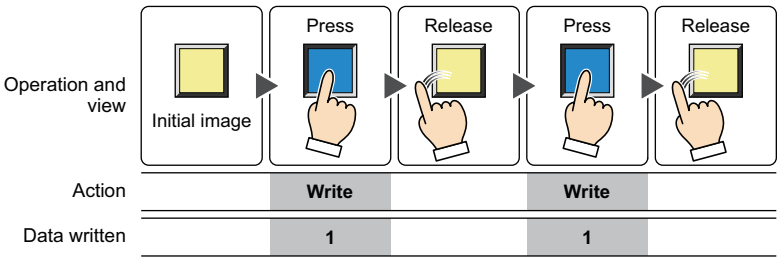
1.1 How the Bit Button is Used

Writes a 0 or 1 to a bit device.



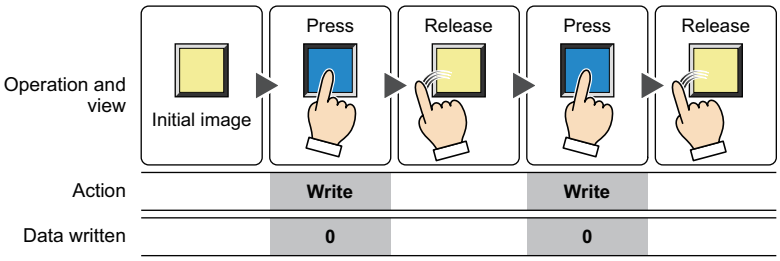
■ **Set**

Pressing the button writes a 1 to the bit device.



■ **Reset**

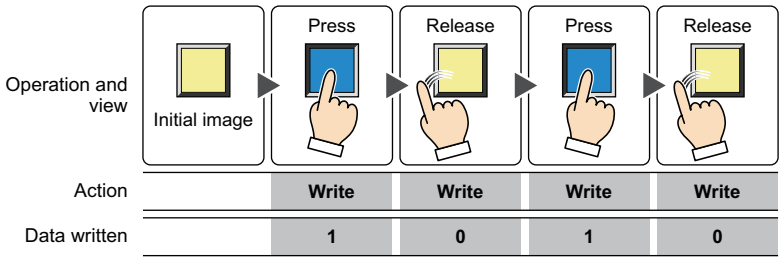
Pressing the button writes a 0 to the bit device.



Momentary

Pressing the button writes a 1 to the bit device.

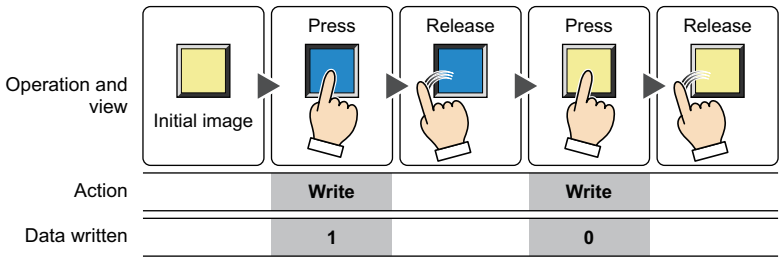
Releasing the button writes a 0 to the bit device.



Pressing and holding the button until the screen changes causes a 0 to be written to the bit device.

Alternate

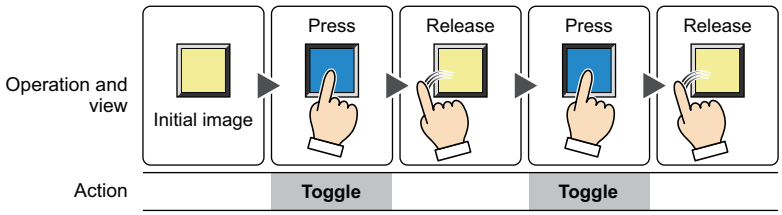
Each press of the button alternately writes a 1 or 0 to the bit device.



Toggle

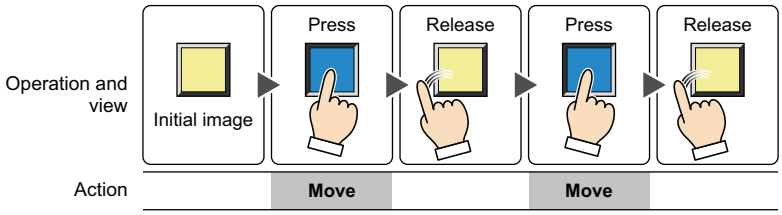
Pressing the button inverts the value of the bit device.

If the value of the bit device is 0 it changes to 1, and vice versa.



Move

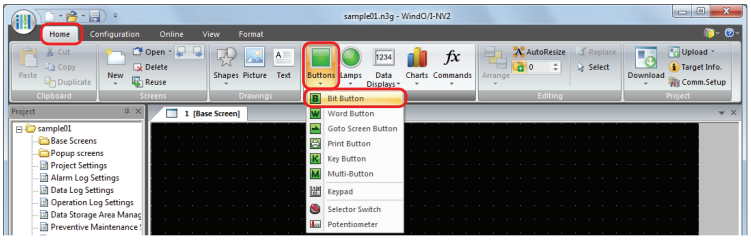
Pressing the button writes the value in the source bit device to the value in the destination bit device.



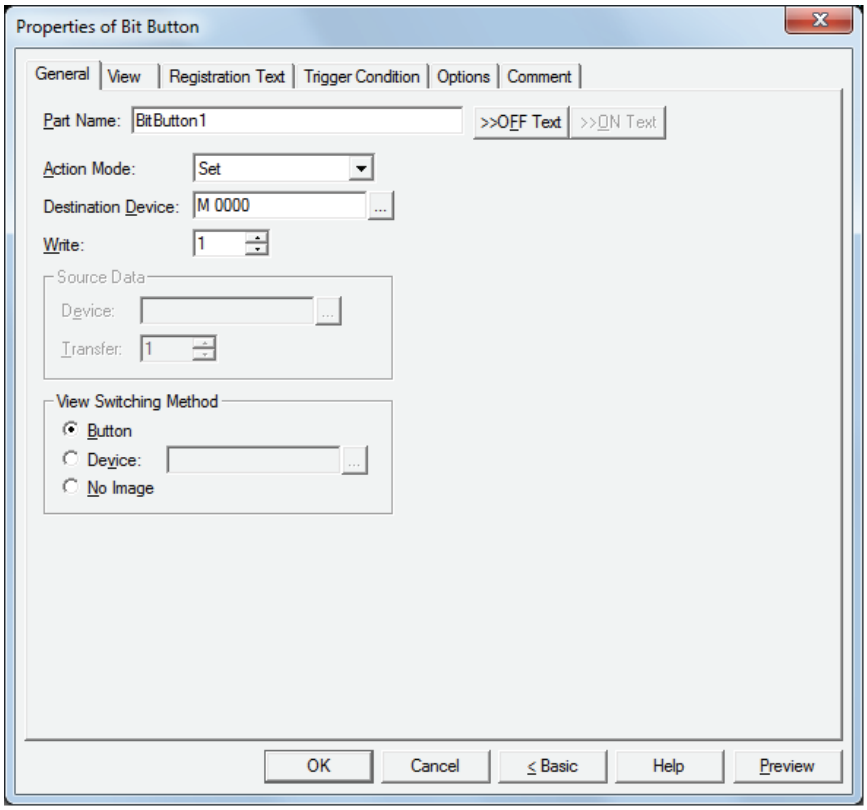
1.2 Bit Button Configuration Procedure

This section describes the configuration procedure for Bit Buttons.

1. On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Bit Button**.



2. Click a point on the edit screen where you wish to place the Bit Button.
3. Double-click the dropped Bit Button and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

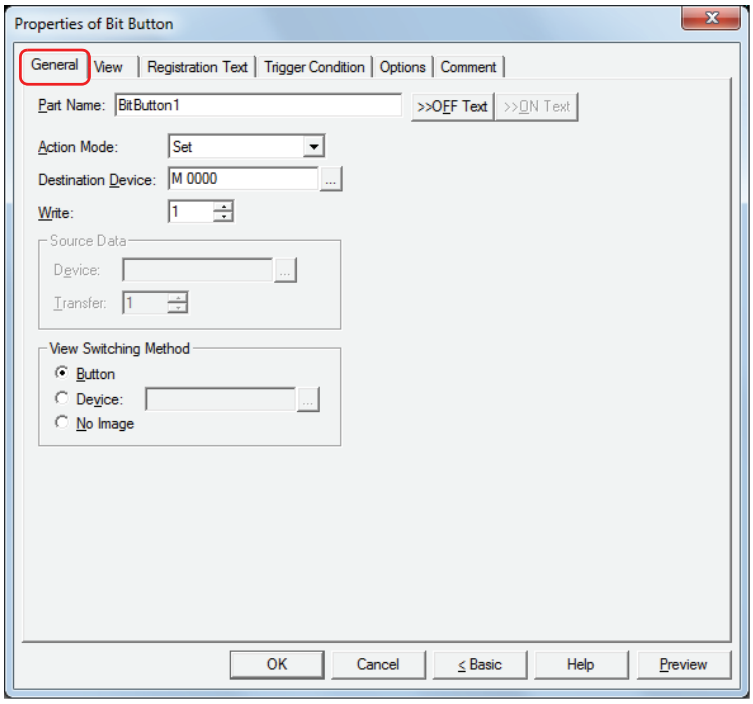


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

1.3 Properties of Bit Button Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



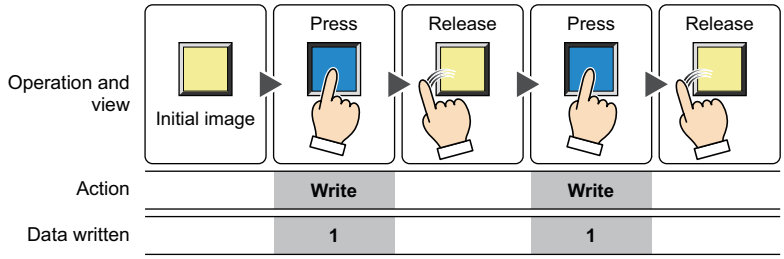
■ **Part Name**
Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**
Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

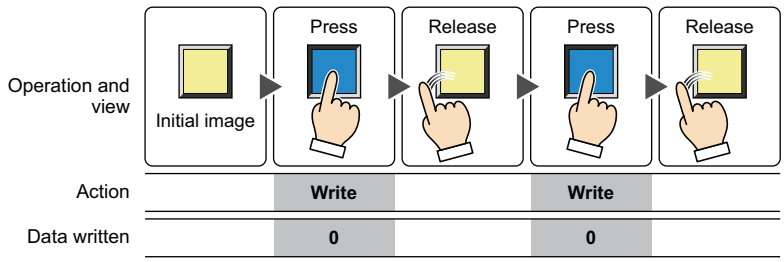
> To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Action Mode**
Select the behavior of the button from the following:

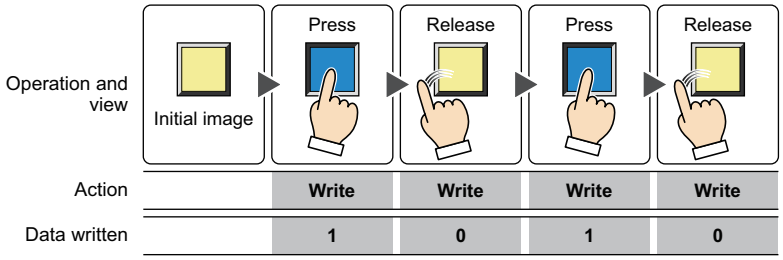
Set: Pressing the button writes a 1 to the bit device.



Reset: Pressing the button writes a 0 to the bit device.

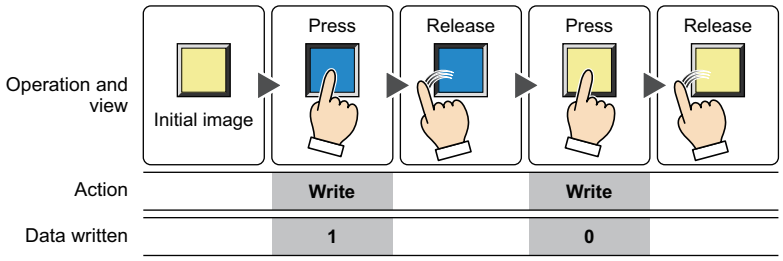


Momentary: Pressing the button writes a 1 to the bit device.
Releasing the button writes a 0 to the bit device.

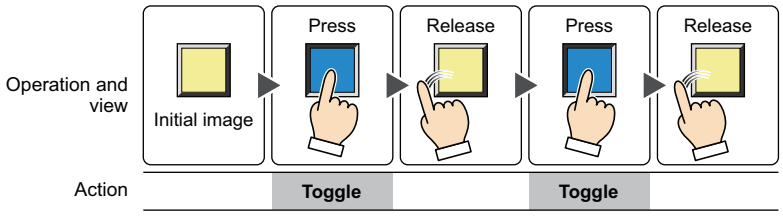


Pressing and holding the button until the screen changes causes a 0 to be written to the bit device.

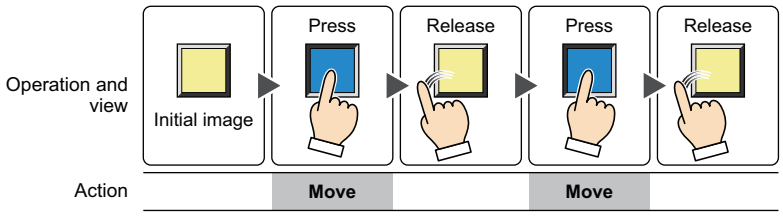
Alternate: Each press of the button alternately writes a 1 or 0 to the bit device.



Toggle: Pressing the button inverts the value of the bit device.
If the value of the bit device is 0 it changes to 1, and vice versa.



Move: Pressing the button writes the value in the source bit device to the value in the destination bit device.



Destination Device

Specify the destination bit device.

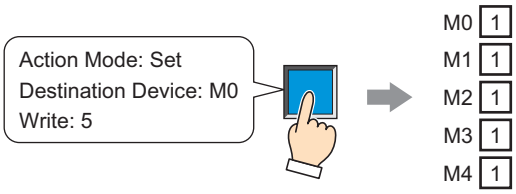
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Write*1

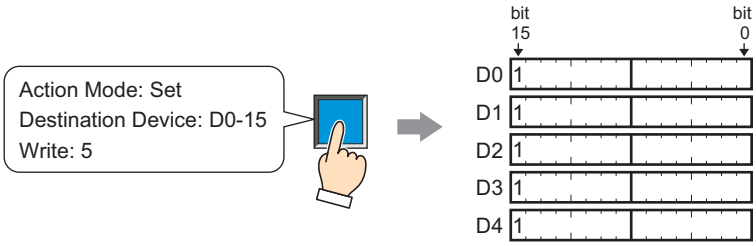
Specify the number of bit devices (1 to 64) at the destination.

This setting is enabled only if **Action Mode** is set to **Set** or **Reset**.

Example: This fills a contiguous block of bit devices with the same value.



If the bit in a word device is specified, the same value is written to same bit of contiguous word devices.



Source Data

Specifies the device that stores the data to be written.

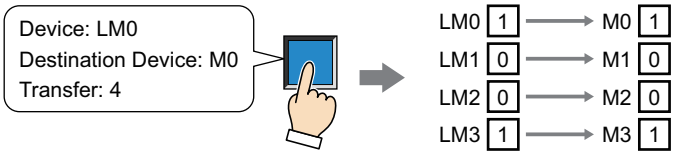
This setting is enabled only if **Action Mode** is set to **Move**.

Device: Specify the source bit device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Transfer: Specify the number of bit devices (1 to 64) to transfer.

Example: This button writes the values in a contiguous block of bit devices to a contiguous block of devices at the destination.



*1 Advanced mode only

View Switching Method*1

Select how to display the ON/OFF status of the button.

Button: Pressing the button changes the drawing object displayed.

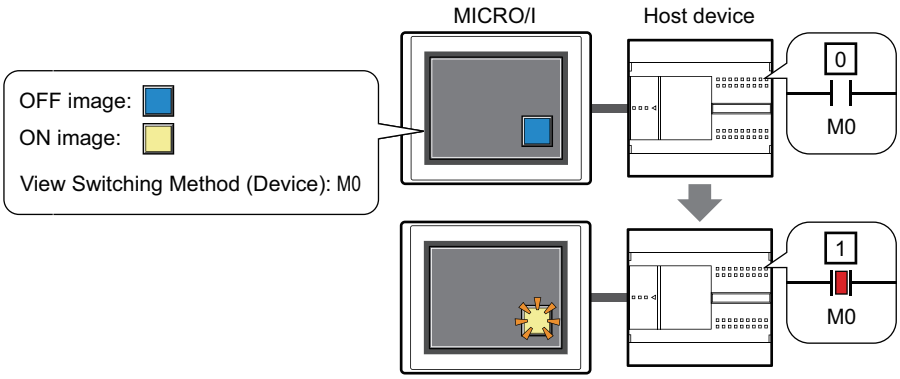
Device: The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

No Image: The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for **View** and **Registration Text** are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

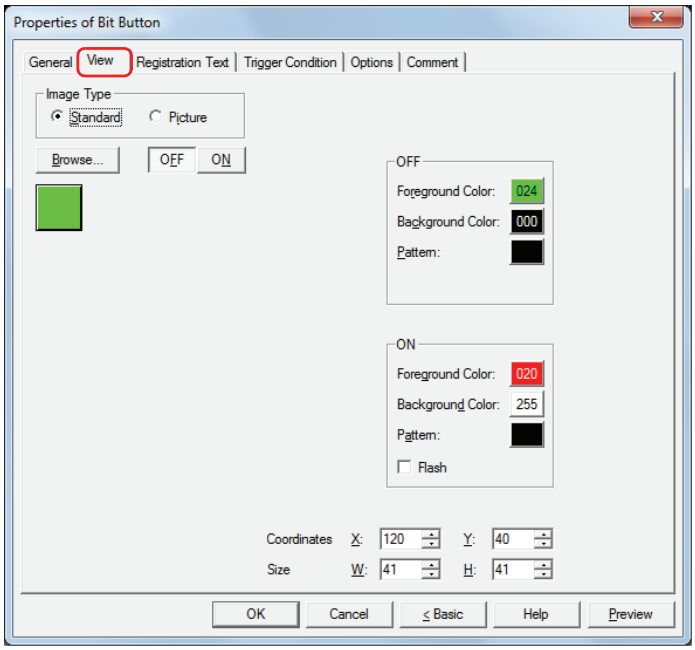
Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switch according to the value of M0 even if the button is not pressed.



*1 Advanced mode only

● **View** Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphics contained within WindO/I-NV2.

Picture: Uses an image file saved in the Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **OFF button, ON button**

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ **OFF, ON**

Selects the color and pattern of the standard graphic when ON and OFF.

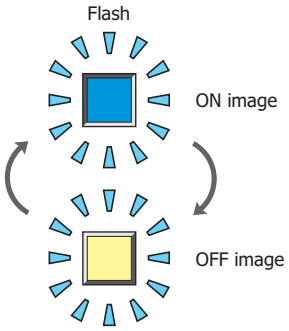
Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ **Flash**

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.



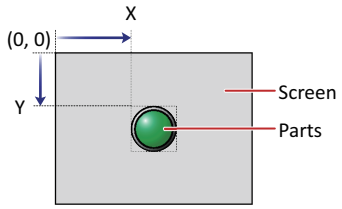
■ **Coordinates**

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

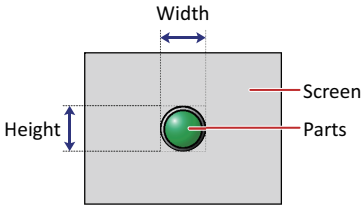


■ **Size**

W, H: Sets width and height to define the size of parts.

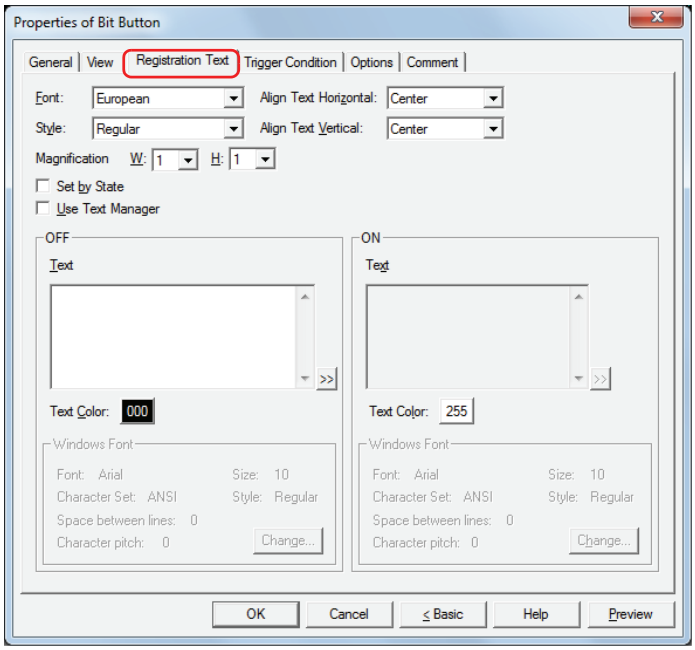
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8[*1]) for text display.

Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

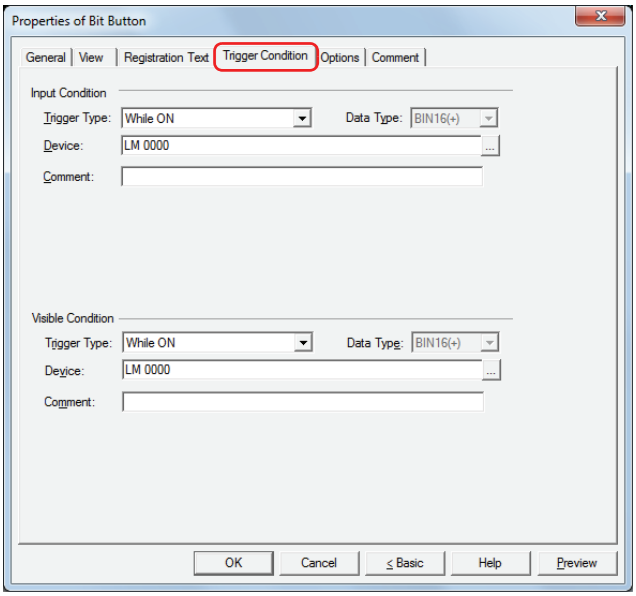
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



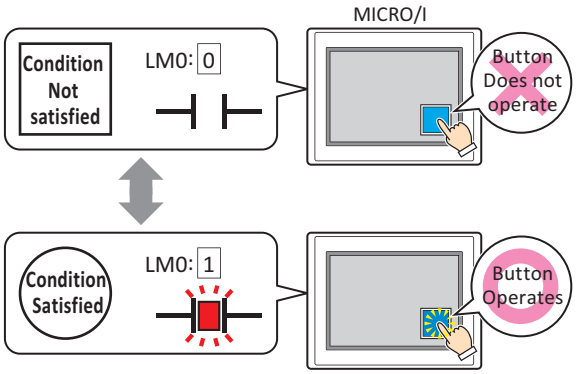
■ Input Condition

The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

While LM 0 is 0, the condition is not satisfied and the Button is not operational.

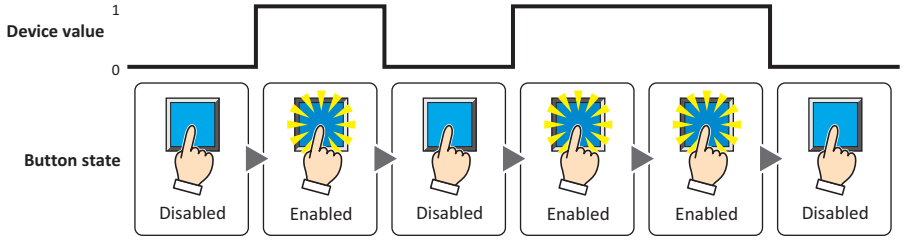
While LM 0 is 1, the condition is satisfied and the Button is operational.



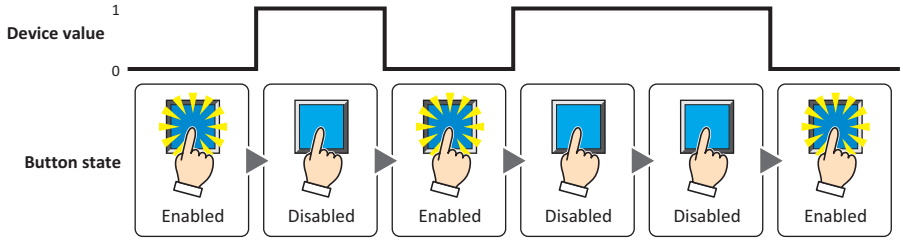
Trigger Type: Selects the condition to enable the Button from the following.

Always enable: The Button is always enabled.

While ON: Enables the Button when the device value is 1.

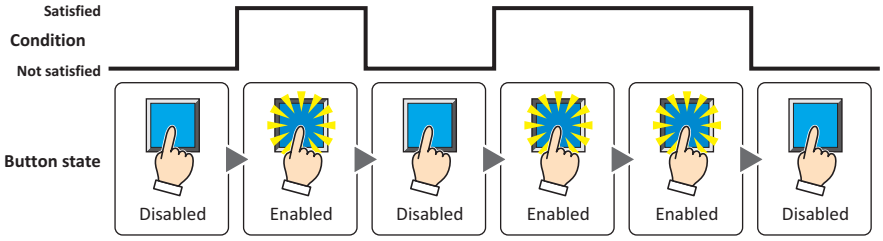


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

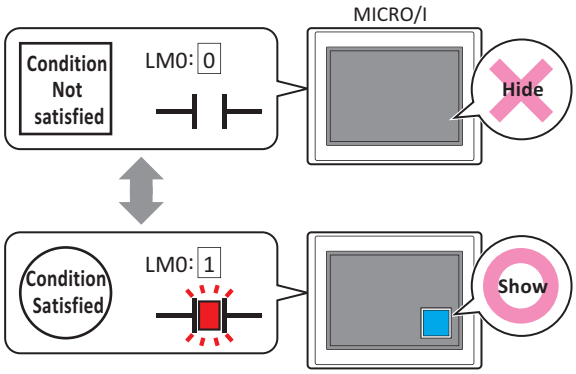
Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

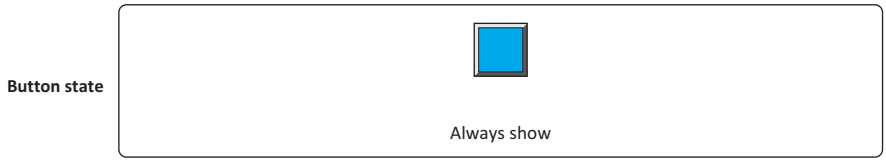


- When **Alternate** is selected for **Action Mode** on the **General** tab, the button remains on when hidden in the on state.
- When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

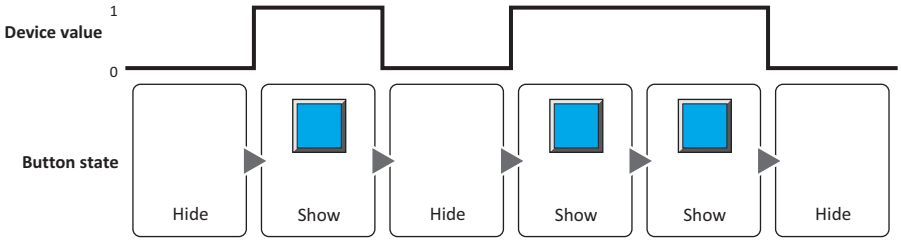
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Button from the following.

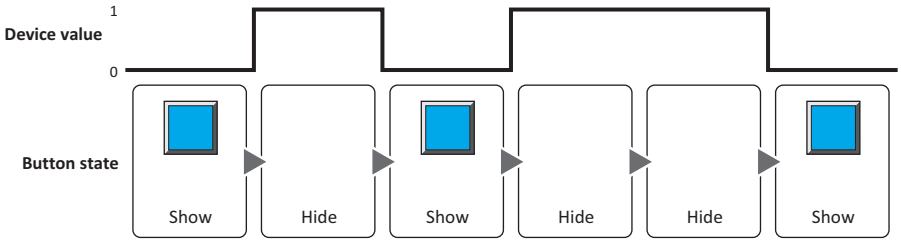
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

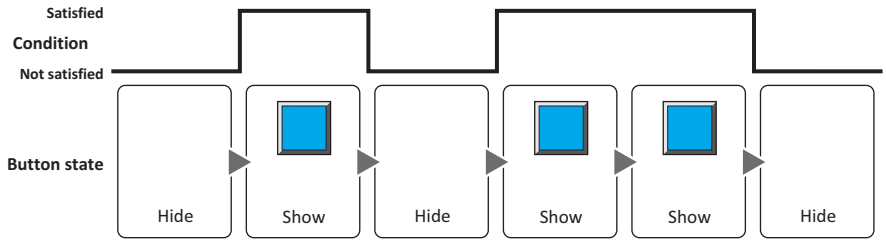


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

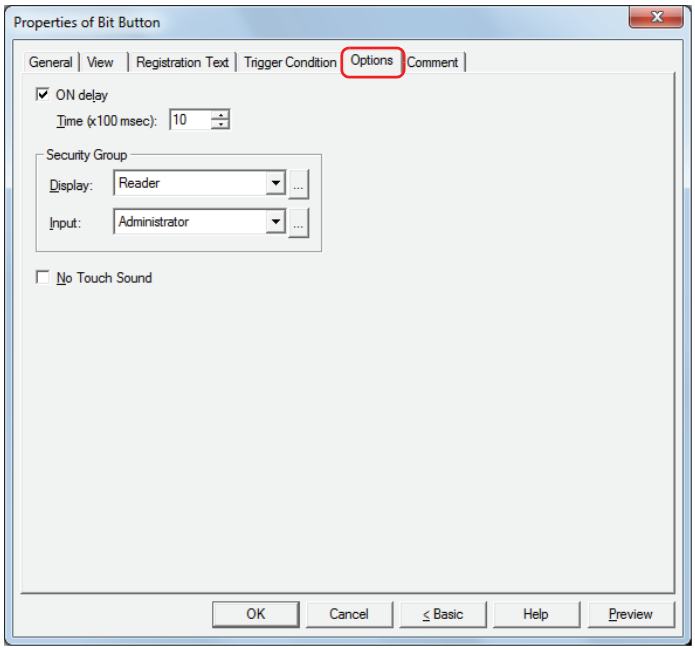
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

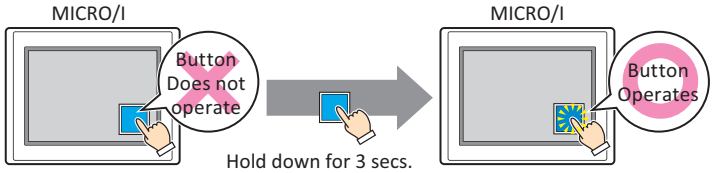
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

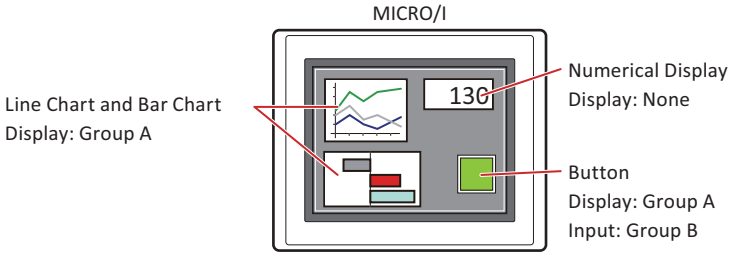
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

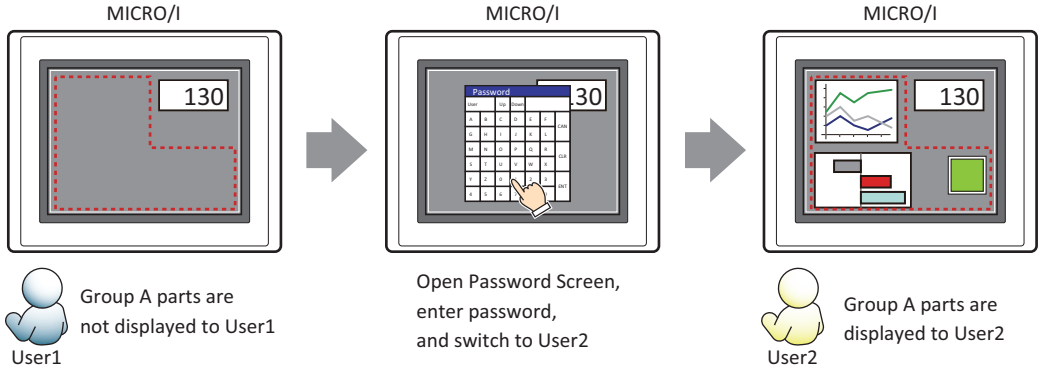
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

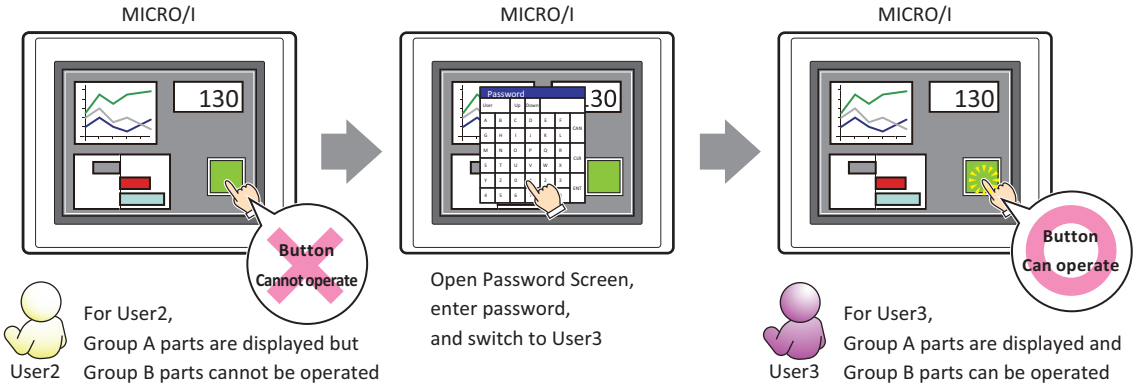
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

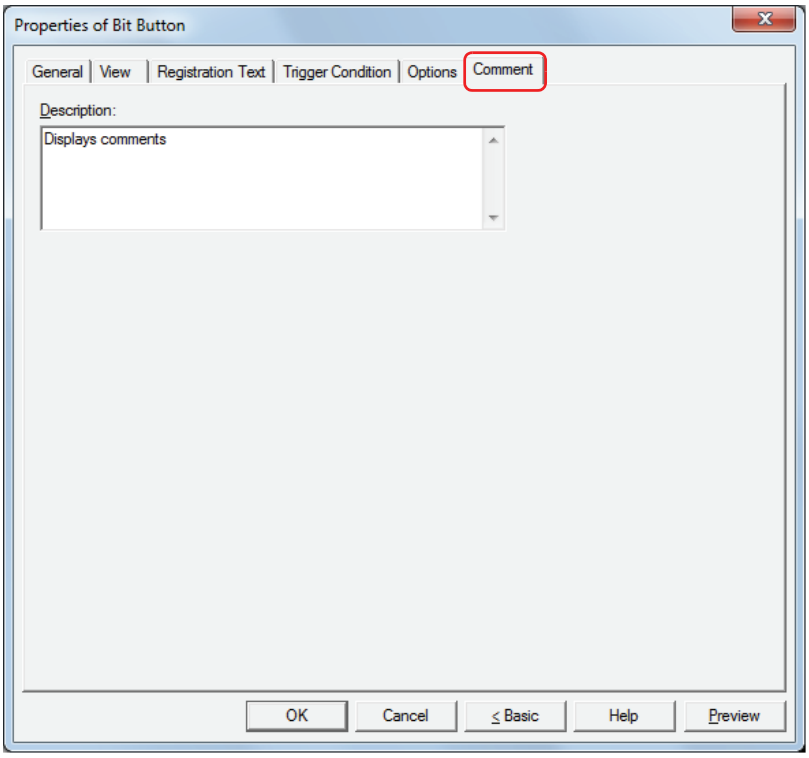
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen

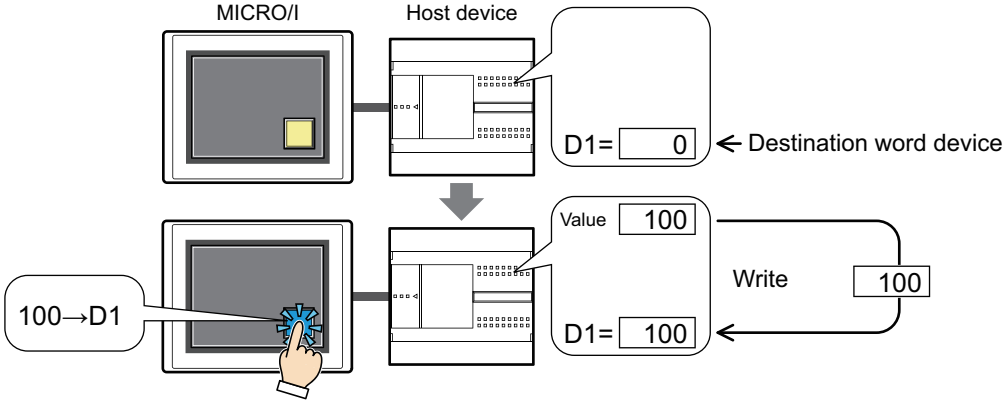
2 Word Button

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

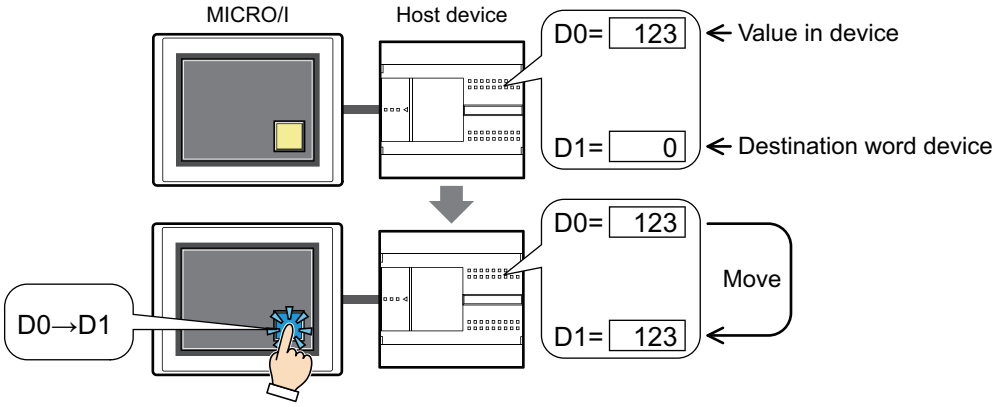
2.1 How the Word Button is Used

Writes a value to a word device. Can be used to indirectly specify the destination address or to perform operations on the written value.

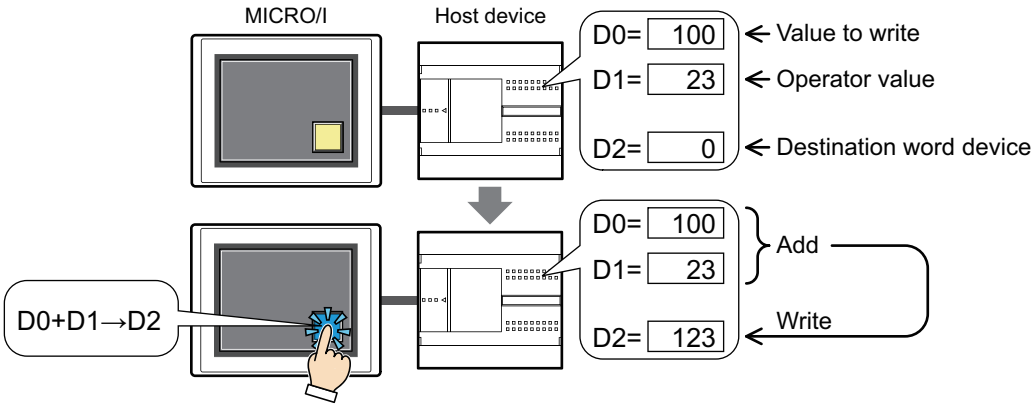
- Pressing the button writes a fixed value to a word device.



- Pressing the button writes the value of device address to a word device.

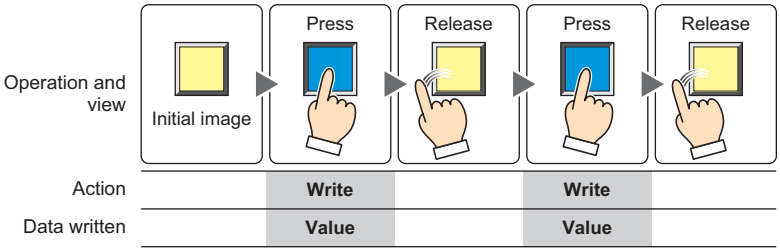


- Pressing the button performs arithmetic on the value to write before writing it to a word device.



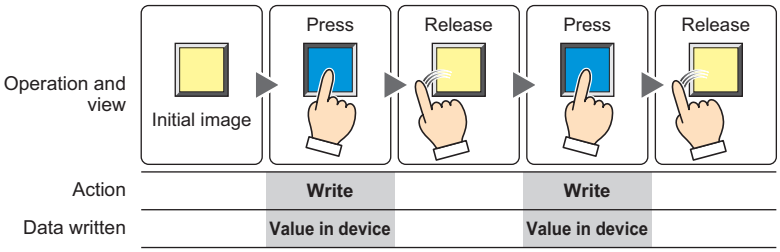
■ **Set**

Pressing the button writes a fixed value to a word device.



■ **Move**

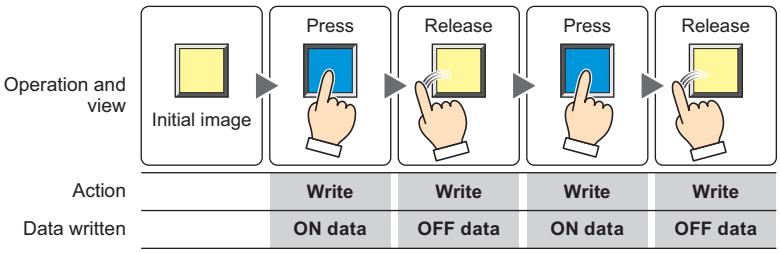
Pressing the button writes the value of source device to the destination word device.



■ **Momentary**

Pressing the button writes the fixed value of ON Data to a word device.

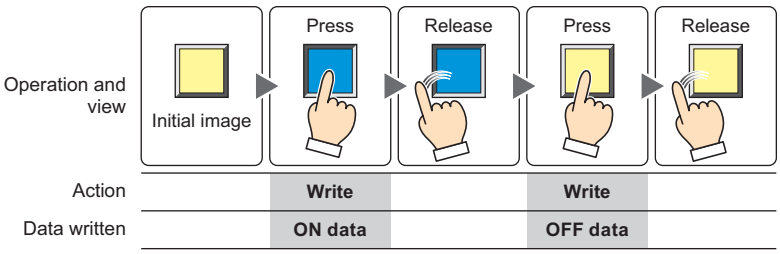
Releasing the button writes the fixed value of OFF Data to a word device.



Pressing and holding the button until the screen changes causes the OFF data to be written to the word device.

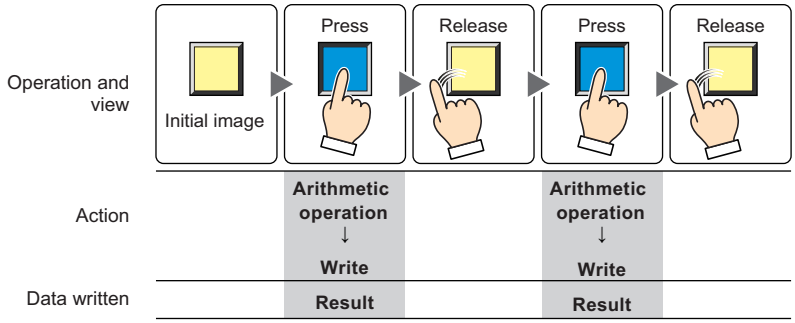
■ **Alternate**

Each press of the button alternately writes the fixed value of ON data and OFF data to the word device.



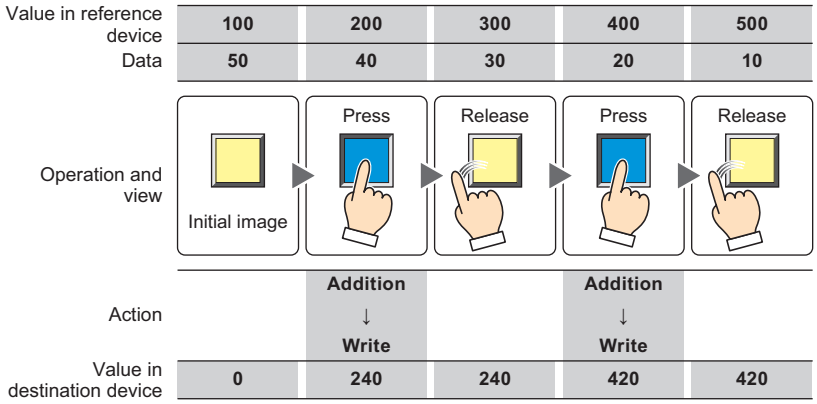
■ Add, Sub, Multi, Div, Mod, OR, AND, XOR

Pressing the button performs arithmetic on the value of source device and a fixed value, or a value of device and writes the result to a word device.



Example: Add (Addition)

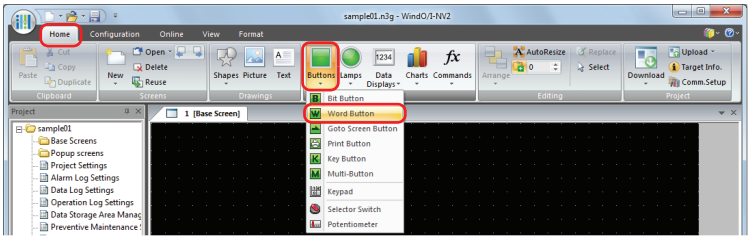
Pressing the button adds the value in the **Source 1** to the **Source 2** value and writes the sum in the word device.



2.2 Word Button Configuration Procedure

This section describes the configuration procedure for Word Buttons.

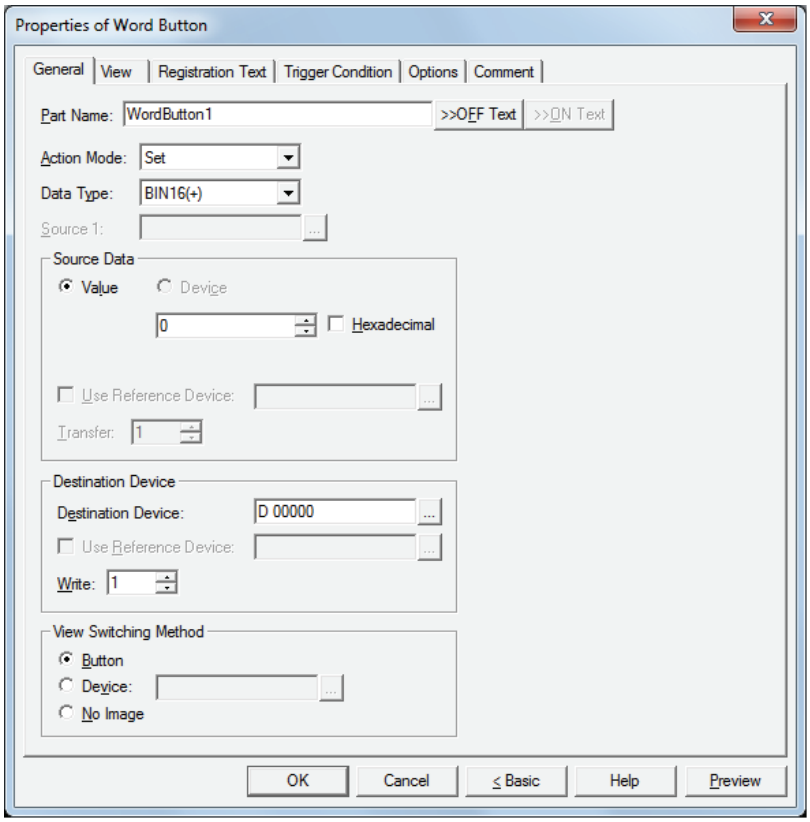
1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Word Button**.



2 Click a point on the edit screen where you wish to place the Word Button.

3 Double-click the dropped Word Button and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

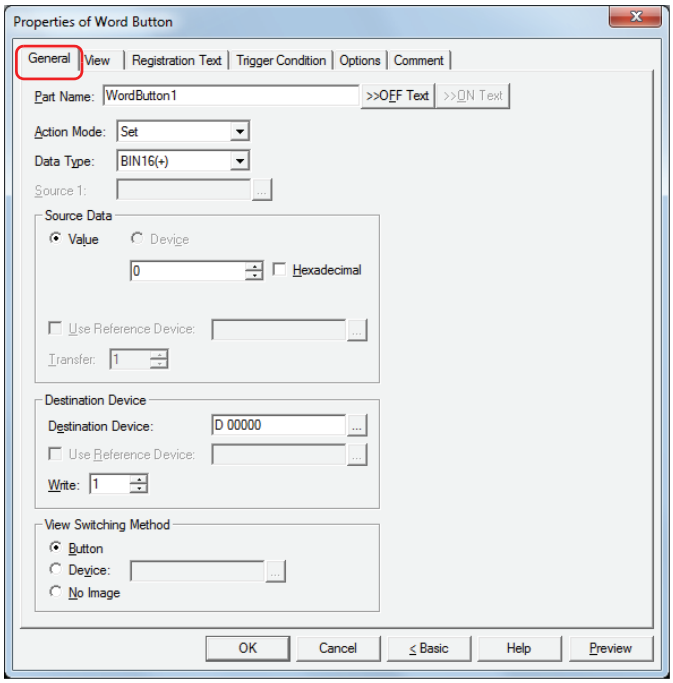


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

2.3 Properties of Word Button Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



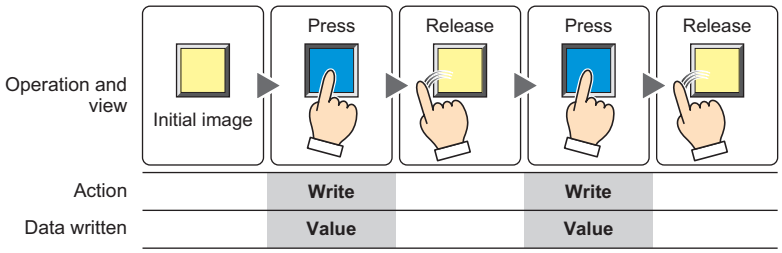
■ **Part Name**
Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**
Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

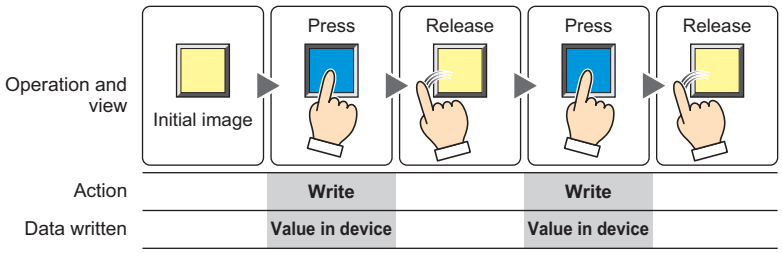
> To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Action Mode**
Select the behavior of the button from the following:

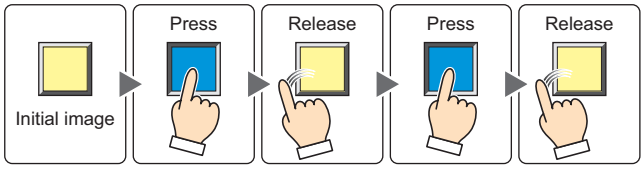
Set: Pressing the button writes a constant value to a word device.



Move: Pressing the button writes the value in the source device to the destination word device.



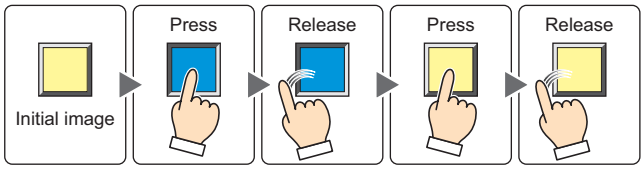
Momentary: Pressing the button writes the constant value of ON data to a word device.
Releasing the button writes the constant value of OFF data to a word device.



Action	Write	Write	Write	Write
Data written	ON data	OFF data	ON data	OFF data

Pressing and holding the button until the screen changes causes the OFF data to be written to the word device.

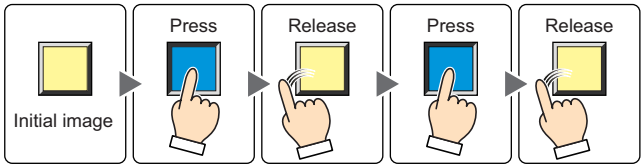
Alternate: Each press of the button alternately writes the fixed value of ON data and OFF data to the word device.



Action	Write		Write	
Data written	ON data		OFF data	

Add, Sub, Multi, Div, Mod, OR, AND, XOR:

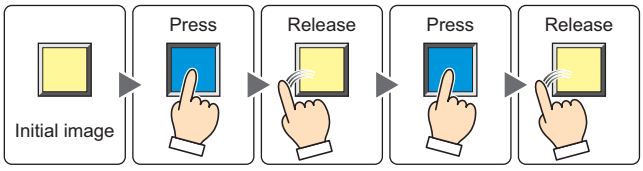
Pressing the button performs arithmetic on a value of source device and a constant value or the value of device and writes the result to a word device.



Action	Arithmetic operation ↓ Write		Arithmetic operation ↓ Write	
Data written	Result		Result	

Example: Add (Addition)
Pressing the button adds the value in the **Source 1** to the **Source 2** value and writes the sum in the word device.

Value in reference device	100	200	300	400	500
Data	50	40	30	20	10



Action		Addition ↓ Write		Addition ↓ Write	
Value in destination device	0	240	240	420	420

Data Type

Select the data type to be handled by the operation selected for **Action Mode**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.
BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **OR**, **AND**, or **XOR**.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **Move**. Because the number of devices to transfer is specified in Advanced mode, you do not need to set Data Type.

If **BCD4**, **BCD8** or **float32** is selected and the arithmetic data contains a value inexpressible in BCD, a 1 is written to the System Area 2 Arithmetic error bit (address+2, bit 5) and an error message is displayed.
For details, refer to Chapter 4 "Arithmetic error" on page 4-34.

Source 1

Specify the source word device.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This setting is enabled only if **Action Mode** is set to **Add**, **Sub**, **Multi**, **Div**, **Mod**, **OR**, **AND**, or **XOR**.

Source Data

Select the data to be handled by the operation selected for **Action Mode**.

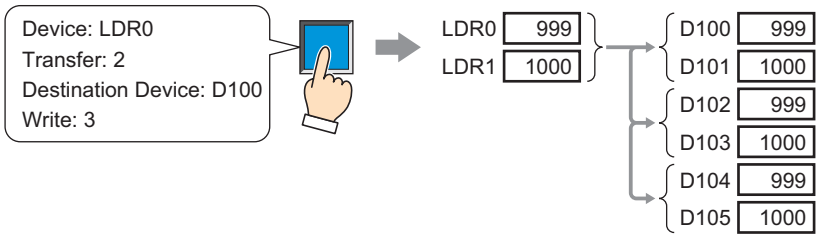
Value: Use a constant.
Only a **Value** can be handled if **Action Mode** is set to **Set**, **Momentary**, or **Alternate**.
If **Action Mode** is set to **Momentary** or **Alternate**, the value in the **ON Data** is written when the button is ON, and the value in the **OFF Data** is written when the button is OFF.

Hexadecimal: Select this check box to enter the **ON Data** and **OFF Data** values in hexadecimal.

Device: Use a word device.
Specify the device.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the source word device according to the value of the specified device.
This setting is enabled only if **Action Mode** is set to **Move**.
For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Transfer*1: Specify the number of word devices (1 to 64) to transfer.
This setting is enabled only if **Action Mode** is set to **Move**.
Example: If **Transfer** is set to **2** and **Write** is set to **3**, the same data in 2 continuous word devices will be written to the destination device 3 times.



*1 Advanced mode only

Destination Device

Destination Device: Specify the destination word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the destination word device according to the value of the specified device.

This setting is enabled only if **Action Mode** is set to **Move**.

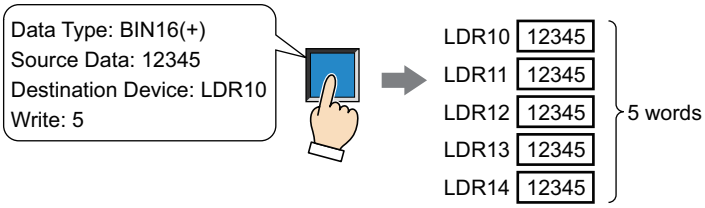
For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Write*1: Specify the number of word devices (1 to 64) at the destination.

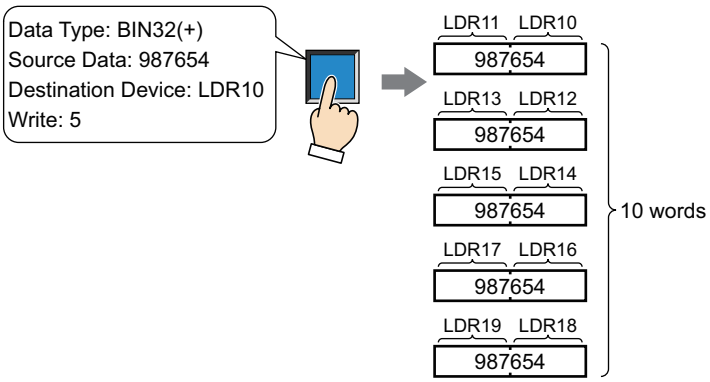
For **Move**, specify how many times to write.

This setting is enabled only if **Action Mode** is set to **Set**, **Momentary**, **Alternate**, or **Move**.

Example: If **Data Type** is set to **BIN16(+)** and **Write** is set to 5, the same data will be written to 5 continuous word addresses.



Example: If **Data Type** is set to **BIN32(+)** and **Write** is set to 5, the same data will be written to a total of 10 word addresses (2 words 5 times).



*1 Advanced mode only

■ View Switching Method*1

Select how to display the ON/OFF status of the button.

Button: Pressing the button changes the drawing object displayed.

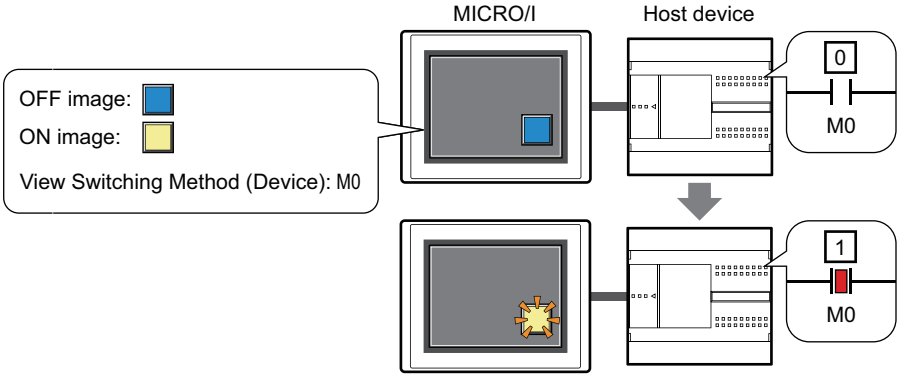
Device: The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

No Image: The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for **View** and **Registration Text** are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

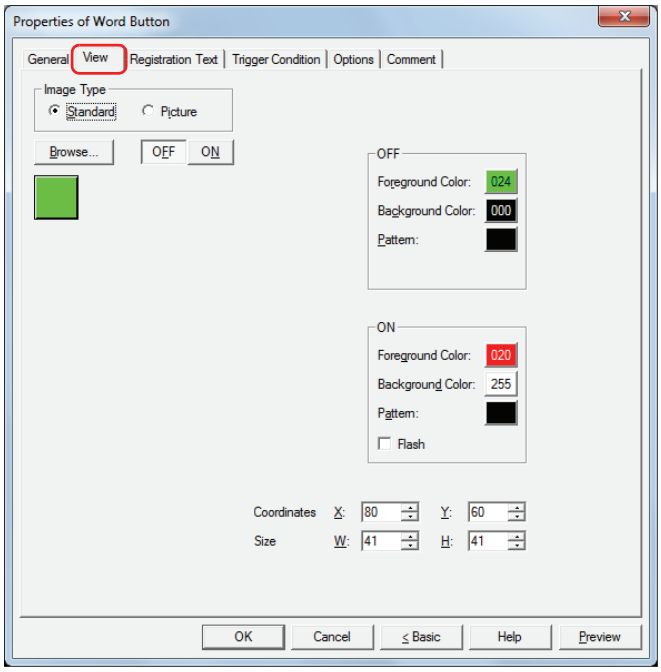
Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switched according to the value of M0 even if the button is not pressed.



*1 Advanced mode only

● **View** Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphics contained within WindO/I-NV2.

Picture: Uses an image file saved in the Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **OFF button, ON button**

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ **OFF, ON**

Selects the color and pattern of the standard graphic when ON and OFF.

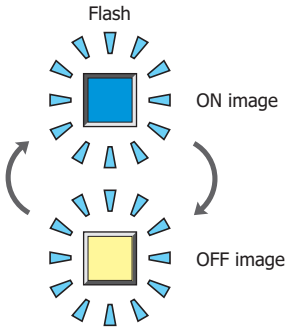
Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

Flash

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.



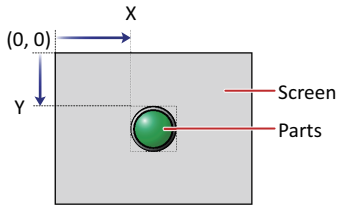
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

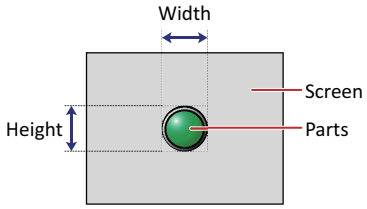


Size

W, H: Sets width and height to define the size of parts.

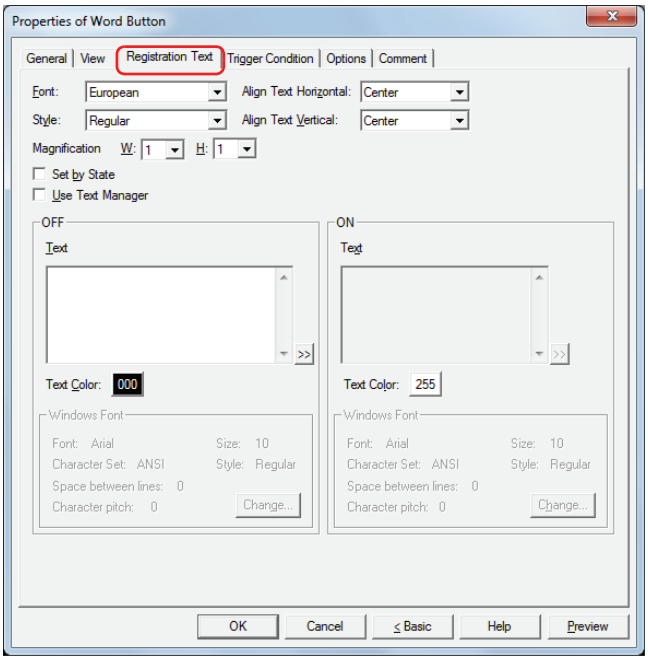
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.

Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

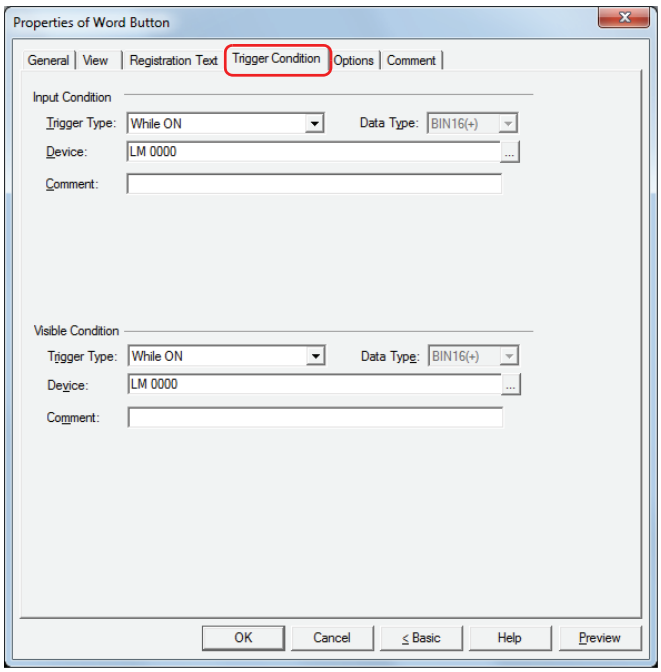
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

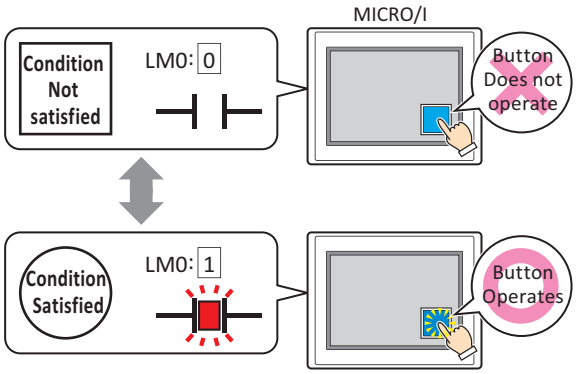
The **Trigger Condition** tab is displayed in Advanced mode.



■ Input Condition

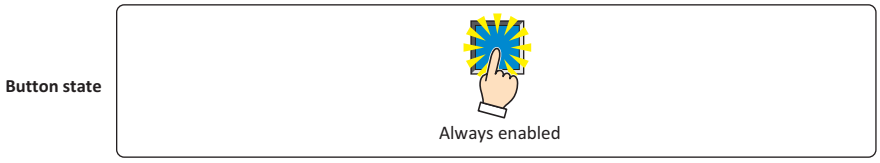
The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is not operational.
While LM 0 is 1, the condition is satisfied and the Button is operational.

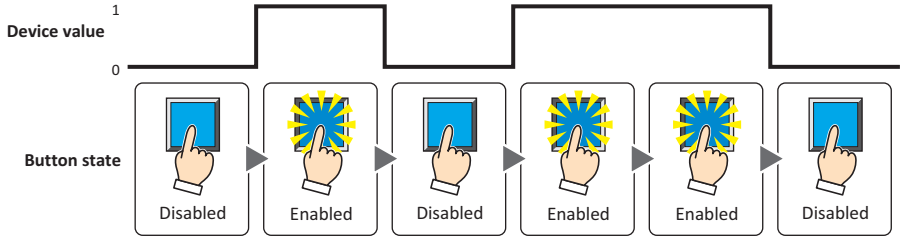


Trigger Type: Selects the condition to enable the Button from the following.

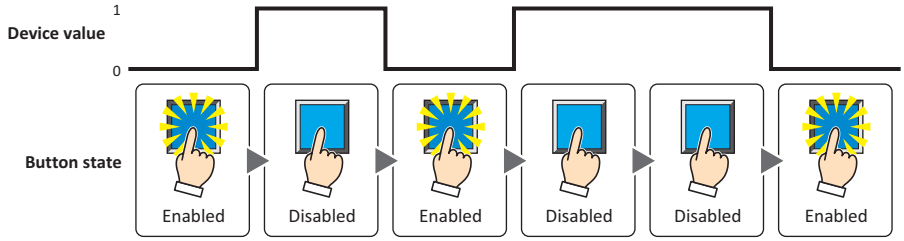
Always enable: The Button is always enabled.



While ON: Enables the Button when the device value is 1.

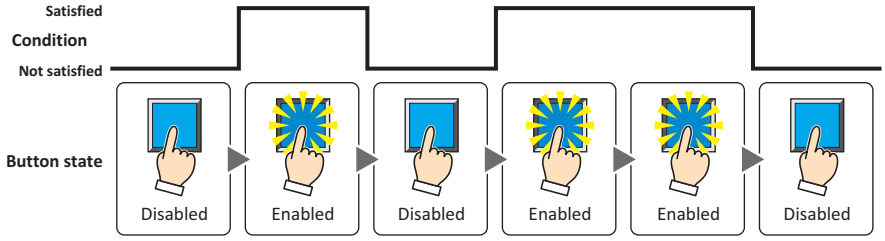


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

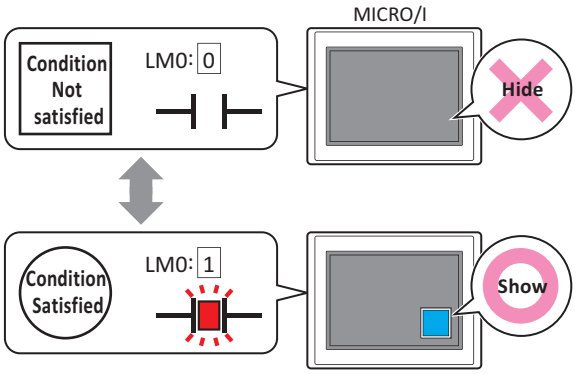
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

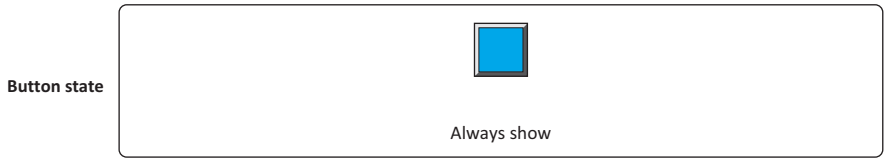


- When **Alternate** is selected for **Action Mode** on the **General** tab, the button remains on when hidden in the on state.
- When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

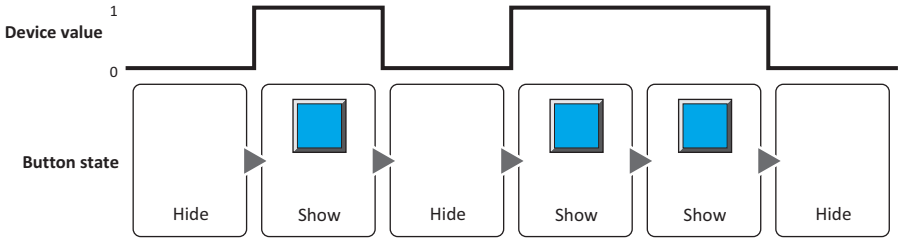
*1 HG2G-5F, HG3G/4G onlsy

Trigger Type: Selects the condition to display the Button from the following.

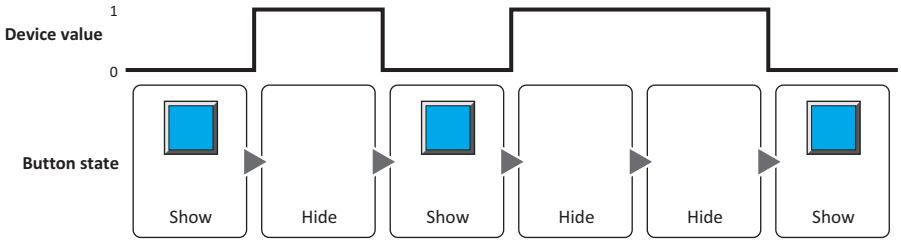
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

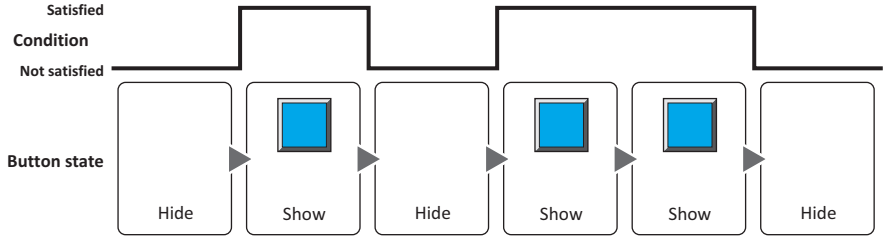


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.

This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.

This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the visible condition.

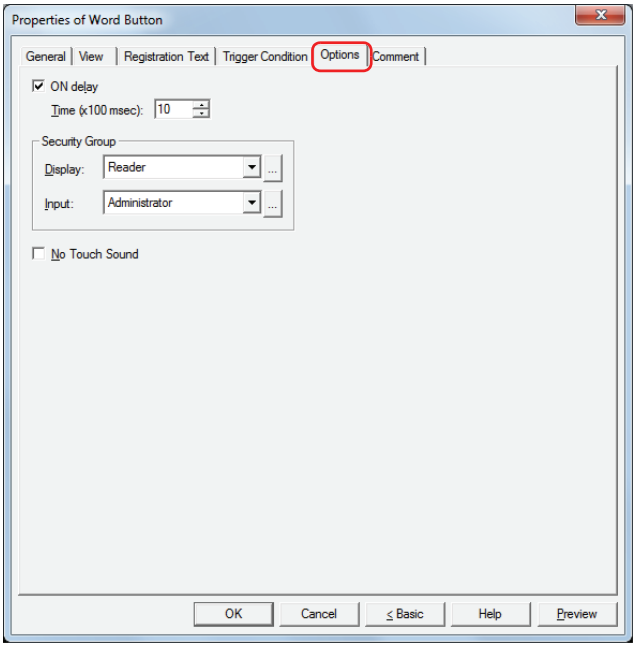
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

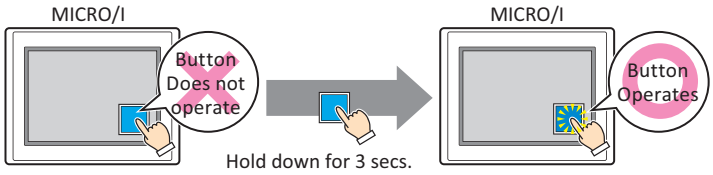
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.
Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

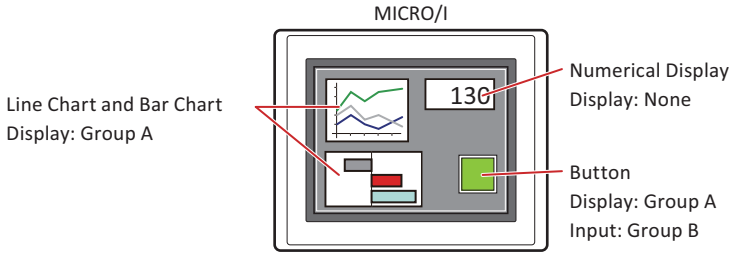
Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.
Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

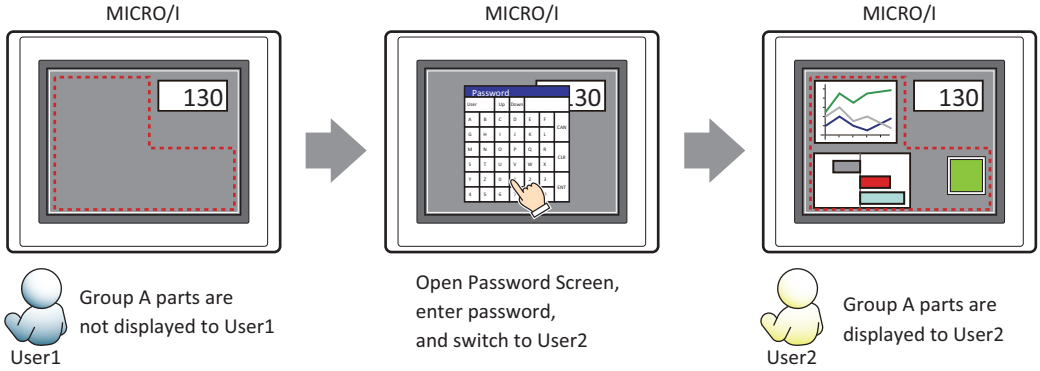
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

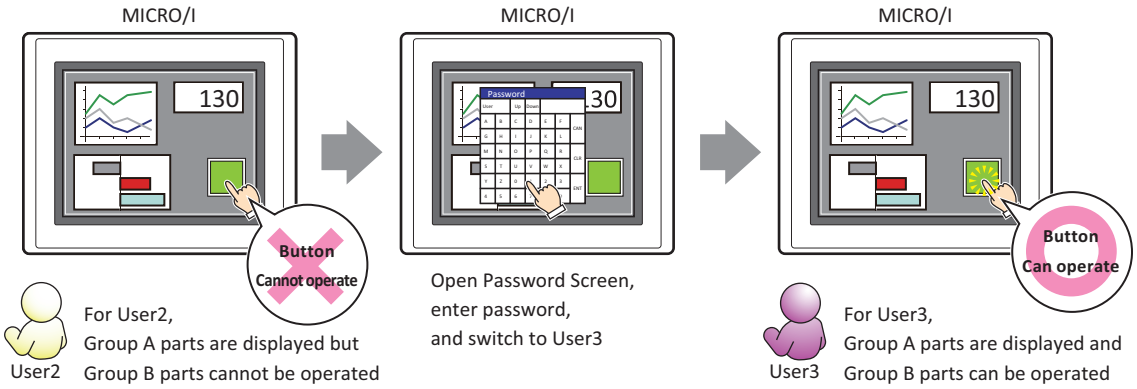
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

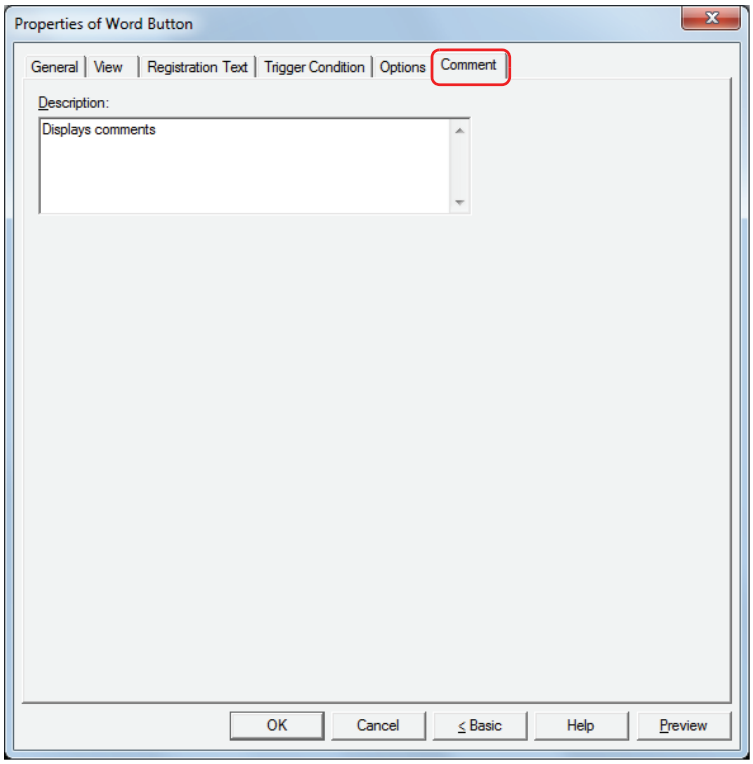
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

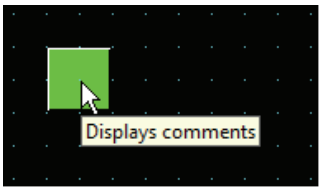
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen



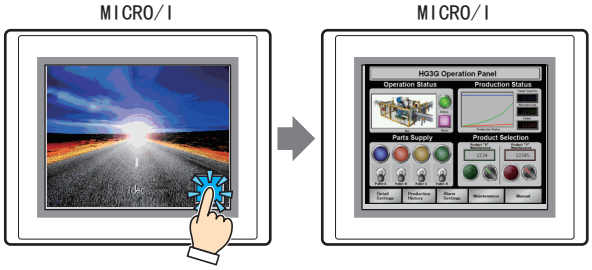
3 Goto Screen Button

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

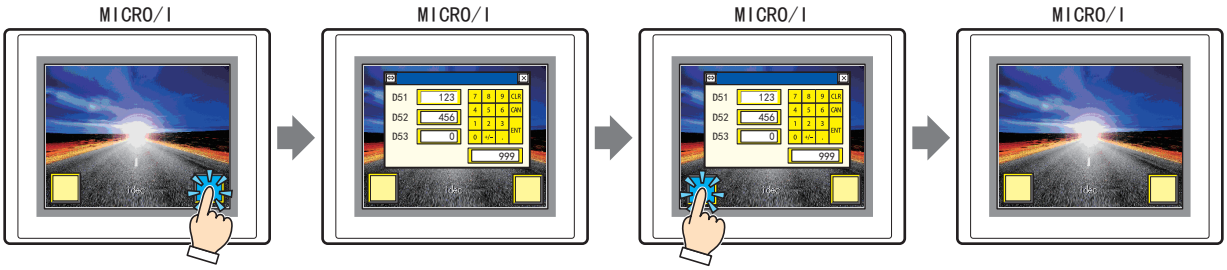
3.1 How the Goto Screen Button is Used

Switches to another screen or displays a window.

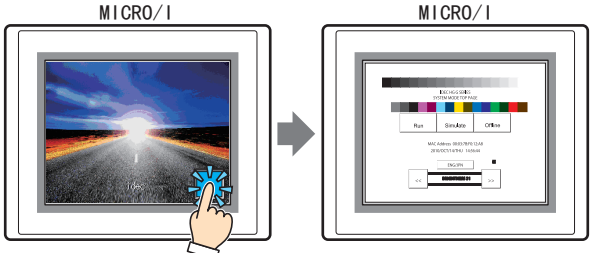
- Pressing the button switches between Base Screens.



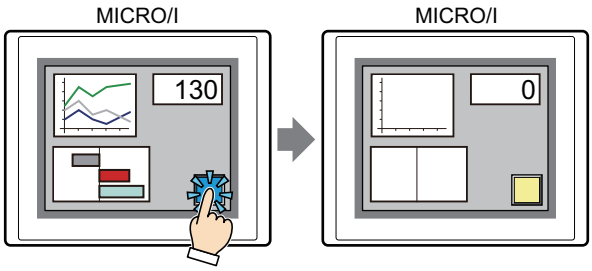
- Pressing the button opens and closes other windows (such as the Popup Screen, Device Monitor, Password Screen, Adjust Contrast Screen, and File Screen).



- Pressing the button switches to the System Menu.



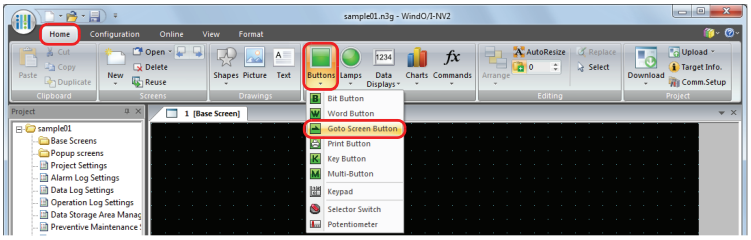
- Pressing the button resets the current screen.



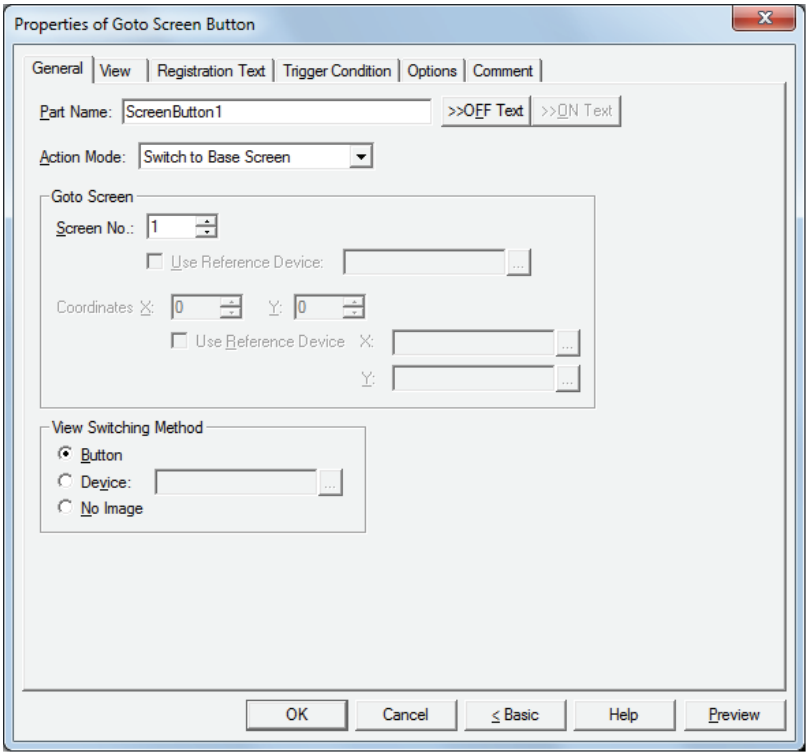
3.2 Goto Screen Button Configuration Procedure

This section describes the configuration procedure for Goto Screen Buttons.

1. On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.



2. Click a point on the edit screen where you wish to place the Goto Screen Button.
3. Double-click the dropped Goto Screen Button and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

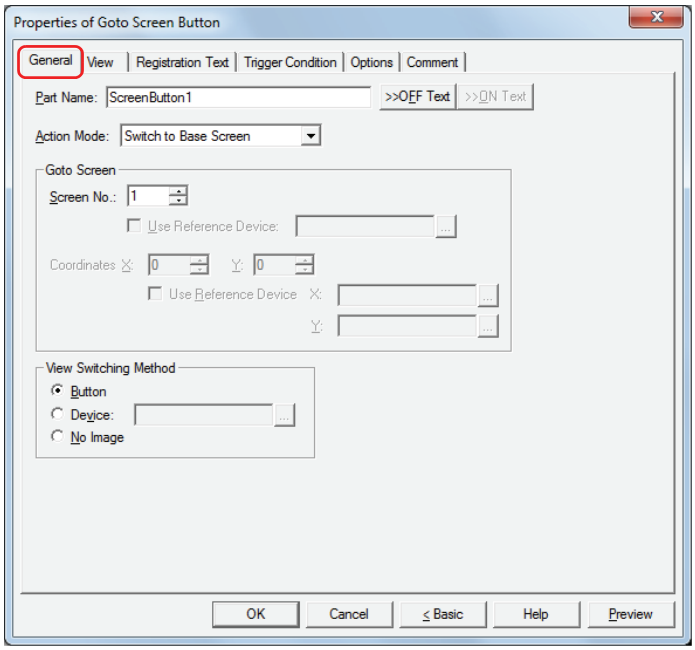


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

3.3 Properties of Goto Screen Button Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**
Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**
Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Action Mode**
Select the behavior of the button from the following:

Back to previous Screen:	Switches to the previous screen. Returns to up to 16 earlier screens.
Switch to Base Screen:	Switches between Base Screen.
Open Popup Screen:	Opens a Popup Screen.
Close Popup Screen:	Closes a Popup Screen.
Open Device Monitor Screen:	Opens the Device Monitor Screen.
Close Device Monitor Screen:	Closes the Device Monitor Screen.
Open Password Screen:	Opens the Password Screen.
Close Password Screen:	Closes the Password Screen.
Open Adjust contrast Screen:	Opens the Adjust contrast Screen.
Close Adjust contrast Screen:	Closes the Adjust contrast Screen.
Open File Screen for movie files:	Opens the File Screen.
Close File Screen for movie files:	Closes the File Screen.
Switch to System Menu Screen:	Switches to the System Menu Screen.
Reset current screen:	Resets the current Base Screen.

When the current Base Screen is reset using the **Reset current screen** function, the window and internal devices restart as if the Base Screens were switched.

Goto Screen

Screen No.: If **Action Mode** is set to **Switch to Base Screen**, specify the Base Screen number to switch to (from 1 to 3000). If **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**, specify the number of the Popup Screen to open or close (from 1 to 3015).
This setting is enabled only if **Action Mode** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the screen number using the value of the specified device.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This setting is enabled only if **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**.

Coordinates X, Y: Specify the coordinates on the Base Screen for displaying a window.
X and Y specify the upper left corner of the window using the upper left corner of the screen as the origin.
This setting is enabled only if **Action Mode** is set to **Open Popup Screen**, **Open Device Monitor Screen**, **Open Password Screen**, **Open Adjust contrast Screen**, or **Open Movie File Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the coordinates using the value of the specified device.
Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This setting is enabled only if **Action Mode** is set to **Open Popup Screen**.

With the HG2F/2S/3F/4F, window display coordinates are automatically adjusted to a position in multiples of 20 dots.

View Switching Method*1

Select how to display the ON/OFF status of the button.

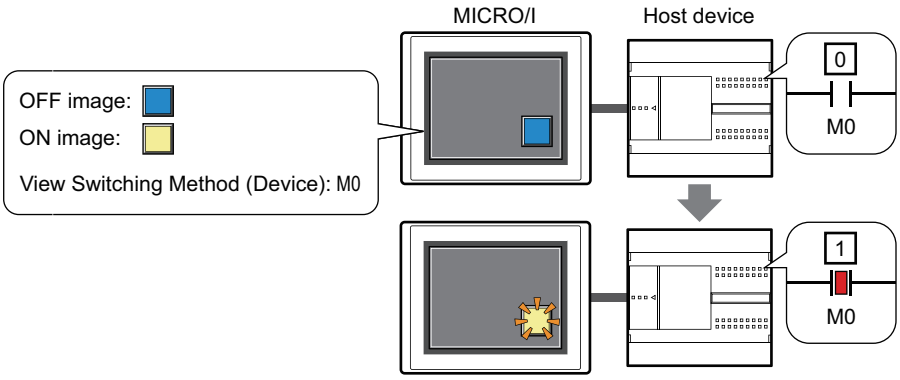
Button: Pressing the button changes the drawing object displayed.

Device: The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

No Image: The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for **View** and **Registration Text** are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

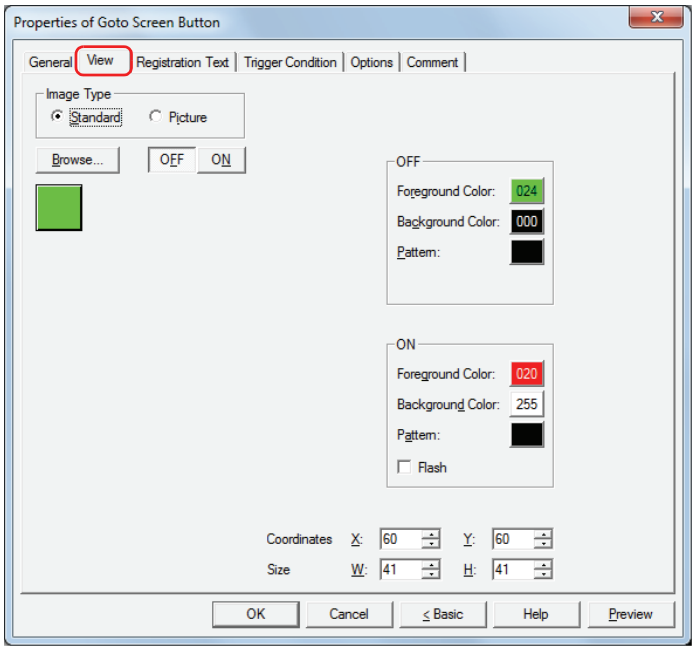
Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switched according to the value of M0 even if the button is not pressed.



*1 Advanced mode only

● **View** Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphics contained within WindO/I-NV2.

Picture: Uses an image file saved in the Picture Manager.

For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **OFF button, ON button**

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ **OFF, ON**

Selects the color and pattern of the standard graphic when ON and OFF.

Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).

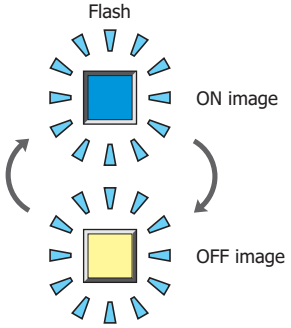
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

Flash

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.

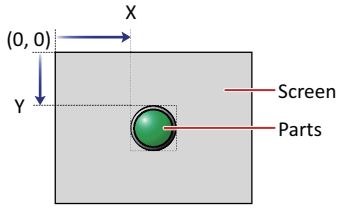


Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

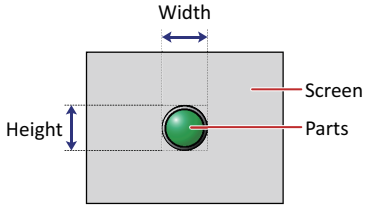


Size

W, H: Sets width and height to define the size of parts.

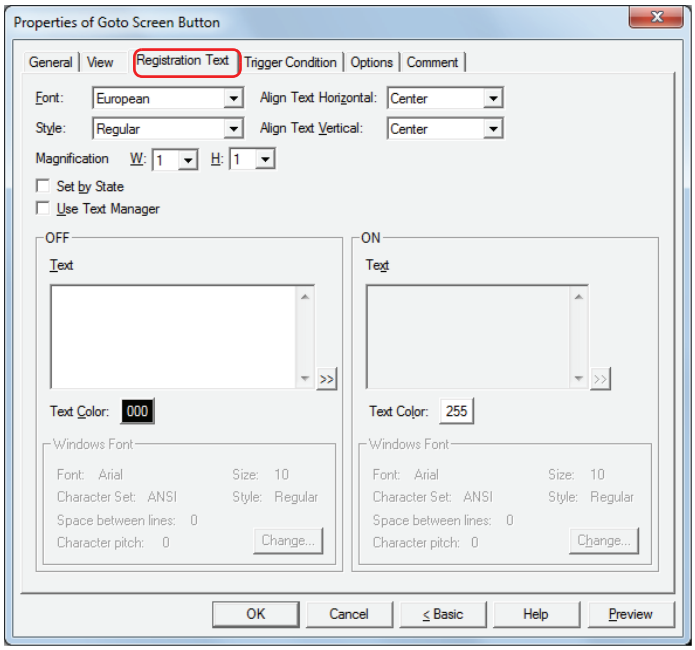
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

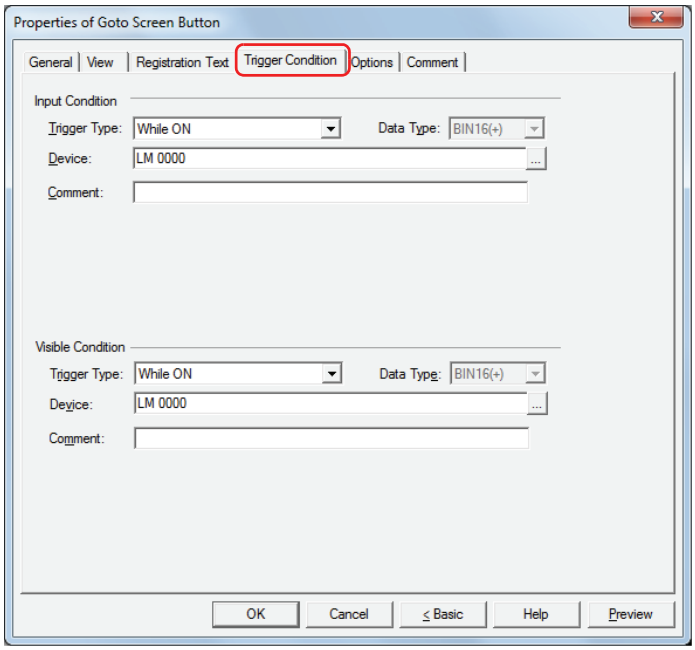
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



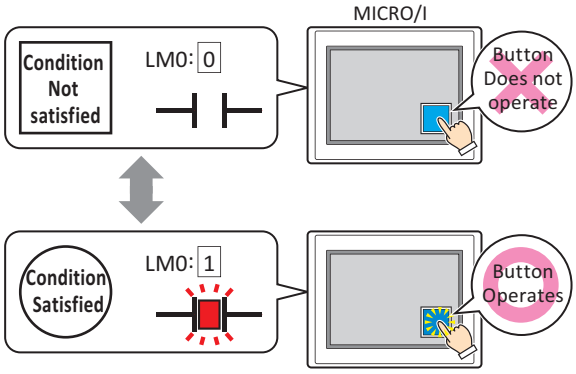
■ Input Condition

The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

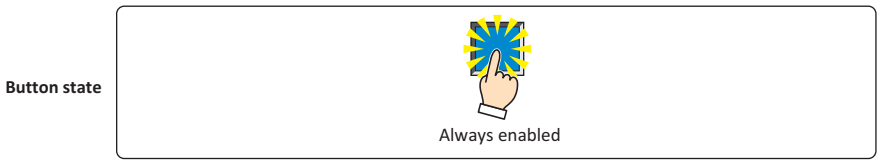
While LM 0 is 0, the condition is not satisfied and the Button is not operational.

While LM 0 is 1, the condition is satisfied and the Button is operational.

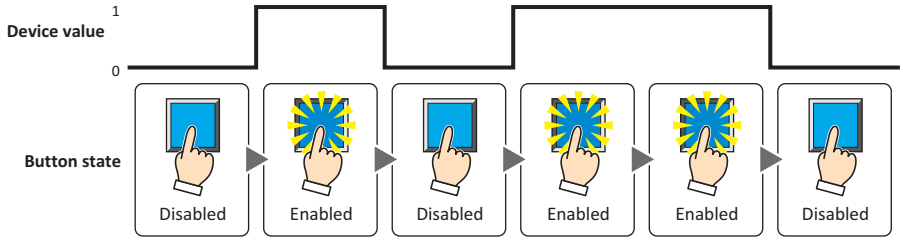


Trigger Type: Selects the condition to enable the Button from the following.

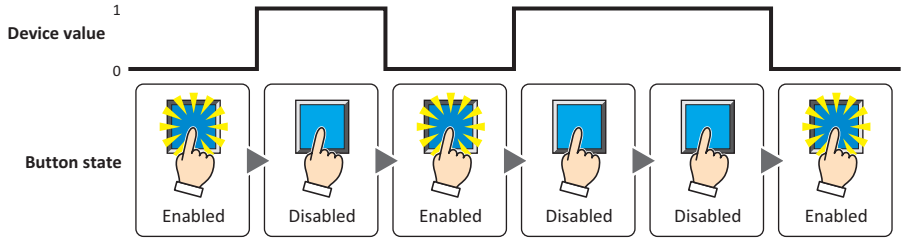
Always enable: The Button is always enabled.



While ON: Enables the Button when the device value is 1.

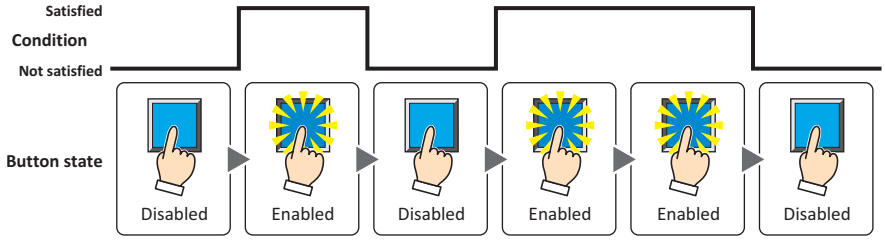


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

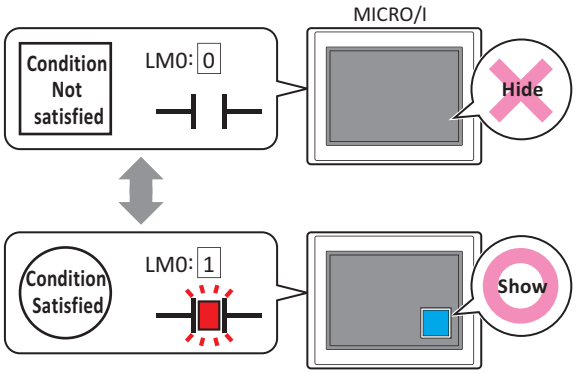
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

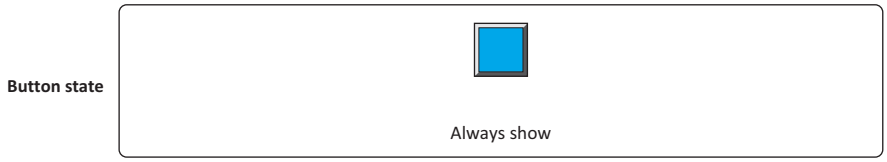


When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

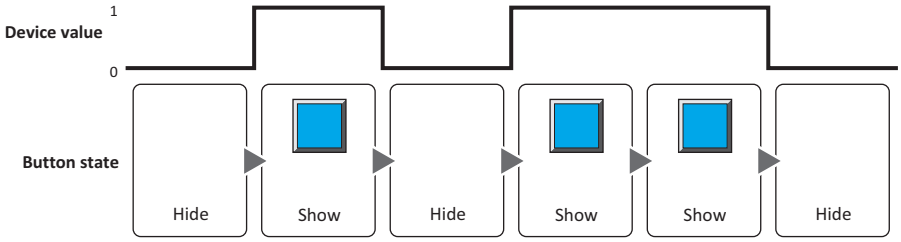
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Button from the following.

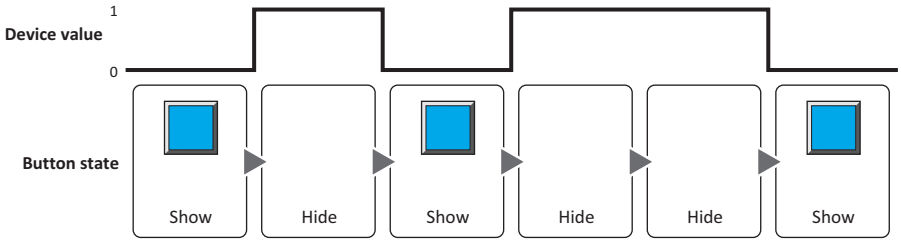
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

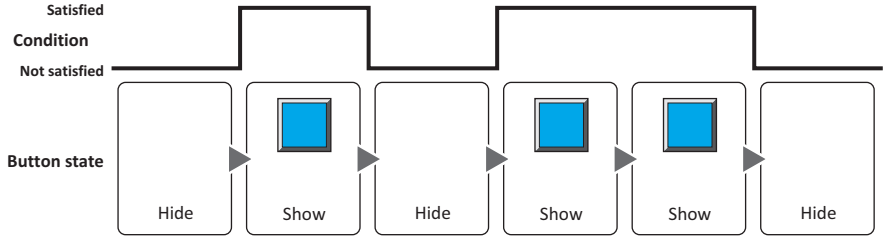


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.

This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.

This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the visible condition.

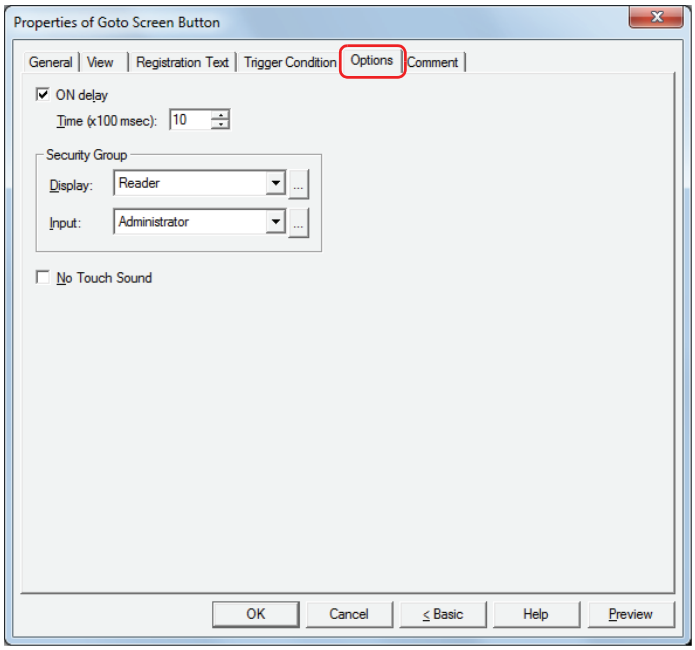
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

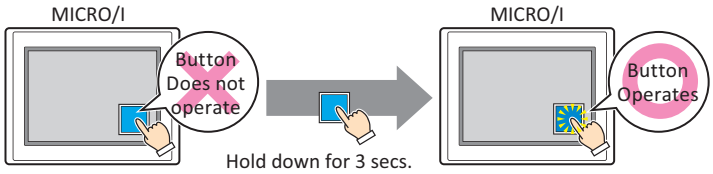
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

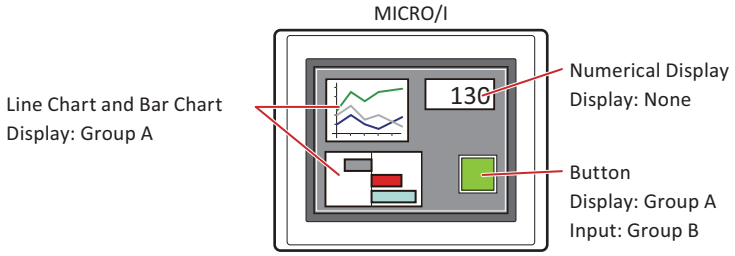
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

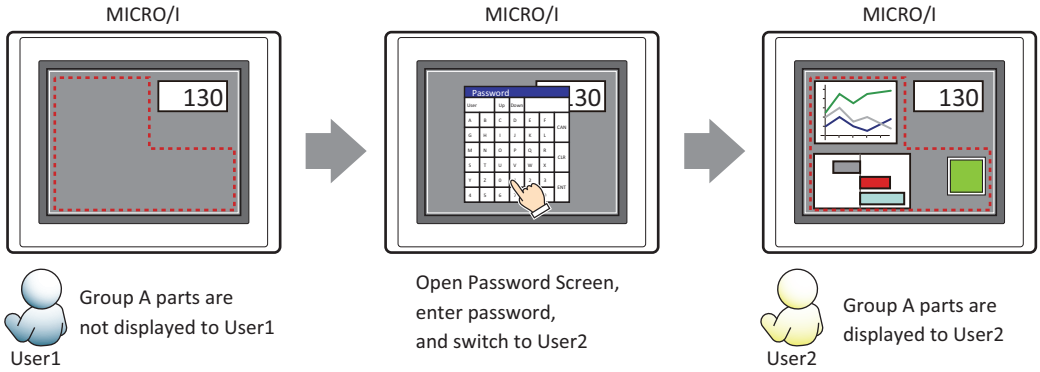
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

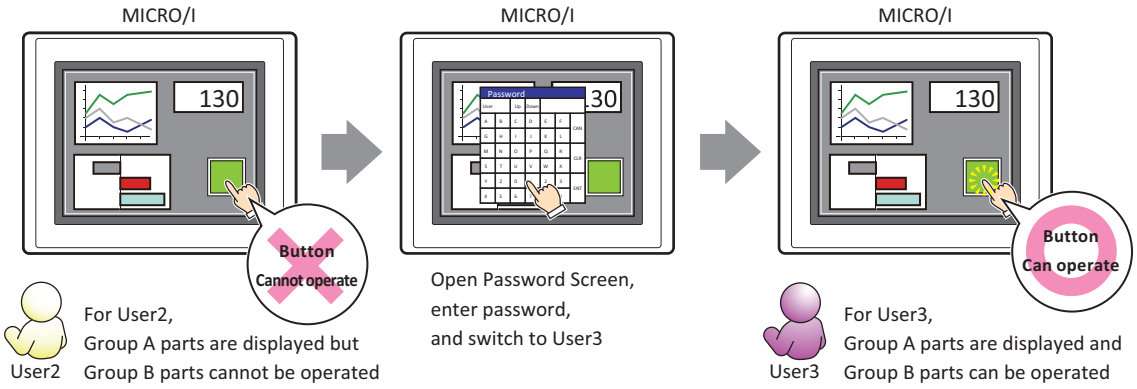
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

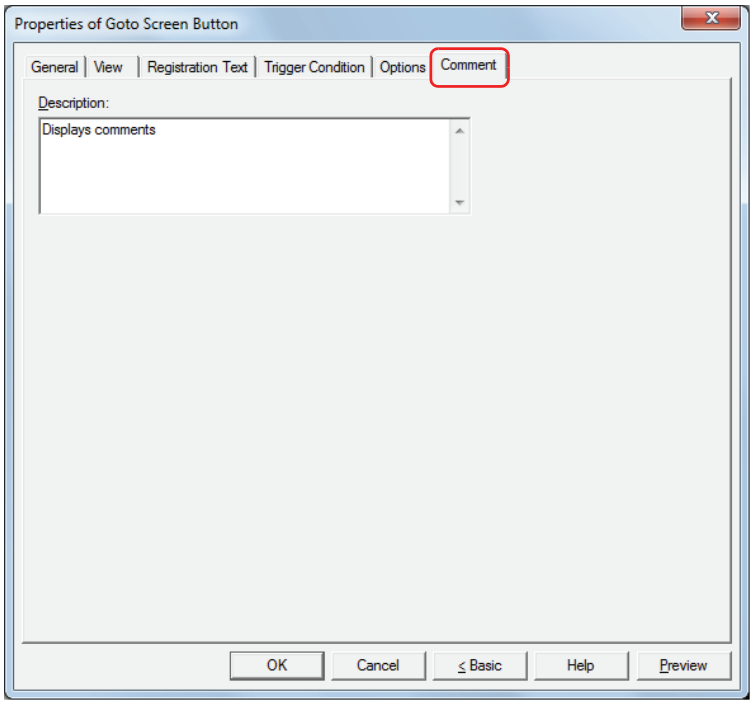
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen

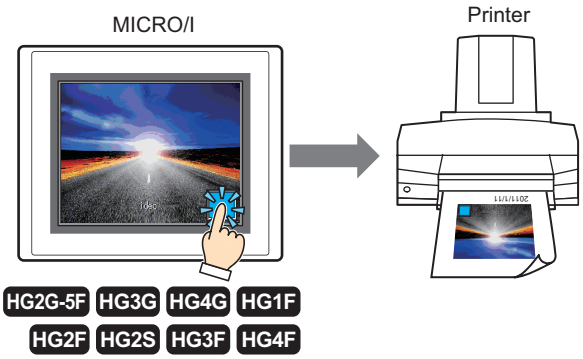
4 Print Button

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 How the Print Button is Used

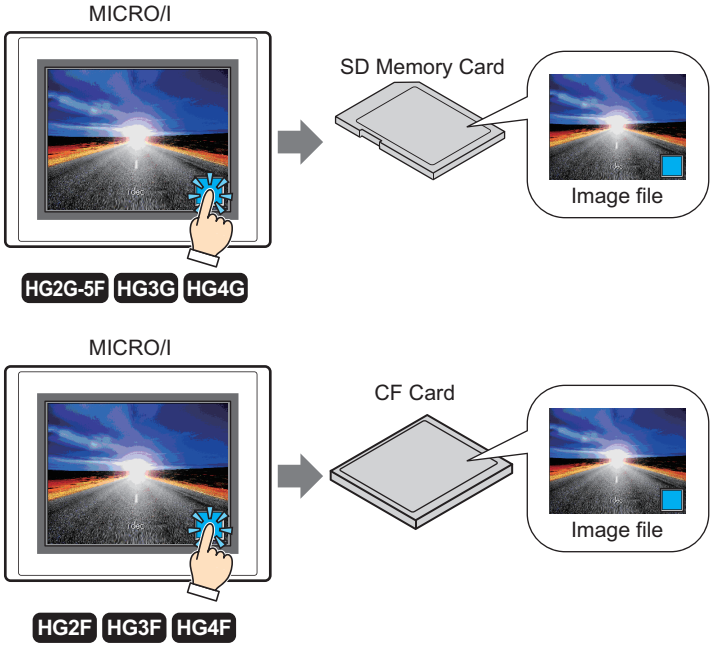
Outputs a screenshot to a printer or a memory card.

- Pressing the Print Button outputs a screenshot of the current screen to the printer.



Refer to Chapter 31 "1.3 Connecting a Printer to MICRO/I" on page 31-1 for compatible printers and instructions on how to connect one to the MICRO/I.

- Pressing the Print Button outputs a screenshot of the current screen to a memory card.

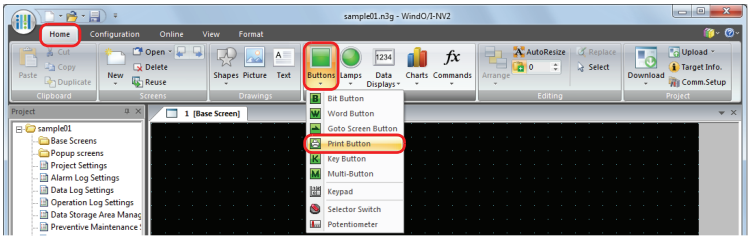


This function is only supported by models that are equipped with a memory card interface.

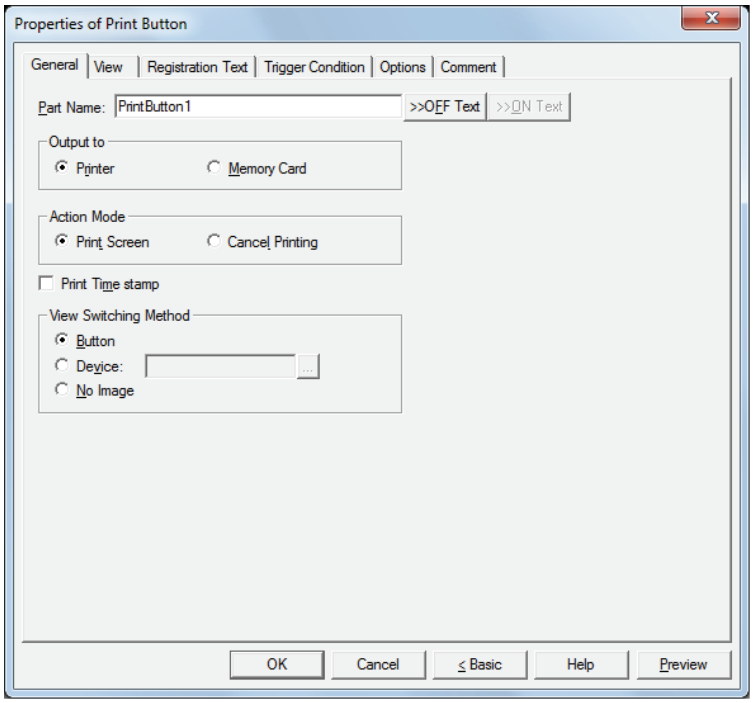
4.2 Print Button Configuration Procedure

This section describes the configuration procedure for Print Buttons.

1. On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Print Button**.



2. Click a point on the edit screen where you wish to place the Print Button.
3. Double-click the dropped Print Button and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

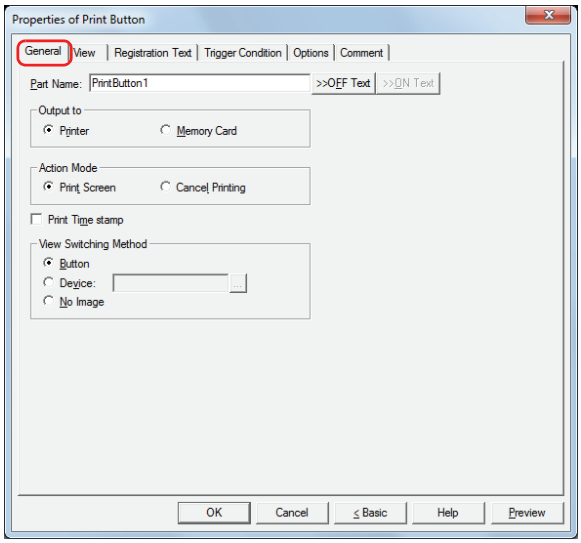


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

4.3 Properties of Print Button Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**

Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

To specify the Registration Text to use when the button is ON, place a check in the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Output to**

Select where to direct the screenshot to.

Printer: Outputs the screenshot to the printer connected to the MICRO/I.

Memory Card*1: Outputs the screenshot as a file to the memory card inserted in the MICRO/I.
Files are output as follows:

Series	File format	File name	File size
HG2G-5F HG3G/4G	JPEG	CAP***.JPG (***: date and time when file was output) Example: A file created at 18:50:25 on June 30, 2011 will be named "CAP110630_185025.JPG".	Depends on image being displayed.
HG2F	Bitmap	CAP***.BMP (***: serial number from 001 to 999)	77,878 bytes
HG3F			308,278 bytes
HG4F			481,078 bytes

- For details about printers, refer to Chapter 31 "Printer" on page 31-1.
- For details about memory cards, refer to Chapter 30 "1 Memory Cards" on page 30-1.

■ **Action Mode**

Select the behavior of the button from the following:

Print Screen: Outputs a screenshot of the current screen to the printer or the memory card.

Cancel Printing: Cancels printout to the printer.

*1 This is applicable for models with the memory card interface only.

Print Time stamp

Adds the date and time of printing to the screenshot before sending it to the printer.
The date and time format depends on the language selected in **Language**. **Language** is available on the **Project Details** tab of the **Project Settings** dialog box.
The display formats are shown below:

- Japanese: YYYY*2/MM/DD HH:MM
- English: MM/DD/YYYY*2 HH:MM

YYYY: year, MM: month, DD: day, HH: hour, MM: minute

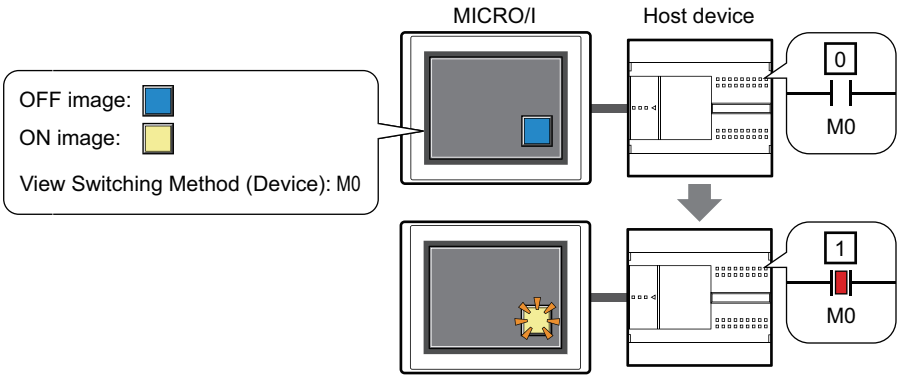
View Switching Method*3

Select how to display the ON/OFF status of the button.

Button:	Pressing the button changes the drawing object displayed.
Device:	The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
No Image:	The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for **View** and **Registration Text** are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switched according to the value of M0 even if the button is not pressed.



- These operations cannot be performed simultaneously.
  - Outputting to the memory card by pressing the Print Button.*1
  - Outputting to the printer by pressing the Print Button.
  - Printing alarm logs*4
- It may take some time to output screenshots when copying files using the USB Autorun function or a Key Button.
- The HG2G-5F, HG3G/4G cannot stop printing in the middle of a page, even when the print job is canceled. Print jobs after the current print job are canceled after the current page finishes printing.
- When printing a screenshot from the HG3F/4F using SII DPU-414 printer, the printed image will only include 320 pixels from the left edge of the screen.

The maximum number of screenshots that can be captured (1 to 999) can be set in HG Special Registers LSD65. (Default: 99)

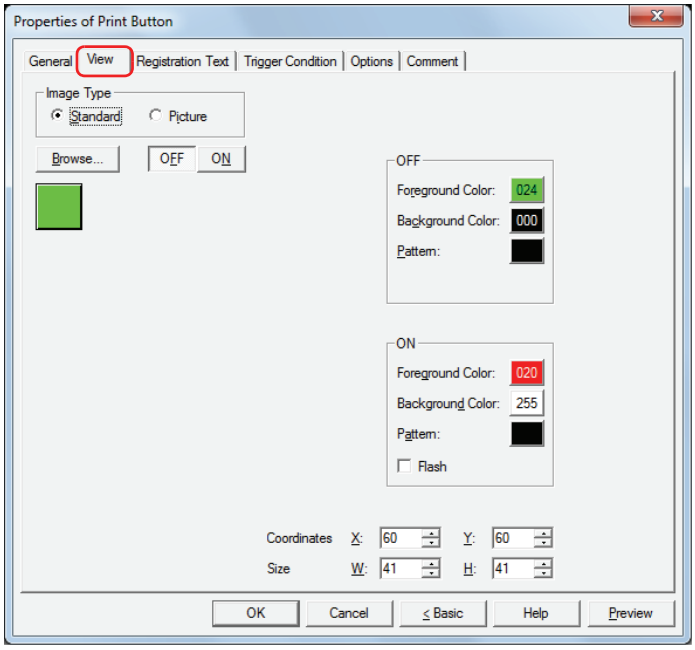
*1 This is applicable for models with the memory card interface only.
*2 Only last two digits of year shown on the HG1F/2F/2S/3F/4F.
*3 Advanced mode only
*4 HG2G-5F, HG3G/4G only

The methods to erase screenshot files saved on the memory card are as follows.

- To erase files during operation using parts, on the **Memory Card** tab on the **Project Settings** dialog box, select the **Remove Files stored in Memory Card** check box and the **All Screenshot data** check box, and then configure the trigger device. Assign that trigger device to a part.
- To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the **Clear Data** dialog box. Select the **Screenshot Data** check box and click **OK**.
- To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

● View Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphics contained within WindO/I-NV2.

Picture: Uses an image file saved in the Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ OFF button, ON button

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ OFF, ON

Selects the color and pattern of the standard graphic when ON and OFF.

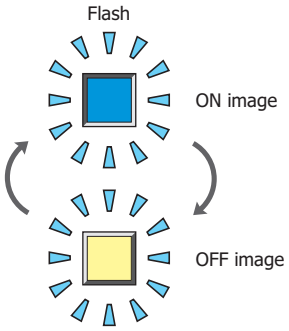
Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ **Flash**

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.



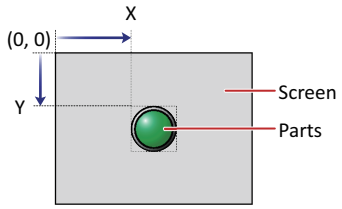
■ **Coordinates**

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

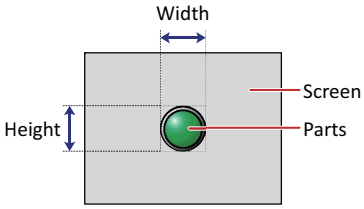


■ **Size**

W, H: Sets width and height to define the size of parts.

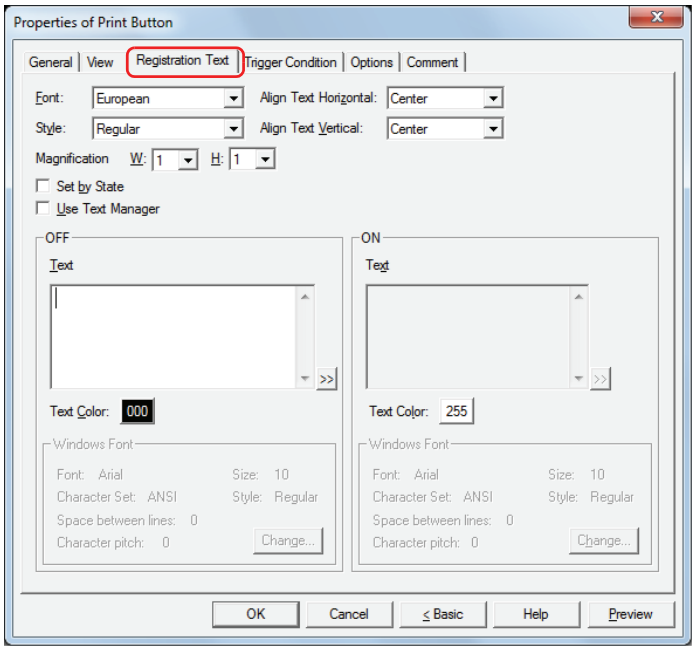
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.

Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

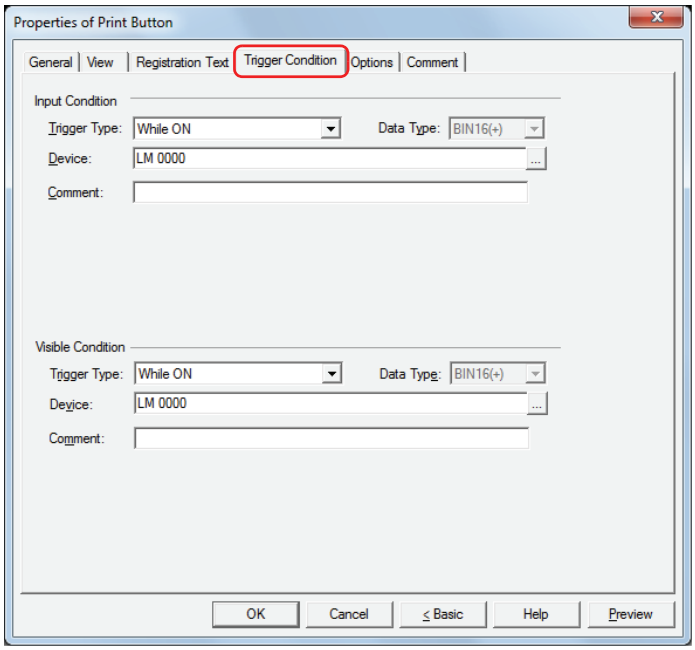
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



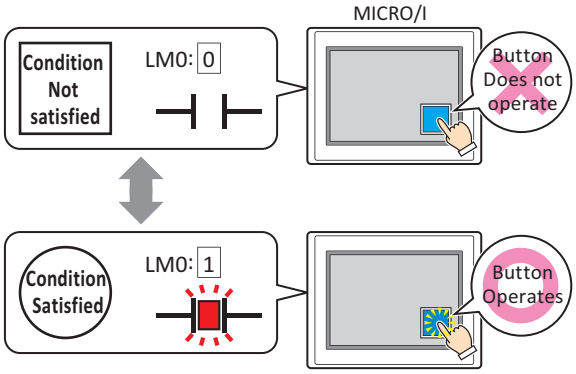
■ Input Condition

The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

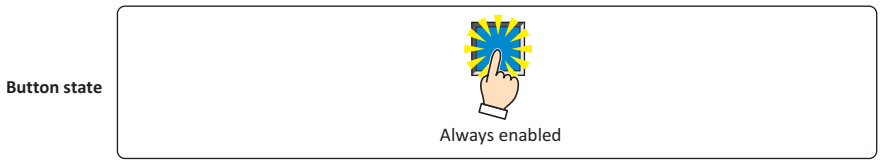
While LM 0 is 0, the condition is not satisfied and the Button is not operational.

While LM 0 is 1, the condition is satisfied and the Button is operational.

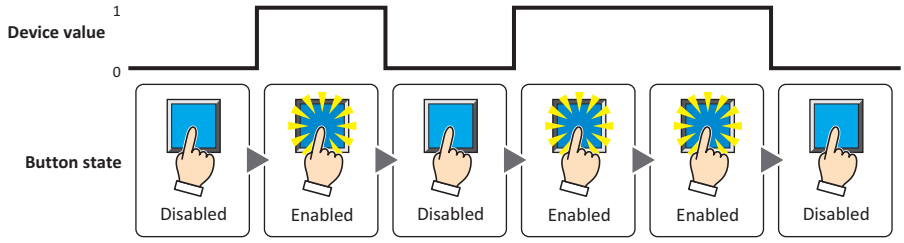


Trigger Type: Selects the condition to enable the Button from the following.

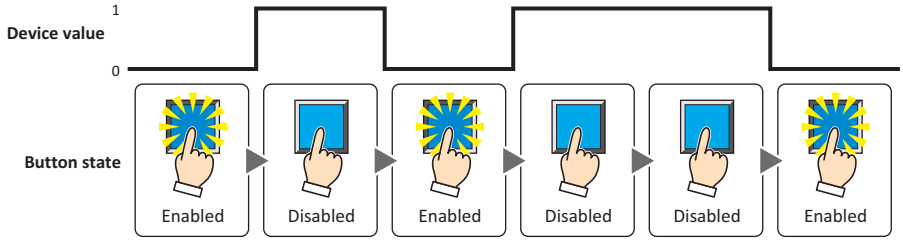
Always enable: The Button is always enabled.



While ON: Enables the Button when the device value is 1.

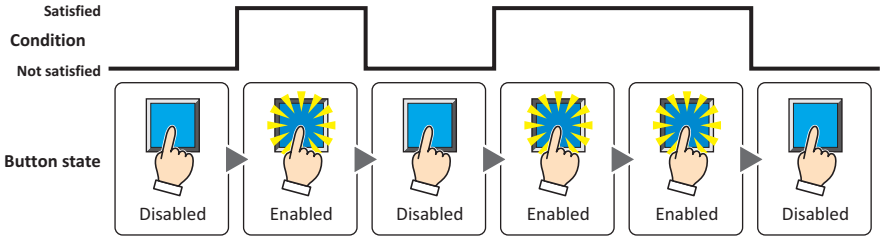


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

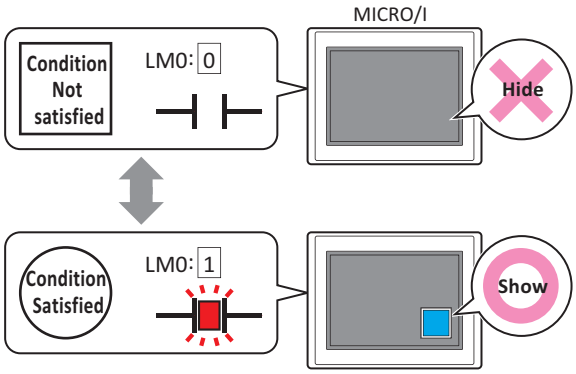
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

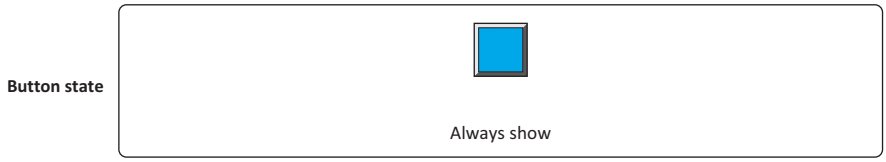


When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

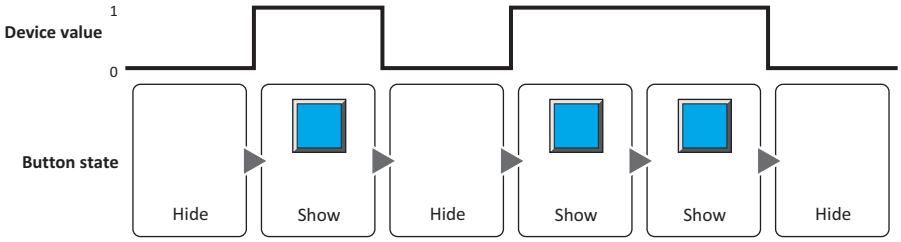
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Button from the following.

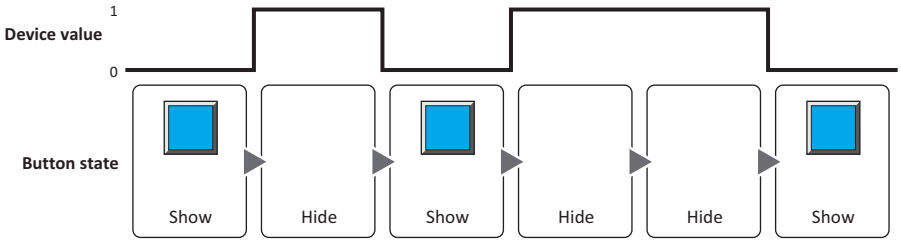
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

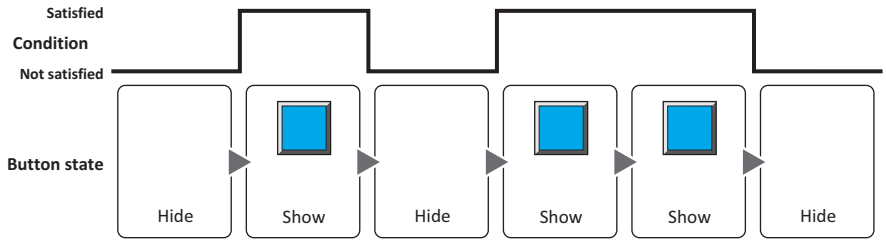


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.

This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.

This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the visible condition.

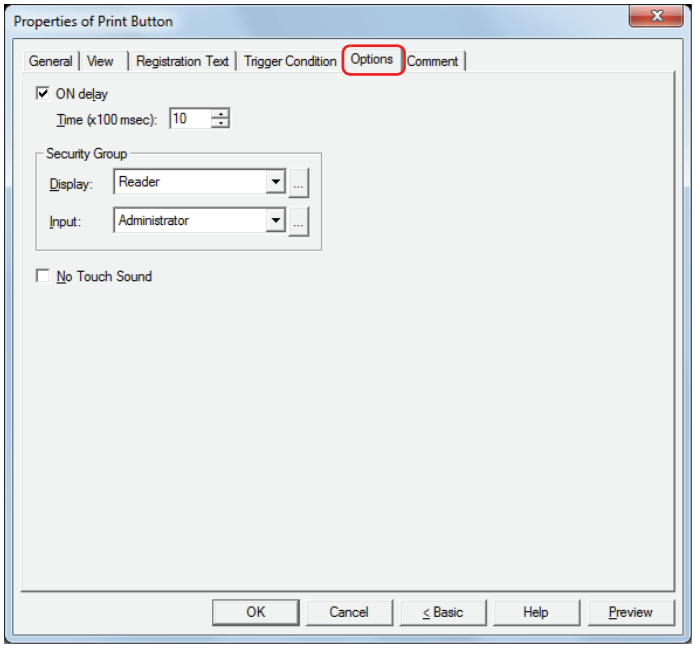
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

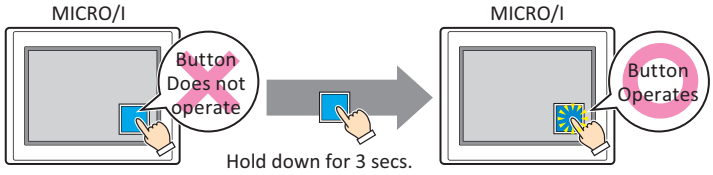
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

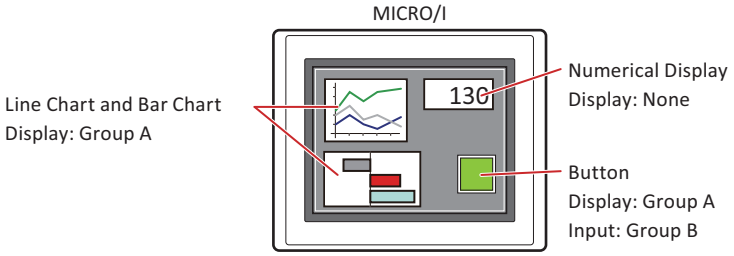
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

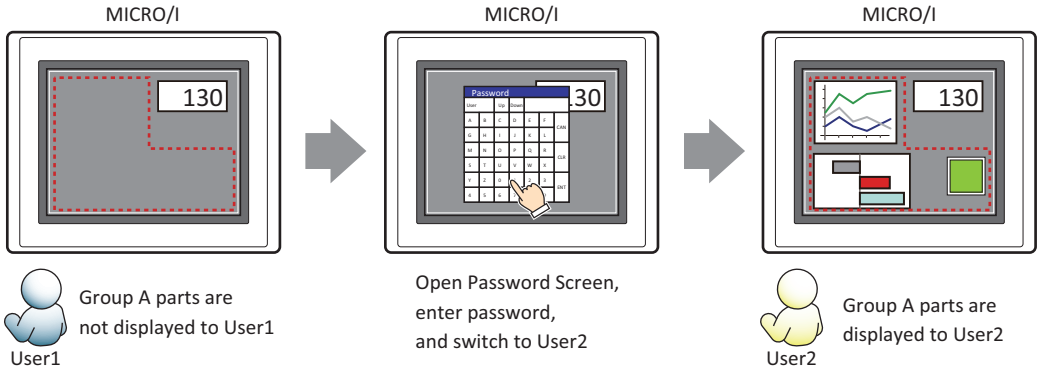
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

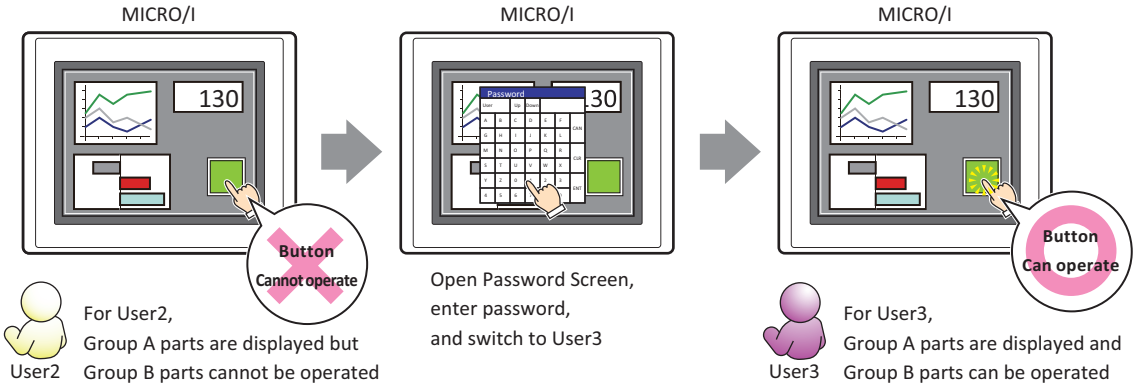
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

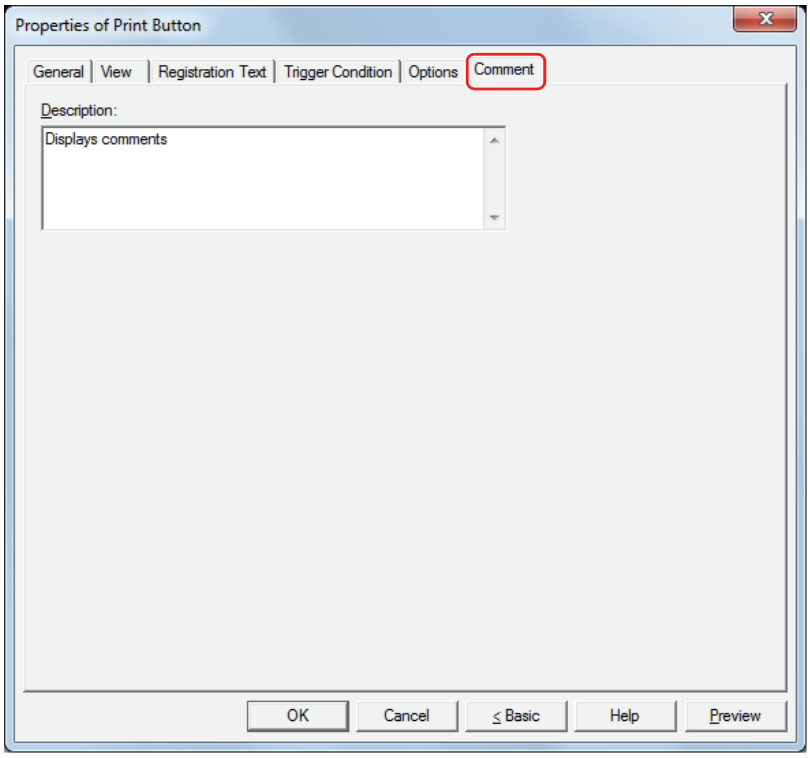
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen

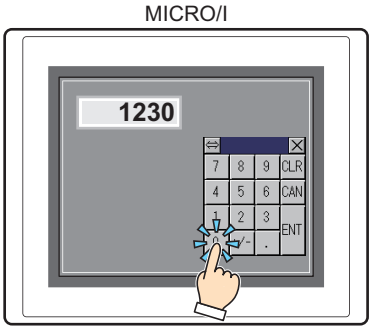
5 Key Button

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

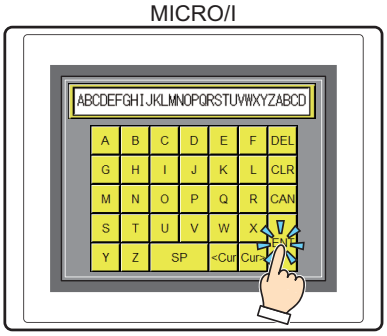
5.1 How the Key Button is Used

Performs a variety of functions including uploading and downloading, copying files, and operating other parts.

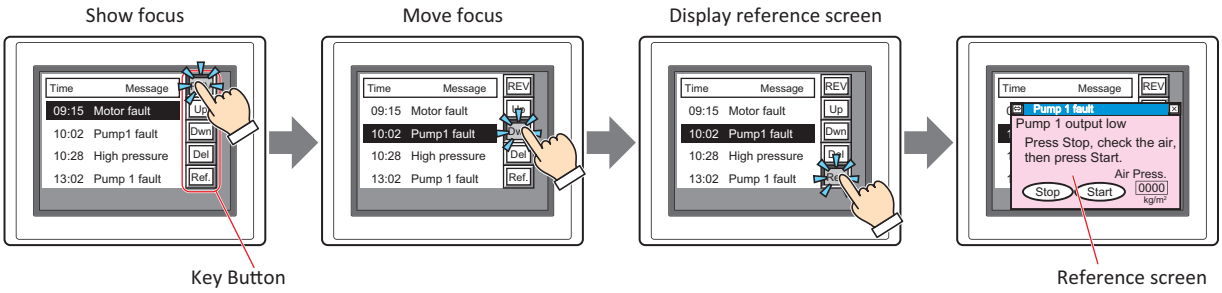
- Entering numbers in the Numerical Input



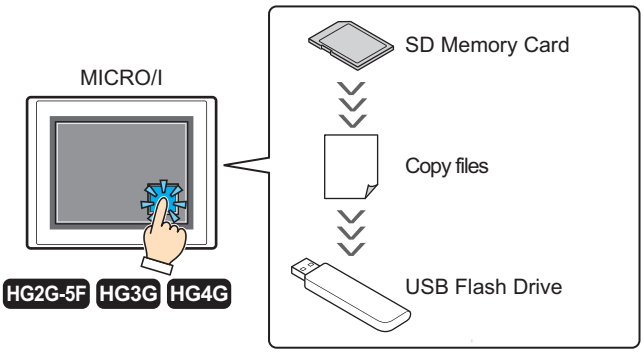
- Entering characters in the Character Input



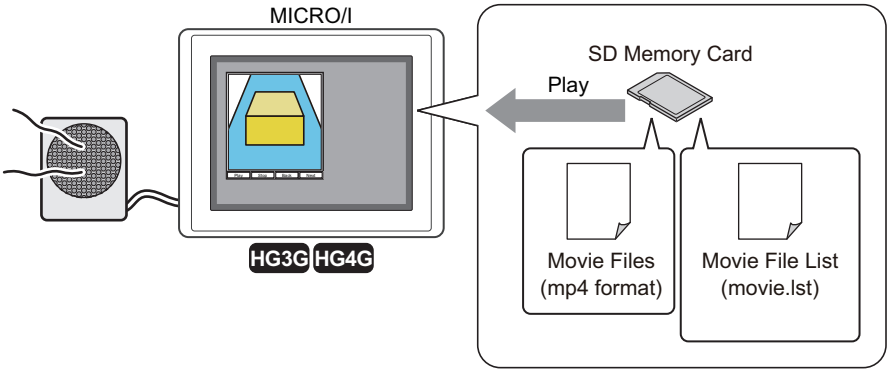
- Operating the Alarm List Display or Alarm Log Display



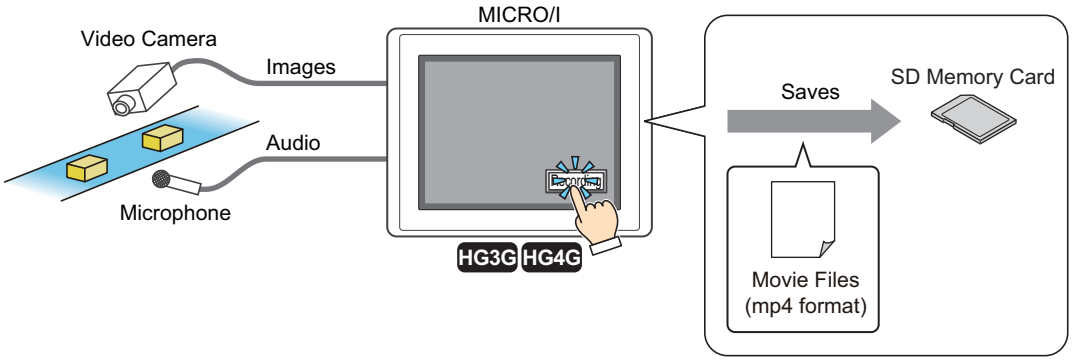
- Copying and recovering data archived on the SD memory card, inserted in the MICRO/I, to the USB flash drive.



- Operating the Video Display*1



- Record images from a video camera and microphone audio to an SD Memory Card*1

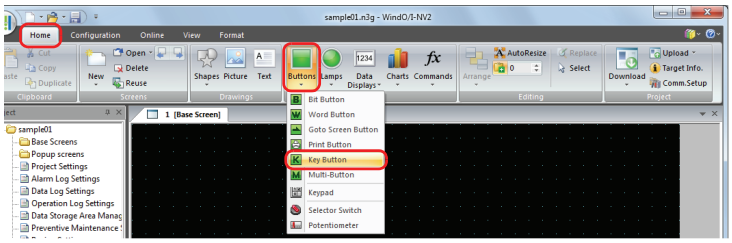


*1 This is applicable for models with a video interface only.

5.2 Key Button Configuration Procedure

This section describes the configuration procedure for Key Buttons.

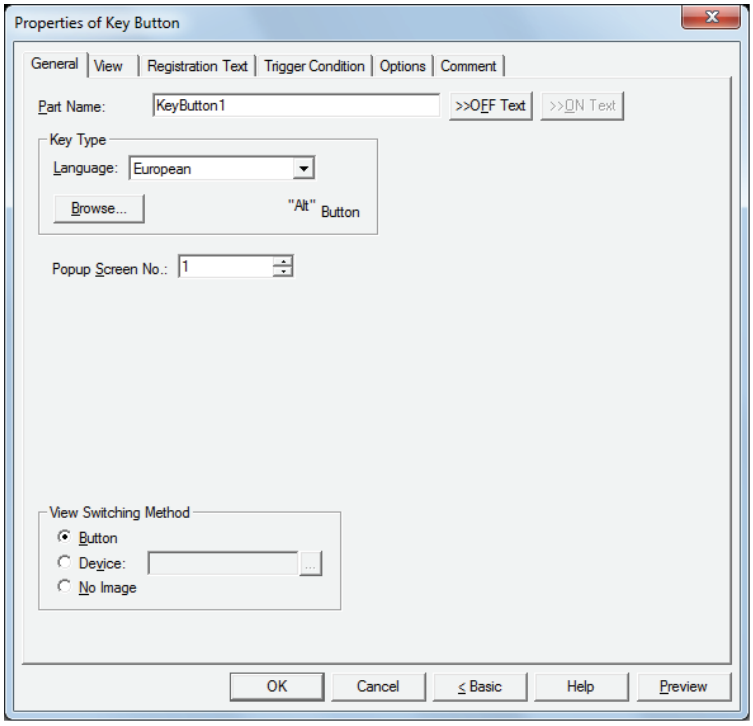
1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Key Button**.



2 Click a point on the edit screen where you wish to place the Key Button.

3 Double-click the dropped Key Button and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

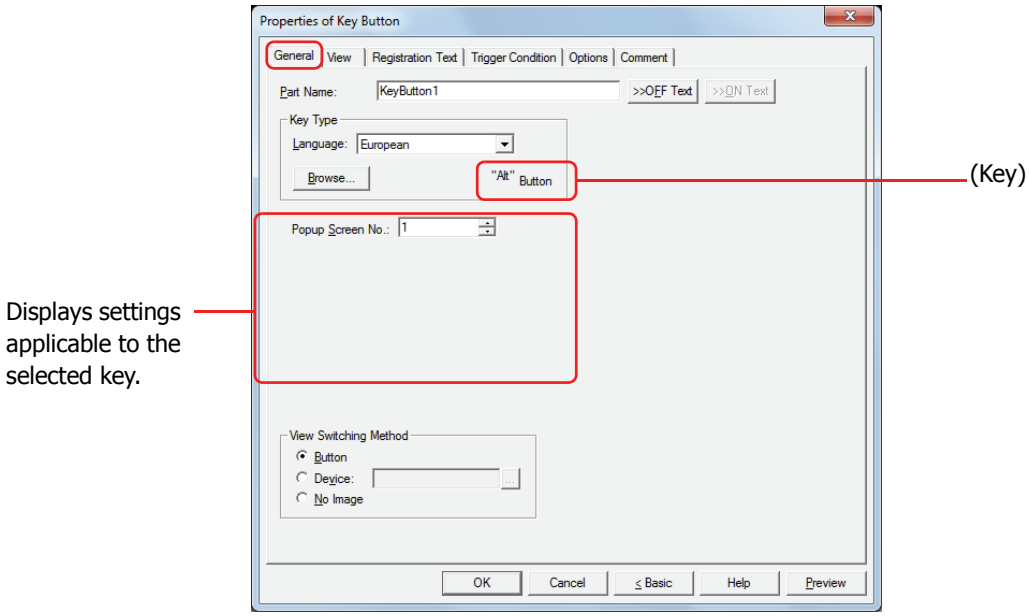


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

5.3 Properties of Key Button Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**

Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Key Type**

Select the function for the Key Button.

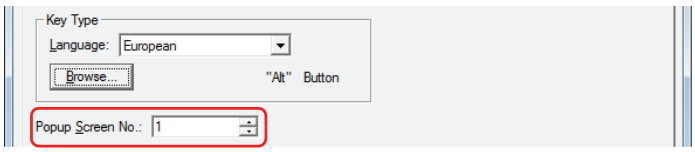
Language:	Switches the display of the key that is displayed when **Keypad** is selected in Key Browser. These languages are available: **Japanese**, **European**, **Central European**, **Baltic, Cyrillic**.
Browse:	Opens the Key Browser when clicked. Select a key. For details, refer to "5.5 Key Browser" on page 8-88.
(Key):	Displays the name of the key selected using the Key Browser.

- When you select a key, the label for that key is assigned as the Registration Text.
- The function of Key Button will affect on the next scan when the trigger condition is satisfied.

The settings explained below appear depending on the type of key selected.

■ **Popup Screen No.**

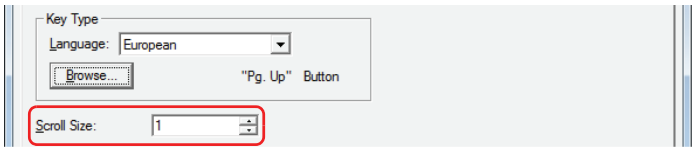
The **Alt** key switches the current Popup Screen used as a Keypad when this button is pressed.
Specify the Popup Screen number to open a Keypad for.
This setting is enabled only if **Alt** was selected using the Key Browser.



Scroll Size

Key Buttons **Pg. Up** and **Pg. Dwn** scroll the list up and down, respectively. Key Buttons **Fcs. Up** and **Fcs. Dwn** move the focus up and down, respectively. This settings specifies the number of pages or lines (1 to 1023 lines) to scroll or move the focus per each press of the button.

This setting is enabled only if **Pg. Up**, **Pg. Dwn**, **Fcs. Up**, and **Fcs. Dwn** are selected using the Key Browser.

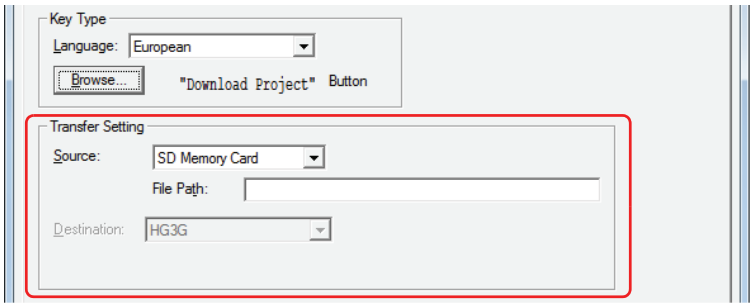


Transfer Setting*1

Key Buttons **Download Project**, **Upload Project**, **Copy Files**, **Download PLC Program**, and **Upload PLC Program**, perform the data transfer function specified by their names. These settings specify the source, data to be transfered, and destination.

This setting is enabled only if one of these keys is selected after clicking **Data Transfer** in the Key Browser.

If **Download Project** is selected.

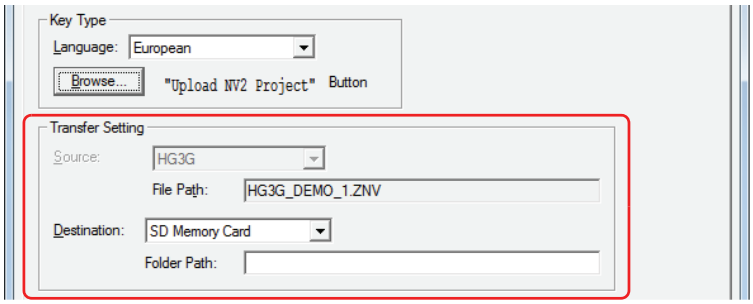


Source: Select the the external memory where the project file to transfer (.ZNV) is stored: **SD Memory Card** or **USB Flash Drive**.

File Path: Specify the path to the project file (.ZNV) to transfer. The maximum number is 247 characters.

Example: Where "HG3G_DEMO_1.ZNV" is a project file saved on the root directory of an SD memory card or USB flash drive:
HG3G_DEMO_1.ZNV

If **Upload Project** is selected.



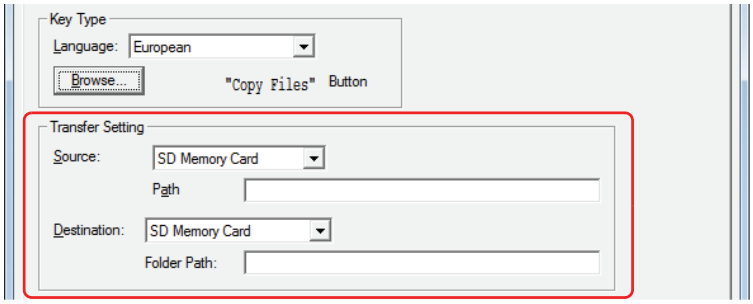
Destination: Specify where to save the project uploaded from MICRO/I. Select the location: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded project file will be saved. The maximum number is 247 characters.

Example: To save it to the folder "Uploaded_Project" on an SD memory card or USB flash drive:
Uploaded_Project

*1 HG2G-5F, HG3G/4G only

If **Copy Files** is selected.



Source: Select the source external memory: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path of the file to be transferred. The maximum number is 247 characters.

Example: Where "Error.wav" is a sound file saved on the root directory of an SD memory card or USB flash drive:
Error.wav

Destination: Select the destination external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the folder path where the file will be transferred. The maximum number is 247 characters.

Example: To save it to the folder "SOUND" inside "HGDATA01" on an SD memory card or USB flash drive:
HGDATA01\SOUND

- If a file name is specified as the source path name, the specified file is copied.
  If a folder name is specified, all of the files and subfolders contained in the folder, and all of the files in the subfolders, are copied.
- The subfolders can be copied up to five levels.
- To prevent copying the subfolders and the files contained in the subfolders, LSM30 must be set to 1 before executing the copy.
- To stop copying files during the copy operation, write 1 to LSM31. However, it will continue to copy the file until it is finished then it will stop copying.

If **Download PLC Program** is selected.

Source: Select the the external memory where the PLC program file to transfer (.ZLD) is stored: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path to the PLC program file (.ZLD) to be transferred. The maximum number is 247 characters.

Example: Where "LDR_PROGRAM.ZLD" is a PLC program file saved in folder "LDRDATA" of an SD memory card or USB flash drive:
LDRDATA\LDR_PROGRAM.ZLD

Destination: Specify the destination PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the download destination PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the destination PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the destination PLC.

If **Upload PLC Program** is selected.

Source: Specify the source PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the source PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the source PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the source PLC.

Destination: Specify where to save the PLC program uploaded from the PLC connected to the MICRO/I. Select the type of external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded PLC program file will be saved. The maximum number is 247 characters.

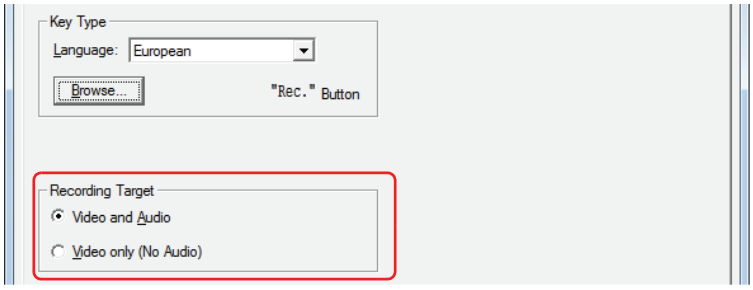
Example: To save it to the folder "Uploaded_Program" on an SD memory card or USB flash drive:
Uploaded_Program

■ Recording Target*2

The recording of images and sound starts. Select the target to record out of the signals input from the device.

Video and Audio: Records images and sound.

Video only (No Audio): Records images only.



- Movie files cannot be recorded during playback.
- While data is being recorded after an event occurs with the event recording function and while data is being saved to the memory card, recording cannot be executed with parts. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

*2 This is applicable for models with a video interface only.

View Switching Method*3

Select how to display the ON/OFF status of the button.

Button: Pressing the button changes the drawing object displayed.

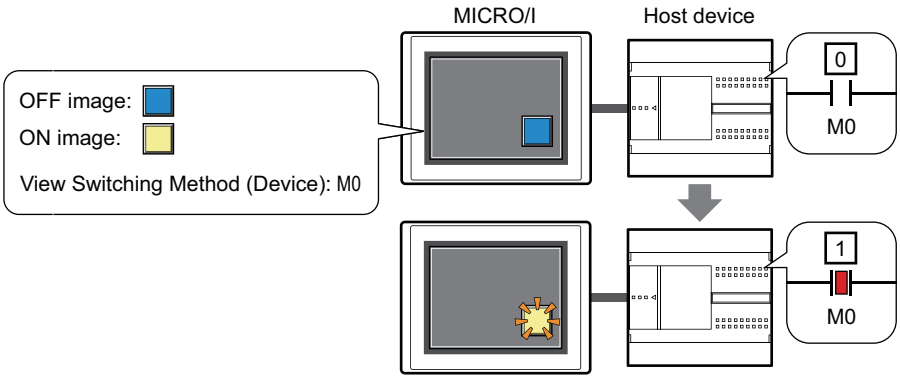
Device: The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

No Image: The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for **View** and **Registration Text** are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

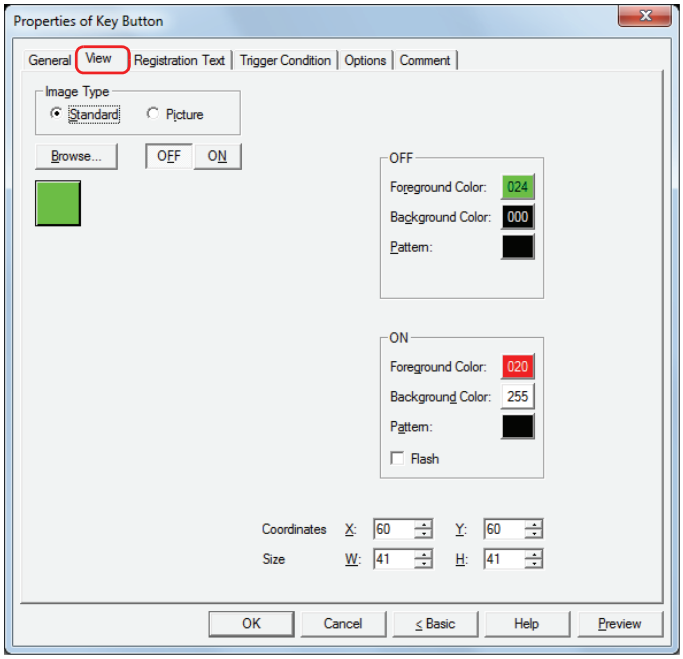
Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switched according to the value of M0 even if the button is not pressed.



*3 Advanced mode only

● **View** Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **OFF button, ON button**

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ **OFF, ON**

Selects the color and pattern of the standard graphic when ON and OFF.

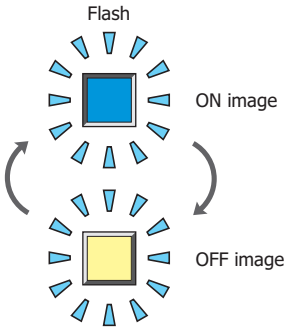
Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ **Flash**

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.



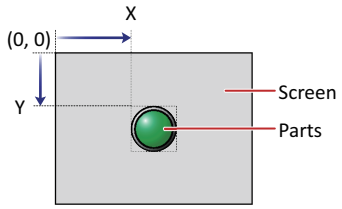
■ **Coordinates**

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

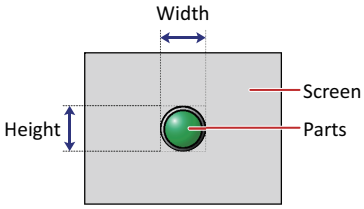


■ **Size**

W, H: Sets width and height to define the size of parts.

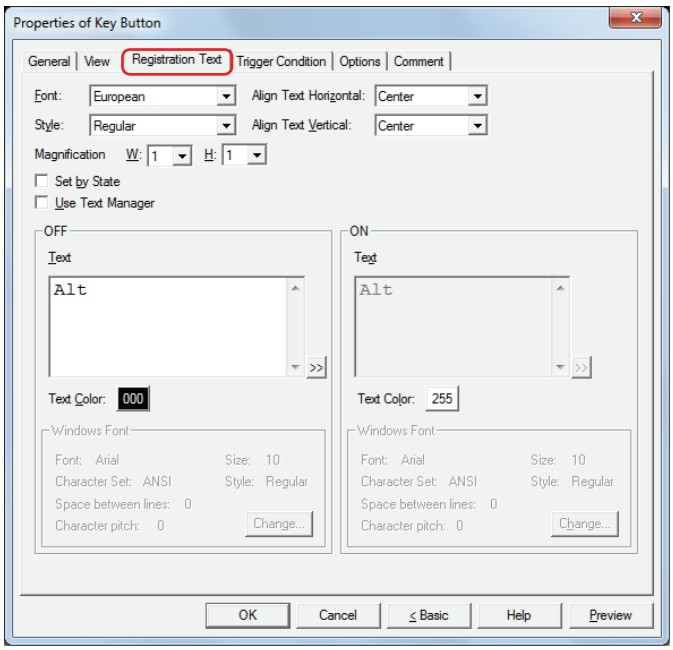
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

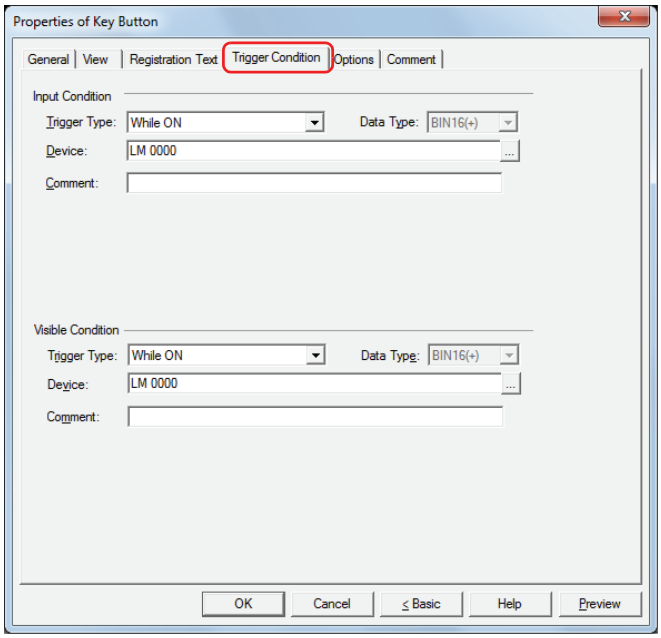
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



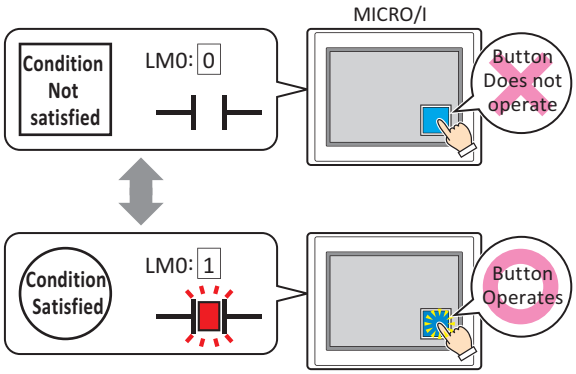
■ Input Condition

The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

While LM 0 is 0, the condition is not satisfied and the Button is not operational.

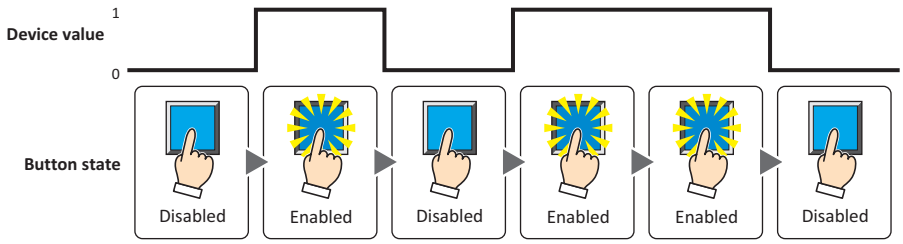
While LM 0 is 1, the condition is satisfied and the Button is operational.



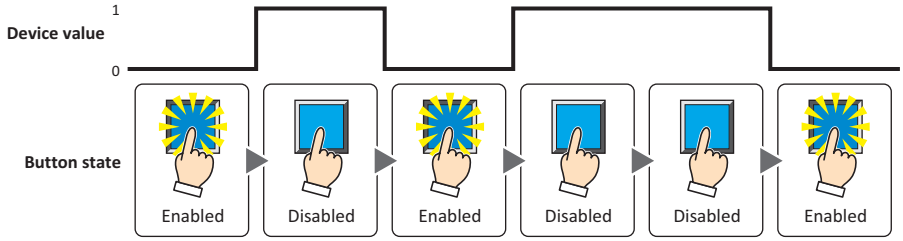
Trigger Type: Selects the condition to enable the Button from the following.

Always enable: The Button is always enabled.

While ON: Enables the Button when the device value is 1.

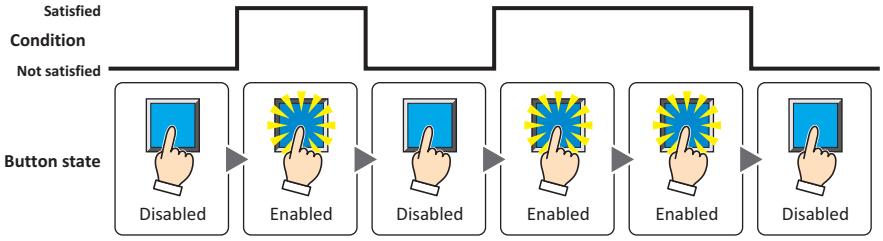


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

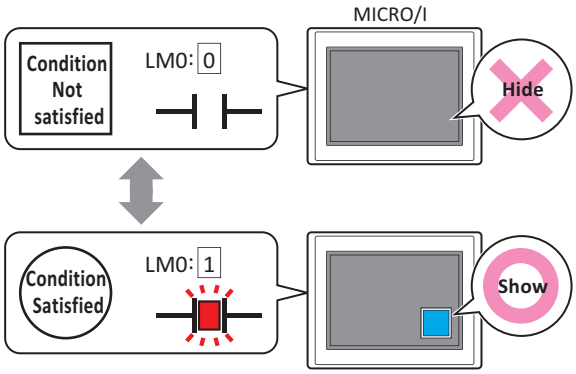
Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

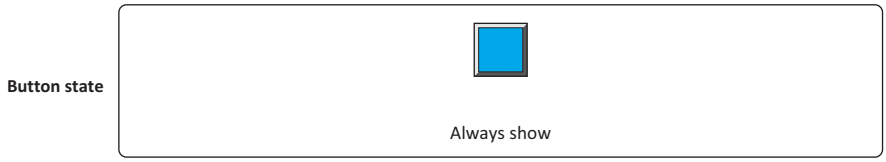


- When **Alternate** is selected for **Action Mode** on the **General** tab, the button remains on when hidden in the on state.
- When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

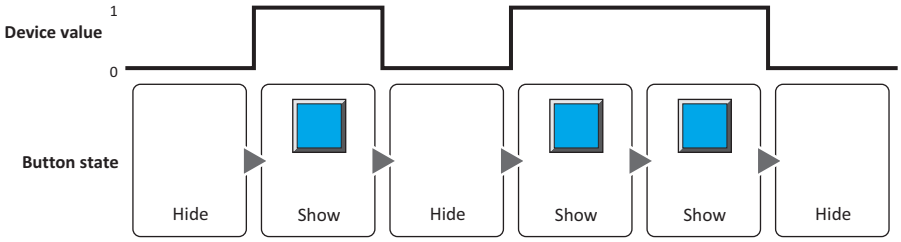
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Button from the following.

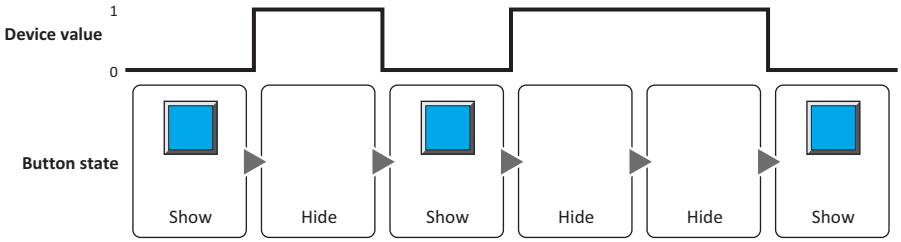
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

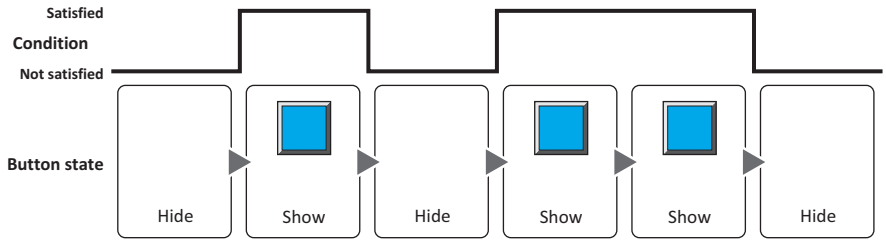


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

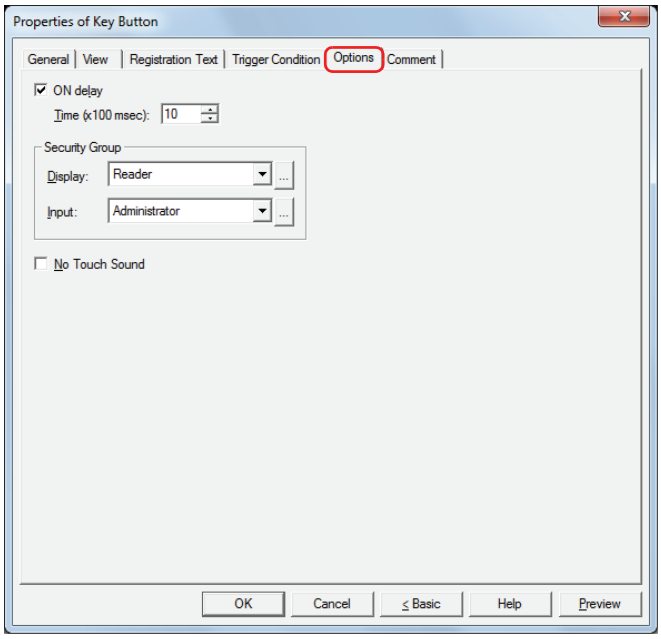
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

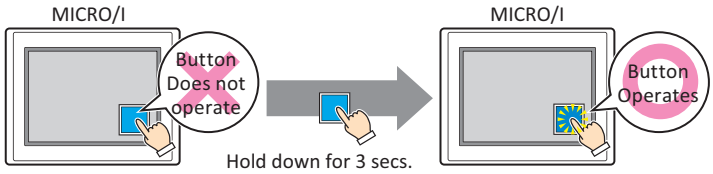
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

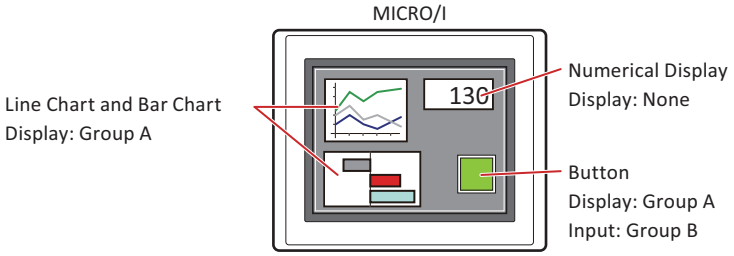
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

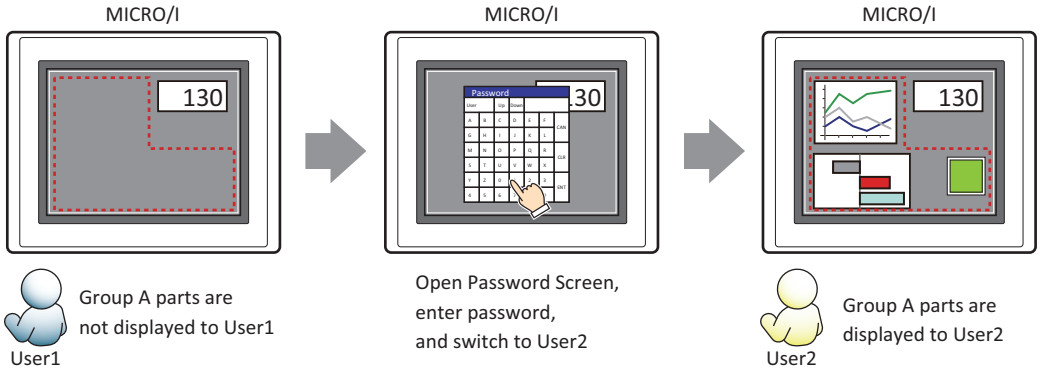
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

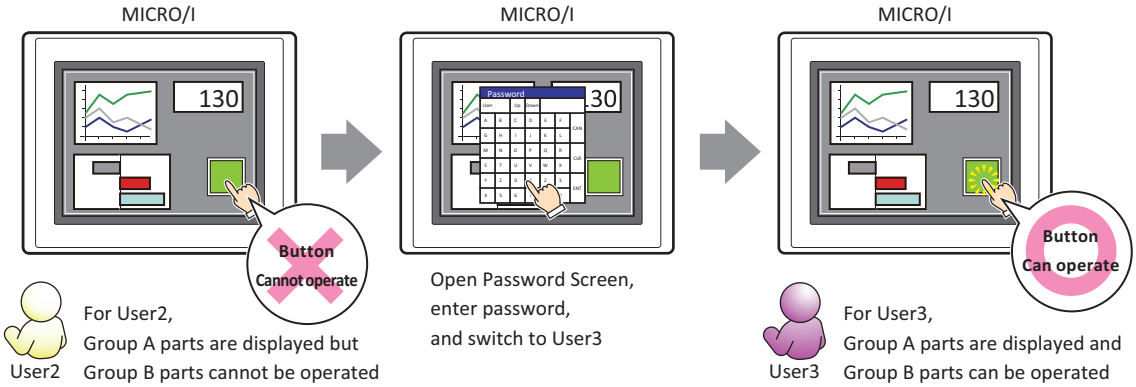
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

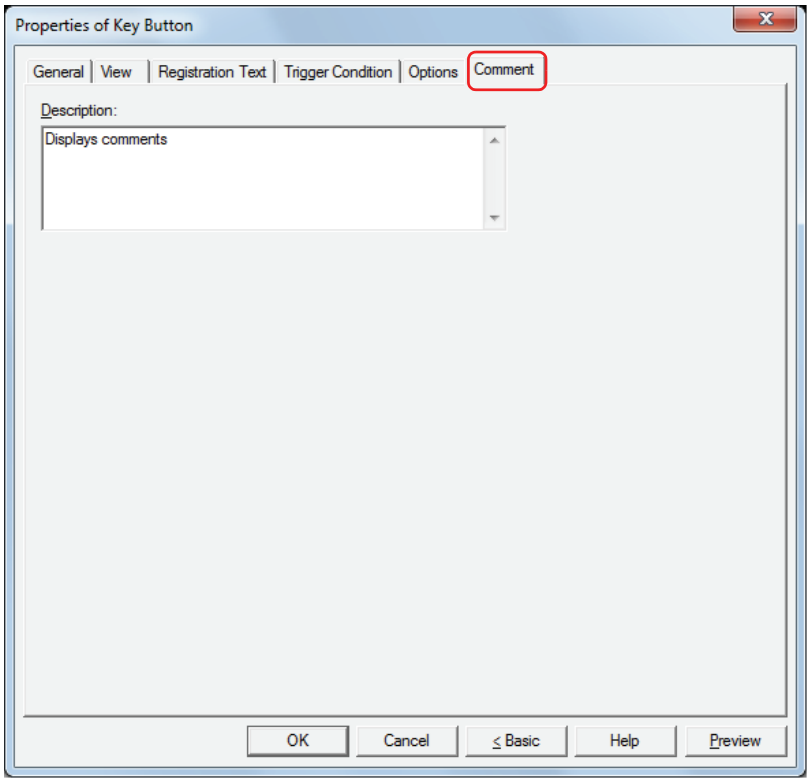
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

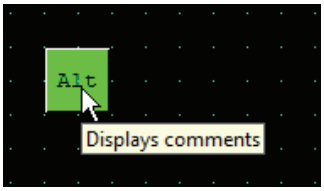
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen



5.4 Key Buttons

● For Keypad

These keys can be used for Numerical Input and Character Input:

■ Numerical Input Keypad

Key	Operation
.	Inputs a decimal point.
0 to 9	Inputs a number from 0 to 9.
A to F	Inputs a character from A to F.
+/-	Toggles the sign.
CAN	Clears the data input thus far and cancels the input. Closes the Popup Screen that is opened as the Keypad, if this key is placed on it.
CLR	Clears the data input thus far and stands by for further input.
BS	Deletes the character to the left of the character at the cursor position.
ENT	Writes the characters input as a numeric value to a device. After the data is written, the focus can be moved according to the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
< Fcs.	Moves the focus one item before the current one as per the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
Fcs. >	Moves the focus one item after the current one as per the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
Alt	The Alt key switches the Popup Screen opened as a Keypad. Closes the Popup Screen that is opened as the Keypad and opens another Popup Screen as the Keypad.

The **Alt** key can be used, for instance, to switch between a decimal and a hexadecimal Keypad.

■ Character Input Keypad

Key	Operation
!	Inputs a !.
"	Inputs a ".
#	Inputs a #.
$	Inputs a $.
%	Inputs a %.
&.	Inputs a &.
'	Inputs a '.
(	Inputs a (.
)	Inputs a).
*	Inputs a *.
+	Inputs a +.
,	Inputs a ,.
-	Inputs a -.
.	Inputs a .
/	Inputs a /.
0 to 9	Inputs a number from 0 to 9.
:	Inputs a :.
;	Inputs a ;.
<	Inputs a <.
=	Inputs a =.

Key	Operation
>	Inputs a >.
?	Inputs a ?.
@	Inputs a @.
A to Z	Inputs a character from A to Z.
[	Inputs a [.
\	Inputs a \.
]	Inputs a].
^	Inputs a ^.
_	Inputs a _.
'	Inputs a '.
a to z	Inputs a character from a to z.
{	Inputs a {.
|	Inputs a |.
}	Inputs a }.
~	Inputs a ~.
(Keys dependent on Language setting)	Inputs the text displayed according to the language selected in the **Language** setting. For a list of the characters input using these keys, refer to Chapter 2 "1.2 Available Text" on page 2-5.
CAN	Clears the data input thus far and cancels the input. Closes the Popup Screen if it is opened as a Keypad.
CLR	Clears the data input thus far and stands by for further input.
DEL	Deletes the character at the cursor.
BS	Deletes the character to the left the cursor.
ENT	Writes the text input in ASCII code form to a device. After the data is written, the focus can be moved according to the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
SP	Inputs a space.
Cur. >	Moves the cursor right.
< Cur.	Moves the cursor left.
< Fcs.	Moves the focus one item before the current one as per the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
Fcs. >	Moves the focus one item after the current one as per the **Focus Order** setting. **Focus Order** can be set on the **Options** tab of the Screen Properties dialog box.
Alt	The Alt key switches the Popup Screen opened as a Keypad. Closes the Popup Screen that is opened as the Keypad and opens another Popup Screen as the Keypad.

Press and hold the **< Cur.** and **Cur. >** keys for more than one second to cause it to move repeatedly.

The **Alt** key can be used, for instance, to switch between Keypads for lower case and upper case letters.

● For Data Transfer Keys*1

These keys can be used to execute Data Transfer functions.

Key	Operation
Download Project	Downloads a project file (ZNV format) saved on an SD memory card or USB flash drive to the MICRO/I.
Upload Project	Uploads the project used for operation on the MICRO/I and saves the project file (ZNV format) to an SD card or USB flash drive.
Copy Files	Copies files between the SD memory card and USB flash drive inserted in the MICRO/I.
Download PLC Program	Downloads a PLC program file (ZLD format) saved on an SD memory card or USB flash drive to a PLC connected to the MICRO/I.
Upload PLC Program	Uploads a PLC program from the PLC connected to the MICRO/I and saves the PLC program file (ZLD format) to an SD memory card or USB flash drive.

For details about Data Transfer functions, refer to Chapter 28 "Data Transfer Function" on page 28-1.

Copy Files can also be used to copy files within the SD memory card or USB flash drive.

● For Alarm Displays

These keys can be used for the Alarm List Display and Alarm Log Display parts.

■ Alarm List Display

Key	Operation
Pg. Up	Scrolls up the number of lines (1 to 1023) specified in **Scroll Size**.
Pg. Dwn	Scrolls down the number of lines (1 to 1023) specified in **Scroll Size**.
Fcs. Up	Moves the focus the number of lines (1 to 1023) specified in **Scroll Size**. The current point of focus can be shown by pressing **REVERSE**.
Fcs. Dwn	Moves the focus the number of lines (1 to 1023) specified in **Scroll Size**. The current point of focus can be shown by pressing **REVERSE**.
REVERSE	Toggles the focus between show and hide.
Ref.	The reference screen appears.

Press and hold the **Pg. Up**, **Pg. Dwn**, **< Cur.**, and **Cur. >** keys for more than one second to move the focus repeatedly.

■ Alarm Log Display

Key	Operation
Fcs. Up	Moves the focus the number of lines (1 to 1023) specified in **Scroll Size**. The current point of focus can be shown by pressing **REVERSE**.
Fcs. Dwn	Moves the focus the number of lines (1 to 1023) specified in **Scroll Size**. The current point of focus can be shown by pressing **REVERSE**.
REVERSE	Toggles the focus between show and hide.
CHECK	Shows the date and time the alarm that has focus was confirmed.
All Chk.	Shows the date and time that all alarms were confirmed.
Del.	Clears the alarm that has focus.
Del. All	Clears all alarms.
Ref.	Shows the reference screen for the alarm that has focus.
Stop Beep	Stops the beeping sound heard when an alarm occurs.

Press and hold the **Fcs. Up** and **Fcs. Dwn** keys for more than one second to move the focus repeatedly.

*1 HG2G-5F, HG3G/4G only

● For the Multimedia Function*1

■ Recording

Key	Operation
Stop	Stops recording images and sound.
Rec.	Records images and sound.

■ Video Display

The keys that can be used with the Video Display are given below.

Key	Operation
Play	Play movie file and display images from the video input.
Stop	Stops movie file playback.
Pause	Pauses playback of a movie file.
Next	When this button is pressed during playback, the next movie file is played.
Back	When this button is pressed during playback, the previous movie file is played.
REW	When this button is pressed during playback, the movie file rewinds while being played. Press this button during rewind to return to normal playback. This button cannot be used during fast forward, slow, or when paused.
FF	When this button is pressed during playback, the movie file fast forwards while being played. Press this button during fast forward to return to normal playback. This button cannot be used during rewind, slow, or when paused.
Slow	Press this button for slow movie file playback. Press this button during slow playback to return to normal playback. This button cannot be used during fast forward, rewind, or when paused.
Frame Fwd	Press this button to play the movie file one frame at a time. After frame forward, the movie file is paused. This button cannot be used during fast forward, rewind, or slow playback.
Full Screen	Expand the display image to the maximum size of the screen.
Restore	Returns Full Screen to its original display.
Repeat ON	Repeats playback from the top of the list when the movie file list or playlist is played until the end.
Repeat OFF	Stops playback after the movie file list or playlist is played until the end.

*1 This is applicable for models with a video interface only.

5.5 Key Browser

Select the key using the Key Browser. The Key Browser closes when a key is selected. The name of the key is shown in **Key Type**. Settings that apply to the selected key are displayed.

When you select a key, the label for that key is assigned as the Registration Text.

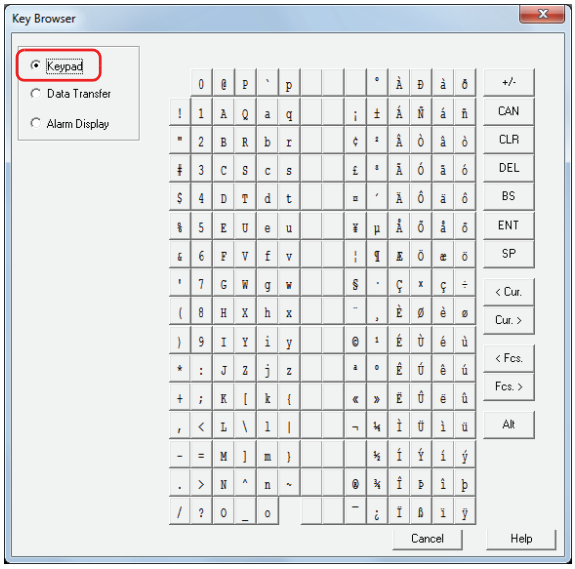
● For the HG2G-5F, HG3G/4G

Select the key type from the following uses:

Keypad, **Data Transfer**, **Alarm Display, Multimedia Function**[*1]

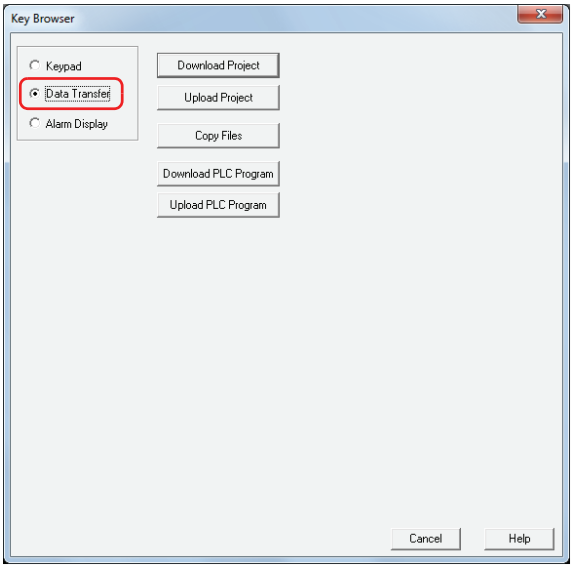
■ Keypad

These buttons are used for Numerical Input and Character Input:



■ Data Transfer

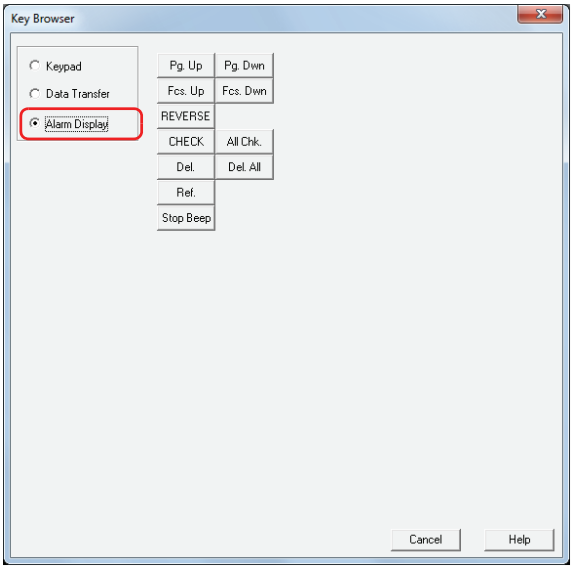
These buttons are used to execute Data Transfer functions.



*1 This is applicable for models with a video interface only.

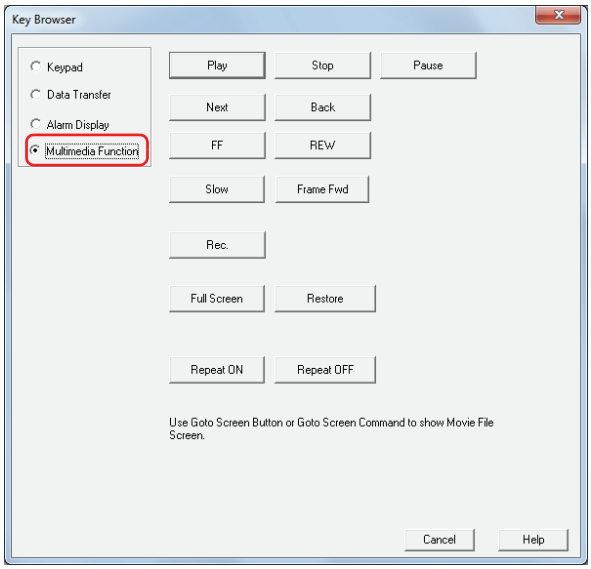
■ Alarm Display

These buttons are used to manipulate the Alarm List Display and Alarm Log Display parts.



■ Multimedia Function*1

These buttons are used to start and stop recording and to operate the Video Display.



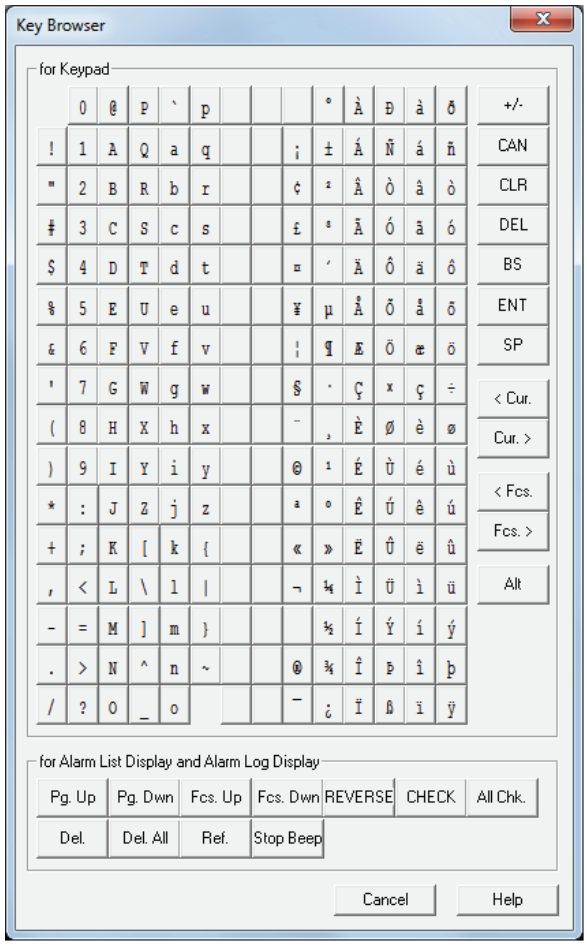
*1 This is applicable for models with a video interface only.

● For the HG2G-S/-5S, HG1F/2F/2S/3F/4F

Language:

Switches the language displayed for each key. These languages are available:

Japanese, **European**, **Central European**, **Baltic**, **Cyrillic**.



5.6 Key Button Usage Examples

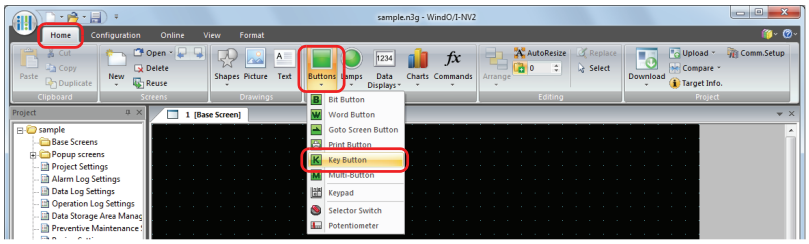
● Recording Images and Sound

HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

This section describes how to record using the **Rec.** and **Stop** key buttons.

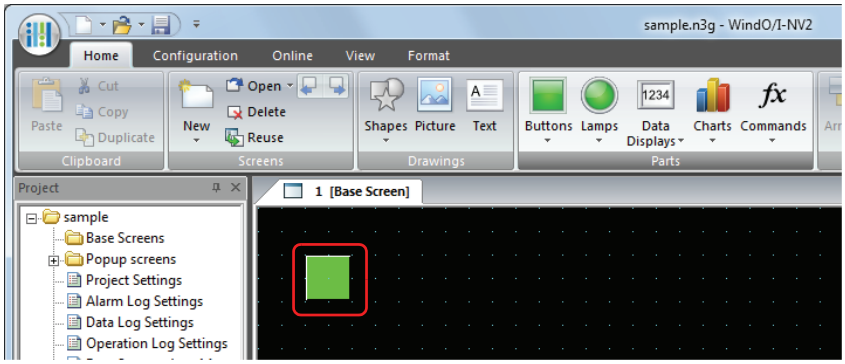
Configuration Procedure

1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Key Button**.



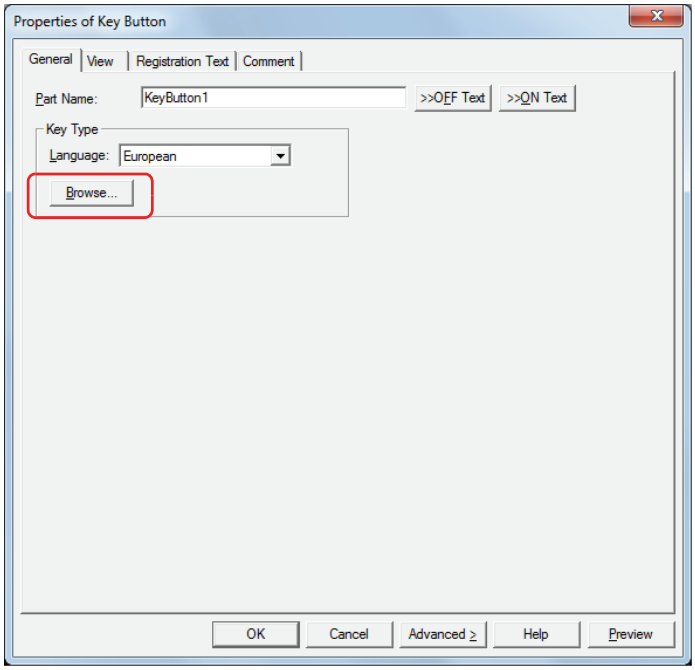
2 Click a point on the edit screen where you wish to place the Key Button.

3 Double-click the dropped Key Button and a Properties dialog box will be displayed.



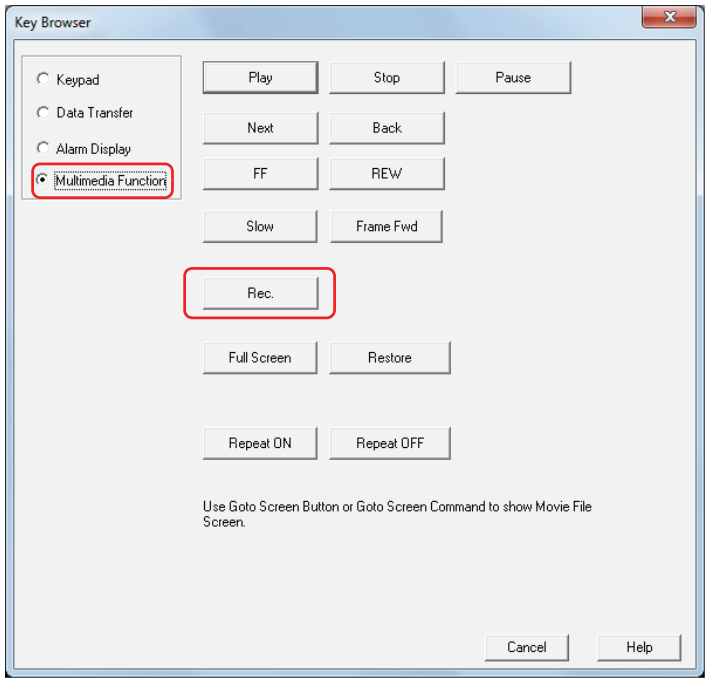
4 On the **General** tab, under **Key Type**, click **Browse**.

Key Browser is displayed.

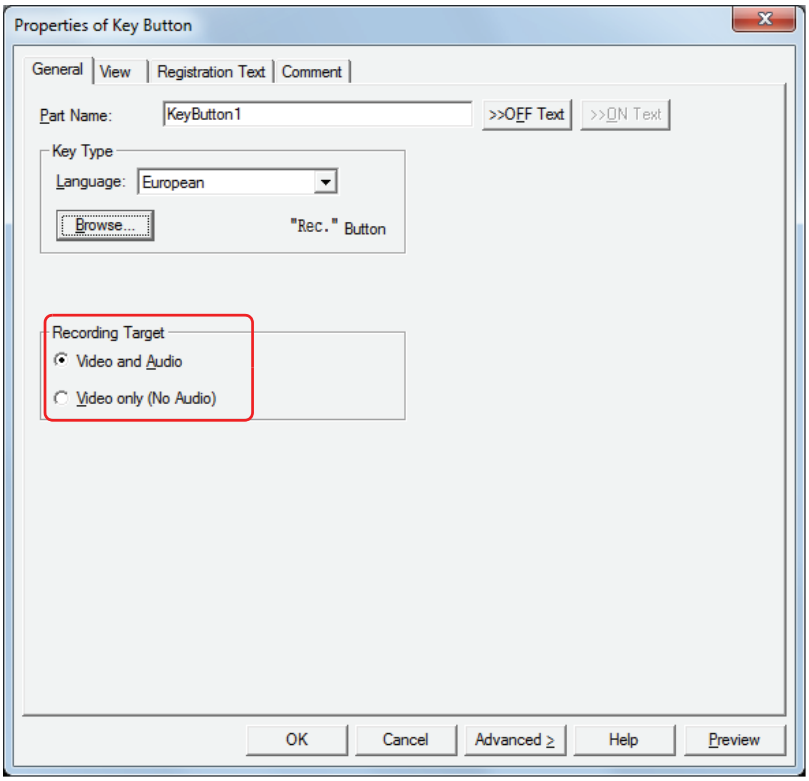


5 Select **Multimedia Function** and click **Rec**.

You are returned to the Properties of Key Button dialog box.



6 Select **Video and Audio** or **Video only (No Audio)** as the target to record out of the signals input from the device.



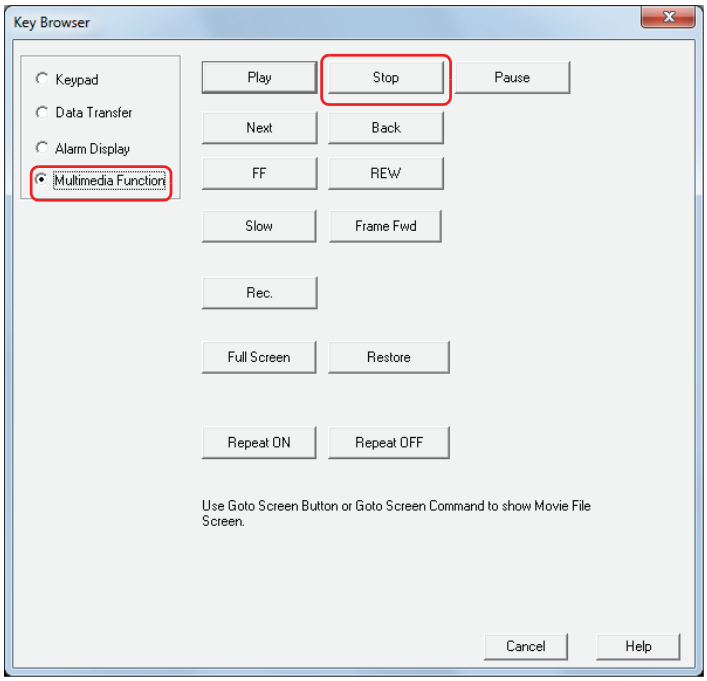
7 Click **OK**.

Close the Properties of Key Button dialog box.

8 Repeat steps *1* through *4*.

9 Select **Multimedia Function** and click **Stop**.

You are returned to the Properties of Key Button dialog box.



10 Click **OK**.

Close the Properties of Key Button dialog box.

This concludes configuring the record function and key buttons.

Operating Procedure

The MICRO/I must be connected to a video camera and microphone.

1 Press the **Rec.** button.

The MICRO/I starts recording images and sound.

2 Press the **Stop** button.

The MICRO/I stops recording images and sound.

Recording stops when the maximum recording time (30 sec.) has elapsed, even if the **Stop** button is not pressed.

The recorded images and sound are saved as an MP4 file in the following folder on the memory card.

\Memory card folder\RECORD\Year month day (format: YYYYMMDD)

The memory card folder name is configured in the **Project Settings** dialog box. For details, refer to Chapter 30 "1.5 Setting the Memory Card Folder" on page 30-16.

The "year month day" folder name is the date the file was recorded.

The file name for the recorded file is the time the file was saved.

- Movie files cannot be recorded during playback.
- While data is being recorded after an event occurs with the event recording function and while recorded data is being saved to the memory card, recording cannot be executed with parts. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

The signal standard for the video camera connected to the MICRO/I is configured in the **Multimedia Settings** dialog box, on the **Video Input** tab. For details, refer to Chapter 22 "2.3 Configuring the Video Input" on page 22-11.

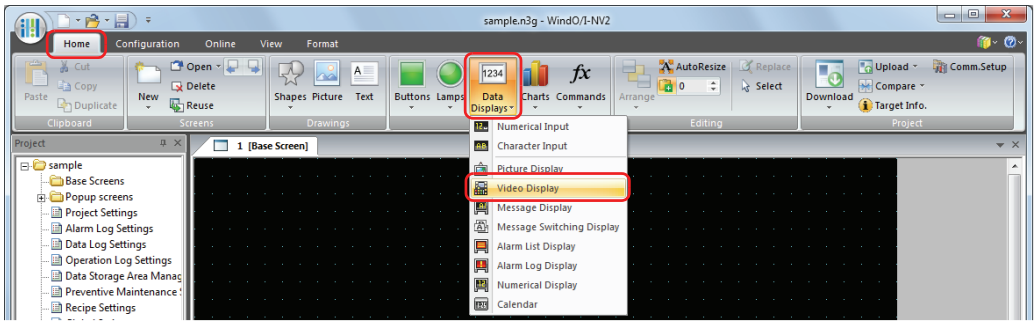
● Playing Recorded Images and Sound

HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

This section describes how to select a movie file to play with the Movie File Screen and play it on a Video Display.

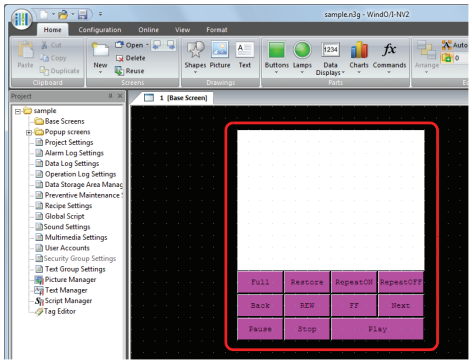
Configuration Procedure

1 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Video Display**.



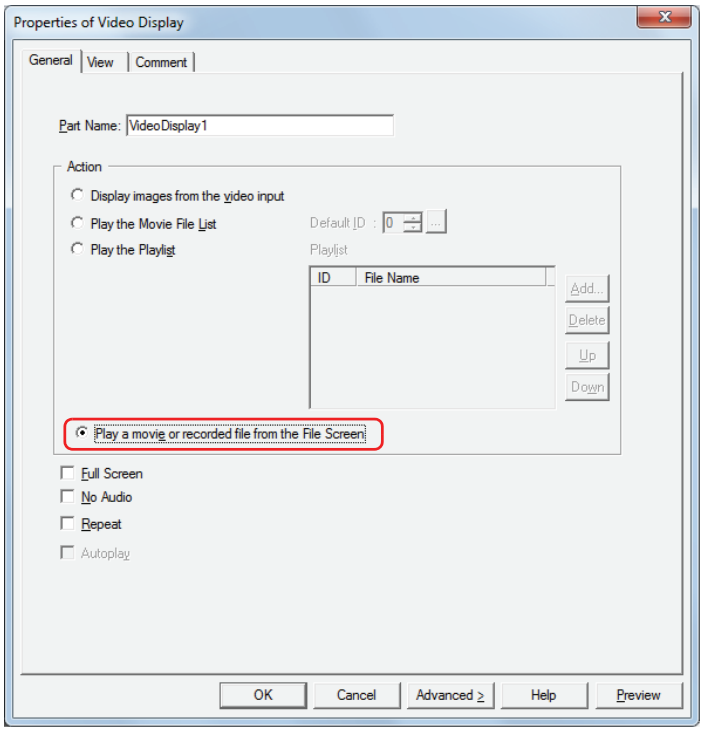
2 Click a point on the edit screen where you wish to place the Video Display.

3 Double-click the dropped Video Display and the Properties dialog box is displayed.



4 On the **General** tab, under **Action**, select **Play a movie or recorded file from the File Screen**.

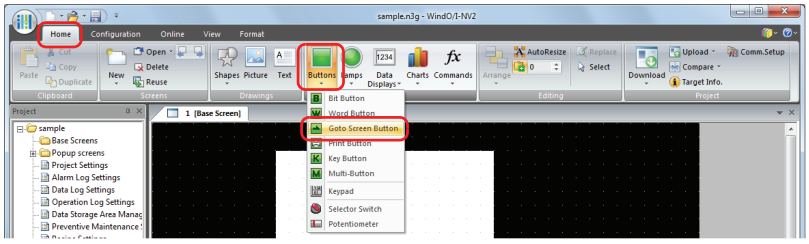
This option selects and plays movie files using the File Screen.



5 Click **OK**.

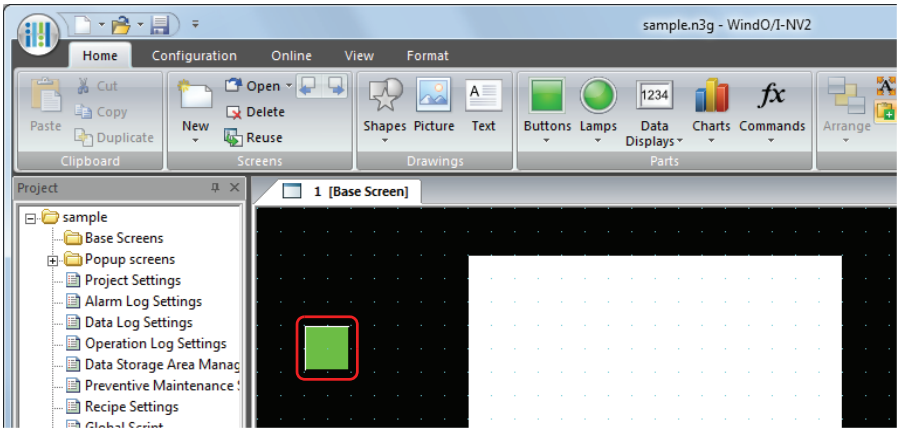
The Properties of Video Display dialog box closes.

6 Create a button to open the screen to select a recorded images.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.

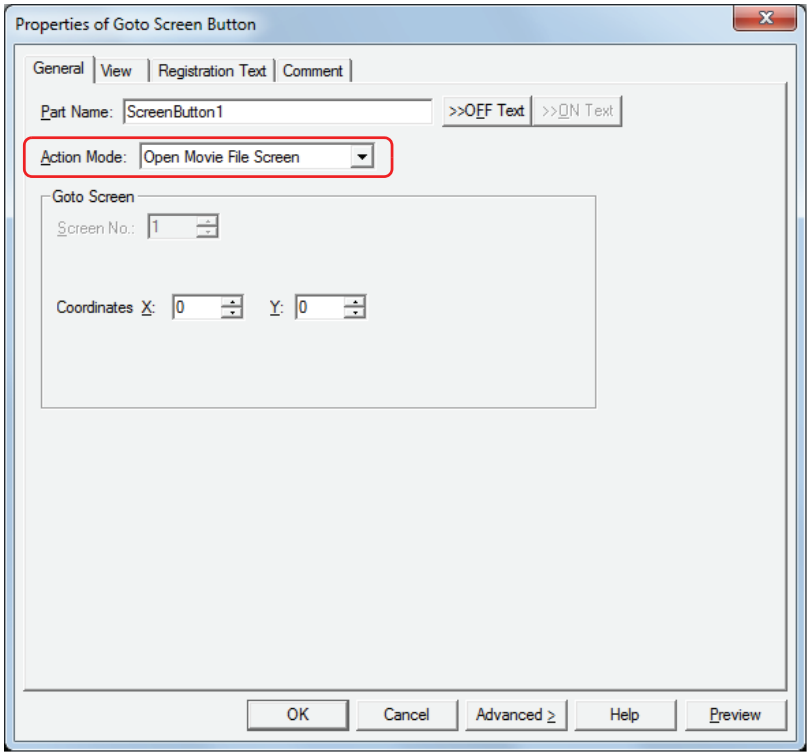


7 Click a point on the edit screen where you wish to place the Goto Screen Button.

8 Double-click the dropped Goto Screen Button and a Properties dialog box will be displayed.



9 Select **Open Movie File Screen** for **Action Mode.**



10 Specify the display location in coordinates for the movie file screen to open above the base screen with **Coordinates X, Y**.

With the upper-left corner of the screen as the origin, the upper-left corner of the window is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

11 Click **OK**.
Close the Properties of Goto Screen Button dialog box.
This concludes configuring playback of recorded images.

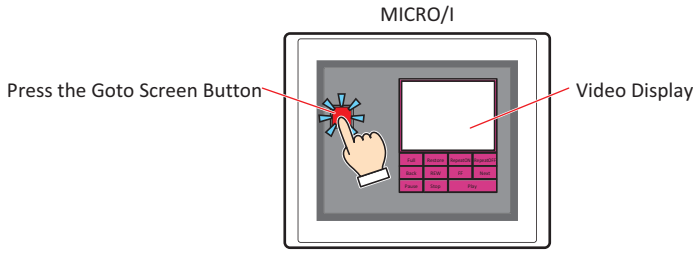
Operating Procedure

To play sound, the MICRO/I must be connected to speakers.

This section describes the example of playing the movie file "123000.mp4" located in the "20110313" folder under the "RECORD" folder when the memory card folder is "HGDATA01".

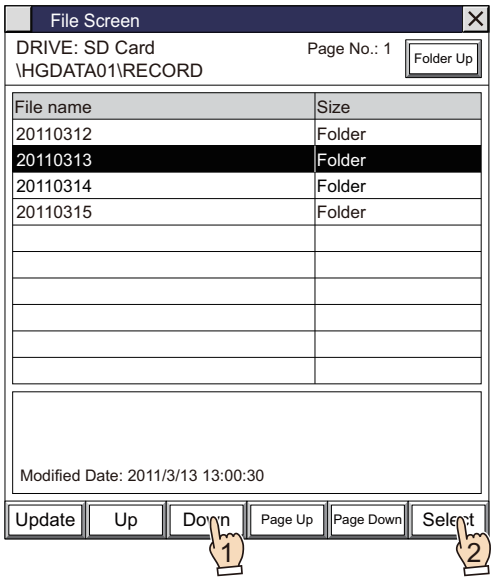
1 Press the Goto Screen Button set to **Open Movie File Screen**.

The File Screen is displayed.



2 Select the folder with the date of the recorded images.

Press **Down** to select **20110313** and then press **Select**.
The contents of the "20110313" folder will be displayed.

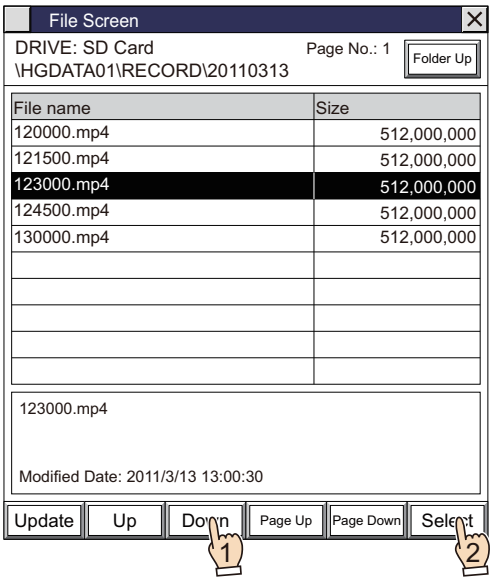


Once the File Screen is opened, the "RECORD" folder in the Memory Card Folder will be displayed.
If the "RECORD" folder does not exist, the Memory Card Folder will be displayed.

3 Select a movie file.

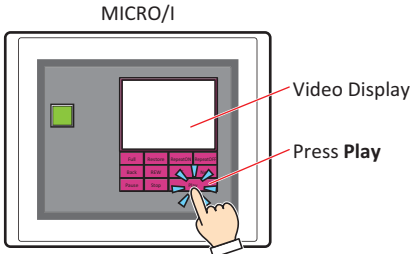
Press **Down** to select "123000.mp4" and then press **Select**.

The movie file will be selected and the File Screen will close.



4 Press **Play** on the Video Display.

The movie file is played.



While data is being recorded after an event occurs with the event recording function, while data is being recorded with parts, and while data is being saved to the memory card, movie files cannot be played. While data is recording after an event occurs and while data is being saved to the memory card, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

6 Multi-Button

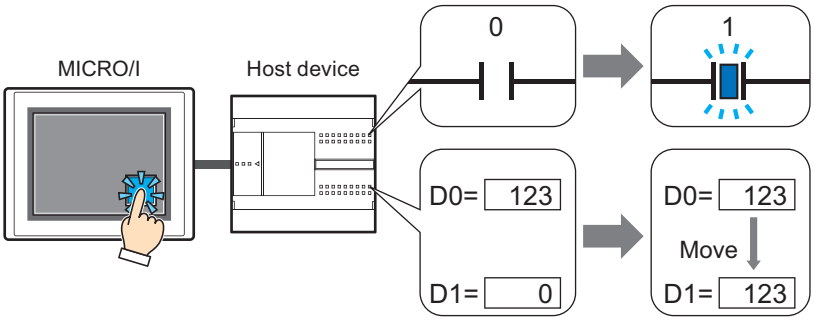
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

6.1 How the Multi-Button is Used

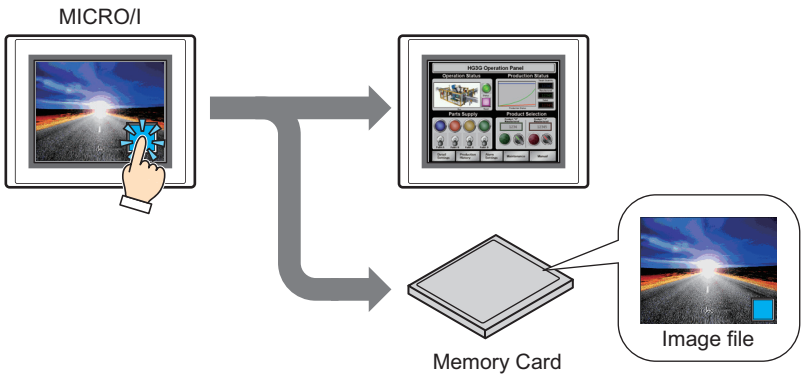
Executes multiple commands at once.
These commands can be assigned to a Multi-Button.

Command	Description
Bit Write	Writes a 0 or 1 to the specified bit device when pressed.
Word Write	Writes a value to a word device when pressed. You can specify the destination address indirectly, and perform arithmetic on the value to be written.
Goto Screen	Switches screens and opens other windows when pressed.
Print	Outputs a screenshot to the printer or the memory card when pressed.
Key	Performs downloads, uploads, and file copying when pressed. Also used to manipulate other parts.
Script	Executes a script when pressed.

- Pressing the button writes a 1 to a bit device, and the value in a word device to another device.

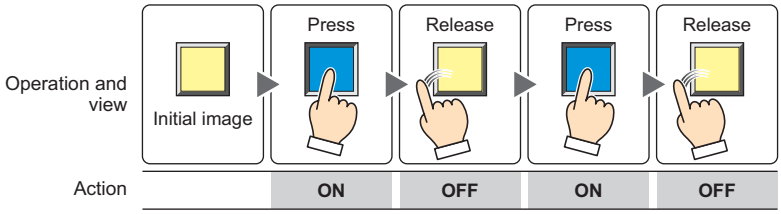


- Pressing the button outputs a screenshot of the current screen to a memory card, and then switches the Base Screen.



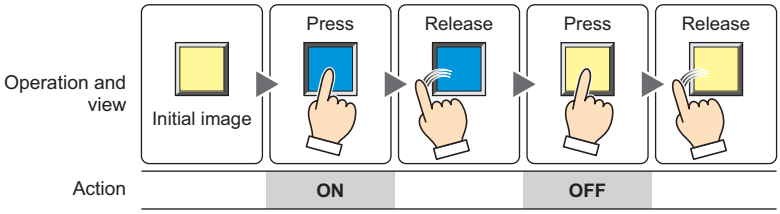
■ **Momentary**

The button turns ON when pressed, and OFF when released.



■ **Alternate**

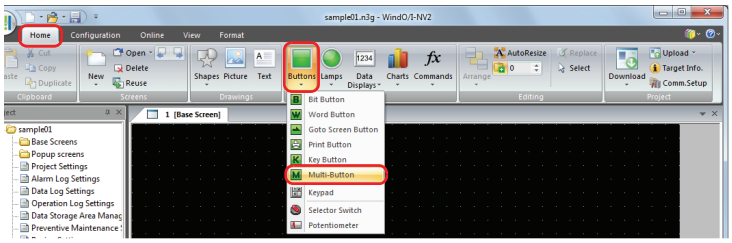
The button switches between ON and OFF each time it is pressed.



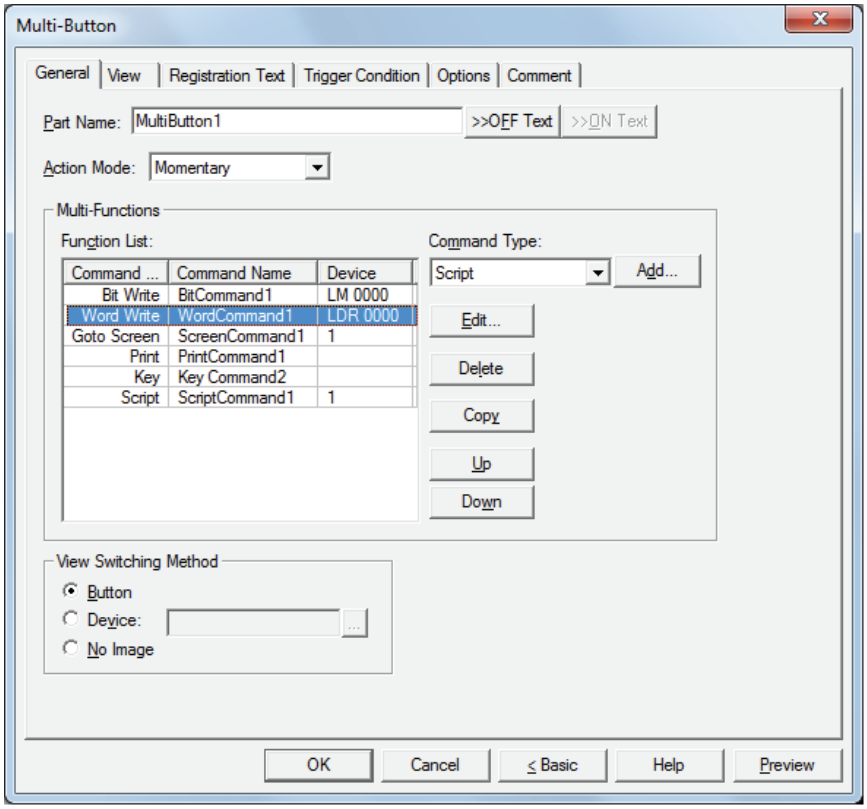
6.2 Multi-Button Configuration Procedure

This section describes the configuration procedure for Multi-Buttons.

1. On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Multi-Button**.



2. Click a point on the edit screen where you wish to place the Multi-Button.
3. Double-click the dropped Multi-Button and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

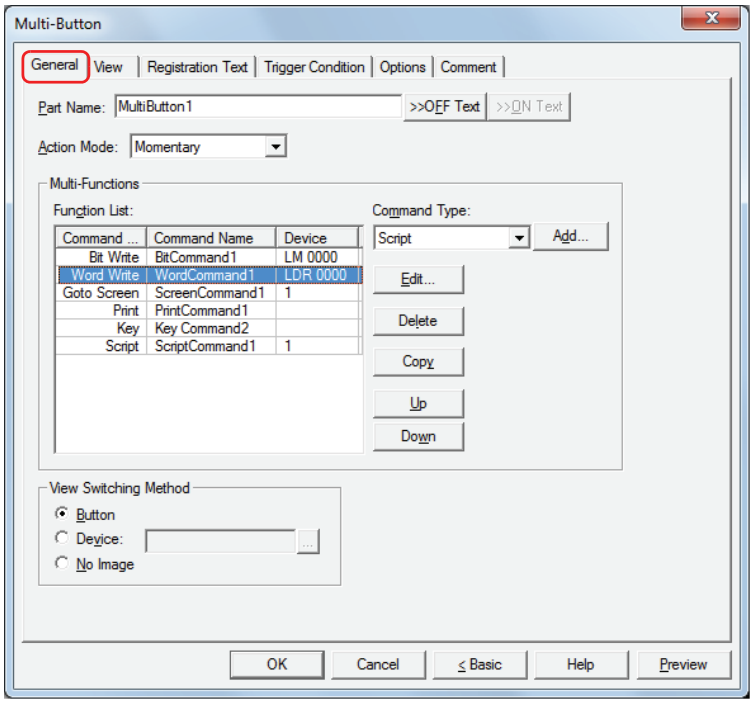


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

6.3 Properties of Multi-Button Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ >>OFF Text, >>ON Text

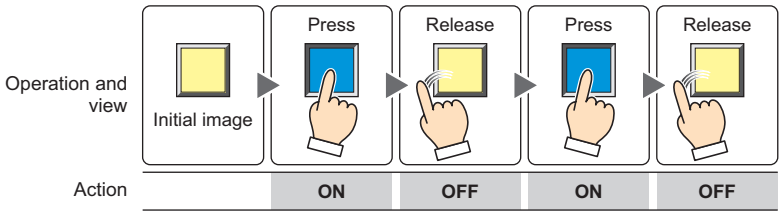
Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the button is OFF or ON.

> To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

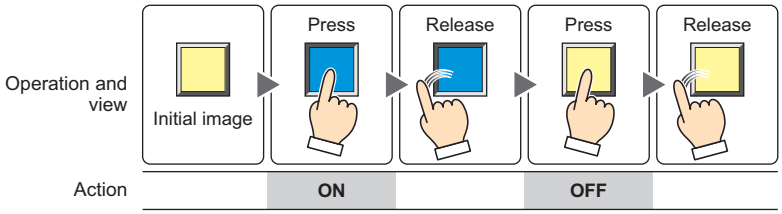
■ Action Mode

Select the **Action Mode** for the Multi-Button: **Momentary** or **Alternate**.

Momentary: The button turns ON when pressed, and OFF when released.



Alternate: The button switches between ON and OFF each time it is pressed.



Multi-Function

Use this grid to add or edit commands to execute when the Multi-Button is pressed.

Function List: Lists the commands to be executed.

- Command Type: Shows the command type.
- Command Name: Shows the command name.
- Device: Shows the setting when one of the following Command Type is selected.
  - Shows the destination device for the **Bit Write** and **Word Write** commands.
  - Shows the screen number when **Goto Screen** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.
  - Shows the script ID for the **Script** command.

- Executes only the Goto Screen command at the end of the **Function List** when multiple **Switch to Base Screen** type commands are set for **Action Mode**.
- Goto Screen commands are not executed from top to bottom as they appear in the **Function List**. Rather, they are executed at the end of the scan when the Multi-Button is pressed.
- If multiple Key commands are set, only the first and second Key commands in the **Function List** are executed. The third and following Key commands are not executed. Also, only the first Key command that specifies a Data Transfer function in the **Function List** is executed if multiple Key commands are set.
- Key commands are executed in the scan that follows a scan that satisfies the trigger condition.

Command Type: Select the command to add.

- Bit Write: Writes a 0 or 1 to the bit device or bit of the word device. For details, refer to "Properties of Bit Write for Multi-Functions dialog box" on page 8-104.
- Word Write: Writes a value to a word device. Can be used to indirectly specify the destination address or to perform operations on the written value. For details, refer to "Properties of Word Write for Multi-Functions dialog box" on page 8-105.
- Goto Screen: Switches to another screen or displays a window. For details, refer to "Properties of Goto Screen for Multi-Functions dialog box" on page 8-107.
- Print: Outputs a screenshot to a printer or a memory card. For details, refer to "Properties of Print for Multi-Functions dialog box" on page 8-109.
- Key: Performs a variety of functions including uploading and downloading, copying files, and operating other parts. For details, refer to "Properties of Key for Multi-Functions dialog box" on page 8-111.
- Script: Executes the script. For details, refer to "Properties of Script for Multi-Functions dialog box" on page 8-115.

Add: Adds a command to the list. A maximum of 32 commands may be added.
Click this button to display the Properties dialog box for the command selected from **Command Type**.

Edit: Changes a command in the list.
Click this button to display the Properties dialog box for the command selected in **Function List**.

Delete: Deletes a command from the list.
Select the command in the list and click this button.

Copy: Copies a command in the list.
Select a command in the list and click this button. A copy of the selected command is added to the end of the list.

Up: Shifts the selected command upward in the list.

Down: Shifts the selected command downward in the list.

View Switching Method*1

Select how to display the ON/OFF status of the button.

Button: Pressing the button changes the drawing object displayed.

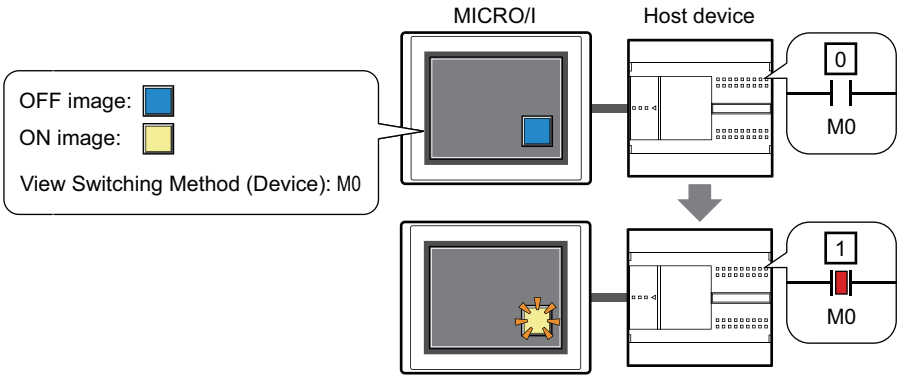
Device: The drawing objects assigned to the OFF and ON states are displayed when the value of the device is 0 and 1, respectively. Specifies the device used to switch the drawing object display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

No Image: The button is not displayed on the screen. The button appears as a dashed line frame on the edit screen. Pressing the corresponding area on the MICRO/I activates the assigned function. If **No Image** is selected, the settings for View and Registration Text are disabled.

Selecting **Device** in **View Switching Method** allows you to create an illuminated pushbutton.
The illuminated pushbutton switches state (or image) according to ON or OFF state of the device address, allowing you to display the state of a device that is being operated.

Example: When you set a host device 'M0' as **Device** in **View Switching Method**, if the value of M0 changes, the display image will switched according to the value of M0 even if the button is not pressed.

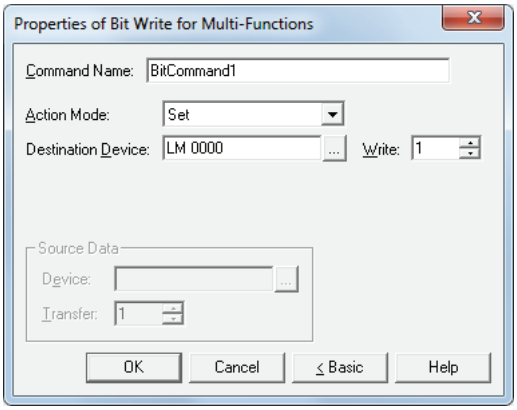


*1 Advanced mode only

Properties of Bit Write for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Bit Write command for the Multi-Button.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Action Mode

Select the behavior of the Multi-Button from the following:

Set:	Pressing the Multi-Button writes a 1 to the bit device.
Reset:	Pressing the Multi-Button writes a 0 to the bit device.
Set & Reset:	Pressing the Multi-Button writes a 1 to the bit device. Releasing the Multi-Button writes a 0 to the bit device.
Toggle:	Pressing the Multi-Button inverts the value of the bit device. If the value of the bit device is 0 it changes to 1, and vice versa.
Move:	Pressing the Multi-Button writes the value in the source bit device to the value in the destination bit device.

For details about the **Action Mode**, refer to "Action Mode" on page 8-4. However, **Set & Reset** for the Multi-Button has the same function as **Momentary** for the Bit Button.

■ Destination Device

Specify the destination bit device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Write*1

Specify the number of bit devices (1 to 64) at the destination.
This setting is enabled only if **Action Mode** is set to **Set** or **Reset**. For details, refer to "Write*1" on page 8-6.

■ Source Data

Specifies the device that stores the data to be written.
This setting is enabled only if **Action Mode** is set to **Move**. For details, refer to "Source Data" on page 8-6.

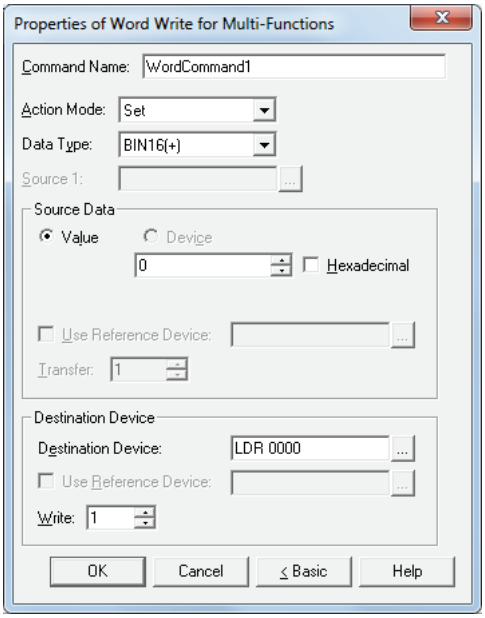
Device:	Specify the source bit device. Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Transfer:	Specify the number of bit devices (1 to 64) to transfer.

*1 Advanced mode only

Properties of Word Write for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Word Write command for the Multi-Button.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Action Mode

Select the behavior of the Multi-Button from the following:

Set: Pressing the button writes a fixed value to a word device.

Move: Pressing the button writes a value in a source device to a destination word device.

Set ON & OFF Data: Pressing the button writes a fixed value of **ON Data** to a word device.
Releasing the button writes a fixed value of **OFF Data** to a word device.

Add, Sub, Multi, Div, Mod, OR, AND, XOR:
Pressing the button performs arithmetic on a value of source device and a fixed value or a value of device and writes the result to a word device.

For details about the **Action Mode**, refer to "Action Mode" on page 8-22. However, **Set ON** & **OFF Data** for the Multi-Button has the same function as **Momentary** for the Word Button.

■ Data Type

Select the data type handled by the operation selected for **Action Mode**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **OR, AND**, or **XOR**.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **Move**. Because the number of devices to transfer is specified in Advanced mode, you do not need to set Data Type.

If **BCD4**, **BCD8** or **float32** is selected and the arithmetic data contains a value inexpressible in BCD, a 1 is written to System Area 2 Arithmetic error bit (address+2, bit 5) and an error message is displayed.
For details, refer to Chapter 4 " Arithmetic error" on page 4-34.

■ Source 1

Specify the source word device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Add**, **Sub**, **Multi**, **Div**, **Mod**, **OR**, **AND**, or **XOR**.

Source Data

Select the data handled by the operation selected for **Action Mode**.

Value: Use a constant.

Only a **Value** can be handled if **Action Mode** is set to **Set** or **Set ON** & **OFF Data**.

If **Action Mode** is set to **Set ON** & **OFF Data**, the value in the **ON Data** is written when the button is ON, and the value in the **OFF Data** is written when the button is OFF.

Hexadecimal: Select this check box to enter the **ON Data** and **OFF Data** values in hexadecimal.

Device: Use a word device.

Specify the device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the source word device according to the value of the specified device.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Transfer*1: Specify the number of word devices (1 to 64) to transfer.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to "Transfer*1" on page 8-24.

Destination Device

Destination Device: Specify the destination word device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the destination word device according to the value of the specified device.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Write*1: Specify the number of word devices (1 to 64) at the destination.

For **Move**, specify how many times to write.

This setting is enabled only if **Action Mode** is set to **Set**, **Move**, or **Set ON** & **OFF Data**.

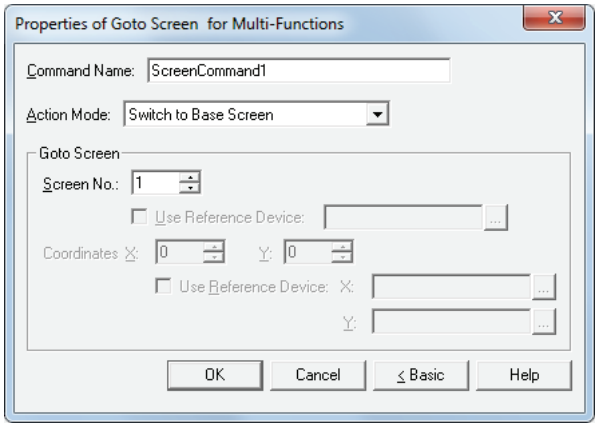
For details, refer to "Write*1" on page 8-25.

*1 Advanced mode only

Properties of Goto Screen for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Goto Screen command for the Multi-Button.



Command Name

Enter a name for the command. The maximum number is 20 characters.

Action Mode

Select the behavior of the Multi-Button from the following:

Back to previous Screen:	Switches to the previous screen. Returns to up to 16 earlier screens.
Switch to Base Screen:	Switches between Base Screen.
Open Popup Screen:	Opens a Popup Screen.
Close Popup Screen:	Closes a Popup Screen.
Open Device Monitor Screen:	Opens the Device Monitor Screen.
Close Device Monitor Screen:	Closes the Device Monitor Screen.
Open Password Screen:	Opens the Password Screen.
Close Password Screen:	Closes the Password Screen.
Open Adjust contrast Screen:	Opens the Adjust contrast Screen.
Close Adjust contrast Screen:	Closes the Adjust contrast Screen.
Open File Screen for movie files:	Opens the File Screen.
Close File Screen for movie files:	Closes the File Screen.
Switch to System Menu Screen:	Switches to the System Menu Screen.
Reset current screen:	Resets the current Base Screen.

When the current Base Screen is reset using the **Reset current screen** function, the window and internal devices restart as if the Base Screens were switched.

Goto Screen

Screen No.: If **Action Mode** is set to **Switch to Base Screen**, specify the Base Screen number to switch to (from 1 to 3000). If **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**, specify the number of the Popup Screen to open or close (from 1 to 3015).

This setting is enabled only if **Action Mode** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the screen number using the value of the specified device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**.

Coordinates X, Y: Specify the coordinates on the Base Screen for displaying a window.

X and Y specify the upper left corner of the window using the upper left corner of the screen as the origin.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**, **Open Device Monitor Screen**, **Open Password Screen**, **Open Adjust contrast Screen**, or **Open Movie File Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the coordinates using the value of the specified device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**.

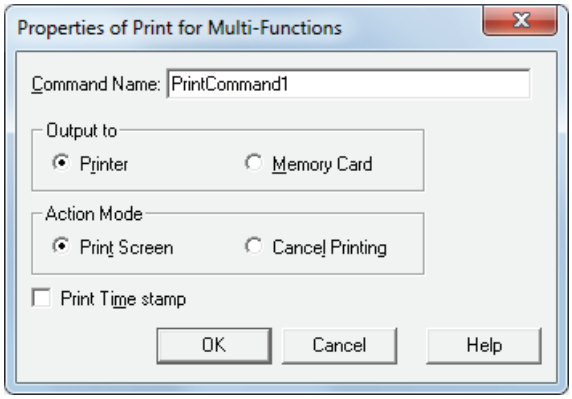
With the HG2F/2S/3F/4F, window display coordinates are automatically adjusted to a position in multiples of 20 dots.

*1 Advanced mode only

Properties of Print for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Print command for the Multi-Button.



Command Name

Enter a name for the command. The maximum number is 20 characters.

Output to

Select where to direct the screenshot to.

Printer: Outputs the screenshot to the printer connected to the MICRO/I.

Memory Card*2: Outputs the screenshot as a file to the memory card inserted in the MICRO/I.
Files are output as follows:

Series	File format	File name	File size
HG2G-5F HG3G/4G	JPEG	CAP***.JPG (***: date and time when file was output) Example: A file created at 18:50:25 on June 30, 2011 will be named "CAP110630_185025.JPG".	Depends on image being displayed.
HG2F	Bitmap	CAP***.BMP (***: serial number from 001 to 999)	77,878 bytes
HG3F			308,278 bytes
HG4F			481,078 bytes

- For details about printers, refer to Chapter 31 "Printer" on page 31-1.
- For details about memory cards, refer to Chapter 30 "1 Memory Cards" on page 30-1.

Action Mode

Select the behavior of the button from the following:

Print Screen: Outputs a screenshot of the current screen to the printer or the memory card.

Cancel Printing: Cancels printout to the printer.

Print Time stamp

Adds the date and time of printing to the screenshot before sending it to the printer.

The date and time format depends on the language selected in **Language. Language** is available on the **Project Details** tab of the Project Settings dialog box.

The display formats are shown below:

- Japanese: YYYY*3MM/DD HH:MM
- English: MM/DD/YYYY*3HH:MM

YYYY: year, MM: month, DD: day, HH: hour, MM: minute

*2 This is applicable for models with the memory card interface only.
*3 Only last two digits of year shown on the HG1F/2F/2S/3F/4F.

- These operations cannot be performed simultaneously.
  - Outputting to the memory card by pressing the Multi-Button.*2
  - Outputting to the printer by pressing the Multi-Button.
  - Printing alarm logs*4
- It may take some time to output screenshots when copying files using the USB Autorun function or a Key Button.
- The HG2G-5F, HG3G/4G cannot stop printing in the middle of a page, even when the print job is canceled. Print jobs after the current print job are canceled after the current page finishes printing.
- When printing a screenshot from the HG3F/4F using SII DPU-414 printer, the printed image will only include 320 pixels from the left edge of the screen.

The maximum number of screenshots that can be captured (1 to 999) can be set in HG Special Registers LSD65. (Default: 99)

The methods to erase screenshot files saved on the memory card are as follows.

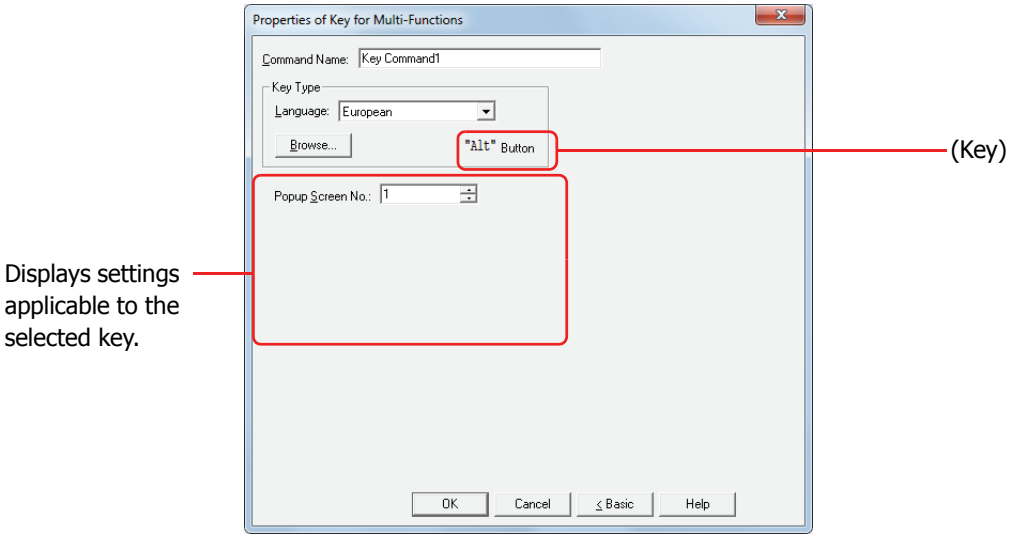
- To erase files during operation using parts, on the **Memory Card** tab on the Project Settings dialog box, select the **Remove Files stored in Memory Card** check box and the **All Screenshot data** check box, and then configure the trigger device. Assign that trigger device to a part.
- To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the Clear Data dialog box. Select the **Screenshot Data** check box and click **OK**.
- To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

*2 This is applicable for models with the memory card interface only.
*4 HG2G-5F, HG3G/4G only

Properties of Key for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Key command for the Multi-Button.



Command Name

Enter a name for the command. The maximum number is 20 characters.

Key Type

Select the function for the Key Button.

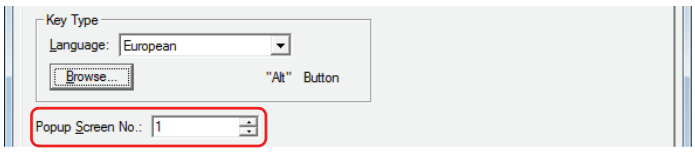
Language:	Switches the display of the key that is displayed when **Keypad** is selected in Key Browser. These languages are available: **Japanese**, **European**, **Central European**, **Baltic**, **Cyrillic**.
Browse:	Opens the Key Browser when clicked. Select a key. For details, refer to "5.5 Key Browser" on page 8-88.
(Key):	Displays the name of the key selected using the Key Browser.

- When you select a key, the label for that key is assigned as the Registration Text.
- The function of Key button will affect on the next scan when the trigger condition is satisfied.

The settings explained below appear depending on the type of key selected.

Popup Screen No.

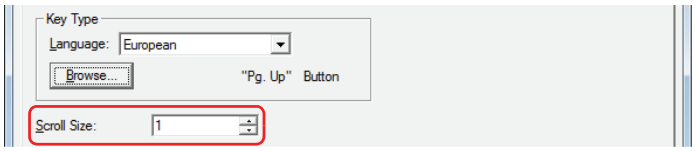
The **Alt** key switches the current Popup Screen used as a Keypad when this button is pressed.
Specify the Popup Screen number to open a Keypad for.
This setting is enabled only if **Alt** was selected using the Key Browser.



Scroll Size

Key Buttons **Pg. Up** and **Pg. Dwn** scroll the list up and down, respectively. Key Buttons **Fcs. Up** and **Fcs. Dwn** move the focus up and down, respectively. This settings specifies the number of pages or lines (1 to 1023 lines) to scroll or move the focus per each press of the button.

This setting is enabled only if **Pg. Up**, **Pg. Dwn**, **Fcs. Up**, and **Fcs. Dwn** are selected using the Key Browser.

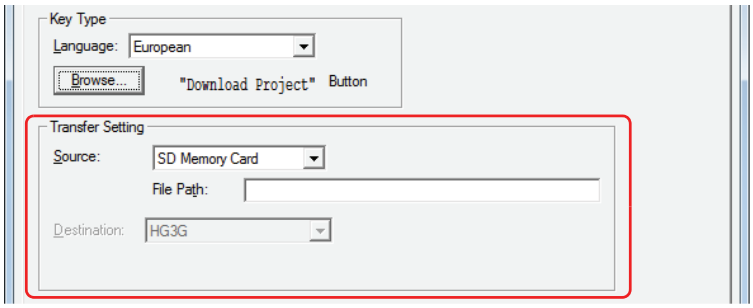


■ Transfer Setting*4

Key Buttons **Download Project**, **Upload Project**, **Copy Files**, **Download PLC Program**, and **Upload PLC Program**, perform the data transfer function specified by their names. These settings specify the source, data to be transfered, and destination.

This setting is enabled only if one of these keys is selected after clicking **Data Transfer** in the Key Browser.

If **Download Project** is selected.

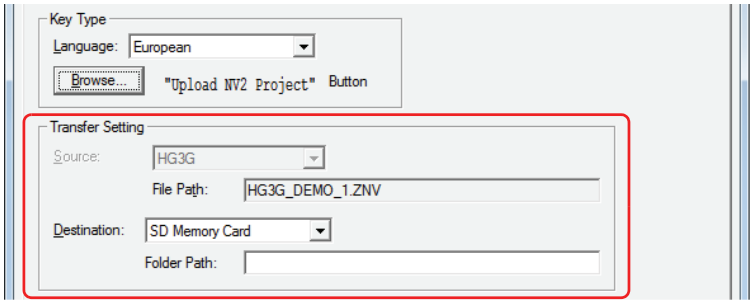


Source: Select the the external memory where the project file to transfer (.ZNV) is stored: **SD Memory Card** or **USB Flash Drive**.

File Path: Specify the path to the project file (.ZNV) to transfer. The maximum number is 247 characters.

Example: Where "HG3G_DEMO_1.ZNV" is a project file saved on the root directory of an SD memory card or USB flash drive:
HG3G_DEMO_1.ZNV

If **Upload Project** is selected.



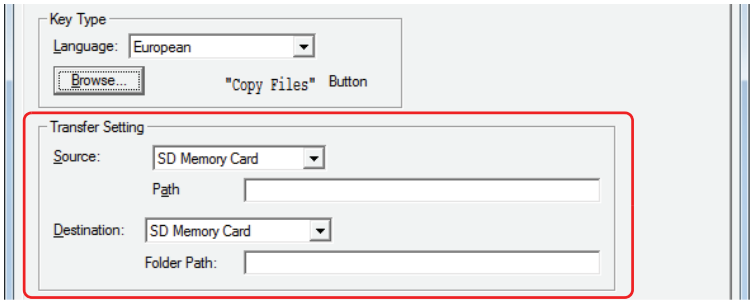
Destination: Specify where to save the project uploaded from MICRO/I. Select the location: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded project file will be saved. The maximum number is 247 characters.

Example: To save it to the folder "Uploaded_Project" on an SD memory card or USB flash drive:
Uploaded_Project

*4 HG2G-5F, HG3G/4G only

If **Copy Files** is selected.



Source: Select the source external memory: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path of the file to be transferred. The maximum number is 247 characters.
Example: Where "Error.wav" is a sound file saved on the root directory of an SD memory card or USB flash drive:
Error.wav

Destination: Select the destination external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the folder path where the file will be transferred. The maximum number is 247 characters.
Example: To save it to the folder "SOUND" inside "HGDATA01" on an SD memory card or USB flash drive:
HGDATA01\SOUND

- If a file name is specified as the source path name, the specified file is copied.
  If a folder name is specified, all of the files and subfolders contained in the folder, and all of the files in the subfolders, are copied.
- The subfolders can be copied up to five levels.
- To prevent copying the subfolders and the files contained in the subfolders, LSM30 must be set to 1 before executing the copy.
- To stop copying files during the copy operation, write 1 to LSM31. However, it will continue to copy the file until it is finished then it will stop copying.

If **Download PLC Program** is selected.

Source: Select the the external memory where the PLC program file to transfer (.ZLD) is stored: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path to the PLC program file (.ZLD) to be transferred. The maximum number is 247 characters.
Example: Where "LDR_PROGRAM.ZLD" is a PLC program file saved in folder "LDRDATA" of an SD memory card or USB flash drive:
LDRDATA\LDR_PROGRAM.ZLD

Destination: Specify the destination PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the download destination PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the destination PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the destination PLC.

If **Upload PLC Program** is selected.

Source: Specify the source PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the source PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the source PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the source PLC.

Destination: Specify where to save the PLC program uploaded from the PLC connected to the MICRO/I. Select the type of external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded PLC program file will be saved. The maximum number is 247 characters.

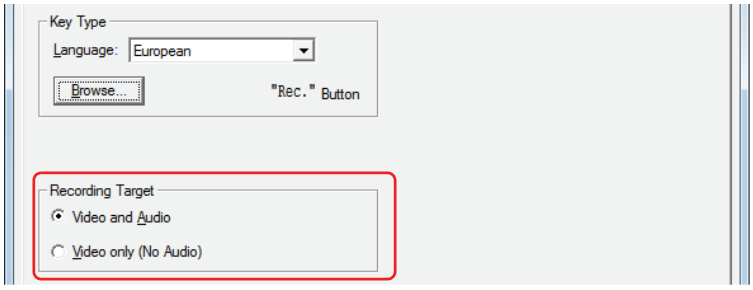
Example: To save it to the folder "Uploaded_Program" on an SD memory card or USB flash drive:
Uploaded_Program

■ Recording Target*5

The recording of images and sound starts. Select the target to record out of the signals input from the device.

Video and Audio: Records images and sound.

Video only (No Audio): Records images only.



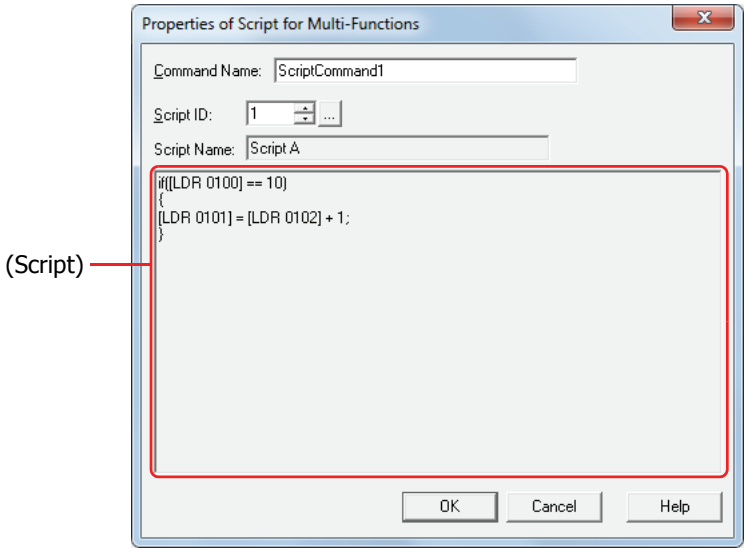
- Movie files cannot be recorded during playback.
- While data is being recorded after an event occurs with the event recording function and while data is being saved to the memory card, recording cannot be executed with parts. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

*5 This is applicable for models with a video interface only.

Properties of Script for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the script for the Multi-Button.



■ **Command Name**

Enter a name for the command. The maximum number is 20 characters.

■ **Script ID**

Specify the script ID (1 to 32000) of the script to operate.

Script Manager will open when ... is clicked. Select a script from the script list.

For details, refer to Chapter 20 "2.2 Script Manager" on page 20-7.

■ **Script Name**

Displays the name of the script selected in Script Manager.

■ **(Script)**

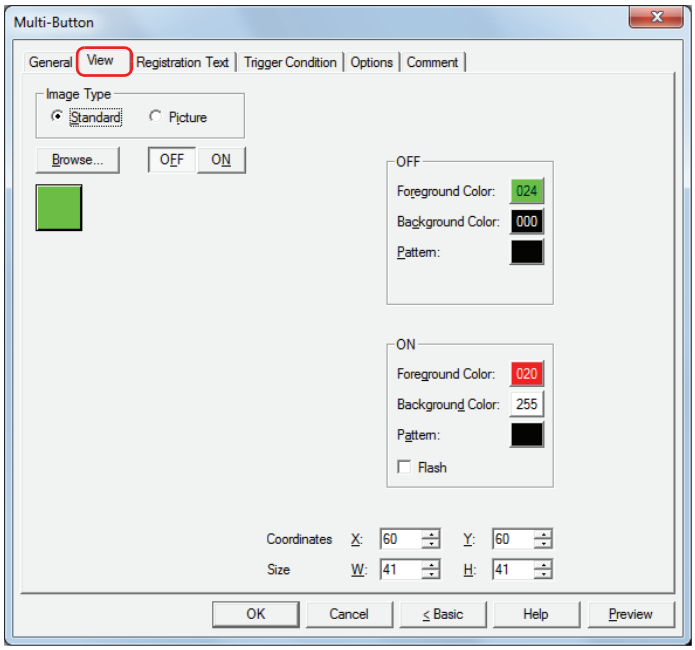
Displays the contents of the script selected in Script Manager.

Once this area is double clicked, the Script Editor will open and editing can be done.

For details, refer to Chapter 20 "2.3 Script Editor" on page 20-8.

● **View** Tab

Only **Coordinates** and **Size** can be configured when **No Image** is selected for **View Switching Method** on the **General** tab.



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphics contained within WindO/I-NV2.

Picture: Uses an image file saved in the Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **OFF button, ON button**

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ **OFF, ON**

Selects the color and pattern of the standard graphic when ON and OFF.

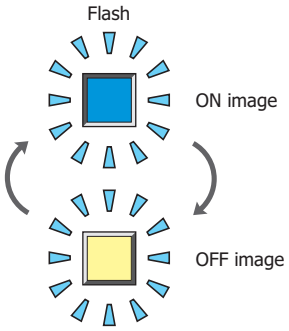
Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ **Flash**

Select this check box if flashing is desired (alternating ON and OFF) when a part is ON.



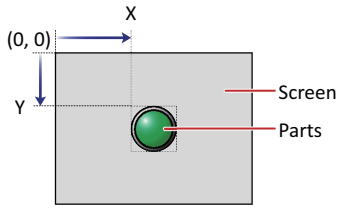
■ **Coordinates**

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

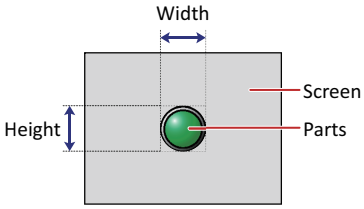


■ **Size**

W, H: Sets width and height to define the size of parts.

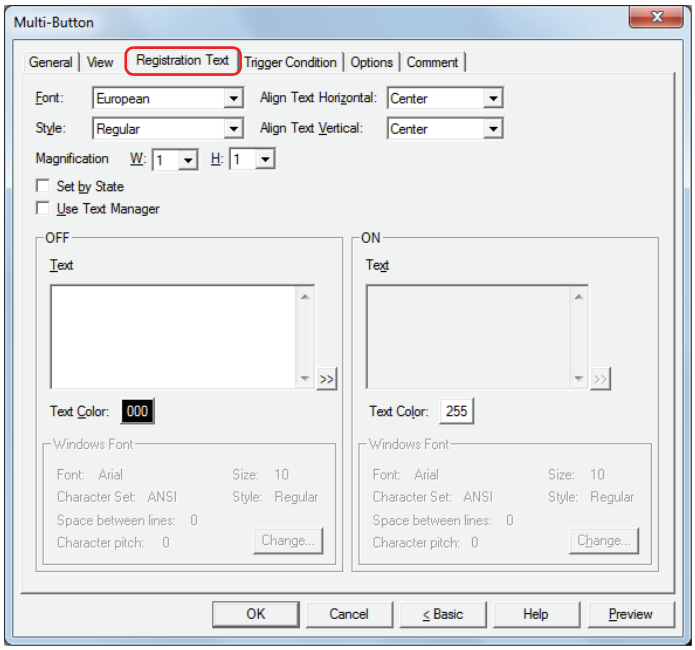
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Registration Text Tab

These options can only be configured when **Button** or **Device** is selected for **View Switching Method** on the **General** tab.



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

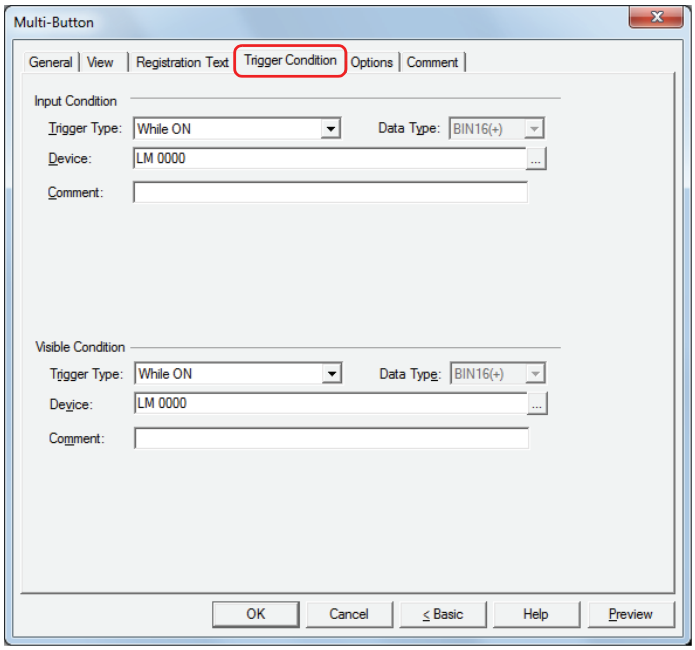
Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



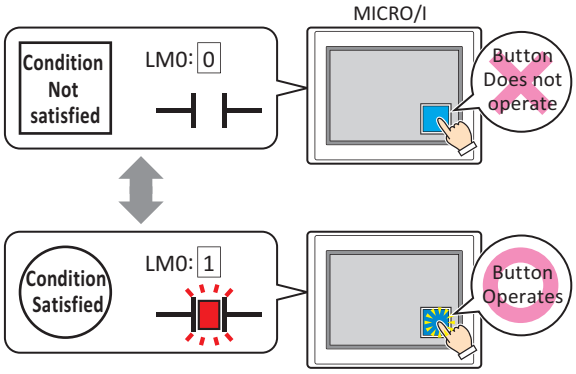
■ Input Condition

The Button is enabled and operational while the condition is satisfied. The Button is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

While LM 0 is 0, the condition is not satisfied and the Button is not operational.

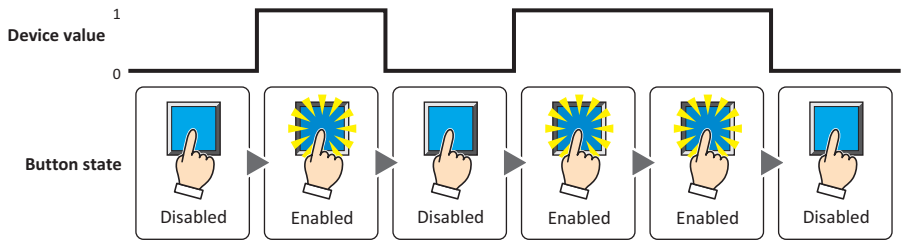
While LM 0 is 1, the condition is satisfied and the Button is operational.



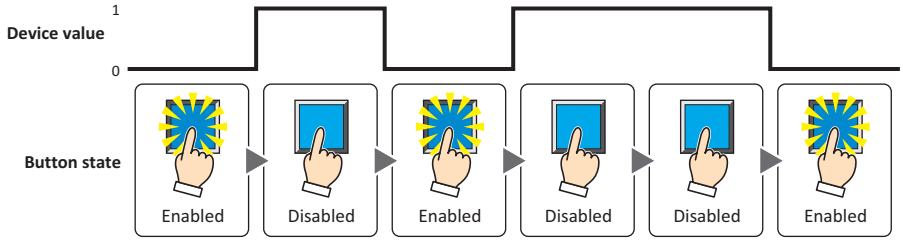
Trigger Type: Selects the condition to enable the Button from the following.

Always enable: The Button is always enabled.

While ON: Enables the Button when the device value is 1.

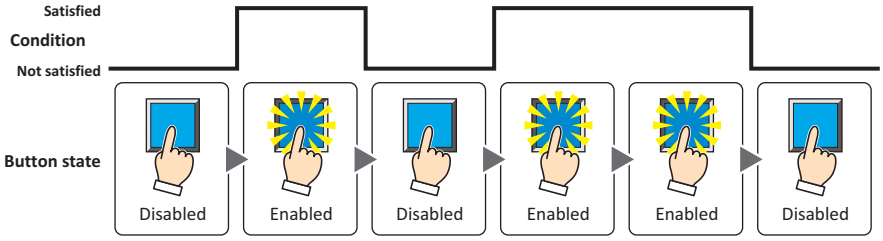


While OFF: Enables the Button when the device value is 0.



While satisfying the condition:

Enables the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

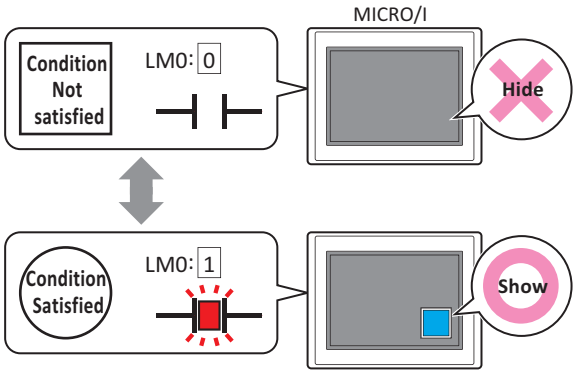
Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Button is displayed while the condition is satisfied. The Button is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Button is hidden.
While LM 0 is 1, the condition is satisfied and the Button is displayed.

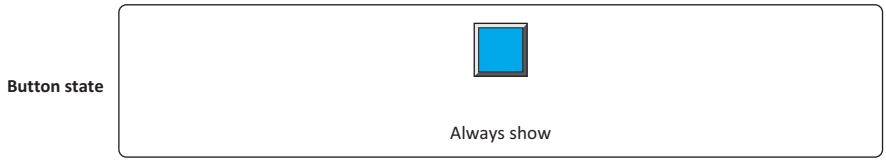


- When **Alternate** is selected for **Action Mode** on the **General** tab, the button remains on when hidden in the on state.
- When the **ON delay** check box is selected on the **Options** tab, if the button is hidden before the set time elapses from when the button begins to be pressed, the on delay is reset and the button does not operate.

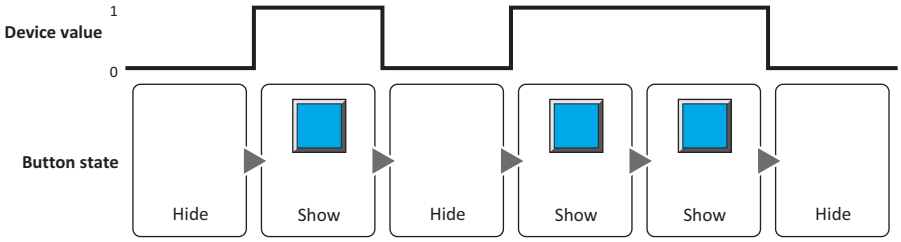
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Button from the following.

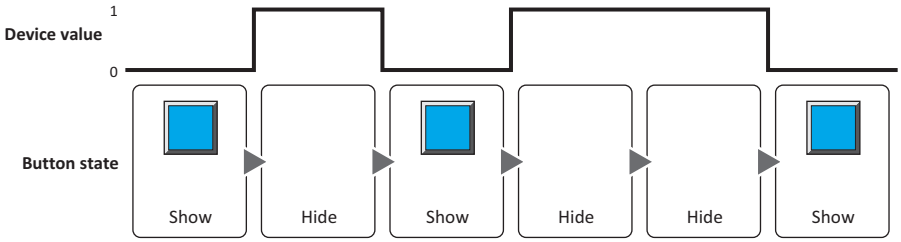
Always visible: The Button is always displayed.



While ON: Displays the Button when the device value is 1.

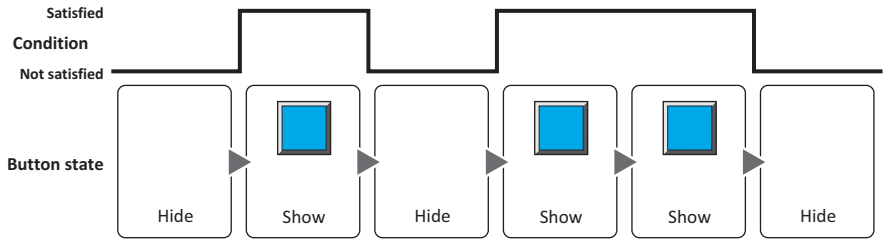


While OFF: Displays the Button when the device value is 0.



While satisfying the condition:

Displays the Button when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.

This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.

This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the visible condition.

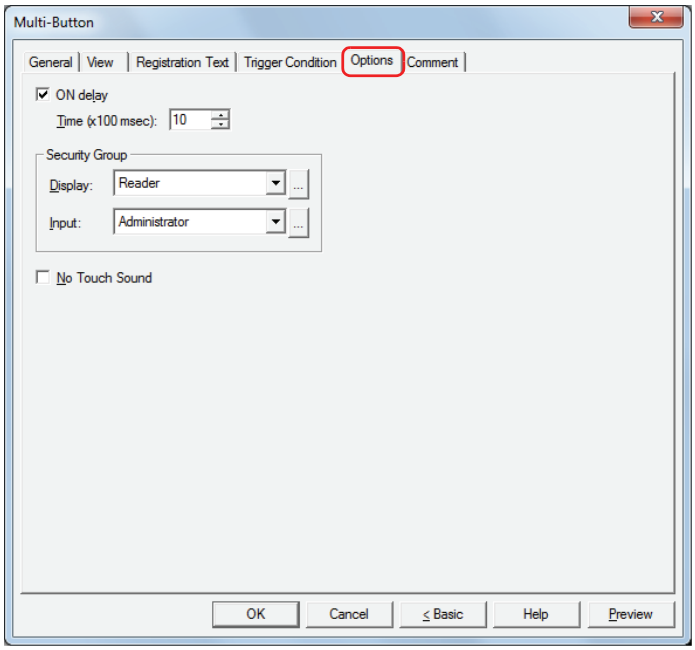
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

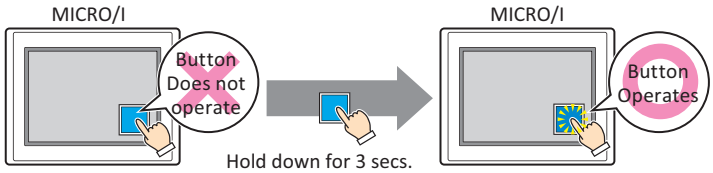
The **Options** tab is displayed in Advanced mode.



■ **ON delay**

Select this check box to use the ON delay function.

Time (x100 msec): Specify the length of time that the button must be held down before activation by selecting a value from 0 to 600 (units of 10 ms).
The button activates after it is held down for a specified period of time.



This feature protects against mistaken operation by ensuring that the button will not be activated if touched accidentally.

■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

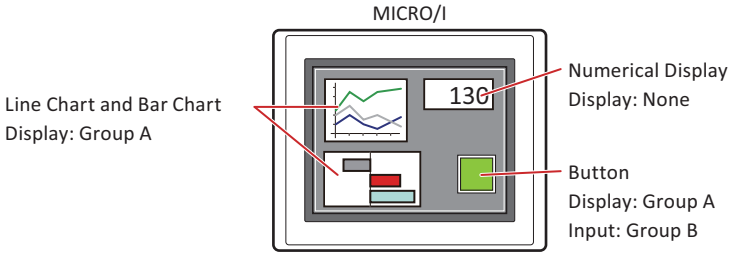
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

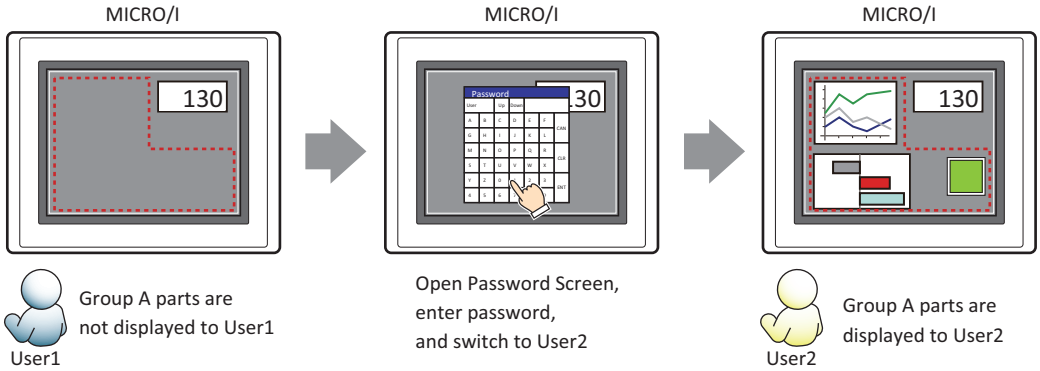
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

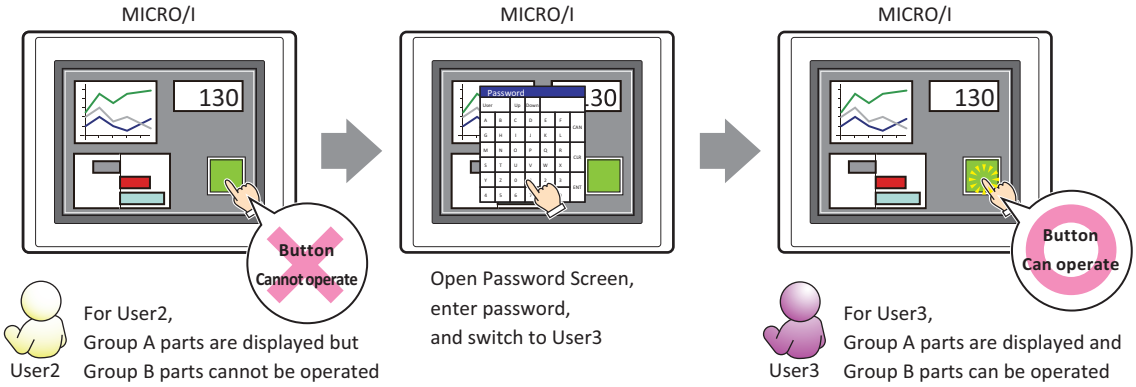
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

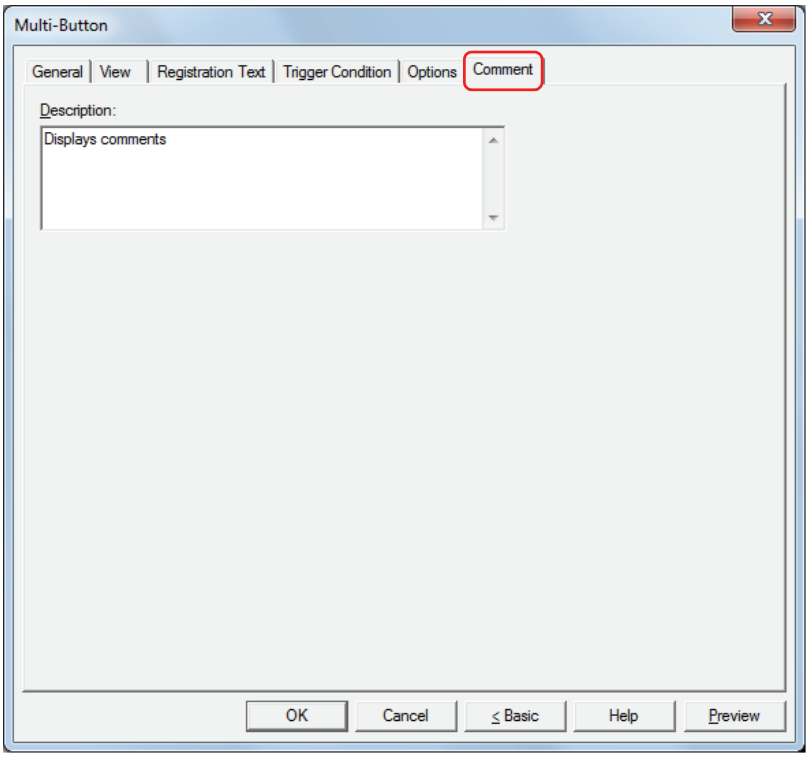
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Button on the editing screen

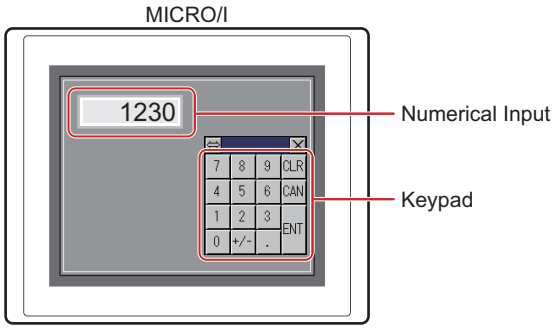
7 Keypad

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

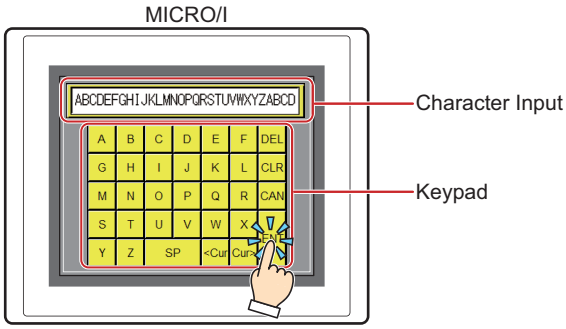
7.1 How the Keypad is Used

A part comprised of Key Buttons. Enters numbers and characters into Numerical or Character Input parts.

- Entering numbers in the Numerical Input



- Entering characters in the Character Input

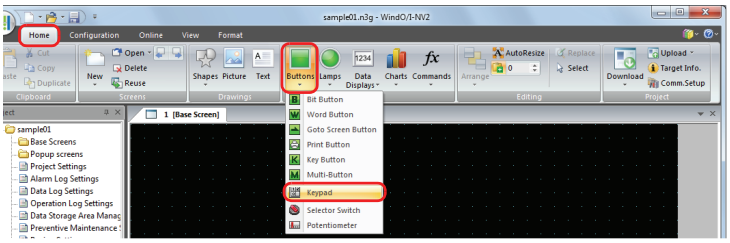


Do not use the Keypad part with the Goto Screen Button or a combination of Goto Screen Commands. For details, refer to "5 Key Button" on page 8-66.

7.2 Keypad Configuration Procedure

This section describes the configuration procedure for Keypads.

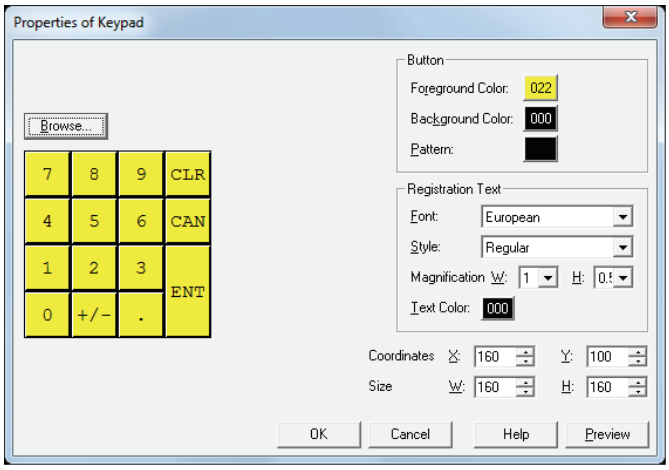
1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Keypad**.



2 Click a point on the edit screen where you wish to place the Keypad.

3 Double-click the dropped Keypad and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.



The Keypad Properties dialog box is displayed until **OK** is clicked.

☞ Refer to "7.3 Properties of Keypad Dialog Box" on page 8-128.

After **OK** on the Keypad Properties dialog box is clicked, double clicking the Keypad thereafter calls up the Properties dialog box for the Key Buttons as a group.

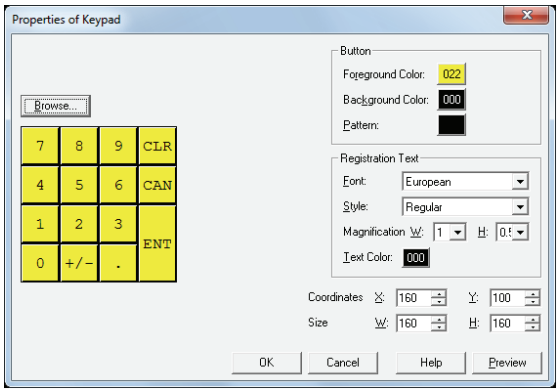
This allows editing of settings common to each button.

- View: "View Tab" on page 8-74
- Registration Text: "Registration Text Tab" on page 8-76
- Options: "Options Tab" on page 8-81

  The **Options** tab only appears in Advanced mode. To switch to Advanced mode, click **Advanced**.

7.3 Properties of Keypad Dialog Box

This section describes items and buttons in the Properties dialog box.



Browse

Select a prebuilt Keypad within WindO/I-NV2.
Displays the Standard Browser when clicked. Select numeric keys or character keys registered in the Standard Browser.

Button

Foreground Color, Background Color:

Select the foreground and background color to use for the Keypad (color: 256 colors, monochrome: 16 shades).
Displays the Color Palette when **Color** is clicked. Select a color from the Color Palette.

Pattern: Select a pattern to use for the Keypad.
Displays the Pattern Palette when **Pattern** is clicked. Select a pattern from the Pattern Palette.

Registration Text

Font: Select one of the following fonts to use for the text on the buttons.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Stroke**.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Style: Select a character style: **Regular** or **Bold**.

Magnification W, H: Select the zoom factor (0.5, 1 to 8[*1]) to use on the text.
This setting is only enabled when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

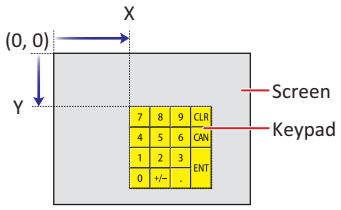
Text Color: Select the text color (color: 256 colors, monochrome: 16 shades).
Displays the Color Palette when **Color** is clicked. Select a color from the Color Palette.

Coordinates

X, Y: Specify the display coordinates of the Keypad.
X and Y specify the upper left corner of the Keypad using the upper left corner of the screen as the origin.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)



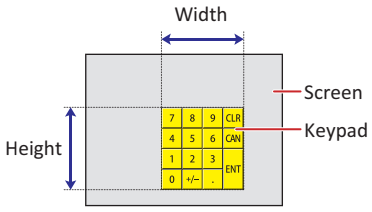
*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ Size

W, H: Specify the size of the Keypad by specifying width and height.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



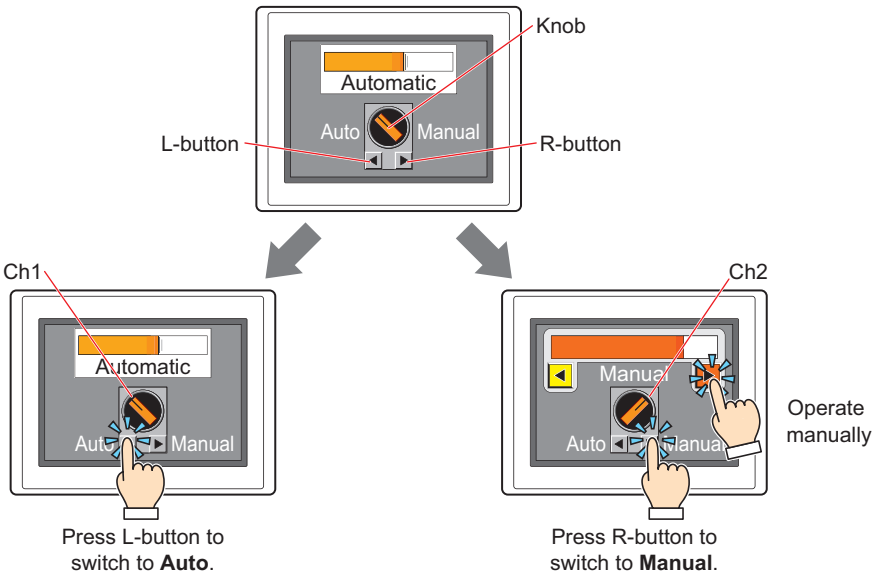
8 Selector Switch

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

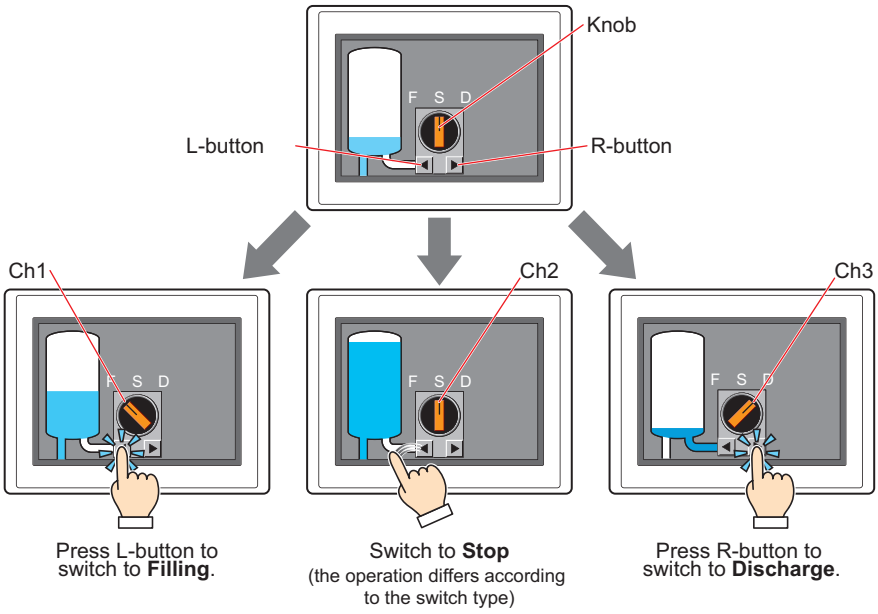
8.1 How the Selector Switch is Used

Writes a 0 or 1 to a bit device. This is an exclusive control that only writes a single value as 1 and all other values as 0.

- Switching between two Run Modes (Manual and Auto)



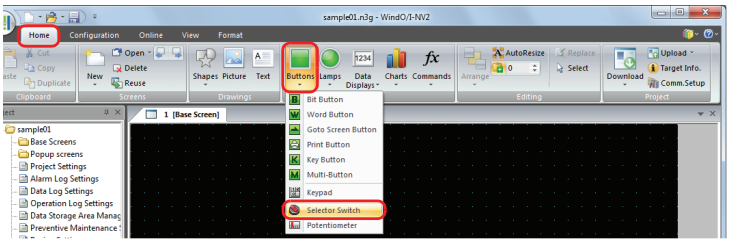
- Switching between three Run Modes (Filling - Stop - Discharge)



8.2 Selector Switch Configuration Procedure

This section describes the configuration procedure for Selector Switch buttons.

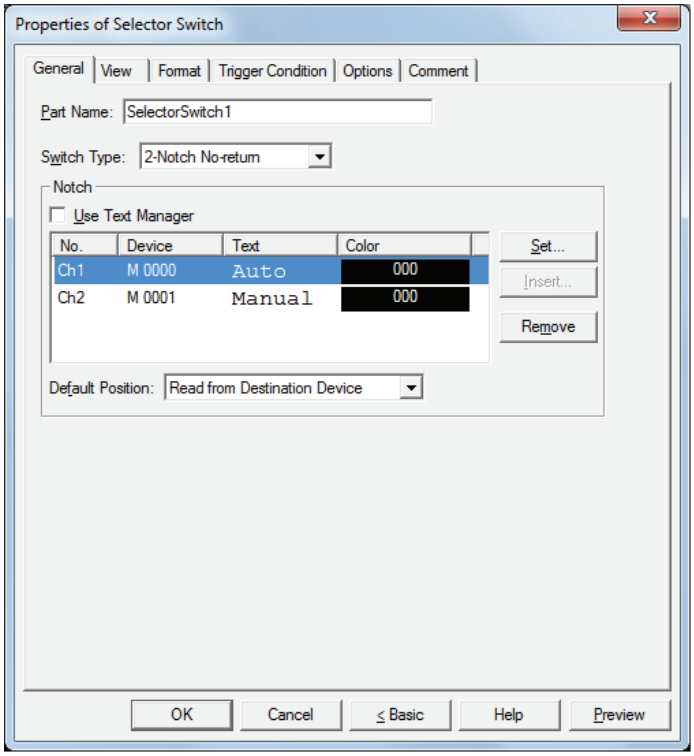
1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Selector Switch**.



2 Click a point on the edit screen where you wish to place the Selector Switch.

3 Double-click the dropped Selector Switch and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

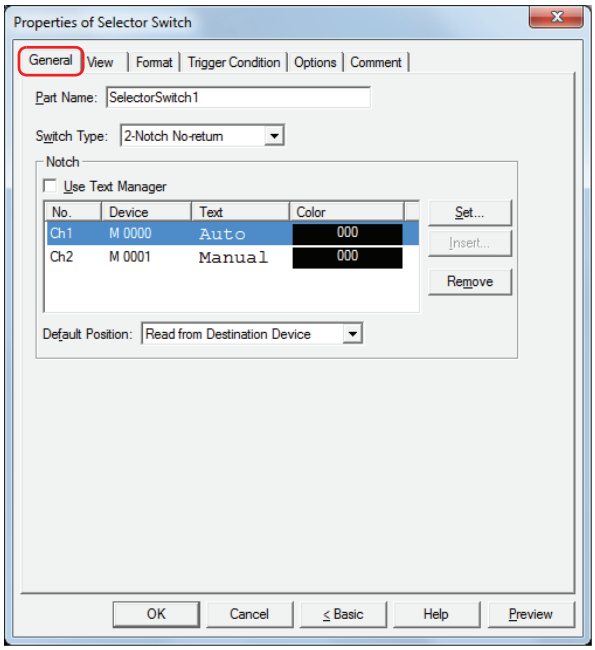


The **Trigger Condition** tab and **Options** tab only appear in **Advanced mode**.
To switch to **Advanced mode**, click **Advanced**.

8.3 Properties of Selector Switch Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Switch Type

The 2-Notch action is as follows.

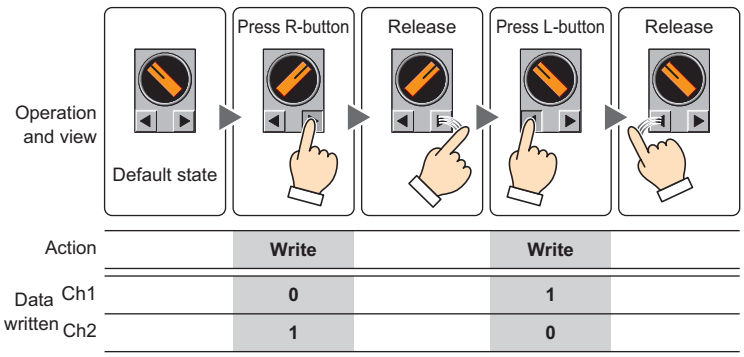
- When the knob is at Ch1 (left), pressing the right button switches the selector knob to Ch2 (right). During this action, the device for Ch1 is set to 0 and Ch2 is set to 1.
- When the knob is at Ch2 (right), pressing the left button switches the selector knob to Ch1 (left). During this action, the device for Ch1 is set to 1 and Ch2 is set to 0.

The 3-Notch action is as follows.

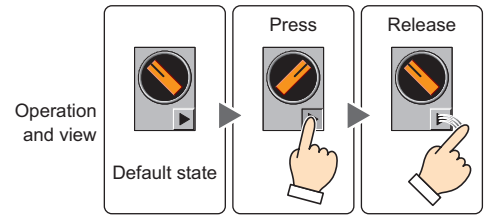
- The knob behaves as follows for **3-Notch No-return**, **3-Notch R-return**, and **3-Notch L-return** button:
  - Press R-button: knob switches from Ch1 (left) -> Ch2 (middle) -> Ch3 (right), in that order.
  - Press L-button: knob switches from Ch3 (right) -> Ch2 (middle) -> Ch1 (left), in that order.
- Switching the knob writes 1 to the device for the new knob position, and 0 to the devices for the other two channels.

Whether the knob returns and the direction it returns depends on the switch type.
Select the switch type from the following.

2-Notch No-return: The knob does not return when the operator's finger is released.

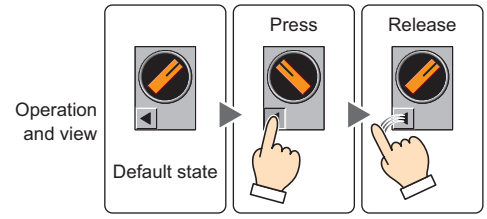


2-Notch R-return: After the knob switches from Ch1 to Ch2, it returns to Ch1 when the R-button is released.



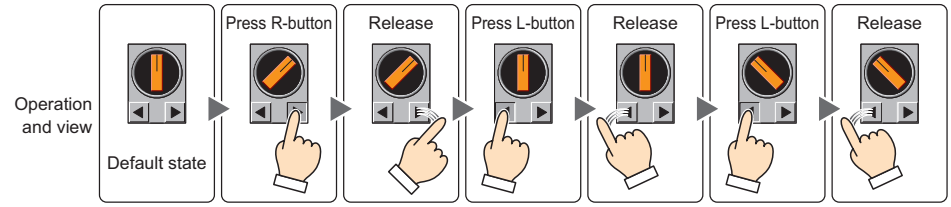
Action		Write	Write
Data written	Ch1	0	1
	Ch2	1	0

2-Notch L-return: After the knob switches from Ch2 to Ch1, it returns to Ch2 when the L-button is released.



Action		Write	Write
Data written	Ch1	1	0
	Ch2	0	1

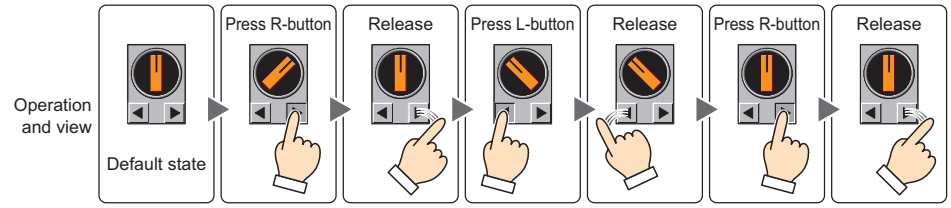
3-Notch No-return: The knob does not return when the operator's finger is released.



Action		Write		Write		Write
Data written	Ch1	0		0		1
	Ch2	0		1		0
	Ch3	1		0		0

3-Notch R-return:

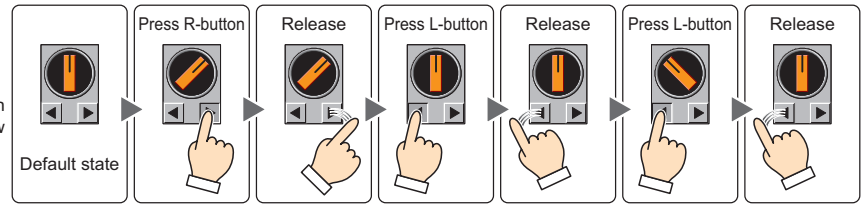
- If the knob is switched to Ch3, it returns to Ch2 when the button is released.
- If the knob is switched to Ch1, or from Ch1 to Ch2, it stays where it is even if the button is released.



Action		Write	Write	Write		Write
Data written	Ch1	0	0	1		0
	Ch2	0	1	0		1
	Ch3	1	0	0		0

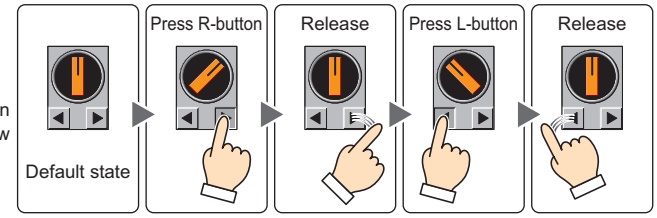
3-Notch L-return:

- If the knob is switched to Ch1, it returns to Ch2 when the button is released.
- If the knob is switched to Ch2, or from Ch3 to Ch2, it stays where it is even if the button is released.



Action		Write		Write		Write	Write
Data written Ch1		0		0		1	0
Data written Ch2		0		1		0	1
Data written Ch3		1		0		0	0

3-Notch Both-return: If the knob is switched to Ch1 or Ch3, it returns to Ch2 when the button is released.



Action		Write	Write	Write	Write
Data written Ch1		0	0	1	0
Data written Ch2		0	1	0	1
Data written Ch3		1	0	0	0

■ Notch

Register and edit the settings for each notch to each channel.

Use Text Manager: Select this check box to use the text registered in the Text Manager as the Registration Text for each channel.

(List of Notch settings): This list shows the notch settings for each channel.

No.: Shows the channel to be output. The number of notches selected in the **Switch Type** determines the number of channels.
Double clicking the cell displays the **Notch Settings** dialog box where you can edit the notch settings. For details, refer to "Notch Settings dialog box" on page 8-136.

Device: Shows the destination bit device or bit in the destination word device.
Double clicking the cell displays the **Device Address Settings** dialog box where you can edit the device address. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Text: Shows the Registration Text for the channel.
Double clicking the cell displays the **Unicode Input** dialog box where you can edit the Registration Text.
If you select the **Use Text Manager** check box, the text ID is shown. Double clicking the cell displays the Text Manager where you can edit the text.

Color: Shows the color of the Registration Text for the channel.
Double clicking the cell displays Color Palette. Select a color from the Color Palette.

Set: Registers or changes the notch settings. Selecting a number that has already been registered changes the existing notch settings.
Clicking **Set** displays the **Notch Settings** dialog box where you can configure the notch. For details, refer to "Notch Settings dialog box" on page 8-136.
Notches are always registered from Ch1.

Insert: Inserts a notch setting entry above the currently selected position.
Select the channel number from the list where you wish to insert the notch setting and click **Insert**. This displays the **Notch Settings** dialog box where you can configure the notch. The notch settings at the point of insertion shift down one line. Notch settings cannot be inserted if all channel numbers have a notch setting.

Remove: Deletes the registered notch setting from the list.
Select the channel number in the list and click **Remove**.

Default Position: Selects the default position of the knob when the MICRO/I starts operation and the Selector Switch is first displayed on the screen.

Ch1: Makes Ch1 the default knob position. Writes 1 to the device configured for Ch1, writes 0 to the devices configured for the other channels.

Ch2: Makes Ch2 the default knob position. Writes 1 to the device configured for Ch2, writes 0 to the devices configured for the other channels.

Ch3: Makes Ch3 the default knob position. Writes 1 to the device configured for Ch3, writes 0 to the devices configured for the other channels.

Read from Destination Device:

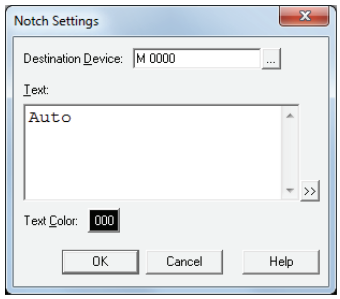
The position of the knob is determined by the device value.

The default knob position is fixed for these two switch types because of the return functionality.
2-Notch R-return: Ch1
2-Note L-return, 3-Notch Both-return: Ch2

- If **Default Position** is **Ch1**, **Ch2**, or **Ch3**, the position of the knob does not change even if the value in the device configured for the channel changes, unless the change is caused by the buttons on the Selector Switch. If **Default Position** is **Read from Destination Device**, the position of the knob changes according to the value of the device configured for the channel.
- When a Selector Switch is redisplayed immediately after switching the screen or when a hidden Selector Switch is redisplayed, values are not written to the destination devices for the channels.
- If the value in the device used to determine the default knob position contains an illegal value, the knob will be shown as follows:
  - 2-Notch No-return: Ch1
  - 3-Notch: Ch2

Notch Settings dialog box

This dialog configures a notch for a channel. If the channel has already been set with a notch, the setting is overwritten.



■ **Destination Device**

Specify the destination bit device or bit in the destination word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Text**

Enter the Registration Text for the channel.

The characters that can be entered depends on the font selected for **Font** on the **Format** tab. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

To enter Unicode characters, click >> to display the **Unicode Input** dialog box. Enter the characters in the **Unicode Input** dialog box and click **OK**.

■ **Text ID**

To use the text registered in the Text Manager as the Registration Text for the channel, specify the ID number from 1 to 32000.

Click ... to display Text Manager.

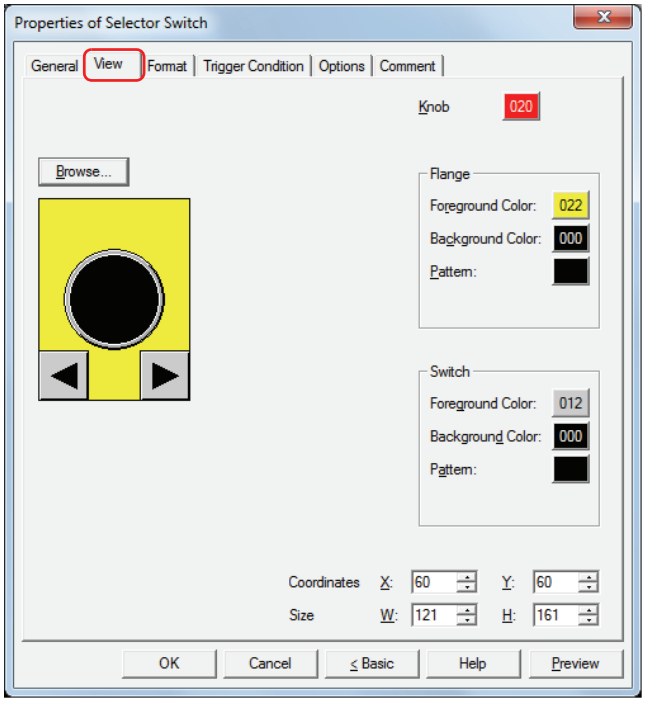
The text ID setting is only enabled if you select the **Use Text Manager** check box.

■ **Text Color**

Select the Registration Text color for the channel (color: 256 colors, monochrome: 16 shades).

Displays the Color Palette when **Color** is clicked. Select a color from the Color Palette.

● View Tab



■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Knob Color

Selects the knob color of the Selector Switch (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

■ Flange

Foreground Color, Background Color:	Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades). Click **Color** to display the Color Palette. Select a color from the Color Palette.
Pattern:	Selects a pattern for the flange. Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Buttons

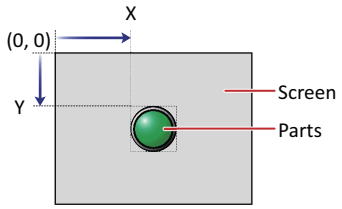
Foreground Color, Background Color:	Selects the foreground and background colors of the buttons (color: 256 colors, monochrome: 16 shades). Click **Color** to display the Color Palette. Select a color from the Color Palette.
Pattern:	Selects a pattern for the button. Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

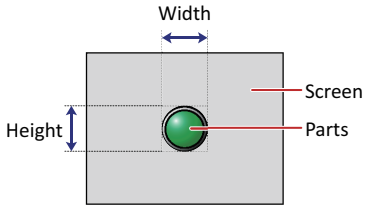


Size

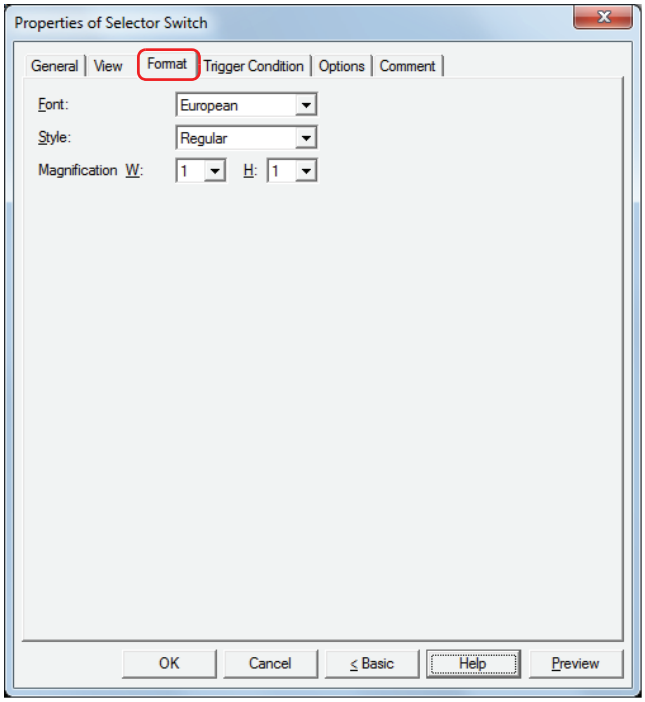
W, H: Sets width and height to define the size of parts.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Format** Tab



■ **Font**

Selects the font used for displaying text from the following.

Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Stroke**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**

Sets the character size (8 to 128).

Can only be set when **Stroke** is selected.

■ **Style**

Selects **Regular** or **Bold** for text style.

Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ **Magnification**

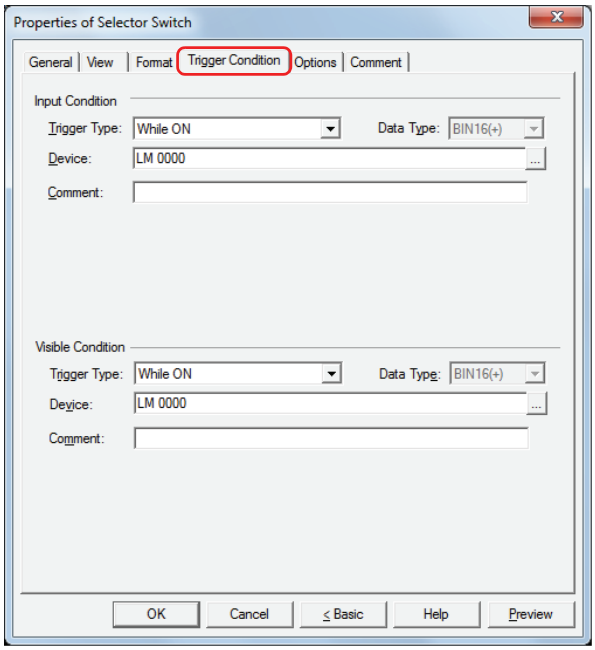
W, H: Selects the magnification (0.5, 1 to 8*1) for text display.

Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.

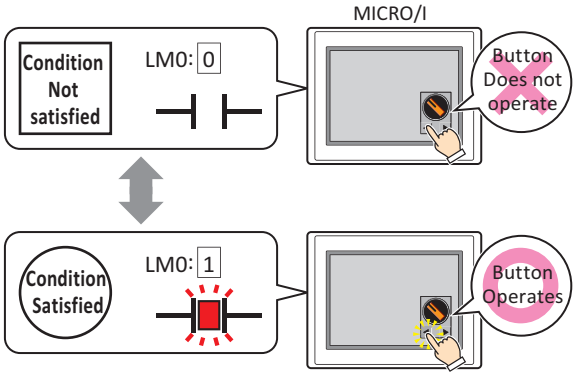


■ Input Condition

The Selector Switch is enabled and operational while the condition is satisfied. The Selector Switch is disabled and not operational while the condition is not satisfied.

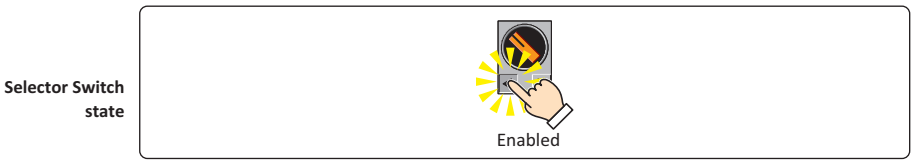
Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**

While LM 0 is 0, the condition is not satisfied and the Selector Switch is not operational.
While LM 0 is 1, the condition is satisfied and the Selector Switch is operational.

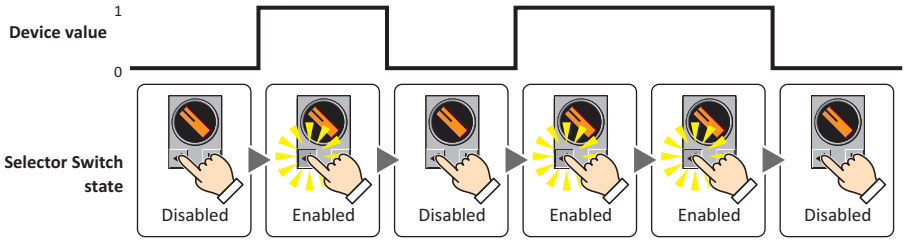


Trigger Type: Selects the condition to enable the Selector Switch from the following.

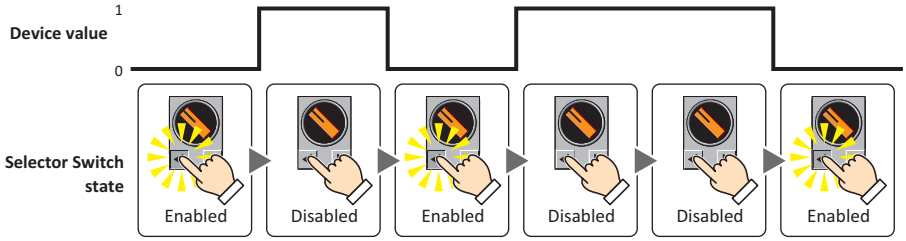
Always enable: The Selector Switch is always enabled.



While ON: Enables the Selector Switch when the device value is 1.

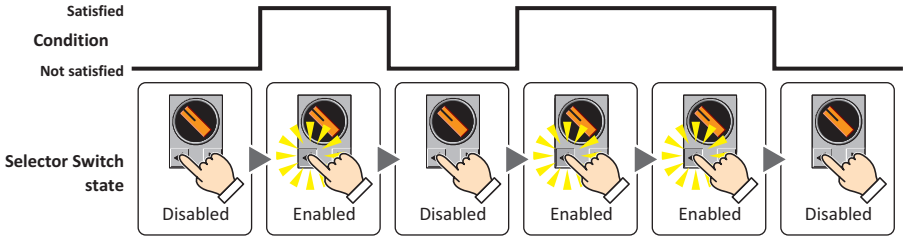


While OFF: Enables the Selector Switch when the device value is 0.



While satisfying the condition:

Enables the Selector Switch when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

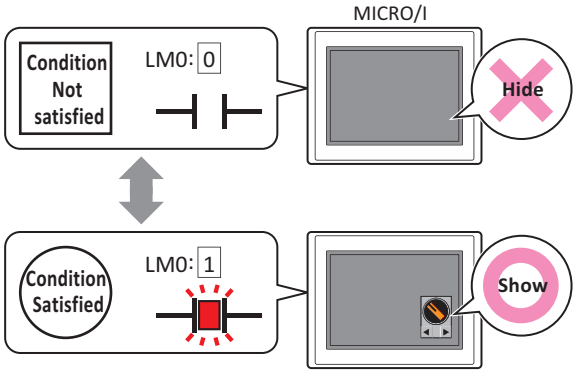
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Selector Switch is displayed while the condition is satisfied. The Selector Switch is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Selector Switch is hidden.
While LM 0 is 1, the condition is satisfied and the Selector Switch is displayed.



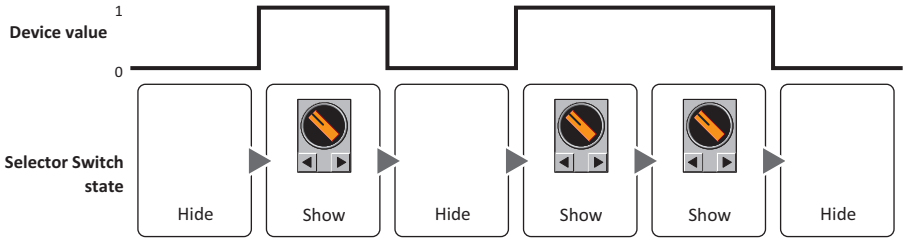
If a hidden Selector Switch is redisplayed on the screen when **Read from Destination Device** is selected for **Default Position** on the **General** tab, the display position of the knob changes according to the value of the device configured for the channel. When **Ch1**, **Ch2**, or **Ch3** is selected, the knob is displayed at the same position as before it was hidden, regardless of the device value configured for the channel.

*1 HG2G-5F, HG3G/4G only

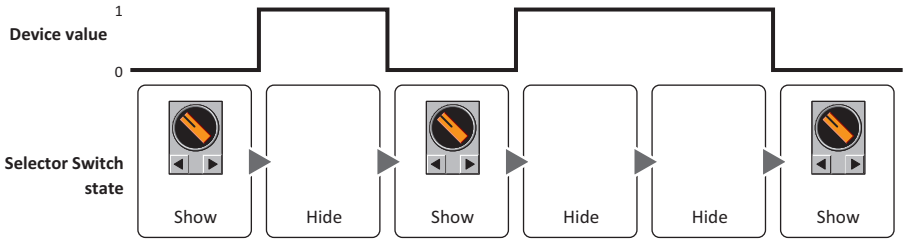
Trigger Type: Selects the condition to display the Selector Switch from the following.

Always visible: The Selector Switch is always displayed.

While ON: Displays the Selector Switch when the device value is 1.

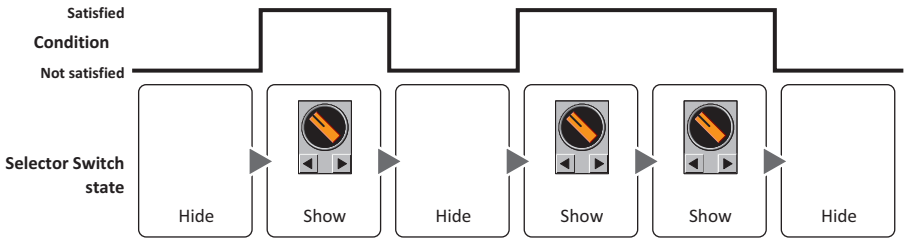


While OFF: Displays the Selector Switch when the device value is 0.



While satisfying the condition:

Displays the Selector Switch when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.

This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.

This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the visible condition.

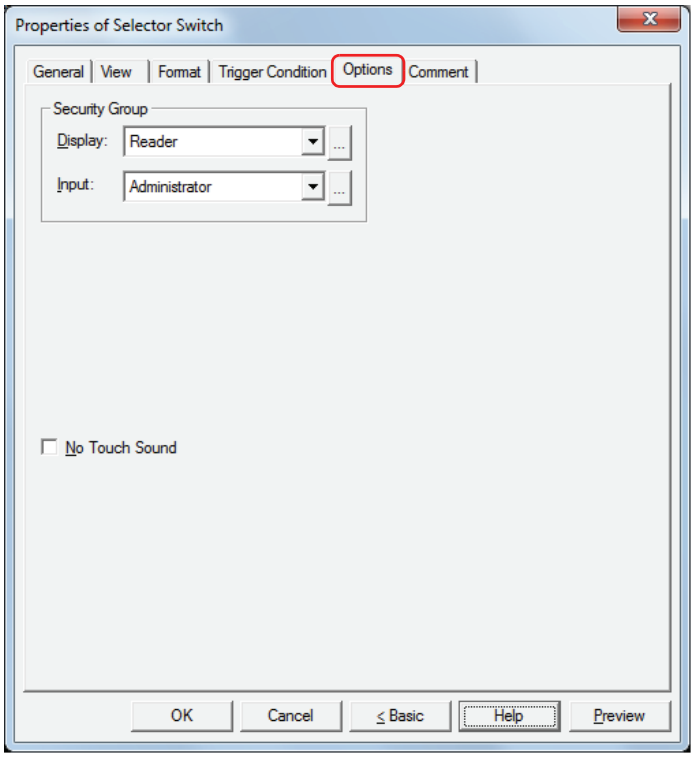
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

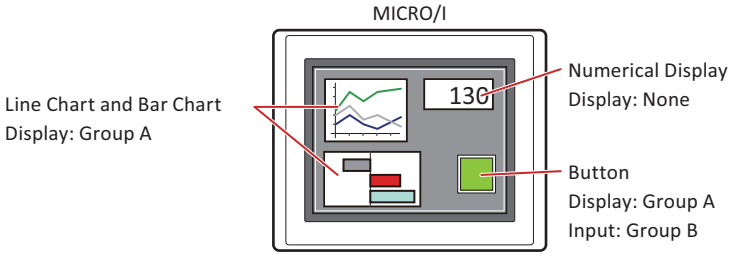
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

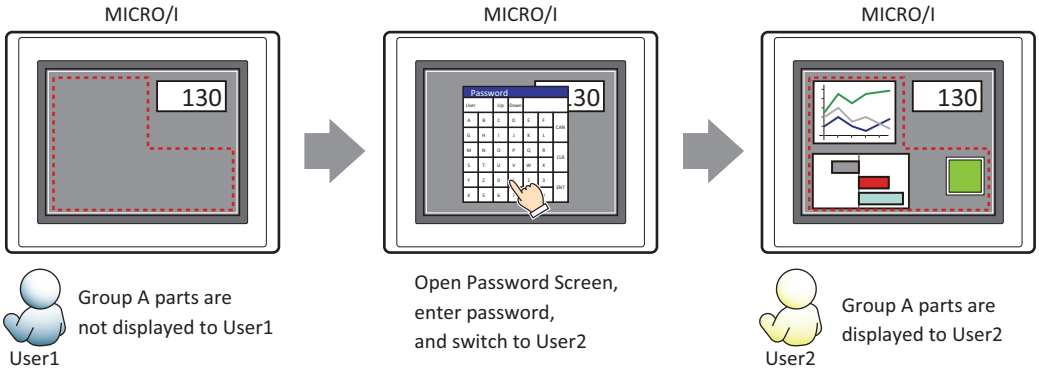
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

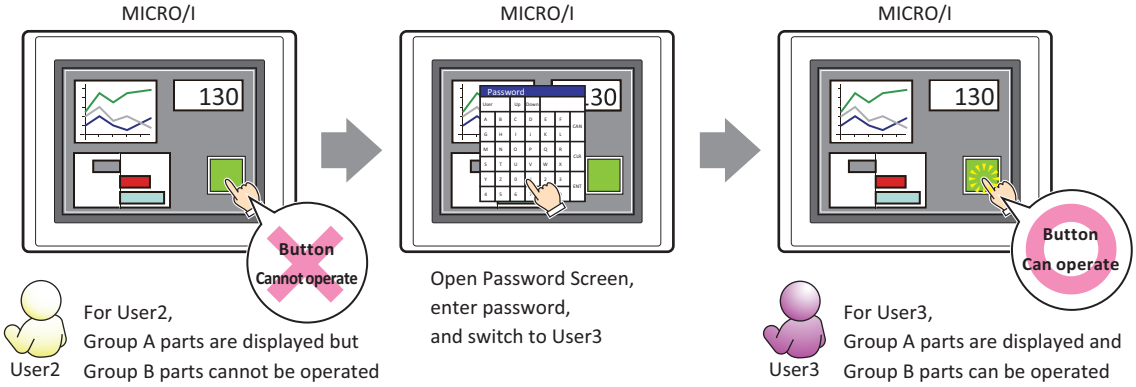
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

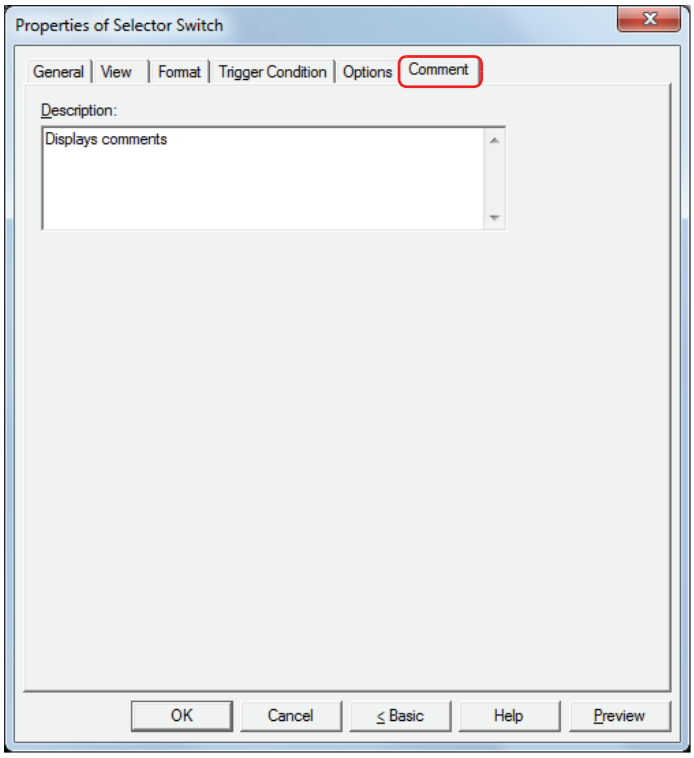
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

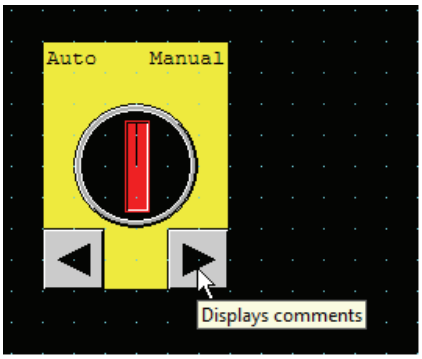
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ Description

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Selector Switch on the editing screen



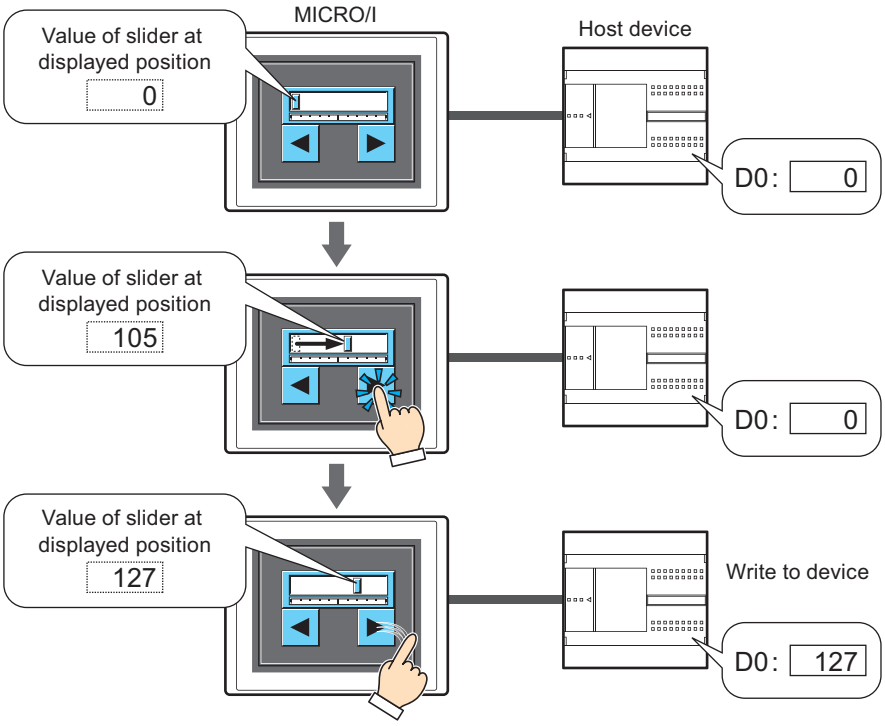
9 Potentiometer

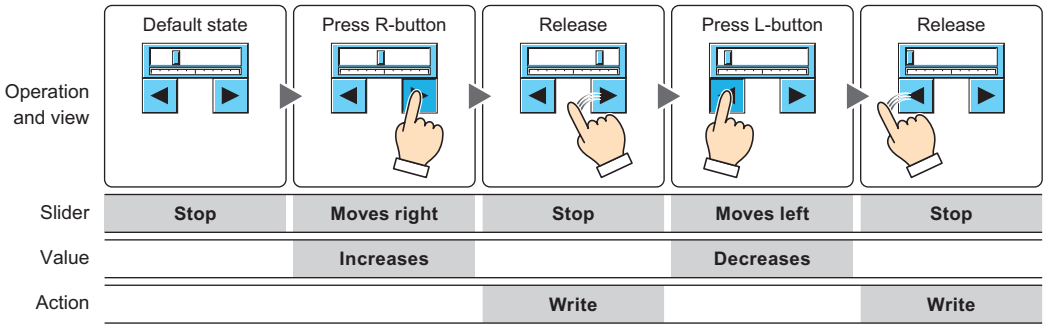
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

9.1 How the Potentiometer is Used

Writes a value to a word device by pressing a slider button.

- The slider display position increases and decreases while the button is depressed. The value of the slider at the displayed position is written to the device when the button is released.





The slider indicates the value written to the device. When the value is increased or decreased, the slider display position also changes.

The slider moves between a user-defined minimum and maximum value.

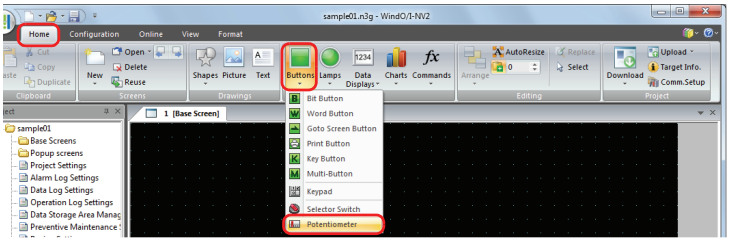
The input value increases and decreases while the button is depressed. The value of the slider at the displayed position is written to the device when the button is released.

> The slider display position does not change when the destination device value changes unless it was changed by the Potentiometer buttons. However, immediately after the screen is switched and immediately after the part is displayed on the screen, the slider is displayed at the position specified by the destination device value.

9.2 Potentiometer Configuration Procedure

This section describes the configuration procedure for Potentiometer parts.

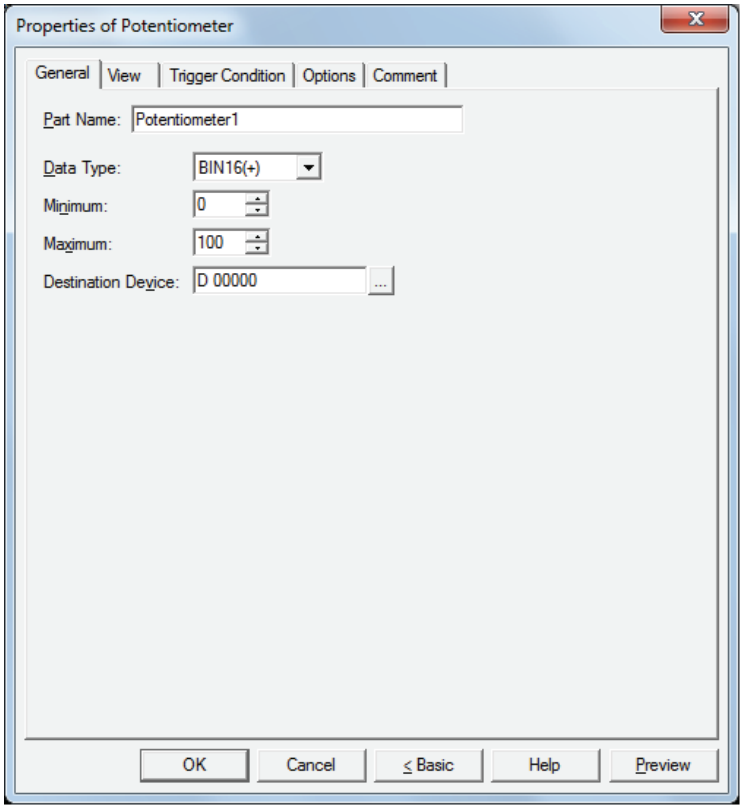
1 On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Potentiometer**.



2 Click a point on the edit screen where you wish to place the Potentiometer.

3 Double-click the dropped Potentiometer and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

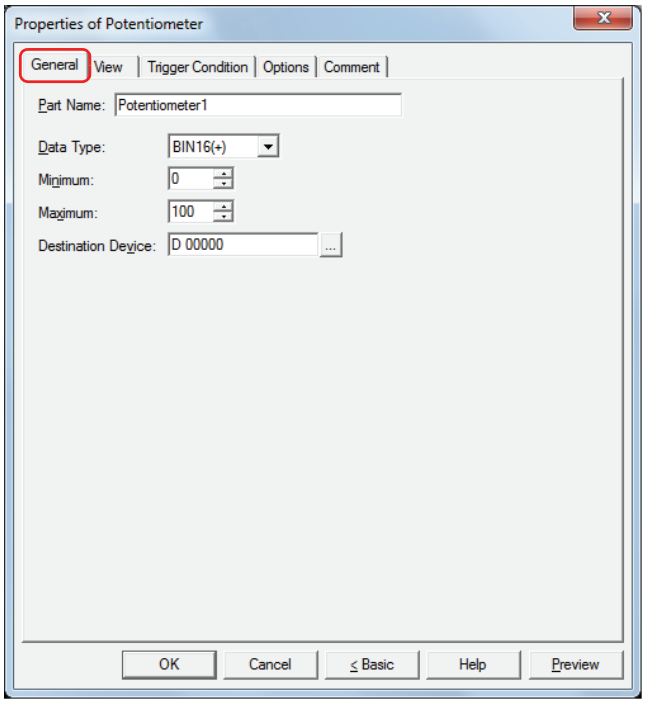


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

9.3 Properties of Potentiometer Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**
Enter a name for the part. The maximum number is 20 characters.

■ **Data Type**
Select the data type to be handled by the Potentiometer.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

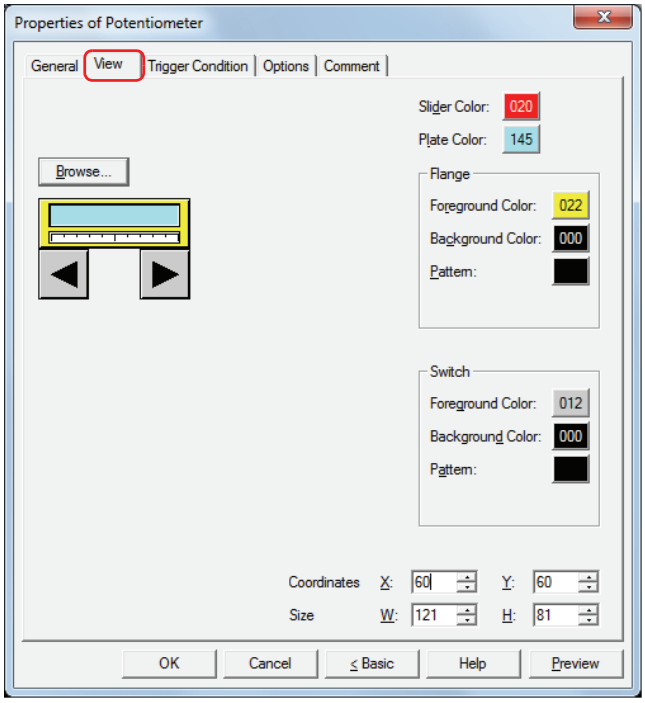
■ **Minimum**
Specify the minimum value that can be entered. The minimum value differs depending on the data type.

■ **Maximum**
Specify the maximum value that can be entered. The maximum value differs depending on the data type.

■ **Destination Device**
Specify the destination word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● View Tab



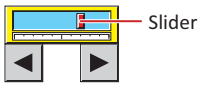
■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Slider Color

Selects the slider color of the Potentiometer (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



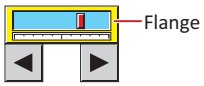
■ Plate Color

Selects the plate color (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

■ Flange

Foreground Color, Background Color:	Selects the foreground and background colors of the flange (from 256 colors or 16 shades for monochrome). Click **Color** to display the Color Palette. Select a color from the Color Palette.
Pattern:	Selects a pattern for the flange. Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



Buttons

Foreground Color, Background Color: Selects the foreground and background colors of the buttons (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

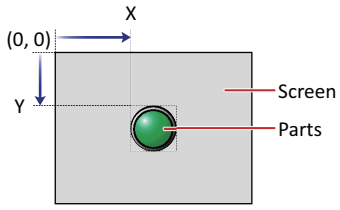
Pattern: Selects a pattern for the button.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

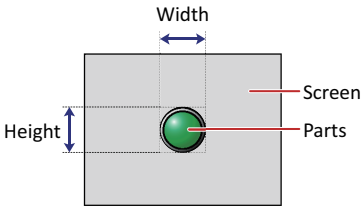


Size

W, H: Sets width and height to define the size of parts.

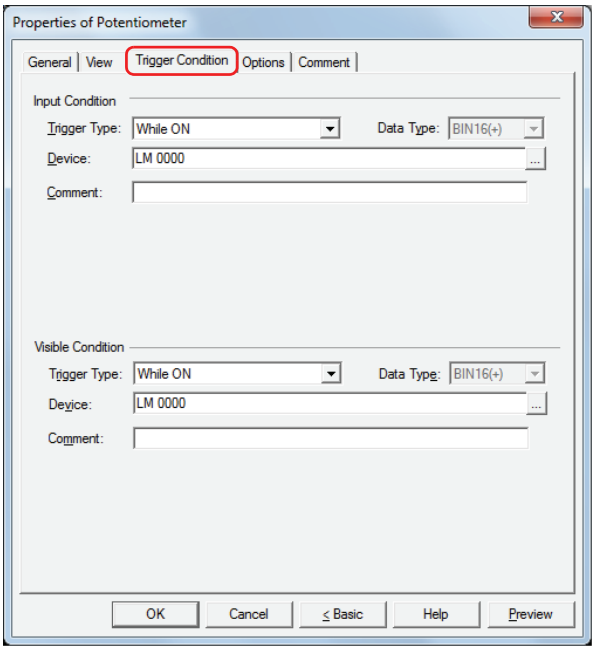
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● Trigger Condition Tab

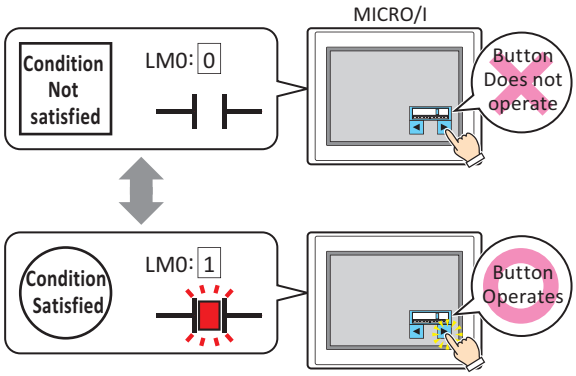
The **Trigger Condition** tab is displayed in Advanced mode.



■ Input Condition

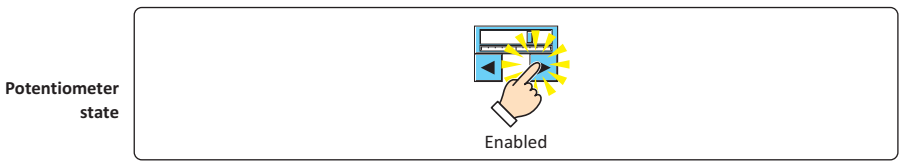
The Potentiometer is enabled and operational while the condition is satisfied. The Potentiometer is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Potentiometer is not operational.
While LM 0 is 1, the condition is satisfied and the Potentiometer is operational.

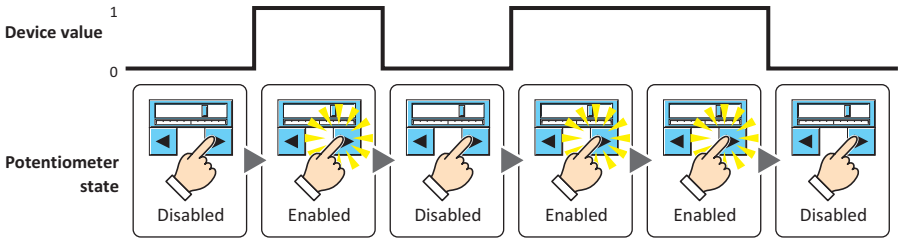


Trigger Type: Selects the condition to enable the Potentiometer from the following.

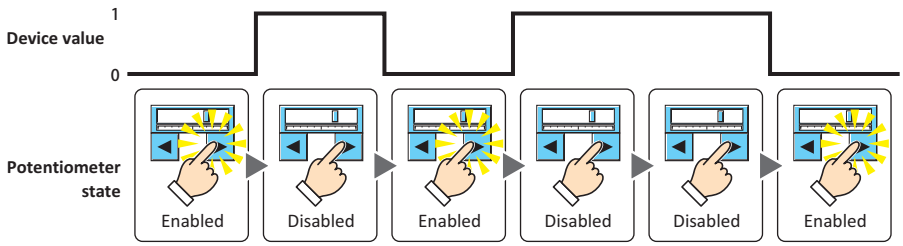
Always enable: The Potentiometer is always enabled.



While ON: Enables the Potentiometer when the device value is 1.

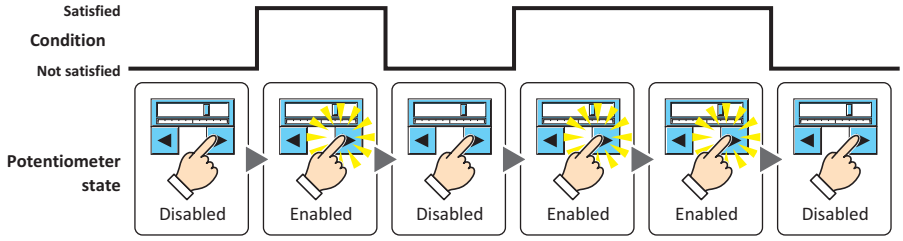


While OFF: Enables the Potentiometer when the device value is 0.



While satisfying the condition:

Enables the Potentiometer when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

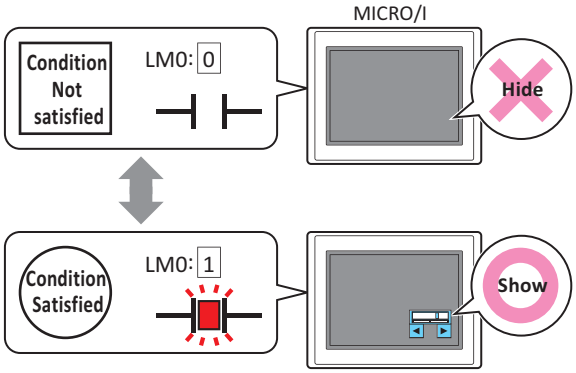
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Potentiometer is displayed while the condition is satisfied. The Potentiometer is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Potentiometer is hidden.
While LM 0 is 1, the condition is satisfied and the Potentiometer is displayed.

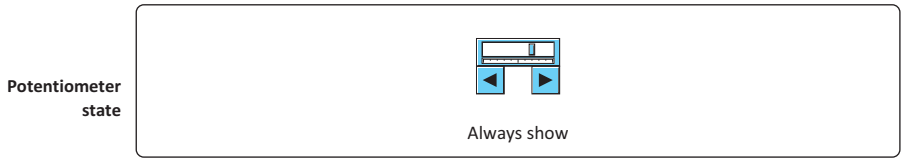


When a hidden Potentiometer is redisplayed, the slider is displayed at the position specified by the device value.

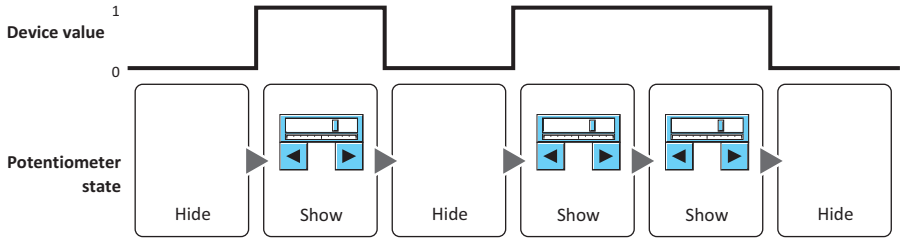
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Potentiometer from the following.

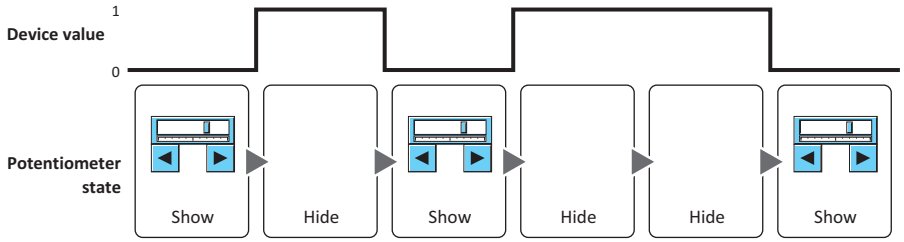
Always visible: The Potentiometer is always displayed.



While ON: Displays the Potentiometer when the device value is 1.

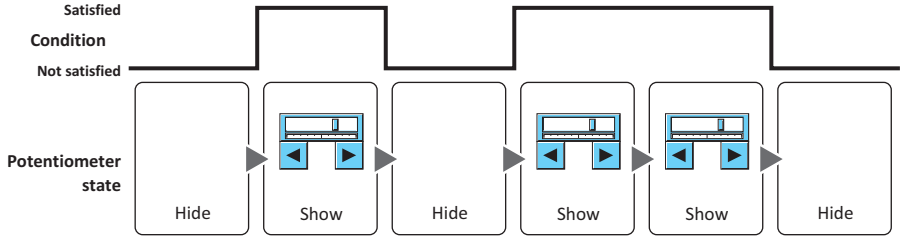


While OFF: Displays the Potentiometer when the device value is 0.



While satisfying the condition:

Displays the Potentiometer when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

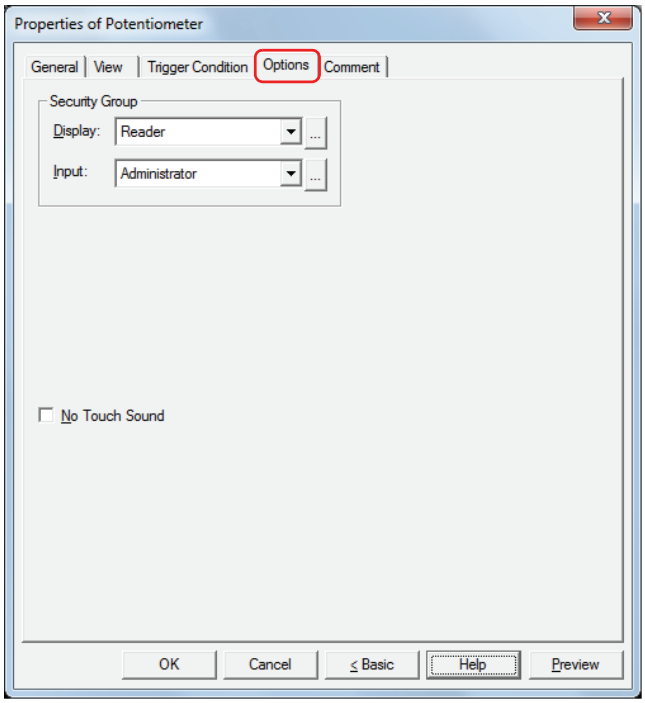
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

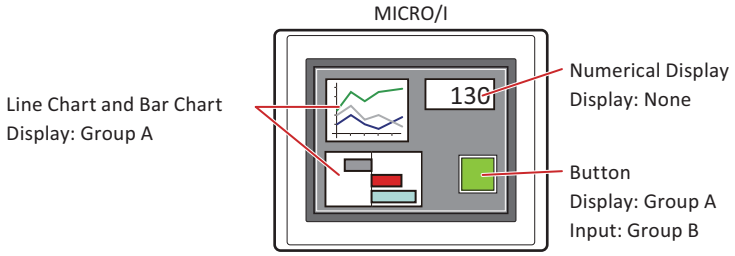
None: No security function is used.
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

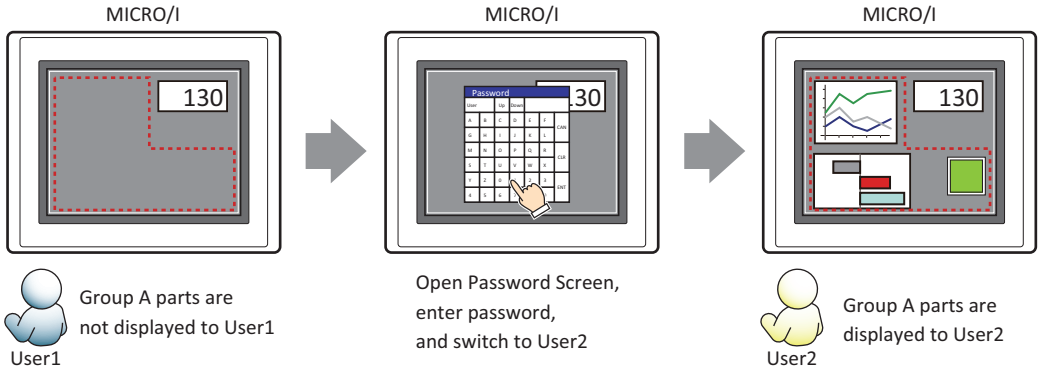
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

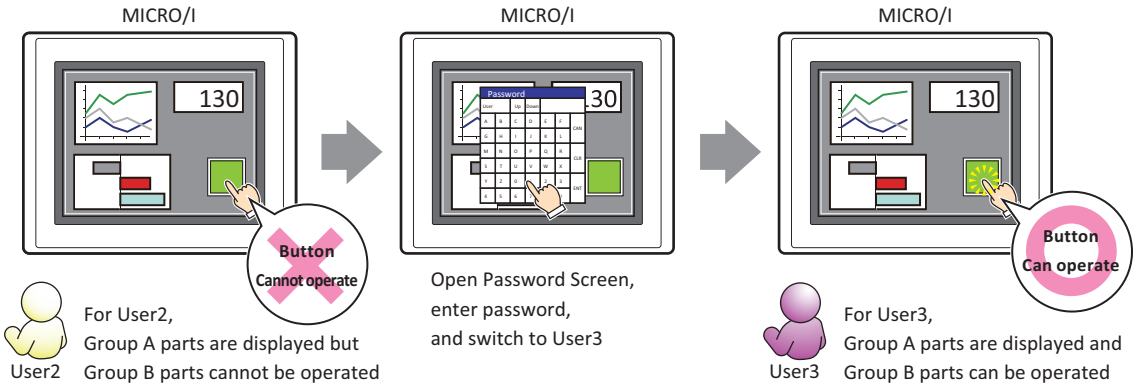
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



Since the display security group is Group A, User2 can view the buttons. But since the input security group is Group B, User2 cannot operate the buttons.
Suppose that the Password Screen is now opened and User3 logs in to the system. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

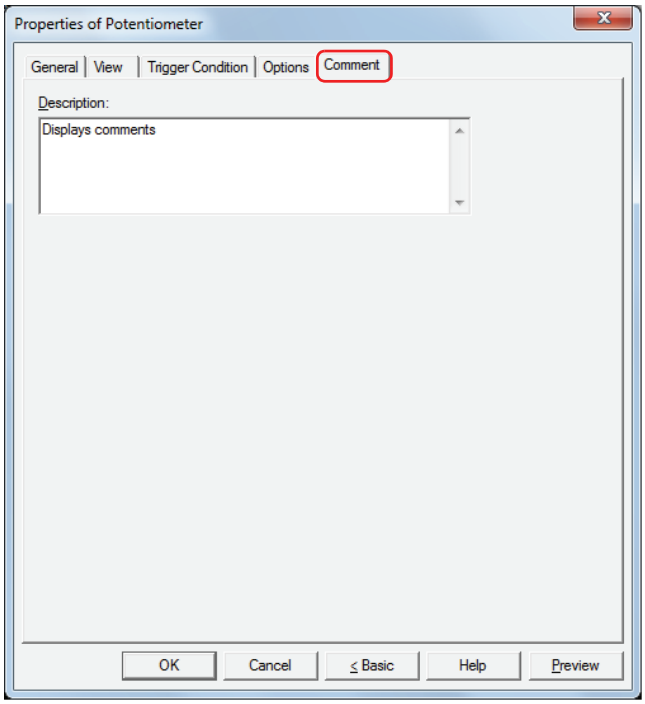
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

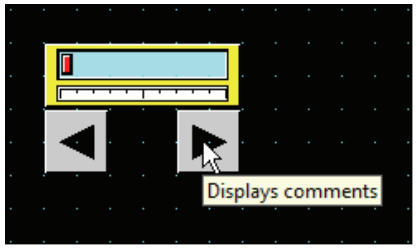
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Potentiometer on the editing screen



Chapter 9 Lamps

This chapter describes the setup for the lamp parts and related MICRO/I operations.

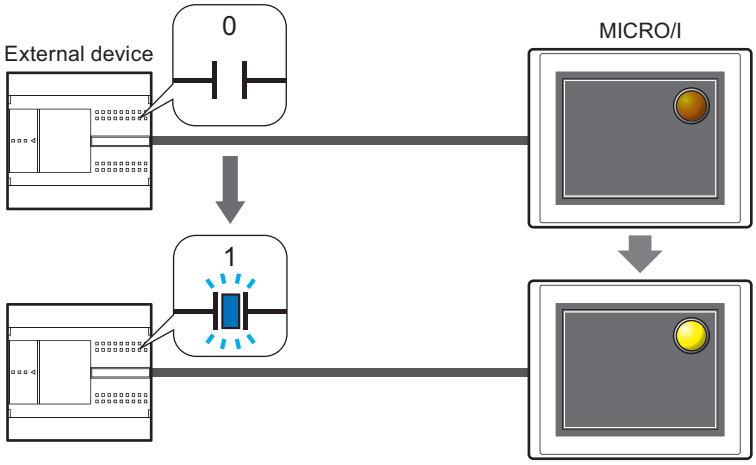
1 Pilot Lamps

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Pilot Lamp is Used

Pilot Lamp parts display drawing objects. The value of a bit device is used to switch the drawing object displayed.

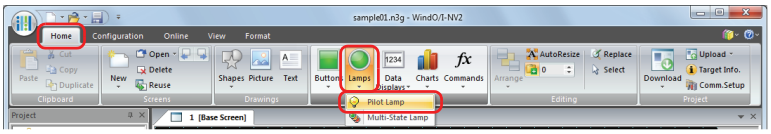
- Switch and display pictures by device values



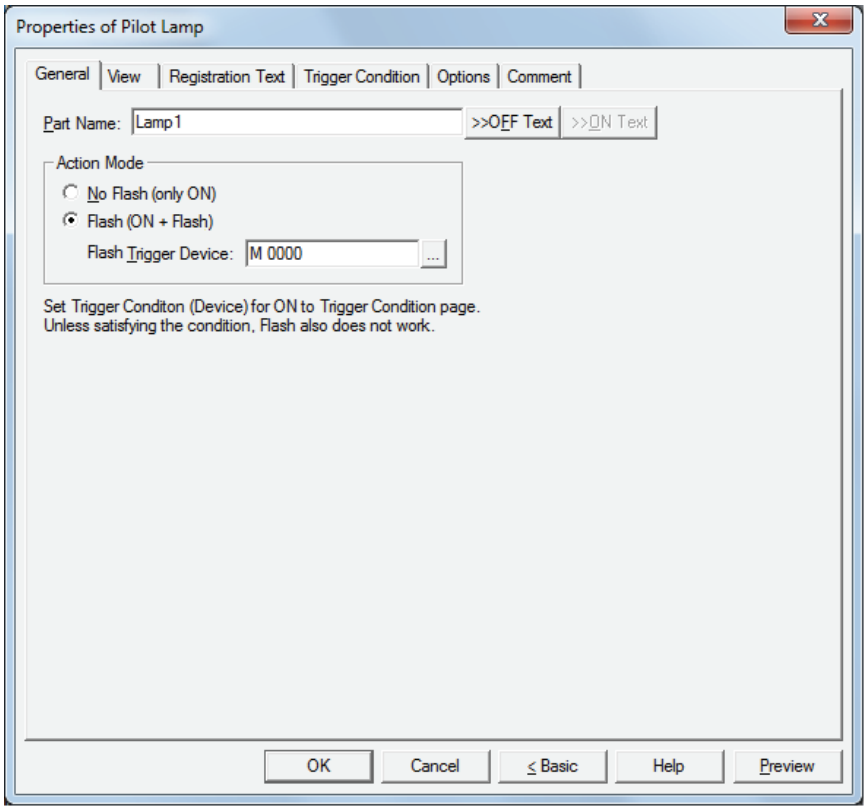
1.2 Pilot Lamp Configuration Procedure

This section describes the configuration procedure for Pilot Lamps.

1. On the **Home** tab, in the **Parts** group, click **Lamps**, and then click **Pilot Lamp**.



2. Click a point on the Edit screen where you wish to place the Pilot Lamp.
3. Double-click the dropped Pilot Lamp and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

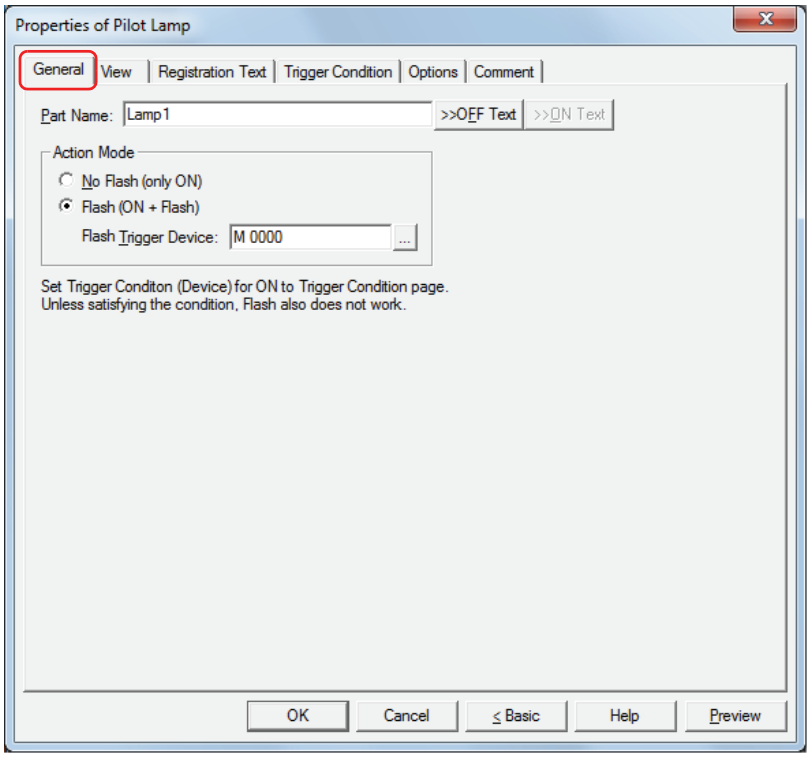


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

1.3 Properties of Pilot Lamp Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **>>OFF Text, >>ON Text**

Applies the text entered in the **Part Name** field to the **Text** field under the **OFF** or **ON** fields on the **Registration Text** tab. This is used as the Registration Text when the lamp is OFF or ON.

To specify the Registration Text to use when the button is ON, select the **Set by State** check box on the **Registration Text** tab. If left unchecked, the same Registration Text assigned for the OFF state is displayed for the ON state as well.

■ **Action Mode**

Select the action when the part is ON.

No Flash (only ON): Displays the drawing object for the ON state when the trigger condition is satisfied.

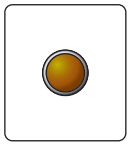
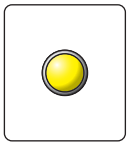
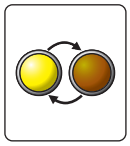
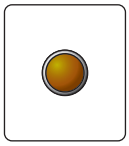
Flash (ON + Flash): When the condition is satisfied and the value of the trigger device is 1, the object flashes (alternates between the drawing object for the ON and OFF states at fixed intervals). The flashing interval can be set with the **Flashing Cycle** setting on the **System** tab of the **Project Settings** dialog box.

Flash Trigger Device: Specify the bit device to cause the lamp to flash.

The lamp flashes when the value of the device is 1. The action for **No Flash (only ON)** applies when the value is 0.

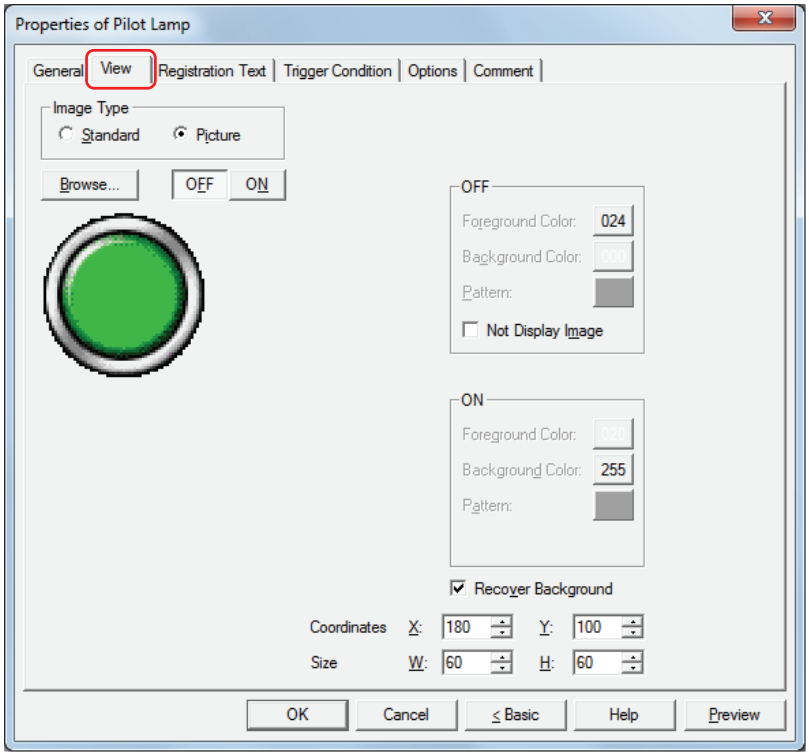
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When **Action Mode** is **Flash (ON + Flash)**, **Flash Trigger Device** is M 0, and on the **Trigger Condition** tab, **Trigger Type** is **While ON**, **Device** is LM 0

Trigger Condition: Device LM0 value	0	1	1	0
Action Mode: Value in trigger device M0	0	0	1	1
Displayed drawing object				
Action	Displays OFF drawing object	Displays ON drawing object	Flashing	Displays OFF drawing object

The lamp will neither turn on or flash if the trigger conditions are not met. Lamp trigger conditions are configured on the **Trigger Condition** tab.

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture: Uses an image file saved using Picture Manager.

For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ OFF button, ON button

Displays the graphic when ON or OFF. Clicking **ON** or **OFF** switches the image displayed on the **View** tab.

■ OFF, ON

Selects the color and pattern of the standard graphic when ON and OFF.

Foreground Color, Background Color:

Selects the foreground and background colors of the standard graphic (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the standard graphic.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ Not Display Image*1

Select this check box to display no drawing object in the OFF state.

If the **Not Display Image** check box is selected:

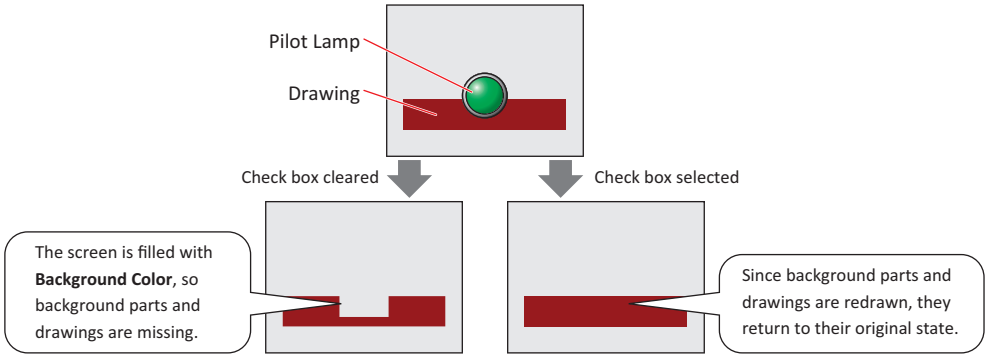
- The Recover Background function will always be enabled.
- Text set as registration text for the OFF state will be displayed.

*1 Advanced mode only

Recover Background*1

Select this check box to recover the background of the area where the picture had been displayed after the picture is switched. When this check box is cleared, the background is filled with the screen's **Background Color**.

When parts or drawings are arranged so they overlap the background of the Pilot Lamp (below), the background of parts and drawings is displayed as follows if the Pilot Lamp picture is hidden.



Can only be set when **Picture** is selected for **Image Type**.

For the HG2G-5F and the HG3G/4G, the function to recover the background is always enabled, so this item is not displayed. However, when the background part is the Alarm List Display, Alarm Log Display, bar chart, line chart, or pie chart, the missing sections will remain.

If the **Recover Background** check box is selected, the number of parts that can be placed on a single screen decreases. If an error message appears when the Picture Display is displayed on the MICRO/I screen, clear the **Recover Background** check box or reduce the number of parts.

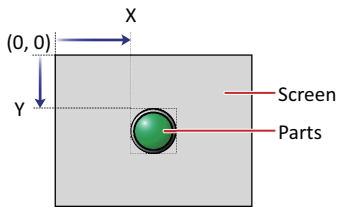
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

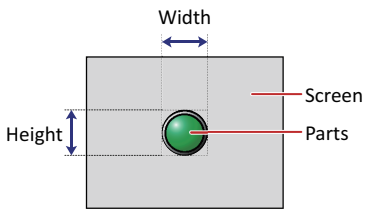


Size

W, H: Sets width and height to define the size of parts.

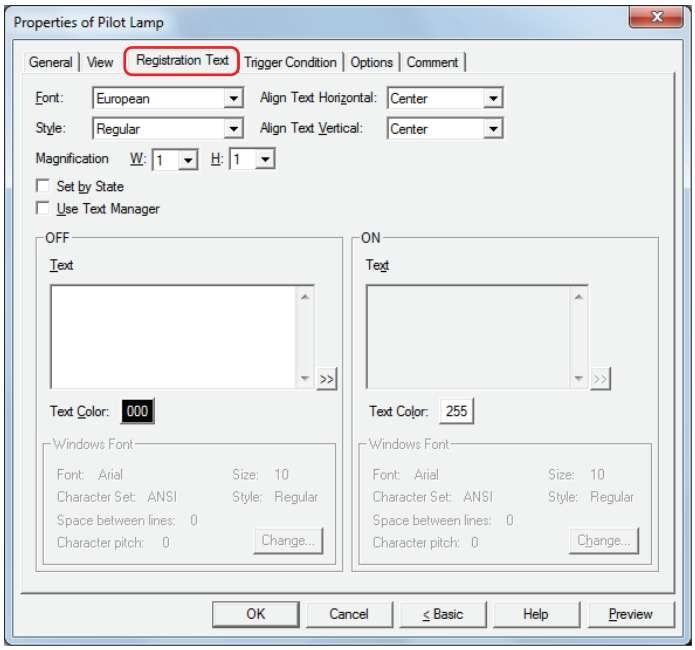
W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



*1 Advanced mode only

● Registration Text Tab



■ Font

Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ Style

Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Magnification

W, H: Selects the magnification (0.5, 1 to 8*1) for text display.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ Align Text Vertical

Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Align Text Horizontal

Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Set by State

Select this check box if displaying different text when ON and OFF.

■ Use Text Manager

Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

OFF, ON

Text: Inputs characters to be displayed on parts. The maximum number is 3,750 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

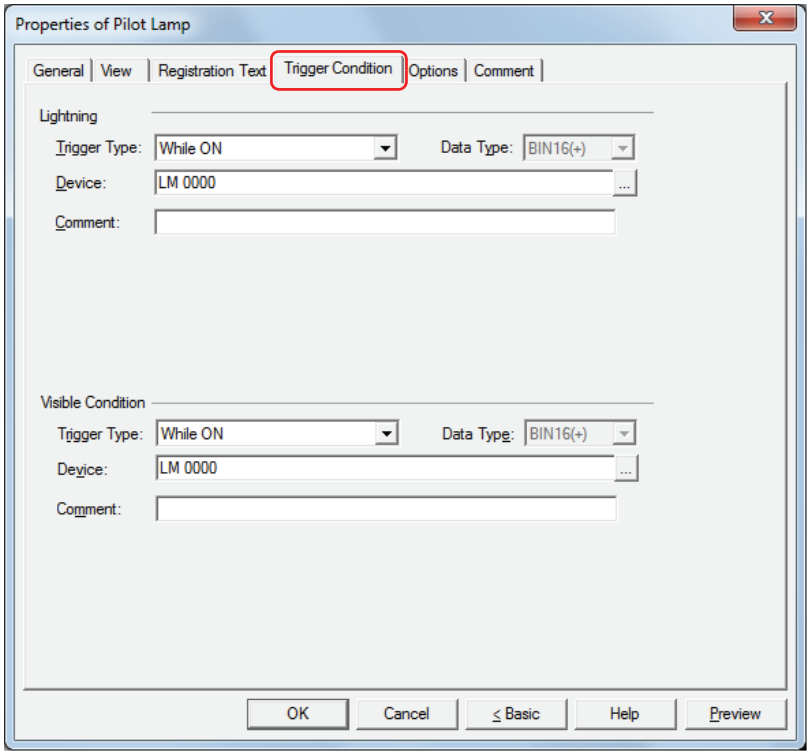
When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

Text ID: Specifies the Text Manager ID No. (1 to 32000) when using the text registered in the Text Manager.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text Color: Selects the color of the text displayed on the part (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the **Font** dialog box.
Can only be set when the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

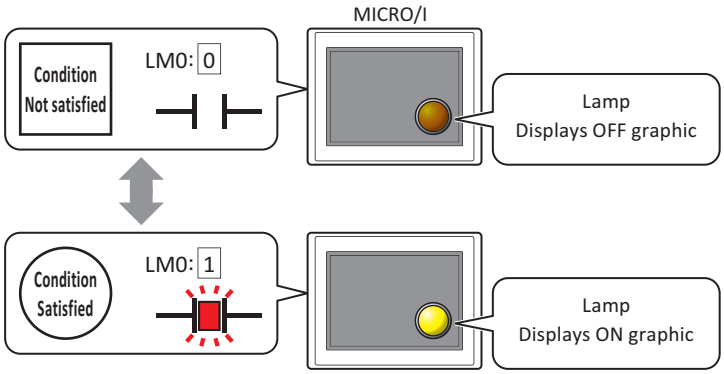
● Trigger Condition Tab



■ Lightning

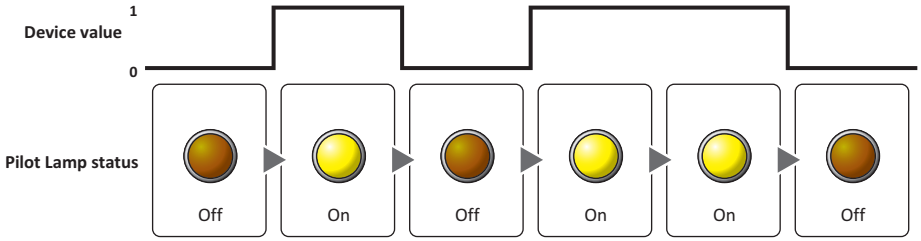
The Pilot Lamp is on while the condition is satisfied, and it is off while the condition is not satisfied. The Pilot Lamp displays the ON graphic when on and it displays the OFF graphic when off.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
When LM 0 is 0, condition is not satisfied, so Lamp displays OFF graphic.
When LM 0 is 1, condition is satisfied, so Lamp displays OFF graphic.

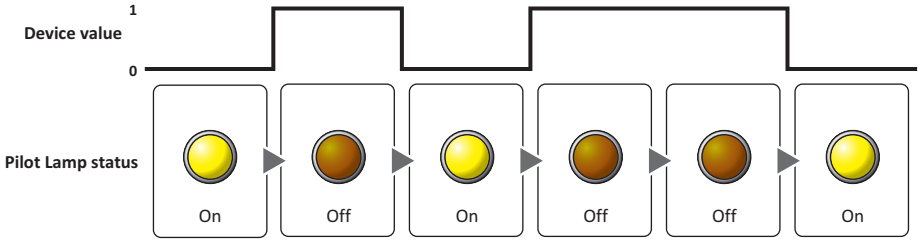


Trigger Type: Selects the condition to turn on the Pilot Lamp from the following.

While ON: Turns on the Pilot Lamp when the device value is 1.

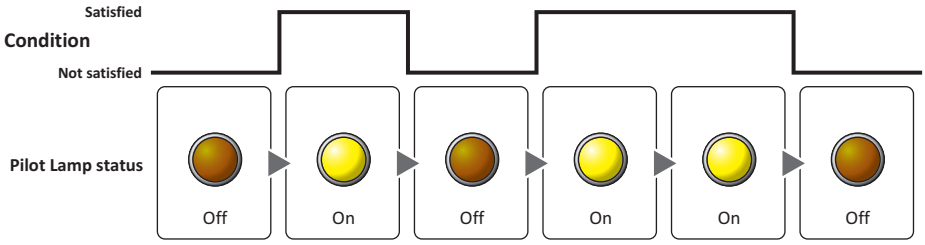


While OFF: Turns on the Pilot Lamp when the device value is 0.



While satisfying the condition:

Turns on the Pilot Lamp when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the on condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the on condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

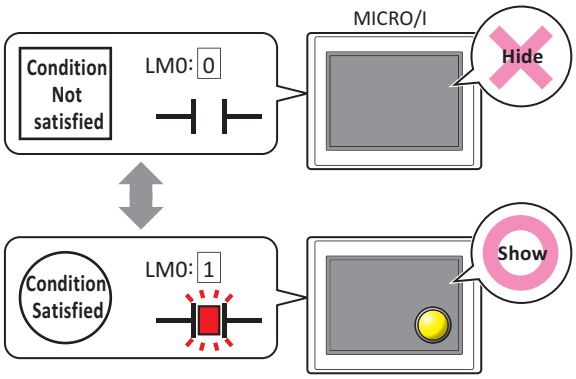
Condition: Specifies the conditional expression for the on condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the on condition. The maximum number is 80 characters.

■ Visible Condition*1

The Pilot Lamp is displayed while the condition is satisfied. The Pilot Lamp is hidden while the condition is not satisfied.

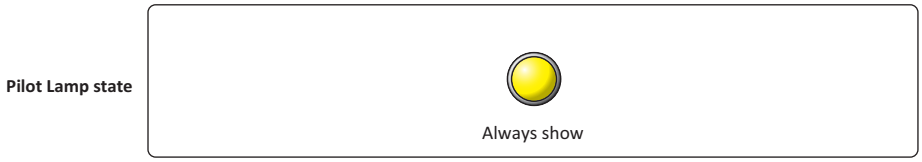
Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Pilot Lamp is hidden.
While LM 0 is 1, the condition is satisfied and the Pilot Lamp is displayed.



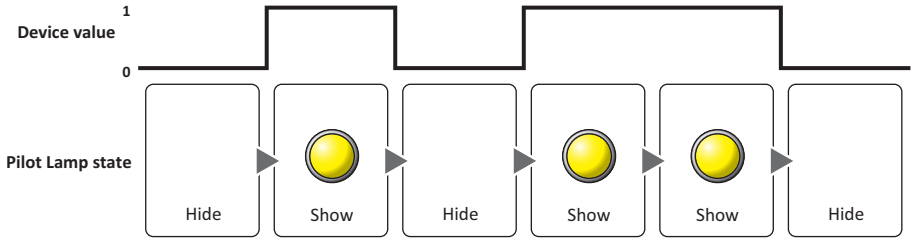
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Pilot Lamp from the following.

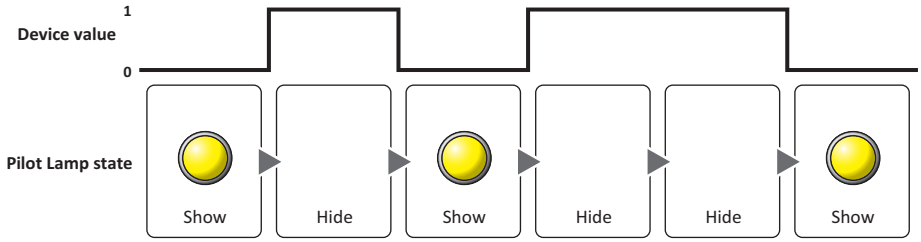
Always visible: The Pilot Lamp is always displayed.



While ON: Displays the Pilot Lamp when the device value is 1.

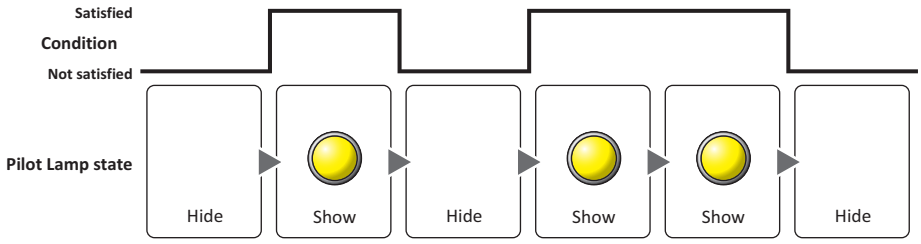


While OFF: Displays the Pilot Lamp when the device value is 0.



While satisfying the condition:

Displays the Pilot Lamp when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

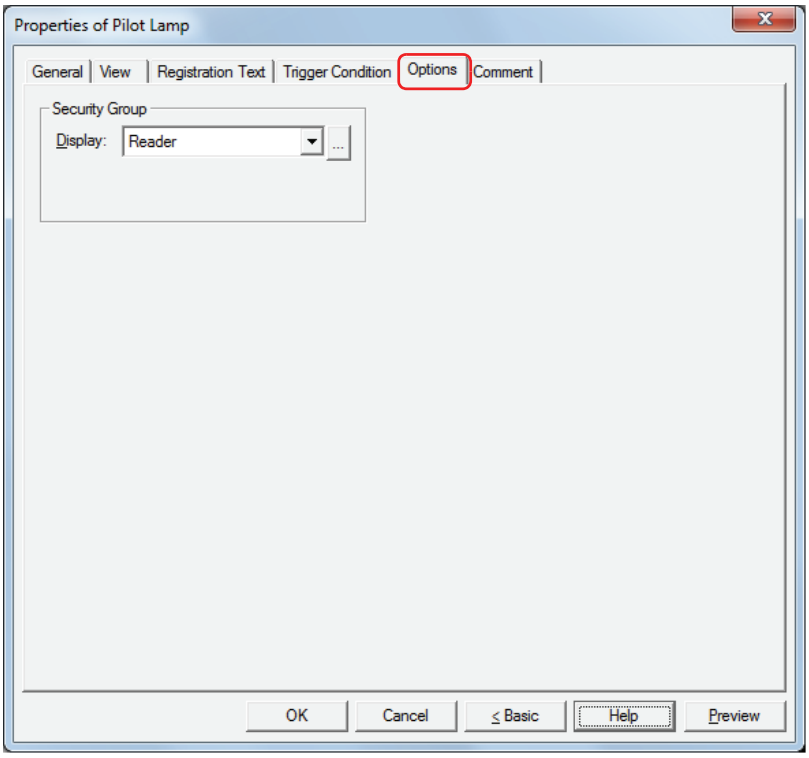
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

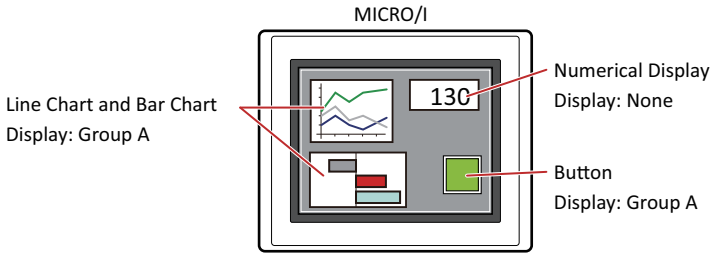
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

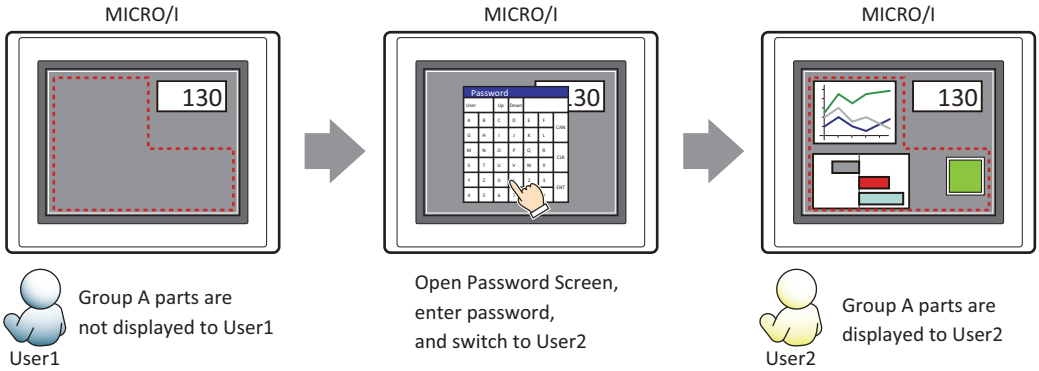
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



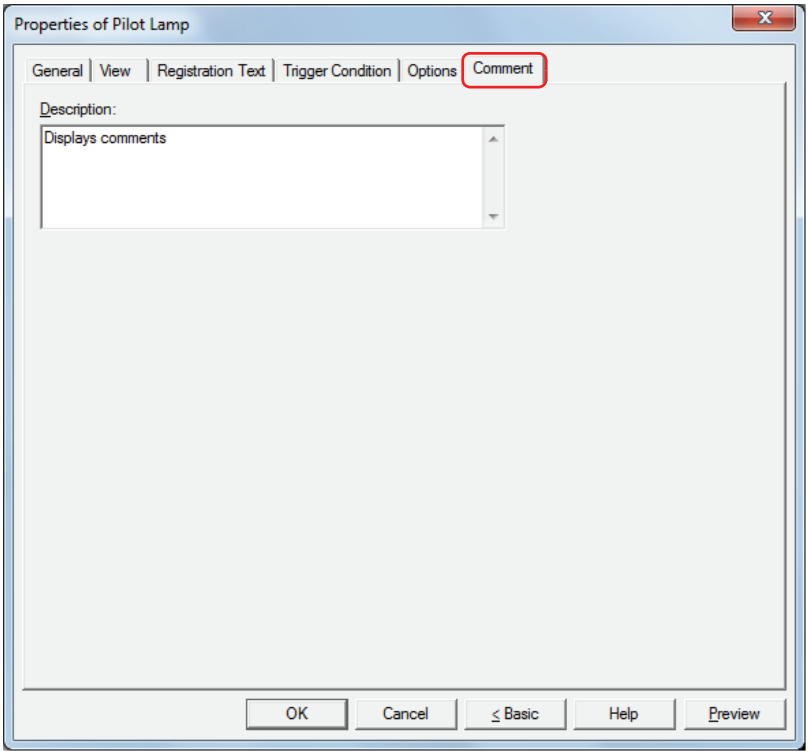
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

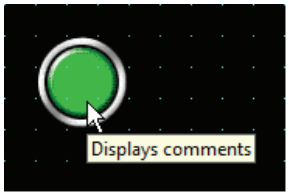
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Pilot Lamp on the editing screen



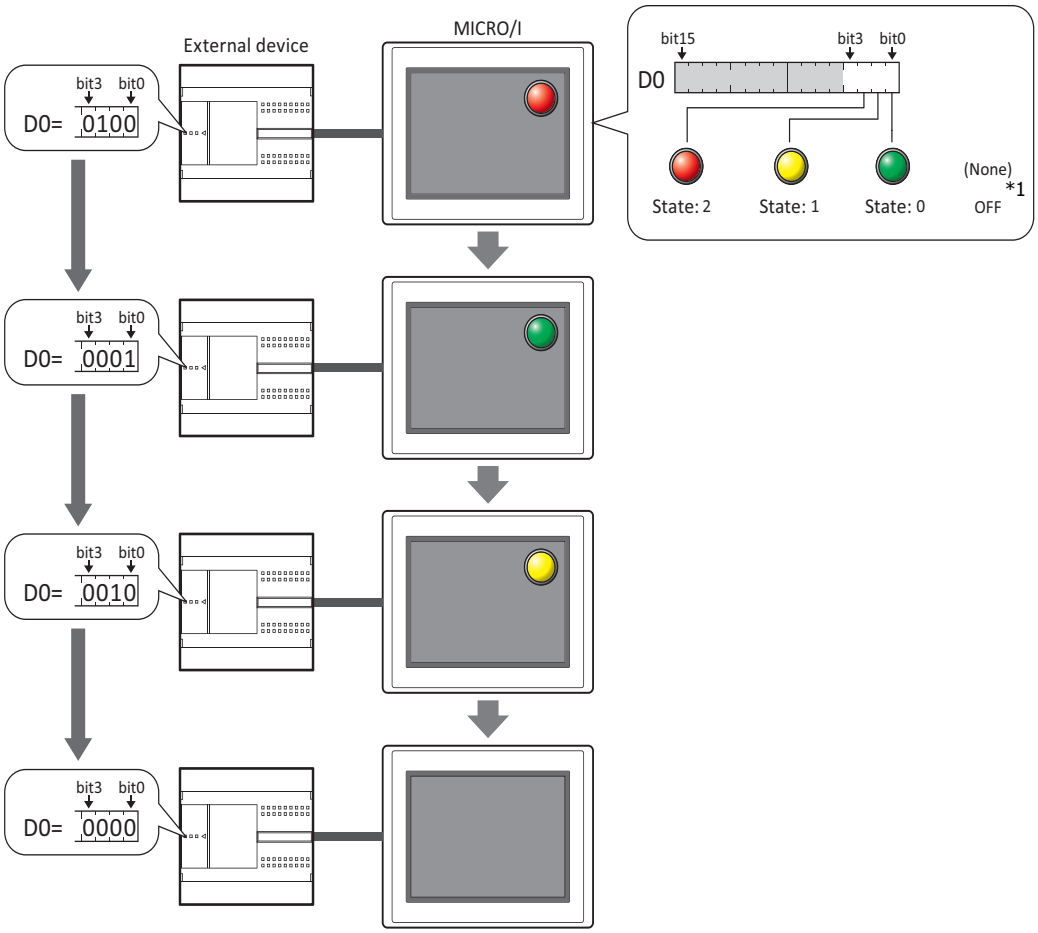
2 Multi-State Lamps

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 How the Multi-State Lamp is Used

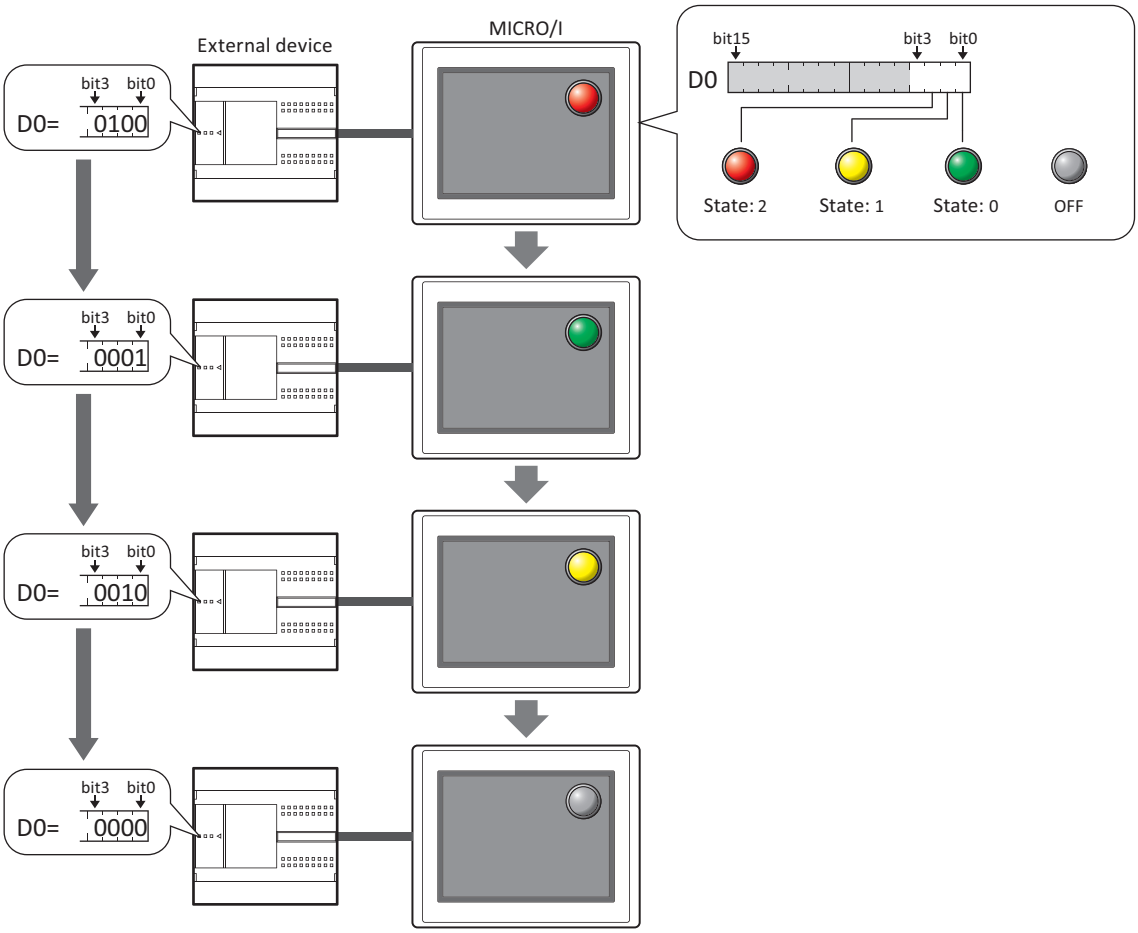
Multi-state lamp parts display drawing objects. The value of a specified word device is used to switch the drawing object to be displayed.

- Switch and display pictures by device values



*1 HG2G-S/-5S/-5F, HG3G/4G only

- Display a picture when in the OFF state.*1



The conditions to display the picture set by the OFF state*1 on the screen are as follows.

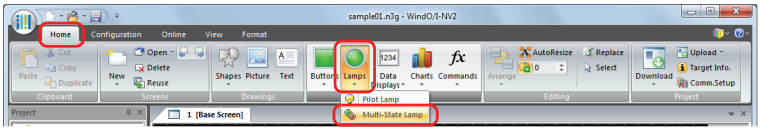
- **Y** is selected under **Flash** on the **State** tab and the trigger condition is not satisfied.
- **Switching Method** on the **General** tab is **Bit**, and the all bit are 0 or a bit not allocated a picture is 1.
- **Switching Method** on the **General** tab is **Value**, and the value of device is a number not allocated a picture.

*1 HG2G-S/-5S/-5F, HG3G/4G only

2.2 Multi-State Lamp Configuration Procedure

This section describes the configuration procedure for Multi-State Lamps.

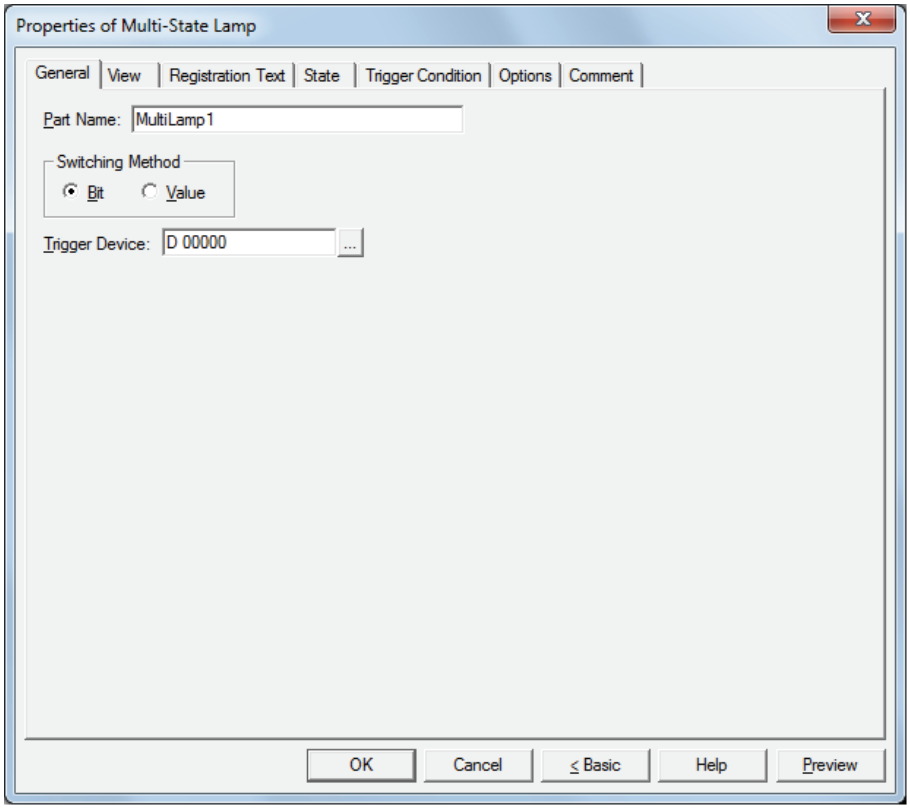
1 On the **Home** tab, in the **Parts** group, click **Lamps**, and then click **Multi-State Lamp**.



2 Click a point on the edit screen where you wish to place the Multi-State Lamp.

3 Double-click the dropped Multi-State Lamp and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

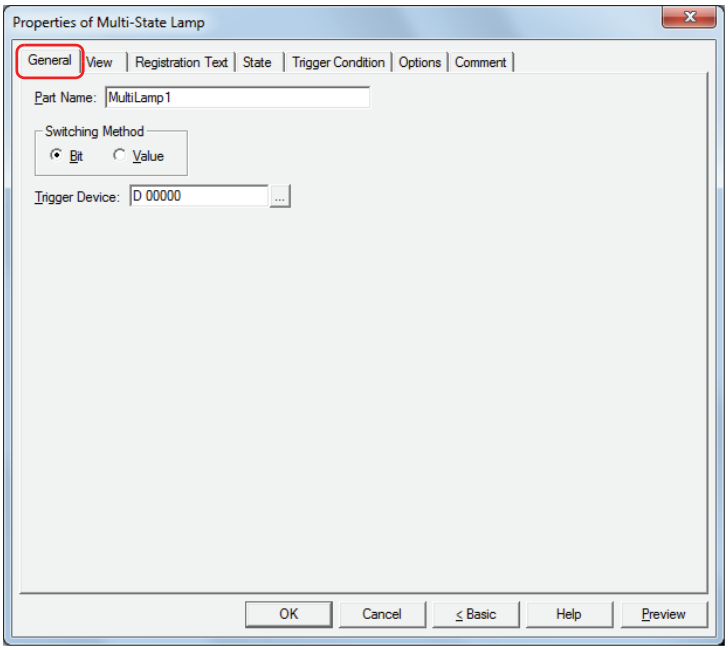


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

2.3 Properties of Multi-State Lamp Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ **Part Name**

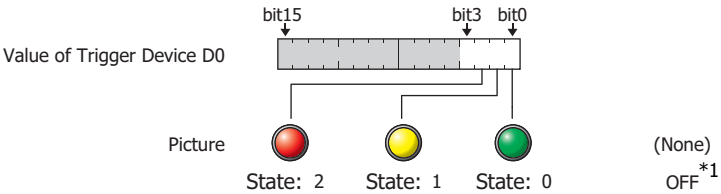
Enter a name for the part. The maximum number is 20 characters.

■ **Switching Method**

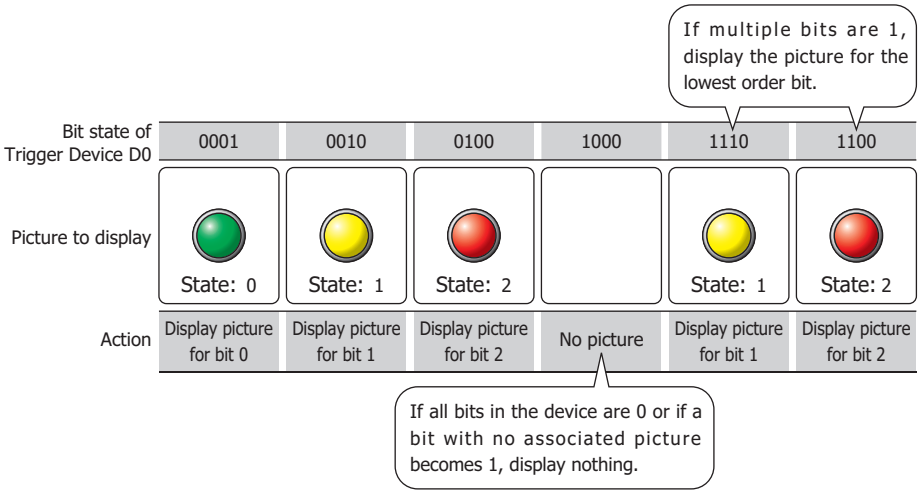
Specify the method to switch drawing objects from the following:

Bit: Switches the drawing object displayed, according to the status of the bits.

Example 1: Bit is selected. The bits triggered in device D0 corresponds to the following pictures and the OFF state*1 is **None**.

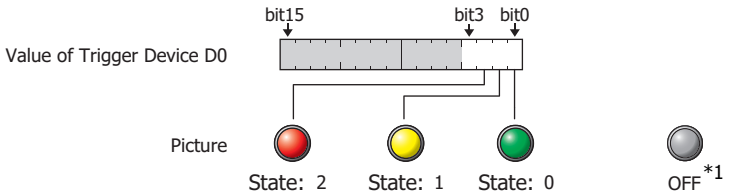


Switches the picture to display according to the status of the bits.

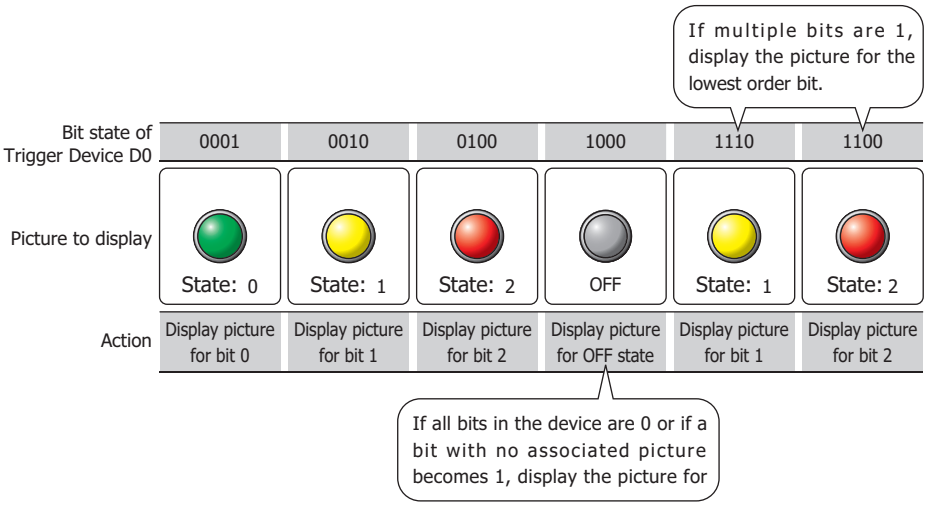


*1 HG2G-S/-5S/-5F, HG3G/4G only

Example 2: Bit is selected. The bits of trigger device D0 and the OFF state are allocated to the following pictures.*1

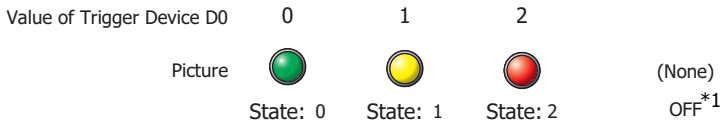


Switches the picture to display according to the status of the bits.

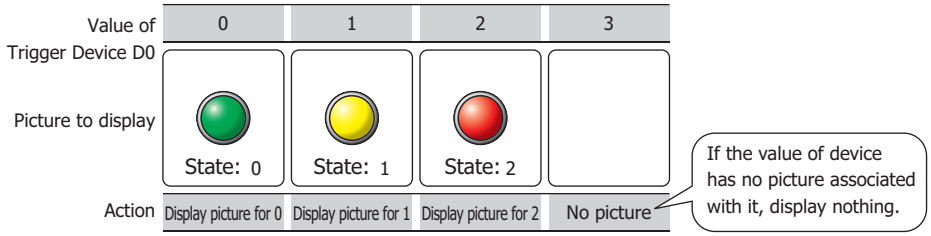


Value: Switches the drawing object displayed, according to the value of the device.

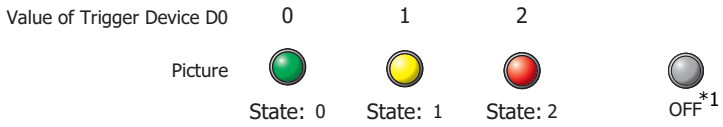
Example 3: Value is selected. The value assigned to the trigger device D0 are allocated to the following pictures and the OFF state*1 is **None**.



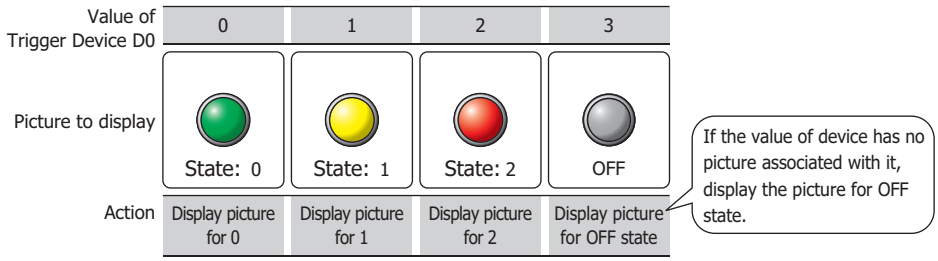
Switches the picture to display according to the value of the device.



Example 4: Value is selected. The values assigned in trigger device D0 and the OFF state are allocated to the following pictures.*1



Switches the picture to display according to the value of the device.



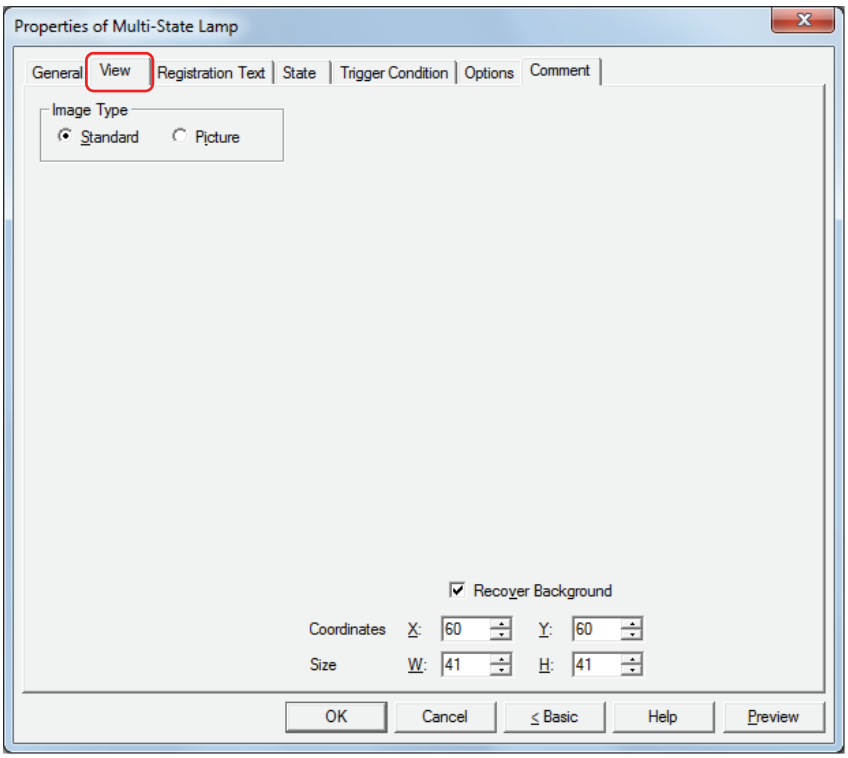
*1 HG2G-S/-5S/-5F, HG3G/4G only

■ **Trigger Device**

Specifies the word device to use as the condition for switching the drawing object.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

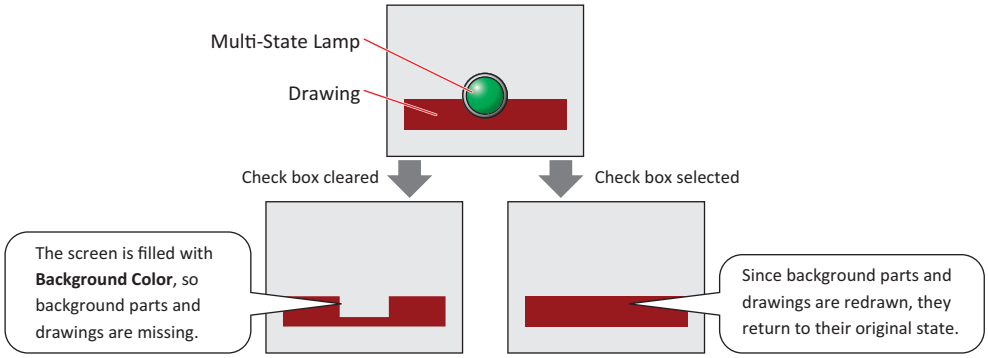
Standard: Uses the default graphic for WindO/I-NV2.

Picture: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ Recover Background*1

Select this check box to recover the background of the area where the picture had been displayed after the picture is switched. When this check box is cleared, the background is filled with the screen's **Background Color**.

When parts or drawings are arranged so they overlap the background of the Multi-State Lamp (below), the background of parts and drawings is displayed as follows if the Multi-State Lamp picture is hidden.



Can only be set when **Picture** is selected for **Image Type**.

For the HG2G-5F and the HG3G/4G, the function to recover the background is always enabled, so this item is not displayed. However, when the background part is the Alarm List Display, Alarm Log Display, bar chart, line chart, or pie chart, the missing sections will remain.

> If the **Recover Background** check box is selected, the number of parts that can be placed on a single screen decreases. If an error message appears when the Multi-State Lamp is displayed on the MICRO/I screen, clear the **Recover Background** check box or reduce the number of parts.

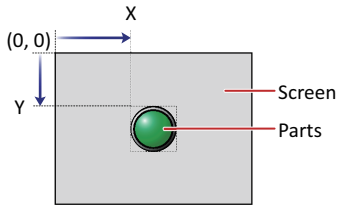
*1 Advanced mode only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

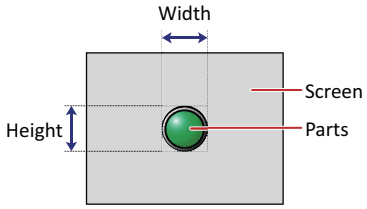


Size

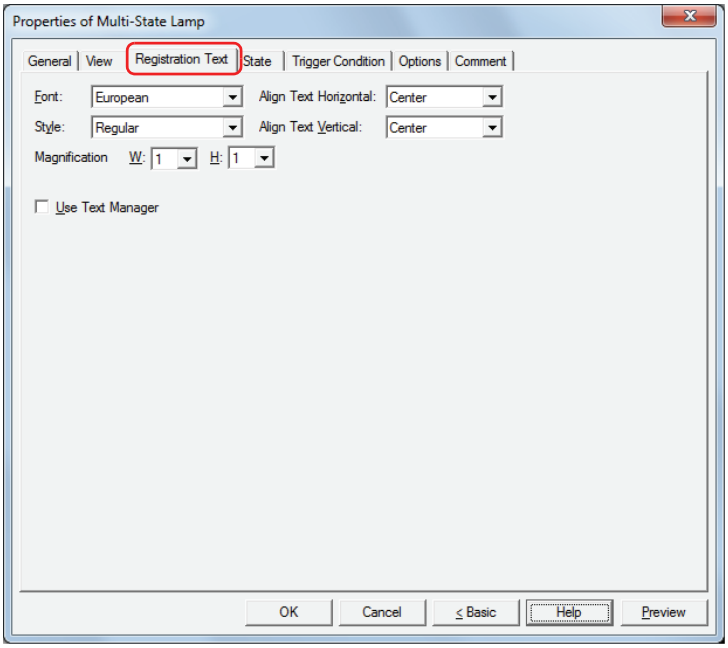
W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● Registration Text Tab



■ **Font**
Selects the font used for displaying text from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**, **Stroke**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**
Sets the character size (8 to 128).
Can only be set when **Stroke** is selected.

■ **Style**
Selects **Regular** or **Bold** for text style.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ **Magnification**
W, H: Selects the magnification (0.5, 1 to 8[*1]) for text display.
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic** or **Cyrillic**.

■ **Align Text Vertical**
Selects text alignment in the vertical direction.
Top, **Center**, **Bottom**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Align Text Horizontal**
Selects text alignment in the horizontal direction.
Left, **Center**, **Right**, **Center-Left**
For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Set by State**
Select this check box if displaying different text when ON and OFF.

■ **Use Text Manager**
Select this check box if using the text registered in Text Manager for text display.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

● **State** Tab

■ Number of States

Specify the number of drawing objects (1 to 16) to display by switching.

■ Settings

Lists the state settings. The list shows various settings such as the state number and file name for the drawing object.

State: Shows the OFF state*1 and state number. Double clicking the cell displays the **State Settings** dialog box where you can edit the state settings. For details, refer to "State Settings dialog box" on page 9-26.

Image: Shows the name or a file name for a drawing object. Double clicking the cell opens the View Browser if **Standard** is selected under Image Type on the **View** tab, or Picture Manager if **Picture** is selected. This allows you to change the drawing object to display.

Text: Shows the registration text. Double clicking the cell displays the **Unicode Input** dialog box. If you selected the **Use Text Manager** check box on the **Registration Text** tab, the **Text Manager** dialog box will appear. This allows you to change the registration text.

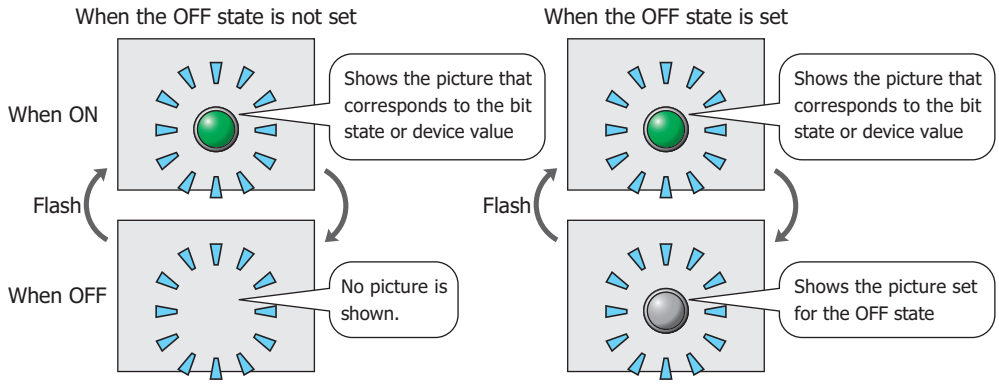
Fg.Color, Bg.Color: Shows the foreground and background colors (color: 256 colors, monochrome: 16 shades) for standard images. Double clicking the cell opens the Color Palette where you can change the foreground and background colors. This setting can only be changed if Image Type is set to **Standard** on the **View** tab.

Pattern: Shows the pattern for standard images. Double clicking the cell opens the Pattern Palette where you can change the pattern of the image. This setting can only be changed if Image Type is set to **Standard** on the **View** tab.

Text Color: Shows the color of the registration text. Double clicking the cell opens the Color Palette where you can change the color of the text.

Flash: Indicates whether to display the drawing object flashing or constantly lit. Double clicking the cell toggles between **Y** for yes and **N** for no. If **Y** is selected, the picture which corresponds to a bit state or value of device is alternately shown and hidden at a fixed time interval.

However, if the OFF state*1 is set, the picture that corresponds to a bit state or value of device and the picture set for the OFF state*1 are alternately displayed at a fixed time interval.



Windows Font: Shows the currently set Windows Font. Double clicking the cell displays the **Font Settings** dialog box where you can change the Windows Font. This setting can only be changed when **Windows** is selected for **Font** on the **Registration Text** tab.

Set: Registers the state settings to the list. If you select the OFF state*1 or state number that is already registered, that number is overwritten with the new settings.
Click this button to display the **State Settings** dialog box. For details, refer to "State Settings dialog box" on page 9-26.

Insert: Inserts the settings in the position selected on the list.
Select a state number in the list and click this button to display the **State Settings** dialog box. The settings at the insertion point shift down one line. Settings cannot be inserted if all state numbers are configured.

Remove: Deletes the registered settings from the list.
Select the OFF state*1 or state number and click this button to delete the selected settings from the list.

*1 HG2G-S/-5S/-5F, HG3G/4G only

■ **Image**

Shows the image for the OFF state[*1] or state number selected in the **Settings** list.

■ **Copy to next State**

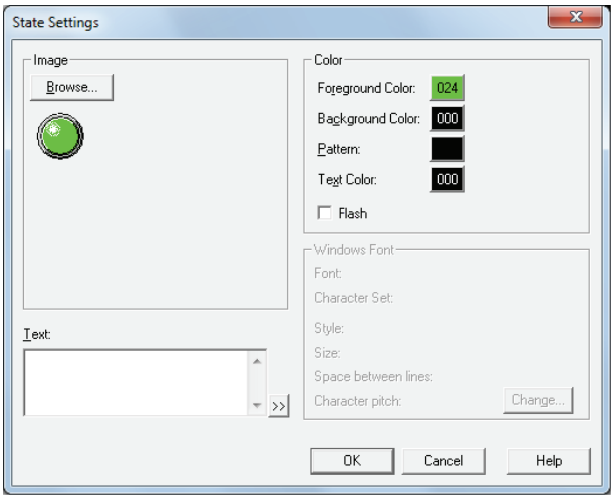
Select this check box to register or change all state settings at once.

This option copies the current settings to all state numbers after the selected state number when the settings are set or changed. This option can only be set when a state number is selected.

*1 HG2G-S/-5S/-5F, HG3G/4G only

State Settings dialog box

This dialog box sets the drawing object and registration text to display.



■ **Image**

Browse: Select the drawing object to use for the lamp part. Clicking this button opens the View Browser if **Standard** is selected under Image Type on the **View** tab, or Picture Manager if **Picture** is selected.

Image: Shows the selected drawing object.

■ **Text**

Enter the text to display. The maximum number is 3,750 characters.
The characters that can be entered depends on the font selected for **Font** on the **Registration Text** tab. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
This setting is only enabled when the **Use Text Manager** check box is cleared on the **Registration Text** tab.

■ **Text ID**

To use the text registered in the Text Manager, specify the ID number from 1 to 32000.
This setting is only enabled when the **Use Text Manager** check box is selected on the **Registration Text** tab.

■ **Color**

Foreground Color, Background Color:

Select the foreground and background color to use for standard images (color: 256 colors, monochrome: 16 shades).
Clicking either button opens the Color Palette. Select a color from the Color Palette.

Pattern: Select the pattern for a standard image.
Clicking this button opens the Pattern Palette. Select a pattern from the Pattern Palette.

Text Color: Select the text color (color: 256 colors, monochrome: 16 shades) for the registration text.
Clicking this button opens the Color Palette. Select a color from the Color Palette.

Flash: Select this check box to make the picture flash (alternately show and hide the picture that corresponds to the bit state or device value at a fixed time interval).
The flashing interval can be set with the **Flashing Cycle** setting on the **System** tab of the **Project Settings** dialog box. This option cannot be set for the OFF state*1.

■ **Windows Font**

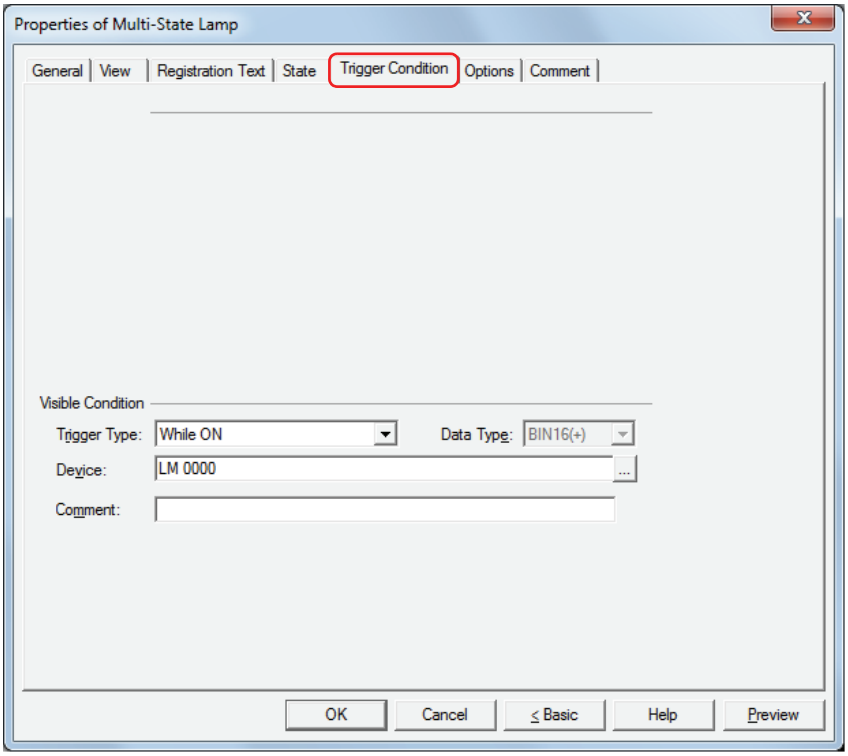
Specify the Windows Font to use.
The current settings are displayed by selecting **Windows** in the **Font** property on the **Registration Text** tab. To change the settings, click **Change** to display the **Font Settings** dialog box.
The text ID setting is only enabled if the **Use Text Manager** check box is cleared.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

*1 HG2G-S/-5S/-5F, HG3G/4G only

● Trigger Condition Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

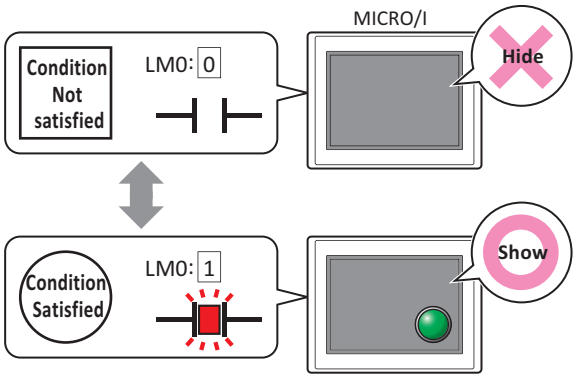
The **Trigger Condition** tab is displayed in Advanced mode.



■ Visible Condition

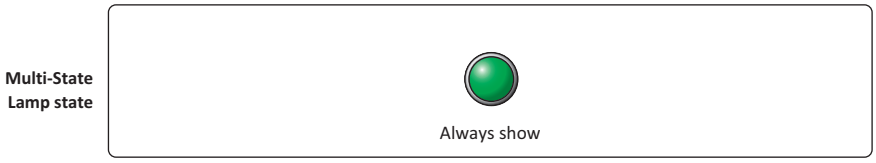
The Multi-State Lamp is displayed while the condition is satisfied. The Multi-State Lamp is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Multi-State Lamp is hidden.
While LM 0 is 1, the condition is satisfied and the Multi-State Lamp is displayed.

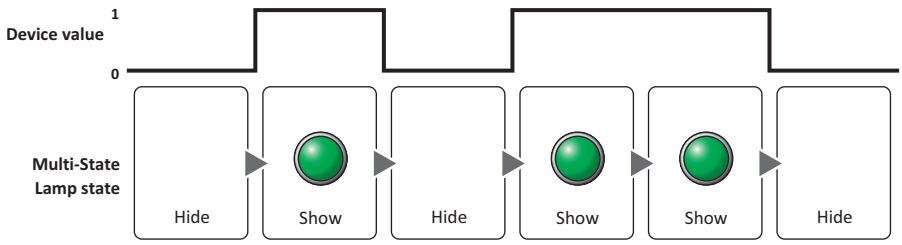


Trigger Type: Selects the condition to display the Multi-State Lamp from the following.

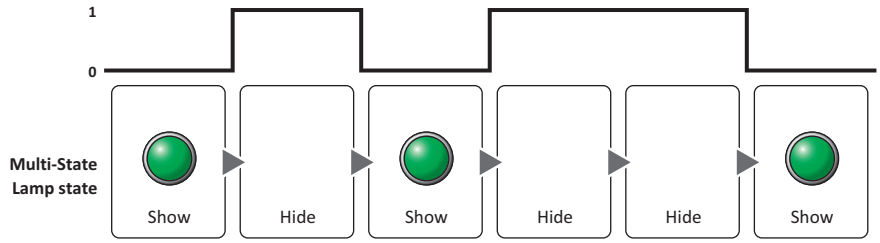
Always visible: The Multi-State Lamp is always displayed.



While ON: Displays the Multi-State Lamp when the device value is 1.

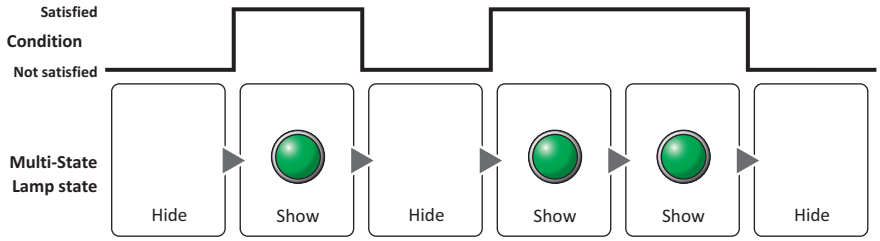


While OFF: Displays the Multi-State Lamp when the device value is 0.



While satisfying the condition:

Displays the Multi-State Lamp when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

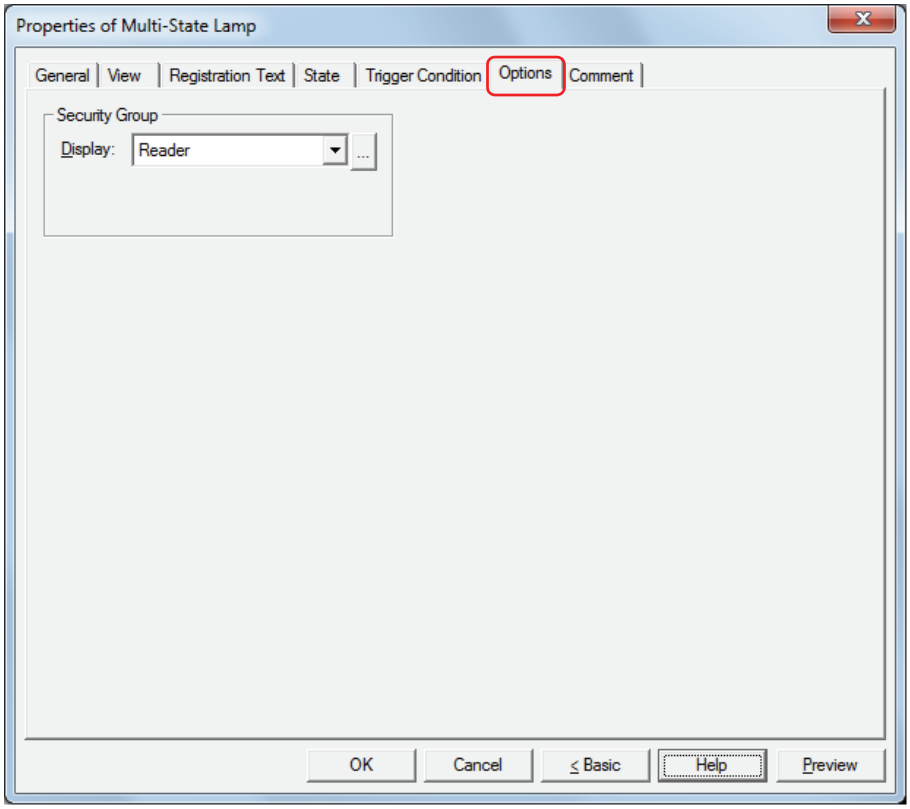
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

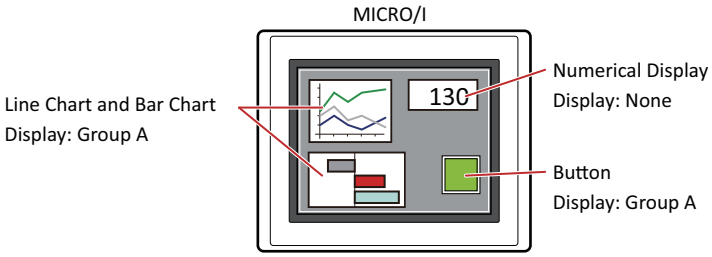
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

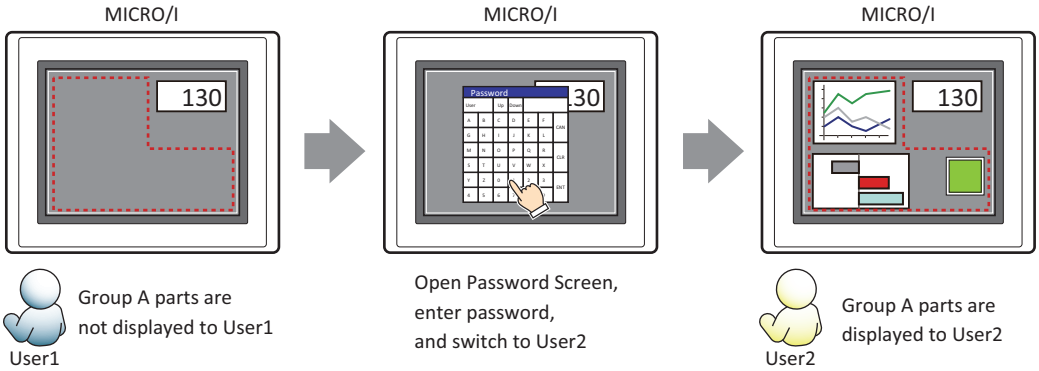
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



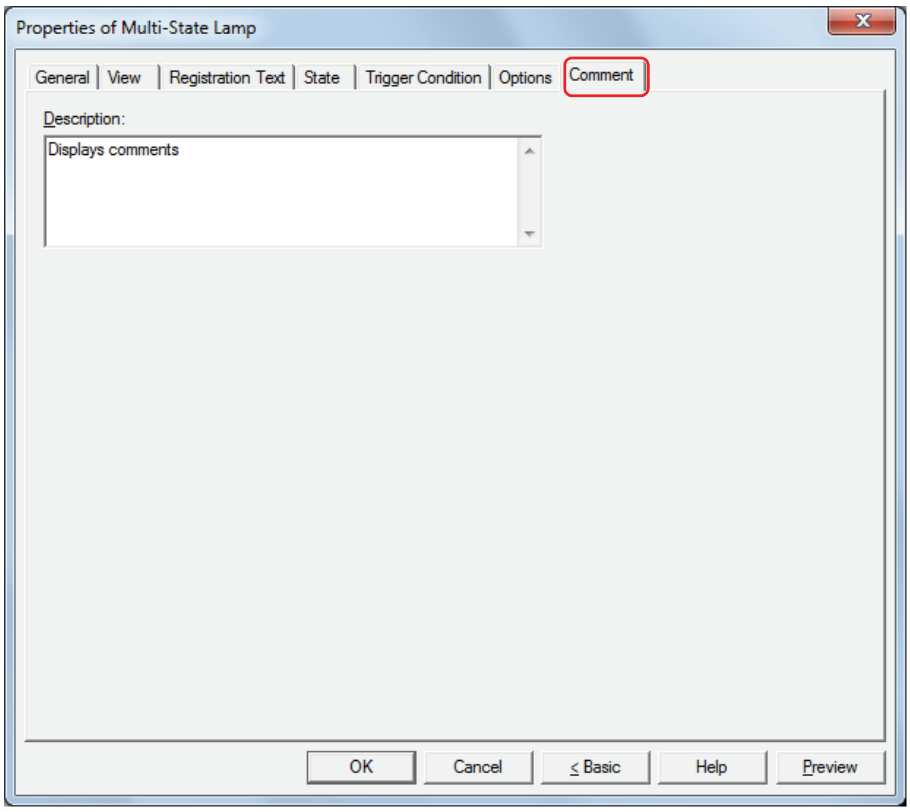
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Multi-State Lamp on the editing screen

Chapter 10 Data Displays

This chapter describes how to configure the Data Display parts and their operation on the MICRO/I.

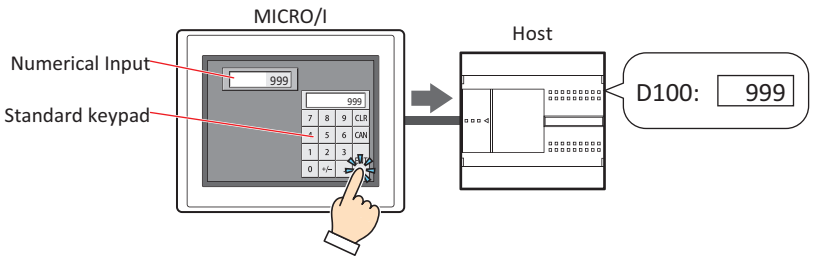
1 Numerical Input

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

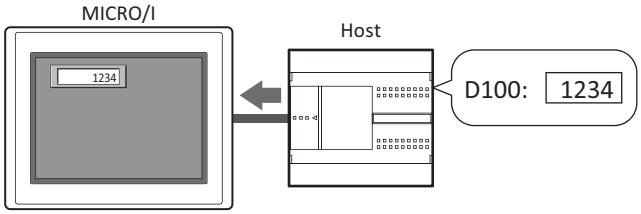
1.1 How the Numerical Input is Used

The Numerical Input features a display mode that displays the current value of a device and an entry mode that enters a value using the keypad or key buttons and writes that value to a device. When the part is displayed on the screen, the Numerical Input is in display mode. To enter a value by pressing the keypad or key buttons, touch the Numerical Input to switch it to entry mode. In entry mode, the value of device is displayed until a value is entered.
The Numerical Input can perform the following functions.

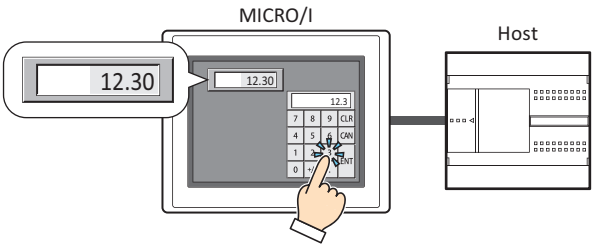
- Write a value entered with the keypad or key buttons to a device



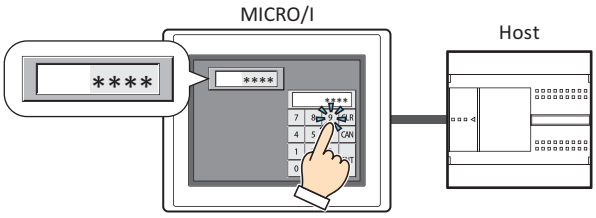
- Display the current value of a device



- Enter and display decimal numbers



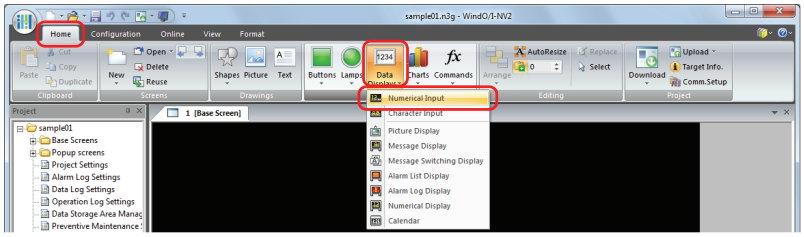
- Display the entered value as * (asterisk)



1.2 Numerical Input Configuration Procedure

This section describes the configuration procedure for Numerical Inputs.

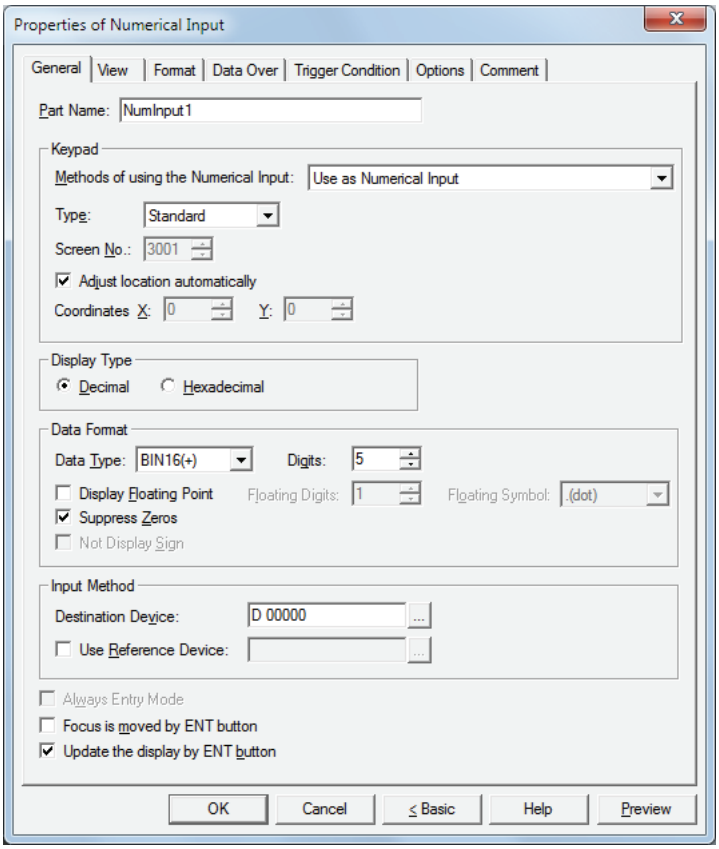
1 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Numerical Input**.



2 Click a point on the edit screen where you wish to place the Numerical Input.

3 Double-click the dropped Numerical Input and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

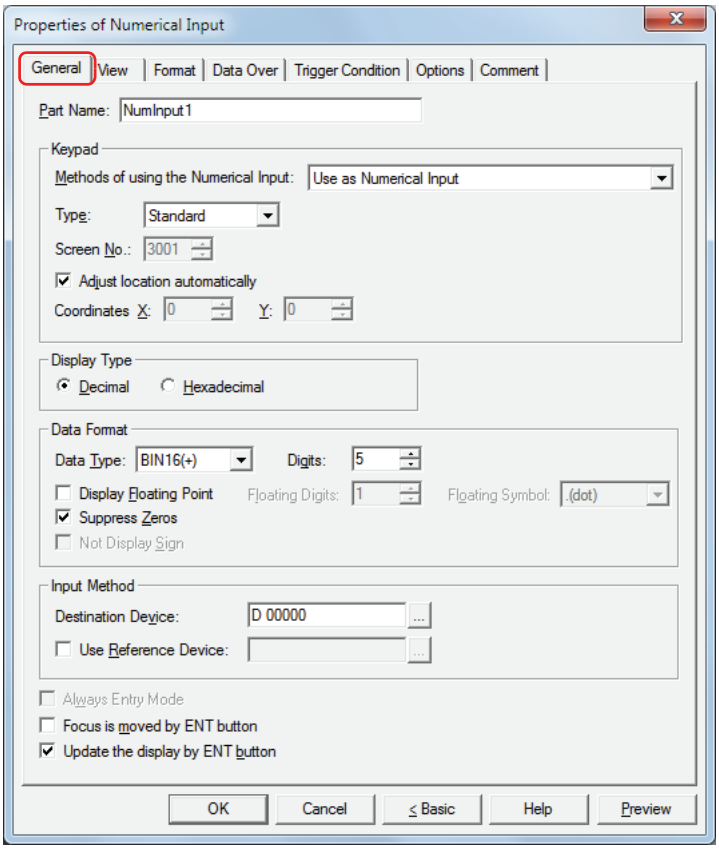


The **Data Over** tab, **Trigger Condition** tab and **Options** tab only appear in Advanced mode. To switch to Advanced mode, click **Advanced**.

1.3 Properties of Numerical Input Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Methods of using the Numerical Input*1

Selects how to use the Numerical Input:

Use as Numerical Input:	Uses the Numerical Input to enter or display values.
Use as Display for Keypad:	Uses the Numerical Input as a part to display the value entered with a Keypad.
Display the Minimum value specified with Data Over:	Uses the Numerical Input as a part to display the minimum value of a Numerical Input switched to input mode.
Display the Maximum value specified with Data Over:	Uses the Numerical Input as a part to display the maximum value of a Numerical Input switched to input mode.

*1 HG2G-S/-5S/-5F, HG3G/4G only

Keypad

Configures the keypad for entering values in the Numerical Input.

Use as Display for Keypad*2*3: Select this check box to only use the Numerical Input as a part to display the value entered with the keypad.

Type: According to the location where the keypad is configured, selects the type from the following.

- Standard: Uses the standard keypad. The standard keypad is the keypad configured as the popup screen for the standard keypad (screen number 3000 to 3015).
  This is the keypad for the type configured by **Display Type**.
- Popup: Uses a keypad configured as a popup screen.
- Current Screen: Uses the keypad configured on the same screen as the Numerical Input.

Screen No.: Specifies the screen number of the popup screen configured as the keypad (1 to 3015).
This option can only be configured if **Popup** is selected for **Type**.

Adjust location automatically: Select this check box to display the popup screen configured as the keypad in a location where it will not overlap the Numerical Input.
This option can only be configured if **Standard** or **Popup** is selected for **Type**.

Coordinates X, Y: Specifies the display location of the popup screen configured as the keypad.
With the upper-left corner of the screen as the origin, the X and Y coordinates are the upper-left corner of the popup screen.
This option can only be configured when **Standard** or **Popup** is selected for **Type** and the **Adjust location automatically** check box is cleared.

- HG2G-S/-5S/-5F, HG3G/4G, HG1F: Specify the coordinates in 1 dot units.
  X: 0 to (base screen horizontal size - 1)
  Y: 0 to (base screen vertical size - 1)
- HG2F/2S/3F/4F: Specify the coordinates in 20 dot units.
  X: 0 to (base screen horizontal size - 20)
  Y: 0 to (base screen vertical size - 20)

Display Type

Selects the display type for the value as **Decimal** or **Hexadecimal**.

Data Format

Data Type: Selects the type of data for the value.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Digits: Specifies the digits to display. The range of digits that can be set varies based on the display type and data type. The digits that can be set are as follows.

Display Type	Data Type	Digits
Decimal display	BIN16 (+), BIN16 (+/-)	1 to 5
	BIN32 (+), BIN32 (+/-)	1 to 10
	BCD4	1 to 4
	BCD8	1 to 8
	float32	1 to 10
Hexadecimal display	BIN16 (+)	1 to 4
	BIN32 (+)	1 to 8

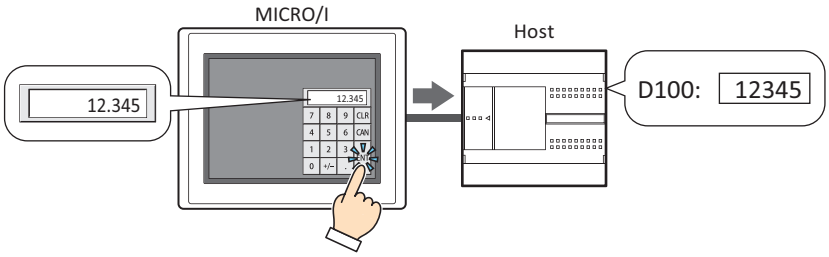
*2 Advanced mode only
*3 HG1F/2F/2S/3F/4F only

Display Floating Point: Select this check box to display the decimal point.

If **Data Type** is **BIN16(+)**, **BIN16(+/-)**, **BIN32(+)**, **BIN32(+/-)**, **BCD4**, or **BCD8** and the **Display Floating Point** check box is selected, a decimal value will be displayed on the Numerical Input when a decimal value is entered on the keypad in entry mode, but an integer is written to the device. In display mode, source data is an integer, but the value is displayed with a decimal point added at the number of floating digits configured for the Numerical Input.

However, if **float32** is selected for **Data Type**, both the destination data and the source data are decimal values.

Example: When **Display Type** is configured as **Decimal, Data Type** is **BIN16(+)**, the **Display Floating Point** check box is selected, **Digits** is 5, **Floating Digits** is 3, and **Destination Device** is D 100



Floating Digits: Specifies the number of digits for the fractional part of the decimal value out of the number of digits specified by **Digits**.

This option can only be configured when the Display Floating Point check box is selected. The range of digits that can be set for the fractional part varies based on the display type and data type. The range of digits that can be set for the fractional part is as follows.

Display Type	Data Type	Floating Digits
Decimal display	BIN16 (+), BIN16 (+/-)	1 to Digits
	BIN32 (+), BIN32 (+/-)	1 to Digits
	BCD4	1 to Digits
	BCD8	1 to Digits
	float32	1 to 8
Hexadecimal display	BIN16 (+)	--
	BIN32 (+)	--

Floating Symbol*2: Selects the decimal point symbol from the following.

.(dot), **:(colon)**, **;(semicolon)**, **,(comma)**, **/(slash)**

This option can only be configured when the **Display Floating Point** check box is selected.

Example: When **Digits** is 4 and **Floating Digits** is 2

When **Floating Symbol** is **.(dot)** 12.34

When **Floating Symbol** is **/(slash)** 12/34

Floating Symbol is not reflected on the standard keypad. To change the decimal point symbol on the standard keypad, please change the keypad button.

Suppress Zeros: Select this check box to hide "0" for the upper digits of the integer part.

Example: **Suppress Zeros** selected: 1234

Suppress Zeros cleared: 00001234

Not Display Sign: Select this check box to hide the - (negative) symbol when displaying negative values.

This option can only be configured when **Data Type** is **BCD4**, **BCD8**, or **float32**.

*2 Advanced mode only

Input Method

These options specify the destination for entered values.

Destination Device: Specifies the word device to write the entered value to.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*2: Select this check box and specify a device to change the destination word device by the value of this device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

For details on indirect writing, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

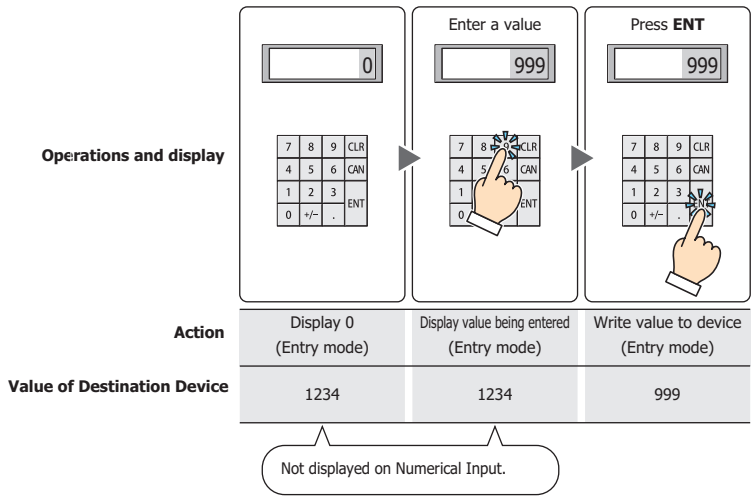
Always Entry Mode*2

Select this check box to enter values by pressing the keypad and key buttons without touching the Numerical Input displayed on the screen.

To display 0 on the Numerical Input until a value is entered, select the **Start from 0 in Always Entry Mode of Numerical Input** check box on the **System** tab in the **Project Settings** dialog box. To display the value of device, clear the **Start from 0 in Always Entry Mode of Numerical Input** check box.

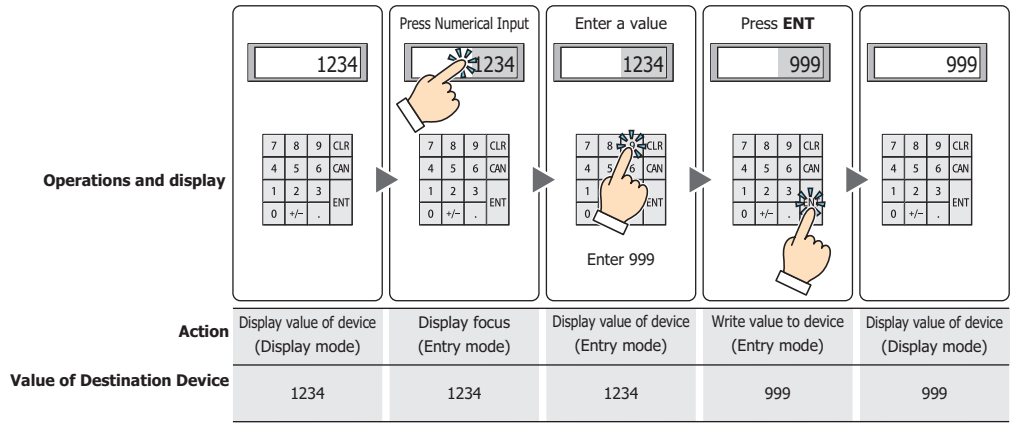
This option can only be configured if **Current Screen** is selected for **Type**.

Example: When the **Always Entry Mode** check box is selected and the **Start from 0 in Always Entry Mode of Numerical Input** check box is selected on the **System** tab in the **Project Settings** dialog box



Only one Numerical Input or one Character Input set to **Always Entry Mode** can be configured for one screen.

Example: When the **Always Entry Mode** check box is cleared



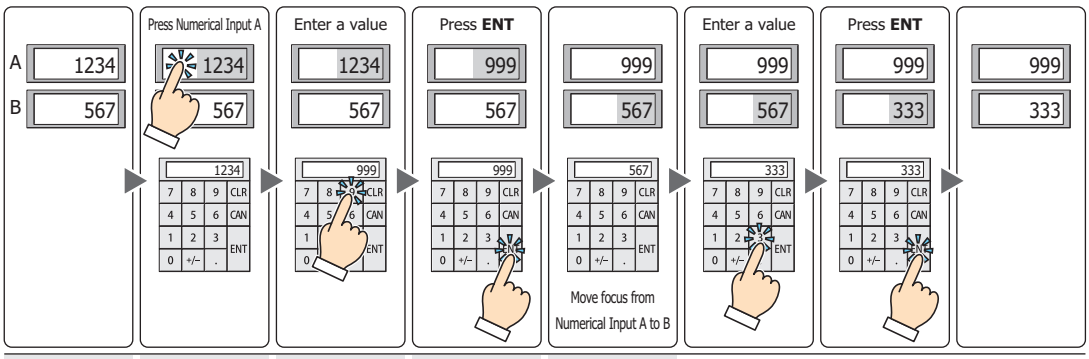
*2 Advanced mode only

■ Focus is moved by ENT button*2

When multiple Numerical Inputs are configured on the screen, select this check box to continue entering values on each of the Numerical Inputs.

Each time **ENT** is pressed, the focus moves between the Numerical Inputs according to **Focus Order**. On the **View** tab, in the **Screens** group, click **Focus Order**, and then click the Numerical Inputs in the order to move the focus.

Example: When Numerical Input A and B are configured and the **Focus is moved by ENT button** check box for Numerical Input A is selected and the **Focus is moved by ENT button** check box for Numerical Input B is cleared

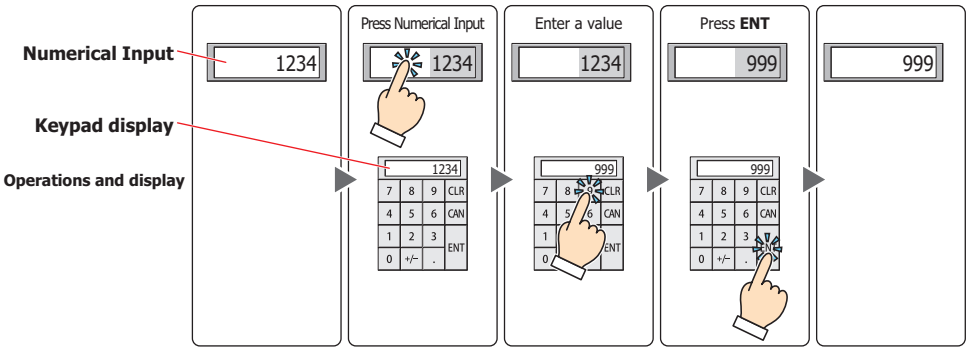


Numerical Input A action	Display value of device (Display mode)	Display focus (Entry mode)	Display value of device (Entry mode)	Write value to device (Entry mode)	Display value of device (Display mode)			
Numerical Input B action	Display value of device (Display mode)				Display focus (Entry mode)	Display value of device (Entry mode)	Write value to device (Entry mode)	Display value of device (Display mode)
Numerical Input A Value of Destination Device	1234	1234	1234	999	999	999	999	999
Numerical Input B Value of Destination Device	567	567	567	567	567	567	333	333

■ Update the display by ENT button*2

Select this check box to display the current value unchanged and update the display when a value is entered and **ENT** is pressed.

When this check box is cleared, the display updates with each press of a number button to display the number being entered.

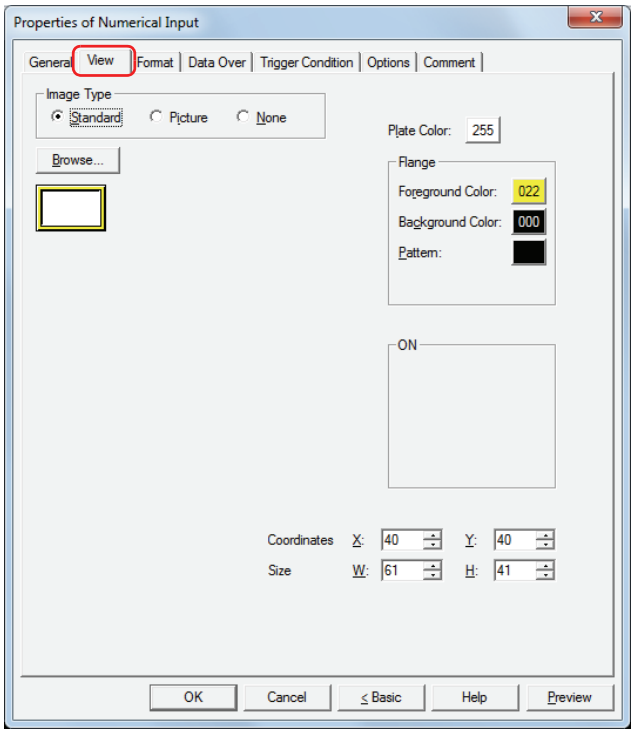


Action	Display value of device (Display mode)	Display focus (Entry mode)	Display value of device (Entry mode)	Write value to device (Entry mode)	Display value of device (Display mode)
Value of Destination Device	1234	1234	1234	999	999
Numerical Input display	1234	1234	1234	999	999
Keypad display	-	1234	999	999	-

When a value outside the input range is entered and **ENT** is pressed, "?" is shown in the display. The value is not written to the device.

*2 Advanced mode only

● **View** Tab



■ **Image Type**

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1: The plate and the flange of the part are not displayed. Only the text is displayed.

> When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

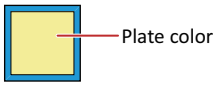
■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ **Plate Color**

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ **Flange**

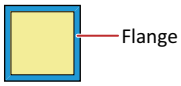
Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



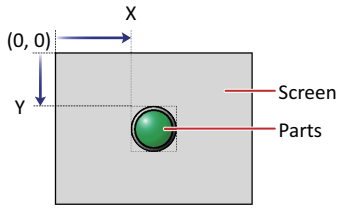
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

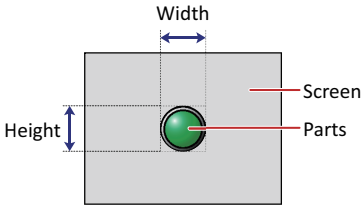


Size

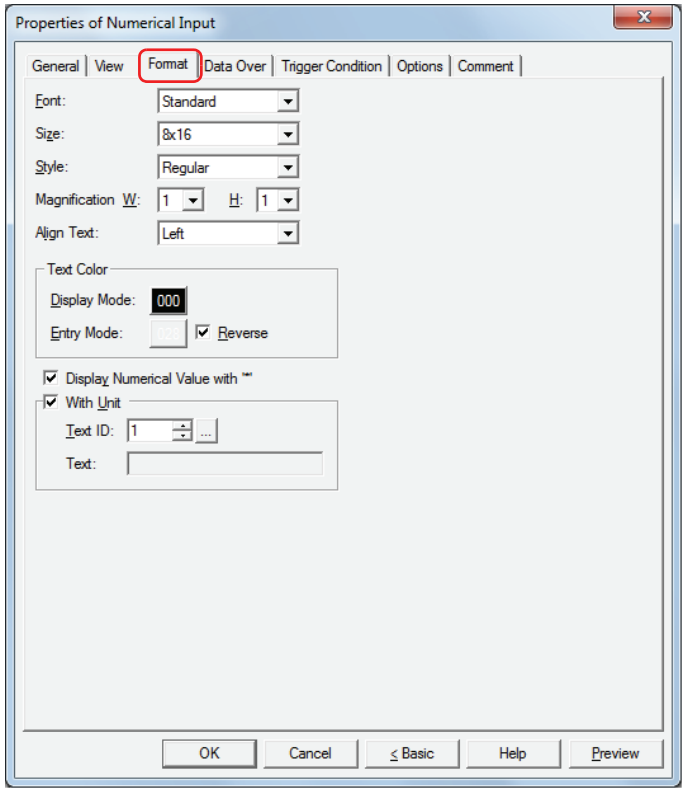
W, H: Sets width and height to define the size of parts.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Format** Tab



■ **Font**

Selects the font used for displaying text from the following.

Standard, **Stroke**, **7-Segment**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**

When **Standard** is selected, selects the text size as **8x16** or **16x16**.

When **Stroke** or **7-Segment** is selected, specifies the text size (8 to 128).

■ **Style**

Selects **Regular** or **Bold** for text style.

Can only be set when **Standard** is selected for **Font**.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

Can only be set when **Standard** is selected for **Font**.

■ **Align Text**

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Text Color**

Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

This option can configure the text color in display mode and in entry mode. However, for **Entry Mode** text color can be set only when the **Reverse** check box is cleared.

■ **Reverse**

Select this check box to reverse the text color and plate color during display mode when in entry mode.

Can only be set when **Standard** is selected for **Image Type** under the **View** tab.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

Display Numerical Value with "*" *2

Select this check box to display the entered value as * (asterisks).

Nothing is displayed if the value of device is 0 when this check box is selected and the **Suppress Zeros** check box is selected on the **General** tab. When this check box is selected in entry mode, nothing is displayed until a value is entered from the key buttons or keypad. If **ENT** is pressed with nothing displayed, 0 is written to the destination device.

With Unit*2

Select this check box to display units or other characters at the end of a number. Displayed characters must be registered in Text Manager. The displayed text color will be as set for **Text Color** under the **Format** tab.

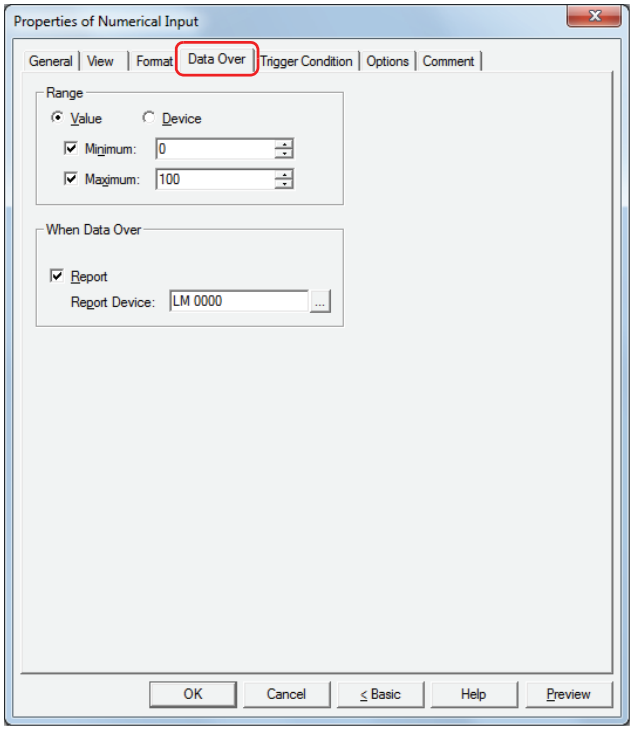
Text ID:	Specifies the Text Manager ID No. (1 to 32000).
	Click ... to display Text Manager.
Text:	Displays the characters of the specified Text ID.

- The maximum number that can be displayed with this function is 4 characters. The fifth and subsequent characters of a character string are not displayed. However, if Windows Font is set for the specified Text ID characters all the characters are displayed.
- If a carriage return (CR) is included the characters after the CR are not displayed.

*2 Advanced mode only

● **Data Over** Tab

The **Data Over** tab is displayed in Advanced mode.



■ **Range**

Select data type.

Value:	Specifies the minimum and/or the maximum as a constant.
Device:	Specifies the minimum and/or the maximum as a value of word device.

Specifies the allowable range of values to enter or display.

Minimum, Maximum: Select these check boxes to specify the minimum and/or maximum.

The minimum and maximum that can be specified when **Value** is selected vary based on the data type selected with **Data Format** on the **General** tab. For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When **Device** is selected, these options specify the source word devices.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- Select **BIN16(+)**, **BIN16(+/-)**, **BIN32(+)**, **BIN32(+/-)**, **BCD4** or **BCD8** for **Data Type** under the **General** tab, and to display a fractional number specify the values of **Minimum** and **Maximum** as an integer.
  Example: To set a value of "1.25" for the upper limit, enter "125".
- If the value of the device to display exceeds the data range that can be processed for the data type selected under **Data Format** on the **General** tab, "?" is displayed.
- If the entered value exceeds the allowable range or if it exceeds the data range that can be processed for the data type selected under **Data Format** on the **General** tab, "?" is displayed and the value is not written to the device.

■ When Data Over

These options configure the operation of the part when the value entered with the keypad exceeds the allowable range.

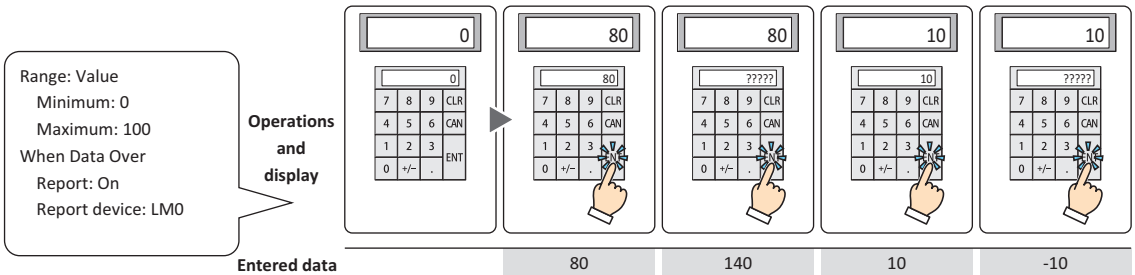
These options can only be configured when the **Minimum** or **Maximum** check boxes are selected under **Range**.

Report: Select this check box to write 1 in the report device when the entered value or the value of the device to display exceeds the allowable range.

Report Device: Specifies the report device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

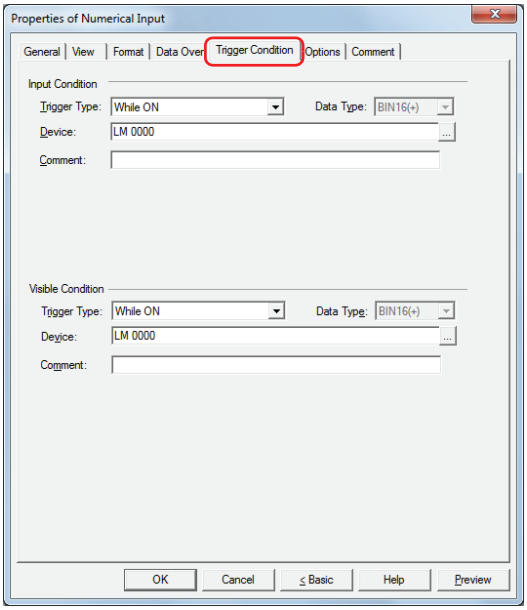
Example: If you attempt to enter "140", which is higher than the maximum of "100", or "-10", which is lower than the minimum of "0", the value is not written and "?" is displayed. 1 is written to **When Data Over** report device LM 0.



Entered data		80	140	10	-10
Written data		80		10	
Data over notification: LM0		0	1	0	1

● Trigger Condition Tab

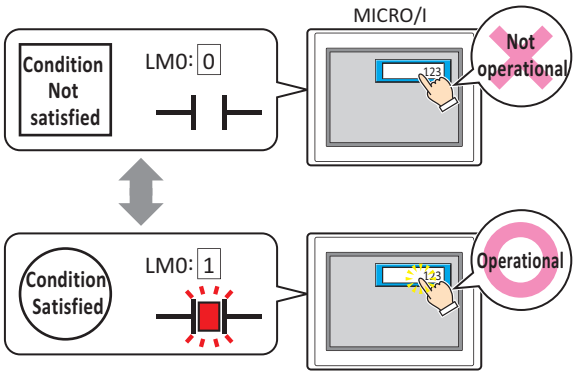
The **Trigger Condition** tab is displayed in Advanced mode.



■ Input Condition

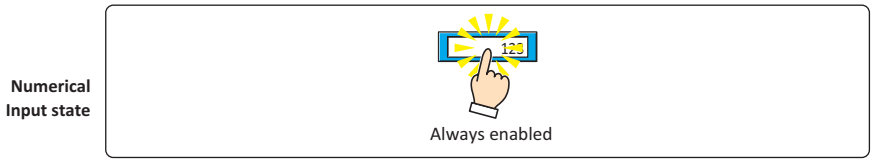
The Numerical Input is enabled and operational while the condition is satisfied. The Numerical Input is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Numerical Input is not operational.
While LM 0 is 1, the condition is satisfied and the Numerical Input is operational.

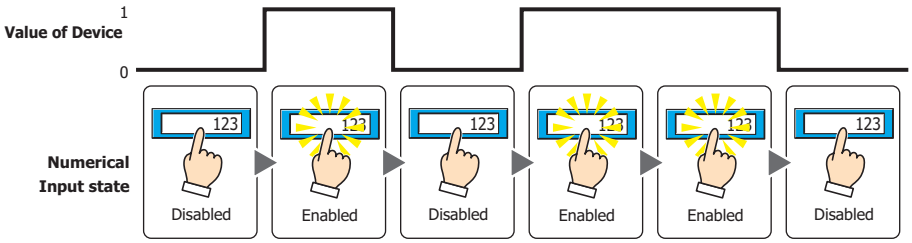


Trigger Type: Selects the condition to enable the Numerical Input from the following.

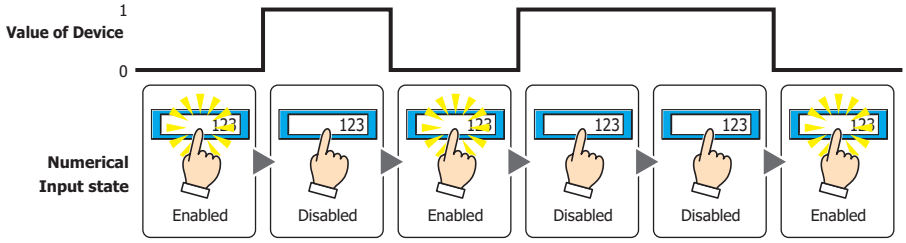
Always enable: The Numerical Input is always enabled.



While ON: Enables the Numerical Input when the value of device is 1.

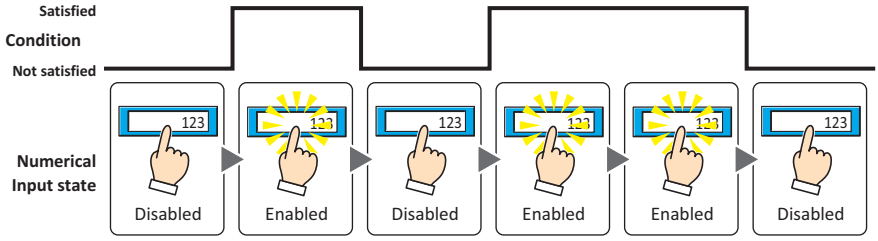


While OFF: Enables the Numerical Input when the value of device is 0.



While satisfying the condition:

Enables the Numerical Input when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

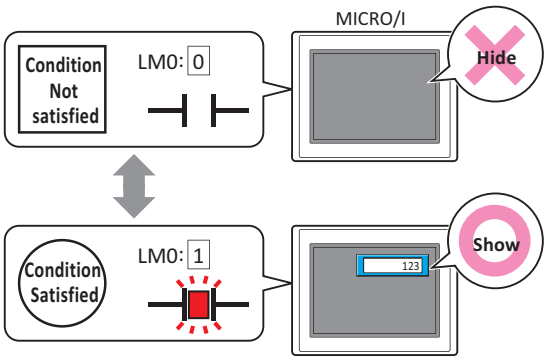
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Numerical Input is displayed while the condition is satisfied. The Numerical Input is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Numerical Input is hidden.
While LM 0 is 1, the condition is satisfied and the Numerical Input is displayed.

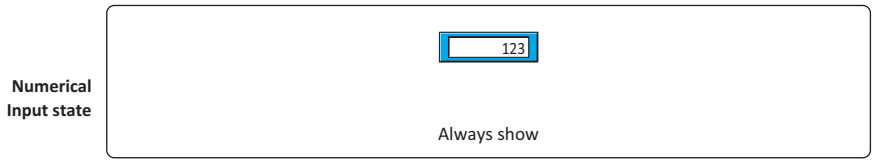


- If the Numerical Input is hidden while entering a value, the input is canceled. If a popup screen configured as the standard keypad or a keypad is displayed, these screens are closed.
- When multiple Numerical Inputs are arranged on the screen and the **Focus is moved by ENT button** check box is selected, entry mode is canceled if the Numerical Input is hidden while entering a value.

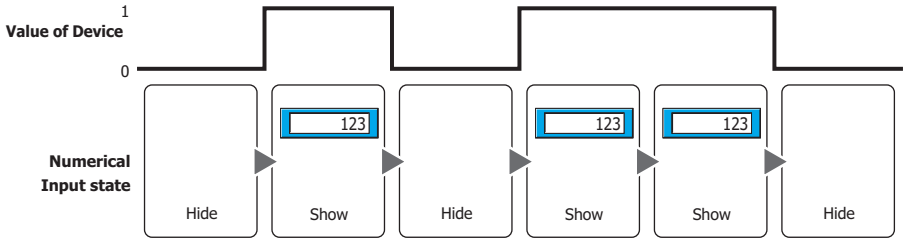
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Numerical Input from the following.

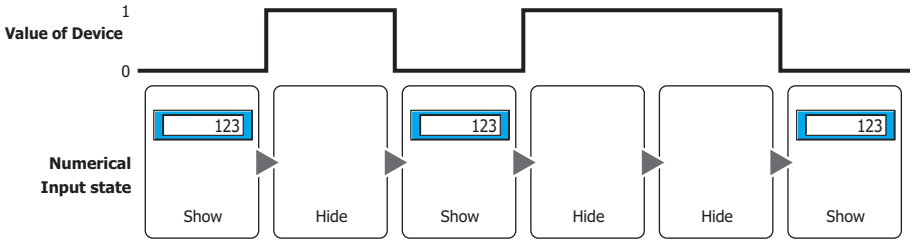
Always visible: The Numerical Input is always displayed.



While ON: Displays the Numerical Input when the value of device is 1.

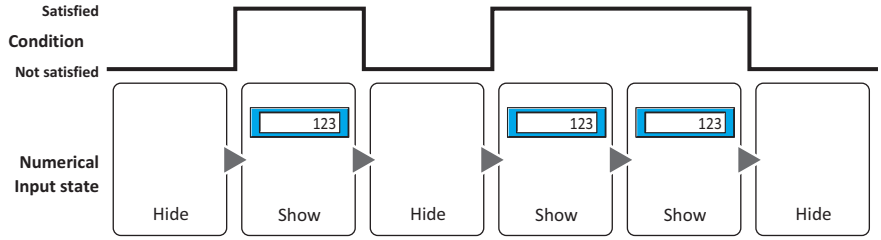


While OFF: Displays the Numerical Input when the value of device is 0.



While satisfying the condition:

Displays the Numerical Input when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

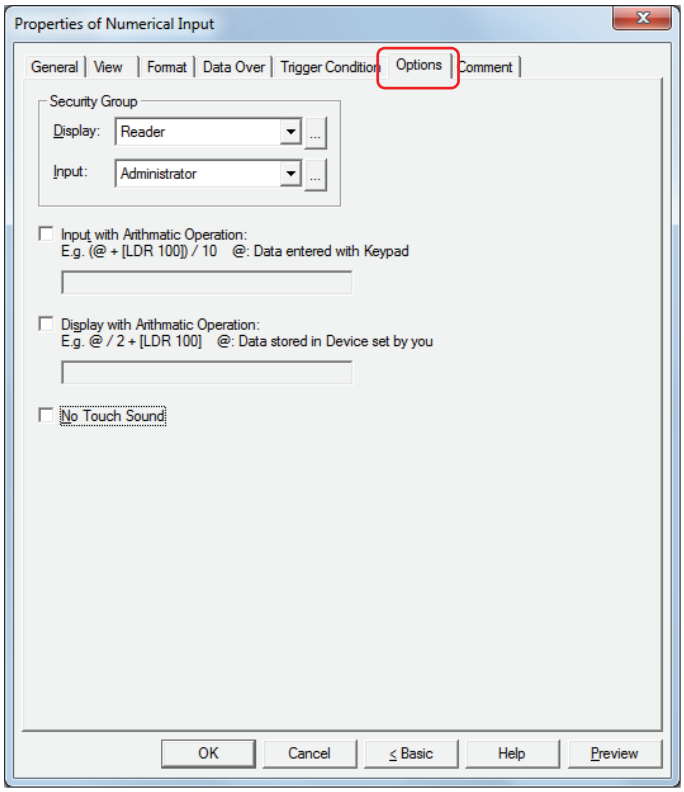
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.

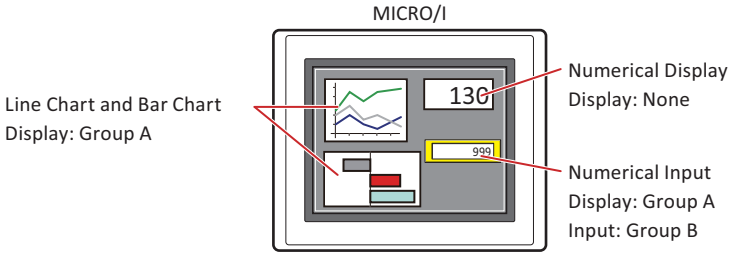
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

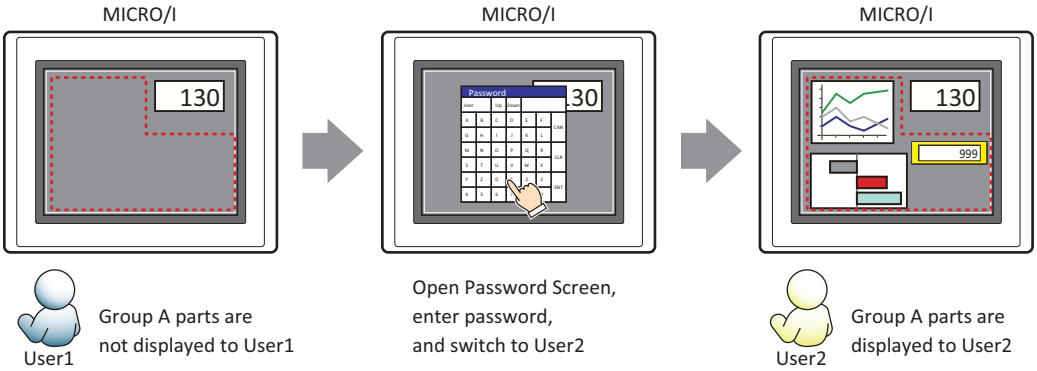
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

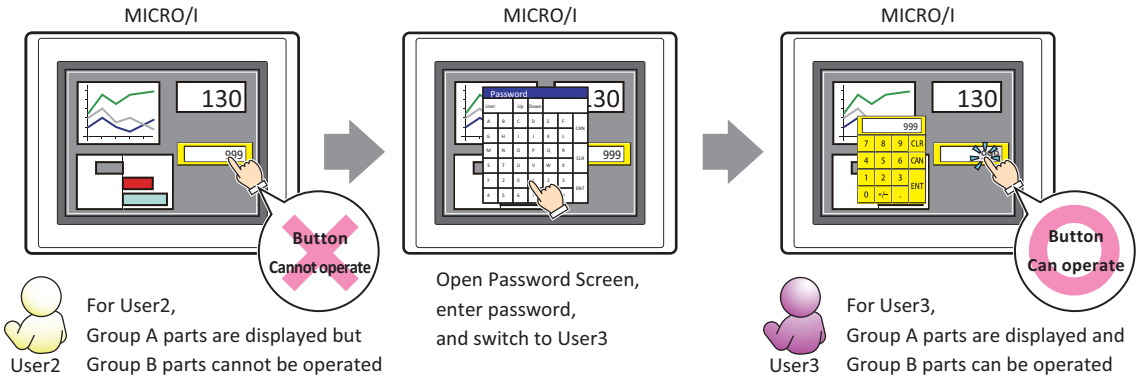
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



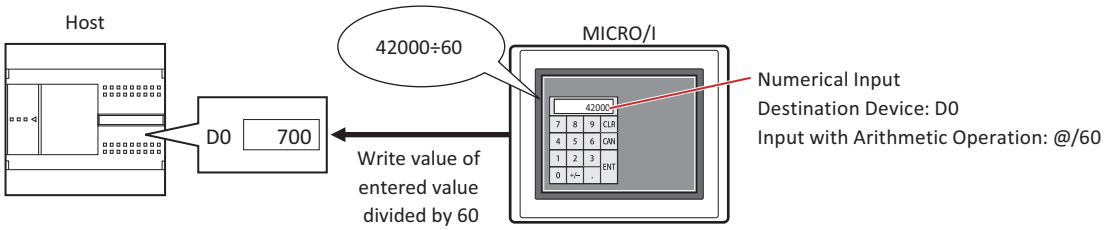
Since the display security group is Group A, User 2 (of Group A) can view the buttons. But since the input security group is Group B, User 2 cannot operate the buttons.
Suppose that the Password Screen is now opened and a switch is made to User 3, who is part of both Group A and Group B. Group A buttons can be displayed, and Group B buttons can be operated.



Input with Arithmetic Operation

To apply arithmetic operations to values entered using a keypad and writing the results, select this check box and input the arithmetic formula.

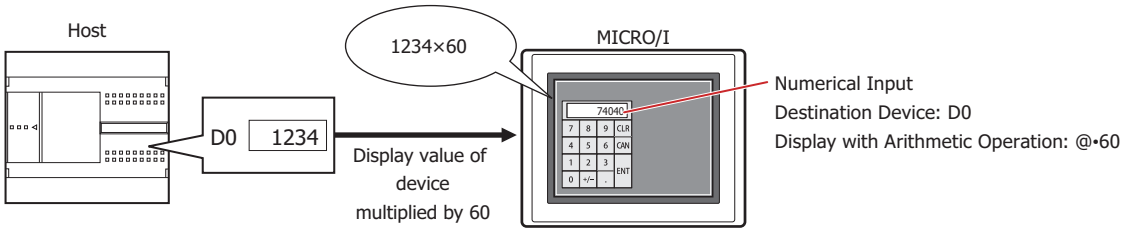
Example: To divide the value of device when entered by 60



Display with Arithmetic Operation

To apply arithmetic operations to values of devices and writing the results, select this check box and input the arithmetic formula.

Example: To multiple the value of device when displayed by 60



Arithmetic Formulas

Arithmetic formulas can be specified by freely combining multiple kinds of data and operators in the following format.

[Data] [Operator] [Data]
to
[Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] ...(up to 120 characters)

- There is no limit on the number of data items or number of operators. However, the maximum number is 120 characters.
- Round brackets can be used.

Data

Item	Description
@	The device on which the arithmetic operation is performed is specified in the arithmetic formula. Only one device can be set for an arithmetic operation. The device is as specified for **Destination Device** under the **General** tab.
Value	Sets the constant values for the arithmetic formula. The values that can be set depend on the data type selected using **Data Format** under the **General** tab. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.
Device	Specifies the bit device or word device for the arithmetic formula.

Operators

Specify the type of arithmetic operation to be performed on the data. The operator priority is the same as for scripts. For details, refer to Chapter 20 "6.4 About the Priority of the Operator" on page 20-55.

Item	Description		
Arithmetic operators	Sets the arithmetic operators.		
	+	Addition	Adds [a] and [b].
	-	Subtraction	Subtracts [b] from [a].
	*	Multiplication	Multiplies [a] and [b].
	/	Division	Divides [a] by [b].
	%	Modulo	Calculates remainder after dividing [a] by [b].

Item	Description		
Bit operator	Sets the bit operator.		
	&	Logical AND	Calculates the logical product (AND) of each bit of [a] and [b].
	|	Logical OR	Calculates the logical sum (OR) of each bit of [a] and [b].
	^	Logical XOR (exclusive OR)	Calculates the exclusive logical sum (XOR) of each bit of [a] and [b].
	<<	Left shift	Shifts each bit of [a] to left by [b] bit(s).
	>>	Right shift	Shifts each bit of [a] to right by [b] bit(s).

Examples of Arithmetic Formula Input

Input Examples	Description
@ + 1	To perform the arithmetic operation and input the result, add 1 to the value entered using the Keypad and write the result to the device.
	To perform the arithmetic operation and display the result, add 1 to the value of device and display the result.
[LDR 0] + @ + 100	To perform the arithmetic operation and input the result, add the value of LDR0 to the value entered using the Keypad and add 100, and write the result to the device.
	To perform the arithmetic operation and display the result, add the value of LDR0 to the value of device and add 100, then display the result.
@ & 3	To perform the arithmetic operation and input the result, write the logical product of the value entered using the Keypad and 3 to the device.
	To perform the arithmetic operation and display the result, add 3 to the value of device and display the result.

■ No Touch Sound

This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.

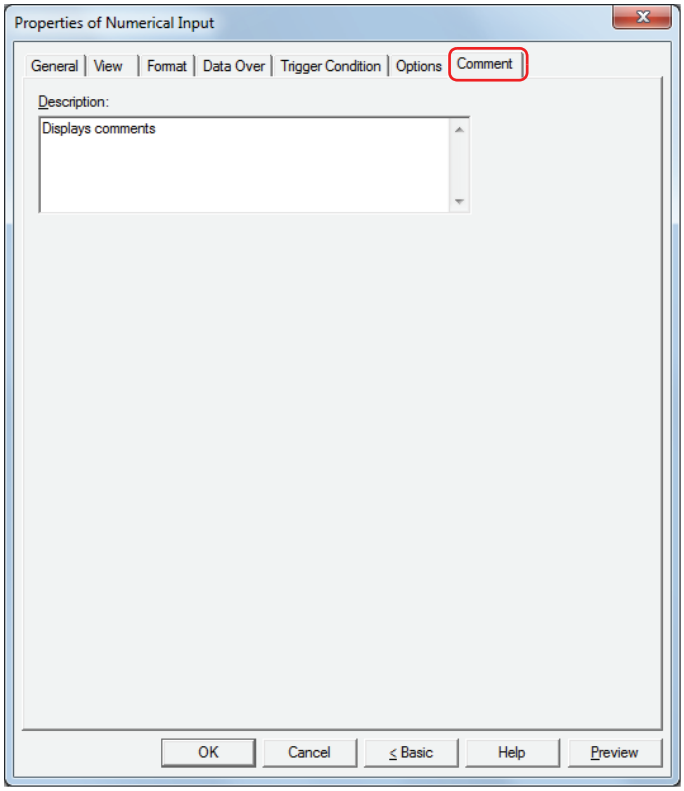
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

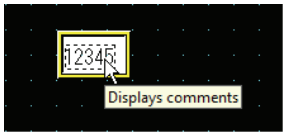
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Numerical Input on the editing screen

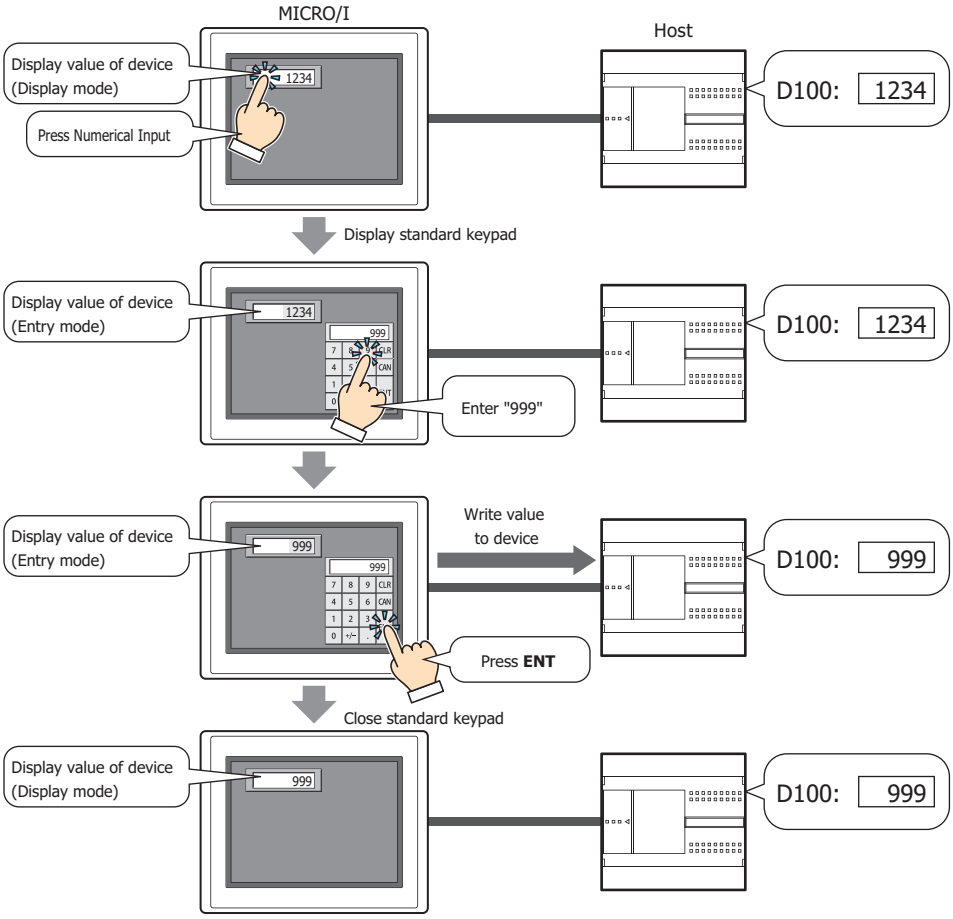


1.4 How to Enter Values

Use the keypad or key buttons to write a value to a device with the Numerical Input. The input methods are as follows.

Pressing the Numerical Input and Entering Values from the Standard Keypad

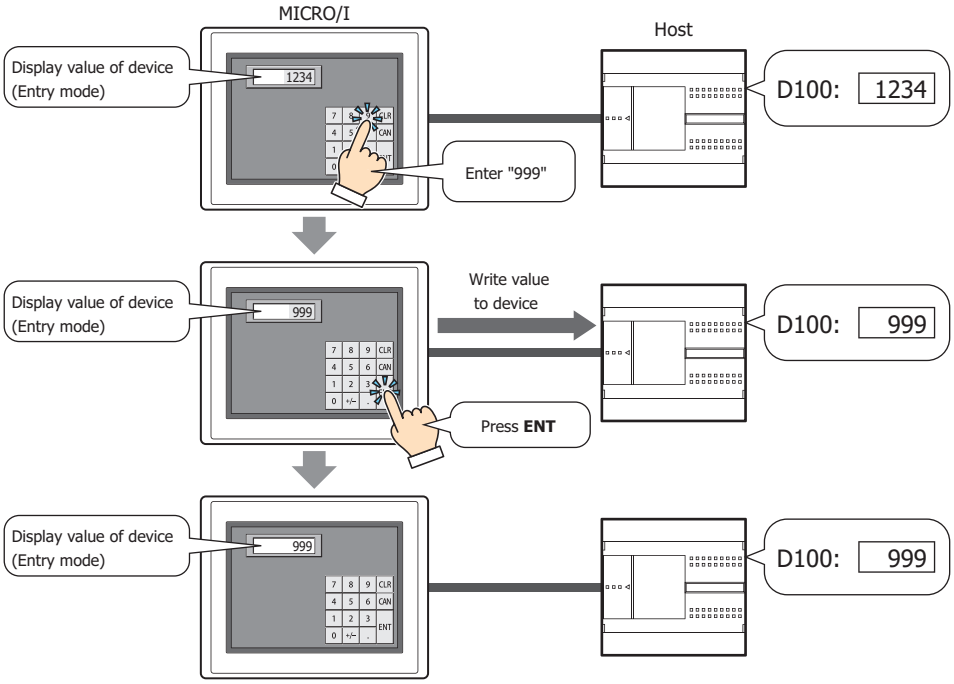
Arrange a Numerical Input on the screen and in its properties dialog box, on the **General** tab, under **Keypad**, select **Standard** for **Type**.



When the following operations are performed, entry mode is canceled and the current value of device is displayed in the Numerical Input. To enter a value, press the Numerical Input again to set it to entry mode.

- **CAN** was pressed
- When the **Focus is moved by ENT button** check box on the **General** tab is cleared and **ENT** was pressed and a value was written to the device

■ **Without Pressing the Numerical Input, Directly Entering Values from a Keypad on the Same Screen**
Arrange a Numerical Input and a keypad on the same screen. In the properties dialog box for the Numerical Input, on the **General** tab, under **Keypad**, select **Current Screen** for **Type** and select the **Always Entry Mode** check box.



1.5 Advanced Usage

● Using the System Area

- When finished entering a value by pressing **ENT**, 1 is written to the System Area 2 Numerical Input Setting Complete bit (address+3, bit 0).

If the System Area 2 numerical input setting complete bit is set to another function's execution condition, that function can be executed when **ENT** is pressed.

Example: To simultaneously close a popup screen when **ENT** is pressed
In the Properties of Goto Screen Command dialog box, on the **General** tab, select **Close Popup Screen** for **Action Mode**. On the **Trigger Condition** tab, select **Rising-edge** for **Trigger Type**, and configure **Device** as the System Area 2 Numerical Input Setting Complete bit (address+3, bit 0).

- When **CAN** is pressed, entry mode is canceled and 1 is written to the System Area 2 Numerical Input Setting Cancel bit (address+3, bit 1). However, if the keypad is closed by pressing ☒ (close) on the popup screen's title bar or another Numerical Input is pressed before finished entering the value by pressing **ENT**, entry mode is canceled and 1 is not written to the System Area 2 Numerical Input Setting Cancel bit (address+3, bit 1).

- To clear the System Area 2 numerical input setting complete bit or the numerical input setting cancel bit, write 1 to System Area 1 Numerical Input Setting Clear bit (address+1, bit 10). To automatically clear these bits when the Numerical Input keypad is pressed in entry mode, select the **Clear Keypad bit in System Area automatically** check box on the **System** tab in the **Project Settings** dialog box.

2 Character Input

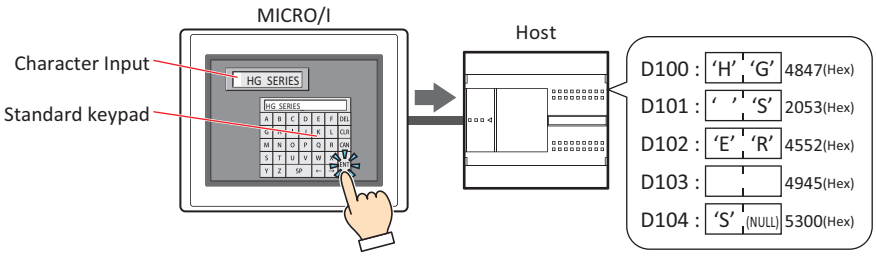
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 How the Character Input is Used

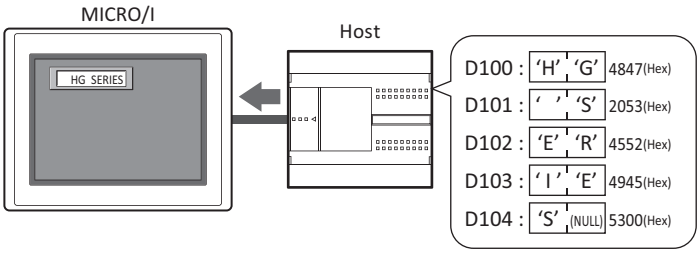
The Character Input features a display mode that displays the character codes in current values of devices as text and an entry mode that enters text using the keypad or key buttons and writes the character codes for the entered text to devices. When the part is displayed on the screen, the Character Input is in display mode. To enter text by pressing the keypad or key buttons, touch the Character Input to switch it to entry mode.

The Character Input can perform the following functions.

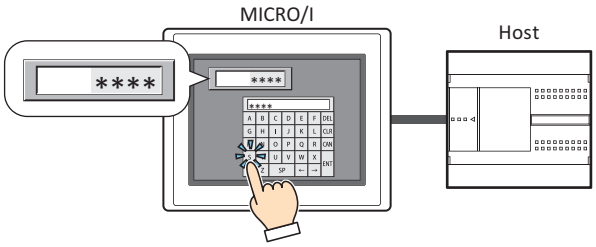
- Write the character codes for text entered with the keypad or key buttons to devices



- Display the character codes in current values of devices as text



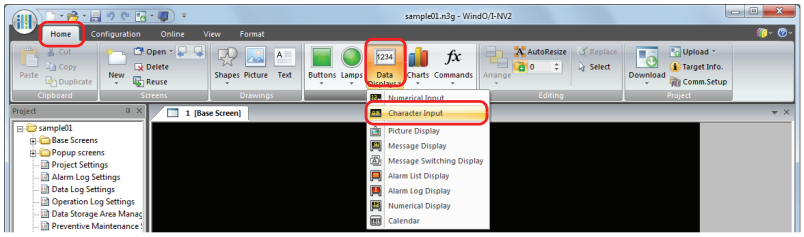
- Display entered text as * (asterisk)



2.2 Character Input Configuration Procedure

This section describes the configuration procedure for Character Inputs.

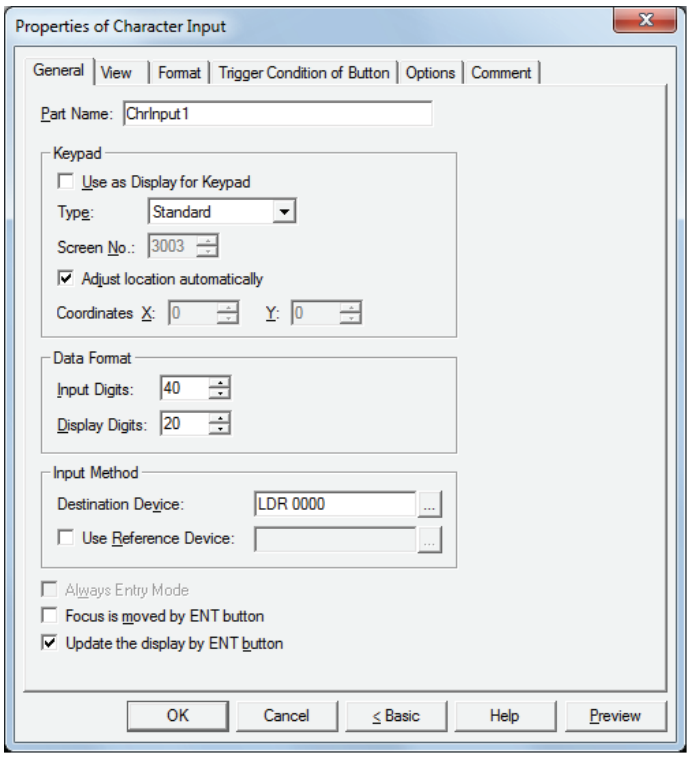
1 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Character Input**.



2 Click a point on the edit screen where you wish to place the Character Input.

3 Double-click the dropped Character Input and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

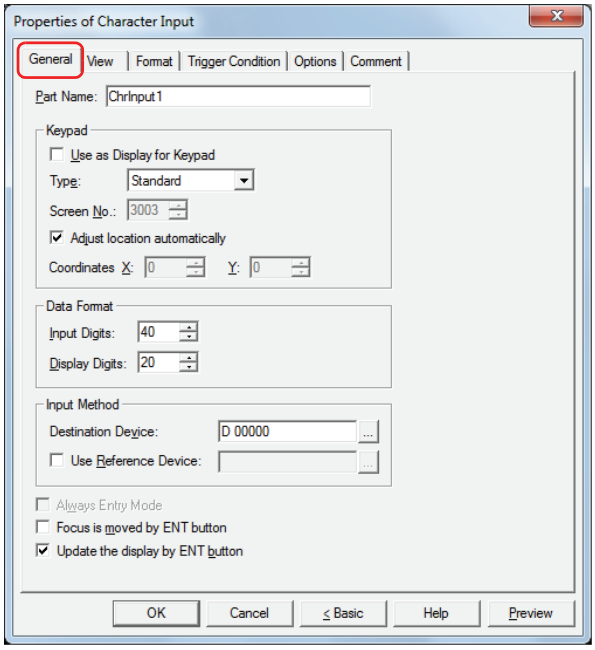


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

2.3 Properties of Character Input Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Keypad

Configures the keypad for entering text in the Character Input.

Use as Display for Keypad*1: Select this check box to only use the Character Input as a part to display the text entered with the keypad.

Type: According to the location where the keypad is configured, selects the type from the following.

- Standard: Uses the standard keypad. The standard keypad is the keypad configured as the popup screen for the standard keypad (screen number 3000 to 3015).
- Popup: Uses a keypad configured as a popup screen.
- Current Screen: Uses the keypad configured on the same screen as the Character Input.

Screen No.: Specifies the screen number of the popup screen configured as the keypad (1 to 3015).
This option can only be configured if **Popup** is selected for **Type**.

Adjust location automatically: Select this check box to display the popup screen configured as the keypad in a location where it will not overlap the Character Input.
This option can only be configured if **Standard** or **Popup** is selected for **Type**.

Coordinates X, Y: Specifies the display location of the popup screen configured as the keypad.
With the upper-left corner of the screen as the origin, the X and Y coordinates are the upper-left corner of the popup screen.
This option can only be configured when **Standard** or **Popup** is selected for **Type** and the **Adjust location automatically** check box is cleared.

- HG2G-S/-5S/-5F, HG3G/4G, HG1F: Specify the coordinates in 1 dot units.
  X: 0 to (base screen horizontal size - 1)
  Y: 0 to (base screen vertical size - 1)
- HG2F/2S/3F/4F: Specify the coordinates in 20 dot units.
  X: 0 to (base screen horizontal size - 20)
  Y: 0 to (base screen vertical size - 20)

*1 Advanced mode only

Data Format

Specifies the digits to display.

Input Digits: Specifies the number of digits that can be entered with the Character Input (1 to 127).

Display Digits: Specifies the number of digits that can be displayed in the Character Input display (1 to 100).

Input Method

These options configure the destination for the character codes for the entered text.

Destination Device: Specifies the destination word device for the character codes for the entered text.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the destination word device by the value of this device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

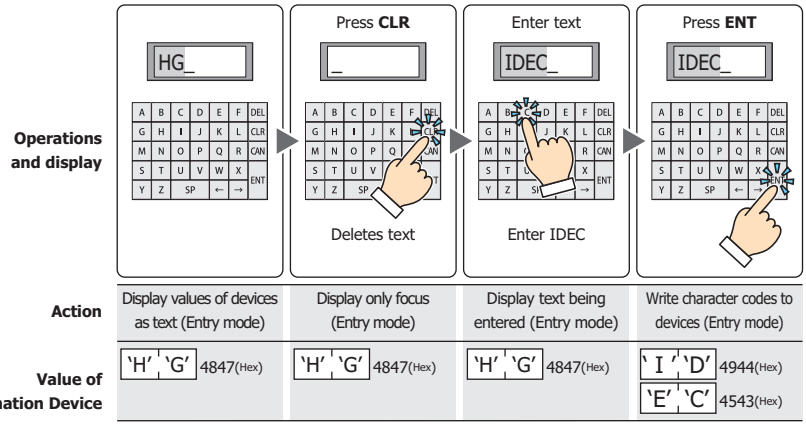
For details on indirect writing, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Always Entry Mode*1

Select this check box to enter text by pressing the keypad and key buttons without touching the Character Input displayed on the screen.

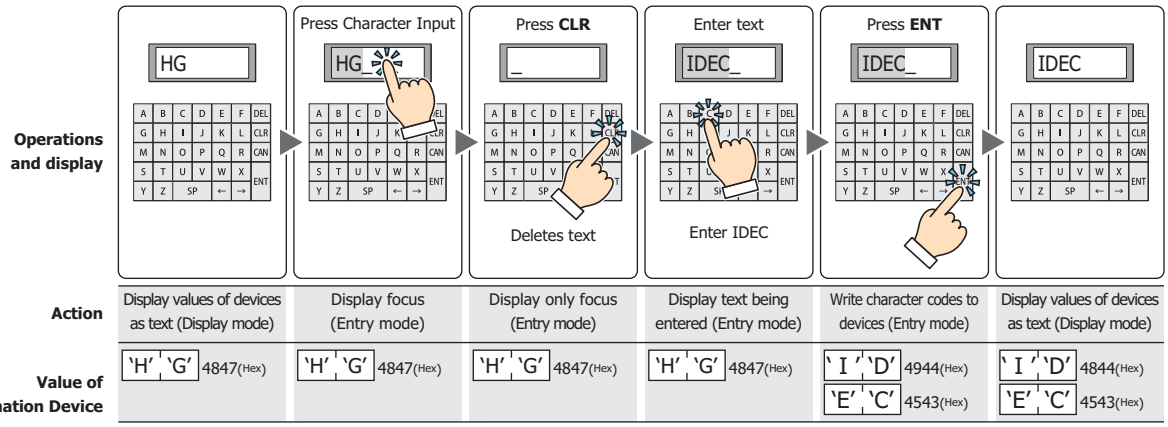
This option can only be configured if **Current Screen** is selected for **Type**.

Example: When the **Always Entry mode** check box is selected



Only one Numerical Input or one Character Input set to **Always Entry Mode** can be configured for one screen.

Example: When the **Always Entry Mode** check box is cleared



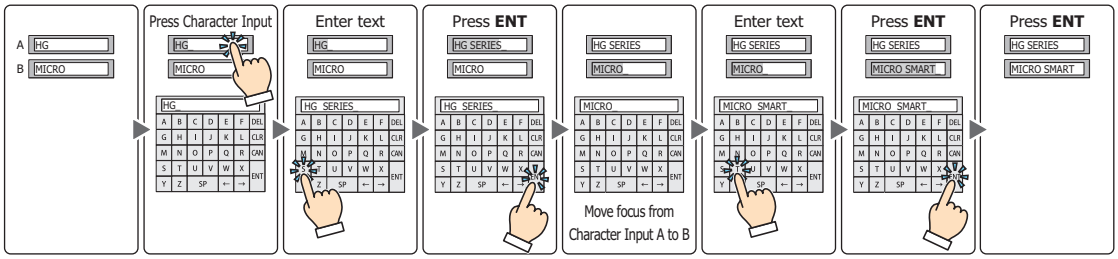
*1 Advanced mode only

■ Focus is moved by ENT button*1

When multiple Character Inputs are configured on the screen, select this check box to continue entering text on each of the Character Inputs.

Each time **ENT** is pressed, the focus moves between the Character Inputs according to **Focus Order**. On the **View** tab, in the **Screens** group, click **Focus Order**, and then click the Character Inputs in the order to move the focus.

Example: When Character Input A and B are configured and the **Focus is moved by ENT button** check box for Character Input A is selected and the **Focus is moved by ENT button** check box for Character Input B is cleared

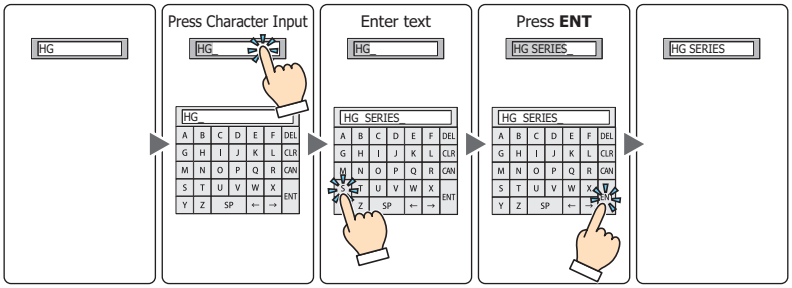


Character Input A action	Display values of devices as text (Display mode)	Display focus (Entry mode)	Display text being entered (Entry mode)	Write character codes to devices (Entry mode)	Display values of devices as text (Display mode)			
Character Input B action	Display values of devices as text (Display mode)				Display focus (Entry mode)	Display text being entered (Entry mode)	Write character codes to devices (Entry mode)	Display values of devices as text (Display mode)
Character Input A destination device	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4945(Hex) 'S' (NULL) 5300(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4945(Hex) 'S' (NULL) 5300(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4945(Hex) 'S' (NULL) 5300(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4945(Hex) 'S' (NULL) 5300(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4945(Hex) 'S' (NULL) 5300(Hex)
Character Input B destination device	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' (NULL) 4100(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' ' ' 4120(Hex) 'S' 'M' 534D(Hex) 'A' 'R' 4152(Hex) 'T' (NULL) 5400(Hex)	'M' 'I' 4D49(Hex) 'C' 'R' 4352(Hex) 'O' ' ' 4120(Hex) 'S' 'M' 534D(Hex) 'A' 'R' 4152(Hex) 'T' (NULL) 5400(Hex)

■ Update the display by ENT button*1

Select this check box to display the current text unchanged and update the display when text is entered and **ENT** is pressed.

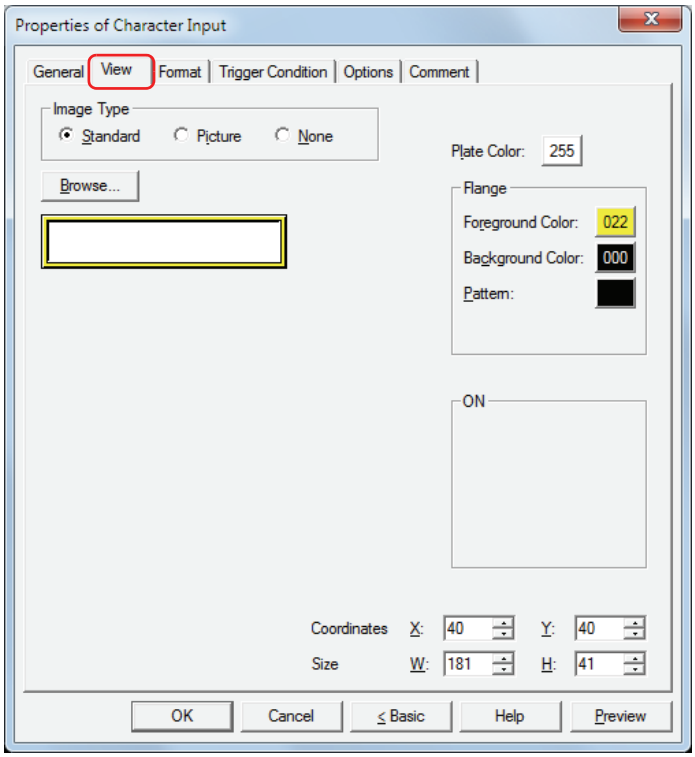
When this check box is cleared, the display updates with each press of a character button to display the character being entered.



Action	Display values of devices as text (Display mode)	Display focus (Entry mode)	Display text being entered (Entry mode)	Write character codes to devices (Entry mode)	Display values of devices as text (Display mode)
Value of Destination Device	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4943(Hex) 'S' (NULL) 5300(Hex)	'H' 'G' 4847(Hex) ' ' 'S' 2053(Hex) 'E' 'R' 4552(Hex) 'I' 'E' 4943(Hex) 'S' (NULL) 5300(Hex)
Character Input display	HG	HG	HG	HG SERIES	HG SERIES
Keypad display	Hide	HG	HG SERIES	HG SERIES	Hide

*1 Advanced mode only

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1: The plate and the flange of the part are not displayed. Only the text is displayed.

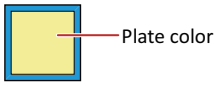
When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

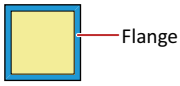


■ Flange

Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



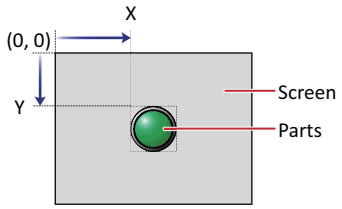
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

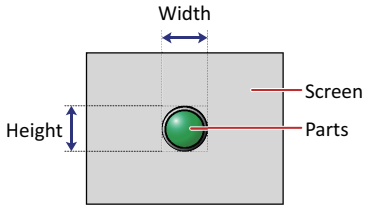


Size

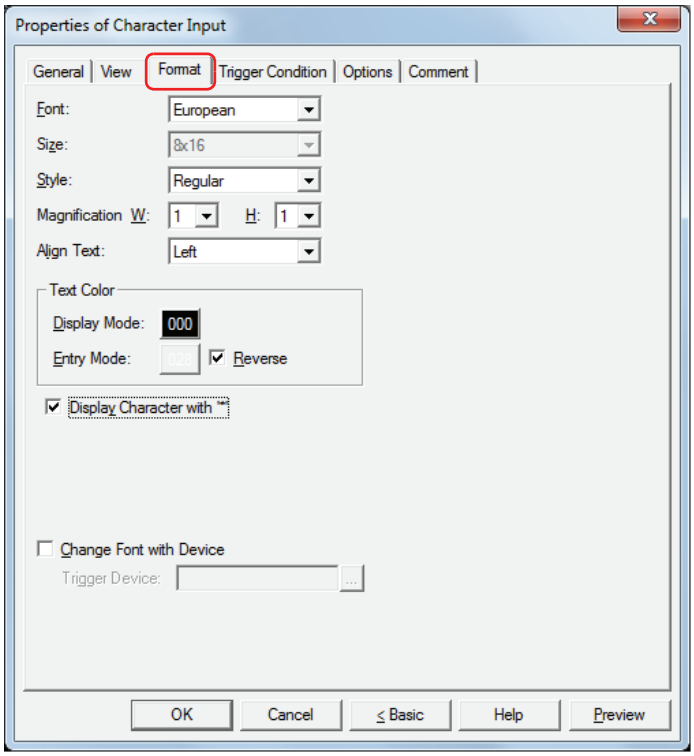
W, H: Sets width and height to define the size of parts.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Format** Tab



■ Font

Selects the font used for displaying text from the following.

Japanese, **European**, **Central European**, **Baltic**, **Cyrillic**, **Stroke**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

When **Japanese** is selected, selects the text size as **8x16** or **16x16**.

When **Stroke** is selected, specifies the text size (8 to 128).

Can only be set when **Japanese** or **Stroke** is selected for **Font**.

■ Style

Selects **Regular** or **Bold** for text style.

Can only be set when **Japanese**, **European**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ Magnification

W, H: Selects text magnification (0.5, 1 to 8[*1]).

Can only be set when **Japanese**, **European**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ Align Text

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Text Color

Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

This option can configure the text color in display mode and in entry mode. However, for **Entry Mode** text color can be set only when the **Reverse** check box is cleared.

■ Reverse

Select this check box to reverse the text color and plate color during display mode when in entry mode.

Can only be set when **Standard** is selected for **Image Type** under the **View** tab.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ Display Character with "*"*2

Select this check box to display the entered characters as * (asterisks).

If this check box is selected, nothing is displayed until a value is entered from the key buttons or keypad when the Character Input is in entry mode. If **ENT** is pressed with nothing displayed, 0 is written to the destination device.

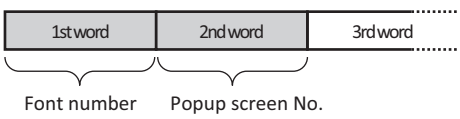
■ Change Font with Device*2

Select this check box to change the font used to display the text with a value of device.

The keypad (popup screen) can also be changed when **Standard** or **Popup** is selected for **Type** under **Keypad** on the **General** tab.

Trigger Device: Specifies the word device (2 words) to use as the condition to change the font.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.



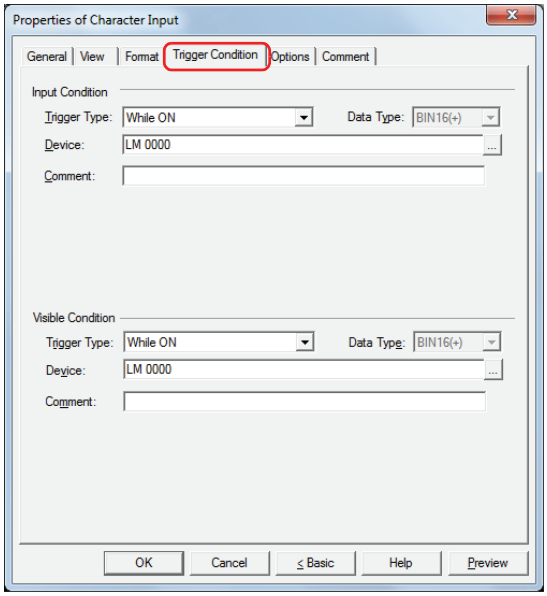
Font number	1. Japanese 2. European 6. Central European 7. Baltic 8. Cyrillic
Popup screen No.	1 to 3015

Example: With **Trigger Device** set to D 100, to enter Central European text from popup screen 100 using a Character Input for entering European text from the standard keypad (popup screen 3003)
Write 6 to D 100 and 100 to D 101.

*2 Advanced mode only

● Trigger Condition Tab

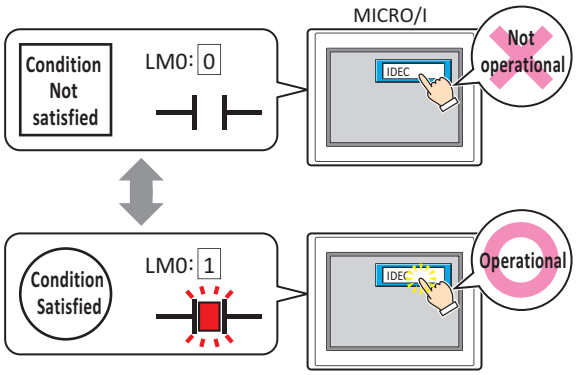
The **Trigger Condition** tab is displayed in Advanced mode.



■ Input Condition

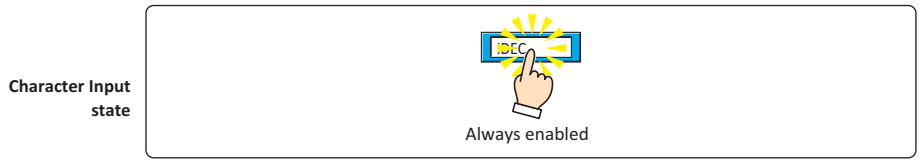
The Character Input is enabled and operational while the condition is satisfied. The Character Input is disabled and not operational while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Character Input is not operational.
While LM 0 is 1, the condition is satisfied and the Character Input is operational.

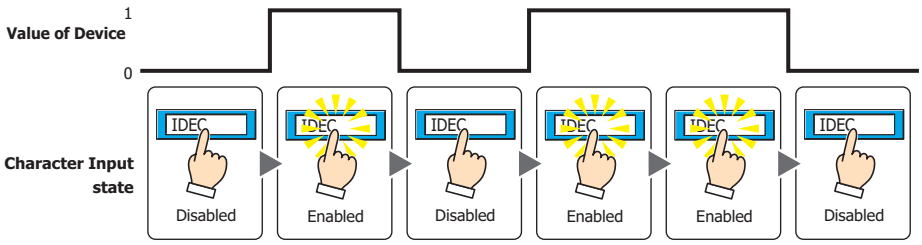


Trigger Type: Selects the condition to enable the Character Input from the following.

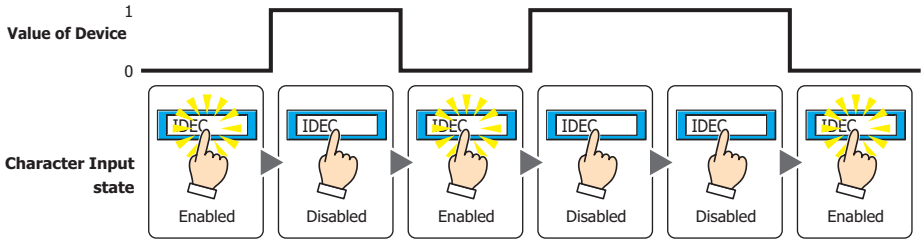
Always enable: The Character Input is always enabled.



While ON: Enables the Character Input when the value of device is 1.

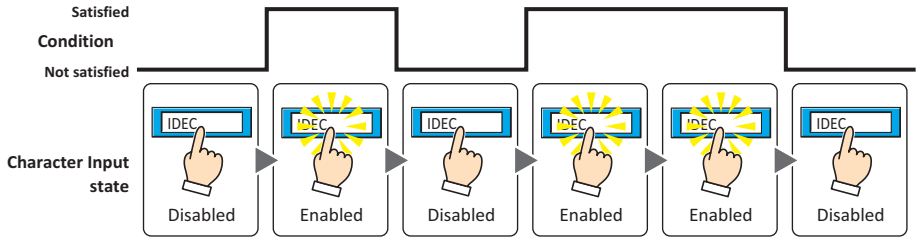


While OFF: Enables the Character Input when the value of device is 0.



While satisfying the condition:

Enables the Character Input when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the input condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the input condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition: Specifies the conditional expression for the input condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

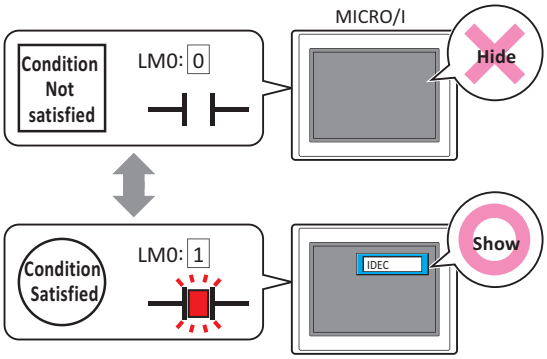
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the input condition. The maximum number is 80 characters.

■ Visible Condition*1

The Character Input is displayed while the condition is satisfied. The Character Input is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Character Input is hidden.
While LM 0 is 1, the condition is satisfied and the Character Input is displayed.

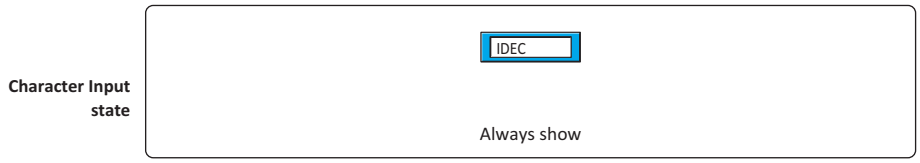


- If the Character Input is hidden while entering a value, the input is canceled. If a popup screen configured as the standard keypad or a keypad is displayed, these screens are closed.
- When multiple Character Inputs are arranged on the screen and the **Focus is moved by ENT button** check box is selected, entry mode is canceled if the Character Input is hidden while entering a value.

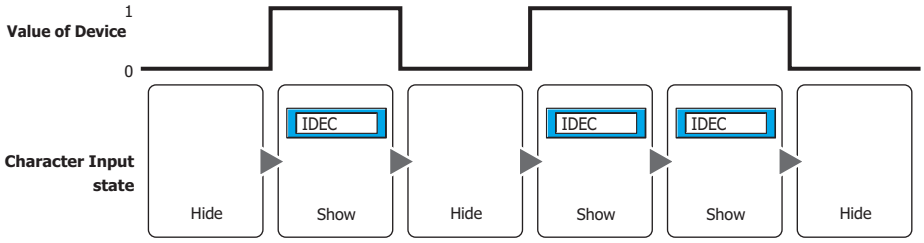
*1 HG2G-5F, HG3G/4G only

Trigger Type: Selects the condition to display the Character Input from the following.

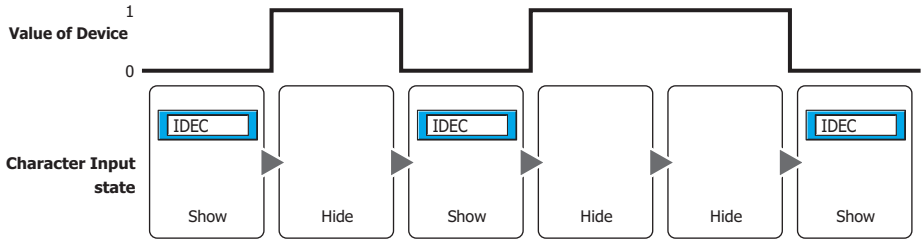
Always visible: The Character Input is always displayed.



While ON: Displays the Character Input when the value of device is 1.

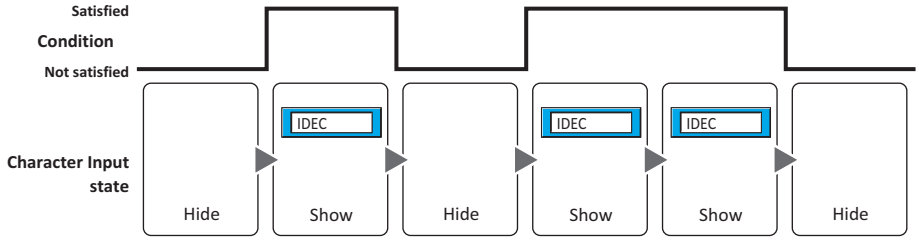


While OFF: Displays the Character Input when the value of device is 0.



While satisfying the condition:

Displays the Character Input when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

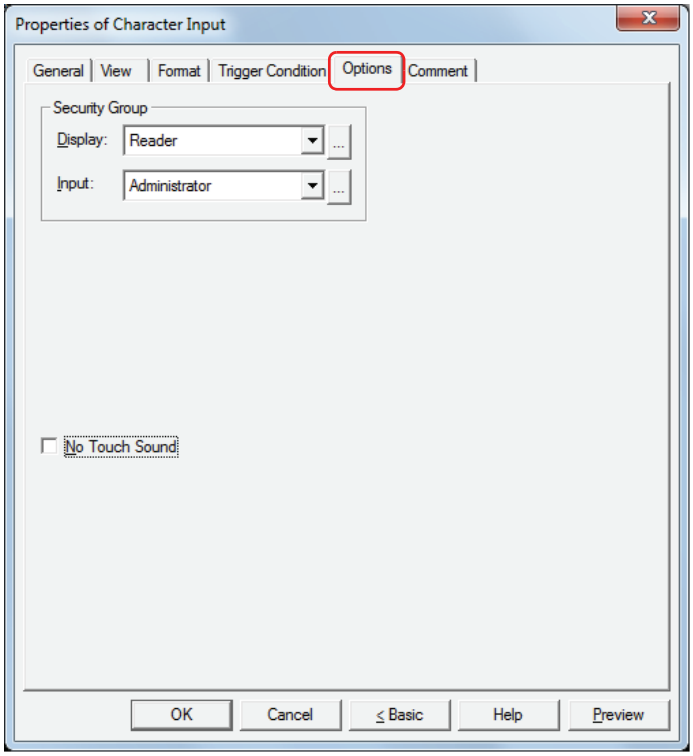
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Setting the security group makes it possible to limit the display and operation in a similar way to using the **Trigger Condition** tab.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.

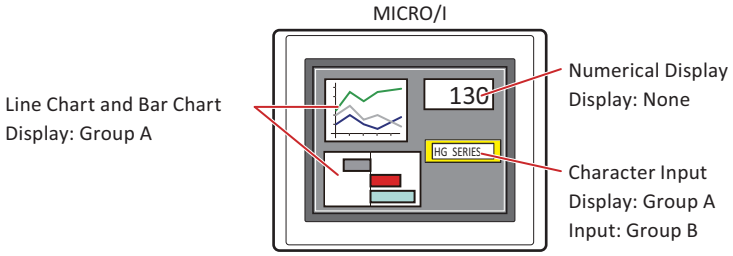
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

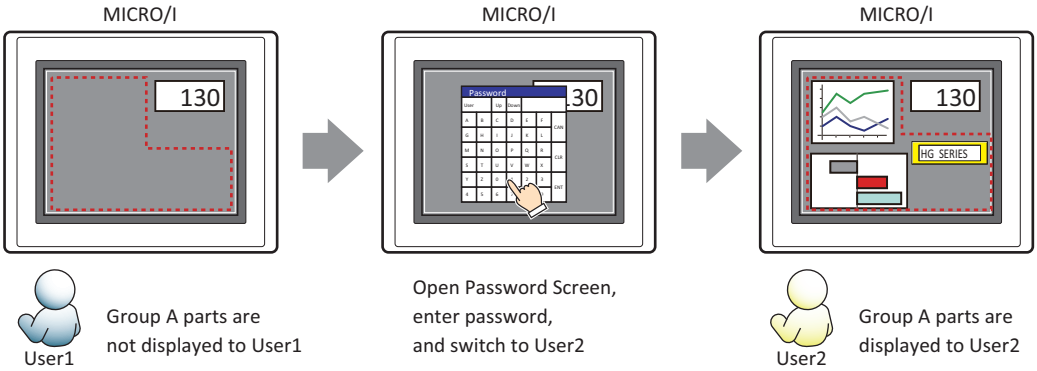
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

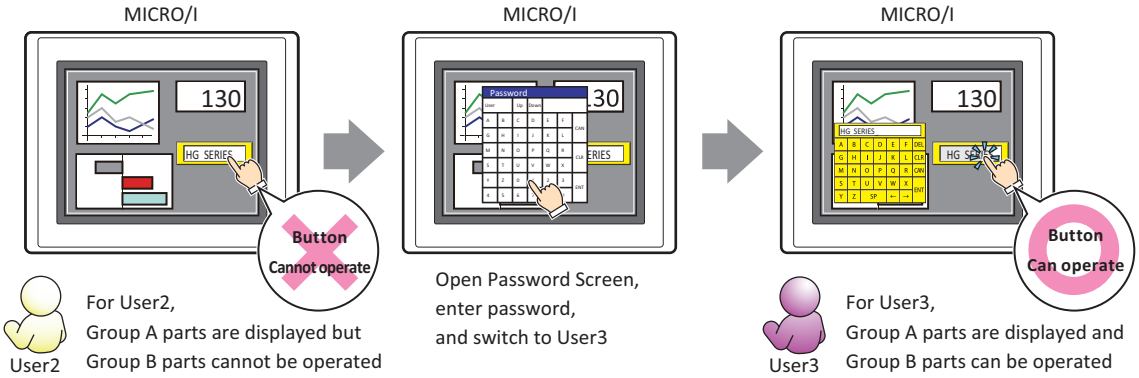
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



Since the display security group is Group A, User 2 (of Group A) can view the buttons. But since the input security group is Group B, User 2 cannot operate the buttons.
Suppose that the Password Screen is now opened and a switch is made to User 3, who is part of both Group A and Group B. Group A buttons can be displayed, and Group B buttons can be operated.



■ No Touch Sound

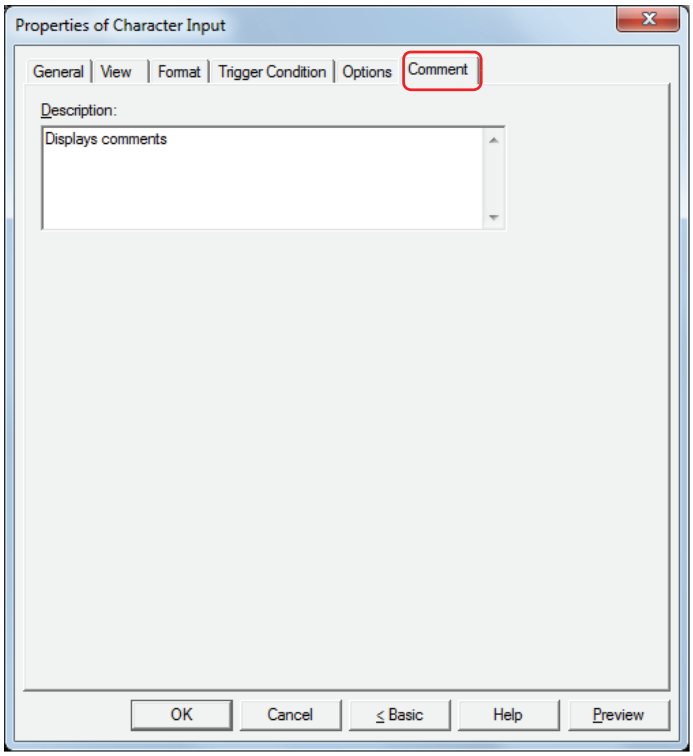
This function is to disable touch sounds only for specified parts when the MICRO/I makes touch sounds.
Select this check box to display disable touch sounds for this part.

To enable touch sounds on the MICRO/I, select the **Enable Touch Sound** check box under the **System** tab of the **Project Settings** dialog box.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

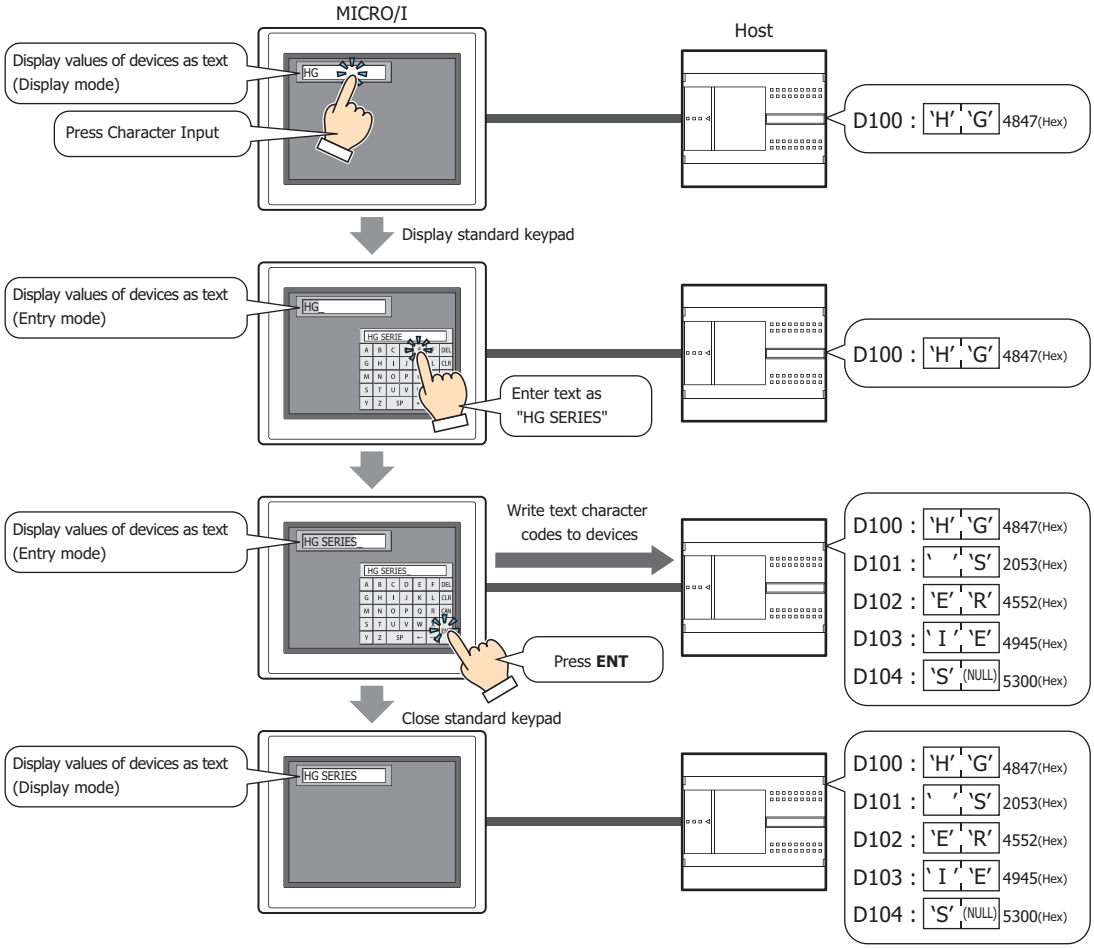
Example: When mousing over the Character Input on the editing screen

2.4 How to Enter Text

Use the keypad or key buttons to write character codes to devices with the Character Input. The input methods are as follows.

Pressing the Character Input and Entering Text from the Standard Keypad

Arrange a Character Input on the screen and in its properties dialog box, on the **General** tab, under **Keypad**, select **Standard** for **Type**.

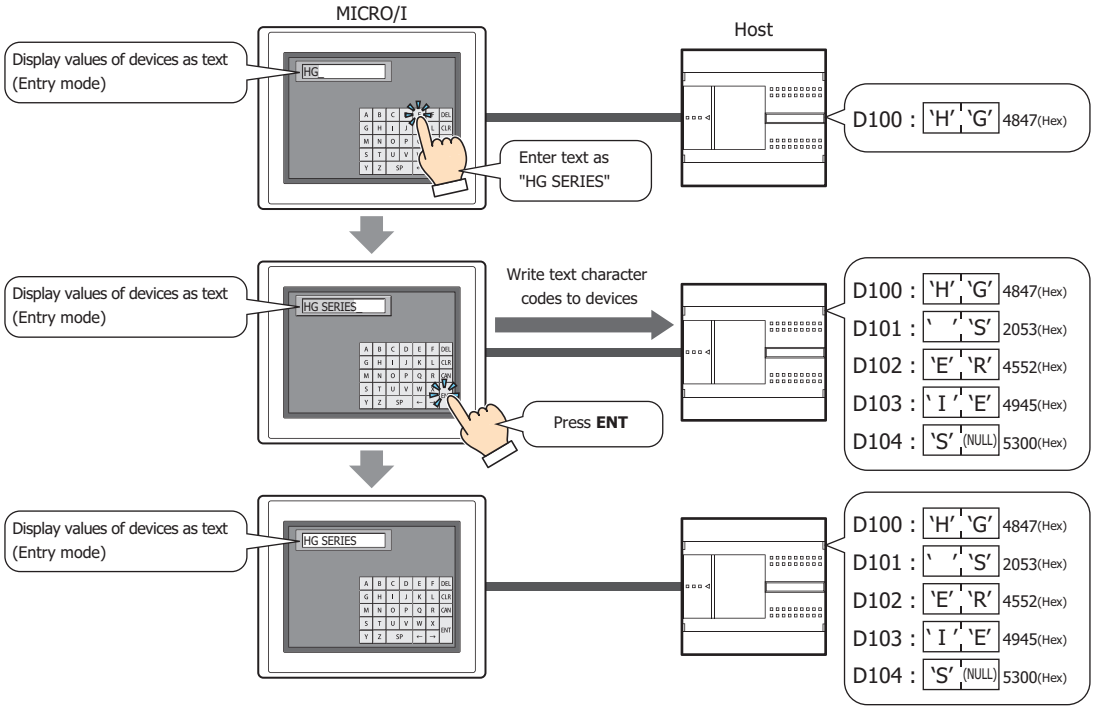


When the following operations are performed, entry mode is canceled and the current values of devices are displayed as character codes on the Character Input. To enter text, press the Character Input again to select it and set it to entry mode.

- **CAN** was pressed
- When the **Focus is moved by ENT button** check box on the **General** tab is cleared and **ENT** was pressed and a value was written to the device

■ **Without Pressing the Character Input, Directly Entering Text from a Keypad on the Same Screen**

Arrange a Character Input and a keypad on the same screen. In the properties dialog box for the Character Input, on the **General** tab, under **Keypad**, select **Current Screen** for **Type** and select the **Always Entry Mode** check box.



■ **Changing the Language and Entering Text**

Select the **Change Font with Device** check box on the **Format** tab in the properties dialog box.

It is convenient to use this setting together with the text group settings.

The font and popup screen with this setting will change simultaneously with the text group change and text can be entered with the same font as the text group.

Select the **Use Dynamic Text** check box in the **Text Group Settings** dialog box and specify the same device in **Trigger Device** as the **Trigger Device** for this setting.

2.5 String Data Storage Method

The entered text is stored in the upper byte and lower byte according to the **Storage Method of String Data** setting. **Storage Method of String Data** is configured on the **System** tab in the **Project Settings** dialog box. For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

Example: When the destination device is LDR 100 and the entered text is ABCDE

- When **from Upper byte** is selected for **Storage Method of String Data**

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'A' = 41 (hex)	'B' = 42 (hex)
LDR 101	'C' = 43 (hex)	'D' = 44 (hex)
LDR 102	'E' = 45 (hex)	0

NULL terminating character

- When **from Lower byte** is selected for **Storage Method of String Data**

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'B' = 42 (hex)	'A' = 41 (hex)
LDR 101	'D' = 44 (hex)	'C' = 43 (hex)
LDR 102	0	'E' = 45 (hex)

NULL terminating character

When handling strings, 0 is written to the device as the NULL terminating character and treated as the end of the string.

2.6 Advanced Usage

● Using the System Area

- When finished entering text by pressing **ENT**, 1 is written to the System Area 2 Character Input Setting Complete bit (address+3, bit 5).
- When **CAN** is pressed, entry mode is canceled and 1 is written to the System Area 2 Character Input Setting Cancel bit (address+3, bit 6). However, if the keypad is closed by pressing ☒ (close) on the popup screen's title bar or another Character Input is pressed and selected before finished entering the text by pressing **ENT**, entry mode is canceled and 1 is not written to the System Area 2 Character Input Setting Cancel bit (address+3, bit 5).
- To clear the System Area 2 character input setting complete bit or the character input setting cancel bit, write 1 to System Area 1 Character Input Setting Clear bit (address+1, bit 11). To automatically clear these bits when the Character Input keypad is pressed in entry mode, select the **Clear Keypad bit in System Area automatically** check box on the **System** tab in the **Project Settings** dialog box.

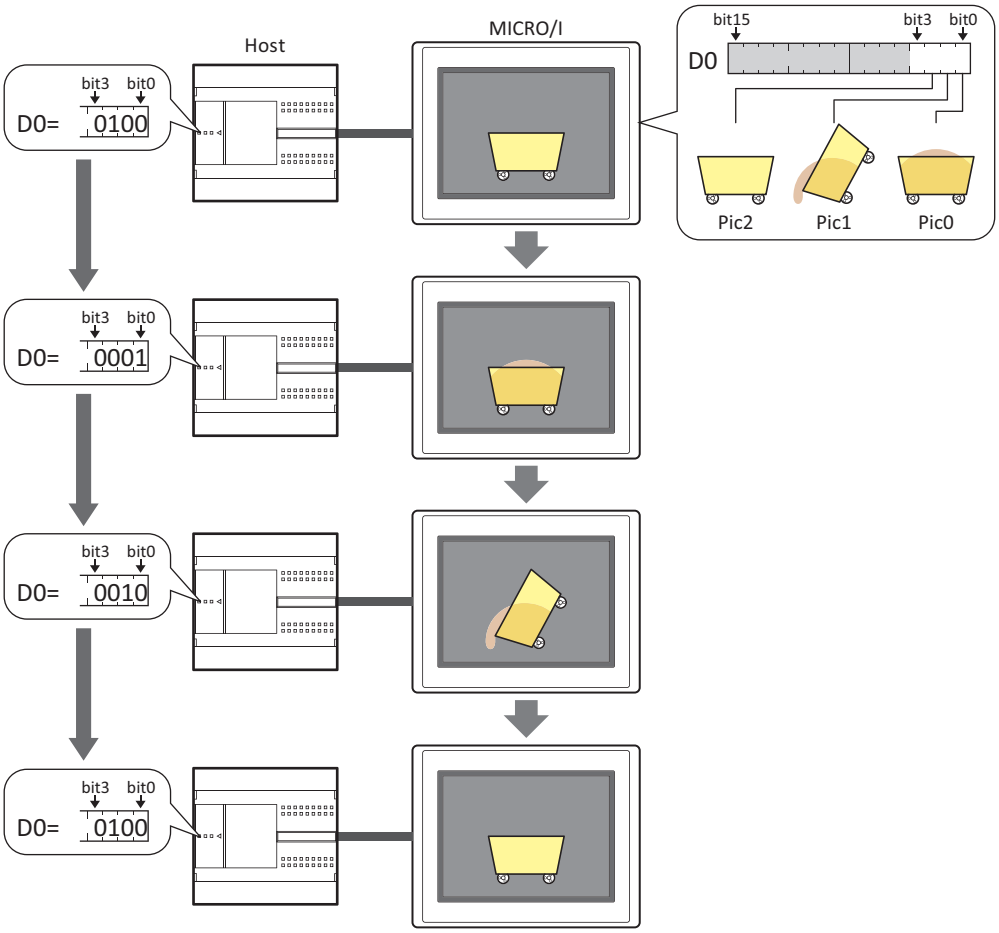
3 Picture Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

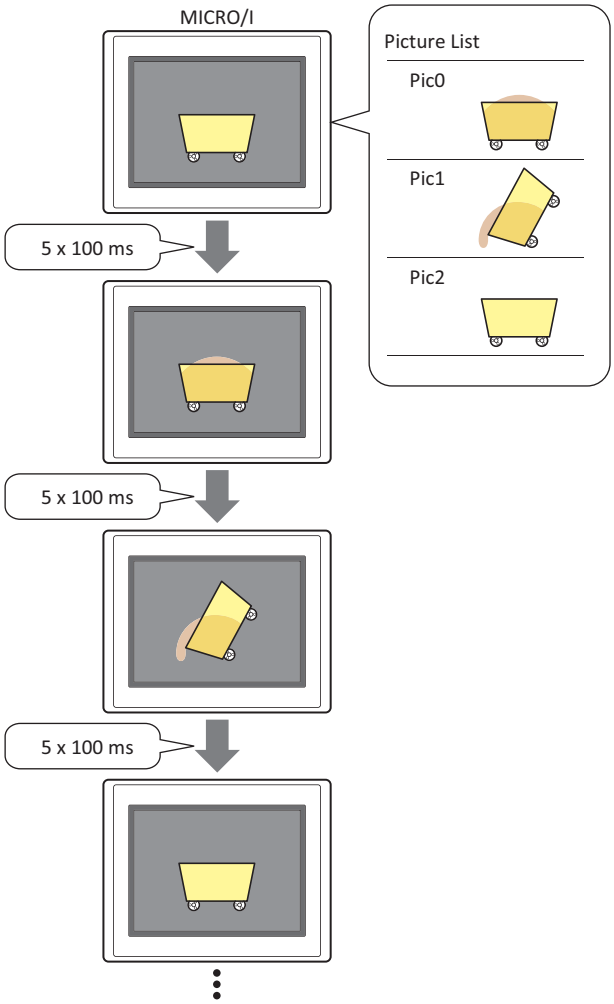
3.1 How the Picture Display is Used

The Picture Display displays pictures. It can change, move, or scale the displayed picture according to value of device.

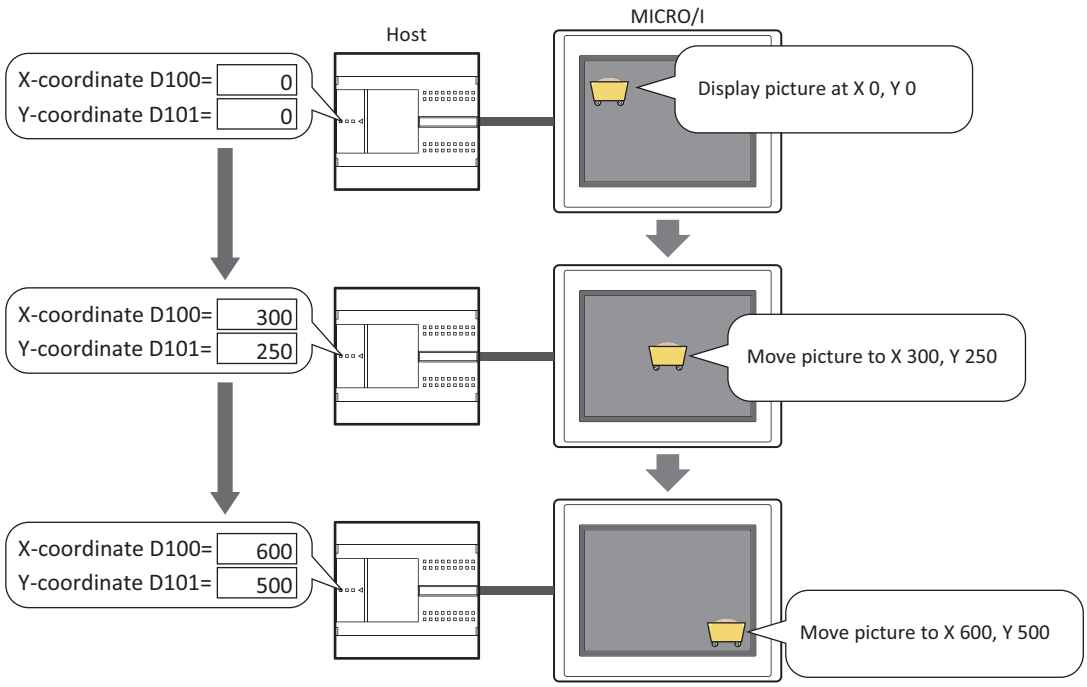
- Switch and display pictures by value of device



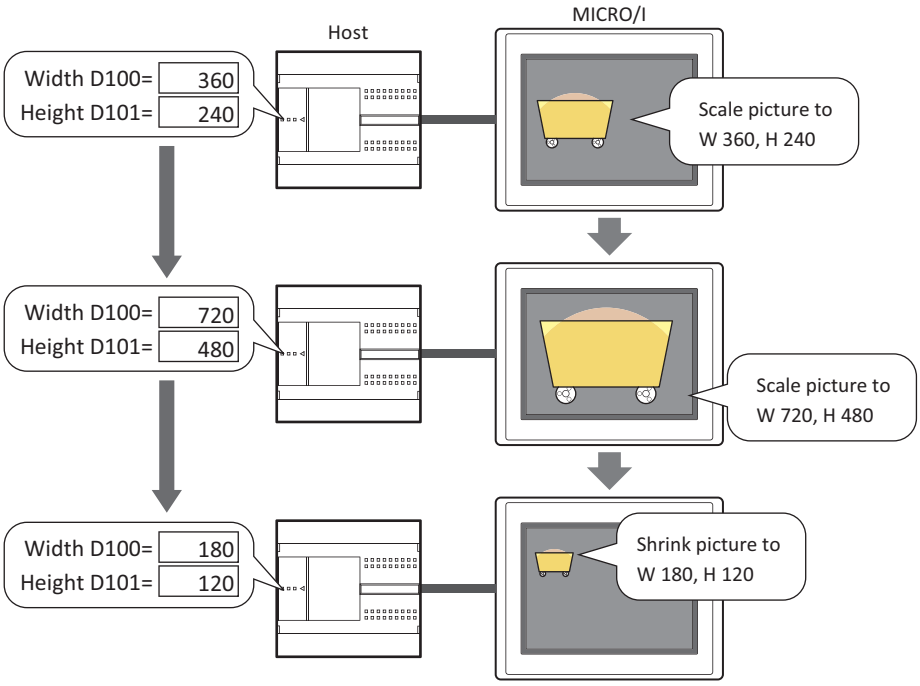
- Switch and display pictures at a regular interval



- Move the picture position by values of devices



- Scale the size of the picture by values of devices and display it

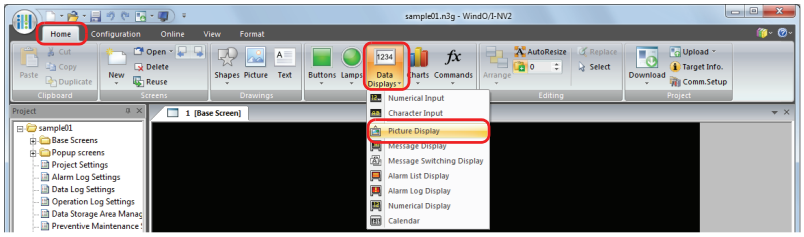


When the size of pictures to switch differs and the **Dynamic Size** check box is cleared, all the pictures are displayed with the same size as Pic0.

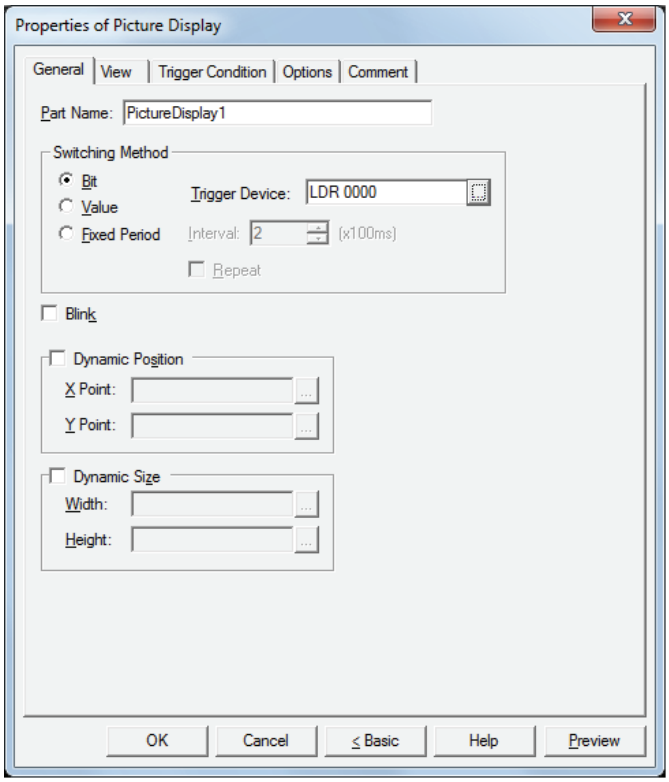
3.2 Picture Display Configuration Procedure

This section describes the configuration procedure for Picture Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Picture Display**.



2. Click a point on the edit screen where you wish to place the Picture Display.
3. Double-click the dropped Picture Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

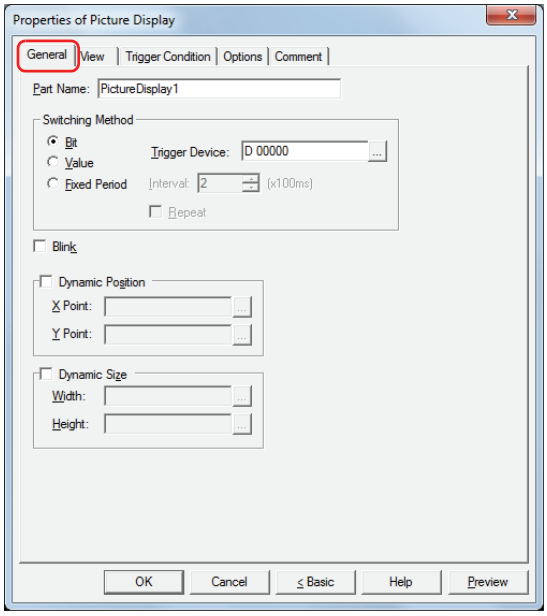


The **Trigger Condition** tab and **Options** tab only appear in **Advanced** mode.
To switch to Advanced mode, click **Advanced**.

3.3 Properties of Picture Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

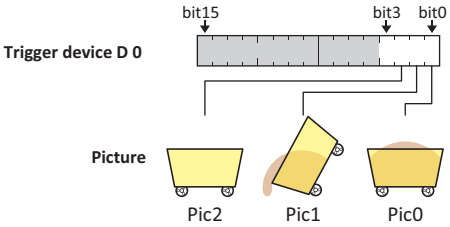
Enter a name for the part. The maximum number is 20 characters.

■ Switching Method

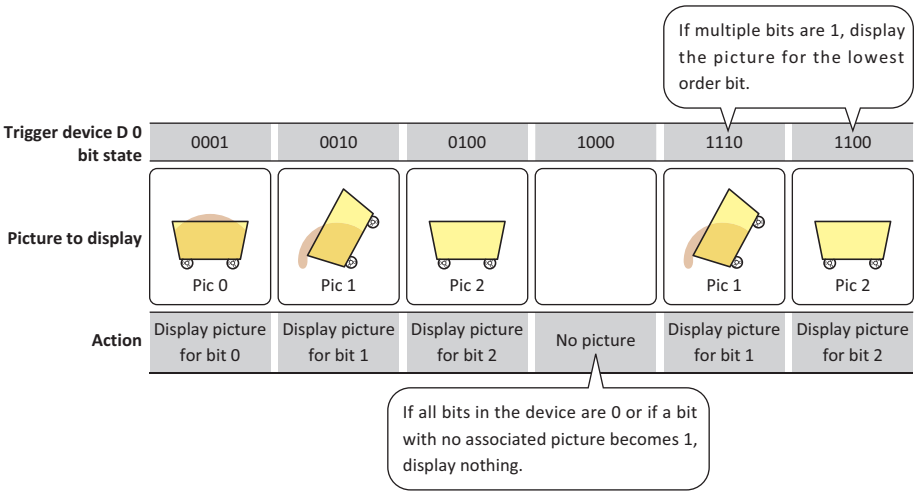
Specifies the method for switching pictures to display from the following. Register pictures in **Picture List** on the **View** tab.

Bit: Switches the picture to display according to the status of bits in a device.

Example: When **Bit** is selected and the bits of trigger device D 0 are allocated to the following pictures.

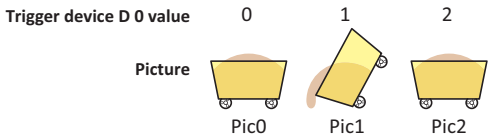


Switches the picture to display according to the status of the bits.

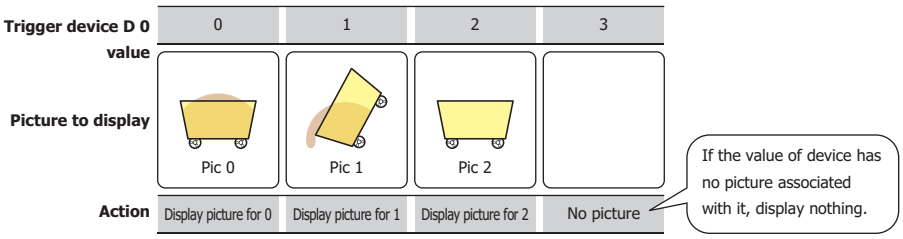


Value: Switches the picture to display according to the value of the device.

Example: When **Value** is selected and the values of device D 0 are allocated to the following pictures.



Switches the picture to display according to the value of the device.



Trigger Device: Specifies the word device to use as the condition for switching pictures.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

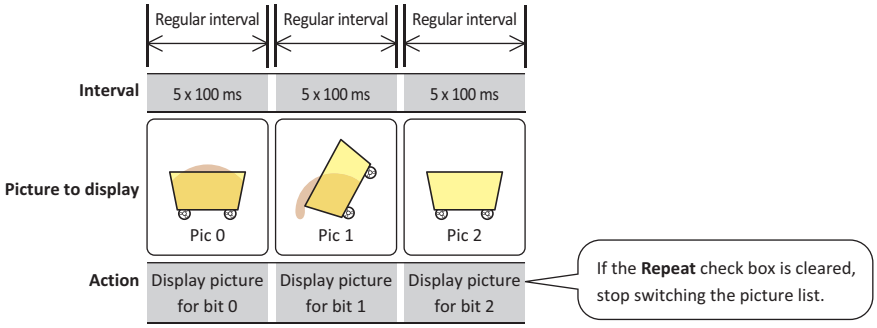
This option can only be configured when **Bit** or **Value** is selected.

When the size of pictures to switch differs and the **Dynamic Size** check box is cleared, all the pictures are displayed with the same size as Pic0.

Fixed Period*1: Switches the pictures to display at a regular interval in picture number order on the picture list.

Example: When **Fixed Period** is selected and the following pictures are allocated to the picture list.

Switches the pictures to display at a regular interval in picture number order on the picture list.



Interval: Specifies the interval to switch pictures as 1 to 3600 (100 ms units).

This option can only be configured when **Fixed Period** is selected.

Repeat: Select this check box to repeat displaying pictures from the start of the picture list when the picture at the end of the list is displayed.

This option can only be configured when **Fixed Period** is selected.

When **Fixed Period** is selected, the picture may not be displayed when the interval is shorter than the scan time for the screen on the MICRO/I. The maximum value for the MICRO/I scan time can be checked by the value of HG special register LSD 4. Refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

*1 HG2G-5F, HG3G/4G only

Flash

Select this check box to flash the displayed pictures.

Dynamic Position*2

Select this check box to move and display the picture by specifying the coordinates of the picture as values of devices.

X Point: Specifies the word device that is the X-coordinate of the picture.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

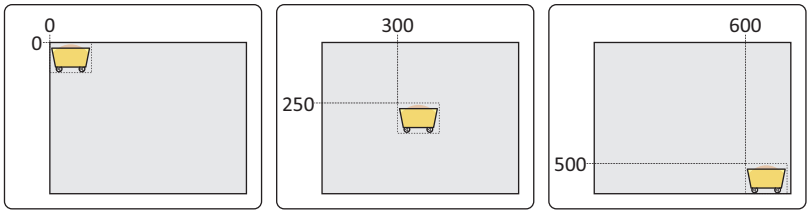
Y Point: Specifies the word device that is the Y-coordinate of the picture.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the X-coordinate is D 100 and the Y-coordinate is D 101
The picture is moved to the values of D 100 and D 101.

X-coordinate device D 100 value	0	300	600
Y-coordinate device D 101 value	0	250	500

Position of picture to display



Dynamic Size*2

Select this check box to scale the picture by specifying the size of the picture as values of devices.

Width: Specifies the word device that is the width of the picture.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

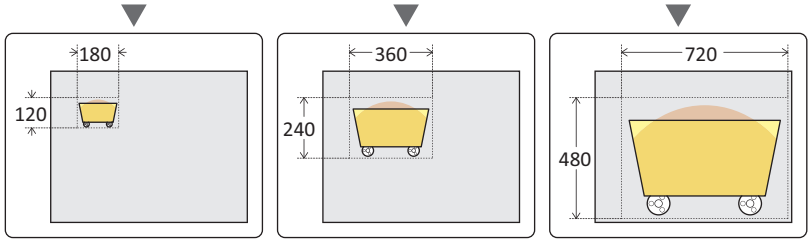
Height: Specifies the word device that is the height of the picture.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the width device is D 100 and the height device is D 101
The picture is displayed with its size scaled to the values of D 100 and D 101.

Width device D 100 value	180	360	720
Height device D 101 value	120	240	480

Size of picture to display

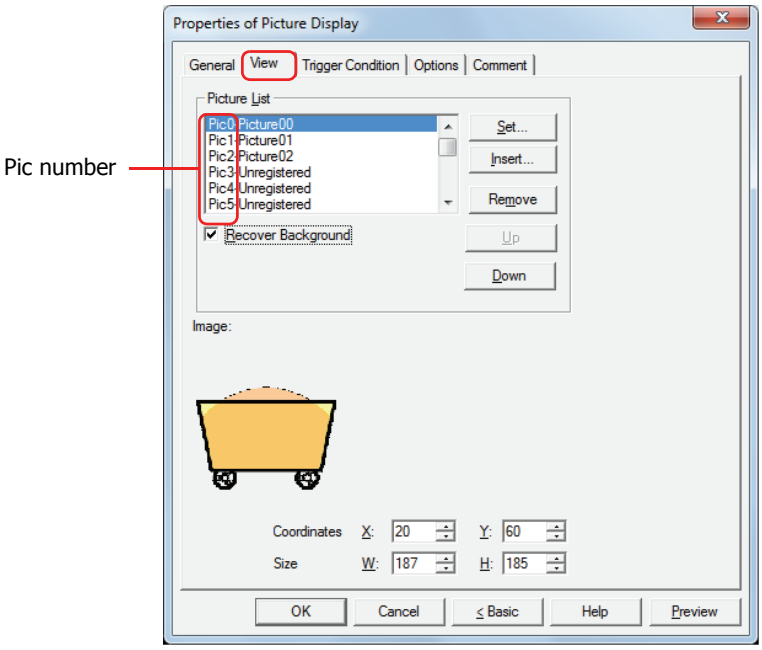


When the size of pictures to switch differs and the **Dynamic Size** check box is cleared, all the pictures are displayed with the same size as Pic0.

When moving and scaling pictures, set the values of devices so the picture is not moved or scaled outside the screen's display area.

*2 Advanced mode only

● View Tab



■ Picture List

Registers the pictures to display on the Picture Display. The picture number (Pic number) and the file name of the registered picture are displayed in the list.

Set: Registers a picture to the list. If you select a Pic number with a picture that is already registered, that number is overwritten with the new picture.

Select a Pic number on the list and click this button to display Picture Manager. Specify the picture to register with Picture Manager.

Insert: Inserts the picture in the position selected on the list.

Select the Pic number on the list at the position to insert the picture and click this button to display Picture Manager. Specify the picture to insert. The picture at the insertion point shifts one Pic number down. The picture cannot be inserted when pictures are registered to all the Pic numbers.

Remove: Deletes the registered picture from the list.

Select a Pic number on the list and click this button to delete the selected picture from the list.

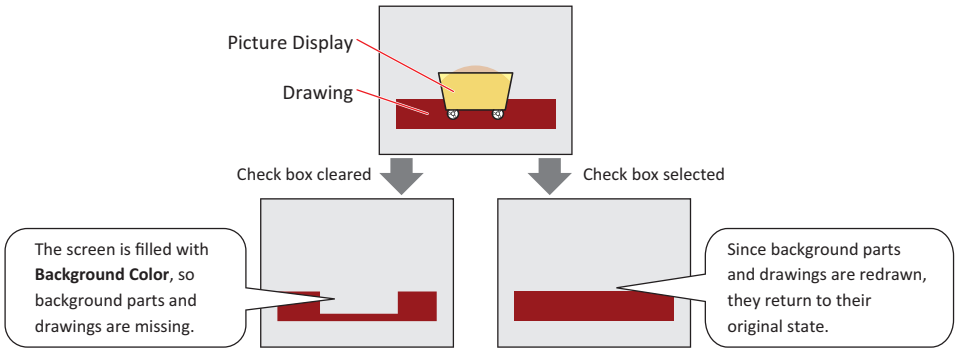
Up: Shifts the selected settings upward in the list.

Down: Shifts the selected settings downward in the list.

Recover Background*1:

Select this check box to recover the background of the area where the picture had been displayed after the picture is switched. When this check box is cleared, the background is filled with the screen's **Background Color**.

When parts or drawings are arranged so they overlap the background of the Picture Display (below), the background of parts and drawings is displayed as follows if the Picture Display picture is hidden.

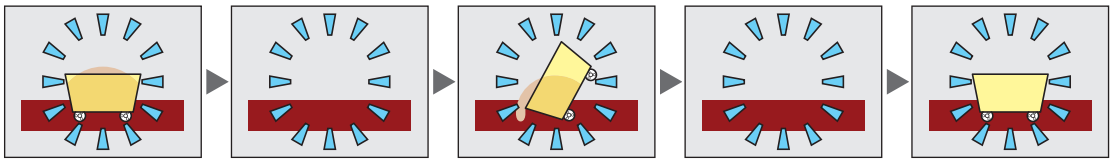


For the HG2G-5F and the HG3G/4G, the function to recover the background is always enabled, so this item is not displayed. However, when the background part is the Alarm List Display, Alarm Log Display, Bar Chart, Line Chart, or Pie Chart, the missing sections will remain.

*1 Advanced mode only

If the **Recover Background** check box is selected, the number of parts that can be placed on a single screen decreases. If an error message appears when the Picture Display is displayed on the MICRO/I screen, clear the **Recover Background** check box or reduce the number of parts.

- When the **Dynamic Position** check box or the **Dynamic Size** check box is selected on the **General** tab, the **Recover Background** check box cannot be selected.
- When the **Recover Background** check box and the **Flash** check box on the **General** tab are selected, the picture is repeatedly displayed and hidden.



Image

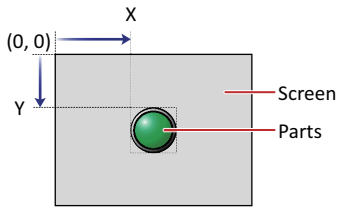
Displays picture for the Pic number that has been selected in the Picture List.

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

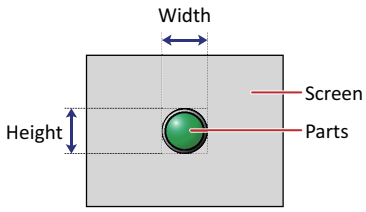


Size

W, H: Sets width and height to define the size of parts.

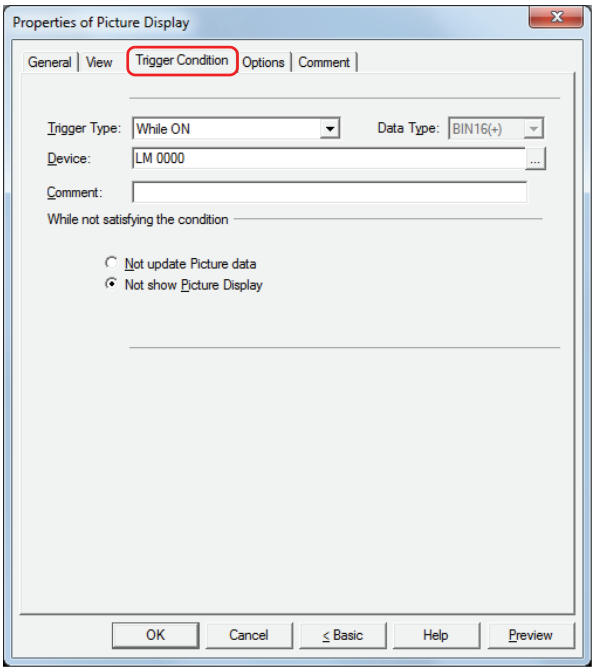
W: 2 to (base screen horizontal size)

H: 2 to (base screen vertical size)



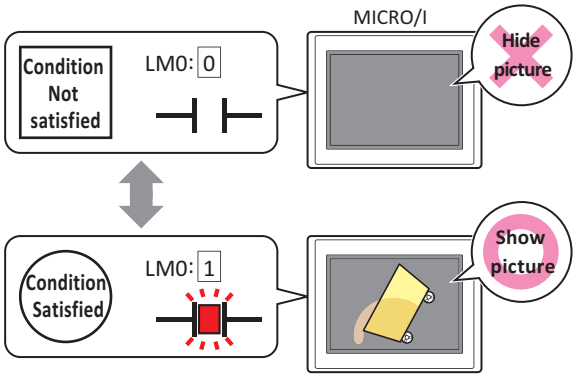
● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



The Picture Display is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. Select the operation when the condition is not satisfied as **Not update Picture data** or **Not show Picture Display** under **While not satisfying the condition**.

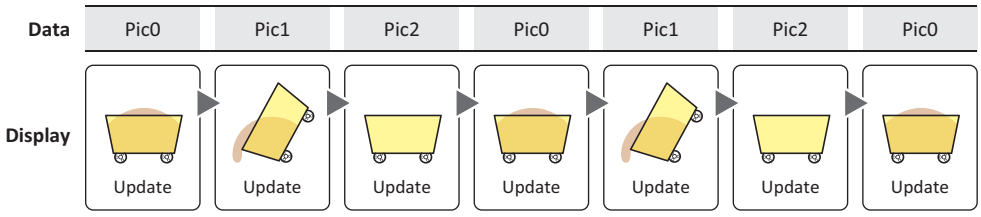
Example: When **Trigger Type** is **While ON, Device** is **LM 0**, and **While not satisfying the condition** is **Not show Picture Display**
While LM 0 is 0, the condition is not satisfied and the Picture Display does not display the picture.
While LM 0 is 1, the condition is satisfied and the Picture Display displays the picture.



■ Trigger Type

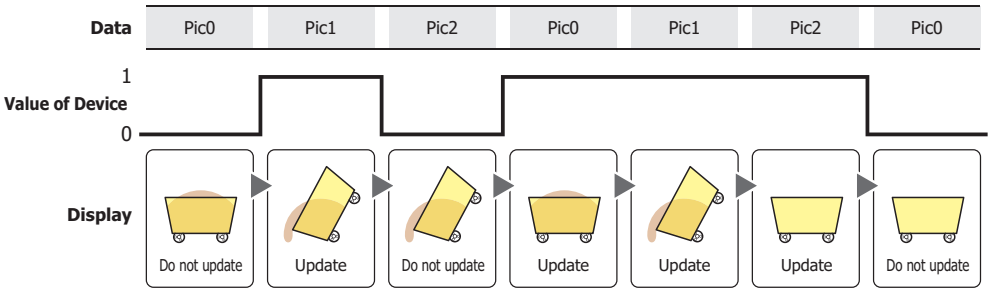
Selects the condition to enable the Picture Display from the following.

Always visible: The Picture Display is always enabled.



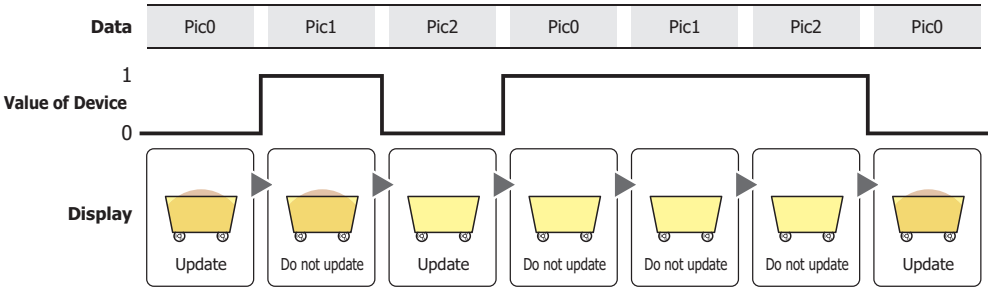
While ON: Enables the Picture Display when the value of device is 1.

Example: When **While not satisfying the condition** is **Not update Picture data**



While OFF: Enables the Picture Display when the value of device is 0.

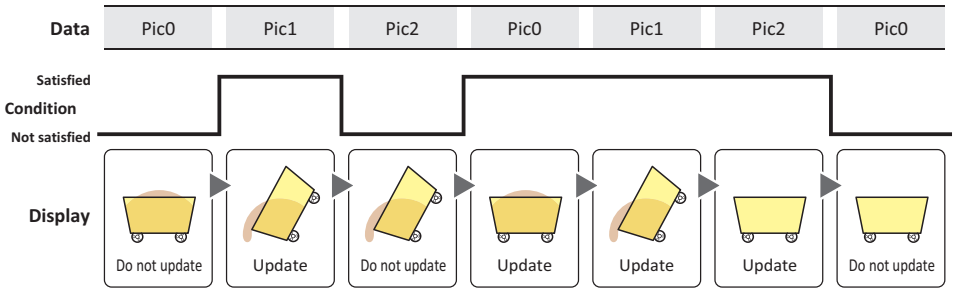
Example: When **While not satisfying the condition** is **Not update Picture data**



While satisfying the condition:

Enables the Picture Display when the condition is satisfied.

Example: When **While not satisfying the condition** is **Not update Picture data**



■ Data Type

Selects the data type to be handled by the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ Device

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Condition

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

■ Comment

Used for entering comments about trigger conditions. Maximum number is 80 characters.

■ While not satisfying the condition

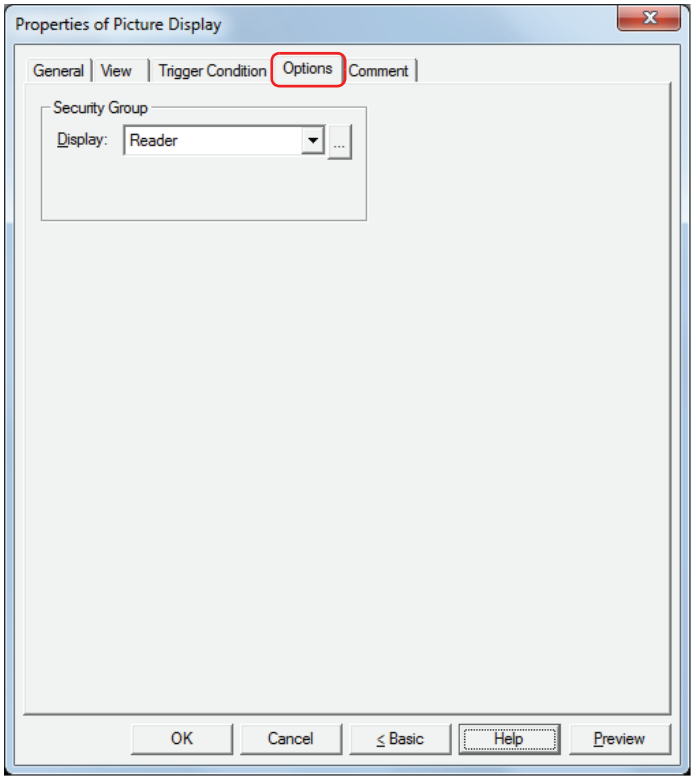
Selects operation of parts when condition is not satisfied.

Not update Picture data: The last updated graphic is displayed. The graphic does not change.

Not show Picture Display: Graphic is not displayed.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

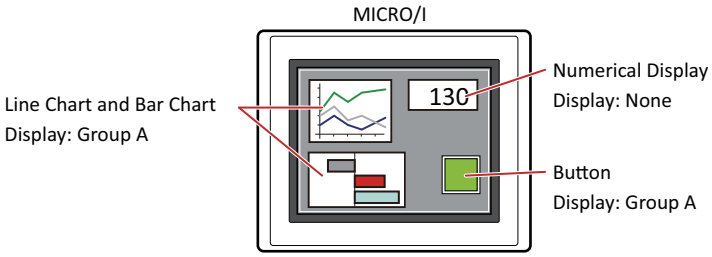
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

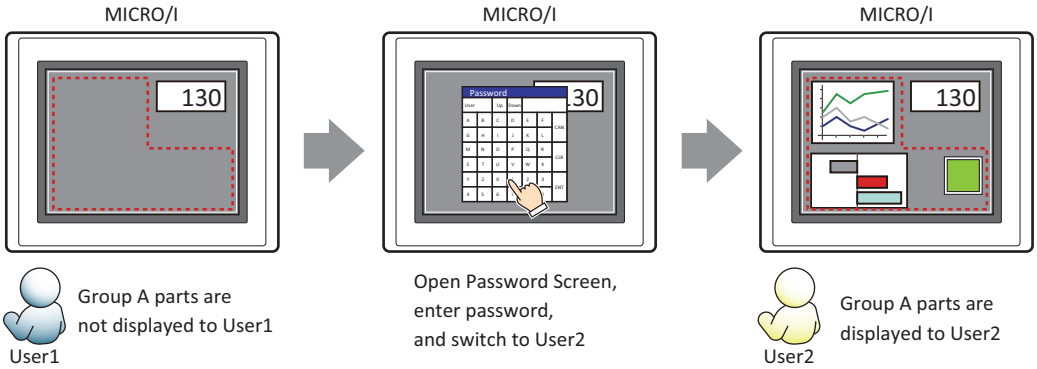
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



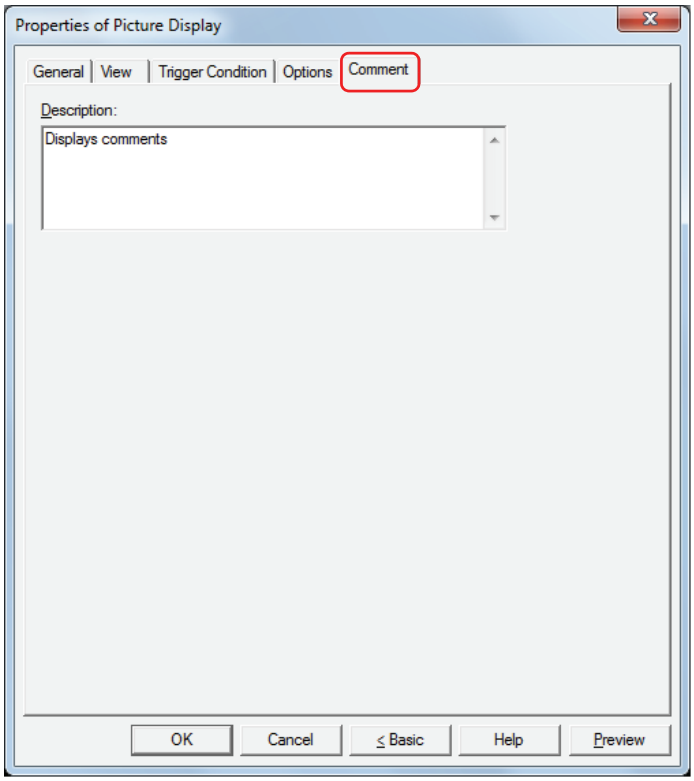
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

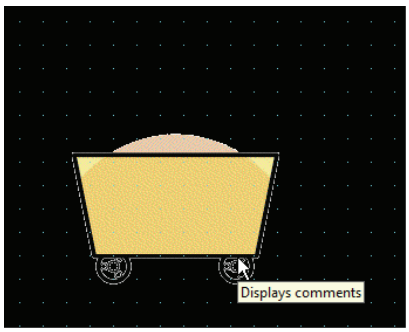
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Picture Display on the editing screen



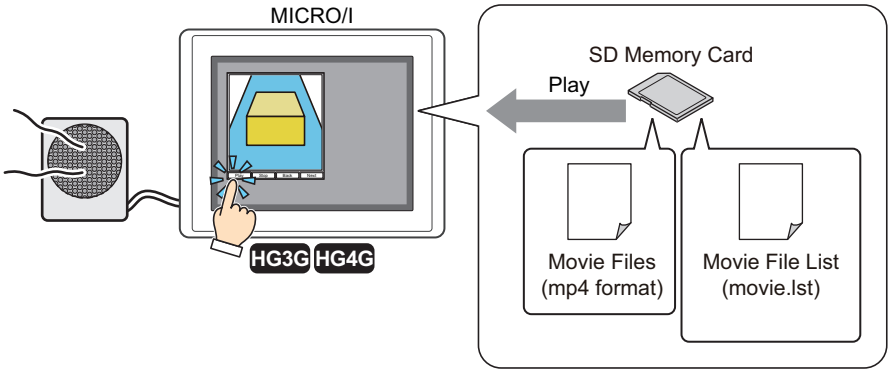
4 Video Display

This function is only supported by models that are equipped with a video interface.

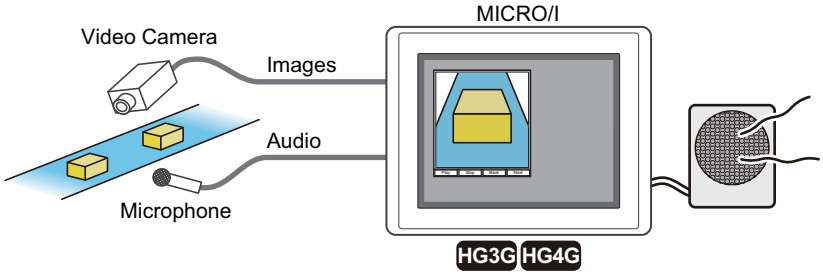
HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

4.1 How the Video Display is Used

- Play movie files

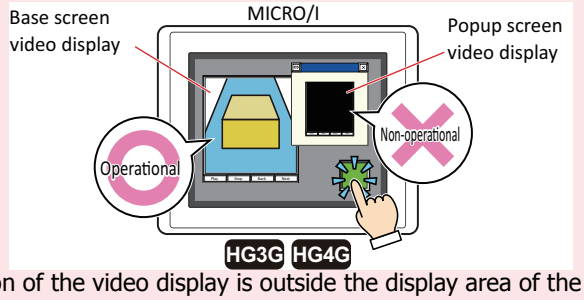


- Display video camera images on the MICRO/I and output microphone audio from a connected speaker



Video Display can be operated using the Key Buttons, Multi-Buttons, and Multi-Commands.

- When Video Displays have been placed on two or more screens, only the Video Display that was displayed first will operate.
  Example: If the Popup Screen with a Video Display is opened from the Base Screen which also contains a Video Display, only the Video Display on the Base Screen will operate.

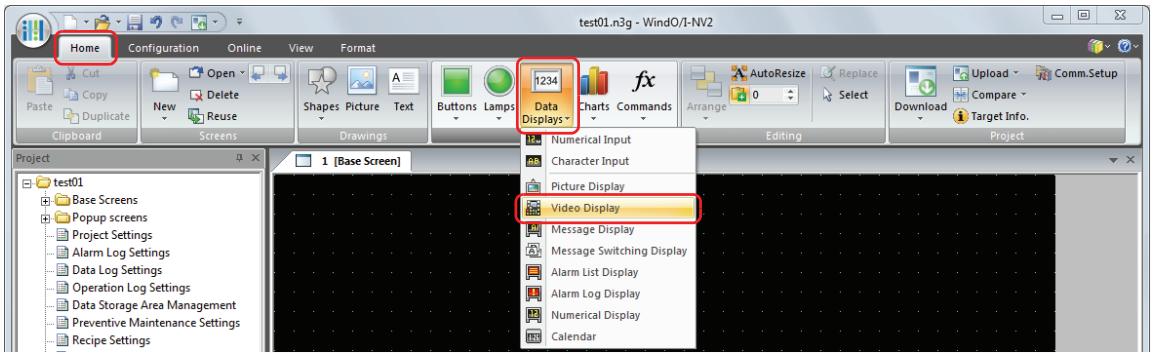


- If a portion of the video display is outside the display area of the screen, the video display will not display anything. If a video display on a popup screen is moved outside the display area of the screen, the movie playback and displayed video will stop.
- Depending on the size of the video display, the displayed image may be shrunk.
- When the frame size of the movie file to be played is less than or equal to half the size of the Video Display, the movie file cannot be played.
- While data is being recorded after an event occurs with the event recording function, while data is being recorded with parts, and while data is being saved to the memory card, movie files cannot be played. While data is recording after an event occurs and while data is being saved to the memory card, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

4.2 Video Display Configuration Procedure

This section describes the configuration procedure for the Video Display.

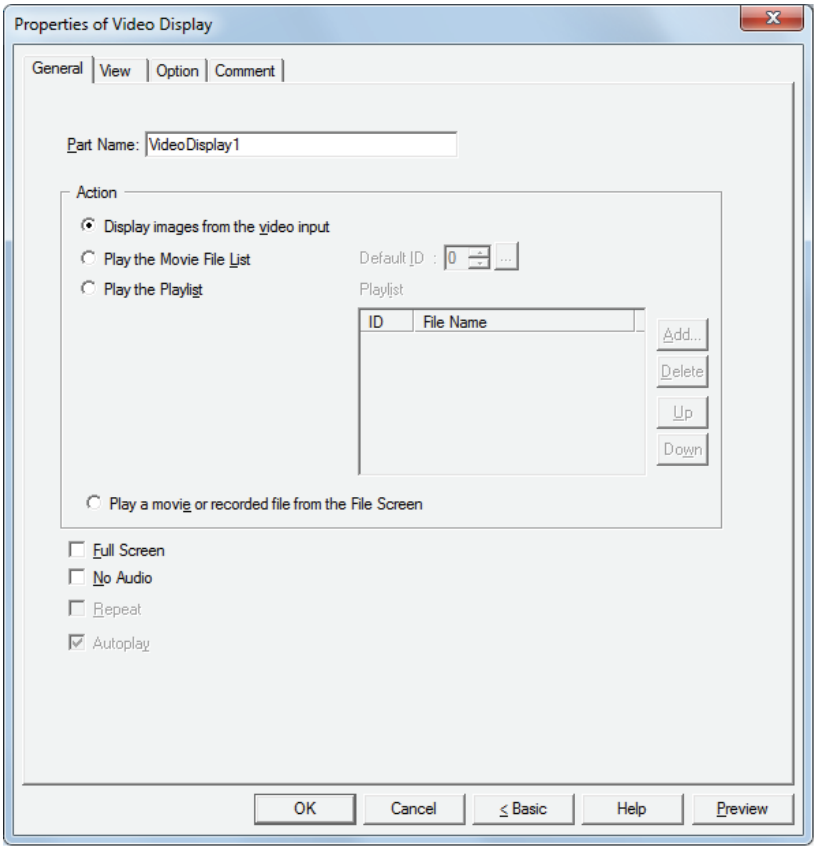
1 On the **Home** tab, in the **Parts** group, click **Data Display**, and then click **Video Display**.



2 Click a point on the edit screen where you wish to place the Video Display.

3 Double-click the dropped Video Display and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

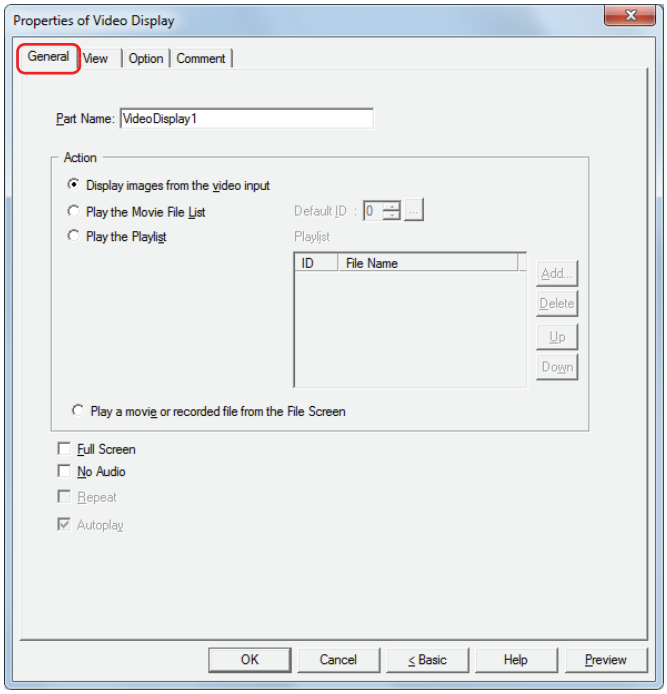


The **Options** tab only appears in Advanced Mode.
To switch to Advanced Mode, click **Advanced**.

4.3 Properties of Video Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. Maximum number is 20 characters.

■ Action

Select the content to execute on the Video Display from the following.

Display images from the video input: Displays images from the video interface and outputs sound from the audio interface.

Play the Movie File List: Plays movie files in order of ID number on the movie file list.

It is a list of movie files that have been registered in the Multimedia Function settings. You cannot change the order when you play files. For details, refer to Chapter 22 "Multimedia Function" on page 22-1.

Default ID: Pressing the play button specifies the ID number (1 to 64) of the movie file to be played.

Clicking ... displays the **Multimedia Settings** dialog box. Select an ID number from the movie file list.

Play the Playlist: Plays movie files in order of the ID number on the playlist.

It is a custom list in which you need to register the movie files and then you can select from the list to play.

Playlist: Selects files to be played from the movie file list and then creates a list of files to be played.

This can be set only when **Play the Playlist** is selected.

ID: Displays the movie file list ID.

File Name: Displays the file path of the movie file.

Add : Adds a movie file (1 to 8) to the list. Clicking this button opens the movie file list. Specify files using the movie file list.

Delete:	Deletes files from the list. Select a file from the list and then click this button. Movie files deleted from the playlist will not be deleted from the movie file list.
Up:	Shifts a selected file upward on this list.
Down:	Shifts a selected file downward on this list.

Play a movie or recorded file from the File Screen:

Selects and plays files using the File Screen. For details, refer to "4.4 File Screen" on page 10-65.

■ **Full Screen**

Select this to set the entire screen of the MICRO/I to the display area of an image or movie file.

To exit Full Screen, place a Key Button (**Restore**) on the same screen as the Video Display and press that Key Button while in Full Screen.

■ **No Audio**

Select this to play movie files without sound.

■ **Repeat**

Select this to repeat playback of a movie file.

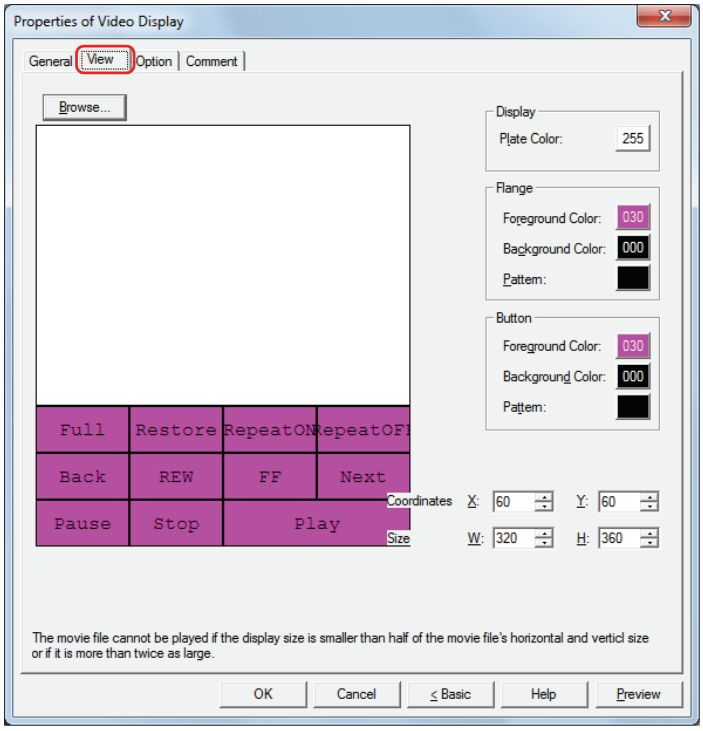
This can be set only when **Play the Movie File List**, **Play the Playlist**, or **Play a movie or recorded file from the File Screen** is selected in **Action**.

■ **Autoplay**

Select this to automatically play movies when a Video Display is shown on the screen. When **Display images from the video input** is selected for **Action**, movie files are always automatically played.

However, while data is being recorded after an event occurs with the event recording function, while data is being recorded with parts, and while data is being saved to the memory card, movie files are not automatically played when the Video Display is shown on the screen.

● **View** Tab



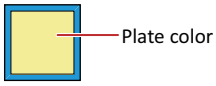
■ **Browse**

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ **Plate Color**

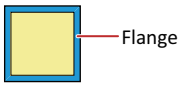
Selects the plate (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ **Flange**

Foreground Color, Background Color:	Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades). Click **Color** to display the Color Palette. Select a color from the Color Palette.
Pattern:	Selects a pattern for the flange. Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



Buttons

Foreground Color, Background Color: Selects the foreground and background colors of the buttons (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the button.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

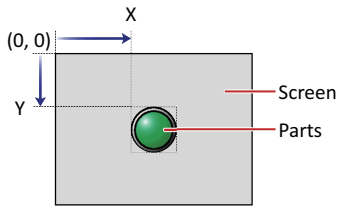
Can be set only when there are grouped Key Buttons.

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

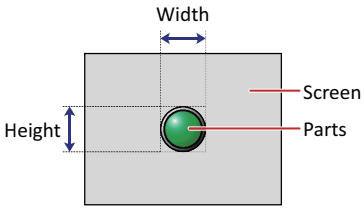


Size

W, H: Sets width and height to define the size of parts.

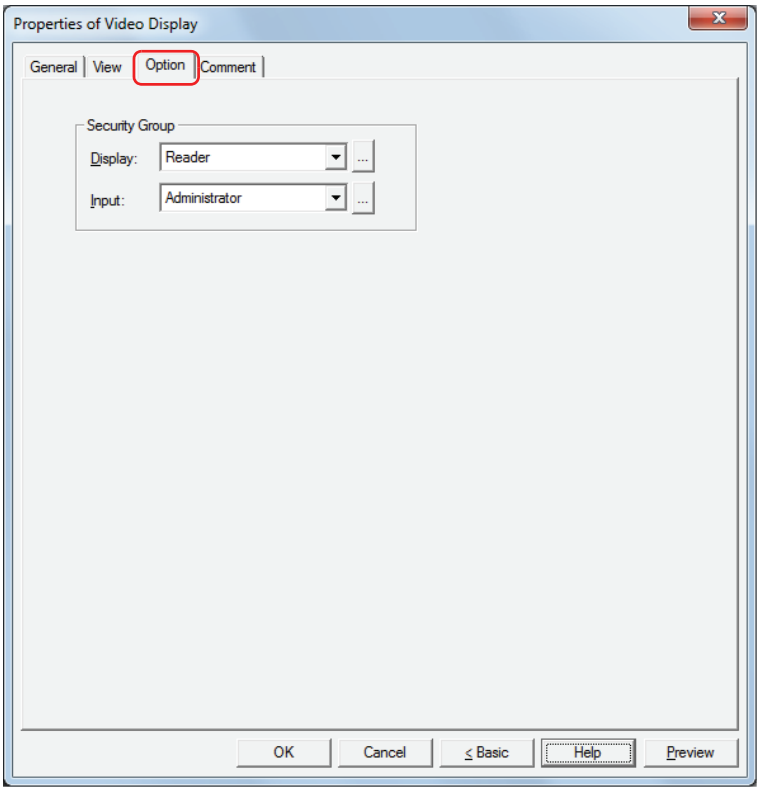
W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Groups**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.

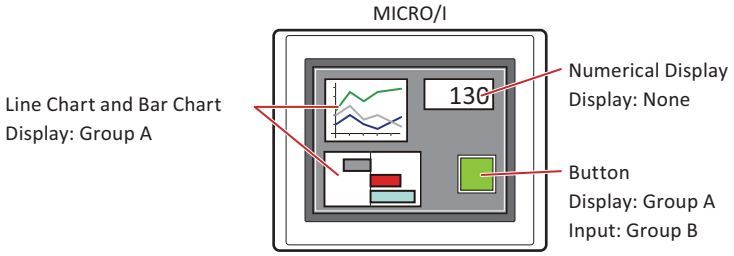
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

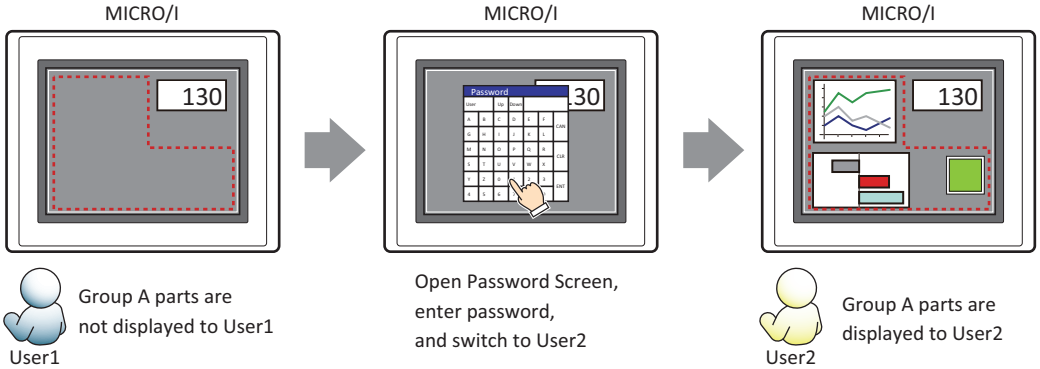
- The security group for input can only be configured when there are grouped key buttons.
- For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

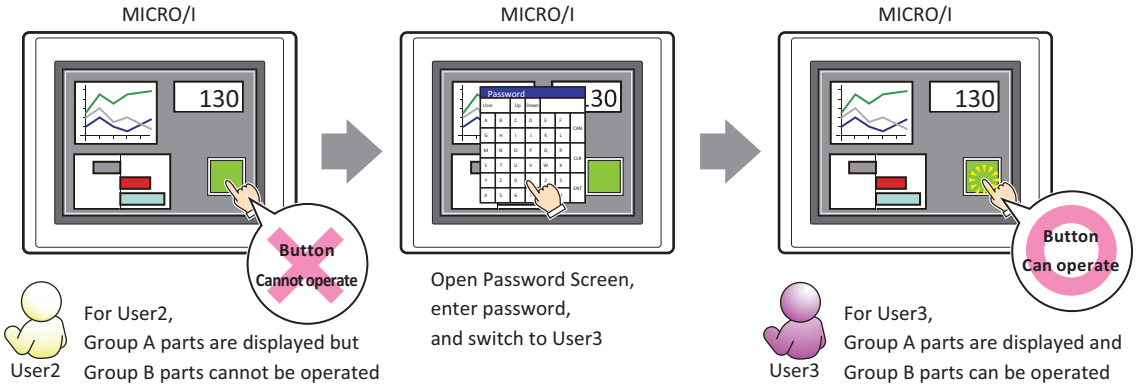
User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B



For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



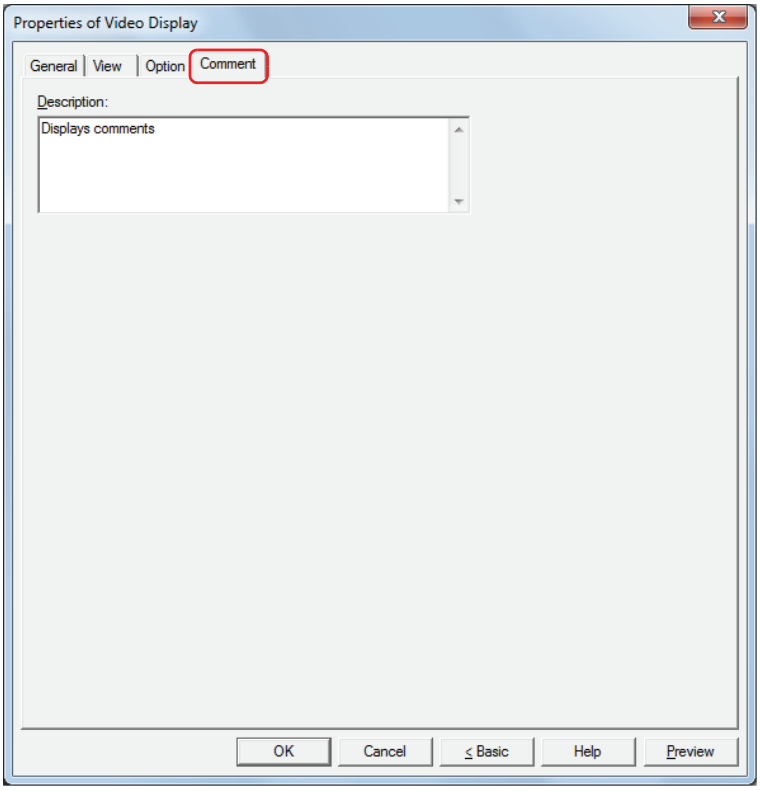
Since the display security group is Group A, User 2 (of Group A) can view the buttons. But since the input security group is Group B, User 2 cannot operate the buttons.
Suppose that the Password Screen is now opened and a switch is made to User 3, who is part of both Group A and Group B. Group A buttons can be displayed, and Group B buttons can be operated.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

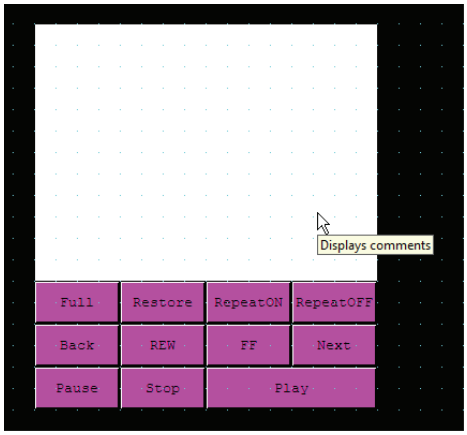
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Video Display on the editing screen

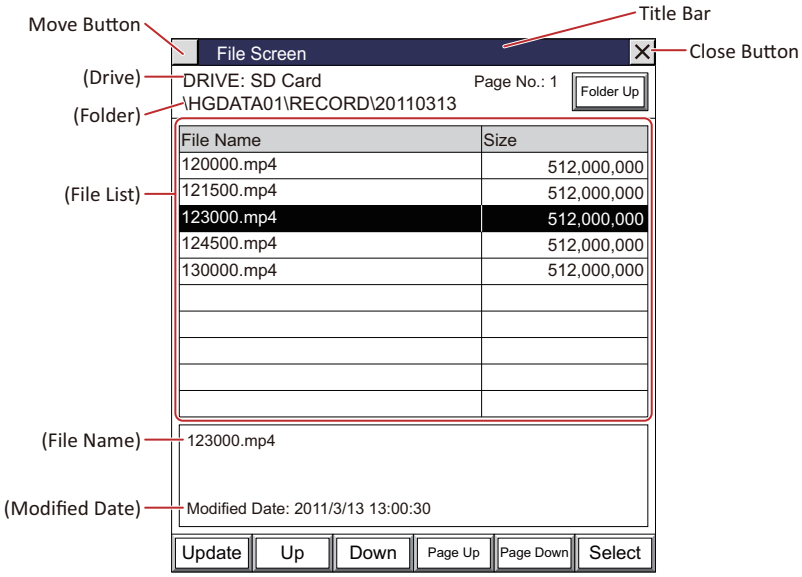


4.4 File Screen

With the File Screen, movie files can be selected from an SD Memory Card and then played on a Video Display.

When **Play a movie or recorded file from the File Screen** has been selected in **Action** for the Video Display, movie files can be selected with the File Screen and then played. **Action** is set in the **General** tab of the Video Display properties dialog box.

● File Screen Configuration



■ **Title Bar**

Displays the Title, ☐ (Move) button, and ☒ (Close) button.

☐ (Move) button: Moves the File Screen.

☒ (Close) button: Closes the File Screen.

■ **(Drive)**

Displays the selected drive. Displays as SD Card.

■ **(Folder)**

Displays the folder path of the currently selected folder.

- When the folder path exceeds 36 characters, up to 35 characters will be displayed.
- Once the File Screen is opened, the "RECORD" folder in the Memory Card Folder will be displayed. If the "RECORD" folder does not exist, the Memory Card Folder will be displayed.

■ **Page No.**

Displays the current page number.

■ **Folder Up button**

Moves to a folder that is 1 level higher in the hierarchy.

■ **(File List)**

File Name: Displays a list of the files and folders in the currently selected folder.

Size: For files, this displays the file size (bytes).
For folders, this is displayed as **Folder**.

Only MP4 format movie files will be displayed on the file list. File names should be alphanumeric characters only.

■ **(File Name)**

Displays the file name of the selected file. The maximum number for the file name is 120 characters.

- **(Modified Date)**
  Displays the updated date and time.
- **Update**
  Updates to the newest file list state.
- **Up**
  Moves the focus up by one level.
- **Down**
  Moves the focus down by one level.
- **Page Up**
  Moves up by one page.
- **Page Down**
  Moves down by one page.
- **Select**
  Selects the file or folder that is in focus.
  If a folder has been selected, this will open the folder and display its contents.

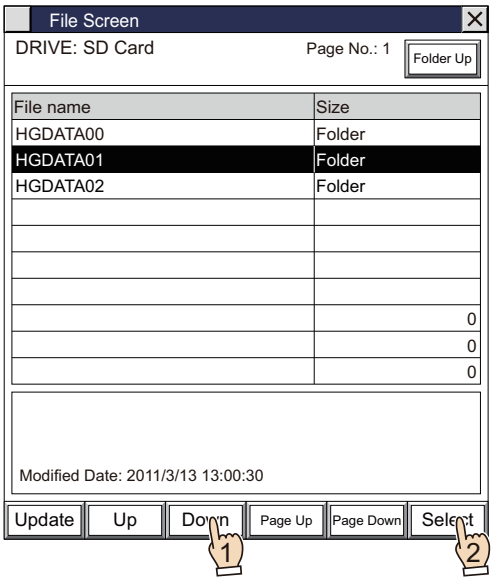
● Select a Movie File

Display the File Screen on the Base Screen and select a movie file from a Memory Card.

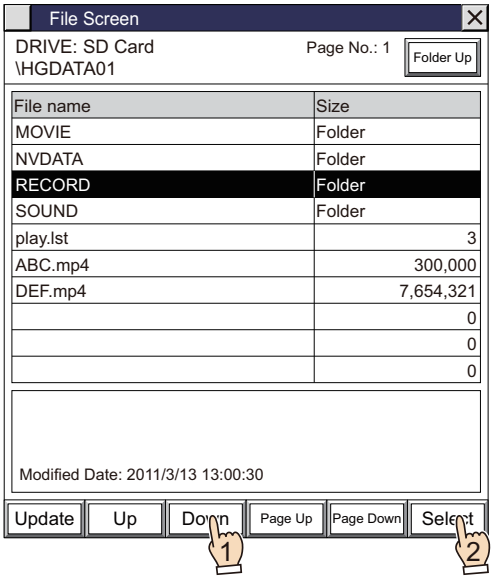
1 Press the Goto Screen Button or Multi-Button that has been set to **Open File Screen** or execute the Goto Screen Command or Multi-Command.
The File Screen will be displayed.

2 Select the movie file to be played.
Example: When selecting the movie file "123000.mp4" in the "20110313" folder of the "RECORD" folder located in the memory card folder "HGDATA01":

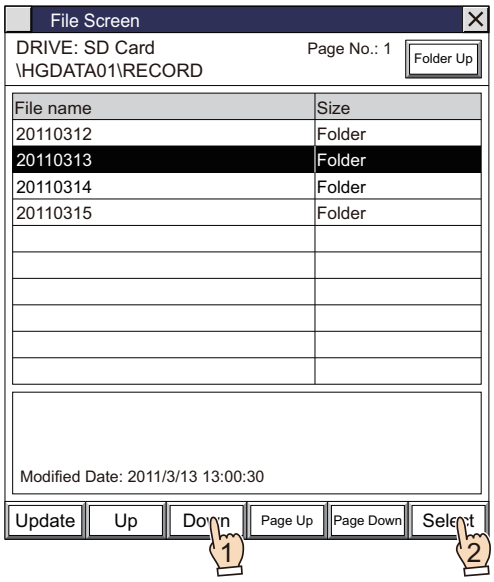
1. Press **Down** to select "HGDATA01" and then press **Select**.
The contents of the "HGDATA01" folder will be displayed.



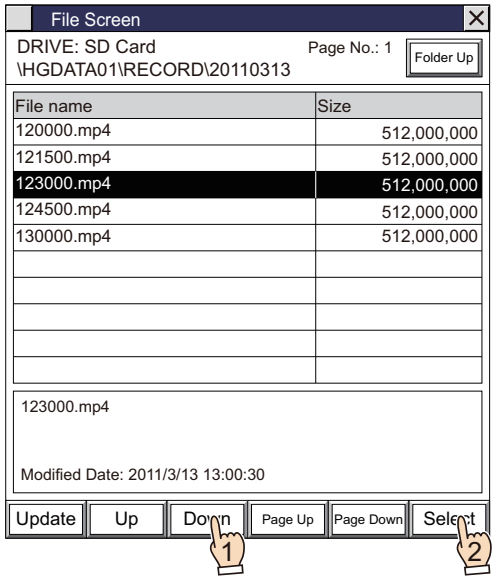
2. Press **Down** to select "RECORD" and then press **Select**.
The contents of the "RECORD" folder will be displayed.



3. Press **Down** to select "20110313" and then press **Select**.
   The contents of the "20110313" folder will be displayed.



4. Press **Down** to select "123000.mp4" and then press **Select**.
   The movie file will be selected and the File Screen will close.
   When you press a key button or a Multi-Button configured with the play key, or when you execute a Multi-Command, the movie file plays.



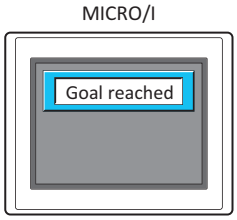
5 Message Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

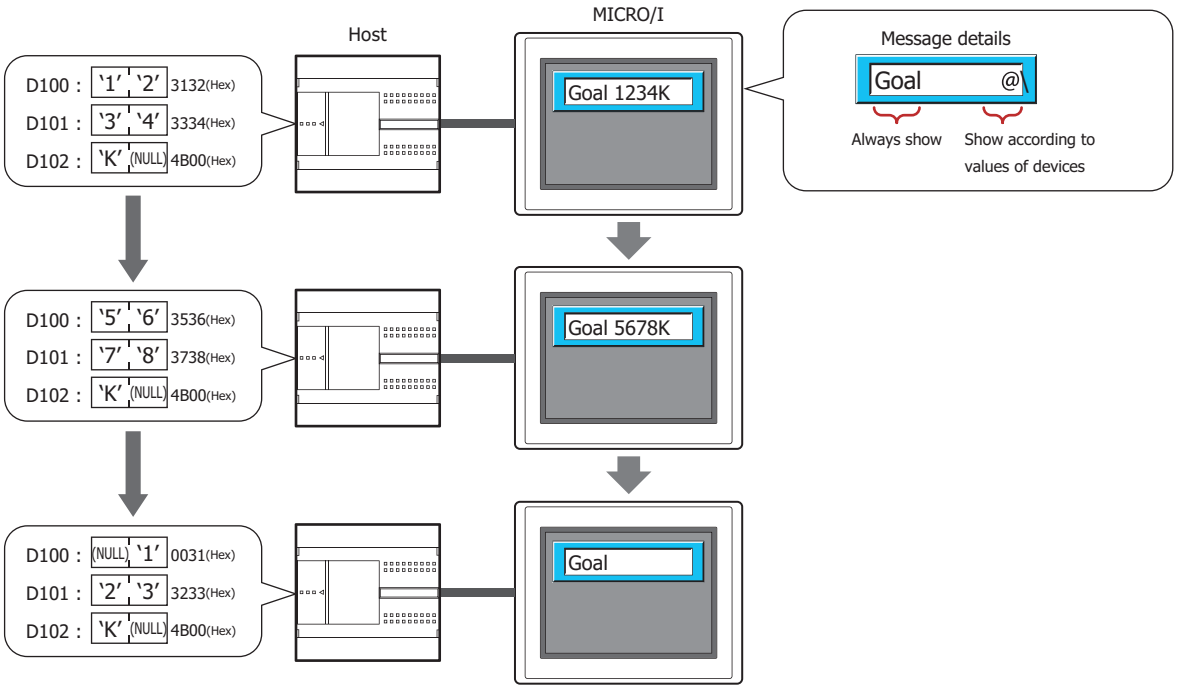
5.1 How the Message Display is Used

The Message Display is used to constantly display messages registered in advance and to display text read from values of word devices as character codes.
The Message Display can perform the following functions.

- Display messages

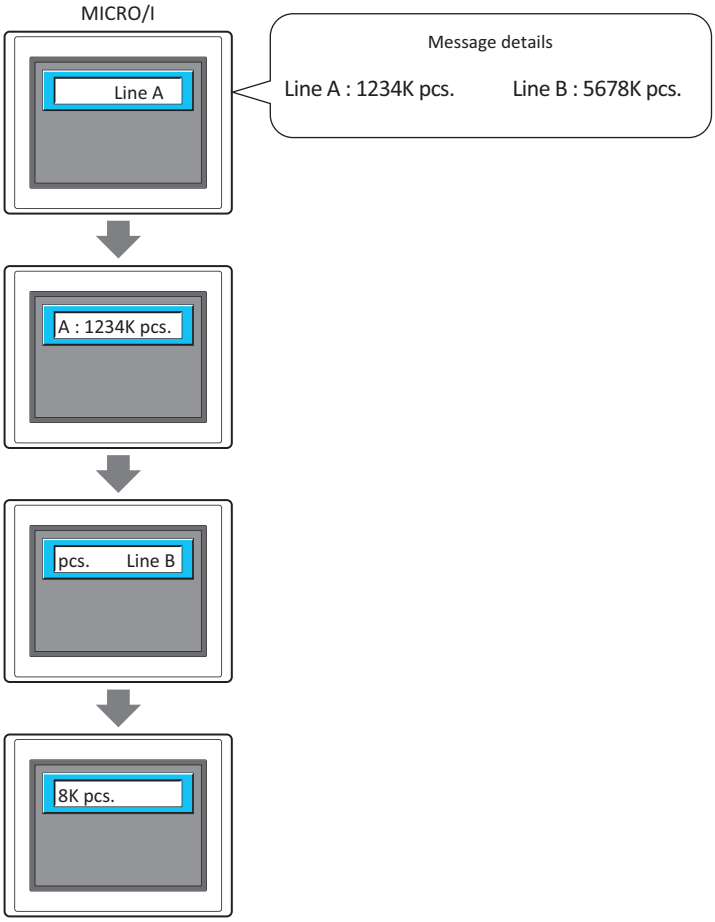


- Display text according to values of devices

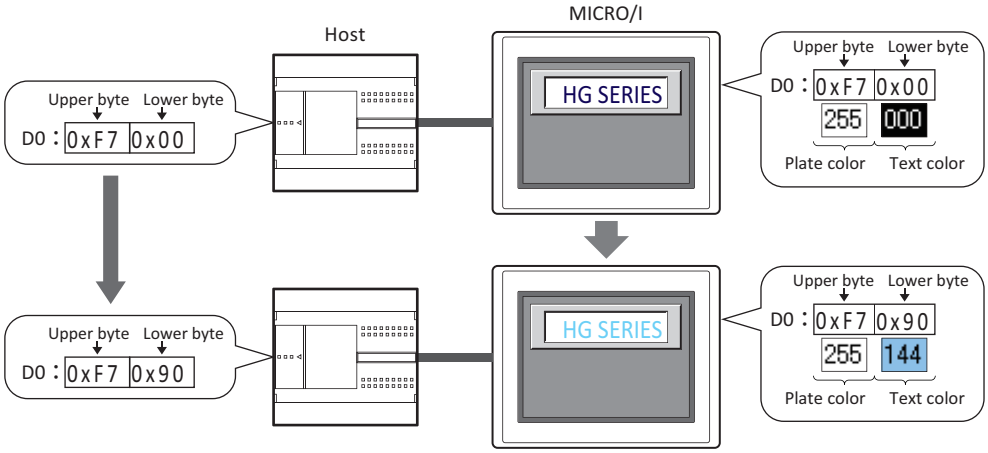


Value of Source Device	D100	'1' '2' 3132(Hex)	'5' '6' 3536(Hex)	(NULL) '1' 0031(Hex)
	D101	'3' '4' 3334(Hex)	'7' '8' 3738(Hex)	'2' '3' 3233(Hex)
	D102	'K' (NULL) 4B00(Hex)	'K' (NULL) 4B00(Hex)	'K' (NULL) 4B00(Hex)
Display		Goal 1234K	Goal 5678K	Goal
Action		Display always shown text and text shown according to values of devices	Display always shown text and text shown according to values of devices	Display only always shown text Do not show if upper byte of the source device starting address is 00 (NULL)

- Scroll messages



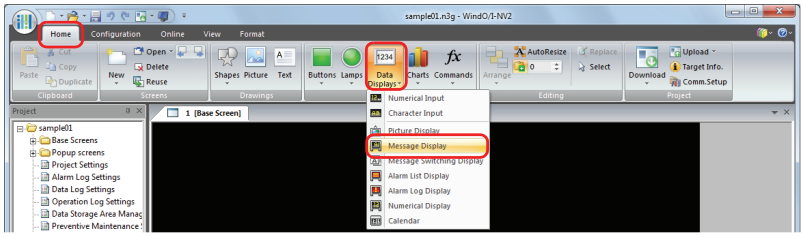
- Change the message and plate color according to a value of device



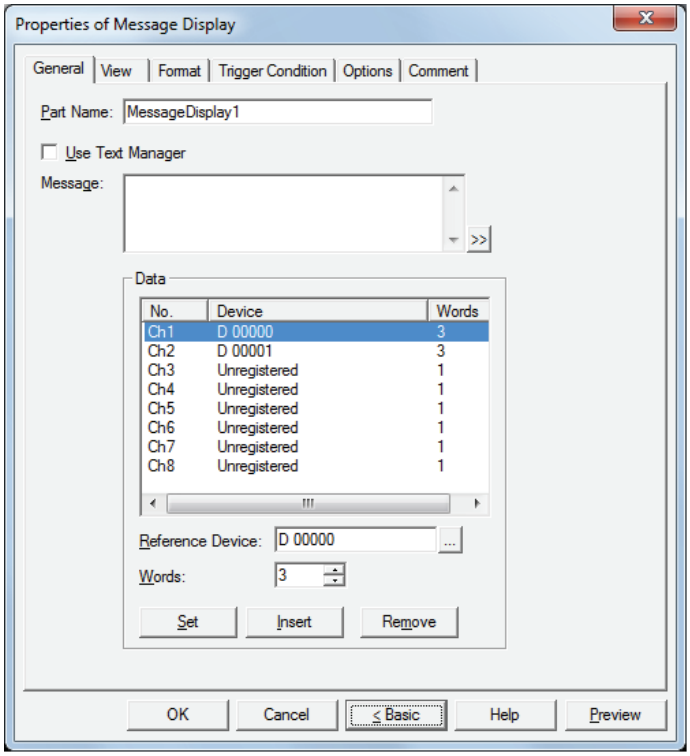
5.2 Message Display Configuration Procedure

This section describes the configuration procedure for Message Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Message Display**.



2. Click a point on the edit screen where you wish to place the Message Display.
3. Double-click the dropped Message Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

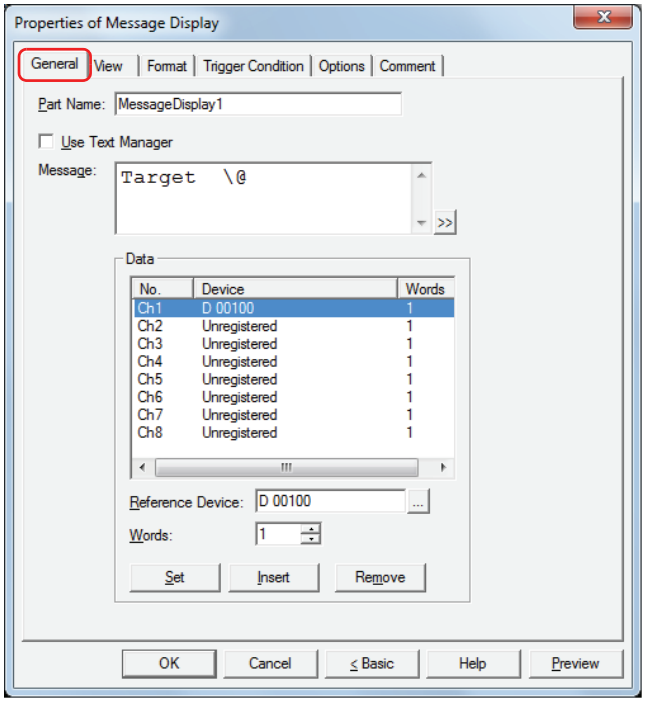


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

5.3 Properties of Message Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Use Text Manager

Select this check box to use text registered in Text Manager.

■ Text ID

Specifies the Text Manager ID number (1 to 32000) when using text registered in Text Manager.

Click ... to display Text Manager.

This option can only be configured when the **Use Text Manager** check box is selected.

To read values of word devices as character codes with text registered in Text Manager and display it as text, enter "\@" (1 to 8) in **Text** for the **Text ID** at the position to display the value of device as text. The channels configured under **Data** are allocated in order from the first "\@". The text is displayed according to the values of devices in order from the first reference device.

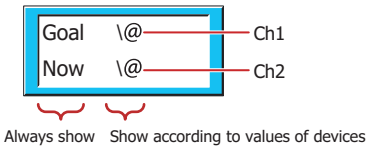
However, in the following situations "\@" is not handled as text to display according to values of devices and is displayed unchanged.

- When **Font** is **Windows** for **Text ID** configured in Text Manager
- When the number of "\@" configured in **Text** for **Text ID** is greater than the number of channels configured with devices
  (Text for the character codes corresponding to the values of devices is only displayed for the number of channels in order from the beginning.)

■ **Message**

Enter the text to display. The maximum number is 610 characters. You can enter multi-line messages by inserting a newline. To configure text to display according to values of devices, enter "\@" (1 to 8) at the location to read the values of word devices as character codes and display them as text. The channels configured under **Data** are allocated in order from the first "\@". The text is displayed according to the values of devices in order from the first reference device.

Example: The device configured in Ch1 is allocated to the first "\@". The device configured in Ch2 is allocated to the second "\@".



The characters that can be entered vary based on to the font selected for **Font** on the **Format** tab. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

This option can only be configured if the **Use Text Manager** check box is cleared.

- To enter Unicode characters, click [>>] to display the **Unicode Input** dialog box. Enter the characters in the **Unicode Input** dialog box and click **OK**.
- To display the backslash (\), enter a backslash (\) before the backslash (\).
  Example: \\

■ **Data**

These options are used to register or edit the devices with values to read as character codes.

(Settings): Lists the settings for the text to display according to values of devices.

- No.: Shows the channel numbers (Ch1 to Ch8).
- Device: Shows the reference device configured for the channel.
- Words: Shows the number of words used by the reference device.

Reference Device: Specifies the word device that stores the values read as character codes.

Click [...] to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Set the value of device to the character codes for the language used. For details, refer to Chapter 2 "Character Code Table" on page 2-15.

Words: Specifies the number of words for the length of the text to display (1 to 64). Values of devices for the configured amount of words are read as character codes starting from the device address set by **Reference Device**. 2 single-byte characters can be displayed by 1 word.

Set: Registers the settings for the text to display according to values of devices to the list. If you select a number that is already registered, that number is overwritten with the new settings.

Select a Ch number on the list and click this button to register the **Reference Device** and **Words** settings.

Always register the settings from Ch1.

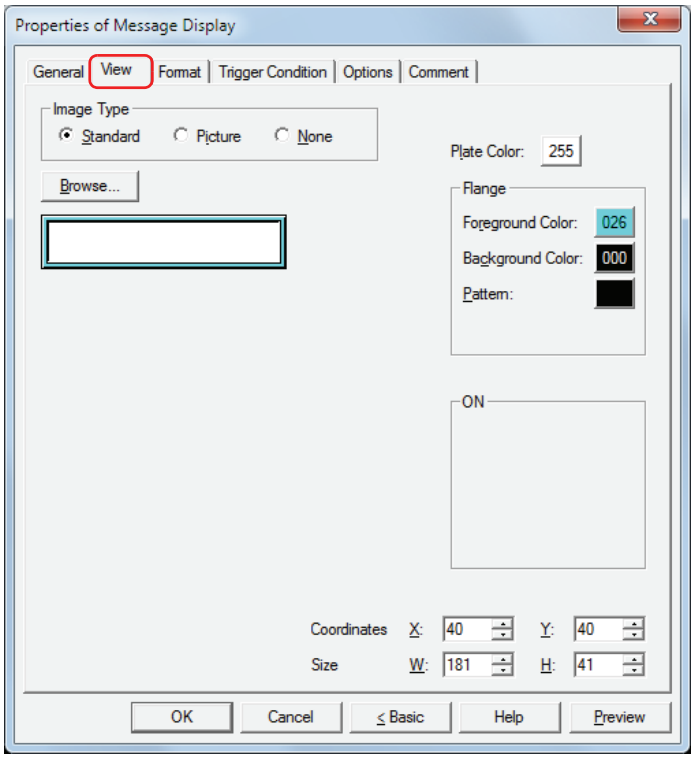
Insert: Inserts the settings in the position selected on the list.

Select a Ch number on the list and click this button to insert the **Reference Device** and **Words** settings. The settings at the insertion point shift down one line. Settings cannot be inserted if all the Ch numbers are configured.

Remove: Deletes the registered settings from the list.

Select a Ch number and click this button to delete the selected settings from the list.

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1: The plate and the flange of the part are not displayed. Only the text is displayed.

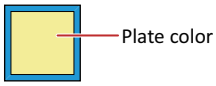
> When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

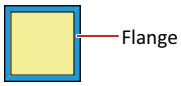


■ Flange

Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



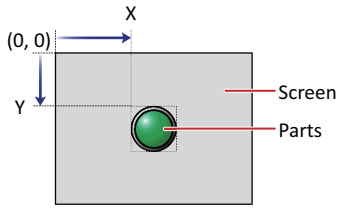
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

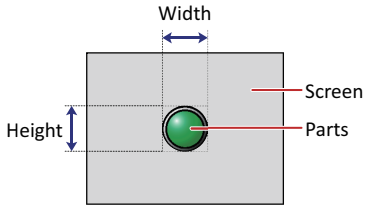


Size

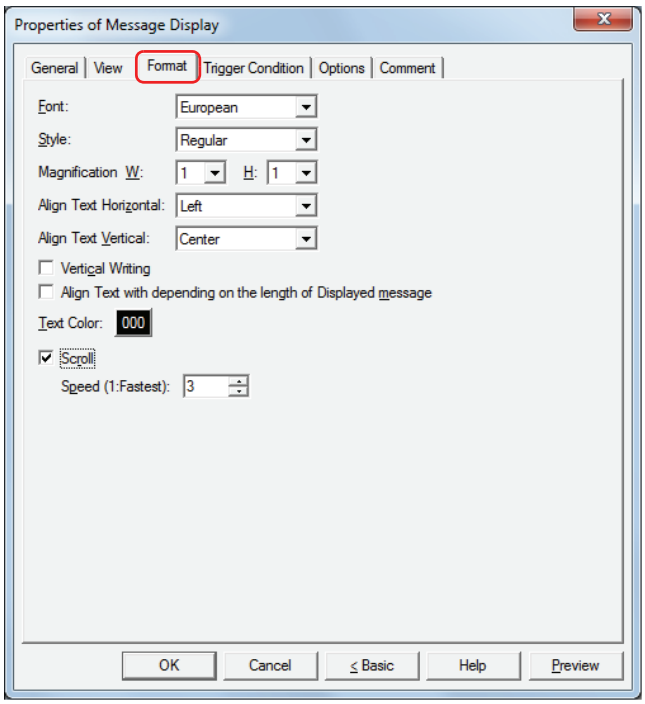
W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● **Format** Tab



■ **Font**

Selects the font used for displaying text from the following.

Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Stroke**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**

Sets the character size (8 to 128).

Can only be set when **Stroke** is selected.

■ **Style**

Selects **Regular** or **Bold** for text style.

Can only be set when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

Can only be set when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ **Align Text Vertical**

Selects the text alignment in the vertical direction from the following.

Top, **Center**, **Bottom**, **Center-Top**

Set to **Center** when the **Vertical Writing** check box is selected.

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Align Text Horizontal**

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

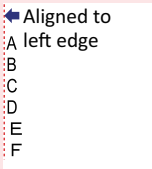
Vertical Writing

Select this check box when displaying text vertically.

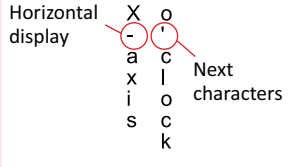
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic**.

When the **Vertical Writing** check box is selected, take care about the following points. This is applicable for Windows supports East Asian characters.

- When there is a mixture of double-byte and single-byte characters, the half-width characters are left-aligned.

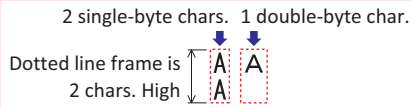


- Dashes are displayed horizontally. Symbols representing voiced and semi-voiced sounds of single-byte characters are shown as follows.



- When using text displayed according to values of devices, the characters are counted as single-byte characters and the display area for the characters is indicated by dotted lines. Therefore, when the text to display according to values of devices is double-byte characters, the display area actually required differs from the area indicated by the dotted lines.

  Example: When 1 word of text to display according to values of devices is set to vertical writing, the vertical size of the dotted lines is displayed as 2 single-byte characters.

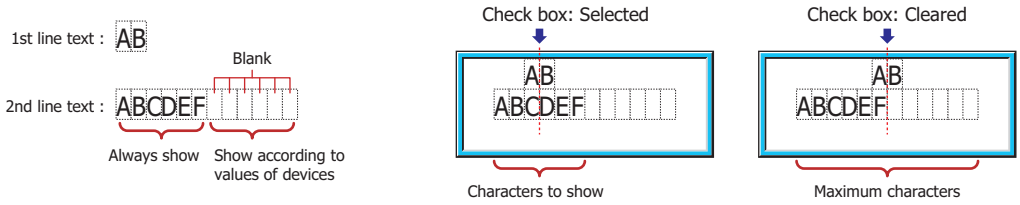


Align Text depending on the length of the displayed message*2

Select this check box to align text as standard to the number of characters that will be displayed.

When cleared, the maximum number of characters (set number of words) is always aligned as standard.

Example: When there are 2 characters of text to always display on the first line, 6 characters of text to always display on the second line and 6 characters of text (3 words) to display according to values of devices, **Align Text Horizontal** is set to **Center**, and the text to display according to values of devices is blank (when only 6 characters are always displayed on the second line)



Text Color

Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

*2 Advanced mode only

Scroll*2

Select this check box to enable scrolling display displaying of messages.

This option can only be configured when the **Enable** check box under **Flash** on the **Options** tab is cleared and **Standard** is selected for **Image Type** on the **View** tab.

Speed (1: Fastest): Sets the scrolling speed (1 to 10). 1 is fastest, 10 is slowest.

When the **Scroll** check box is selected operation is follows.

- Messages that include CRs are displayed without the CRs.
- Messages scroll in the direction in which the text is drawn.
- When the text displayed according to values of devices, the text color, or the displayed text changes, the message is scrolled from the beginning.

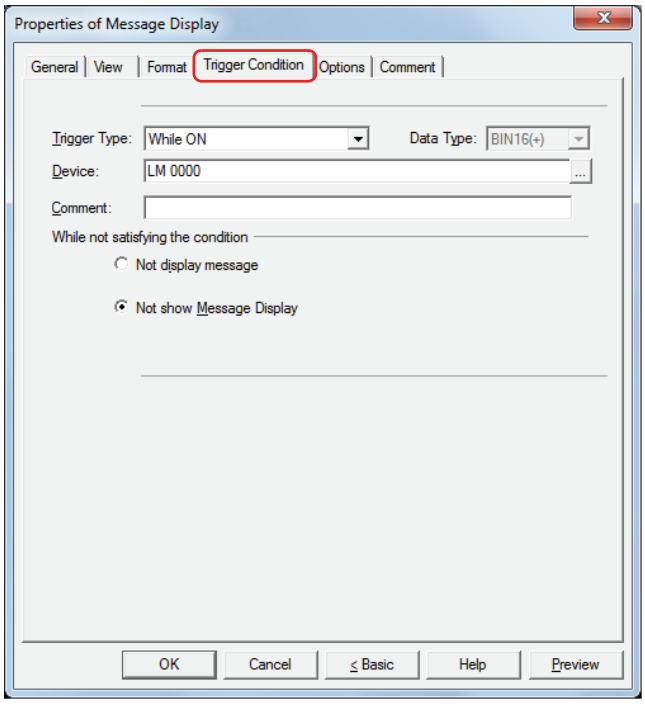
When the **Scroll** check box is selected, take care about the following points.

- The number of parts that can be arranged on a single screen decreases. If the MICRO/I displays an error message, clear the **Scroll** check box, or reduce the number of parts on the screen.
- When the scan time is long, scrolling speed may become slow.

*2 Advanced mode only

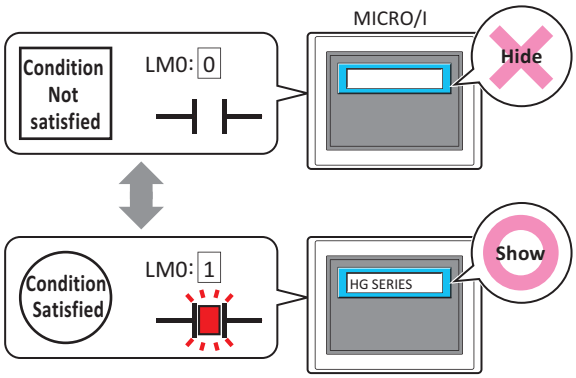
● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



The Message Display is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. When disabled, the plate and flange are displayed, but the message is not displayed. For the HG2G-5F and the HG3G/4G, select the operation when disabled as **Not display message** or **Not show Message Display** under **While not satisfying the condition**.

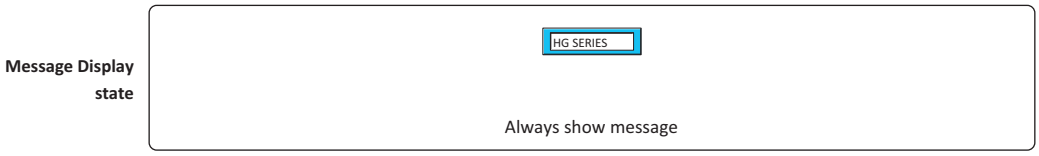
Example: When **Trigger Type** is **While ON**, **Device** is **LM 0**, and **While not satisfying the condition** is **Not display message**.
While LM 0 is 0, the condition is not satisfied and the Message Display does not display the message.
While LM 0 is 1, the condition is satisfied and the Message Display displays the message.



■ Trigger Type

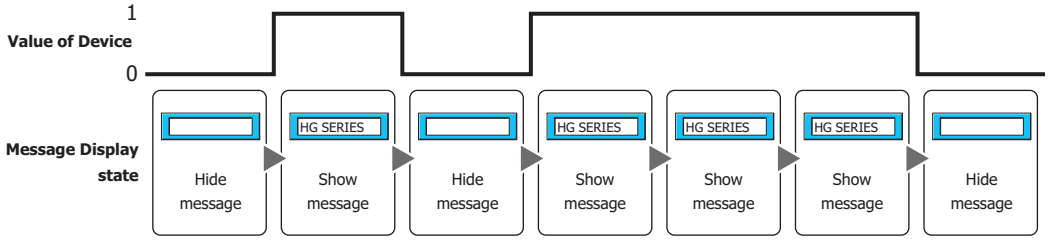
Selects the condition to enable the Message Display from the following.

Always visible: The Message Display is always enabled.



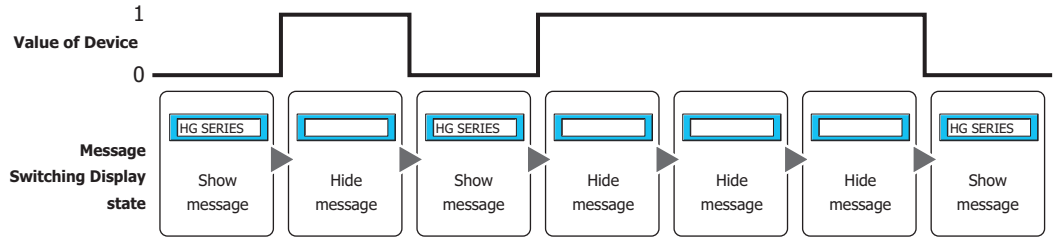
While ON: Enables the Message Display when the value of device is 1.

Example: When **While not satisfying the condition** is **Not display message**.



While OFF: Enables the Message Display when the value of device is 0.

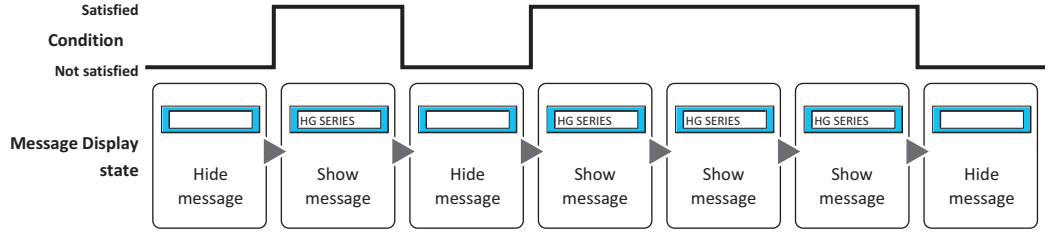
Example: When **While not satisfying the condition** is **Not display message**.



While satisfying the condition:

Enables the Message Display when the condition is satisfied.

Example: When **While not satisfying the condition** is **Not display message**.



■ Data Type

Selects the data type to be handled by the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ Device

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Condition

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

■ Comment

Used for entering comments about trigger conditions. Maximum number is 80 characters.

■ While not satisfying the condition*1

Selects the operation of the part when the condition is not satisfied.

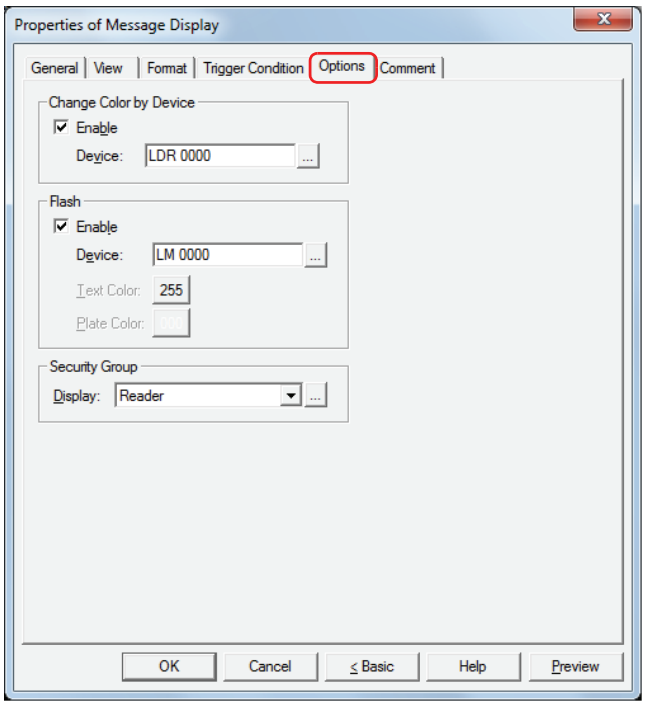
Not display message: The plate and flange are displayed, but the message is not displayed.

Not show Message Display: Hides the Message Display.

*1 HG2G-5F, HG3G/4G only

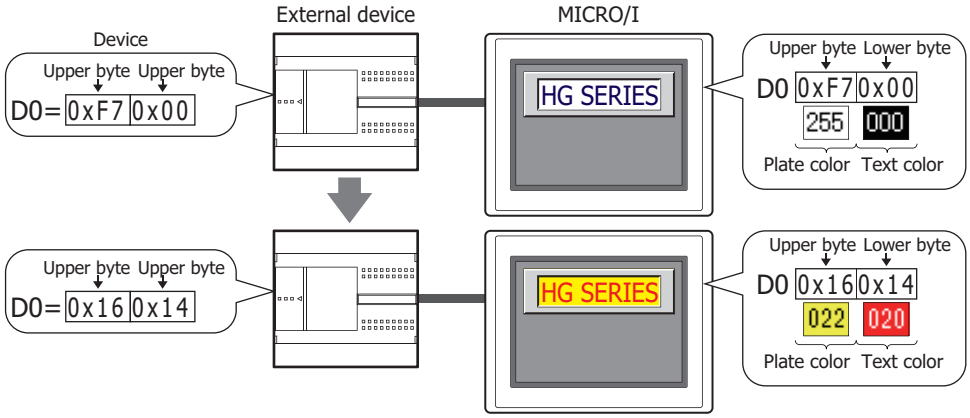
● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Change Color by Device**

Switches the text and plate colors.



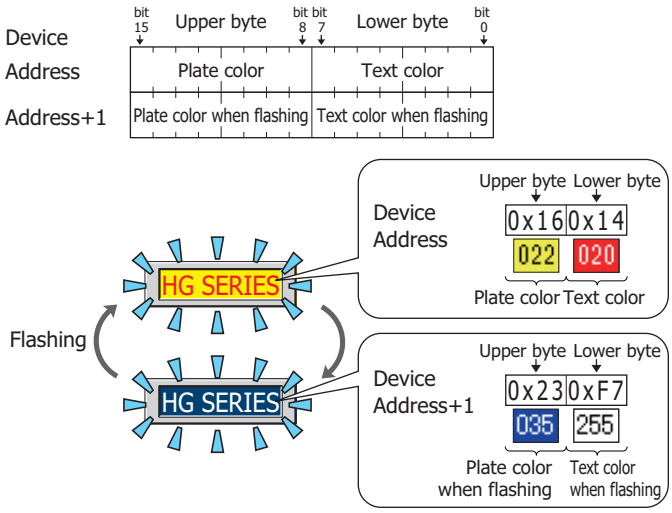
Enable: Select this check box to switch the color of the text or plate depending on the value of device.

Device: Specifies the word device that stores the color data for the text or plate.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This uses address+1 to specify the text and plate colors when the **Enable** check box under **Flash** has been selected.

Color data assignments that are stored to devices are given below.

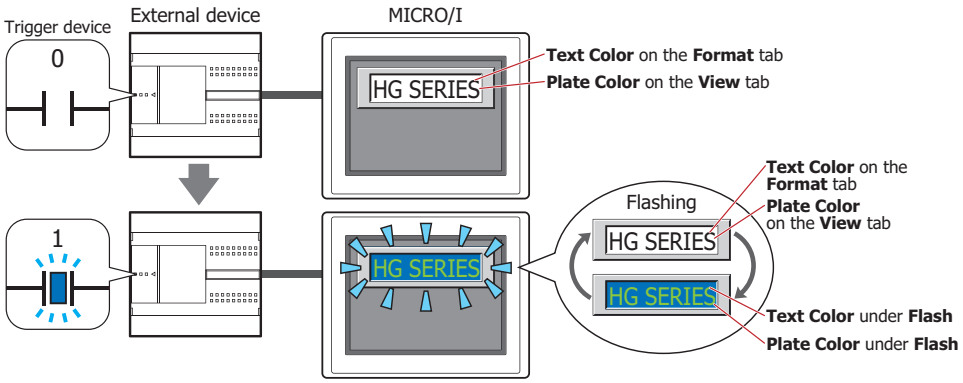


For color data, refer to Appendix "1 Color Number Correspondence Table" on page A-1.

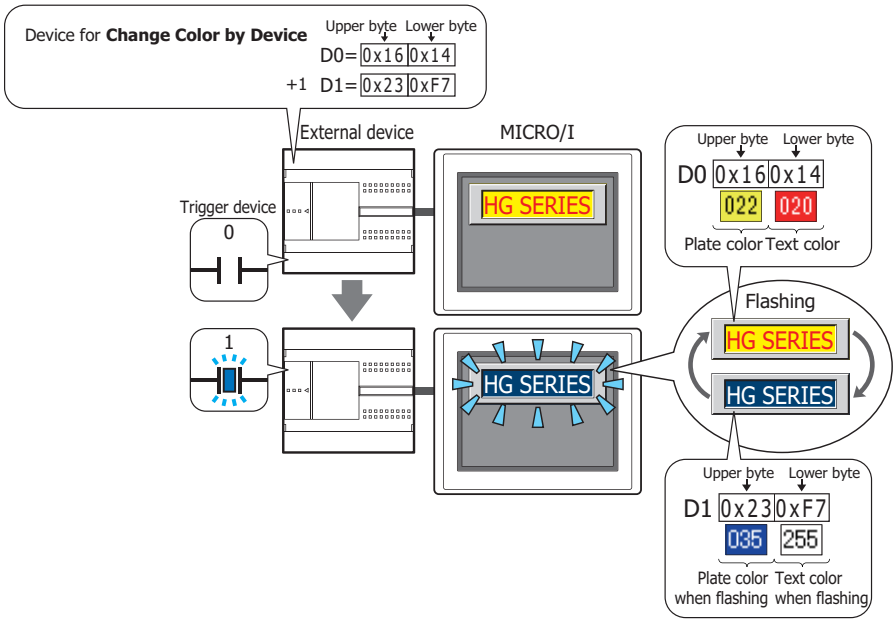
Flash

Flashes the text and plate colors.

- When the **Change Color by Device** check box is cleared
  The colors specified by **Text Color** on the **Format** tab and **Plate Color** on the **View** tab and the colors specified by **Text Color** and **Plate Color** under **Flash** are alternately displayed.



- When the **Change Color by Device** check box is selected
  The colors that correspond to the values stored in the device addresses for **Change Color by Device** and the this device address + 1 are alternately displayed.



Enable: Selects this check box to make text color and plate color flash.

Trigger Device: Specifies the bit device or word device that will be used as a condition to trigger flash.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Flash intervals are set in the **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

Text Color: Selects the color (color: 256 colors, monochrome: 16 shades) of text when flashing.

Click this button to display the Color Palette. Select a color from the Color Palette.

This option can only be configured when the **Change Color by Device** check box is cleared.

Plate Color: Selects the plate color (color: 256 colors, monochrome: 16 shades) when flashing.

Click this button to display the Color Palette. Select a color from the Color Palette.

This option can only be configured when the **Change Color by Device** check box is cleared and **Standard** is selected for **Image Type** on the **View** tab.

Security Group

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

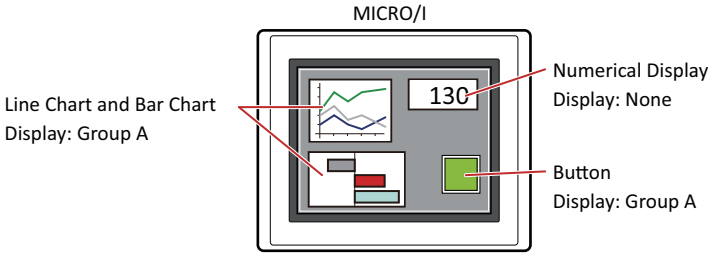
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

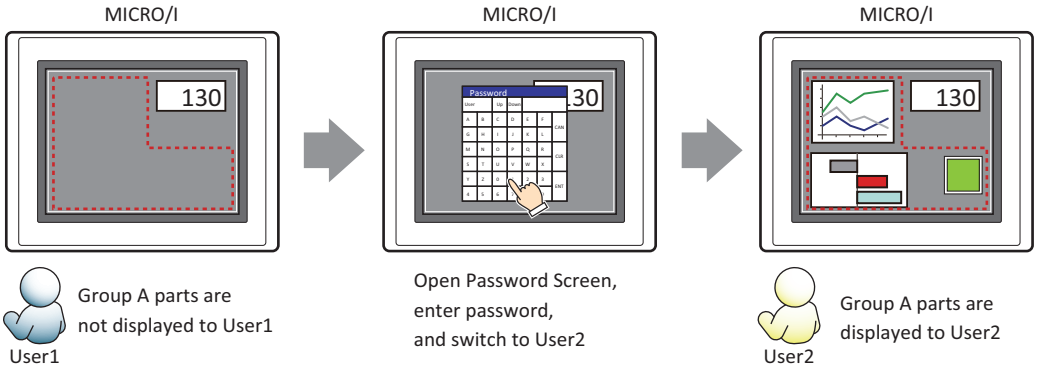
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



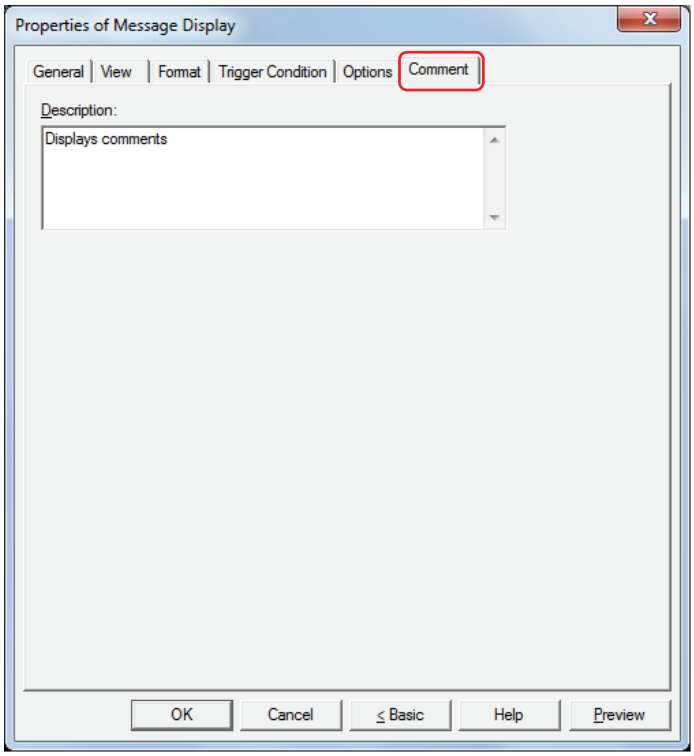
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

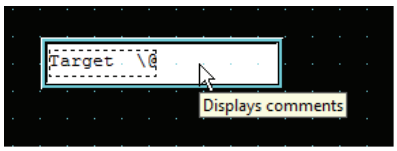
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Message Display on the editing screen



5.4 String Data Storage Method

The values of devices read as character codes are stored in the upper byte and lower byte of words according to the **Storage Method of String Data** setting. **Storage Method of String Data** is configured on the **System** tab in the **Project Settings** dialog box.

For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

Example: When reference device D 100 = 3132 (hex), D 101 = 3334 (hex), D 102 = 3500 (hex)

- When **from Upper byte** is selected for **Storage Method of String Data**

Device	Stored value		Displayed string
	Upper byte	Lower byte	
D 100	31 (hex)	32 (hex)	12
D 101	33 (hex)	34 (hex)	34
D 102	35 (hex)	0	5

NULL terminating character

- When **from Lower byte** is selected for **Storage Method of String Data**

Device	Stored value		Displayed string
	Upper byte	Lower byte	
D 100	32 (hex)	31 (hex)	21
D 101	34 (hex)	33 (hex)	43
D 102	0	35 (hex)	

NULL terminating character

When handling values of devices as character codes, 0 is handled as the NULL terminating character to end the string. Therefore, when the upper byte is 0, nothing is displayed.

- When handling values of devices as character codes, 0 is handled as the NULL terminating character to end the string. Therefore, when the upper byte is 0, nothing is displayed.
- To display only a single character, set the lower byte to 0.
  Example:To display a single-byte 7

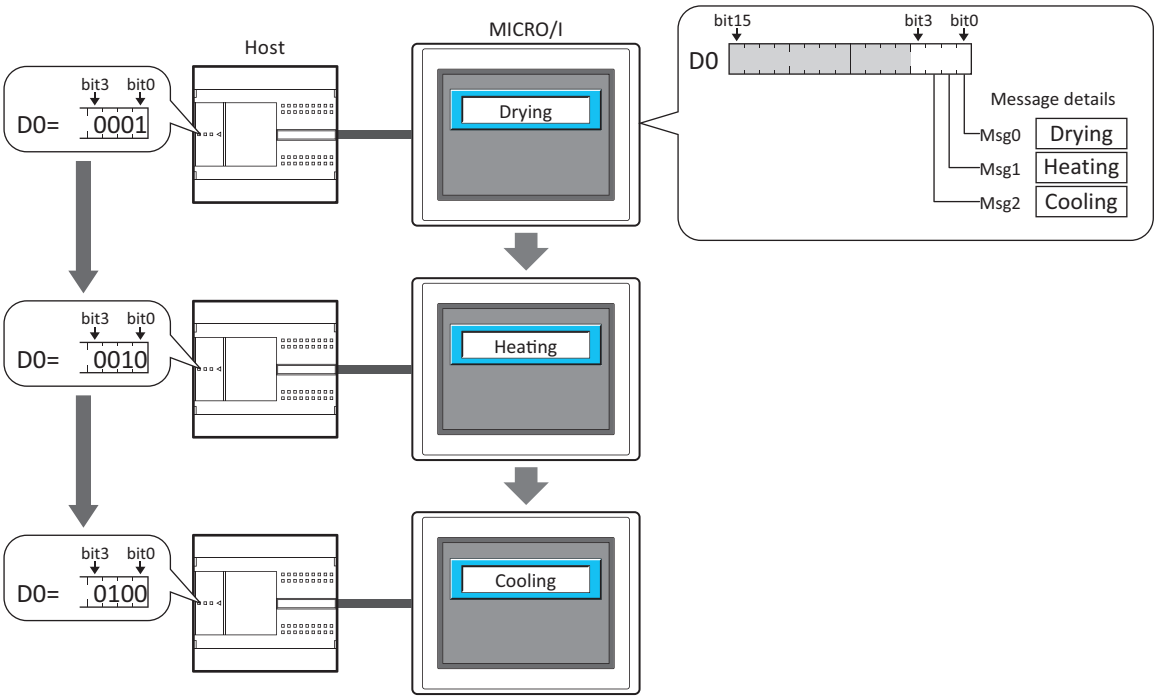
  '7' 3700(Hex)

6 Message Switching Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

6.1 How the Message Switching Display is Used

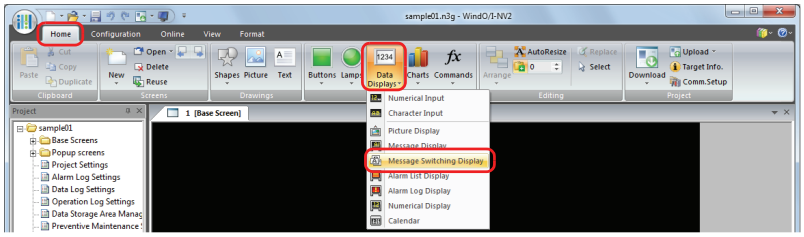
The Message Switching Display is used to switch the displayed message according to the value of a word device.



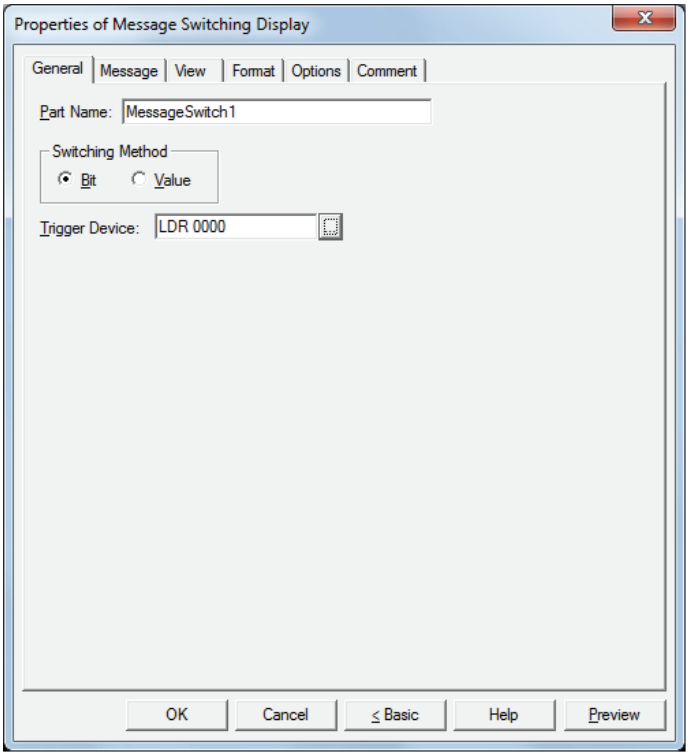
6.2 Message Switching Display Configuration Procedure

This section describes the configuration procedure for Message Switching Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Message Switching Display**.



2. Click a point on the edit screen where you wish to place the Message Switching Display.
3. Double-click the dropped Message Switching Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

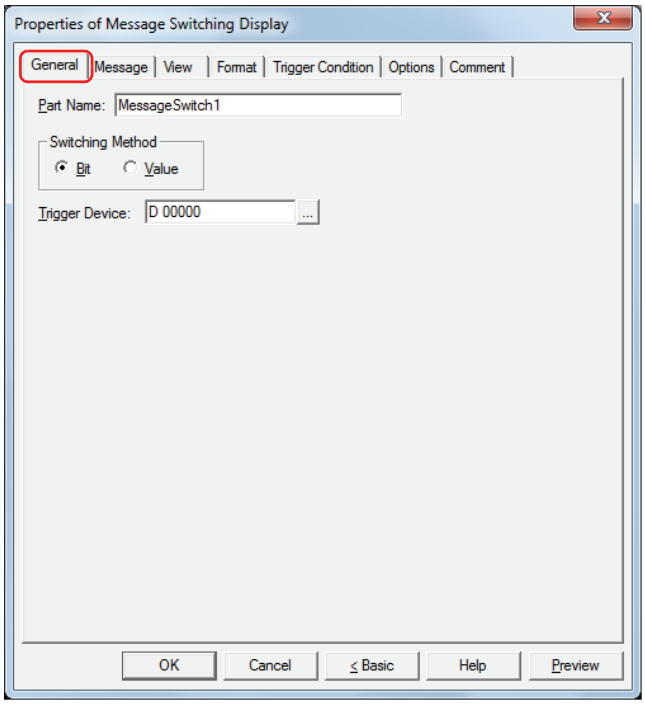


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

6.3 Properties of Message Switching Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ **Part Name**

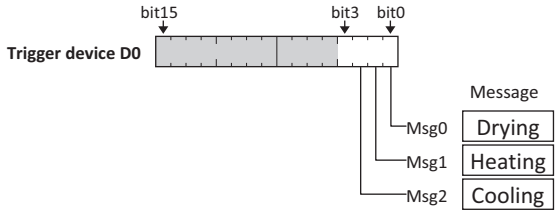
Enter a name for the part. The maximum number is 20 characters.

■ **Switching Method**

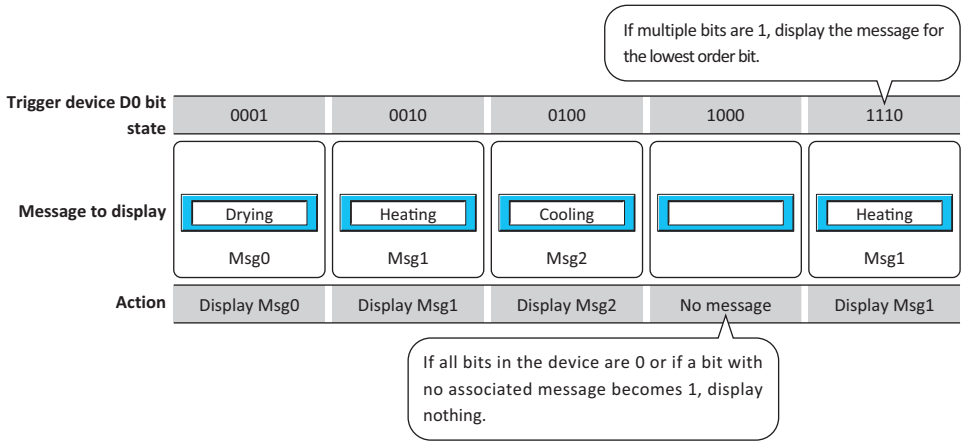
Selects the method for switching message to display from the following. Messages are registered in **Settings** on the **Message** tab.

Bit: Switches the message to display according to the status of bits in a device.

Example: When **Bit** is selected and the bits of trigger device D 0 are allocated to the following messages.

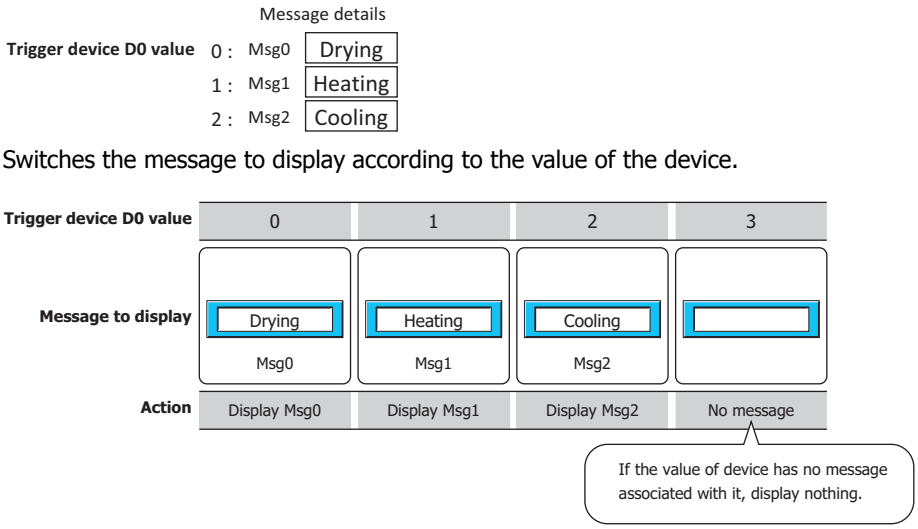


Switches the message to display according to the status of the bits.



Value: Switches the message to display according to the value of a device.

Example: When **Value** is selected and the values of device D 0 are allocated to the following messages.

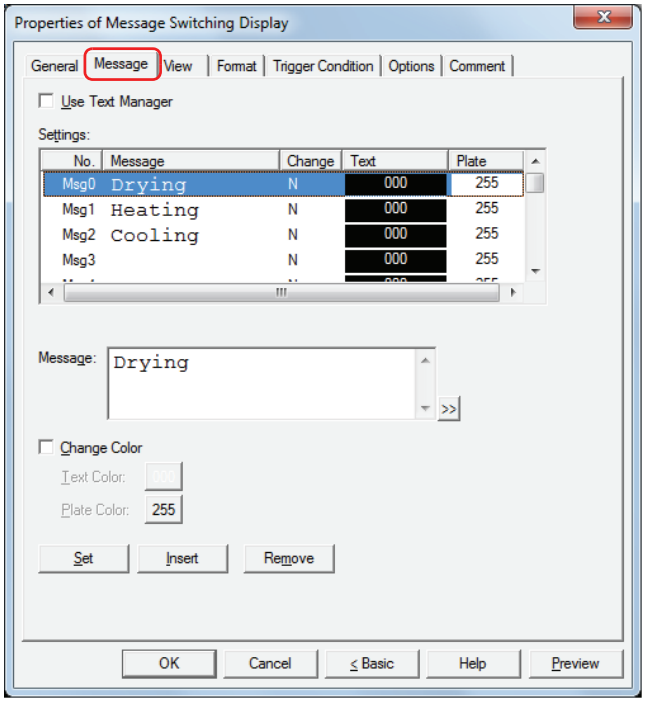


■ Trigger Device

Specifies the word device to use as the condition for switching messages.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● **Message** Tab



■ **Use Text Manager**

Select this check box to use text registered in Text Manager.

■ **Settings**

Lists the message settings.

No.:	Shows the message number (Msg number). The number of messages that can be registered varies based on **Switching Method** on the **General** tab. Bit: Msg0 to Msg15 Value: Msg0 to Msg999
Message:	Shows the registered message.
Change:	Shows **Y** when the **Change Color** check box is selected. Shows **N** when the check box is cleared.
Text:	Shows the text color of the message.
Plate:	Shows the plate color.

■ **Text ID**

Specifies the Text Manager ID number (1 to 32000) when using text registered in Text Manager.

Click ... to display Text Manager.

This option can only be configured when the **Use Text Manager** check box is selected.

■ **Message**

Enter the text to display. The maximum number is 3750 characters. You can enter multi-line messages by inserting a newline.

The characters that can be entered vary based on the font selected for **Font** on the **Format** tab. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

This option can only be configured if the **Use Text Manager** check box is cleared.

- To enter Unicode characters, click >> to display the **Unicode Input** dialog box. Enter the characters in the **Unicode Input** dialog box and click **OK**.
- To display the backslash (\), enter a backslash (\) before the backslash (\).

Change Color

Select this check box to configure **Text Color** and **Plate Color** per Msg number.

Text Color:	Selects the text color for the messages when configuring the text color per Msg number (color: 256 colors, monochrome: 16 shades). Click this button to display the Color Palette. Select a color from the Color Palette.
Plate Color:	Selects the plate color for the messages when configuring the plate color per Msg number (color: 256 colors, monochrome: 16 shades). Click this button to display the Color Palette. Select a color from the Color Palette.

When this check box is cleared, the colors are configured by **Text Color** on the **Format** tab and **Plate Color** on the **View** tab.

Set

Registers the message and color settings to the list. If you select a Msg number that is already registered, that number is overwritten with the new settings.

Select a Msg number on the list and click this button to register the **Message** and **Change Color** settings.

Insert

Inserts the message and color settings in the position selected on the list.

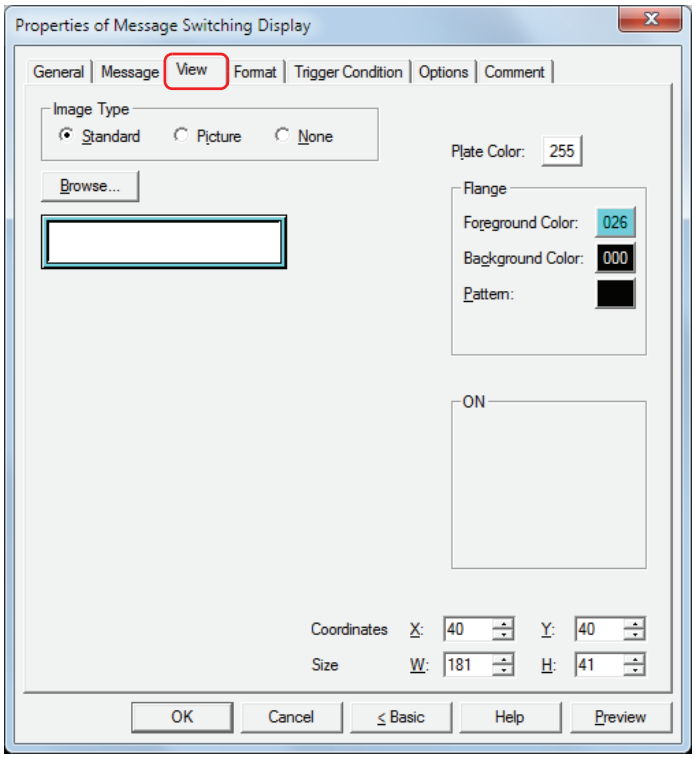
Select a Msg number on the list and click this button to insert the **Message** and **Change Color** settings. The settings at the insertion point shift down one line. Settings cannot be inserted if all Msg numbers are configured.

Remove

Deletes the registered settings from the list.

Select a Msg number and click this button to delete the selected settings from the list.

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1: The plate and the flange of the part are not displayed. Only the text is displayed.

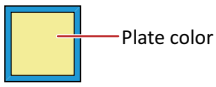
> When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

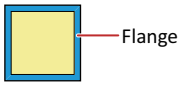


■ Flange

Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



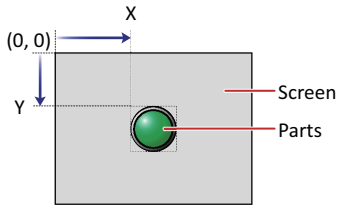
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

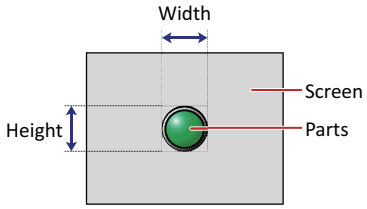


Size

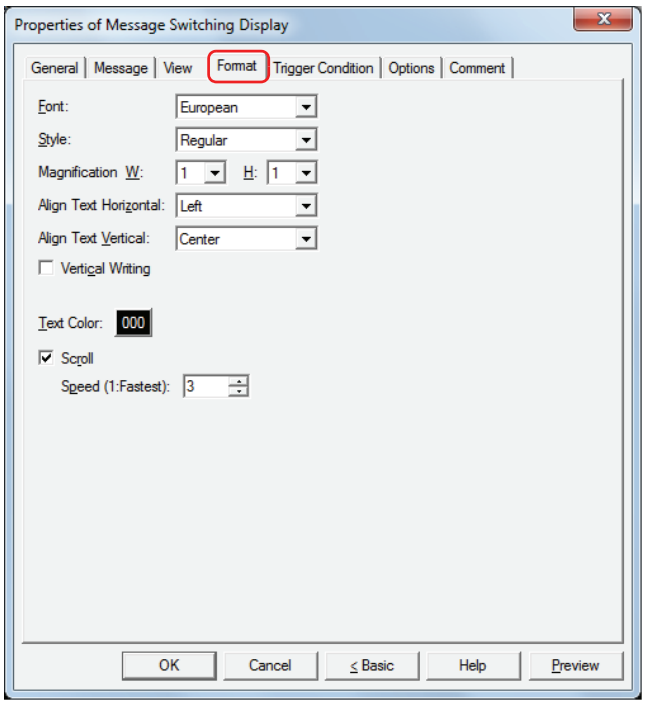
W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● **Format** Tab



■ **Font**

Selects the font used for displaying text from the following.

Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Stroke**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**

Sets the character size (8 to 128).

Can only be set when **Stroke** is selected.

■ **Style**

Selects **Regular** or **Bold** for text style.

Can only be set when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

Can only be set when **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic** is selected for **Font**.

■ **Align Text Vertical**

Selects the text alignment in the vertical direction from the following.

Top, **Center**, **Bottom**, **Center-Top**

Set to **Center** when the **Vertical Writing** check box is selected.

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Align Text Horizontal**

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

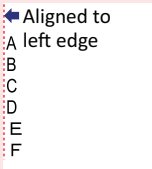
Vertical Writing

Select this check box when displaying text vertically.

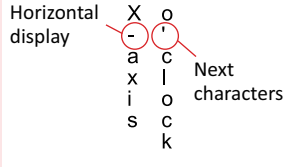
Can only be set when **Font** is set to **Japanese**, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, or **Cyrillic**.

When the **Vertical Writing** check box is selected, take care about the following points. This is applicable for Windows supports East Asian characters.

- When there is a mixture of double-byte and single-byte characters, the half-width characters are left-aligned.



- Dashes are displayed horizontally. Symbols representing voiced and semi-voiced sounds of single-byte characters are shown as follows.



Text Color

Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Scroll*2

Select this check box to enable scrolling display displaying of messages.

This option can only be configured when **Standard** is selected for **Image Type** on the **View** tab.

Speed (1: Fastest): Sets the scrolling speed (1 to 10). 1 is fastest, 10 is slowest.

When the **Scroll** check box is selected operation is follows.

- Messages that include CRs are displayed without the CRs.
- Messages scroll in the direction in which the text is drawn.
- When the message is switched, the message is scrolled from the beginning.

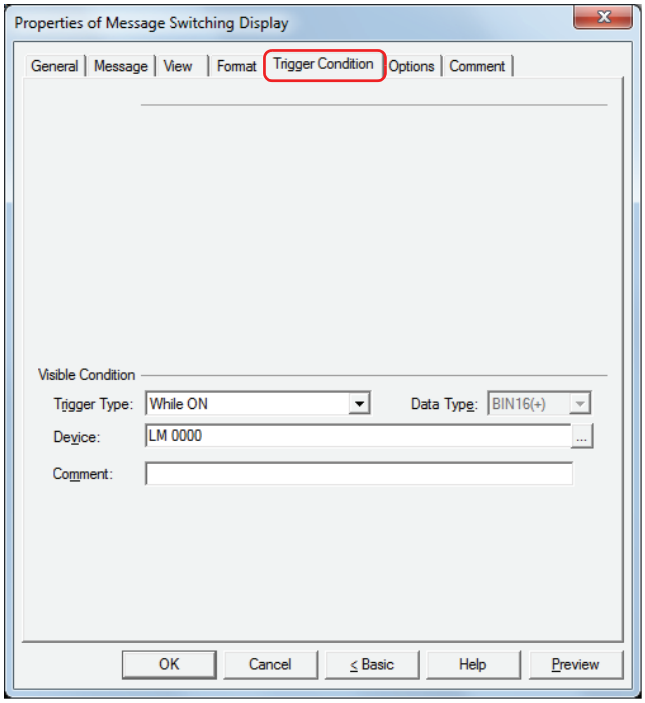
When the **Scroll** check box is selected, take care about the following points.

- The number of parts that can be arranged on a single screen decreases. If the MICRO/I displays an error message, clear the **Scroll** check box, or reduce the number of parts on the screen.
- When the scan time is long, scrolling speed may become slow.

*2 Advanced mode only

● Trigger Condition Tab*1

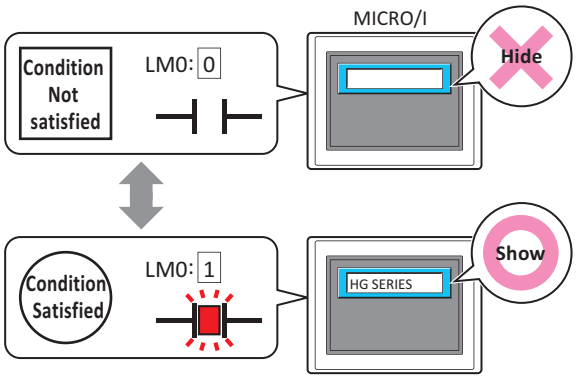
The **Trigger Condition** tab is displayed in Advanced mode.



■ Visible Condition

The Message Switching Display is displayed while the condition is satisfied. The Message Switching Display is hidden while the condition is not satisfied.

Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the Message Switching Display is hidden.
While LM 0 is 1, the condition is satisfied and the Message Switching Display is displayed.

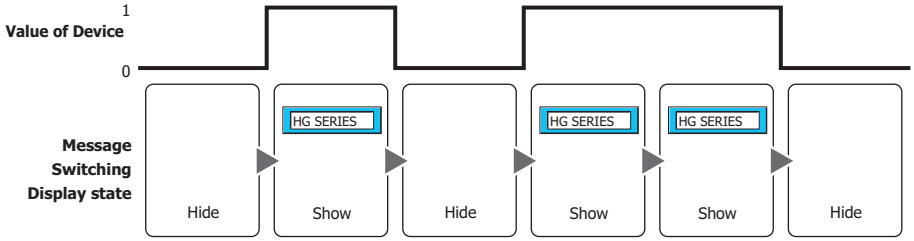


*1 HG2G-5F, HG3G/4G only

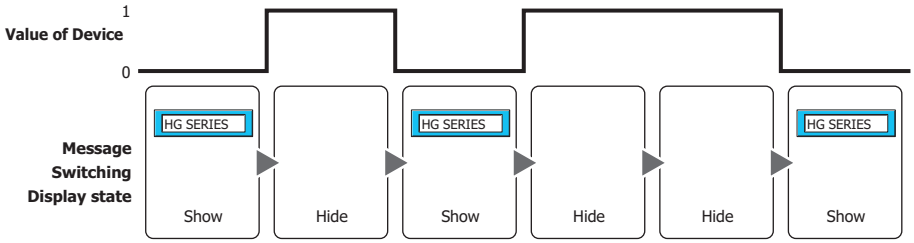
Trigger Type: Selects the condition to display the Message Switching Display from the following.

Always visible: The Message Switching Display is always displayed.

While ON: Displays the Message Switching Display when the value of device is 1.

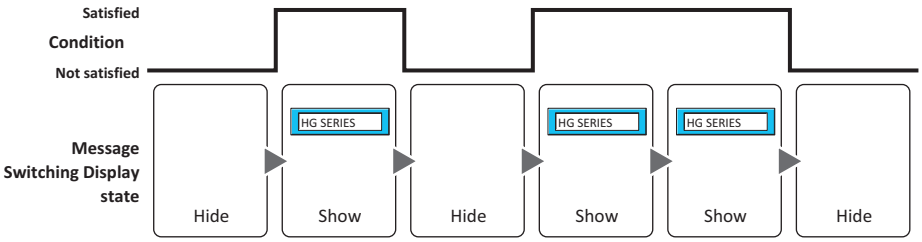


While OFF: Displays the Message Switching Display when the value of device is 0.



While satisfying the condition:

Displays the Message Switching Display when the condition is satisfied.



Data Type: Selects the type of data handled by the conditional expression for the visible condition.
This option can only be configured if **While satisfying the condition** is selected for **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device: Specifies the bit device or bit of the word device to serve as the visible condition.
This option can only be configured when **While ON** or **While OFF** is selected for **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

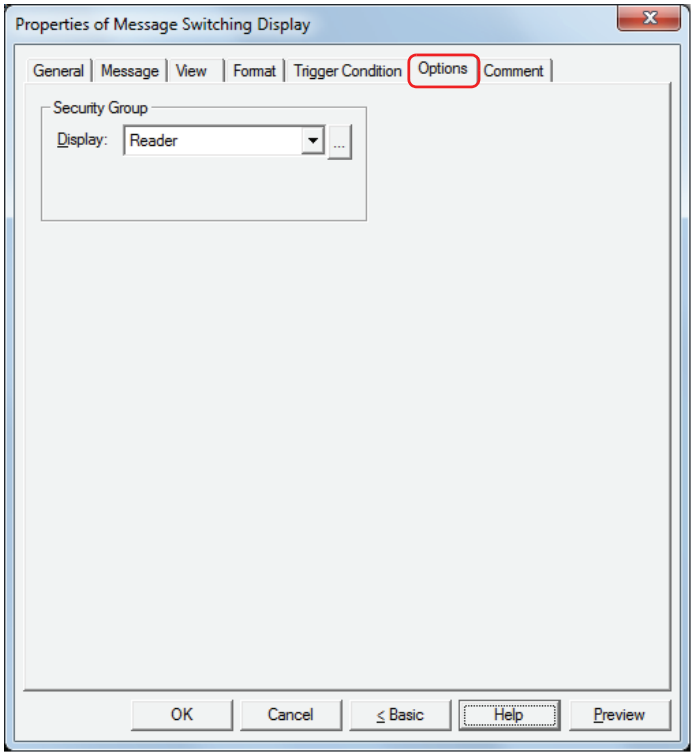
Condition: Specifies the conditional expression for the visible condition.
This option can only be configured when **While satisfying the condition** is selected for **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment: Used for entering a comment for the visible condition. The maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

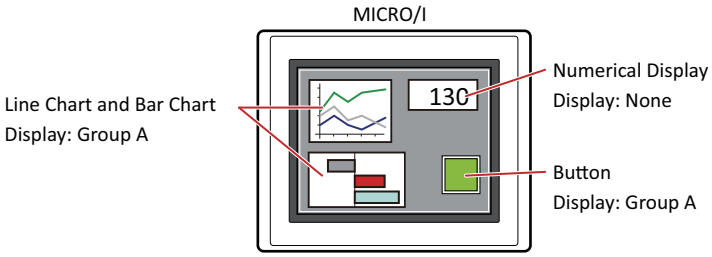
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

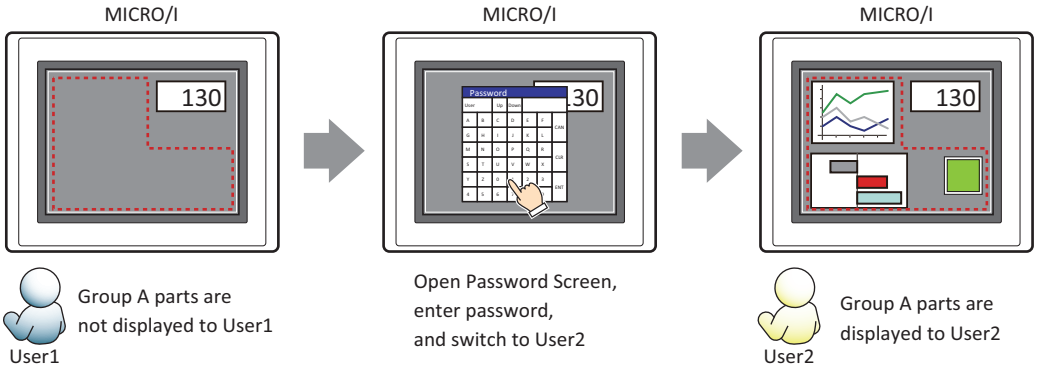
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



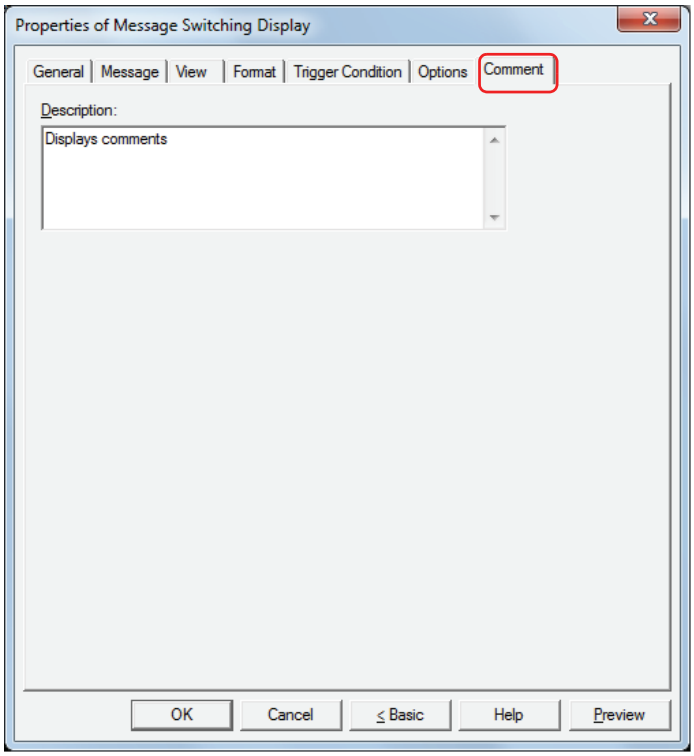
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

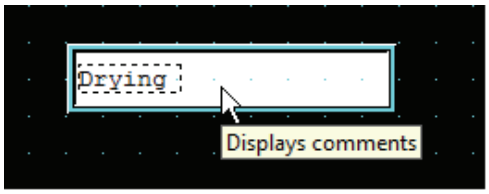
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Message Switching Display on the editing screen



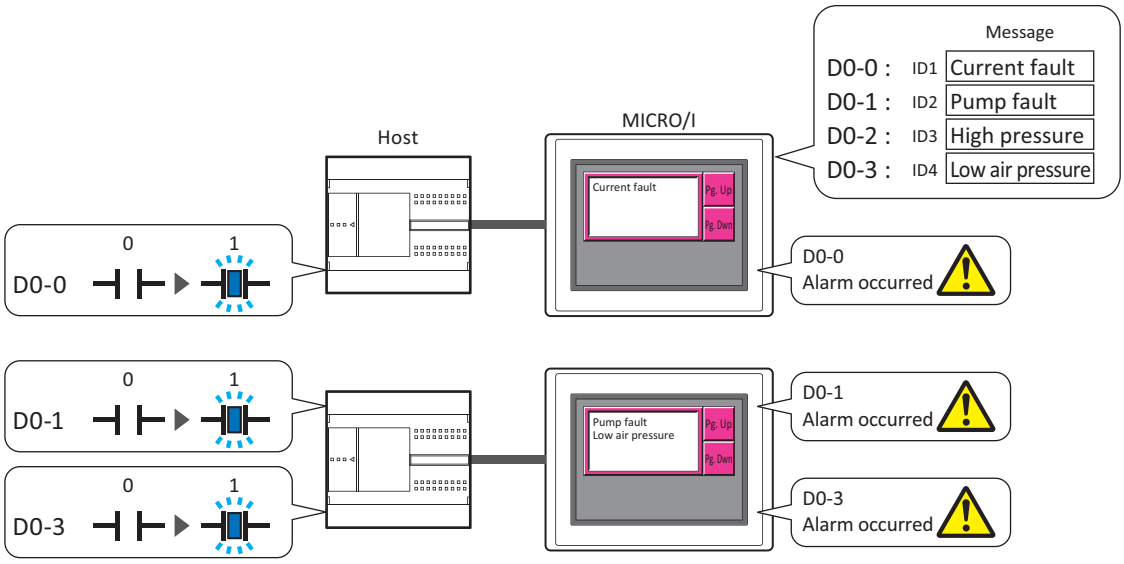
7 Alarm List Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

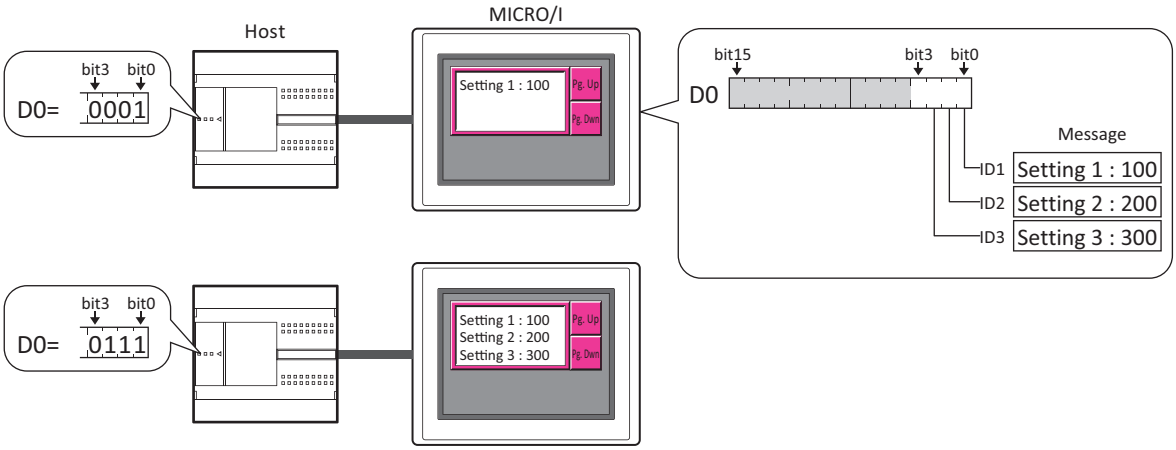
7.1 How the Alarm List Display is Used

The Alarm List Display works with the Alarm Log function to display messages for active alarms and to display multiple messages according to values of devices in a list.

- List currently active alarms out of the alarms configured in the Alarm Log settings



- Display multiple messages according to values of devices



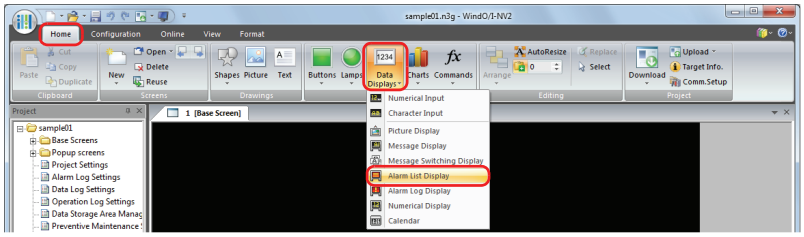
- Only one Alarm List Display or Alarm Log Display can be configured on a single screen.
- When the active alarm is displayed on the Alarm List Display, the message disappears from the list when the alarm is recovered from regardless of the **Lock/Unlock** setting. To display the alarm message until it can be checked, use the Alarm Log Display. **Lock/Unlock** is configured on the **Channel** tab in the **Alarm Log Settings** dialog box.

- For the key buttons used with the Alarm List Display, refer to Chapter 8 "Alarm List Display" on page 8-86.
- The number of the message (channel when using the Alarm function) that has focus on the Alarm List Display is stored in HG special register LSD 50.
- The information about where on the list the message that has focus is displayed, out of all the messages displayed on the Alarm List Display, is stored in HG special register LSD 56.

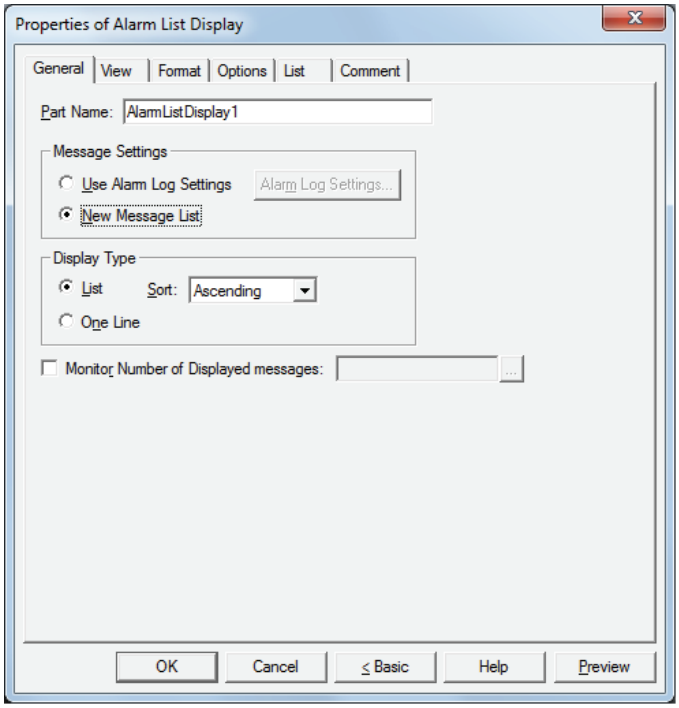
7.2 Alarm List Display Configuration Procedure

This section describes the configuration procedure for Alarm List Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Alarm List Display**.



2. Click a point on the edit screen where you wish to place the Alarm List Display.
3. Double-click the dropped Alarm List Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

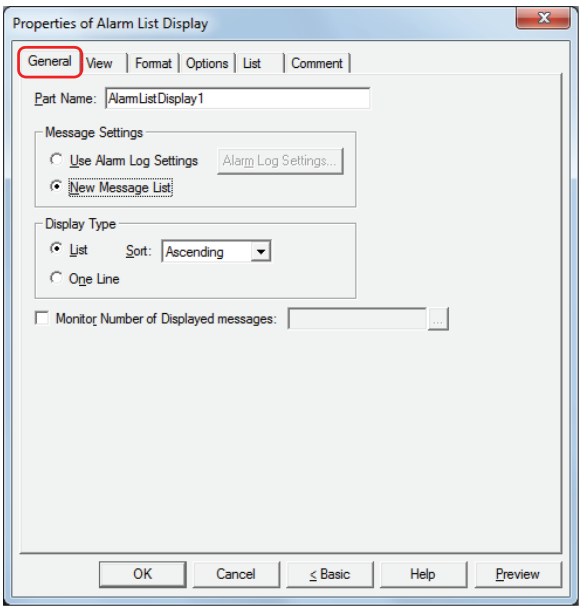


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

7.3 Properties of Alarm List Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Message Settings

Selects the method for switching message to display.

Use Alarm Log Settings: Displays messages for the active alarms. The alarms are configured by the Alarm Log settings.

Alarm Log Settings: Displays the **Alarm Log Settings** dialog box.

New Message List: Displays the messages registered in Text Manager according to the state of bits in the trigger device configured on the **List** tab.

Example: When **Use Alarm Log Settings** is selected, the source device (device to monitor) configured by the Alarm Log function is D 0, and the following messages are allocated to the channels

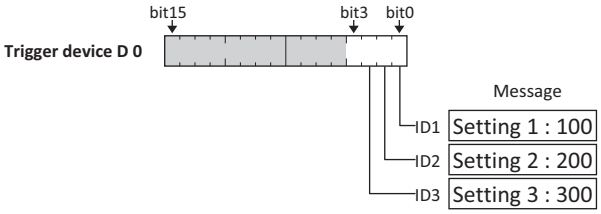
			Message
Reference Device	**D0-0 :**	ID1	Current fault
	D0-1 :	ID2	Pump fault
	D0-2 :	ID3	High pressure
	D0-3 :	ID4	Low air pressure

The active alarm messages are displayed.

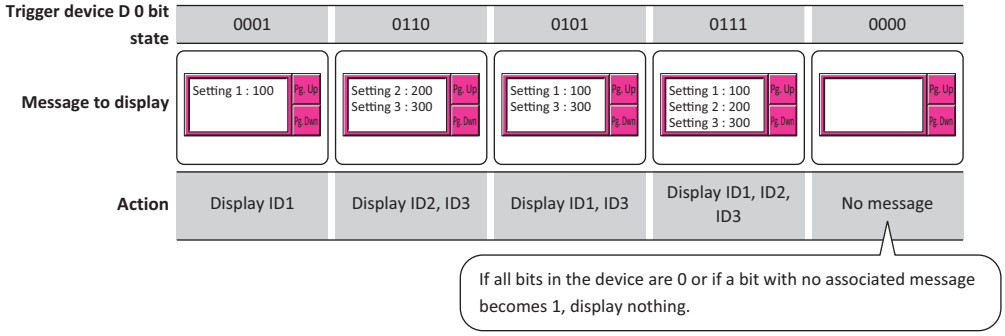
Reference device bit state	**D0-0**	1	0	1	1	0
	D0-1	0	1	0	1	0
	D0-2	0	1	1	1	0
	D0-3	0	0	1	1	0
Message to display		Current fault	Pump fault High pressure	Current fault High pressure Low air pressure	Current fault Pump fault High pressure Low air pressure	
Action		Display ID1	Display ID2, ID3	Display ID1, ID3, ID4	Display ID1, ID2, ID3, ID4	No message

If all bits in the device are 0 or if a bit with no associated message becomes 1, display nothing.

Example: When **New Message List** is selected and the bits of trigger device D 0 are allocated to the following messages.



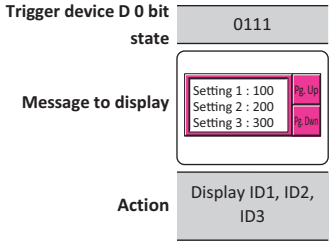
The messages are displayed according to the state of the bits.



■ Display Type

Selects whether or not to simultaneously display multiple messages.

List: Simultaneously displays multiple messages.



Sort: Selects the display order when displaying multiple messages.

Old and **New** can only be configured when the **Use Alarm Log Settings** check box is selected.

Ascending: Sorts the list in alphabetic order from A to Z.

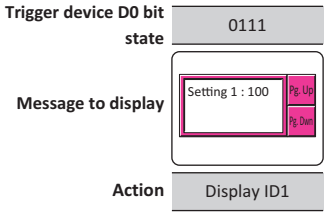
Descending: Sorts the list in alphabetic order from Z to A.

Old: Sorts the list in order from oldest to newest.

New: Sorts the list in order from newest to oldest.

One Line: Displays only a single message.

When multiple bits are 1, the message for the lowest order bit is displayed.



■ Register Occurred No.

Select this check box to count the number of displayed messages.

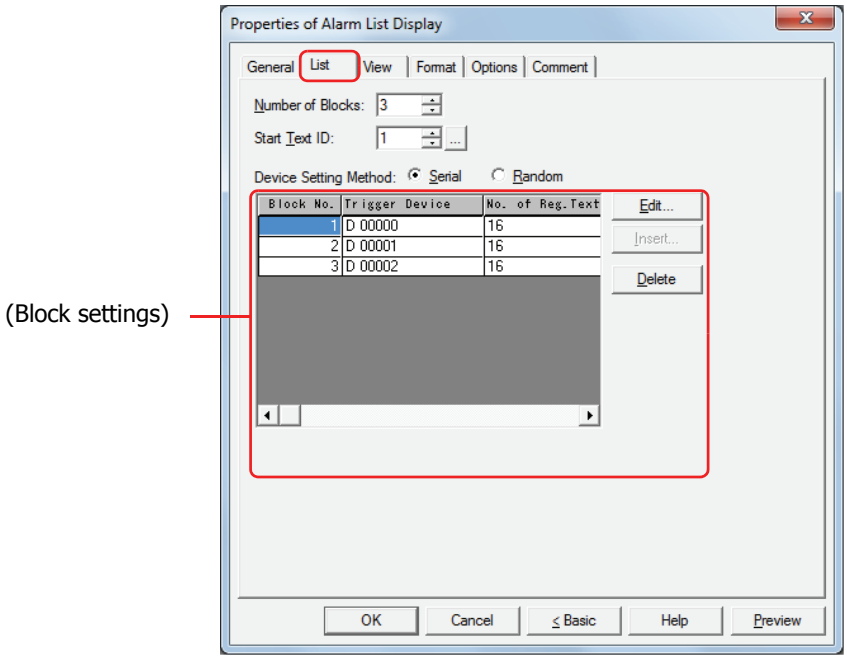
This option can only be configured when the **New Message List** check box is selected.

(Destination device): Specifies the word device to write the number of displayed messages to.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● **List** Tab

The **List** tab is only displayed when **New Message List** is selected for **Message Settings** on the **General** tab.



■ **Number of Blocks**

Configures the devices that trigger messages to display and message switching as blocks (0 to 64).

1 block is composed of 16 channels. 1 device bit can be monitored for each channel. The maximum number of device bits that can be monitored is 16 for each block.

■ **Start Text ID**

Specifies the Text Manager ID number (1 to 32000) of the message to display. The text ID numbers are sequentially configured for all channels from the first block starting with the ID number configured here. Click ... to display Text Manager.

■ **Device Setting Method**

Selects the trigger device setting method.

Serial: The trigger devices after the block number selected in the block settings are configured with sequential addresses.

Random: Configures trigger devices for each block number.

■ **(Block settings)**

Registers and edits the messages to display for each block channel.

Block No.: Shows the block numbers in the amount specified by **Number of Blocks**.
Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "Individual Settings Dialog Box" on page 10-107.

Trigger Device: Shows the word device to use as the condition to display messages.
Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
When **Serial** is selected for **Device Setting Method**, the trigger devices for block numbers after the selected block number are automatically configured with the configured trigger device as the starting address.

No. of Reg. Text: Shows the number of messages registered to the block.
Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "Individual Settings Dialog Box" on page 10-107.

Edit: Changes the block settings in list.
Select a block number in the list and click this button to display the **Individual Settings** dialog box. For details, refer to "Individual Settings Dialog Box" on page 10-107.

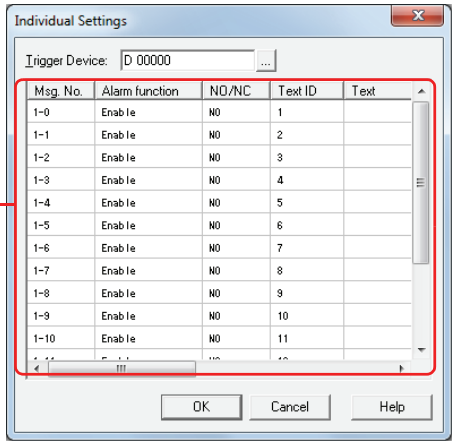
Insert: Inserts the block settings in the position selected on the list.
Select the block number at the position to insert the settings in the list and click this button to display the **Individual Settings** dialog box. For details, refer to "Individual Settings Dialog Box" on page 10-107.
The settings at the insertion point shift down one line. Settings cannot be inserted if all block numbers are configured.

Delete: Deletes the registered settings from the list.
Select a block number on the list and click this button to delete the selected settings from the list.

Individual Settings Dialog Box

The **Individual Settings** dialog box is used to configure the conditions to display the messages.

(Settings)



■ Trigger Device

Specifies the word device to use as the condition to display messages. The word device bits correspond to the message numbers.

Example: When the number of blocks is 1 and D 0 is specified as the trigger device
Message number 1-0 device bit is D0-0, message number 1-1 device bit is D0-1, up to message number 1-15 device bit which is D0-15.

Block 1
16 channels

Msg. No.	Device bit
1-0	D0-0
1-1	D0-1
1-2	D0-2
⋮	⋮
1-14	D0-14
1-15	D0-15

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
When **Serial** is selected for **Device Setting Method** on the **List** tab, the trigger devices for block numbers after the block number being registered or edited are automatically changed with the configured trigger device as the starting address.

■ (Settings)

Msg. No.: Displayed as (Block No.)-(Message No.).

Alarm function: Selects whether or not to use the alarm function. Double clicking the cell switches between **Enable** and **Disable**.

Enable: Monitors the state of the device bit configured for the channel and displays the message.

Disable: The device bit is not monitored and the message is not displayed.

NO/NC: Selects the alarm detection condition. Double clicking the cell switches between **NO** and **NC**.

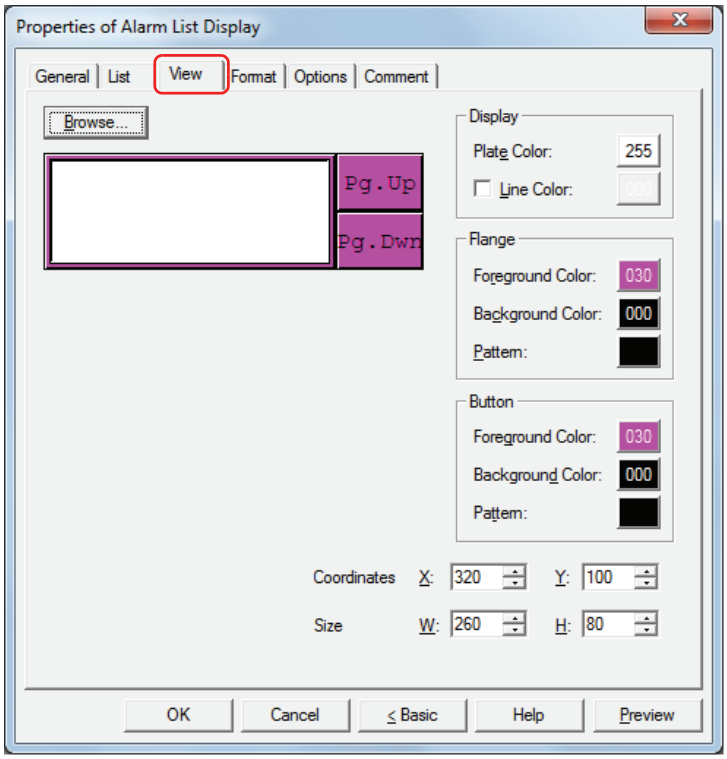
NO: Displays the message when the monitored bit changes from 0 to 1.

NC: Displays the message when the monitored bit changes from 1 to 0.

Text ID: Shows the Text Manager ID number (1 to 32000) to use for the message.
The text ID is sequentially configured starting with the text ID configured by **Start Text ID** on the **List** tab.

Text: Shows the text for the specified text ID.
Only shows the first line of text when the text registered to the text ID has multiple lines.

● View Tab



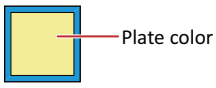
■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Plate Color

Selects the plate (color: 256 colors, monochrome: 16 shades).

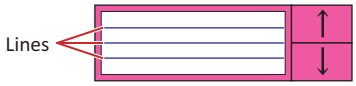
Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ Line Color

When lines are displayed, select this check box and select line color (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ Flange

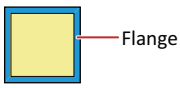
Foreground Color, Background Color:

Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



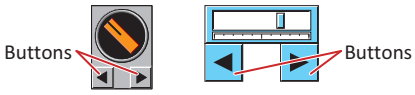
Buttons

Foreground Color, Background Color: Selects the foreground and background colors of the buttons (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the button.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



Can be set only when there are grouped Key Buttons.

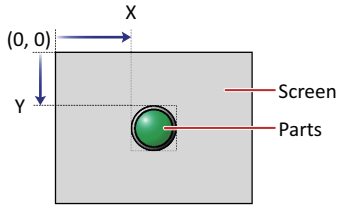
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

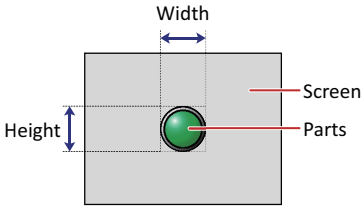


Size

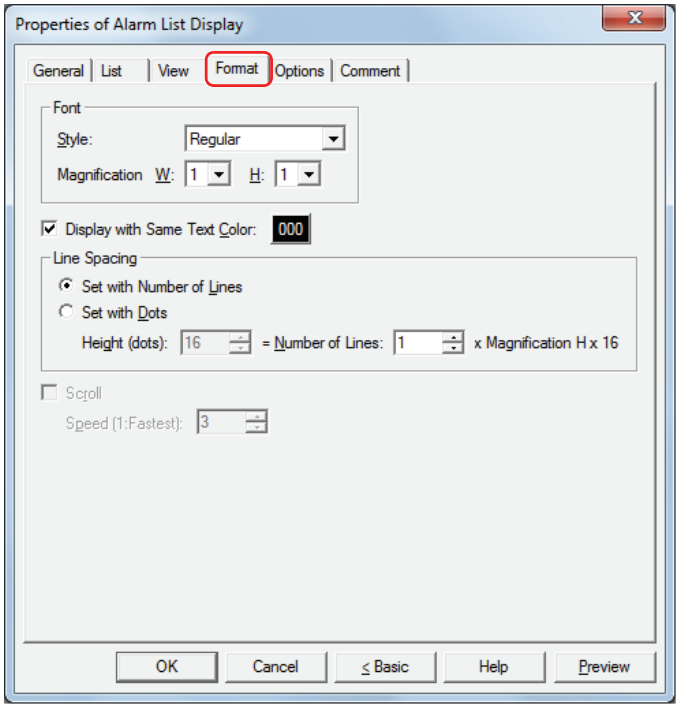
W, H: Sets width and height to define the size of parts.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Format** Tab



■ **Style**

Selects **Regular** or **Bold** for text style.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

■ **Display with Same Text Color**

To set the text color for all messages to the same color, select this check box and select the text color to display (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

When this check box is cleared, the color for messages is the text color configured in Text Manager.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

■ Line Spacing*2

Selects the specification method for line spacing in the list and configures the line spacing.

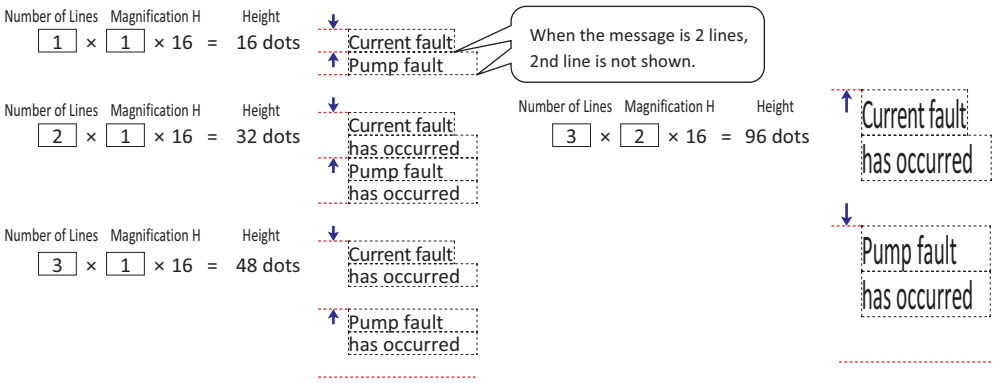
Set with Number of Lines:

Specifies the number of lines for the message to display for one alarm line.

Number of Lines: Enter the number of lines (1 to 10). To completely display a message that contains newlines, a number of lines that is equal to or greater than the number of message lines is required.

When you enter a value in **Number of Lines**, **Height (dots)** is automatically calculated according to the display area.

The relationship between the number of lines and the height (dots) is height (dots) = number of lines x magnification H x 16.



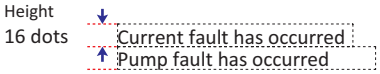
Since the alarm line spacing is adjusted with the number of lines for the message fixed, this option is convenient to use when displaying multi-line messages.

Set with Dots: Specifies the line spacing for the message to display for one alarm line in dots.

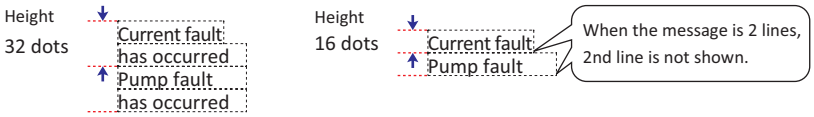
Height (dots): Enter the height (8 to 160). To completely display a message, a height equal to or greater than **Magnification H** x 16 dots x the number of message lines is required.

When **Magnification H** is 1

To display a one-line message, 1 x 16 = 16 dots, a height of 16 dots or higher is required.



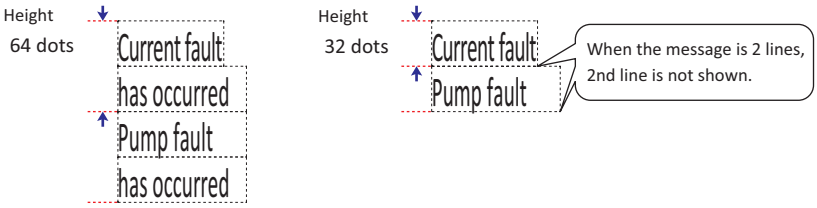
To display a two-line message, 2 x 16 = 32 dots, a height of 32 dots or higher is required.



When **Magnification H** is 2

To display a one-line message, 1 x 32 = 32 dots, a height of 32 dots or higher is required.

To display a two-line message, 2 x 32 = 64 dots, a height of 64 dots or higher is required.



*2 Advanced mode only

■ Scroll*2

Select this check box to enable scrolling display displaying of messages.

Can only be set when **One Line** is selected for **Display Type** under the **General** tab.

For Alarm List Display, this can only be set if **One Line** is selected for **Display Type** under the **General** tab.

Speed (1: Fastest): Sets the scrolling speed (1 to 10). 1 is fastest, 10 is slowest.

When the **Scroll** check box is selected operation is follows.

- Messages that include CRs are displayed without the CRs.
- Messages scroll in the direction in which the text is drawn.
- When the text displayed according to values of devices, the text color, the displayed text, or the alarm state changes, the message is scrolled from the beginning.

When the **Scroll** check box is selected, take care about the following points.

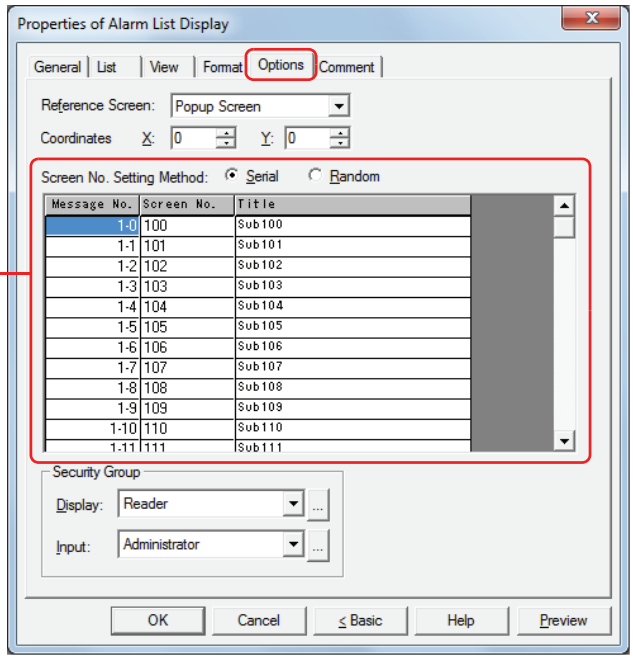
- The number of parts that can be arranged on a single screen decreases. If the MICRO/I displays an error message, clear the **Scroll** check box, or reduce the number of parts on the screen.
- When the scan time is long, scrolling speed may become slow.

*2 Advanced mode only

● Options Tab

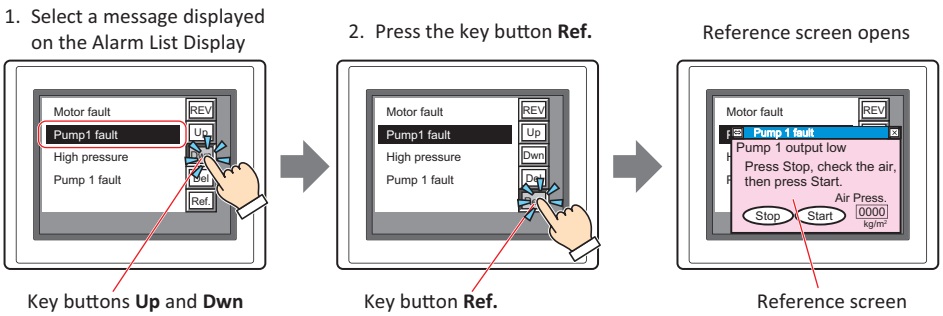
The **Options** tab is displayed in Advanced mode.

(Reference screen list)



■ Reference Screen

The **Options** tab is used to configure the reference screen. The reference screen is a base screen or popup screen associated with each individual message. The reference screen is displayed when the key button **Ref.** is pressed.



When displaying a reference screen, select either **Base Screen** or **Popup Screen** as the reference screen type.

When not displaying a reference, select **Not Use**.

This can only be set when **New Message List** has been selected in **Message Settings** on the **General** tab. When **Use Alarm Log Settings** has been selected, the screen type will become the one selected in **Reference Screen** on the **Channel** tab in the **Alarm Log Settings** dialog box.

■ Coordinates

X, Y: Specifies the coordinates to display the reference screen.

With the upper-left corner of the screen as the origin, the X and Y coordinates are the upper-left corner of the reference screen.

This option can only be configured when **Popup Screen** is selected for **Reference Screen**.

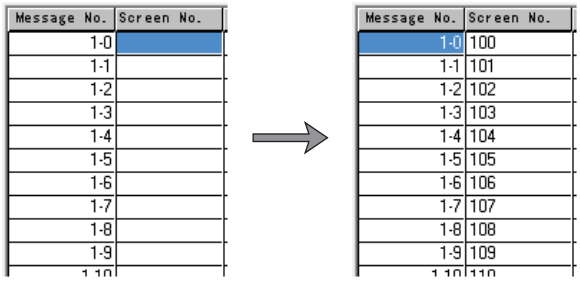
HG2G-S/-5S/-5F, HG3G/4G, HG1F:	Specify the coordinates in 1 dot units. X: 0 to (base screen horizontal size - 1) Y: 0 to (base screen vertical size - 1)
HG2F/2S/3F/4F:	Specify the coordinates in 20 dot units. X: 0 to (base screen horizontal size - 20) Y: 0 to (base screen vertical size - 20)

■ Screen No. Setting Method

Selects the setting method for the screen numbers on the reference screen list.

Serial: Continuously and automatically specifies screen numbers (1 to 3000) that are at or below the selected message number.

Example 1: When screen number "100" has been entered for message number 1-0.

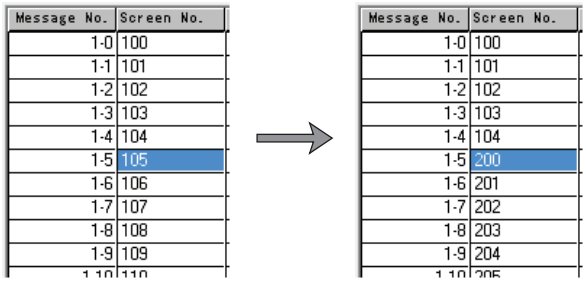


Message No.	Screen No.
1-0	
1-1	
1-2	
1-3	
1-4	
1-5	
1-6	
1-7	
1-8	
1-9	

Message No.	Screen No.
1-0	100
1-1	101
1-2	102
1-3	103
1-4	104
1-5	105
1-6	106
1-7	107
1-8	108
1-9	109

Screen numbers "100", "101", "102"....are automatically specified in order from message number 1-0.

Example 2: When screen number "200" has been entered for message number 1-5.



Message No.	Screen No.
1-0	100
1-1	101
1-2	102
1-3	103
1-4	104
1-5	105
1-6	106
1-7	107
1-8	108
1-9	109

Message No.	Screen No.
1-0	100
1-1	101
1-2	102
1-3	103
1-4	104
1-5	200
1-6	201
1-7	202
1-8	203
1-9	204

Message numbers 1-0 to 1-4 are left unchanged and screen numbers "200", "201", "202"....are automatically specified in order from message number 1-5.

Random: Specifies a reference screen number (1 to 3000) for each message number.

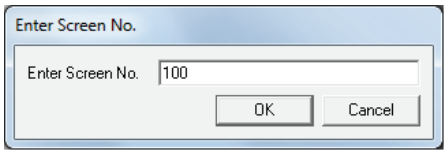
■ (Reference Screen List)

Displays a list reference screen numbers and screen titles that have been set to messages.

Message No.: Displays the message number.

Screen No.: Displays the reference screen number.

The screen number can be set according to the **Screen No. Setting Method**. The screen number is specified in the screen number input dialog box that appears after double clicking on a cell. Enter a screen number (1 to 3000) into **Screen No.** and then click **OK**.

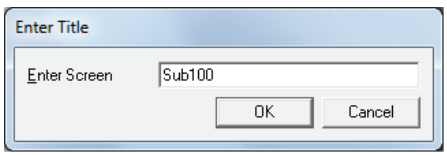


When there is not screen for the specified screen number a message confirming the creation of a new screen will appear.

If **Yes** is clicked, a screen will be created but if **No** is clicked, you will be returned to the **Options** screen without creating a screen.

Title: Displays the title of a reference screen.

When editing a title, editing is performed in the **Enter Title** dialog box that appears after double clicking on a cell. Edit the title and then click **OK**.



The title can be edited only when the screen number has already been set.

Security Group

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.

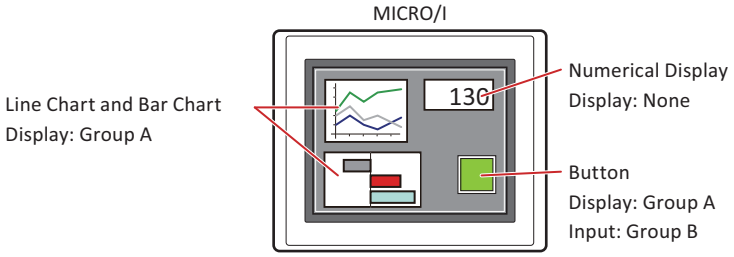
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

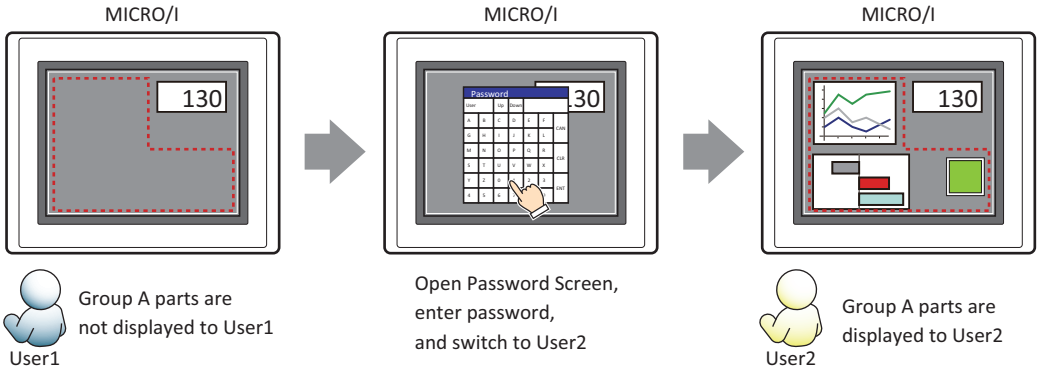
- The security group for input can only be configured when there are grouped key buttons.
- For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B

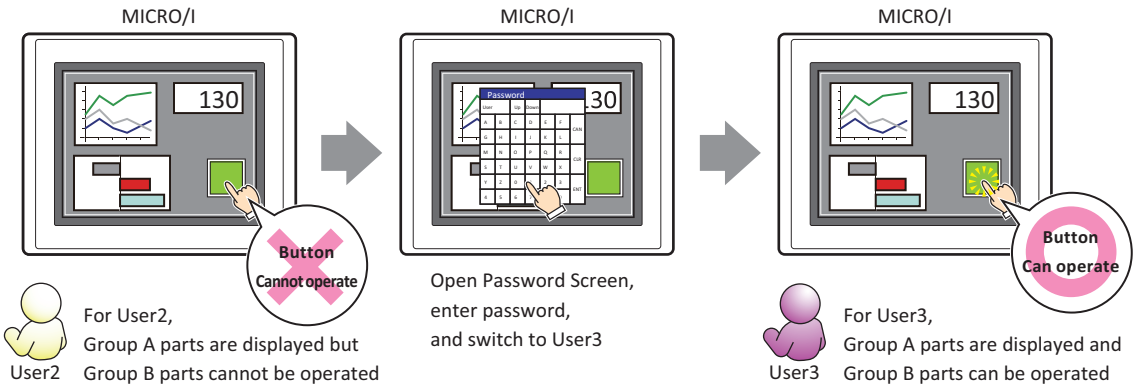


For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



Since the display security group is Group A, User 2 (of Group A) can view the buttons. But since the input security group is Group B, User 2 cannot operate the buttons.

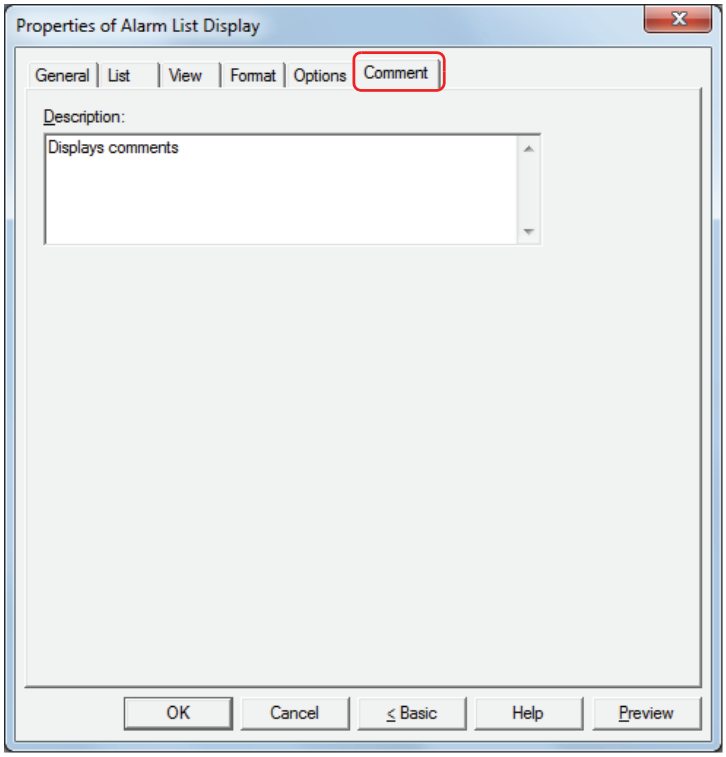
Suppose that the Password Screen is now opened and a switch is made to User 3, who is part of both Group A and Group B. Group A buttons can be displayed, and Group B buttons can be operated.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

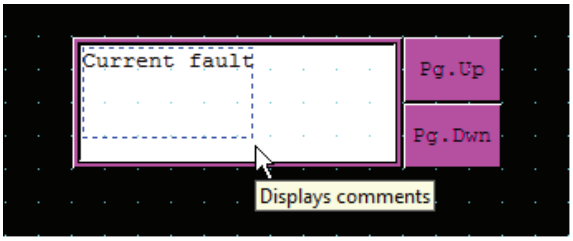
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Alarm List Display on the editing screen



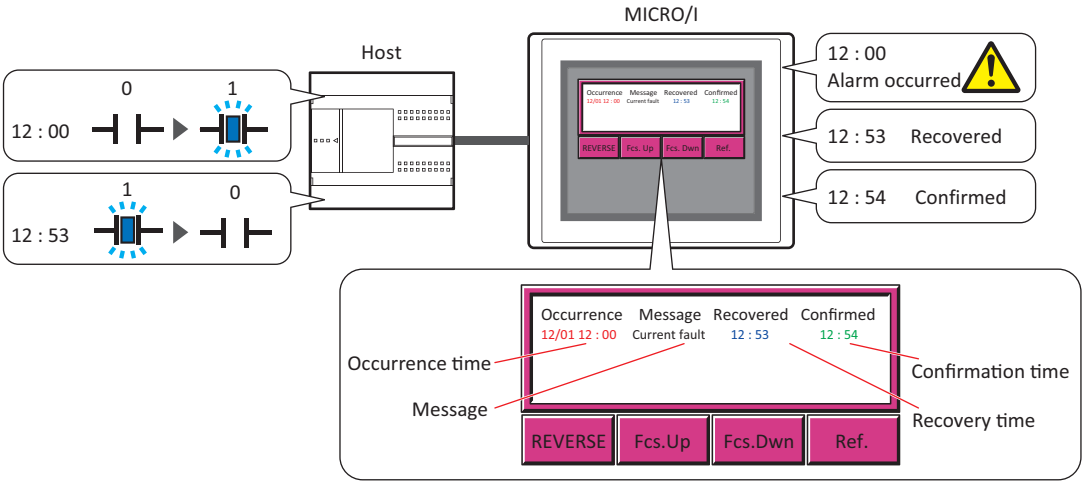
8 Alarm Log Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

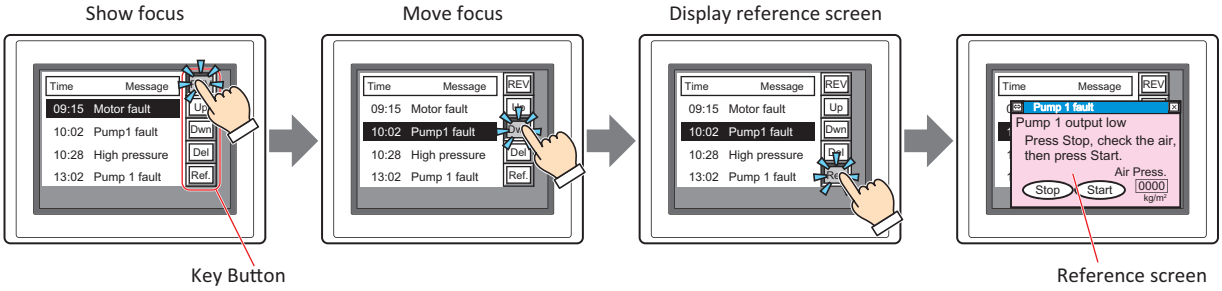
8.1 How the Alarm Log Display is Used

The Alarm Log Display displays Alarm Log data saved in the data storage area.

- List the message, the occurrence time, recovery time, and confirmation time for the alarms that have occurred



- Display the reference screen for alarms that have occurred



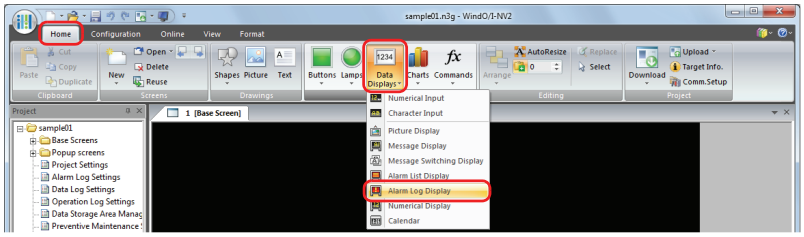
Only one Alarm List Display or Alarm Log Display can be displayed in a screen.

- For the key buttons used with the Alarm Log Display, refer to Chapter 8 "Alarm Log Display" on page 8-86.
- When the **Operate the Alarm on List directly** check box on the **General** tab in the Properties of Alarm Log Display dialog box is selected, a displayed alarm can be given focus by pressing it on the list.
- The number of lines from the start line to the selected line of the message displayed on the Alarm Log Display is stored in HG special register LSD 56.

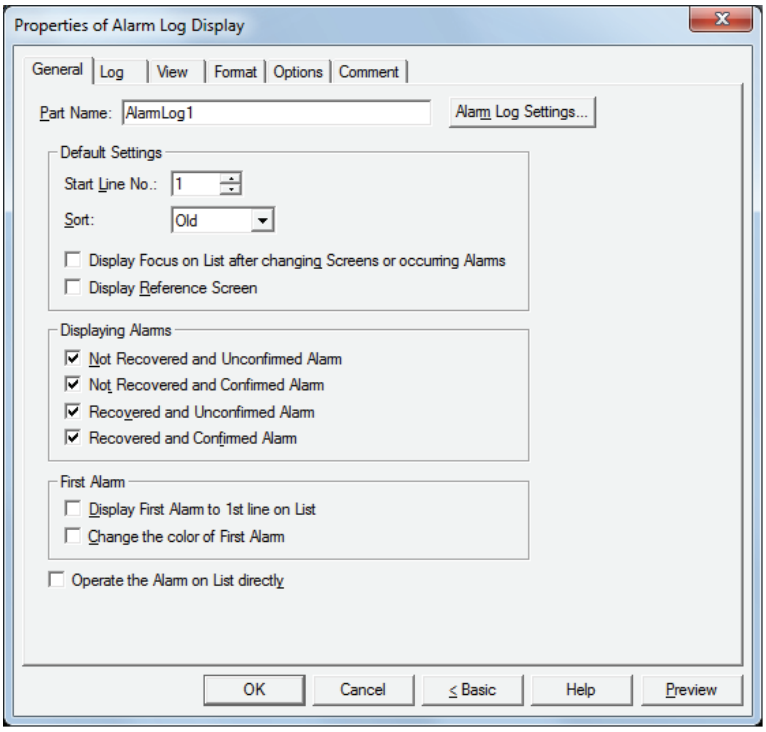
8.2 Alarm Log Display Configuration Procedure

This section describes the configuration procedure for Alarm Log Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Alarm Log Display**.



2. Click a point on the edit screen where you wish to place the Alarm Log Display.
3. Double-click the dropped Alarm Log Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

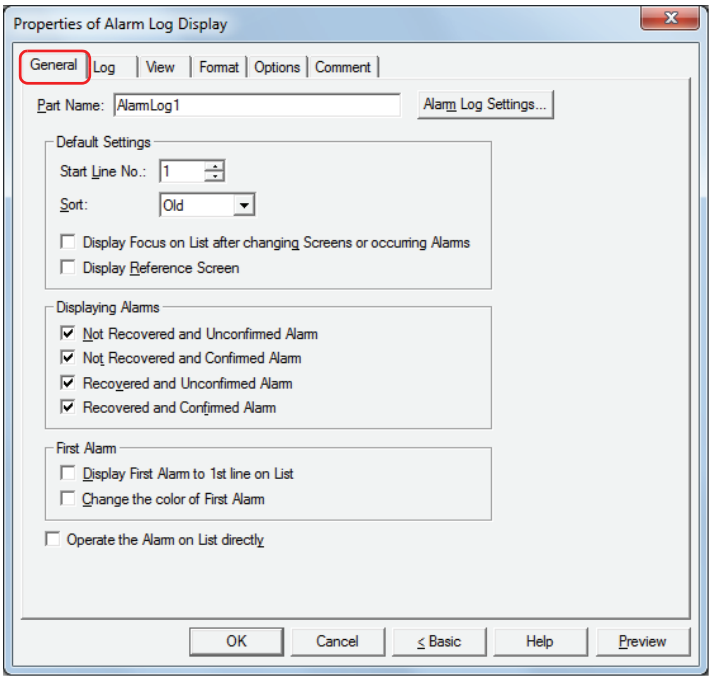


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

8.3 Properties of Alarm Log Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Default Settings

These options configure the default settings when the Alarm Log Display is displayed.

Start Line No.: Specifies what number alarm to display when multiple alarms have occurred.
The range that can be specified varies based on the model type.

HG2G-S/-5S:	1 to 5520
HG2G-5F, HG3G/4G:	1 to 11660
HG1F/2F/2S/3F/4F:	1 to 1024

Sort: Selects the display order for alarms that have occurred as **Old** or **New**.

Display Focus on List after changing Screens or occurring Alarms*1:
Select this check box to automatically display the focus at the first item in the list after switching screens and when an alarm occurs.

Display Reference Screen*1: Select this check box to automatically display the reference screen for the alarm that has focus under the following conditions.
When the focus is displayed
When the focus moves
When a new alarm occurs

■ Displaying Alarms*1

Select these check boxes for alarms to display on the Alarm Log Display.

Not Recovered and Unconfirmed Alarm:	Displays active alarms that have not been recovered and confirmed.
Not Recovered and Confirmed Alarm:	Displays alarms that have not been recovered but the key button **CHECK** has been pressed.
Recovered and Unconfirmed Alarm:	Displays alarms that have been recovered but the key button **CHECK** has not been pressed.
Recovered and Confirmed Alarm:	Displays alarms that have been recovered and the key button **CHECK** has been pressed.

*1 Advanced mode only

■ **First Alarm**[*1]

An alarm that occurs in a state where no alarms have occurred is called the first alarm. Select the check boxes for the operations to execute when the first alarm occurs.

Display First Alarm to 1st line on List:	Always displays the first alarm on the first line of the list.
Change the color of First Alarm:	Changes the text color of the first alarm according to the **First Alarm Color** setting. **First Alarm Color** is configured on the **Format** tab.

■ **Operate the Alarm on List directly**[*1]

Select this check box to display the focus by pressing an alarm displayed on the list.

When an alarm is pressed with no focus displayed, the focus is displayed on that alarm.

When an alarm is pressed that does not have focus when the focus is displayed, the focus is moved to that alarm. The focus is no longer displayed when an alarm with focus is pressed.

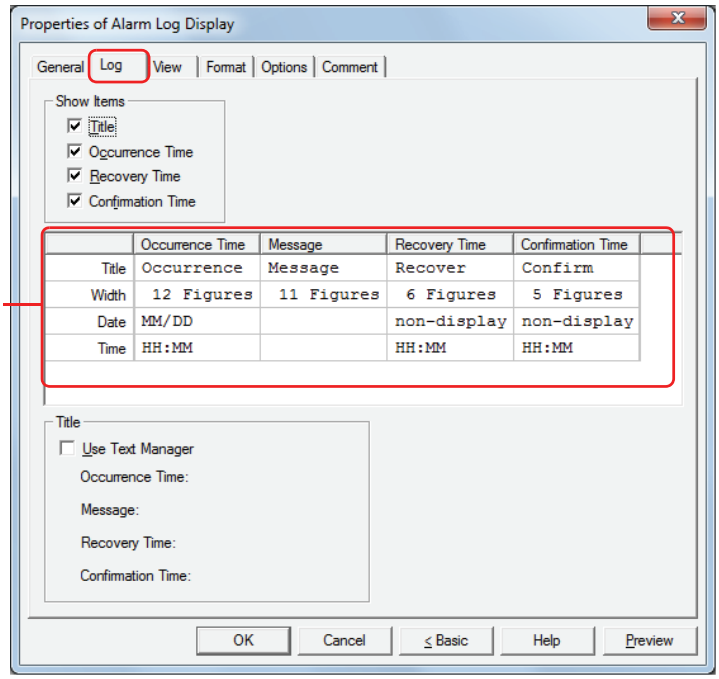
■ **Alarm Log Settings**

Displays the **Alarm Log Settings** dialog box.

*1 Advanced mode only

● **Log** Tab

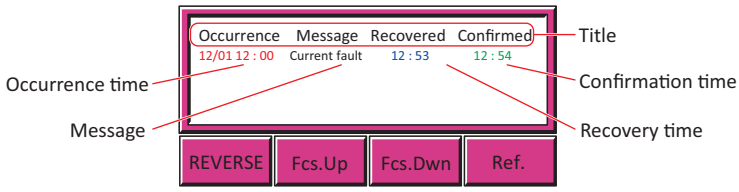
(Show items detailed settings)



■ **Show Items**

Select these check boxes for the items to display on the Alarm Log Display.

Title:	Shows the titles on the first line of the list.
Occurrence Time:	Shows the time the alarm occurred.
Recovery Time:	Shows the time the alarm was recovered from.
Confirmation Time:	Shows the time the alarm was confirmed by pressing the key button **CHECK**.



(Show items detailed settings)

Each of the show items selected by the check boxes under **Show Items** can be configured in detail here.

Title:	Enter the titles for the items to display. The maximum number is 20 characters. Double clicking the cell displays the **Unicode Input** dialog box. Enter the characters in the **Unicode Input** dialog box and click **OK**.
Width:	Specifies the number of characters to display (1 to 40). 1 is the width of a single-byte character, 2 is the width of a double-byte character.
Date:	Selects the display type of the date from the following. **YY/MM/DD**, **MM/DD/YY**, **DD/MM/YY**, **MM/DD**, **DD/MM**, **non-display**
Time:	Selects the display type of the time from the following. **HH:MM**, **HH:MM:SS**, **non-display**

- If the title contains a newline, the text after the newline is not displayed. However, if using a Windows font for the selected text ID, all the characters are displayed.
- If the title contains a language not supported as standard by the OS, the characters may be garbled when displaying the **(Show items detailed settings)**. However, the downloaded data is correctly displayed.

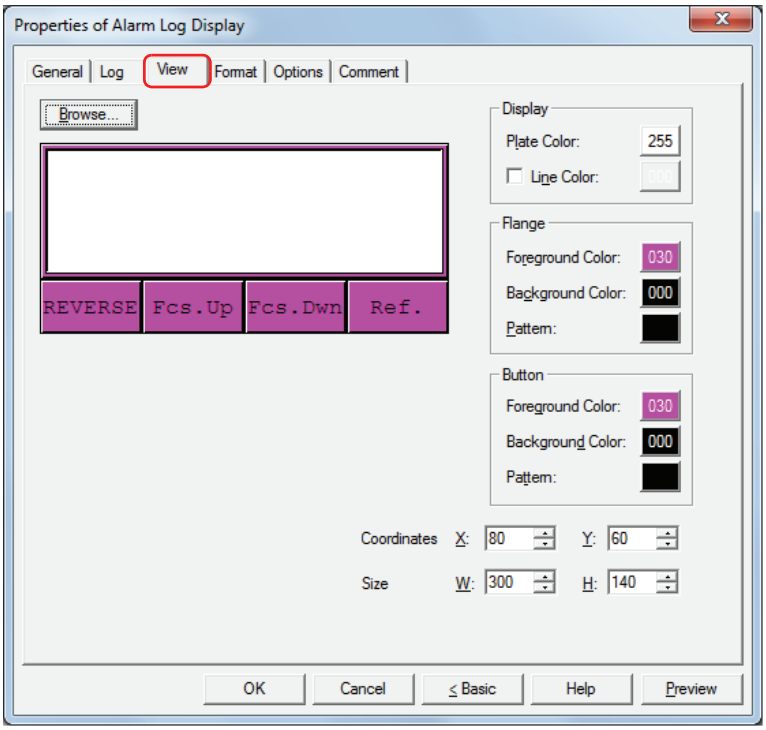
- If you change the display format for **Date** or **Time**, the number for **Width** is automatically adjusted.
- The text color for **Message** changes according to the alarm state. The text color for **Message** is configured by **Occurred Color**, **Recovered Color**, and **Confirmed Color** on the **Format** tab.

Title

Select this check box to use text registered in Text Manager for **Title** in the **(Show items detailed settings)**. The **Text ID** message configured for **Occurrence Time**, **Message**, **Recovery Time**, and **Confirmation Time** is displayed in **(Show Items detailed settings)**.

Text ID:	Specifies the Text Manager ID number (1 to 32000) when using text registered in Text Manager. Click ... to display Text Manager. This option can only be configured when the **Use Text Manager** check box is selected.

● View Tab



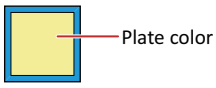
■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Plate Color

Selects the plate (color: 256 colors, monochrome: 16 shades).

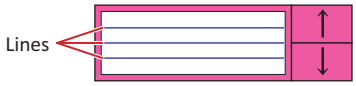
Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ Line Color

When lines are displayed, select this check box and select line color (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ Flange

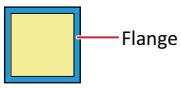
Foreground Color, Background Color:

Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



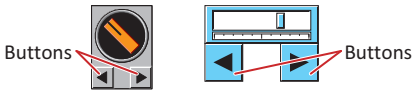
Buttons

Foreground Color, Background Color: Selects the foreground and background colors of the buttons (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the button.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



Can be set only when there are grouped Key Buttons.

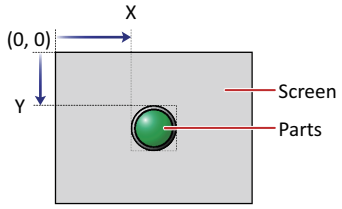
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

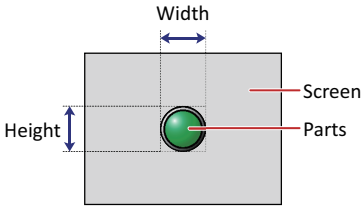


Size

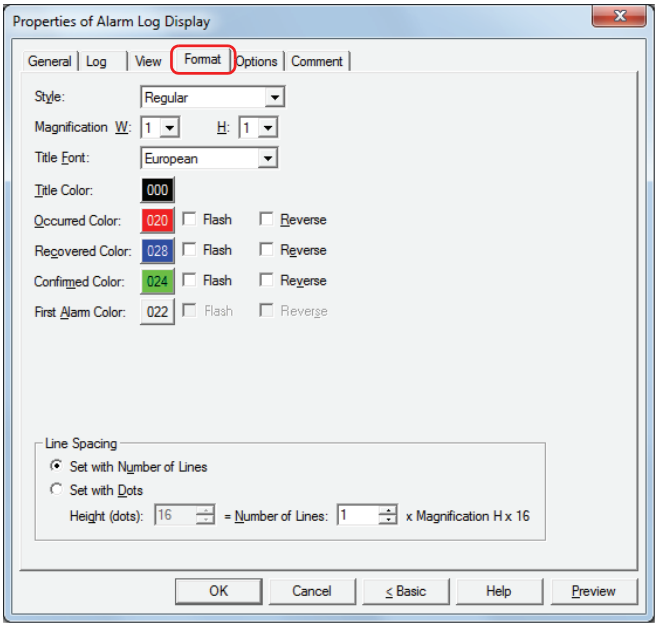
W, H: Sets width and height to define the size of parts.

W: 20 to (base screen horizontal size)

H: 20 to (base screen vertical size)



● **Format** Tab



■ **Style**

Selects **Regular** or **Bold** for text style.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

■ **Title Font**

Select the font that will be used for the title from the following options.

Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Title Color**

Select the color (color: 256 colors, monochrome: 16 shades) of the text for titles.

Click this button to display the Color Palette. Select a color from the Color Palette.

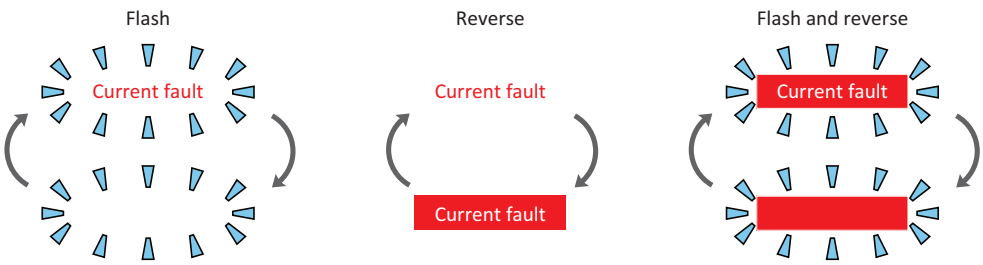
■ **Occurred Color, Recovered Color, Confirmed Color, First Alarm Color**[*2]

Select the color (color: 256 colors, monochrome: 16 shades) of the occurred alarm, recovered alarm, confirmed alarm and first alarm.

Click this button to display the Color Palette. Select a color from the Color Palette.

Flash: Select this check box to flash alarms that are displayed on the list.
The flash interval is specified in **Flashing Cycle** on the **System** tab in the **Project Settings** dialog box.

Reverse: Select this check box to show in reverse, the text color and plate color of alarms that are displayed on the list.



When the Key Button **CHECK** is pressed before recovering a triggered alarm, the alarm display will change from the Occurred Color to the Confirmed Color. After this, the alarm that has changed to the Confirmed Color will remain in that color and will not change to the Recovered Color even when recovered.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.
*2 Advanced mode only

■ Line Spacing*2

Selects the specification method for line spacing in the list and configures the line spacing.

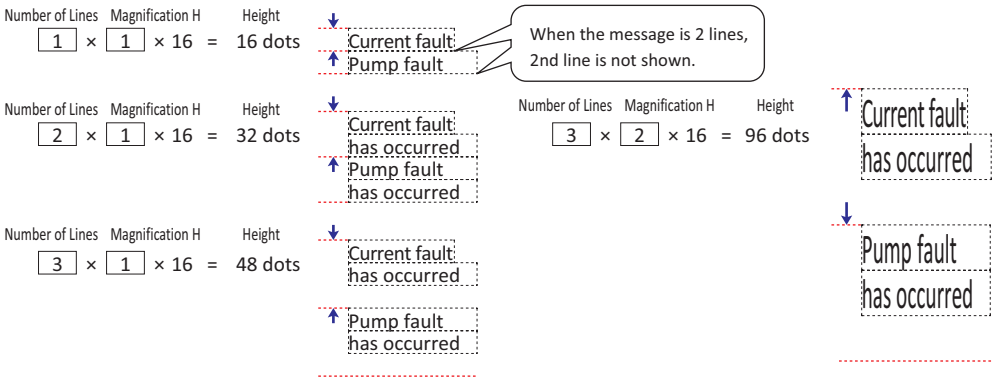
Set with Number of Lines:

Specifies the number of lines for the message to display for one alarm line.

Number of Lines: Enter the number of lines (1 to 10). To completely display a message that contains newlines, a number of lines that is equal to or greater than the number of message lines is required.

When you enter a value in **Number of Lines**, **Height (dots)** is automatically calculated according to the display area.

The relationship between the number of lines and the height (dots) is height (dots) = number of lines x magnification H x 16.



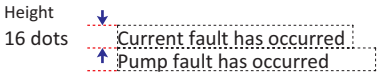
Since the alarm line spacing is adjusted with the number of lines for the message fixed, this option is convenient to use when displaying multi-line messages.

Set with Dots: Specifies the line spacing for the message to display for one alarm line in dots.

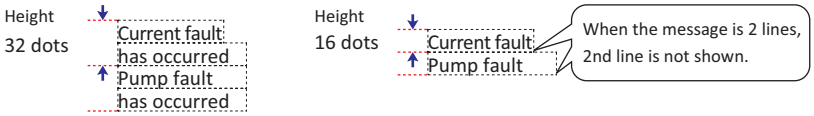
Height (dots): Enter the height (8 to 160). To completely display a message, a height equal to or greater than **Magnification H** x 16 dots x the number of message lines is required.

When **Magnification H** is 1

To display a one-line message, 1 x 16 = 16 dots, a height of 16 dots or higher is required.



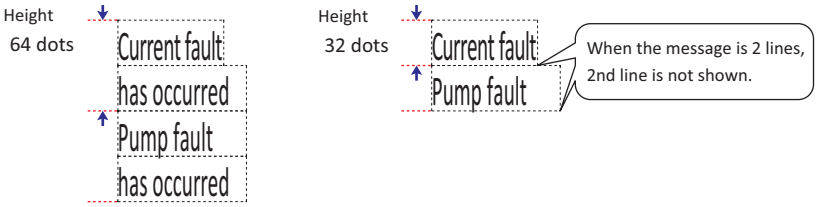
To display a two-line message, 2 x 16 = 32 dots, a height of 32 dots or higher is required.



When **Magnification H** is 2

To display a one-line message, 1 x 32 = 32 dots, a height of 32 dots or higher is required.

To display a two-line message, 2 x 32 = 64 dots, a height of 64 dots or higher is required.



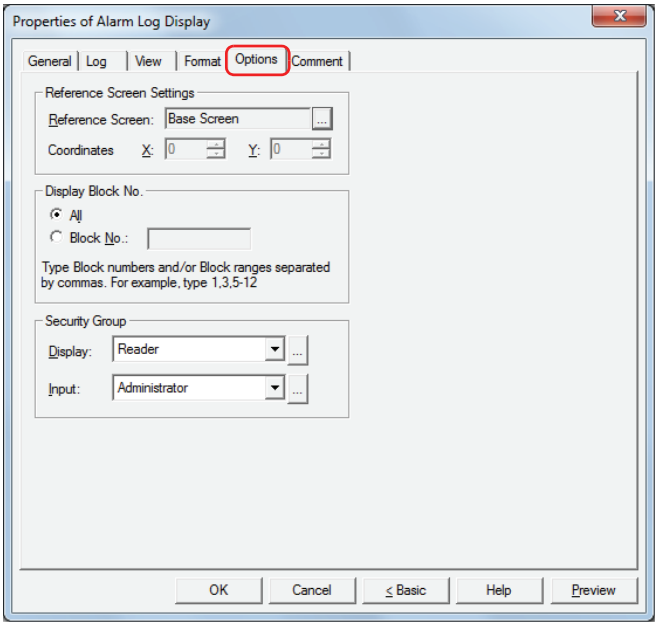
Since only one line of the title is displayed, the title line spacing = 1 (number of lines) x **Magnification H** x 16, regardless of the **Line Spacing** setting.

Example: When **Magnification H** is 1, the title line spacing = 1 x 1 x 16 = 16 dots
When **Magnification H** is 2, the title line spacing = 1 x 2 x 16 = 32 dots

*2 Advanced mode only

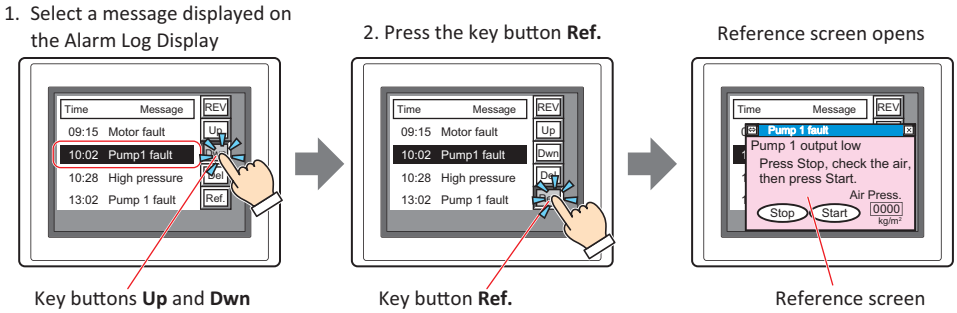
● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Reference Screen Settings**

The **Options** tab is used to configure the reference screen. The reference screen is a base screen or popup screen associated with each individual message. The reference screen is displayed when the key button **Ref.** is pressed.



Reference Screen: Displays the type of screen selected in **Reference Screen** on the **Channel** tab in the **Alarm Log Settings** dialog box.

Click ... to display the **Alarm Log Settings** dialog box.

When displaying a reference screen, select either **Base Screen** or **Popup Screen** as the reference screen type.

When not displaying a reference, select **Not Use**.

Coordinates X, Y: Specifies the coordinates to display the reference screen.

With the upper-left corner of the screen as the origin, the X and Y coordinates are the upper-left corner of the reference screen.

This option can only be configured when **Base Screen** or **Popup Screen** is selected for **Reference Screen**.

HG2G-S/-5S/-5F, HG3G/4G, HG1F:	Specify the coordinates in 1 dot units. X: 0 to (base screen horizontal size - 1) Y: 0 to (base screen vertical size - 1)
HG2F/2S/3F/4F:	Specify the coordinates in 20 dot units. X: 0 to (base screen horizontal size - 20) Y: 0 to (base screen vertical size - 20)

If you overlap the reference screen key button and the move focus key buttons, the reference screen can be switched and checked while moving the focus.

Display Block No.

Specifies the range of block numbers that will display the collected alarm log data.

All: Displays the data for all blocks.

Block No.: Displays only the data for the specified blocks in the Alarm Log Display. Alarms in unspecified blocks are not displayed, even if active.

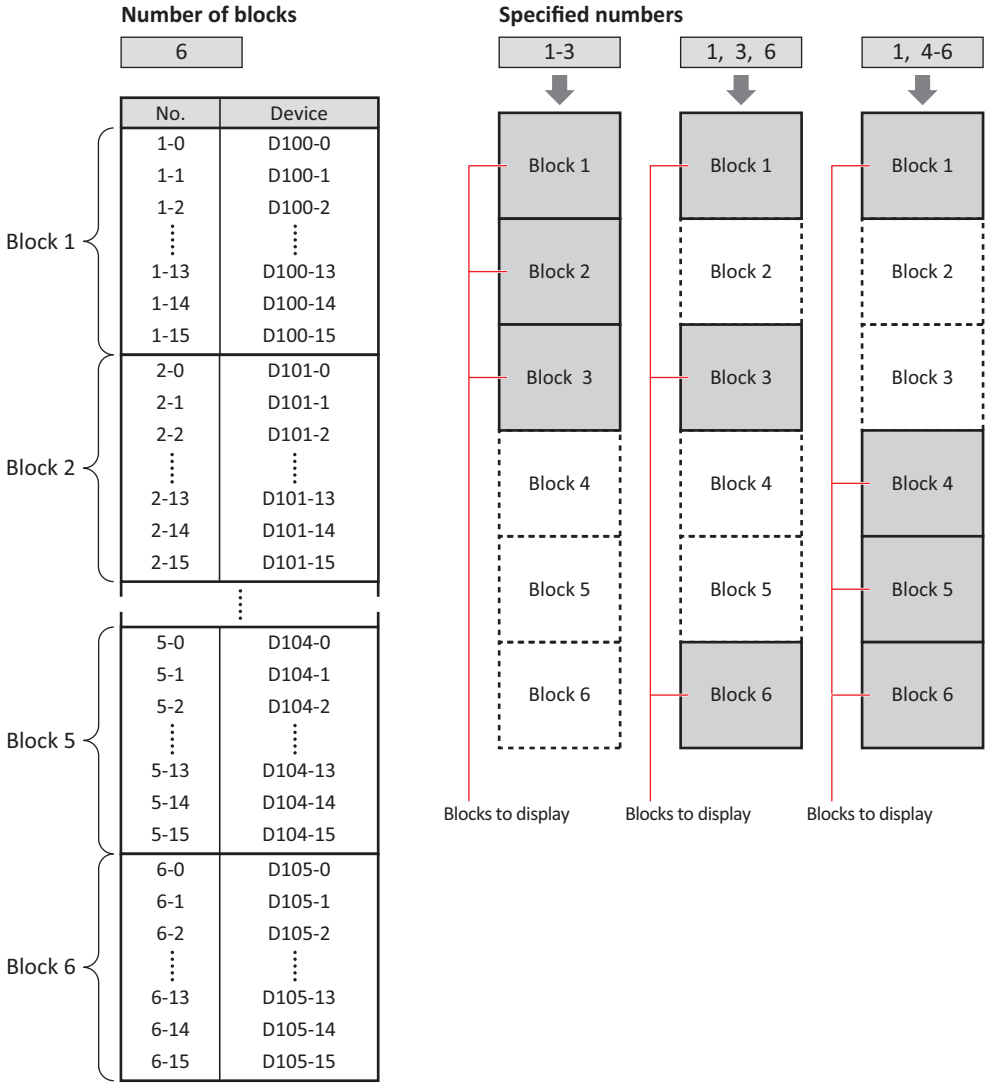
Individual block numbers can be specified by separating the numbers with ",", continuous regions can be specified with "-".

Example: When the number of blocks is 6, enter the following.

To specify blocks 1 to 3: 1-3

To specify blocks 1, 3, 6: 1, 3, 6

To specify blocks 1, 4 to 6: 1, 4-6



- To display the alarms set in blocks 65 to 128 of the Alarm Log settings on the HG2G-S/-5S/-5F and the HG3G/4G, select **All** under **Display Block No.**. If **Block No.** is selected, only blocks 1 to 64 can be specified.
- For the number of blocks, refer to Chapter 13 "Number of Blocks" on page 13-17.

Security Groups

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

Input: Selects the security group for which operation of parts is restricted. (Default: None)

None: No security function is used.

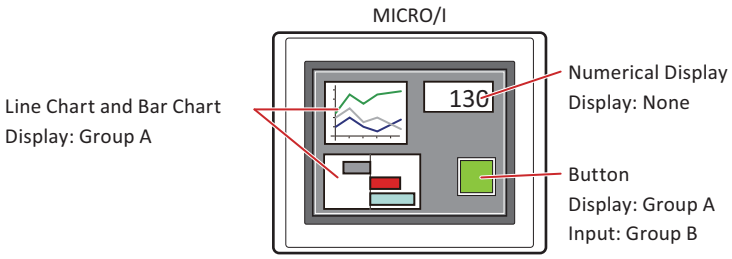
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

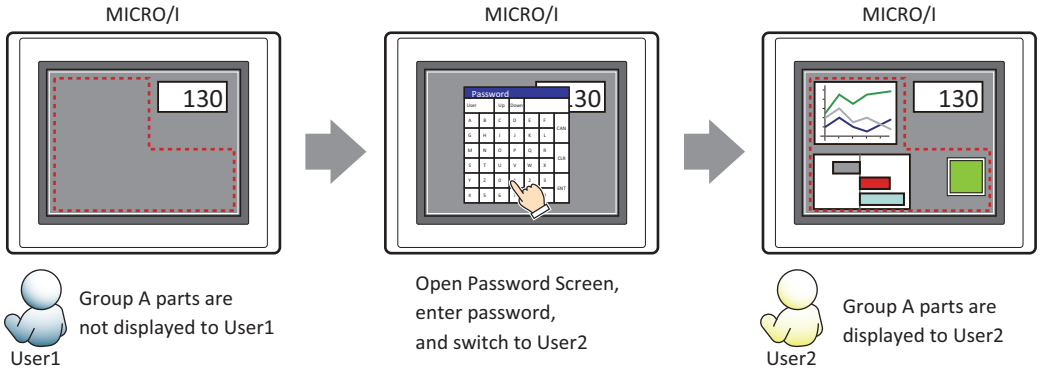
- The security group for input can only be configured when there are grouped key buttons.
- For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2	User3
Security Group	None	Group A	Group A, Group B

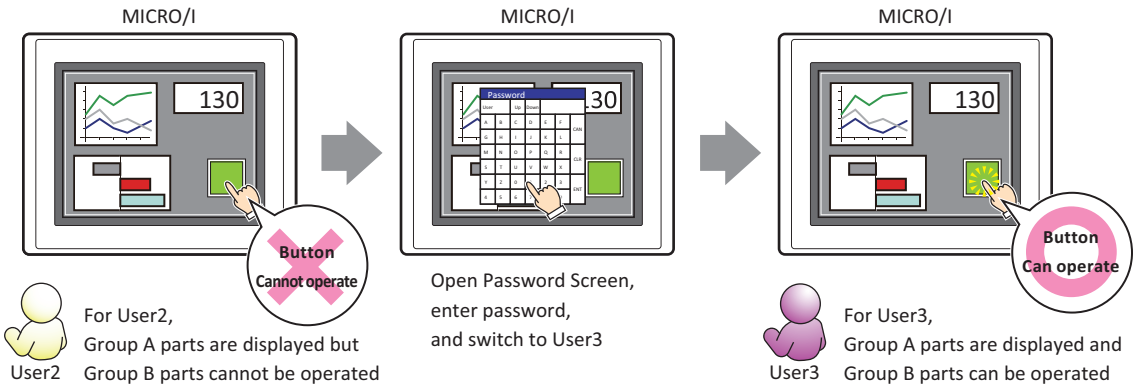


For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



Since the display security group is Group A, User 2 (of Group A) can view the buttons. But since the input security group is Group B, User 2 cannot operate the buttons.

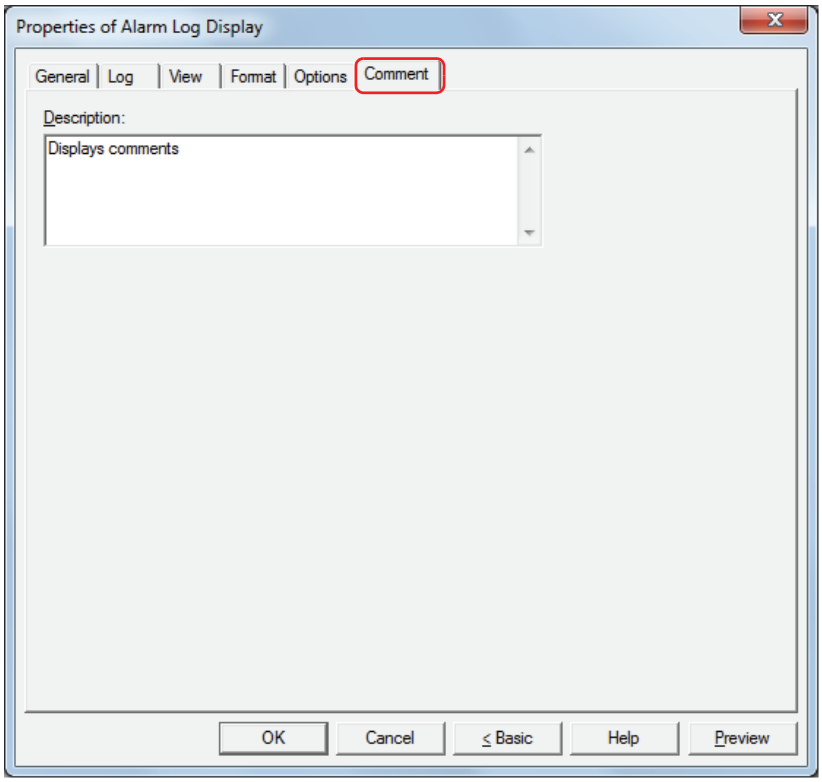
Suppose that the Password Screen is now opened and a switch is made to User 3, who is part of both Group A and Group B. Group A buttons can be displayed, and Group B buttons can be operated.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

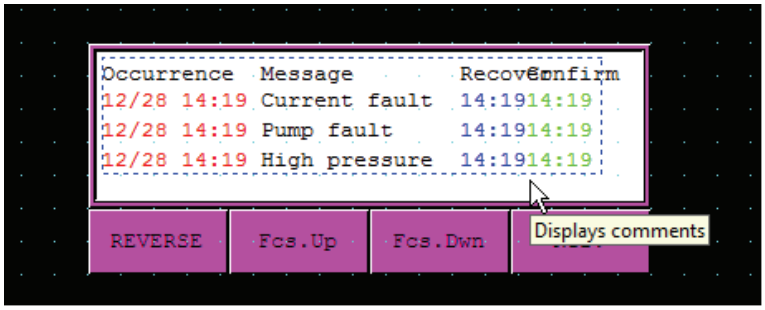
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Alarm Log Display on the editing screen



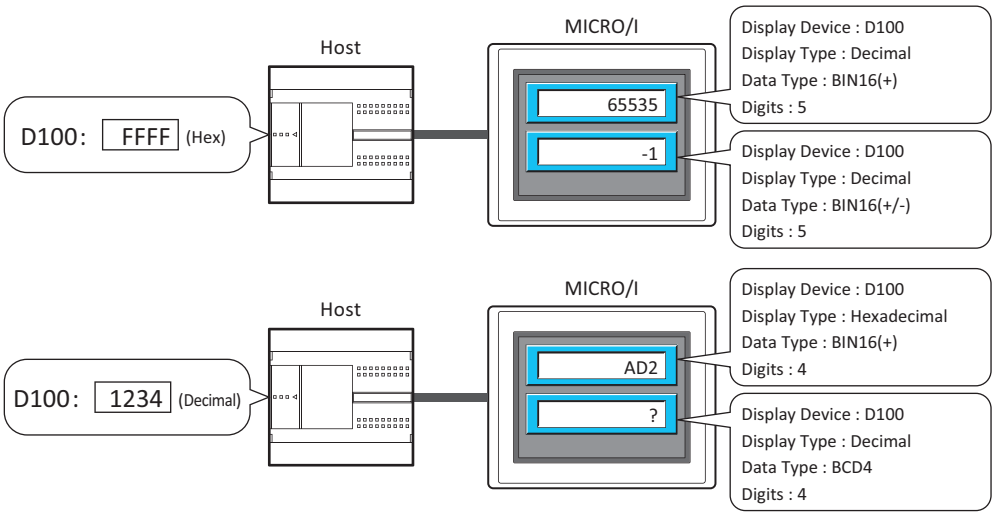
9 Numerical Display

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

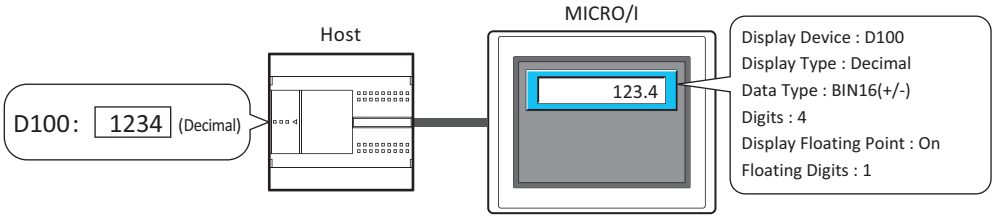
9.1 How the Numerical Display is Used

The Numerical Display is used to display the value of a word device in the specified format.

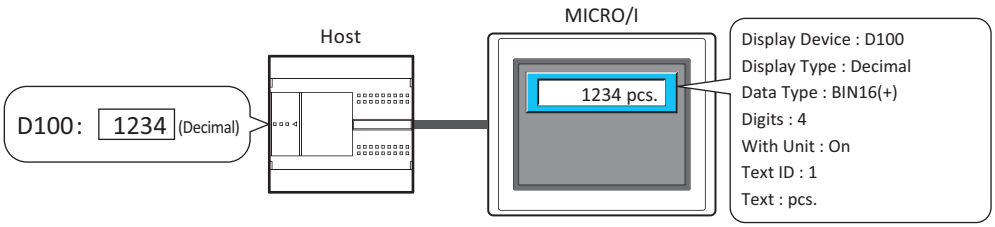
- Display the current value of a device



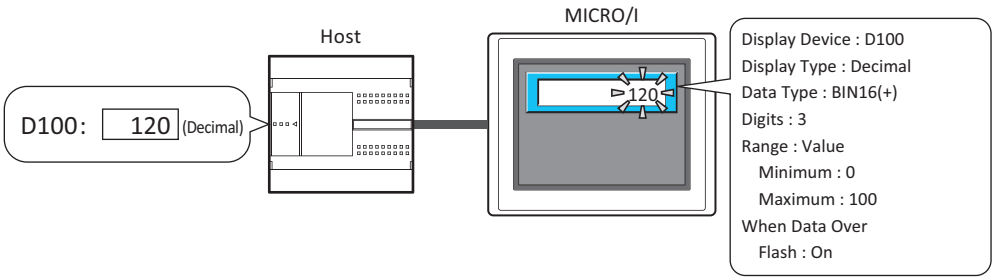
- Display the decimal point



- Display the unit



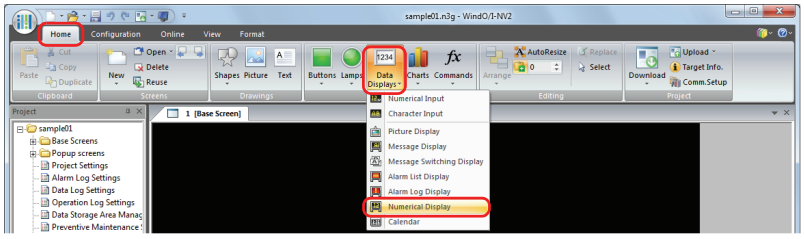
- Flash a value that exceeds the minimum or the maximum



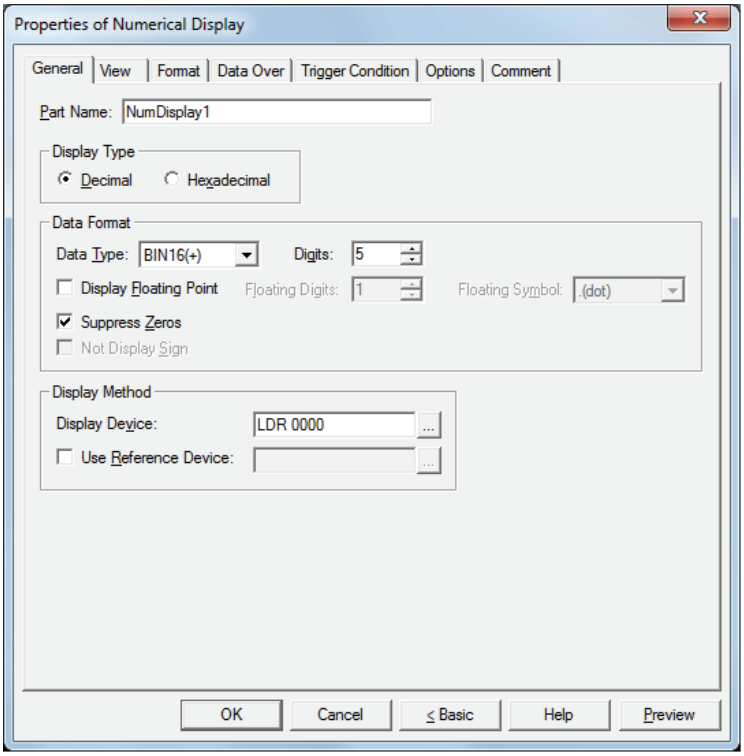
9.2 Numerical Display Configuration Procedure

This section describes the configuration procedure for Numerical Displays.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Numerical Display**.



2. Click a point on the edit screen where you wish to place the Numerical Display.
3. Double-click the dropped Numerical Display and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

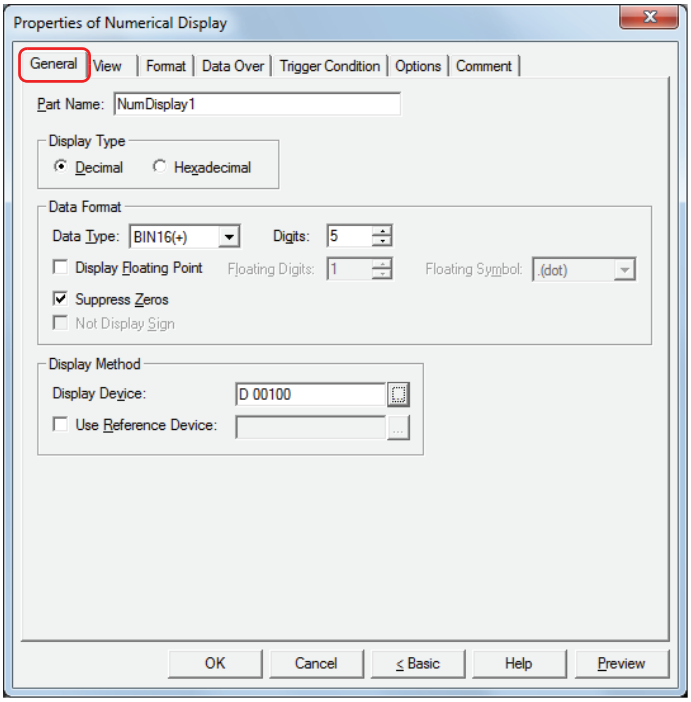


The **Data Over** tab, **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

9.3 Properties of Numerical Display Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ **Part Name**
Enter a name for the part. The maximum number is 20 characters.

■ **Display Type**
Selects the display type for the value as **Decimal** or **Hexadecimal**.

■ **Data Format**

Data Type: Selects the type of data for the value.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Digits: Specifies the digits to display. The range of digits that can be set varies based on the display type and data type. The digits that can be set are as follows.

Display Type	Data Type	Digits
Decimal display	BIN16 (+), BIN16 (+/-)	1 to 5
	BIN32 (+), BIN32 (+/-)	1 to 10
	BCD4	1 to 4
	BCD8	1 to 8
	float32	1 to 10
Hexadecimal display	BIN16 (+)	1 to 4
	BIN32 (+)	1 to 8

Display Floating Point: Select this check box to display the decimal point.

When the **Display Floating Point** check box is selected and **BIN16(+)**, **BIN16(+/-)**, **BIN32(+)**, **BIN32(+/-)**, **BCD4**, or **BCD8** is selected for **Data Type**, the source device is an integer, but the value is displayed with the decimal point added at the configured floating digits.
However, if **float32** is selected for **Data Type**, the source data is a decimal value.

Floating Digits: Specifies the number of digits for the fractional part of the decimal value out of the number of digits specified by **Digits**.

This option can only be configured when the **Display Floating Point** check box is selected. The range of digits that can be set for the fractional part varies based on the display type and data type. The range of digits that can be set for the fractional part is as follows.

Display Type	Data Type	Floating Digits
Decimal display	BIN16 (+), BIN16 (+/-)	1 to Digits
	BIN32 (+), BIN32 (+/-)	1 to Digits
	BCD4	1 to Digits
	BCD8	1 to Digits
	float32	1 to 8
Hexadecimal display	BIN16 (+)	--
	BIN32 (+)	--

Floating Symbol*1: Selects the decimal point symbol from the following.

.(dot), **:(colon)**, **;(semicolon)**, **,(comma)**, **/(slash)**

This option can only be configured when the **Display Floating Point** check box is selected.

Example: When **Digits** is 4 and **Floating Digits** is 2

When **Floating Symbol** is **.(dot)** 12.34

When **Floating Symbol** is **/(slash)** 12/34

Suppress Zeros: Select this check box to hide "0" for the upper digits of the integer part.

Example: **Suppress Zeros** selected: 1234

Suppress Zeros cleared: 00001234

Not Display Sign: Select this check box to hide the - (negative) symbol when displaying negative values.

This option can only be configured when **Data Type** is **BCD4**, **BCD8**, or **float32**.

Display Method

Specifies the source of the value to display.

Display Device: Specifies the word device that stores the value to display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

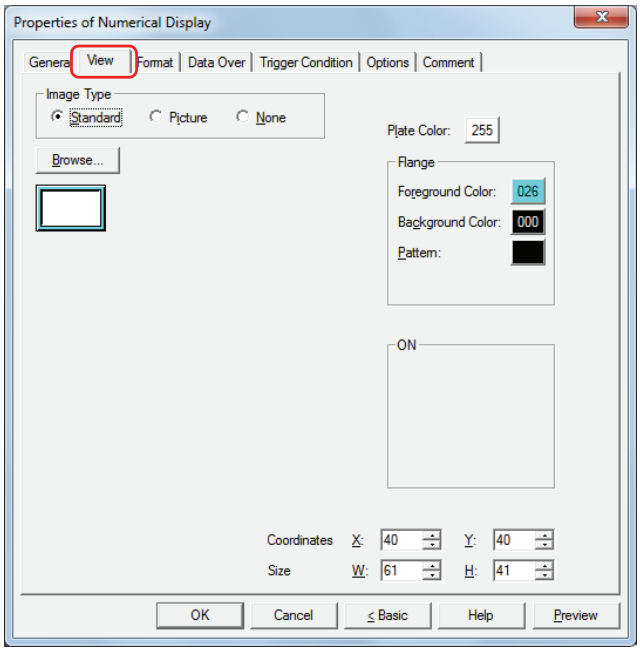
Use Reference Device*1: Select this check box and specify a device to change the source device by the value of this device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

For details on indirect reading, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

*1 Advanced mode only

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1 The plate and the flange of the part are not displayed. Only the text is displayed.

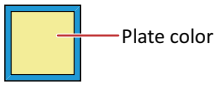
> When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

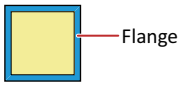


■ Flange

Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



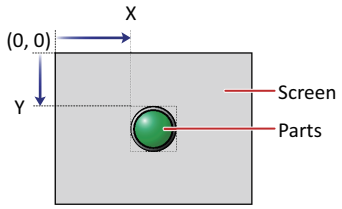
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

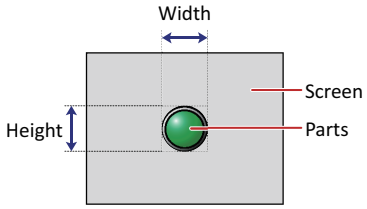


Size

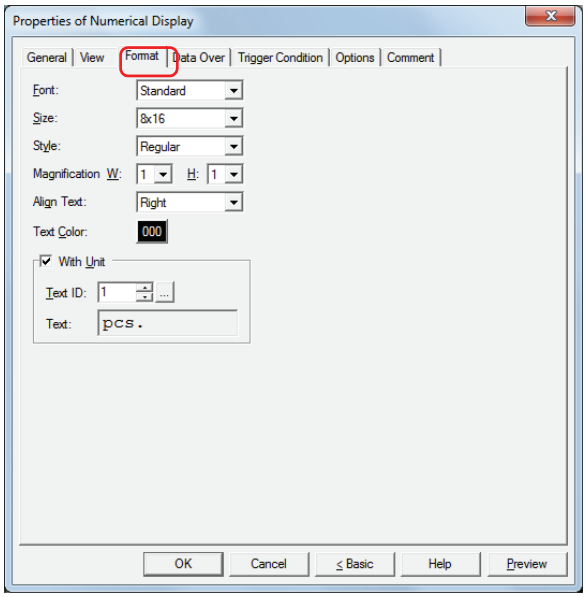
W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● Format Tab



■ Font

Selects the font used for displaying text from the following.

Standard, **Stroke**, **7-Segment**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ Size

When **Standard** is selected, selects the text size as **8x16** or **16x16**.

When **Stroke** or **7-Segment** is selected, specifies the text size (8 to 128).

■ Style

Selects **Regular** or **Bold** for text style.

Can only be set when **Standard** is selected for **Font**.

■ Magnification

W, H: Selects text magnification (0.5, 1 to 8*1).

Can only be set when **Standard** is selected for **Font**.

■ Align Text

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ Text Color

Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

■ With Unit*2

Select this check box to display units or other characters at the end of a number. Displayed characters must be registered in Text Manager. The displayed text color will be as set for **Text Color** under the **Format** tab.

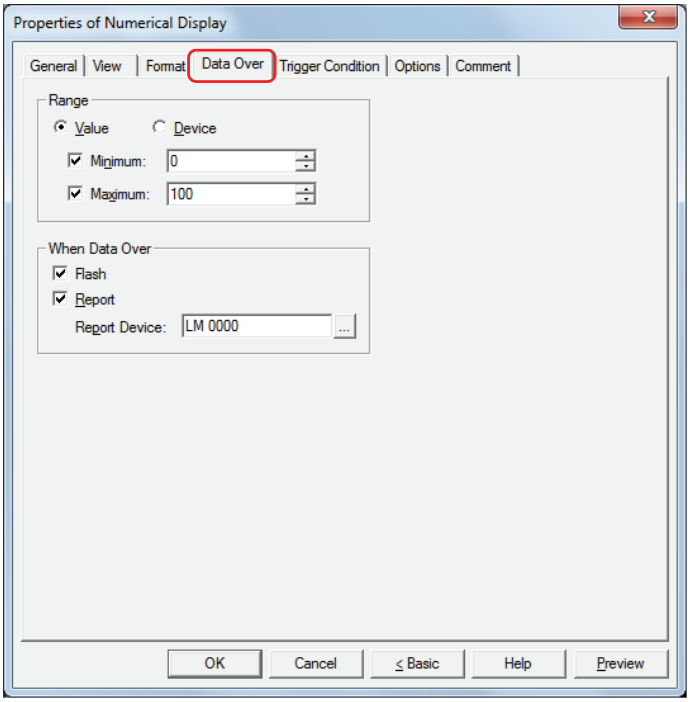
Text ID:	Specifies the Text Manager ID No. (1 to 32000). Click ... to display Text Manager.
Text:	Displays the characters of the specified Text ID.

- The maximum number that can be displayed with this function is 4 characters. The fifth and subsequent characters of a character string are not displayed. However, if Windows Font is set for the specified Text ID characters all the characters are displayed.
- If a carriage return (CR) is included the characters after the CR are not displayed.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.
*2 Advanced mode only

● **Data Over** Tab

The **Data Over** tab is displayed in Advanced mode.



■ **Range**

Select data type.

Value: Specifies the minimum and/or the maximum as a constant.

Device: Specifies the minimum and/or the maximum as a value of word device.

Specifies the allowable range of values to display.

Minimum, Maximum: Select these check boxes to specify the minimum and/or maximum.

The minimum and maximum that can be specified when **Value** is selected vary based on the data type selected with **Data Format** on the **General** tab. For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When **Device** is selected, these options specify the source word devices.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- Select **BIN16(+)**, **BIN16(+/-)**, **BIN32(+)**, **BIN32(+/-)**, **BCD4** or **BCD8** for **Data Type** under the **General** tab, and to display a fractional number specify the values of **Minimum** and **Maximum** as an integer.
  Example: To set a value of "1.25" for the upper limit, enter "125".
- If the value of the device to display exceeds the data range that can be processed for the data type selected under **Data Format** on the **General** tab, "?" is displayed.

■ When Data Over

These options configure the operation of the part when the allowable range is exceeded.

These options can only be configured when the **Minimum** or **Maximum** check boxes are selected under **Range**.

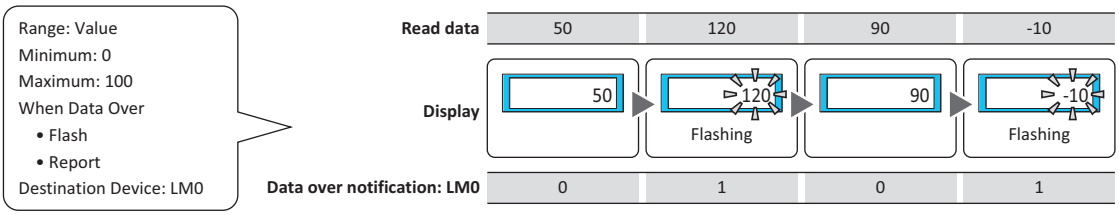
Flash: Select this check box to make the value flash when the displayed data exceeds the allowable range.

Report: Select this check box to write 1 in the report device when the displayed data exceeds the allowable range.

Report Device: Specifies the report device.

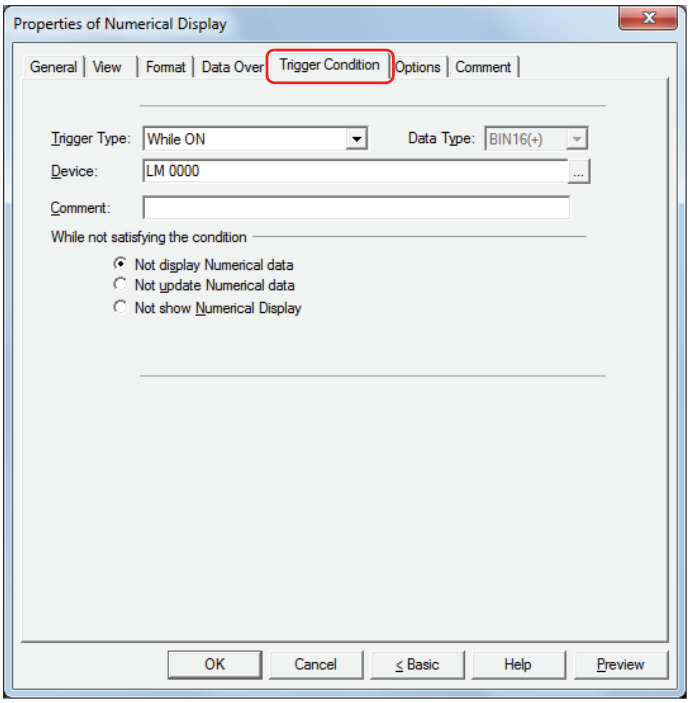
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: If the value of word device of the reading source is "120," which is higher than the upper limit of "100," or "-10," which is below the lower limit of "0," a value of 1 will be written to LM0 and the displayed numerical value will flash.



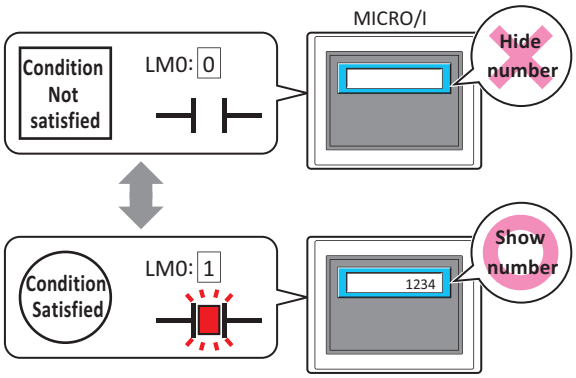
● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



The Numerical Display is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. Select the operation when the condition is not satisfied as **Not display Numerical data** or **Not update Numerical data** under **While not satisfying the condition**. For the HG2G-5F and the HG3G/4G, you can also select **Not show Numerical Display**.

Example: When **Trigger Type** is **While ON**, **Device** is **LM 0**, and **While not satisfying the condition** is **Not display Numerical data**
While LM 0 is 0, the condition is not satisfied and the Numerical Display does not display the number.
While LM 0 is 1, the condition is satisfied and the Numerical Display displays the number.

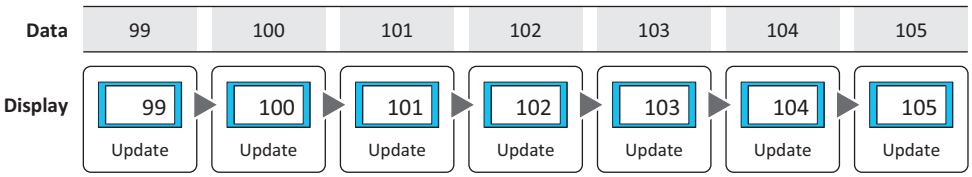


Data over does not operate for hidden Numerical Displays. Data over is reported if the minimum or maximum is exceeded when the Numerical Display changes from hidden to displayed.

■ Trigger Type

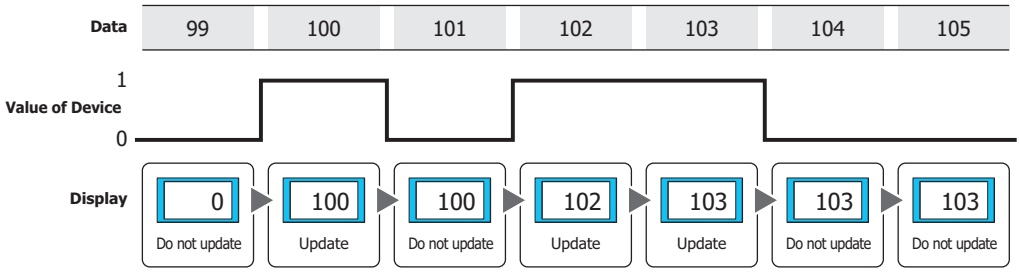
Selects the condition to enable the Numerical Display from the following.

Always visible: The Numerical Display is always enabled.



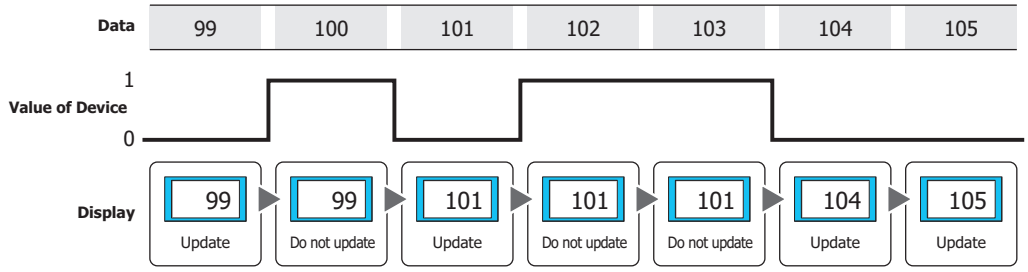
While ON: Enables the Numerical Display when the value of device is 1.

Example: When **While not satisfying the condition** is **Not update Numerical data**



While OFF: Enables the Numerical Display when the value of device is 0.

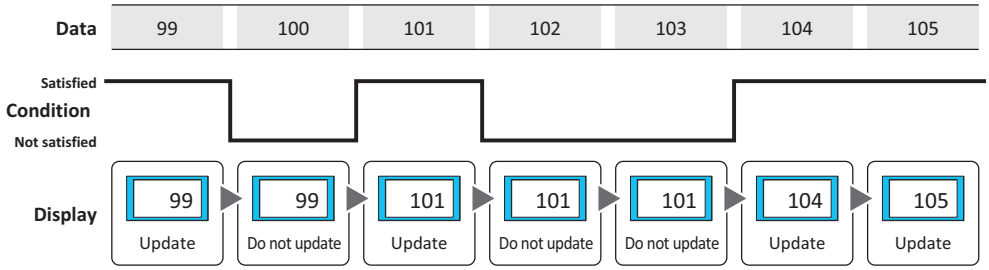
Example: When **While not satisfying the condition** is **Not update Numerical data**



While satisfying the condition:

Enables the Numerical Display when the condition is satisfied.

Example: When **While not satisfying the condition** is **Not update Numerical data**



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

■ **Comment**

Used for entering comments about trigger conditions. Maximum number is 80 characters.

■ **While not satisfying the condition**

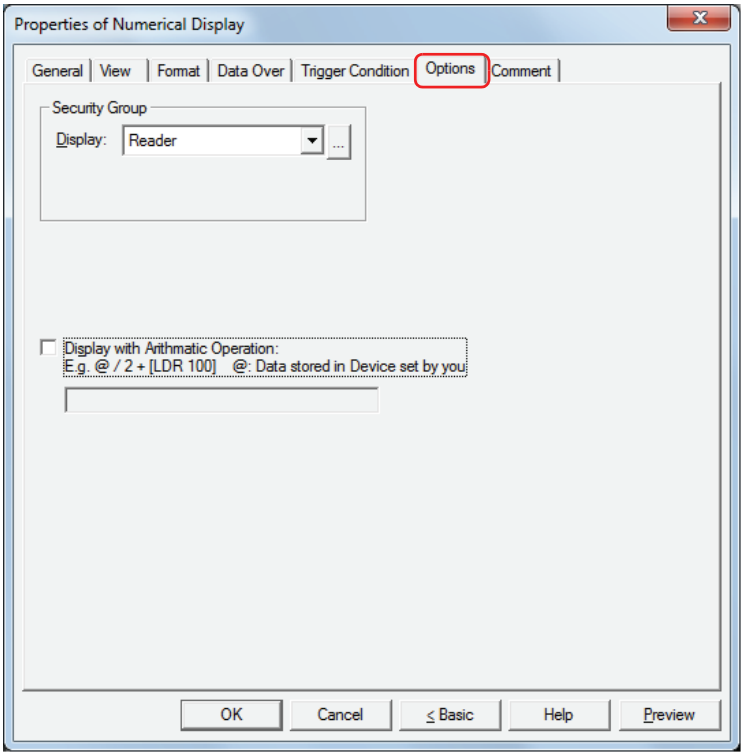
Selects the operation of the Numerical Display when the condition is not satisfied.

Not display Numerical data:	The plate and flange are displayed, but number is not displayed.
Not update Numerical data:	The last updated number is displayed. The number does not change.
Not show Numerical Display*1:	Hides the Numerical Display.

*1 HG2G-5F, HG3G/4G only

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

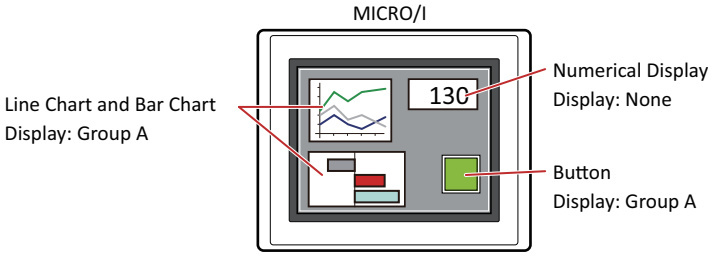
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

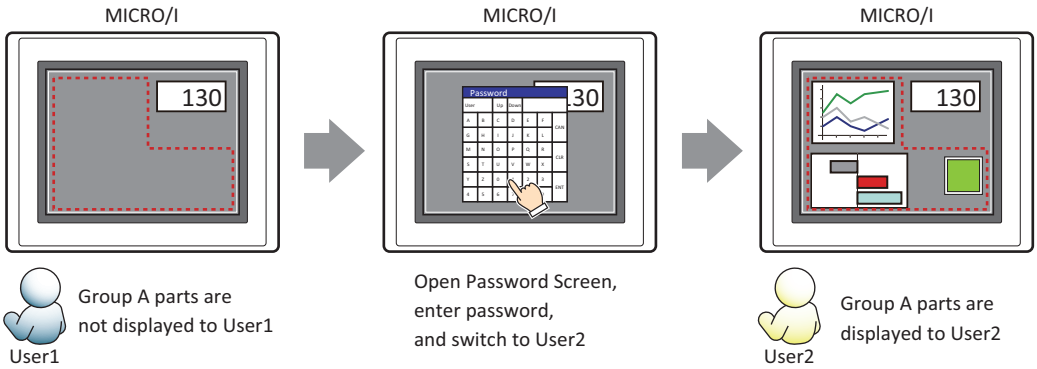
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



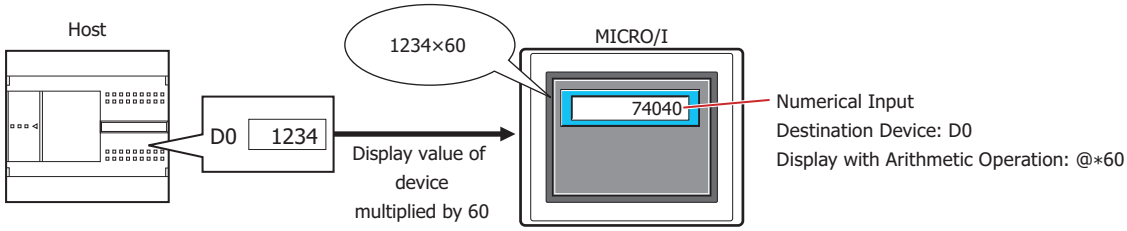
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



Display with Arithmetic Operation

To apply arithmetic operations to values of devices and writing the results, select this check box and input the arithmetic formula.

Example: To multiple the value of device when displayed by 60



Arithmetic Formulas

Arithmetic formulas can be specified by freely combining multiple kinds of data and operators in the following format.

[Data] [Operator] [Data]
to
[Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] [Operator] [Data] ...(up to 120 characters)

- There is no limit on the number of data items or number of operators. However, the maximum number is 120 characters.
- Round brackets can be used.

Data

Item	Description
@	The device on which the arithmetic operation is performed is specified in the arithmetic formula. Only 1 device can be set for an arithmetic operation. The device is as specified for **Display Device** under the **General** tab.
Value	Sets the constant values for the arithmetic formula. The values that can be set depend on the data type selected using **Data Format** under the **General** tab. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.
Device	Specifies the bit device or word device for the arithmetic formula.

Operators

Specify the type of arithmetic operation to be performed on the data. The operator priority is the same as for scripts. For details, refer to Chapter 20 "6.4 About the Priority of the Operator" on page 20-55.

Item	Description		
Arithmetic operators	Sets the arithmetic operators.		
	+	Addition	Adds [a] and [b].
	-	Subtraction	Subtracts [b] from [a].
	*	Multiplication	Multiplies [a] and [b].
	/	Division	Divides [a] by [b].
	%	Modulo	Calculates remainder after dividing [a] by [b].
Bit operator	Sets the bit operator.		
	&	Logical AND	Calculates the logical product (AND) of each bit of [a] and [b].
	|	Logical OR	Calculates the logical sum (OR) of each bit of [a] and [b].
	^	Logical XOR (exclusive OR)	Calculates the exclusive logical sum (XOR) of each bit of [a] and [b].
	<<	Left shift	Shifts each bit of [a] to left by [b] bit(s).
	>>	Right shift	Shifts each bit of [a] to right by [b] bit(s).

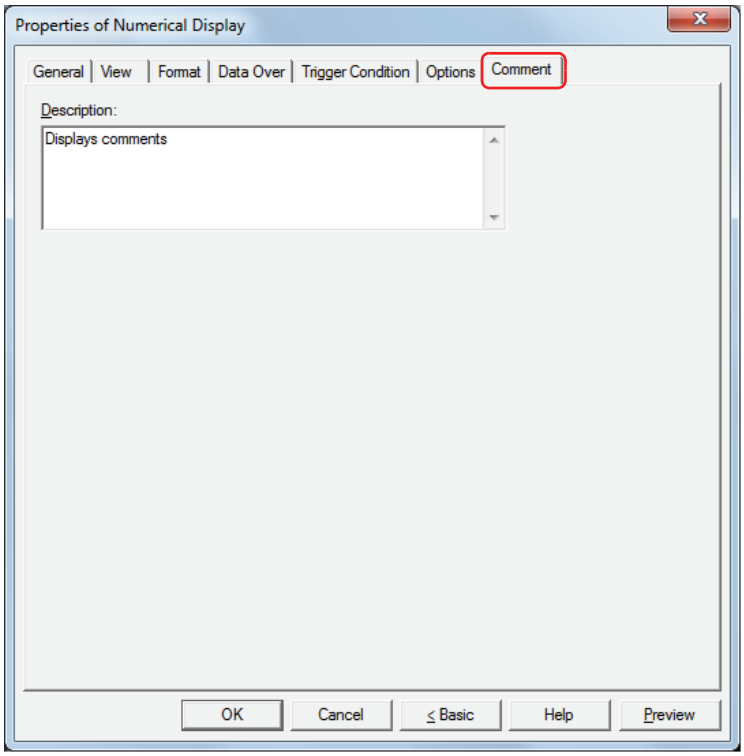
Examples of Arithmetic Formula Input

Input Examples	Description
@ + 1	To perform the arithmetic operation and input the result, add 1 to the value entered using the Keypad and write the result to the device.
	To perform the arithmetic operation and display the result, add 1 to the value of device and display the result.
[LDR 0] + @ + 100	To perform the arithmetic operation and input the result, add the value of LDR0 to the value entered using the Keypad and add 100, and write the result to the device.
	To perform the arithmetic operation and display the result, add the value of LDR0 to the value of device and add 100, then display the result.
@ & 3	To perform the arithmetic operation and input the result, write the logical product of the value entered using the Keypad and 3 to the device.
	To perform the arithmetic operation and display the result, add 3 to the value of device and display the result.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Numerical Display on the editing screen

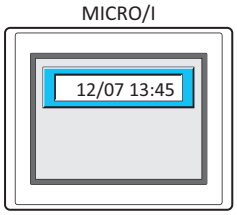
10 Calendar

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

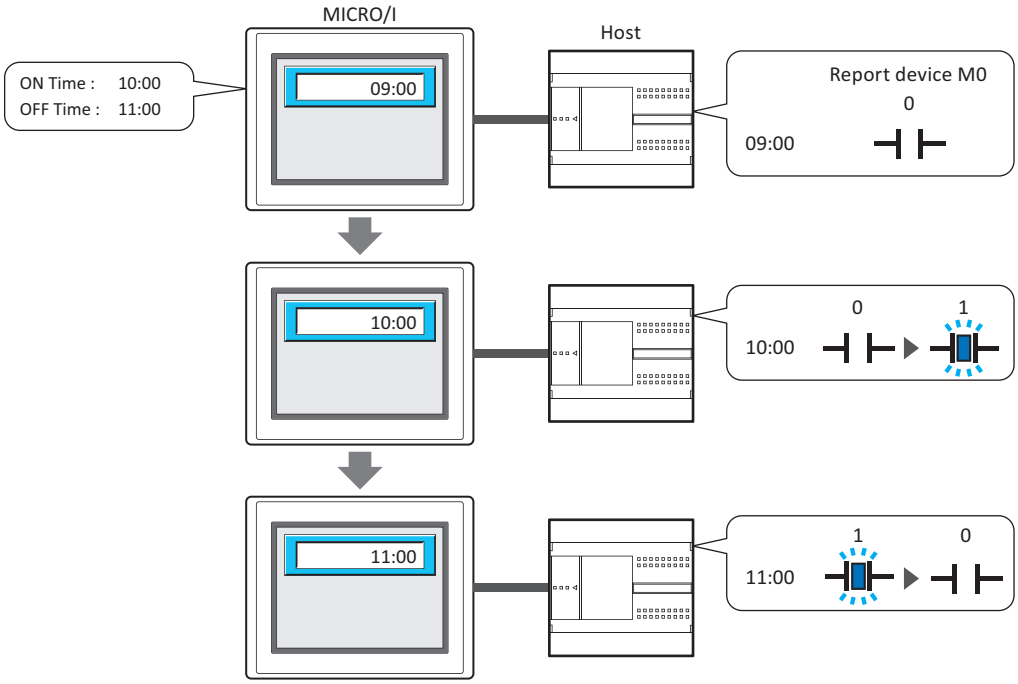
10.1 How the Calendar is Used

The Calendar can be used to display the date and time using the MICRO/I's clock data.

- Display the date and time



- Write 0 or 1 to a device at the configured times



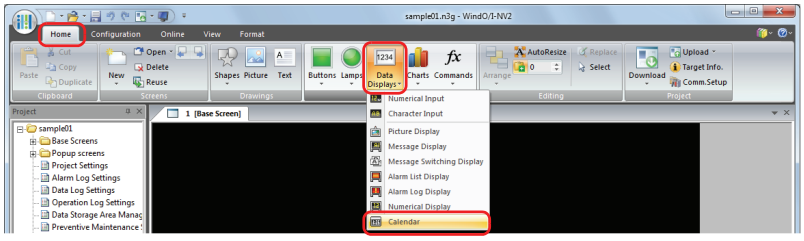
			ON Time		OFF Time
Time	09:00	09:30	10:00	10:30	11:00
Action			Write		Write
Report device M0 value	0	0	1	1	0

When **Alarm** is selected for **Calendar Type**, you can use just the alarm function without displaying the clock on the screen.

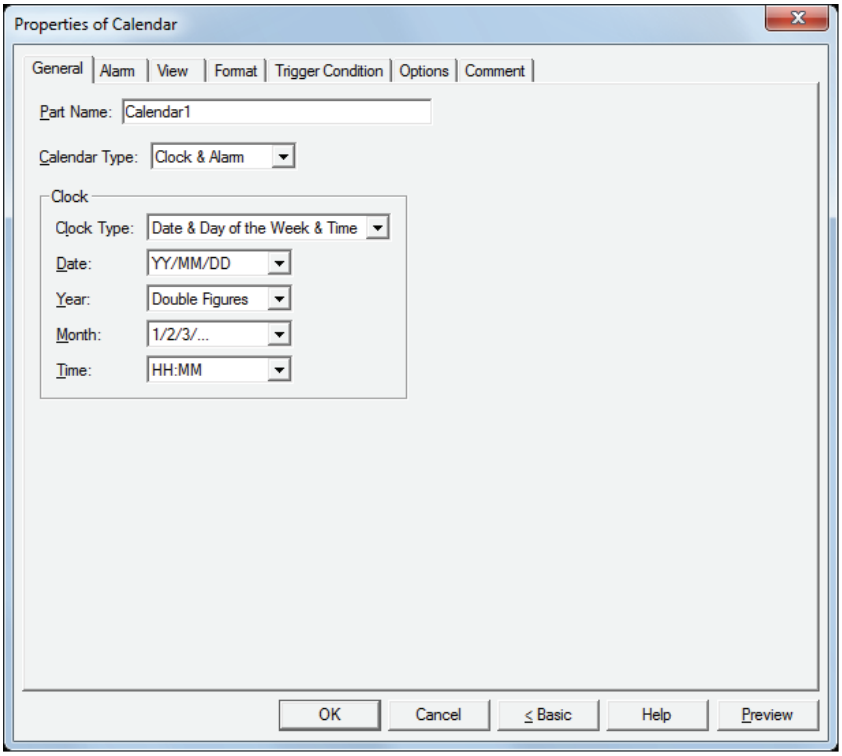
10.2 Calendar Configuration Procedure

This section describes the configuration procedure for Calendars.

1. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Calendar**.



2. Click a point on the edit screen where you wish to place the Calendar.
3. Double-click the dropped Calendar and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

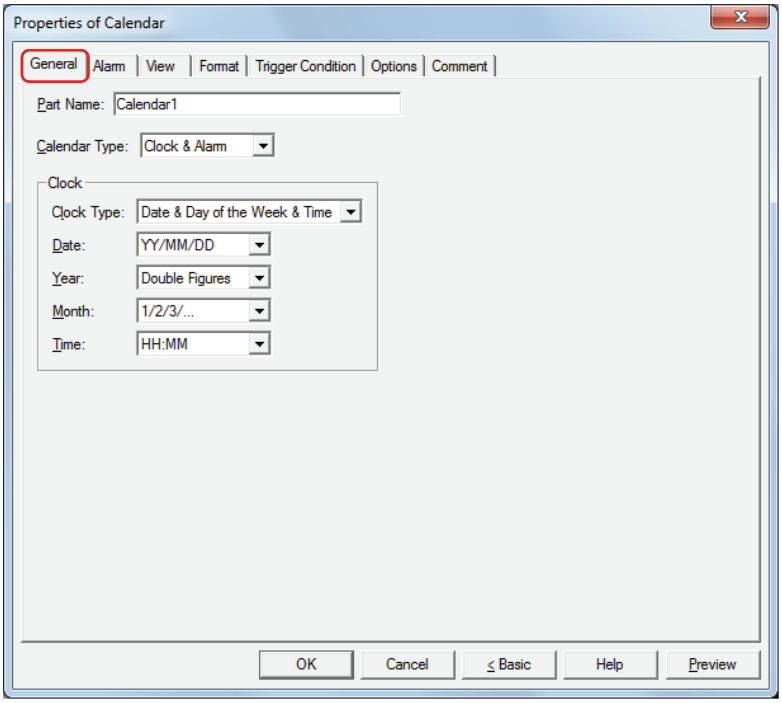


The **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

10.3 Properties of Calendar Dialog Box

This section describes items and buttons on the properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Calendar Type

Selects the type of Calendar from the following.

Clock:	Displays the date and time.
Alarm:	Notifies by writing 1 (ON Time) or 0 (OFF Time) to a device at the configured times without displaying the clock.
Clock & Alarm:	Displays the clock and notifies by writing 1 (ON Time) or 0 (OFF Time) to a device at the configured times.

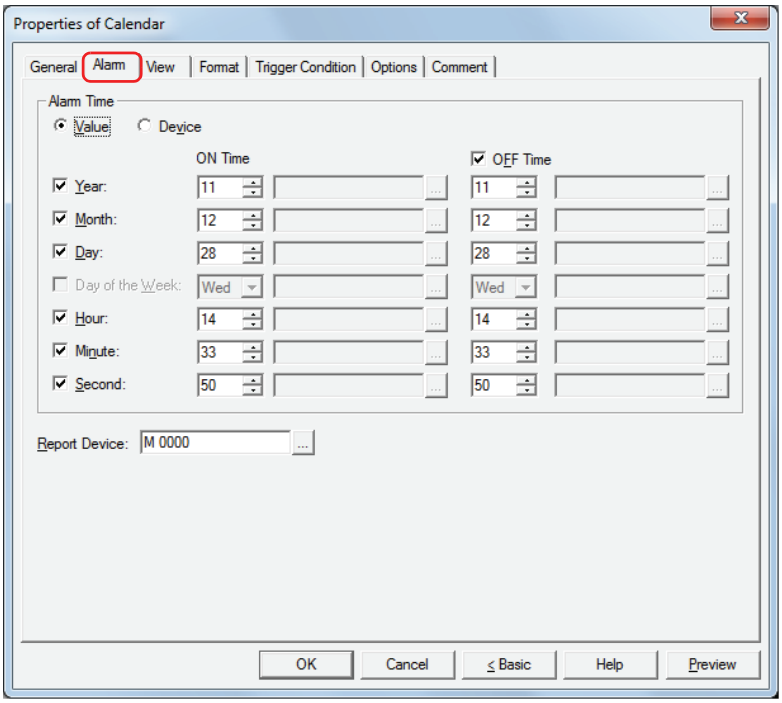
■ Clock

These options configure the type and format of the clock. These options can only be configured when **Clock** or **Clock & Alarm** is selected for **Calendar Type**.

Clock Type:	Selects the items to display for the clock from the following. **Time**, **Day of the Week & Time**, **Date & Time**, **Date & Day of the Week & Time**
Date:	Selects the display type of the date from the following. **YY/MM/DD**, **MM/DD/YY**, **DD/MM/YY**, **MM/DD**, **DD/MM** This option can only be configured when **Date & Time** or **Date & Day of the Week & Time** is selected for **Clock Type**.
Year:	Selects the display type for the year as **Double Figures** or **Four Figures**. This option can only be configured when **Date & Time** or **Date & Day of the Week & Time** is selected for **Clock Type**.
Month:	Selects the display type for the month as **1/2/3/...** or **Jan/Feb/Mar/...**. This option can only be configured when **Date & Time** or **Date & Day of the Week & Time** is selected for **Clock Type**.
Time:	Selects the display type for the time as **HH:MM** or **HH:MM:SS**. HH: hours, MM: minutes, SS: seconds

● **Alarm** Tab

These options can only be configured when **Alarm** or **Clock & Alarm** is selected for **Calendar Type** on the **General** tab.



■ **Alarm Time**

Selects the type of data for the alarm time.

Value: Specifies the alarm time as values and the day of the week.

Year:	Enter the year (0 to 99).
Month:	Enter the month (1 to 12).
Day:	Enter the day (1 to 31).
Day of the Week:	Select the day of the week.
Hour:	Enter the hour (0 to 23).
Minute:	Enter the minute (0 to 59).
Second:	Enter the second (0 to 59).

Device: Configures the alarm time as values of word devices.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **(Alarm conditions)**

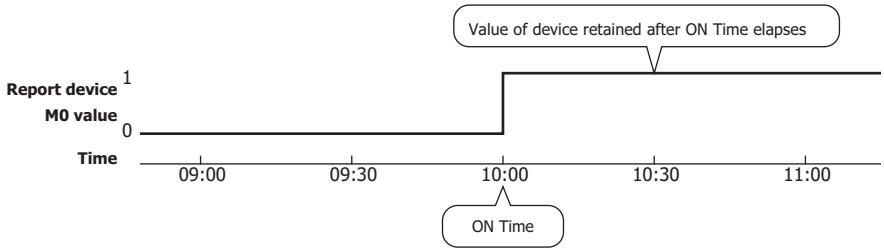
Select the check boxes for the conditions to use as the alarm time.

The **Day of the Week** check box can only be configured when the **Year** check box is cleared.

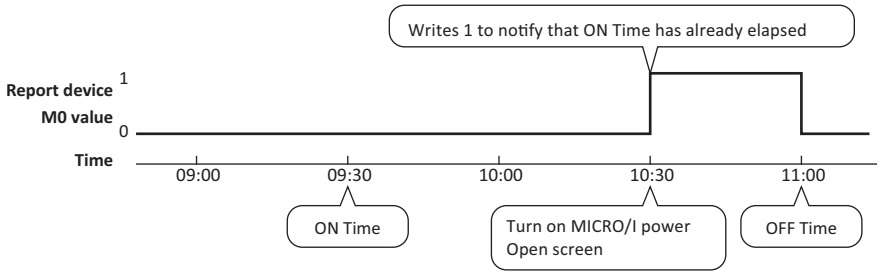
ON Time

Configures the time to write 1 to the report device according to the type of data.

- After 1 is written to the report time with **ON Time**, that value is retained.



- After a screen configured with the Calendar is displayed, if the time is in between **ON Time** and **OFF Time**, 1 is written to the report device.

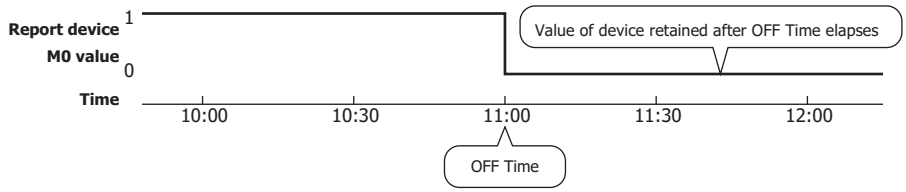


OFF Time

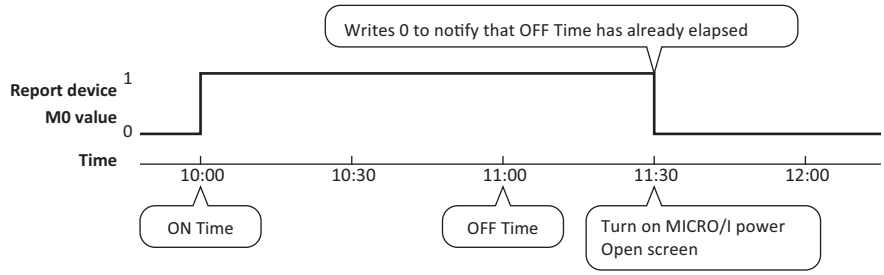
Select this check box to configure the time to write 0 to the report device.

The time is configured according to the type of data.

- The value of report device is retained even when the current time exceeds **OFF Time**.



- After a screen configured with the Calendar is displayed, if the time exceeds **OFF Time**, 0 is written to the report device.

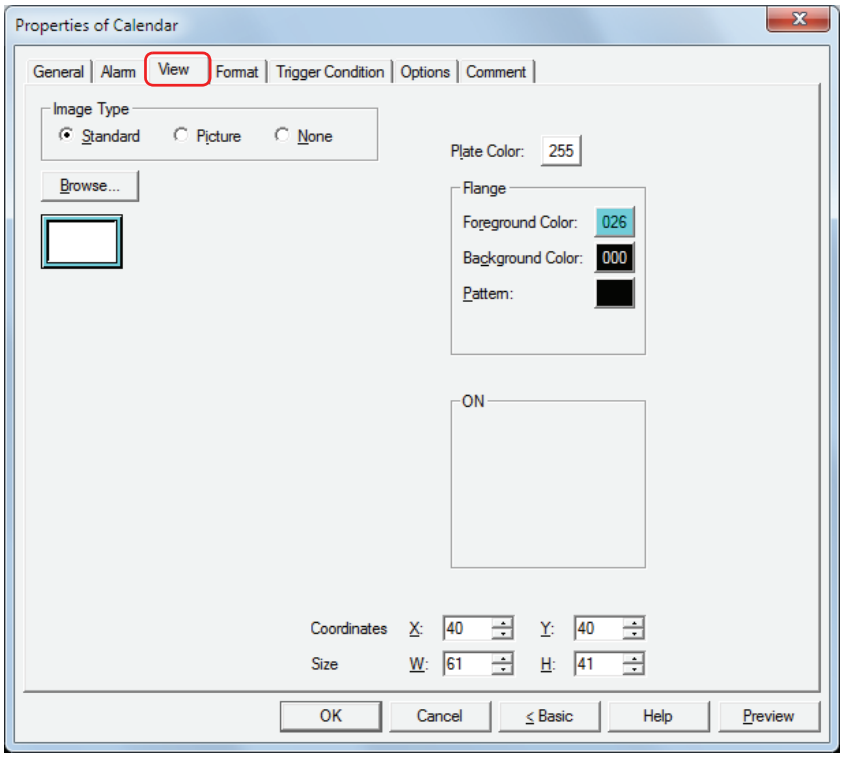


Report Device

Specifies the bit device to write the value to at **ON Time** and **OFF Time**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

None*1: The plate and the flange of the part are not displayed. Only the text is displayed.

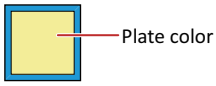
When a bitmap or JPEG image file is placed on top of a part that has **None** selected for **Image Type**, or other parts overlap that part, the screen update rate may slow down.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

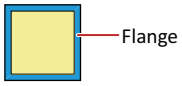


■ Flange

Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



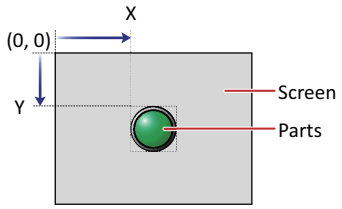
*1 HG2G-5F, HG3G/4G only

Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts is defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

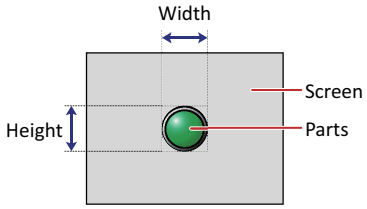


Size

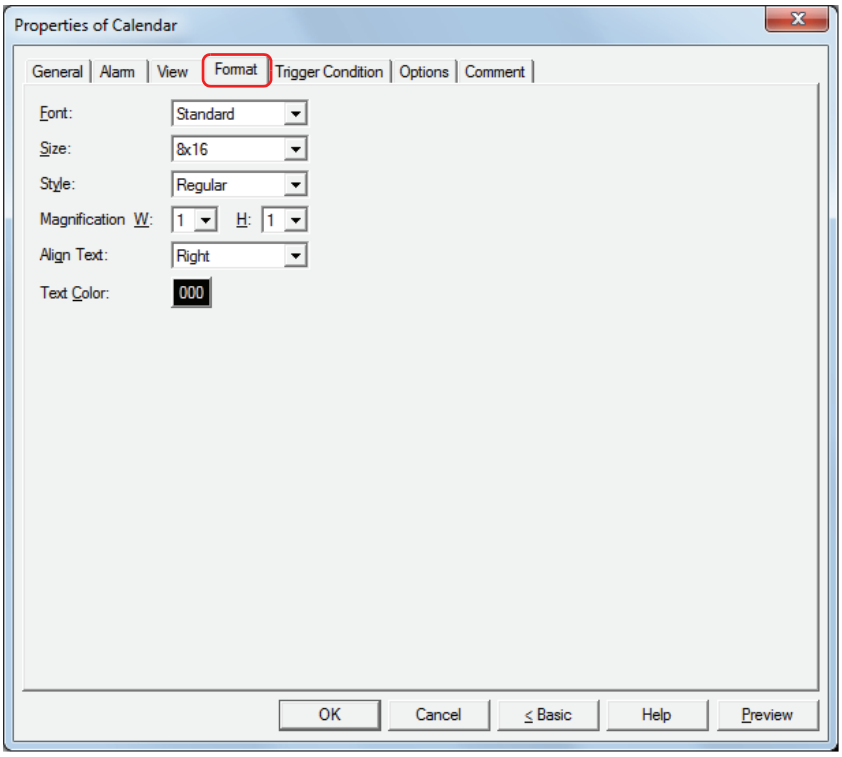
W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● **Format** Tab



■ **Font**

Selects the font used for displaying text from the following.

Standard, **Stroke**, **7-Segment**

The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

■ **Size**

When **Standard** is selected, selects the text size as **8x16** or **16x16**.

When **Stroke** or **7-Segment** is selected, specifies the text size (8 to 128).

■ **Style**

Selects **Regular** or **Bold** for text style.

Can only be set when **Standard** is selected for **Font**.

■ **Magnification**

W, H: Selects text magnification (0.5, 1 to 8[*1]).

Can only be set when **Standard** is selected for **Font**.

■ **Align Text**

Selects the text alignment in the horizontal direction from the following.

Left, **Center**, **Right**

For details, refer to Appendix "5 Text Alignment" on page A-5.

■ **Text Color**

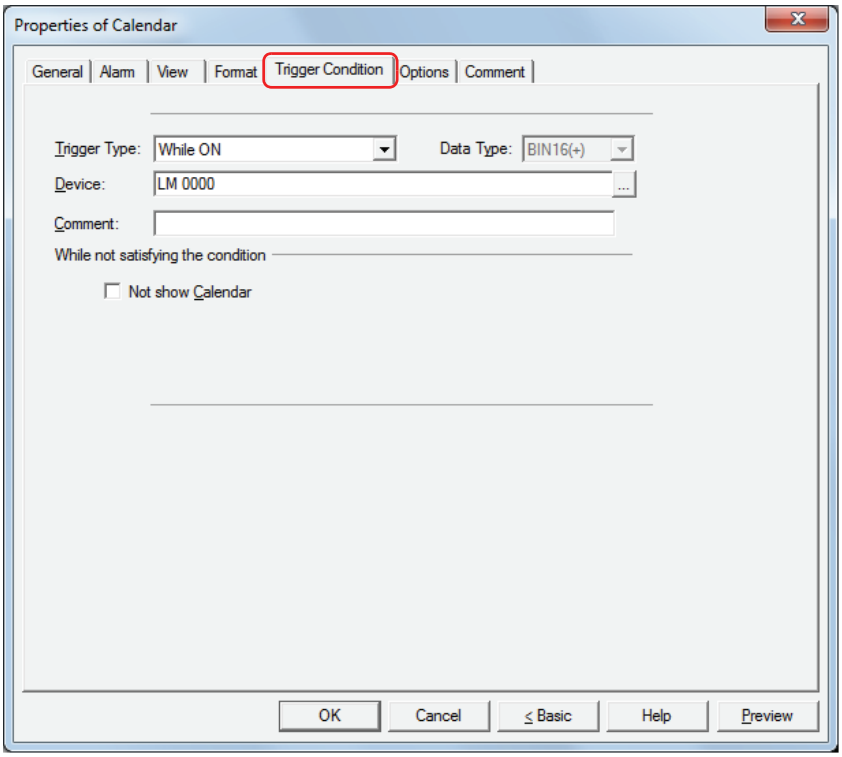
Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

*1 5 to 7 are only for the HG2G-S/-5S/-5F and HG3G/4G.

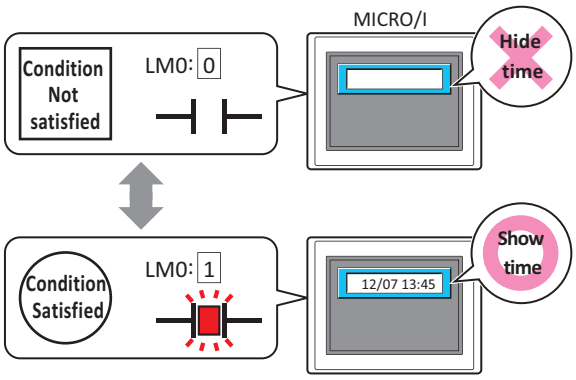
● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



The Calendar is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. When disabled, the plate and flange are displayed, but the time is not displayed. For the HG2G-5F and the HG3G/4G, if the **Not show Calendar** check box under **While not satisfying the condition** is selected, the plate and flange are also hidden and the part image is not displayed.

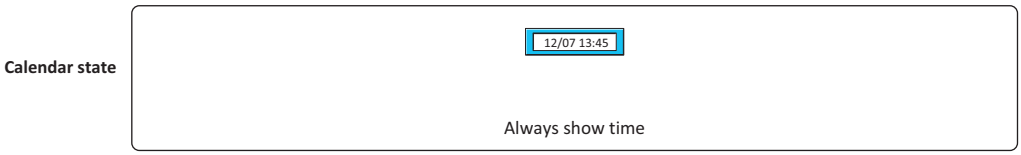
Example: When **Trigger Type** is **While ON**, **Device** is **LM 0**, and the **Not show Calendar** check box under **While not satisfying the condition** is cleared
While LM 0 is 0, the condition is not satisfied and the Calendar does not display the time.
While LM 0 is 1, the condition is satisfied and the Calendar displays the time.



■ Trigger Type

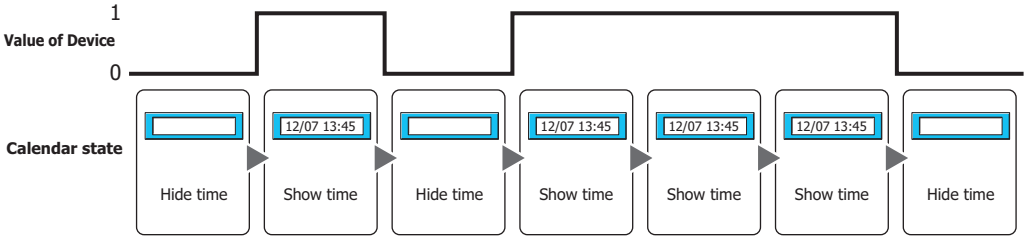
Selects the condition to enable the Calendar from the following.

Always visible: The Calendar is always enabled.



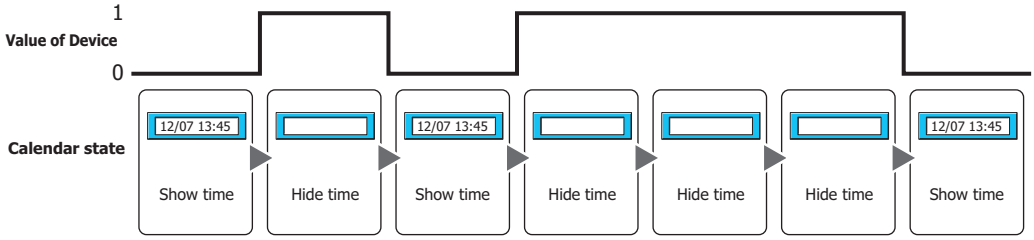
While ON: Enables the Calendar when the value of device is 1.

Example: When the **Not show Calendar** check box is cleared under **While not satisfying the condition**



While OFF: Enables the Calendar when the value of device is 0.

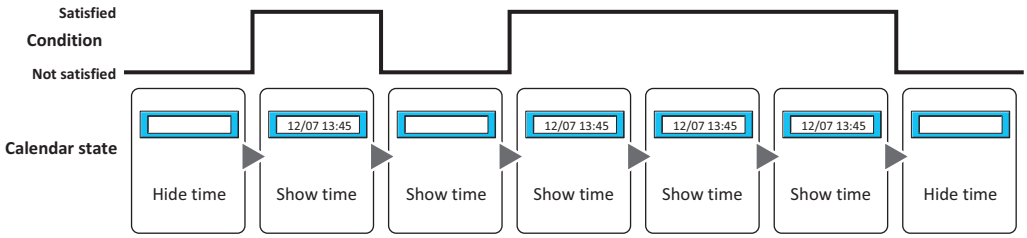
Example: When the **Not show Calendar** check box is cleared under **While not satisfying the condition**



While satisfying the condition:

Enables the Calendar when the condition is satisfied.

Example: When the **Not show Calendar** check box is cleared under **While not satisfying the condition**



■ **Data Type**

Selects the data type to be handled by the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

■ **Not show Calendar*1**

When this check box is cleared, the part image is not displayed when the condition is not satisfied.

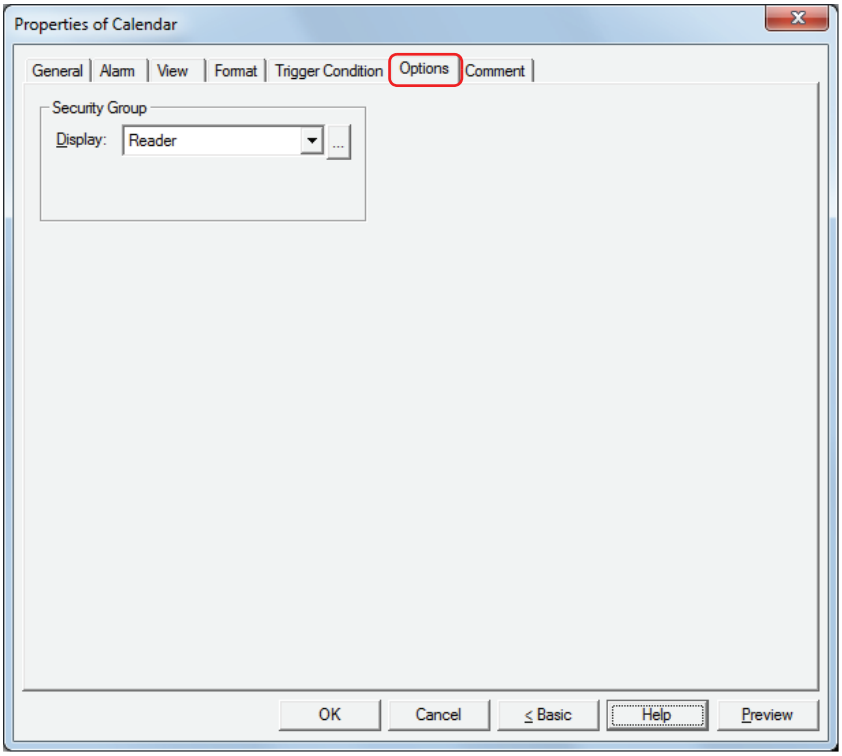
■ **Comment**

Used for entering comments about trigger conditions. Maximum number is 80 characters.

*1 HG2G-5F, HG3G/4G only

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

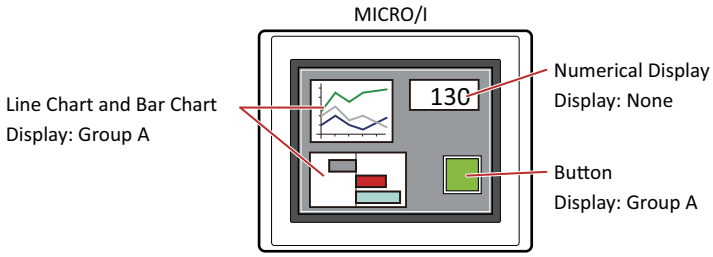
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

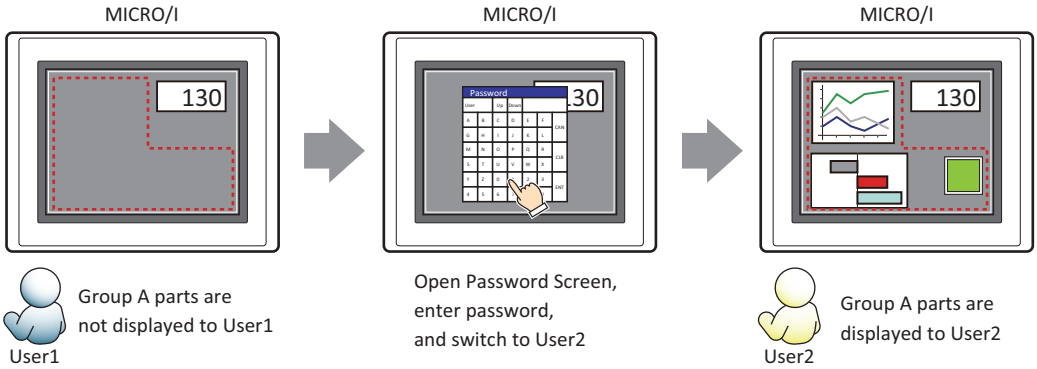
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



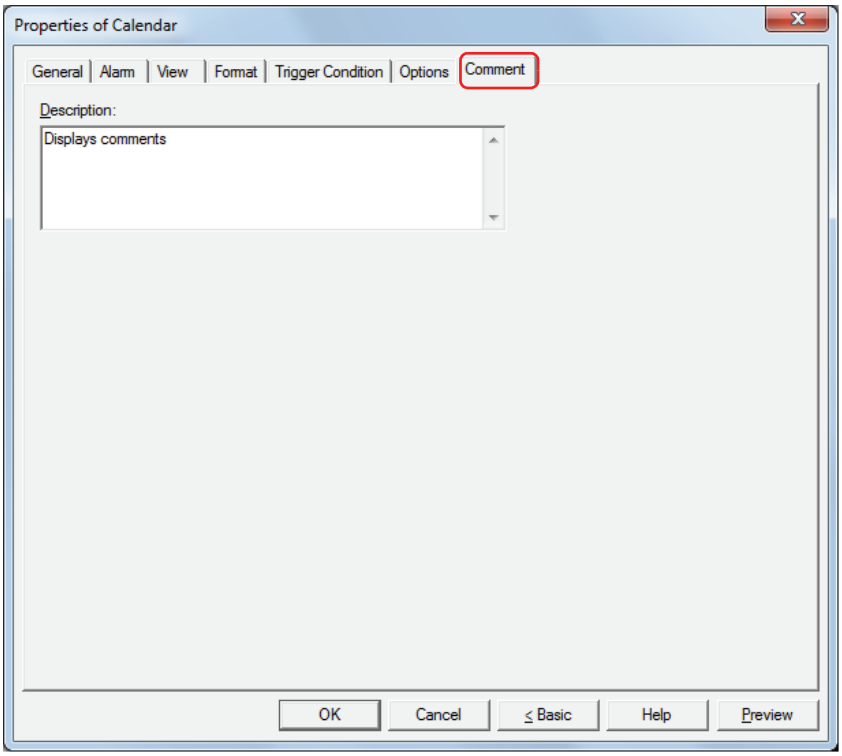
For User 1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and a switch is made to User 2 of Group A, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

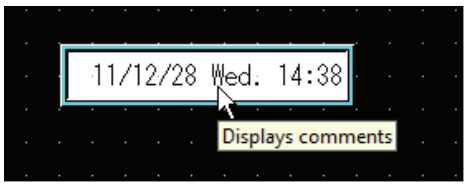
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the Calendar on the editing screen



Chapter 11 Charts

This chapter describes how to configure charts and meters and their operation on the MICRO/I.

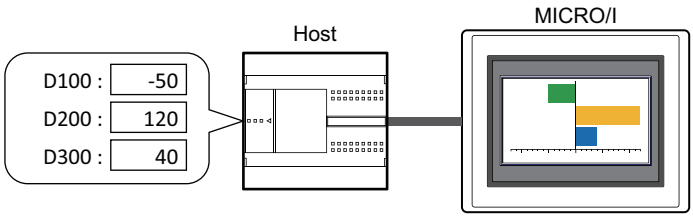
1 Bar Chart

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

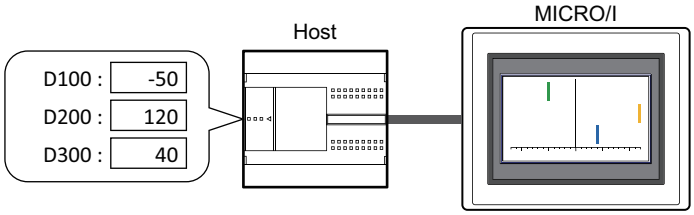
1.1 How the Bar Chart is Used

Bar charts and peak charts can be used to display word device values.

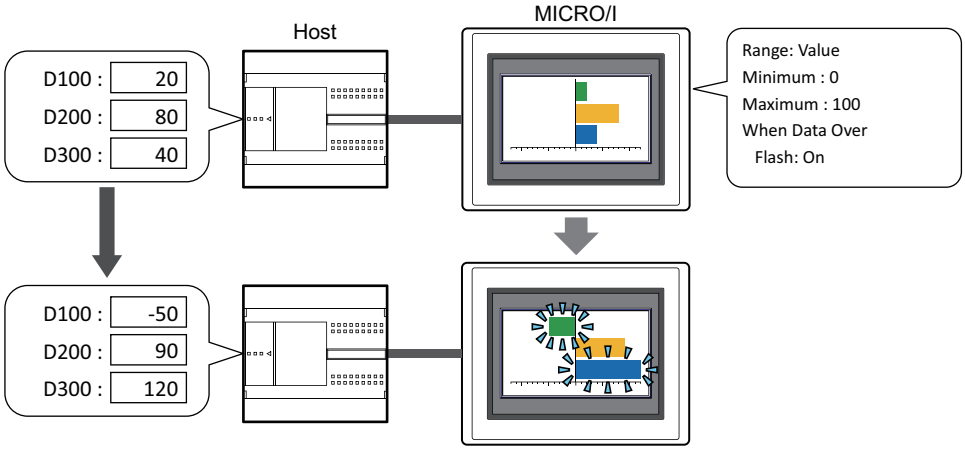
- Display word device values in a bar chart



- Display word device values in a peak chart



- Make the chart flash when the displayed data exceeds the maximum or minimum

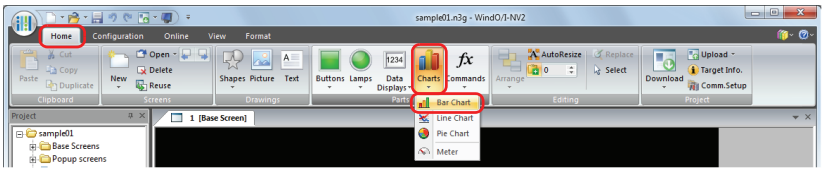


Bar charts cannot be used when displayed on a vertically-installed HG1F.

1.2 Bar Chart Configuration Procedure

This section describes the configuration procedure for bar charts.

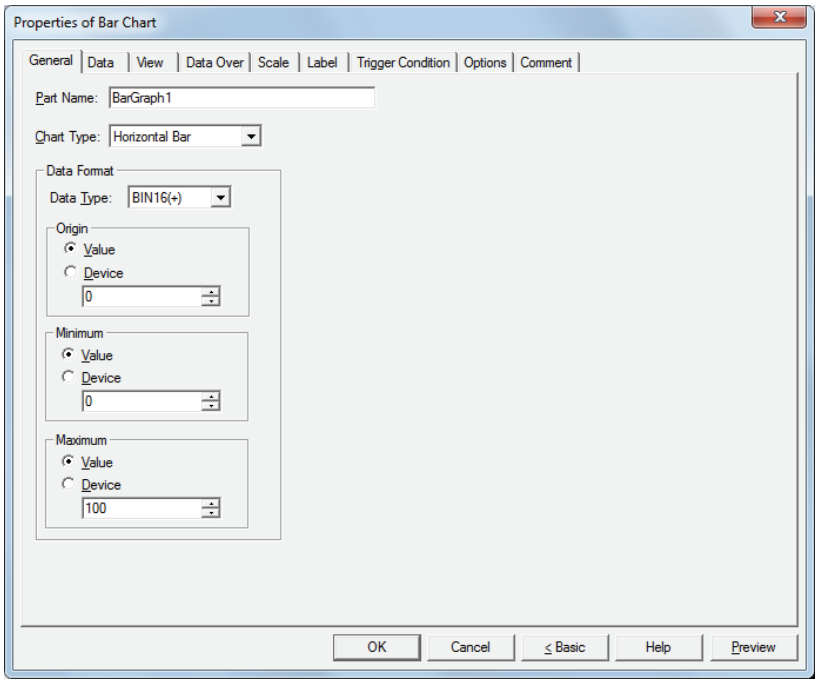
1 On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Bar Chart**.



2 Click a point on the edit screen where you wish to place the Bar Chart.

3 Double-click the dropped Bar Chart and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.



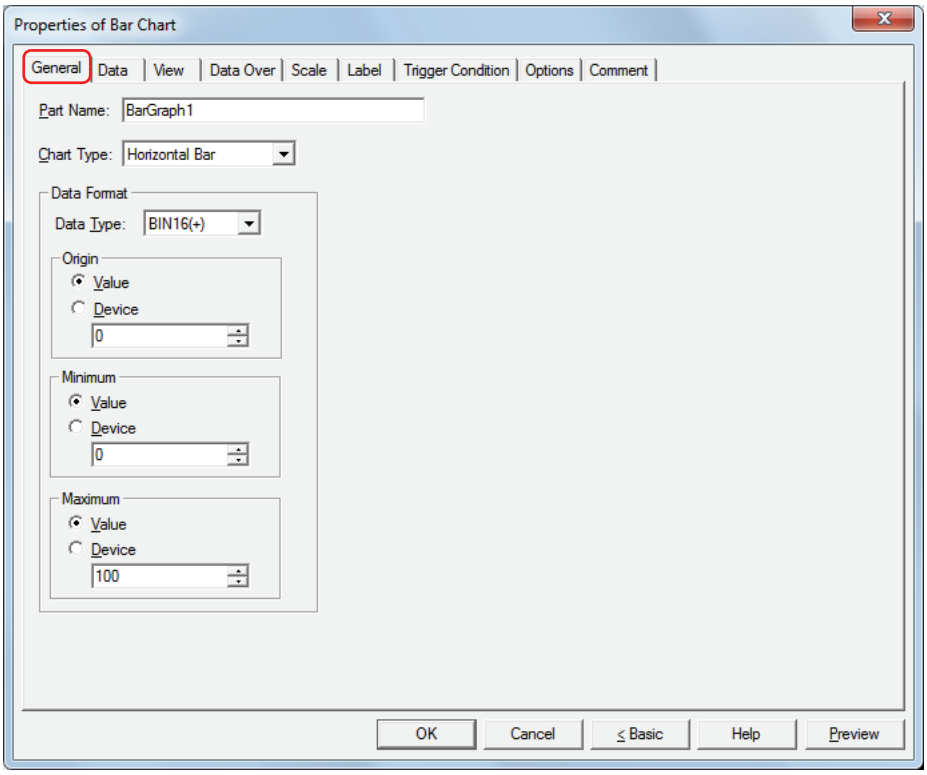
The **Data Over** tab, **Scale** tab, **Label** tab, **Trigger Condition** tab and **Options** tab only appear in Advanced mode.

To switch to Advanced mode, click **Advanced**.

1.3 Properties of Bar Chart Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

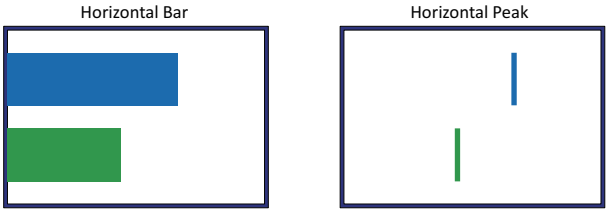
Enter a name for the part. The maximum number is 20 characters.

■ **Chart Type**

Selects the type of chart from the following items.

Horizontal Bar, **Vertical Bar**, **Horizontal Peak**, **Vertical Peak**

Peak charts only display the tip of the bar chart.



Data Format

Data Type: Selects the data type handled by the chart from the following.

"BIN16(+)", "BIN16(+/-)", "BIN32(+)", "BIN32(+/-)", "BCD4", "BCD8", "float32*1"

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

(Data Type)*2: Selects the data type to use for the **Origin**, **Minimum**, and **Maximum**.

Value: Uses a constant.

Device: Uses a word device.

Origin, Minimum, Maximum: Specifies the origin, minimum, and maximum for the chart.

The origin, minimum, and maximum that can be specified during Basic mode and when **Value** is selected vary based on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

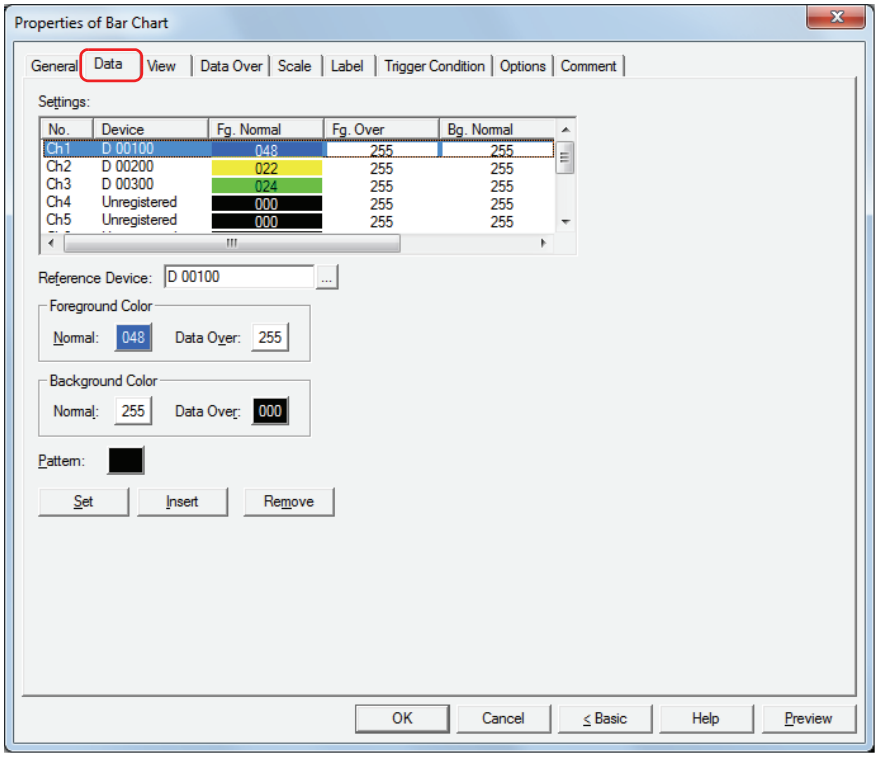
When **Device** is selected, these options specify the source word devices.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- If the data displayed in the chart is invalid, 1 is written to System Area 2 Arithmetic error bit (address+2, bit 5), and an error message is displayed. For details, refer to Chapter 4 " Arithmetic error" on page 4-34. An error occurs in the following states.
  - When the minimum is the same as or larger than the maximum
  - When **Data Type** is **BCD4**, **BCD8**, or **float32** and the value cannot be expressed with the data type selected for the read data
    The chart cannot be displayed when an error has occurred.
- Even if the value of device is changed while the trigger condition is not satisfied, the minimum and maximum are not updated.

*1 HG2G-5F, HG3G/4G only
*2 Advanced mode only

● **Data** Tab

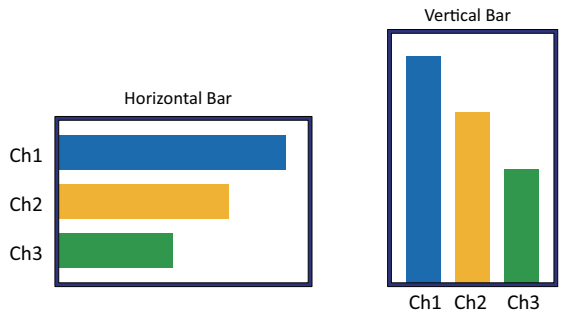


■ **Settings**

Lists the chart settings. The list shows the numbers, source devices, and colors for the chart.

No.: Shows the numbers for the chart (Ch1 to Ch10).

For **Horizontal Bar** and **Horizontal Peak**, the numbers are listed in order from top. For **Vertical Bar** and **Vertical Peak**, the numbers are listed in order from the left.



Device: Shows the source word device for the data to display in the chart.

Fg. Normal: Shows the foreground color of the chart when normal.

Fg. Over*1: Shows the foreground color of the chart when data over.

Bg. Normal: Shows the background color of the chart when normal.

Bg. Over*1: Shows the background color of the chart when data over.

Pattern: Shows the chart pattern.

*1 Advanced mode only

■ **Reference Device**

Specifies the source word device for the data to display in the chart.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Foreground Color**

Normal, Data Over*1: Selects the foreground color for the chart when normal and when data over (color: 256 colors, monochrome: 16 shades).
Click either button to display the Color Palette. Select a color from the Color Palette.

■ **Background Color**

Normal, Data Over*1: Selects the background color for the chart when normal and when data over (color: 256 colors, monochrome: 16 shades).
Click either button to display the Color Palette. Select a color from the Color Palette.

■ **Pattern**

Selects the chart pattern.

Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

■ **Set**

Registers the chart settings to the list. If you select a Ch number that is already registered, that number is overwritten with the new settings.

Select a Ch number on the list and click this button to register the **Reference Device**, **Foreground Color**, **Background Color**, and **Pattern** settings.

■ **Insert**

Inserts the chart settings in the position selected on the list.

Select a Ch number on the list and click this button to insert the **Reference Device**, **Foreground Color**, **Background Color**, and **Pattern** settings. The settings at the insertion point shift down one line. Settings cannot be inserted if all Ch numbers are configured.

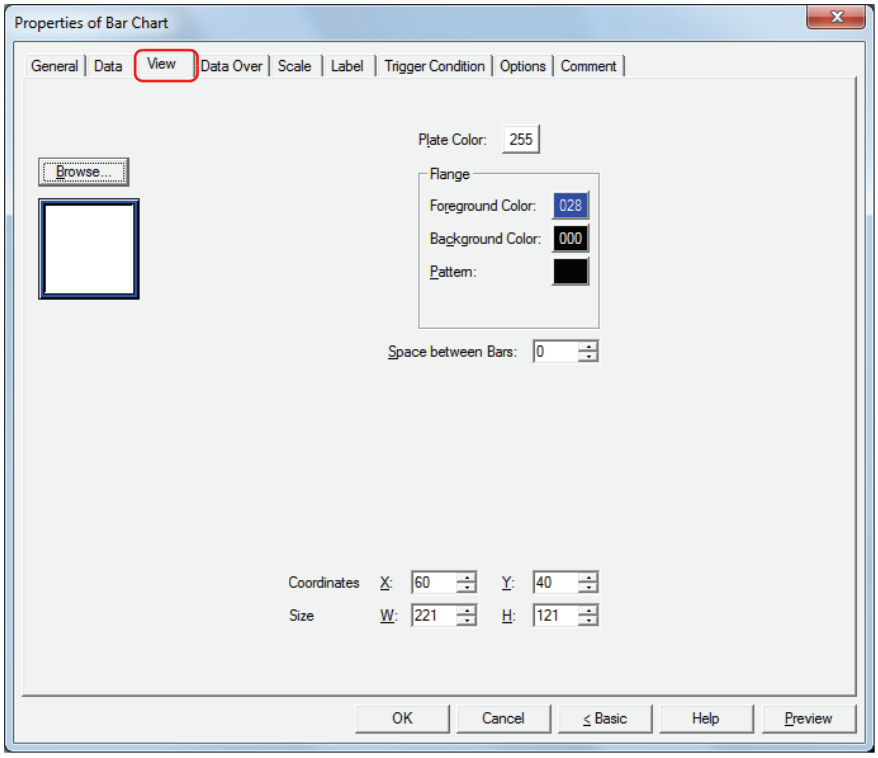
■ **Remove**

Deletes the registered settings from the list.

Select a Ch number and click this button to delete the selected settings from the list.

*1 Advanced mode only

● View Tab



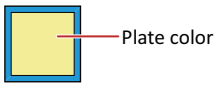
■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Plate Color

Selects the plate (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



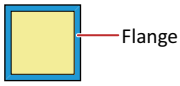
■ Flange

Foreground Color, Background Color: Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

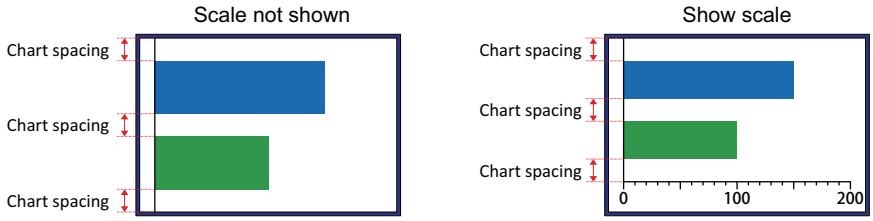
Pattern: Selects a pattern for the flange.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

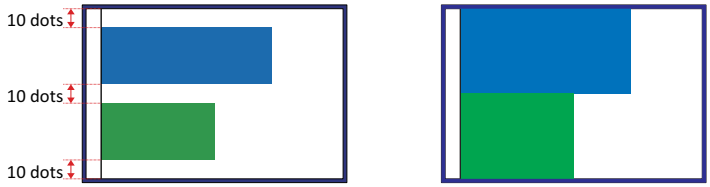


Space between Bars*1

Specifies the spacing for the bar chart (0 to 100 dots).



Example: If **Space between Bars** is 10 If **Space between Bars** is 0



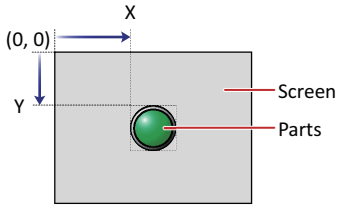
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

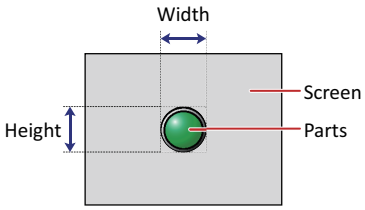


Size

W, H: Sets width and height to define the size of parts.

W: 5 to (base screen horizontal size)

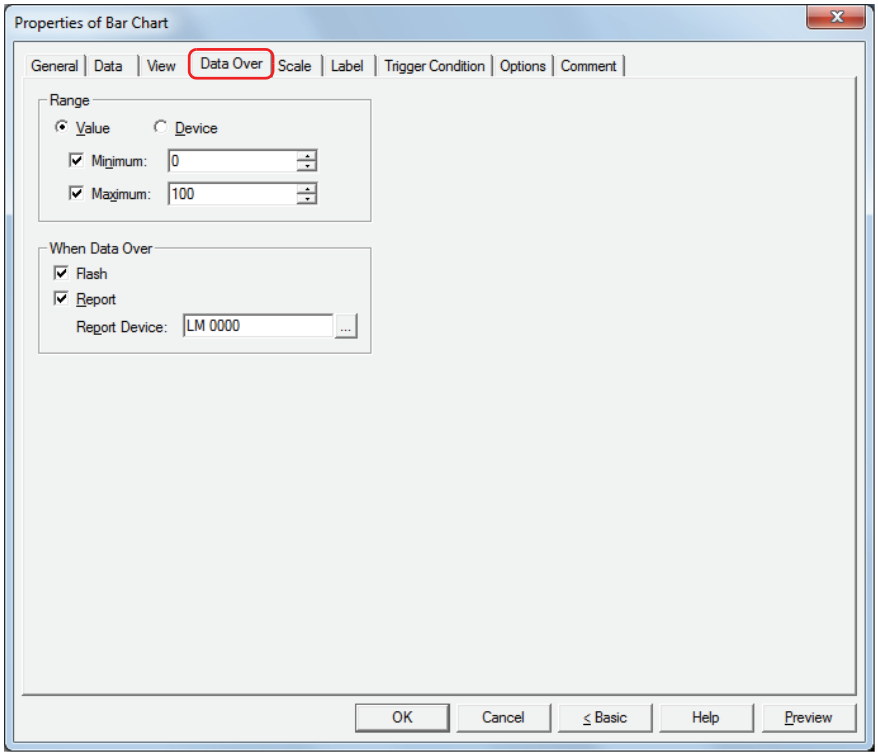
H: 5 to (base screen vertical size)



*1 Advanced mode only

● **Data Over** Tab

The **Data Over** tab is displayed in Advanced mode.



■ **Range**

Select data type.

Value:	Specifies the minimum and/or the maximum as a constant.
Device:	Specifies the minimum and/or the maximum as a word device value.

Specifies the allowable range of values to display.

Minimum, Maximum: Select these check boxes to specify the minimum and/or maximum.

The minimum and maximum that can be specified when **Value** is selected vary based on the data type selected with **Data Format** on the **General** tab. For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When **Device** is selected, these options specify the source word devices.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ When Data Over

These options configure the operation of the part when the allowable range is exceeded.

These options can only be configured when the **Minimum** or **Maximum** check boxes are selected under **Range**.

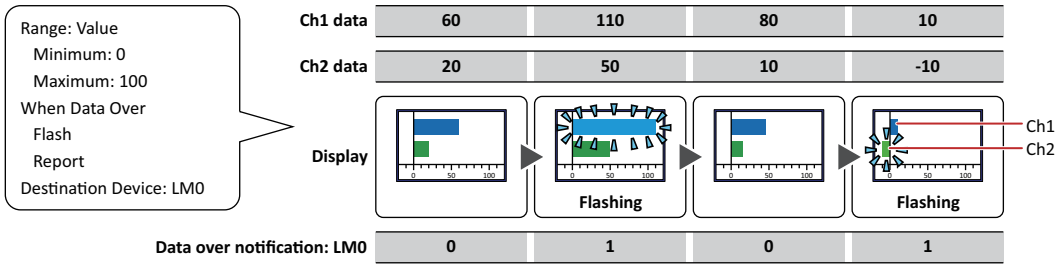
Flash: Select this check box to make the chart flash when the displayed data exceeds the allowable range.

Report: Select this check box to write 1 in the report device when the displayed data exceeds the allowable range.

Report Device: Specifies the report device.

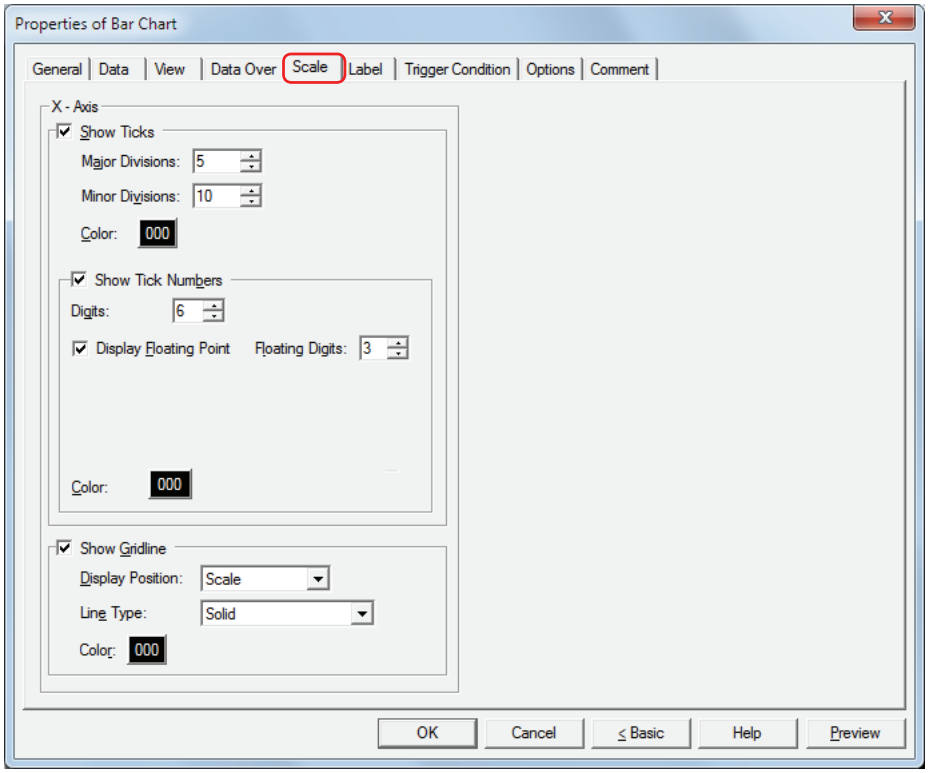
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: If the word device value of the reading source is "110" which is higher than the upper limit of "100", or "-10" which is below the lower limit of "0", a value of 1 will be written to LM0 and the displayed bar will flash.



● **Scale** Tab

The **Scale** tab is displayed in Advanced mode.



The options on the **Scale** tab vary based on the type selected with **Chart Type** on the **General** tab.

Horizontal Bar, Horizontal Peak: **X-Axis**

Vertical Bar, Vertical Peak: **Y-Axis**

■ Show Ticks

Select this check box to display a scale on a chart.

Major Divisions: Enter the number of major scale divisions (1 to 20).

Minor Divisions: Enter the number of minor scale divisions (1 to 20).

Color: Selects the color of scales (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Show Tick Numbers: Select this check box to display numbers along the scale.

Digits*1: Sets the number of digits to be displayed (1 to 10).
Can only be set when **float32** is selected for **Data Type** under the **General** tab.

Display Floating Point*1: Select this check box to display a floating point along the scale.
Can only be set when **float32** is selected for **Data Type** under the **General** tab.

Floating Digits*1: Sets the number of digits for the fractional parts of numbers (1 to 8) from the number of digits specified for **Digits**.
Can only be set when the **Display Floating Point** check box is selected.

Color*1: Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

For the HG2G-S/-5S, HG1F/2F/2S/3F/4F, the numbers and scales will be the same color.

If the area for displaying the scale is small, the scale will not be displayed properly.

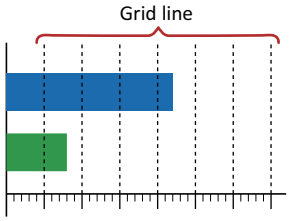
*1 HG2G-5F, HG3G/4G only

Show Gridline

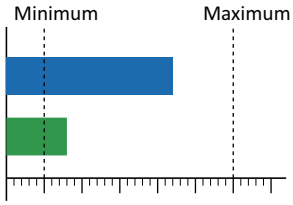
Select this check box to display grid lines on the chart. Grid lines are displayed above the chart.

Display Position: Select from **Scale** and **Data Over** to specify the grid line display position.

Scale: Grid lines are displayed according to the number of major scale divisions.
Can only be set when the **Show Ticks** check box is selected.



Data Over: Grid lines are displayed at the positions of values specified for **Maximum** and **Minimum** under the **Data Over** tab.
This option can only be configured when **Data Format** on the **General** tab and **Range** on the **Data Over** tab are set to **Value**.



Line Type: Selects the type of grid lines from the following.
Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Color: Specifies grid line color (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Show Label*1

Select this check box to display labels on the scale.

Font: Selects the font for text used in labels from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Text ID: Specifies the Text Manager ID No. (1 to 32000) when text registered in the Text Manager are used for labels.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text: Inputs characters to be displayed for labels. Maximum number is 40 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
Can only be input when the **Use Text Manager** check box is cleared.

- When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.
- For details about label settings for the HG2G-5F, HG3G/4G, refer to "Label Tab" on page 11-13.

Color: Selects the color of the text used for labels (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Use Text Manager*1

Select this check box if using the text registered in Text Manager for labels.

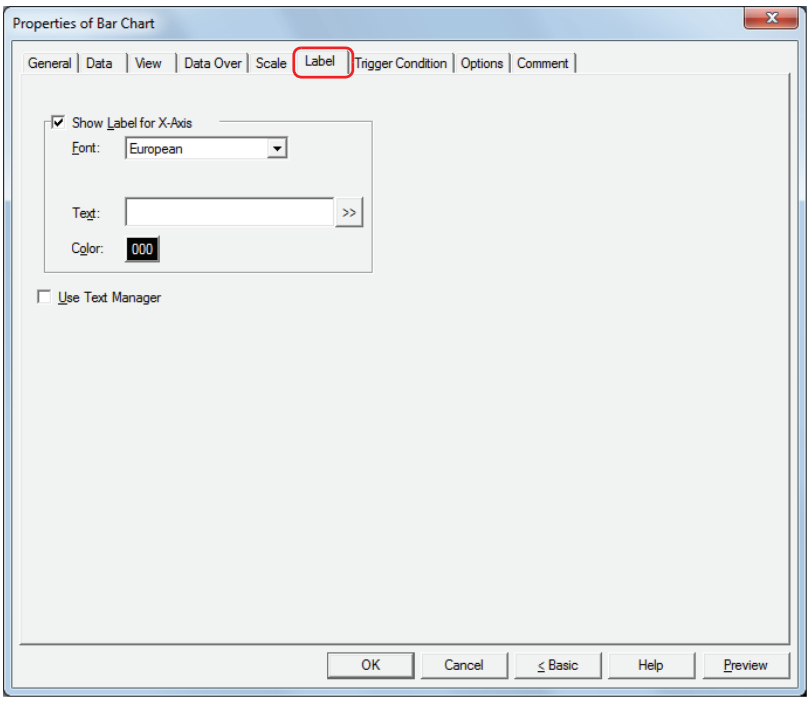
If a carriage return (CR) is included, the characters after the CR are not displayed. However, if Windows Font is set for the specified Text ID, all the characters are displayed.

*1 HG2G-S/-5S, HG1F/2F/2S/3F/4F only

● **Label** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Label** tab is only displayed in Advanced mode.



■ **Show Label for X-Axis, Show Label for Y-Axis**

Select this check box to display a label on X axis and Y axis scales.

The options on the **Label** tab vary based on the type selected with **Chart Type** on the **General** tab.

Horizontal Bar, Horizontal Peak:	**Show Label for X-Axis**
Vertical Bar, Vertical Peak:	**Show Label for Y-Axis**

Font: Selects the font for text used in labels from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Text ID: Specifies the Text Manager ID No. (1 to 32000) when text registered in the Text Manager are used for labels.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text: Inputs characters to be displayed for labels. Maximum number is 40 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
Can only be input when the **Use Text Manager** check box is cleared.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

Color: Selects the color of the text used for labels (color: 256 colors, monochrome: 16 shades).
Click **Color** to open the Color Palette. Select a color from the Color Palette.

If the area for displaying the label is too small, the label will not be displayed properly.

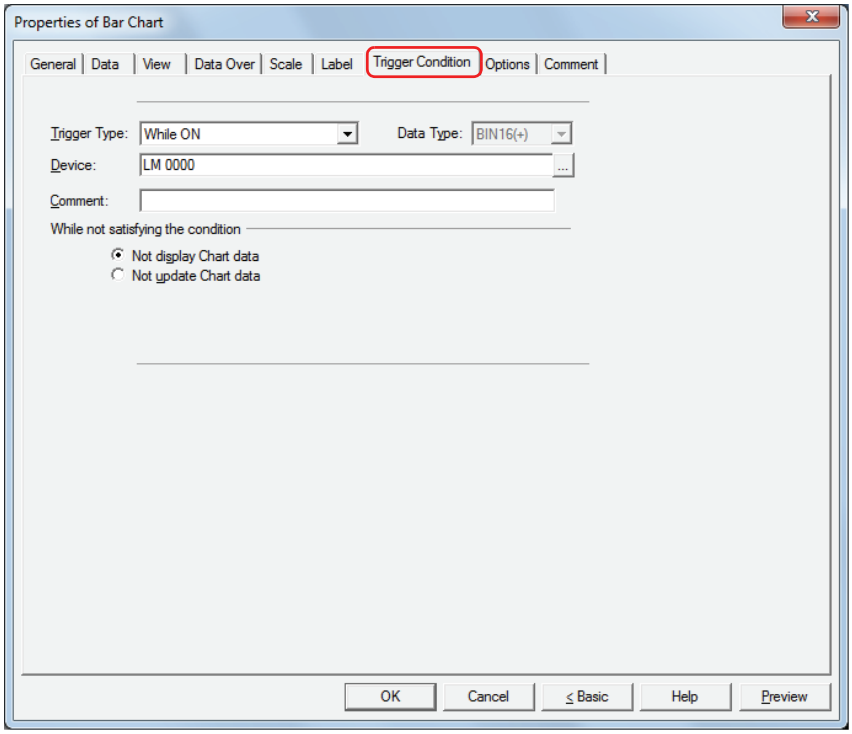
■ **Use Text Manager**

Select this check box if using the text registered in Text Manager for labels.

If a carriage return (CR) is included, the characters after the CR are not displayed. However, if Windows Font is set for the specified Text ID, all the characters are displayed.

● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.

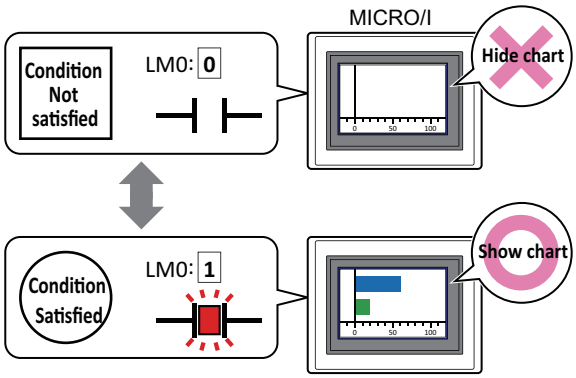


The bar chart is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. Select the operation when the condition is not satisfied as **Not display Chart data** or **Not update Chart data** under **While not satisfying the condition**.

Example: When **Trigger Type** is **While ON**, **Device** is **LM 0**, and **While not satisfying the condition** is **Not display Chart data**

While LM 0 is 0, the condition is not satisfied and the bar chart is not displayed.

While LM 0 is 1, the condition is satisfied and the bar chart is displayed.

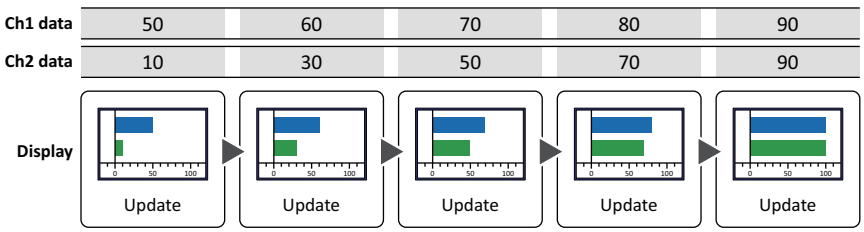


Data over does not operate for hidden bar charts. Data over is reported if the minimum or maximum is exceeded when the bar chart changes from hidden to displayed.

■ Trigger Type

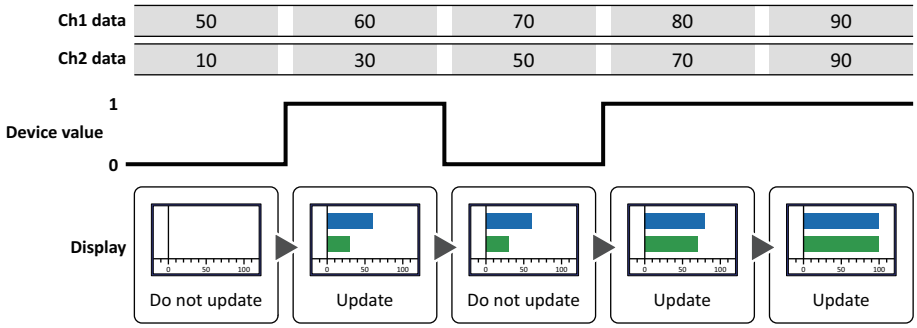
Selects the condition to enable the bar chart from the following.

Always visible: The bar chart is always enabled.



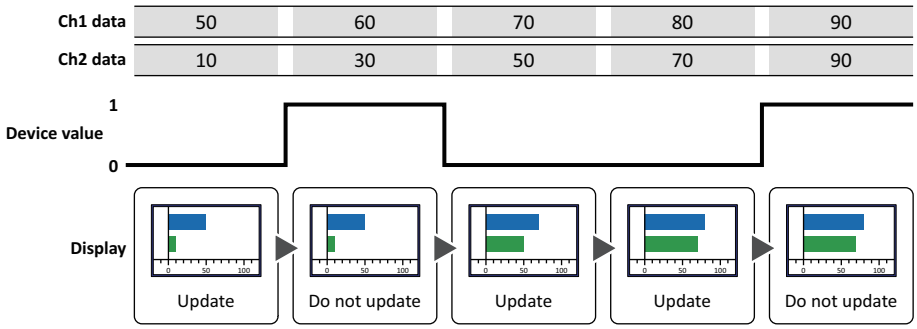
While ON: Enables the bar chart when the device value is 1.

Example: When **While not satisfying the condition** is **Not update Chart data**



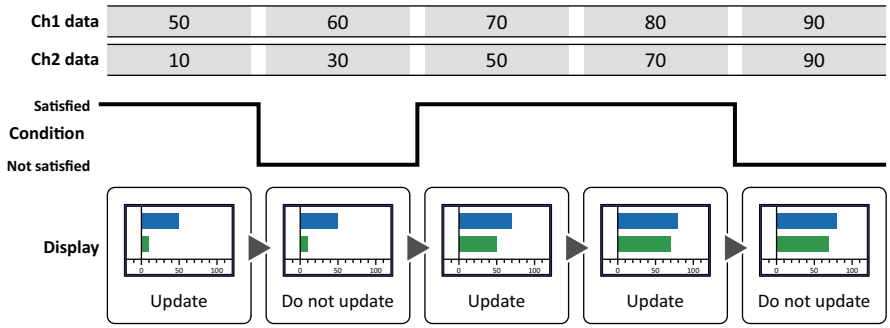
While OFF: Enables the bar chart when the device value is 0.

Example: When **While not satisfying the condition** is **Not update Chart data**



While satisfying the condition: Enables the bar chart when the condition is satisfied.

Example: When **While not satisfying the condition** is **Not update Chart data**



Data Type

Selects the data type to be handled by the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device

Specifies the bit device or bit of the word device to serve as condition.
Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition

Sets the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

Comment

Used for entering comments about trigger conditions. Maximum number is 80 characters.

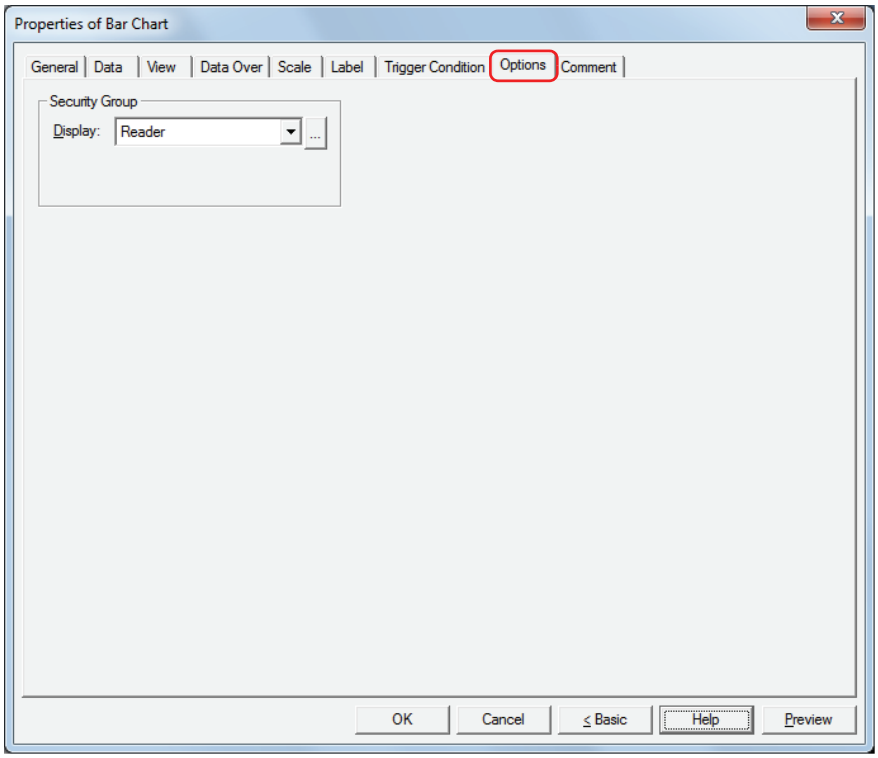
While not satisfying the condition

Selects operation of the Bar Chart when condition is not satisfied.

Not display Chart data:	The plate and flange are displayed, but Bar Chart is not displayed.
Not update Chart data:	The last updated Bar Chart is displayed. The Bar Chart does not change.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

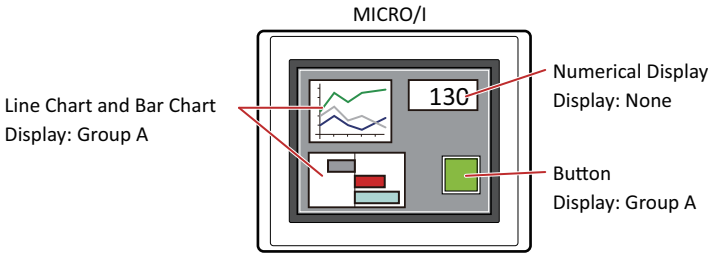
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

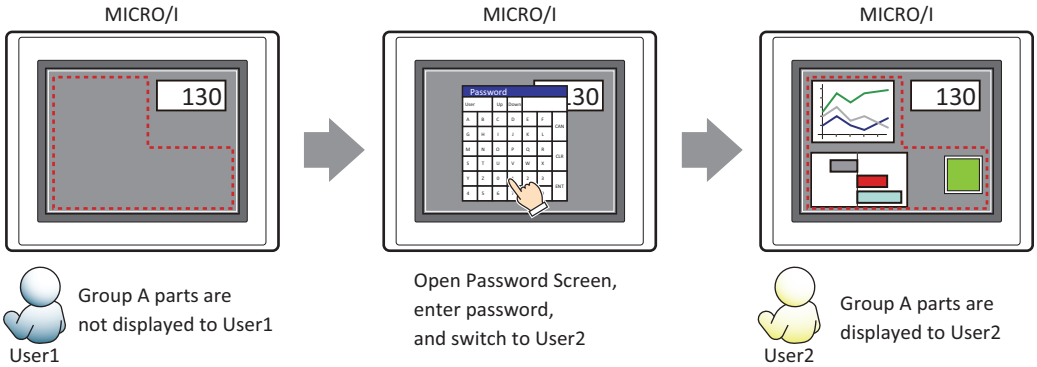
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



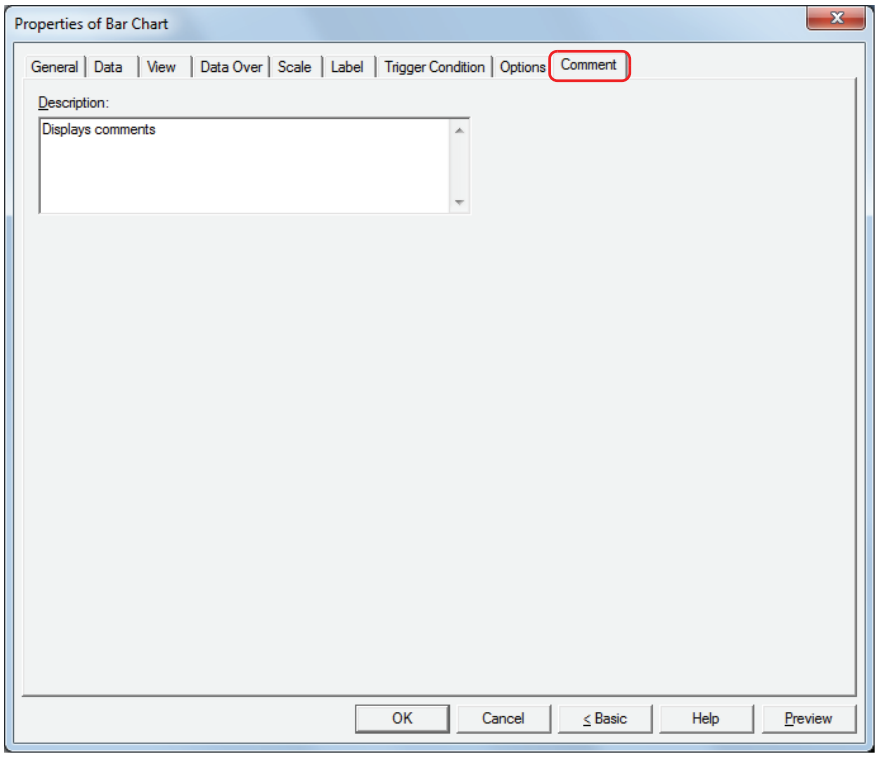
For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

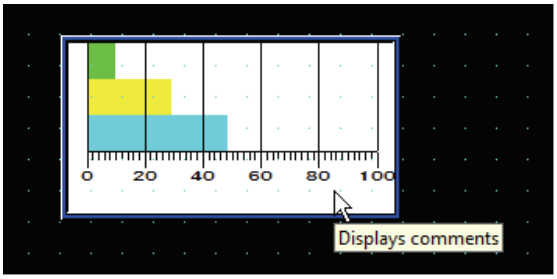
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the bar chart on the editing screen



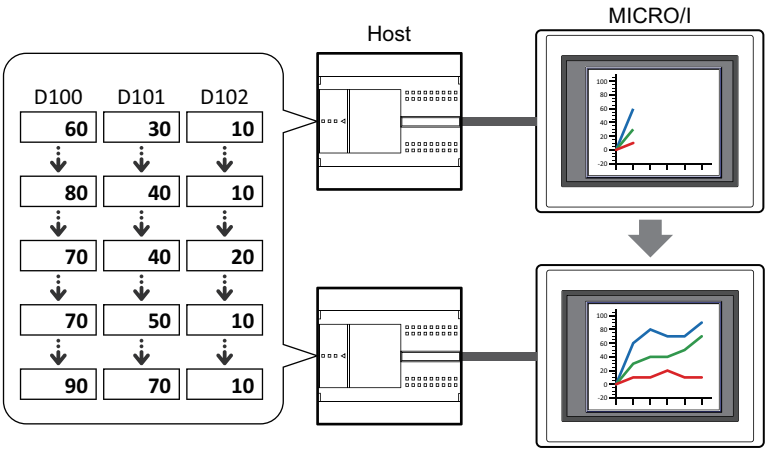
2 Line Chart

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 How the Line Chart is Used

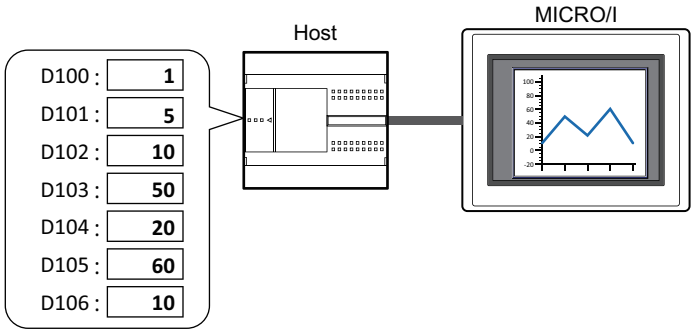
The line chart can be used to display device values sampled with the Data Log function and the values of multiple word devices.

- Display the device values sampled with the Data Log function in a trend chart

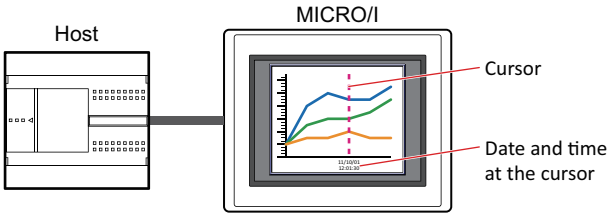


- There are two types of trend charts, a normal trend chart and a pen recorder trend chart.
- If the Data Log data displayed in the chart is deleted, the chart display is erased.

- Display the values of multiple, continuous devices in a single line chart



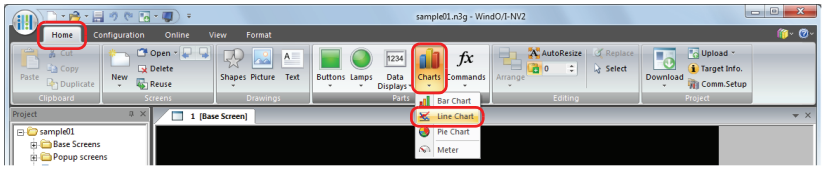
- Display the cursor and the date and time at the cursor



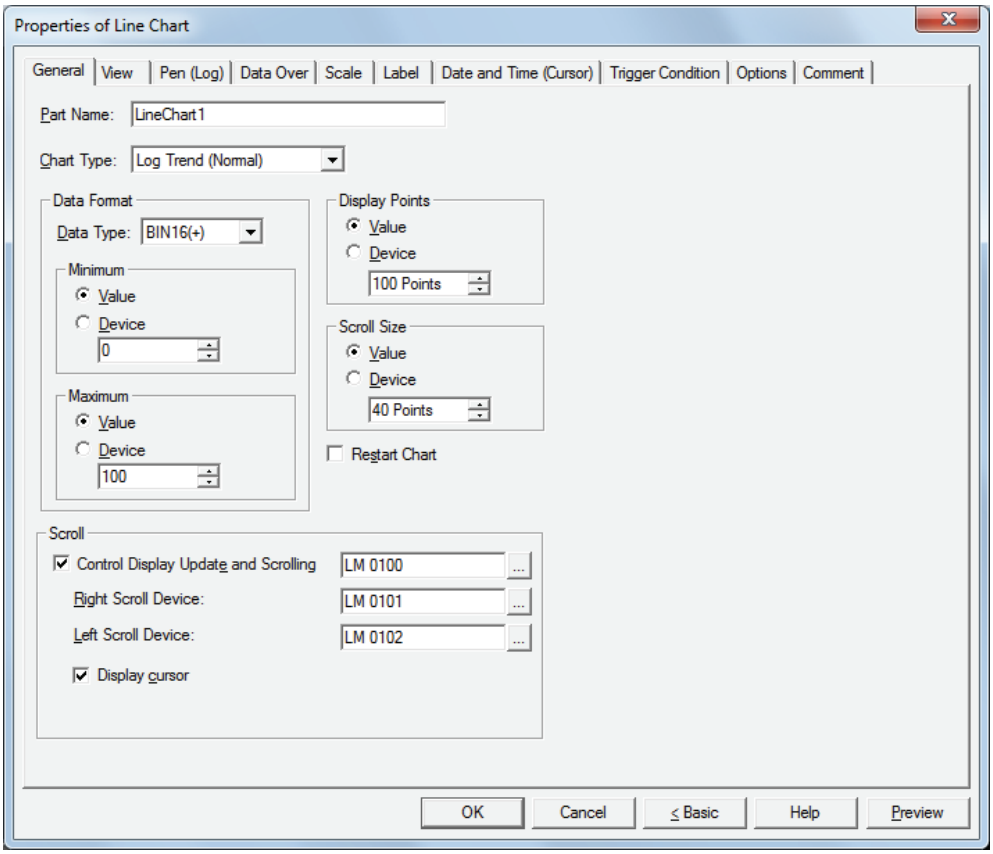
2.2 Line Chart Configuration Procedure

This section describes the configuration procedure for Line Charts.

1. On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Line Chart**.



2. Click a point on the edit screen where you wish to place the Line Chart.
3. Double-click the dropped Line Chart and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

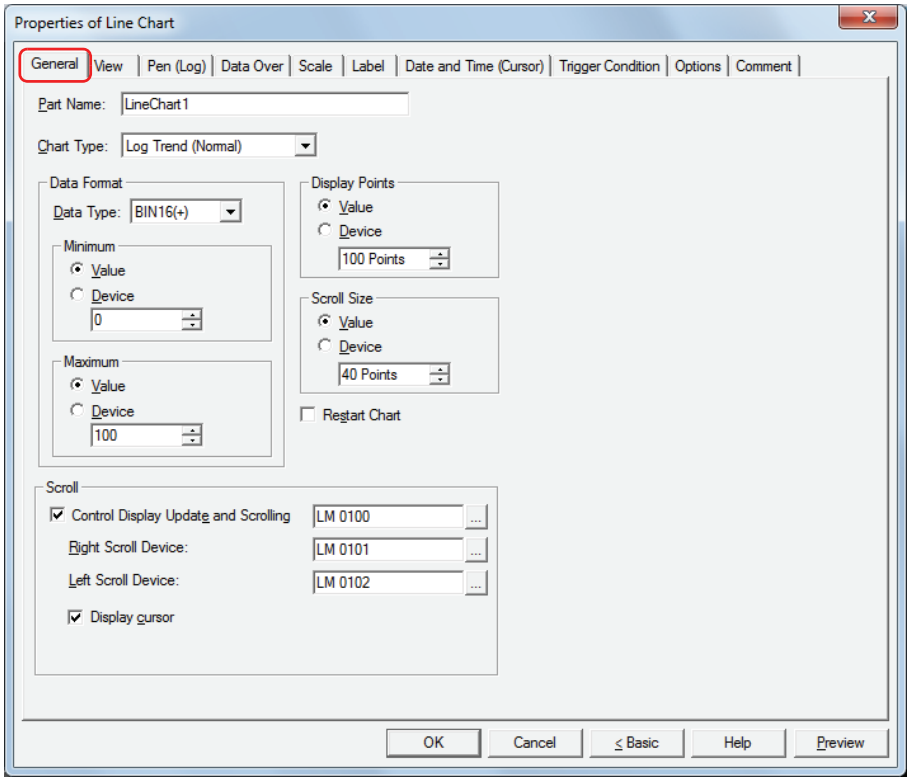


The **Data Over** tab, **Scale** tab, **Label** tab, **Date and Time (Cursor)** tab, **Trigger Condition** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

2.3 Properties of Line Chart Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ Part Name

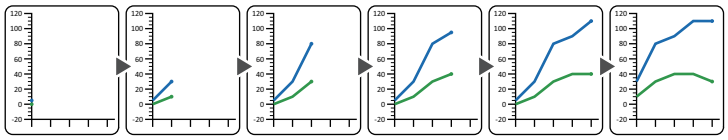
Enter a name for the part. The maximum number is 20 characters.

■ Chart Type

Selects the type of chart from the following.

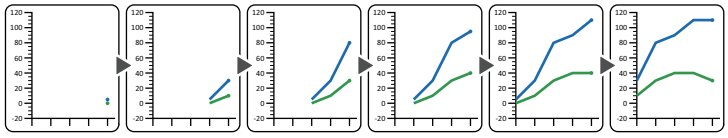
Log Trend (Normal): Shows device values sampled with the Data Log function in a trend chart. The displayed chart is updated each time the latest data is sampled and the latest data is charted from the left edge. If the sampled data exceeds the number of display points, the entire chart is shifted to the left by the configured scroll size and the display is updated.

Example: When **Display Points** is 5 and **Scroll Size** is 1

Ch1 data	**5**	**30**	**80**	**90**	**110**	**110**
Ch2 data	**0**	**10**	**30**	**40**	**40**	**30**
Display						
Operation	Display point 1	Display point 2	Display point 3	Display point 4	Display point 5	Scroll, display point 6

Log Trend (Pen Recorder): Shows device values sampled with the Data Log function in a trend chart. The displayed chart is updated each time the latest data is sampled and the latest data is always displayed at the right edge. The entire chart shifts to the left point by point and the display is updated.

Example: When **Display Points** is 5

Ch1 data	5	30	80	90	110	110
Ch2 data	0	10	30	40	40	30
Display						
Operation	Display point 1	Display point 2	Display point 3	Display point 4	Display point 5	Scroll, display point 6

The chart can display a maximum of 20 lines.

To display multiple items of data, set the sampling conditions and data size for the data to display to the same settings. The data cannot be displayed if its sampling conditions or data size is different.

Device Display: Display the values of multiple, continuous devices as a single line chart. The data size for the devices is 16 bits.

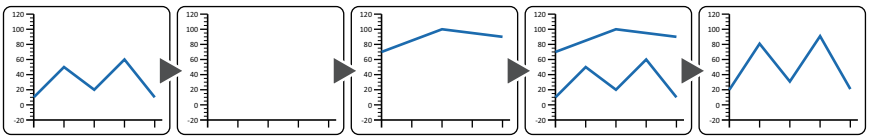
Updating and erasing the display is controlled by the lower 2 bits of the start address value (control status) of the continuous devices.

The number of device values to display is specified by the value of start address + 1.

The device values from start address + 2 are displayed on the chart.

Example: When the start address is D 100

The display updates when the value of D 100 changes from 0 to 1. The display is erased when the value changes to 2. The display is first erased and then updated when the value changes to 3.

(Start address) D100-0 value Update	0→1	0	0→1	0→1	0→1
D100-1 value Erase	0	0→1	0	0	0→1
(Start address +1) D101 value Number of devices to display values	5	5	3	5	5
(Start address +2) D102 value	10	10	70	10	20
(Start address +3) D103 value	50	50	100	50	80
(Start address +4) D104 value	20	20	90	20	30
(Start address +5) D105 value	60	60	110	60	90
(Start address +6) D106 value	10	10	80	10	20
Display					
Operation	Update Do not erase	Update Erase	Update Do not erase	Update Do not erase	Update Erase
			Number of display points changed	Number of display points changed	

If there are many items of data to display, it may take some time to update the display.

Data Format

Data Type: Selects the data type handled by the chart from the following.

BIN16(+), **BIN16(+/-)**, **BIN32(+)**[*1], **BIN32(+/-)**[*1], **BCD4**, **BCD8**[*1], **float32**[*1]

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Minimum, Maximum: Specifies the minimum and maximum for the chart.

(Data Type)[*2]: Selects the data type to use for the minimum and the maximum.

Value: Uses a constant.

Device: Uses a word device.

The minimum and maximum vary based on the selected data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When **Device** is selected for (Data Type)[*2], the minimum and maximum can be specified in the word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- If the data displayed in the chart is invalid, 1 is written to System Area 2 Arithmetic error bit (address+2, bit 5), and an error message is displayed. If **Chart Type** is **Device Display**, an arithmetic error occurs when the chart is initially displayed, when the display is updated, and when it is erased. For details, refer to Chapter 4 " Arithmetic error" on page 4-34.
  An error occurs in the following states.
  - When the minimum is the same as or larger than the maximum
  - When **Data Type** is **BCD4**, **BCD8**, or **float32** and the value cannot be expressed with the data type selected for the read data
    The chart cannot be displayed when an error has occurred.
- If the **Chart Type** is selected as **Log Trend (Normal)** or **Log Trend (Pen Recorder)**, the chart display is updated when a value of device is changed. At this time, chart data not saved to the data storage area is not displayed.
- If the **Chart Type** is selected as **Device Display**, the minimum and maximum are updated when the display is updated or erased.
- Even if the value of device is changed while the trigger condition is not satisfied, the minimum and maximum are not updated.

Display Points

Specifies the maximum number of points of data to display on the chart (2 to (base screen horizontal size)).

This option can only be configured when **Log Trend (Normal)** or **Log Trend (Pen Recorder)** is selected for **Chart Type**.

(Data Type)[*2]: Selects the data type to use with the display points.

Value: Uses a constant.

Device: Uses a word device.

(Display points): Specifies the maximum number of points (2 to Base Screen horizontal size) for the data to be displayed on the chart. The handled data type is BIN16(+) only.

When **Device** is selected for (Data Type)[*2], the display points can be specified in the word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- The minimum value of **Display Points** is 2. If the value of device is smaller than the minimum value, then **Display Points** remains at 2. If the value is larger than the Base Screen horizontal size, then **Display Points** is the value of the Base Screen horizontal size.
- When the value of device changes, the chart display is updated. At this time, chart data not saved to the data storage area is not displayed.
- Even if the value of device is changed while the trigger condition is not satisfied, the chart display is not updated.

*1 HG2G-5F, HG3G/4G only
*2 HG2G-S/-5S/-5F, HG3G/4G only

■ **Scroll Size**

Specifies the number of points of data to scroll when updating the chart display (1 to the value of **Display Points**).

This option can only be configured when **Log Trend (Normal)** is selected for **Chart Type**.

(Data Type)*2: Selects the data type to use with the scroll size.
Value: Uses a constant.
Device: Uses a word device.

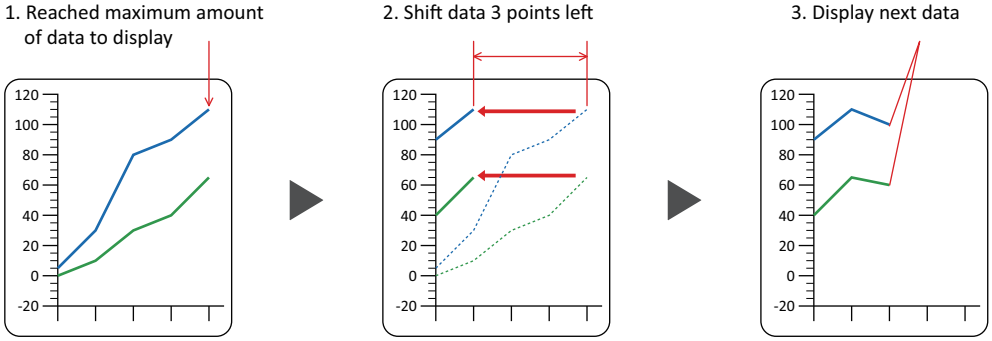
(Scroll size): Specifies the number of points of data to scroll (1 to the value of **Display Points**). The handled data type is BIN16(+) only.

When **Device** is selected for (Data Type)*2, the scroll size can be specified in the word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The minimum value of **Scroll Size** is 1. If the value of device is smaller than the minimum value, then **Scroll Size** remains at 1. If the value is larger than **Display Points**, then **Scroll Size** is the value of **Display Points**.

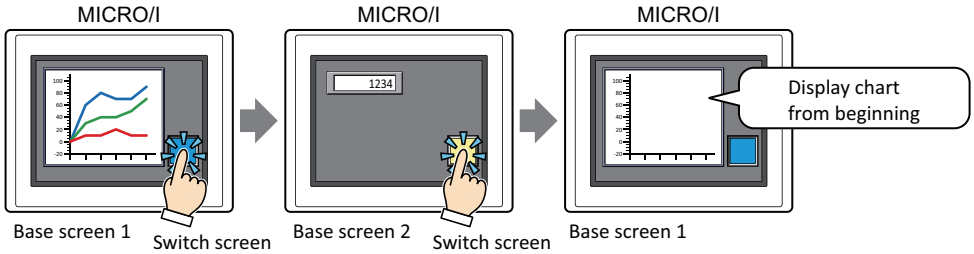
Example: When **Display Points** is 5 and **Scroll Size** is 3



■ **Restart Chart**

Select this check box to display the chart from the beginning when switching screens.

This option can only be configured when **Log Trend (Normal)** or **Log Trend (Pen Recorder)** is selected for **Chart Type**.



*2 HG2G-S/-5S/-5F, HG3G/4G only

Scroll*3

Control Display Update and Scrolling: To scroll the chart to display past data and to display the cursor, the chart display updating must be stopped. To control updating the display, select this check box and specify the bit device or bit of the word device to control the display.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Display updating stops when the device value changes from 0 to 1. Display updating restarts when the device value changes from 1 to 0.

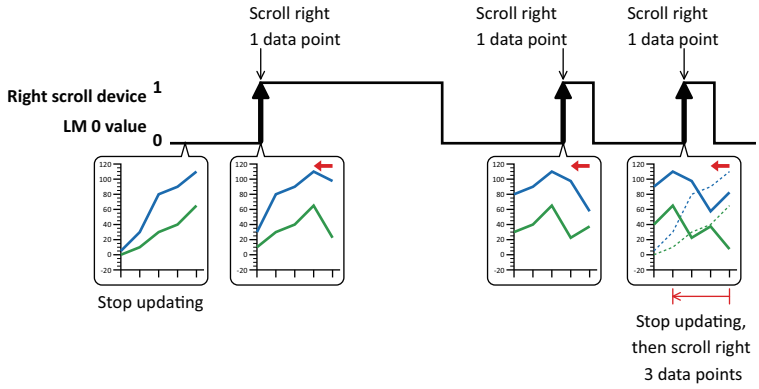
This option can only be configured when **Log Trend (Normal)** or **Log Trend (Pen Recorder)** is selected for **Chart Type**.

Right Scroll Device, Left Scroll Device: The chart can be scrolled to the right or to the left when display updating is stopped. This option specifies the bit device or bit of the word device to scroll the chart left or right.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The chart scrolls right or left one point of data each time the device value changes from 0 to 1.

These options can only be configured when the **Control Display Update and Scrolling** check box is selected.

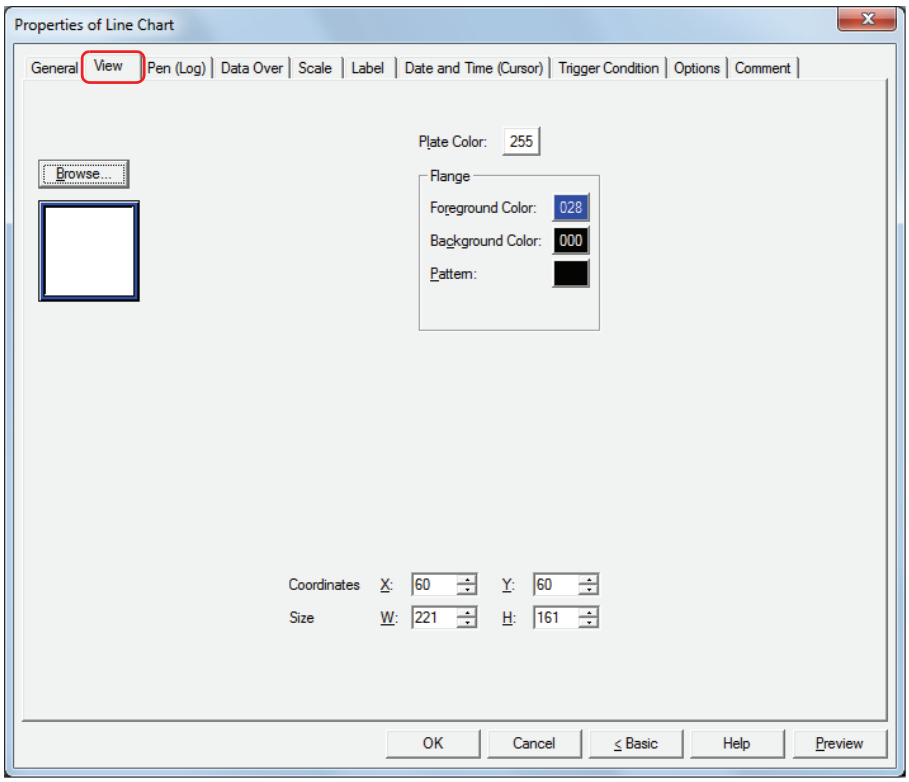


Display cursor*1: The cursor can be displayed when display updating is stopped. The cursor is displayed on the chart. Select this check box to display the cursor. The **Date and Time (Cursor)** tab is displayed where the functions related to the cursor, such as the cursor style and display position control, can be configured.

This option can only be configured when the **Control Display Update and Scrolling** check box is selected.

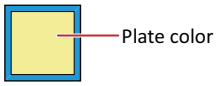
*1 HG2G-5F, HG3G/4G only
*3 Advanced mode only

● View Tab



■ **Browse**
Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

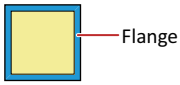
■ **Plate Color**
Selects the plate (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.



■ **Flange**

Foreground Color, Background Color: Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

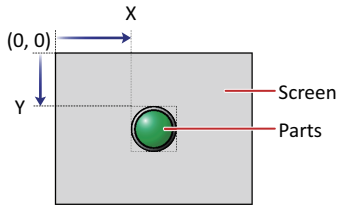


■ **Coordinates**

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

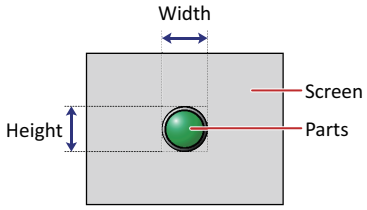


Size

W, H: Sets width and height to define the size of parts.

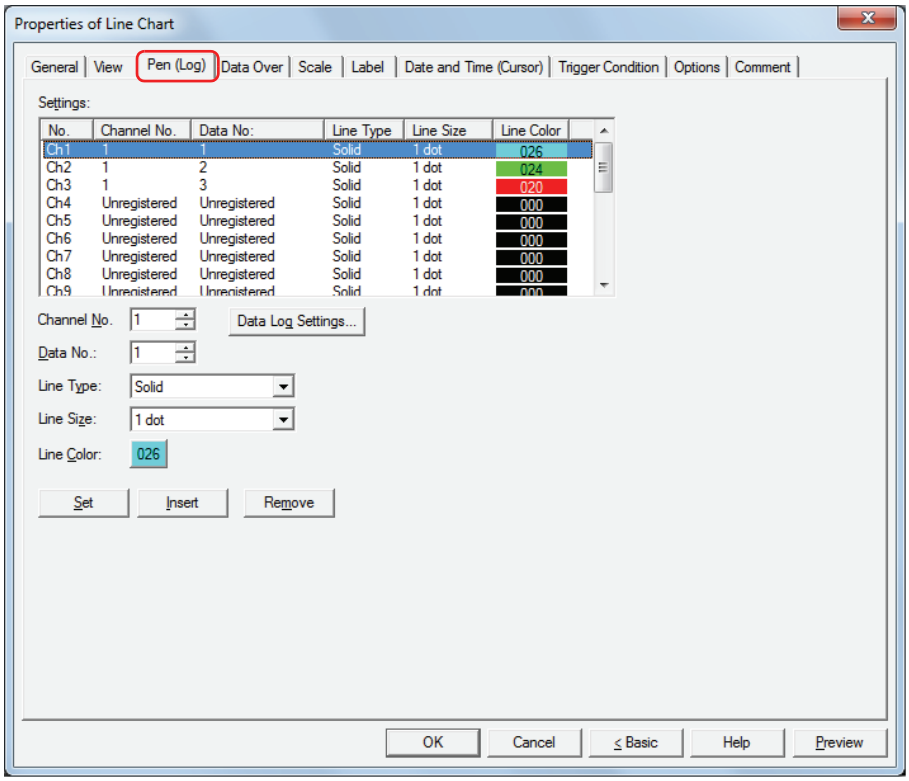
W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● Pen (Log) Tab

The **Pen (Log)** tab is only displayed when **Log Trend (Normal)** or **Log Trend (Pen Recorder)** is selected for **Chart Type** on the **General** tab.



■ Settings

Lists the chart settings.

No.:	Shows the numbers for the chart (Ch1 to Ch20).
Channel No.:	Shows the Data Log channel number to display on the chart.
Data No.:	Out of the data contained in the selected Data Log channel number, shows the data number to display on the chart.
Line Type:	Shows the chart line type.
Line Size:	Shows the chart line size.
Line Color:	Shows the chart line color.

■ Channel No.

Specifies the Data Log channel number to display on the chart (1 to 20).

Data Log Settings:	Displays the **Data Log Settings** dialog box where you can configure the channel while checking the data to display. Select **Channel No.** under **Settings**, and then click **OK** to close the **Data Log Settings** dialog box. **Channel No.** reflects the selected channel number.

If the sampling condition for the channels and the amount of log data saved in the data storage area differ, the chart cannot be displayed. Set the sampling conditions or channel numbers to the same data.

■ Data No.*1

Specifies the data number to display on the chart out of the data contained in the selected Data Log channel number.

For the HG1F/2F/2S/3F/4F, the device value for **No. 1** in **Settings** for the selected Data Log channel number is displayed on the chart.

*1 HG2G-S/-5S/-5F, HG3G/4G only

- **Line Type**
  Selects the type of line from the following.
  Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

- **Line Size**
  Selects the line size from the following.
  1 dot, **2 dots**, **3 dots**, **5 dots**

- **Line Color**
  Selects the line color for the chart (color: 256 colors, monochrome: 16 shades).
  Click this button to display the Color Palette. Select a color from the Color Palette.

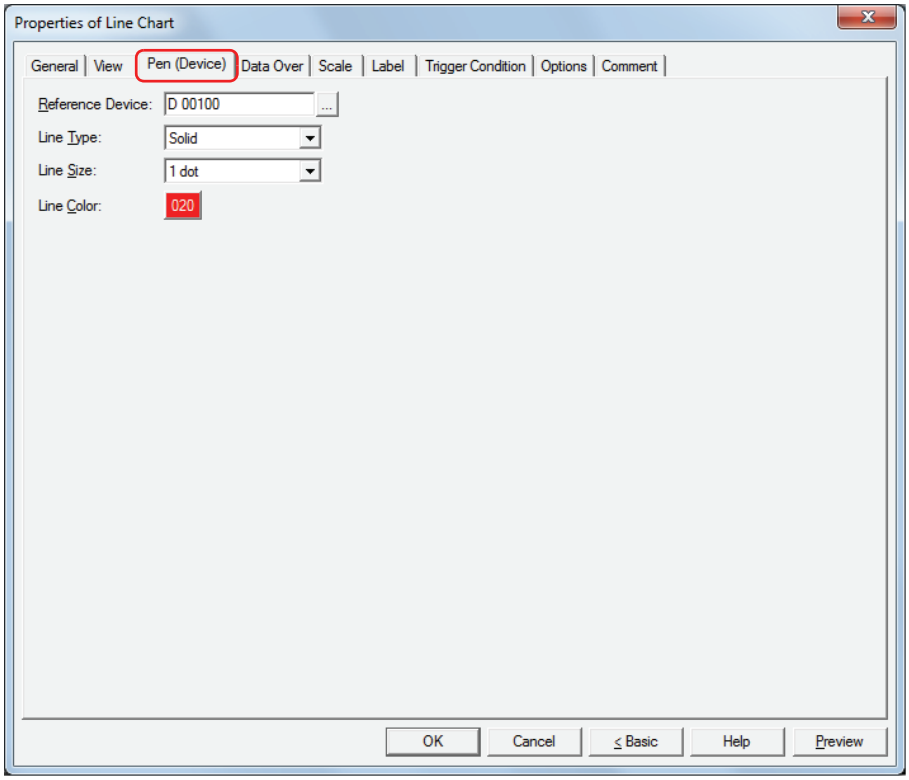
- **Set**
  Registers the chart settings to the list. If you select a Ch number that is already registered, that number is overwritten with the new settings.
  Select a Ch number on the list and click this button to register the settings for the Data Log **Channel No.** and **Data No.** and the chart **Line Type**, **Line Size**, and **Line Color**.
  Always register the settings from Ch1.

- **Insert**
  Inserts the chart settings in the position selected on the list.
  Select a Ch number on the list and click this button to insert the settings for the Data Log **Channel No.** and **Data No.** and the chart **Line Type**, **Line Size**, and **Line Color**. The settings at the insertion point shift down one line. Settings cannot be inserted if all Ch numbers are configured.

- **Remove**
  Deletes the registered settings from the list.
  Select a Ch number and click this button to delete the selected settings from the list.

● Pen (Device) Tab

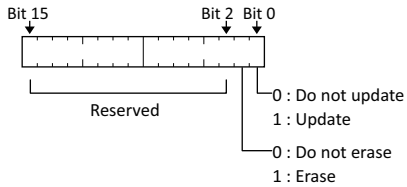
The **Pen (Device)** tab is only displayed when **Device Display** is selected for **Chart Type** on the **General** tab.



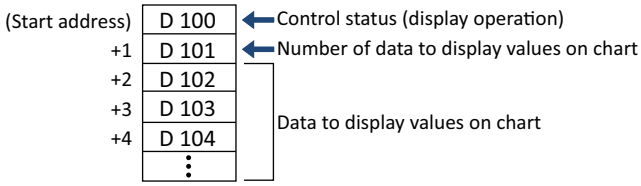
■ Reference Device

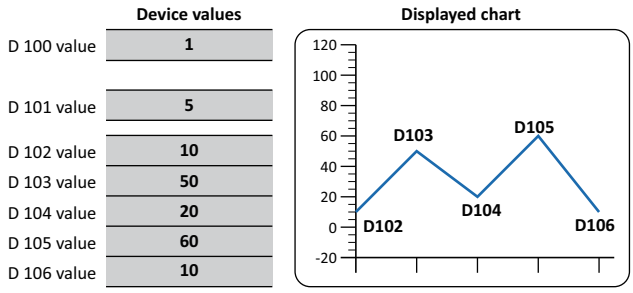
Specifies the start address of the data to display on the chart.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
The data size for the devices is 16 bits.
Updating and erasing the display is controlled by the lower 2 bits of the start address value (control status).



The number of device values to display is specified by the value of start address + 1.
The device values from start address + 2 are displayed on the chart.
Example: If **Reference Device** is set to D 100, continuous devices are used starting from D 100. The used devices are as follows.





Line Type

Selects the type of line from the following.

Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Line Size

Selects the line size from the following.

1 dot, **2 dots**, **3 dots**, **5 dots**

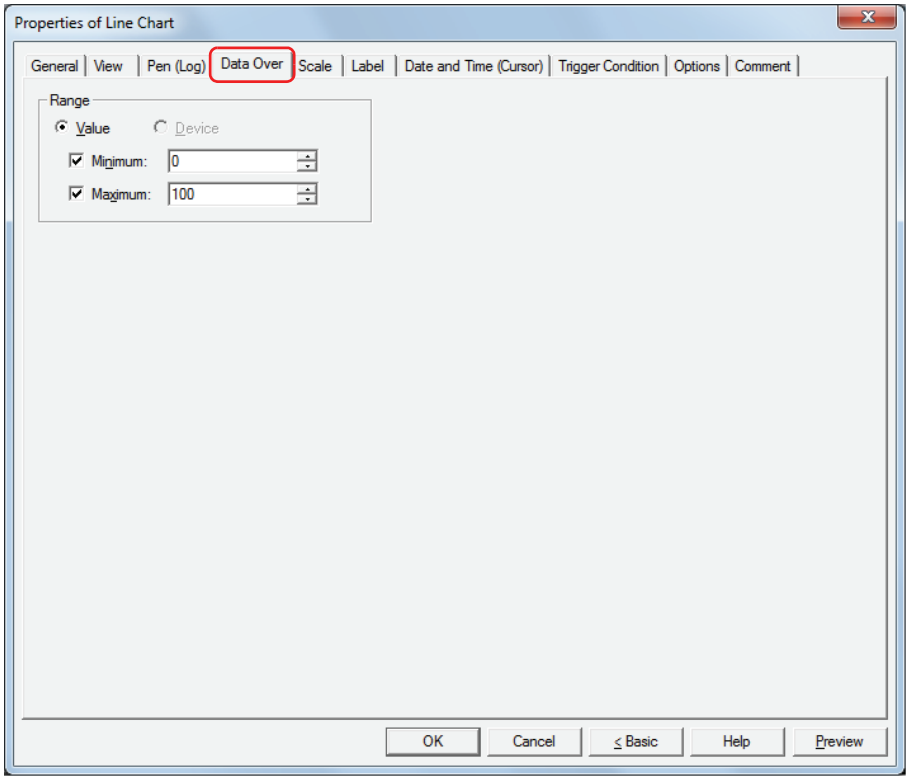
Line Color

Selects the line color for the chart (color: 256 colors, monochrome: 16 shades).

Click this button to display the Color Palette. Select a color from the Color Palette.

● **Data Over** Tab

The **Data Over** tab is displayed in Advanced mode.



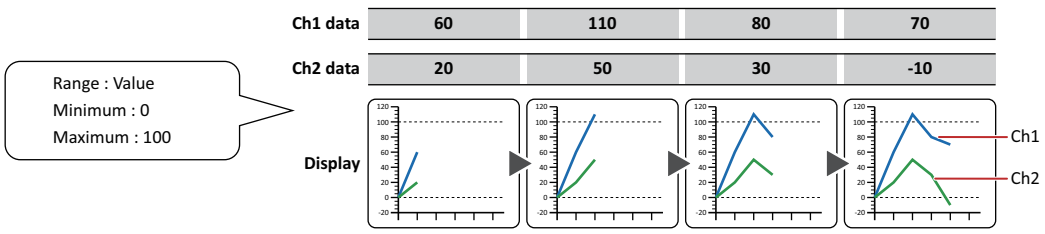
■ Range

The type of data is **Value**. This option uses constants for the allowable range.

Specifies the allowable range of values to display.

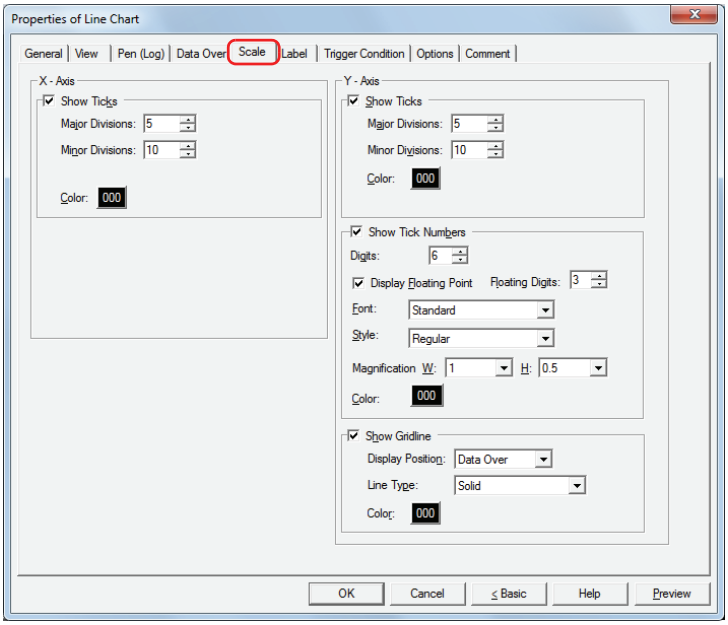
Minimum, Maximum: Select these check boxes to specify the minimum and/or maximum.
The minimum and maximum that can be specified differ according to the data type selected with **Data Format** on the **General** tab. For details on data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When grid lines are displayed for the minimum and maximum, select the **Show Gridline** check box on the **Scale** tab and then select **Data Over**.



● **Scale** Tab

The **Scale** tab is displayed in Advanced mode.



■ **Show Ticks**

Select this check box to display a scale on a chart.

Major Divisions: Enter the number of major scale divisions (1 to 20).

Minor Divisions: Enter the number of minor scale divisions (1 to 20).

Color: Selects the color of scales (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Show Tick Numbers: Select this check box to display numbers along the scale. Can only be set for **Y-Axis**.

- Digits*1: Sets the number of digits to be displayed (1 to 10).
  Can only be set when **float32** is selected for **Data Type** under the **General** tab.
- Display Floating Point*1: Select this check box to display a floating point along the scale.
  Can only be set when **float32** is selected for **Data Type** under the **General** tab.
- Floating Digits*1: Sets the number of digits for the fractional parts of numbers (1 to 8) from the number of digits specified for **Digits**.
  Can only be set when the **Display Floating Point** check box is selected.
- Font*1: Selects the font used for displayed text from the following.
  Standard, **Stroke**, **7-Segment**
  The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
- Style*1: Selects **Regular** or **Bold** for the character style to be displayed.
  Can only be set when **Standard** is selected for **Font**.
- Magnification W, H*1: Selects magnification (0.5, 1 to 4, 8) for the displayed text.
  Can only be set when **Standard** is selected for **Font**.
- Size*1: Sets character size (8 to 128) for displayed text.
  Can only be set when **Stroke** or **7-Segment** is selected for **Font**.
- Color*1: Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).
  Click **Color** to display the Color Palette. Select a color from the Color Palette.

For the HG2G-S/-5S, HG1F/2F/2S/3F/4F, the numbers and scales will be the same color.

If the area for displaying the scale is small, the scale will not be displayed properly.

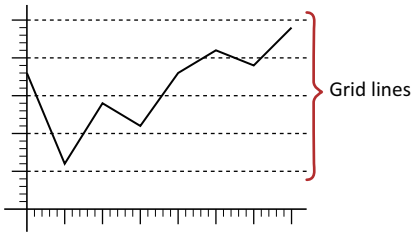
*1 HG2G-5F, HG3G/4G only

Show Gridline

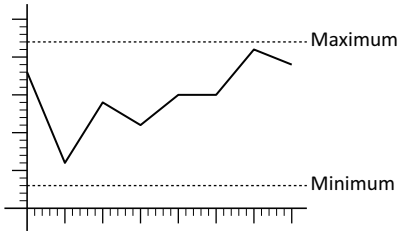
Select this check box to display grid lines on the chart. The grid lines are displayed on the chart.

Display Position: Select from **Scale** and **Data Over** to specify the grid line display position.

Scale: Grid lines are displayed according to the number of major scale divisions.
Can only be set when the **Show Ticks** check box is selected.



Data Over: Grid lines are displayed at the positions of values specified for **Maximum** and **Minimum** under the **Data Over** tab.



Line Type: Selects the type of grid lines from the following.
Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Color: Specifies grid line color (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Show Label*2

Select this check box to display labels on the scale.

Font: Selects the font for text used in labels from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Text ID: Specifies the Text Manager ID No. (1 to 32000) when text registered in the Text Manager are used for labels.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text: Inputs characters to be displayed for labels. Maximum number is 40 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
Can only be input when the **Use Text Manager** check box is cleared.

- When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.
- For details about label settings for the HG2G-5F, HG3G/4G, refer to "Label Tab" on page 11-36.

Color: Selects the color of the text used for labels (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Use Text Manager*2

Select this check box if using the text registered in Text Manager for labels.

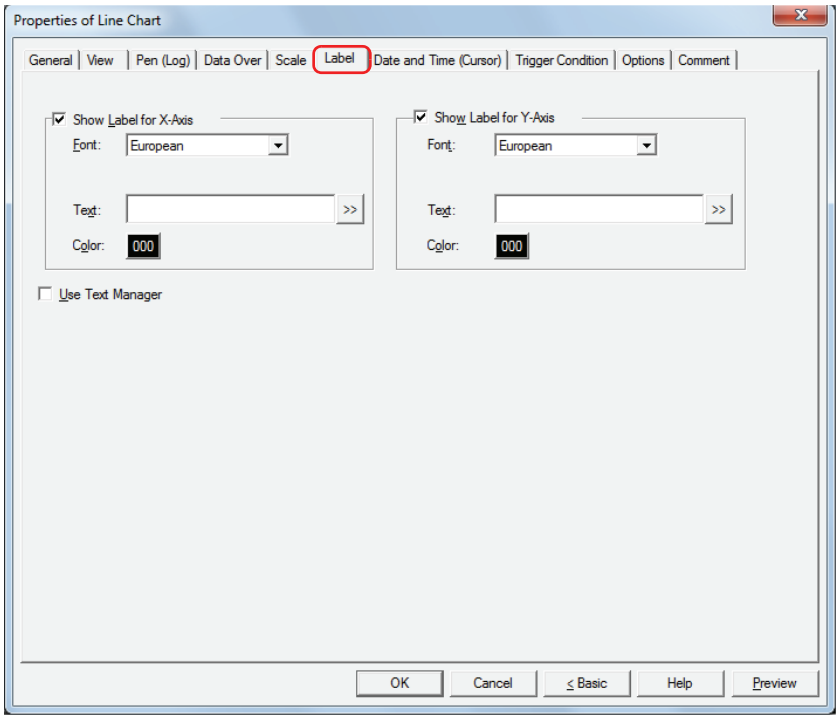
If a carriage return (CR) is included, the characters after the CR are not displayed. However, if Windows Font is set for the specified Text ID, all the characters are displayed.

*2 HG2G-S/-5S, HG1F/2F/2S/3F/4F only

● **Label** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Label** tab is only displayed in Advanced mode.



■ **Show Label for X-Axis, Show Label for Y-Axis**

Select this check box to display a label on X axis and Y axis scales.

Font: Selects the font for text used in labels from the following.
Japanese, **European**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**
Can only be set when the **Use Text Manager** check box is cleared.
The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Text ID: Specifies the Text Manager ID No. (1 to 32000) when text registered in the Text Manager are used for labels.
Click ... to display Text Manager.
Can only be set when the **Use Text Manager** check box is selected.

Text: Inputs characters to be displayed for labels. Maximum number is 40 characters.
The characters that can be entered depend on the font selected using **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
Can only be input when the **Use Text Manager** check box is cleared.

When entering Unicode characters click >> to display the **Unicode Input** dialog box. Enter the characters using the **Unicode Input** dialog box then click **OK**.

Color: Selects the color of the text used for labels (color: 256 colors, monochrome: 16 shades).
Click **Color** to open the Color Palette. Select a color from the Color Palette.

If the area for displaying the label is too small, the label will not be displayed properly.

■ **Use Text Manager**

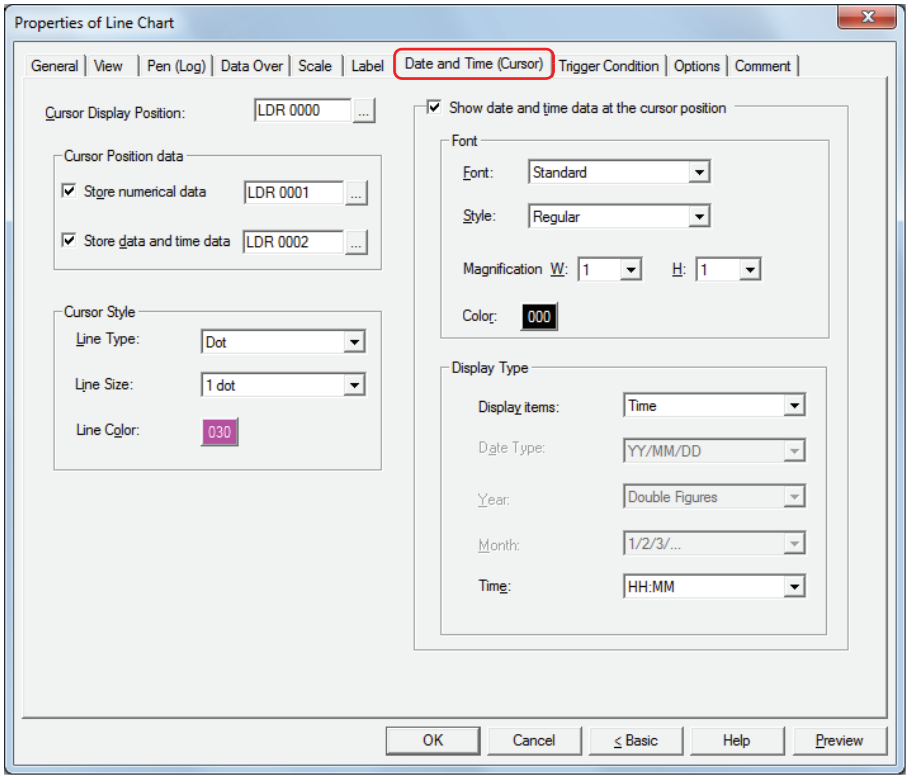
Select this check box if using the text registered in Text Manager for labels.

If a carriage return (CR) is included, the characters after the CR are not displayed. However, if Windows Font is set for the specified Text ID, all the characters are displayed.

● Date and Time (Cursor) Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Date and Time (Cursor)** tab is only displayed in Advanced mode when **Log Trend (Normal)** or **Log Trend (Pen Recorder)** is selected for **Chart Type** on the **General** tab and the **Display cursor** check box is selected.



■ Control Cursor Position

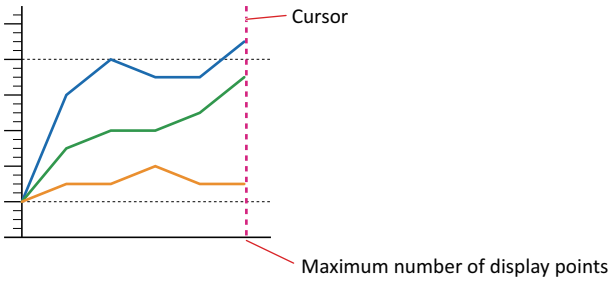
This device value is the cursor's display position. The cursor is displayed at the position counted from the left side of the chart.

This option specifies the word device that is the cursor's display position.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

If the value of the device configured by **Control Cursor Position** is outside the range of points configured by **Display Points** on the **General** tab, the cursor is displayed at the minimum or the maximum value of the display points.

Example: When **Display Points** is 50 and the value of the device configured by **Control Cursor Position** is 100, the cursor is displayed at the 50 (maximum) position.



Cursor Position data

Store numerical data: To store the numerical data at the position indicated by the cursor in internal devices, select this check box and specify the destination word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The data is stored in continuous device addresses starting from the specified device address in order from Ch1 in the amount of charts displayed. The number of used devices varies based on the data size. If there is no data at the cursor position, 0 is stored in the device.

Example: When specifying LDR 10 and storing the numerical data in Ch1 to Ch3

Data size configured in the Data Log: 16 bits

Destination	Numerical data
LDR 10	Ch1 numerical data
LDR 11	Ch2 numerical data
LDR 12	Ch3 numerical data

Data size configured in the Data Log: 32 bits

Destination		Numerical data
LDR 10	LDR 11	Ch1 numerical data
LDR 12	LDR 13	Ch2 numerical data
LDR 14	LDR 15	Ch3 numerical data

Store date and time data: To store the date and time data at the position indicated by the cursor in internal devices, select this check box and specify the destination word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The year, month, day, hour, minute, and second are stored in continuous devices in order as BCD starting from the specified device address. If there is no data at the cursor position, 0 is stored in the device.

Example: When storing the date and time data for October 1, 2011 12:01:30

Destination	Date and time data	
LDR 10	2011	(Year)
LDR 11	10	(Month)
LDR 12	1	(Day)
LDR 13	12	(Hour)
LDR 14	1	(Minute)
LDR 15	30	(Second)

Cursor Style

Line Type: Selects the cursor line type from the following.
Solid, **Dot**, **Dash**, **Long Dash**, **Long Dash Dot**, **Long Dash Dot Dot**

Line Size: Selects the cursor line size from the following.
1 dot, **2 dots**, **3 dots**, **5 dots**

Line Color: Selects the line color for the cursor (color: 256 colors, monochrome: 16 shades).
Click this button to display the Color Palette. Select a color from the Color Palette.

Show date and time data at the cursor position

To show the date and time data at the position indicated by the cursor, select this check box and specify the font and display type.

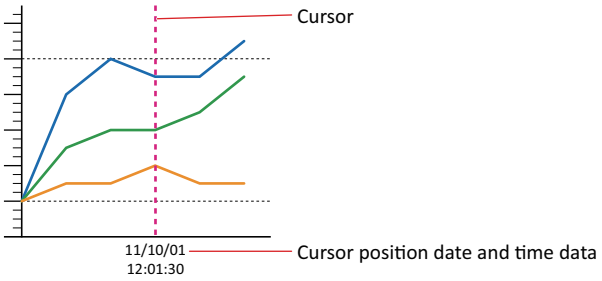
Font: Configures the format to display the date and time data.

- Font: Selects the font for displayed characters from the following.
  Standard, **Stroke**, **7-Segment**
  The characters that can be displayed depend on the font. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.
- Style: Selects the character style as **Regular** or **Bold**.
  This option can only be configured when **Standard** is selected for **Font**.
- Magnification W, H: Selects the zoom factor for characters (0.5, 1 to 4, 8).
  This option can only be configured when **Standard** is selected for **Font**.
- Size: Specifies the character size (8 to 128).
  This option can only be configured when **Stroke** or **7-Segment** is selected for **Font**.
- Color: Selects the text color (color: 256 colors, monochrome: 16 shades).
  Click this button to display the Color Palette. Select a color from the Color Palette.

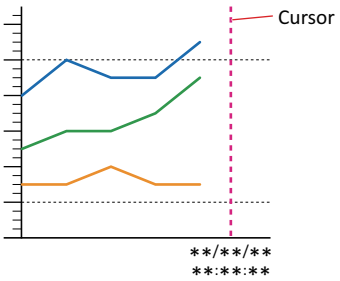
Display Type: Configures the display type for the date and time data.

- Display items: Selects the items to display for the date and time data from the following.
  Time, **Date**, **Date & Time**
  If **Date & Time** is selected, the date is displayed centered on the first line and the time is displayed centered on the second line.
- Date Type: Selects the display type of the date from the following.
  YY/MM/DD, **MM/DD/YY**, **DD/MM/YY**, **MM/DD**, **DD/MM**
  This option can only be configured when **Date** or **Date & Time** is selected for **Display items**.
- Year: Selects the display type for the year as **Double Figures** or **Four Figures**.
  This option can only be configured when **Date** or **Date & Time** is selected for **Display items**.
- Month: Selects the display type for the month as **1/2/3/...** or **Jan/Feb/Mar/...**.
  This option can only be configured when **Date** or **Date & Time** is selected for **Display items**.
- Time: Selects the display type for the time as **HH:MM** or **HH:MM:SS**.
  HH: hours, MM: minutes, SS: seconds

Example: When **Display items** is configured as **Date & Time**, **Date Type** is **YY/MM/DD**, **Month** is **1/2/3/...**, **Year** is **Double Figures**, **Time** is **HH:MM:SS**

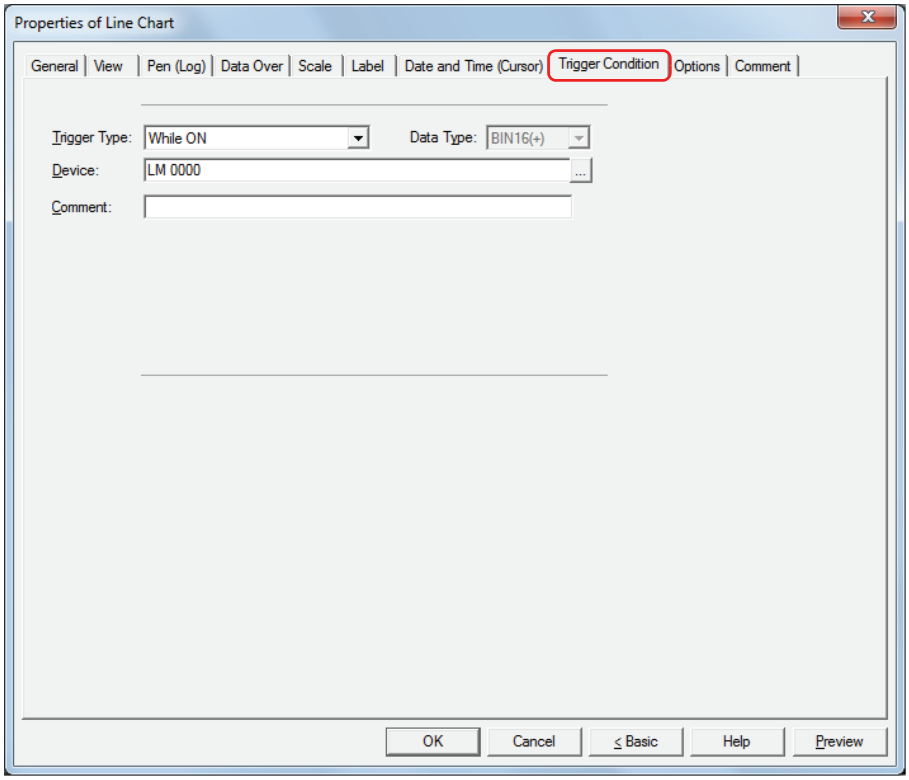


If there is no data at the cursor position, the date and time is displayed as "*".



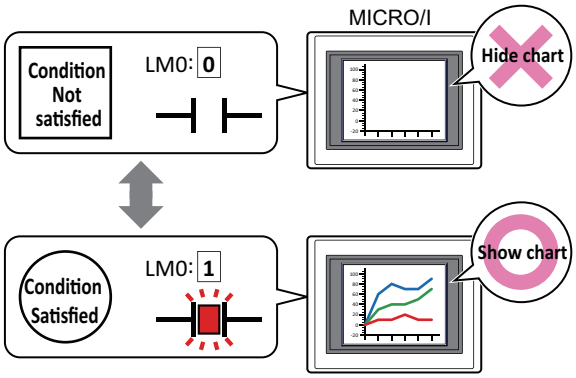
● Trigger Condition Tab

The **Trigger Condition** tab is displayed in Advanced mode.



The line chart is enabled while the condition is satisfied, and it is disabled while the condition is not satisfied. When disabled, the plate and flange are displayed, but the chart is not displayed.

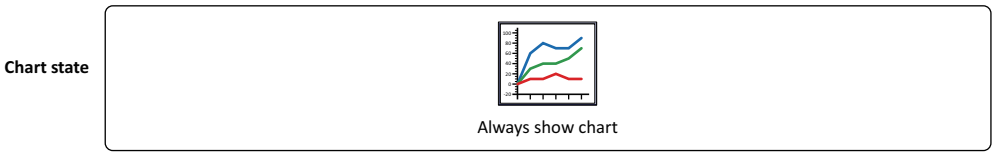
Example: When **Trigger Type** is **While ON** and **Device** is **LM 0**
While LM 0 is 0, the condition is not satisfied and the line chart is not displayed.
While LM 0 is 1, the condition is satisfied and the line chart is displayed.



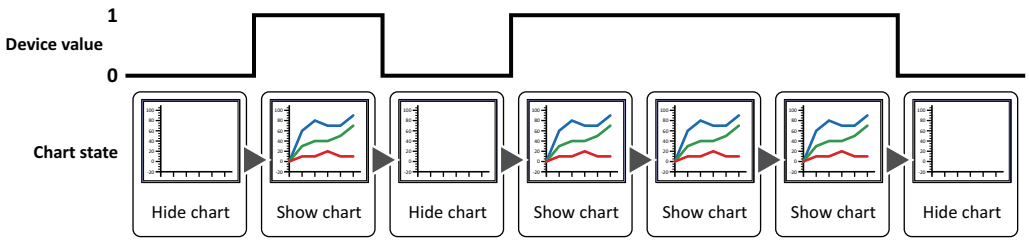
■ Trigger Type

Selects the condition to enable the line chart from the following.

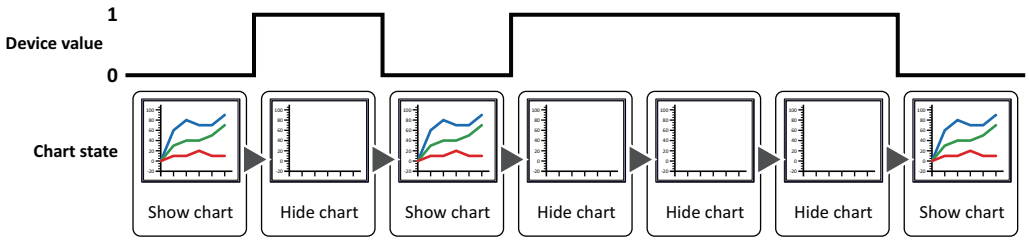
Always visible: The line chart is always enabled.



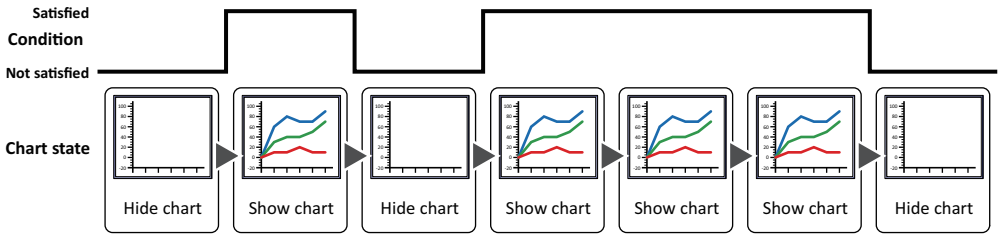
While ON: Enables the line chart when the device value is 1.



While OFF: Enables the line chart when the device value is 0.



While satisfying the condition: Enables the line chart when the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.
Can only be set if **While satisfying the condition** is selected as **Trigger Type**.
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

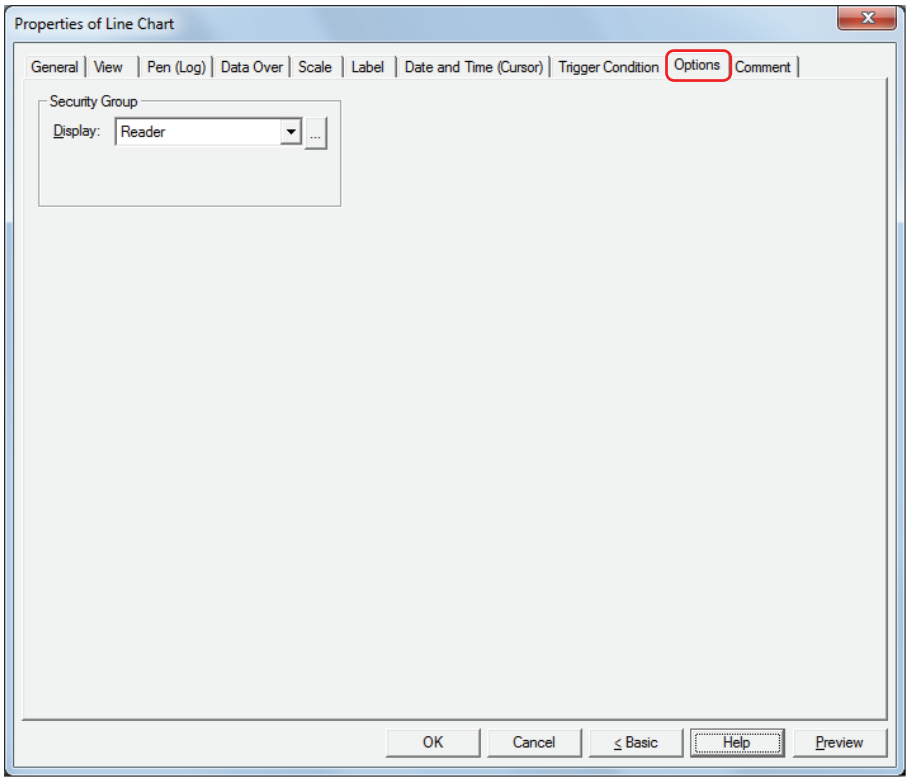
Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

■ **Comment**

Used for entering comments about trigger conditions. Maximum number is 80 characters.

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

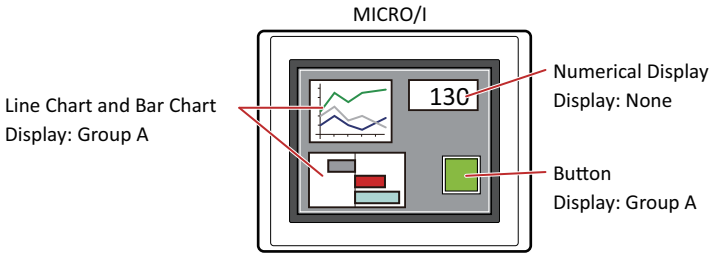
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

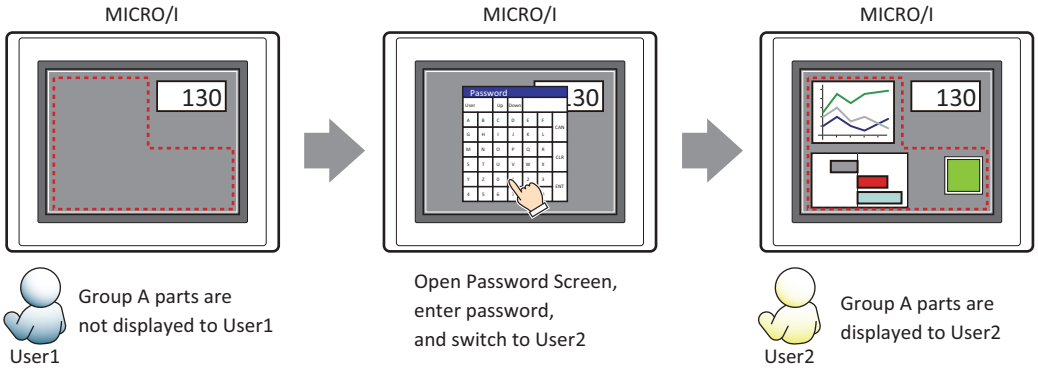
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



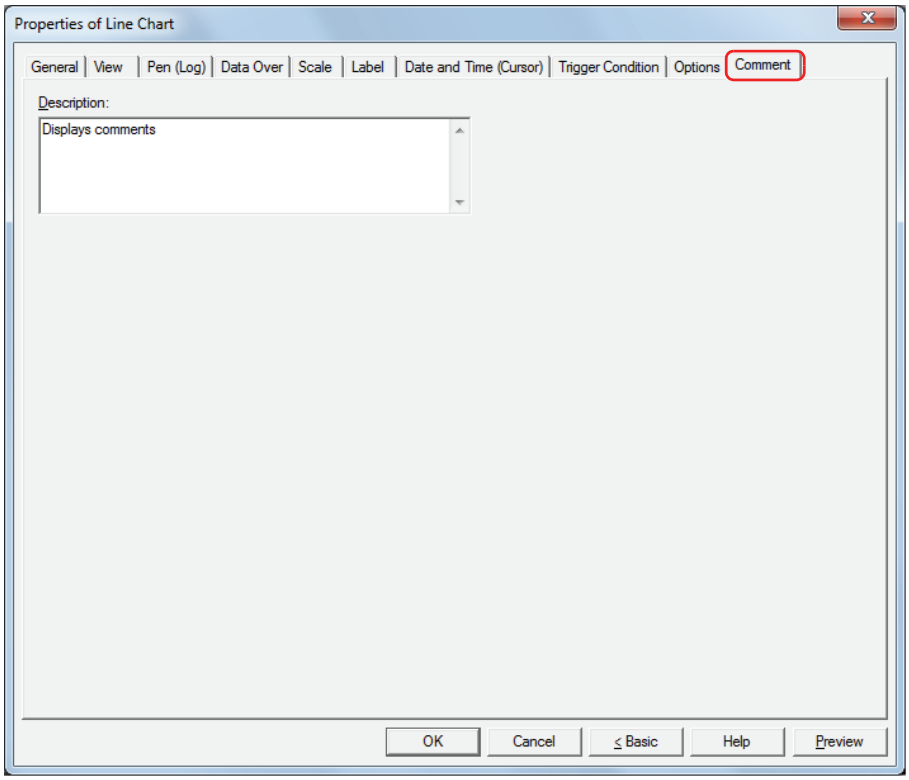
For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

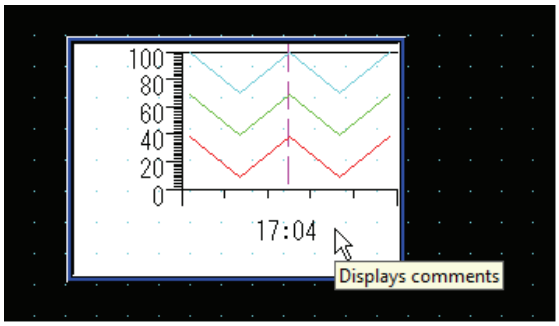
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ Description

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the line chart on the editing screen



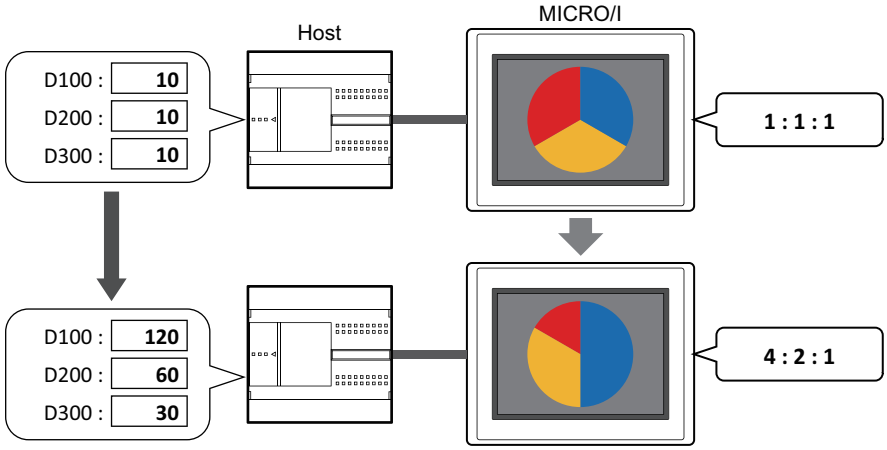
3 Pie Chart

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

3.1 How the Pie Chart is Used

The stacked bar chart and pie chart are used to show the proportion of individual data to the sum of the data. They can be used to check the relative change in multiple device values in real-time.

- Display the proportion of the sum of multiple device values in a stacked bar chart or a pie chart

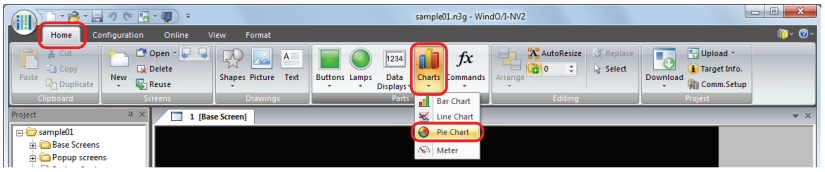


If the source data is all 0, the chart shows the same proportion for all the data.

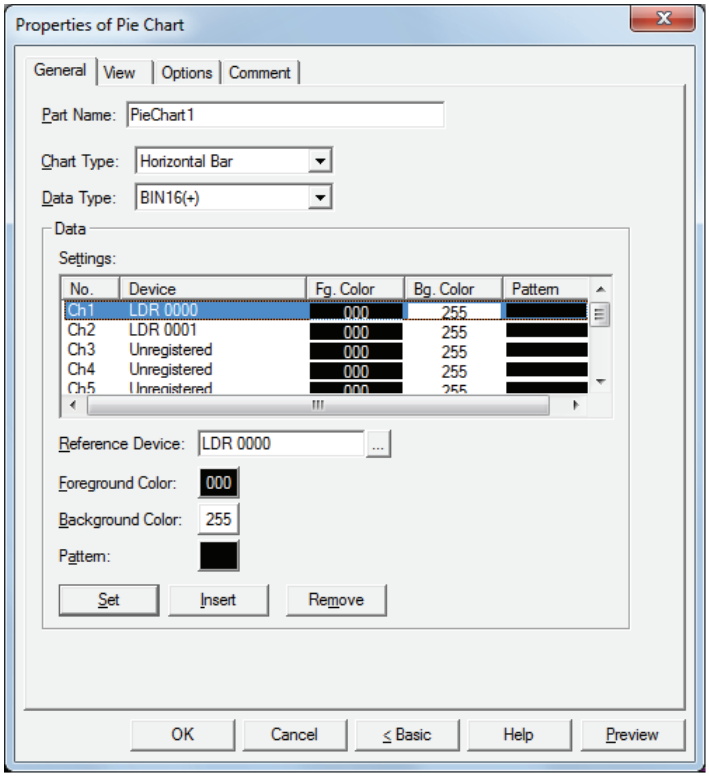
3.2 Pie Chart Configuration Procedure

This section describes the configuration procedure for pie charts.

1. On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Pie Chart**.



2. Click a point on the edit screen where you wish to place the Pie Chart.
3. Double-click the dropped Pie Chart and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.

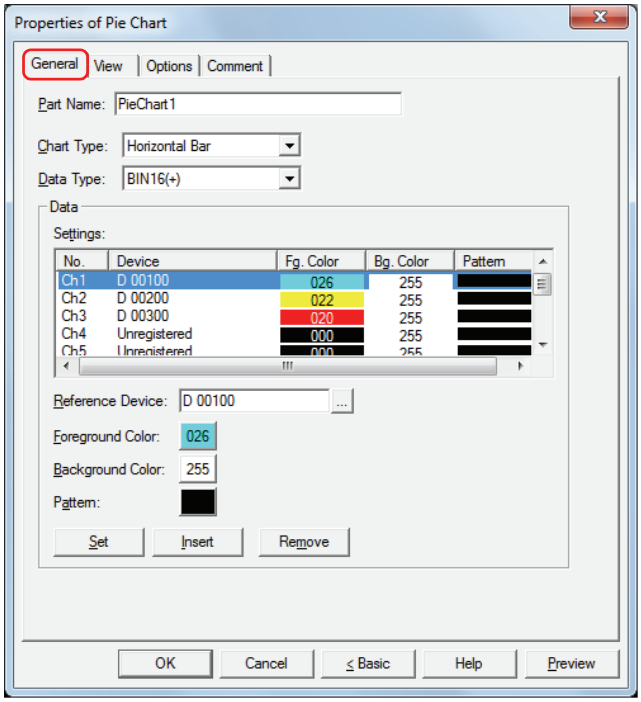


The **Options** tab only appears in Advanced mode.
To switch to Advanced mode, click **Advanced**.

3.3 Properties of Pie Chart Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

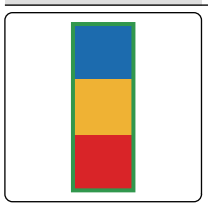
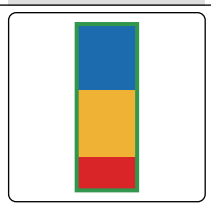
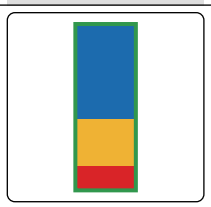
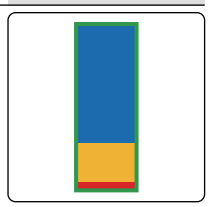
■ **Chart Type**

Select the type of chart from the following items.

Horizontal Bar: Shows the proportion of the sum of the data as a horizontal stacked bar chart.
Example: When displaying the values for three devices

Ch1 data	0	100	120	150
Ch2 data	0	100	60	50
Ch3 data	0	50	30	10
Horizontal bar display				
Proportion	1 : 1 : 1	2 : 2 : 1	4 : 2 : 1	15 : 5 : 1

Vertical Bar: Shows the proportion of the sum of the data as a vertical stacked bar chart.
Example: When displaying the values for three devices

Ch1 data	0	100	120	150
Ch2 data	0	100	60	50
Ch3 data	0	50	30	10
Vertical bar display				
Proportion	1 : 1 : 1	2 : 2 : 1	4 : 2 : 1	15 : 5 : 1

Pie: Shows the proportion of the sum of the data as a pie chart.
Example: When displaying the values for three devices

Ch1 data	0	100	120	300
Ch2 data	0	100	60	50
Ch3 data	0	50	30	10
Pie chart display				
Proportion	1 : 1 : 1	2 : 2 : 1	4 : 2 : 1	30 : 5 : 1

Data Type

Selects the data type handled by the chart from the following.

"BIN16(+)", "BIN32(+)", "BCD4", "BCD8", "float32[*1]"

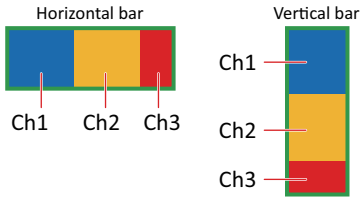
For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When the **BCD4**, **BCD8**, or **float32** is selected as **Data Type** and the value cannot be expressed with the data type selected for the data that was read, 1 is written to System Area 2 Arithmetic Error bit (address+2, bit 5), and an error message is displayed. For details, refer to Chapter 4 "Arithmetic error" on page 4-34.

Settings

Lists the chart settings. The list shows the numbers, source devices, and colors for the chart.

No.: Shows the numbers for the chart (Ch1 to Ch10).
For **Horizontal Bar**, the numbers are listed in order from the left. For **Vertical Bar**, the numbers are listed in order from the top.



For **Pie**, the numbers are listed clockwise.

Device: Shows the source device.

Fg. Color: Shows the foreground color of the chart.

Bg. Color: Shows the background color of the chart.

Pattern: Shows the chart pattern.

Reference Device

Specifies the source word device for the data to display in the chart.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only

- **Foreground Color**
  Selects the foreground color for the chart (color: 256 colors, monochrome: 16 shades).
  Click this button to display the Color Palette. Select a color from the Color Palette.

- **Background Color**
  Selects the background color for the chart (color: 256 colors, monochrome: 16 shades).
  Click this button to display the Color Palette. Select a color from the Color Palette.

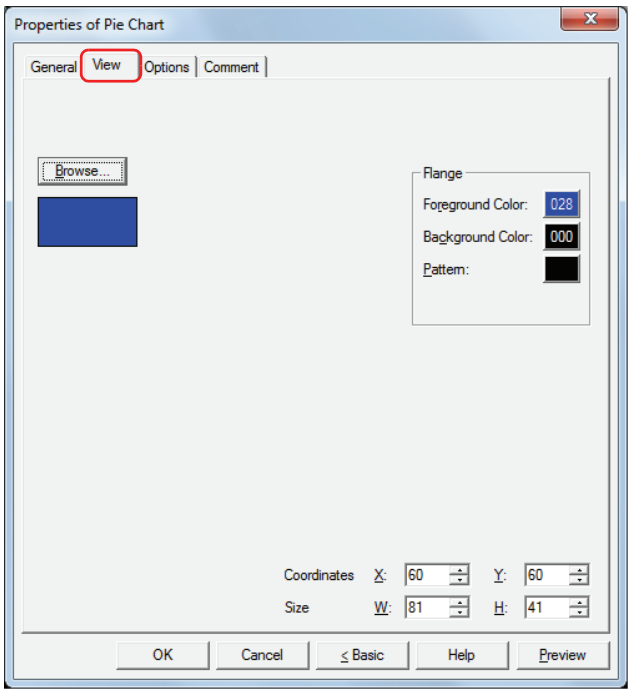
- **Pattern**
  Selects the chart pattern.
  Click this button to display the Pattern Palette. Select a pattern from the Pattern Palette.

- **Set**
  Registers the chart settings to the list. If you select a Ch number that is already registered, that number is overwritten with the new settings.
  Select a Ch number on the list and click this button to register the **Reference Device**, **Foreground Color**, **Background Color**, and **Pattern** settings.

- **Insert**
  Inserts the chart settings in the position selected on the list.
  Select a Ch number on the list and click this button to insert the **Reference Device**, **Foreground Color**, **Background Color**, and **Pattern** settings. The settings at the insertion point shift down one line. Settings cannot be inserted if all Ch numbers are configured.

- **Remove**
  Deletes the registered settings from the list.
  Select a Ch number and click this button to delete the selected settings from the list.

● View Tab



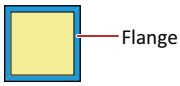
■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser.

■ Flange

Foreground Color, Background Color: Selects the foreground and background colors of the flange (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange.
Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.

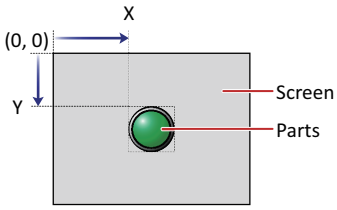


■ Coordinates

X, Y: Sets the display position of parts using coordinates.
The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

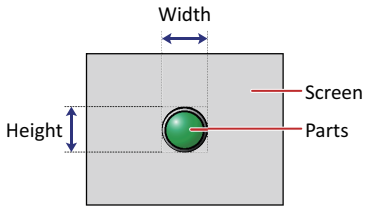


■ Size

W, H: Sets width and height to define the size of parts.

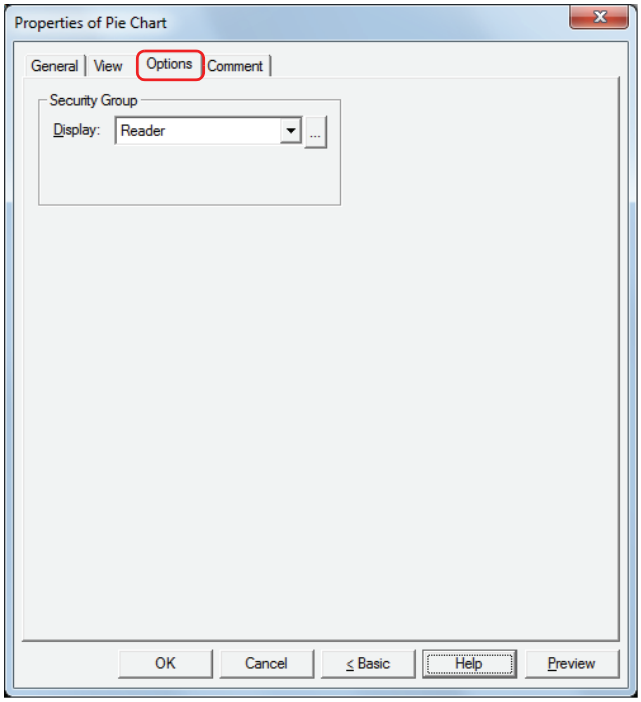
W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

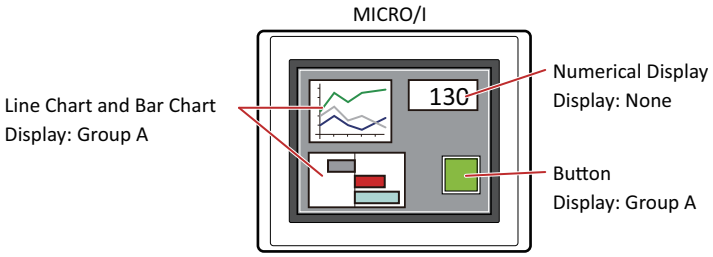
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

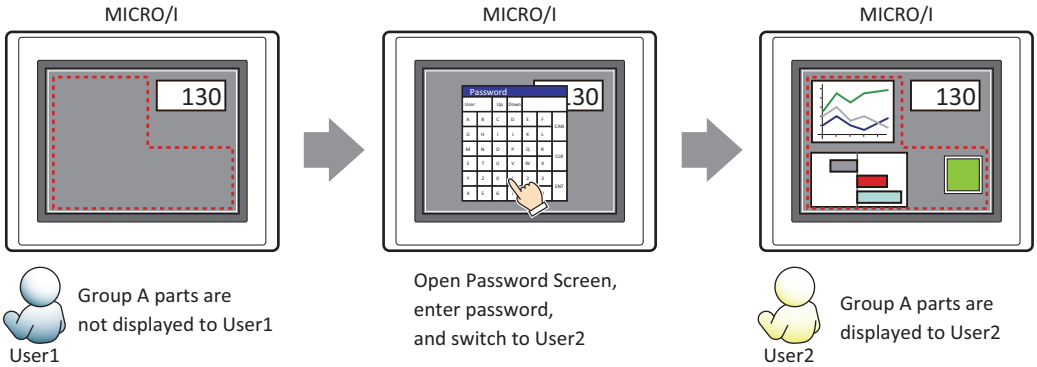
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



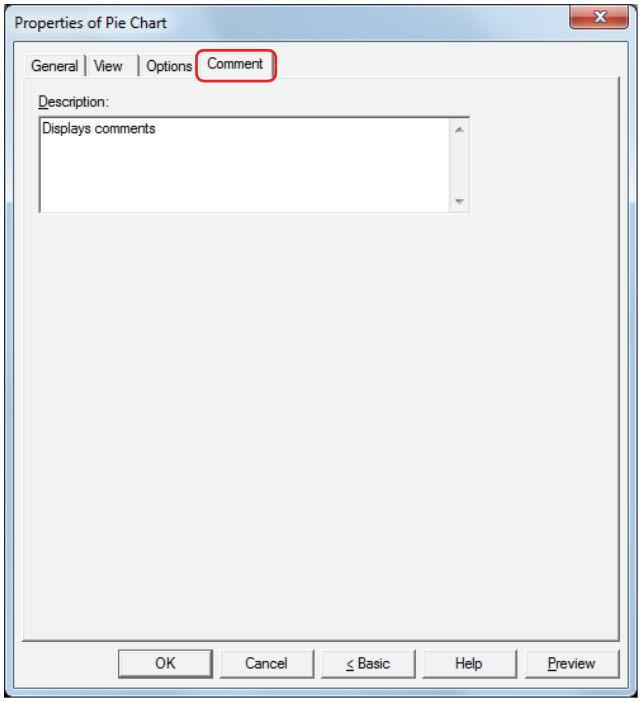
For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

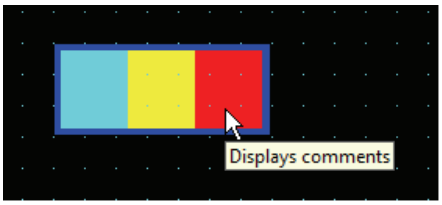
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the pie chart on the editing screen



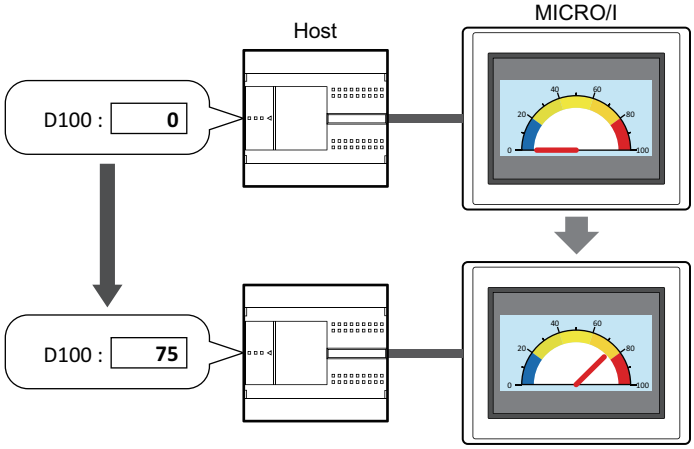
4 Meter

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 How the Meter is Used

The meter displays the value of a word device as the movement of a needle.

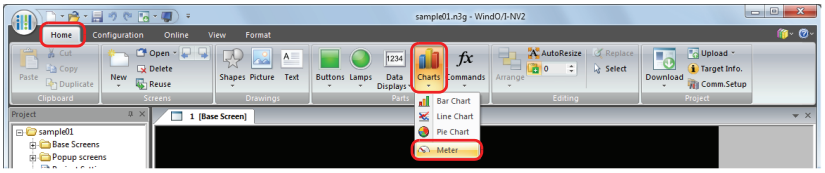
- Display the value of a word device in a meter



4.2 Meter Configuration Procedure

This section describes the configuration procedure for meters.

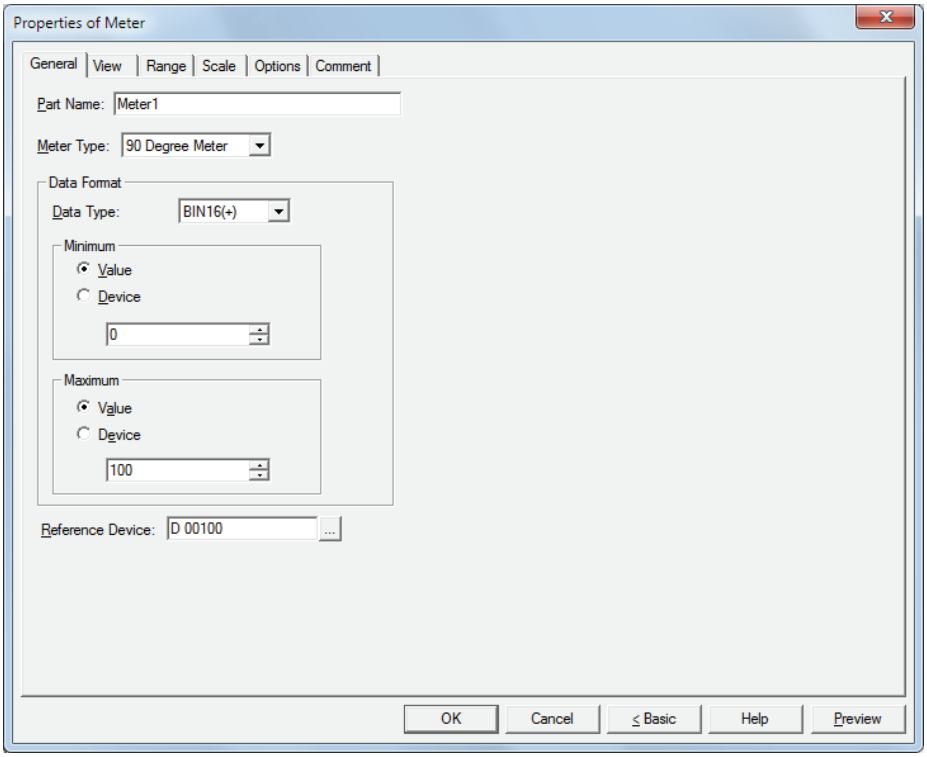
1 On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Meter**.



2 Click a point on the edit screen where you wish to place the Meter.

3 Double-click the dropped Meter and a Properties dialog box will be displayed.

4 Change the settings on each tab as necessary.

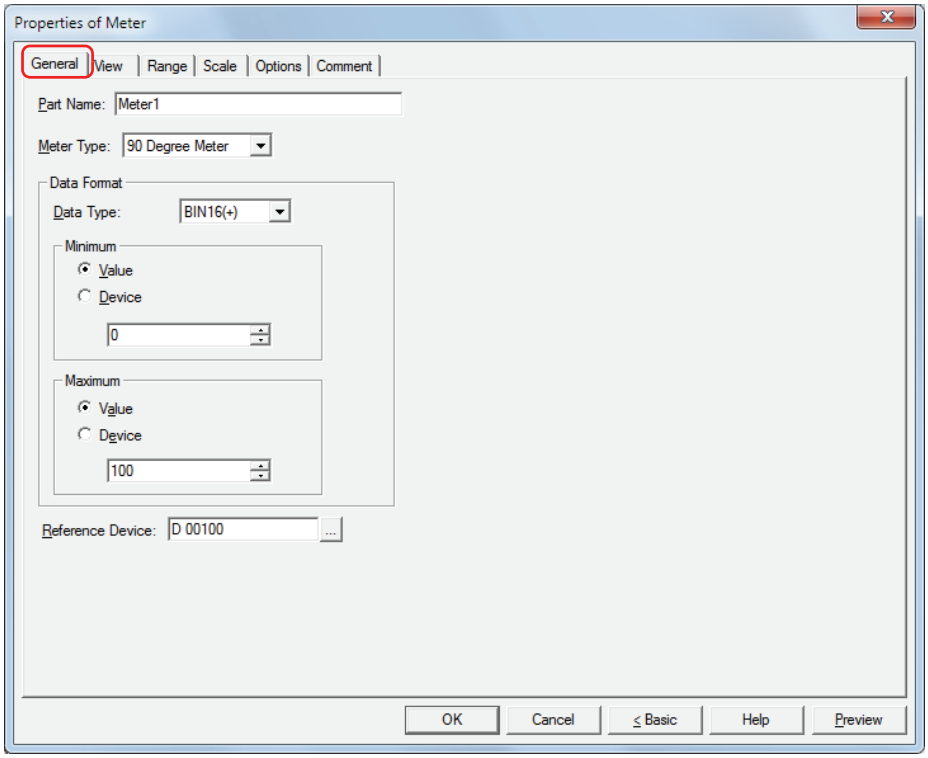


The **Range** tab, **Scale** tab and **Options** tab only appear in Advanced mode.
To switch to Advanced mode, click **Advanced**.

4.3 Properties of Meter Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



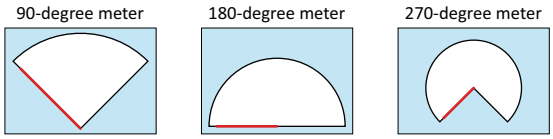
■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

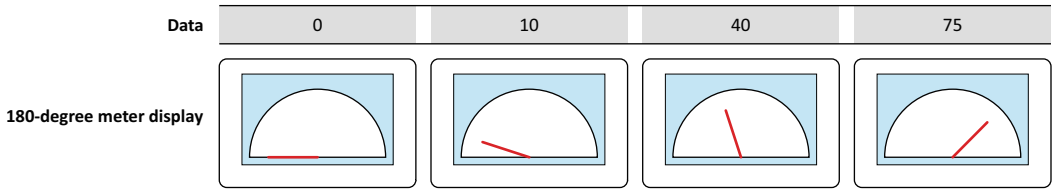
■ **Meter Type**

Select the type of meter from the following items.

90 Degree Meter, 180 Degree Meter, 270 Degree Meter



Example: **180 Degree Meter**



Data Format

Data Type: Selects the data type handled by the meter from the following.

"BIN16(+)", "BIN16(+/-)", "BIN32(+)", "BIN32(+/-)", "BCD4", "BCD8", "float32*1"

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Minimum, Maximum: Specifies the minimum and maximum for the data.

(Data Type)*2: Selects the data type to use for the minimum and the maximum.

Value: Uses a constant.

Device: Uses a word device.

The minimum and maximum vary based on the selected data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

The needle does not move past the left edge when the data value is the minimum or lower.

The needle stops at the right edge when the data value is the maximum or higher.

When **Device** is selected for (Data Type)*2, the minimum and maximum can be specified in the word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

If the data displayed in the meter is invalid, 1 is written to System Area 2 Arithmetic error bit (address +2, bit 5), and an error message is displayed. For details, refer to Chapter 4 " Arithmetic error" on page 4-34.
An error occurs in the following states:

- The minimum is the same as or larger than the maximum
- When the minimum and maximum are not consistent with the range
- The **Data Type** is **BCD4**, **BCD8**, or **float32** and the value cannot be expressed with the data type selected for the read data

If an error occurs, only the flange is initially displayed. Then once the meter is displayed, it doesn't show an update.

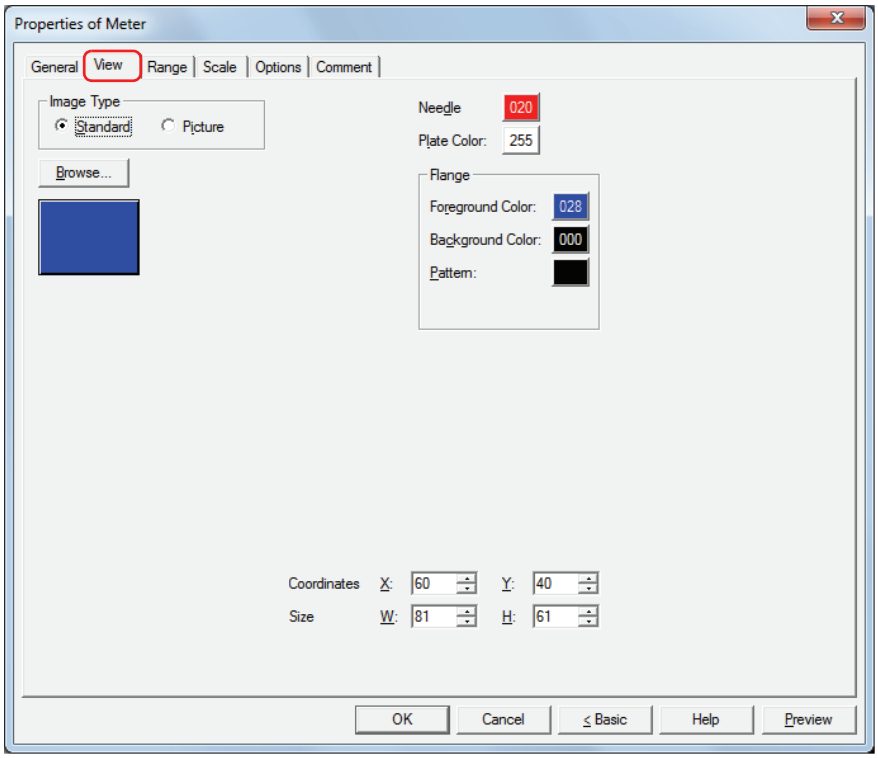
Reference Device

Specifies the source word device for the data to display in the meter.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only
*2 HG2G-S/-5S/-5F, HG3G/4G only

● View Tab



■ Image Type

Select the type of graphic to be used to represent the part.

Standard: Uses the default graphic for WindO/I-NV2.

Picture*1: Uses an image file saved using Picture Manager.
For details about image file restrictions, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.

■ Browse

Select the type of graphic to be used to represent the part from the list of graphics. Click this button to display the View Browser or Picture Manager, depending on the setting for **Image Type**.

■ Needle Color

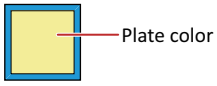
Selects the needle color of the Meter (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

■ Plate Color

Selects the plate color of the standard graphic (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.



*1 HG2G-5F, HG3G/4G only

Flange

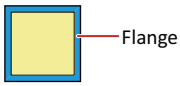
Foreground Color, Background Color:

Selects the foreground and background colors of the flange of the standard graphic (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

Pattern: Selects a pattern for the flange of the standard graphic.

Click **Pattern** to display the Pattern Palette. Select a pattern from the Pattern Palette.



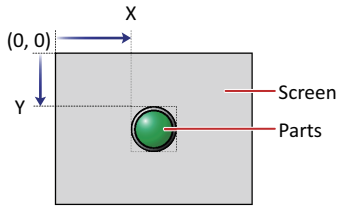
Coordinates

X, Y: Sets the display position of parts using coordinates.

The X and Y coordinates of parts are defined relative to an origin at the top-left corner of the screen.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

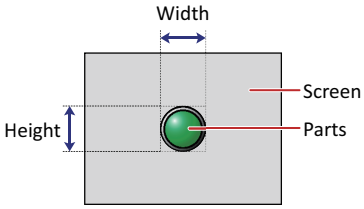


Size

W, H: Sets width and height to define the size of parts.

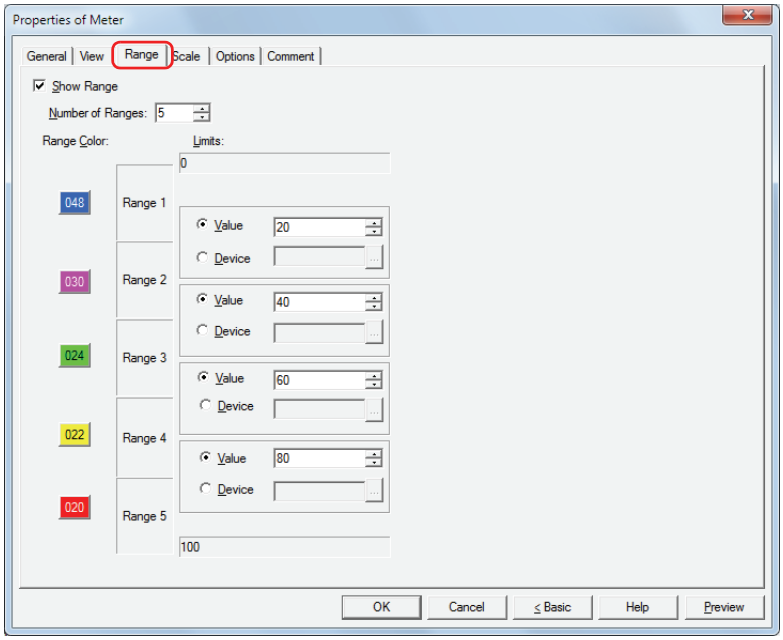
W: 5 to (base screen horizontal size)

H: 5 to (base screen vertical size)



● **Range** Tab

The **Range** tab is only displayed in Advanced mode.



■ **Show Range**

Select this check box to show ranges on the meter and configure the number of ranges, range colors, and limits.

Ranges can only be configured when **Standard** is selected under **Image Type** on the **View** tab.

Number of Ranges: Specifies the number of ranges (1 to 5).

Range Color: Selects the range color (color: 256 colors, monochrome: 16 shades).
Click this button to display the Color Palette. Select a color from the Color Palette.

Limits: Specifies the limit for the range.

(Data Type)*1: Selects the data type to use for the limit.
Value: Uses a constant.
Device: Uses a word device.

The limit varies based on the data type selected with **Data Format** on the **General** tab. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

When Device is selected for (Data Type)*1, the minimum and maximum can be specified in the word device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

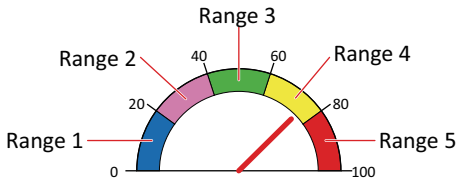
If the data displayed in the meter is invalid, 1 is written to System Area 2 Arithmetic error bit (address +2, bit 5), and an error message is displayed. For details, refer to Chapter 4 " Arithmetic error" on page 4-34.
An error occurs in the following states:

- The minimum is the same as or larger than the maximum
- When the minimum and maximum are not consistent with the range
- The **Data Type** is **BCD4**, **BCD8**, or **float32** and the value cannot be expressed with the data type selected for the read data

If an error occurs, only the flange is initially displayed. Then once the meter is displayed, it doesn't show an update.

Example: 180-degree meter, data minimum is 0, maximum is 100, the number of ranges is set to 5

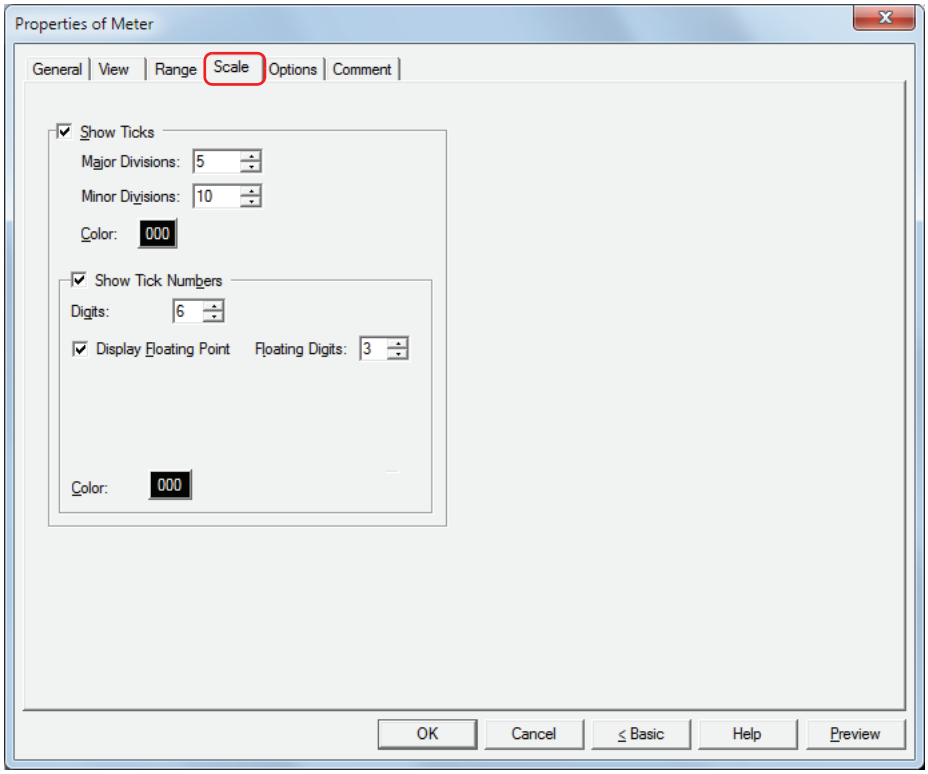
The limit between range 1 and 2: 20
The limit between range 2 and 3: 40
The limit between range 3 and 4: 60
The limit between range 4 and 5: 80



*1 HG2G-5F, HG3G/4G only

● **Scale** Tab

The **Scale** tab is displayed in Advanced mode.



■ **Show Ticks**

Select this check box to display a scale on a or meter.

Scales can only be set when **Standard** is selected for **Image Type** under the **View** tab.

Major Divisions: Enter the number of major scale divisions (1 to 20).

Minor Divisions: Enter the number of minor scale divisions (1 to 20).

Color: Selects the color of scales (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

Show Tick Numbers: Select this check box to display numbers along the scale.

Digits*1: Sets the number of digits to be displayed (1 to 10).
Can only be set when **float32** is selected for **Data Type** under the **General** tab.

Display Floating Point*1: Select this check box to display a floating point along the scale.
Can only be set when **float32** is selected for **Data Type** under the **General** tab.

Floating Digits*1: Sets the number of digits for the fractional parts of numbers (1 to 8) from the number of digits specified for **Digits**.
Can only be set when the **Display Floating Point** check box is selected.

Color*1: Selects the color of displayed text (color: 256 colors, monochrome: 16 shades).
Click **Color** to display the Color Palette. Select a color from the Color Palette.

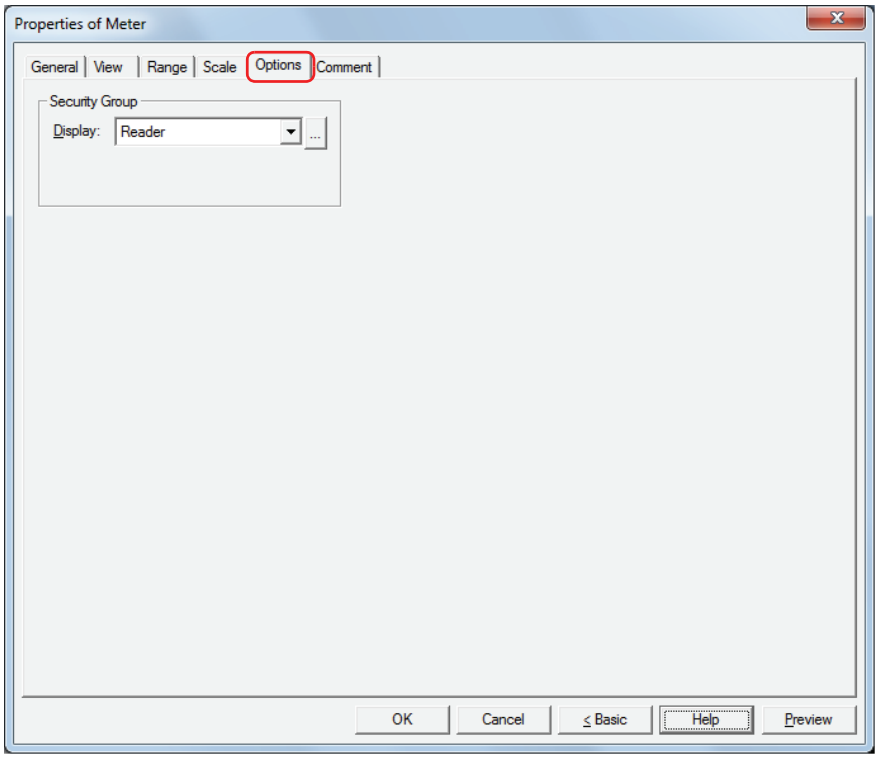
For the HG2G-S/-5S, HG1F/2F/2S/3F/4F, the numbers and scales will be the same color.

If the area for displaying the scale is small, the scale will not be displayed properly.

*1 HG2G-5F, HG3G/4G only

● **Options** Tab

The **Options** tab is displayed in Advanced mode.



■ **Security Group**

Security groups are a security function for restricting the display and operation of parts.

Display: Selects the security group for which display of parts is restricted. (Default: None)

None: No security function is used.

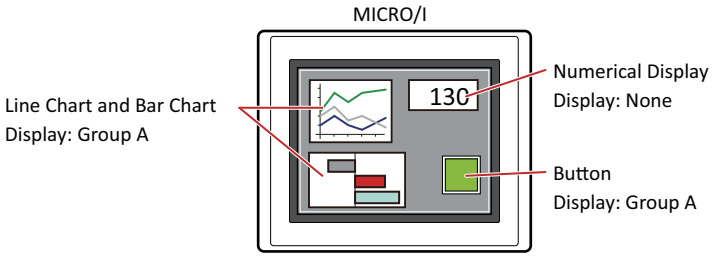
Administrator, Operator, Reader: Three security groups are set up by default.

Click ... to display the **Security Group Settings** dialog box. If you create a security group on the **Security Group Settings** dialog box, you can select that created group. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

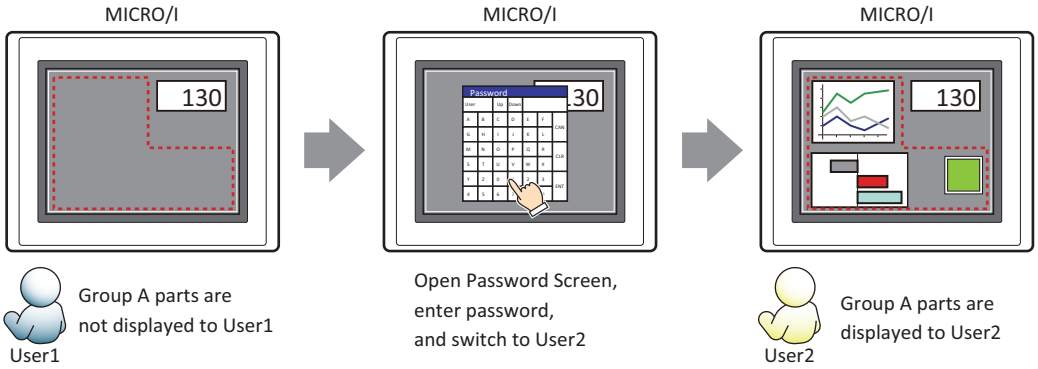
For details about security functions, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

Example: If the user and security group for a part are set as follows:

User Name	User1	User2
Security Group	None	Group A



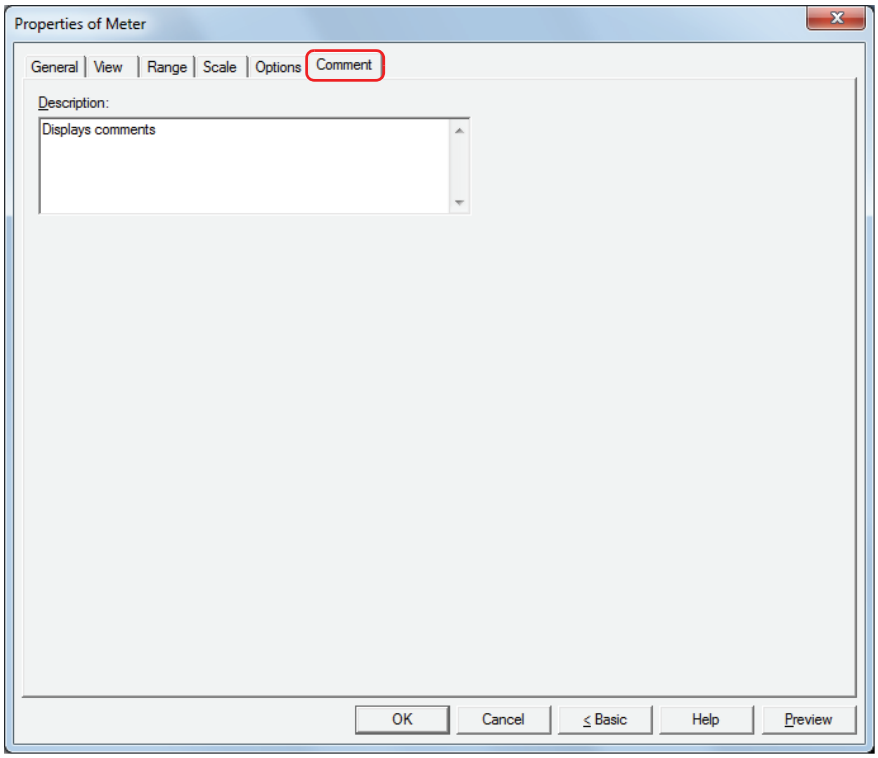
For User1, who is not included in the specified security group, Group A parts are not displayed.
If the Password Screen is now opened and User2 logs in, Group A parts are displayed.



● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

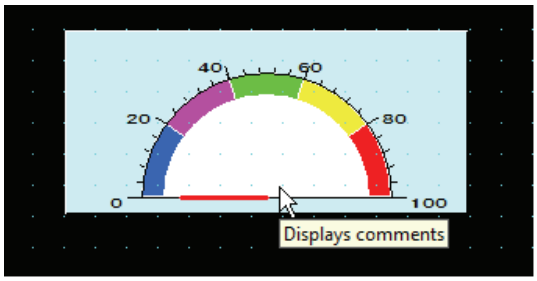
When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. Maximum number is 80 characters.

Example: When mousing over the meter on the editing screen



Chapter 12 Commands

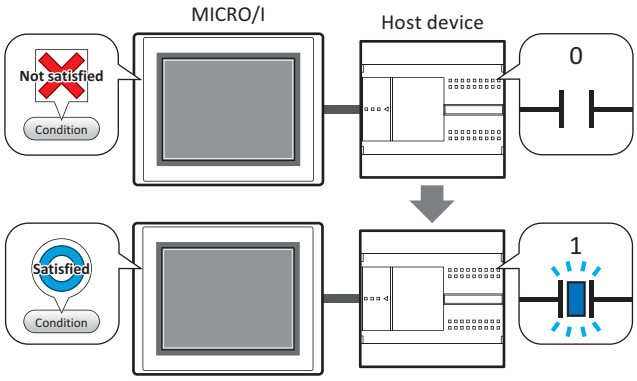
This chapter describes how to setup commands and their operation on the MICRO/I.

1 Bit Write Command

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

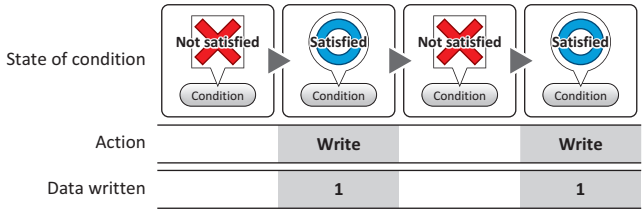
1.1 How the Bit Write Command is Used

Writes a 0 or 1 to a bit device.



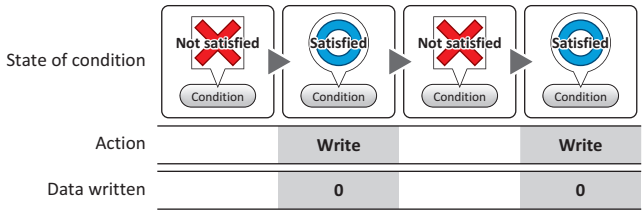
■ **Set**

Writes a 1 to the specified bit device when the trigger condition is satisfied.



■ **Reset**

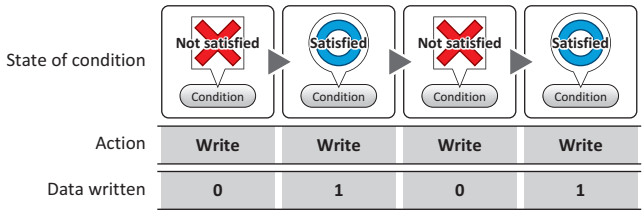
Writes a 0 to the specified bit device when the trigger condition is satisfied.



■ **Momentary**

Writes a 1 to the specified bit device when the trigger condition is satisfied.

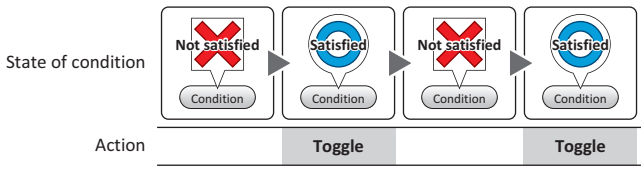
When the trigger condition is no longer satisfied, a 0 is written to the specified bit device.



Toggle

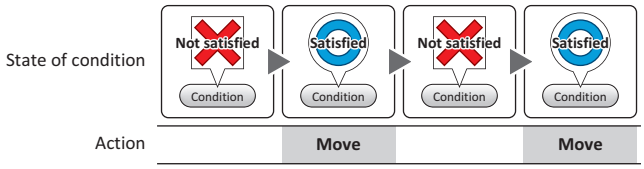
Toggles the value of the specified bit device when the trigger condition is satisfied.

If the value of the bit device is 0 it changes to 1, and vice versa.



Move

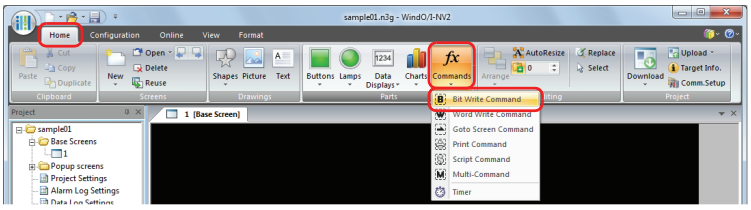
This function writes the value in the source bit device to the value in the destination bit device when the trigger condition is satisfied.



1.2 Bit Write Command Configuration Procedure

This section describes the configuration procedure for the Bit Write Command.

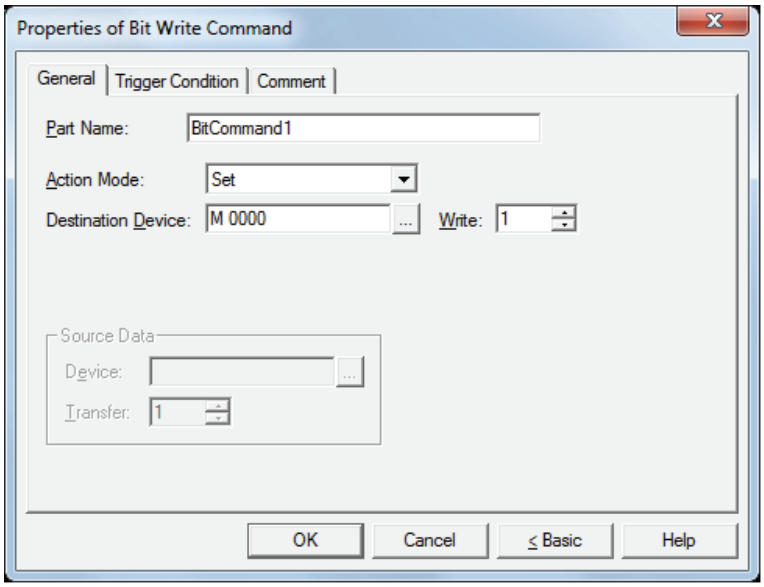
1 On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Bit Write Command**.



2 Click a point on the edit screen where you wish to place the Bit Write Command.

3 Double-click the dropped Bit Write Command and a Properties dialog box will be displayed.

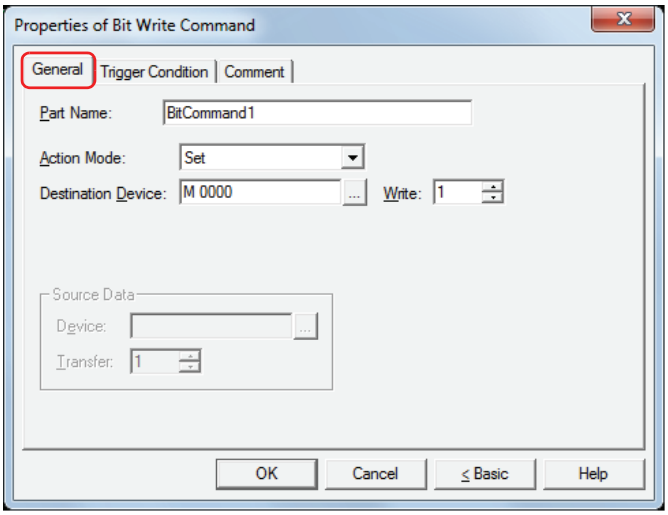
4 Change the settings on each tab as necessary.



1.3 Properties of Bit Write Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



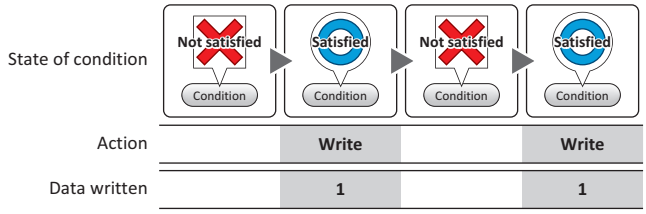
■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

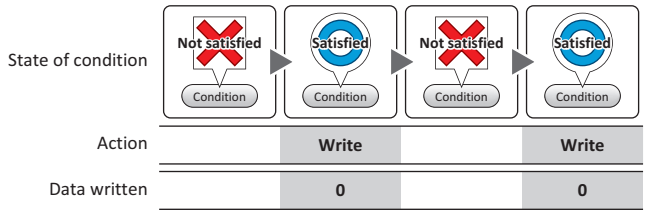
■ **Action Mode**

Select the action to perform when the trigger condition is satisfied from the following:

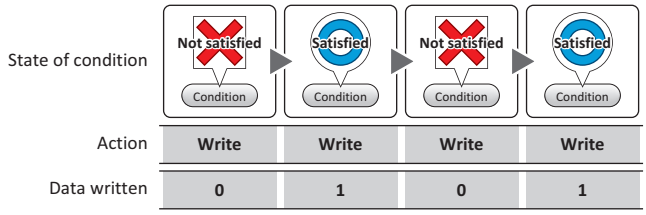
Set: Writes a 1 to the specified bit device when the trigger condition is satisfied.



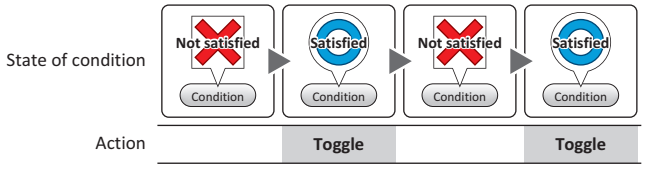
Reset: Writes a 0 to the specified bit device when the trigger condition is satisfied.



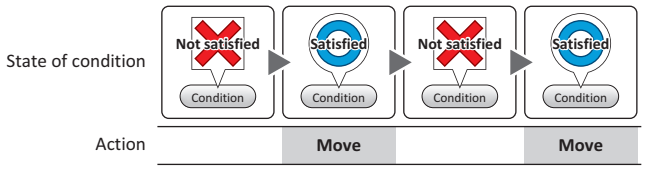
Momentary: Writes a 1 to the specified bit device when the trigger condition is satisfied.
When the trigger condition is no longer satisfied, a 0 is written to the specified bit device.



Toggle: Toggles the value of the specified bit device when the trigger condition is satisfied.
If the value of the bit device is 0 it changes to 1, and vice versa.



Move: This function writes the value in the source bit device to the value in the destination bit device when the trigger condition is satisfied.



■ Destination Device

Specify the destination bit device.

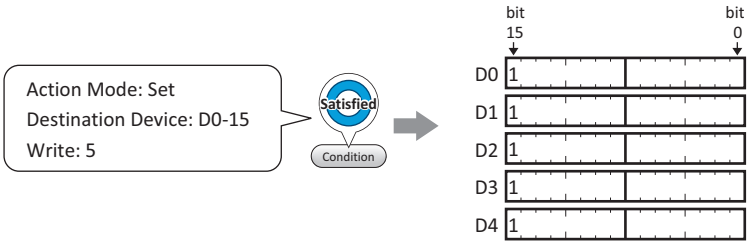
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Write*1

Specify the number of bit devices (1 to 64) at the destination.
This setting is enabled only if **Action Mode** is set to **Set** or **Reset**.

Example: This fills a contiguous block of bit devices with the same value.

If the bit in a word device is specified, the same value is written to same bit of contiguous word devices.



■ Source Data

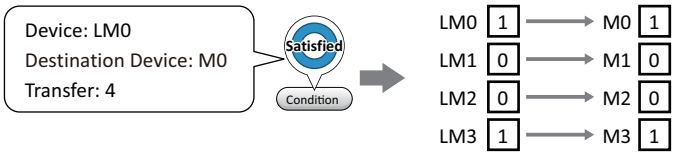
Specifies the device where the data to be written is stored.
This setting is enabled only if **Action Mode** is set to **Move**.

Device: Specify the source bit device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

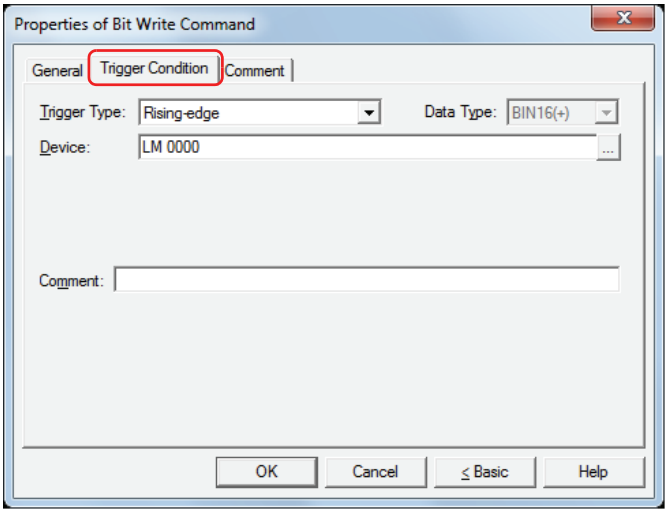
Transfer: Specify the number of bit devices (1 to 64) to move.

Example: This button writes the values in a contiguous block of bit devices to a contiguous block of devices at the destination.



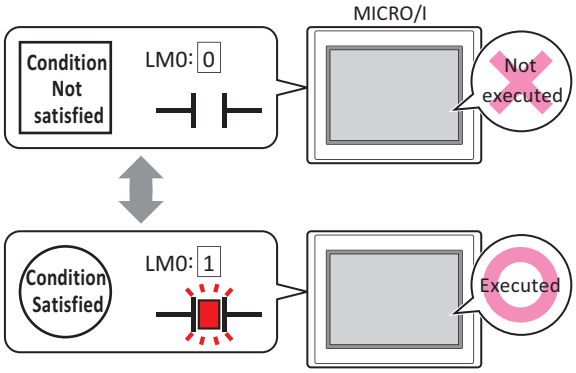
*1 Advanced mode only

● **Trigger Condition** Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

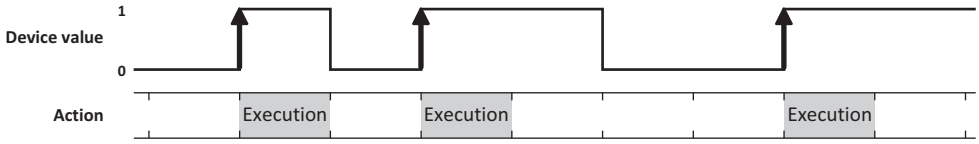
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



■ **Trigger Type**

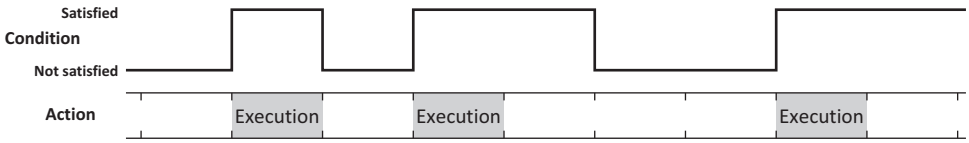
Selects the condition to execute the command from the following.

Rising-edge: Command is executed when device changes from 0 to 1.



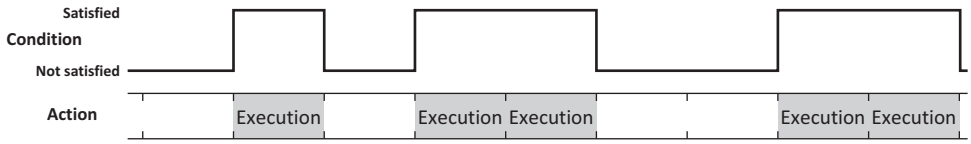
Falling-edge: Command is executed when device changes from 1 to 0.

Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.



While satisfying the condition:

The command continues being executed while the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

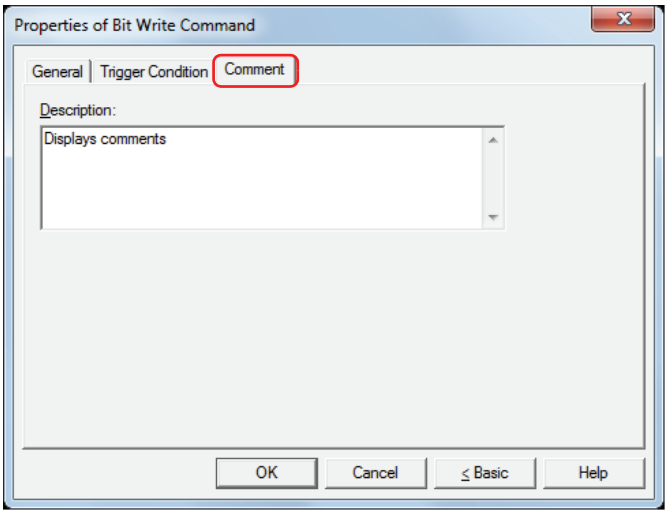
■ **Comment**

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Bit Write Command on the editing screen

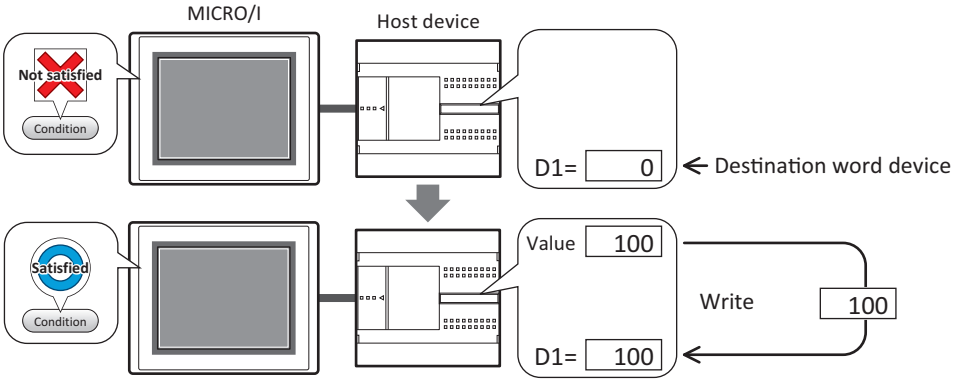
2 Word Write Command

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

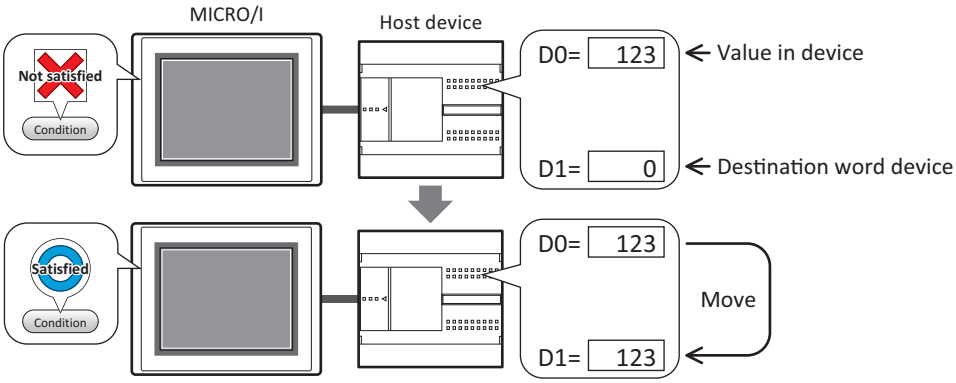
2.1 How the Word Write Command is Used

Writes a value to a word device. Can be used to indirectly specify the destination address or to perform operations on the written value.

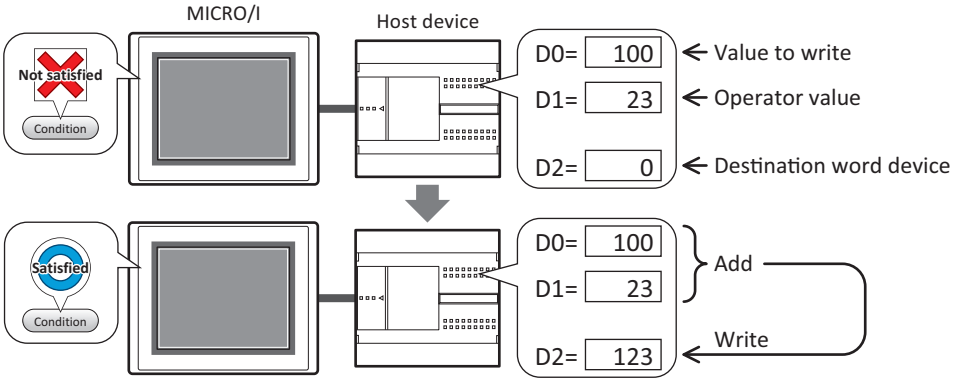
- Writes a fixed value to a word device when the trigger condition is satisfied.



- Writes the value of device to a word device when the trigger condition is satisfied.

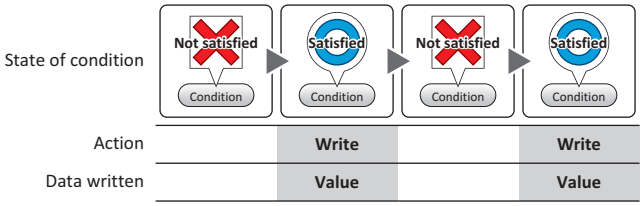


- Performs arithmetic on the value to write before writing it to a word device when the trigger condition is satisfied.



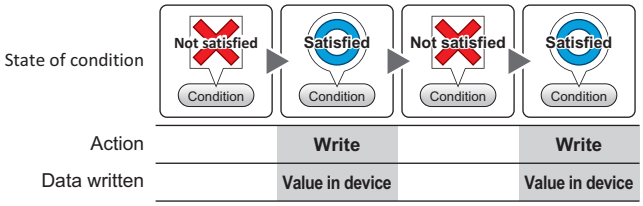
Set

Writes a fixed value to a word device when the trigger condition is satisfied.



Move

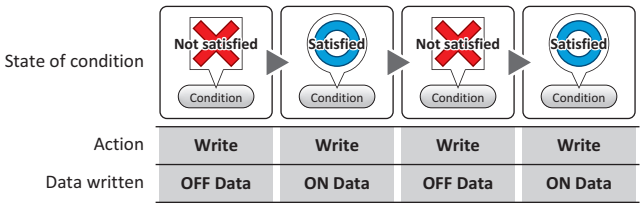
Writes the value of source device to the destination word device when the trigger condition is satisfied.



Momentary

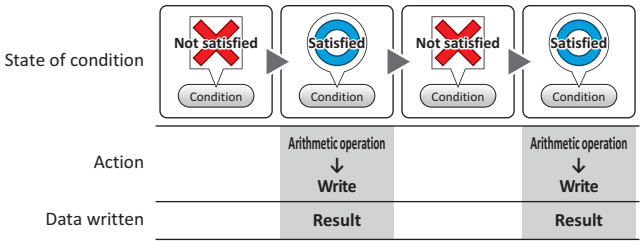
Writes a fixed value of ON Data to a word device when the trigger condition is satisfied.

Writes a fixed value of OFF Data to a word device when the trigger condition is no longer satisfied.



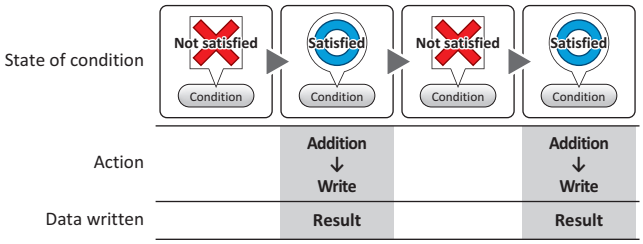
Add, Sub, Multi, Div, Mod, OR, AND, XOR

Performs arithmetic on the value of source device and a fixed value, or a value of device and writes the result to a word device when the trigger condition is satisfied.



Example: Add (Addition)

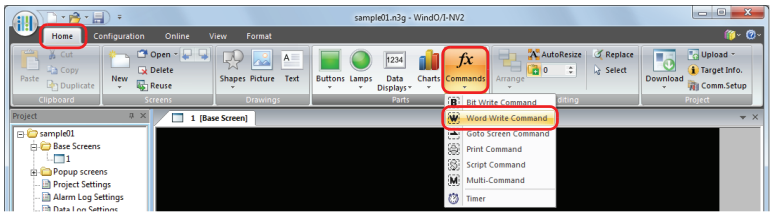
When the trigger condition is satisfied, the value in the **Source 1** is added to the value in **Source 2** and the result is written to the word device.



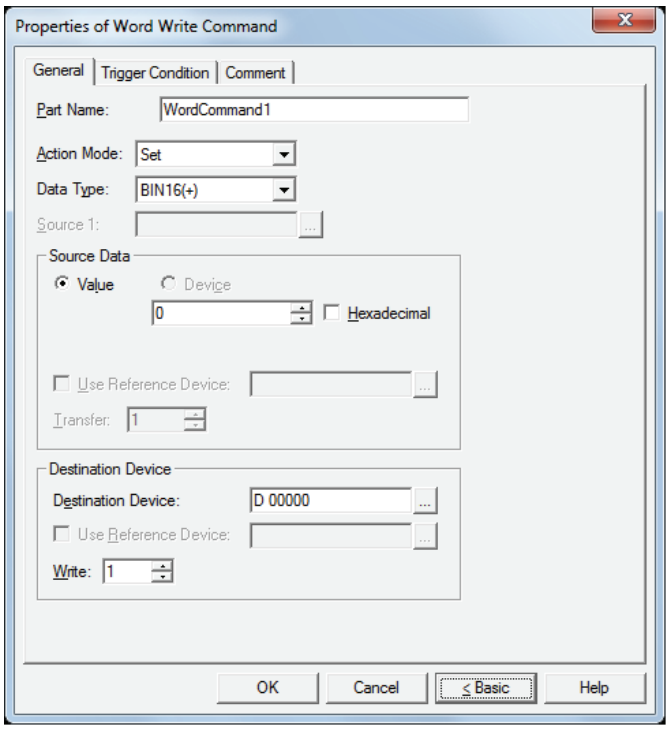
2.2 Word Write Command Configuration Procedure

This section describes the configuration procedure for the Word Write Command.

1. On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Word Write Command**.



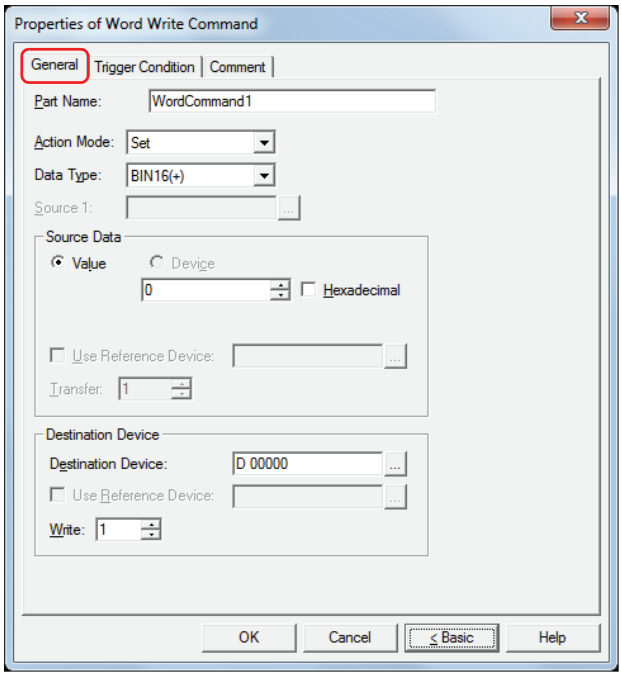
2. Click a point on the edit screen where you wish to place the Word Write Command.
3. Double-click the dropped Word Write Command and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.



2.3 Properties of Word Write Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



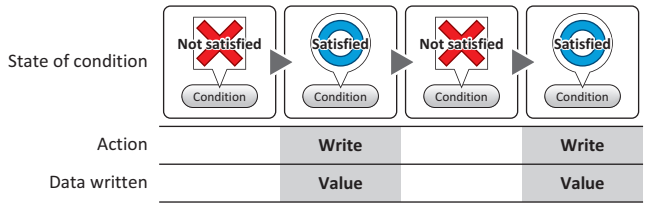
■ Part Name

Enter a name for the part. The maximum number is 20 characters.

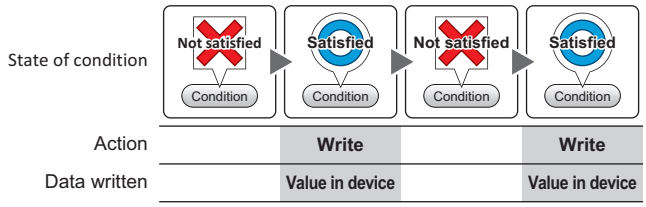
■ Action Mode

Select the action to perform when the trigger condition is satisfied from the following:

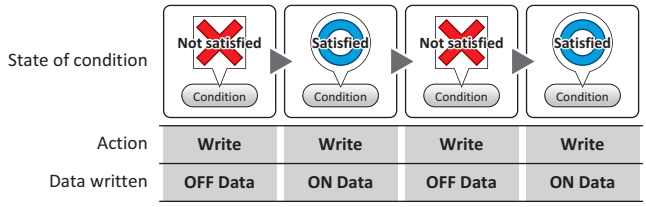
Set: Writes a fixed value to the specified word device when the trigger condition is satisfied.



Move: Writes the value in the source device to the destition word device when the trigger condition is satisfied.

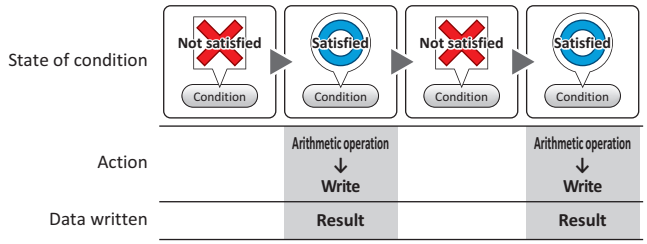


Momentary: Writes the fixed ON Data value to the specified word device when the trigger condition is satisfied. Writes the fixed OFF Data value to the specified word device when the trigger condition is no longer satisfied.

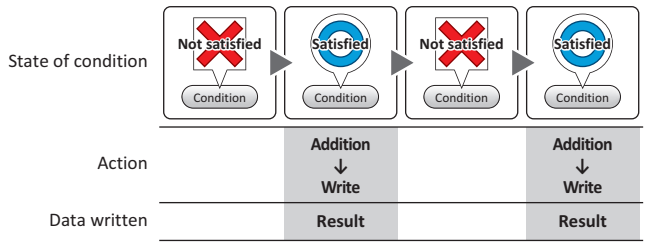


Add, Sub, Multi, Div, Mod, OR, AND, XOR:

Performs arithmetic on the value in a reference device and a fixed value, or the value at a device address and writes the result to a word device when the trigger condition is satisfied.



Example: Add (Addition)
When the trigger condition is satisfied, the value in the **Source 1** is added to the value in **Source 2** and the result is written to the word device.



Data Type

Select the data type handled by the operation selected for **Action Mode**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **OR**, **AND**, or **XOR**.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **Move**. Because the number of devices to transfer is specified in Advanced mode, you do not need to set Data Type.

If **BCD4**, **BCD8** or **float32** is selected and the arithmetic data contains a value inexpressible in BCD, a 1 is written to System Area 2 Arithmetic error bit (address+2, bit 5) and an error message is displayed.

For details, refer to Chapter 4 "Arithmetic error" on page 4-34.

Source 1

Specify the source word device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Add**, **Sub**, **Multi**, **Div**, **Mod**, **OR**, **AND**, or **XOR**.

Source Data

Select the data handled by the operation selected for **Action Mode**.

Value: Use a constant.

Only a **Value** can be handled if **Action Mode** is set to **Set** or **Momentary**.

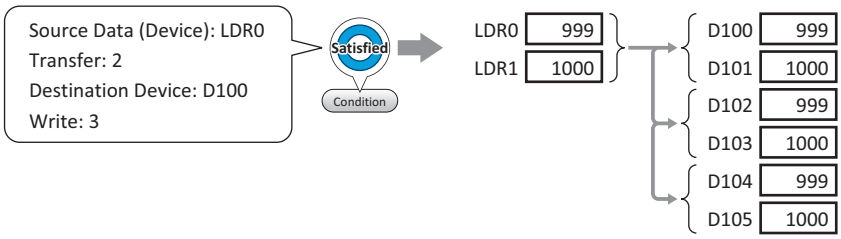
If **Action Mode** is set to **Momentary**, the value in the **ON Data** is written when the trigger condition is satisfied, and the value in the **OFF Data** when the trigger condition is no longer satisfied.

Hexadecimal: Select this check box to enter the **ON Data** and **OFF Data** values as a hexadecimal.

Device: Use a word device.
Specify the device.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the source word device according to the value of the specified device.
This setting is enabled only if **Action Mode** is set to **Move**.
For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Transfer*1: Specify the number of word devices (1 to 64) to transfer.
This setting is enabled only if **Action Mode** is set to **Move**.
Example: If **Transfer** is set to **2** and **Write** is set to **3**, the same data in 2 continuous word devices will be written to the destination device 3 times.

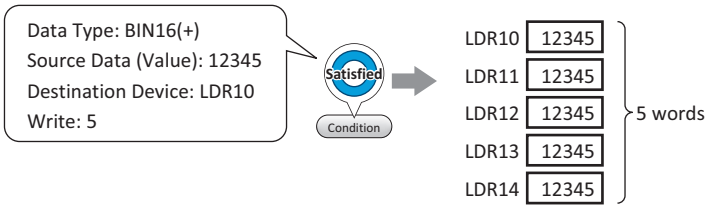


■ Destination Device

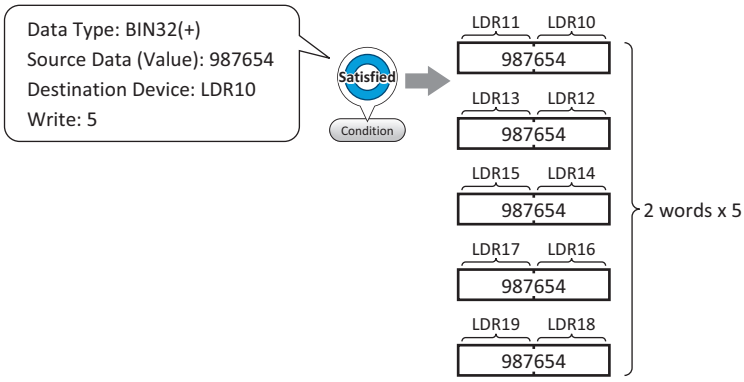
Destination Device: Specify the destination word device.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the destination word device according to the value of the specified device.
This setting is enabled only if **Action Mode** is set to **Move**.
For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Write*1: Specify the number of word devices (1 to 64) at the destination.
For **Move**, specify how many times to write.
This setting is enabled only if **Action Mode** is set to **Set**, **Move**, or **Momentary**.
Example: If **Data Type** is set to **BIN16(+)** and **Write** is set to 5, the same data will be written to 5 continuous word addresses.

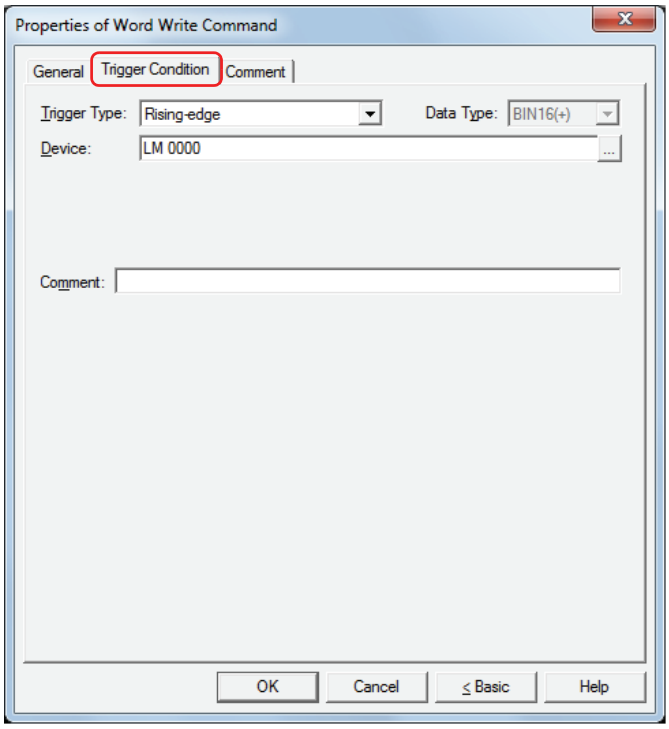


If **Data Type** is set to **BIN32(+)** and **Write** is set to 5, the same data will be written to a total of 10 word addresses (2 words 5 times).



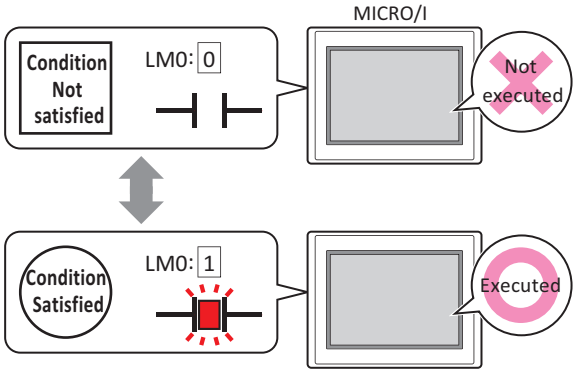
*1 Advanced mode only

● Trigger Condition Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

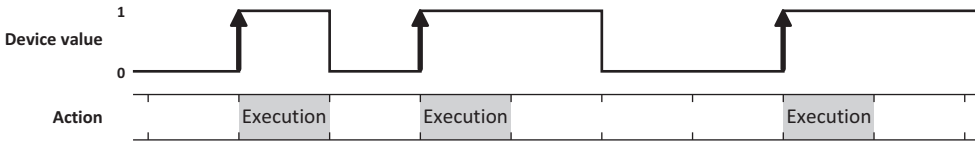
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



■ Trigger Type

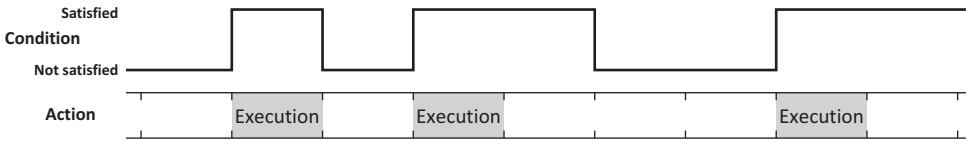
Selects the condition to execute the command from the following.

Rising-edge: Command is executed when device changes from 0 to 1.



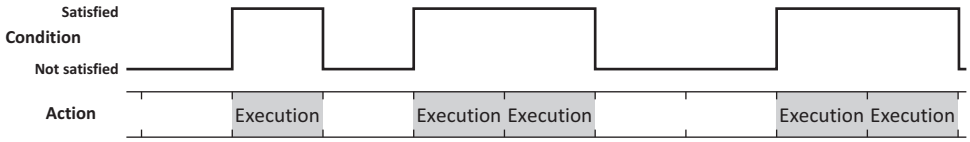
Falling-edge: Command is executed when device changes from 1 to 0.

Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.



While satisfying the condition:

The command continues being executed while the condition is satisfied.



Data Type

Selects the data type to be handled by the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Device

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Condition

Sets the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

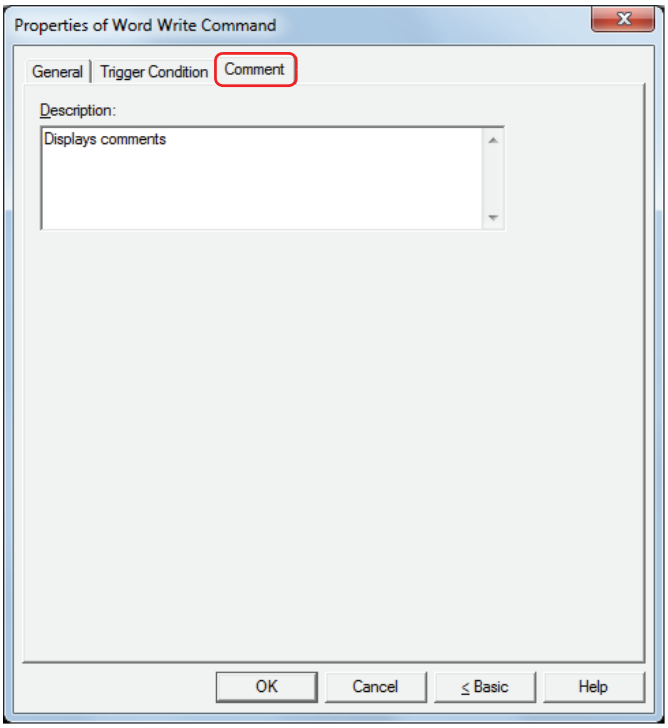
Comment

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Word Write Command on the editing screen

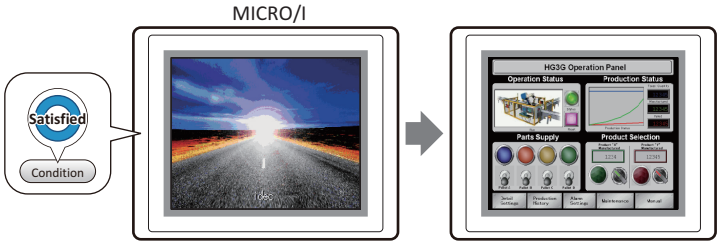
3 Goto Screen Command

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

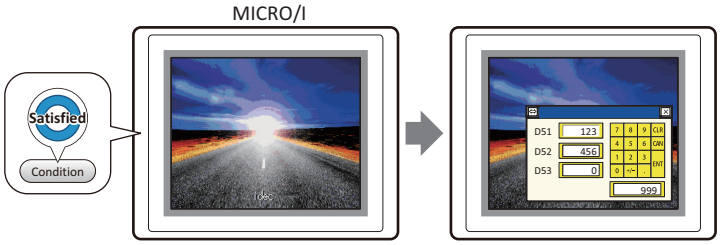
3.1 How the Goto Screen Command is Used

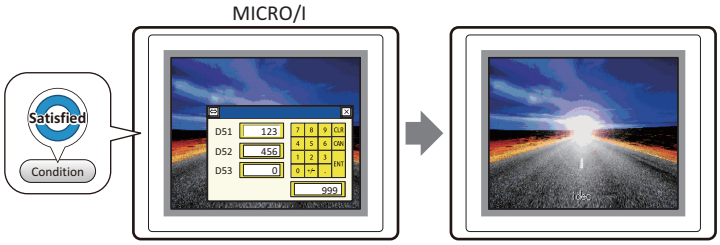
Switches to another screen or displays a window.

- Switches between Base Screens when the trigger condition is satisfied.

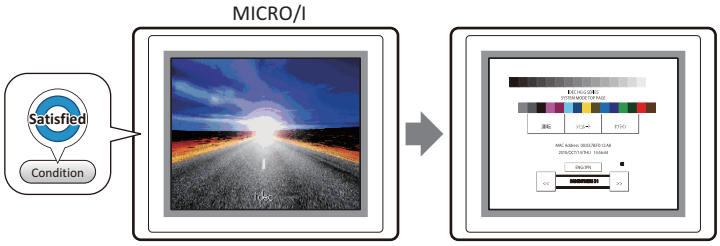


- Opens and closes other windows (such as the Popup Screen, Device Monitor, Password Screen, Adjust Contrast Screen, and File Screen) when the trigger condition is satisfied.

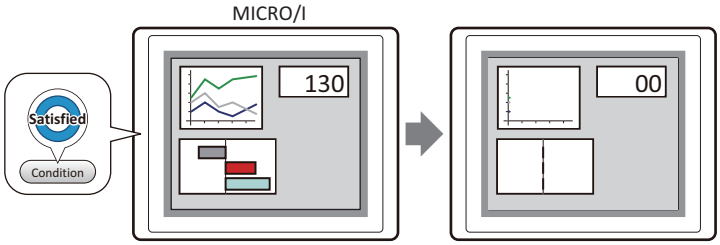




- Switches to the System Menu when the trigger condition is satisfied.



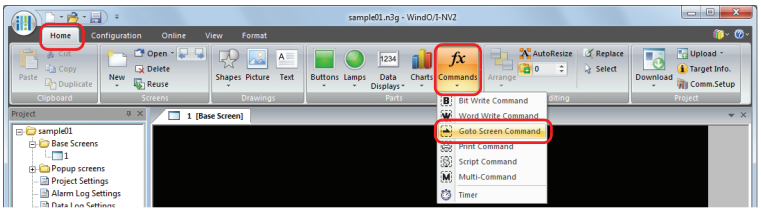
- Resets the current screen when the trigger condition is satisfied.



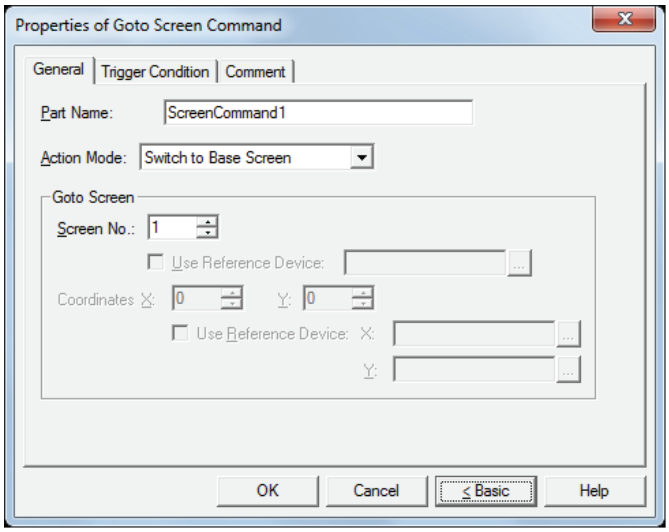
3.2 Goto Screen Command Configuration Procedure

This section describes the configuration procedure for the Goto Screen Command.

1. On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Goto Screen Command**.



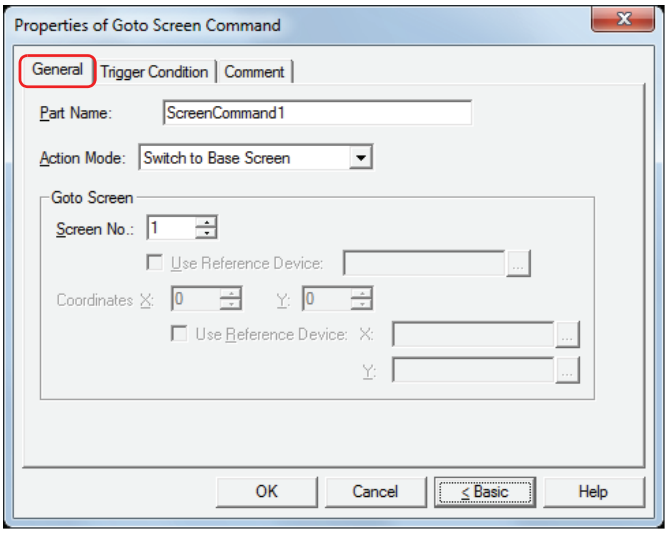
2. Click a point on the edit screen where you wish to place the Goto Screen Command.
3. Double-click the dropped Goto Screen Command and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.



3.3 Properties of Goto Screen Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **Action Mode**

Select the action to perform when the trigger condition is met from the following:

Back to previous Screen:	Switches to the previous screen. Returns to up to 16 earlier screens.
Switch to Base Screen:	Switches between Base Screen.
Open Popup Screen:	Opens a Popup Screen.
Close Popup Screen:	Closes a Popup Screen.
Open Device Monitor Screen:	Opens the Device Monitor Screen.
Close Device Monitor Screen:	Closes the Device Monitor Screen.
Open Password Screen:	Opens the Password Screen.
Close Password Screen:	Closes the Password Screen.
Open Adjust contrast Screen:	Opens the Adjust contrast Screen.
Close Adjust contrast Screen:	Closes the Adjust contrast Screen.
Open File Screen for movie files:	Opens the File Screen.
Close File Screen for movie files:	Closes the File Screen.
Switch to System Menu Screen:	Switches to the System Menu Screen.
Reset current screen:	Resets the current Base Screen.

When the current Base Screen is reset using the **Reset current screen** function, the window and internal devices restart as if the Base Screens were switched.

Goto Screen

Screen No.: If **Action Mode** is set to **Switch to Base Screen**, specify the Base Screen number to switch to (from 1 to 3000). If **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**, specify the number of the Popup Screen to open or close (from 1 to 3015).

This setting is enabled only if **Action Mode** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the screen number using the value of the specified device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**.

Coordinates X, Y: Specify the coordinates on the Base Screen for displaying a window.

X and Y specify the upper left corner of the window using the upper left corner of the screen as the origin.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**, **Open Device Monitor Screen**, **Open Password Screen**, **Open Adjust contrast Screen**, or **Open Movie File Screen.**

Use Reference Device*1: Select this check box and specify a device to specify the coordinates using the value of the specified device.

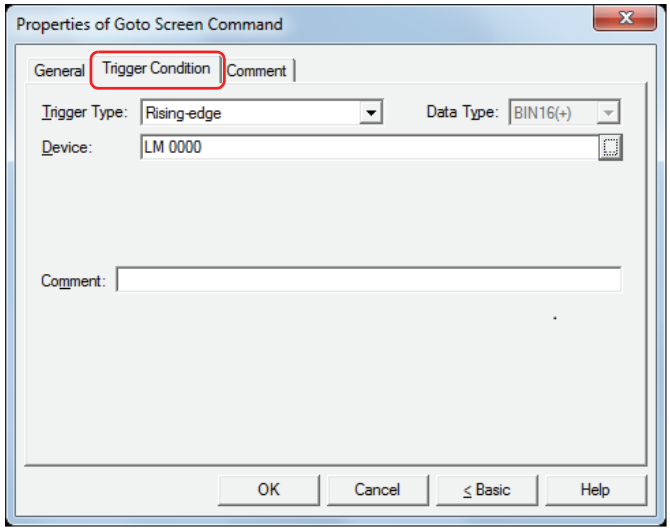
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**.

With the HG2F/2S/3F/4F, window display coordinates are automatically adjusted to a position in multiples of 20 dots.

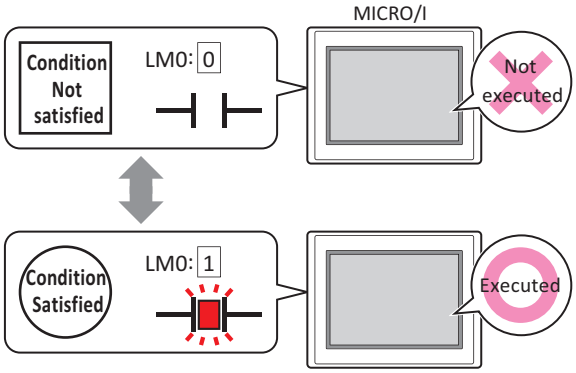
*1 Advanced mode only

● **Trigger Condition** Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

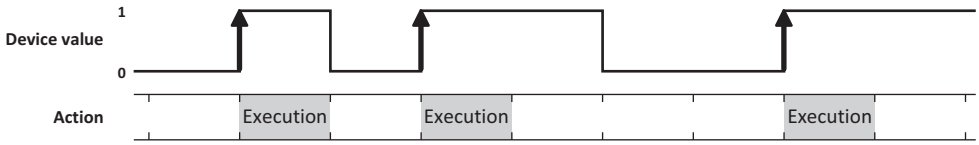
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



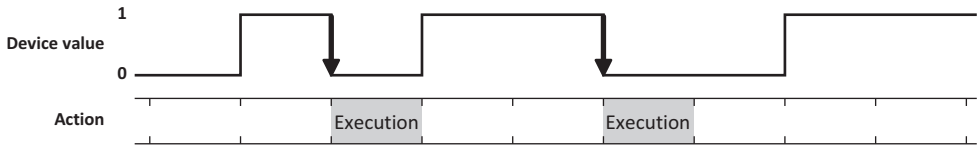
■ **Trigger Type**

Selects the condition to execute the command from the following.

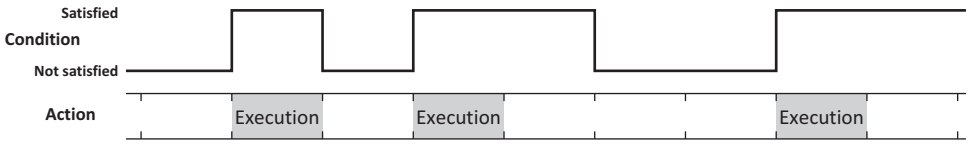
Rising-edge: Command is executed when device changes from 0 to 1.



Falling-edge: Command is executed when device changes from 1 to 0.

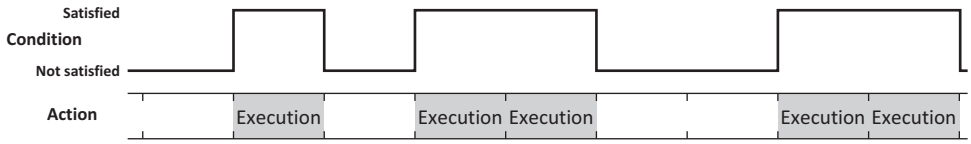


Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.



While satisfying the condition:

The command continues being executed while the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

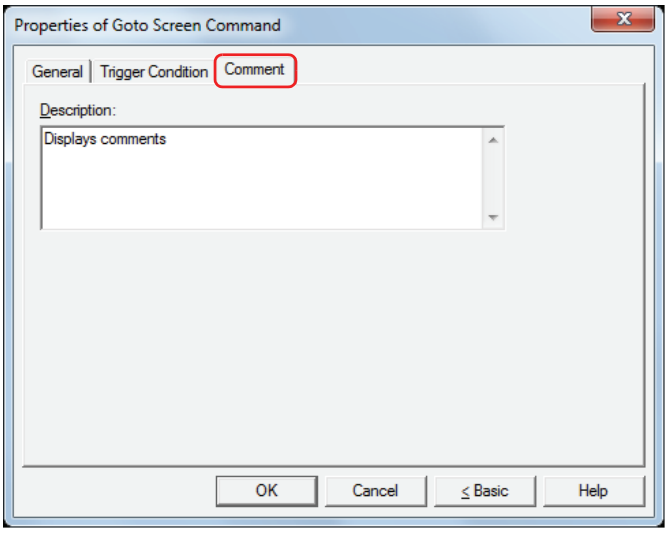
■ **Comment**

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Goto Screen Command on the editing screen

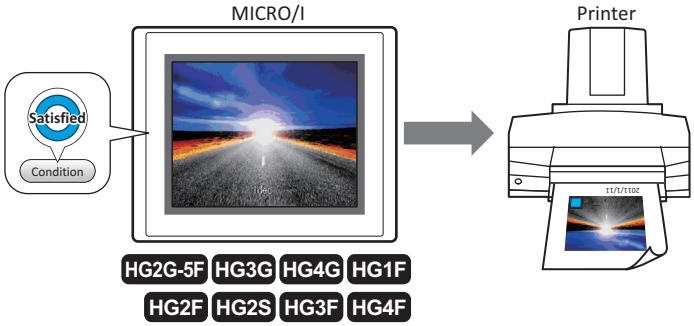
4 Print Command

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 How the Print Command is Used

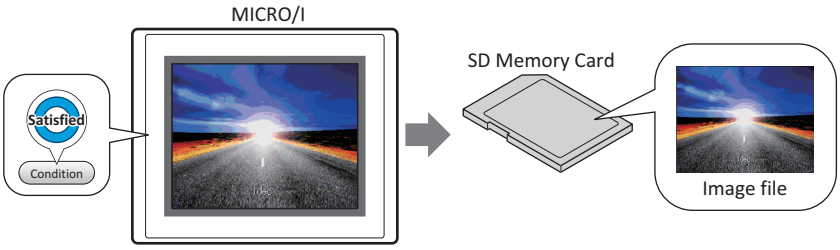
Outputs a screenshot to a printer or a memory card.

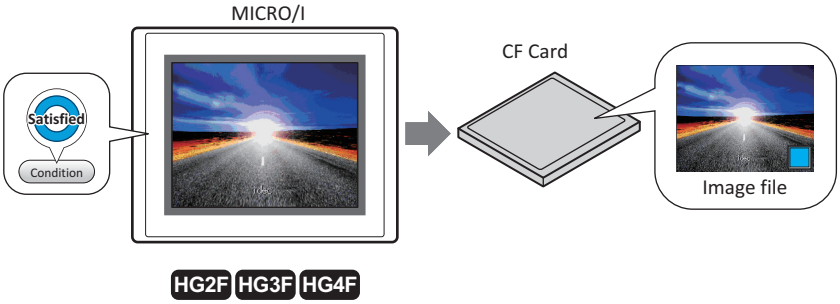
- Outputs a screenshot of the current screen to the printer when the trigger condition is satisfied.



Refer to Chapter 31 "1.3 Connecting a Printer to MICRO/I" on page 31-1 for compatible printers and instructions on how to connect one to the MICRO/I.

- Outputs a screenshot of the current screen to the memory card when the trigger condition is satisfied.



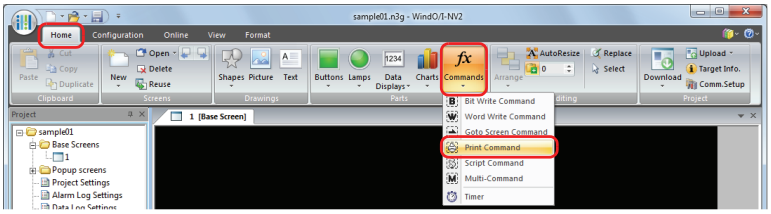


This function is only supported by models that are equipped with a memory card interface.

4.2 Print Command Configuration Procedure

This section describes the configuration procedure for the Print Command.

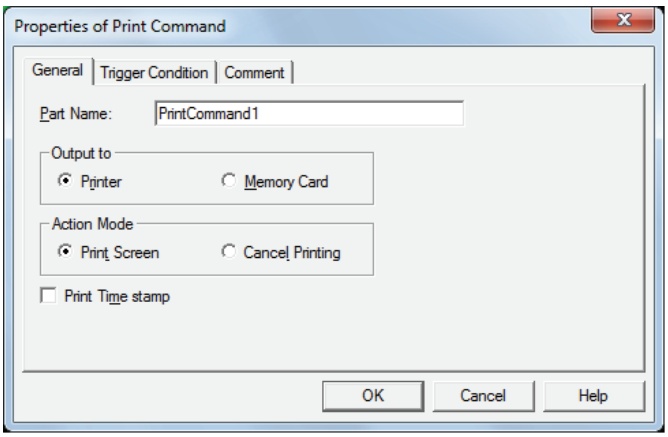
1 On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Print Command**.



2 Click a point on the edit screen where you wish to place the Print Command.

3 Double-click the dropped Print Command and a Properties dialog box will be displayed.

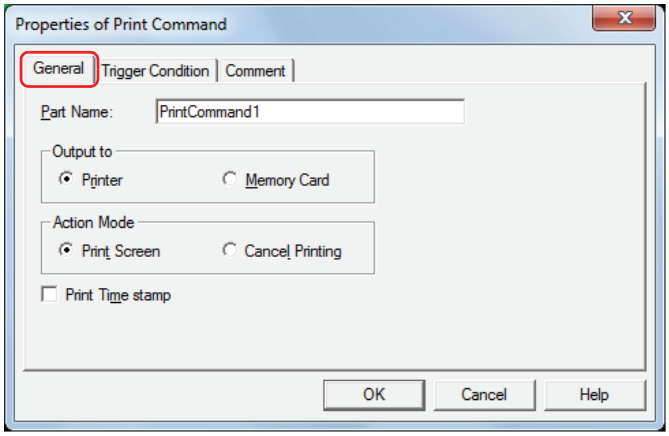
4 Change the settings on each tab as necessary.



4.3 Properties of Print Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **Output to**

Select where to direct the screenshot to.

Printer: Outputs the screenshot to the printer connected to the MICRO/I.

Memory Card*1: Outputs the screenshot as a file to the memory card inserted in the MICRO/I.
Files are output as follows:

Series	File format	File name	File size
HG2G-5F HG3G/4G	JPEG	CAP***.JPG (***: date and time when file was output) Example: A file created at 18:50:25 on June 30, 2011 will be named "CAP110630_185025.JPG".	Depends on image being displayed.
HG2F	Bitmap	CAP***.BMP (***: serial number from 001 to 999)	77,878 bytes
HG3F			308,278 bytes
HG4F			481,078 bytes

- For details about printers, refer to Chapter 31 "Printer" on page 31-1.
- For details about memory cards, refer to Chapter 30 "1 Memory Cards" on page 30-1.

■ **Action Mode**

Select the action to perform when the trigger condition is satisfied from the following:

Print Screen: Outputs a screenshot of the current screen to the printer or the memory card.

Cancel Printing: Cancels printout to the printer.

*1 This is applicable for models with the memory card interface only.

Print Time stamp

Adds the date and time of printing to the screenshot before sending it to the printer.

The date and time format depends on the language selected in **Language**. **Language** is available on the **Project Details** tab of the **Project Settings** dialog box.

The display formats are shown below:

- Japanese: YYYY*2/MM/DD HH:MM
- English: MM/DD/YYYY*2 HH:MM

YYYY: year, MM: month, DD: day, HH: hour, MM: minute

- These operations cannot be performed simultaneously.
  - Outputting to the memory card using the Print Command*1
  - Outputting to the printer using the Print Command
  - Printing alarm logs*3
- It may take some time to output screenshots when copying files using the USB Autorun function or a Key Button.
- The HG2G-5F, HG3G/4G cannot stop printing in the middle of a page, even when the print job is canceled. Print jobs after the current print job are canceled after the current page finishes printing.
- When printing a screenshot from the HG3F/4F using SII DPU-414 printer, the printed image will only include 320 pixels from the left edge of the screen.

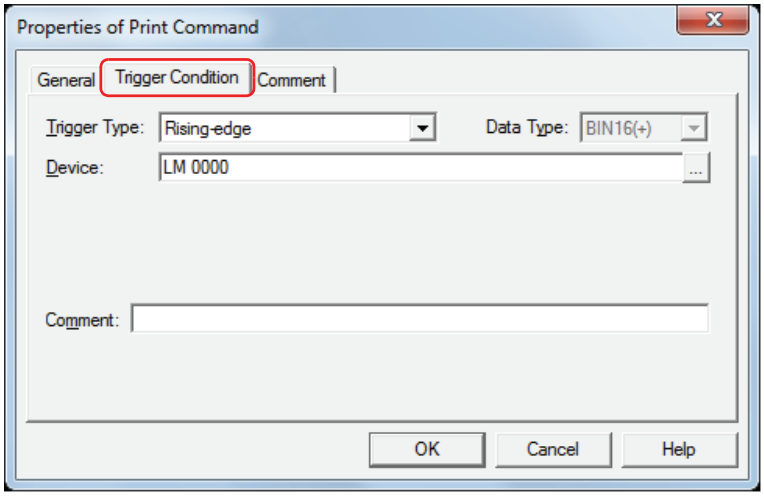
The maximum number of screenshots that can be captured (1 to 999) can be set in HG Special Registers LSD65. (Default: 99)

The methods to erase screenshot files saved on the memory card are as follows.

- To erase files during operation using parts, on the **Memory Card** tab on the **Project Settings** dialog box, select the **Remove Files stored in Memory Card** check box and the **All Screenshot data** check box, and then configure the trigger device. Assign that trigger device to a part.
- To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the **Clear Data** dialog box. Select the **Screenshot Data** check box and click **OK**.
- To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

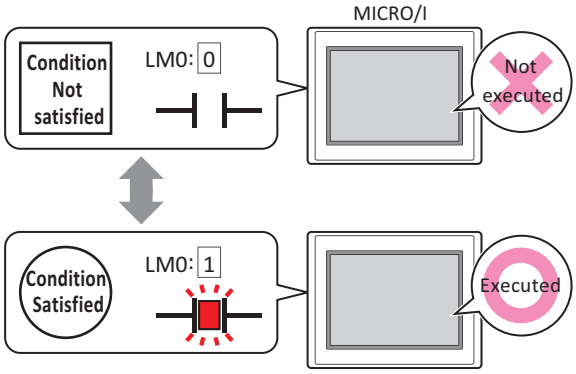
*1 This is applicable for models with the memory card interface only.
*2 Only last two digits of year shown on the HG1F/2F/2S/3F/4F.
*3 HG2G-5F, HG3G/4G only

● Trigger Condition Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

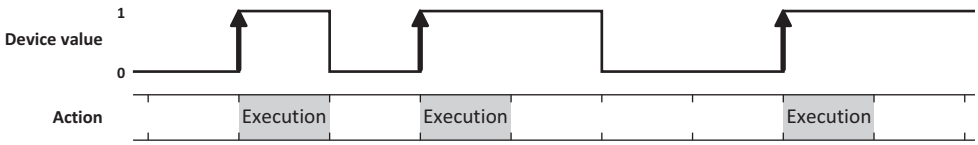
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



■ Trigger Type

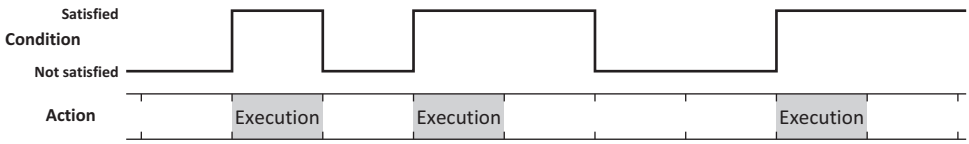
Selects the condition to execute the command from the following.

Rising-edge: Command is executed when device changes from 0 to 1.



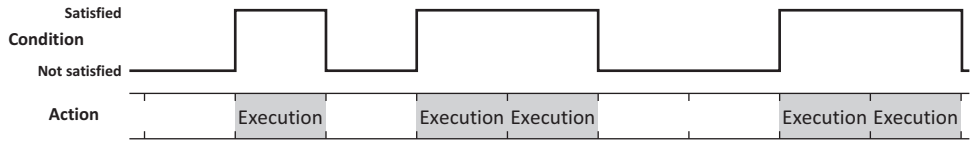
Falling-edge: Command is executed when device changes from 1 to 0.

Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.



While satisfying the condition:

The command continues being executed while the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

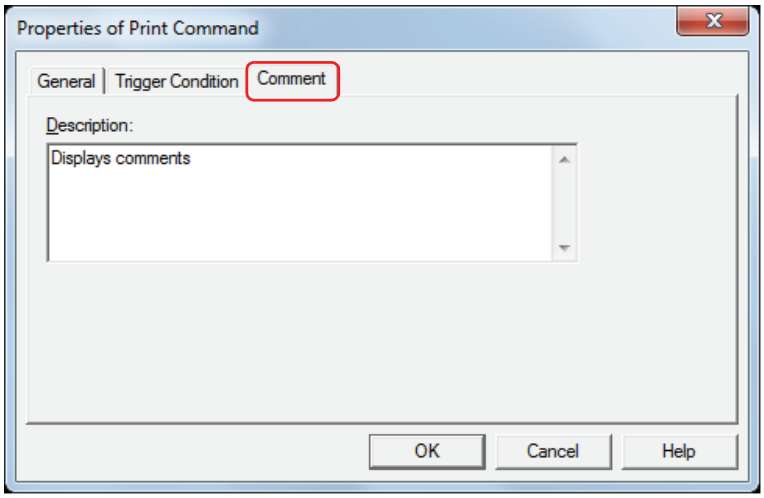
■ **Comment**

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

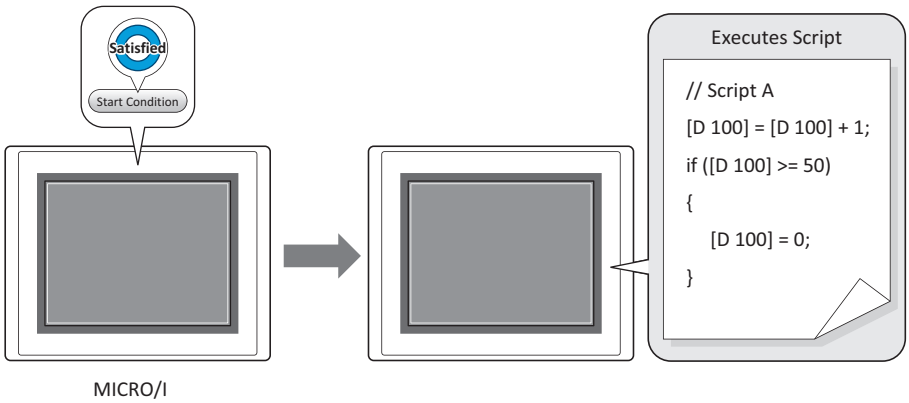
Example: When mousing over the Print Command on the editing screen

5 Script Command

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

5.1 How the Script Command is Used

Executes a script when certain conditions are satisfied.

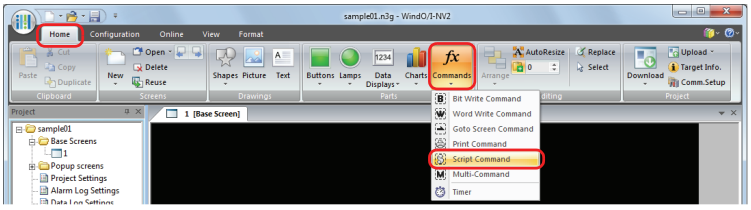


Complex processes such as conditional branching, logical operation, arithmetic operation, function, etc., can be programmed in a text format using Scripts. For details, refer to Chapter 20 "Script" on page 20-1.

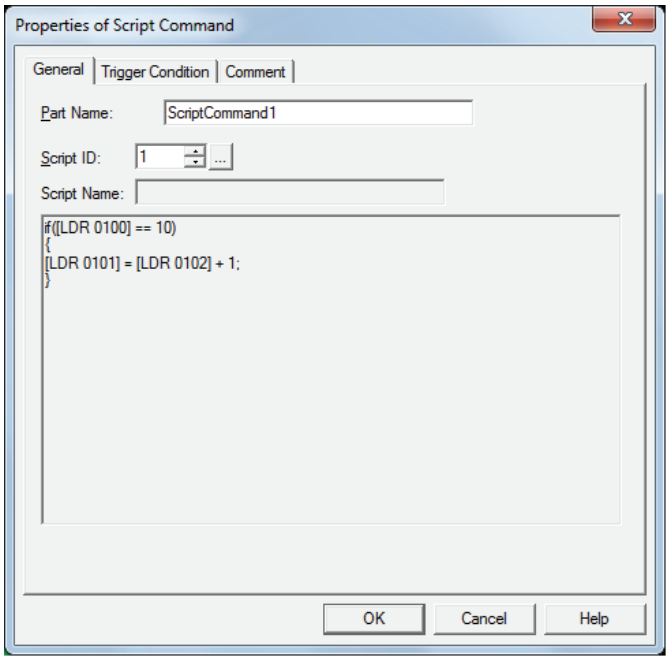
5.2 Script Command Configuration Procedure

This section describes the configuration procedure for Script Commands.

1. On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Script Command**.



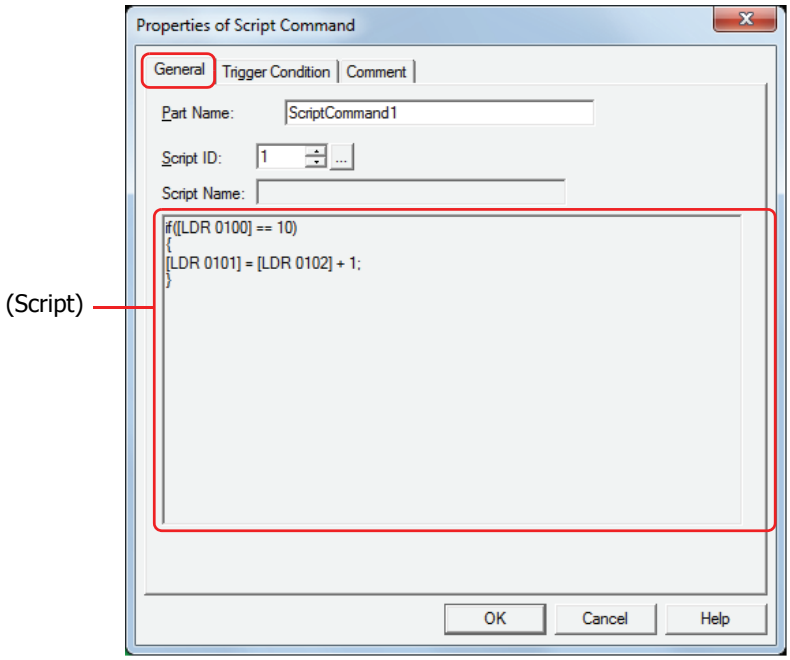
2. Click a point on the edit screen where you wish to place the Script Command.
3. Double-click the dropped Script Command and a Properties dialog box will be displayed.
4. Change the settings on each tab as necessary.



5.3 Properties of Script Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **Script ID**

Specify the script ID (1-32000) of the script to operate.

The Script Manager will open when ... is clicked. Select a script from the script list.

For details, refer to Chapter 20 "2.2 Script Manager" on page 20-7.

■ **Script Name**

Displays the name of the script selected in the Script Manager.

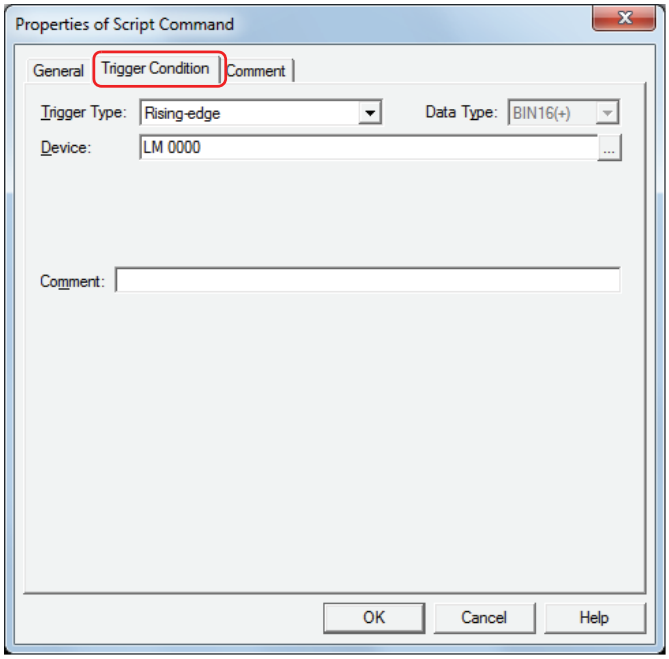
■ **(Script)**

Displays the contents of the script selected in the Script Manager.

Once this area is double clicked, the Script Editor will open and editing can be done.

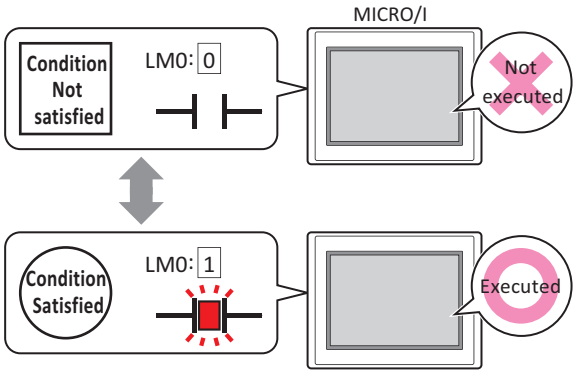
For details, refer to Chapter 20 "2.3 Script Editor" on page 20-8.

● Trigger Condition Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

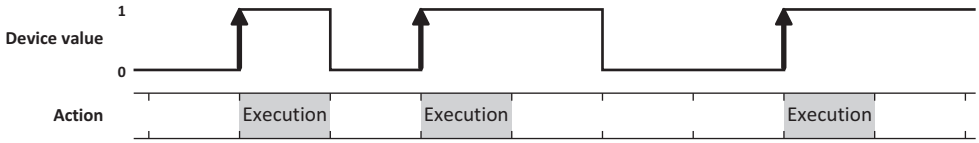
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



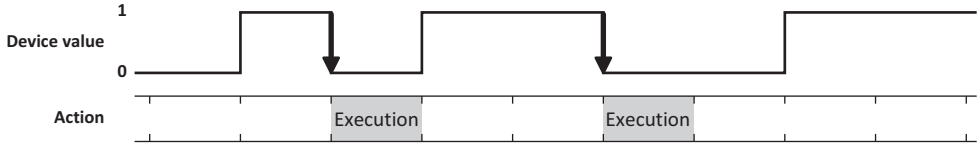
■ Trigger Type

Selects the condition to execute the command from the following.

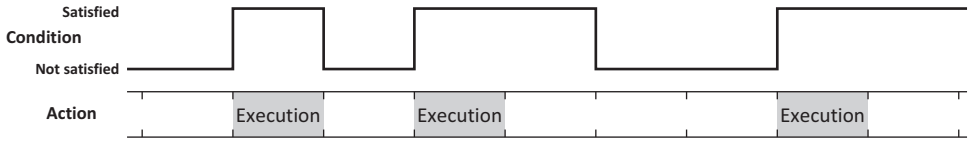
Rising-edge: Command is executed when device changes from 0 to 1.



Falling-edge: Command is executed when device changes from 1 to 0.

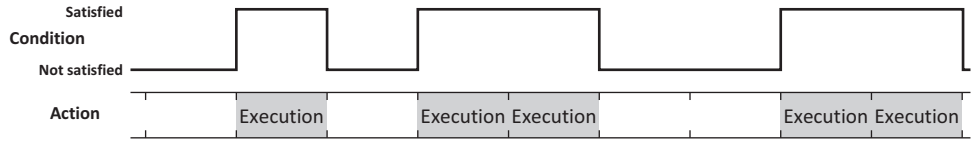


Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.

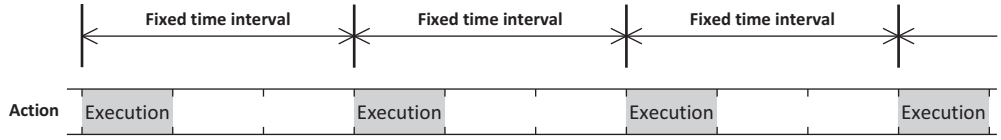


While satisfying the condition:

The command continues being executed while the condition is satisfied.



Fixed Period: Command executes within a fixed time interval.



- **Data Type**

  Selects the data type to be handled by the condition formula.

  Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

  For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

- **Device**

  Specifies the bit device or bit of the word device to serve as condition.

  Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

  Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- **Condition**

  Sets the condition formula.

  Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

  Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

- **Period**

  Sets the period for command execution from 1 to 3600 (seconds).

  Can only be set if **Fixed Period** is selected as **Trigger Type**.

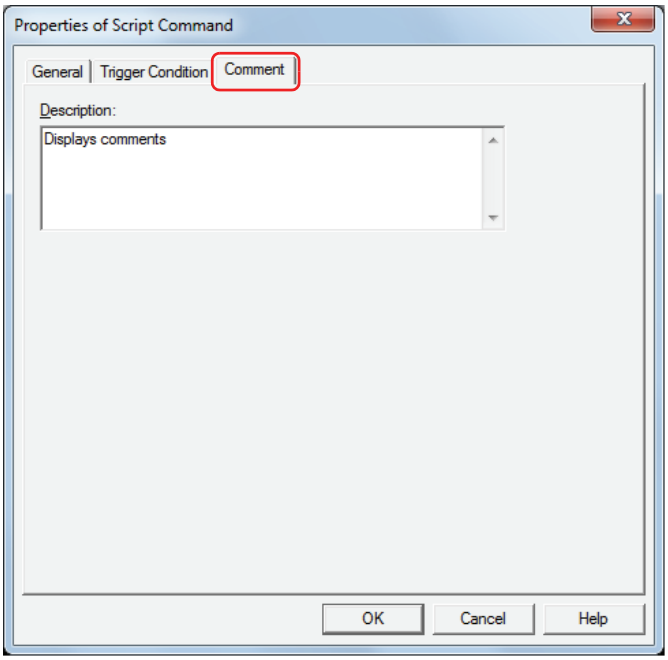
- **Comment**

  Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Script Command on the editing screen

6 Multi-Command

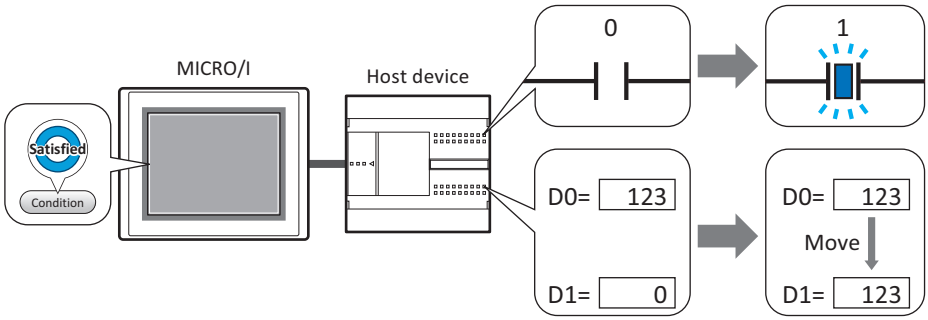
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

6.1 How the Multi-Command is Used

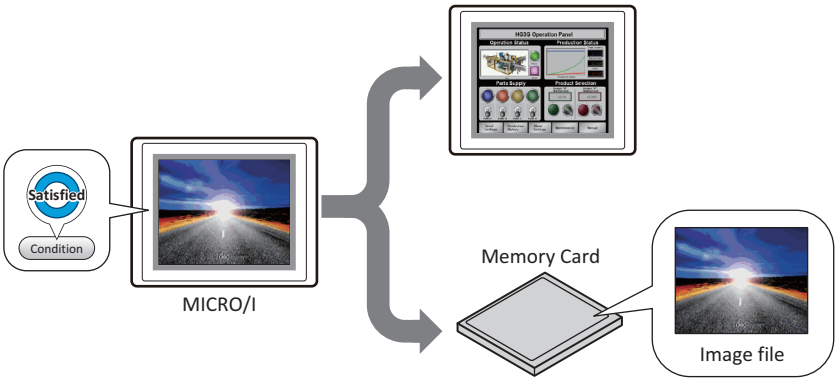
Executes multiple commands at once.
These commands can be assigned to a Multi-Command.

Command	Description
Bit Write	Writes a 0 or 1 to the specified bit device.
Word Write	Writes a value to a word device. You can specify the destination address indirectly, and perform arithmetic on the value to be written.
Goto Screen	Switches screens and opens other windows.
Print	Outputs a screenshot to the printer or the memory card.
Key	Performs downloads, uploads, and file copying. Also used to manipulate other parts.
Script	Executes a script.

- Writes a 1 to a bit device, and the value in a word device to another device when the trigger condition is satisfied.



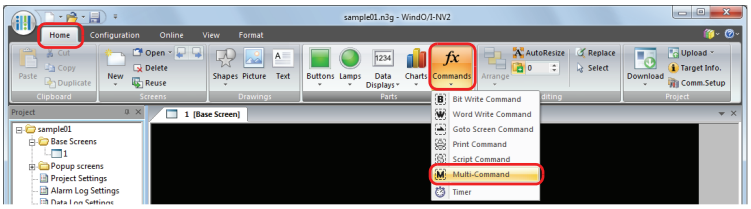
- Outputs a screenshot of the current screen to a memory card, and then switches the Base Screen when the trigger condition is satisfied.



6.2 Multi-Command Configuration Procedure

This section describes the configuration procedure for Multi-Commands.

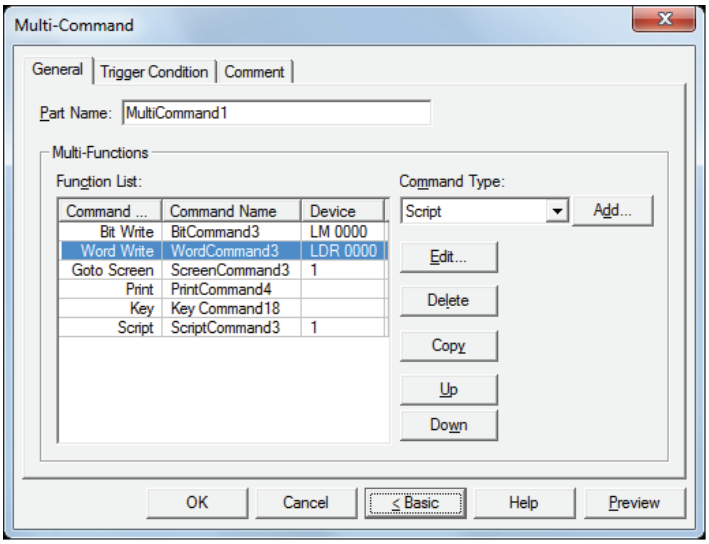
1 On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Multi-Command**.



2 Click a point on the edit screen where you wish to place the Multi-Command.

3 Double-click the dropped Multi-Command and a Properties dialog box will be displayed.

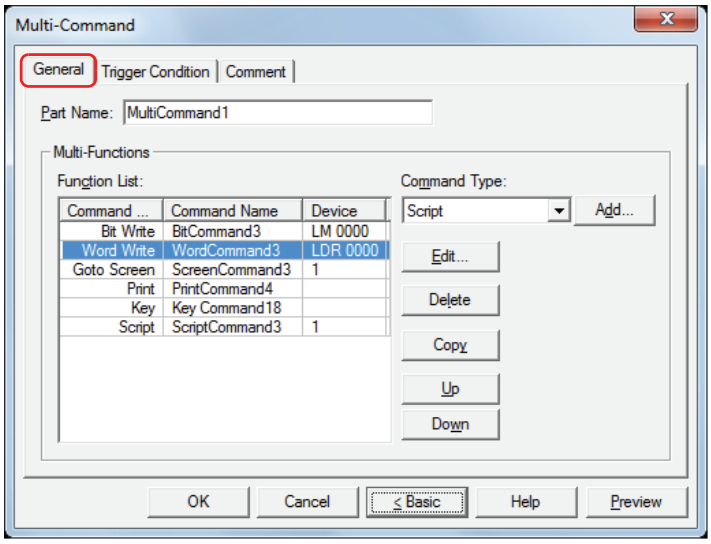
4 Change the settings on each tab as necessary.



6.3 Properties of Multi-Command Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ Part Name

Enter a name for the part. The maximum number is 20 characters.

■ Multi-Functions

Add and edit commands to be executed when the trigger condition is satisfied.

Function List: Lists the commands to be executed.

- Command Type: Shows the command type.
- Command Name: Shows the command name.
- Device: Shows the setting when one of the following Command Type is selected.
  Shows the destination device for the **Bit Write** and **Word Write** commands.
  Shows the screen number when **Goto Screen** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.
  Shows the script ID for the **Script** command.

- Executes only the Goto Screen command at the end of the **Function List** when multiple **Switch to Base Screen** type commands are set for **Action Mode**.
- Goto Screen commands are not executed from top to bottom as they appear in the **Function List**. Rather, they are executed at the end of the scan when the trigger condition is satisfied.
- Key commands are executed in the scan that follows a scan that satisfies the trigger condition.
- If multiple Key commands are set, only the first and second Key commands in the **Function List** are executed. The third and following Key commands are not executed. Also, only the first Key command that specifies a Data Transfer function in the **Function List** is executed if multiple Key commands are set.

Command Type: Select the command to add.

- Bit Write: Writes a 0 or 1 to a bit device or bit of the word device. For details, refer to "Properties of Bit Write for Multi-Functions dialog box" on page 12-42.
- Word Write: Writes a value to a word device. Can be used to indirectly specify the destination address or to perform operations on the written value. For details, refer to "Properties of Word Write for Multi-Functions dialog box" on page 12-43.

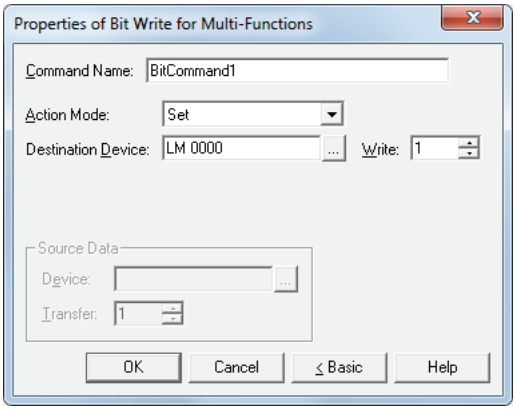
Goto Screen:	Switches to another screen or displays a window. For details, refer to "Properties of Goto Screen for Multi-Functions dialog box" on page 12-45.
Print:	Outputs a screenshot to a printer or a memory card. For details, refer to "Properties of Print for Multi-Functions dialog box" on page 12-47.
Key:	Performs a variety of functions including uploading and downloading, copying files, and operating other parts. For details, refer to "Properties of Key for Multi-Functions dialog box" on page 12-49.
Script:	Executes a script. For details, refer to "Properties of Script for Multi-Functions dialog box" on page 12-53.

Add:	Adds a command to the list. A maximum of 32 commands may be added. Click this button to display the Properties dialog box for the command selected from **Command Type**.
Edit:	Changes a command in the list. Click this button to display the Properties dialog box for the command selected in **Function List**.
Delete:	Deletes a command from the list. Select the command in the list and click this button.
Copy:	Copies a command in the list. Select a command in the list and click this button. A copy of the selected command is added to the end of the list.
Up:	Shifts the selected command upward in the list.
Down:	Shifts the selected command downward in the list.

Properties of Bit Write for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Bit Write command for the Multi-Command.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Action Mode

Select the action to perform when the trigger condition is satisfied from the following:

Set:	Writes a 1 to the specified bit device when the trigger condition is satisfied.
Reset:	Writes a 0 to the specified bit device when the trigger condition is satisfied.
Set & Reset:	Writes a 1 to the specified bit device when the trigger condition is satisfied. When the trigger condition is no longer satisfied, a 0 is written to the specified bit device.
Toggle:	Toggles the value of the specified bit device when the trigger condition is satisfied. If the value of the bit device is 0 it changes to 1, and vice versa.
Move:	This function writes the value in the source bit device to the value in the destination bit device when the trigger condition is satisfied.

For details about the **Action Mode**, refer to "Action Mode" on page 12-4. However, **Set & Reset** for the Multi-Command has the same function as **Momentary** for the Bit Write Command.

■ Destination Device

Specify the destination bit device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Write*1

Specify the number of bit devices (1 to 64) at the destination.

This setting is enabled only if **Action Mode** is set to **Set** or **Reset**. For details, refer to "Write*1" on page 12-5.

■ Source Data

Specifies the device where the data to be written is stored.

This setting is enabled only if **Action Mode** is set to **Move**. For details, refer to "Source Data" on page 12-5.

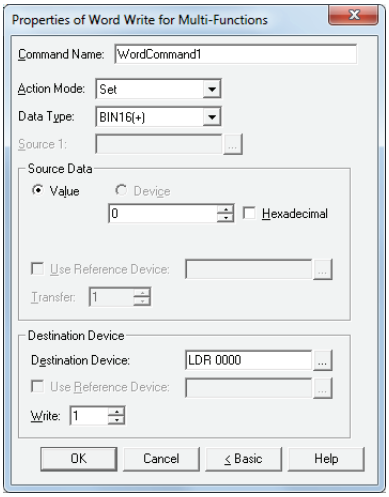
Device:	Specify the source bit device. Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Transfer:	Specify the number of bit devices (1 to 64) to move.

*1 Advanced mode only

Properties of Word Write for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Word Write command for the Multi-Command.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Action Mode

Select the action to perform when the trigger condition is satisfied from the following:

Set:	Writes a fixed value to the specified word device when the trigger condition is satisfied.
Move:	Writes the value in the source device to the destination word device when the trigger condition is satisfied.
Set ON & OFF Data:	Writes a fixed value of **ON Data** to the specified word device when the trigger condition is satisfied. Writes a fixed value of **OFF Data** to the specified word device when the trigger condition is no longer satisfied.
Add, Sub, Multi, Div, Mod, OR, AND, XOR:	Performs arithmetic on the value of source device and a fixed value or a value of device and writes the result to a word device when the trigger condition is satisfied.

For details about the **Action Mode**, refer to "Action Mode" on page 12-12. However, **Set ON & OFF Data** for the Multi-Command has the same function as **Momentary** for the Word Write Command.

■ Data Type

Select the data type handled by the operation selected for **Action Mode**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **OR**, **AND**, or **XOR**.

BIN16(+) and **BIN32(+)** can only be set if **Action Mode** is set to **Move**. Because the number of devices to transfer is specified in Advanced mode, you do not need to set Data Type.

If **BCD4**, **BCD8**, or **float32** is selected and the arithmetic data contains a value inexpressible in BCD, a 1 is written to System Area 2 Arithmetic error bit (address+2, bit 5) and an error message is displayed.

For details, refer to Chapter 4 " Arithmetic error" on page 4-34.

■ Source 1

Specify the source word device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Add**, **Sub**, **Multi**, **Div**, **Mod**, **OR**, **AND**, or **XOR**.

Source Data

Select the data handled by the operation selected for **Action Mode**.

Value: Use a constant.

Only a **Value** can be handled if **Action Mode** is set to **Set** or **Set ON & OFF Data**.

If **Action Mode** is set to **Set ON & OFF Data**, the value in the **ON Data** is written when the trigger condition is satisfied, and the value in the **OFF Data** when the trigger condition is no longer satisfied.

Hexadecimal: Select this check box to enter the **ON Data** and **OFF Data** values as a hexadecimal.

Device: Use a word device.

Specify the device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the source word device according to the value of the specified device.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Transfer*1: Specify the number of word devices (1 to 64) to transfer.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to "Transfer*1" on page 12-14.

Destination Device

Destination Device: Specify the destination word device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Use Reference Device*1: Select this check box and specify a device to change the destination word device according to the value of the specified device.

This setting is enabled only if **Action Mode** is set to **Move**.

For details, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

Write*1: Specify the number of word devices (1 to 64) at the destination.

For **Move**, specify how many times to write.

This setting is enabled only if **Action Mode** is set to **Set**, **Move**, or **Set ON & OFF Data**.

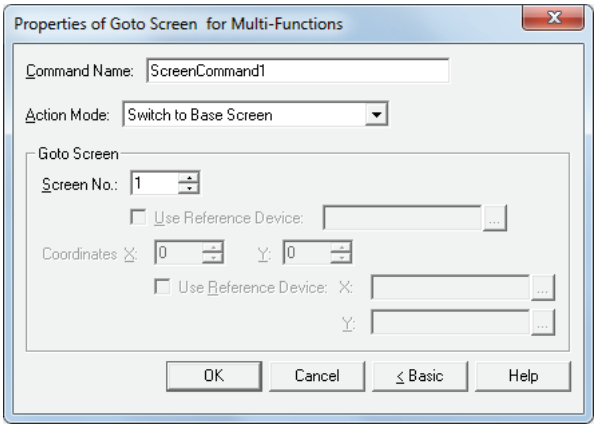
For details, refer to "Write*1" on page 12-14.

*1 Advanced mode only

Properties of Goto Screen for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Goto Screen command for the Multi-Command.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Action Mode

Select the action to perform when the trigger condition is met from the following:

Back to previous Screen:	Switches to the previous screen. Returns to up to 16 earlier screens.
Switch to Base Screen:	Switches between Base Screen.
Open Popup Screen:	Opens a Popup Screen.
Close Popup Screen:	Closes a Popup Screen.
Open Device Monitor Screen:	Opens the Device Monitor Screen.
Close Device Monitor Screen:	Closes the Device Monitor Screen.
Open Password Screen:	Opens the Password Screen.
Close Password Screen:	Closes the Password Screen.
Open Adjust contrast Screen:	Opens the Adjust contrast Screen.
Close Adjust contrast Screen:	Closes the Adjust contrast Screen.
Open File Screen for movie files:	Opens the File Screen.
Close File Screen for movie files:	Closes the File Screen.
Switch to System Menu Screen:	Switches to the System Menu Screen.
Reset current screen:	Resets the current Base Screen.

When the current Base Screen is reset using the **Reset current screen** function, the window and internal devices restart as if the Base Screens were switched.

■ Goto Screen

Screen No.: If **Action Mode** is set to **Switch to Base Screen**, specify the Base Screen number to switch to (from 1 to 3000). If **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**, specify the number of the Popup Screen to open or close (from 1 to 3015).

This setting is enabled only if **Action Mode** is set to **Switch to Base Screen**, **Open Popup Screen**, or **Close Popup Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the screen number using the value of the specified device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen** or **Close Popup Screen**.

Coordinates X, Y: Specify the coordinates on the Base Screen for displaying a window.

X and Y specify the upper left corner of the window using the upper left corner of the screen as the origin.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**, **Open Device Monitor Screen**, **Open Password Screen**, **Open Adjust contrast Screen**, or **Open Movie File Screen**.

Use Reference Device*1: Select this check box and specify a device to specify the coordinates using the value of the specified device.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This setting is enabled only if **Action Mode** is set to **Open Popup Screen**.

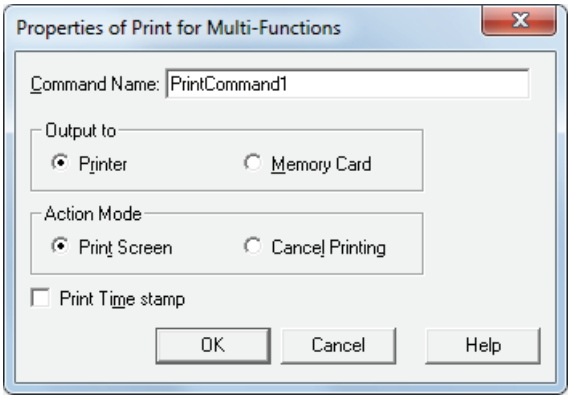
With the HG2F/2S/3F/4F, window display coordinates are automatically adjusted to a position in multiples of 20 dots.

*1 Advanced mode only

Properties of Print for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Print command for the Multi-Command.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Output to

Select where to direct the screenshot to.

Printer: Outputs the screenshot to the printer connected to the MICRO/I.

Memory Card*2: Outputs the screenshot as a file to the memory card inserted in the MICRO/I.
Files are output as follows:

Series	File format	File name	File size
HG2G-5F HG3G/4G	JPEG	CAP***.JPG (***: date and time when file was output) Example: A file created at 18:50:25 on June 30, 2011 will be named "CAP110630_185025.JPG".	Depends on image being displayed.
HG2F	Bitmap	CAP***.BMP (***: serial number from 001 to 999)	77,878 bytes
HG3F			308,278 bytes
HG4F			481,078 bytes

- For details about printers, refer to Chapter 31 "Printer" on page 31-1.
- For details about memory cards, refer to Chapter 30 "1 Memory Cards" on page 30-1.

■ Action Mode

Select the behavior of the button from the following:

Print Screen: Outputs a screenshot of the current screen to the printer or the memory card.

Cancel Printing: Cancels printout to the printer.

■ Print Time stamp

Adds the date and time of printing to the screenshot before sending it to the printer.

The date and time format depends on the language selected in **Language. Language** is available on the **Project Details** tab of the Project Settings dialog box.

The display formats are shown below:

- Japanese: YYYY*3MM/DD HH:MM
- English: MM/DD/YYYY*3HH:MM

YYYY: year, MM: month, DD: day, HH: hour, MM: minute

*2 This is applicable for models with the memory card interface only.
*3 Only last two digits of year shown on the HG1F/2F/2S/3F/4F.

- These operations cannot be performed simultaneously.
  - Outputting to the memory card by pressing the Multi-Command.*2
  - Outputting to the printer by pressing the Multi-Command.
  - Printing alarm logs*4
- It may take some time to output screenshots when copying files using the USB Autorun function or a Key Button.
- The HG2G-5F, HG3G/4G cannot stop printing in the middle of a page, even when the print job is canceled. Print jobs after the current print job are canceled after the current page finishes printing.
- When printing a screenshot from the HG3F/4F using SII DPU-414 printer, the printed image will only include 320 pixels from the left edge of the screen.

The maximum number of screenshots that can be captured (1 to 999) can be set in HG Special Registers LSD65. (Default: 99)

The methods to erase screenshot files saved on the memory card are as follows.

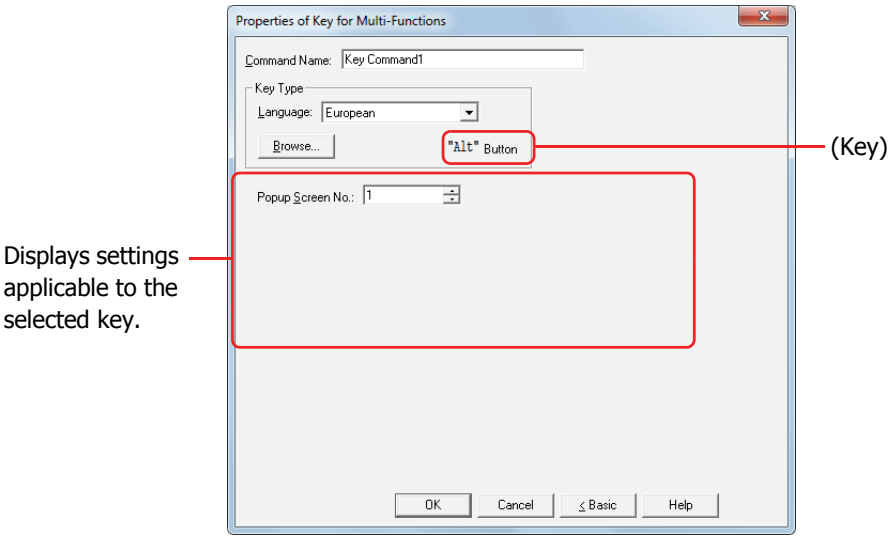
- To erase files during operation using parts, on the **Memory Card** tab on the Project Settings dialog box, select the **Remove Files stored in Memory Card** check box and the **All Screenshot data** check box, and then configure the trigger device. Assign that trigger device to a part.
- To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the Clear Data dialog box. Select the **Screenshot Data** check box and click **OK**.
- To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

*2 This is applicable for models with the memory card interface only.
*4 HG2G-5F, HG3G/4G only

Properties of Key for Multi-Functions dialog box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the Key command for the Multi-Command.



■ Command Name

Enter a name for the command. The maximum number is 20 characters.

■ Key Type

Select the function for the Key Button

Language: Switches the display of the key that is displayed when **Keypad** is selected in Key Browser. These languages are available:
Japanese, **European**, **Central European**, **Baltic**, **Cyrillic**.

Browse: Opens the Key Browser when clicked. Select a key.
For details, refer to Chapter 8 "5.5 Key Browser" on page 8-88.

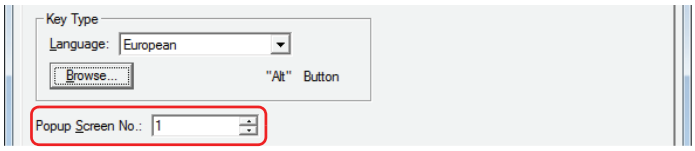
(Key): Displays the name of the key selected using the Key Browser.

- When you select a key, the label for that key is assigned as the Registration Text.
- The function of Key Button will affect on the next scan when the trigger condition is satisfied.

The settings explained below appear depending on the type of key selected.

■ Popup Screen No.

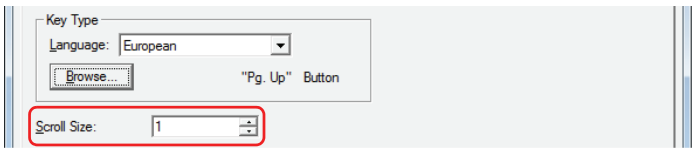
The **Alt** key switches the current Popup Screen used as a Keypad when this button is pressed.
Specify the Popup Screen number to open a Keypad for.
This setting is enabled only if **Alt** was selected using the Key Browser.



■ Scroll Size

Key Buttons **Pg. Up** and **Pg. Dwn** scroll the list up and down, respectively. Key Buttons **Fcs. Up** and **Fcs. Dwn** move the focus up and down, respectively. This settings specifies the number of pages or lines (1 to 1023 lines) to scroll or move the focus per each press of the button.

This setting is enabled only if **Pg. Up**, **Pg. Dwn**, **Fcs. Up**, and **Fcs. Dwn** are selected using the Key Browser.

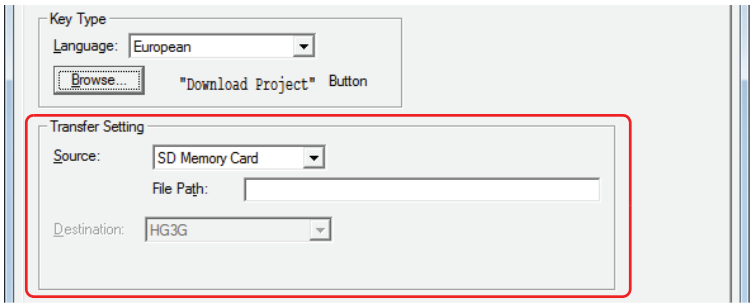


■ Transfer Setting*4

Key Buttons **Download Project**, **Upload Project**, **Copy Files**, **Download PLC Program**, and **Upload PLC Program**, perform the data transfer function specified by their names. These settings specify the source, data to be transfered, and destination.

This setting is enabled only if one of these keys is selected after clicking **Data Transfer** in the Key Browser.

If **Download Project** is selected.

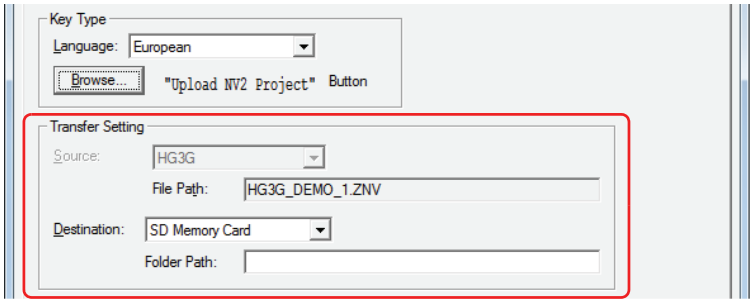


Source: Select the the external memory where the project file to transfer (.ZNV) is stored: **SD Memory Card** or **USB Flash Drive**.

File Path: Specify the path to the project file (.ZNV) to transfer. The maximum number is 247 characters.

Example: Where "HG3G_DEMO_1.ZNV" is a project file saved on the root directory of an SD memory card or USB flash drive:
HG3G_DEMO_1.ZNV

If **Upload Project** is selected.



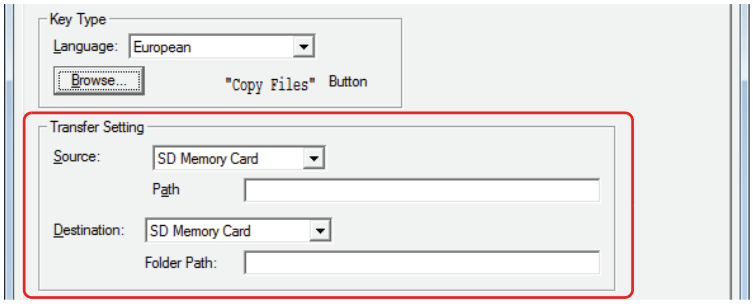
Destination: Specify where to save the project uploaded from MICRO/I. Select the location: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded project file will be saved. The maximum number is 247 characters.

Example: To save it to the folder "Uploaded_Project" on an SD memory card or USB flash drive:
Uploaded_Project

*4 HG2G-5F, HG3G/4G only

If **Copy Files** is selected.



Source: Select the source external memory: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path of the file to be transferred. The maximum number is 247 characters.
Example: Where "Error.wav" is a sound file saved on the root directory of an SD memory card or USB flash drive:
Error.wav

Destination: Select the destination external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the folder path where the file will be transferred. The maximum number is 247 characters.
Example: To save it to the folder "SOUND" inside "HGDATA01" on an SD memory card or USB flash drive:
HGDATA01\SOUND

- If a file name is specified as the source path name, the specified file is copied.
  If a folder name is specified, all of the files and subfolders contained in the folder, and all of the files in the subfolders, are copied.
- The subfolders can be copied up to five levels.
- To prevent copying the subfolders and the files contained in the subfolders, LSM30 must be set to 1 before executing the copy.
- To stop copying files during the copy operation, write 1 to LSM31. However, it will continue to copy the file until it is finished then it will stop copying.

If **Download PLC Program** is selected.

Source: Select the the external memory where the PLC program file to transfer (.ZLD) is stored: **SD Memory Card** or **USB Flash Drive**.

Path: Specify the path to the PLC program file (.ZLD) to be transferred. The maximum number is 247 characters.
Example: Where "LDR_PROGRAM.ZLD" is a PLC program file saved in folder "LDRDATA" of an SD memory card or USB flash drive:
LDRDATA\LDR_PROGRAM.ZLD

Destination: Specify the destination PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the download destination PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the destination PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the destination PLC.

If **Upload PLC Program** is selected.

Source: Specify the source PLC connected to the MICRO/I. The setting varies based on the driver selected for **Host I/F Driver**.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485):

Network Number: Specify the network number of the source PLC.

OpenNet,MicroSmart,SmartAXIS Pro/Lite(Ethernet):

Select from the following method:

Specify Station Number: Specify the station number (0 to 31) of the source PLC. This is the station number set in the **Project Settings** dialog box, on the **Host I/F Network** tab. For 1:1 communication, this is 0.

Specify IP Address: Specify the IP address and port number of the source PLC.

Destination: Specify where to save the PLC program uploaded from the PLC connected to the MICRO/I. Select the type of external memory: **SD Memory Card** or **USB Flash Drive**.

Folder Path: Specify the path to the folder where the uploaded PLC program file will be saved. The maximum number is 247 characters.

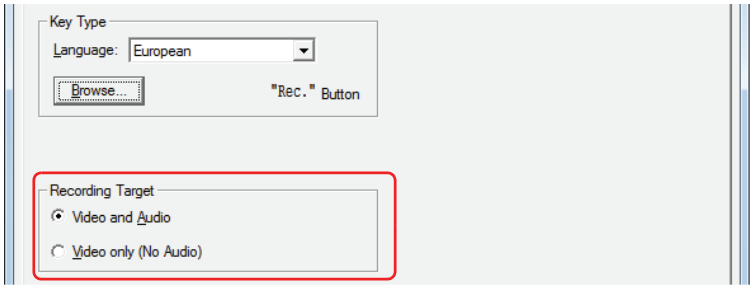
Example: To save it to the folder "Uploaded_Program" on an SD memory card or USB flash drive:
Uploaded_Program

■ Recording Target*5

The recording of images and sound starts. Select the target to record out of the signals input from the device.

Video and Audio: Records images and sound.

Video only (No Audio): Records images only.



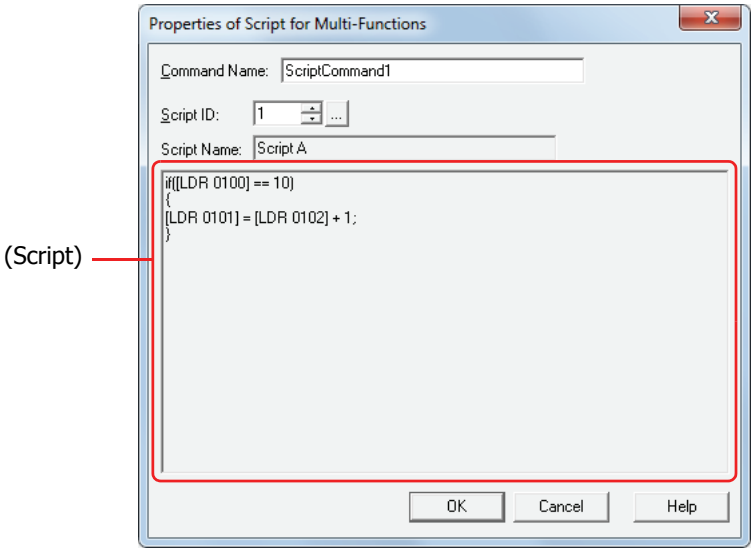
- Movie files cannot be recorded during playback.
- While data is being recorded after an event occurs with the event recording function and while data is being saved to the memory card, recording cannot be executed with parts. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

*5 This is applicable for models with a video interface only.

Properties of Script for Multi-Functions dialog box

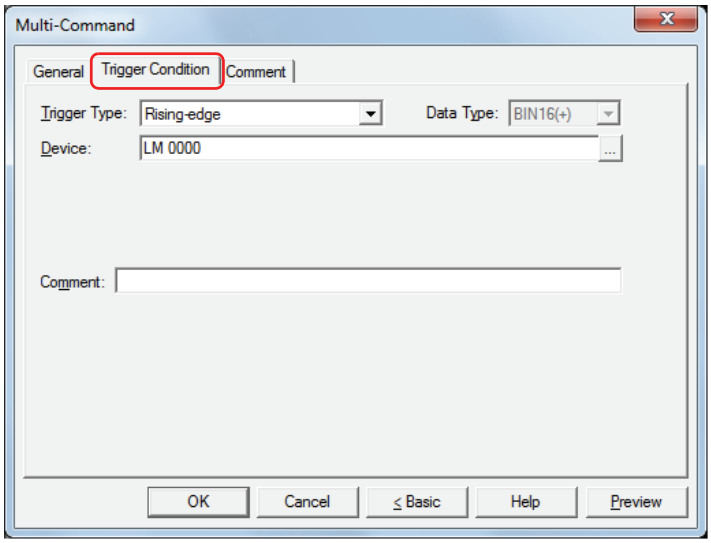
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Sets the script for the Multi-Command.



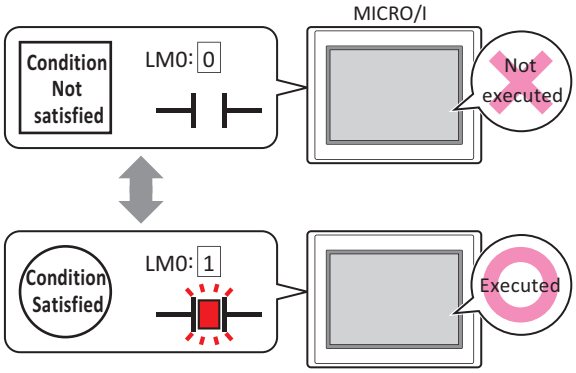
- **Command Name**
  Enter a name for the command. The maximum number is 20 characters.
- **Script ID**
  Specify the script ID (1 to 32000) of the script to operate.
  Script Manager will open when is clicked. Select a script from the script list.
  For details, refer to Chapter 20 "2.2 Script Manager" on page 20-7.
- **Script Name**
  Displays the name of the script selected in Script Manager.
- **(Script)**
  Displays the contents of the script selected in Script Manager.
  Once this area is double clicked, the Script Editor will open and editing can be done.
  For details, refer to Chapter 20 "2.3 Script Editor" on page 20-8.

● **Trigger Condition** Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

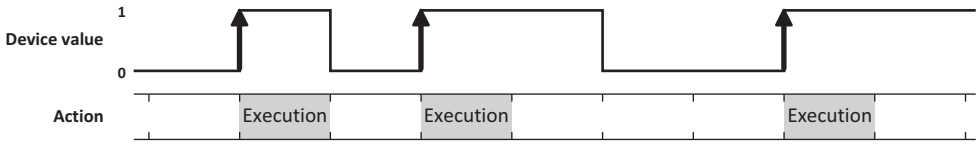
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



■ **Trigger Type**

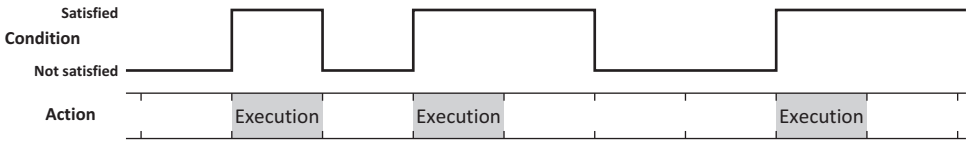
Selects the condition to execute the command from the following.

Rising-edge: Command is executed when device changes from 0 to 1.



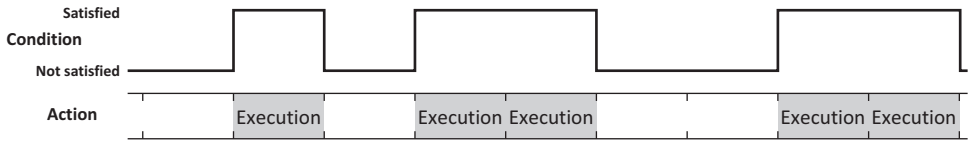
Falling-edge: Command is executed when device changes from 1 to 0.

Satisfy the condition: Command is executed when condition changes from not satisfied to satisfied.



While satisfying the condition:

The command continues being executed while the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **Rising-edge** or **Falling-edge** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **Satisfy the condition** or **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

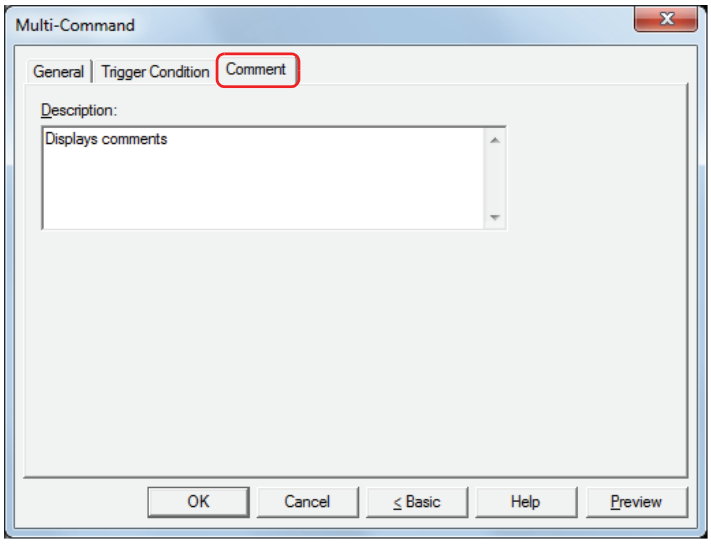
■ **Comment**

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

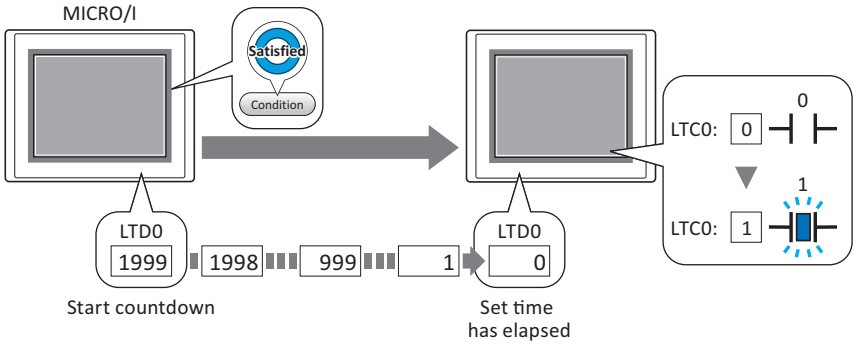
Example: When mousing over the Multi-Command on the editing screen

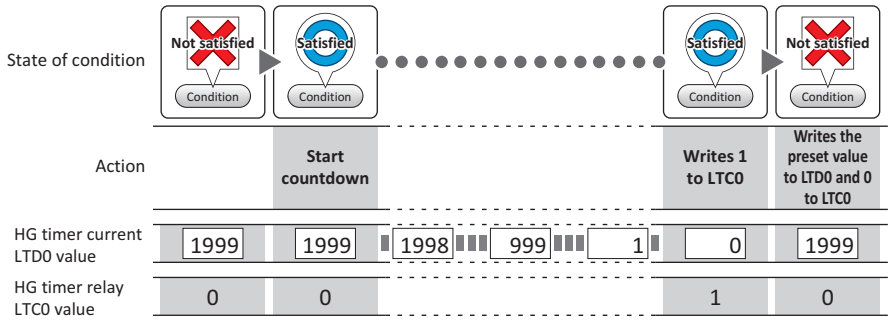
7 Timer

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

7.1 How the Timer is Used

Starts a countdown when the trigger condition is satisfied, and writes 1 to an internal device (HG Timer Relay LTC) once the set time has elapsed.



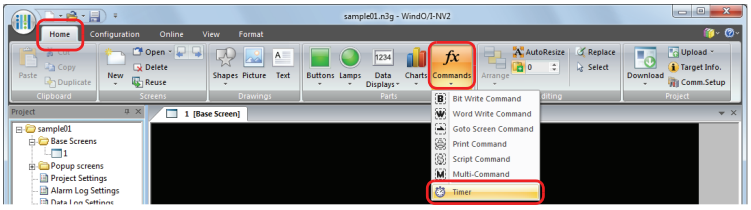


- The HG Timer Relay LTC is an internal device (bit device) that changes to 1 once the time set for the timer has elapsed.
- The HG Timer Current LTD is an internal device (word device) that stores current values for the timer.
- Once switched to the screen that the timer has been placed in, the following values will be given regardless of the whether the trigger condition is satisfied or not satisfied.
  - HG Timer Relay LTC: 0
  - HG Timer Current LTD: Preset Value

7.2 Timer Configuration Procedure

This section describes the configuration procedure for Timers.

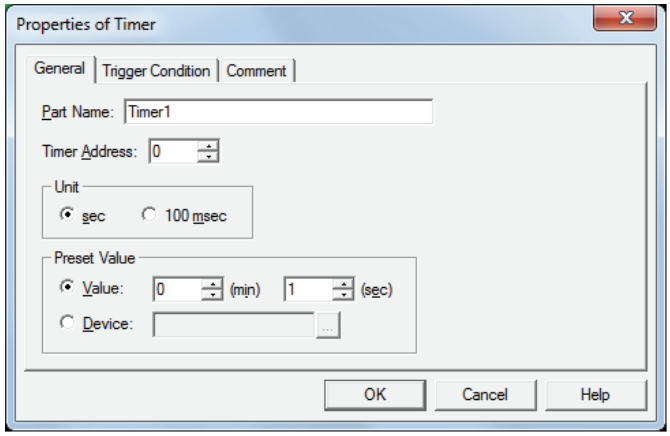
1 On the **Home** tab, in the **Parts** group, click **Commands**, and then click **Timer**.



2 Click a point on the edit screen where you wish to place the Timer.

3 Double-click the dropped Timer and a Properties dialog box will be displayed.

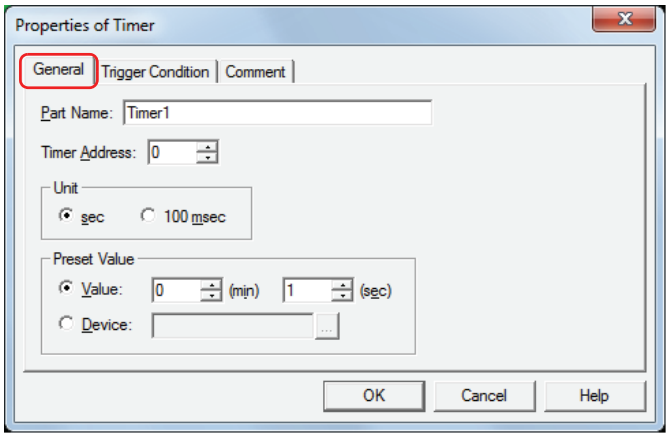
4 Change the settings on each tab as necessary.



7.3 Properties of Timer Dialog Box

This section describes items and buttons in the Properties dialog box.

● General Tab



■ **Part Name**

Enter a name for the part. The maximum number is 20 characters.

■ **Timer Address**

Specifies the HG timer address (0 to 31).

The device type for the HG timer relay is LTC. The device type where the current value is stored is LTD.

Example: When 0 is specified for **Timer Address**

HG Timer Relay: LTC 0

HG Timer Current: LTD 0

■ **Unit**

Select the unit of time from **sec** or **100 msec**.

■ **Preset Value**

Select the data type to use and the enter the preset value.

The preset value is the time from when the timer starts its countdown until 1 is written to the HG Timer Relay LTC.

Value: When selecting **sec** in **Unit**, the preset value is specified with 1 to 65535 (second units) up to a maximum of 1092 minutes 15 seconds.

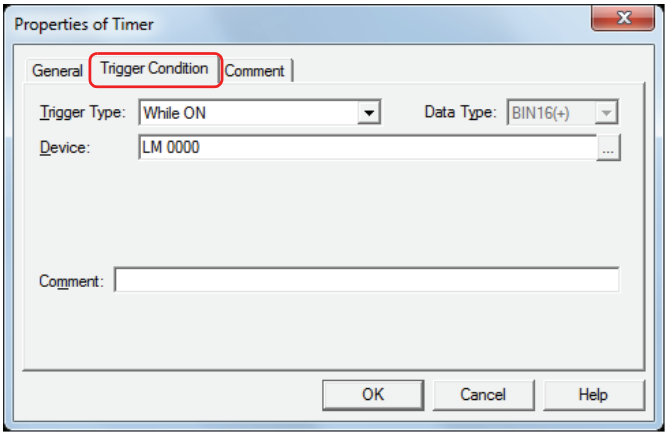
When selecting **100 msec** in **Unit**, the preset value is specified with 1 to 65535 (100 msec units).

Device: Uses word device values.

Specify the Device Address.

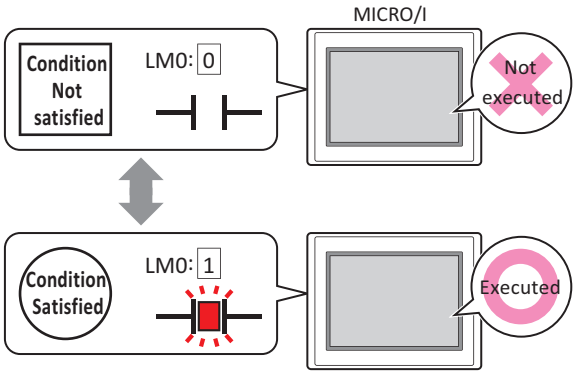
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● **Trigger Condition** Tab



When the condition has been or is satisfied, the command is executed; when not satisfied, the command is not executed.

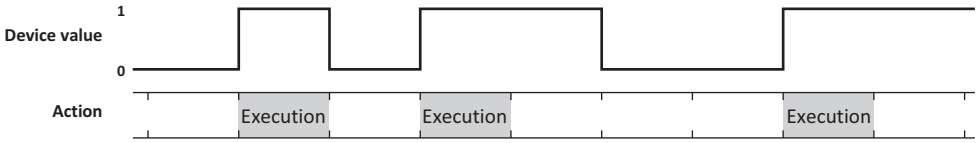
Example: When **Trigger Type** is **Rising-edge** and **Device** is **LM 0**
The command is executed when LM 0 changes from 0 to 1.



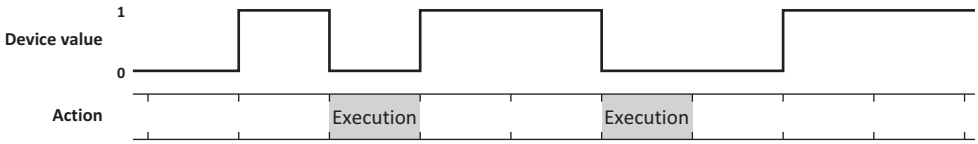
■ **Trigger Type**

Selects the condition to execute the command from the following.

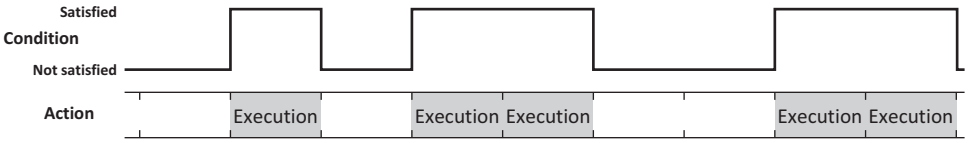
While ON: Command is executed when device is 1.



While OFF: Command is executed when device is 0.



While satisfying the condition:
The command continues being executed while the condition is satisfied.



■ **Data Type**

Selects the data type to be handled by the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Device**

Specifies the bit device or bit of the word device to serve as condition.

Can only be set if **While ON** or **While OFF** is selected as **Trigger Type**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Condition**

Sets the condition formula.

Can only be set if **While satisfying the condition** is selected as **Trigger Type**.

Click ... to display the **Trigger Condition Settings** dialog box. For the conditional expression configuration procedure, refer to Chapter 2 "5.2 Setting Conditional Expressions" on page 2-68.

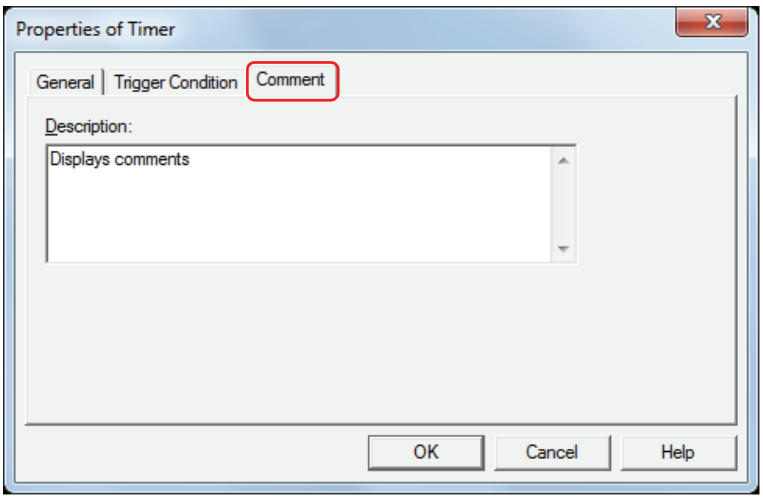
■ **Comment**

Used for entering comments about trigger conditions. The maximum number is 80 characters.

● **Comment** Tab

The **Comment** tab is used to specify the parts arranged on the editing screen, and the popup text displayed when the mouse pointer is placed close to **No.**, **Name**, or **Type** in the object list.

When there are multiple parts of the same shape on the screen, this features makes it possible to distinguish between the parts without displaying the Properties dialog box for each part, by just mousing over the part.



■ **Description**

Used for entering comments about parts. The maximum number is 80 characters.

Example: When mousing over the Timer on the editing screen

Chapter 13 Alarm Log Function

This chapter describes how to configure the Alarm Log function and its operation on the MICRO/I.

1 Overview

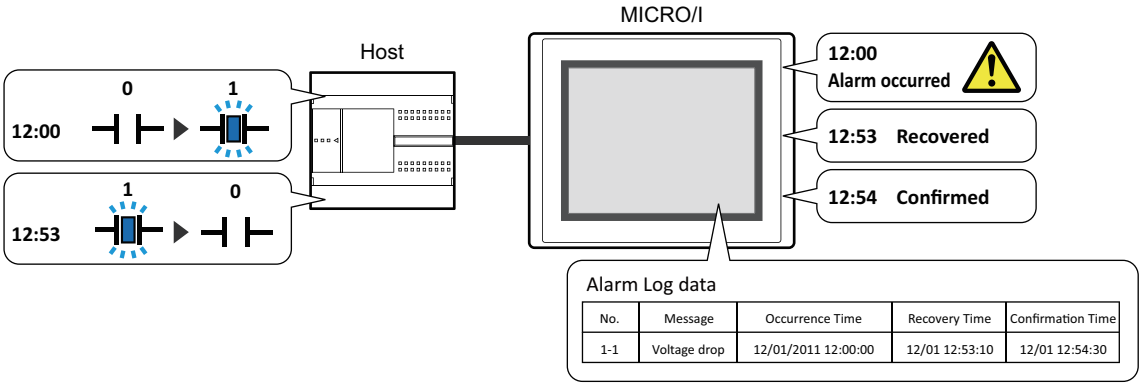
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Alarm Log Function is Used

The Alarm Log function samples the occurrence of alarms and recovery information by monitoring and evaluating the state of devices.

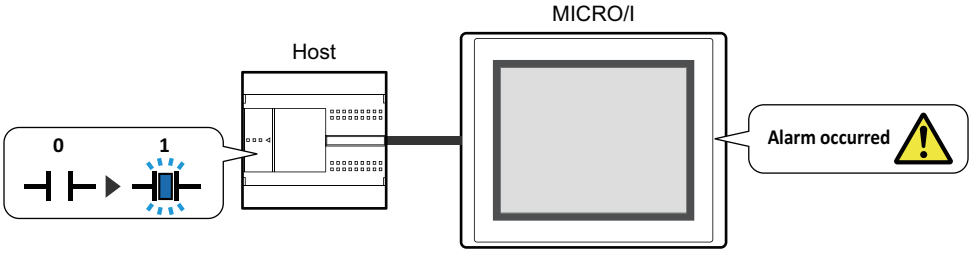
The Alarm Log function can perform the following functions.

- Monitor device states and create Alarm Log data

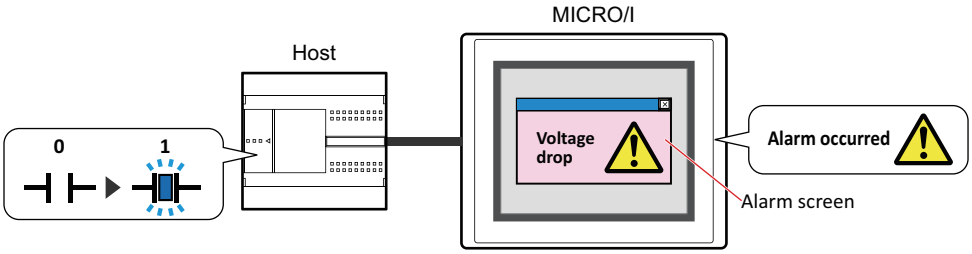


No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:00:00	12/01 12:53:10	12/01 12:54:30

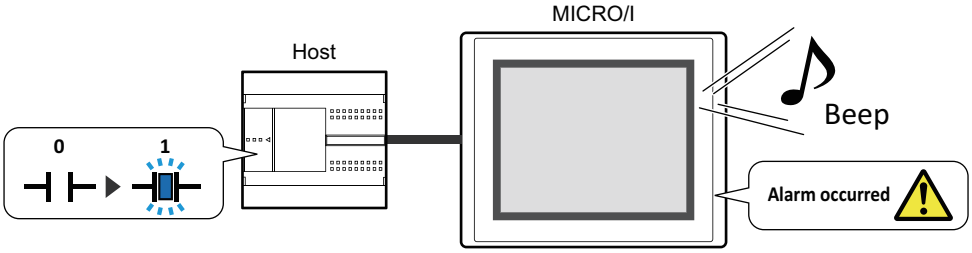
- Monitor device states and detect alarms



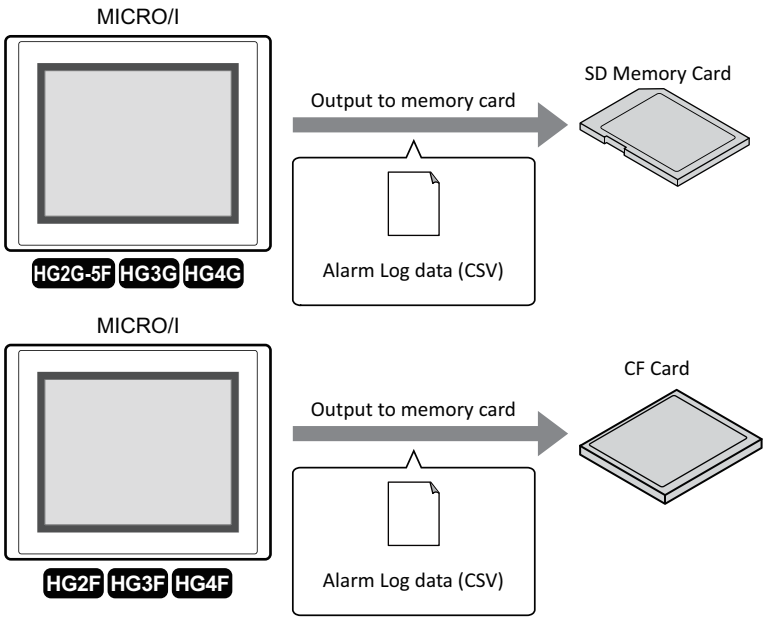
- Display an alarm screen when an alarm occurs



- Sound a beep when an alarm occurs

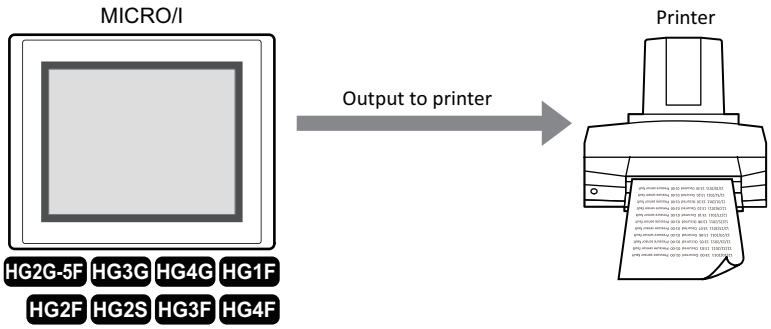


- Output Alarm Log data to the memory card



This function is only supported by models that are equipped with the memory card interface.

- Output Alarm Log data to the printer



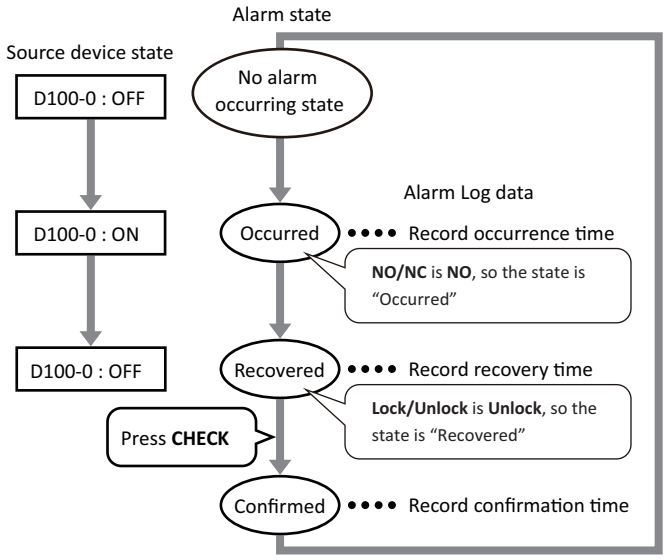
For compatible printers and instructions on how to connect one to the MICRO/I, refer to Chapter 31 "1.3 Connecting a Printer to MICRO/I" on page 31-1.

1.2 Alarm States

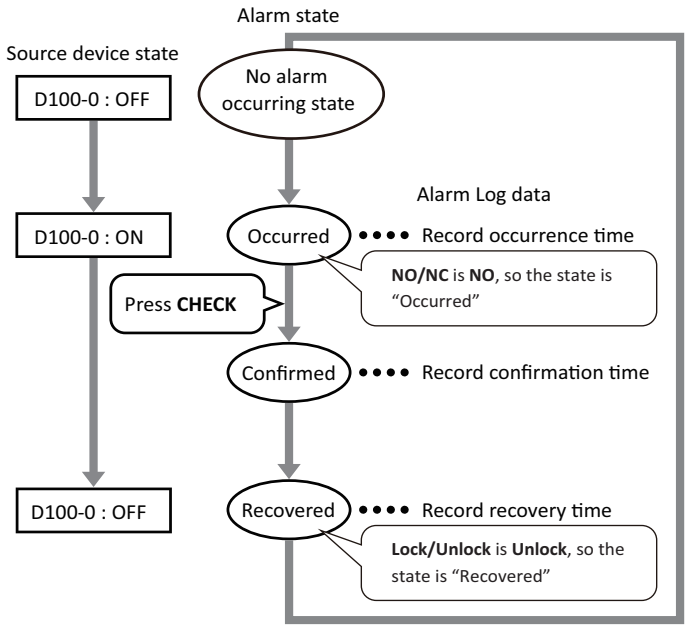
Alarms have three states: occurred, recovered, and confirmed.

Alarm state	Details
Occurred	Indicates that an alarm has occurred. There are two types of alarms that occur. First Alarm: The first alarm that occurs in a state where no alarms have occurred. Second and later: An alarm that has occurred while another alarm is active.
Recovered	Indicates that the alarm that occurred has been recovered from. However, for channels set to lock, the alarm is not recovered from until a key button is pressed (**CHECK** or **All Chk.**).
Confirmed	Indicates the key button **CHECK** or **All Chk.** was pressed.

Example: When the source device (the device to monitor) is D100-0, the error state (when an alarm has occurred) is ON, the channel is set to **Unlock**, and the used key button is **CHECK**
When the source device is ON, the alarm changes to the "Occurred" state. When the source device is OFF, the alarm changes to the "Recovered" state. When **CHECK** is pressed, the alarm changes to the "Confirmed" state.



If **CHECK** is pressed before the source device changes to OFF, the alarm changes to the "Confirmed" state regardless of the state of the source device.



1.3 Sampling Data

Data is sampled each time the alarm occurs, is recovered from, or confirmed.

Example: When the message for channel number 1-1 is "Voltage drop" and the message for channel number 1-2 is "Temperature abnormal"

1

Channel No. 1-1: Alarm occurred (12:50:00)
Channel No. 1-2: No alarm

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	–	–

2

Channel No. 1-1: Alarm (12:50:00)
Channel No. 1-2: Alarm occurred (12:50:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	–	–
1-2	Temperature abnormal	12/01/2011 12:50:10	–	–

3

Channel No. 1-1: Recovered from alarm (12:50:20)
Channel No. 1-2: Alarm (12:50:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	–
1-2	Temperature abnormal	12/01/2011 12:50:10	–	–

4

Channel No. 1-1: **CHECK** pressed (12:50:30)
Channel No. 1-2: Alarm (12:50:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	12/01 12:50:30
1-2	Temperature abnormal	12/01/2011 12:50:10	–	–

5

Channel No. 1-1: Alarm occurred (12:51:00)
Channel No. 1-2: Alarm (12:50:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	12/01 12:50:30
1-2	Temperature abnormal	12/01/2011 12:50:10	–	–
1-1	Voltage drop	12/01/2011 12:51:00	–	–

6

Channel No. 1-1: Alarm (12:51:00)
Channel No. 1-2: **CHECK** pressed (12:52:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	12/01 12:50:30
1-2	Temperature abnormal	12/01/2011 12:50:10	–	12/01 12:52:10
1-1	Voltage drop	12/01/2011 12:51:00	–	–

7

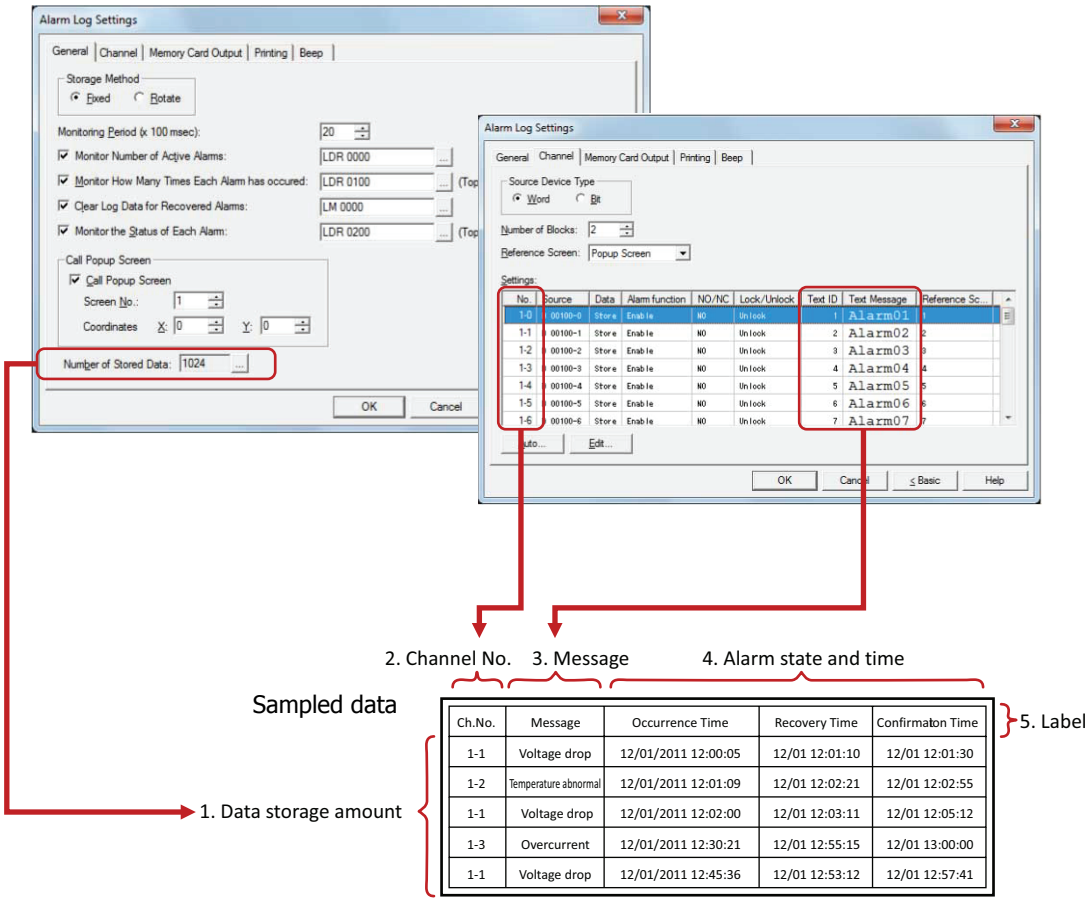
Channel No. 1-1: Alarm (12:51:00)
Channel No. 1-2: Recovered from alarm (12:52:10)

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	12/01 12:50:30
1-2	Temperature abnormal	12/01/2011 12:50:10	12/01 12:53:00	12/01 12:52:10
1-1	Voltage drop	12/01/2011 12:51:00	–	–

1.4 Data Configuration

The sampled data is composed of the channel number, message, alarm state, time, and label.
The relationship between the Alarm Log function settings and the sampled data is as follows.

Alarm Log settings



1. Data storage amount: The amount of data that can be saved in the data storage area. For details, refer to "Data Storage Amount" on page 13-8.

2. Channel No.: Composed of (Block No.)-(Channel No.). The devices to monitor and the conditions for alarm occurrence and recovery are configured in the channels. When the sampled data is output as a CSV file, the displayed label is "Ch.No.".

3. Message: The message displayed when an alarm has occurred.

4. Alarm state and time: The alarm state (occurred, recovered, confirmed) and the time the alarm occurred, was recovered from, and confirmed. When the sampled data is output as a CSV file, the displayed label varies based on the output method.

5. Label: When the sampled data is output as a CSV file, this is the text displayed in the label row. This cannot be changed.

For sampled data, the format for displayed items varies based on the output method.

Batch

Batch output shows the recovery and confirmation time for an alarm that has occurred on a single line.

The labels displayed in the label row are “Ch.No.”, “Message”, “Occurrence Time”, “Recovery Time”, and “Confirmation Time”.

Example: When the message for channel number 1-1 is “Voltage drop” and the message for channel number 1-2 is “Temperature abnormal”

Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:50:00	12/01 12:50:20	12/01 12:50:30
1-2	Temperature abnormal	12/01/2011 12:50:10	--	12/01 12:52:10
1-1	Voltage drop	12/01/2011 12:51:00	--	--

Real Time

Real time output displays the alarm state and the time the alarm became that state on a single line each time an alarm occurs, is recovered from, or is confirmed.

The labels displayed in the label row are “Ch.No.”, “Message”, “State”, and “Time”.

Example: When the message for channel number 1-1 is “Voltage drop” and the message for channel number 1-2 is “Temperature abnormal”

Ch.No.	Message	State	Time
1-1	Voltage drop	Occurred	12/01/2011 12:50:00
1-2	Temperature abnormal	Occurred	12/01/2011 12:50:10
1-1	Voltage drop	Recovered	12/01/2011 12:50:20

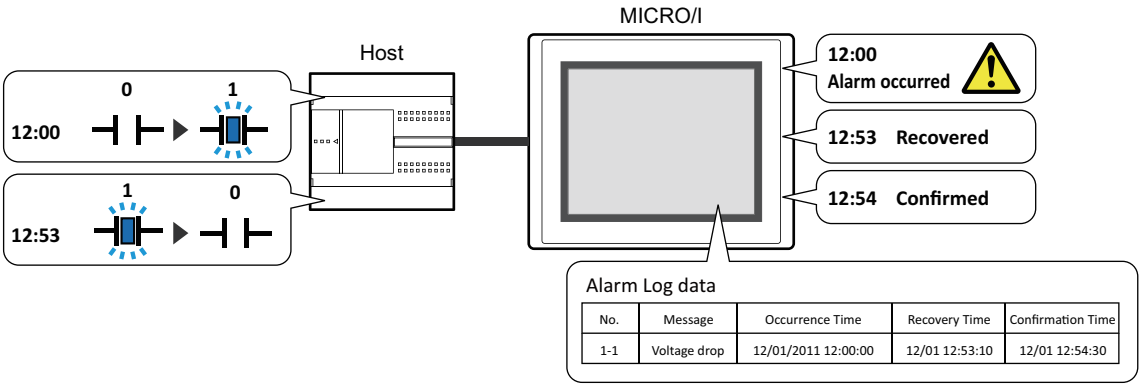
1.5 Saving and Deleting Data

● Saving Data

You can select whether or not to save the sampled data in the data storage area. The method to save data is configured on the **Channel** tab in the Alarm Log Settings dialog box.

When Saving Data to the Data Storage Area

Select **Store** under **Data** in the Auto-Setup dialog box or in the Individual Settings dialog box.

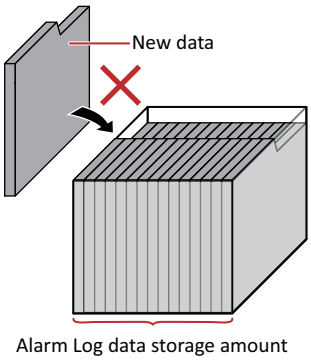


No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:00:00	12/01 12:53:10	12/01 12:54:30

If the number of active alarms exceeds the Alarm Log data storage amount set for the data storage area, the data is processed with either of the following methods.

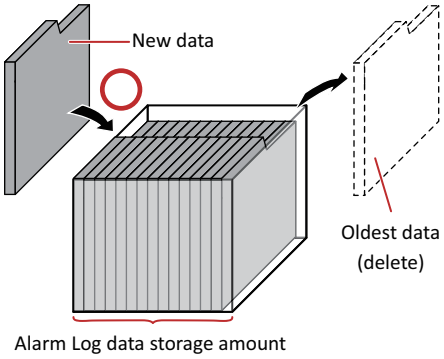
■ **Fixed**

If the saved data exceeds the Alarm Log data storage amount, the new data is not saved.



■ **Rotate**

If the saved data exceeds the Alarm Log data storage amount, the oldest data is deleted and the new data is saved.



When the backup battery is depleted and for the HG2G-5ST22VF-*, the data in the Alarm Log is erased when the MICRO/I is turned off.

Data Storage Amount

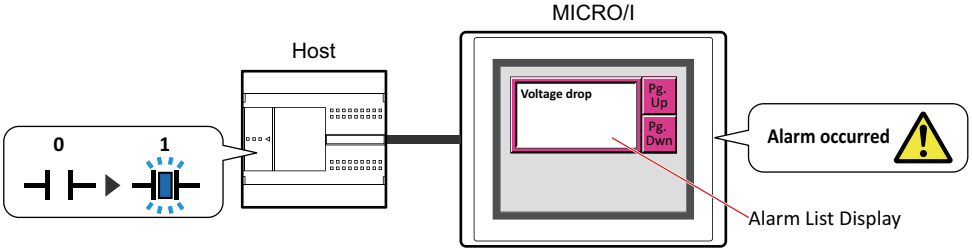
The maximum amount of data that can be saved in the data storage area is as follows.

Model	Maximum amount of data that can be saved in the data storage area
HG2G-S/-5S	5,520
HG2G-5F, HG3G/4G	11,660
HG1F/2F/2S/3F/4F	1,024

When Not Saving Data to the Data Storage Area

Select **No Store** under **Data** in the Auto-Setup dialog box or in the Individual Settings dialog box.

Use this option to monitor a device state and display only detected active alarms on the Alarm List Display.



● Deleting Data

The method to delete sampled data from the data storage area is as follows.

- On the **Online** tab in WindO/I-NV2, click the arrow under **Clear**, and click **All** or **Alarm Log Data**. For details, refer to Chapter 24 "4 Clear" on page 24-26.
- For the HG2G-S/-5S/-5F and the HG3G/4G, in the System Mode, on the System Menu screen, press **Initial Setting**, **Initialize**, **Alarm Log** in order.
  For the HG1F/2F/2S/3F/4F, in the System Mode, on the System Menu screen, press **Initial Setting**, **Initialize**, **Alarm** in order.

1.6 Using Data and Detected Alarms

The saved data and detected alarms can be used in the following ways.

● Using Saved Data

The saved data can be used in the following ways.

Alarm Log data

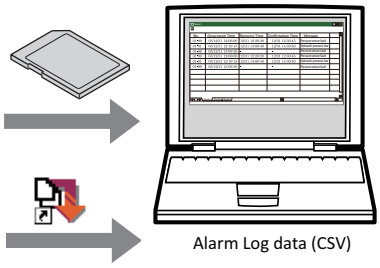
Ch.No.	Message	Occurrence Time	Recovery Time	Confirmation Time
1-1	Voltage drop	12/01/2011 12:00:05	12/01 12:01:10	12/01 12:01:30
1-2	Temperature abnormal	12/01/2011 12:01:09	12/01 12:02:21	12/01 12:02:55
1-1	Voltage drop	12/01/2011 12:02:00	12/01 12:03:11	12/01 12:05:12
1-3	Overcurrent	12/01/2011 12:30:21	12/01 12:55:15	12/01 13:00:00
1-1	Voltage drop	12/01/2011 12:45:36	12/01 12:53:12	12/01 12:57:41

To use with the MICRO/I

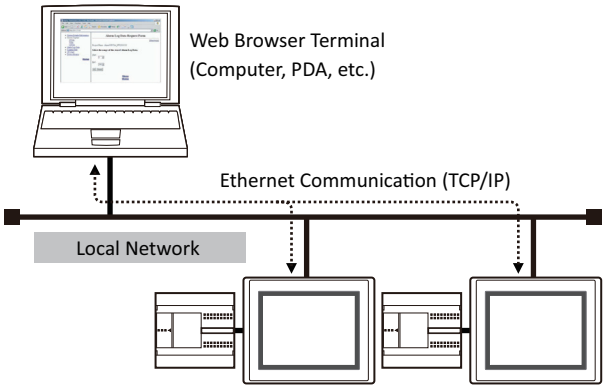
To use with devices other than the MICRO/I

- Display data with the Alarm Log Display
  Display Alarm Log data with the Alarm Log Display.
  For details, refer to Chapter 10 "8 Alarm Log Display" on page 10-118.

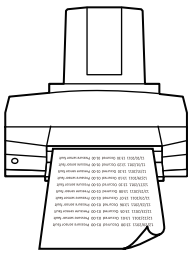
- Save to and read from a memory card
  Output data from the MICRO/I to the memory card as a CSV file and use it on a PC.
  For details, refer to "4.4 Saving Data as a CSV File" on page 13-38.
- Upload the data with the WindO/I-NV2 utility Downloader
  Use the uploaded data as a CSV file on a PC.
  For details on Downloader, refer to the Downloader manual.



- Access the data with the web server function*1
  You can access the data in internal memory or on the memory card inserted in the MICRO/I.
  For details, refer to Chapter 27 "2.7 Data Display" on page 27-20.



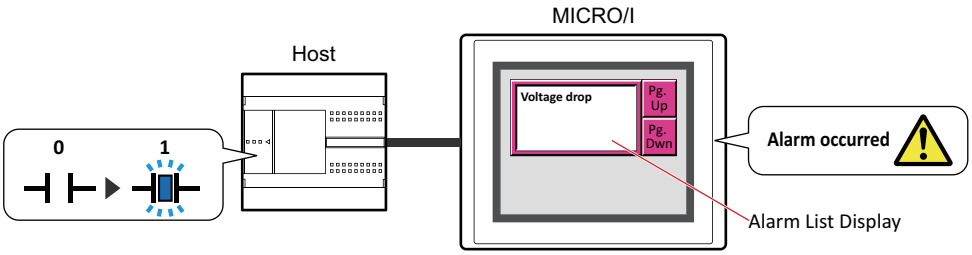
- Print data with the printer
  Print Alarm Log data with the printer connected to the MICRO/I.
  For details, refer to Chapter 31 "Printer" on page 31-1



*1 HG3F/4F only

● Using Detected Alarms

- Display alarms with the Alarm List Display
  Display detected alarms with the Alarm List Display.
  For details, refer to "4.2 Displaying Registered Messages with the Alarm List Display According to the Active Alarm" on page 13-32.



2 Alarm Log Function Configuration Procedure

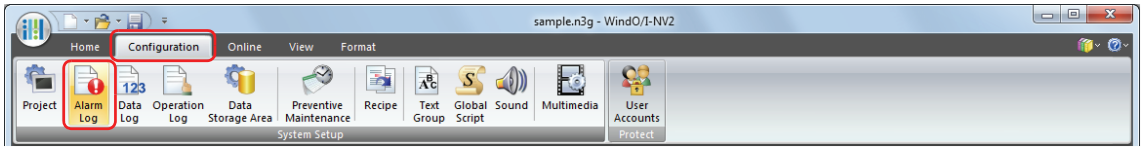
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Alarm Log function.

2.1 Configuring the Devices to Monitor and the Alarm Detection Condition

1 On the **Configuration** tab, in the **System Setup** group, click **Alarm Log**.

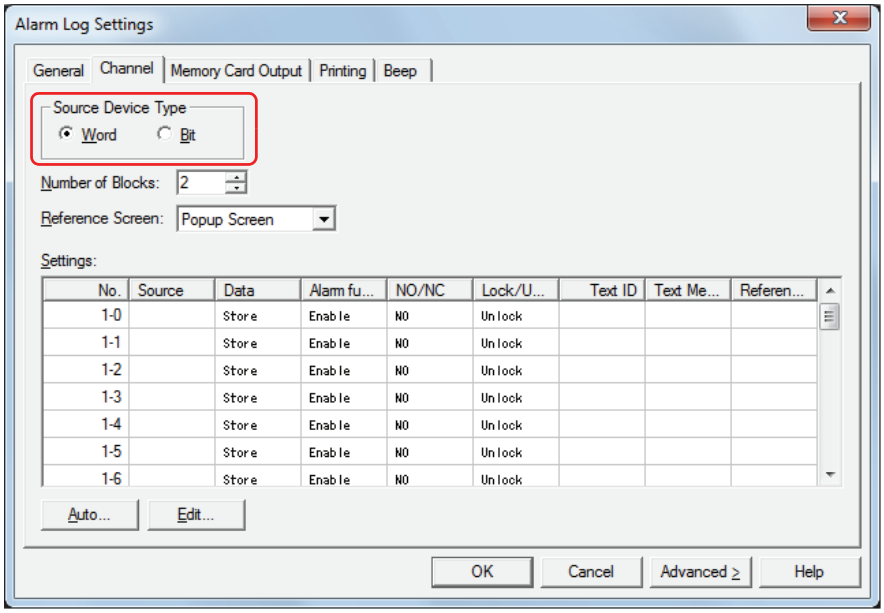
The Alarm Log Settings dialog box is displayed.



2 Select the type of device to monitor under **Source Device Type** on the **Channel** tab.

If you select **Word**, devices are configured per block.

If you select **Bit**, devices are configured per channel.



3 Set the number of blocks to manage in **Number of Blocks**.

1 channel is used for 1 device to monitor. 1 block is 16 channels.

The number of blocks that can be set varies based on the **Source Device Type** setting and the MICRO/I model.

4 Select the reference screen type in **Reference Screen**.

The reference screen is associated with the channel. This screen is displayed when the key button **Ref.** is pressed.

If a reference screen is not displayed, select **Not Use**.

5 To batch register all channels, click **Auto**. To individually register each channel, click **Edit**.

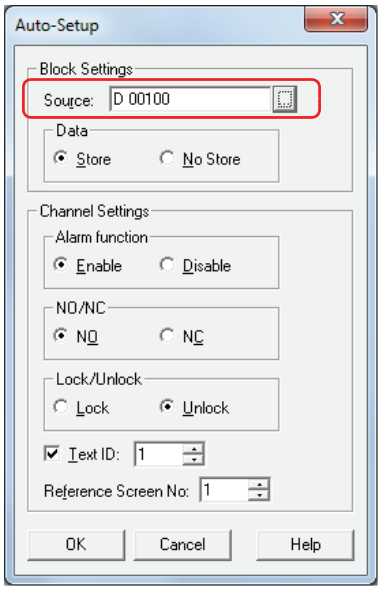
An example when **Auto** is clicked is described here.

The Auto-Setup dialog box is displayed.

6 Specify the device to monitor in **Source**.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

For the Auto-Setup dialog box, the device addresses are sequentially set starting with the specified device address from the highlighted row in **Settings**.



7 Under **Data**, select whether or not to save Alarm Log data in the date storage area.

To display Alarm Log data on the MICRO/I or to output the data to a file, select **Store**.

If you select **No Store**, Alarm Log data is not created, but device states are monitored.

8 Under **Alarm function**, select whether or not to use the alarm function.

For channels with **Disable** selected, device states are not monitored and Alarm Log data is not created.

9 Under **NO/NC**, select the alarm detection condition.

If you select **NO**, the alarm occurs when the monitored bit changes from 0 to 1. If you select **NC**, the alarm occurs when the monitored bit changes from 1 to 0.

10 Under **Lock/Unlock**, select whether or not to automatically recover based on the state of the monitored bit.

If you select **Unlock**, the alarm is automatically recovered from based on the bit state when the monitored bit becomes the normal state.

If you select **Lock**, even if the monitored bit becomes the normal state, the alarm remains active until the key button **CHECK** is pressed.

11 Select the **Text ID** check box and specify the message to display when the alarm occurs as a Text Manager ID number (1 to 32000).

Number of blocks x 16 (number of channels) text IDs are used starting from the set ID number.

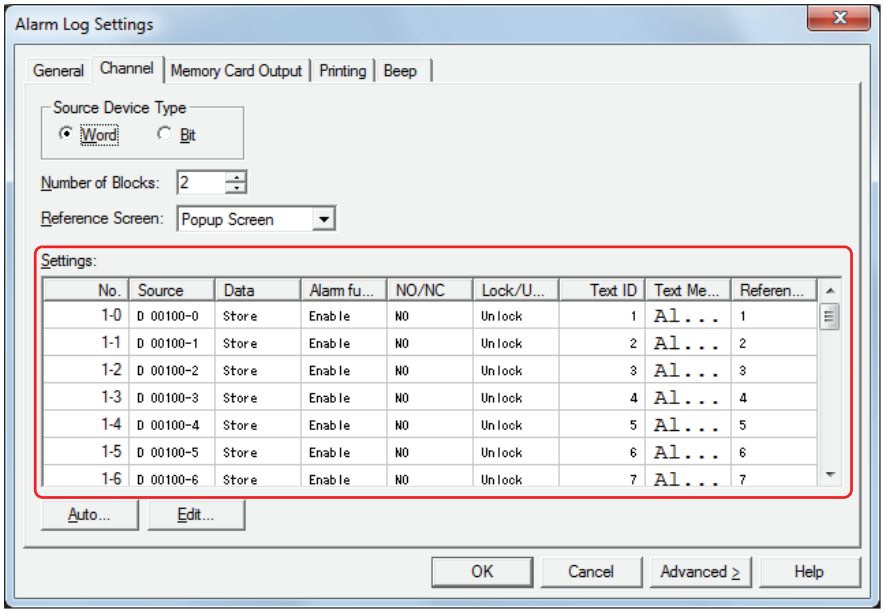
12 Specify the screen number (1 to 3000) to display when the key button **Ref.** is pressed in **Reference Screen No**.

Number of blocks x 16 (number of channels) screens are used starting from the screen number.

This option can only be configured when **Base Screen** or **Popup Screen** is selected in **Reference Screen**.

13 Click **OK**.

The devices to monitor and the messages are batch configured and displayed in **Settings**.



14 Click **OK**.

The Alarm Log Settings dialog box closes.

This concludes configuring the devices to monitor and the alarm detection condition.

Next, configure the functions to execute using saved data and detected alarms.

☞ "4.1 Displaying Saved Data with the Alarm Log Display" on page 13-30
☞ "4.2 Displaying Registered Messages with the Alarm List Display According to the Active Alarm" on page 13-32
☞ "4.3 Sounding a Beep when an Alarm has Occurred" on page 13-36
☞ "4.4 Saving Data as a CSV File" on page 13-38

3 Alarm Log Settings Dialog Box

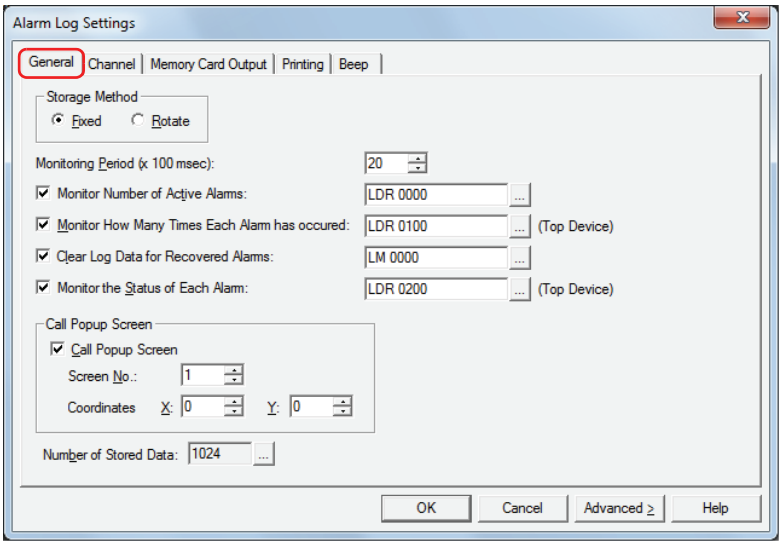
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the Alarm Log Settings dialog box.

3.1 Alarm Log Settings Dialog Box

● General Tab

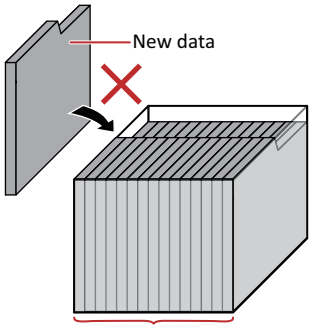
The **General** tab is used to configure what kind of data to sample when an alarm occurs and the methods for saving and deleting the sampled data.



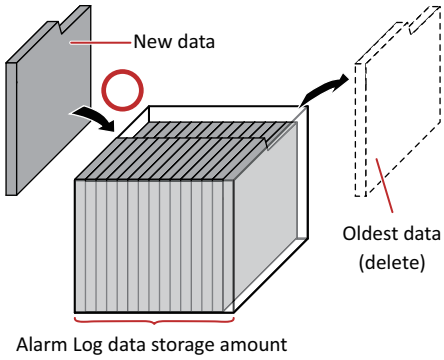
■ Storage Method

Selects the data processing method when the number of active alarms exceeds the Alarm Log data storage amount set for the data storage area.

Fixed: If the saved data exceeds the Alarm Log data storage amount, the new data is not saved.



Rotate: If the saved data exceeds the Alarm Log data storage amount, the oldest data is deleted and the new data is saved.



Monitoring Period (x 100 msec)

Specifies the period to write the state of the monitored device to the MICRO/I (6 to 500 (100 ms units)).

Monitor Number of Active Alarms

Select this check box to count the number of active alarms.

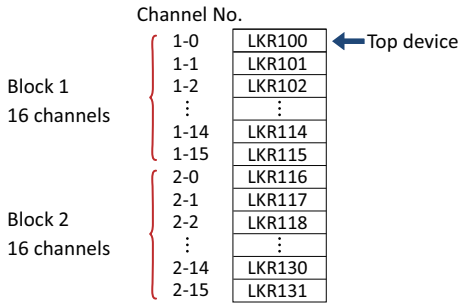
(Destination Device): Specifies a word device to write the number of active alarms.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Monitor How Many Times Each Alarm has occurred

Select this check box to count the number of alarms that has occurred per channel.

(Top Device): Specifies a word device to write the number of alarms that has occurred. Number of blocks x 16 (number of channels) addresses are used starting from the set device address.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the number of blocks is 2 and LKR 100 is specified as the start device
The number of alarms that has occurred for channel number 1-0 is saved in LKR 100.
The number of alarms that has occurred for channel 1-1 is saved in LKR 101, and this pattern continues up to LKR 131 where the number of alarms that has occurred for channel number 2-15 is saved.



- If you specify HG keep registers (LKR) as the destination word device, the number of alarms that has occurred is retained even when the MICRO/I power is turned off.
- The amount of Alarm Log data saved in the data storage area with the Alarm Log function is stored in HG special register LSD 57.

- To monitor the number of alarms that has occurred, number of blocks x 16 (number of channels) devices are required from the set start device. If the destination device does not exist, "Device range error" occurs on the MICRO/I.
- If the values of the devices that are counting the number of alarms that has occurred are overwritten by another process, the alarms cannot be accurately counted.

Clear Log Data for Recovered Alarms

Select this check box to delete recovered data out of the saved Alarm Log data.

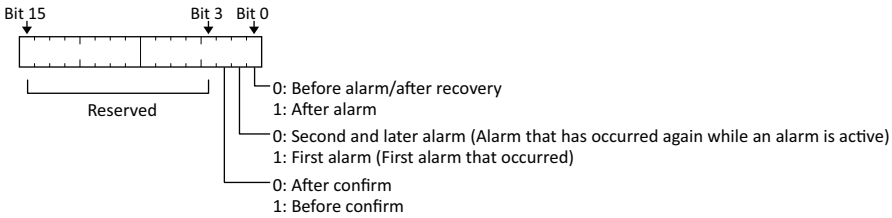
(Trigger Device): Specifies the bit device or bit of the word device to serve as condition to delete data. The recovered data is deleted when the value of the configured device changes from 0 to 1. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Monitor the State of Each Alarm

Select this check box to check the alarm state per channel.

(Top Device): Specifies a word device to write the alarm state. Number of blocks x 16 (number of channels) addresses are used starting from the set device address.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The following values are written to the bits depending on the alarm state.



Call Popup Screen

These settings configure the popup screen to display when an alarm occurs. The popup screen displayed when an alarm occurs is called the alarm screen.

Call Popup Screen:	Select this check box to display the alarm screen when an alarm occurs.
Screen No.:	Specifies the alarm screen number (1 to 3015) to display when an alarm occurs.
Coordinates X, Y:	Specifies the coordinates to display the alarm screen. With the upper-left corner of the screen as the origin, the upper-left corner of the alarm screen is the X and Y coordinates. The units and range for the display coordinates is as follows. HG2G-S/-5S/-5F, HG3G/4G, HG1F: Specify the coordinates in 1 dot units. X: 0 to (base screen horizontal size - 1) Y: 0 to (base screen vertical size - 1) HG2F/2S/3F/4F: Specify the coordinates in 20 dot units. X: 0 to (base screen horizontal size - 20) Y: 0 to (base screen vertical size - 20)

Number of Stored Data

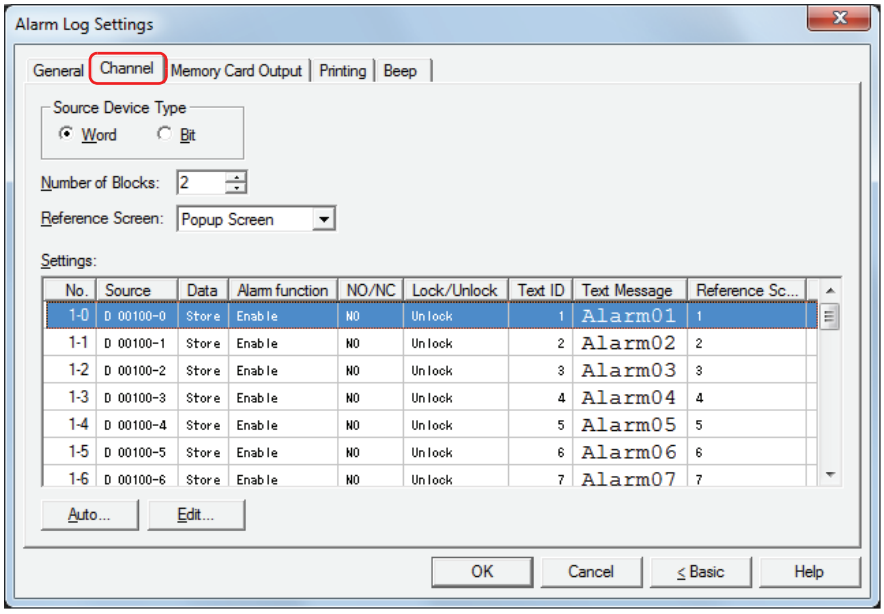
Specifies the maximum amount of Alarm Log data saved in the data storage area. Data is saved up to the set amount. The maximum amount of data that can be saved in the data storage area is as follows.

HG2G-S/-5S:	5,520
HG2G-5F, HG3G/4G:	11,660
HG1F/2F/2S/3F/4F:	1,024

Click ... to open the Data Storage Area Management dialog box. You can change the allocation of data storage area memory in the Data Storage Area Management dialog box. For details, refer to Chapter 16 “Data Storage Area” on page 16-1.

● **Channel** Tab

The **Channel** tab is used to configure the devices to monitor and the alarm detection condition.



■ **Source Device Type**

Selects the type of device to monitor.

Word: Uses a word device. Devices are configured per block.

Bit: Uses a bit device. Devices are configured per channel.

■ **Number of Blocks**

Configures the Alarm Log data in block units. The number of blocks that can be set varies based on the **Source Device Type** setting and the MICRO/I model.

HG2G-S/-5S/-5F, HG3G/4G: 0 to 128 for **Word**, 0 to 8 for **Bit**

HG1F/2F/2S/3F/4F: 0 to 64 for **Word**, 0 to 7 for **Bit**

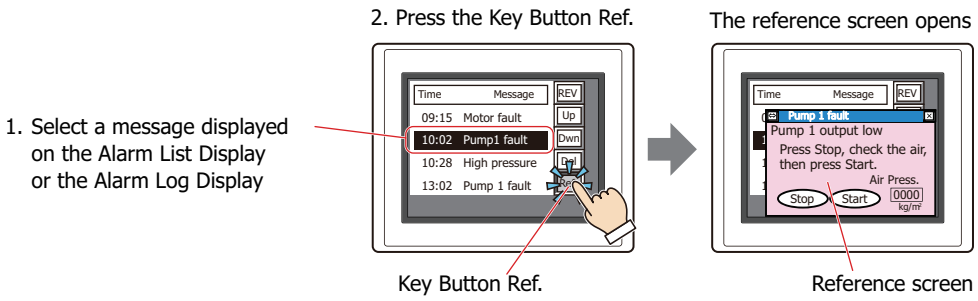
1 block is composed of 16 channels. 1 device can be monitored for each channel. The maximum number of devices that can be monitored is 16 for each block.

■ **Reference Screen**

Select the type of reference screen from the following items.

Base Screen, **Popup Screen**, **Not Use**

The reference screen is displayed when a message is selected on the Alarm List Display or the Alarm Log Display and the key button **Ref.** is pressed. It is the base screen or popup screen associated with each channel.



Settings

The Alarm Log settings for each channel are edited here.

No.:	Displayed as (Block No.)-(Channel No.). Double clicking the cell opens the Individual Settings dialog box.
Source:	Shows the bit device or bit of the word device to monitor. Double clicking the cell opens the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Data:	Shows whether or not to save Alarm Log data in the date storage area. Double clicking the cell switches between **Store** and **No Store**.
Alarm function:	Shows whether or not the alarm function is used. Double clicking the cell switches between **Enable** and **Disable**. Channels switched to **Disable** cannot be configured. Device states are not monitored and Alarm Log data is not created.
NO/NC:	Shows the alarm detection condition. Double clicking the cell switches between **NO** and **NC**.
Lock/Unlock:	Shows whether or not to automatically recover based on the state of the monitored bit. Double clicking the cell switches between **Lock** and **Unlock**.
Text ID:	Shows the Text Manager ID number (1 to 32000) to use for the message displayed when an alarm occurs. Double clicking the cell allows you to specify the Text Manager ID number.
Text Message:	Shows the text for the specified text ID. Double clicking the cell opens the Text Manager.
Reference Screen No.:	Shows the screen number to display when the key button **Ref.** is pressed. Double clicking the cell opens the Individual Settings dialog box. This option can only be configured when **Base Screen** or **Popup Screen** is selected in **Reference Screen**.

Auto

Batch registers or changes the settings for all the channels.

Click this button to open the Auto-Setup dialog box. The Auto-Setup dialog box settings are reflected in all the channels.

For details, refer to "Auto-Setup Dialog Box and Individual Settings Dialog Box" on page 13-19.

Edit

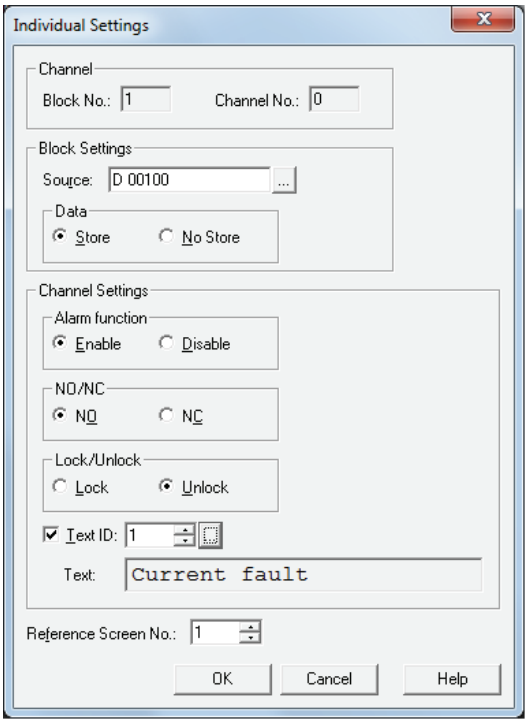
Registers or changes the settings for the selected channel.

Select a channel and click this button to open the Individual Settings dialog box. The settings for the selected channel are reflected in the Individual Settings dialog box.

For details, refer to "Auto-Setup Dialog Box and Individual Settings Dialog Box" on page 13-19.

Auto-Setup Dialog Box and Individual Settings Dialog Box

With the Auto-Setup dialog box, the Alarm Log settings for all channels are batch registered or changed.
With the Individual Settings dialog box, the Alarm Log settings for the selected channel are registered or changed.



■ **Channel**[*1]

Shows the block number and the channel number for the selected channel.

Block No.: Shows the block number for the channel selected in **Settings**.

Channel No.: Shows the channel number for the channel selected in **Settings**.

■ **Block Settings**

Configures **Source** and **Data** in block units.

Source: For the Auto-Setup dialog box, the device addresses are sequentially set from block number 1-channel number 1, starting with the specified device address.

For the Individual Settings dialog box, if **Source Device Type** on the **Channel** tab is **Word**, the 16 channels for the block selected at the start of the specified device address are batch configured. For **Bit**, the selected channel is individually configured.

Click ... to open the Device Address Settings dialog box where you can edit the device address. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Data: Selects whether or not to save Alarm Log data in the date storage area.

For the Auto-Setup dialog box, all the channels are batch configured.

For the Individual Settings dialog box, the 16 channels for the selected block are batch configured.

Store: Alarm Log data can be displayed on the MICRO/I or output to file.

No Store: Alarm Log data is not created, but device states are monitored.

*1 Individual Settings dialog box only

Channel Settings

The trigger condition for the channel is configured here.

Alarm function: Selects whether or not to use the alarm function.

- Enable: Monitors the state of the device configured for the channel and samples the alarm information.
- Disable: Does not monitor the state of the device. No Alarm Log data is created.

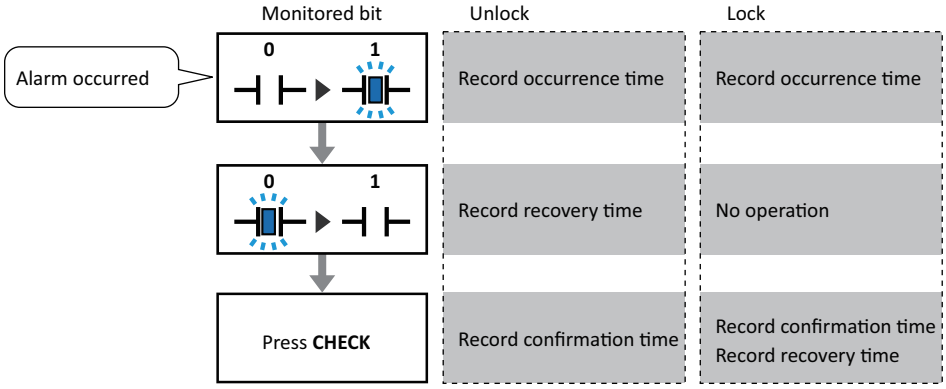
NO/NC: Selects the alarm detection condition.

- NO: The alarm occurs when the monitored bit changes from 0 to 1.
- NC: The alarm occurs when the monitored bit changes from 1 to 0.

Lock/Unlock: Selects whether or not to automatically recover based on the state of the monitored bit.

- Lock: Even if the monitored bit returns the normal state, the alarm remains active until the key button **CHECK** is pressed.
- Unlock: The alarm is automatically recovered from based on the bit state when the monitored bit returns the normal state.

Example: When **NO/NC** is **NO**



The display on the Alarm List Display disappears when the alarm is recovered from, regardless of the **Lock/Unlock** setting. To keep displaying the alarm until **CHECK** is pressed, use the Alarm Log Display.

Text ID: To use text registered in Text Manager as the message to display when an alarm occurs, select this check box and specify the Text Manager ID number to use as the message. Number of blocks x 16 (number of channels) text IDs are used starting from the set ID number.

Click ... to open Text Manager where you can edit the text.

Text: Shows the text for the specified text ID.

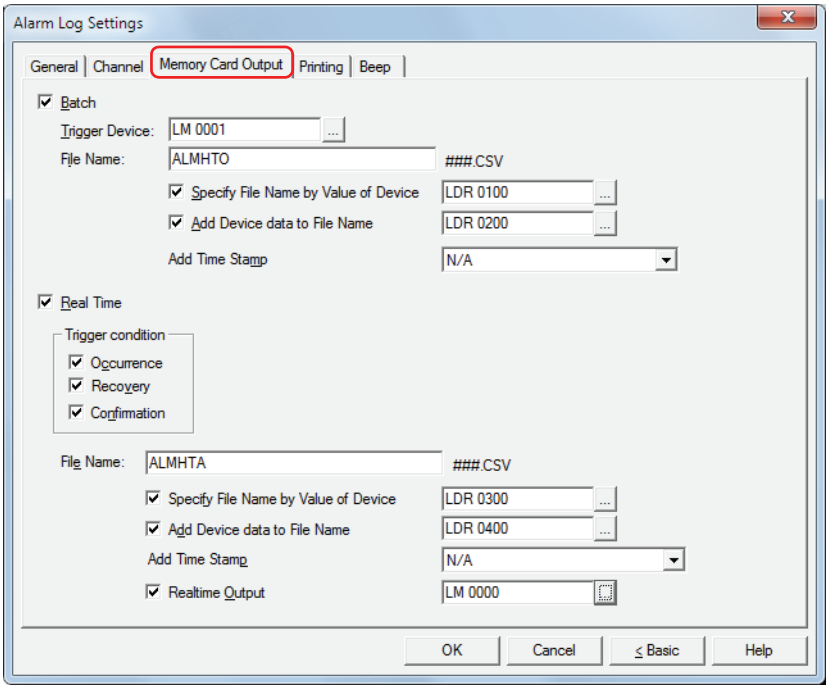
Reference Screen No.: Specifies the screen number (1 to 3000) to display when the key button **Ref.** is pressed. Number of blocks x 16 (number of channels) screens are used starting from the screen number.

This option can only be configured when **Base Screen** or **Popup Screen** is selected in **Reference Screen**.

● **Memory Card Output** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Memory Card Output** tab is used to configure whether or not to output saved data to the memory card.



The output data is stored in the following folder on the memory card.

HG2G-5F, HG3G/4G: \Memory card folder\ALARMLOG

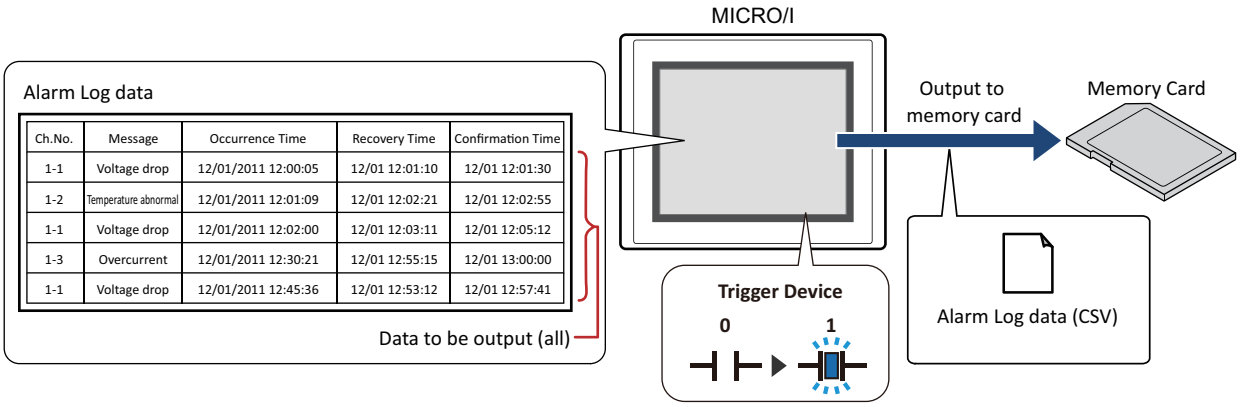
HG2F/3F/4F: \Memory card folder\ALARM

The default memory card folder name is "HGDATA01". For details, refer to Chapter 30 "1.5 Setting the Memory Card Folder" on page 30-16.

Sampled data after starting output to the memory card is not included in the output data.

Batch

Select this check box to batch output all the sampled data to the memory card.



All the data is saved on the memory card when the trigger devices changes from 0 to 1. If a file with the same name already exists on the memory card, that file is overwritten. The maximum amount of output data is the amount configured by the data storage area.

> Output stops if there is insufficient free space on the memory card. Memory card error information is stored in HG special register LSD42.

Trigger Device: Specifies the bit device or bit of the word device to serve as condition for batch output. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Data is output to file when the trigger device changes from 0 to 1.

File Name: Enter the file name for the output data or shows the file name.

HG2G-5F, HG3G/4G: The default is "ALMHTO.CSV". To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

HG2F/3F/4F: The file name is "ALMHTO.CSV". This cannot be changed.

Specify File Name by Value of Device*1*2:

Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).

The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

(File Name Device)	LDR100	←	'I' 'D'	4844(Hex)
	LDR101	←	'E' 'C'	4543(Hex)
	LDR102	←	(NULL)	0000(Hex)

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Add Device data to File Name*1:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: When **File Name** is "ALMHTO01" and the value of the device configured by (File Name Device) is 123, the file name is "ALMHTO01123.CSV".

Add Time Stamp*1*2:

Selects the format of the output date and time to add to the file name for the output data.

None, **YY**, **YY+MM**, **YY+MM+DD**, **YY+MM+DD+HH**, **YY+MM+DD+HH+MM**, **YY+MM+DD+HH+MM+SS**

The format is YYMMDD_TTMMSS (YY: year, MM: month, DD: day, HH: hour, MM: minute, SS: second).

Example: **File Name** is "ALMHTO01" on September 15 2013 at 23:30:50

YY:	ALMHTO01_13
YY+MM:	ALMHTO01_1309
YY+MM+DD:	ALMHTO01_130915
YY+MM+DD+HH:	ALMHTO01_130915_23
YY+MM+DD+HH+MM:	ALMHTO01_130915_2330
YY+MM+DD+HH+MM+SS:	ALMHTO01_130915_233050

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device***1*2.
\ / : ; * ? " < > |

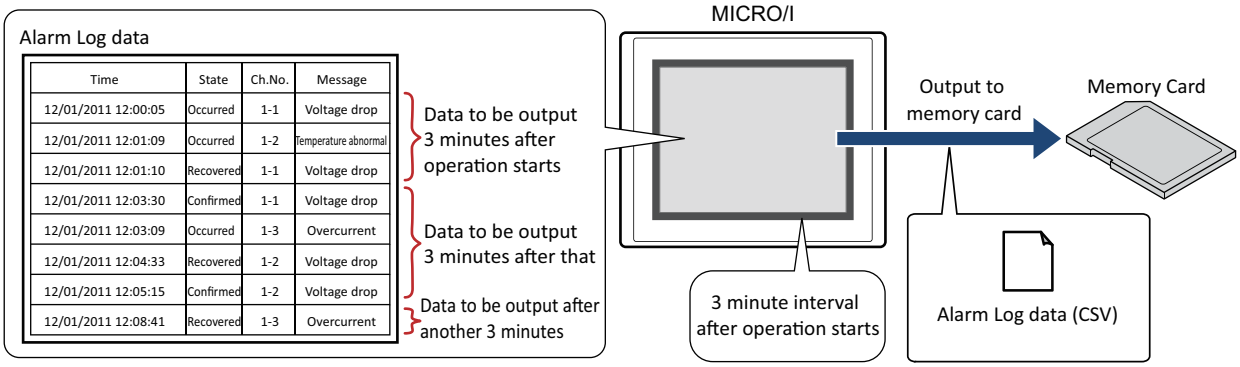
File names that exceed the limits in **Specify File Name by Value of Device***1*2 and file names configured with characters that cannot be used are as follows.

- When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
- When a character that cannot be used is set, the text is up to that character.
- When the first character is a character that cannot be used, the text is that set for **File Name**.

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Real Time

Select this check box to output data to the memory card in real time.



With real time output, data is saved to the memory card in three minute intervals after the MICRO/I starts running. For the HG2G-5F and the HG3G/4G, if the accumulated data reaches 819th item, then the data is forcibly saved to the memory card. When there is already data with the same file name on the memory card, data is appended to that file. If there was no update to the data during the three minutes, it is not output.
Data is appended to the file until the size of the file reaches the restriction size (256 MB), so the maximum amount of output data varies based on the settings for the output channel such as the amount of data, the data size, and the labels.

If the interval to update the Alarm Log is shorter than real time output (the interval for writing to the memory card), that Alarm Log is recorded up to the 1023rd item, and then afterwards, old data is discarded in order and replaced with new data.

Real time output stops when the file size of the Alarm Log data exceeds 256 MB or when there is insufficient space on the memory card. Memory card error information is stored in HG special register LSD42.

- When the value of HG special relay LSM20 changes from 0 to 1, the data at that time is first output in real time to the memory card, and then access to the memory card is stopped.
- You can check the free space on the memory card with HG special registers LSD43 to 44.

Trigger condition: Select the check boxes for the items that will trigger the output of Alarm Log data to the memory card.

Occurrence: Alarm Log data is output to the memory card when an alarm has occurred.

Recovery: Alarm Log data is output to the memory card when the alarm is recovered from.

Confirmation: Alarm Log data is output to the memory card when the key button **CHECK** was pressed.

Month/day/year hour:minute:second is output for the trigger condition occurrence time, recovery time, and confirmation time.

File Name: Enter the file name for the output data or shows the file name.

HG2G-5F, HG3G/4G: The default is "ALMHTA.CSV". To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

HG2F/3F/4F: The file name is "ALMHTA.CSV". This cannot be changed.

Specify File Name by Value of Device*1*2:

Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).
The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

(File Name Device)	LDR100	←	'I' 'D'	4844(Hex)
	LDR101	←	'E' 'C'	4543(Hex)
	LDR102	←	(NULL)	0000(Hex)

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Add Device data to File Name*1:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: **File Name** is "ALMHTA" and the value of the device configured by (File Name Device) is 123, the file name is "ALMHTA123.CSV".

Add Time Stamp*1*2:

Selects the format of the output date and time to add to the file name for the output data.
None, **YY**, **YY+MM**, **YY+MM+DD**
The format is YYMMDD (YY: year, MM: month, DD: day).
Example: **File Name** is "ALMHTA" on September 15 2013

YY:	ALMHTA_13
YY+MM:	ALMHTA_1309
YY+MM+DD:	ALMHTA_130915

Realtime Output*1*2:

Select this check box to forcibly output the data and save it to file at the desired timing.

(Trigger device): Specifies the bit device or the bit of the word device to serve as the condition to forcibly output the data. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Data is output to file when the trigger device changes from 0 to 1.

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device***1*2.
\ / : ; * ? " < > |

- File names that exceed the limits in **Specify File Name by Value of Device***1*2 and file names configured with characters that cannot be used are as follows.
  - When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
  - When a character that cannot be used is set, the text is up to that character.
  - When the first character is a character that cannot be used, the text is that set for **File Name**.
- The following operations are as follows if the **Realtime Output** check box*1*2 is selected.
  - Even if the data is outputted forcibly, the real time output period (3 minute interval) is not reset.
  - If the data is outputted but the value of device changes from 0 to 1, then there will be no output to the data.
  - Even when output has finished, the value of device does not automatically change to 0.

- The function to sample data operates when Alarm Log data is being saved to the memory card.
- For the HG2G-5F and the HG3G/4G, the batch output or real time output status of the Alarm Log data can be checked with the value of HG special relay LSM36. When the data starts to be written to the memory card, the value of device is 1. When writing is complete, the value is 0.
- The methods to erase Alarm Log files saved on the memory card are as follows.
  - To erase files during operation using parts, on the **Memory Card** tab on the Project Settings dialog box, select the **Remove Files stored in Memory Card** check box and the **All Alarm Log data** check box, and then configure the trigger device. Assign that trigger device to a part.
  - To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the Clear Data dialog box. Select the **Alarm Log Data** check box and click **OK**.
  - To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Output Data File Name

The file name is as follows.

File Name Value of Device_YYMMDD_TTMMSS.CSV

File Name:	The text entered in **File Name** or the text in the value of device configured by **Specify File Name by Value of Device**[*2]
Value of Device:	The lower 3 digits of the value of the device configured by **Add Device data to File Name**
YYMMDD:	The year, month, and day of the date configured by **Add Time Stamp**[*2]
TTMMSS:	The hour, minute, and second of the time configured by **Add Time Stamp**[*2]

Setting example 1

Item	Setting	
File Name	ALMHTO	
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM	Date when data was output: September 2013

The file name is "ALMHTO123_1309.CSV".

Setting example 2

Item	Setting	
Specify File Name by Value of Device	(File Name Device) is LDR100 Text to set is "IDEC"	LDR100 value: 4944 (hexadecimal) LDR101 value: 4543 (hexadecimal) LDR102 value: 0000 (hexadecimal)
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM+DD+HH+MM+SS	Date and time when data was output: September 15 2013 at 23:30:50

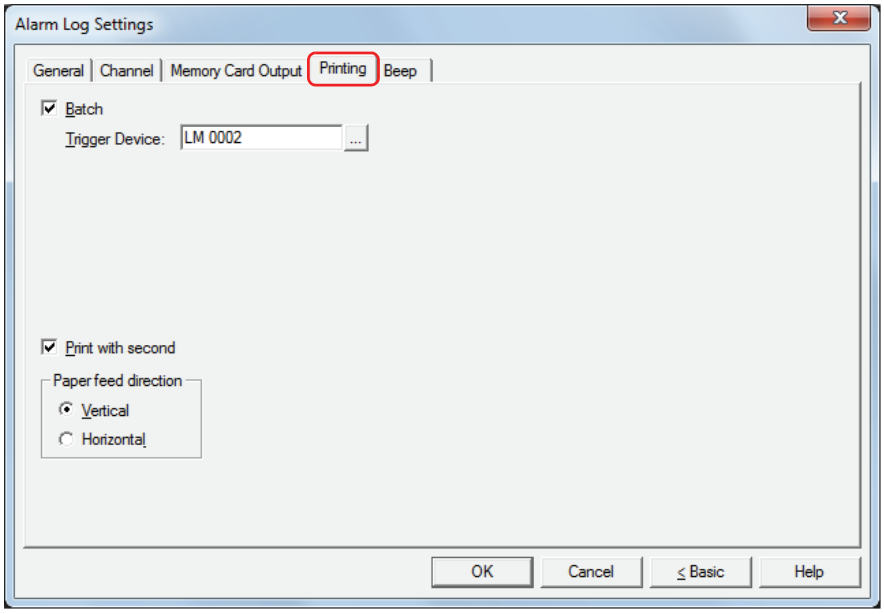
The file name is "IDEC123_130915_233050.CSV".

*2 HG2G-5F, HG3G/4G only

● **Printing** Tab

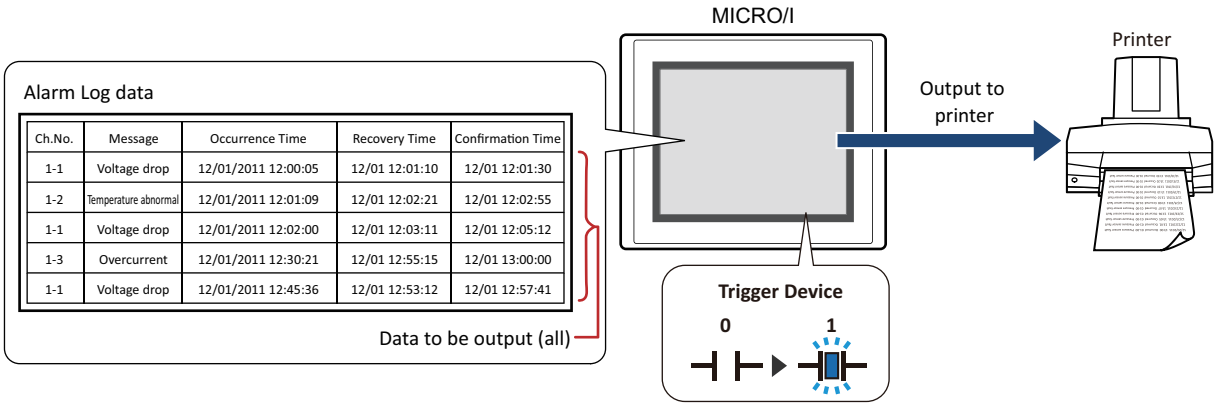
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Printing** tab is used to configure whether or not to output saved data to the printer.



■ **Batch**

Select this check box to batch output all the sampled data to the printer.



Printing of all the data starts when the trigger device changes from 0 to 1. Alarm Log data that occurs after the start of printing is not printed.

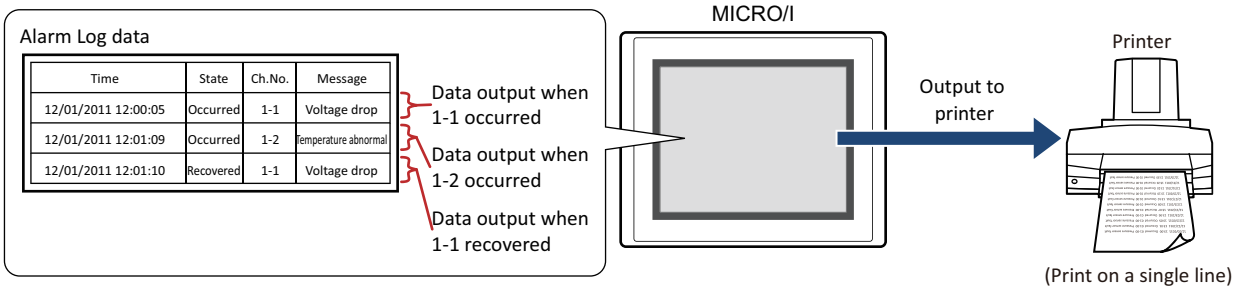
Trigger Device: Specifies the bit device or bit of the word device to serve as condition to print.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
The data prints when trigger device changes from 0 to 1.

Batch output example (printing)

No.	Occurrence Time	Recovery Time	Confirmation Time	Message
01-00	12/31/11 12:00:00	12/31 12:20:20	12/31 12:30:45	Pressure sensor fault
01-01	12/31/11 12:10:15	12/31 14:00:40	12/31 14:30:50	Hydraulic pressure low
01-00	12/31/11 13:00:30	-	-	Pressure sensor fault
		⋮		

■ Real Time*1

Select this check box to output data to the printer in real time. The data is printed as a single row when the printing trigger condition is satisfied.



When the printing trigger condition is satisfied, that printing request is recorded up to 100 items and the data is printed sequentially on a single line. If the printing requests exceed 100 items, the printing requests for the portion that is exceeded is discarded.

Trigger condition: Select the check box for the items that will trigger printing.
Occurrence: Data prints when an alarm has occurred.
Recovery: Data prints when an alarm was recovered from.
Confirmation: Data prints when the key button CHECK was pressed.

Depending on the printer, data may not print until a certain amount of data is stored in the printer's buffer. You can print by pressing the forced discharge button.

With some PLC (HP) printer models, the print data disappears after a certain amount of time elapses when data is stored in the printer, so do not use real time output.

Real time output example (printing)

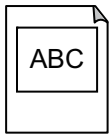
12/31/11 12:00:00	Occurred	01-00	Pressure sensor fault
12/31/11 12:10:15	Occurred	01-01	Hydraulic pressure low
12/31 12:20:20	Recovered	01-00	Pressure sensor fault
12/31 12:30:45	Confirmed	01-00	Pressure sensor fault
12/31/11 13:00:30	Occurred	01-00	Pressure sensor fault
	⋮		

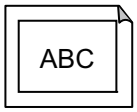
■ Print with second

Select this check box to print the time including seconds.

■ Paper feed direction

Paper feed direction: Selects the paper feed direction as either **Vertical** or **Horizontal**.

Vertical: 

Horizontal: 

- For A4 size paper, up to 40 items of Alarm Log data are printed on a single sheet.
- The year is not printed for recovery times and confirmation times.

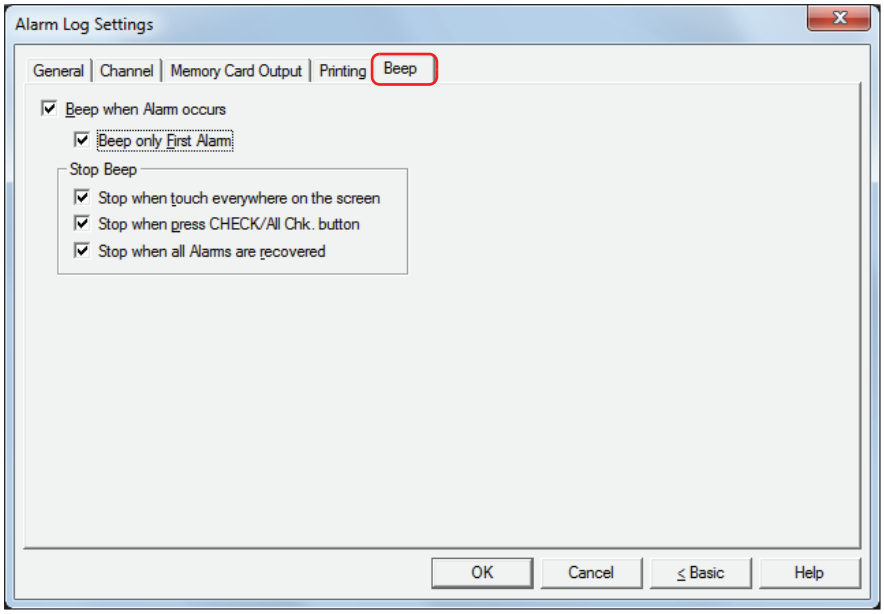
The function to sample data operates when Alarm Log data is printing.

*1 HG1F/2F/2S/3F/4F only

● Beep Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Beep** tab is used to configure whether or not the MICRO/I's internal buzzer operates.



■ Beep when Alarm occurs

Select this check box to sound a beep when an alarm has occurred.

Beep only First Alarm*1:	Select this check box to sound a beep only when the first alarm*2 has occurred. No beeps will sound when another alarm is already active. Clear this check box to sound a beep each time an alarm occurs.

■ Stop Beep*1

Select the check box for the items that will trigger the beep to stop.

Stop when touch everywhere on the screen:	The beep stops when you touch anywhere on the screen.
Stop when press CHECK/All Chk. button:	The beep stops when you touch the key buttons **CHECK** or **All Chk.** on the Alarm Log Display.
Stop when all Alarms are recovered:	The beep stops when all the alarms are recovered from.

- While the beep is sounding, System Area 1 address + 1 bit 6 is 1.
- To stop the beep when an alarm has occurred, use the following methods.
  - Press the key button **Stop Beep**
  - When a condition selected with the **Stop Beep** check boxes is satisfied
  - Set System Area 1 address + 1 bit 6 to 0.

  However, when 1 is written to System Area 1 address + 1 bit 6 for a reason other than the occurrence of an alarm, the beep does not stop until 0 is written.

*1 Advanced mode only
*2 The first alarm that has occurred in a state where no alarms are active

4 Using Data and Detected Alarms

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Displaying Saved Data with the Alarm Log Display

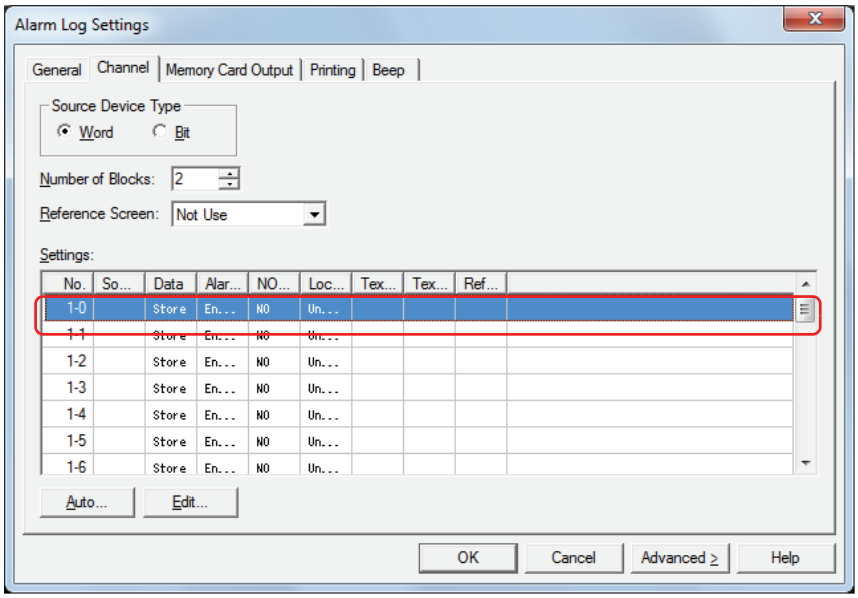
1 On the **Configuration** tab, in the **System Setup** group, click **Alarm Log**.

The Alarm Log Settings dialog box is displayed.

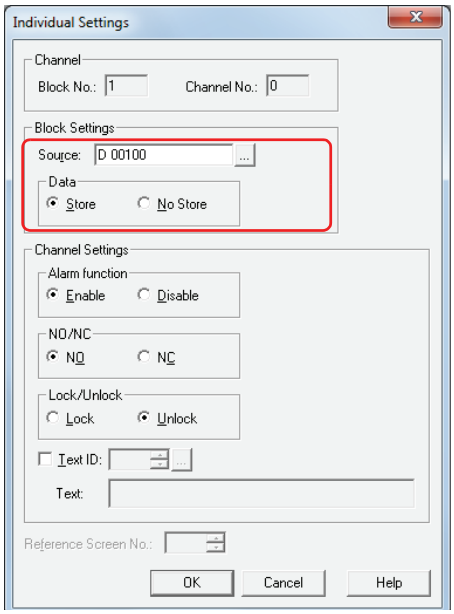
2 Select the type of device to monitor under **Source Device Type** on the **Channel** tab and specify **Number of Blocks**.

3 Select the channel number to register and click **Edit**.

The Individual Settings dialog box is displayed.



4 Specify the device to monitor in **Source** and select **Store** under **Data**.



5 Select **Enable** under **Alarm function**, configure **NO/NC** and **Lock/Unlock**, and click **OK**.

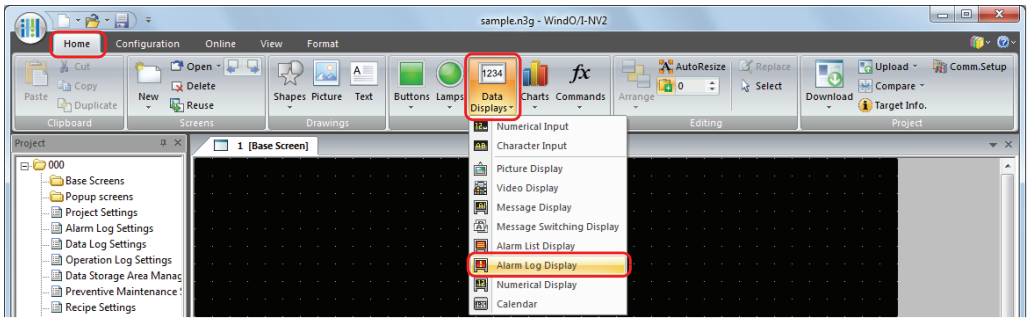
You are returned to the Alarm Log Settings dialog box.

6 Repeat steps *3* through *5* to register all the channels.

7 Click **OK**.

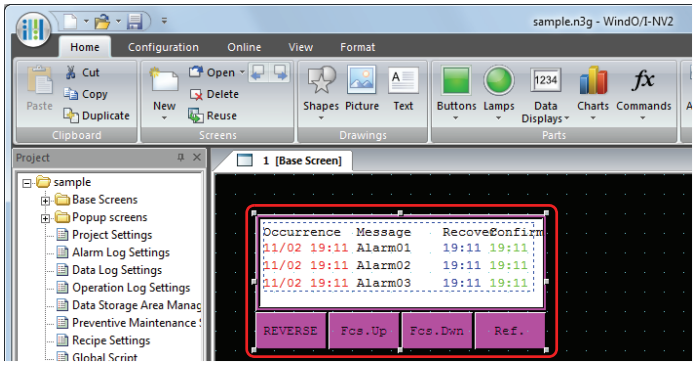
The Alarm Log Settings dialog box closes.

8 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Alarm Log Display**.



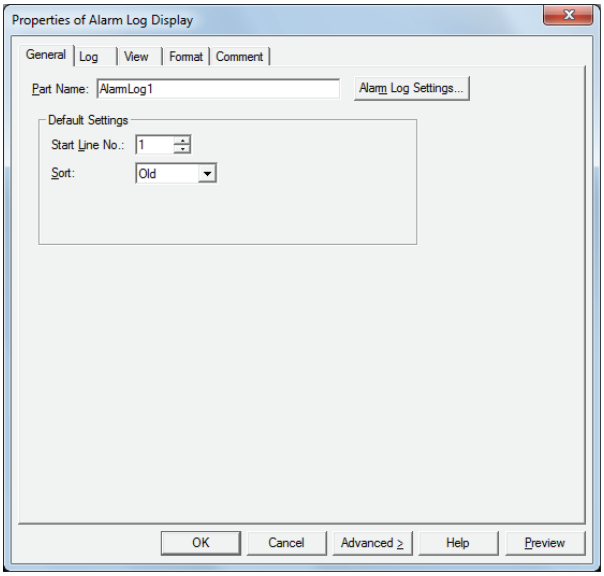
9 Click a point on the edit screen where you wish to place the Alarm Log Display.

10 Double-click the dropped Alarm Log Display and a Properties dialog box will be displayed.



11 Change the settings on each tab as necessary.

For details, refer to Chapter 10 "8.3 Properties of Alarm Log Display Dialog Box" on page 10-120.



12 Click **OK**.

The Properties of Alarm Log Display dialog box closes.

This concludes configuring the MICRO/I to display saved data with the Alarm Log Display.

4.2 Displaying Registered Messages with the Alarm List Display According to the Active Alarm

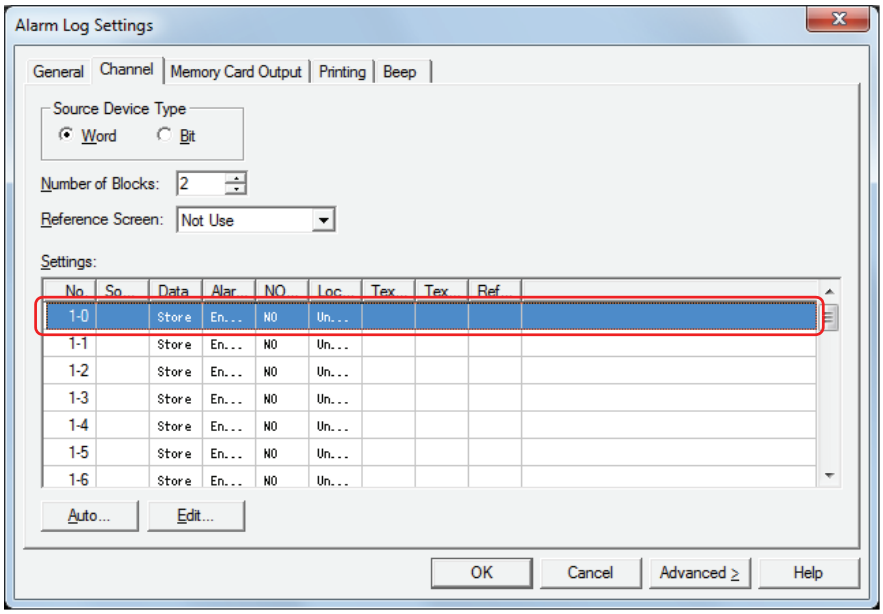
1. On the **Configuration** tab, in the **System Setup** group, click **Alarm Log**.

   The Alarm Log Settings dialog box is displayed.

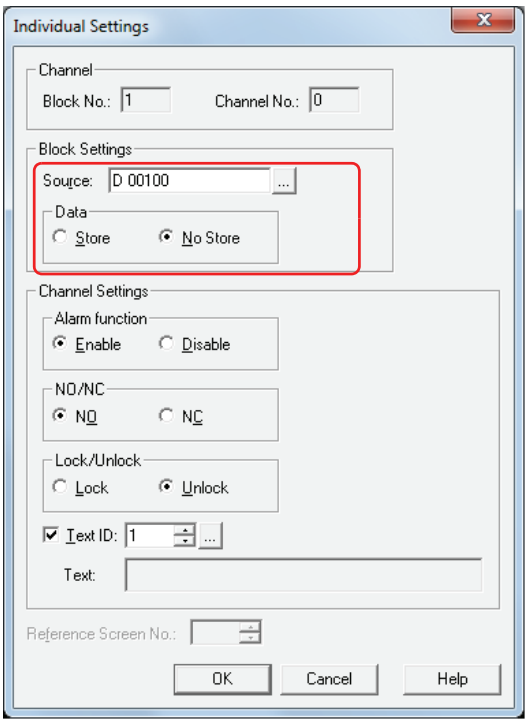
2. Select the type of device to monitor under **Source Device Type** on the **Channel** tab and specify **Number of Blocks**.

3. Select the channel number to register a message to and click **Edit**.

   The Individual Settings dialog box is displayed.



4 Specify the device to monitor in **Source** and select **No Store** under **Data**.

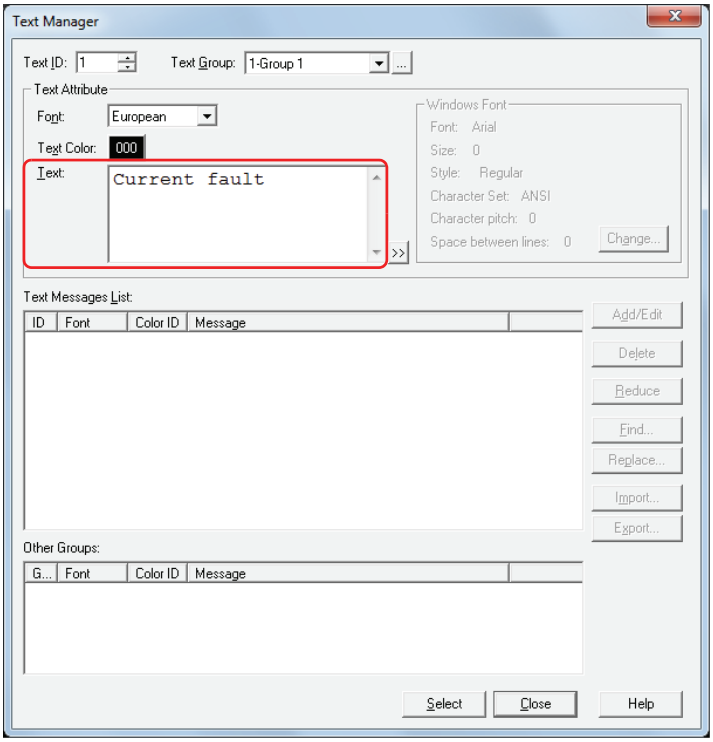


5 Select **Enable** under **Alarm function** and configure **NO/NC** and **Lock/Unlock**.

6 Select the **Text ID** check box and click ...

Text Manager opens.

7 Enter the message in **Text**.

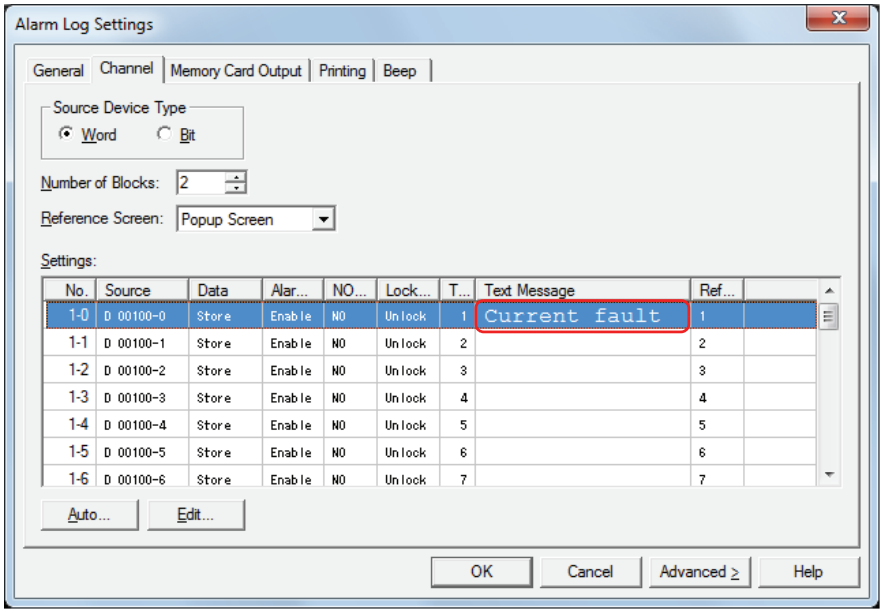


8 Click **Select**.

You are returned to the Individual Settings dialog box.

9 Click **OK**.

The registered message is displayed in **Settings**.



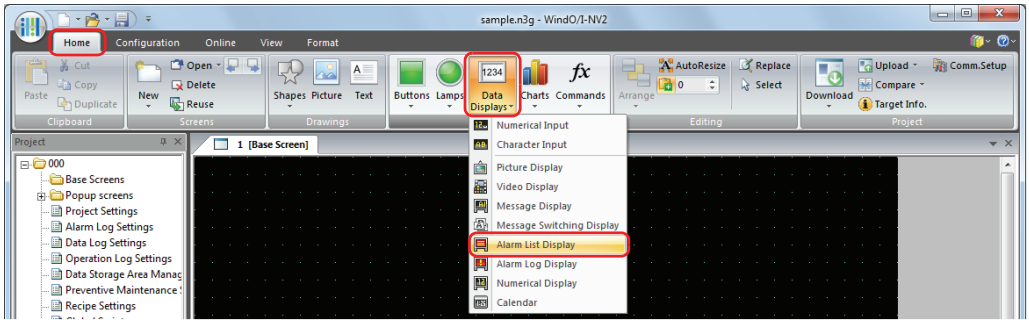
10 Repeat steps *3* through *9* to register messages for all the channels.

The messages to use can be registered in advance in Text Manager.

11 Click **OK**.

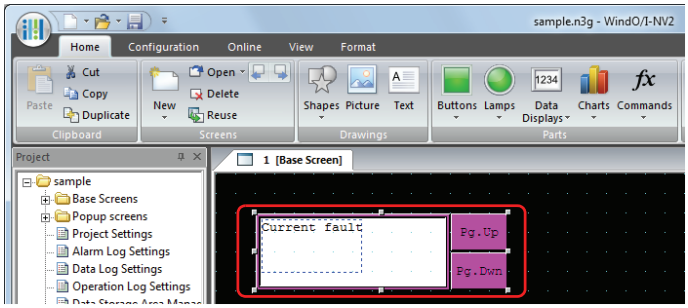
The Alarm Log Settings dialog box closes.

12 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Alarm List Display**.

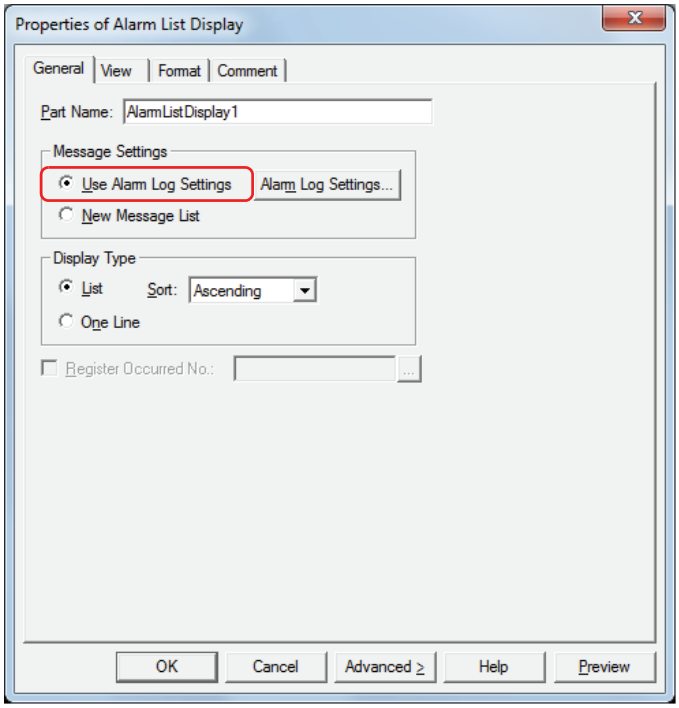


13 Click a point on the edit screen where you wish to place the Alarm List Display.

14 Double-click the dropped Alarm List Display and a Properties dialog box will be displayed.



15 On the **General** tab, under **Message Settings**, select **Use Alarm Log Settings**.



16 Configure the other settings and the settings on each tab as necessary.

For details, refer to Chapter 10 "7.3 Properties of Alarm List Display Dialog Box" on page 10-104.

17 Click **OK**.

The Properties of Alarm List Display dialog box closes.

This concludes configuring the MICRO/I to display registered messages with the Alarm List Display according to the active alarm.

4.3 Sounding a Beep when an Alarm has Occurred

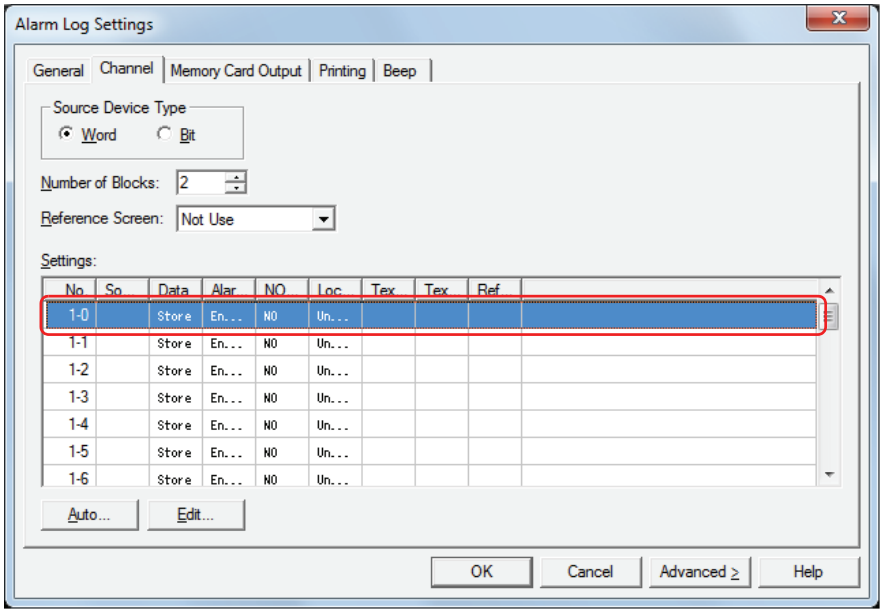
1. On the **Configuration** tab, in the **System Setup** group, click **Alarm Log**.

   The Alarm Log Settings dialog box is displayed.

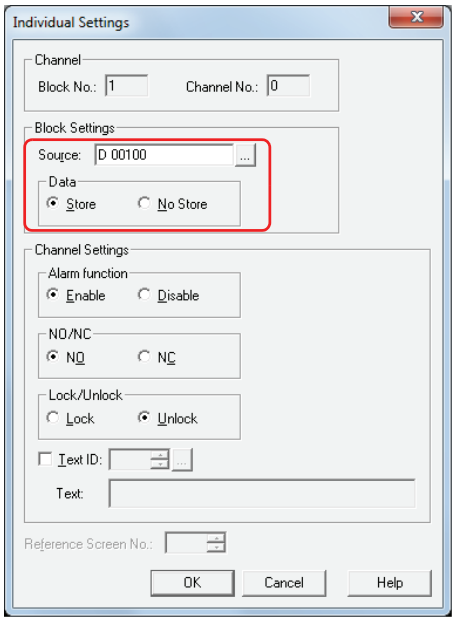
2. Select the type of device to monitor under **Source Device Type** on the **Channel** tab and specify **Number of Blocks**.

3. Select the channel number to register a message to and click **Edit**.

   The Individual Settings dialog box is displayed.



4. Specify the device to monitor in **Source** and select **Store** under **Data**.

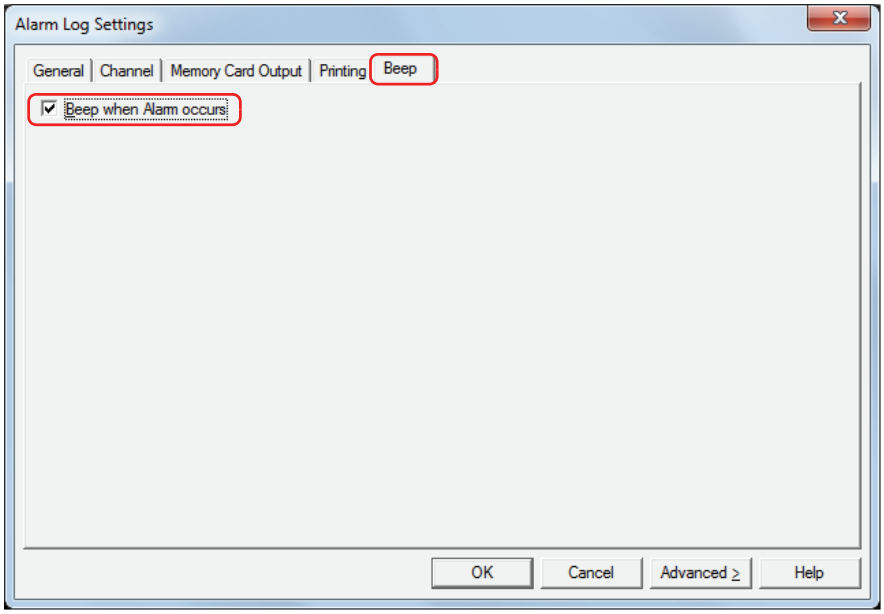


5. Select **Enable** under **Alarm function**, configure **NO/NC** and **Lock/Unlock**, and click **OK**.

   You are returned to the Alarm Log Settings dialog box.

6 Click the **Beep** tab.

7 Select the **Beep when Alarm occurs** check box.



8 Click **OK**.

The Alarm Log Settings dialog box closes.

This concludes configuring the MICRO/I to sound a beep when an alarm has occurred.

4.4 Saving Data as a CSV File

● Saving Data as a CSV File

The Alarm Log data can be saved to the memory card as a CSV file or uploaded to a PC.

The procedure to save the data is as follows.

- To save the data to a memory card, click **Alarm Log** on the WindO/I-NV2 **Configuration** tab to open the Alarm Log Settings dialog box. Select an output method check box on the **Memory Card Output** tab and configure the items. The data can be saved to the memory card folder on the memory card. For details, refer to "Memory Card Output Tab" on page 13-21.
- To upload the data to a PC, click the **Upload** menu in Downloader, and click **All Log Data** or **Alarm Log Data** to open the Select Path dialog box. Specify the location to save the file and click **OK** to save the file to the specified folder. For details, refer to the Downloader manual.

● Data Structure and Output Example

The data structure for files output with batch output and real time output is different.

HG2G-S/-5S/-5F, HG3G/4G

■ Batch

Batch output shows the recovery and confirmation time for an alarm that has occurred on a single line.

The data structure of files output with batch output is as follows. Bold items are replaced by the Alarm Log settings, sampled data, project file name, and WindO/I-NV2 version.

Headers	"Project Name","**Project name**","**Version number**" "File Type","**Log type**" Blank row
Title row	"Ch.No.","Message","Occurrence Time","Recovery Time","Confirmation Time"
Data row	" **Channel number**","**Message**"," **MM/DD/YYYY HH:MM:SS**"," **MM/DD/YYYY HH:MM:SS**", " **MM/DD/YYYY HH:MM:SS**" : :

Output example

	Data size of each row
"Project Name","Dimmer Console","V4.50"	- 41 bytes
"File Type","Alarm Log Data"	- 30 bytes
	- 2 bytes
"Ch.No.","Message","Occurrence Time","Recovery Time","Confirmation Time"	- 74 bytes
" 1-0","Voltage drop"," 08/11/2011 14:46:12"," 08/11 14:46:13"," 08/11 14:46:16"	- 82 bytes
" 1-1","Temperature abnormal"," 08/11/2011 14:47:18"," 08/11 14:47:19", " 08/11 14:47:20"	- 90 bytes
:	

Real Time

Real time output displays the alarm state and the time the alarm became that state on a single line each time an alarm occurs, is recovered from, or is confirmed.

The data structure of files output with real time output is as follows. Bold items are replaced by the Alarm Log settings, sampled data, project file name, and WindO/I-NV2 version.

Headers	"Project Name","**Project name**","**Version number**" "File Type","**Log type**" Blank row
Title row	"Time","State","Ch.No.","Message"
Data row	" **MM/DD/YYYY HH:MM:SS**","**State**"," **Channel number**","**Message**" : :

Output example

	Data size of each row
"Project Name","Dimmer Console","V4.50"	- 41 bytes
"File Type","Alarm Log Data"	- 30 bytes
	- 2 bytes
"Time","State","Ch.No.","Message"	- 35 bytes
" 08/11/2011 14:46:12","Occurred"," 1-0","Voltage drop"	- 57 bytes
" 08/11/2011 14:46:13","Recovered"," 1-0","Voltage drop"	- 58 bytes
" 08/11/2011 14:46:16","Confirmed"," 1-0","Voltage drop"	- 58 bytes
" 08/11/2011 14:47:18","Occurred"," 1-1","Temperature abnormal"	- 65 bytes
:	
:	

- The data size for each row is counted as 2 bytes for full-width characters, 1 byte for half-width characters, and 2 bytes for newlines. The total for each row is the total amount of space for the file.
- A space is inserted before the date in the data row.
- The display type for the date and time varies based on the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.
  Japanese: YYYY/MM/DD HH:MM:SS
  European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

HG1F/2F/2S/3F/4F

Batch

The data structure of files output with batch output is as follows. Bold items are replaced by the Alarm Log settings, sampled data, project file name, and WindO/I-NV2 version.

Headers
"**Project name**","Project Name","**Version number**","**Font name**"
"File Type","**Log type**"
Blank row

Title row
"Number","Message","Occurrence Time","Recovery Time","Confirmation Time","Font Name"

Data row
" **Channel number**","**Message**"," **MM/DD/YYYY HH:MM:SS**"," **MM/DD/YYYY HH:MM:SS**",
" **MM/DD/YYYY HH:MM:SS**","**Font name**"
⋮

Output example

	Data size of each row
"Dimmer Console","Project Name","V4.50","English"	- 51 bytes
"File Type","Alarm Log data"	- 30 bytes
	- 2 bytes
"Ch.No.","Message","Occurrence Time","Recovery Time","Confirmation Time","Font Name"	- 86 bytes
" 1-0","Voltage drop"," 08/11/2011 14:46:12"," 08/11 14:46:13", " 08/11 14:46:16","English"	- 92 bytes
" 1-1","Temperature abnormal"," 08/11/2011 14:47:18"," 08/11 14:47:19", " 08/11 14:47:20","English"	- 100 bytes
⋮	

Real Time

The data structure of files output with real time output is as follows. Bold items are replaced by the Alarm Log settings, sampled data, project file name, WindO/I-NV2 version, and font name.

Headers
"**Project name**","Project Name","**Version number**","**Font name**"
"File Type","**Log type**"
Blank row

Title row
"Time","State","Ch.No.","Message","Font name"

Data row
" **MM/DD/YYYY HH:MM:SS**","**State**"," **Channel number**","**Message**","**Font name**"
⋮

Output example

	Data size of each row
"Dimmer Console","Project Name","V4.50","English"	- 51 bytes
"File Type","Alarm Log data"	- 30 bytes
	- 2 bytes
"Time","State","Number","Message","Font Name"	- 47 bytes
" 08/11/2011 14:46:12","Occurred"," 1-0","Voltage drop","English"	- 67 bytes
" 08/11/2011 14:46:13","Recovered"," 1-0","Voltage drop","English"	- 68 bytes
" 08/11/2011 14:46:16","Confirmed"," 1-0","Voltage drop","English"	- 68 bytes
" 08/11/2011 14:47:18","Occurred"," 1-1","Temperature abnormal","English"	- 75 bytes
⋮	

- The data size for each row is counted as 2 bytes for full-width characters, 1 byte for half-width characters, and 2 bytes for newlines. The total for each row is the total amount of space for the file.
- A space is inserted before the date in the data row.
- The display type for the date and time varies based on the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.
  Japanese: YYYY/MM/DD HH:MM:SS
  European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

Chapter 14 Data Log Function

This chapter describes how to configure the Data Log function and its operation on the MICRO/I.

1 Overview

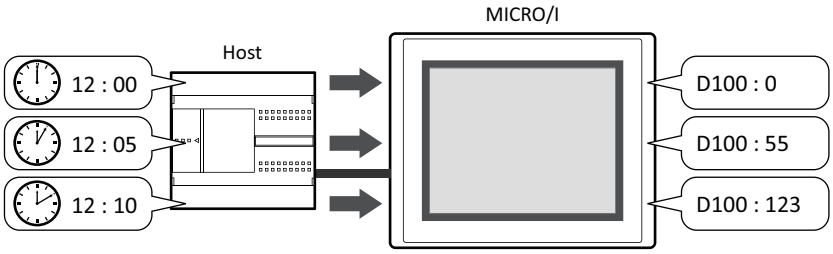
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Data Log Function is Used

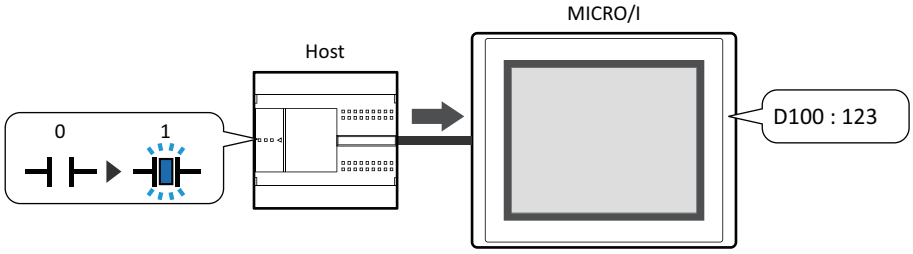
The Data Log function samples values of devices with the MICRO/I using the configured sampling condition. The sampled values of devices are saved in internal memory along with the sampling time.

The Data Log function can perform the following functions.

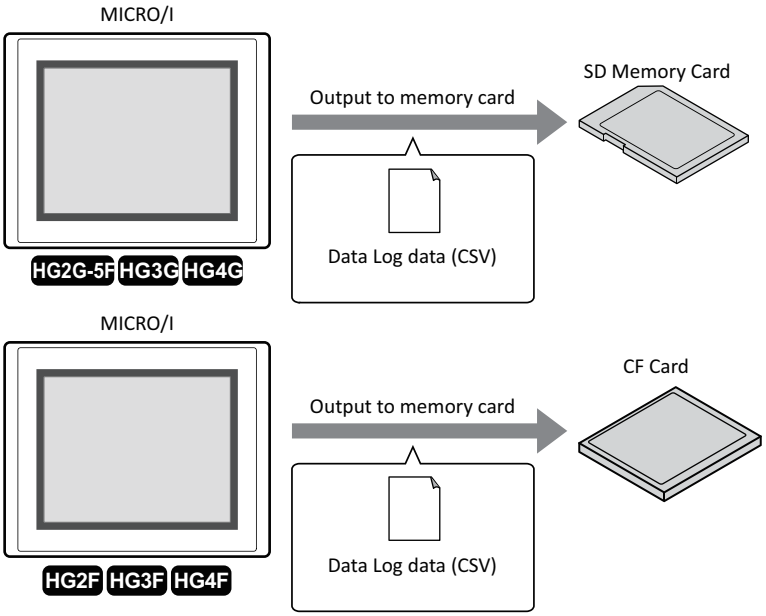
- Sample values of devices at a fixed interval



- Sample values of devices when a value of device change

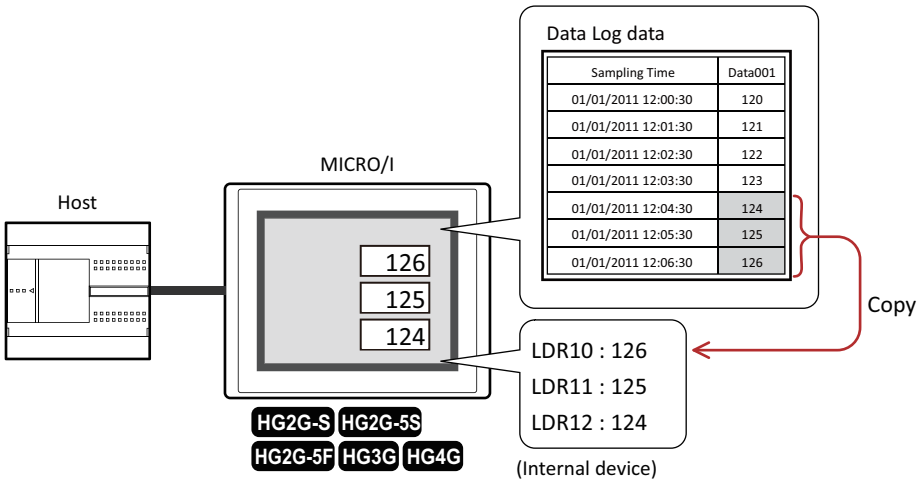


- Output Data Log data to the memory card



This function is only supported by models that are equipped with the memory card interface.

- Copy Data Log data to internal devices

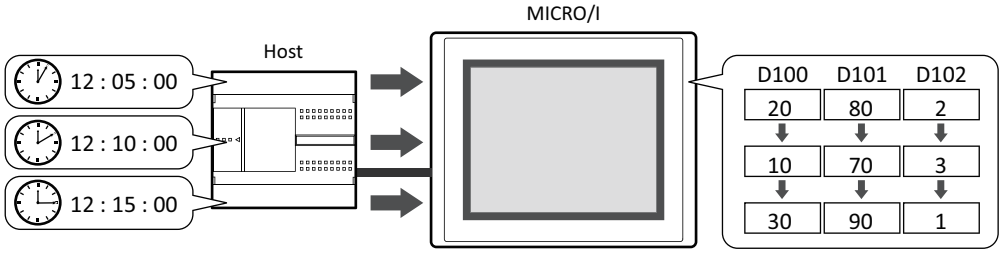


1.2 Sampling Values of Devices

The MICRO/I samples values of target devices at a regular interval or when a value of device changes.

● Sampling Value of Devices at a Regular Interval

When sampling values of devices (D100 to D102) at a 5 minute interval (Time: 300 seconds) with the data storage amount in the data storage area is set to 3, the MICRO/I samples Data Log data as follows.



1 5 minutes after data sampling starts, the MICRO/I stores the values for devices D100 to D102.

2 10 minutes after data sampling starts, the MICRO/I stores the values for devices D100 to D102.

3 15 minutes after data sampling starts, the MICRO/I stores the values for devices D100 to D102.

Values of Devices

Time	Value		
	D100	D101	D102
01/01/2011 12:01:00	10	70	3
01/01/2011 12:02:00	20	80	2
01/01/2011 12:03:00	30	90	1
01/01/2011 12:04:00	10	70	3
01/01/2011 12:05:00	20	80	2
01/01/2011 12:06:00	30	90	1
01/01/2011 12:07:00	10	70	3
01/01/2011 12:08:00	20	80	2
01/01/2011 12:09:00	30	90	1
01/01/2011 12:10:00	10	70	3
01/01/2011 12:11:00	20	80	2
01/01/2011 12:12:00	30	90	1
01/01/2011 12:13:00	10	70	3
01/01/2011 12:14:00	20	80	2
01/01/2011 12:15:00	30	90	1
01/01/2011 12:16:00	10	70	3

Data stored on the MICRO/I

Sampling Time	Value		
	Data 1	Data 2	Data 3
01/01/2011 12:05:00	20	80	2
01/01/2011 12:10:00	10	70	3
01/01/2011 12:15:00	30	90	1

4 20 minutes after data sampling starts, the MICRO/I stores the values for devices D100 to D102.

Since the data storage amount in the data storage area is set to 3, the oldest data is deleted in order to make room for the newest data.

Values of Devices

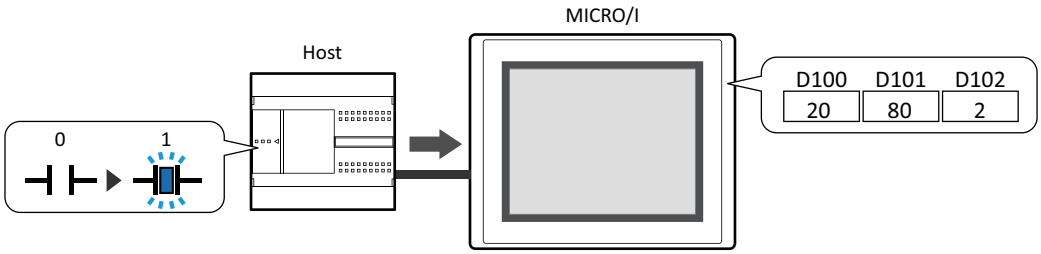
Time	Value		
	D100	D101	D102
⋮	⋮	⋮	⋮
01/01/2011 12:17:00	40	60	2
01/01/2011 12:18:00	30	60	1
01/01/2011 12:19:00	10	90	3
01/01/2011 12:20:00	20	80	2

Data stored on the MICRO/I

Sampling Time	Value			
	Data 1	Data 2	Data 3	
				Deleted
01/01/2011 12:10:00	10	70	3	
01/01/2011 12:15:00	30	90	1	
01/01/2011 12:20:00	20	80	2	

● Sampling Values of Devices when a Value of Device Changes

If sample values of devices (D100 to D102), when a bit device or bit of the word device configured as the sampling condition switches from 0 to 1 and the data storage amount in the data storage area is set to 3, the MICRO/I samples Data Log data as follows.



1 When data sampling starts and the value of device configured as the sampling condition switches from 0 to 1, the MICRO/I stores the values for devices D100 to D102.

2 When the value of device configured as the sampling condition switches from 0 to 1 the second time, the MICRO/I stores the values for devices D100 to D102.

3 When the value of device configured as the sampling condition switches from 0 to 1 the third time, the MICRO/I stores the values for devices D100 to D102.

Values of Devices

Time	Value		
	D100	D101	D102
01/01/2011 12:01:00	10	70	3
01/01/2011 12:02:00	20	80	2
01/01/2011 12:03:00	30	90	1
01/01/2011 12:04:00	10	70	3
01/01/2011 12:05:00	20	80	2
01/01/2011 12:06:00	30	90	1
01/01/2011 12:07:00	10	70	3
01/01/2011 12:08:00	20	80	2
01/01/2011 12:09:00	30	90	1
01/01/2011 12:10:00	10	70	3
01/01/2011 12:11:00	20	80	2
01/01/2011 12:12:00	30	90	1
01/01/2011 12:13:00	10	70	3
01/01/2011 12:14:00	20	80	2
01/01/2011 12:15:00	30	90	1
01/01/2011 12:16:00	10	70	3

Data stored on the MICRO/I

Sampling Time	Value		
	Data 1	Data 2	Data 3
01/01/2011 12:05:00	20	80	2
01/01/2011 12:13:00	10	70	3
01/01/2011 12:15:00	30	90	1

4 When the value of device configured as the sampling condition switches from 0 to 1 the fourth time, the MICRO/I stores the values for devices D100 to D102.

Since the data storage amount in the data storage area is set to 3, the oldest data is deleted in order to make room for the newest data.

Values of Devices

Time	Value		
	D100	D101	D102
⋮	⋮	⋮	⋮
01/01/2011 12:17:00	40	60	2
01/01/2011 12:18:00	30	60	1
01/01/2011 12:19:00	10	90	3
01/01/2011 12:20:00	20	80	2

Data stored on the MICRO/I

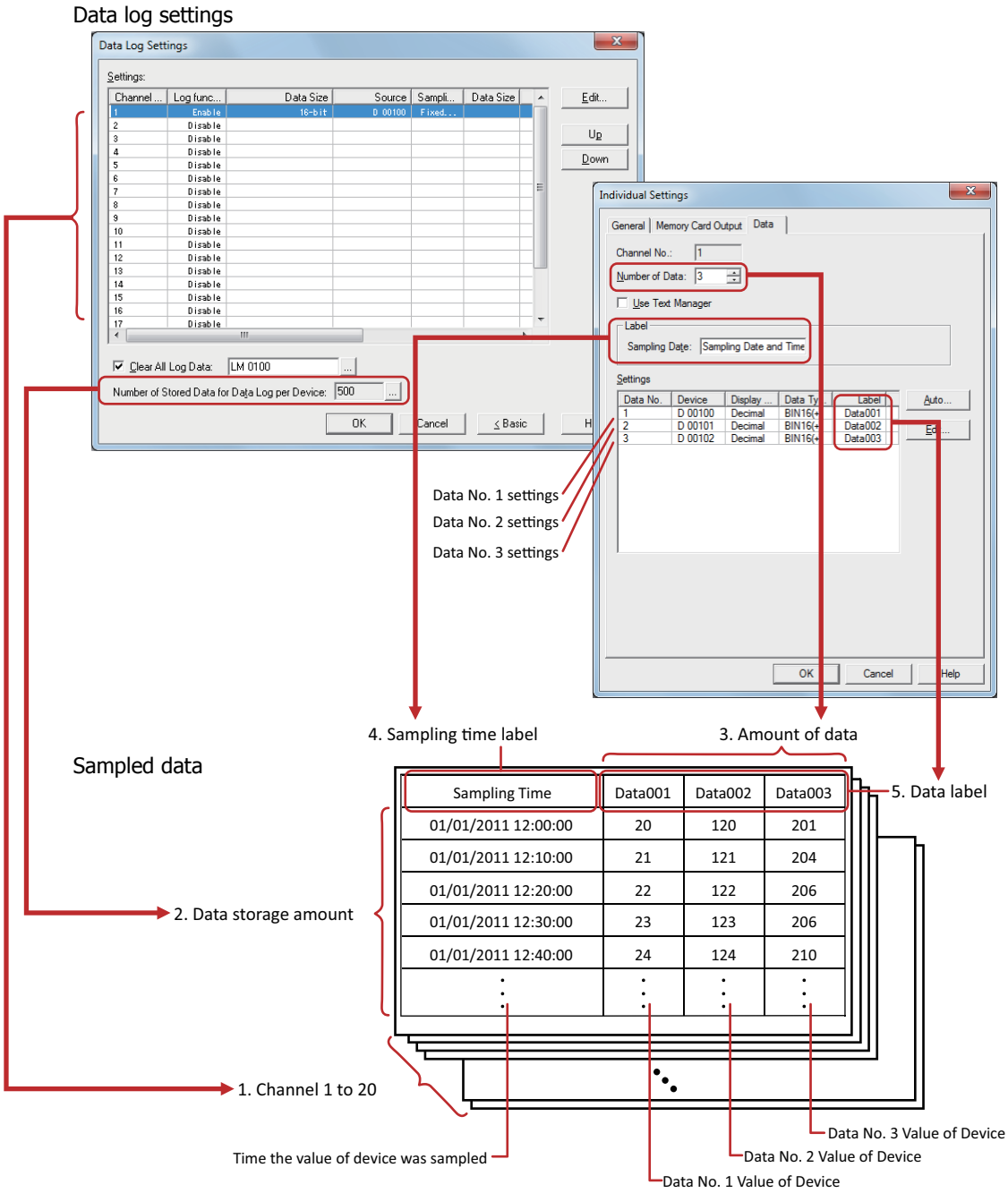
Sampling Time	Value		
	Data 1	Data 2	Data 3
01/01/2011 12:13:00	10	70	3
01/01/2011 12:15:00	30	90	1
01/01/2011 12:20:00	20	80	2

Deleted

1.3 Data Configuration

The sampled data is composed of the sampling time, values of devices, and labels.

The relationship between the Data Log function settings and the sampled data is as follows.



1. Channel — The sampled data is in channel units. A maximum of 20 channels can be configured.
2. Data storage amount: — The amount of sampled data to save. The maximum amount that can be configured per device differs according to the model. For details, refer to "Data Storage Amount" on page 14-6.
3. Amount of data: — The amount of data configured for one channel. The maximum amount of data that can be configured is 128. The maximum number of devices that can be configured to sample values is 128 total for all channels.
   For example, when the amount of data for channel 1 is set to 128, this is the maximum amount total for all channels, so channel 2 through 20 cannot be configured.
4. Sampling time label: — When the sampled data is output as a CSV file, this label is displayed in the label row for the sampling time column.
5. Data label: — When the sampled data is output as a CSV file, this label is displayed in the label row for the data number columns.

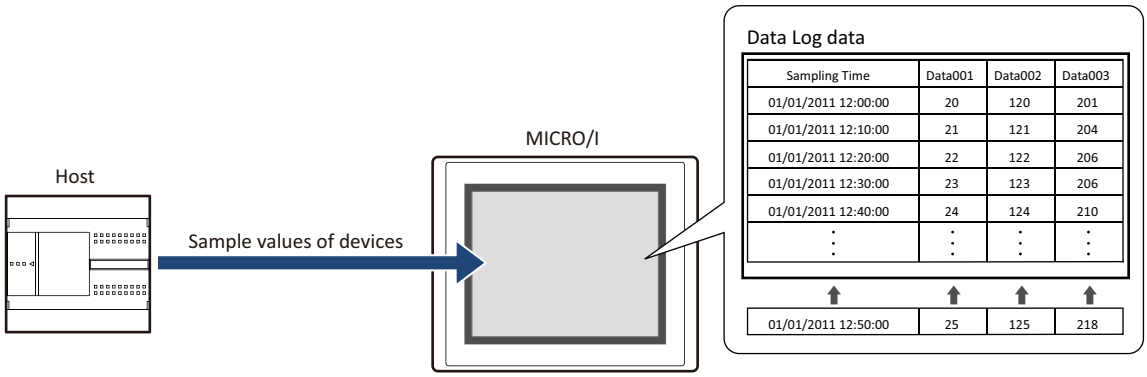
1.4 Saving and Deleting Data

● Saving Data

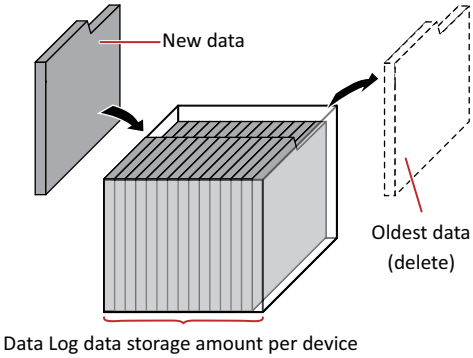
The save location for sampled data differs according to the model. The save locations are as follows.

HG2G-S/-5S/-5F, HG3G/4G: The sampled values of devices, along with the sampling time, are all saved in the data storage area.

HG1F/2F/2S/3F/4F: You can select whether or not to save in the data storage area. To save in the data storage area, on the **Data Log Settings** dialog box, select the **Log to Data Storage Area** check box. If sampled values of devices are not saved in the data storage area, the data in the Data Log is erased when the MICRO/I is turned off.



If the saved data exceeds the Data Log data storage amount per device, the old data is deleted and the new data is saved.



When the backup battery is depleted, and for the HG2G-5ST22VF-*, the data in the Data Log is erased when the MICRO/I is turned off.

Data Storage Amount

When saving the sampled data to the data storage area, set the data storage amount per device. The amount of data that can be saved in the data storage area is calculated from the configured data storage amount per device and data amount for each channel.
The maximum amount of data that can be saved in the data storage area is as follows.

Model	Maximum amount of data that can be saved in the data storage area
HG2G-5F, HG3G/4G	29,165
HG2G-S/-5S	13,808
HG1F/2F/2S/3F/4F	2,048

If sampled data is not saved in the data storage area*1, the maximum amount of data in the Data Log overall is 131,072, and the maximum amount per device is 1,024.

● Deleting Data

The method to delete sampled data from the data storage area is as follows.

- On the **Online** tab in WindO/I-NV2, click the arrow under **Clear**, and click **All** or **Data Log Data**. For details, refer to Chapter 24 "4 Clear" on page 24-26.
- For the HG2G-S/-5S/-5F and the HG3G/4G, touch **Initial Setting** on the System Menu, **Initialize**, **Data Log** in order.
  For the HG1F/2F/2S/3F/4F, touch **Initial Setting** on the System Menu, **Initialize**, **Logging** in order.

*1 HG1F/2F/2S/3F/4F only

1.5 Using the Data

The saved data can be used in the following ways.

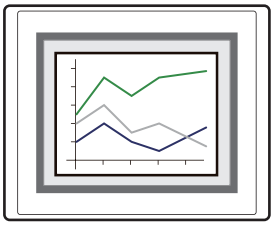
Data Log data

Sampling Time	Data001	Data002	Data003
01/01/2011 12:00:00	20	120	201
01/01/2011 12:10:00	21	121	204
01/01/2011 12:20:00	22	122	206
01/01/2011 12:30:00	23	123	206
01/01/2011 12:40:00	24	124	210
⋮	⋮	⋮	⋮

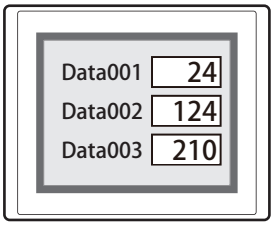
To use with the MICRO/I

To use with devices other than the MICRO/I

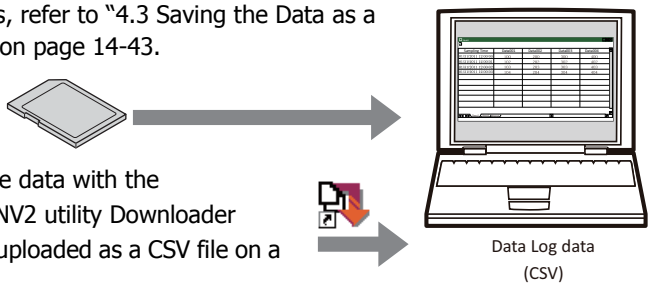
- Display the data in the Line Chart
  Configure the data channel numbers and data numbers and display the data in the Line Chart.
  For details, refer to "4.1 Display the Data in the Line Chart" on page 14-31.



- Display the data with the Numerical Input or the Numerical Display*1
  Copy the data to an internal device and display it with the Numerical Input or the Numerical Display.
  For details, refer to "4.2 Displaying Data as Numerical Values" on page 14-33.

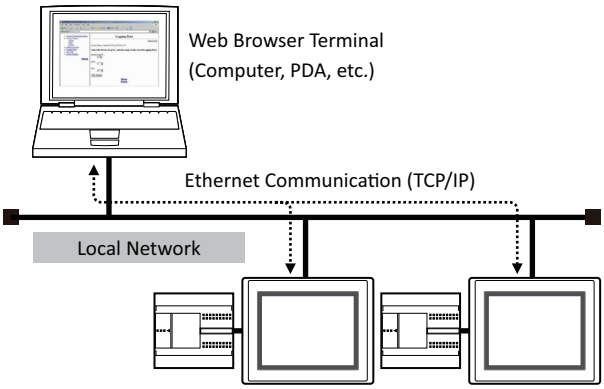


- Save to and read from a memory card
  Output data from the MICRO/I to the memory card as a CSV file and use it on a PC.
  For details, refer to "4.3 Saving the Data as a CSV File" on page 14-43.



- Upload the data with the WindO/I-NV2 utility Downloader
  Use data uploaded as a CSV file on a PC.
  For details, refer to the Downloader manual.

- Access the data with the web server function*2
  You can access the data in internal memory or on the memory card inserted in the MICRO/I.
  For details, refer to Chapter 27 "2.7 Data Display" on page 27-20.



*1 HG2G-S/-5S/-5F, HG3G/4G only
*2 HG3F/4F only

2 Data Log Function Configuration Procedure

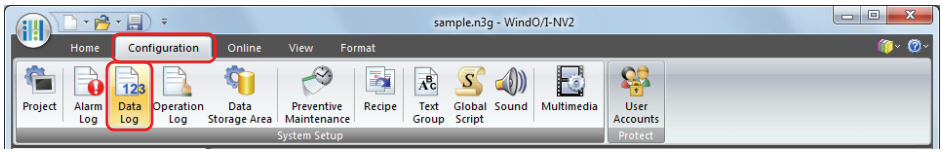
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Data Log function.

2.1 Configuring the Sampling Condition and Devices for Sampling Data

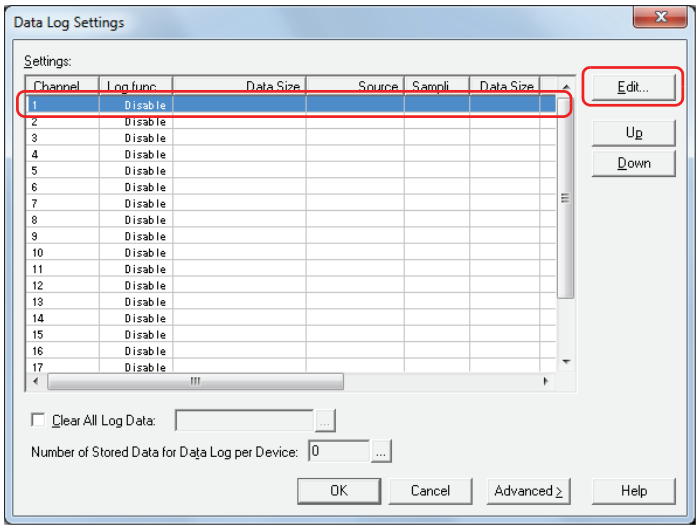
1 On the **Configuration** tab, in the **System Setup** group, click **Data Log**.

The **Data Log Settings** dialog box is displayed.

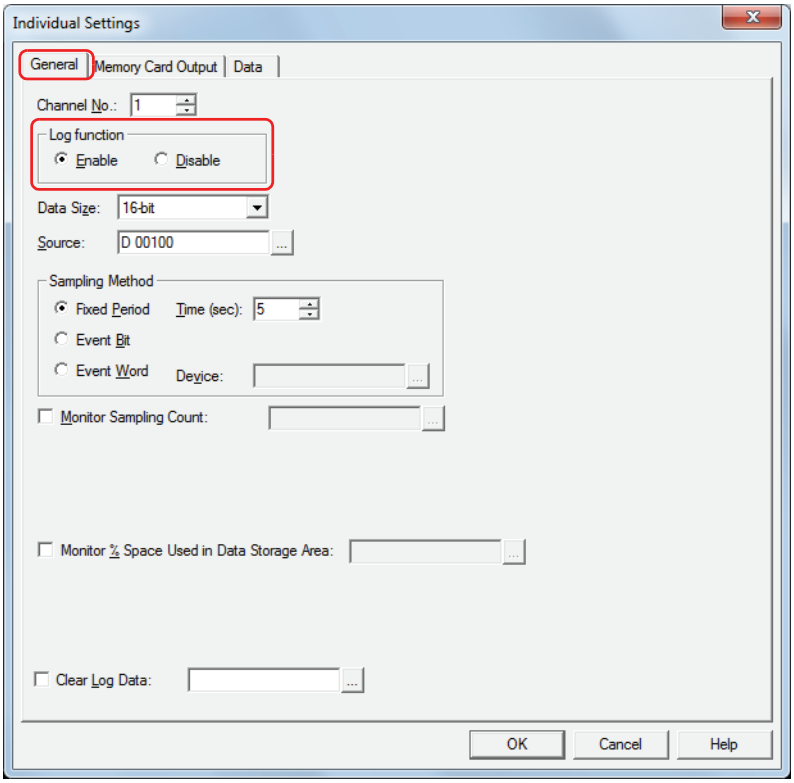


2 Select the channel number to register the Data Log settings to in **Settings**, then click **Edit**.

The **Individual Settings** dialog box is displayed.



3 On the **General** tab, under **Log function**, select **Enable**.



4 Select the data size for the source device in **Data Size**.

5 Specify the device for sampling data in **Source**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

6 Select the condition for sampling data under **Sampling Method**.

- **Fixed Period**
  Samples the value of source device at a fixed interval. If **Fixed Period** is selected, specify **Time** in seconds.

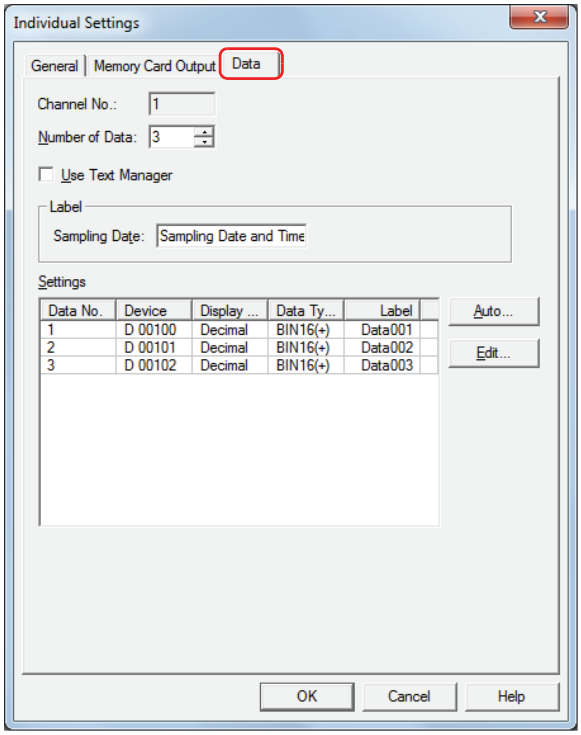
- **Event Bit**
  Samples the value of source device each time the monitored bit device or word device bit changes from 0 to 1. If **Event Bit** is selected, specify the device to monitor as the condition for sampling data in **Device**.

  Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- **Event Word**
  Samples the value of source device each time the value of monitored word device changes. If **Event Word** is selected, select the data size for the word device to monitor in **Data Size**, and specify the device to monitor as the condition for sampling data in **Device**.

  Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

7 Click the **Data** tab.



The channel number selected on the **General** tab is displayed in **Channel No.**

8 In **Number of Data**, specify the number of devices to sample starting with the source device configured on the **General** tab.

The sequential devices from the start address for the number of configured devices are displayed in **Settings**.

9 Enter the label to display in the sampling time column when the data is output as CSV under **Sampling Time**, in **Label**.

To use text registered in Text Manager, select the **Use Text Manager** check box and specify the ID number of the text to use as the label.

Click ... to open Text Manager where you can edit the text.

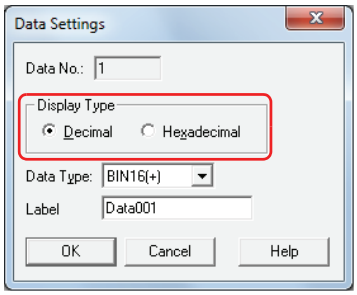
10 Configure the details in **Settings**.
To batch register all the data settings for all data numbers, click **Auto**.
To individually register the data settings for each data number, select a data number and click **Edit**.

The dialog box that corresponds to each button is displayed.
An example when **Edit** is clicked is described here.

11 Check that the data number selected under **Settings** in **Data No.** is displayed.

12 Select the display type for the sampled value of device with **Display Type**.

The display type selected here is the display type for the numerical values when the data is output as CSV.



13 Select the data type for the sampled value of device with **Data Type**.

The data type selected here is the data type for the numerical values when the data is output as CSV.
The data type that can be selected differs according to **Data Size** on the **General** tab.

14 Enter the text to display in the data label in **Label**.

The text entered here is the label row for the data number columns when the data is output as CSV.

If you selected the **Use Text Manager** check box on the **Data** tab, specify the ID number for the text to use in the label.

15 Click **OK** to close the **Data Settings** dialog box.

You are returned to the **Individual Settings** dialog box.

To individually register Data Log settings, repeat steps *10* through *14*.

16 Click **OK** to close the **Individual Settings** dialog box.

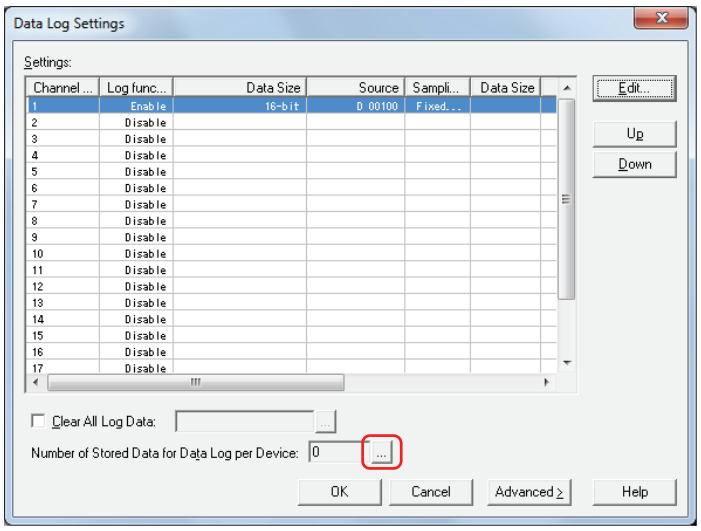
You are returned to the **Data Log Settings** dialog box.

17 Repeat steps *2* through *16* to register Data Log settings for all of the channel numbers to use.

18 Specify the Data log data storage amount per device.

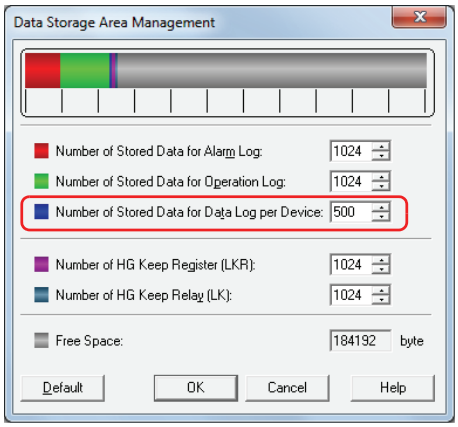
■ **For the HG2G-S/-5S/-5F and HG3G/4G**

Click ... for **Number of Stored Data for Data Log per Device** to display the **Data Storage Area Management** dialog box.



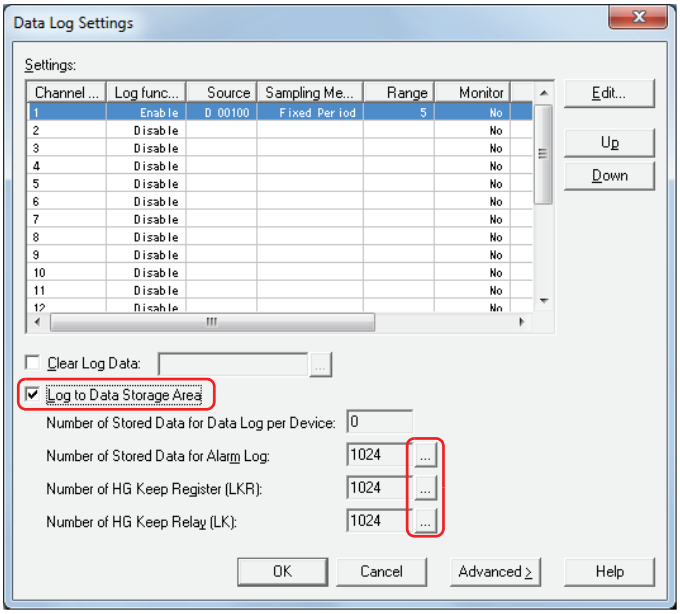
Increase the number for **Number of Stored Data for Data Log per Device**.

Click **OK** to close the **Data Storage Area Management** dialog box.



■ **For the HG1F/2F/3F/4F**

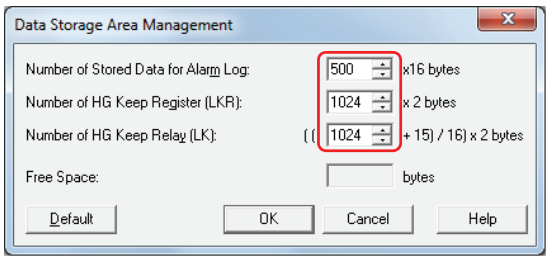
Select the **Log to Data Storage Area** check box and click ... for either **Number of Stored Data for Alarm Log**, **Number of HG Keep Register (LKR)**, or **Number of HG Keep Relay (LK)** to display the **Data Storage Area Management** dialog box.



Decrease the numbers for **Number of Stored Data for Alarm Log**, **Number of HG Keep Register (LKR)**, and **Number of HG Keep Relay (LK)**. Click **OK** to close the **Data Storage Area Management** dialog box.

The number for **Number of Stored Data for Data Log per Device** is set.

The free space created by adjusting the numbers for **Number of Stored Data for Alarm Log**, **Number of HG Keep Register (LKR)**, and **Number of HG Keep Relay (LK)** is automatically allocated to the data storage amount for the Data Log.



19 Click **OK**.

The **Data Log Settings** dialog box closes.

This concludes configuring the sampling conditions and devices for sampling data.

Next, configure the functions to execute using sampled data.

☞ "4.1 Display the Data in the Line Chart" on page 14-31
☞ "4.2 Displaying Data as Numerical Values" on page 14-33
☞ "4.3 Saving the Data as a CSV File" on page 14-43

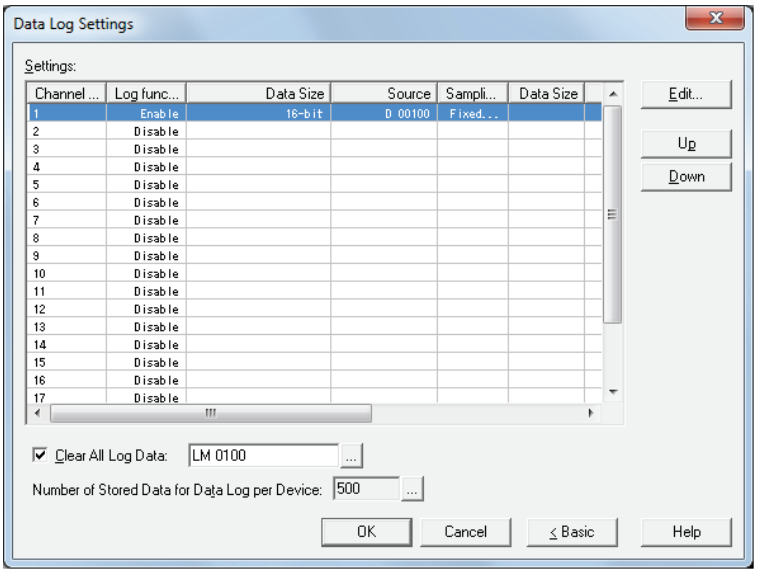
3 Data Log Settings Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the items and buttons on the **Data Log Settings** dialog box and the **Individual Settings** dialog box.

3.1 Data Log Settings Dialog Box

All the devices to sample values from and their sampling conditions are collectively managed in the **Data Log Settings** dialog box.



■ **Settings**

Edits the Data Log settings for each channel.

Channel No.:	Shows the channel number. Double clicking the cell displays the **Individual Settings** dialog box where you can edit the settings. For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16.
Log function:	Shows whether or not the Data Log function is used. Double clicking the cell switches between **Enable** and **Disable**. If switched to **Disable**, that channel's settings all return to the default settings.
Data Size*1:	Shows the data size for the source device. Double clicking the cell switches between **16-bit** and **32-bit**. This option can only be set when **Enable** is selected in **Log Function**.
Source:	Specifies the device to sample values from. Double clicking the cell displays the **Device Address Settings** dialog box where you can edit the device address. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be set when **Enable** is selected in **Log Function**.
Sampling Method:	Shows the condition for sampling data. Double clicking the cell switches between **Fixed Period**, **Event Bit**, and **Event Word**. This option can only be set when **Enable** is selected in **Log Function**.
Data Size*1:	Shows the data size for the device that is the sampling condition. Double clicking the cell switches between **16-bit** and **32-bit**. This option can only be set when **Event Word** is selected in **Sampling Method**.
Range:	Shows the time in seconds (1 to 9999) to sample data in a fixed interval when **Fixed Period** is selected in **Sampling Method**. Double clicking the cell displays the **Individual Settings** dialog box where you can edit the settings. For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16.
	Shows the device that is the condition for sampling data when **Event Bit** or **Event Word** is selected in **Sampling Method**. Double clicking the cell displays the **Device Address Settings** dialog box where you can edit the device address. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only

Monitor: Shows the write destination device for the amount of data when monitoring the amount of sampled data. Shows **No** when not monitoring. Double clicking the cell displays the **Individual Settings** dialog box where you can edit the settings. For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16. This option can only be set when **Enable** is selected in **Log Function**.

Batch: Shows the trigger device that triggers batch output when batch outputting all the data saved in the data storage area to the memory card. Shows **No** when there is no batch output. Double clicking the cell displays the **Individual Settings** dialog box where you can edit the settings. For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16.

Real Time: Shows whether or not to perform real time output. Double clicking the cell switches between **Yes** and **No**. Data is output to the memory card in 3 minute intervals for **Yes** channels. This option can only be set when **Enable** is selected in **Log Function**.

No. of Data*2: Shows the number of devices to sample in one channel. Double clicking the cell displays the **Individual Settings** dialog box where you can edit the settings. For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16. This option can only be set when **Enable** is selected in **Log Function**.

■ Edit

Registers or changes the settings for the selected channel number.

Select a channel number and click this button to display the **Individual Settings** dialog box. The settings for the selected channel are reflected in the **Individual Settings** dialog box.

For details, refer to "3.2 Individual Settings Dialog Box" on page 14-16.

■ Up

Shifts the selected settings upward in the list.

■ Down

Shifts the selected settings downward in the list.

■ Clear All Log Data*3, Clear Log Data*4

Select this check box to erase the all log data saved in the data storage area.

(Trigger device): Specifies the bit device or bit of the word device that triggers the erasure of the data. The data for all channels is erased when the value of the configured device changes from 0 to 1. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Log to Data Storage Area*4

Select this check box to retain Data Log data even when the MICRO/I is turned off.

The amount of data that can be sampled per device is determined by the data storage area settings used by the Data Log data storage amount and the HG keep register (LKR) and HG keep relay (LK) addresses.

The data storage amount per device is calculated as shown next.

Data storage amount per device =
(Data storage area capacity (18560) - (Data log data storage amount × 16 + HG keep register addresses × 2 + ((HG keep relay addresses + 15) ÷ 16) × 2)) ÷ (6 × Number of used channels + 2 × Amount of used data)

Example: When the Data Log data storage amount is 500, the HG keep register addresses (LKR) are 1024, the HG keep relay addresses (LK) are 1024, the channels used by the Data Log are 2, and the amount of data used is 2:
The data storage amount per device is
(18560 - 16 × 500 + 1024 × 2 + ((1024 + 15) ÷ 16) × 2)) ÷ (6 × 2 + 2 × 2) = 524

If this check box is cleared, the data storage amount per device automatically becomes 1024.

*2 Advanced mode only
*3 HG2G-S/-5S/-5F, HG3G/4G only
*4 HG1F/2F/2S/3F/4F only

■ **Number of Stored Data for Data Log per Device**

Shows the maximum amount of data storage per device for Data Log data saved in the data storage area. If data is saved up the maximum amount and then the maximum is exceeded, the old data is deleted and the new data is saved.

HG2G-S/-5S/-5F, HG3G/4G:	The default is 0. Click ... to display the **Data Storage Area Management** dialog box where you can change the allocation of data storage area memory. For details, refer to Chapter 16 "Data Storage Area" on page 16-1.
HG1F/2F/2S/3F/4F:	The default is 0. Change the alarm log data storage amount and the HG keep register (LKR) and HG keep relay (LK) addresses to set the maximum amount of data storage per device.

■ **Number of Stored Data for Alarm Log*4**

Shows the maximum amount of alarm log data saved in the data storage area.

Click ... to display the **Data Storage Area Management** dialog box where you can change the allocation of data storage area memory.

For details, refer to Chapter 16 "Data Storage Area" on page 16-1.

■ **Number of HG Keep Register (LKR)*4**

Shows the number of HG keep register (LKR) addresses.

Click ... to display the **Data Storage Area Management** dialog box where you can change the allocation of data storage area memory.

For details, refer to Chapter 16 "Data Storage Area" on page 16-1.

■ **Number of HG Keep Relay (LK)*4**

Shows the current number of HG keep relay (LK) addresses.

Click ... to display the **Data Storage Area Management** dialog box where you can change the allocation of data storage area memory.

For details, refer to Chapter 16 "Data Storage Area" on page 16-1.

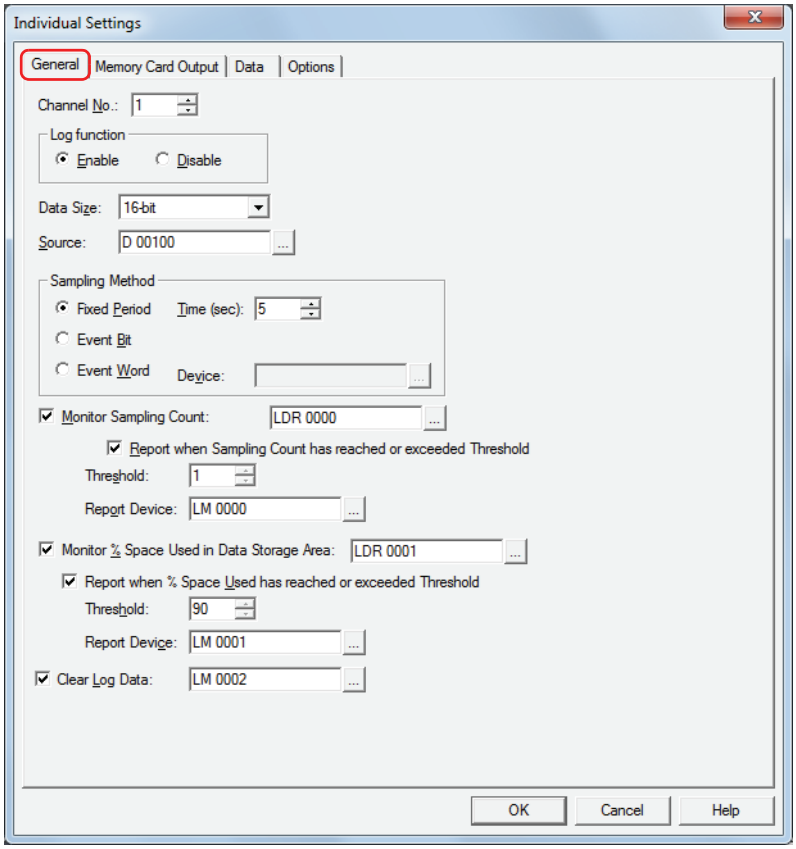
*4 HG1F/2F/2S/3F/4F only

3.2 Individual Settings Dialog Box

Use the **Individual Settings** dialog box to register or edit the Data Log settings for the selected channel.

● General Tab

The **General** tab is used to configure the source devices for sampling data and the sampling conditions.



■ Channel No.

Specifies the channel number for sampling data (1 to 20).

■ Log function

Selects whether or not to use the Data Log function.

Enable:	Samples values of devices and saves the data along with the sampling time.
Disable:	Does not sample values of devices.

■ Data Size*1

Selects the data size of the source device as **16-bit** or **32-bit**.

The value of device in the selected data size is read and saved in the data storage area.

■ Source

Specifies the word device that is the source for sampling data.

For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only

■ Sampling Method

Sets the condition for sampling device values.

Fixed Period: Samples the value of source device at a fixed interval.

Time (sec): Specifies the time in seconds (1 to 9999).
This option can only be set when **Fixed Period** is selected.

Event Bit: Samples the value of source device each time the bit device or word device bit changes from 0 to 1.

Event Word: Samples the value of source device each time the value of word device changes.

Data Size*1: Selects the data size of the monitored device as **16-bit** or **32-bit**.
This option can only be set when **Event Word** is selected.

Device: Specifies the word device that triggers sampling data.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This option can only be set when **Event Bit** or **Event Word** is selected.

Data for channels with different sampling methods cannot be displayed in the Line Chart.

■ Monitor Sampling Count*2

Select this check box to monitor the number of times devices values are sampled. The sampling count is written to the specified device.

(Destination Device): Specifies the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report when Sampling Count has reached or exceeded Threshold*3:

Writes 1 in the report device when the current sampling count reaches or exceeds the set threshold.

Threshold*3: Specifies the sampling count that is the basis for reporting.

HG2G-S/-5S:	1 to 13808
HG2G-5F, HG3G/4G:	1 to 29165

Report Device*3: Specifies the destination bit device or the bit in the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Monitor % Space Used in Data Storage Area*2

Select this check box to monitor the usage of the allocated data storage area as the save destination for Data Log data. The usage is calculated from the data storage amount allocated to the data storage area and the amount of saved data, and then written to the specified device.

Usage = Current amount of Data Log data ÷ Data Log data storage amount per device (omits values after the decimal point)

(Destination Device): Specifies the destination word device to write the current usage of the amount of Data Log data storage.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report when % Space Used has reached or exceeded Threshold*3:

Writes 1 in the report device when the current usage reaches or exceeds the set threshold.

Threshold*3: Specifies the usage (1 to 100) that is the basis for reporting.

Report Device*3: Specifies the destination bit device or the bit in the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only
*2 HG2G-S/-5S/-5F, HG3G/4G only
*3 Advanced mode only

Clear Log Data*2

Select this check box to erase the Data Log data for the selected channel from the Data Storage Area.

(Trigger device): Specifies the bit device or bit of the word device that triggers the erasure of the data. The data for selected channels is erased when the value of the configured device changes from 0 to 1. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

If the amount of log data for the channel differs, the Line Chart cannot be displayed.

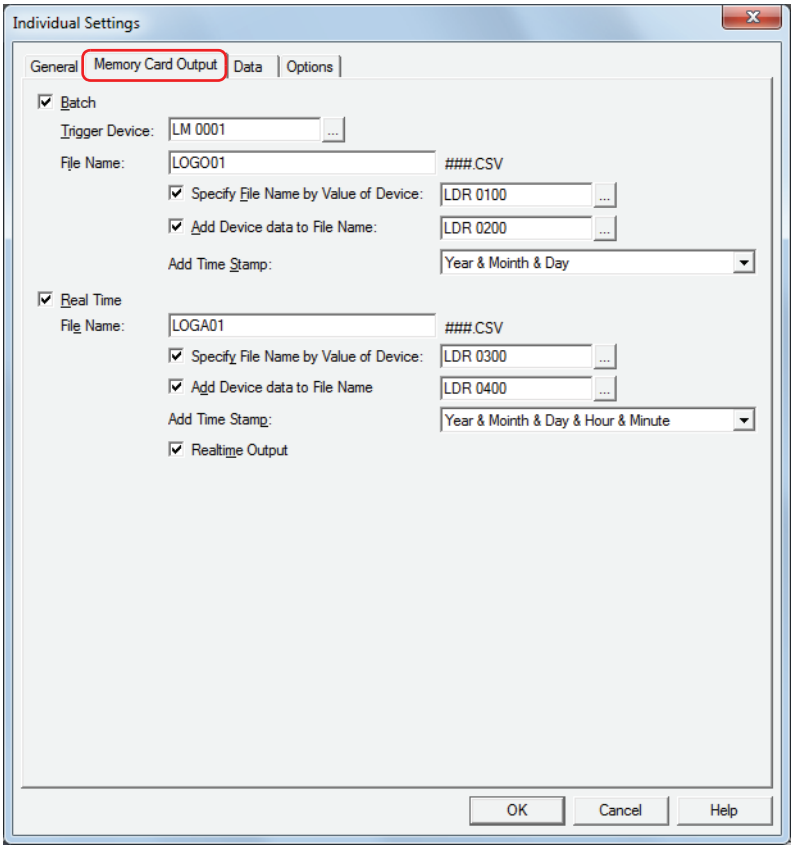
If differing channels of data were displayed in the same chart, the chart can no longer be displayed if the Data Log data is erased by channel units.

*2 HG2G-S/-5S/-5F, HG3G/4G only

● **Memory Card Output** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Memory Card Output** tab is used to configure whether or not to output saved data to the memory card.



The output data is stored in the following folder on the memory card.

HG2G-5F, HG3G/4G: \Memory card folder\DATALOG

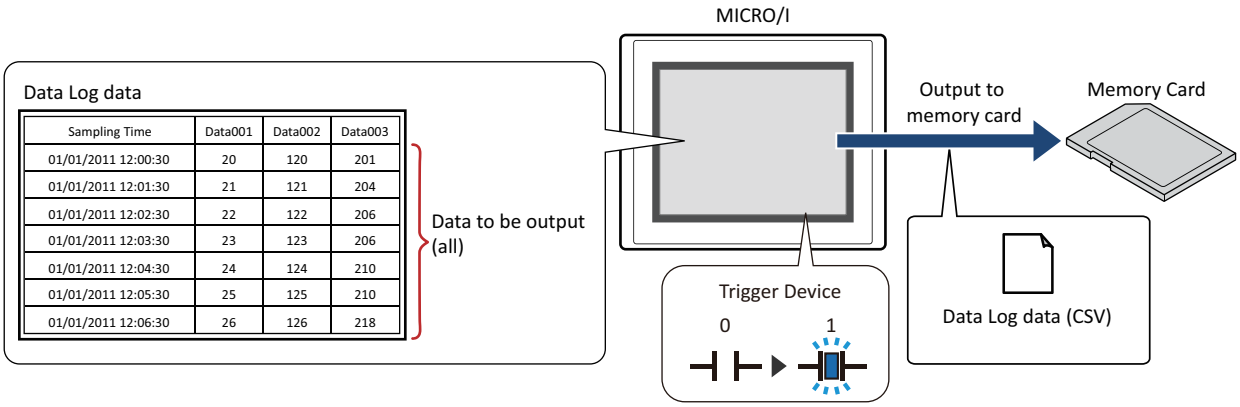
HG2F/3F/4F: \Memory card folder\LOG

The default memory card folder name is "HGDATA01". For details, refer to Chapter 30 "1.5 Setting the Memory Card Folder" on page 30-16.

Data that is sampled after starting output to the memory card is not included in the output data.

Batch

Select this check box to batch output all the sampled data to the memory card.



All the data is saved on the memory card when the trigger devices changes from 0 to 1. If a file with the same name already exists on the memory card, that file is overwritten. The maximum amount of output data is the number displayed in the **Number of Stored Data for Data Log per Device Address** on the **Data Log Settings** dialog box.

> Output stops if there is insufficient free space on the memory card. Memory card error information is stored in HG special register LSD42.

Trigger Device: Specifies the bit device that triggers batch output. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Data is output to file when the trigger device changes from 0 to 1.

File Name: Enter the file name for the output data or shows the file name.

HG2G-5F, HG3G/4G: The default is "LOGO*n*.CSV". (*n*: Data log channel number)

To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

HG2F/3F/4F: The file name is "LOGO*n*.CSV". (*n*: Data log channel number)

This cannot be changed.

Specify File Name by Value of Device*1*2:

Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).

The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Add Device data to File Name[*1]:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: When **File Name** is "LOGO01" and the value of the device configured by (File Name Device) is 123, the file name is "LOGO01123.CSV".

Add Time Stamp[*1*2]:

Selects the format of the output date and time to add to the file name for the output data.

None, **YY**, **YY+MM**, **YY+MM+DD**, **YY+MM+DD+HH**, **YY+MM+DD+HH+MM**, **YY+MM+DD+HH+MM+SS**

The format is YYMMDD_TTMMSS (YY: year, MM: month, DD: day, HH: hour, MM: minute, SS: second).

Example: **File Name** is "LOGO01" on September 15 2013 at 23:30:50

YY:	LOGO01_13
YY+MM:	LOGO01_1309
YY+MM+DD:	LOGO01_130915
YY+MM+DD+HH:	LOGO01_130915_23
YY+MM+DD+HH+MM:	LOGO01_130915_2330
YY+MM+DD+HH+MM+SS:	LOGO01_130915_233050

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device**[*1*2].

\ / : ; * ? " < > |

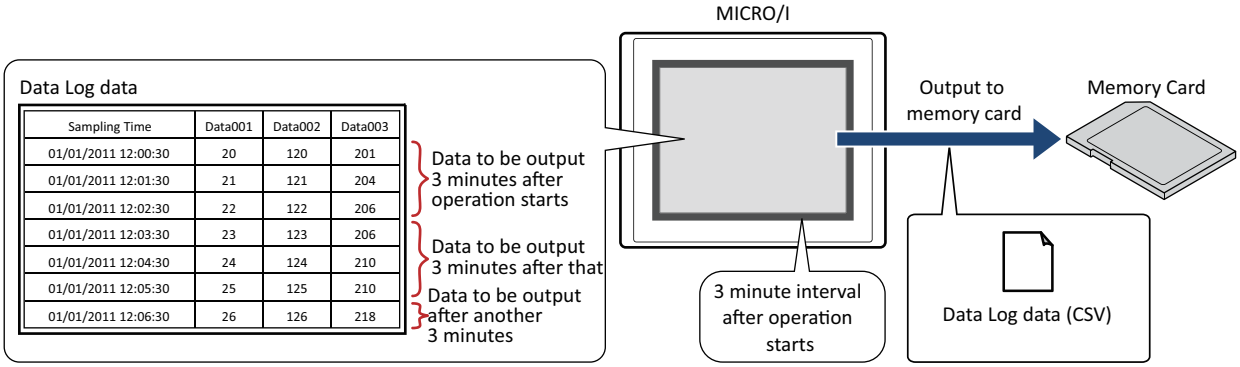
File names that exceed the limits in **Specify File Name by Value of Device**[*1*2] and file names configured with characters that cannot be used are as follows.

- When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
- When a character that cannot be used is set, the text is up to that character.
- When the first character is a character that cannot be used, the text is that set for **File Name**.

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Real Time

Select this check box to output data to the memory card in real time.



With real time output, data is saved to the memory card in three minute intervals after the MICRO/I starts running. For the HG2G-5F and the HG3G/4G, if the accumulated data reaches 80% of the amount set in the Data Storage Area, then the data is forcibly saved to the memory card. When there is already data with the same file name on the memory card, data is appended to that file. If there was no update to the data during the three minutes, it is not output. Data is appended to the file until the size of the file reaches the restriction size (256 MB), so the maximum amount of output data differs according to the settings for the output channel such as the amount of data, the data size, and the labels.

If the sampling interval is shorter than real time output (the interval for writing to the memory card), that Data Log is recorded up to the data storage amount - 1, and then afterwards, old data is discarded in order and replaced with new data.

Real time output stops when the file size of the Data Log data exceeds 256 MB or when there is insufficient space on the memory card. Memory card error information is stored in HG special register LSD42.

- When the value of HG special relay LSM20 changes from 0 to 1, the data at that time is first output in real time to the memory card, and then access to the memory card is stopped.
- The text font configured for the starting device is output as the label font.
- You can check the free space on the memory card with HG special registers LSD43 to 44.

File Name: Enter the file name for the output data or shows the file name.

HG2G-5F, HG3G/4G: The default is "LOGO*n*.CSV". (*n*: Data log channel number)

To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

HG2F/3F/4F: The file name is "LOGO*n*.CSV". (*n*: Data log channel number)

This cannot be changed.

Specify File Name by Value of Device*1*2:

Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).

The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Add Device data to File Name*1:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: When **File Name** is "LOGA01" and the value of the device configured by (File Name Device) is 123, the file name is "LOGA01123.CSV".

Add Time Stamp*1*2:

Selects the format of the output date and time to add to the file name for the output data.

None, **YY**, **YY+MM**, **YY+MM+DD**

The format is YYMMDD (YY: year, MM: month, DD: day).

Example: **File Name** is "LOGA01" on September 15 2013

YY:	LOGO01_13
YY+MM:	LOGO01_1309
YY+MM+DD:	LOGO01_130915

Realtime Output*1*2:

Select this check box to forcibly output the data and save it to file at the desired timing.

(Trigger device): Specifies the bit device or the bit of the word device to serve as the condition to forcibly output the data. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. Data is output to file when the trigger device changes from 0 to 1.

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device***1*2.

\ / : ; * ? " < > |

- File names that exceed the limits in **Specify File Name by Value of Device***1*2 and file names configured with characters that cannot be used are as follows.
  - When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
  - When a character that cannot be used is set, the text is up to that character.
  - When the first character is a character that cannot be used, the text is that set for **File Name**.
- The following operations are as follows if the **Realtime Output** check box*1*2 is selected.
  - Even if the data is outputted forcibly, the real time output period (3 minute interval) is not reset.
  - If the data is outputted but the value of device changes from 0 to 1, then there will be no output to the data.
  - Even when output has finished, the value of device does not automatically change to 0.

- The function to sample data operates when Data Log data is being saved to the memory card.
- For the HG2G-5F and the HG3G/4G, the batch output or real time output status of the Data Log data can be checked with the value of HG special relay LSM35. When the data starts to be written to the memory card, the value of device is 1. When writing is complete, the value is 0.
- The methods to erase Data Log files saved on the memory card are as follows.
  - To erase files during operation using parts, on the **Memory Card** tab on the **Project Settings** dialog box, select the **Remove Files stored in Memory Card** and the **All Data Log data** check boxes, and then configure the trigger device. Assign that trigger device to a part.
  - To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to display the **Clear Data** dialog box. Select the **Data Log Data** check box and click **OK**.
  - To erase files on the HG2G-5F and the HG3G/4G, select the files to erase with the System Menu File Manager, and then press **DEL**.

*1 Advanced mode only
*2 HG2G-5F, HG3G/4G only

Output Data File Name

The file name is as follows.

File Name Value of Device_YYMMDD_TTMMSS.CSV

File Name:	The text entered in **File Name** or the text in the value of device configured by **Specify File Name by Value of Device**[*2]
Value of Device:	The lower 3 digits of the value of the device configured by **Add Device data to File Name**
YYMMDD:	The year, month, and day of the date configured by **Add Time Stamp**[*2]
TTMMSS:	The hour, minute, and second of the time configured by **Add Time Stamp**[*2]

Setting example 1

Item	Setting	
File Name	LOGO01	
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM	Date when data was output: September 2013

The file name is "LOGO01123_1309.CSV".

Setting example 2

Item	Setting	
Specify File Name by Value of Device	(File Name Device) is LDR100 Text to set is "IDEC"	LDR100 value: 4944 (hexadecimal) LDR101 value: 4543 (hexadecimal) LDR102 value: 0000 (hexadecimal)
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM+DD+HH+MM+SS	Date and time when data was output: September 15 2013 at 23:30:50

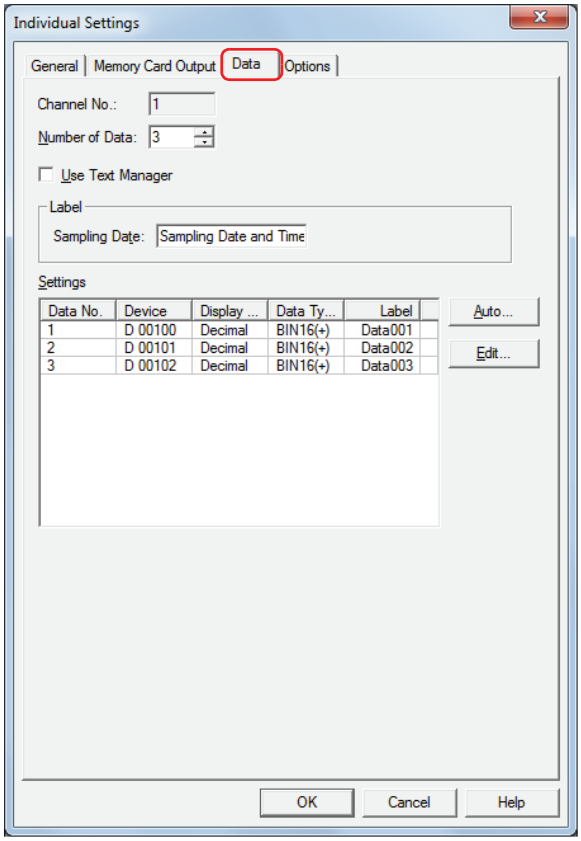
The file name is "IDEC123_130915_233050.CSV".

*2 HG2G-5F, HG3G/4G only

● **Data** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Data** tab is used to configure the data to sample.



■ **Channel No.**

Shows the selected channel number.

■ **Number of Data**

Specifies the number of devices (1 to 128) for sampling data. Samples values of devices in this amount starting with the device configured as the source device on the **General** tab.

> The maximum amount of data that can be configured for one channel is 128. However, for the HG2G-5F and the HG3G/4G, if **32-bit** is selected for **Data Size**, it is counted as 16-bit data times 2 devices, so the maximum number devices that can be configured for one channel is 64. **Data Size** is configured with the **General** tab on the **Individual Settings** dialog box.

■ **Use Text Manager**

Select this check box to use text registered in the Text Manager for labels when outputting data as CSV.

■ **Label**[*1]

Sampling Time: Specifies the label to display in the sampling time column when outputting data as CSV.

- Text ID: Specifies the Text Manager ID number (1 to 32000) when text registered in Text Manager are used for labels.

  Click ... to open Text Manager where you can edit the text.

  This option is only enabled if you select the **Use Text Manager** check box.

- (Text): Enter the text to display in the label. The maximum number is 40 characters.

  Text can only be entered when the **Use Text Manager** check box is cleared. The registered text is displayed when a text ID is specified.

*1 HG2G-S/-5S/-5F, HG3G/4G only

Settings

Settings is used to configure the details of the data to sample for each data number in the selected channel.

Data No.:	Shows the data numbers for the amount of data specified by **Number of Data**. Double clicking the cell displays the **Data Settings** dialog box. The data number cannot be edited. For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.
Device:	Shows the device as sequential numbers starting with the source device specified on the **General** tab. Double clicking the cell displays the **Data Settings** dialog box. The device cannot be edited. For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.
Display Type:	Shows the display type for numerical values when data is output as CSV. Double clicking the cell displays the **Data Settings** dialog box where you can edit the data settings. For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.
Data Type:	Shows the data type for numerical values when data is output as CSV. Double clicking the cell displays the **Data Settings** dialog box where you can edit the data settings. For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.
Text ID:	Shows the Text Manager ID number when text registered in Text Manager is used for labels. Double clicking the cell opens Text Manager where you can edit the text. **Text ID** is only displayed when you select the **Use Text Manager** check box.
Label:	Shows the text to display as labels when data is output as CSV. Double clicking the cell allows you to edit the label. The maximum number is 40 characters. Text can only be entered when the **Use Text Manager** check box is cleared. The default label is "Data" and the data number. Example: Data001

Auto

Batch registers or changes the settings for all the data.

Click this button to display the **Auto-Setup** dialog box. The details configured on the **Auto-Setup** dialog box are registered for all the data.

For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.

Edit

Registers or changes the settings for the selected data.

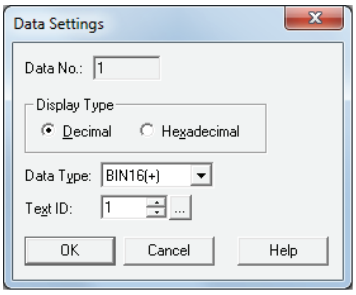
Select the data and click this button to display the **Data Settings** dialog box. The details configured on the **Data Settings** dialog box are registered or changed for the selected data.

For details, refer to "Auto-Setup Dialog Box and Data Settings Dialog Box" on page 14-27.

Auto-Setup Dialog Box and **Data Settings** Dialog Box

With the **Auto-Setup** dialog box, all the data for the selected channel is batch registered or changed.

With the **Data Settings** dialog box, the selected data for the selected channel is registered or changed.



Data No.: Displays 1 when the **Auto-Setup** dialog box was displayed by clicking **Auto**.

Displays the data number for the selected data when the **Data Settings** dialog box was displayed by clicking **Edit**.

Display Type: Select the display type as **Decimal** or **Hexadecimal** for numerical values when data is output as CSV.

Data Type: Select the data type for numerical values when data is output as CSV. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

The data type that can be selected differs according to **Data Size** on the **General** tab.

When **float32** is selected, the maximum number of digits for the integer part is 10 and the number of digits for the decimal part is 5.

Text ID: Specifies the Text Manager ID number (1 to 32000) when text registered in Text Manager are used for labels. For the **Auto-Setup** dialog box, **Text ID** is automatically configured sequentially starting with the specified text ID.

Click ... to open Text Manager where you can edit the text.

Text ID can only be configured when you select the **Use Text Manager** check box.

Label: Enter the text to display as the label when data is output as CSV. The maximum number is 40 characters.

The default label is Data+number.

Example: Data001

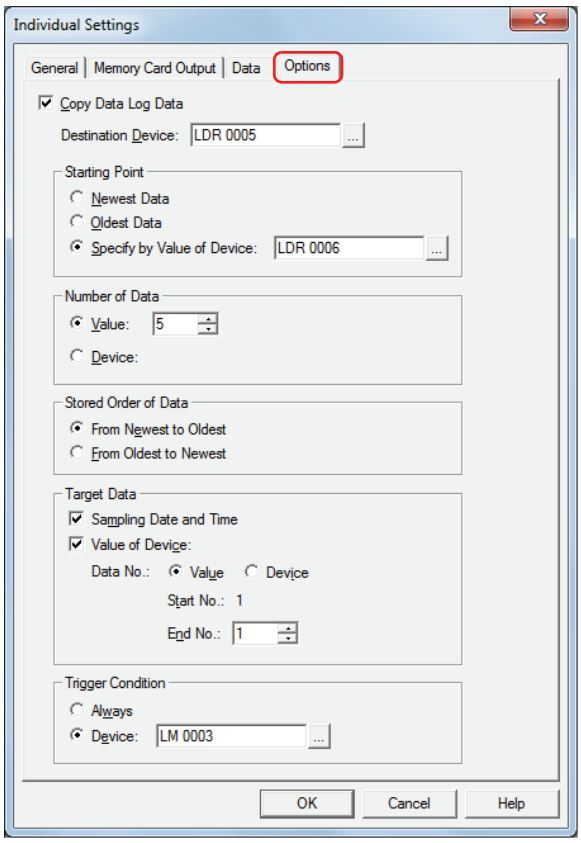
This item is only displayed on the **Data Settings** dialog box when the **Use Text Manager** check box is cleared.

● **Options** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Options** tab only appears in Advanced mode. To switch to Advanced mode, click **Advanced** on the **Data Log Settings** dialog box.

To display the data saved in the data storage area as numerical values on the MICRO/I, copy this data to the specified internal device.



■ **Copy Data Log Data**

Select this check box to copy data to a device.

Destination Device: Specifies the destination device for copied data. You can only specify an internal device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 HG2G-5F, HG3G/4G only

Starting Point

Selects the starting point of the data to copy.

Newest Data:	Sets the starting point as the newest data.
Oldest Data:	Sets the starting point as the oldest data.
Specify by Value of Device:	Specifies which data from the oldest data to set as the starting point. Specifies the source word device. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: 1. For **Newest Data**, the starting point is the newest sampling time data.
2. For **Oldest Data**, the starting point is the oldest sampling time data.
3. For **Specify by Value of Device** and source device: 3, the starting point is the third item of data from the oldest sampling time data.

Data log data

	Sampling Time	Value
2. **Oldest Data** read starting point →	12/18/2011 17:44:10	20
	12/18/2011 18:34:10	21
3. **Specify by Value of Device** read starting point (source device: 3) →	12/19/2011 19:24:43	22
	12/19/2011 20:01:54	24
	12/19/2011 21:39:21	26
1. **Newest Data** read starting point →	12/20/2011 05:57:06	28

Number of Data

Selects the specification method for the amount of data to copy.

Value:	Uses a constant. Specifies the amount to copy (1 to 64).
Device:	Uses a word device. Specifies the source word device. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The maximum amount of data that can be copied to the internal device is 64, regardless of data size.

Stored Order of Data

Selects the order to copy data.

From Newest to Oldest:	Of the data to copy, copies from the start point in order of the newest data first.
From Oldest to Newest:	Of the data to copy, copies from the start point in order of the oldest data first.

Example: When **Starting Point** is **Newest Data** and **Number of Data** is 3, data is copied in the following order starting from device LDR 10 configured in **Destination Device**.

Data log data

	Sampling Time	Value
	12/18/2011 17:44:10	20
	:	:
	12/19/2011 19:24:43	22
	12/19/2011 20:01:54	24
Newest data read starting point→	12/19/2011 21:39:21	26
	12/20/2011 05:57:06	28

Amount of data: 3

Configured device→

Destination Device	Value	
LDR 10	28	←Copy from newest data
LDR 11	26	
LDR 12	24	

Configured device→

Destination Device	Value	
LDR 10	24	←Copy from oldest data
LDR 11	26	
LDR 12	28	

Target Data

Selects the data to copy from the Data Log data.

Sampling Time: Select this check box to copy the sampling time data from the Data Log data. When this check box is selected, values of devices are copied in order from the data for data number 1.

Value of Device: Select this check box to copy the value of device from the Data Log data.

Data No.: Selects the specification method for the data number of the value to copy.

Value: Uses a constant.

Device: Uses a word device.

Start No.: Of the data to copy, specifies the data number of the data to start copying.

If you select **Value**, specify the data number (1 to 128).

If you select **Device**, specify the source device. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

When the **Sampling Time** check box is selected, the data number is 1. This cannot be changed.

End No.: Of the data to copy, specifies the data number of the data to end copying.

If you select **Value**, specify the data number (1 to 128).

If you select **Device**, specify the source device. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When **Start No.** is 2 and **End No.** is 4, data 2 to 4 is the copy target.

		Start No.		End No.	
Data No.:	1	2	3	4	5
	↓	↓	↓	↓	↓
Sampling Time	**Data 1**	**Data 2**	**Data 3**	**Data 4**	**Data 5**
10/01/2011 12:34:56	100	60	240	60	240
10/02/2011 03:45:12	200	80	450	80	450

Copy target

Trigger Condition

Selects the condition to start copying.

Always: Copies each time the data is updated.

Device: Specifies the device that triggers the start of copying the data. Copies the data when the value of the specified device changes from 0 to 1.

For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

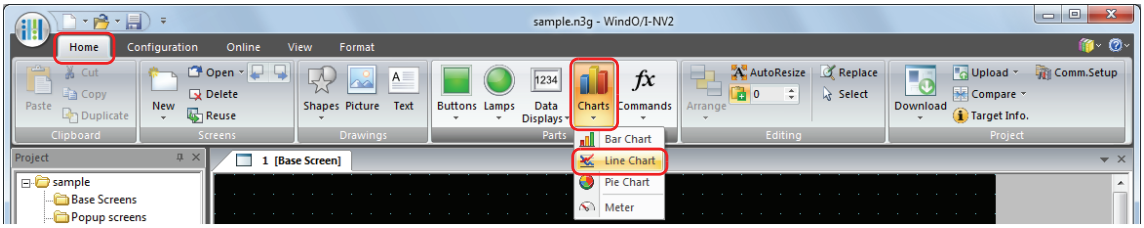
4 Using the Data

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Display the Data in the Line Chart

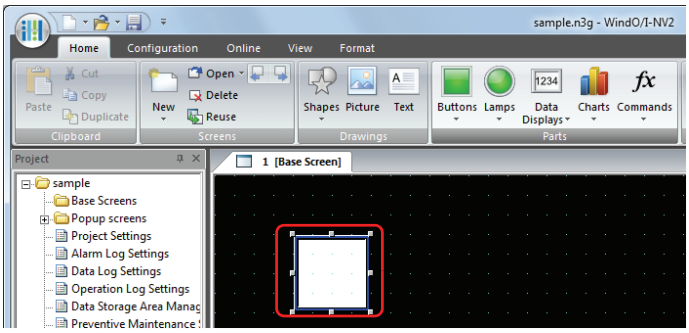
You can display the sampled data in the Line Chart.

1 On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Line Chart**.

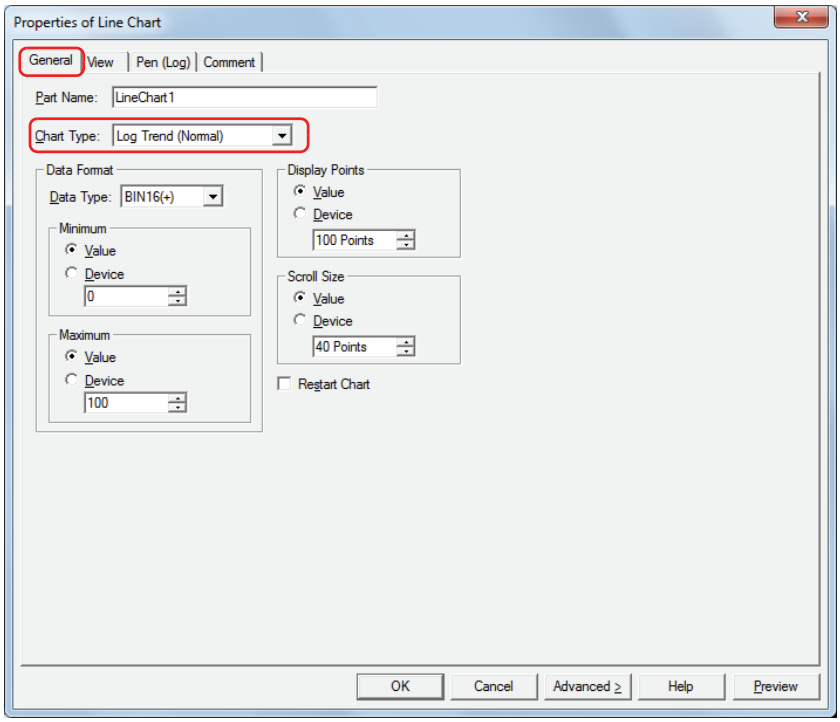


2 Click a point on the edit screen where you wish to place the Line Chart.

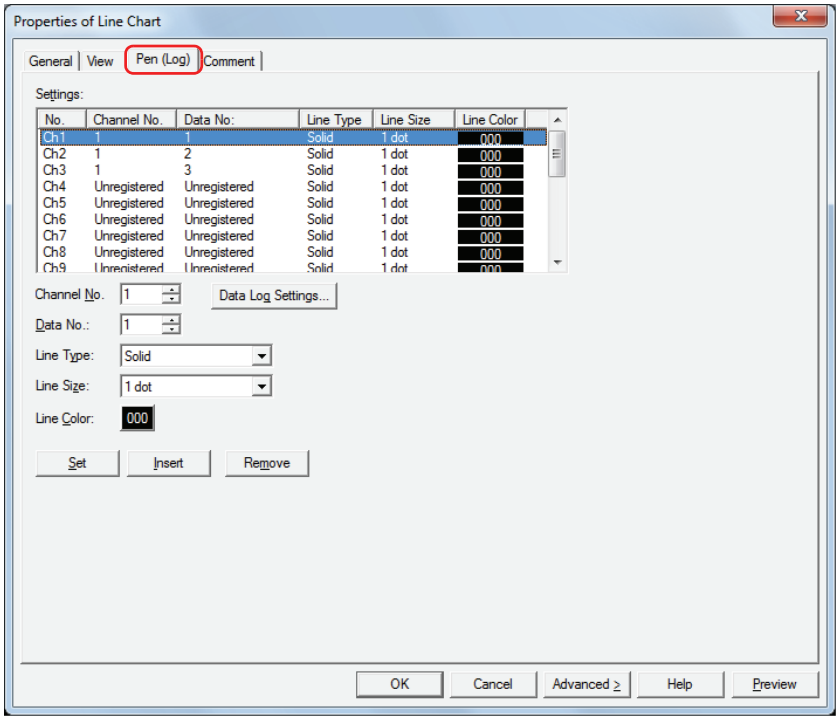
3 Double-click the dropped Line Chart and a Properties dialog box will be displayed.



4 On the **General** tab, select **Chart Type** as **Log Trend (Normal)** or **Log Trend (Pen Recorder)**.



5 Click the **Pen (Log)** tab.



6 Specify **Channel No.** and **Data No.** for the data to display in the chart.

Click **Data Log Settings** to display the **Data Log Settings** dialog box where you can configure the channel while checking the data to display. Select **Channel No.** under **Settings**, and then click **OK** to close the **Data Settings** dialog box. **Channel No.** reflects the selected channel number.

7 Select **Line Type**, **Line Size**, and **Line Color**.

8 Click **Set**.

The data to display in the chart is registered in the channel number (Ch1 to Ch20) for the chart selected in **Settings**.

9 Repeat steps *6* through *8* to register the data to display in the chart.

10 Click **OK**.

The Properties dialog box closes.

This concludes configuring the Line Chart.

4.2 Displaying Data as Numerical Values

You can display data in the Numerical Display by copying data saved in the data storage area to an internal device according to the conditions configured with the **Options** tab on the **Individual Settings** dialog box.

● Copying Data to Internal Devices

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Copying Sampling Time Data

Sampling time data is copied as a BCD value to the six sequential devices starting with the device configured by **Destination Device**.

The sampling time data is copied in year, month, day, hour, minute, second order regardless of the **Stored Order of Data** setting.

■ **Example**

When the sampling time 10/01/2011 12:01:30 is copied to the destination device

Data log data

Sampling Time	Value
10/01/2011 12:01:30	20

Configured device→

Destination Device	Value	
LDR 10	2011	←Year
LDR 11	10	←Month
LDR 12	1	←Day
LDR 13	12	←Hour
LDR 14	1	←Minute
LDR 15	30	←Second

Data Read Start Position and Copy Order of Data to the Destination Device

The data to copy and the order differs according to the **Starting Point** and the **Stored Order for Data** settings.

■ **Example 1**

Copying three items of the newest data in the Data Log to the destination device

Item	Setting
Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	3
Stored Order of Data	From Newest to Oldest

Data log data

	Sampling Time	Value
	12/18/2011 17:44:10	20
	:	:
	12/19/2011 19:24:43	22
	12/19/2011 20:01:54	24
Newest data read starting point →	12/19/2011 21:39:21	26
	12/20/2011 05:57:06	28

Amount of data: 3

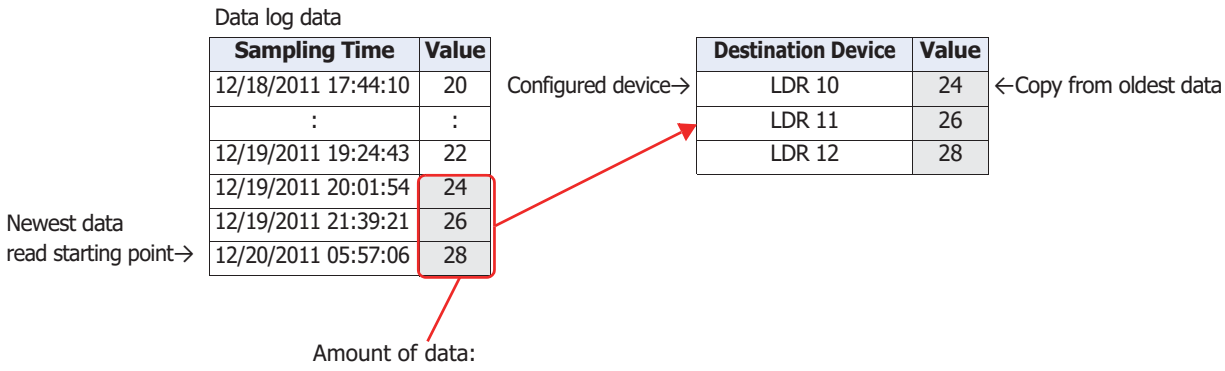
Configured device→

Destination Device	Value	
LDR 10	28	←Copy from newest data
LDR 11	26	
LDR 12	24	

Example 2

Copying three items of the newest data in the Data Log in order from the oldest to the destination device

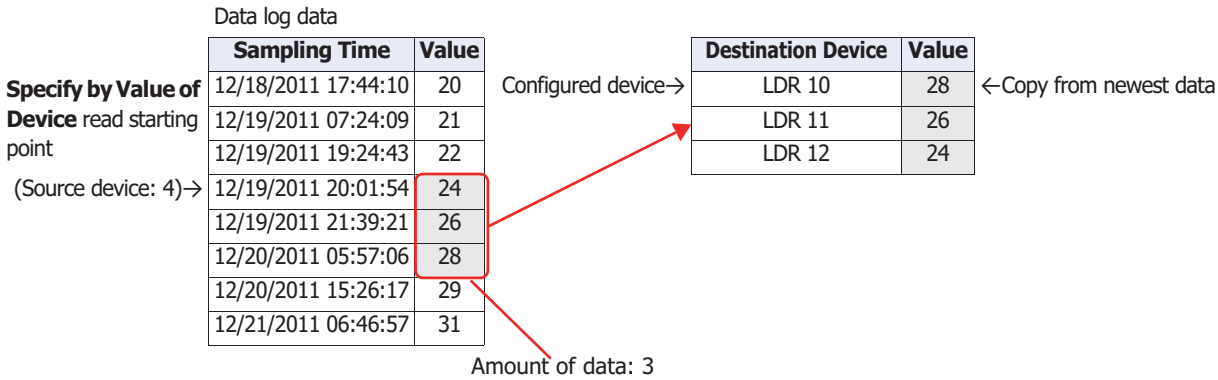
Item	Setting
Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	3
Stored Order of Data	From Oldest to Newest



Example 3

Setting the starting point to the fourth item of the oldest data in the Data Log and copying three items of data from the newest to the destination device

Item	Setting
Destination Device	LDR 10
Starting Point	Specify by Value of Device (value is 4)
Number of Data	3
Stored Order of Data	From Newest to Oldest



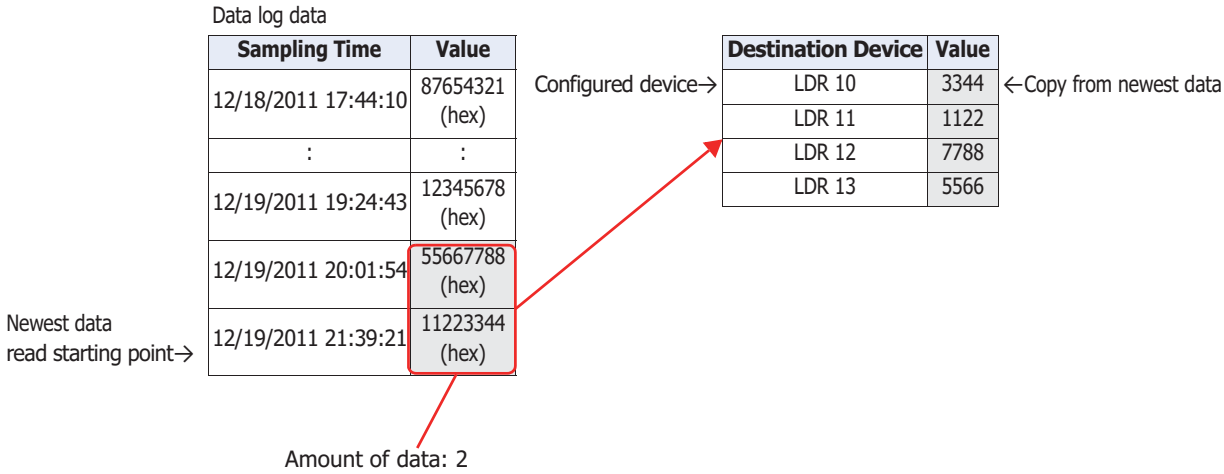
Copying Data when 32-bit is Selected as the Data Size

When **32-bit** is selected for **Data Size** on the **General** tab on the **Individual Settings** dialog box, two destination devices are required for a single item of data.

■ **Example 1**

Copying the newest data in the Data Log with the data size selected as 32-bit to the destination device LDR 10.

Item	Setting
Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	2
Data Size	32-bit
Stored Order of Data	From Newest to Oldest



The data copy order for the device selected with a data size of 32-bit is configured on the **Project Settings** dialog box, on the **System** tab, with **Storage Method of 32-bit Numerical Data**. For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

Copying Multiple Items of Data

When copying multiple items of data, first all the sampling times for the data are copied in order starting with the device configured as the destination device, then the values of devices for all the data are copied in order.
For example, data is copied in this order: first sampling time → second sampling time → ... → first data 1 value of device → first data 2 value of device → second data 1 value of device → second data 2 value of device and so on.

■ **Example 1: When the amount of data is greater than the data to copy**

When the sampling time and values of devices from data start number 1 to end number 3 are copied to the destination device as two items of data

Item	Setting
Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	2
Stored Order of Data	From Oldest to Newest
Target Data	Sampling Time, Value of Device
	Data No.: Start No. 1, End No. 3

Data log data

	Sampling Time	Data 1	Data 2	Data 3	Data 4	Data 5	
	10/01/2011 12:00:30	10	40	100	20	120	
1.	10/01/2011 12:34:56	100	60	240	30	200	
2.	10/02/2011 03:45:12	200	80	450	70	400	←Newest Data read starting point
		3.	4.	5.			

	Destination Device	Value	
Configured device→	LDR 10	2011	←Copy from oldest data
	LDR 11	10	
	LDR 12	01	
1.	LDR 13	12	←First sampling time
	LDR 14	34	
	LDR 15	56	
	LDR 16	2011	
	LDR 17	10	
	LDR 18	02	
2.	LDR 19	03	←Second sampling time
	LDR 20	45	
	LDR 21	12	
3.	LDR 22	100	←First data 1 value
	LDR 23	200	←Second data 1 value
4.	LDR 24	60	←First data 2 value
	LDR 25	80	←Second data 2 value
5.	LDR 26	240	←First data 3 value
	LDR 27	450	←Second data 3 value

Example 2: When the amount of data is less than the data to copy

When the sampling time and values of devices from data start number 1 to end number 3 are copied to the destination device as two items of data

Item	Setting
Destination Device	LDR 10
Starting Point	Newest Data
Number of Data	2
Stored Order of Data	From Oldest to Newest
Target Data	Sampling Time, Value of Device
	Data No.: Start No. 1, End No. 3

Data log data

	Sampling Time	Data 1	Data 2	
	10/01/2011 12:00:30	10	40	Data 3 (no data)
1.	10/01/2011 12:34:56	100	60	
2.	10/02/2011 03:45:12	200	80	← Newest Data read starting point
		3.	4.	

	Destination Device	Value	
Configured device →	LDR 10	2011	←Copy from oldest data
	LDR 11	10	
	LDR 12	01	
1.	LDR 13	12	←First sampling time
	LDR 14	34	
	LDR 15	56	
	LDR 16	2011	
	LDR 17	10	
2.	LDR 18	02	←Second sampling time
	LDR 19	03	
	LDR 20	45	
	LDR 21	12	
	LDR 22	100	←First data 1 value
3.	LDR 23	200	←Second data 1 value
	LDR 24	60	←First data 2 value
4.	LDR 25	80	←Second data 2 value
If the amount of data in the Data Log is less than the data to copy, 0 is stored	LDR 26	0	←First data 3 value
	LDR 27	0	←Second data 3 value

When writing with the following settings, "Device range error" is displayed.

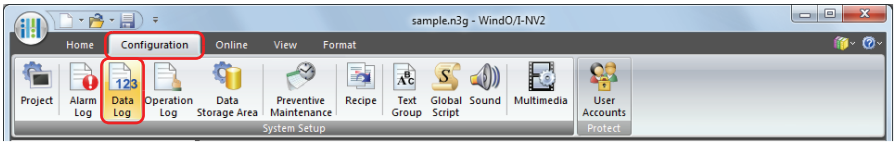
- **Starting Point** is 0 or a value larger than the amount of saved data
- **Start No.** is 0 or a value larger than **Data No.**
- **End No.** is 0 or a value larger than **Data No.**
- **Start No.** is a value larger than **End No.**

● Displaying Data on the Numerical Display

You can copy sampled data to an internal device and display it with the Numerical Display.

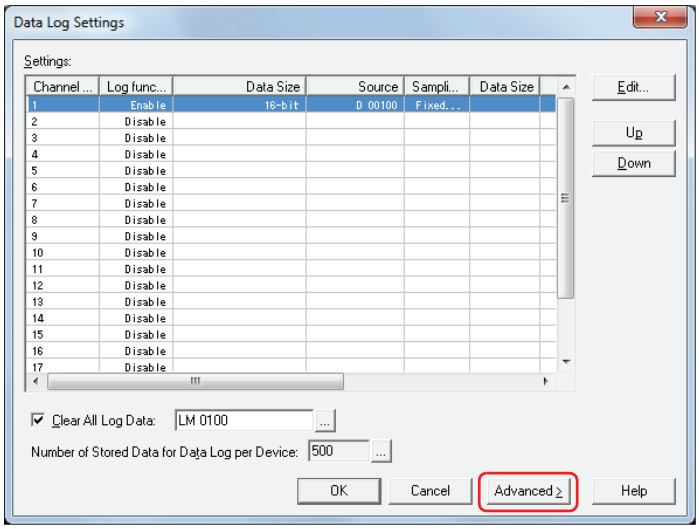
1 On the **Configuration** tab, in the **System Setup** group, click **Data Log**.

The **Data Log Settings** dialog box is displayed.



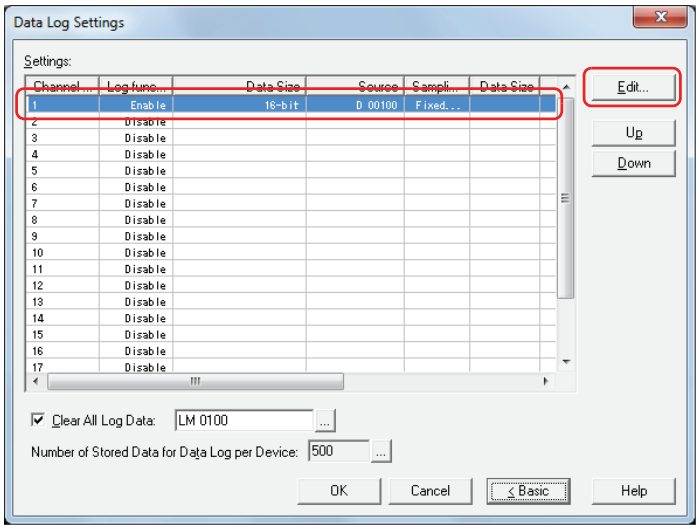
2 Click **Advanced**.

The dialog box switches to Advanced mode.



3 Under **Settings**, select the channel number for the data to display numerical values of on the Numerical Display, then click **Edit**.

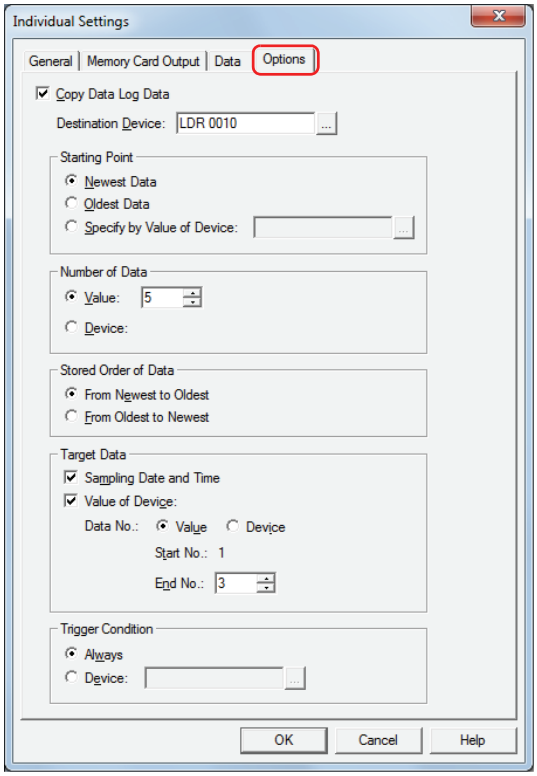
The **Individual Settings** dialog box is displayed.



4 Select **Enable** for **Log function** on the **General** tab and configure **Data Size**, **Source**, and **Sampling Method**.

5 Specify the number of devices to sample in **Number of Data** on the **Data** tab, and configure **Display Type** and **Data Type** for each item of data in **Settings**.

6 Click the **Options** tab.



7 Select the **Copy Data Log Data** check box.

8 Specify the destination device for the copied data in **Destination Device**.

You can only specify an internal device.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

9 Select the data that is the start point for copying data in **Starting Point**.

- **Newest Data**
  Set the starting point to read as the newest data.

- **Oldest Data**
  Set the starting point to read as the oldest data.

- **Specify by Value of Device**
  Specifies which data from the oldest data to set as the starting point to read by value of device, and sets that data as the starting point to read.

  Specifies the source word device. You can only specify an internal device.

  Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

10 Select the specification method for the amount of data to copy in **Number of Data**.

- **Value**
  Use a constant.
  Specifies the amount to copy (1 to 64).
- **Device**
  Use a word device.
  Specifies the source word device. You can only specify an internal device.
  Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The maximum amount of data that can be copied to the internal device is 64, regardless of data size.

11 Select the order to copy data in **Stored Order of Data**.

- **From Newest to Oldest**
  Of the data to copy, copies from the start point in order of the newest data first.
- **From Oldest to Newest**
  Of the data to copy, copies from the start point in order of the oldest data first.

12 Select the data to copy from the data in **Target Data**.

Select the **Sampling Time** check box to copy the sampling time data from the data.
Select the **Value of Device** check box to copy the value of device from the data. When not copying the value of device, proceed to step *15*.

13 Select the specification method for the data number to copy the value in **Data No.**.

- **Value**
  Use a constant.
- **Device**
  Use a word device.

14 Specify the data number of the data to start copying out of the data to copy with **Start No.**.

If you select **Value**, specify the data number (1 to 128).

If you select **Device**, specify the source device. You can only specify an internal device. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

When the **Sampling Time** check box is selected, the data number is 1. This cannot be changed.

15 Specify the data number of the data to end copying out of the data to copy with **End No.**.

If you select **Value**, specify the data number (1 to 128).

If you select **Device**, specify the source device. You can only specify an internal device. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

16 Select the condition to start copying in **Trigger Condition**.

- **Always**
  Copies each time the data is updated.
- **Device**
  Specifies the device that triggers the start of copying the data. Copies the data when the value of the specified device changes from 0 to 1. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

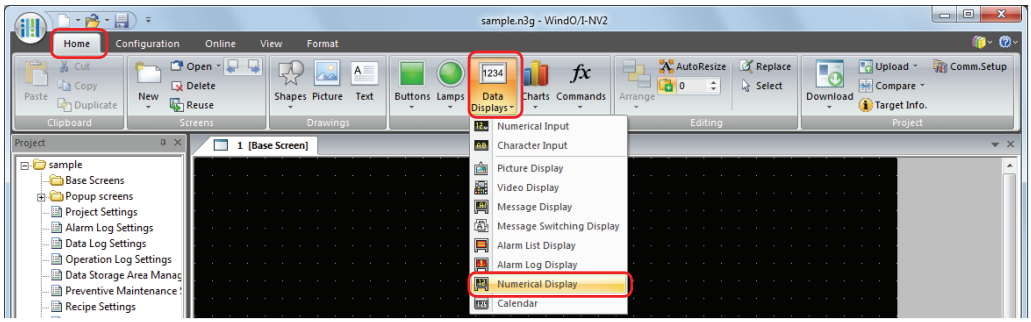
17 Click **OK** to close the **Individual Settings** dialog box.

You are returned to the **Data Log Settings** dialog box.

18 Click **OK**.

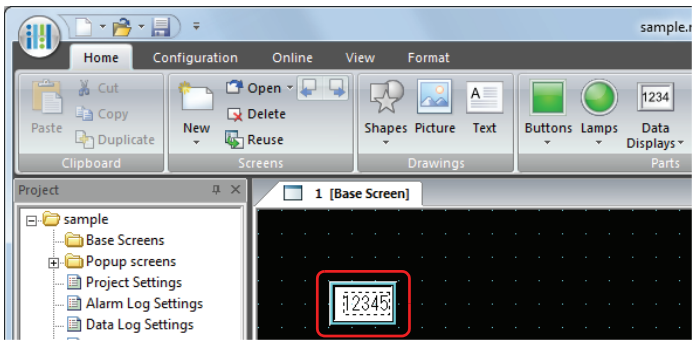
The **Data Log Settings** dialog box closes.

19 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Numerical Display**.

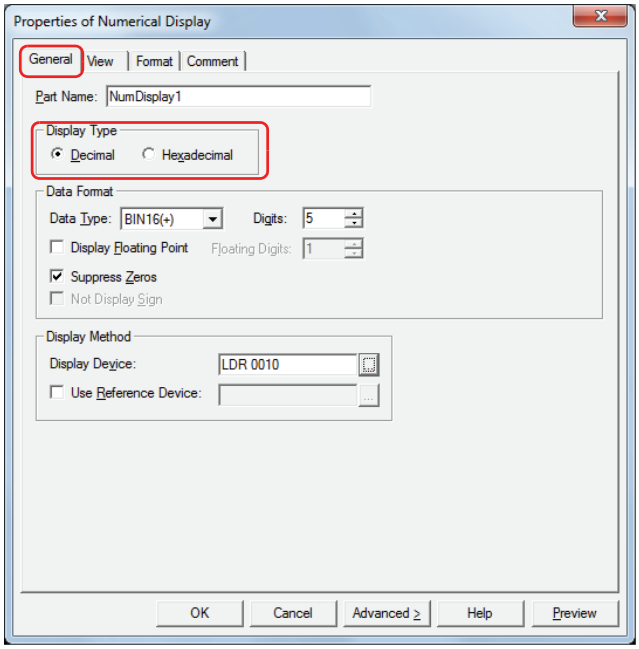


20 Click a point on the edit screen where you wish to place the Numerical Display.

21 Double-click the dropped Numerical Display and a Properties dialog box will be displayed.



22 Select the display type for the copied data with **Display Type** on the **General** tab.



23 Select the data type for the copied data in **Data Type** under **Data Format**.

24 Specify the number of digits to display in **Digits** under **Data Format**.

The range of digits that can be set differs according to the display type and data type.

25 Specify the source device for the copied data in **Display Device** under **Display Method**.

For sequential devices of the amount of data to copy starting with **Destination Device** configured on the **Options** tab on the Data Log Settings **Individual Settings** dialog box, set **Display Device** for each Numerical Display to those devices.

Example: When **Destination Device** is LDR 10, **Number of Data** is 3
Specify three Numerical Displays with **Display Device** specified as LDR 10, LDR 11, LDR 12

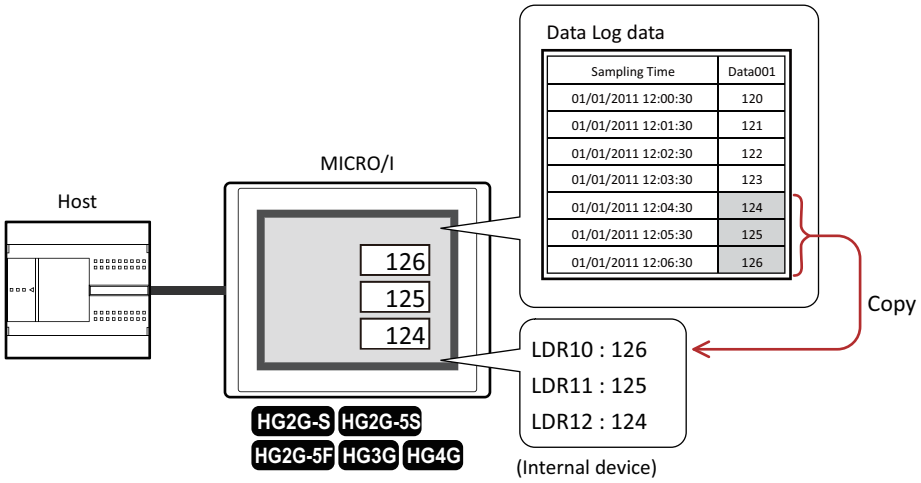
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

26 Click **OK**.

The Properties dialog box closes.

27 Repeat step *17* through *26* to configure the Numerical Displays for the amount of data to copy.

This concludes configuring the Numerical Display.



4.3 Saving the Data as a CSV File

● Saving the Data as a CSV File

The Data Log data can be saved to the memory card as a CSV file or uploaded to a PC.

The procedure to save the data is as follows.

- To save the data to a memory card, click **Data Log** on the WindO/I-NV2 **Configuration** tab to display the **Data Log Settings** dialog box. Select a channel number to save to the memory card and click **Edit** to display the **Individual Settings** dialog box. Select an output method check box on the **Memory Card Output** tab and configure the items. The data can be saved to the memory card folder on the memory card. For details, refer to "Memory Card Output Tab" on page 14-19.
- To upload the data to a PC, click the **Upload** menu in Downloader, and click **All Log Data** or **Data Log Data** to display the **Select Path** dialog box. Specify the location to save the file and click **OK** to save the file to the specified folder. For details, refer to the Downloader manual.

● Data Structure and Output Example

HG2G-S/-5S/-5F, HG3G/4G

The data structure of the output file is as follows. The data structure for files output with batch output and real time output is the same.

Bold items are replaced by the Data Log settings, sampled data, project file name, and WindO/I-NV2 version.

Headers	"Project Name","**Project name**","**Version number**" "File Type","**Log type**" Blank row "Channel No.","**Channel number**" "Source","**Source device**" "Sampling Method","**Sampling condition (type)**" "**Sampling condition (label)**","**Sampling condition (configuration details)**" Blank row
Label row	"**Label (sampling time)**","**Label (data number 1)**","**Label (data number 2)**"... times the amount of data
Data row	"**MM/DD/YYYY HH:MM:SS**",**Data number 1 data value**,**Data number 2 data value**... times the amount of data ⋮

Output example

	Data size of each row
"Project Name","Dimmer Console","V4.50"	- 41 bytes
"File Type","Data Log Data"	- 29 bytes
	- 2 bytes
"Channel No.","1"	- 19 bytes
"Source","LDR 100"	- 20 bytes
"Sampling Method","Fixed Period"	- 34 bytes
"Time[Sec]","1"	- 17 bytes
	- 2 bytes
"Sampling Time","Data001","Data002"	- 37 bytes
"08/23/2011 18:32:04",171,234	- 32 bytes
⋮	

- The data size for each row is counted as 2 bytes for full-width characters, 1 byte for half-width characters, and 2 bytes for newlines. The total for each row is the total amount of space for the file.
- A space is inserted before the year in the data row.
- The display type for the date and time differs according to the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.
  Japanese: YYYY/MM/DD HH:MM:SS
  European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

HG1F/2F/2S/3F/4F

The data structure of the output file is as follows. The data structure for files output with batch output and real time output is the same.

Bold items are replaced by the Data Log settings, sampled data, project file name, and WindO/I-NV2 version.

Headers	"Project Name","**Project name**","**Version number**","**Font name**" "File Type","**Log type**" Blank row "Channel No.","**Channel number**" "Source","**Source device**" "Sampling Method","**Sampling condition (type)**" "**Sampling condition (label)**","**Sampling condition (configuration details)**" "Title Font","**Font name**" Blank row
Label row	"**Label (sampling time)**","**Label (data)**" times the amount of data
Data row	"**MM/DD/YYYY HH:MM:SS**",**Data value** times the amount of data ⋮

Output example

	Data size of each row
"Project Name","Dimmer Console","V4.50","English"	- 51 bytes
"File Type","Data Log Data"	- 29 bytes
	- 2 bytes
"Channel No.","1"	- 19 bytes
"Source","LDR 00000000"	- 25 bytes
"Sampling Method","Event Word"	- 32 bytes
"Device","LDR 00000100"	- 25 bytes
"Title Font","English"	- 24 bytes
	- 2 bytes
"Sampling Time","Data001","Data002"	- 37 bytes
"08/23/2011 18:32:04",171,234	- 32 bytes
⋮	

- The data size for each row is counted as 2 bytes for full-width characters, 1 byte for half-width characters, and 2 bytes for newlines. The total for each row is the total amount of space for the file.
- A space is inserted before the year in the data row.
- The display type for the date and time differs according to the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.
  Japanese: YYYY/MM/DD HH:MM:SS
  European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

Chapter 15 Operation Log Function

This chapter describes how to configure the Operation Log function and its operation on the MICRO/I.

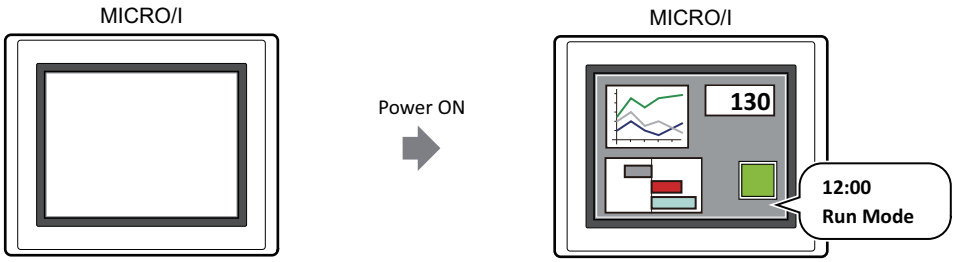
1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

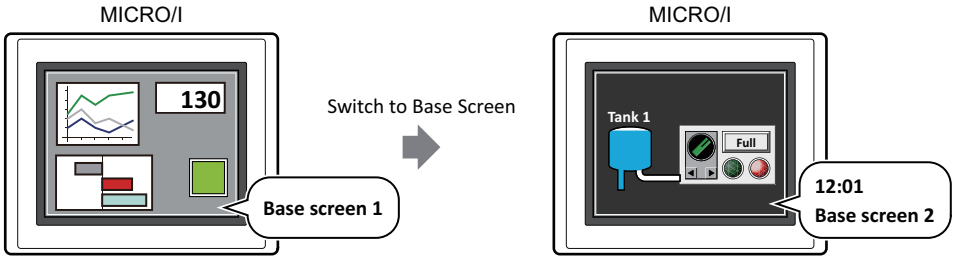
1.1 How the Operation Log Function is Used

The Operation Log function records events that have occurred on the MICRO/I, including user operations such as pressing a button or changing the operation mode.
You can perform the following actions using the Operation Log function.

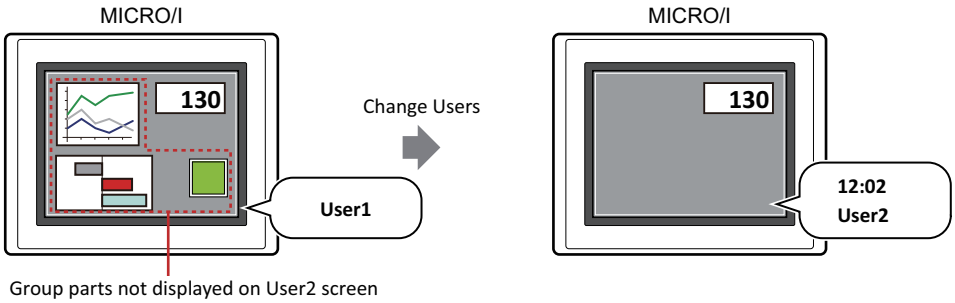
- Record turning on the MICRO/I power



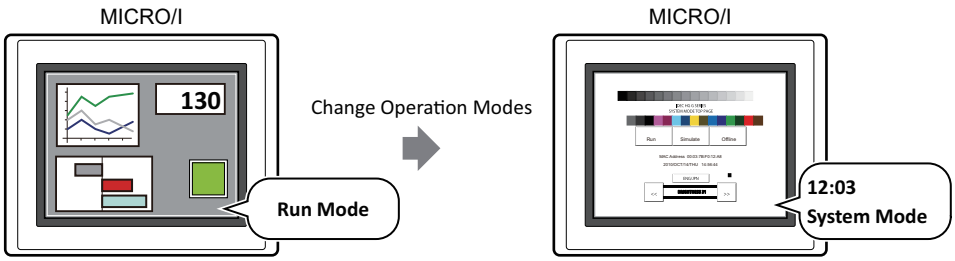
- Record switching the base screen



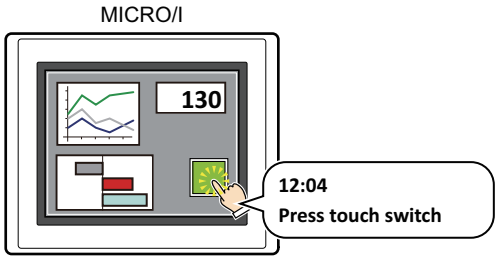
- Record changing the user



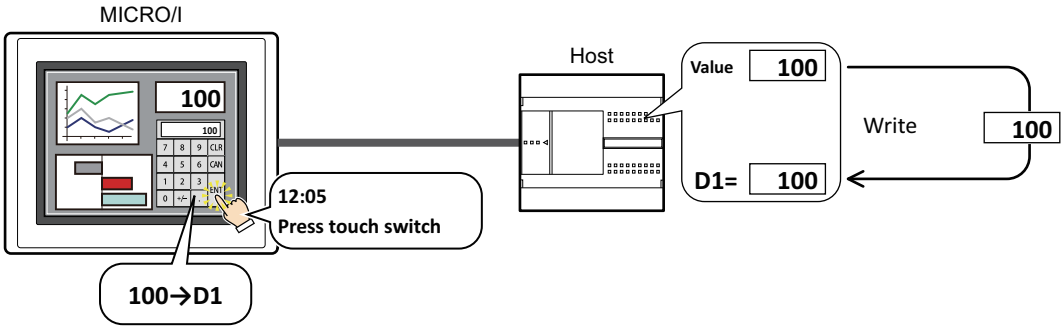
- Record changing the operation mode



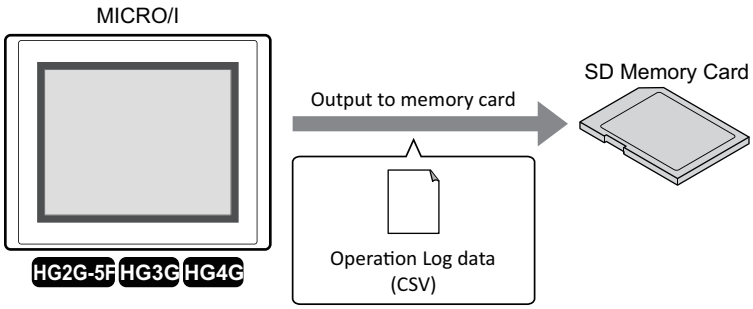
- Record pressing a touch switch



- Record writing a value to a device by pressing a touch switch



- Output Operation Log data to the memory card



This function is only supported by models that are equipped with the memory card interface.

1.2 Recorded Events

The recorded events are as follows.

Power ON

This operation is recorded when the MICRO/I power is turned on.

Switch to Base Screen

This operation is recorded by the following events.

- Switched the base screen by pressing the Goto Screen Button or a Multi-Button
- Switched the base screen by pressing the key button **Ref.** on the Alarm List Display or the Alarm Log Display
- Switched the base screen by executing the Goto Screen Command or a Multi-Command
- Switched the base screen by writing a screen number to System Area 1 address + 0 (displayed screen number)

Change Users

This operation is recorded by the following events.

- Switched the user by entering a password on the Password Screen
- Switched the user by writing a value of device
- Switched to the default user

- If User is selected in **Default User** in the **Security** dialog box, a **Change Users** event occurs when the power is turned on and when the operation mode is changed.
- If the **Switch to Base Screen** check box is selected, a **Switch to Base Screen** event also occurs when a **Change Users** event occurs.

Change Operation Modes

This operation is recorded by the following events.

- Switched to System Mode by pressing the Goto Screen Button or a Multi-Button
- Switched to System Mode by executing the Goto Screen Command or a Multi-Command
- Switched to System Mode by pressing **System Mode** on the Maintenance screen
- Switched to Run Mode from System Mode by pressing **Run** on the System menu
- Switched to Monitor Mode from Run Mode by clicking **Start Monitor** on the WindO/I-NV2 **Online** tab
- Switched to Run Mode from Monitor Mode by clicking **Stop Monitor** on the WindO/I-NV2 **Online** tab
- Switched to Simulation Mode from Monitor Mode by clicking **Start Simulation** on the WindO/I-NV2 **Online** tab
- Switched to Monitor Mode from Simulation Mode by clicking **Stop Simulation** on the WindO/I-NV2 **Online** tab

The Operation Log is only recorded during Run Mode.
Switching from Run Mode to System Mode and switching from System Mode to Run Mode is recorded.
Switching from System Mode to Data Transfer Mode and switching from Data Transfer Mode to System Mode is not recorded.

Press buttons

This operation is recorded by the following events.

- Pressing a Bit Button, Word Button, Goto Screen Button, Multi-Button, Selector Switch, Potentiometer, Numerical Input, Character Input
- Pressing the key buttons **ENT**, **Download Project**, **Upload Project**, **Copy Files**, **Download PLC Program**, **Upload PLC Program**, **All Chk.**, **Del. All**, **Ref.**, **Stop Beep**, **Record**

The Operation Log only records button presses for parts created in WindO/I-NV2.
Operations for the following screens and buttons displayed in messages and title bars are not recorded.

- System screen
- Password screen
- System error messages
- Popup screen title bar

Write Data to any Devices

This operation is recorded by the following event.

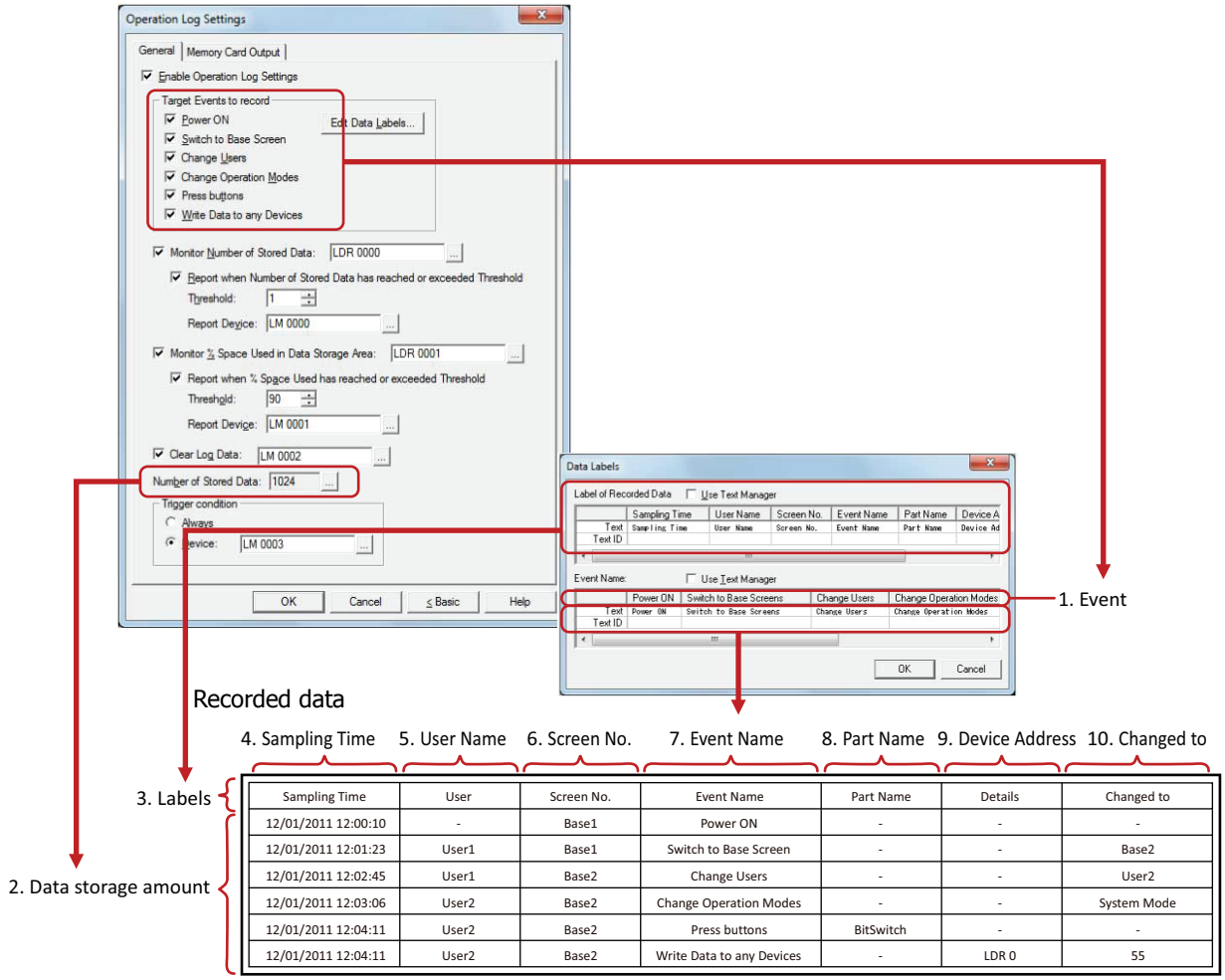
Writing a value to a device by pressing a Bit Button, Word Button, Multi-Button, Selector Switch, Potentiometer, Numerical Input, Character Input

1.3 Data Configuration

The recorded data is composed of a label, time, user name, screen number, event name, part name, device, and content after the change.

The relationship between the Operation Log function settings and the recorded data is as follows.

Operation Log settings



Sampling Time	User	Screen No.	Event Name	Part Name	Details	Changed to
12/01/2011 12:00:10	-	Base1	Power ON	-	-	-
12/01/2011 12:01:23	User1	Base1	Switch to Base Screen	-	-	Base2
12/01/2011 12:02:45	User1	Base2	Change Users	-	-	User2
12/01/2011 12:03:06	User2	Base2	Change Operation Modes	-	-	System Mode
12/01/2011 12:04:11	User2	Base2	Press buttons	BitSwitch	-	-
12/01/2011 12:04:11	User2	Base2	Write Data to any Devices	-	LDR 0	55

1. Event: Events that occur on the MICRO/I due to operations including user operations. Only the checked events are recorded.

2. Data storage amount: The amount of data to record. For details, refer to "Data Storage Amount" on page 15-6.

3. Label: When the recorded data is output as a CSV file, this is the text displayed in the label row.

4. Sampling Time: The time the event occurred.

The display type for the date and time varies based on the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.

YYYY/MM/DD HH:MM:SS: Japanese

MM/DD/YYYY HH:MM:SS: European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic

5. User Name: The user name when the event occurred.

The user name is only recorded when the **Use Security functions** check box is selected on the **General** tab in the **Security** dialog box.

6. Screen No.: The screen type and number that was displayed when the event occurred.

Base *n*: Base screen (*n*: screen number)

Example: Base 1

Popup *n*: Popup screen (*n*: screen number)

Example: Popup 10

7. Event Name: When the recorded data is output as a CSV file, this is the text displayed as a label to describe the event that occurred. This item is configured in the Data Labels dialog box.

8. Part Name: The part name for the pressed touch switch when the **Press buttons** event occurs.

9. Device Address: The destination device when the **Write Data to any Devices** event occurs.

When an indirect write is used, the device specified by the indirect value is recorded.

Example: When the device configured as the destination for the value 100 is LDR 100 and the indirect value is 3

	Event Name	Part Name	Details	Changed to
	Press buttons	WordSwitch1	–	–
	Write Data to any Devices	–	LDR 103	100

10. Changed to: The result produced from the event that occurred. The recorded content varies based on the event that occurred.

Switch to Base Screen: The screen type and number after switching.

Base *n*: Base screen (*n*: screen number)

Example: Base 1

Change Users: The user name after the change.

Change Operation Modes: The operation mode after the change.

Run Mode: Run Mode

System Mode: System Mode

Monitor Mode: Monitor Mode

Simulation Mode: Simulation Mode

Write Data to any Devices: The value written to the device by pressing the touch switch. This value is handled as BIN16 (+). For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

The value written to the device is recorded as BIN16 (+) regardless of the data type.

Example: When -10 (0xFFF6) is written to device D 0

	Event Name	Part Name	Details	Changed to
	Press buttons	WordSwitch1	–	–
	Write Data to any Devices	–	D 0	65526 (0xFFF6)

If the written value is 2 words (32 bits), each word is recorded (16 bits). For the storage order for 32-bit device data, the upper word and lower word are stored following the **Storage Method of 32-bit Numerical Data** setting. **Storage Method of 32-bit Numerical Data** is configured on the **System** tab in the Project Settings dialog box. For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

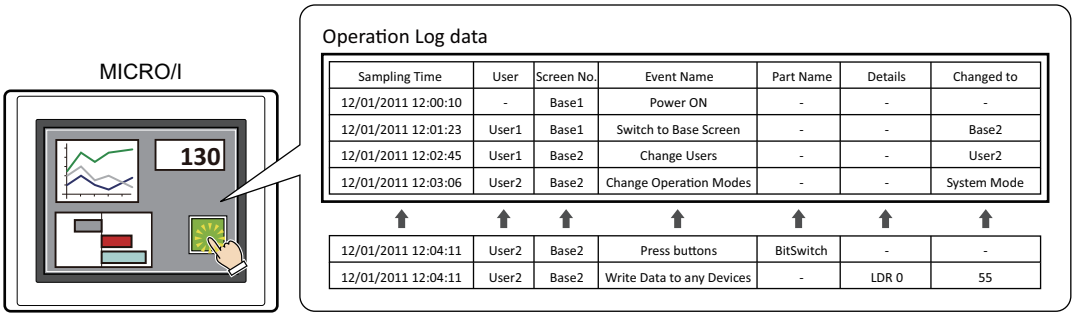
Example: When **Storage Method of 32-bit Numerical Data** is **from Lower word** and 12345678 (0xBC614E) is written to device D 0 with the data type BIN32 (+)

	Event Name	Part Name	Details	Changed to
	Press buttons	WordSwitch1	–	–
	Write Data to any Devices	–	D 0	24910 (0x614E)
	Write Data to any Devices	–	D 1	188 (0xBC)

1.4 Saving and Deleting Data

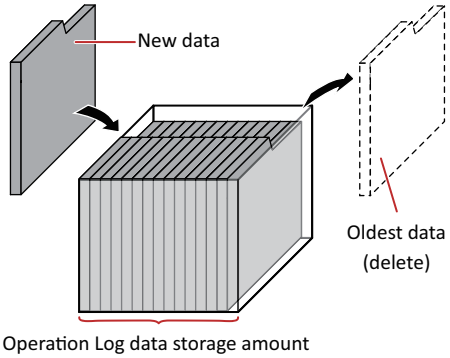
● Saving Data

The recorded data is saved in the data storage area.



Sampling Time	User	Screen No.	Event Name	Part Name	Details	Changed to
12/01/2011 12:00:10	-	Base1	Power ON	-	-	-
12/01/2011 12:01:23	User1	Base1	Switch to Base Screen	-	-	Base2
12/01/2011 12:02:45	User1	Base2	Change Users	-	-	User2
12/01/2011 12:03:06	User2	Base2	Change Operation Modes	-	-	System Mode
12/01/2011 12:04:11	User2	Base2	Press buttons	BitSwitch	-	-
12/01/2011 12:04:11	User2	Base2	Write Data to any Devices	-	LDR 0	55

If the saved data exceeds the Operation Log data storage amount, the oldest data is deleted and the new data is saved.



When there is no remaining battery power and for the HG2G-5ST22VF-*, the data in the Operation Log is erased when the MICRO/I is turned off.

Data Storage Amount

The maximum amount of data that can be saved in the data storage area is as follows.

Model	Maximum amount of data that can be saved in the data storage area
HG2G-S/-5S	3,945
HG2G-5F, HG3G/4G	8,330

The maximum amount of data that can be recorded by a single operation is 150 items. When writing to multiple devices in a single operation using the Multi-Button or other part, data over 150 items cannot be recorded. If the data to be recorded in a single operation exceeds 150 items, HG special relay LSM 22 is set to 1. For details, refer to Chapter 32 "HG Special Relay (LSM)" on page 32-3.

● Deleting Data

The method to delete recorded data from the data storage area is as follows.

- On the **Online** tab in WindO/I-NV2, click the arrow under **Clear**, and click **All** or **Operation Log Data**. For details, refer to Chapter 24 "4 Clear" on page 24-26.
- Touch **Initial Setting** on the System Menu, **Initialize**, **Operation Log** in order.

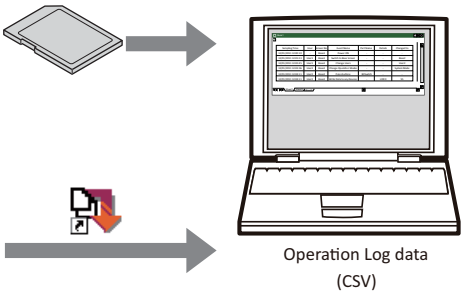
1.5 Using the Data

The saved data can be used in the following ways.

Operation Log data

Sampling Time	User	Screen No.	Event Name	Part Name	Details	Changed to
12/01/2011 12:00:10	-	Base1	Power ON	-	-	-
12/01/2011 12:01:23	User1	Base1	Switch to Base Screen	-	-	Base2
12/01/2011 12:02:45	User1	Base2	Change Users	-	-	User2
12/01/2011 12:03:06	User2	Base2	Change Operation Modes	-	-	System Mode
12/01/2011 12:04:11	User2	Base2	Press buttons	BitSwitch	-	-
12/01/2011 12:04:11	User2	Base2	Write Data to any Devices	-	LDR 0	55

- Save to and read from a memory card
  Output data from the MICRO/I to the memory card as a CSV file and use it on a PC.
  For details, refer to "4.1 Saving the Data as a CSV File" on page 15-20.
- Upload the data with the WindO/I-NV2 utility Downloader
  Use the uploaded data as a CSV file on a PC.
  For details on Downloader, refer to the Downloader manual.



2 Operation Log Function Configuration Procedure

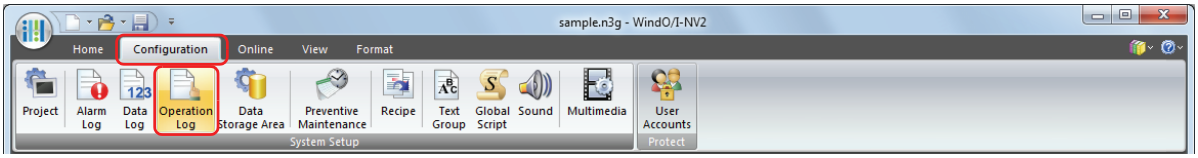
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Operation Log function.

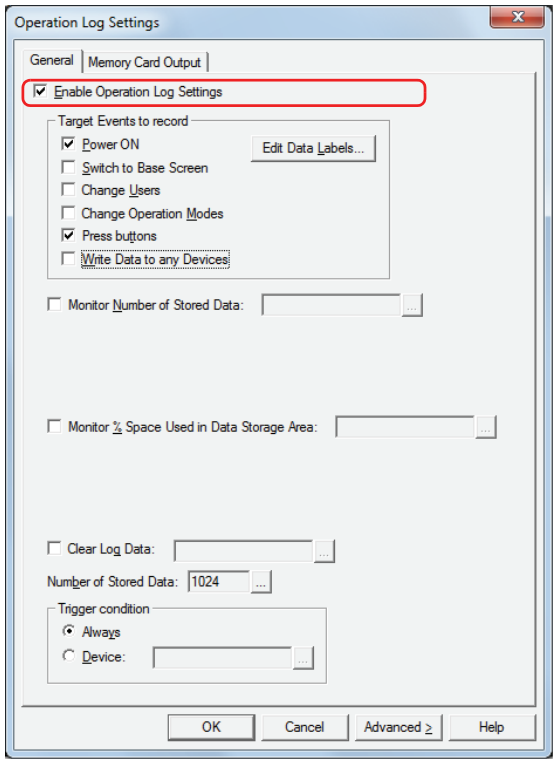
2.1 Configuring the Events and the Condition for Recording

1 On the **Configuration** tab, in the **System Setup** group, click **Operation Log**.

The Operation Log Settings dialog box is displayed.



2 Select the **Enable Operation Log Settings** check box.

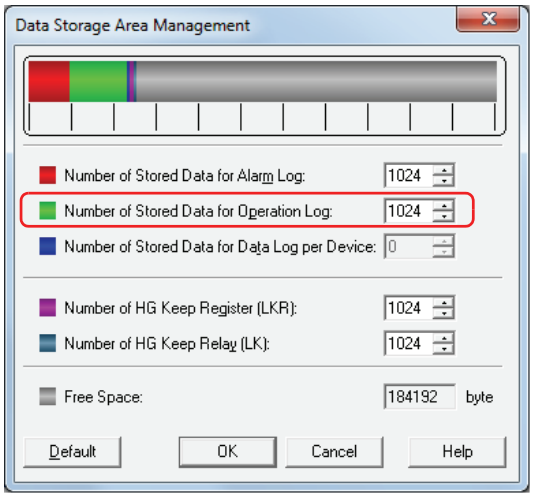


3 Select the check boxes for the events to record under **Target Events to record**.

Power ON:	The following items are recorded when the MICRO/I power is turned on. Time, screen number, event name
Switch to Base Screen:	The following items are recorded when the base screen is switched. Time, user name, screen number, event name, changed to
Change Users:	The following items are recorded when the user is changed. Time, user name, screen number, event name, changed to
Change Operation Modes:	The following items are recorded when the operation mode is changed. Time, user name, screen number, event name, changed to
Press buttons:	The following items are recorded when a touch switch is pressed. Time, user name, screen number, event name, part name
Write Data to any Devices:	The following items are recorded when a value is written to a device by pressing a touch switch. Time, user name, screen number, event name, device, changed to

4 Configure the Operation Log data storage amount in **Number of Stored Data**.

Click ... to display the Data Storage Area Management dialog box.
Specify the Operation Log data storage amount in **Number of Stored Data for Operation Log** and click **OK.**
The Data Storage Area Management dialog box closes.



5 Select the condition to record events in **Trigger condition**.

- **Always**
  Always records events.

- **Device**
  Records events when the specified device is 1. You can only specify an internal device.
  For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

6 Click **OK**.

The Operation Log Settings dialog box closes.
This concludes configuring the events and the condition for recording.

3 Operation Log Settings Dialog Box

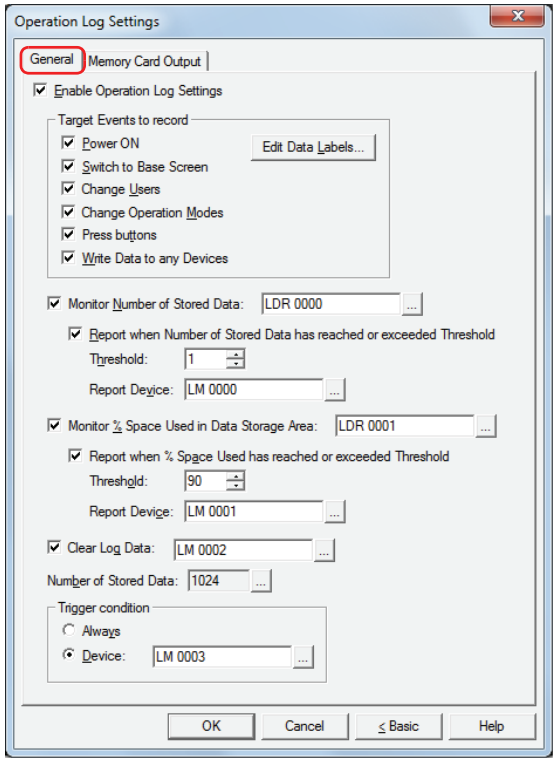
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the Operation Log Settings dialog box.

3.1 Operation Log Settings Dialog Box

● General Tab

The **General** tab is used to configure the events and the condition for recording.



■ Enable Operation Log Settings

Select this check box to use the Operation Log function.

■ Target Events to record

Selects the events to record. Select the check boxes for the events to record.

Power ON:	The following items are recorded when the MICRO/I power is turned on. Time, screen number, event name
Switch to Base Screen:	The following items are recorded when the base screen is switched. Time, user name, screen number, event name, changed to
Change Users:	The following items are recorded when the user is changed. Time, user name, screen number, event name, changed to
Change Operation Modes:	The following items are recorded when the operation mode is changed. Time, user name, screen number, event name, changed to
Press buttons:	The following items are recorded when a touch switch is pressed. Time, user name, screen number, event name, part name
Write Data to any Devices:	The following items are recorded when a value is written to a device by pressing a touch switch. Time, user name, screen number, event name, device, changed to
Edit Data Labels:	Displays the Data Labels dialog box. The Data Labels dialog box is used to edit the text displayed in the label row and the event names displayed in the data rows when the recorded data is output as a CSV file. For details, refer to "Data Labels Dialog Box" on page 15-12.

Monitor Number of Stored Data

Select this check box to count the amount of recorded Operation Log data. The amount of recorded data is written to the specified device.

(Destination Device): Specifies the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report when Number of Stored Data has reached or exceeded Threshold*1:
Writes 1 to the report device when the current amount of data reaches or exceeds the set threshold.

Threshold*1: Specifies the amount of data that is the basis for reporting.

HG2G-S/-5S:	1 to 3945
HG2G-5F, HG3G/4G:	1 to 8330

Report Device*1: Specifies the destination bit device or the bit in the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Monitor % Space Used in Data Storage Area

Select this check box to monitor the usage of the data storage area allocated as the save destination for Operation Log data. The usage is calculated from the data storage amount allocated to the data storage area and the amount of saved data, and then written to the specified device.

Usage = Current amount of Operation Log data ÷ Operation Log data storage amount (omits values after the decimal point)

(Destination Device): Specifies the destination word device to write the current usage of the amount of Operation Log data storage.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report when % Space Used has reached or exceeded Threshold*1:
Writes 1 in the report device when the current usage reaches or exceeds the set threshold.

Threshold*1: Specifies the usage (1 to 100) that is the basis for reporting.

Report Device*1: Specifies the destination bit device or the bit in the destination word device.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Clear Log Data

Select this check box to erase the Operation Log data saved in the data storage area.

(Trigger Device): Specifies the bit device that triggers the erasure of the data. The saved data is erased when the value of the configured device changes from 0 to 1. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Number of Stored Data

Shows the maximum amount of Operation Log data to save in the data storage area. Data is saved up to the set amount. The maximum amount of data that can be saved in the data storage area is listed next.

HG2G-S/-5S:	3,945
HG2G-5F, HG3G/4G:	8,330

Click ... to open the Data Storage Area Management dialog box where you can change the allocation of data storage area memory. For details, refer to Chapter 16 "Data Storage Area" on page 16-1.

Trigger Condition

Selects the trigger condition for the Operation Log function.

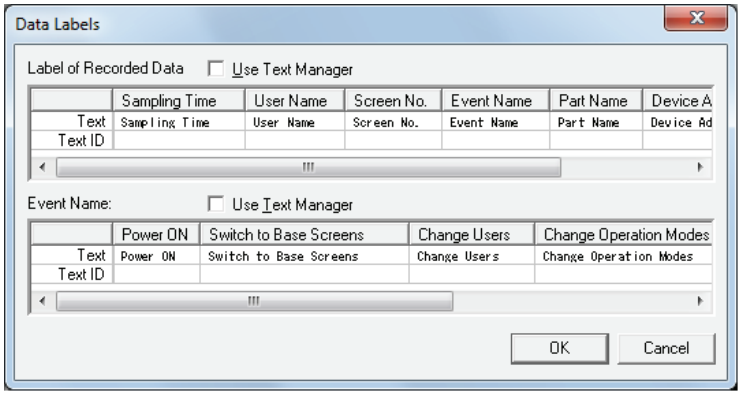
Always: Always records events.

Device: Records events when the specified device is 1.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

*1 Advanced mode only

Data Labels Dialog Box

The Data Labels dialog box is where you can edit labels for recorded data and event names when saving data as a CSV file.



Label of Recorded Data

- **Use Text Manager**
  Select this check box to use text registered in Text Manager for recorded data labels when saving data as a CSV file.

- **Label of Recorded Data**
  Specifies the text to display in the label row in **Text** or **Text ID**.

Text:	Double click the cell to enter the text to display as the label. The maximum number is 40 characters. Text can only be entered when the **Use Text Manager** check box is cleared.
Text ID:	Double click the cell to specify the Text Manager ID number (1 to 32000) when using text registered in Text Manager as the label. This option is only enabled if you select the **Use Text Manager** check box.

The details for each label row label is as follows.

Sampling Time:	The label for the column to display the time the event occurred.
User Name:	The label for the column to display the user name when the event occurred.
Screen No.:	The label for the column to display the screen type and number that was displayed when the event occurred.
Event Name:	The label for the column to display the name of the event that occurred on the MICRO/I by an operation including a user operation.
Part Name:	The label for the column to display the part name for the pressed touch switch when the **Press buttons** event occurs.
Device Address:	The label for the column to display the destination device when the **Write Data to any Devices** event occurs.
Changed to:	The label for the column to display the result produced from the event that occurred. The recorded content varies based on the event that occurred.

Event Name

■ Use Text Manager

Select this check box to use text registered in Text Manager for the event names when saving data as a CSV file.

■ Event Name

Specifies the text to display in Event Name in **Text** or **Text ID**.

Text: Double click the cell to enter the text to display as the event name. The maximum number is 40 characters.
Text can only be entered when the **Use Text Manager** check box is cleared.

Text ID: Double click the cell to specify the Text Manager ID number (1 to 32000) when using text registered in Text Manager as the event name.
This option is only enabled if you select the **Use Text Manager** check box.

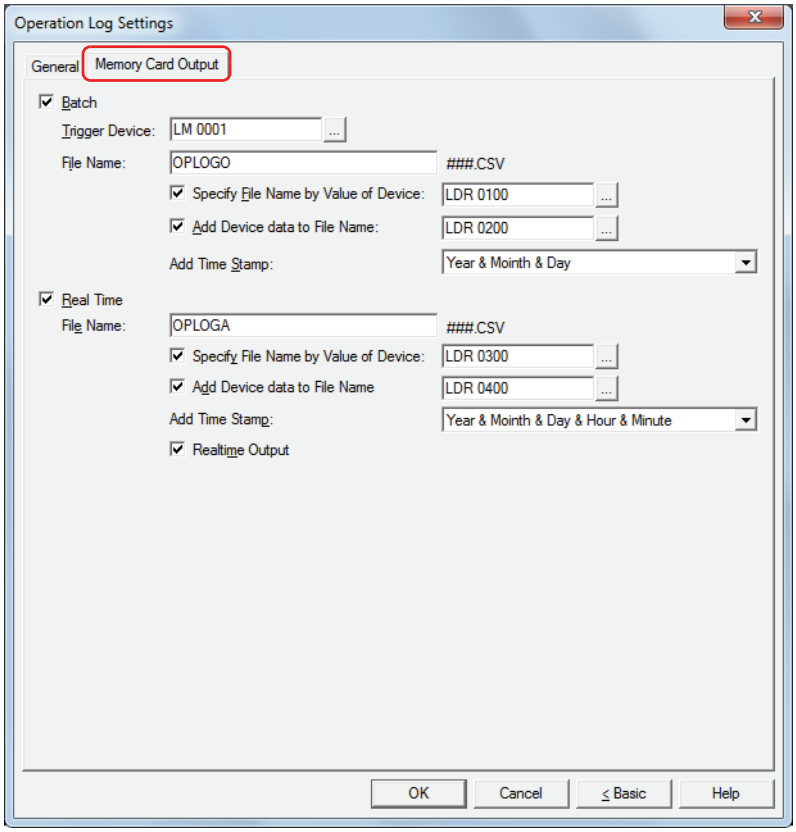
Event name details are as follows.

Power ON:	The event name when the MICRO/I power is turned on.
Switch to Base Screens:	The event name when the base screen is switched.
Change Users:	The event name when the user is changed.
Change Operation Modes:	The event name when the MICRO/I operation mode is changed.
Press buttons:	The event name when a touch switch is pressed.
Write Data to any Devices:	The event name when a value is written to a device by pressing a touch switch.

● **Memory Card Output** Tab

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The **Memory Card Output** tab is used to configure whether or not to output saved data to the memory card.



The output data is stored in the following folder on the memory card.

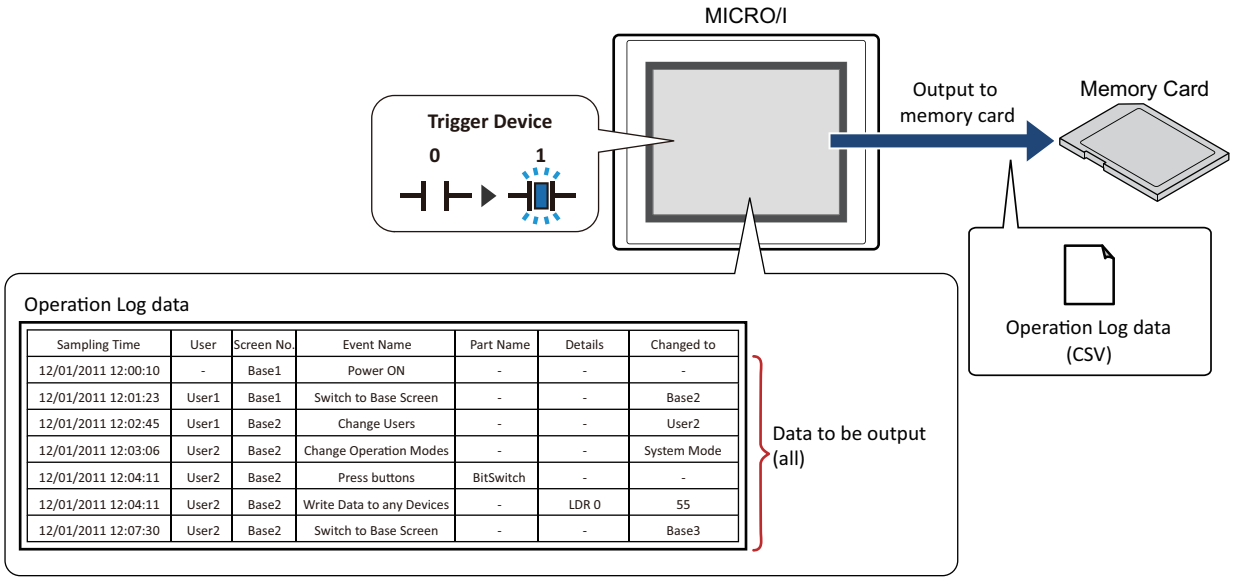
HG2G-5F, HG3G/4G: \Memory card folder\OPERATIONLOG

The default memory card folder name is "HGDATA01". For details, refer to Chapter 30 "1.5 Setting the Memory Card Folder" on page 30-16.

Data recorded after starting output to the memory card is not included in the output data.

■ **Batch**

Select this check box to batch output all the sampled data to the memory card.



Sampling Time	User	Screen No.	Event Name	Part Name	Details	Changed to
12/01/2011 12:00:10	-	Base1	Power ON	-	-	-
12/01/2011 12:01:23	User1	Base1	Switch to Base Screen	-	-	Base2
12/01/2011 12:02:45	User1	Base2	Change Users	-	-	User2
12/01/2011 12:03:06	User2	Base2	Change Operation Modes	-	-	System Mode
12/01/2011 12:04:11	User2	Base2	Press buttons	BitSwitch	-	-
12/01/2011 12:04:11	User2	Base2	Write Data to any Devices	-	LDR 0	55
12/01/2011 12:07:30	User2	Base2	Switch to Base Screen	-	-	Base3

All the data is saved on the memory card when the trigger device changes from 0 to 1. If a file with the same name already exists on the memory card, that file is overwritten. The maximum amount of output data is the amount configured by the data storage area.

Output stops if there is insufficient free space on the memory card. Memory card error information is stored in HG special register LSD42.

Trigger Device: Specifies the bit device that triggers batch output. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Data is output to file when the trigger device changes from 0 to 1.

File Name: Enter the file name for the output data or shows the file name.

The default is "OPLOGO.CSV".

To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

Specify File Name by Value of Device*1:

Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).

The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

(File Name Device)				
LDR100	←	'I'	'D'	4844(Hex)
LDR101	←	'E'	'C'	4543(Hex)
LDR102	←	(NULL)		0000(Hex)

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only

Add Device data to File Name*1:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: **File Name** is "OPLOGO" and the value of the device configured by (File Name Device) is 123, the file name is "OPLOGO123.CSV".

Add Time Stamp*1:

Selects the format of the output date and time to add to the file name for the output data.

None, **YY**, **YY+MM**, **YY+MM+DD**, **YY+MM+DD+HH**, **YY+MM+DD+HH+MM**, **YY+MM+DD+HH+MM+SS**

The format is YYMMDD_TTMMSS (YY: year, MM: month, DD: day, HH: hour, MM: minute, SS: second).

Example: **File Name** is "OPLOGO" on September 15 2013 at 23:30:50

YY:	OPLOGO_13
YY+MM:	OPLOGO_1309
YY+MM+DD:	OPLOGO_130915
YY+MM+DD+HH:	OPLOGO_130915_23
YY+MM+DD+HH+MM:	OPLOGO_130915_2330
YY+MM+DD+HH+MM+SS:	OPLOGO_130915_233050

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device***1.
\ / : ; * ? " < > |

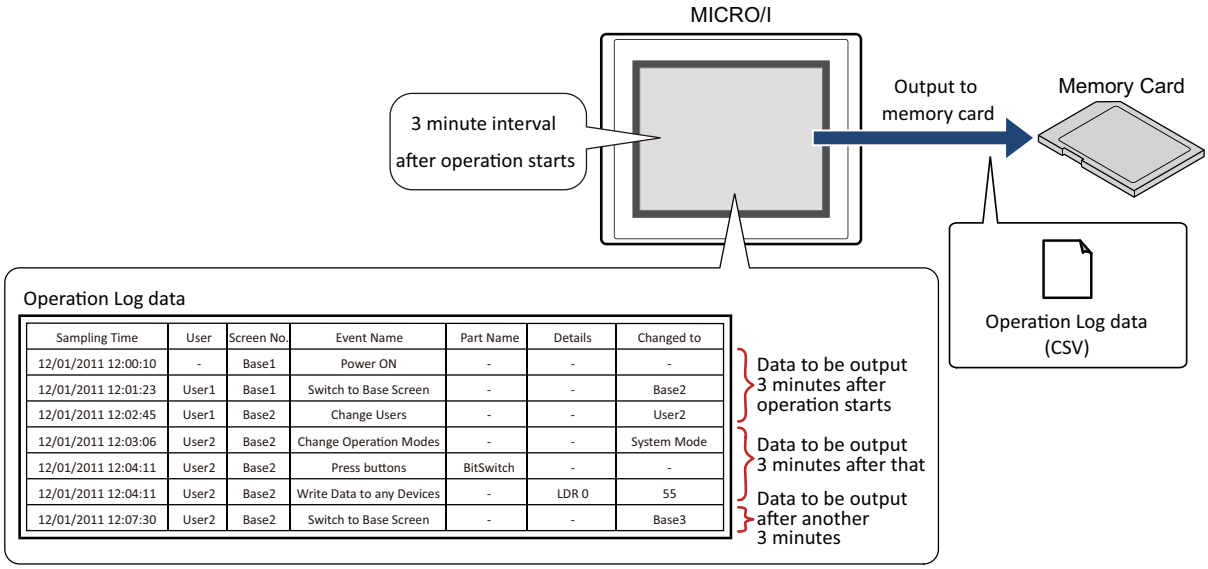
File names that exceed the limits in **Specify File Name by Value of Device***1 and file names configured with characters that cannot be used are as follows.

- When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
- When a character that cannot be used is set, the text is up to that character.
- When the first character is a character that cannot be used, the text is that set for **File Name**.

*1 Advanced mode only

■ Real Time

Select this check box to output data to the memory card in real time.



Sampling Time	User	Screen No.	Event Name	Part Name	Details	Changed to
12/01/2011 12:00:10	-	Base1	Power ON	-	-	-
12/01/2011 12:01:23	User1	Base1	Switch to Base Screen	-	-	Base2
12/01/2011 12:02:45	User1	Base2	Change Users	-	-	User2
12/01/2011 12:03:06	User2	Base2	Change Operation Modes	-	-	System Mode
12/01/2011 12:04:11	User2	Base2	Press buttons	BitSwitch	-	-
12/01/2011 12:04:11	User2	Base2	Write Data to any Devices	-	LDR 0	55
12/01/2011 12:07:30	User2	Base2	Switch to Base Screen	-	-	Base3

With real time output, data is saved to the memory card in three minute intervals after the MICRO/I starts running. For the HG2G-5F and the HG3G/4G, if the accumulated data reaches 80% of the amount set in the Data Storage Area, then the data is forcibly saved to the memory card. When there is already data with the same file name on the memory card, data is appended to that file. If there was no update to the data during the three minutes, it is not output.

Data is appended to the file until the size of the file reaches the restriction size (256 MB), so the maximum amount of output data varies based on the settings for the output channel such as the amount of data, the data size, and the labels.

If the interval events occur more quickly than the time it takes to accomplish the real time output (the interval for writing to the memory card), the Operation Log is recorded up to the data storage amount - 1, and then afterwards, old data is discarded in order and replaced with new data.

Real time output stops when the file size of the Operation Log data exceeds 256 MB or when there is insufficient space on the memory card. Memory card error information is stored in HG special register LSD42.

- When the value of HG special relay LSM20 changes from 0 to 1, the data at that time is first output in real time to the memory card, and then access to the memory card is stopped.
- You can check the free space on the memory card with HG special registers LSD43 and 44.

File Name: Enter the file name for the output data or shows the file name.
The default is "OPLOGA.CSV".
To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).

Specify File Name by Value of Device*1:
Select this check box to specify the name of the file for the output data with the value of the device configured by (File Name Device).

(File Name Device): Specifies the word device that is the source of the data to use as the file name. The file name is set by reading the values sequentially from the starting device specified with the file name device and handling those values as character data up to the character before NULL (00).
The maximum number of devices is 40 (80 single-byte characters). You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the device specified by (File Name Device) is LDR100 and the text to set is "IDEC":

(File Name Device)	LDR100	←	'I' 'D'	4844(Hex)
	LDR101	←	'E' 'C'	4543(Hex)
	LDR102	←	(NULL)	0000(Hex)

The file name at this time becomes "IDEC.CSV".

*1 Advanced mode only

Add Device data to File Name*1:

Select this check box to add the bottom three digits of the value of the device configured by (File Name Device) to the end of the file name for the output data.

(File Name Device): Specifies the word device that is the source for the value to add to the file name. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when the **Add Device data to File Name** check box is selected.

Example: When **File Name** is "OPLOGA" and the value of the device configured by (File Name Device) is 123, the file name is "OPLOGA123.CSV".

Add Time Stamp*1:

Selects the format of the output date and time to add to the file name for the output data.

None, **YY**, **YY+MM**, **YY+MM+DD**

The format is YYMMDD (YY: year, MM: month, DD: day).

Example: **File Name** is "OPLOGA" on September 15 2013

YY: OPLOGA_13
YY+MM: OPLOGA_1309
YY+MM+DD: OPLOGA_130915

Realtime Output*1:

Select this check box to forcibly output the data and save it to file at the desired timing.

(Trigger device): Specifies the bit device or the bit of the word device to serve as the condition to forcibly output the data. You can only specify an internal device. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Data is output to file when the trigger device changes from 0 to 1.

The following single-byte characters cannot be used in the file name configured by **File Name** or **Specify File Name by Value of Device***1.
\ / : ; * ? " < > |

- File names that exceed the limits in **Specify File Name by Value of Device***1 and file names configured with characters that cannot be used are as follows.
  - When the values of the source word devices exceeds the maximum number of devices (no NULL), the text is up to the maximum number of devices from the start.
  - When a character that cannot be used is set, the text is up to that character.
  - When the first character is a character that cannot be used, the text is that set for **File Name**.
- The following operations are as follows if the **Realtime Output** check box*1 is selected.
  - Even if the data is outputted forcibly, the real time output period (3 minute interval) is not reset.
  - If the data is outputted but the value of device changes from 0 to 1, then there will be no output to the data.
  - Even when output has finished, the value of device does not automatically change to 0.

- The function to record data operates when Operation Log data is being saved to the memory card.
- For the HG2G-5F and the HG3G/4G, the batch output or real time output status of the Operation Log data can be checked with the value of HG special relay LSM37. When the data starts to be written to the memory card, the value of device is 1. When writing is complete, the value is 0.
- The methods to erase Operation Log files saved on the memory card are as follows.
  - To erase files during operation using parts, on the **Memory Card** tab in the Project Settings dialog box, select the **Remove Files stored in Memory Card** check box and the **All Operation Log data** check box, and then configure the trigger device. Assign that trigger device to a part.
  - To erase files with WindO/I-NV2, click **Clear** on the **Online** tab, and then click **Stored Data in Memory Card** to open the Clear Data dialog box. Select the **Operation Log Data** check box and click **OK**.
  - Select the files to erase with the System Menu File Manager, and then press **DEL**.

*1 Advanced mode only

Output Data File Name

The file name is as follows.

File Name Value of Device_YYMMDD_TTMMSS.CSV

File Name:	The text entered in **File Name** or the text in the values of devices configured by **Specify File Name by Value of Device**
Value of Device:	The lower 3 digits of the value of the device configured by **Add Device data to File Name**
YYMMDD:	The year, month, and day of the date configured by **Add Time Stamp**
TTMMSS:	The hour, minute, and second of the time configured by **Add Time Stamp**

■ Setting example 1

Item	Setting	
File Name	OPLOGA	
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM	Date when data was output: September 2013

The file name is "OPLOGA123_1309.CSV".

■ Setting example 2

Item	Setting	
Specify File Name by Value of Device	(File Name Device) is LDR100 Text to set is "IDEC"	LDR100 value: 4944 (hexadecimal) LDR101 value: 4543 (hexadecimal) LDR102 value: 0000 (hexadecimal)
Add Device data to File Name	(File Name Device) is LDR200	LDR200 value: 123
Add Time Stamp	YY+MM+DD+HH+MM+SS	Date and time when data was output: September 15 2013 at 23:30:50

The file name is "IDEC123_130915_233050.CSV".

4 Using the Data

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Saving the Data as a CSV File

● Saving the Data as a CSV File

The Operation Log data can be saved to the memory card as a CSV file or uploaded to a PC.

The procedure to save the data is as follows.

- To save the data to a memory card, click **Operation Log** on the WindO/I-NV2 **Configuration** tab to open the Operation Log Settings dialog box. Select an output method check box on the **Memory Card Output** tab and configure the items. The Operation Log data is saved to the memory card folder on the memory card according to the **Memory Card Output** tab settings. For details, refer to "Memory Card Output Tab" on page 15-14.
- To upload the data to a PC, click the **Upload** menu in Downloader, and click **All Log Data** or **Operation Log Data** to open the Select Path dialog box. Specify the location to save the file and click **OK** to save the Operation Log data as a CSV file in the specified folder. For details, refer to the Downloader manual.

● Data Structure and Output Example

The data structure of the output file is as follows. The data structure for files output with batch output and real time output is the same.

Bold items are replaced by the Operation Log settings, recorded data, project file name, and WindO/I-NV2 version.

Headers	"Project Name","**Project name**","**Version number**" "File Type","**Log type**" Blank row
Label row	"**Sampling Time**","**User Name**","**Screen No.**","**Event Name**","**Part Name**","**Device Address**","**Changed to**"
Data row	" **MM/DD/YYYY HH:MM:SS**","**User Name**","**Screen Type & No.**","**Event**","**Part Name**","**Device Address**", "**Changed to**" ⋮

Output example	Data size of each row
"Project Name","Dimmer Console","V4.50"	- 41 bytes
"File Type","Operation Log Data"	- 34 bytes
	- 2 bytes
"Sampling Time","User","Screen No.","Operation","Part Name","Details", "Changed to"	- 85 bytes
" 12/01/2011 12:00:10","-","Base 1","Power ON","-","-","-"	- 60 bytes
" 12/01/2011 12:01:23","User1","Base 1","Switch to Base Screen","-","-", "Base2"	- 81 bytes
⋮	

- The data size for each row is counted as 2 bytes for full-width characters, 1 byte for half-width characters, and 2 bytes for newlines. The total for each row is the total amount of space for the file.
- A space is inserted before the date in the data row.
- The display type for the date and time varies based on the language configured in **Project Settings**, on the **Project Details** tab, in **Language**.
  Japanese: YYYY/MM/DD HH:MM:SS
  European, Chinese, Taiwanese, Korean, Central European, Baltic, Cyrillic: MM/DD/YYYY HH:MM:SS

Chapter 16 Data Storage Area

This chapter describes how to configure the data storage area and its operation on the MICRO/I.

1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 What is the Data Storage Area?

The data storage area is the area in the MICRO/I's internal memory where saved data is not erased even when the power is turned off.
The following data can be saved in the data storage area.

- Alarm Log data
  ☞ Chapter 13 "Alarm Log Function" on page 13-1

- Data Log data
  ☞ Chapter 14 "Data Log Function" on page 14-1

- Operation Log data
  ☞ Chapter 15 "Operation Log Function" on page 15-1

- When there is no remaining battery poBodyBullwer, and for the HG2G-5ST22VF-*, the data in the data storage area is erased when the MICRO/I is turned off.
- If you download the project data from WindO/I-NV2, Alarm Log data, Operation Log data, and Data Log data is erased. The data saved in the HG keep registers (LKR) and the HG keep relays (LK) is saved.

1.2 Data Storage Area

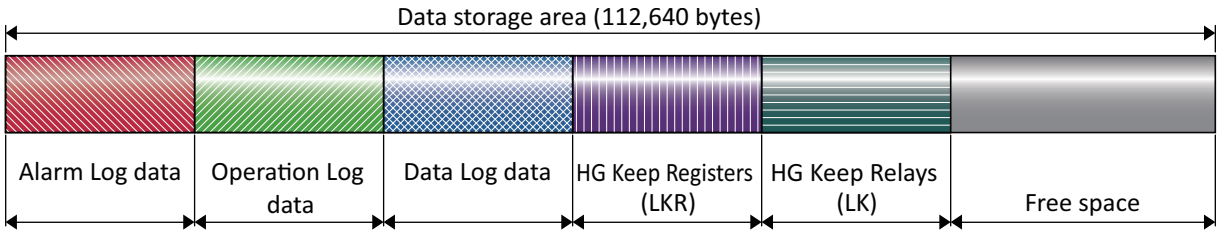
The capacity of the data storage area and the types and sizes of data that can be saved there differ according to the MICRO/I model.

● Data Storage Area Capacity and Types of Storable Data

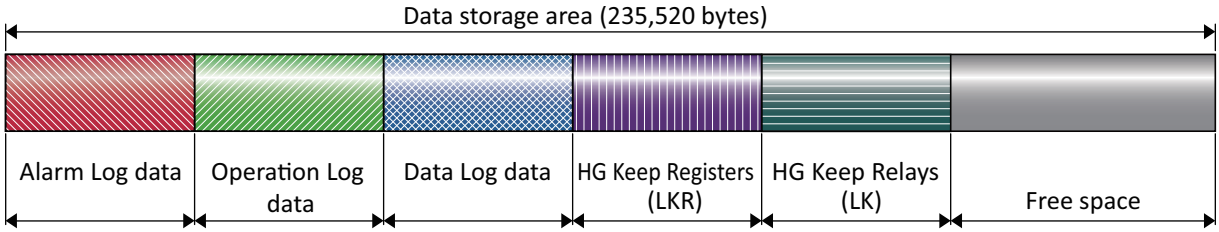
HG2G-S/-5S/-5F, HG3G/4G

You can allocate areas to save Alarm Log data, Operation Log data, and Data Log data, as well as areas to use as HG keep registers (LKR) and HG keep relays (LK). The unallocated leftover area is free space.

■ HG2G-S/-5S



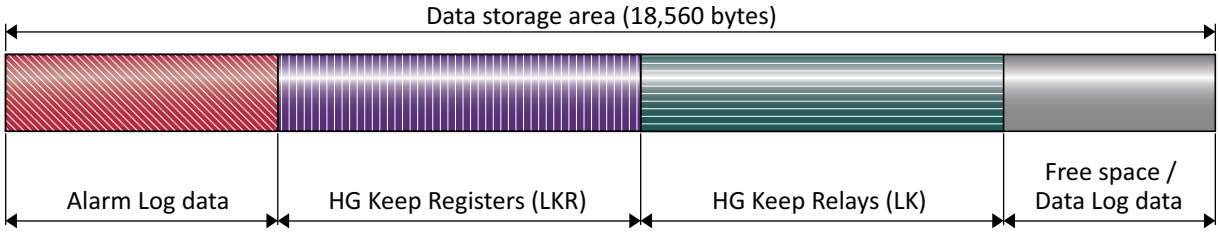
■ HG2G-5F, HG3G/4G



HG1F/2F/2S/3F/4F

You can allocate an area to save Alarm Log data, as well as areas to use as HG keep registers (LKR) and HG keep relays (LK). The unallocated leftover area is free space or an area to store Data Log data.

By default, the entire area is allocated into an area to save Alarm Log data and areas used as HG keep registers (LKR) and HG keep relays (LK), so to change the allocation of memory, you must first change these areas.



● Minimum and Maximum Amount of Data Storage and Number of Addresses

The minimum and maximum amount of data storage and the minimum and maximum number of addresses that can be configured for the data storage area is as follows.

Data type	HG2G-S/-5S		HG2G-5F HG3G/4G		HG1F/2F/2S/3F/4F	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Number of Stored Data for Alarm Log	0	5520	0	11660	0	1024
Number of Stored Data for Operation Log	0	3945	0	8330	-	-
Number of Stored Data for Data Log per Device	0	13808	0	29165	0	2048
Number of HG Keep Register (LKR)	1024	8192	1024	8192	1024	8192
Number of HG Keep Relay (LK)	1024	8192	1024	8192	1024	8192

2 Data Storage Area Configuration Procedure

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

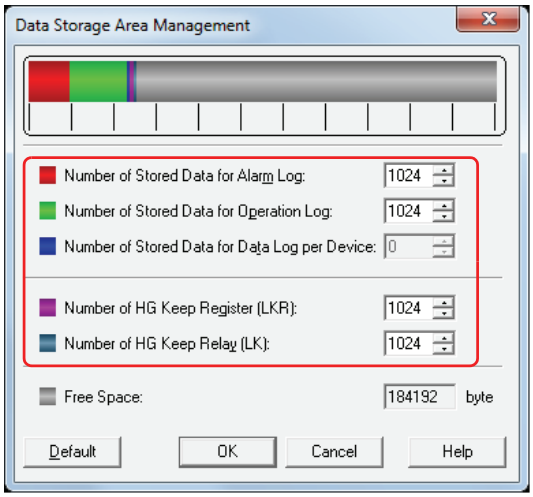
This section describes the configuration procedure for the data storage area.

2.1 HG2G-S/-5S/-5F, HG3G/4G

1 On the **Configuration** tab, in the **System Setup** group, click **Data Storage Area**.

The **Data Storage Area Management** dialog box is displayed.

2 Specify the amount of Alarm Log data to save in the data storage area in **Number of Stored Data for Alarm Log** (HG2G-S/-5S: 0 to 5520, HG2G-5F, HG3G/4G: 0 to 11660).



3 Specify the amount of Operation Log data to save in the data storage area in **Number of Stored Data for Operation Log** (HG2G-S/-5S: 0 to 3945, HG2G-5F, HG3G/4G: 0 to 8330).

4 Specify the amount of Data Log data per device to save in the data storage area in **Number of Stored Data for Data Log per Device** (HG2G-S/-5S: 0 to 13808, HG2G-5F, HG3G/4G: 0 to 29165).

5 Specify the number of HG keep register (LKR) addresses in **Number of HG Keep Register (LKR)** (1024 to 8192).

6 Specify the number of HG keep relay (LK) addresses in **Number of HG Keep Relay (LK)** (1024 to 8192).

7 Click **OK**.

The **Data Storage Area Management** dialog box closes.

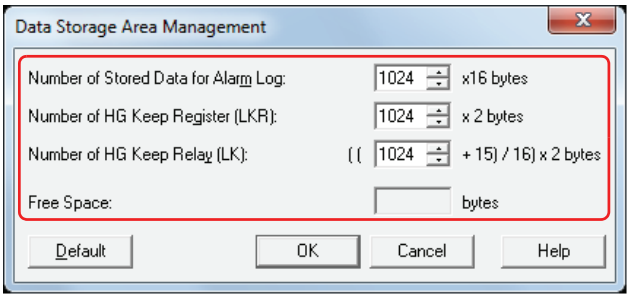
This concludes configuring the data storage area.

2.2 HG1F/2F/2S/3F/4F

1 On the **Configuration** tab, in the **System Setup** group, click **Data Storage Area**.

The **Data Storage Area Management** dialog box is displayed.

By default, the entire area is allocated into an area to save Alarm Log data and areas used as HG keep registers (LKR) and HG keep relays (LK), so to change the allocation of memory, first you must change these areas.



2 Specify the amount of Alarm Log data to save in the data storage area in **Number of Stored Data for Alarm Log** (0 to 1024).

3 Specify the number of HG keep register (LKR) addresses in **Number of HG Keep Register (LKR)** (1024 to 8192).

4 Specify the number of HG keep relay (LK) addresses in **Number of HG Keep Relay (LK)** (1024 to 8192).

5 Click **OK**.

The **Data Storage Area Management** dialog box closes.

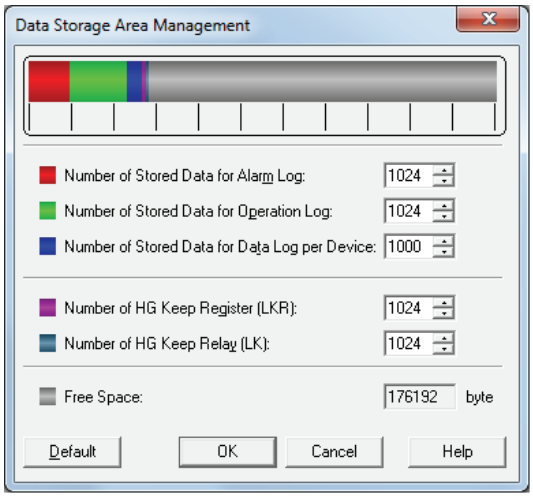
This concludes configuring the data storage area.

3 Data Storage Area Management Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the **Data Storage Area Management** dialog box.

3.1 HG2G-S/-5S/-5F, HG3G/4G



- **Number of Stored Data for Alarm Log**
  Specifies the amount of Alarm Log data to save in the data storage area (HG2G-S/-5S: 0 to 5520, HG2G-5F, HG3G/4G: 0 to 11660).

  Alarm Log data is only saved in the data storage area when **Store** is selected under **Block Settings**, **Data** in the **Auto-Setup** dialog box or in the **Individual Settings** dialog box for Alarm Log Settings.

- **Number of Stored Data for Operation Log**
  Specifies the amount of Operation Log data to save in the data storage area (HG2G-S/-5S: 0 to 3945, HG2G-5F, HG3G/4G: 0 to 8330).

- **Number of Stored Data for Data Log per Device**
  Specifies the amount of Data Log data per device to save in the data storage area (HG2G-S/-5S: 0 to 13808, HG2G-5F, HG3G/4G: 0 to 29165).

  Data Log data is only saved in the data storage area when **Enable** is selected under **Log function** on the **General** Tab in the **Individual Settings** dialog box for Data Log Settings.

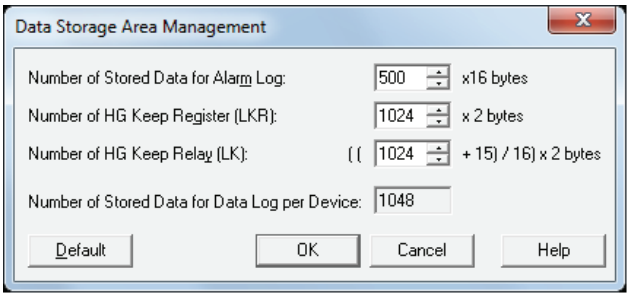
- **Number of HG Keep Register (LKR)**
  Specifies the number of HG keep register (LKR) addresses (1024 to 8192).

- **Number of HG Keep Relay (LK)**
  Specifies the number of HG keep relay (LK) addresses (1024 to 8192).

- **Free Space**
  Shows the amount of free space in the data storage area (in bytes).

- **Default**
  Returns the configured values to their default values.

3.2 HG1F/2F/2S/3F/4F



- **Number of Stored Data for Alarm Log**
  Specifies the amount of Alarm Log data to save in the data storage area (0 to 1024).
  Alarm Log data is only saved in the data storage area when **Store** is selected under **Block Settings**, **Data** in the **Auto-Setup** dialog box or in the **Individual Settings** dialog box for Alarm Log Settings.

- **Number of HG Keep Register (LKR)**
  Specifies the number of HG keep register (LKR) addresses (1024 to 8192).

- **Number of HG Keep Relay (LK)**
  Specifies the number of HG keep relay (LK) addresses (1024 to 8192).

- **Free Space/Number of Stored Data for Data Log per Device**
  The displayed item changes according to the setting in Data Log Settings.

Free Space:	Shows the amount of free space in the data storage area (in bytes). This item is only displayed when the **Log to Data Storage Area** check box is cleared in the **Data Log Settings** dialog box.
Number of Stored Data for Data Log per Device:	Specifies the amount of Data Log data per device to save in the data storage area (0 to 2048). This item is only displayed when the **Log to Data Storage Area** check box is selected in the **Data Log Settings** dialog box.

- **Default**
  Returns the configured values to their default values.

Chapter 17 Preventive Maintenance Function

This chapter describes how to configure the Preventive Maintenance function and its operation on the MICRO/I.

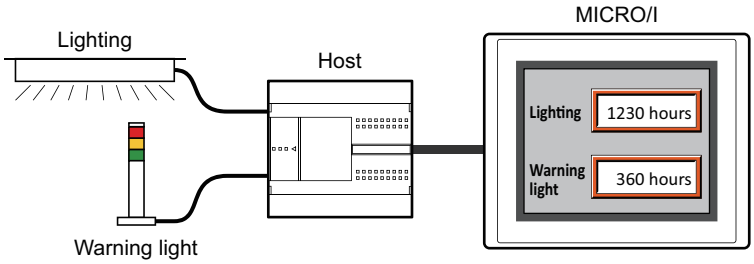
1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

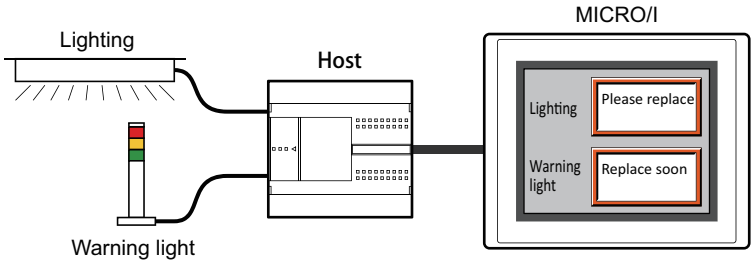
1.1 How the Preventive Maintenance Function is Used

The Preventive Maintenance function monitors the state of devices and counts the time the monitored devices are 1, as well as the number of times the monitored device values change to 1.
The Preventive Maintenance function can perform the following functions.

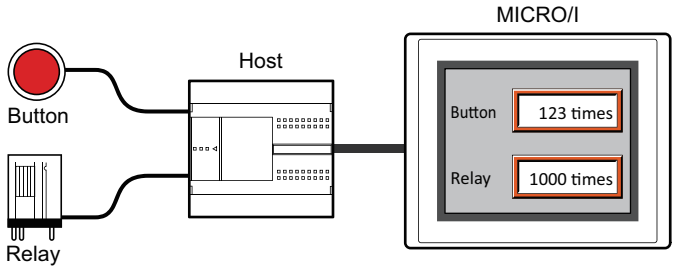
- Monitor devices that turn on lighting or warning lights and count the operation time



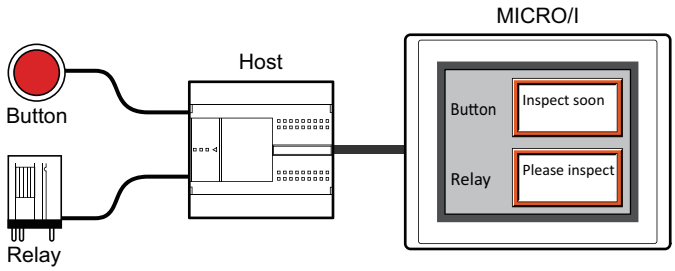
- Report the replacement time for lighting and warning lights by the counted operation time



- Monitor devices connected to buttons and relays and count the operation count



- Report the inspection time for buttons and relays by the counted operation count



1.2 Counting the Operation Time and Operation Count

The operation time and operation count are counted up to the set maximum value. The counted operation time and operation count are saved in HG keep registers (LKR) and the values are retained until they are reset. To reset a counted value, set the value of the configured HG keep register (LKR) to 0.

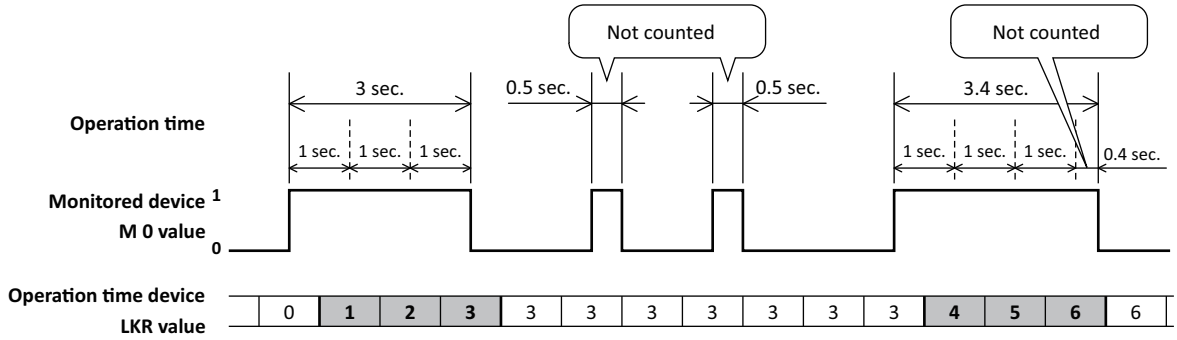
The maximum value that can be configured varies based on the data type of the destination device for the operation time and operation count.

● Counting the Operation Time

While the value of the monitored device is 1, 1 is added to the value of the device (operation time device) configured in **Measure Operation Time** for each second that elapses. The operation time is not counted when it is less than one second.

The counted operation time is written to the device configured in **Measure Operation Time**.

Example: When the value of monitored device M 0 is 1, 1 is added to the value of operation time device LKR 0.

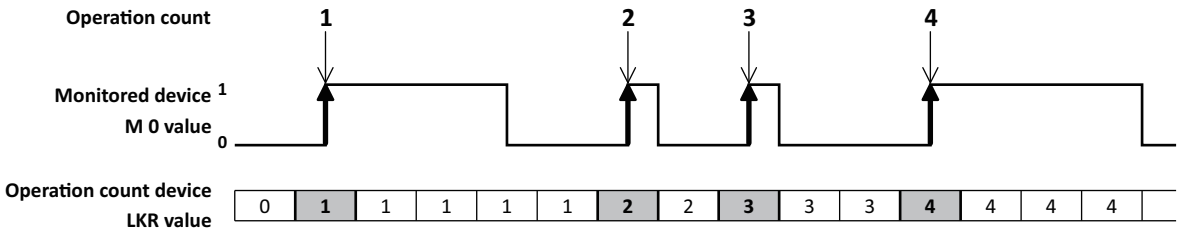


● Counting the Operation Count

When the value of the monitored device changes from 0 to 1, 1 is added to the value of the device (operation count device) configured in **Measure Operation Count**.

The counted operation count is written to the device configured in **Measure Operation Count**.

Example: When the value of monitored device M 0 changes from 0 to 1, 1 is added to the value of operation count device LKR 0.



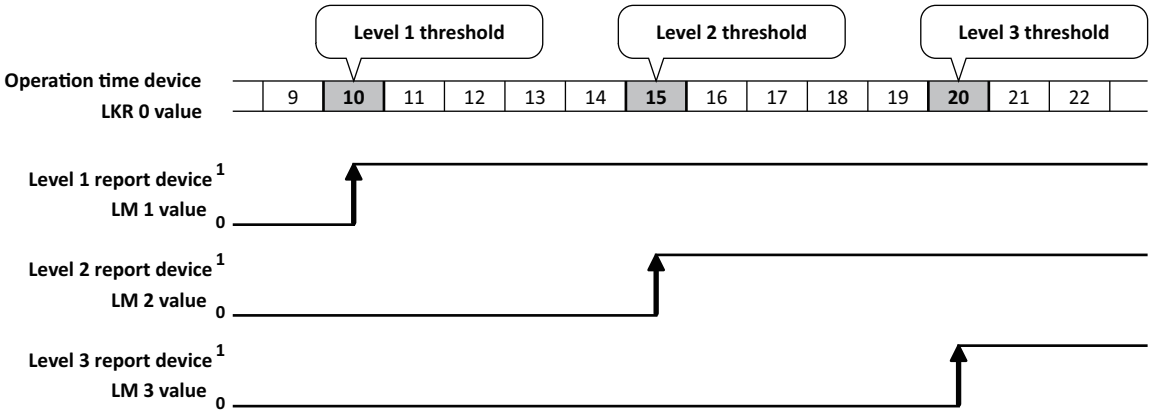
If the monitored device value changes from 0 to 1 in an interval shorter than the MICRO/I scan time and the communication cycle with hosts, the operation time and operation count is not counted normally. You can check the maximum MICRO/I scan time (x 1 ms) with the value of HG special internal register LSD 4. You can check the communication cycle with hosts (x 1 ms) with the value of HG special internal register LSD 6. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

1.3 Thresholds

The threshold is a value that is the criterion for reporting to a configured device (report device) when the value counted for the operation time or operation count (operation time device value or operation count device value) has reached the threshold value. 1 is written to the configured device when the operation time and operation count reach the threshold.

Example: When the value of operation time device LKR 0 reaches the threshold set for level 1 through level 3, 1 is written to the report device configured for each level, LM 1 through LM 3.

Level	Threshold	Report device
Level 1	10	LM 1
Level 2	15	LM 2
Level 3	20	LM 3



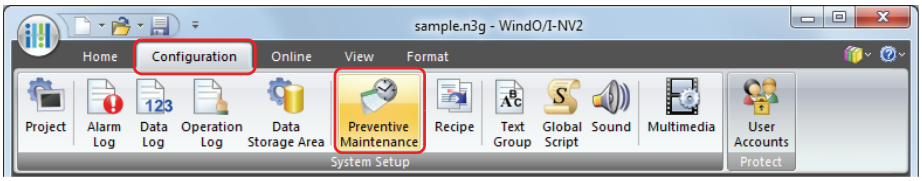
2 Preventive Maintenance Function Configuration Procedure

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

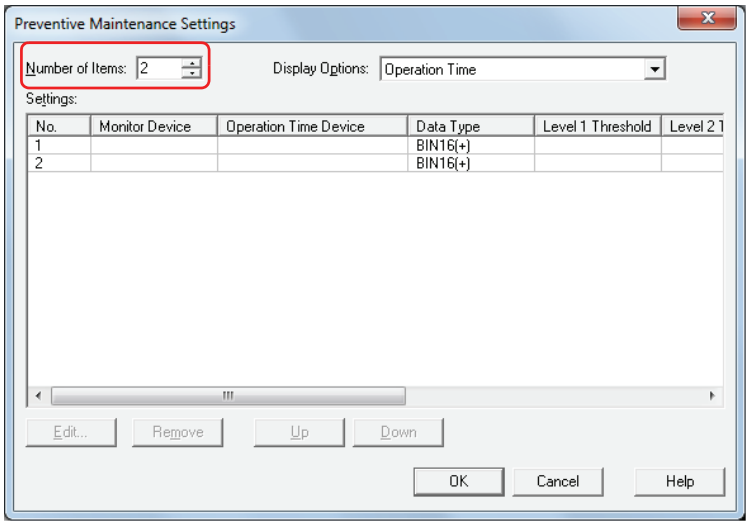
This section describes the configuration procedure for the Preventive Maintenance function.

2.1 Counting Operation Time and Operation Count

1 On the **Configuration** tab, in the **System Setup** group, click **Preventive Maintenance**.
The **Preventive Maintenance Settings** dialog box is displayed.



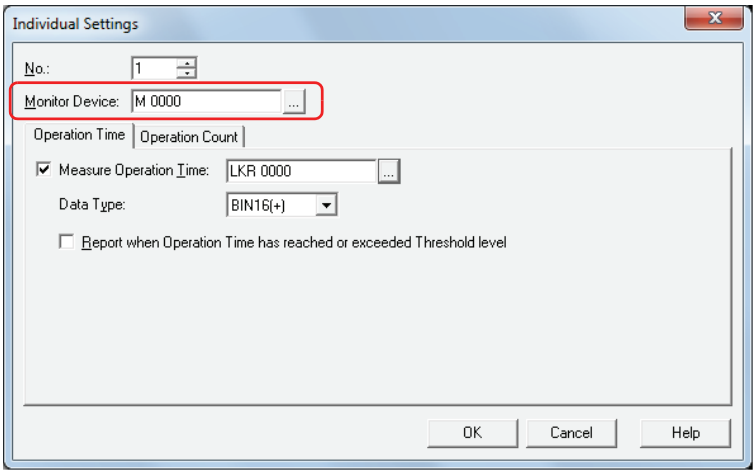
2 Specify the number of devices to monitor in **Number of Items**.



3 Select the item to display in **Settings** with **Display Options**.
Select **Operation Time + Operation Count**.
The **Operation Time** and **Operation Count** settings are displayed in **Settings**.

4 Select the number to register the Preventive Maintenance settings to in **Settings**, then click **Edit**.
The **Individual Settings** dialog box is displayed.

5 Specify the bit device or bit of the word device to monitor with **Monitor Device**.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.



6 Select the **Measure Operation Time** check box on the **Operation Time** tab.

If you are not counting the operation time, leave the **Measure Operation Time** check box cleared and proceed to step *9*.

7 Specify the destination device for the counted operation time.

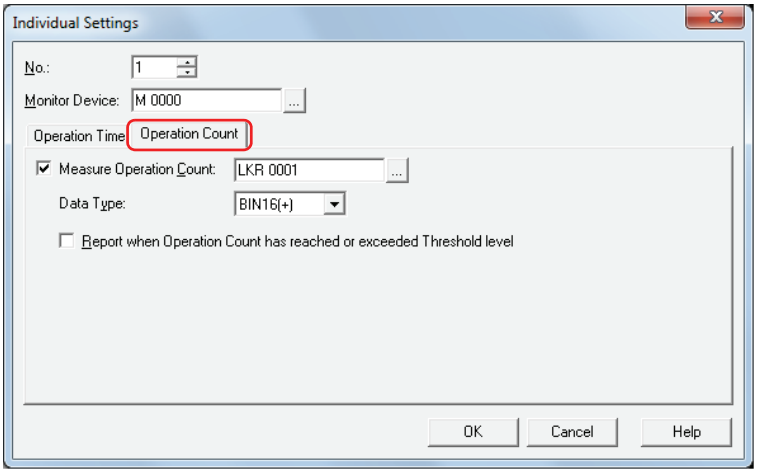
You can only specify an HG keep register (LKR).

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

8 Select the data type for the **Measure Operation Time** device value with **Data Type**.

This concludes configuring operation time counting.

9 Click the **Operation Count** tab.



10 Select the **Measure Operation Count** check box.

If you are not counting the operation count, leave the **Measure Operation Count** check box cleared and proceed to step *13*.

11 Specify the destination device for the counted operation count.

You can only specify an HG keep register (LKR).

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

12 Select the data type for the **Measure Operation Count** device value with **Data Type**.

This concludes configuring operation count counting.

13 Click **OK** to close the **Individual Settings** dialog box.

You are returned to the **Preventive Maintenance Settings** dialog box.

14 Repeat steps *2* to *13* to register settings to count the operation time and operation count in all the used numbers.

This concludes configuring operation time and operation count counting.

Next, configure the functions to execute using counted data.

☞ "4.1 Displaying the Counted Operation Count on a Numerical Display" on page 17-11
☞ "4.2 Notifying with a Beep when the Counted Operation Time Reaches the Threshold" on page 17-14

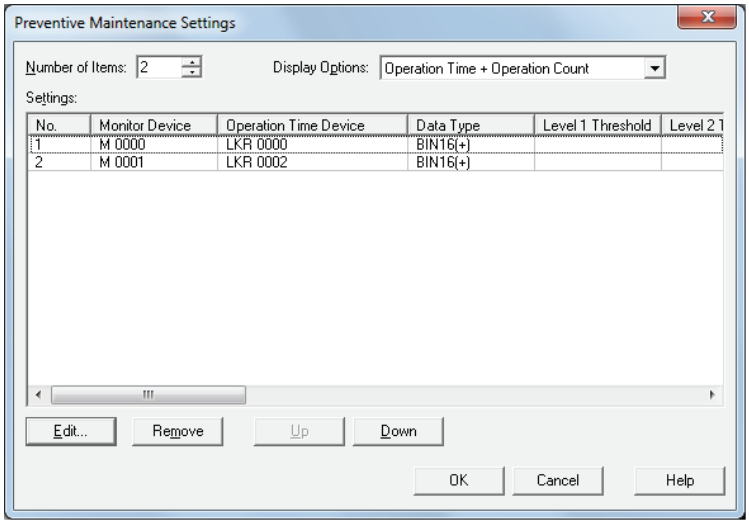
3 Preventive Maintenance Settings Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the items and buttons on the **Preventive Maintenance Settings** dialog box and the **Individual Settings** dialog box.

3.1 Preventive Maintenance Settings Dialog Box

The **Preventive Maintenance Settings** dialog box is used to manage the preventive maintenance settings for each monitored device.



■ Number of Items

Specifies the number of devices (1 to 256) to monitor. The numbers for the amount of configured devices is displayed in **Settings**.

■ Display Options

Select the item to display in **Settings** from the following:

Operation Time:	Operation time settings are displayed in **Settings**.
Operation Count:	Operation count settings are displayed in **Settings**.
Operation Time + Operation Count:	Operation time and operation count settings are displayed in **Settings**.

■ Settings

Edits the settings for each number.

No.:	Shows the number of the preventive maintenance settings to manage. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8.
Monitor Device:	Shows the bit device or bit of the word device to count the operation time or operation count. Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Operation Time Device:	Shows the destination device for the counted operation time. You can only specify an HG keep register (LKR). Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option is only displayed when **Operation Time** or **Operation Time + Operation Count** is selected in **Display Options**.
Data Type:	Shows the date type of the operation time device. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8. This option is only displayed when **Operation Time** or **Operation Time + Operation Count** is selected in **Display Options**.

Level 1 to 3 Threshold: Shows the time as a constant or a device that is the criterion for reporting at level 1 through level 3. For a constant, double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8. For a device, the **Device Address Settings** dialog box is displayed. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option is only displayed when **Operation Time** or **Operation Time + Operation Count** is selected in **Display Options**.

Level 1 to 3 Report Device: Shows the bit device or bit of the word device for reporting when the operation time reaches or exceeds the level 1 through level 3 thresholds.

Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option is only displayed when **Operation Time** or **Operation Time + Operation Count** is selected in **Display Options**.

Operation Count Device: Shows the destination device for the counted operation count. You can only specify an HG keep register (LKR).

Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option is only displayed when **Operation Count** or **Operation Time + Operation Count** is selected in **Display Options**.

Data Type: Shows the date type of the operation count device. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8.

This option is only displayed when **Operation Count** or **Operation Time + Operation Count** is selected in **Display Options**.

Level 1 to 3 Threshold: Shows the count as a constant or a device that is the criterion for reporting at level 1 through level 3. For a constant, double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8. For a device, the **Device Address Settings** dialog box is displayed. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option is only displayed when **Operation Count** or **Operation Time + Operation Count** is selected in **Display Options**.

Level 1 to 3 Report Device: Shows the bit device or bit of the word device for reporting when the operation count reaches or exceeds the level 1 through level 3 thresholds.

Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option is only displayed when **Operation Count** or **Operation Time + Operation Count** is selected in **Display Options**.

■ Edit

Registers or changes the settings for the selected number.

Select a number and click this button to display the **Individual Settings** dialog box. The configured content for the selected number is reflected in the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 17-8.

■ Remove

Deletes the settings for the selected number.

Select a number and click this button.

■ Up

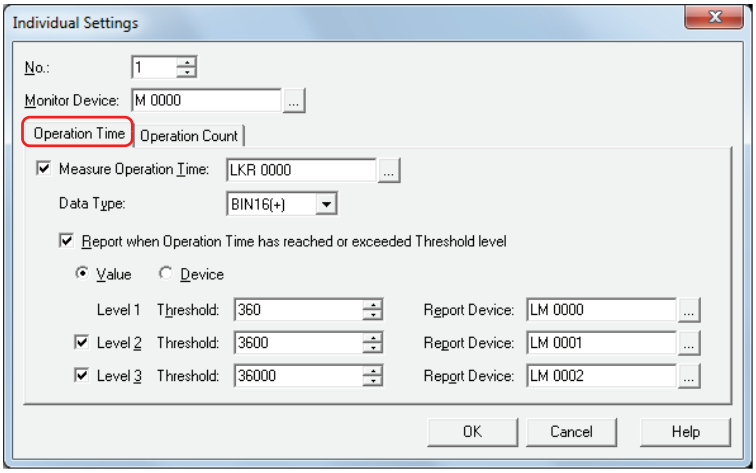
Shifts the selected settings upward in the list.

■ Down

Shifts the selected settings downward in the list.

3.2 Individual Settings Dialog Box

The **Individual Settings** dialog box is used to configure the operation time and operation count settings for each monitored device.



No.: Shows the number selected in **Settings** in the **Preventive Maintenance Settings** dialog box. To change the set number, specify a number (1 to 256).
You can only specify a number of the amount of devices configured by **Number of Items** in the **Preventive Maintenance Settings** dialog box.

Monitor Device: Specifies the bit device or bit of the word device to count the operation time or operation count.
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● Operation Time Tab

The **Operation Time** tab is used to configure the destination device for the counted operation time and the report conditions when the threshold is reached or exceeded.

■ Measure Operation Time

Select this check box to count the operation time.

(Operation Time Device): Specifies the destination device for the counted operation time. You can only specify an HG keep register (LKR).
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

> If you specify the same device as the operation time device for multiple numbers, the counted operation time is added in total by all the monitored devices for each number and the function will not be able to count normally.

■ Data Type

Select the data type for the operation time device as **BIN16 (+)** or **BIN32 (+)**. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ Report when Operation Time has reached or exceeded Threshold level

Select this check box to report when the counted operation time reaches or exceeds the threshold.

■ (Data Type)

Selects the type of data for the threshold.

Value: Uses a constant as the threshold.
Device: Uses a device value as the threshold.

■ Level 1

Configures the level 1 threshold and report device.

Threshold: Specifies the time as a constant or a device that is the criterion for reporting at level 1. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report Device: Specifies the bit device or bit of the word device for reporting when the operation time reaches or exceeds the level 1 threshold.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Level 2

Select this check box to configure the level 2 threshold and report device.

Threshold: Specifies the time as a constant or a device that is the criterion for reporting at level 2. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report Device: Specifies the bit device or bit of the word device for reporting when the operation time reaches or exceeds the level 2 threshold.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ Level 3

Select this check box to configure the level 3 threshold and report device.

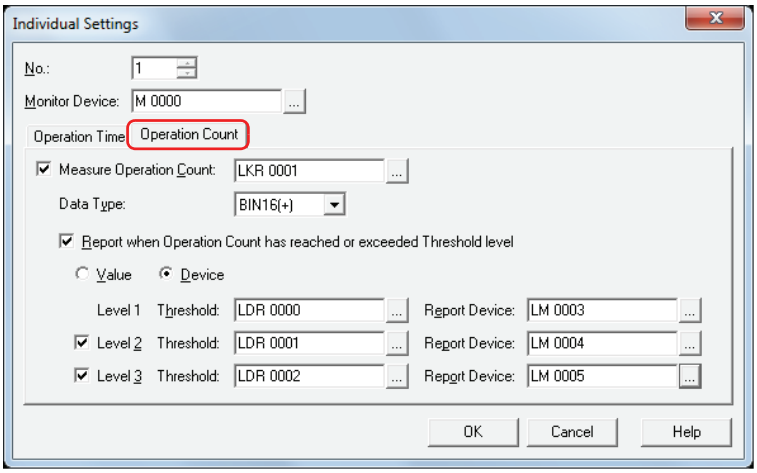
Threshold: Specifies the time as a constant or a device that is the criterion for reporting at level 3. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Report Device: Specifies the bit device or bit of the word device for reporting when the operation time reaches or exceeds the level 3 threshold.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

● Operation Count Tab

The **Operation Count** tab is used to configure the destination device for the counted operation count and the report conditions when the threshold is reached or exceeded.



■ Measure Operation Count

Select this check box to count the operation count.

(Operation Count Device): Specifies the destination device for the counted operation count. You can only specify an HG keep register (LKR).

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

If you specify the same device as the operation count device for multiple numbers, the counted operation count is added in total by all the monitored devices for each number and the function will not be able to count normally.

Data Type

Select the data type for the operation count device as **BIN16 (+)** or **BIN32 (+)**. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Report when Operation Count has reached or exceeded Threshold level

Select this check box to report when the counted operation count reaches or exceeds the threshold.

(Data Type)

Selects the type of data for the threshold.

Value:	Uses a constant as the threshold.
Device:	Uses a device value as the threshold.

Level 1

Configures the level 1 threshold and report device.

Threshold	Specifies the count as a constant or a device that is the criterion for reporting at level 1. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Report Device:	Specifies the bit device or bit of the word device for reporting when the operation count reaches or exceeds the level 1 threshold. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Level 2

Select this check box to configure the level 2 threshold and report device.

Threshold	Specifies the count as a constant or a device that is the criterion for reporting at level 2. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Report Device:	Specifies the bit device or bit of the word device for reporting when the operation count reaches or exceeds the level 2 threshold. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Level 3

Select this check box to configure the level 3 threshold and report device.

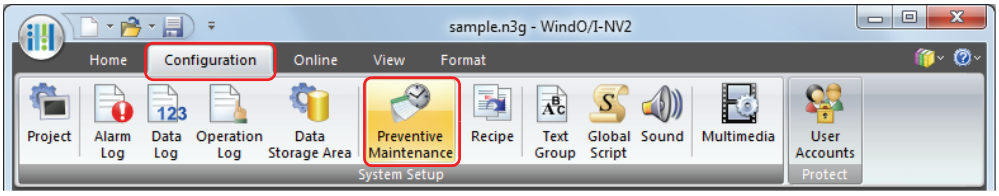
Threshold	Specifies the count as a constant or a device that is the criterion for reporting at level 3. For a constant, the range that can be set varies based on the data type. For a device, click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
Report Device:	Specifies the bit device or bit of the word device for reporting when the operation count reaches or exceeds the level 3 threshold. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

4 Using the Data

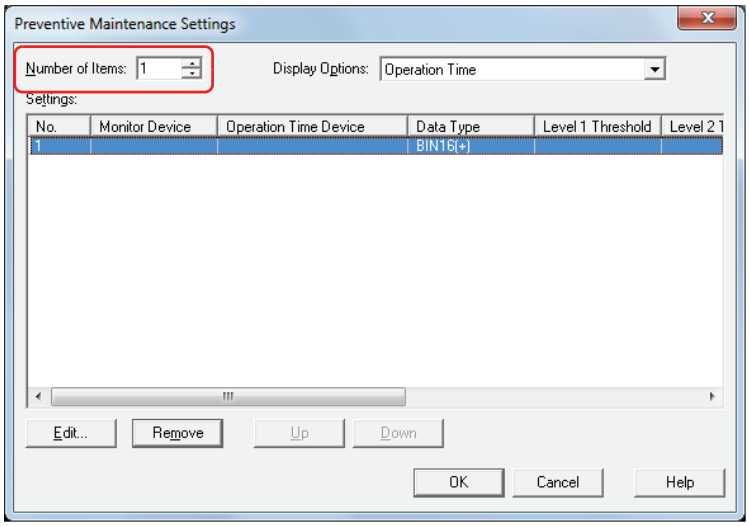
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Displaying the Counted Operation Count on a Numerical Display

1 On the **Configuration** tab, in the **System Setup** group, click **Preventive Maintenance**.
The **Preventive Maintenance Settings** dialog box is displayed.



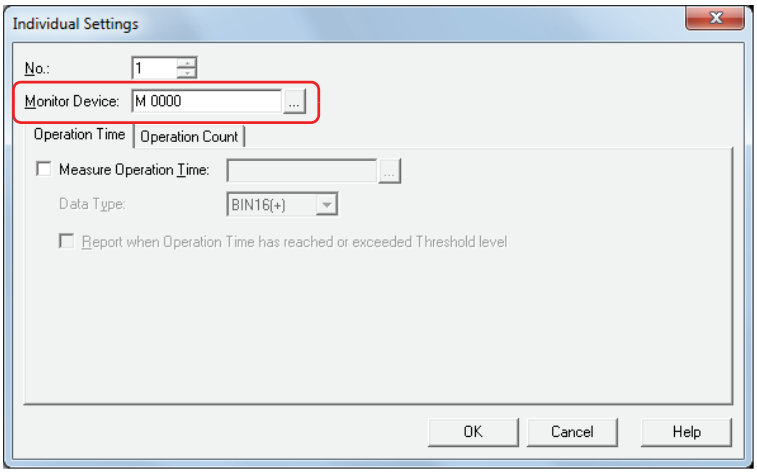
2 Specify the number of devices to monitor in **Number of Items**.



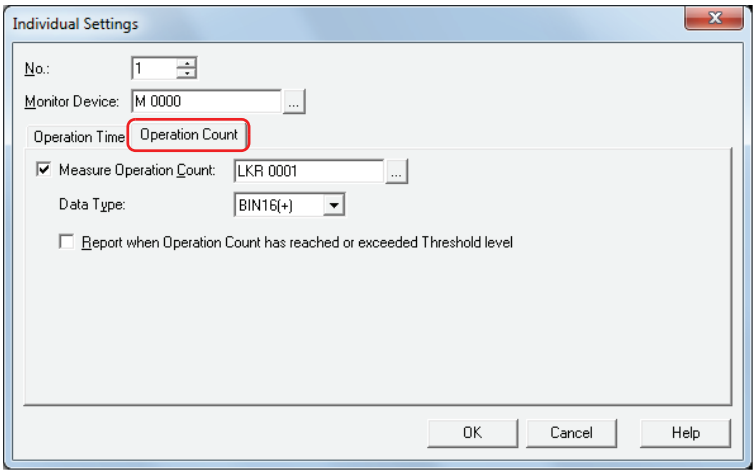
3 Select the item to display in **Settings** with **Display Options**.
Select **Operation Count**.
Operation count settings are displayed in **Settings**.

4 Select the number to register the Preventive Maintenance settings to in **Settings**, then click **Edit**.
The **Individual Settings** dialog box is displayed.

5 Specify the bit device or bit of the word device to monitor with **Monitor Device**.



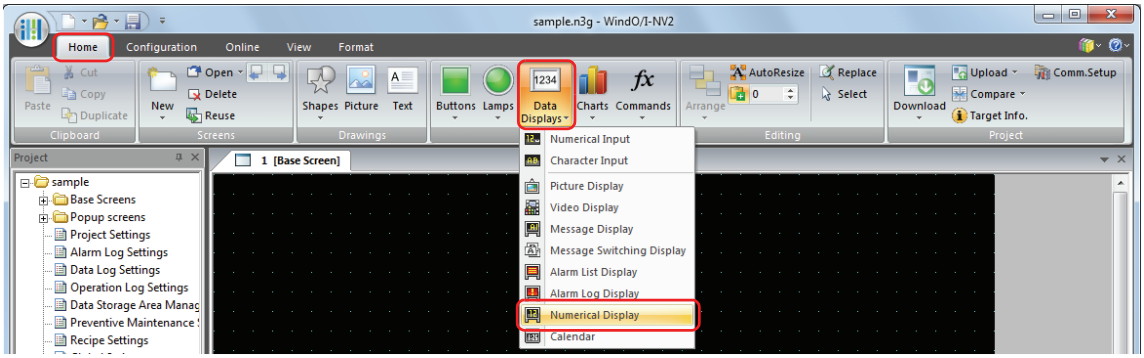
6 Click the **Operation Count** tab.



7 Select the **Measure Operation Count** check box and specify the destination device for the counted operation count.

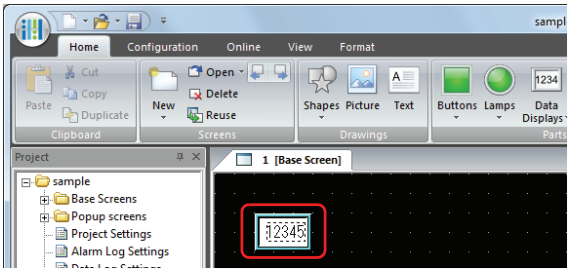
8 Select the data type for the **Measure Operation Count** device value with **Data Type**.

9 On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Numerical Display**.

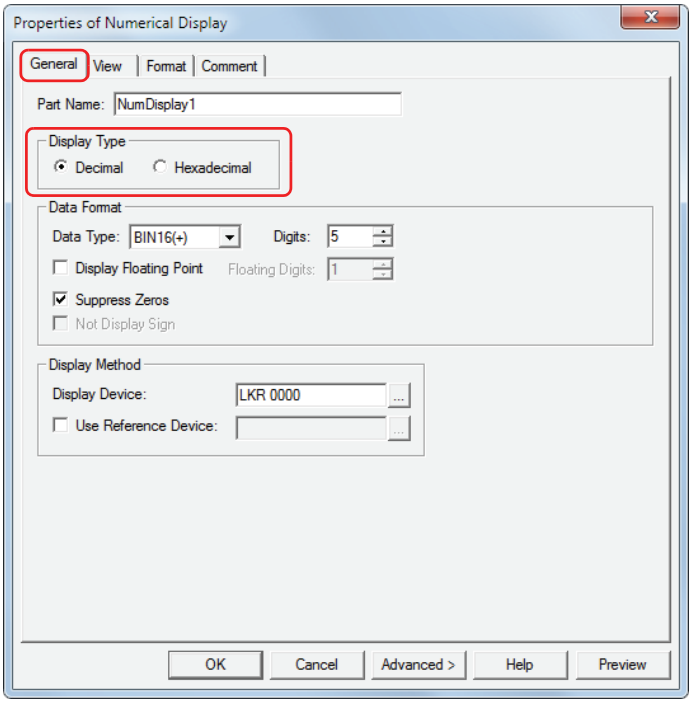


10 Click a point on the edit screen where you wish to place the Numerical Display.

11 Double-click the dropped Numerical Display and the Properties dialog box is displayed.



12 On the **General** tab, under **Display Type**, click **Decimal**.



13 Under **Data Format**, in **Data Type**, select the data type for the value to display.

Select the same data type as the data type selected on the **Operation Count** tab in the Preventive Maintenance settings **Individual Settings** dialog box.

14 Specify **Digits** for the value to display.

The digits that can be set varies based on the display type or data type.

15 Under **Display Method**, in **Display Device**, specify the destination device for the counted operation count.

Select the same device as the device configured with **Measure Operation Count** on the **Operation Count** tab in the Preventive Maintenance settings **Individual Settings** dialog box.

16 Click **OK**.

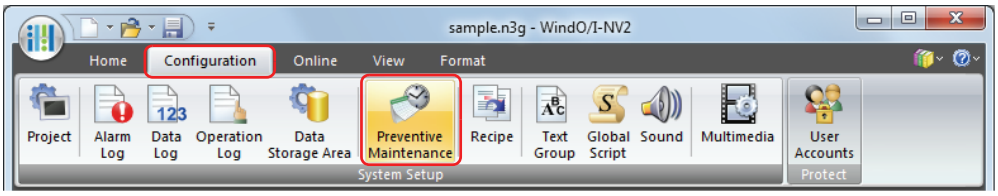
The properties dialog box closes.

This concludes the configuration to display the counted operation count on a Numerical Display.

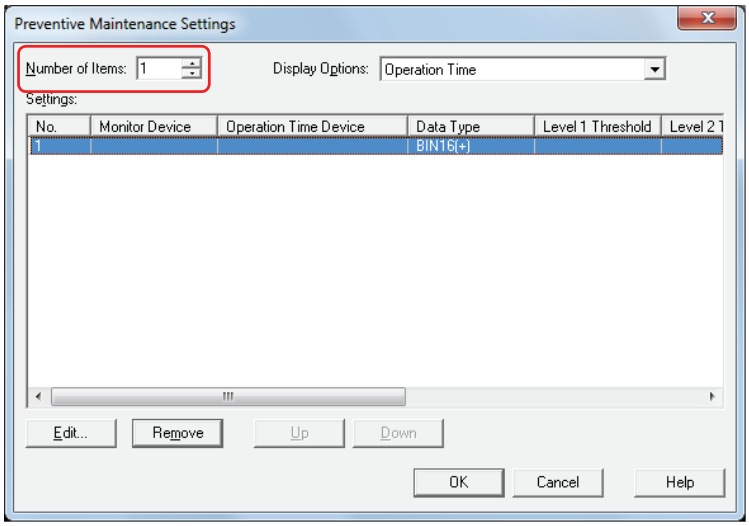
4.2 Notifying with a Beep when the Counted Operation Time Reaches the Threshold

1 On the **Configuration** tab, in the **System Setup** group, click **Preventive Maintenance**.

The **Preventive Maintenance Settings** dialog box is displayed.



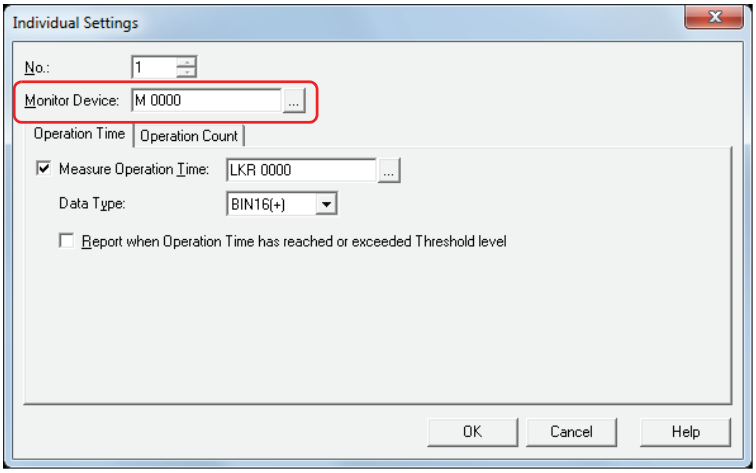
2 Specify the number of devices to monitor in **Number of Items**.



3 Select the number to register the Preventive Maintenance settings to in **Settings**, then click **Edit**.

The **Individual Settings** dialog box is displayed.

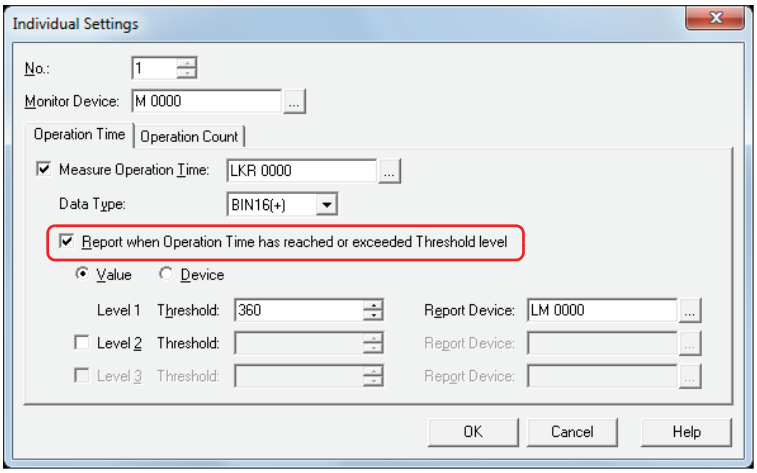
4 Specify the bit device or bit of the word device to monitor with **Monitor Device**.



5 Select the **Measure Operation Time** check box on the **Operation Time** tab and specify the destination device for the counted operation time.

6 Select the data type for the **Measure Operation Time** device value with **Data Type**.

7 Select the **Report when Operation Time has reached or exceeded Threshold level** check box.



8 Select the type of data for the threshold.

If you select **Value**, specify the threshold as a constant.

If you select **Device**, specify the threshold as a device value.

9 Configure **Threshold** for level 1.

When you select **Value** as the threshold data type, specify the threshold as a constant. The range for the constant that can be set varies based on the data type.

When you select **Device** as the threshold data type, specify the threshold as a device value. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

10 Configure **Report Device** for level 1.

Specify the bit device or bit of the word device for reporting when the threshold is reached or exceeded. Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

You can only specify an internal device.

11 Click **OK** to close the **Individual Settings** dialog box.

You are returned to the **Preventive Maintenance Settings** dialog box.

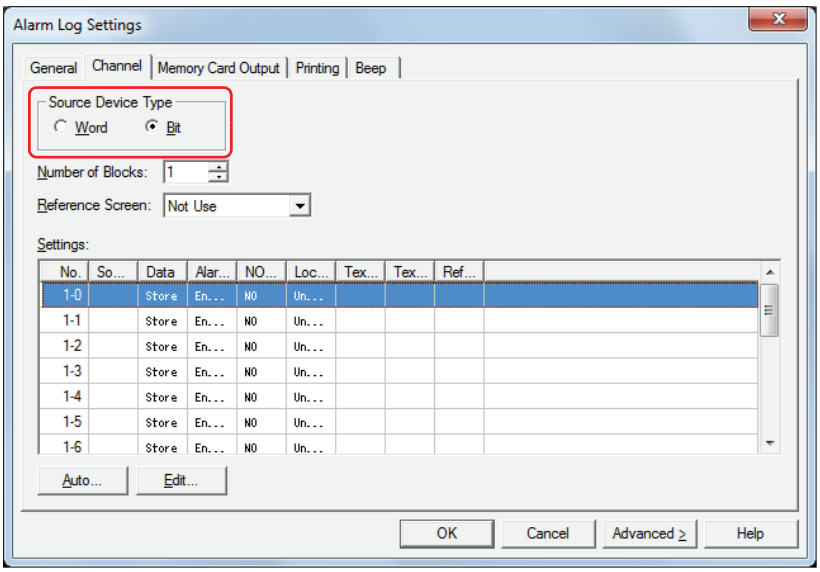
12 Click **OK**.

The **Preventive Maintenance Settings** dialog box closes.

13 On the **Configuration** tab, in the **System Setup** group, click **Alarm Log**.

The **Alarm Log Settings** dialog box is displayed.

14 On the **Channel** tab, under **Source Device Type**, select **Bit** and specify **Number of Blocks**.

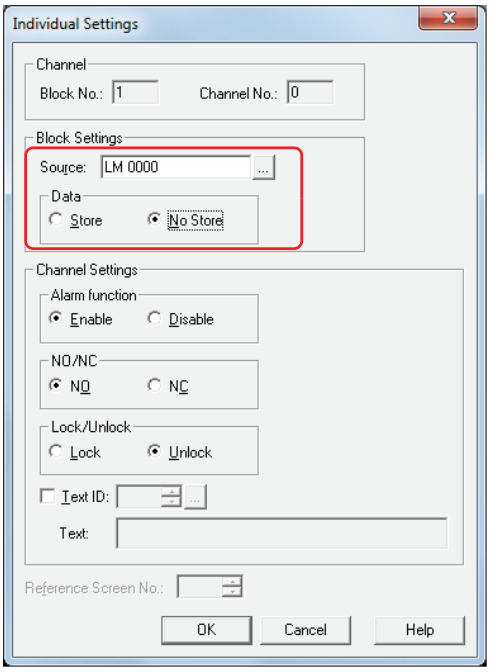


15 Select the channel number to register the level 1 report device to and click **Edit**.

The **Individual Settings** dialog box is displayed.

16 Specify the level 1 report device in **Source** and select **No Store** under **Data**.

Set **Source** to the level 1 report device configured on the **Operation Time** tab in the Preventive Maintenance settings **Individual Settings** dialog box.

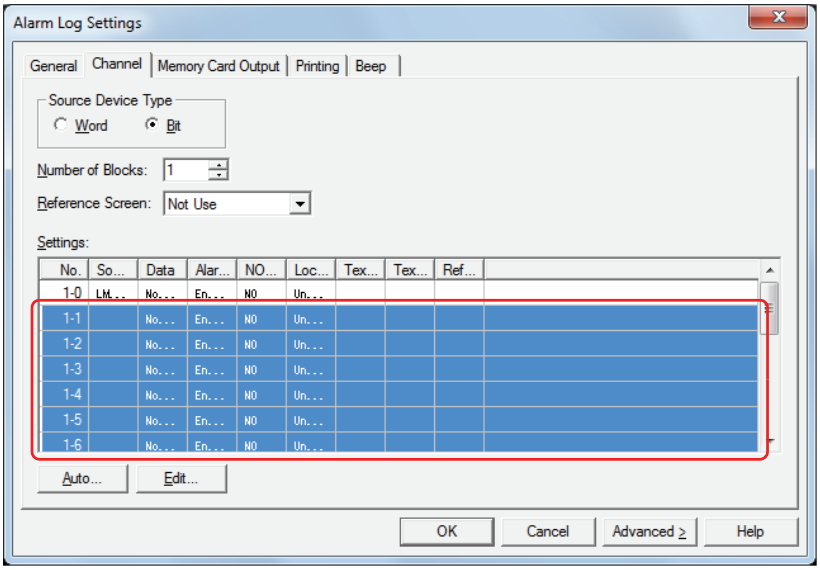


17 Select **Enable** under **Alarm function**, select **NO** under **NO/NC**, and click **OK**.

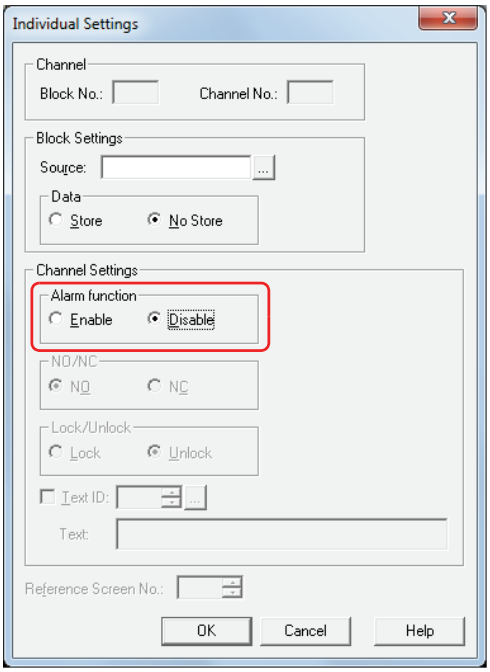
You are returned to the **Alarm Log Settings** dialog box.

18 Switch the alarm function for all the unused channel numbers to **Disable**.

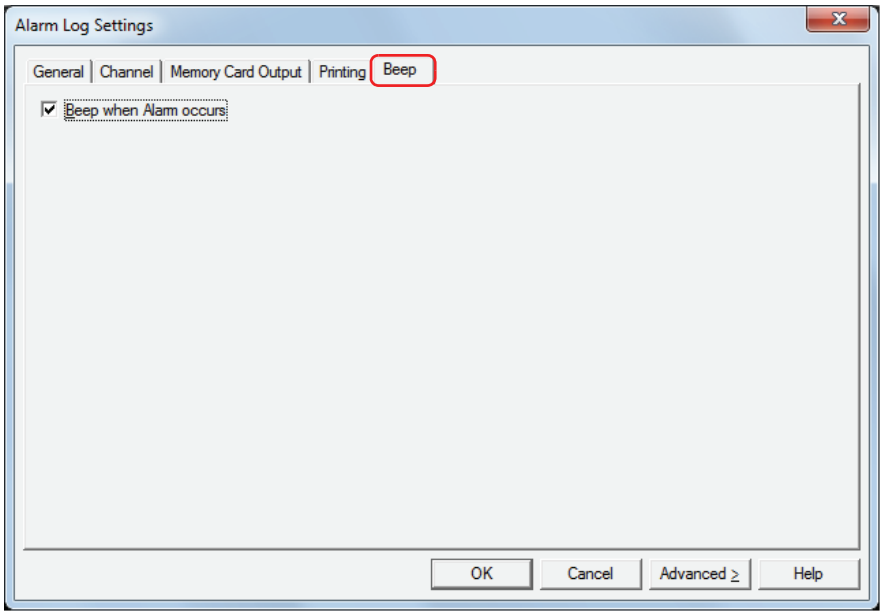
Select all the unused channels with the Shift key + click or the Ctrl key + click and click **Edit**.
The **Individual Settings** dialog box is displayed.



Under **Channel Settings** - **Alarm function**, select **Disable** and click **OK**.
You are returned to the **Alarm Log Settings** dialog box.



19 Click the **Beep** tab.



20 Select the **Beep when Alarm occurs** check box.

21 Click **OK**.

The **Alarm Log Settings** dialog box closes.

This concludes the configuration to notify with a beep when the counted operation time reaches the threshold.

Chapter 18 Recipe Function

This chapter describes how to configure the Recipe function and its operation on the MICRO/I.

1 Overview

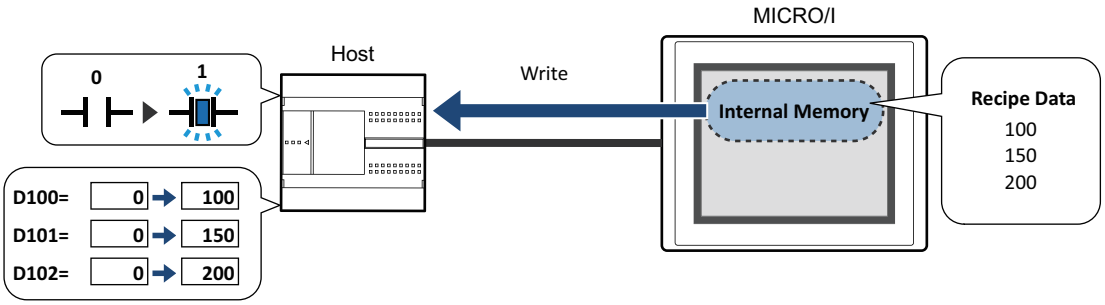
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Recipe Function is Used

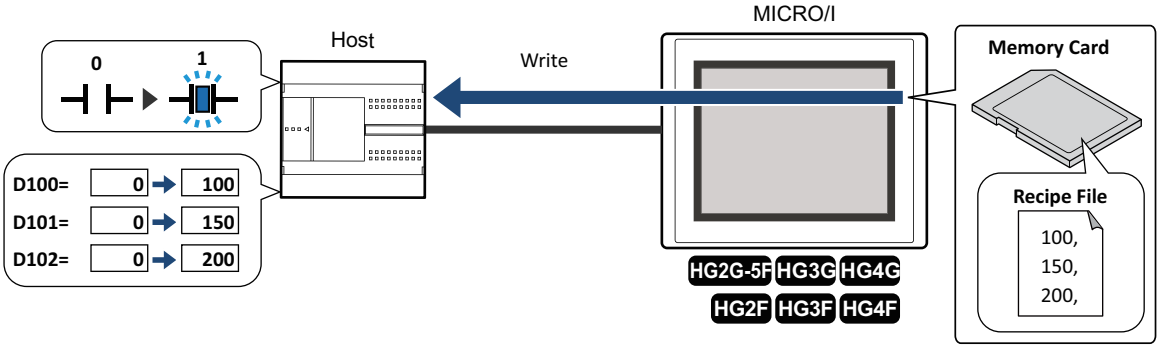
The Recipe function batch writes values prepared in advanced to specified devices and batch reads the values for specified devices according to the state of a device. Use this function for situations such as configuring the initial values of a host when the MICRO/I starts running. The data used by the Recipe function is called recipe data for the data saved in internal memory, a recipe file for data saved to the memory card, and recipe values for the values written to devices that were saved in recipe data and recipe files.

The Recipe function can perform the following functions.

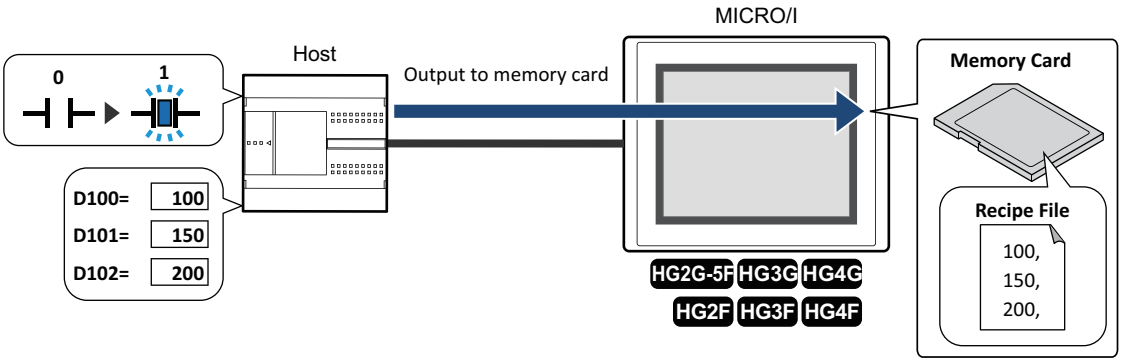
- Batch write the recipe values saved in internal memory to devices when a device value changes from 0 to 1



- Batch write the recipe values saved on the memory card to devices when a device value changes from 0 to 1



- Batch read device values and save them to the memory card as a recipe file when a device value changes from 0 to 1



Device values can be retained when the power is turned off by reading device values to the memory card and saving them as a recipe file and then writing those values the next time the power is turned on.

1.2 Data for Recipes

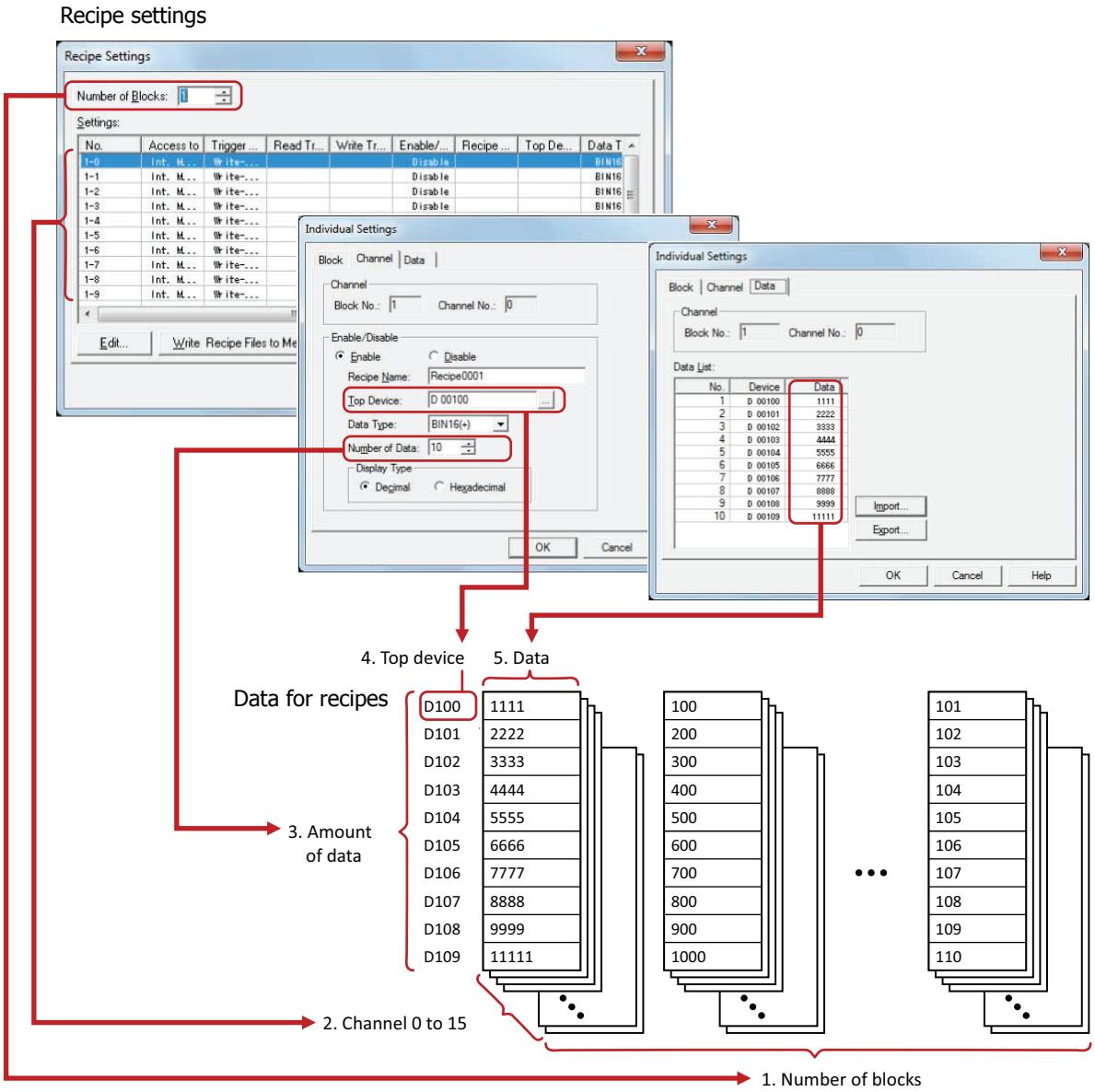
The data handled by the Recipe function is based on the top device and the amount of data selected.

Example: When the top device is D 100 and the amount of data is 10

D 100 value	1111
D 101 value	2222
D 102 value	3333
D 103 value	4444
D 104 value	5555
D 105 value	6666
D 106 value	7777
D 107 value	8888
D 108 value	9999
D 109 value	11111

1.3 Data Configuration

The relationship between the Recipe function settings and the data for recipes is as follows.



1. Number of blocks: The operation using the data for recipes is configured in blocks (0 to 64). 1 block is 16 channels.

2. Channels: Destination devices and recipe values are configured in channels. 1 channel is used for 1 item of data for the recipe.

3. Amount of data: The amount of data configured for one channel. The maximum amount of data that can be configured is 8192.

4. Top device: The start device of the destination devices for recipe values and the source devices for device values.

5. Data: The values to write to the devices.

If there are many word devices for the data for the recipe, it will take time to read and write them. For example, when using the Recipe function to configure initial values, if other processes are executed before the function is finished writing all the settings, you may experience unexpected results. Monitor System Area 2 Transferring recipe bit (address+3, bit4) while the recipe is transferring and wait until reading and writing the data for the recipe is finished before executing other processes. For details, refer to Chapter 4 "System Area" on page 4-32.

2 Recipe Function Configuration Procedure

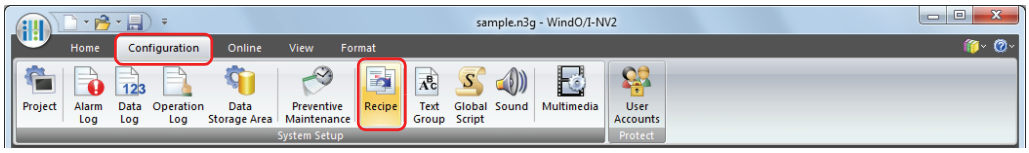
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Recipe function.

2.1 Configuring Recipe Function Operations and Devices

1 On the **Configuration** tab, in the **System Setup** group, click **Recipe**.

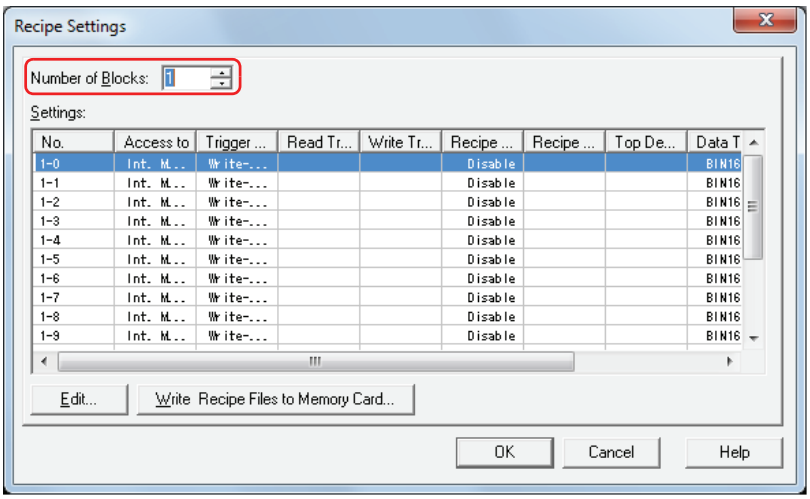
The **Recipe Settings** dialog box is displayed.



2 Specify the number of blocks to use as data for the recipe in **Number of Blocks**.

The operation using the data for the recipe is configured in blocks (0 to 64). 1 channel is used for 1 item of data for the recipe. 1 block is 16 channels.

The maximum number of blocks that can be configured is 64 blocks. The maximum number of devices that can be configured for 1 channel is 8192 devices.

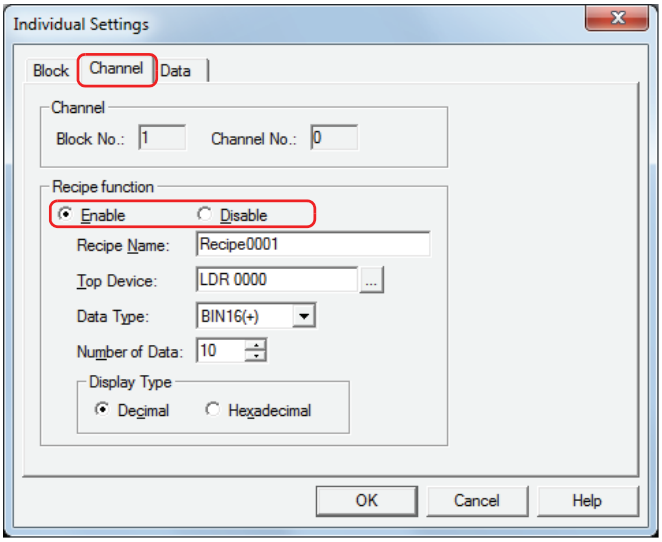


3 Select the number of the data for the recipe to configure in **Settings**, then click **Edit**.

The **Individual Settings** dialog box is displayed.

4 On the **Channel** tab, under **Recipe Function**, select **Enable**.

The channel for the block number displayed in **Channel** is enabled.



5 Enter the name for the Recipe function in **Recipe Name**.

The maximum number is 40 characters.

6 Specify the destination device for the Recipe values in **Top Device**.

To read device values and save them as a recipe file, specify the source device of the values.

Click ... to display the **Device Address Settings** dialog box.

For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The specified device addresses are configured sequentially from the number 1 in **Data List** on the **Data** tab.

7 Select the data type for the values to write with **Data Type**.

To read device values and save them as a recipe file, specify the type of data for the read values.

8 With **Number of Data**, specify the number of destination devices starting with the device address configured by **Top Device**.

To read device values and save them as a recipe file, specify the number of source devices.

The sequential devices from the start address for the number of configured devices is displayed in **Settings** on the **Data** tab.

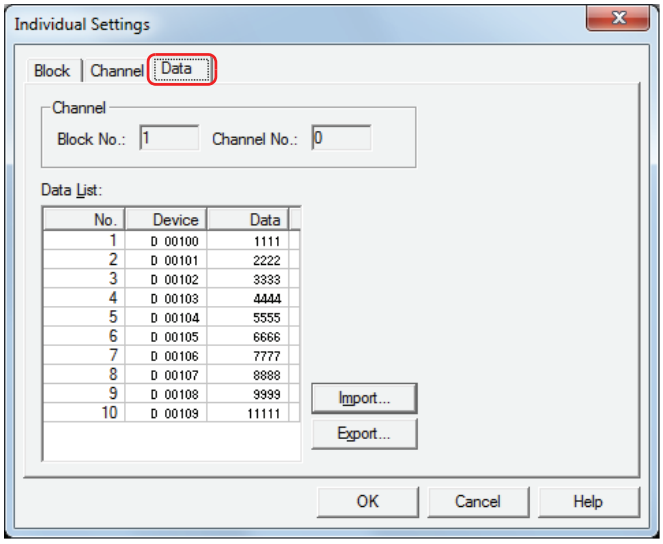
The amount of data that can be set varies based on the data type. When **BIN16 (+)**, **BIN16 (+/-)**, or **BCD4** is selected for **Data Type**, up to 8192 items of data can be configured. When **BIN32 (+)**, **BIN32 (+/-)**, **BCD8**, or **float32**[*1] is selected, up to 4096 items of data can be configured.

9 With **Display Type**, select the display type for **Data** to configure in **Data List** on the **Data** tab.

To save data to a recipe file, the display type is decimal for all.

*1 HG2G-S/-5S/-5F, HG3G/4G only

10 Click the **Data** tab.



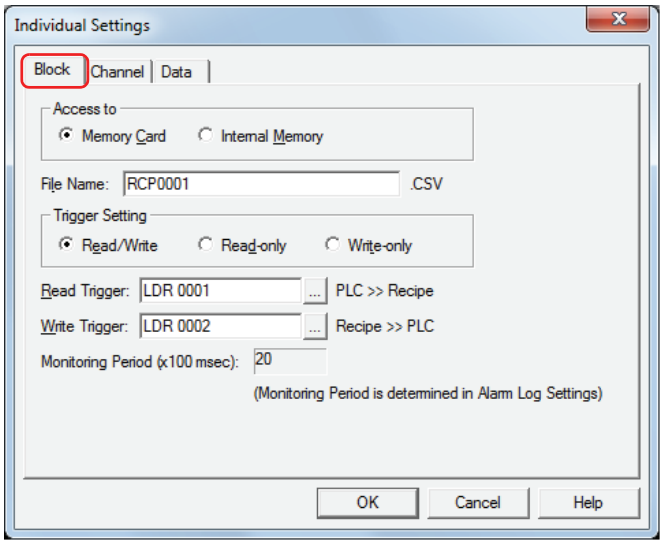
The data for the recipe in the amount specified by **Number of Data** on the **Channel** tab is configured in **Data List**. In **Device**, the devices are sequentially configured starting from the device address specified by **Top Device**.

11 Double click the data cell for each number in **Data List** to enter the value to write to the device.

The value for the device that can be configured varies based on **Data Type** and **Display Type** configured on the **Channel** tab.

When **Read-only** is selected under **Trigger Setting** on the **Block** tab, entering device values is unnecessary.

12 Click the **Block** tab.



13 Select the destination to save recipe data to under **Access to**.

This option is set by block.

- **Memory Card**
  Use a recipe file saved to the memory card.
- **Internal Memory**
  Use recipe data saved to internal memory.

If you selected **Internal Memory**, proceed to step *17*.

14 Enter the file name for the recipe file in **File Name**.

The file name that can be set depends on the O/I type.

HG2G-5F, HG3G/4G:	The default is "RCP*n*.CSV". (*n*: 4 digit sequential number) To change the file name, enter a new file name. The maximum number is 120 characters (including the extension). The file is overwritten when there is a recipe file with the same name on the memory card.
HG2F/3F/4F:	The file name is "RCP*n*.CSV". (*n*: 4 digit sequential number) This cannot be changed.

15 Select the operation using the data for the recipe under **Trigger Setting**.

This option is set by block.

- **Read/Write**
  Save batch read device values to the memory card as a recipe file or write them to devices as recipe values.
  This option can only be configured when **Memory Card** is selected under **Access to**.

- **Read-only**
  Save batch read device values to the memory card as a recipe file.
  This option can only be configured when **Memory Card** is selected under **Access to**.

- **Write-only**
  Write recipe values to devices.

If you select **Write-only**, proceed to step *17*.

16 Specify the device that triggers batch reading device values and saving them to the memory card as a recipe file in **Read Trigger**.

This option is set by block.

Click ... to display the **Device Address Settings** dialog box.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This option can only be configured when **Read/Write** or **Read-only** is selected under **Trigger Setting**.
If you selected **Read-only**, proceed to step *18*.

17 Specify the device that triggers batch writing recipe values to devices in **Write Trigger**.

This option is set by block.

Click ... to display the **Device Address Settings** dialog box.
For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
This option can only be configured when **Read/Write** or **Write-only** is selected under **Trigger Setting**.

18 Click **OK** to close the **Individual Settings** dialog box.

You are returned to the **Recipe Settings** dialog box.

19 Repeat steps *3* through *18* to register data for the recipe to all the used channels.

20 Click **OK**.

The **Recipe Settings** dialog box closes.

For details on how to create and edit the data for recipes, refer to "4 Creating and Deleting Data for Recipes" on page 18-14.

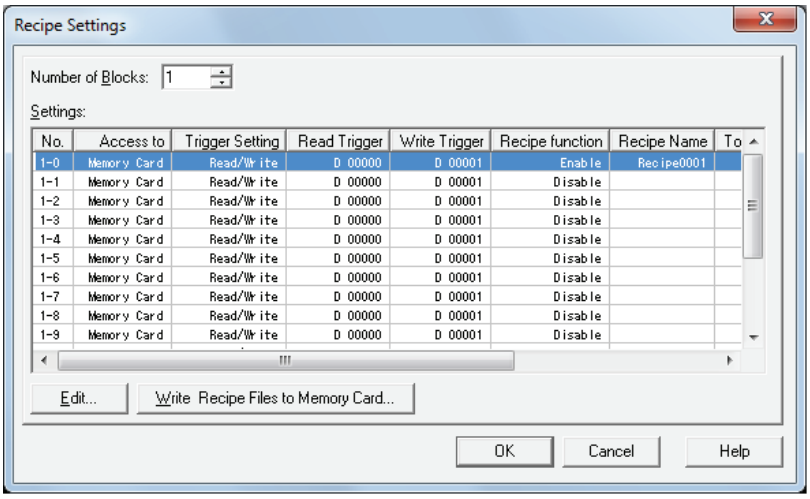
3 Recipe Settings Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the items and buttons on the **Recipe Settings** dialog box and the **Individual Settings** dialog box.

3.1 Recipe Settings Dialog Box

Use the **Recipe Settings** dialog box to collectively manage the save destination of data for recipes, the devices for writing recipe values and reading device values, and those execution conditions.



Number of Blocks

The operation using the data for the recipe is configured in blocks (0 to 64). 1 channel is used for 1 item of data for the recipe. 1 block is 16 channels.

The maximum number of blocks that can be configured is 64 blocks. The maximum number of devices that can be configured for 1 channel is 8192 devices.

Settings

Edits the recipe settings for each channel.

No.:	Displayed as (Block No.)-(Channel No.). Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.
Access to:	Shows the save destination for the data for the recipe. Double clicking the cell switches between **Internal Memory** and **Memory Card**.
Trigger Setting:	Shows the operation using the data for the recipe. When **Memory Card** is selected for **Access to**, double clicking the cell switches between **Write-only**, **Read/Write**, and **Read-only**. Shows **Write-only** when **Internal Memory** is selected for **Access to**.
Read Trigger:	Shows the device that triggers saving the recipe file. Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when **Read/Write** or **Read-only** is selected under **Trigger Setting**.
Write Trigger:	Shows the device that triggers writing recipe values to devices. Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when **Read/Write** or **Write-only** is selected under **Trigger Setting**.
Recipe Function:	Shows whether or not to use the Recipe function. Double clicking the cell switches between **Enable** and **Disable**.

Recipe Name:	Shows the name of the Recipe function for each channel. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.
Top Device:	Shows the start device of the destination devices for recipe values and the source devices for device values. Double clicking the cell displays the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. This option can only be configured when **Recipe Function** is **Enable**.
Data Type:	Shows the data type of the source or destination device values. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.
No. of Data:	Shows the number of source or destination devices starting with the device address configured by **Top Device**. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.
Display Type:	Shows the display type of **Data** in **Data List** configured on the **Data** tab in the **Individual Settings** dialog box. Double clicking the cell displays the **Individual Settings** dialog box. For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.

■ Edit

Registers or changes the settings for the selected number.

Select a number in **Settings** and click this button to display the **Individual Settings** dialog box. The settings for the selected channel are reflected in the **Individual Settings** dialog box.

For details, refer to "3.2 Individual Settings Dialog Box" on page 18-10.

■ Write Recipe Files to Memory Card

Saves all the settings in every channel on the **Recipe Settings** dialog box to the memory card as a recipe file.

Click this button to display the **Select Memory Card Drive** dialog box.

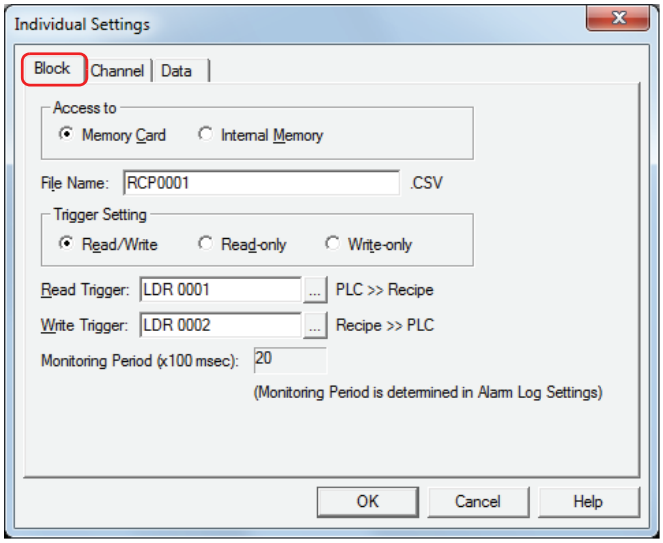
Only saves channels configured with **Access to** set to **Memory Card** and **Recipe Function** set to **Enable**.

3.2 Individual Settings Dialog Box

Use the **Individual Settings** dialog box to register or edit the recipe settings for the selected channel.

● Block Tab

The **Block** tab is used to configure settings that are managed by blocks such as the save destination for the data for the recipe to use, the Recipe function operation, and the operation trigger.



■ Access to

Selects the save destination for data for the recipe to use when writing values to devices.

Memory Card*1: Uses a recipe file saved to the memory card.
Requires a memory card with a saved recipe file. For details, refer to "4.2 Creating Recipe Files" on page 18-17.

Internal Memory: Uses recipe data saved to internal memory.
Since recipe data is handled as a portion of project data, it may put pressure on the volume of project data that can be downloaded. One item of recipe data uses 2 bytes when the top device data type is 16 bits and it uses 4 bytes when the top device data type is 32 bits.
Example: When the top device data type is 16 bits and using 1 block of 16 channels of recipe data with a data amount of 10
2 x 10 x 1 x 16 = 320 bytes
When the top device data type is 32 bits and using 64 blocks of 16 channels of recipe data with a data amount of 100
4 x 100 x 64 x 16 = 409.6 kilobytes

■ File Name

Enter the file name of the recipe file to save on the memory card.
The file name that can be set depends on the O/I type.

HG2G-5F, HG3G/4G: The default is "RCP*n*.CSV". (*n*: 4 digit sequential number)
To change the file name, enter a new file name. The maximum number is 120 characters (including the extension).
The file is overwritten when there is a recipe file with the same name on the memory card.

HG2F/3F/4F: The file name is "RCP*n*.CSV". (*n*: 4 digit sequential number)
This cannot be changed.

For the HG2G-5F and the HG3G/4G, if **float32** is selected for **Data Type** on the **Channel** tab, read the value of device as a decimal type. However, when the value is 8 digits or larger, read it as an exponential type.

*1 This is applicable for models with the memory card interface only.

Trigger Setting

Selects the operation using the data for the recipe.

Read/Write:	Saves batch read device values to the memory card as a recipe file and writes them to devices as recipe values. This option can only be configured when **Memory Card** is selected under **Access to**.
Read-only:	Saves batch read device values to the memory card as a recipe file. This option can only be configured when **Memory Card** is selected under **Access to**.
Write-only:	Writes recipe values to devices.

Read Trigger

Specifies the device that triggers batch reading device values and saving them to the memory card as a recipe file.

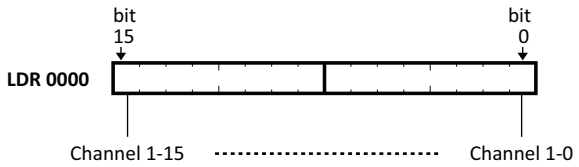
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option can only be configured when **Read/Write** or **Read-only** is selected under **Trigger Setting**.

Each bit of the word device configured by the read trigger corresponds to a channel.

When a bit changes from 0 to 1, a read to the device is executed.

Example: When the block 1 read trigger is specified as LDR 0000
LDR 0000-0 corresponds to channel 1-0, LDR 0000-1 to channel 1-1, through to LDR 0000-15 which corresponds to channel 1-15.



Write Trigger

Specifies the device that triggers batch writing recipe values to devices by block.

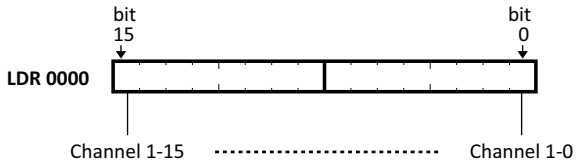
Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

This option can only be configured when **Read/Write** or **Write-only** is selected under **Trigger Setting**.

Each bit of the word device configured by the write trigger and the read trigger corresponds to a channel.

When a bit changes from 0 to 1, a write to the device is executed.

Example: When the block 1 write trigger is specified as LDR 0000
LDR 0000-0 corresponds to channel 1-0, LDR 0000-1 to channel 1-1, through to LDR 0000-15 which corresponds to channel 1-15.



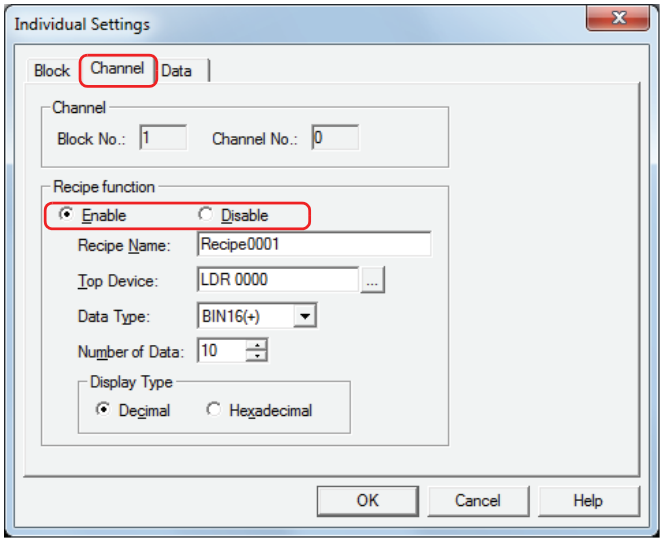
Monitoring Period

Shows the period to monitor the write device and the read device. This period is for detecting alarms so it is the same as the period to monitor device states. This option is configured on the **General** tab in the **Alarm Log Settings** dialog box.

- When recipe values are batch written to devices with **Access to** set to **Memory Card** and **Trigger Setting** set to **Read/Write** or **Write-only**, if no recipe file exists in the "RECIPE" folder in the memory card folder on the memory card, 0 is written to all the devices.
- If device value reads and recipe value writes occur simultaneously, first the device values are read, then the recipe values are written.

● **Channel** Tab

The **Channel** tab is used to configure the recipe name for the selected channel and the devices to read and write values to.



■ **Channel**

Shows the block number and the channel number for the selected channel.

Block No.:	Shows the block number for the channel selected in **Settings**.
Channel No.:	Shows the channel number for the channel selected in **Settings**.

■ **Recipe Function**

Selects whether or not to use the Recipe function.

Enable:	Writes recipe values to devices, reads device values and saves them to the memory card as a recipe file.
Disable:	The Recipe function is not used.

■ **Recipe Name**

Enter the name for the Recipe function to differentiate the channel. The maximum number is 40 characters. The default is "Recipe*n*". (*n*: 4 digit sequential number)

■ **Top Device**

Specifies the start device of the destination devices for recipe values and the source devices for device values.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The specified device addresses are configured sequentially from the number 1 in **Data List** on the **Data** tab.

■ **Data Type**

Selects the type of data for recipe values to write and device values that are read. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **Number of Data**

Specifies the number of source or destination devices starting with the device address configured by **Top Device**.

The sequential devices from the start address for the number of configured devices is displayed in **Settings** on the **Data** tab.

The amount of data that can be set varies based on the data type. When **BIN16 (+)**, **BIN16 (+/-)**, or **BCD4** is selected for **Data Type**, up to 8192 items of data can be configured. When **BIN32 (+)**, **BIN32 (+/-)**, **BCD8**, or **float32**[*1] is selected, up to 4096 items of data can be configured.

■ **Display Type**

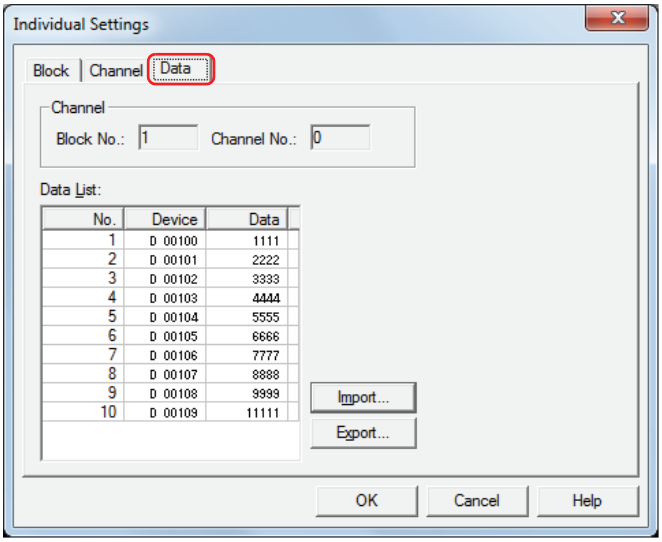
Selects the display type for **Data** in **Data List** configured on the **Data** tab as **Decimal** or **Hexadecimal**.

Values when saving data to a recipe file are decimal.

*1 HG2G-S/-5S/-5F, HG3G/4G only

● **Data** Tab

The **Data** tab is used to configure recipe values written to devices.



■ Channel

Shows the block number and the channel number for the selected channel.

Block No.:	Shows the block number for the channel selected in **Settings**.
Channel No.:	Shows the channel number for the channel selected in **Settings**.

■ Data List

Enter the recipe values to write to devices for each number in the selected channel.

No.:	Shows the data numbers for the amount of data specified by **Number of Data**.
Device:	Devices are sequentially configured starting from the device address specified by **Top Device** on the **Channel** tab.
Data:	Double click a cell to enter a recipe value. The value that can be configured varies based on **Data Type** and **Display Type** configured on the **Channel** tab. When **Read-only** is selected under **Trigger Setting** on the **Block** tab, entering recipe values is unnecessary.

■ Import

Displays the **Open** dialog box.

Select a recipe file and click **Open** to overwrite the data in **Data List** with the selected recipe file.

■ Export

Displays the **Save As** dialog box.

Select the location to save the recipe file, enter a file name, and then click **Save** to save the recipe file for the selected channel.

The saved recipe file can be edited using Notepad, commercially available text editors, and spreadsheet software.

4 Creating and Deleting Data for Recipes

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Editing Recipe Data

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

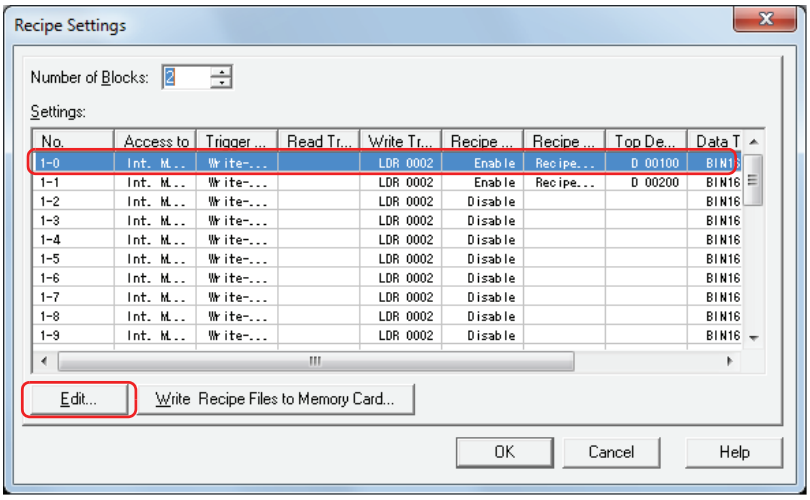
You can export recipe data for the selected channel, edit the recipe values in a saved file, and import a recipe file back into WindO/I-NV2.

1 On the **Configuration** tab, in the **System Setup** group, click **Recipe**.

The **Recipe Settings** dialog box is displayed.

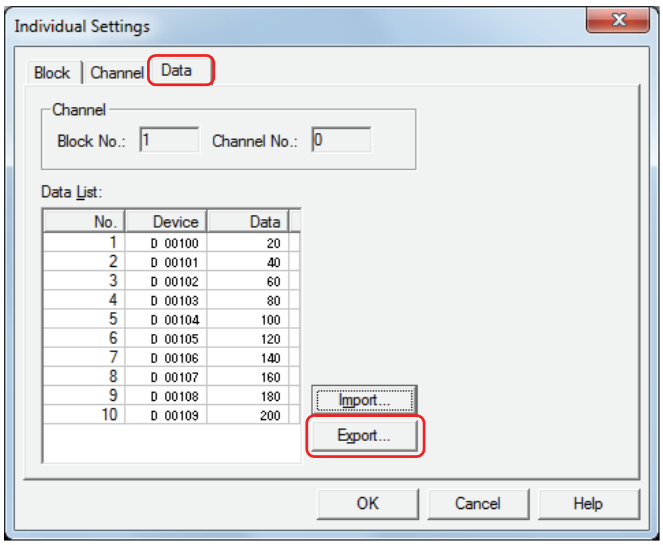
2 Select the channel number to export its recipe data in **Settings**, then click **Edit**.

The **Individual Settings** dialog box is displayed.



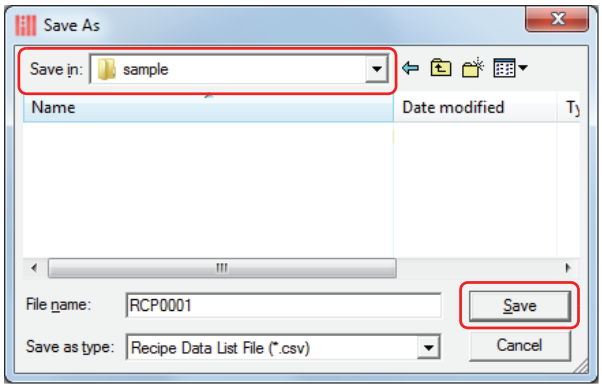
3 Click the **Data** tab, then click **Export**.

The **Save As** dialog box is displayed.



4 Specify the save location in **Save in** and click **Save**.

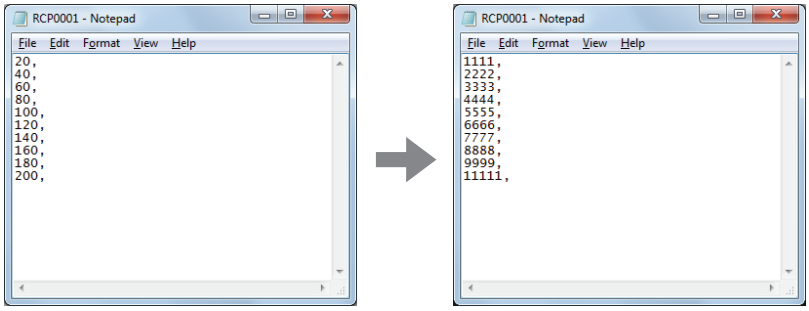
The file name specified on the **Block** tab in the **Individual Settings** dialog box is entered in **File name**.



5 Open the exported recipe data file.

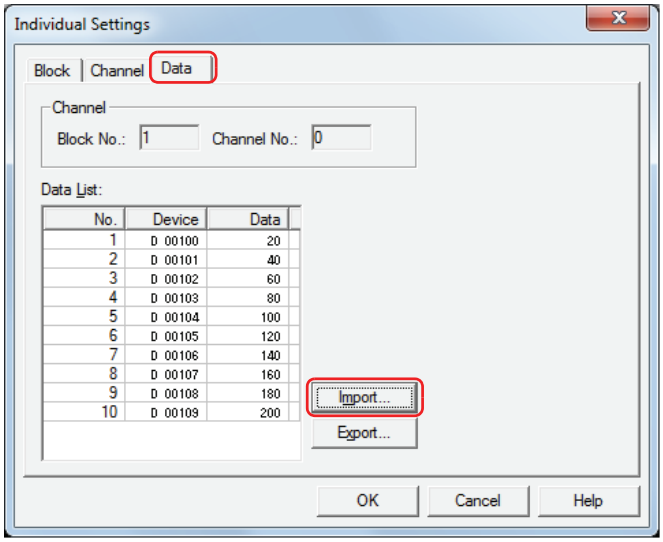
Use Notepad, a commercially available text editor, or spreadsheet software.

6 Edit the values and save the file.

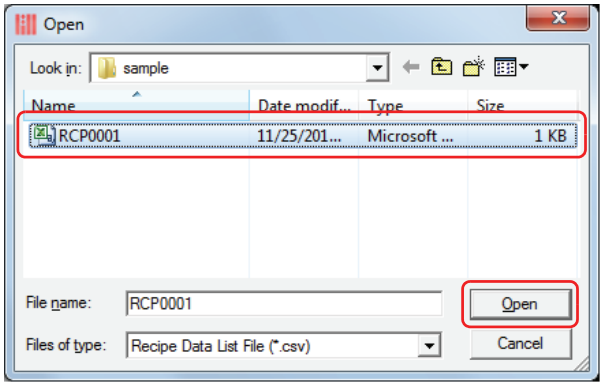


7 Return to the **Data** tab in the **Individual Settings** dialog box and click **Import**.

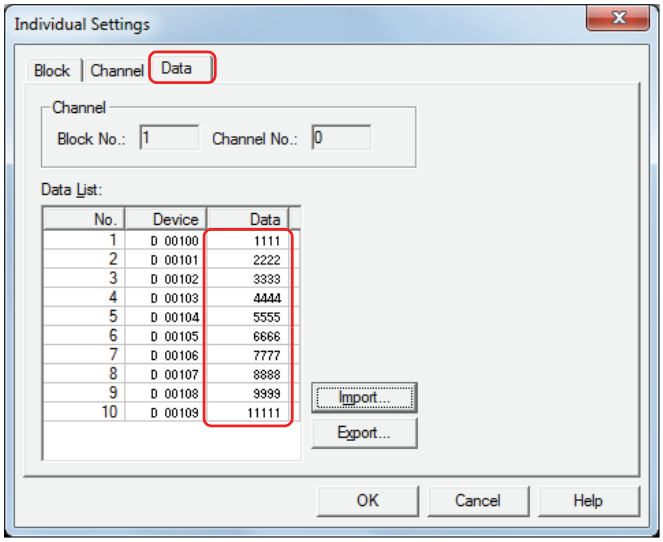
The **Open** dialog box is displayed.



8 Specify the file and click **Open**.



The recipe data is imported.



9 Click **OK**.

The **Individual Settings** dialog box closes.

10 Click **OK**.

The **Recipe Settings** dialog box closes.

This concludes editing recipe data.

4.2 Creating Recipe Files

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

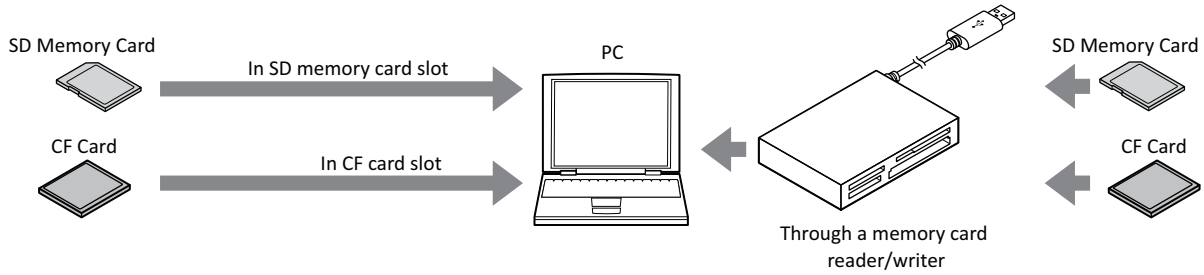
Recipe files can be created on the memory card with the following procedure. The recipe values configured on the **Data** tab in the **Individual Settings** dialog box are saved in recipe files.

☞ "Creating Recipe Files in the Recipe Settings Dialog Box" on page 18-17
☞ "Creating Recipe Files when Downloading Project Data" on page 18-19
☞ "Creating Recipe Files with a Text Editor" on page 18-20

● Creating Recipe Files in the **Recipe Settings** Dialog Box

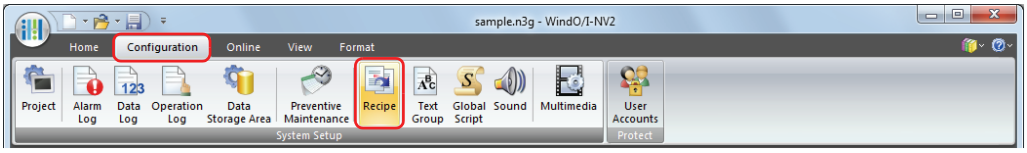
1 Insert a memory card in the PC.

Insert it into the PC's memory card slot or use it via a memory card reader/writer.



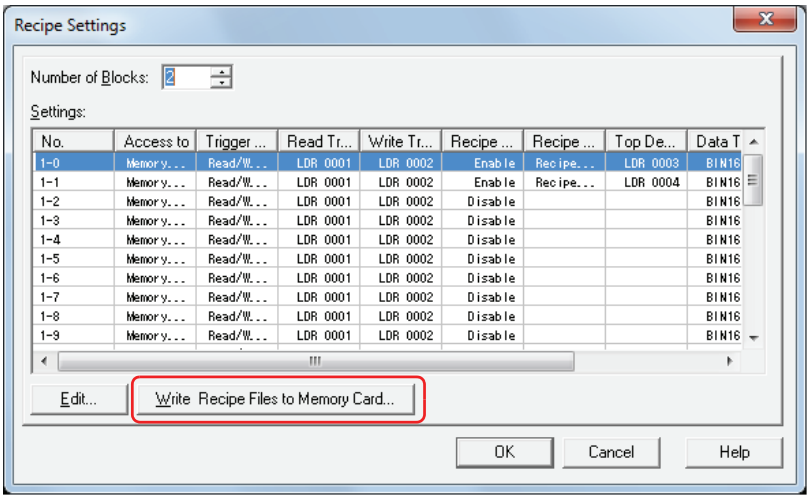
2 On the **Configuration** tab, in the **System Setup** group, click **Recipe**.

The **Recipe Settings** dialog box is displayed.

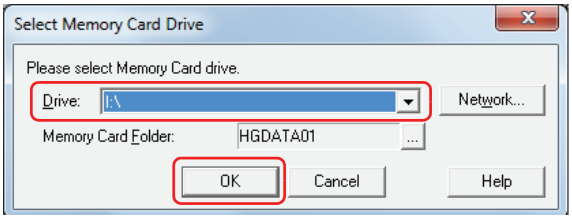


3 Click **Write Recipe Files to Memory Card**.

The **Select Memory Card Drive** dialog box is displayed.



4 Specify the memory card drive, then click **OK**.



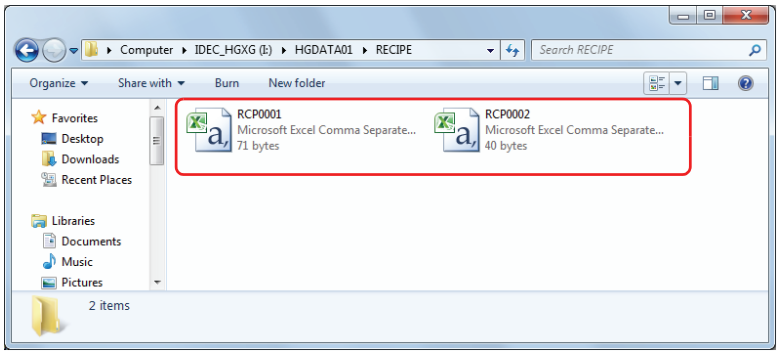
- **Drive**
  Specifies the drive assigned to the memory card.
- **Network**
  Displays the **Map Network Drive** dialog box. This dialog box allows you to specify a drive on the network.
- **Memory Card Folder**
  Specifies the folder to save the created recipe file.

  Click ... to display the **Project Settings** dialog box. You can specify the memory card folder used as the save destination.

5 Click **OK**.

The **Recipe Settings** dialog box closes.

The "RECIPE" folder is created in the memory card folder used as the save destination, and the recipe files for the channels configured with **Access to** set to **Memory Card** and **Recipe Function** set to **Enable** in the **Recipe Settings** dialog box are created.

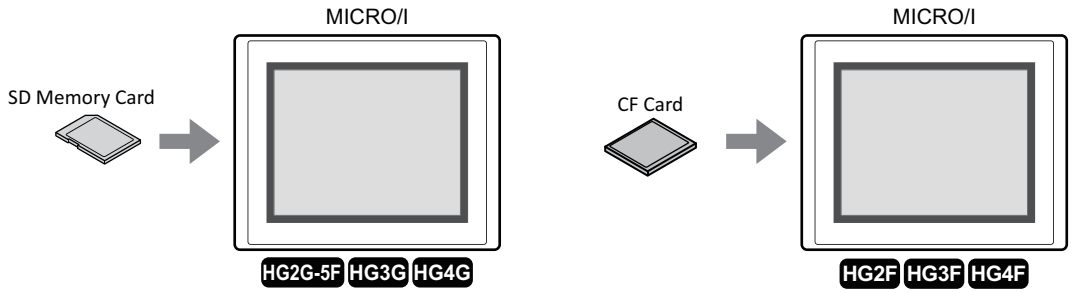


● Creating Recipe Files when Downloading Project Data

When a project download is executed, the "RECIPE" folder is created in the memory card folder on the memory card inserted in the MICRO/I and the recipe files are created. The recipe files are only created for channels configured with **Access to** set to **Memory Card** and **Recipe Function** set to **Enable** in the **Recipe Settings** dialog box.

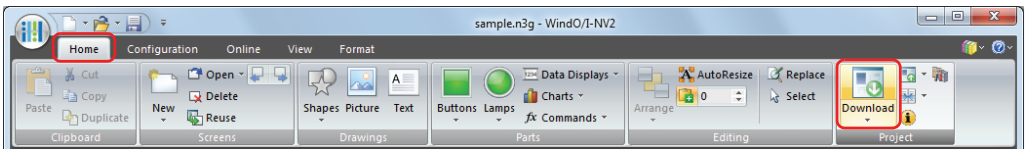
> The memory card folder is configured in the **Project Settings** dialog box. For details, refer to Chapter 30 "1.5 Setting the Memory Card Folder" on page 30-16.

1 Insert a memory card into the MICRO/I.



2 On the **Home** tab, in the **Project** group, click the **Download** icon.

The **Download** dialog box is displayed.

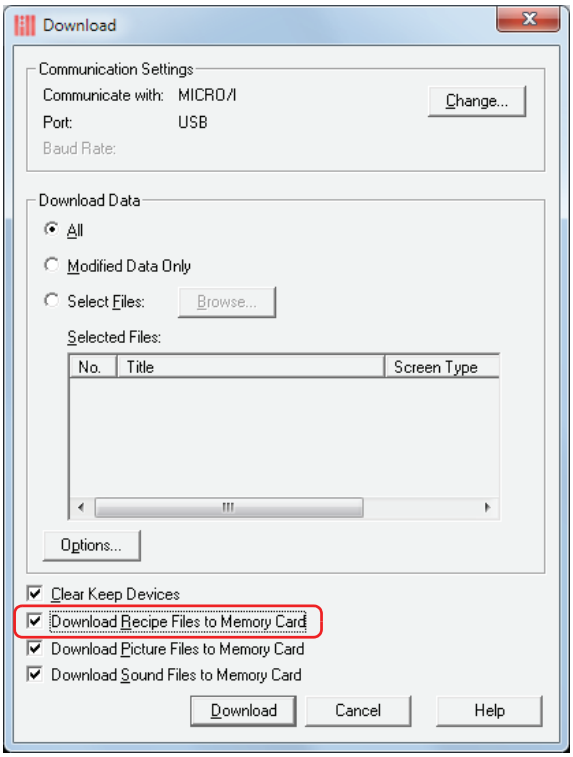


If the project data was changed, a confirmation message to save the project data is displayed.

Click **OK** to save the project data and display the **Download** dialog box.

Click **Cancel** to return to the editing screen without saving the project data.

3 Select the **Download Recipe Files to Memory Card** check box.



4 Verify **Communication Settings** and click **Download**.

Since the recipe files are downloaded to the memory card inserted in the MICRO/I, use the same settings as when communicating with the MICRO/I.

To change **Communication Settings**, click **Change** to display the **Communication Settings** dialog box. Change **Communicate with**, **Port**, and **Baud Rate**. For details, refer to Chapter 24 "1 Communicating with the MICRO/I" on page 24-1.

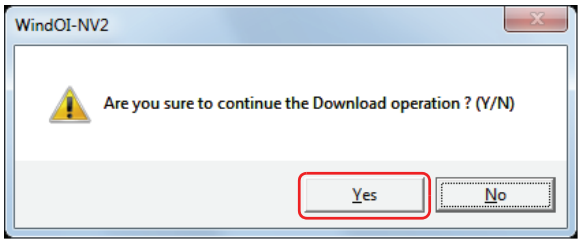
If security is enabled in the MICRO/I project, the Password Screen is displayed. Select the user name and enter the password.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

5 Click **Yes**.

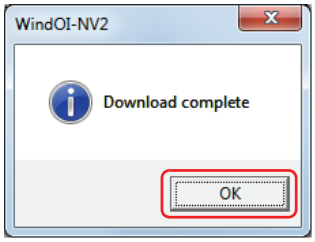
The **Download Project** dialog box is displayed and the project files start downloading.

When finished downloading, a completion message is displayed.

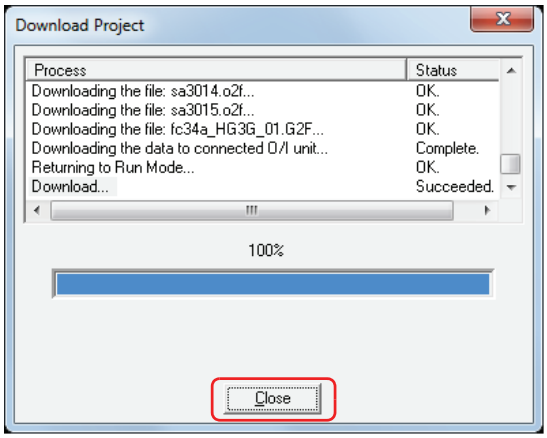


6 Click **OK**.

You are returned to the **Download Project** dialog box.



7 Click **Close**.



● Creating Recipe Files with a Text Editor

You can edit recipe files using Notepad, commercially available text editors, or spreadsheet software.

1 Write the data for the amount of data in "device value" comma (,) new line order.

If the amount of data in the recipe file is lower than the amount of data for the top device configured on the **Channel** tab in the **Individual Settings** dialog box, 0 is written in the rest of the devices.

2 Save the file with the ".csv" extension.

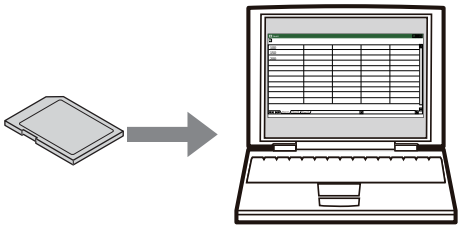
Give the file the file name configured on the **Block** tab in the **Individual Settings** dialog box. If the file name is different, 0 is written to all the devices.

3 Copy the edited recipe files to the "RECIPE" folder in the memory card folder on the memory card.

4.3 Editing Recipe Files

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

You can read and display the data saved from the MICRO/I to the memory card as a recipe file on a PC.



The recipe file that was read can be edited using Notepad, commercially available text editors, or spreadsheet software.

You can upload recipe files from the memory card using WindO/I-NV2 or the WindO/I-NV2 utility Downloader.

- For WindO/I-NV2
  On the **Online** tab, click the arrow under **Upload**, and click **Stored Data in Memory Card** to display the **Upload Data from Memory Card** dialog box. Select the **Recipe Files** check box, specify the location to save the recipe files in **Path**, and click **OK** to be able to save the recipe files in the specified folder.
- For the WindO/I-NV2 utility Downloader
  Click the **Memory Card Maintenance** menu and click **Upload** to display the **Upload Data from Memory Card** dialog box. Select the **Recipe Data** check box, specify the location to save the recipe files in **Path**, and click **OK** to be able to save the recipe files in the specified folder. For details, refer to the Downloader manual.

4.4 Deleting Recipe Files

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The methods to delete recipe files saved on the memory card are as follows.

- To delete files with WindO/I-NV2, on the **Online** tab, in the **Touch Screen** group, click **Clear**, and then click **Stored Data in Memory Card** to display the **Clear Data** dialog box. Select the **Recipe Files** check box and click **OK**.
- To delete files on the MICRO/I, go to the System Menu, press the **Offline** on the top page, press the File Manager on the **Main Menu** tab, select the files to delete, and then press **DEL**.

Chapter 19 Text Group

This chapter describes the Text Group function and how to configure text groups and text.

1 Overview

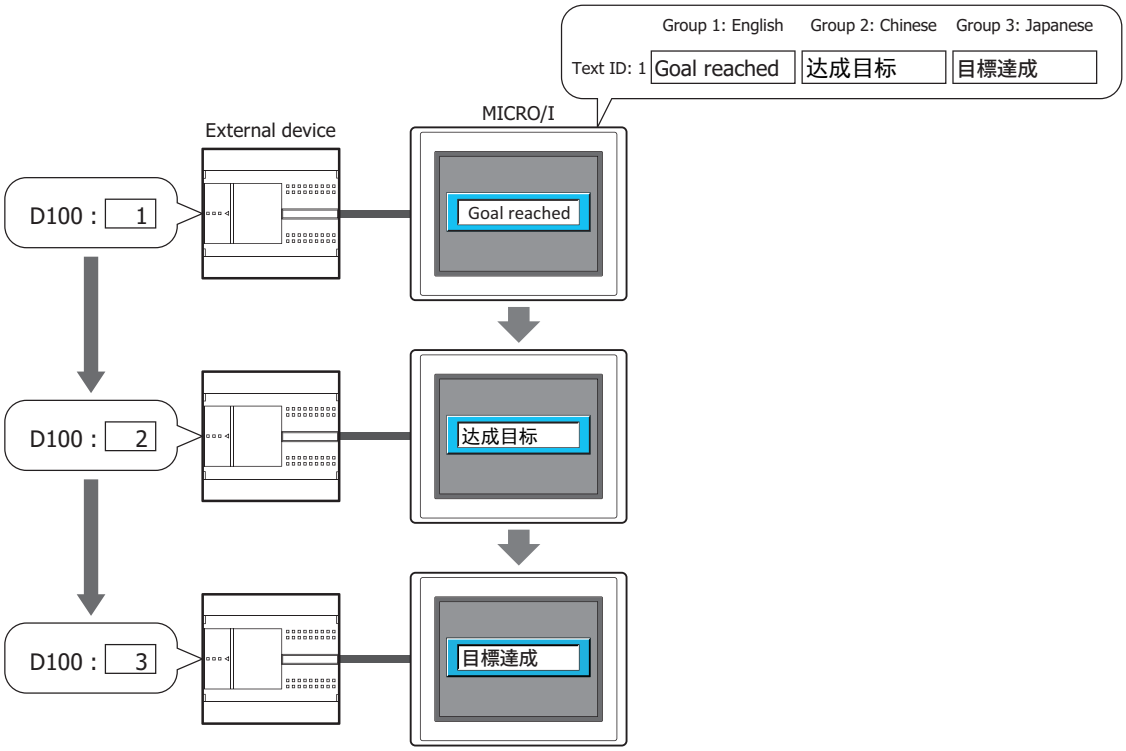
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Text Group Function is Used

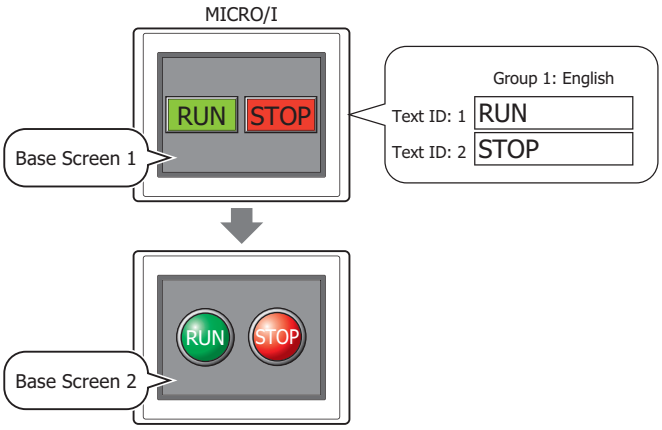
Text groups are a function where the text used for such purposes as registration text, messages for parts, chart labels, and titles for Popup Screens are registered in advance. The registered text is loaded and displayed when displaying parts and screens. The text can be managed collectively including editing the registered text and adding or deleting text.

Text groups can perform the following functions.

- Switch the displayed language by value of device.



- Use common text for parts.



1.2 Functions that Support Text Groups

The functions that support text groups are as follows.

Item		Setting
Screen	Popup Screen	Title
Drawings	Text	Text
Buttons	Bit Button	Registration Text
	Word Button	Registration Text
	Goto Screen Button	Registration Text
	Print Button	Registration Text
	Key Button	Registration Text
	Selector Switch	Registration Text
Lamps	Pilot Lamp	Registration Text
	Multi-State Lamp	Registration Text
Data Displays	Numerical Input	Unit
	Message Display	Message
	Message Switching Display	Message
	Alarm List Display	Message
	Alarm Log Display	Message, Title
	Numerical Display	Unit
Charts	Bar Chart	X-axis and Y-axis scale labels
	Line Chart	X-axis and Y-axis scale labels
Alarm Log		Messages displayed in data output as CSV
Data Log		Labels displayed in data output as CSV
Operation Log		Recorded item labels and event names displayed in data output as CSV

When the text group is switched, the displayed Base Screen is reset. Popup Screens and internal devices have the same behavior as when the Base Screen is switched. If the **Close while changing Base Screen** check box is selected on the **Options** tab in the properties dialog box for the Popup Screen, the displayed Popup Screen is closed. The behavior of the internal devices differs according to the internal devices. For details, refer to Chapter 32 "Internal Devices" on page 32-1.

2 Text Groups and Text Configuration Procedure

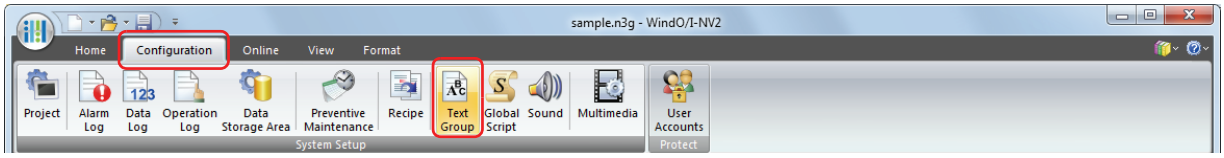
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for text groups and text.

2.1 Creating Text Groups

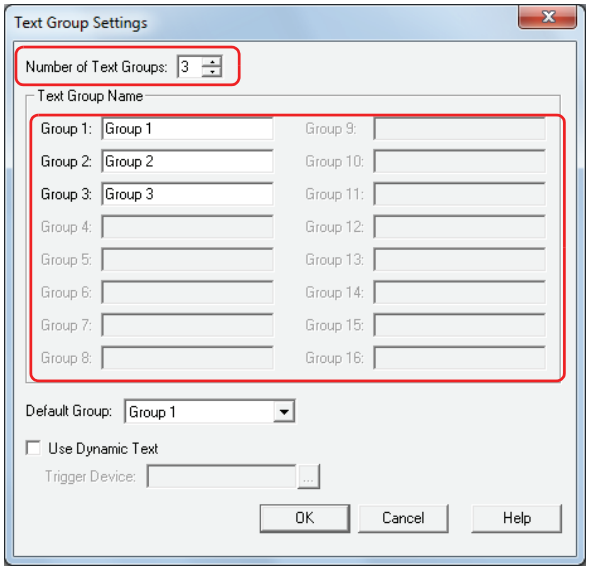
1 On the **Configuration** tab, in the **System Setup** group, click **Text Group**.

The Text Group Settings dialog box is displayed.



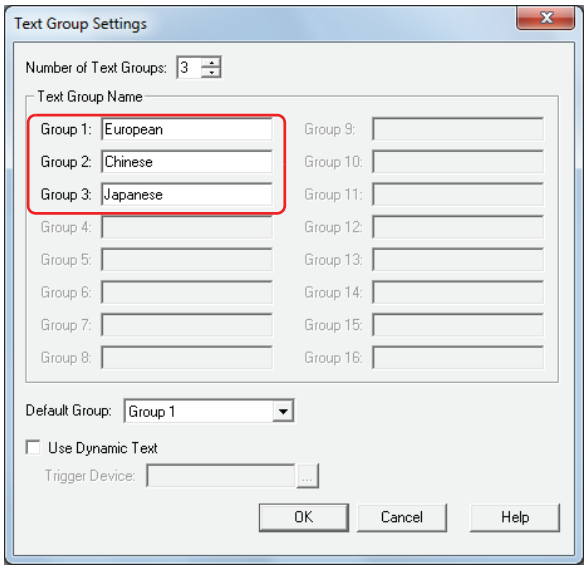
2 In **Number of Text Groups**, specify the number of text groups to create (1 to 32 for HG2G-S/-5S/-5F, HG3G/4G or 1 to 16 for HG1F/2F/2S/3F/4F).

The configured number of text groups are enabled.



3 Under **Text Group Name**, enter the name for each text group.

The maximum number for the Text Group name is 20 characters.



For one text group, proceed to step *7*.

4 In **Default Group**, select the text group to use when the MICRO/I power is turned on and when switched to run mode.

5 Select the **Use Dynamic Text** check box.

6 With **Trigger Device**, specify the word device to use as the condition to switch the text group.

Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

These options can only be configured when **Number of Text Groups** is specified as two or more.

When the value of device is 0, the text group switches to the default group.
If the value of device is invalid, the text group is not switched.

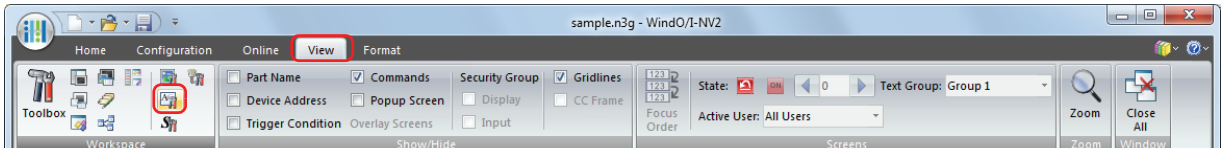
7 Click **OK** to close the Text Group Settings dialog box.

This concludes creating text groups.

2.2 Registering Text

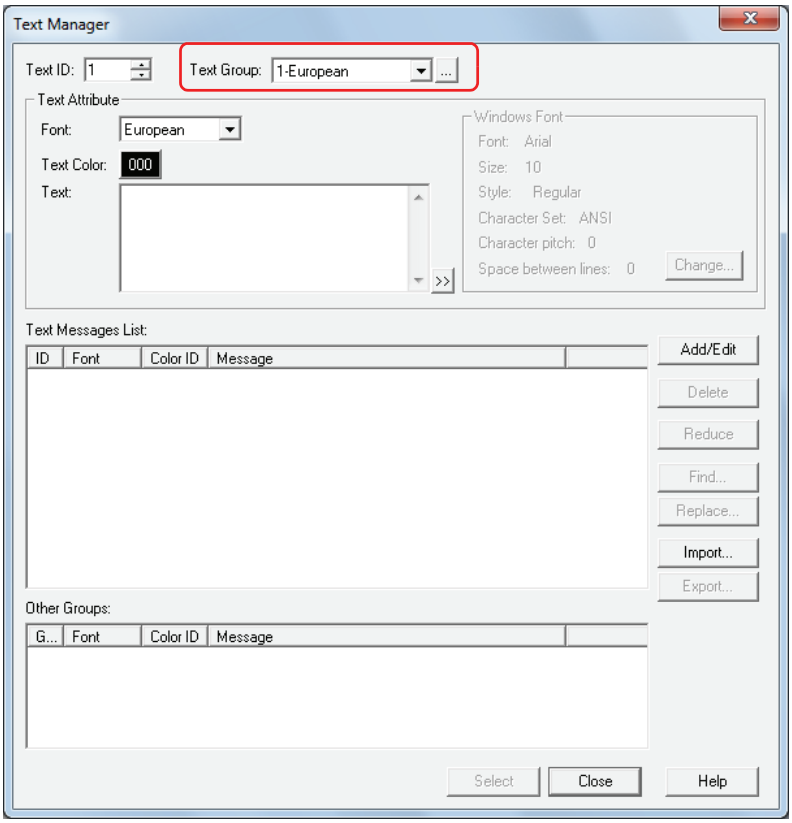
1 On the **View** tab, in the **Workspace** group, click (Text Manager).

Text Manager is displayed.



2 With **Text Group**, select the text group to register text to.

The default is "1-Group 1" only. To manage text by groups, create the groups in the Text Group Settings dialog box. Click ... to display the Text Group Settings dialog box. For details, refer to "3.2 Text Group Settings Dialog Box" on page 19-15.



3 With **Text ID**, specify the ID number to register (1 to 32,000).

4 With **Font** under **Text Attribute**, select the font to use for the text to register from the following.

European, **Japanese**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**

When **Windows** is selected, all the fonts installed on the computer can be used. This allows you to display fonts and languages that are not installed on the MICRO/I.

Click **Change** to display the Font Settings dialog box. Configure the details such as the font, style, and size. For details, refer to Chapter 2 "Windows Font" on page 2-12.

5 With **Text Color** under **Text Attribute**, select the color of the text to register (color: 256 colors, monochrome: 16 shades).

Click **Color** to display the Color Palette. Select a color from the Color Palette.

6 In **Text** under **Text Attribute**, enter the text to register.

The maximum number is 3750 characters.

The characters that can be entered vary based on the font selected by **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

- You can enter multi-line text by inserting a newline. The newline is displayed as \n and is counted as two characters.
- To enter Unicode characters, click >> to display the Unicode Input dialog box. Enter the characters in the Unicode Input dialog box, and then click **OK**.

7 Click **Add/Edit**.

The text is registered and displayed in the text list.

8 Repeat steps *2* through *7* to create the necessary text in each text group.

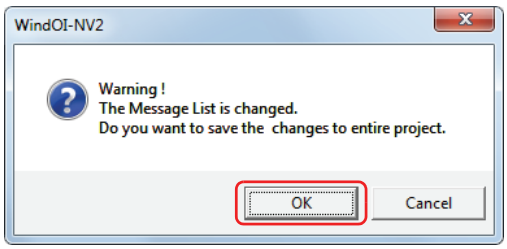
9 Click **Close**.

A save confirmation message is displayed.

10 Click **OK**.

The confirmation message and Text Manager close.

This concludes registering text.

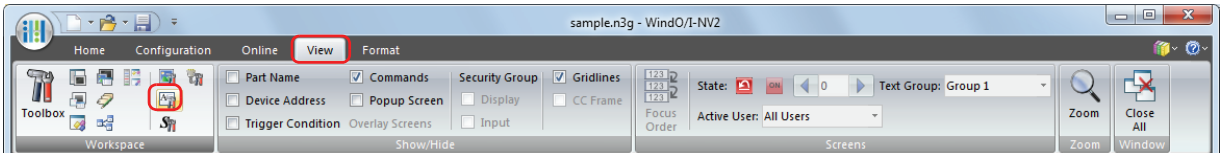


● Saving Registered Text as a CSV File

To use registered text in another project, save the text as a CSV file or as a text file. This file is called a text list.

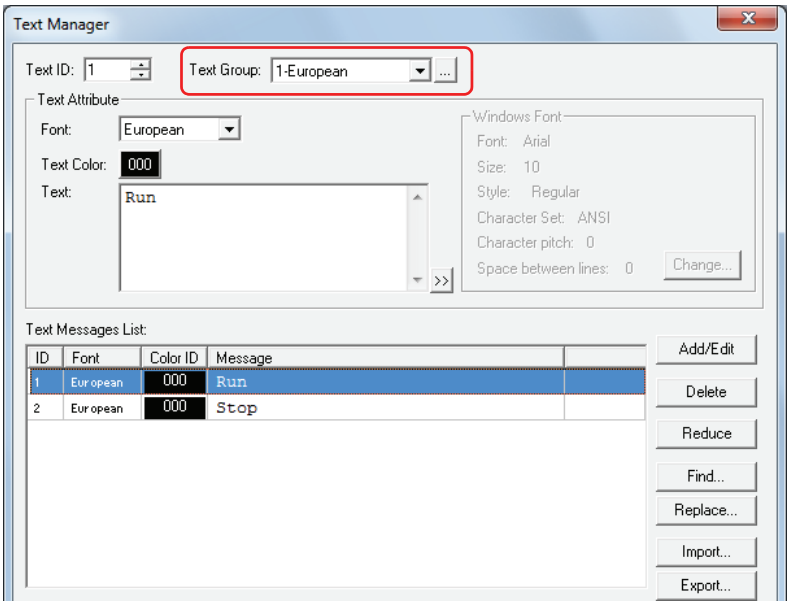
1 On the **View** tab, in the **Workspace** group, click (Text Manager).

Text Manager is displayed.



2 With **Text Group**, select the text group where the text ID to save is registered.

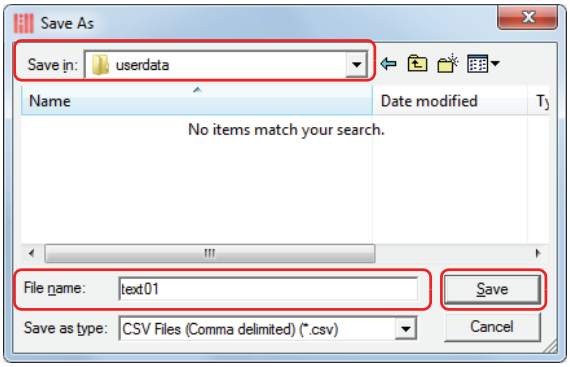
For one text group, proceed to step *3*.



3 Click **Export**.

The Save As dialog box is displayed.

4 Select **Save in**, enter **File name**, and then click **Save**.



5 Click **Close** to close Text Manager.

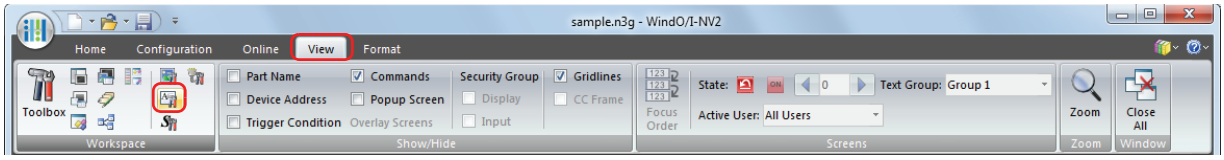
This concludes saving a text list.

● Importing Text from a Text List

A text list saved as a CSV file or as a text file can be imported into Text Manager for the project being edited.

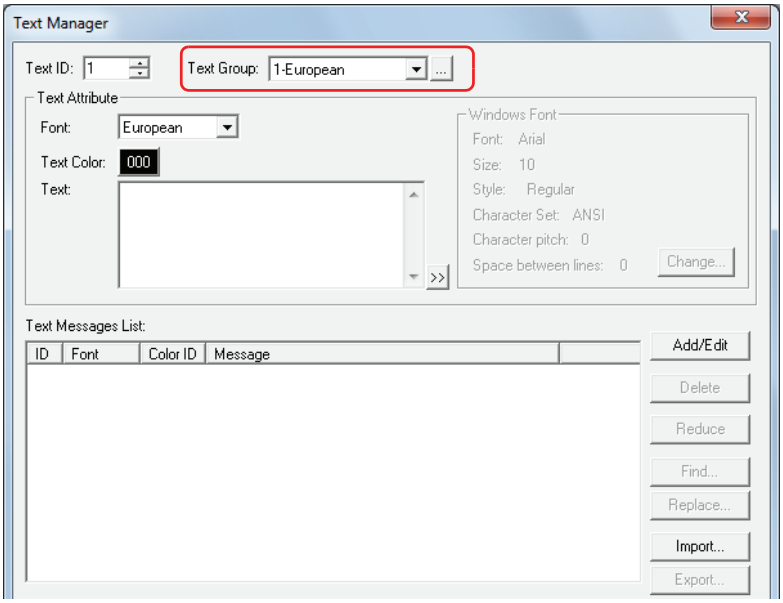
1 On the **View** tab, in the **Workspace** group, click (Text Manager).

Text Manager is displayed.



2 With **Text Group**, select the text group to register the imported text to.

For one text group, proceed to step *3*.

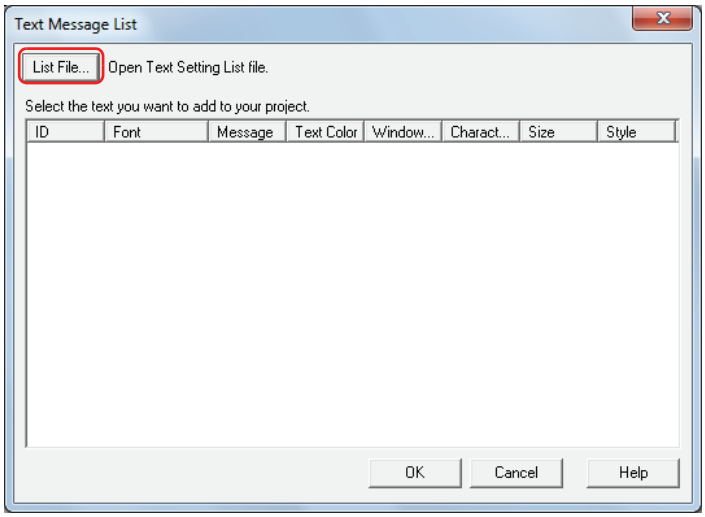


3 Click **Import**.

The Text Message List dialog box is displayed.

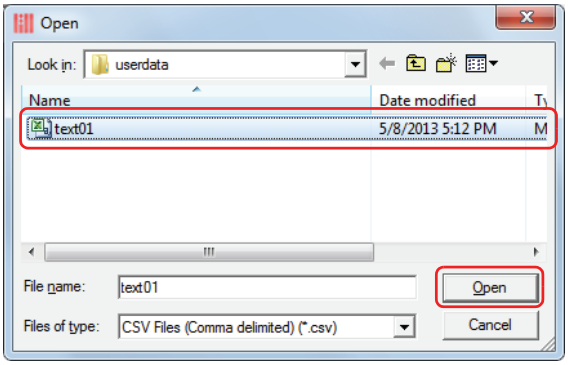
4 Click **List File**.

The Open dialog box is displayed.



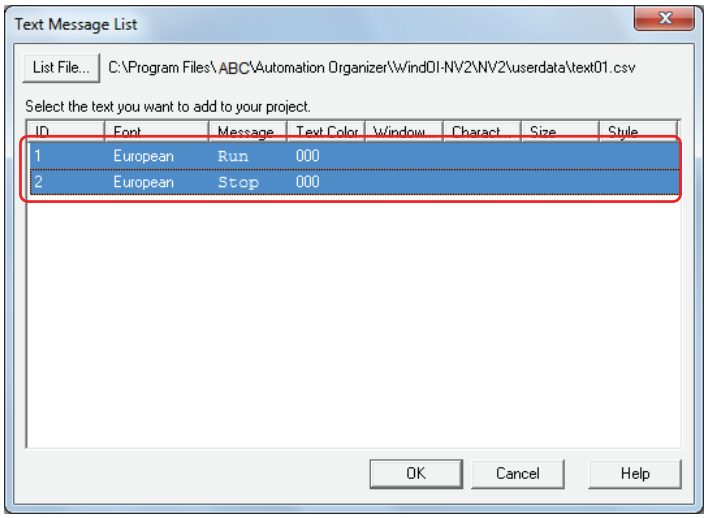
5 Select a saved text list, and then click **Open**.

The text is displayed in the list.



6 Click the text to import.

To select multiple items of text, press and hold SHIFT or CTRL while you click the specific items.



7 Click **OK**.

If there is text with an already registered ID number in Text Manager, a confirmation message to overwrite that text is displayed.

- Click **Yes** to overwrite the text with the ID number displayed in the confirmation message.
- Click **Yes To All** to overwrite all the text.
- Click **No** to display the next confirmation message without overwriting the text with the ID number displayed in the confirmation message.
- Click **Cancel** to stop importing text.

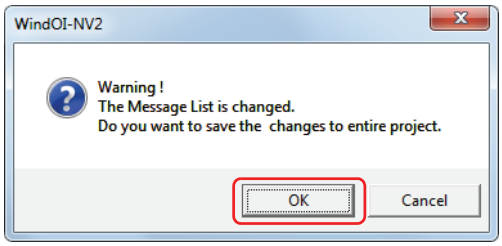
8 Click **Close** in Text Manager.

A save confirmation message is displayed.

9 Click **OK**.

The confirmation message and Text Manager close.

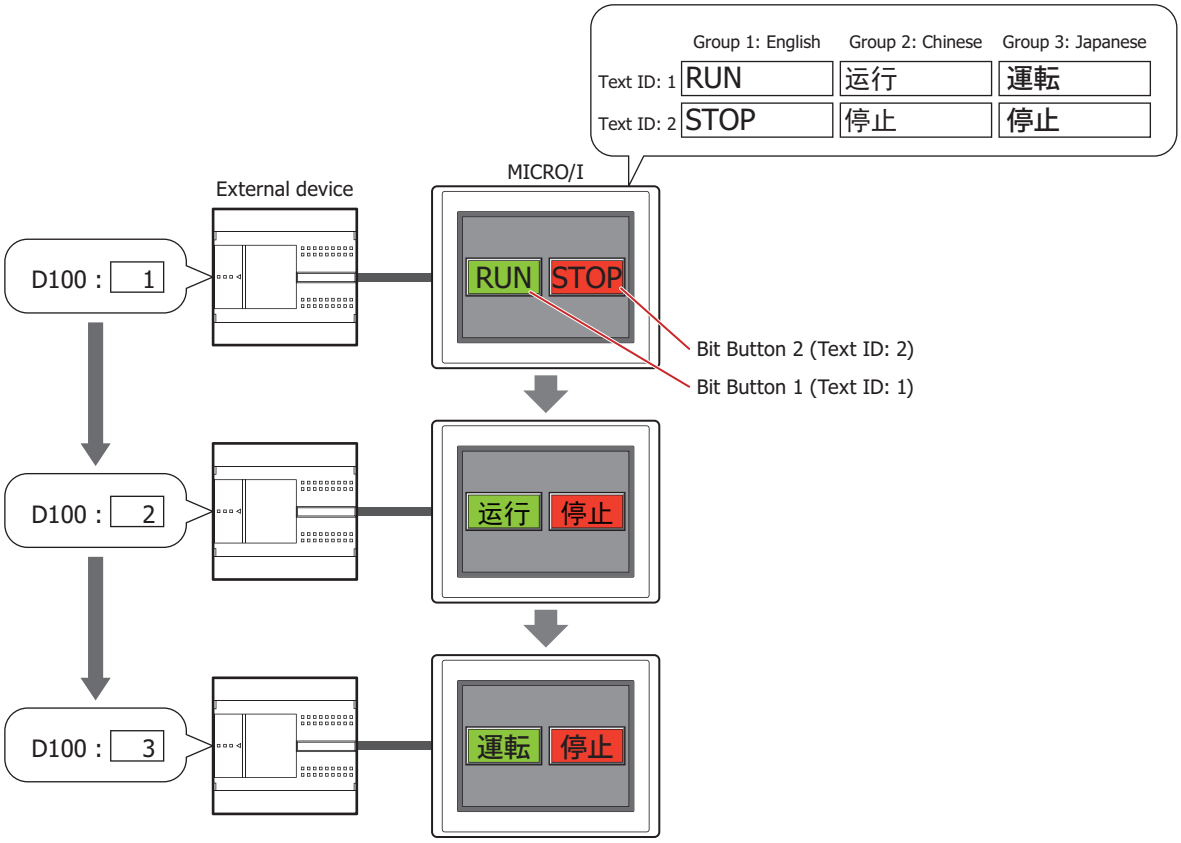
This concludes importing text from a text list.



2.3 Switching the Displayed Language by Value of Device

When multiple text groups have been created, the text group can be switched with a value of device to display a different language.

This section describes an example when the registration text for a button changes between English, Chinese, and Japanese.

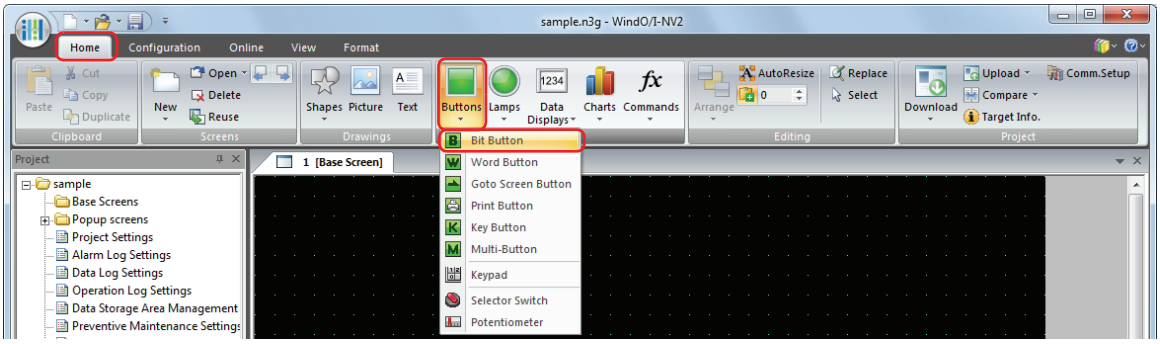


1 Following the steps in "Creating Text Groups" on page 19-3, specify **Number of Text Groups** as 3, and under **Text Group Name**, enter "English" for **Group 1**, "Chinese" for **Group 2**, and "Japanese" for **Group 3**. Select the **Use Dynamic Text** check box and set **Trigger Device** to D100.

2 Following the steps in "Registering Text" on page 19-5, register the text.

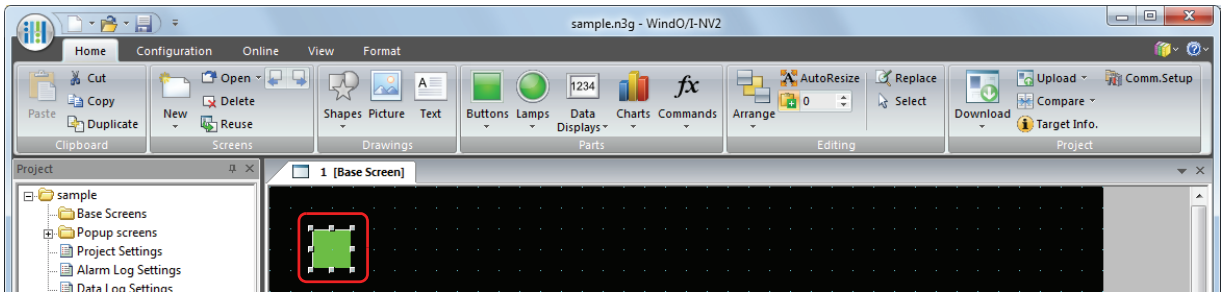
	Group 1: English	Group 2: Chinese	Group 3: Japanese
Text ID: 1	RUN	运行	運転
Text ID: 2	STOP	停止	停止

3 Create a Bit Button.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Bit Button**.

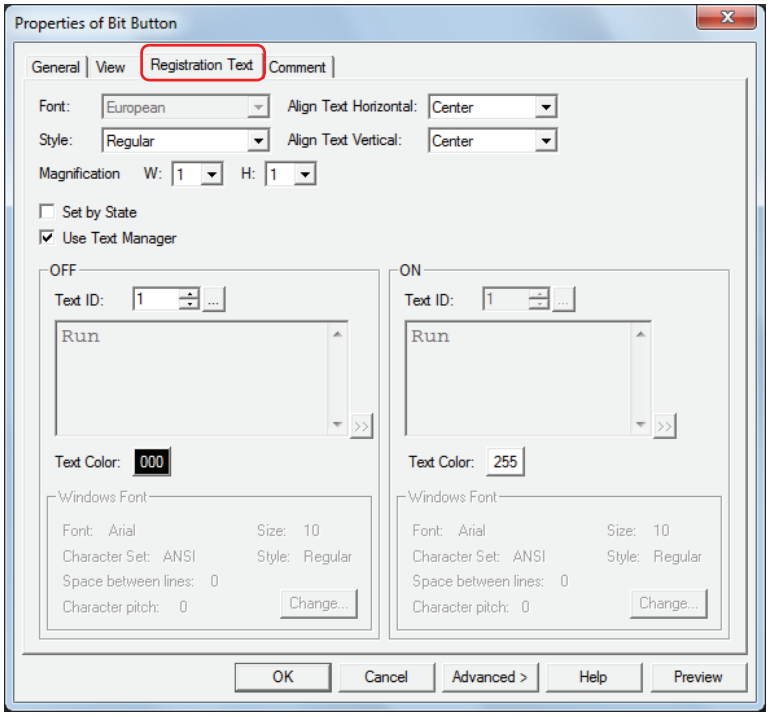


4 Click a point on the edit screen where you want to place the Bit Button.

5 Double-click the dropped Bit Button and the properties dialog box is displayed.



6 Click the **Registration Text** tab.



7 Select the **Use Text Manager** check box.

8 Specify 1 for the **Text ID** under **OFF**.

9 Configure the settings on each tab as necessary, and then click **OK**.

The Properties of Bit Button dialog box closes.

10 Repeat steps *3* through *9* and create a Bit Button to use text ID 2 for the registration text.

This concludes configuring the settings to switch the displayed language by a value of device.

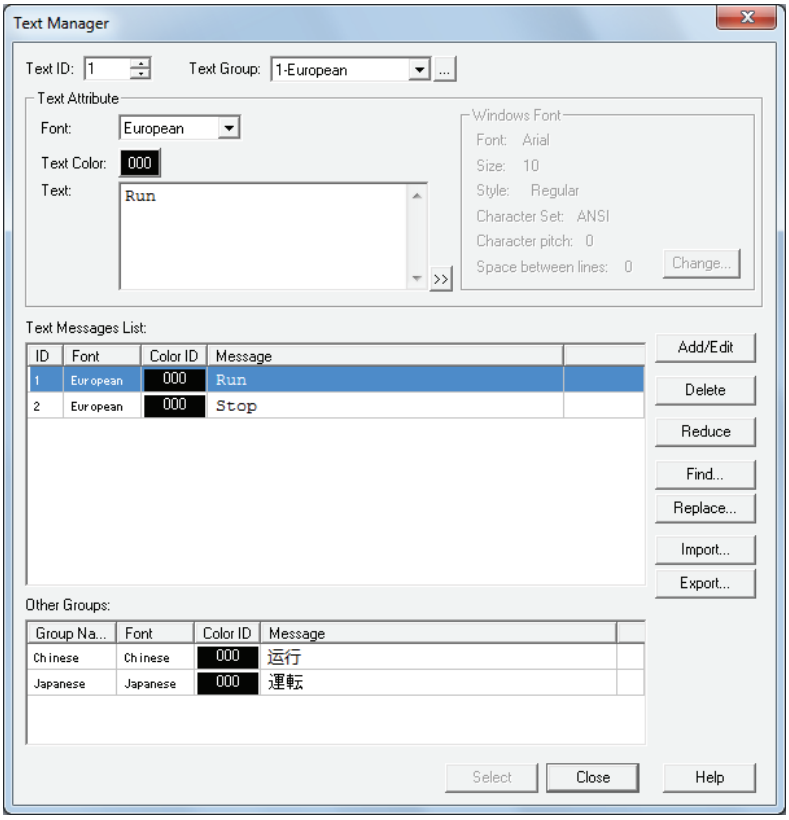
3 Text Manager

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons in Text Manager and on the Text Group Settings dialog box.

3.1 Text Manager

The text that is loaded and displayed when objects and Popup Screens are displayed is collectively managed with Text Manager.



■ Text ID

Shows the ID number (1 to 32,000).

When registering text, specify the ID number to register (1 to 32,000).

When using registered text when displaying parts and screens, specify the ID number to use (1 to 32,000).

■ Text Group

Selects the group where text is registered.

The default is "1-Group 1" only. To manage text by groups, create the groups in the Text Group Settings dialog box.

Click ... to display the Text Group Settings dialog box. For details, refer to "3.2 Text Group Settings Dialog Box" on page 19-15.

■ Text Attribute

This area configures the text to register and the font and color for the text.

Font:	Selects the font used for displaying text from the following. **European**, **Japanese**, **Chinese**, **Taiwanese**, **Korean**, **Central European**, **Baltic**, **Cyrillic**, **Windows**
Text Color:	Selects the color of the text to register (color: 256 colors, monochrome: 16 shades). Click **Color** to display the Color Palette. Select a color from the Color Palette.
Text:	Enter the text to register here. The maximum number is 3,750 characters. The characters that can be entered vary based on the font selected by **Font**. For details, refer to Chapter 2 "1.2 Available Text" on page 2-5.

Windows Font: Sets the font to be used as the Windows Font.
Select **Windows** using **Font** to display the current setting. To change the setting, click **Change** to display the Font Settings dialog box.
For details, refer to Chapter 2 "Windows Font" on page 2-12.

- You can enter multi-line text by inserting a newline. The newline is displayed as \n and is counted as two characters.
- To enter Unicode characters, click [>>] to display the Unicode Input dialog box. Enter the characters in the Unicode Input dialog box, and then click **OK**.

Text Messages List

The attributes for the registered text are displayed in this list.

ID:	Shows the ID number (1 to 32,000).
Font:	Shows the font to use to display the registered text.
Color ID:	Shows the color ID for the registered text (color: 256 colors, monochrome: 16 shades).
Message:	Shows the registered text.

Add/Edit

Registers the settings in **Text Attribute** to the ID number specified by **Text ID**. When you specify an ID number that is already registered, that ID number is overwritten with the new settings. The registered text and its attributes are displayed in the **Text Messages List**.

Delete

Deletes the text with the ID number selected in the **Text Messages List**. Click this button and the Confirm Message Delete Dialog dialog box is displayed.

- Click **Yes** to delete the text with the ID number displayed in the confirmation message from all the text groups.
- Click **Yes To All** to delete the text for all the ID numbers selected in the **Text Messages List** from all the text groups.
- Click **No** to display the next confirmation message without deleting the text with the ID number displayed in the confirmation message.
- Click **Cancel** to stop deleting the text.

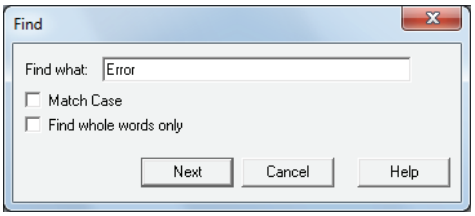
To select multiple items of text, press and hold SHIFT or CTRL while you click the specific items.

Reduce

Deletes the text with ID numbers that are registered in the Text Message List but are not used in the project.

Find

Displays the Find dialog box.
The text entered in **Find what** is searched for in **Message** in the **Text Messages List**.

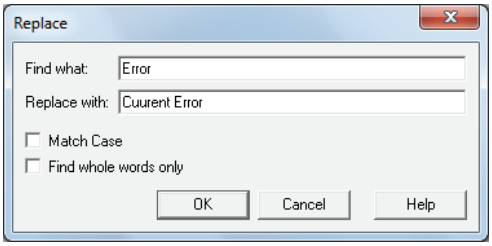


When **Find** is clicked after selecting a range of text, it will only search within the selected range.
To select multiple items of text, press and hold SHIFT or CTRL while you click the specific items.

Replace

Displays the Replace dialog box.

The text entered in **Find what** is searched for in **Message** in the **Text Messages List** and that text is replaced with the text entered in **Replace with**.



When **Replace** is clicked after selecting a range of text, it will only search and replace within the selected range.

To select multiple items of text, press and hold SHIFT or CTRL while you click the specific items.

Import

Imports text in a text list saved as a CSV file or as a text file.

Click this button to display the Text Message List dialog box. For details, refer to "Importing Text from a Text List" on page 19-8.

Export

Saves the text for the text group being edited as a CSV file or as a text file. This file is called a text list. The types of files that can be saved are as follows.

- CSV file (comma delimited) (*.csv)
- CSV file (semicolon delimited) (*.csv)
- Text file (comma delimited) (*.txt)
- Text file (semicolon delimited) (*.txt)
- Unicode text file (tab delimited) (*.txt)

Click this button to display the Save As dialog box. For details, refer to "Saving Registered Text as a CSV File" on page 19-7.

The saved text list can be imported with **Import**.

When **Unicode text file (tab delimited) (*.txt)** is selected, the file can handle multiple languages by using a commercially available text editor or spreadsheet software that supports Unicode.

Other Groups

When text with the same ID number as the text selected in the **Text Messages List** is registered to other text groups, that text is displayed in this list.

Group Name:	Shows the group name.
Font:	Shows the font for the registered text.
Color ID:	Shows the color ID for the registered text (color: 256 colors, monochrome: 16 shades).
Message:	Shows the registered text.

Select

Closes Text Manager and sets the ID number selected in Text Manager **Text Messages List** in the dialog box or screen that opened Text Manager. This button is only enabled when Text Manager was called from the properties dialog box of an object.

Close

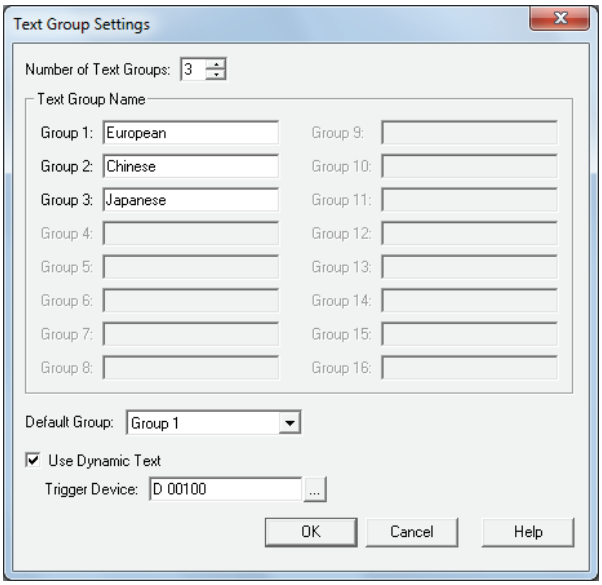
Closes Text Manager.

When Text Manager was called from the properties dialog box of an object, **Add/Edit**, **Delete**, **Reduce**, **Replace**, **Import**, and **Export** are disabled. These buttons are only enabled when Text Manager is displayed with the following operations.

- Double click **Text Manager** in the **Project** window
- On the **View** tab, in the **Workspace** group, click (Text Manager)

3.2 Text Group Settings Dialog Box

The groups for switching text are managed in the Text Group Settings dialog box.



- **Number of Text Groups**
  Specifies the number of text groups (1 to 32 for HG2G-S/-5S/-5F, HG3G/4G or 1 to 16 for HG1F/2F/2S/3F/4F). The configured number of text groups are created.

- **Text Group Name**
  Enters the names of the text groups.
  The maximum number for the Text Group name is 20 characters.

- **Default Group**
  Select the group to use when the MICRO/I power is turned on and when switching to run mode.

- **Use Dynamic Text**
  Select this check box to switch the text group according to the value of device.
  Specify the word device to use as the condition to switch the text group.

  Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.
  These options can only be configured when **Number of Text Groups** is specified as two or more.

> When the value of device is 0, the text group switches to the text group set as the default group.
> If the value of device is invalid, the text group is not switched.

Chapter 20 Script

This chapter explains the script function, editing and management of the script, definition method, and definition sample.

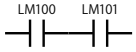
1 About the Script Function

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Overview of the Script Function

● What is the script function?

Complex processes such as conditional branching, logical operation, arithmetic operation, functions, etc., can be programmed in a text format using Script Function.

As an example, the logical product (AND) calculation described as 

in a ladder diagram is described as `[LM 100] & [LM 101]` in text format in the script.

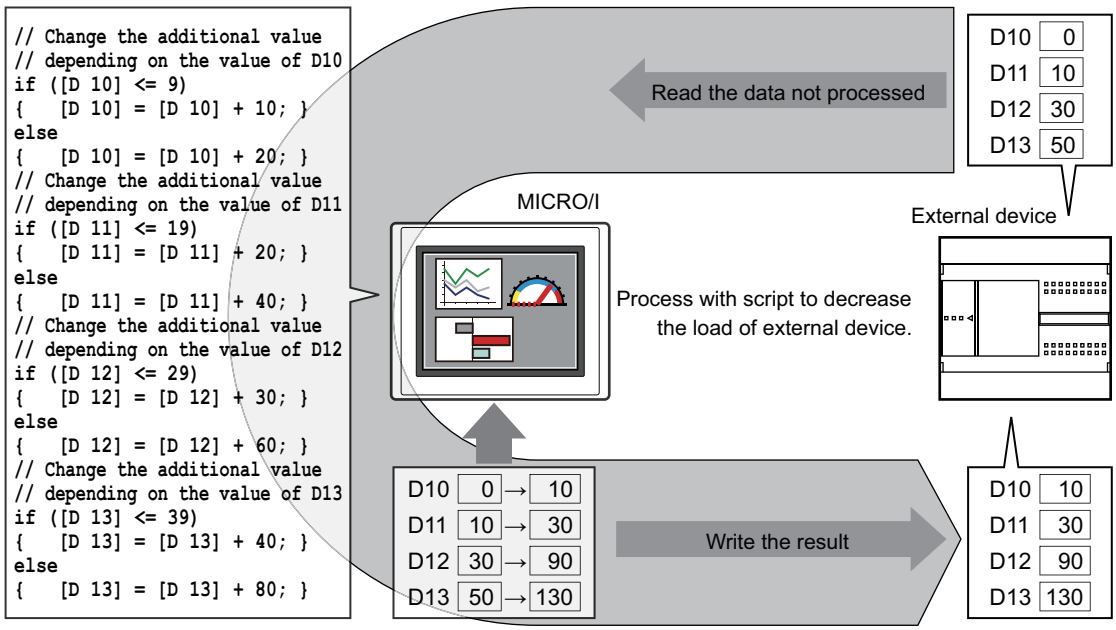
■ **Description and management of the script**

The script is programmed by WindO/I-NV2 script editor, and managed by Script Manager.

- By using the Script Editor, conditional expressions, operators, and functions can be described by selecting them from a list, and an error in the script can also be determined. The script can also be exported as a text file, so the script can be edited by a text editor such as Notepad, and the edited script can be imported back into the Script Editor by saving it as a text file.
  For details, refer to "2.3 Script Editor" on page 20-8.
- Script Manager can manage the script collectively by adding, deleting, organizing, etc., the script created by the Script Editor.
  For details, refer to "2.2 Script Manager" on page 20-7.

■ **Example of using the script**

As an example, when reading the data from the external device and displaying on the MICRO/I, the load on the external device can be reduced for processes such as conditional branching or function calculation, which apply a heavy load on the external device, by processing it with a script on the MICRO/I.



Get the result by processing with script

1.2 Types and Trigger Conditions of the Script

● Types of scripts

There are 3 types of scripts used.

■ Script Command

This is a script that executes in accordance with trigger conditions in the same way as other parts, such as switches or lamps, for each screen.

- It is executed only in the screens where it is placed.
- Multiple scripts can be set for each screen.

For details, refer to Chapter 12 "5 Script Command" on page 12-32.

■ Global Script

This is a script that operates within the whole project. This script is executed at the end of MICRO/I scan process in accordance with the trigger condition. The amount of Global Scripts which can be used in a project is as follows. For details about setup, refer to "3 Global Script" on page 20-12.

HG2G-S/-5S/-5F, HG3G/4G:	16 scripts
HG1F/2F/2S/3F/4F:	One script

■ Cyclic Script*1

This is a script that can be repeated in fixed intervals independent of the scan process of the MICRO/I. Input delay and output delay of the expansion module can be kept to a minimum by this script.

Only one cyclic script can be set to a project.

For details, refer to Chapter 29 "3 Cyclic Script" on page 29-9.

● Trigger condition of the script

Trigger conditions that can be set for the script are as follows:

Script	Trigger Condition					
	Rising-edge	Falling-edge	Satisfy the condition	While satisfying the condition	Fixed Period	Always ON
Script Command	YES	YES	YES	YES	YES	NO
Global Script	YES	YES	NO	NO	YES	YES
Fixed interval script	NO	NO	NO	NO	YES	NO

■ Rising-edge

Script is executed when trigger device changes from 0 to 1.

■ Falling-edge

Script is executed when trigger device changes from 1 to 0.

■ Satisfy the condition

Script is executed when the set condition is met.

This can only be set for the Script Command.

■ While satisfying the condition

Script is executed while the set condition is met.

This can only be set for the Script Command.

■ Fixed Period

Script is executed at set intervals.

■ Always ON

Script is executed on every scan of the MICRO/I.

This can only be set for the Global Script.

*1 HG2G-5F, HG3G/4G only

1.3 Data Type of the Script

It is required to set the data type appropriate for the range of data to be used, such as the maximum and minimum values of the data used in the script, negative numbers or real numbers required, etc., considering what is to be processed with the script.

Data type is set by the Script Editor.
For the setting method, refer to "2.3 Script Editor" on page 20-8.

● Data Types

There are 7 types of data that can be processed by the script function.
For details about the data types, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Types of the data type	Required word count	Range that can be processed
BIN16 (+)	1	0 to 65,535
BIN16 (+/-)	1	-32,768 to 32,767
BIN32 (+)	2	0 to 4,294,967,295
BIN32 (+/-)	2	-2,147,483,648 to 2,147,483,647
BCD4	1	-999 to 9,999
BCD8	2	-9,999,999 to 99,999,999
float32	2	-3.4×10^{38} to -1.18×10^{-38} 0 1.18×10^{-38} to 3.4×10^{38}

There are functions that cannot be used when the data types are different. Please refer to the format list.
For details, refer to "4 Script Definition Method" on page 20-17.

1.4 Script Error

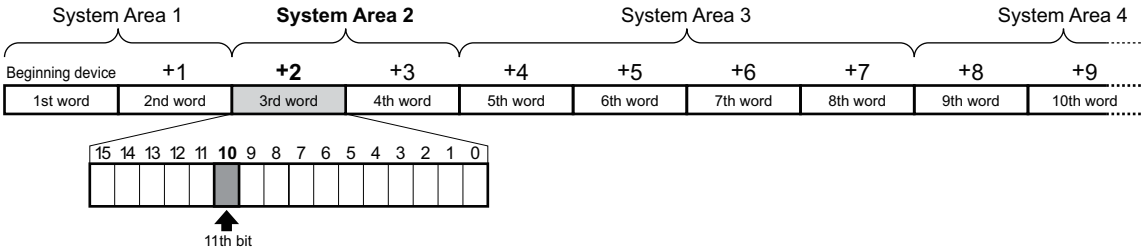
This section describes the types, cause, and information of script errors.

● Error information

Script error information is stored in the following locations. An error message is displayed on the screen when a script error has occurred.

Category	Storage location	Stored value	
Existence of a script error	Bit 10 of the System Area address +2	0	No error
		1	Error
Script ID of the script with an error	HG Special Register LSD 52	1 to 32,000	Script ID
Types of script errors	HG Special Register LSD 53	1	Processing error
		2	Execution time over error
		3	Writing count error
		4	Indirect device error
		5	Parameter error
		6	Fixed Interval Script execution time over
		7	Fixed interval execution error

If there is a script error, bit 10 (11th bit) of the beginning device +2 (third word from the beginning) of the System Area will be 1.



Beginning device of the System Area is set in the **System** tab of the **Project Settings** dialog box.

For details about the System Area, refer to Chapter 4 "System Area" on page 4-32.

● Types and causes of script errors

Script will stop running when an error occurs.

Types of script error	Cause
Processing error	Dividend was divided by 0 for division and residue calculation.
	Data types are BCD, float32, and value out of range is specified.
Execution time over error	The execution time for one script exceeded the following limit. HG2G-5F, HG3G/4G: 3,000 milliseconds HG2G-S/5S, HG1F/2F/2S/3F/4F: 500 milliseconds
Fixed Interval Script execution time over	
Writing count error	Data count written to the external device address in one script has exceeded 64.
Indirect device error	Indirect read or indirect write of external device address is performed with the Global Script.
Parameter error	Value out of range was specified as argument for LINE function, RECTANGLE function, or CIRCLE function.
	Executed the LINE function, RECTANGLE function, and CIRCLE function in a Cyclic Script.
Fixed interval execution error	Execution interval is automatically adjusted since the execution of the Fixed Interval Script has taken more time than half of the execution interval specified in the Fixed Interval Script.

2 Editing and Management of the Script

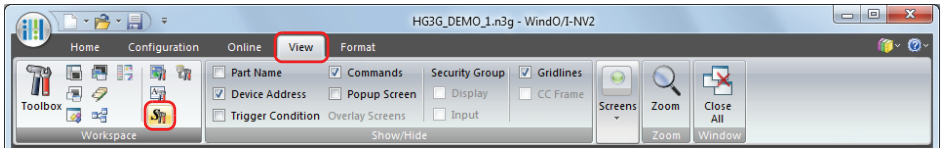
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Script Registration Procedure

This section describes the procedure to create a script and register it in the project.
The registered script can be used in a Multi-Button, Script Command, Multi-Command, Global Script, and Cyclic Script.

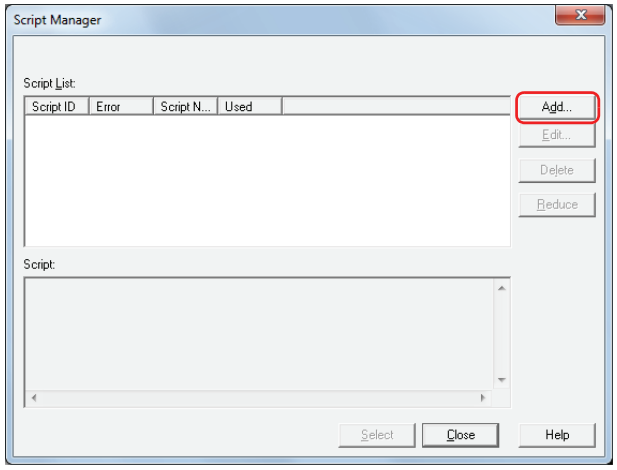
1 On the **View** tab, in the **Workspace** group, click (Script Manager).

Script Manager opens.



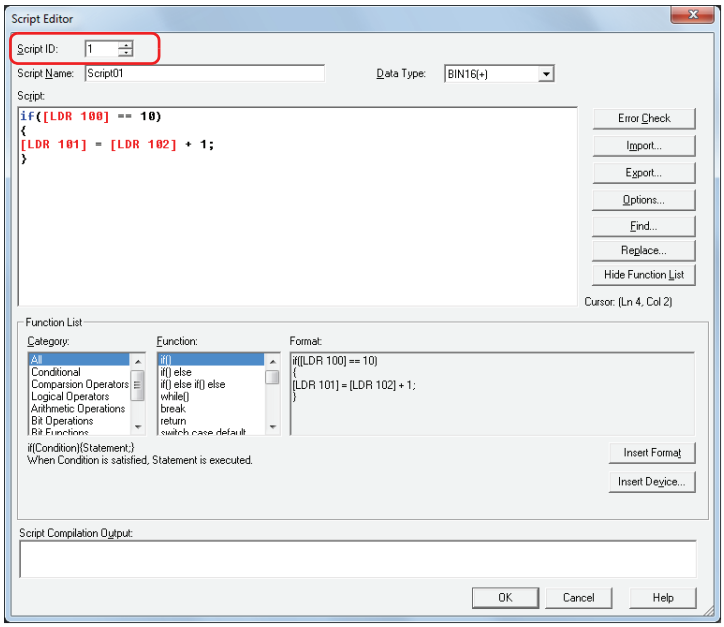
2 Click **Add**.

Script Editor opens.



3 Specify **Script ID**.

When creating a new script, enter the script ID (1 to 32000).



4 Enter **Script Name**.

Maximum number for the script name is 40 characters.

5 Select **Data Type**.

Be sure to match the Data Type of the script with the types of data being used within the script.
For example, if the script contains numbers with decimals, the Data Type of the script would be float32. If the script contains only whole numbers between 0 and 65,535, the Data Type of the script would be BIN16[+].

6 Code a program in **Script**.

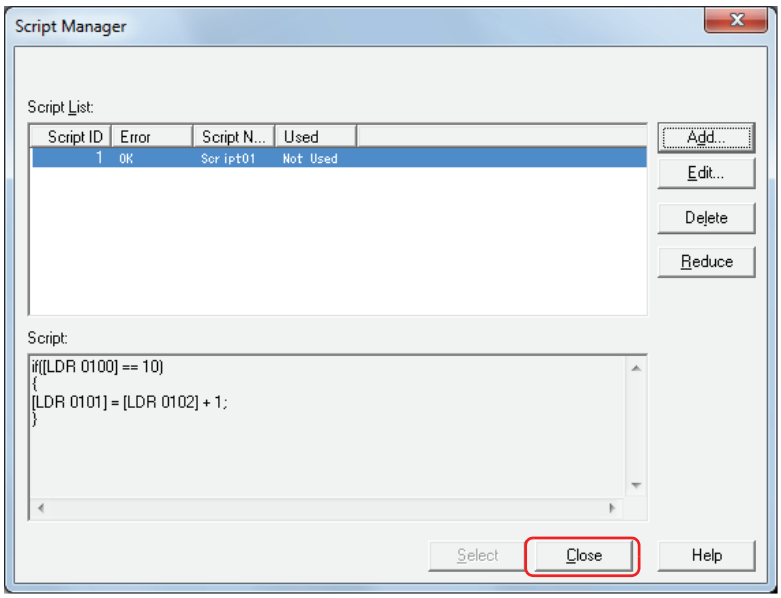
To create a script using the samples provided by WindO/I-NV2, under **Function List**, select **Category** and **Function**, and then click **Insert Format**. The sample shown in **Format** is inserted at the cursor position in **Script**.

7 When the script is finished, click **OK**.

The created script is shown in **Script List**.

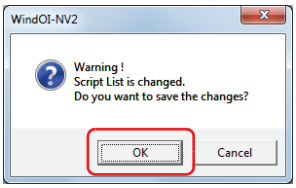
8 Click **Close**.

A save confirmation message is displayed.



9 Click **OK**.

The scripts are saved in the project data and Script Manager closes.
If you click **Cancel**, Script Manager closes without saving the scripts.

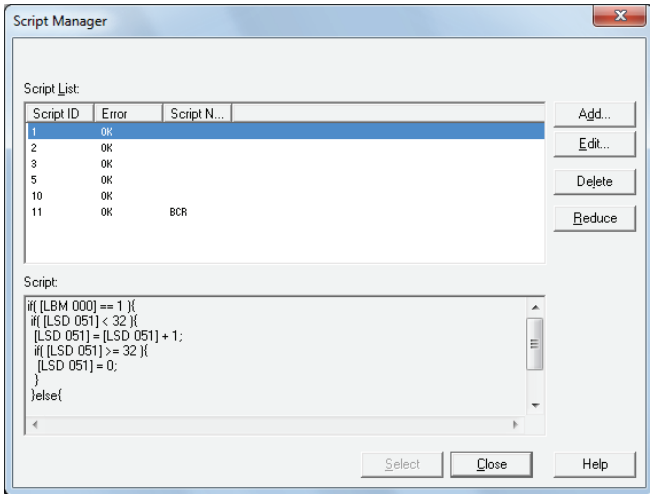


When you are in the following dialog boxes, clicking ... will open the Script Manager. When you close the Script Manager, you will be taken back to the original dialog box.

- Global Script **General** tab
- Script Command properties **General** tab
- Multi-function script properties for Multi-Buttons and Multi-Commands
- Project Settings **Expansion Module** tab

2.2 Script Manager

Script Manager can add, delete and manage the script created by Script Editor.



■ **Script List**

Displays a list of registered scripts.

Script ID:	Displays the script ID (1-32000) of the registered scripts.
Error:	OK is displayed when there is no error in the registered script and NG is displayed when there is an error.
Script Name:	Displays the script name of the registered scripts.

■ **Script**

Displays the contents of the script selected in the script list.

■ **Add**

Displays the **Script Editor** dialog box to add a script.

For details, refer to "2.3 Script Editor" on page 20-8.

■ **Edit**

Displays the **Script Editor** dialog box to allow editing of the selected script. For details, refer to "2.3 Script Editor" on page 20-8.

■ **Delete**

Deletes the script selected in the script list.

If a script is used in a project or parts, it cannot be deleted.

■ **Reduce**

Deletes the scripts that are registered in the script list but are not used in the project.

■ **Select**

The highlighted script in the script list is selected and the Script Manager is closed.

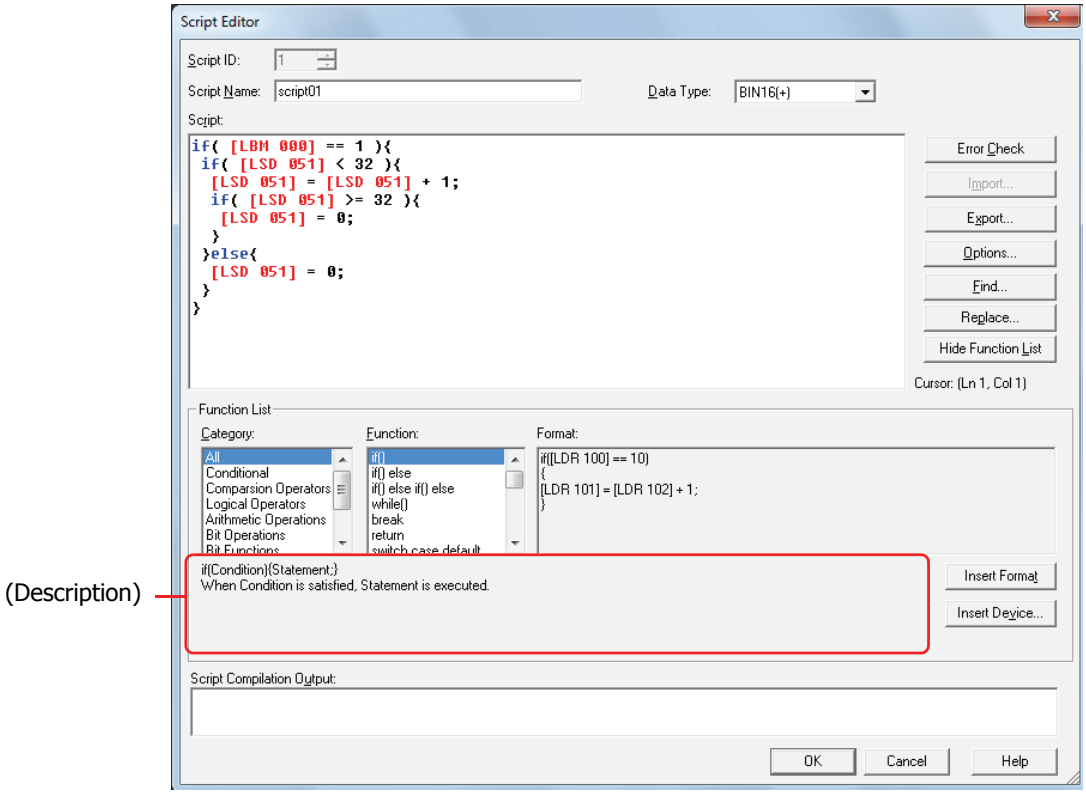
■ **Close**

Closes the Script Manager.

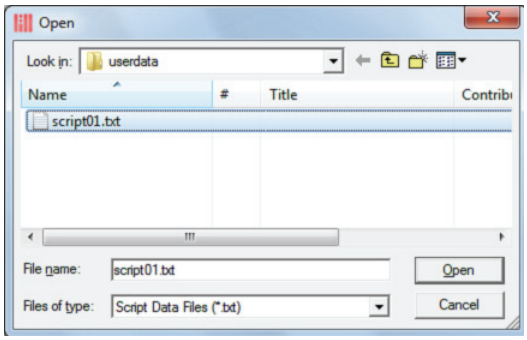
When the **Close** button is clicked after a change has been made in the script list, a confirmation message to save is displayed. The change will be saved when the **OK** button is clicked. The change will be discarded and the Script Manager closed when the **Cancel** button is clicked.

2.3 Script Editor

A new script can be created or the script selected in the Script Manager can be edited using Script Editor.



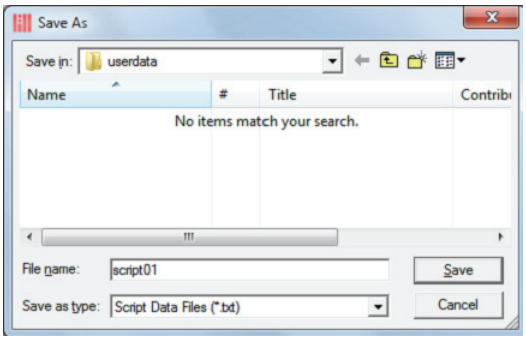
- **Script ID**
  To create a new script, enter the script ID (1-32000).
  To edit an existing script, the set script ID is displayed.
- **Script Name**
  Enter the script name. Maximum number for script name is 40 characters.
- **Data Type**
  Select the data type to be processed by the script.
  For details about the data type, refer to "1.3 Data Type of the Script" on page 20-3.
- **Script**
  Enter the script.
  Single script limitation is 240 characters per line with up to 1024 lines.
- **Error Check**
  The script being edited is checked for errors.
- **Import**
  The **File Open** dialog box is displayed.
  By selecting a script saved (exported) in a text format (*.txt) and clicking on the Open button, the imported script is inserted at the cursor position of the script being edited.



■ **Export**

The **Save As** dialog box is displayed.

By selecting a save location and clicking on the **Save** button, the script being edited is saved in text format (*.txt). A saved script can be inserted in the script using the **Import** button.



■ **Options**

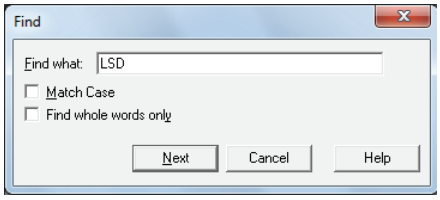
The Options dialog box is displayed.

The fonts and color of the text, tab indents, etc., used in the **Script** text box are set in the Options dialog box. For details, refer to "Script Formatting Options dialog box" on page 20-11.

■ **Find**

The **Find** dialog box is displayed.

Enter the text to be searched for in the Find What box.

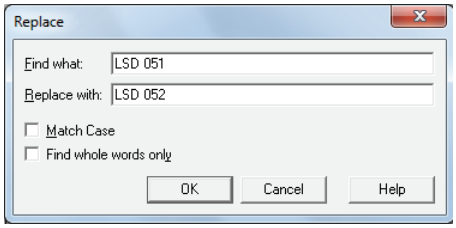


When the **Find** button is clicked after selecting a range in the **Script** text box, it will only search within the selected range.

■ **Replace**

The **Replace** dialog box is displayed.

Text entered in **Find what** will be replaced with the text entered in **Replace with**.



- This is useful when replacing device addresses.
- When the **Replace** button is clicked after selecting a range in the **Script** text box, it will only search and replace within the selected range.

■ **Show/Hide Function List**

Switches between showing and not showing the **Function List** and **Script Compilation Output**.

The size of the script edit box can be changed by dragging the right bottom corner of the Script Editor. By hiding the **Function List** and **Script Compilation Output**, the script editing area (text box) will become larger, making the editing of script easier.

■ **Cursor**

Displays the current position of the cursor in the **Script** text box by line number and column number.

Function list

Category:	Lists the categories of the functions.
Function:	Lists the functions of the selected category.
Format:	Displays the definition example of the selected function.
(description):	Displays the description of the selected function.
Insert Format:	Contents displayed in the selected **Format** are inserted at the cursor position.
Insert Device:	The **Device Address Settings** box is displayed. By specifying the device address and clicking on the **OK** button, specified device address is inserted at the cursor position.

Script Compilation Output

The contents of any errors found when using error check are displayed.

By double-clicking on the comment displayed in the **Script Compilation Output**, the part corresponding to the error is highlighted in the **Script** text box.

Depending on the error, there may be an error in the line that is different from the line displayed in the Script Compilation Output, or multiple errors may be displayed.

OK

Error check is performed for the script being edited and save it.

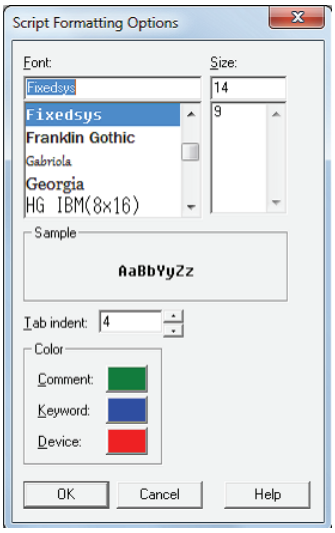
If there is an error in the script being edited, a message will appear before saving the script. It is possible to save a script with an error.

Cancel

Closes Script Editor without saving the script being edited.

● Script Formatting Options dialog box

Font, **Size**, **Tab indent**, and **Color** used in the **Script** text box of the Script Editor can be specified.



■ Font

The font name for the text displayed in the **Script** is entered or selected.

■ Size

The font size (dots) for the text displayed in the **Script** is entered or selected.

■ Sample

Displays a sample of the text with the **Font** and **Size** as specified in the **Script** text box.

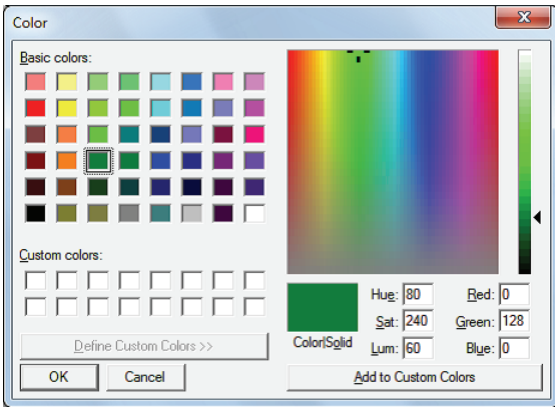
■ Tab indent

Specify the position of the indent when a tab is inserted (1-20).

■ Color

Displays each of the text colors for **Comment**, **Keyword**, and **Device**.

Color setting dialog box is displayed when the color button is clicked.



Text other than comment, keyword, or device is displayed in black.

3 Global Script

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

A Global Script operates for the entire project. The amount that can be set to Global Script actions and the project are as follows.

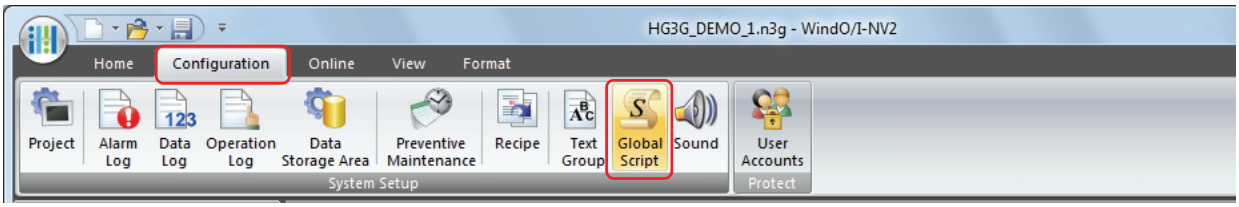
HG2G-S/-5S/-5F, HG3G/4G:	The scripts are executed in order on the list and in accordance with the trigger conditions at the end of MICRO/I scan process. A maximum of 16 scripts can be set to a project.
HG1F/2F/3F/4F:	The script is executed in accordance with the trigger conditions at the end of MICRO/I scan process. A maximum of only one script can be set to a project.

3.1 Setting procedures for Global Script

Global Script is setup using the following procedures.

1 On the **Configuration** tab, in the **System Setup** group, click **Global Script**.

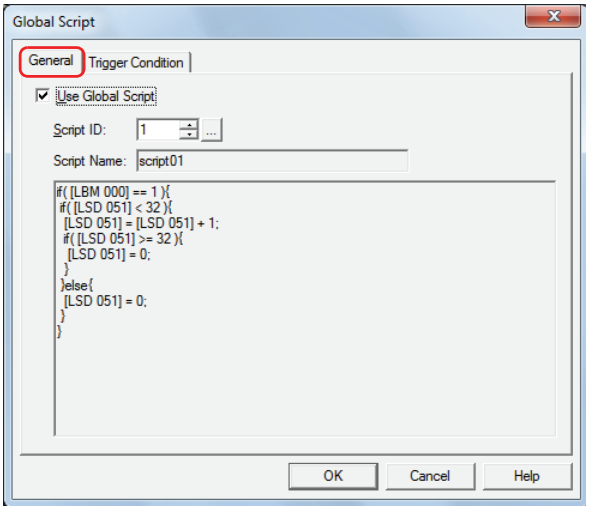
The **Global Script Settings** dialog box (HG2G-S/-5S/-5F, HG3G/4G) or the **Global Script** dialog box (HG1F/2F/2S/3F/4F) is displayed. For the HG1F/2F/2S/3F/4F, proceed to step *3*.



2 Under **Settings**, select the script ID to configure, and then click **Edit**.

The **Global Script** dialog box is displayed.

3 On the **General** tab, select the **Use Global Script** check box.

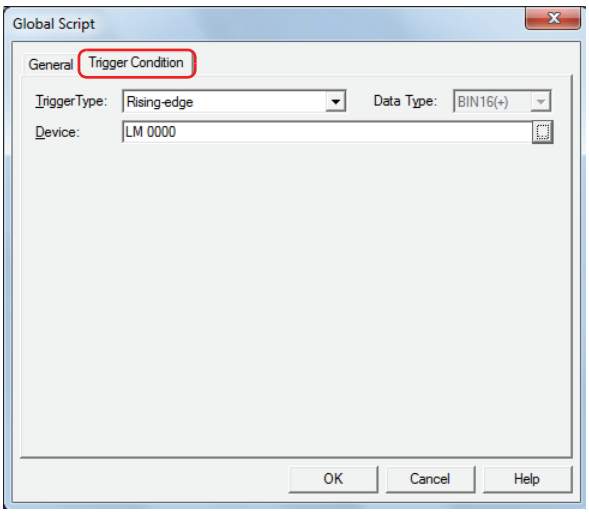


With Global Script, you cannot do indirect read and indirect write of the external device address.
For details about the indirect read and indirect write, refer to Chapter 2 "Indirect Read and Indirect Write Settings" on page 2-4.

4 Specify the script ID (1 to 32,000) of the script to execute.

The Script Manager is displayed when the ... button is clicked. The script can be selected from the script list of the Script Manager. For details, refer to "2.2 Script Manager" on page 20-7.

5 Click **Trigger Condition** tab.



6 With **Trigger Type**, select the condition to execute the script.

- **Rising-edge**
  Script is executed when trigger device changes from 0 to 1. Specify a bit device or a bit of a word device for **Device**.

  Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- **Falling-edge**
  Script is executed when trigger device changes from 1 to 0. Specify a bit device or a bit of a word device for **Device**.

  Click ... to display the Device Address Settings dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

- **Always ON**
  The script is executed on every scan of the MICRO/I.

- **Fixed Period**
  Script is executed at set intervals. Specify **Period** in seconds.

7 Click **OK** to close the **Global Script** dialog box.
For HG1F/2F/2S/3F/4F, this concludes the Global Script configuration.

8 Click **Close** on the **Global Script Settings** dialog box.
This concludes the Global Script configuration.

3.2 Global Script Settings Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the **Global Script Settings** dialog box.
Global Script is managed as a group in the **Global Script Settings** dialog box.

Settings

This area is for editing the Global Script settings.

Order:	Displays the number (1 to 16) for the order to execute the Global Script.
Script:	Displays whether or not to use the Global Script. Double clicking the cell switches between **Enable** and **Disable**.
Script ID:	Specify the script ID (1 to 32,000) of the script to execute.
Script Name:	Displays the name of the script specified by the script ID.
Trigger Type:	Specify the condition to execute the script.
Trigger Condition:	Displays details about the condition to execute the script. The displayed content varies based on **Trigger Type**.

Rising-edge, Falling-edge:	Displays the bit device or the bit of the word device to serve as condition.
Always ON:	Nothing is displayed.
Fixed Period:	Displays the specified period.

Edit

Registers or changes the Global Script settings for the selected line.
Click this button to display the **Global Script** dialog box.
The **Global Script** dialog box settings are reflected on the selected line.
For details, refer to "3.3 Global Script Dialog Box" on page 20-15.

Up

Shifts the selected Global Script settings up the list.

Down

Shifts the selected Global Script settings down the list.

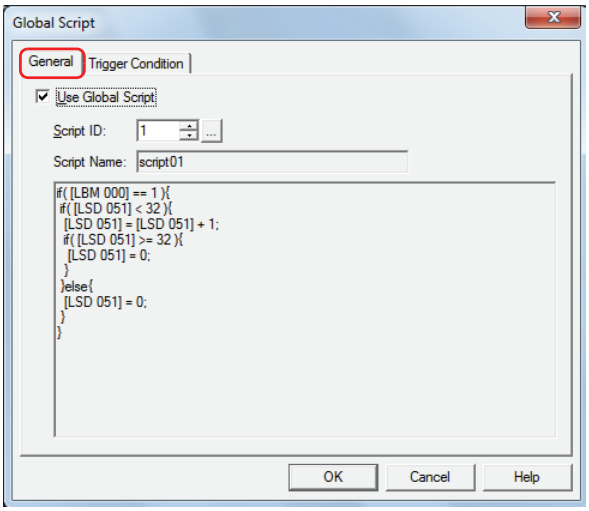
Delete

Deletes the registered settings from the list.

3.3 Global Script Dialog Box

This section describes items and buttons on the **Global Script** dialog box.

● General Tab



■ **Use Global Script**

To use the Global Script, select the **Use Global Script** check box.

> With Global Script, you cannot do indirect read and indirect write of the external device address.

■ **Script ID**

Specify the script ID (1 to 32,000) of the script to execute.

The Script Manager is displayed when the ... button is clicked. The script can be selected from the script list of the Script Manager. For details, refer to "2.2 Script Manager" on page 20-7.

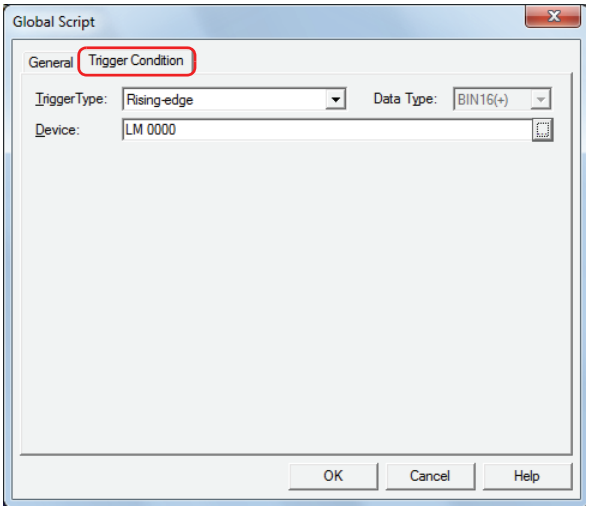
■ **Script Name**

Displays the name of the script specified by the script ID.

■ **Script**

Displays the contents of the script specified by the script ID.

● Trigger Condition Tab



■ **Trigger Type**

Specify the condition to execute the script.

Rising-edge:	Script is executed when trigger device changes from 0 to 1.
Falling-edge:	Script is executed when trigger device changes from 1 to 0.
Always ON:	The script is executed on every scan of the MICRO/I.
Fixed Period:	Script is executed at set intervals.

■ **Device**

Specify the bit device or bit of the word device.

This is enabled only when **Rising-edge** or **Falling-edge** is selected in **Trigger Type**.

■ **Period (sec)**

Specify the scan frequency in seconds (1 to 3,600).

This is enabled only when **Fixed Period** is selected in **Trigger Type**.

4 Script Definition Method

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

4.1 Format List

This section describes the format and operation of control statements, operators, functions, etc.
Enter everything except comments in single-byte. For specific definition examples, refer to "5 Script Coding Examples" on page 20-25.

● Control statements

Conditional expressions are described as (Cond. expr.), (Cond. expr. 1), (Cond. expr. 2) here. Execution lines are described as (Exe. line), (Exe. line 1), (Exe. line 2) ...

■ Conditional branching

Format		Description
if else else if	**if** ((Cond. expr.)) { (Exe. line); }	Execution line is executed if the conditional expression is satisfied.

	if ((Cond. expr.))
	{ (Exe. line 1); }
	else
	{ (Exe. line 2); }
		Execution line 1 is executed if the conditional expression is satisfied.
		Execution line 2 is executed if it is not satisfied.

	if ((Cond. expr. 1))
	{ (Exe. line 1); }
	else if ((Cond. expr. 2))
	{ (Exe. line 2); }
	else
	{ (Exe. line 3); }
		Execution line 1 is executed if the conditional expression 1 is satisfied.
		Conditional expression 2 is determined if conditional expression 1 is not satisfied, and execution line 2 is executed if conditional expression 2 is satisfied.
		Execution line 3 is executed if conditional expression 2 is not satisfied too.

switch
case
default
	switch ((Cond. expr.))
	{
	case constant 1:
	(Exe. line 1);
	break;
	case constant2:
	(Exe. line 2);
	break;
	default:
	(Exe. line 3):
	break;
	}
		Execution line 1 is executed if the value of conditional expression matches constant 1.
		Execution line 2 is executed if the value of conditional expression matches constant 2.
		Execution line 3 is executed if the value of conditional expression does not match constant 1 nor constant 2.

■ Repeat

Format		Description

while	**while** ((Cond. expr.))
	{
	(Exe. line);
	}
		Execution line is repeatedly executed while the conditional expression is satisfied.
		• It will go into an infinite loop when the conditional expression is always satisfied, so do not set fixed values or devices that do not change as the conditional expression.
		• Do not write a value to the external device address in the while definition.

Halt and exit

Format		Description

break	while ((Cond. expr. 1))
	{
	if ((Cond. expr. 2))
	{
	(Exe. line 1);
	break;
	}
	(Exe. line 2);
	}
	(Exe. line 3);
		Process will be as follows while the conditional expression 1 is satisfied.
		• Execution line 2 is continuously executed while the conditional expression 2 is not satisfied.
		• Once the conditional expression is satisfied, it will go out of the loop by break (not executing execution line 2), and execution line 3 is executed.

break	switch ((Cond. expr.))
	{
	case constant 1:
	(Exe. line 1);
	break;
	case constant 2:
	(Exe. line 2);
	break;
	}
	(Exe. line 3);
		When the conditional expression 2 matches the constant 1, it will halt the determination of constant 2 by break after executing execution line 1, and process will move to execution line 3.

return	return;	It will exit the script, and execute the next parts or script.

Operator

Device, constant, and temporary device are described as [a], [b] here, and expression is described as (Expr.), (Expr. 1), (Expr. 2).

Relational operator

Operator	Format	Description
==	[a] == [b]	Compares if [a] is equal to [b].
!=	[a] != [b]	Compares if [a] is not equal to [b].
<	[a] < [b]	Compares if [a] is less than [b].
<=	[a] <= [b]	Compares if [a] is equal or less than [b].
>	[a] > [b]	Compares if [a] is greater than [b].
>=	[a] >= [b]	Compares if [a] is equal or greater than [b].

Logical operator

Operator	Format	Description
&&	((Expr. 1)) && ((Expr. 2))	Calculates the logical product (AND) of (Expr. 1) and (Expr. 2).
||	((Expr. 1)) || ((Expr. 2))	Calculates the logical sum (OR) of (Expr. 1) and (Expr. 2).
!	! ((Expr.))	Reverses the logic of (Expr.).

Arithmetic operator

Operator	Format	Description
+	[a] + [b]	Adds [a] and [b].
–	[a] – [b]	Subtracts [b] from [a].
*	[a] * [b]	Multiplies [a] and [b].
/	[a] / [b]	Divides [a] by [b].
%	[a] % [b]	Calculates remainder after dividing [a] by [b].

Bit operator

Operator	Format	Description
&	a & b	Calculates the logical product (AND) of each bit of a and b.
|	a | b	Calculates the logical sum (OR) of each bit of a and b.
^	a ^ b	Calculates the exclusive logical sum (XOR) of each bit of a and b.
~	~a	Reverses the logic of each bits of a. For word device and fixed values, 0 will be 65535, and 65535 will be 0. For bit device, 0 will be 1, and 1 will be 0.
<<	a << b	Shifts each bit of a to left for b bit(s).
>>	a >> b	Shifts each bit of a to right for b bit(s).

Function

Device, constant, and temporary device are described as a, b, c, d... here.

Bit function

Function	Format	Description
Bit set	SET(a);	Turns bit device a to 1. It will be same result as a = 1;.
Bit reset	RST(a);	Turns bit device a to 0. It will be same result as a = 0;.
Bit reverse	REV(a);	Reverses the 1 and 0 of bit device a. It will be same result as a = ~a;.

Word function

Arithmetic operation

Function	Format	Description
Maximum value	MAX(a, b, c)	Maximum value out of a, b, c is returned. • This can be used for all data types. • Up to 15 arguments can be defined.
Minimum value	MIN(a, b, c)	Minimum value out of a, b, c is returned. • This can be used for all data types. • Up to 15 arguments can be defined.
Exponential function	EXP(a)	Exponential function of a is returned. • This can only be used for data type float32.
Natural logarithm (Base: e)	LOGE(a)	Natural logarithm (base is e) for a is returned. • This can only be used for data type float32. • Set a value larger than 0 for argument.
Common logarithm (Base: 10)	LOG10(a)	Common logarithm (base is 10) for a is returned. • This can only be used for data type float32. • Set a value larger than 0 for argument.
Exponentiation	POW(a, b)	a to the b power is returned. • This can only be used for data type float32.

(Continued to next page)

Arithmetic operation (Continued)

Function	Format	Description
Square root	ROOT(a)	Square root of a is returned. • This can only be used for data type float32.
Sine	SIN(a)	Sine of a (-1 - +1) is returned. Specify arbitrary formula to represent angle (units in radian) for argument a. • This can only be used for data type float32.
Cosine	COS(a)	Cosine of a (-1 - +1) is returned. Specify arbitrary formula to represent angle (units in radian) for argument a. • This can only be used for data type float32.
Tangent	TAN(a)	Tangent of a (-1 - +1) is returned. Specify arbitrary formula to represent angle (units in radian) for argument a. • This can only be used for data type float32.
Arcsine	ASIN(a)	Arcsine of a (-1 - +1) in radian value (-π/2 - +π/2) is returned. Specify arbitrary formula for argument a. • This can only be used for data type float32.
Arccosine	ACOS(a)	Arccosine of a (-1 - +1) in radian value (0 - π) is returned. Specify arbitrary formula for argument a. • This can only be used for data type float32.
Arctangent	ATAN(a);	Arctangent of a (-1 - +1) in radian value (-π/2 - +π/2) is returned. Specify arbitrary formula for argument a. • This can only be used for data type float32.
Conversion from Angle to Radian	RAD(a);	Value of a is converted from degree (°) to radian, and the value is returned. • This can only be used for data type float32.
Conversion from Radian to Angle	DEG(a);	Value of a is converted from radian to degree (°), and the value is returned. • This can only be used for data type float32.

Data type conversion

Function	Format	Description
Conversion from BCD to Binary	BCD2BIN(a)	BCD value of a is returned in binary value. • This can be used with data types BIN16 (+), BIN16 (+/-), BIN32 (+), and BIN32 (+/-).
Conversion from Binary to BCD	BIN2BCD(a)	Binary value of a is returned in BCD value. • This can be used with data types BIN16 (+), BIN16 (+/-), BIN32 (+), and BIN32 (+/-).
Conversion from float32 to Binary	FLOAT2BIN(a)	Float32 value of a is returned in binary value. Values under the decimal point is truncated. • This can be used with data types BIN32 (+) and BIN32 (+/-).
Conversion from Binary to float32	BIN2FLOAT(a)	Binary value of a is returned in float32 value. • This can be used with data types BIN32 (+) and BIN32 (+/−).
Conversion from Decimal to String character	DEC2ASCII(a , b)	Decimal number value b is converted to a character string, and store in order with a as a beginning device. • This can be used with data types BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, and BCD8.
Conversion from String character to Decimal	ASCII2DEC(a)	Character string a is returned as decimal number value. • This can be used with data types BIN16 (+), BIN16 (+/-), BIN32 (+), BIN32 (+/-), BCD4, and BCD8.

Data comparison and copy

Function	Format	Description
Data comparison	MEMCMP (a , b , c)	a : Beginning device of comparison target 1 b : Beginning device of comparison target 2 c : Range of comparison (in words) Values of device a for c words and values of device b for c words are compared. 1 is returned if all the values of devices match, and 0 is returned if any of the value does not match. • Specified range is compared in word unit, and result is returned. • Up to 64 words can be compared.
Data copy	MEMCPY (a , b , c)	a : Beginning device of copy source b : Beginning device of copy target c : Range of copy (in words) Values from a for c words are copied to b for c words respectively. • Specified range is copied in word unit. • Up to 64 words can be copied.

Character string operation

Only internal devices can be specified as an argument for character string operation function.

Termination character NULL (0x00) is treated as end of character string when character string is handled. Also, termination character NULL is not included in the length of the character string.

Function	Format	Description
Character string copy	STRCUT (a , b , c , d)	a : Beginning device of copy target b : Beginning device containing copy source character string c : Start location of copy (0-127) d : Number of characters to copy (1-128) From the character string starting from b , character string from c bytes forward for d characters are stored into a for d characters.
Character number count	STRLEN (a)	Number of characters for character string starting from a is returned.
Character string concatenation	STRCAT (a , b)	To the character string starting from a , the character string starting from b is concatenated, and a is returned to beginning.
Character string search	STRSTR (a , b)	From the character string starting from a , character string starting from b is searched, and location found (number of characters from beginning -1) is returned. • Maximum number for character string to search is 128 characters.

Draw

- This is a function to draw an object on the screen. Top left corner of the screen is coordinates X=0 and Y=0.
- When a device is used as an argument, an object is drawn with the changed value when the value is changed. However, the object that is already drawn is not erased. To erase the drawn object, overwrite it with the background color.
- When an out-of-range value is used as an argument, 5 is stored in the LSD 53 and script is halted.

<table>
<tr><th>Function</th><th>Format</th><th>Description</th></tr>
<tr><td rowspan="2">Drawing of straight line</td><td>LINE(a , b , c , d , e , f , g)</td><td rowspan="2">Straight line connecting the start coordinate and end coordinate is drawn.
a : Start coordinate X, b : Start coordinate Y, c : End coordinate X, d : End coordinate Y, e : Line width, f : Line type, g : Line color
• e : Line width, f : Line type, g : Line color can be omitted.
• Specification of e : Line width is as follows:
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>5</td></tr>
<tr><td>Line width</td><td>1 dot</td><td>2 dots</td><td>3 dots</td><td>5 dots</td></tr>
</table>
It will be set to 1 (1 dot) when omitted.
• Specification of f : Line type is as follows.
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Line type</td><td>Solid</td><td>Dot</td><td>Dash</td><td>Long Dash</td><td>Long Dash Dot</td><td>Long Dash Dot Dot</td></tr>
</table>
It will be set to 1 (Solid) when omitted or when the line width is set to anything other than 1 (1 dot).
• g : Line color is specified by the color data. It will be set to 255 (white) when omitted.
For color data, refer to Appendix “1 Color Number Correspondence Table” on page A-1.</td></tr>
<tr><td>LINE(a , b , c , d)</td></tr>
<tr><td rowspan="2">Drawing of Rectangle</td><td>RECTANGLE(a , b , c , d , e , f , g , h , i , j , k)</td><td rowspan="2">Rectangle with left top corner as start coordinate and bottom right corner as end coordinate is drawn.
a : Start coordinate X, b : Start coordinate Y, c : End coordinate X, d : End coordinate Y, e : Line width, f : Line type, g : Foreground color, h : Background color, i : Pattern, j : Rounded corner type, k : Rounded corner radius
• e : Line width, f : Line type, g : Foreground color, h : Background color, i : Pattern, j : Rounded corner type, k : Rounded corner radius can be omitted.
• Specification of e : Line width is as follows:
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>5</td></tr>
<tr><td>Line width</td><td>1 dot</td><td>2 dots</td><td>3 dots</td><td>5 dots</td></tr>
</table>
It will be set to 1 (1 dot) when omitted.
• Specification of f : Line type is as follows.
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Line type</td><td>Solid</td><td>Dot</td><td>Dash</td><td>Long Dash</td><td>Long Dash Dot</td><td>Long Dash Dot Dot</td></tr>
</table>
It will be set to 1 (Solid) when omitted or when the line width is set to anything other than 1 (1 dot).
• g : Foreground color, h : Background color is specified by the color data. It will be set to 255 (white) when omitted.
For color data, refer to Appendix “1 Color Number Correspondence Table” on page A-1.
• Specification of i : Pattern is as follows.
<table>
<tr><td>Set value</td><td>0</td><td>2</td><td>3</td><td>4</td><td>7</td><td>8</td></tr>
<tr><td>Line type</td><td>None</td><td>Foreground 100%</td><td>Foreground 25%</td><td>Foreground 50%</td><td>Background 100%</td><td>Horizontal lines</td></tr>
</table>
<table>
<tr><td>Set value</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr>
<tr><td>Line type</td><td>Vertical lines</td><td>Slant Upwards</td><td>Slant Down-wards</td><td>Cross-hatch</td><td>Tint</td></tr>
</table>
It will be set to 0 (None) when omitted.
• Specification of j : Rounded corner type is as follows.
<table>
<tr><td>Set value</td><td>0</td><td>1</td><td>2</td></tr>
<tr><td>Line type</td><td>None</td><td>Straight</td><td>Curve</td></tr>
</table>
It will be set to 0 (None) when omitted.
• k : Rounded corner radius is specified with number of dots (0 - 200). It will be set to 0 (0 dot) when omitted.</td></tr>
<tr><td>RECTANGLE(a , b , c , d)</td></tr>
</table>

(Continued to next page)

Draw (Continued)

<table>
<tr><th>Function</th><th>Format</th><th>Description</th></tr>
<tr><td rowspan="2">Drawing of circle and ellipse</td><td>CIRCLE (a , b , c , d , e , f , g , h , i)</td><td rowspan="2">A circle with specified radius from center coordinate is drawn.
a : Center coordinate X, b : Center coordinate Y,
c : X axis radius, d : Y axis radius, e : Line width,
f : Line type, g : Foreground color,
h : Background color, i : Pattern
• e : Line width, f : Line type, g : Foreground color, h : Background color, i : Pattern can be omitted.
• Specification of e : Line width is as follows:
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>5</td></tr>
<tr><td>Line width</td><td>1 dot</td><td>2 dots</td><td>3 dots</td><td>5 dots</td></tr>
</table>
It will be set to 1 (1 dot) when omitted.
• Specification of f : Line type is as follows.
<table>
<tr><td>Set value</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Line type</td><td>Solid</td><td>Dot</td><td>Dash</td><td>Long Dash</td><td>Long Dash Dot</td><td>Long Dash Dot Dot</td></tr>
</table>
It will be set to 1 (Solid) when omitted or when the line width is set to anything other than 1 (1 dot).
• g : Foreground color, h : Background color is specified by the color data. It will be set to 255 (white) when omitted. For color data, refer to Appendix "1 Color Number Correspondence Table" on page A-1.
• Specification of i : Pattern is as follows.
<table>
<tr><td>Set value</td><td>0</td><td>2</td><td>3</td><td>4</td><td>7</td><td>8</td></tr>
<tr><td>Line type</td><td>None</td><td>Foreground 100%</td><td>Foreground 25%</td><td>Foreground 50%</td><td>Background 100%</td><td>Horizontal lines</td></tr>
</table>
<table>
<tr><td>Set value</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr>
<tr><td>Line type</td><td>Vertical lines</td><td>Slant Upwards</td><td>Slant Down-wards</td><td>Cross-hatch</td><td>Tint</td></tr>
</table>
It will be set to 0 (none) when omitted.</td></tr>
<tr><td>CIRCLE (a , b , c , d)</td></tr>
</table>

Offset

<table>
<tr><th>Function</th><th>Format</th><th>Description</th></tr>
<tr><td>Indirect specification</td><td>OFFSET (a , b)</td><td>a : Reference device
b : Device to store the indirect value (0 to 32767)
Specify the device b words from a .
Indirect read
Specify OFFSET function to the right of the assignment statement.
Format example: c = OFFSET (a , b)
Operation: Stores the value of device in b words from a into c .
Indirect write
Specify OFFSET function to the left of the assignment statement.
Format example: OFFSET (a , b) = c
Operation: Stores the value of c into the device b words from a .
• Store the value appropriate for the data type as the indirect value. As an example, when the data type is BCD4, store the indirect value of BCD4 into the device.</td></tr>
</table>

● Other

This section provides definitions for constant, device, temporary device, and comment.

■ Constant

Constant can be defined as decimal or hexadecimal numbers.

Sample definition of decimal numbers

`1234`	Define the numeric value directly.
`-1234`	Define the negative number with a "-" (minus) symbol at the beginning.
`12.34`	Decimal number can be defined for real numbers (float32). Define a "." (period) between the whole numbers and decimal numbers.

There are 2 ways to define hexadecimal numbers.

Sample definition of hexadecimal numbers

`0x12AB`	Define "0" (zero) and "x" (lower case x) at the beginning of the value.
`12ABh`	Append "h" at the tail of the value.

■ Device Address

Device Address is defined with the device symbol and address within "[" and "]".

Definition of the device

`[Device symbol address]`	(" " represents a space.)

Sample definition

```
[LDR 100]
```

■ Temporary Device

Temporary device is a device that can be used only with the script. It can store a value and can be used as a variable. It is defined with a device symbol "@" followed by address (1 - 16).

Definition of the temporary device

`@Address`	(Space between the device symbol "@" and address is not required.)

Sample definition

`@2`	Temporary device number 2

All the values for temporary devices are set to "0" when the execution of the script is started.

■ Comment

A note defined in the script is called a comment. The line with "//" defined at the beginning of a line will become a comment. "//" is defined with a single-byte. Double-byte characters can be used after "//".

Definition of comment

```
// Arbitrary note
```

Sample definition

```
// Store the initial value to calculation
data [LDR 100] for process A
[LDR 100] = 1234;
:
:
```

←This line is not executed.

- It will be useful to use comments to explain the contents of the script (especially when the editor of the script has changed or some time has passed since editing).
- Comments are ignored (not executed) when the script is executed, so they can be defined freely without worrying about the execution time.

5 Script Coding Examples

This section provides script coding examples for control statements, arithmetic operators, and functions, as well as the descriptions of their operations.

5.1 Control Statements

Example 5.1.1 Conditional branch

Script

```
if ([LDR 100])
{
    [LDR 200] = 100;
}
```

Operation description
If the value of LDR100 is not 0, then 100 is stored in LDR200.

Example 5.1.2 Conditional branching

Script

```
if ([LM 100])
{
    [LDR 200] = [LDR 300] + [LDR 400] + [LDR 500];
}
```

Operation description
If the value of LM100 is not 0, then LDR300, LDR400, and LDR500 are added and that value is stored in LDR200.

Example 5.1.3 Conditional branching

Script

```
if (0 != [LDR 100])
{
    if (0 != [LDR 200])
    {
        [LDR 300] = 0x1234;
    }
}
```

Operation description
If the value of LDR100 is not 0 and the value of LDR200 is also not 0, then 0x1234 is stored in LDR300.
If the value of LDR100 is not 0 and the value of LDR200 is 0, then nothing is executed.
If the value of LDR100 is 0, then nothing is executed regardless of the value of LDR200.

Example 5.1.4 Conditional branching

Script

```
if ((0 != [LDR 100]) || (0 != [LDR 200]))
{
    [LDR 300] = 100;
}
else
{
    [LDR 400] = [LDR 500] + 100;
}
```

Operation description

If either the value of LDR100 or the value of LDR200 is not 0, then 100 is stored in LDR300.

If the value of both LDR100 and LDR200 is 0, 100 is added to LDR500 and that value is stored in LDR400.

Example 5.1.5 Conditional branching

Script

```
if ([LDR 100] == 0)
{
    [LDR 200] = 0x1234;
}
else if ([LDR 100] == 1)
{
    [LDR 200] = 0x5678;
}
else
{
    [LDR 200] = 0x9999;
}
```

Operation description

If the value of LDR100 is 0, then 0x1234 is stored in LDR200.

If the value of LDR100 is 1, then 0x5678 is stored in LDR200.

If the value of LDR100 is not 0 or 1, then 0x9999 is stored in LDR200.

Example 5.1.6 Conditional branching

Script

```
if ([LDR 100])
{
    if ([LDR 200])
    {
        if ([LDR300])
        {
            [LDR 400] = 100;
        }
        else
        {
            [LDR 400] = 200;
        }
    }
}
```

Operation description

If the values of LDR100, LDR200, and LDR300 are all not 0, then 100 is stored in LDR400.

If the values of LDR100 and LDR200 are not 0 and the value of LDR300 is 0, then 200 is stored in LDR400.

If either the value of LDR100 or LDR200 is 0, then nothing is executed regardless of the value of LDR300.

Example 5.1.7 Iteration

Script

```
[LDR 100] = 10;
[LDR 200] = 10;

while (0 < [LDR 100])
{
    [LDR 200] = [LDR 200] + 1;
    [LDR 100] = [LDR 100] - 1;
}
```

Operation description

If the value of LDR100 is larger than 0, then 1 is repeatedly added to the value of LDR200 and 1 is repeatedly subtracted from the value of LDR100.

In the script example above, when the while statement repeats ten times, the value of LDR100 becomes 0 and the while statement ends.

After this script executes, the value of LDR100 is 0 and the value of LDR200 is 20.

Example 5.1.8 Iteration

Script

```
[LDR 100] = 0;
[LDR 200] = 3;
[LDR 300] = 5;

while ([LDR 100] == 0)
{
    [LDR 200] = [LDR 200] + 1;

    if ([LDR 300] = [LDR 200)
    {
        SET([LM 0]);
        break;
    }
}
```

Operation description

While the value of LDR100 is 0, the while statement repeats.

Inside the while statement, if the values of LDR200 and LDR300 are equal, the while statement will terminate, and after [LM 0] changes to 1, execution breaks out of the while statement.

In the script example above, the values of LDR200 and LDR300 are equal when the while statement repeats twice, and after LM0 changes to 1, execution breaks out of the while statement loop. After execution, the value of LDR100 is 0, the value of LDR200 is 5, the value of LDR300 is 5, and LM0 is 1.

■ **Example 5.1.9** Indirect write and indirect read using iteration (while statement)

Script

```
// Transfer LDR10 through LDR19 to LDR100 through LDR109

// Initialize the indirect value
[LDR 0] = 0;

// Loop ten times
while ([LDR 0] < 10)
{
    // Transfer 1 word by indirect assignment
    OFFSET([LDR 100], [LDR 0]) = OFFSET([LDR 10], [LDR 0]);
    // Increment indirect value
    [LDR 0] = [LDR 0] + 1
}
```

This script stores the values of LDR10 through LDR19 in LDR100 through LDR109.

It operates as follows.

First, the indirect value LDR0 is initialized and set to 0.

First iteration (loop): The value of LDR0 is 0, so the condition "[LDR 0] < 10" is true and the statements inside while are executed.

- The value of LDR10, 0 words from LDR10, is stored in LDR100, 0 words from LDR100.
- 1 is added to the value of the indirect value LDR0 so that it becomes 1.

Second iteration (loop): The value of LDR0 is 1, so the condition "[LDR 0] < 10" is true and the statements inside while are executed.

- The value of LDR11, 1 word from LDR10, is stored in LDR101, 1 word from LDR100.
- 1 is added to the value of the indirect value LDR0 so that it becomes 2.

:

(Repeats in this manner for the third to ninth iterations)

:

Tenth iteration (loop): The value of LDR0 is 9, so the condition "[LDR 0] < 10" is true and the statements inside while are executed.

- The value of LDR19, 9 words from LDR10, is stored in LDR109, 9 words from LDR100.
- 1 is added to the value of the indirect value LDR0 so that it becomes 10.

The value of LDR0 is 10, so the condition "[LDR 0] < 10" is false and execution breaks out of the while loop.

After execution, the values of LDR100 through LDR109 are the values of LDR10 through LDR19.

■ **Example 5.1.10** Decimal to octal conversion using a while statement

Script

```
// Convert a decimal value to octal
// - For example, convert 10 (dec) to 12 (oct), 16 (dec) to 20 (oct)
// - Convert a value to octal up to 4 digits max

@1 = 0;            // while counter
@2 = [LDR 100];    // gets original data
@3 = 1;            // decimal base
@4 = 0;            // calculation results

// repeat four times
while (@1 < 4)
{
    // Extract 1st octal digit from original data. Store working result in @10.
    @10 = @2 % 8;
    // Convert the extracted results to decimal and add to results
    @4 = @4 + (@10 * @3);

    // Increase the decimal base by one digit
    @3 = @3 * 10;
    // Reduce the original data by one digit
    @2 = @2 / 8;
    // If @2 is 0, terminate the while statement
    if (0 == @2)
    {
        break;
    }

    // Increment while counter by 1
    @1 = @1 + 1;

}

// Store the calculation result in LDR200
[LDR 200] = @4;
```

Operation description

This example converts a decimal value to octal using a while statement.

By repeating the process to divide the original decimal data by 8 and converting each digit to octal in a while statement, the conversion is implemented up to four digits.

The unconverted decimal value is stored in LDR100. After the script is executed, the converted octal value is stored in LDR200.

■ **Example 5.1.11** Conditional branching with switch

Script

```
switch ([LDR 100])
{
    case 10:
        [LDR 200] = 0x1234;
        break;
    case 999:
        [LDR 200] = 0x5678;
        SET([LM 10]);
        break;
}
```

Operation description

If the value of LDR100 is 10, then 0x1234 is stored in LDR200.

If the value of LDR100 is 999, then 0x5678 is stored in LDR200 and LM10 turns on.

If the value of LDR100 is not 10 or 999, then nothing is executed.

■ **Example 5.1.12** Conditional branching with switch using the default statement

Script

```
switch ([LDR 100])
{
    case 0:
        [LDR 200] = 0x1234;
        break;
    case 1:
        [LDR 200] = 0x5678;
        break;
    default:
        [LDR 200] = 0x9999;
        break;
}
```

Operation description

If the value of LDR100 is 0, then 0x1234 is stored in LDR200.

If the value of LDR100 is 1, then 0x5678 is stored in LDR200.

If the value of LDR100 is not 0 or 1, then 0x9999 is stored in LDR200.

■ **Example 5.1.13** Terminate the script with the return statement

Script

```
if (0x1234 == [LDR 100])
{
    [LDR 200] = 0x5678;
    return;
}
[LDR 300] = 0;
```

Operation description

If the value of LDR100 is not 0x1234, then 0 is stored in LDR300.

If the value of LDR100 is 0x1234, then 0x5678 is stored in LDR200 and the script terminates.

The return statement does not break out of a function like the break statement, it terminates the script and executes the next part or script.

■ **Example 5.1.14** Break out of a loop with the break statement

Script

```
[LDR 100] = 0;
[LDR 200] = 3;
[LDR 300] = 5;

while ([LDR 100] == 0)
{
    [LDR 200] = [LDR 200] + 1;

    if ([LDR 200] == [LDR 300)
    {
        SET([LM 0]);
        break;
    }
}
```

Operation description

While the value of LDR100 is 0, the while statement repeats until LDR200 and LDR300 are equal.

Inside the while statement, if the values of LDR200 and LDR300 are equal, the while statement will end and execution breaks out of the while statement.

In the script example above, the values of LDR200 and LDR300 are equal when the while statement repeats twice, and after LM0 changes to 1, the while statement ends. After execution, the value of LDR100 is 0, the value of LDR200 is 5, the value of LDR300 is 5, and the value of LM0 is 1.

5.2 Relational Operators

■ **Example 5.2.1** Equal to

Script

```
if ([LDR 100] == [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description

If the value of LDR100 is equal to the value of LDR200, then 0x100 is stored in LDR300.

■ **Example 5.2.2** Not equal to

Script

```
if ([LDR 100] != [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description

If the value of LDR100 is not equal to the value of LDR200, then 0x100 is stored in LDR300.

■ **Example 5.2.3** Less than

Script

```
if ([LDR 100] < [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description

If the value of LDR100 is less than the value of LDR200, then 0x100 is stored in LDR300.

Example 5.2.4 Less than or equal to

Script

```
if ([LDR 100] <= [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description
If the value of LDR100 is less than or equal to the value of LDR200, then 0x100 is stored in LDR300.

Example 5.2.5 Greater than

Script

```
if ([LDR 100] > [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description
If the value of LDR100 is greater than the value of LDR200, then 0x100 is stored in LDR300.

Example 5.2.6 Greater than or equal to

Script

```
if ([LDR 100] > [LDR 200])
{
    [LDR 300] = 0x100;
}
```

Operation description
If the value of LDR100 is greater than or equal to the value of LDR200, then 0x100 is stored in LDR300.

5.3 Logical Operators

Example 5.3.1 Logical AND

Script

```
if (([LDR 100] == [LDR 200]) && ([LDR 300] == [LDR 400] + [LDR 500]))
{
    [LDR 600] = 100;
}
```

Operation description
If the value of LDR100 is equal to the value of LDR200, and if the value of LDR300 is equal to the value of LDR400 and LDR500 added together, then 100 is stored in LDR600.
If either ([LDR 100] == [LDR 200]) or ([LDR 300] == [LDR 400] + [LDR 500]) is false, the processing in the brackets "{ }" is not executed.

Example 5.3.2 Logical OR

Script

```
if ((0 != [LDR 100]) || (0 != [LDR 200]))
{
    [LDR 300] = 100;
}
```

Operation description
If the value of LDR100 is not 0 or the value of LDR200 is not 0, then 100 is stored in LDR300.
If either is true, the processing in the brackets "{ }" is executed.

Example 5.3.3 Logical inversion

Script

```
if (!([LDR 100] == 0x1234))
{
    [LDR 300] = 100;
}
```

Operation description
If the value of LDR100 is not equal to 0x1234, then 100 is stored in LDR300.

Example 5.3.4 Logical inversion

Script

```
if (!(0 !=[LDR 100]))
{
    [LDR 300] = 100 ;
}
```

Operation description
If the value of LDR100 is 0, then 100 is stored in LDR300.
This is the same as the code "if (0==[LDR 100]))".

5.4 Arithmetic Operators

Example 5.4.1 Addition

Script

```
[LDR 300] = [LDR 100] + [LDR 200];
```

Operation description
The values of LDR100 and LDR200 are added together and the result is stored in LDR300.

Example 5.4.2 Subtraction

Script

```
[LDR 300] = [LDR 100] - [LDR 200];
```

Operation description
The value of LDR200 is subtracted from the value of LDR100 and the result is stored in LDR300.

Example 5.4.3 Multiplication

Script

```
[LDR 300] = [LDR 100] * [LDR 200];
```

Operation description
The values of LDR100 and LDR200 are multiplied together and the result is stored in LDR300.

Example 5.4.4 Division

Script

```
[LDR 300] = [LDR 100] / [LDR 200];
```

Operation description
The value of LDR100 is divided into the value of LDR200 and the result is stored in LDR300.

Example 5.4.5 Modulo

Script

```
[LDR 300] = [LDR 100] % [LDR 200];
```

Operation description
The value of LDR100 is divided into the value of LDR200 and the remainder is stored in LDR300.

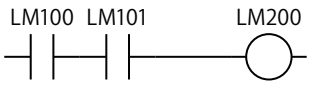
5.5 Bitwise Operators

■ **Example 5.5.1** Logical AND

Script

```
if ([LM 100] & [LM 101])
{
    SET([LM 200)]);
}
else
{
    RST([LM 200]);
}
```

Operation description
If the bitwise logical AND operation on the values of LM100 and LM101 is 1, LM200 changes to 1.
If the bitwise logical AND operation on the values of LM100 and LM101 is 0, LM200 changes to 0.
The operation is the same as the following ladder diagram.

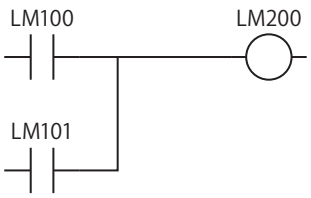


■ **Example 5.5.2** Logical OR

Script

```
if ([LM 100] | [LM 101])
{
    SET([LM 200]);
}
else
{
    RST([LM 200]);
}
```

Operation description
If the bitwise logical OR operation on the values of LM100 and LM101 is 1, LM200 changes to 1.
If the bitwise logical OR operation on the values of LM100 and LM101 is 0, LM200 changes to 0.
The operation is the same as the following ladder diagram.



■ **Example 5.5.3** Logical XOR (exclusive OR)

Script

```
[LDR 200] = [LDR 100] ^ 0xFF;
```

Operation description
The logical XOR operation on the value of LDR100 and each bit in 0xFF is stored in LDR200.
For example, if the value of LDR100 is 15 (0x0F), then LDR200 is 240 (0xF0).

Example 5.5.4 Inversion

Script

```
[LDR 200] = ~[LDR 100];
```

Operation description

The bits in the value of LDR100 are flipped and stored in LDR200.

For example, if the value of LDR100 is 0, then LDR200 is 65535.

Example 5.5.5 Inversion

Script

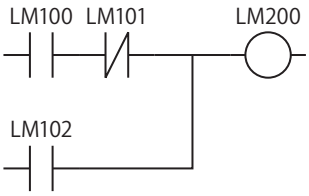
```
if (([LM 100] & ~ [LM 101]) | [LM 102])
{
    SET([LM 200]);
}
else
{
    RST([LM 200]);
}
```

Operation description

If the bitwise logical OR operation on the value of LM102 and the result of the bitwise logical AND operation on the value of LM100 and the inverted result of the value of LM101 is 1, then LM200 changes to 1.

If the bitwise logical OR operation on the value of LM102 and the result of the bitwise logical AND operation on the value of LM100 and the inverted result of the value of LM101 is 0, then LM200 changes to 0.

The operation is the same as the following ladder diagram.



Example 5.5.6 Left shift

Script

```
[LDR 300] = [LDR 100] << [LDR 200];
```

Operation description

The value of LDR100 is shifted left by only the amount of the value of LDR200 and the result is stored in LDR300.

For example, if the value of LDR100 is 1 and the value of LDR200 is 3, 1 is shifted 3 bits to the left and the result 8 is stored in LDR300.

Example 5.5.7 Right shift

Script

```
[LDR 300] = [LDR 100] >> [LDR 200];
```

Operation description

The value of LDR100 is shifted right by only the amount of the value of LDR200 and the result is stored in LDR300.

For example, if the value of LDR100 is 8 and the value of LDR200 is 3, 8 is shifted 3 bits to the right and the result 1 is stored in LDR300.

5.6 Bit Functions

Example 5.6.1 Set a bit

Script

```
SET([LM 100]);
```

Operation description

Turns LM100 to 1. The result is the same as `[LM 100] = 1`.

Example 5.6.2 Reset a bit

Script

```
RST([LM 100]);
```

Operation description

Turns LM100 to 0. The result is the same as `[LM 100] = 0`.

Example 5.6.3 Invert a bit

Script

```
REV([LM 100]);
```

Operation description

Flips LM100 1 and 0. The result is the same as `[LM 100] = ~[LM 100]`.

5.7 Word Functions

● Arithmetic operations

■ **Example 5.7.1** Maximum value

Script

```
[LDR 200] = MAX([LDR 100], [LDR 110], [LDR 120], [LDR 130], [LDR 140]);
```

Operation description
Out of the values stored in LDR100, LDR110, LDR120, LDR130, and LDR140, stores the maximum value in LDR200.
Up to 15 arguments can be used.

■ **Example 5.7.2** Minimum value

Script

```
[LDR 200] = MIN([LDR 100], [LDR 110], [LDR 120], [LDR 130], [LDR 140]);
```

Operation description
Out of the values stored in LDR100, LDR110, LDR120, LDR130, and LDR140, stores the minimum value in LDR200.
Up to 15 arguments can be used.

■ **Example 5.7.3** Exponential function

Script

```
[D 10] = EXP([D 20]);
```

Operation description
Calculates the exponential function of the value of D20 and the result is stored in D10.
Only the data type float32 can be used.

■ **Example 5.7.4** Natural logarithm

Script

```
[D 10] = LOGE([D 20]);
```

Operation description
Calculates the natural logarithm of the value of D20 and the result is stored in D10.
Only the data type float32 can be used.

■ **Example 5.7.5** Common logarithm

Script

```
[D 10] = LOG10([D 20]);
```

Operation description
Calculates the logarithm of the value of D20 with 10 as the base and the result is stored in D10.
Only the data type float32 can be used.

■ **Example 5.7.6** Power

Script

```
[D 10] = POW([D 20],[D 30]);
```

Operation description
Calculates the power of a value.
For example, when the value of D20 is 10 and the value of D30 is 5, the function calculates 10 to the power of 5 and stores the result in D10.
Only the data type float32 can be used.

Example 5.7.7 Square root

Script

```
[D 10] = ROOT([D 20]);
```

Operation description
Calculates the square root of the value of [D 20] and the result is stored in [D 10].
Only the data type float32 can be used.

Example 5.7.8 Sine

Script

```
[D 10] = SIN([D 20]);
```

Operation description
Calculates the sine of the radian value of D20 and stores the result in D10.
Only the data type float32 can be used.

Example 5.7.9 Cosine

Script

```
[D 10] = COS([D 20]);
```

Operation description
Calculates the cosine of the radian value of D20 and stores the result in D10.
Only the data type float32 can be used.

Example 5.7.10 Tangent

Script

```
[D 10] = TAN([D 20]);
```

Operation description
Calculates the tangent of the radian value of D20 and stores the result in D10.
Only the data type float32 can be used.

Example 5.7.11 Arcsine

Script

```
[D 10] = ASIN([D 20]);
```

Operation description
Calculates the arcsine of the value of D20 and stores the result as radians in D10.
Only the data type float32 can be used.

Example 5.7.12 Arccosine

Script

```
[D 10] = ACOS([D 20]);
```

Operation description
Calculates the arccosine of the value of D20 and stores the result as radians in D10.
Only the data type float32 can be used.

Example 5.7.13 Arctangent

Script

```
[D 10] = ATAN([D 20]);
```

Operation description
Calculates the arctangent of the value of D20 and stores the result as radians in D10.
Only the data type float32 can be used.

Example 5.7.14 Convert angle to radians

Script

```
[D 10] = RAD([D 20]);
```

Operation description
Converts the value of D20 from degrees (°) to radians and stores the result in D10.
Only the data type float32 can be used.

Example 5.7.15 Convert radians to angle

Script

```
[D 10] = DEG([D 20]);
```

Operation description
Converts the value of D20 from radians to degrees (°) and stores the result in D10.
Only the data type float32 can be used.

● Data type conversions

■ Example 5.7.16 Convert BCD to binary

Script

```
[LDR 200] = BCD2BIN([LDR 100]);
```

Operation description

Converts the BCD value in LDR100 to a binary value and stores it in LDR200.

For example, if the BCD value 10 (16 as a binary value) is stored in LDR100, 10 (binary value) is stored in LDR200.

■ Example 5.7.17 Convert binary to BCD

Script

```
[LDR 200] = BIN2BCD([LDR 100]);
```

Operation description

Converts the binary value in LDR100 to a BCD value and stores it in LDR200.

For example, if the binary value 16 (10 as a BCD value) is stored in LDR100, 16 (BCD value) is stored in LDR200.

■ Example 5.7.18 Convert float32 to binary

Script

```
[LDR 200] = FLOAT2BIN([LDR 100]);
```

Operation description

Converts the float value in LDR100 to a binary value and stores it in LDR200.

For example, if the float value 1234 (0x449A4000 as a binary value) is stored in LDR100, 1234 (binary value) is stored in LDR200. If the float value 1234.56 (0x449A51EC as a binary value) is stored in LDR100, the value after the decimal point is discarded and 1234 (binary value) is stored in LDR200.

■ Example 5.7.19 Convert binary to float32

Script

```
[LDR 200] = BIN2FLOAT([LDR 100]);
```

Operation description

Converts the binary value in LDR100 to a float value and stores it in LDR200.

For example, if the binary value 1234 is stored in LDR100, the float value 1234 (0x449A4000 as a binary value) is stored in LDR200.

Example 5.7.20 Convert decimal to string

Script

```
DEC2ASCII([LDR 100], [LDR 200]);
```

Operation description

Converts the decimal numeric value in LDR200 to a string and stores it in order with LDR100 as the starting address.

- This function can be used with data types BIN16(+), BIN16(+/-), BIN32(+), BIN32(+/-), BCD4, and BCD8.
- Only internal devices can be used.
- When using functions that handle strings, check the **Storage Method of string data** setting on the **System** tab in the **Project Settings** dialog box. Depending on the setting, the upper and lower bytes are stored in the reverse of the following explanation.
  For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.
- A NULL terminating character (0x00) is added to the end of the string.

Converting 1234 (when the data type is BIN16+)

Device	Stored value
LDR 200	1234

⟹

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'1' = 0x31	'2' = 0x32
LDR 101	'3' = 0x33	'4' = 0x34
LDR 102	0x00	0x00

Terminating character

Converting -12345 (when the data type is BIN16+/-)

Device	Stored value
LDR 200	-12345

⟹

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'-' = 0x2D	'1' = 0x31
LDR 101	'2' = 0x32	'3' = 0x33
LDR 102	'4' = 0x34	'5' = 0x35
LDR 103	0x00	0x00

Terminating character

Converting 1234567890 (when the data type is BIN32+)

Device	Stored value
LDR 200	1234567890
LDR 201	

⟹

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'1' = 0x31	'2' = 0x32
LDR 101	'3' = 0x33	'4' = 0x34
LDR 102	'5' = 0x35	'6' = 0x36
LDR 103	'7' = 0x37	'8' = 0x38
LDR 104	'9' = 0x39	'0' = 0x30
LDR 105	0x00	0x00

Terminating character

Converting -1234567890 (when the data type is BIN32+/-)

Device	Stored value
LDR 200	-1234567890
LDR 201	

⟹

Device	Stored value	
	Upper byte	Lower byte
LDR 100	'-' = 0x2D	'1' = 0x31
LDR 101	'2' = 0x32	'3' = 0x33
LDR 102	'4' = 0x34	'5' = 0x35
LDR 103	'6' = 0x36	'7' = 0x37
LDR 104	'8' = 0x38	'9' = 0x39
LDR 105	'0' = 0x30	0x00

Terminating character

■ **Example 5.7.21** Convert string to decimal

Script

```
[LDR 100] = ASCII2DEC([LDR 200]);
```

Operation description

Converts the stored string starting at LDR200 to a decimal and stores the result in LDR100.

The number of digits that can be converted is the maximum number of digits for each data type with added sign.

If the string to convert contains NULL or characters that cannot be converted to numeric values, the string is converted up to that character.

- This function can be used with data types BIN16(+), BIN16(+/-), BIN32(+), BIN32(+/-), BCD4, and BCD8.
- Only internal devices can be used.
- When using functions that handle strings, check the **Storage Method of string data** setting on the **System** tab in the **Project Settings** dialog box. Depending on the setting, the upper and lower bytes are stored in the reverse of the following explanation.
  For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

Setting the string "1234" (when the data type is BIN16+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'1' = 0x31	'2' = 0x32
LDR 201	'3' = 0x33	'4' = 0x34
LDR 202	0x00	0x00

Terminating character

→

Device	Stored value
LDR 100	1234

Setting the string "1234567" (when the data type is BIN16+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'1' = 0x31	'2' = 0x32
LDR 201	'3' = 0x33	'4' = 0x34
LDR 202	'5' = 0x35	'6' = 0x36
LDR 203	'7' = 0x37	0x00

Terminating character

→

Device	Stored value
LDR 100	12345

Setting the string "-12345" (when the data type is BIN16+/-)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'-' = 0x2D	'1' = 0x31
LDR 201	'2' = 0x32	'3' = 0x33
LDR 202	'4' = 0x34	'5' = 0x35
LDR 203	0x00	0x00

Terminating character

→

Device	Stored value
LDR 100	-12345

String "1234567890" (when the data type is BIN32+)

Device	Stored value	
	Upper byte	Lower byte
LDR 200	'1' = 0x31	'2' = 0x32
LDR 201	'3' = 0x33	'4' = 0x34
LDR 202	'5' = 0x35	'6' = 0x36
LDR 203	'7' = 0x37	'8' = 0x38
LDR 204	'9' = 0x39	'0' = 0x30
LDR 205	0x00	0x00

Terminating character

→

Device	Stored value
LDR 100 - 101	1234567890

● Data comparison and copying

■ **Example 5.7.22** Word-unit data comparison

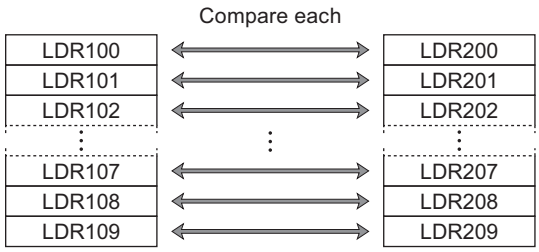
Script

```
[LDR 0] = MEMCMP([LDR 100], [LDR 200], 10);
```

Operation description

Compares the value of 10 words from LDR100 (up to LDR109) with the value of 10 words from LDR200 (up to LDR209).

If the value for each is entirely equal, 1 is stored in LDR0. If even a single one is not equal, 0 is stored.



Even if the data type is set to BIN32+, BIN32+/-, BCD8, or float32, the comparison is performed from the start device in word units.

■ **Example 5.7.23** Bit-unit data comparison

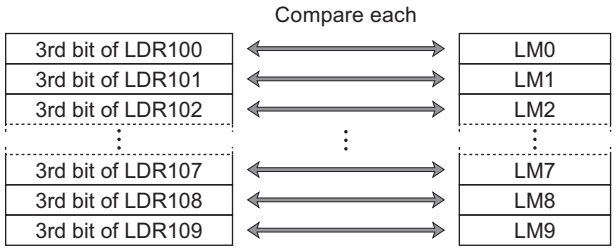
Script

```
[LDR 0] = MEMCMP([LDR 100-2], [LM 0], 10);
```

Operation description

Compares the third bit of LDR100 through the third bit of LDR109 with the state of the bits from LM0 to LM9.

If the value for each is entirely equal, 1 is stored in LDR0. If even a single one is not equal, 0 is stored.



Even if the data type is set to BIN32+, BIN32+/-, BCD8, or float32, the comparison is performed from the start device in bit units.

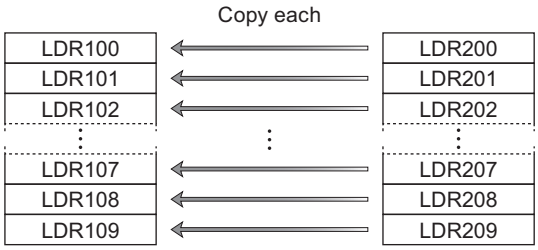
Example 5.7.24 Word-unit data copy

Script

```
MEMCPY([LDR 100], [LDR 200], 10);
```

Operation description

Copies the value of 10 word devices from LDR200 (up to LDR209) to 10 word devices from LDR100 (up to LDR109).



Even if the data type is set to BIN32+, BIN32+/-, BCD8, or float32, the data is copied from the start device in word units.

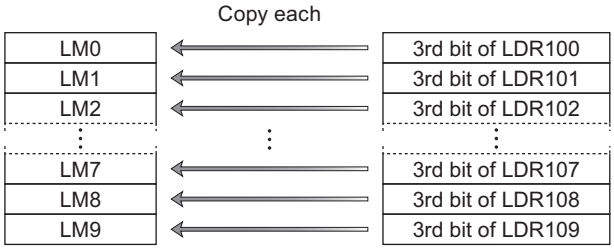
Example 5.7.25 Bit-unit data copy

Script

```
MEMCPY([LM 0], [LDR 100-2], 10);
```

Operation description

Copies the third bit of 10 words from LDR100 (up to LDR109) to the bit state for 10 bits of devices from LM0 (up to LM9).



Even if the data type is set to BIN32+, BIN32+/-, BCD8, or float32, the bits are copied from the start device in bit units.

● String operations

When using functions that handle string data, check the **Storage Method of string data** setting in the project settings.

For details, refer to Chapter 4 "3.1 System Tab" on page 4-26.

■ Example 5.7.26 Copy a string

Script

```
STRCUT([LDR 100], [LDR 200], 2, 3);
```

Operation description

Stores in order from LDR100 character count 3 (3 characters worth) from start position 2 (starting from 0, so the 3rd character) of the string "ABCDEFG" that starts from LDR200.

The start position can be specified in the range from 0 to 127, the character count can be specified in the range from 1 to 128.

Copy from string "ABCDEFG" at start position 2, character count 3

Device		Stored value	Start position	Character count
LDR 200	Upper byte	'A' = 0x41	0	
	Lower byte	'B' = 0x42	1	
LDR 201	Upper byte	'C' = 0x43	**←2**	3 characters
	Lower byte	'D' = 0x44	3	
LDR 202	Upper byte	'E' = 0x45	4	
	Lower byte	'F' = 0x46	5	
LDR 203	Upper byte	'G' = 0x47	:	
	Lower byte	0x00	Terminating character	

→

Device		Stored value	
LDR 100	Upper byte	'C' = 0x43	
	Lower byte	'D' = 0x44	
LDR 101	Upper byte	'E' = 0x45	
	Lower byte	0x00	Terminating character

Script

```
STRUCT([LDR 100], [LDR 200], 1, 4);
```

Copy from string "ABCDEFG" at start position 1, character count 4

Device		Stored value	Start position	Character count
LDR 200	Upper byte	'A' = 0x41	0	
	Lower byte	'B' = 0x42	**←1**	
LDR 201	Upper byte	'C' = 0x43	**←2**	4 characters
	Lower byte	'D' = 0x44	3	
LDR 202	Upper byte	'E' = 0x45	4	
	Lower byte	'F' = 0x46	5	
LDR 203	Upper byte	'G' = 0x47	:	
	Lower byte	0x00	Terminating character	

→

Device		Stored value	
LDR 100	Upper byte	'B' = 0x42	
	Lower byte	'C' = 0x43	
LDR 101	Upper byte	'D' = 0x44	
	Lower byte	'E' = 0x45	
LDR 102	Upper byte	0x00	Terminating character
	Lower byte	0x00	

■ **Example 5.7.27** Count a string

Script

```
[LDR 100] = STRLEN([LDR 200]);
```

Operation description

Finds the length (character count) of the string starting from LDR200 and stores that in LDR100.

- The only devices that can be specified as function arguments in string operations are internal devices.
- The NULL terminating character (0x00) is the end of the string. (The terminating character is not included in the string length.)

Device		Stored value
LDR 200	Upper byte	'A' = 0x41
	Lower byte	'B' = 0x42
LDR 201	Upper byte	'C' = 0x43
	Lower byte	'D' = 0x44
LDR 202	Upper byte	'E' = 0x45
	Lower byte	'F' = 0x46
LDR 203	Upper byte	'G' = 0x47
	Lower byte	0x00

Character count → Terminating character

Device	Stored value
LDR 100	7

Device		Stored value
LDR 200	Upper byte	'A' = 0x41
	Lower byte	'B' = 0x42
LDR 201	Upper byte	'C' = 0x43
	Lower byte	0x00
LDR 202	Upper byte	'E' = 0x45
	Lower byte	'F' = 0x46
LDR 203	Upper byte	'G' = 0x47
	Lower byte	0x00

Character count → Terminating character

Device	Stored value
LDR 100	3

Example 5.7.28 Concatenate strings

Script

```
STRCAT([LDR 100], [LDR 200]);
```

Operation description

Concatenates the string starting from LDR200 to the string starting from LDR100.

- Only internal devices can be used.
- The NULL terminating character (0x00) is the end of the string. (The terminating character is not included in the string length.)

Device		Stored value
LDR 100	Upper byte	'A' = 0x41
	Lower byte	'B' = 0x42
LDR 101	Upper byte	'C' = 0x43
	Lower byte	0x00

Terminating character

Device		Stored value
LDR 200	Upper byte	'D' = 0x44
	Lower byte	'E' = 0x45
LDR 201	Upper byte	'F' = 0x46
	Lower byte	'G' = 0x47
LDR 202	Upper byte	0x00
	Lower byte	0x00

Terminating character

Concatenate →

Device		Stored value
LDR 100	Upper byte	'A' = 0x41
	Lower byte	'B' = 0x42
LDR 101	Upper byte	'C' = 0x43
	Lower byte	'D' = 0x44
LDR 102	Upper byte	'E' = 0x45
	Lower byte	'F' = 0x46
LDR 103	Upper byte	'G' = 0x47
	Lower byte	0x00

Terminating character

■ Example 5.7.29 Search a string

Script

```
[LDR 0] = STRSTR([LDR 100], [LDR 200]);
```

Operation description

Searches for the search string "DEFG" that starts from LDR200 in the string to be searched "ABCDEFGHIJKLMNO" that starts from LDR100 and stores the position of the occurrence of the string in LDR0. If not found, -1 is stored in LDR0.

If "?" is specified as a character to search for, it is handled as an arbitrary single-byte character.
When specifying "?" (0x3F) as a character, specify it as "~?" (0x7E3F) in two bytes.
When specifying "~" (0x7E) as a character, specify it as "~~" (0x7E7E) in two bytes.

- The maximum number for the search string is 128 characters.
- Only internal devices can be used.

When searching for "DEFG" and the string was found

Search string

Device		Stored value
LDR 200	Upper byte	'D' = 0x44
	Lower byte	'E' = 0x45
LDR 201	Upper byte	'F' = 0x46
	Lower byte	'G' = 0x47
LDR 202	Upper byte	0x00
	Lower byte	0x00

Terminating character

String to be searched

Device		Stored value	Position
LDR 100	Upper byte	'A' = 0x41	0
	Lower byte	'B' = 0x42	1
LDR 101	Upper byte	'C' = 0x43	2
	Lower byte	'D' = 0x44	←3
LDR 102	Upper byte	'E' = 0x45	4
	Lower byte	'F' = 0x46	5
LDR 103	Upper byte	'G' = 0x47	6
	Lower byte	'H' = 0x48	7
LDR 104	Upper byte	'I' = 0x49	8
	Lower byte	'J' = 0x4A	9
LDR 105	Upper byte	'K' = 0x47	10
	Lower byte	'L' = 0x4C	11
LDR 106	Upper byte	'M' = 0x4D	12
	Lower byte	'N' = 0x4E	13
LDR 107	Upper byte	'O' = 0x4F	14
	Lower byte	0x00	Terminating character

Search result

Device	Stored value
LDR 0	3

When searching for "WXYZ" and the string was not found

Search string

Device		Stored value
LDR 200	Upper byte	'W' = 0x57
	Lower byte	'X' = 0x58
LDR 201	Upper byte	'Y' = 0x59
	Lower byte	'Z' = 0x5A
LDR 202	Upper byte	0x00
	Lower byte	0x00

Terminating character

String to be searched

Device		Stored value	Position
LDR 100	Upper byte	'A' = 0x41	0
	Lower byte	'B' = 0x42	1
LDR 101	Upper byte	'C' = 0x43	2
	Lower byte	'D' = 0x44	3
LDR 102	Upper byte	'E' = 0x45	4
	Lower byte	'F' = 0x46	5
LDR 103	Upper byte	'G' = 0x47	6
	Lower byte	'H' = 0x48	7
LDR 104	Upper byte	'I' = 0x49	8
	Lower byte	'J' = 0x4A	9
LDR 105	Upper byte	'K' = 0x47	10
	Lower byte	'L' = 0x4C	11
LDR 106	Upper byte	'M' = 0x4D	12
	Lower byte	'N' = 0x4E	13
LDR 107	Upper byte	'O' = 0x4F	14
	Lower byte	0x00	Terminating character

Search result

Device	Stored value
LDR 0	-1

When searching for "?" as an arbitrary single-byte character

Search string

Device		Stored value
LDR 200	Upper byte	'E' = 0x45
	Lower byte	'?' = 0x3F
LDR 201	Upper byte	'G' = 0x47
	Lower byte	'H' = 0x48
LDR 202	Upper byte	0x00
	Lower byte	0x00

Terminating character

String to be searched

Device		Stored value	Position
LDR 100	Upper byte	'A' = 0x41	0
	Lower byte	'B' = 0x42	1
LDR 101	Upper byte	'C' = 0x43	2
	Lower byte	'D' = 0x44	3
LDR 102	Upper byte	'E' = 0x45	**←4**
	Lower byte	'F' = 0x46	5
LDR 103	Upper byte	'G' = 0x47	6
	Lower byte	'H' = 0x48	7
LDR 104	Upper byte	'I' = 0x49	8
	Lower byte	'J' = 0x4A	9
LDR 105	Upper byte	'K' = 0x47	10
	Lower byte	'L' = 0x4C	11
LDR 106	Upper byte	'M' = 0x4D	12
	Lower byte	'N' = 0x4E	13
LDR 107	Upper byte	'O' = 0x4F	14
	Lower byte	0x00	Terminating character

Search result

Device	Stored value
LDR 0	4

When searching for "?" as a character

Search string

Device		Stored value
LDR 200	Upper byte	'E' = 0x45
	Lower byte	'~' = 0x7E
LDR 201	Upper byte	'?' = 0x3F
	Lower byte	'G' = 0x47
LDR 202	Upper byte	'H' = 0x48
	Lower byte	0x00

Terminating character

String to be searched

Device		Stored value	Position
LDR 100	Upper byte	'A' = 0x41	0
	Lower byte	'B' = 0x42	1
LDR 101	Upper byte	'C' = 0x43	2
	Lower byte	'D' = 0x44	3
LDR 102	Upper byte	'E' = 0x45	**←4**
	Lower byte	'?' = 0x3F	5
LDR 103	Upper byte	'G' = 0x47	6
	Lower byte	'H' = 0x48	7
LDR 104	Upper byte	'I' = 0x49	8
	Lower byte	'J' = 0x4A	9
LDR 105	Upper byte	'K' = 0x47	10
	Lower byte	'L' = 0x4C	11
LDR 106	Upper byte	'M' = 0x4D	12
	Lower byte	'N' = 0x4E	13
LDR 107	Upper byte	'O' = 0x4F	14
	Lower byte	0x00	Terminating character

Search result

Device	Stored value
LDR 0	4

When searching for "~" as a character

Search string

Device		Stored value
LDR 200	Upper byte	'E' = 0x45
	Lower byte	'~' = 0x7E
LDR 201	Upper byte	'~' = 0x7E
	Lower byte	'G' = 0x47
LDR 202	Upper byte	'H' = 0x48
	Lower byte	0x00

Terminating character

String to be searched

Device		Stored value	Position
LDR 100	Upper byte	'A' = 0x41	0
	Lower byte	'B' = 0x42	1
LDR 101	Upper byte	'C' = 0x43	2
	Lower byte	'D' = 0x44	3
LDR 102	Upper byte	'E' = 0x45	**←4**
	Lower byte	'~' = 0x7E	5
LDR 103	Upper byte	'G' = 0x47	6
	Lower byte	'H' = 0x48	7
LDR 104	Upper byte	'I' = 0x49	8
	Lower byte	'J' = 0x4A	9
LDR 105	Upper byte	'K' = 0x47	10
	Lower byte	'L' = 0x4C	11
LDR 106	Upper byte	'M' = 0x4D	12
	Lower byte	'N' = 0x4E	13
LDR 107	Upper byte	'O' = 0x4F	14
	Lower byte	0x00	Terminating character

Search result

Device	Stored value
LDR 0	4

● Drawing

■ Example 5.7.30 Draw a line

Script

```
LINE(20, 20, 60, 60, 3, 1, 20);
```

Operation description

Draws a line connecting the start coordinates X=20, Y=20 and the end coordinates X=60, Y=60 on the screen where the script is running. The line has a line width of 3 (3 pixels), line type of 1 (solid line), and line color of 20 (red).

■ Example 5.7.31 Draw a line (omitting arguments)

Script

```
LINE(0, 0, 150, 100);
```

Operation description

Draws a line connecting the start coordinates X=0, Y=0 and the end coordinates X=150, Y=100 on the screen where the script is running. The line width, line type, and line color have been omitted, so the line's line width is 1 (1 pixel), the line type is 1 (solid line), and the line color is 255 (white).

■ Example 5.7.32 Draw a rectangle

Script

```
RECTANGLE(20, 20, 100, 60, 1, 2, 24, 22, 13, 2, 5);
```

Operation description

Draws a rectangle with the start coordinates (the coordinates of the rectangle's upper-left corner) X=20, Y=20 and the end coordinates (the coordinates of the rectangle's lower-right corner) X=100, Y=60 on the screen where the script is running. The rectangle's line width is 1 (1 pixel), line type is 2 (dotted line), foreground color is 24 (green), background color is 22 (yellow), pattern is 13 (tint), rounding type is 2 (curve), and rounding radius is 5 (5 pixels).

■ Example 5.7.33 Draw a rectangle (omitting arguments)

Script

```
RECTANGLE(0, 0, 150, 100);
```

Operation description

Draws a rectangle with the start coordinates (the coordinates of the rectangle's upper-left corner) X=0, Y=0 and the end coordinates (the coordinates of the rectangle's lower-right corner) X=150, Y=100 on the screen where the script is running. The line width, line type, foreground color, background color, pattern, rounding type, and rounding radius are omitted, so the rectangle's line width is 1 (1 pixel), line type is 1 (solid line), foreground color and background color is 255 (white), pattern is 0 (none), rounding type is 0 (none), and rounding radius is 0 (0 pixels).

■ Example 5.7.34 Draw a circle or ellipse

Script

```
CIRCLE(100, 100, 60, 60, 1, 2, 26, 0, 4);
```

Operation description

Draws a circle with the center coordinate X=100, Y=100, the X-axis radius 60 pixels, and the Y-axis radius 60 pixels. The circle's line width is 1 (1 pixel), line type is 2 (dotted line), foreground color is 26 (light blue), background color is 0 (black), and pattern is 4 (foreground 50%).

■ Example 5.7.35 Draw a circle or ellipse (omitting arguments)

Script

```
CIRCLE(100, 100, 80, 40);
```

Operation description

Draws an ellipse with the center coordinate X=100, Y=100, the X-axis radius 80 pixels, and the Y-axis radius 40 pixels. The line width, line type, foreground color, background color, and pattern are omitted, so the ellipse's line width is 1 (1 pixel), line type is 1 (solid line), foreground color and background color is 255 (white), and pattern is 0 (none).

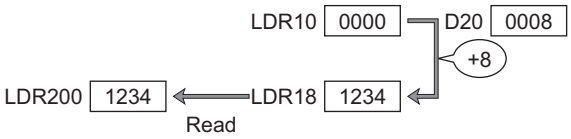
● Indirect assignment

■ **Example 5.7.36** Indirect read

Script

```
[LDR 200] = OFFSET([LDR 10],[D 20]);
```

Operation description
When the value of D20 is 8, the value of LDR18, the device 8 words from LDR10, is read and stored in LDR200.

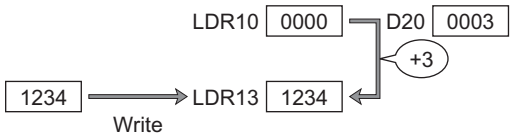


■ **Example 5.7.37** Indirect write

Script

```
OFFSET([LDR 10],[D 20]) = 1234;
```

Operation description
When the value of D20 is 3, the constant 1234 is stored in LDR13, the device 3 words from LDR10.



6 Important Notes

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes important notes when defining a script.

6.1 Important Notes Regarding the While Definition

- **Define so it will not go into an infinite loop.**

The execution expression is repeatedly executed while the conditional expression is satisfied.
However, it will go into an infinite loop when the conditional expression is satisfied continually.

```
[LDR 100] = 10;

while (0 != [LDR 100])
{
    [LDR 200] = [LDR 200] + 1;
}
```

In the conditional expression of the while definition, it states to exit the loop when the value of LDR100 turns 0. However, the value stored in the LDR 100 is not changed after storing 10 in the first line of the script, so it will go into an infinite loop.

When using the while definition, define it so it will not go into an infinite loop.
The value of LDR 100 will become 0 when the while definition is repeated 10 times in the next example, and it will get out of the while definition.

```
[LDR 100] = 10;

while (0 != [LDR 100])
{
    [LDR 200] = [LDR 200] + 1;
    [LDR 100] = [LDR 100] - 1;
}
```

- **Define it so it will not continue the process for longer than the time limit.**

When the processing of a single script continues for more than the time limit due to a while definition, etc., an execution time over error occurs and that script will be halted. Define the script so the execution time for one script does not exceed the following limit.

HG2G-5F, HG3G/4G: 3,000 milliseconds
HG2G-S/5S, HG1F/2F/2S/3F/4F: 500 milliseconds

For details, refer to "1.4 Script Error" on page 20-4.

- **Do not write into the external device address.**

When it is written into an external device address in the while definition, a script error will occur.

6.2 Number of Devices That Can Be Used

The number of external device addresses that can be used in the script are as follows:

Item	Number of devices
Destination external devices	Max. 64 Devices
Source external devices	Max. 64 Devices

- For HG2G-S/-5S/-5F, HG3G/4G Grobal Script, the maximum number of source external device addresses which can be used as a trigger condition and in scripts executed as Grobal Script is 256.
- When the total number of write data to an external device address exceeds 64 in a single script while executing a script with MICRO/I, that script will be halted with an error.

6.3 Write delay

Since the writing process to the external device address is performed at the end of a script, it may not operate correctly due to a write delay.

Example where write delay occurs

```
[D 100] = 1000;
[D 200] = [D 100] + 5000;
```

Initial value of D100 is 0.

Since the write destination of 1000 in first line is the external device address, the value is not reflected immediately, and the value of D100 is still 0 when the second line is executed.

Therefore, the value where 5000 is added to 0 (value of D100) would be written to D200 in second line.

The value of D100 will be 1000 and the value of D200 will be 5000 when above script is executed.

There are 2 countermeasures for cases like this.

● Not using the device cache

Write delay does not occur when writing to the internal device, so the calculation is performed only in the internal device, and only the result will be written to the external device address.

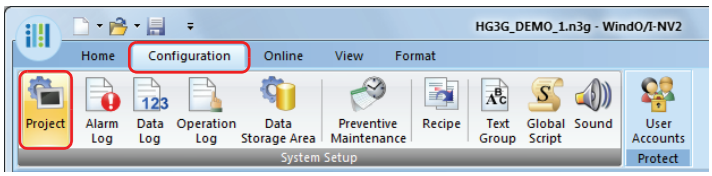
```
[LDR 0] = 1000;
[LDR 0] = [LDR 0] + 5000;
[D 200] = [LDR 0];
```

● Using the device cache

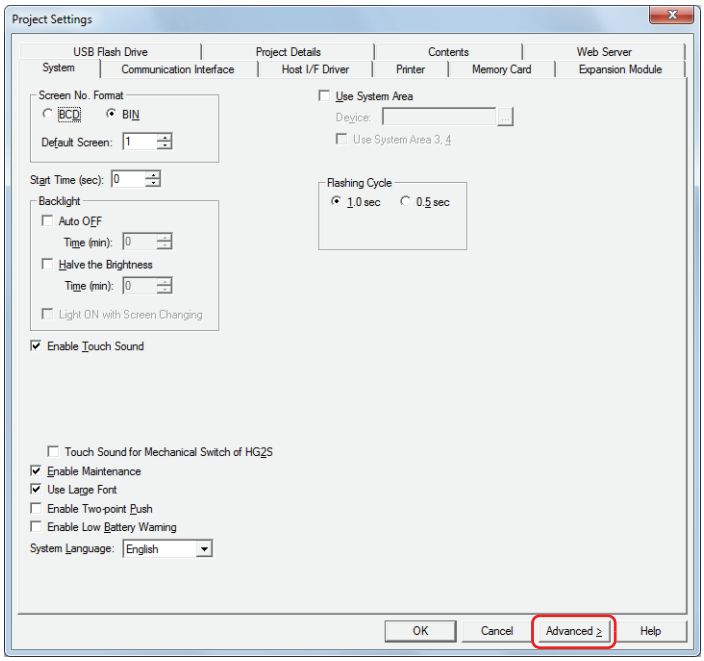
Problems with the write delay to the external device address can be avoided by caching the value of the external device address into the internal memory. To use the device cache, setup as follows in WindO/I-NV2.

1. On the **Configuration** tab, in the **System Setup** group, click **Project**.

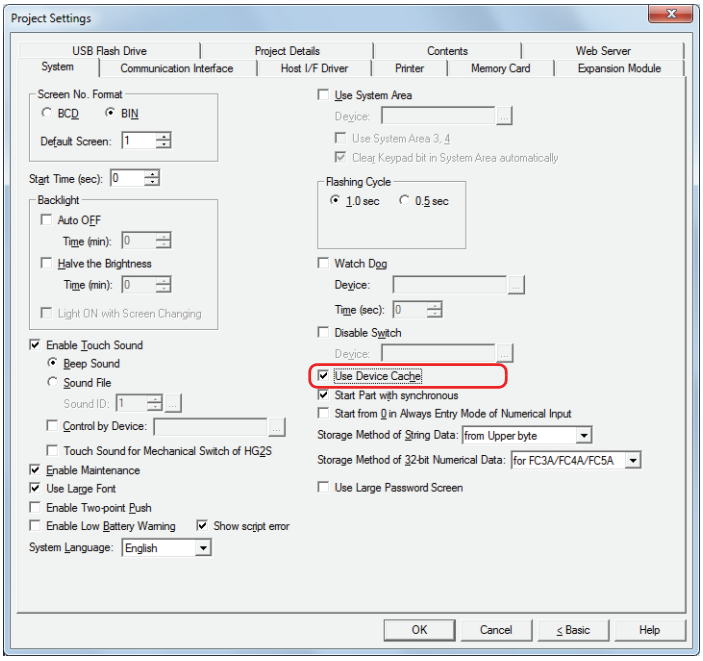
   The **Project Settings** dialog box is displayed.



2. In the **System** tab, click **Advanced** button.



3 Select the **Use Device Cache** check box.



4 Click **OK** button.

This setting will be applied not only to the script, but to the whole project.

6.4 About the Priority of the Operator

As a basic rule, operators are calculated in order from left of the line, but when multiple calculations are combined, they are calculated in following priority.

Priority	Operator
High	( )
	! ~ -(Negative number)
	* / %
	+ -(Subtraction)
	<< >>
	&
	^
	|
	< <= > >=
	== !=
	&&
	||
Low	=

Chapter 21 Sound Function

This chapter describes the setup for the sound function and related MICRO/I operations.

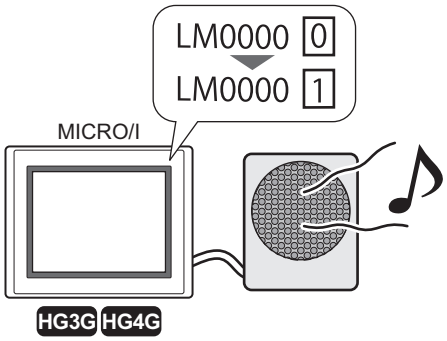
1 Function and Settings

HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

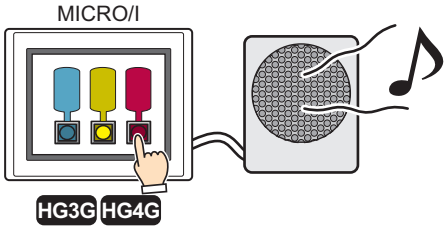
1.1 Overview - How the Sound Function is Used

MICRO/Is that have an audio interface (AUDIO OUT) can be connected to external speakers with built-in amplifiers and use the following functions.

- Play a sound file when an arbitrary Device Address changes to 1



- Play a sound file when the screen is pressed instead of a beep



1.2 Supported Sound Files

Sound files that meet the following specifications can be played with MICRO/I:

Item	Description
File format	WAVE file (*.WAV)
Data format	PCM
Sampling rate	8 kHz to 44.1 kHz
Quantization bit rate	16-bit
Audio type	Mono or stereo
File size	Max. 512 kB

2 Sound Function Configuration Procedure

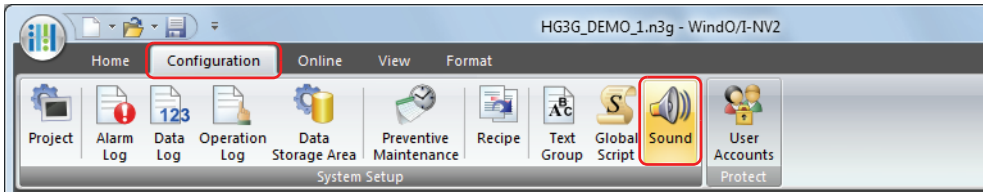
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Sound function.

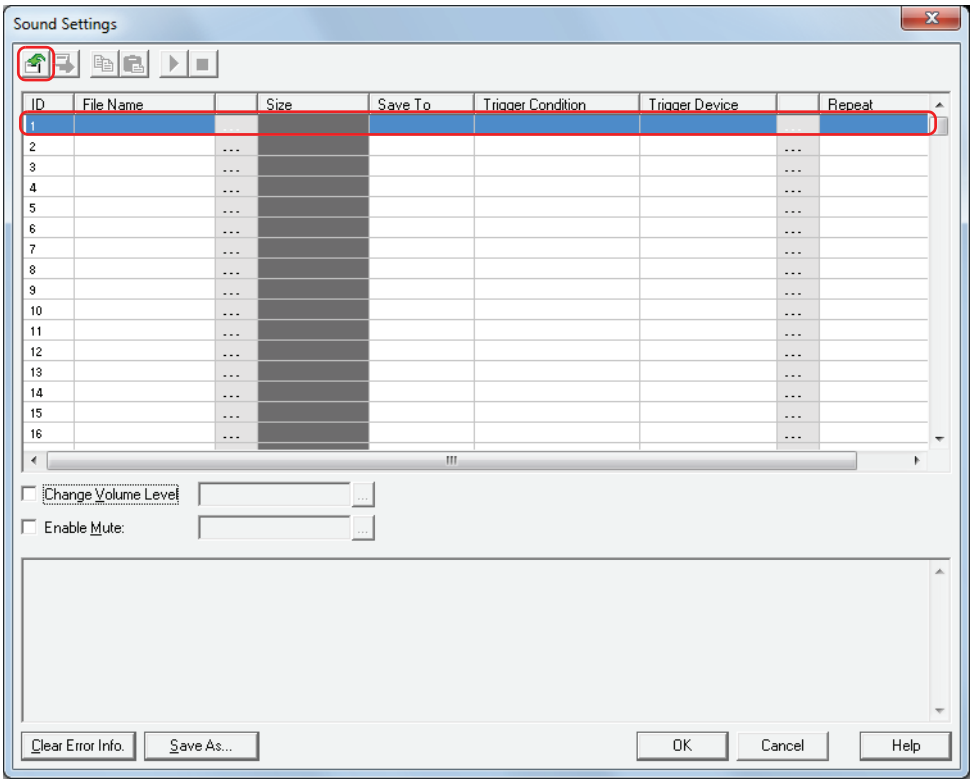
2.1 Configuring Sound Files & Trigger Conditions

● To play a sound file when a device value changes from 0 to 1

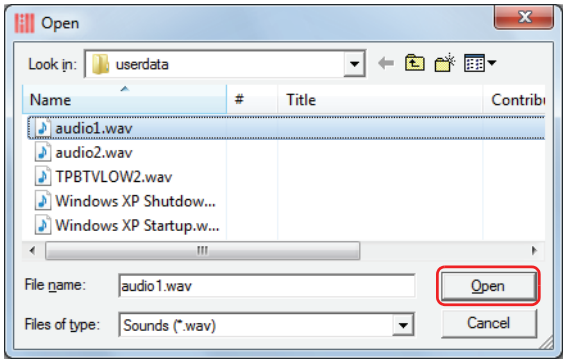
1 On the **Configuration** tab, in the **System Setup** group, click **Sound**.
The **Sound Settings** dialog box is displayed.



2 Select the ID's row to register the sound file to and click (import sound file).
The **Open** dialog box is displayed.



3 Specify the sound file to register and click **Open**.



4 Double click the cell under **Save To** and select the save destination for the sound file.

- **Int. Memory**
  Saves the sound file to internal memory.
- **Memory Card**
  Saves the sound file to memory card inserted in the MICRO/I.

> The procedures to write the sound file to the memory card are as follows.
> - On the **Home** tab, click the arrow under **Download**, and click **Project Data** to display the **Download** dialog box. Select the **Download Sound Files to Memory Card** check box and click **OK**.
> - On the **Home** tab, click the arrow under **Download**, and click **Data to Memory Card** to display the **Open** dialog box. Specify a sound file and click **Open**.

5 Double click the cell under **Trigger Condition** and select **Device Address**.

6 Specify the device address that will trigger playing the sound file in **Trigger Device**.

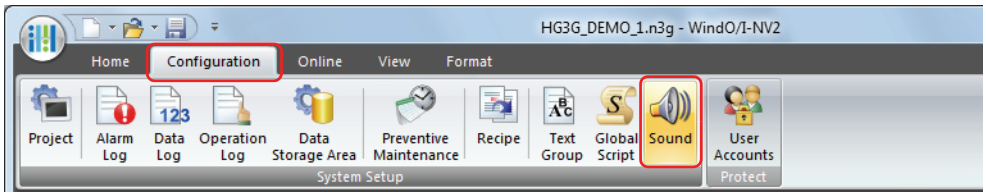
Double click the cell under **Trigger Device** or click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

7 Configure **Repeat**, **Change Volume Level**, and any other options, and then click **OK**.

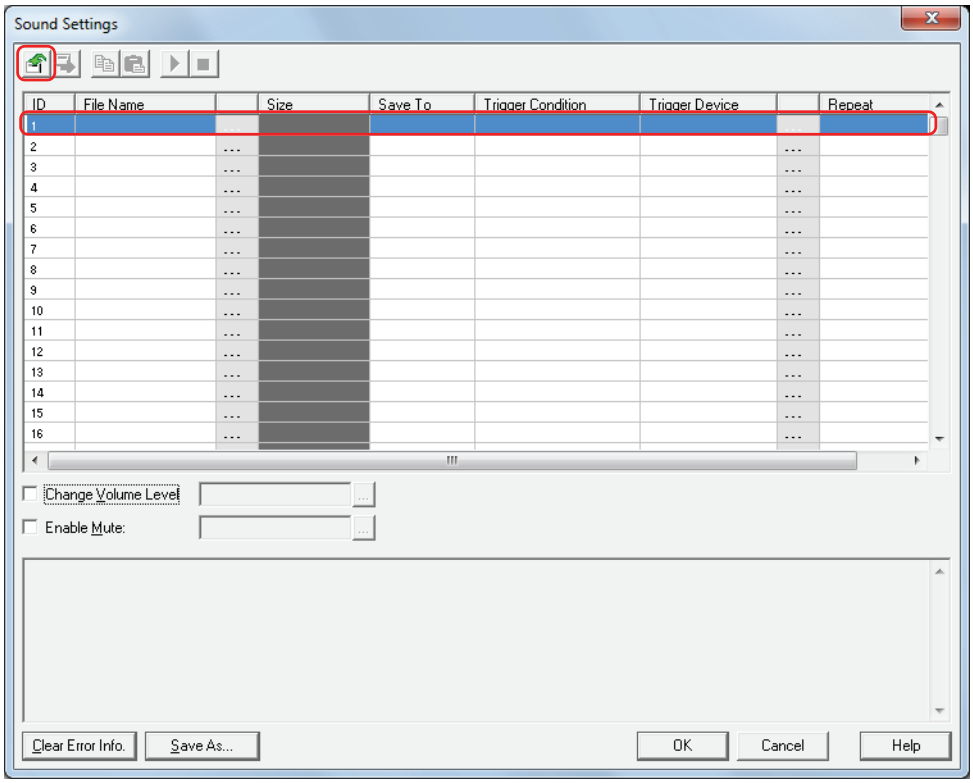
The **Sound Settings** dialog box closes.
This concludes the configuration to play a sound file when a device changes to 1.

● To play a sound file as a touch sound instead of a beep.

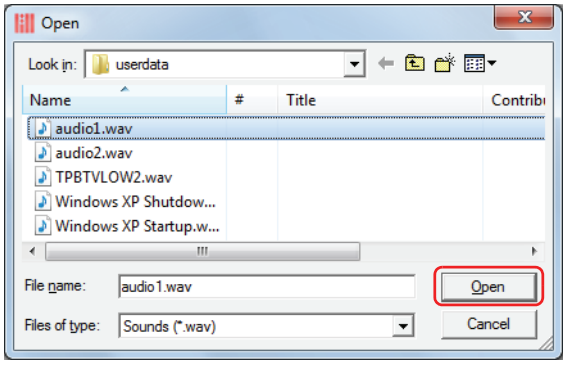
1 On the **Configuration** tab, in the **System Setup** group, click **Sound**.
The **Sound Settings** dialog box is displayed.



2 Select the ID's row to register the sound file to and click (import sound file).
The **Open** dialog box is displayed.



3 Specify the sound file to register and click **Open**.



4 Double click the cell under **Save To** and select the save destination for the sound file.

- **Int. Memory**
  Saves the sound file to internal memory.
- **Memory Card**
  Saves the sound file to memory card inserted in the MICRO/I.

The procedures to write the sound file to the memory card are as follows.

- On the **Home** tab, click the arrow under **Download**, and click **Project Data** to display the **Download** dialog box. Select the **Download Sound Files to Memory Card** check box and click **OK**.
- On the **Home** tab, click the arrow under **Download**, and click **Data to Memory Card** to display the **Open** dialog box. Specify a sound file and click **Open**.

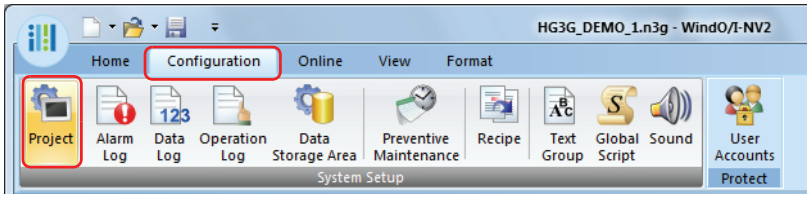
5 Double click the cell under **Trigger Condition** and select **None**.

6 Click **OK**.

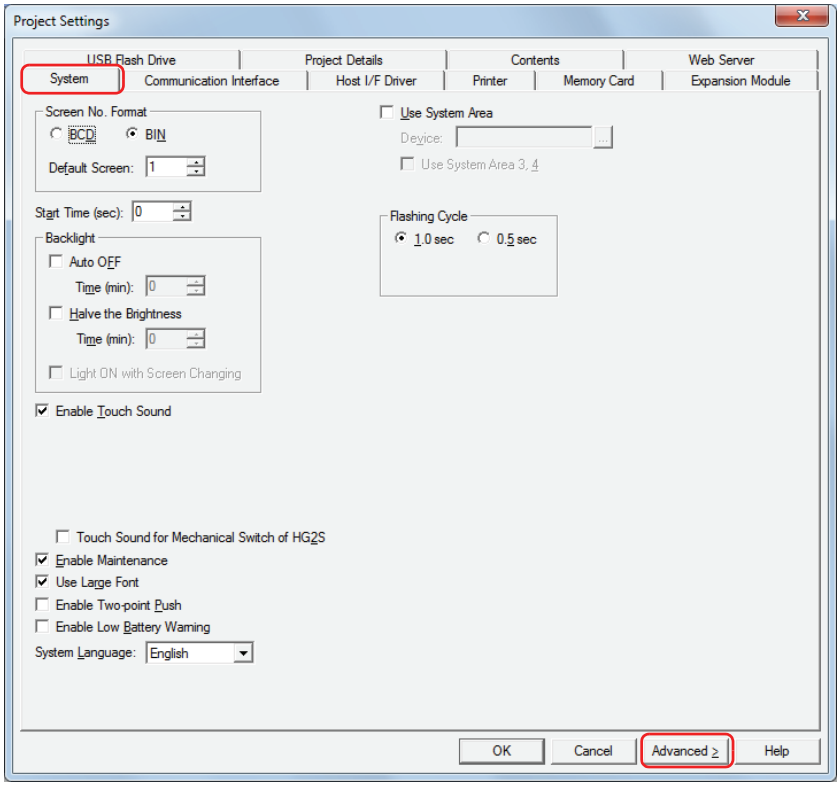
The **Sound Settings** dialog box closes.

7 On the **Configuration** tab, in the **System Setup** group, click **Project**.

The **Project Settings** dialog box is displayed.



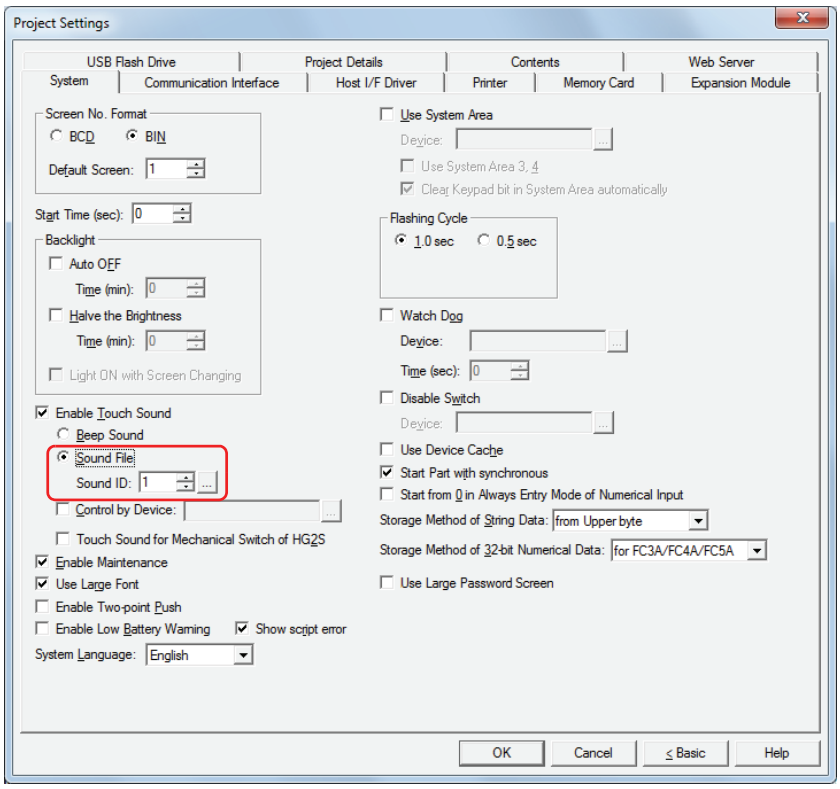
8 Select the **System** tab, and click on the **Advanced >/< Basic** button so that **< Basic** is showing.



9 Select the **Enable Touch Sound** check box.

10 Select **Sound File** and specify the ID of the sound file to play in **Sound ID**.

Enter a sound ID number or click ... to specify the sound ID number with the displayed **Sound Settings** dialog box.



11 Click the **OK** button.

The **Sound Settings** dialog box closes.

This concludes the configuration to play a sound file as the touch sound.

3 Sound Settings Dialog Box

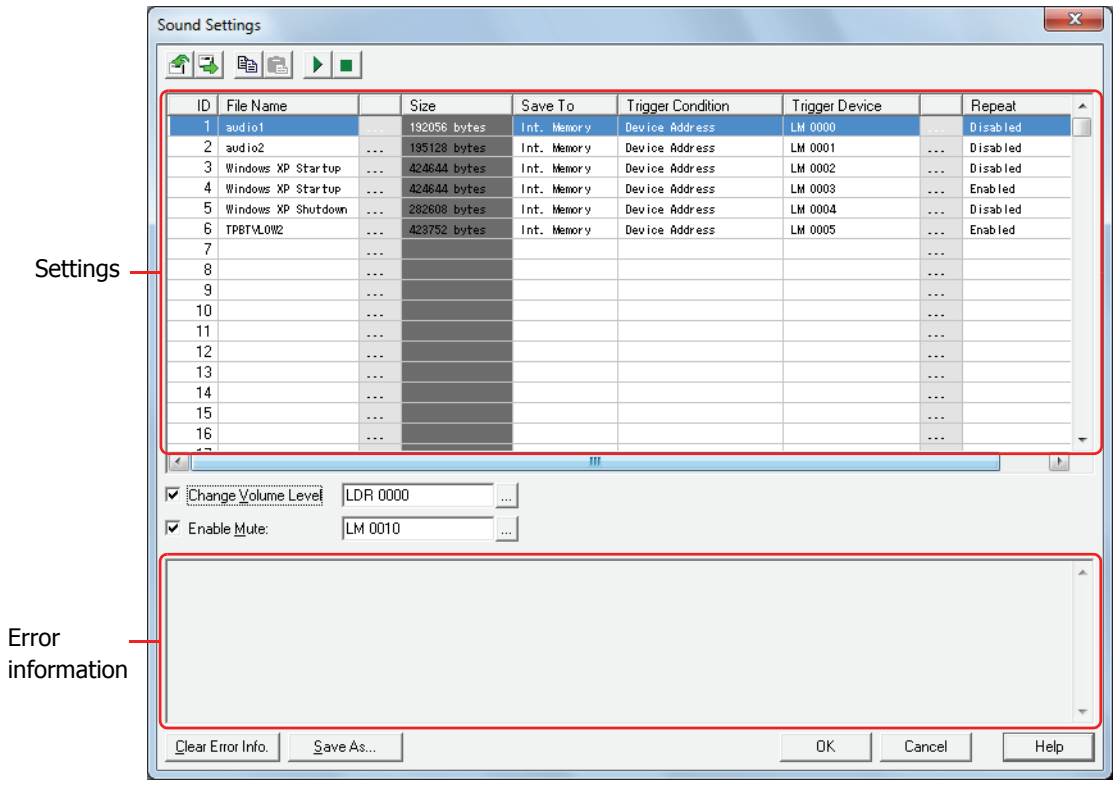
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons in the **Sound Settings** dialog box.

3.1 Sound Settings Dialog Box

All the sound files used with the MICRO/I and their trigger conditions are managed in the **Sound Settings** dialog box.

For HG special registers and HG special relays related to the sound function, refer to Chapter 32 "Internal Devices" on page 32-1.



- **(Sound file import)**
  Assigns a sound file to the selected ID.

- **(Sound file export)**
  Exports the selected ID's sound file.

- **(Copy)**
  Select an ID's row and click the button to copy the contents of that row to the clipboard.

- **(Paste)**
  Select an ID's row and click the button to paste the contents of the clipboard to that row.

- **(Sound file play)**
  Select an ID's row and click the button to play that row's sound file.

- **(Sound file stop)**
  Stops playing the sound file.

■ **Settings**

Displays a list of the settings for sound files used by MICRO/I.

ID: Shows the sound ID (1 to 1024) of the sound file to play.

When a sound file has been assigned, you can change the ID by clicking the cell.

File Name: Shows the sound file name that was set with ... .

Click the ... button to display the **Open** dialog box. Then specify a sound file with the **Open** dialog box.

The operating procedure is the same as when the button is clicked.

Size: Shows the size of the sound file displayed in **File Name**.

Save To: Select the location to save the sound file to as **Int. Memory** or **Memory Card**.

Double click the cell to change.

Trigger Condition: Select **Device Address** or **None** for the condition to play the sound file.

Double click the cell to change.

Use trigger device: Plays the sound file according to the Device Address's value.

None: Select when playing a sound file as a touch sound.

Trigger Device: When **Trigger Condition** is **Device Address**, specify the Device Address that will be used as the condition to play the sound file.

Double click on the cell or click ... to specify the address on the displayed **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The address cannot be specified when **Trigger Condition** is **None**.

The maximum number of Host Devices that can be used as trigger devices is 128. However, when the bits of a word device are specified, if those bits are in the same word device, it counts as one device even when multiple bits are used.

Repeat: Specifies whether the sound is repeated or not.

Enable: Repeat playing the sound until the trigger condition is no longer satisfied.

Disable: Play the sound only once.

■ **Change Volume Level**

Adjust the volume (0 to 31) of the sound file played by the MICRO/I.

The volume changes according to the value of the specified Device Address.

The sound is muted when the Device Address value is 0, and the volume is maximum when the value is 31 or out of range.

Enter the Device Address in the text box or click ... to specify the address in the displayed **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Enable Mute**

Mute the volume of the sound file played by the MICRO/I.

When the value of the specified Device Address is 1, the sound is muted.

When the sound is muted while a sound file is playing, it continues playing without making a sound.

Enter the Device Address in the text box or click ... to specify the address in the displayed **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Error information**

Displays error information when sound settings are invalid.

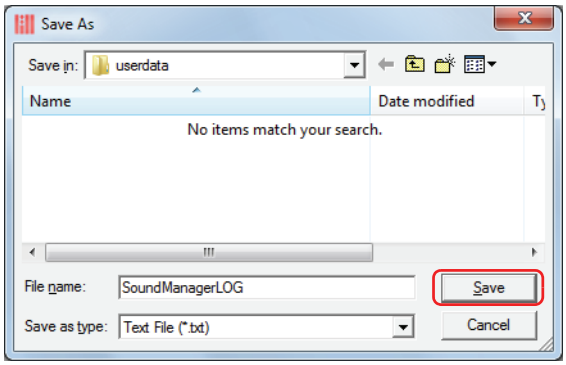
■ **Clear Error Info. button**

Click to clear the error information.

■ **Save As button**

Saves error information to a text file (.txt).

Click to display the **Save As** dialog box. Specify the save location and file name, then click the **Save** button.



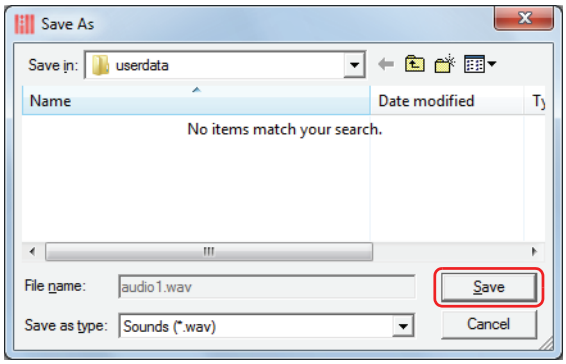
● Exporting sound files

To use the sound files used in one project with in another project, export the sound files.

1. Select the row of the ID for the sound file to export and click the button.

   The **Save As** dialog box is displayed.

2. Specify **Save in** and click the **Save** button.



The sound file is exported using the current file name.

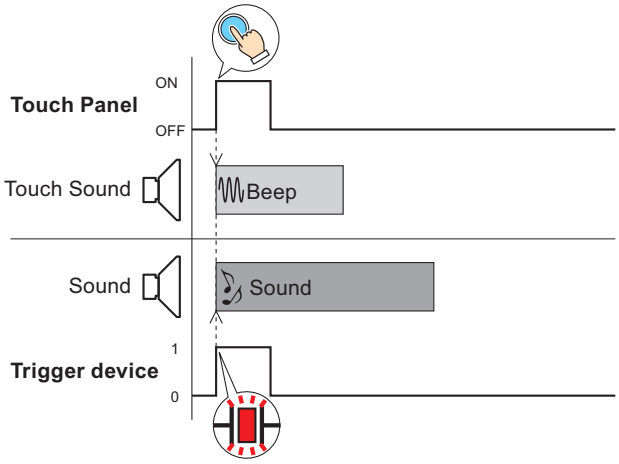
4 Operation

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The MICRO/I only plays a single sound file at a time. It cannot simultaneously play multiple sound files. Therefore, if multiple trigger devices simultaneously change to 1 or if a sound file is set as the touch sound, the sound file played changes according to the trigger conditions.

■ Touch sound (beep) and sound file by trigger device

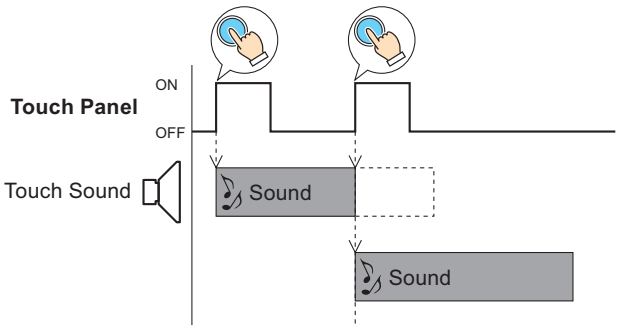
The touch sound's beep and a sound file can be played simultaneously.



■ When touch panel is touched twice (before sound from first touch has finished playing)

For the same touch sound file, the one played later has priority.

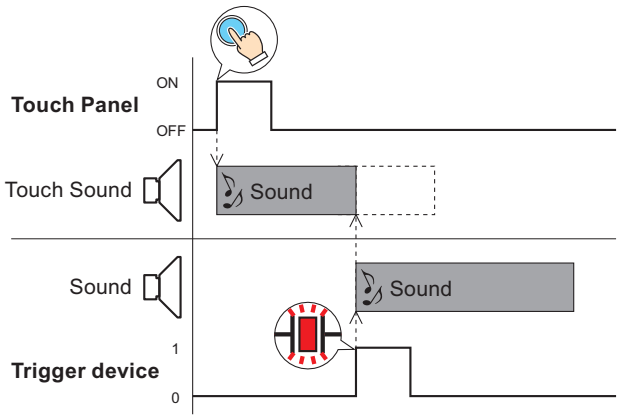
If the touch panel is pressed twice (before the sound has finished playing from the first touch), playback of the sound file stops and the same sound file plays again from the beginning.



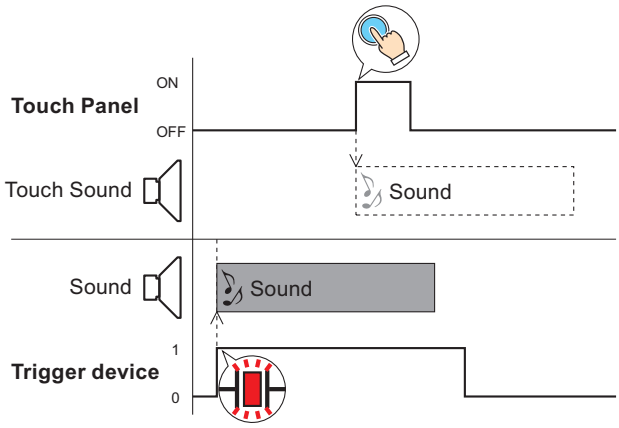
Touch sound (sound file) and sound file by trigger device

When both a touch sound file and sound file set by the trigger device are programmed, the sound file set by the trigger device is given priority.

- As soon as the touch panel is pressed the sound file is played. However, if the trigger device changes to 1, the touch sound file stops and the trigger device sound file plays.



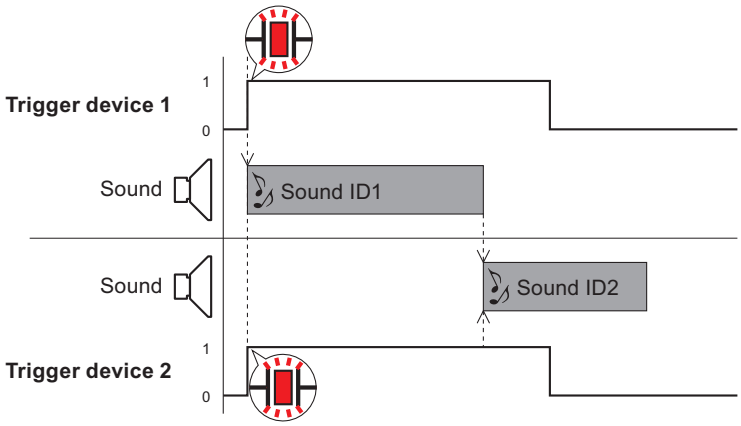
- If a sound file is playing because it was turned on by a trigger device, the touch sound file will not play even if the touch panel is pressed.



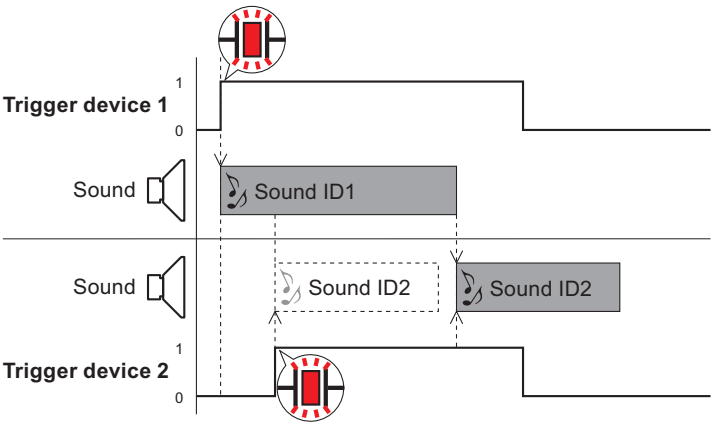
Sound file set by 2 triggering devices

For sound files set by trigger devices, the one played first has priority. If both change to 1 simultaneously, the smaller sound ID has priority.

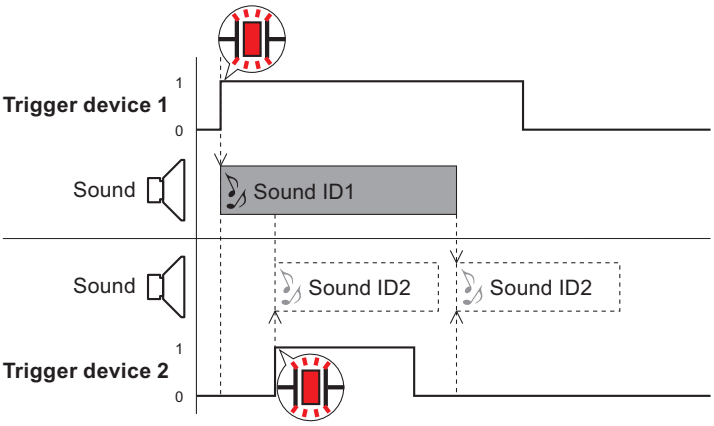
- When multiple trigger devices change to 1 simultaneously, the smaller sound ID has priority and the sound files play in order.
  For example, when playing sound ID1 when trigger device 1 is 1 and sound ID2 when trigger device 2 is 1, if trigger device 1 and trigger device 2 change to 1 simultaneously, sound ID1 playback starts and after it finishes, if trigger device 2 is 1, sound ID2 playback starts.



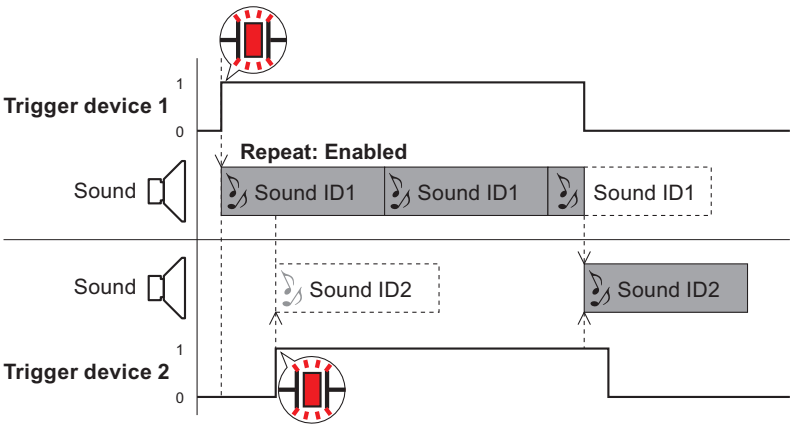
- While a sound file is playing, the sound ID for the trigger device that changed to 1 is put into a queue for playback. For example, when playing sound ID1 when trigger device 1 is 1 and sound ID2 when trigger device 2 is 1, if trigger device 2 changes to 1 while sound ID1 is playing, then sound ID2 playback starts if trigger device 2 is 1 when sound ID1 finishes playing.



However, if the trigger device for sound ID2 is 0 when sound ID1 finishes playing, sound ID2 does not play.



- When the sound ID currently playing is set to **Repeat: Enabled**, no other sound IDs will play until the trigger condition for this sound ID is no longer satisfied.
  For example, when playing sound ID1 when trigger device 1 is 1 and sound ID2 when trigger device 2 is 1, even if sound ID2's trigger device changes to 1 while sound ID1 is set to **Repeat: Enabled** and repeatedly playing, sound ID1 playback continues. When sound ID1's trigger device changes to 0, sound ID2 playback starts if trigger device 2 is 1.



Chapter 22 Multimedia Function

This chapter describes how to register and play movie files played on the Video Display, how to save video and audio to the memory card before and after an event occurs, how to play saved video and audio, and how to configure the video input.

This function is only supported by models that are equipped with a video interface.

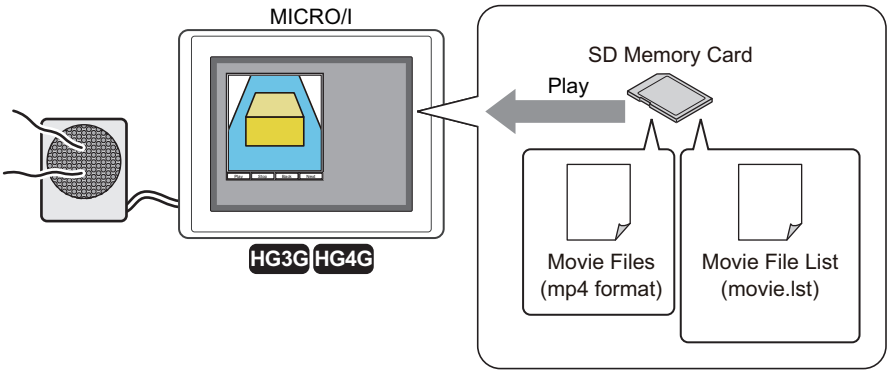
1 Function and Settings

HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

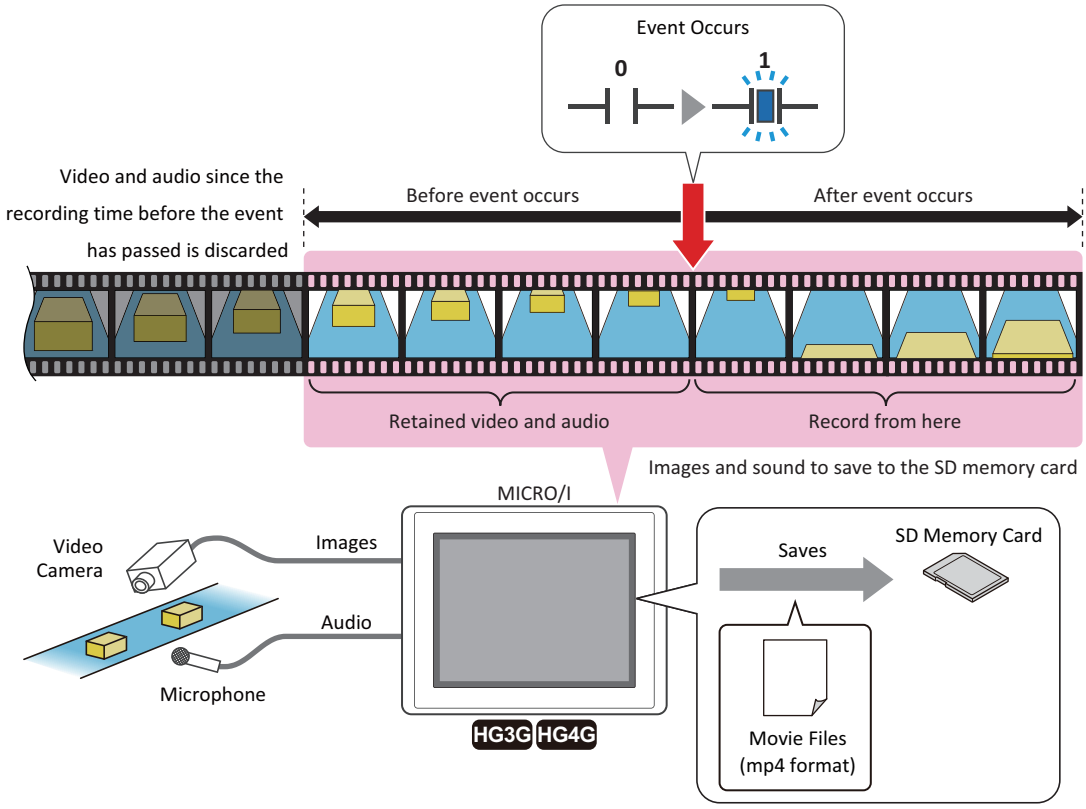
1.1 How the Multimedia Function is Used

With its built-in video interface (VIDEO IN/OUT) and audio interface (AUDIO IN/OUT), a video camera or microphone can be connected to the MICRO/I and used in the following ways.

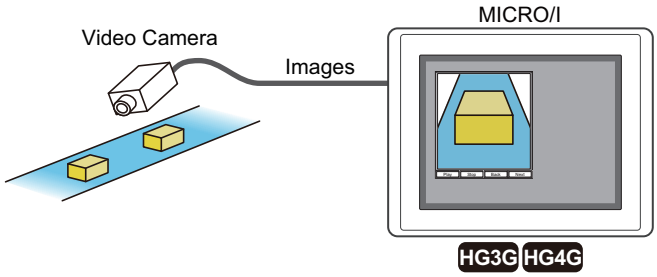
- Register movie files to play with the MICRO/I and play the movie files on the Video Display



- Save video camera images and microphone audio to the memory card before and after an event occurs.



- Configure the video input for the device connected to the MICRO/I



- The MICRO/I can play movie files, display video, and output audio using the Video Display.
  ☞ Chapter 10 "4 Video Display" on page 10-56
- The MICRO/I can record and play video and audio using the key buttons.
  ☞ Chapter 8 "Recording Images and Sound" on page 8-91
  ☞ Chapter 8 "Playing Recorded Images and Sound" on page 8-94

1.2 Supported Movie Files

Movie files that meet the following specifications can be played with the MICRO/I:

Item	Description
File format	MP4 file (.mp4)
Movie	MPEG-4 Simple Profile
Audio	AAC-LC (Bit rate 32 kbps or less recommended)
Frame rate	30 fps or less (15 fps or less recommended)
Resolution	720 x 480 dots or less (640 x 480 dots or less recommended)
File size	64 Mbyte or less (32 Mbyte or less recommended)

The MICRO/I may not be able to play the formats above correctly depending on the minimum system requirements. In this situation, shrink the size of the file by lowering the frame rate or the resolution of the file or by lowering the bit rate of the audio. If audio is unnecessary, set to a file without sound.

2 Multimedia Function Configuration Procedure

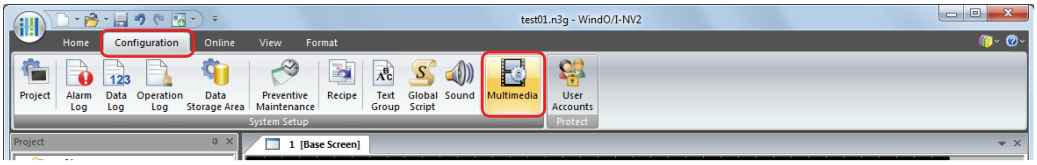
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Multimedia function.

2.1 Registering Movie Files

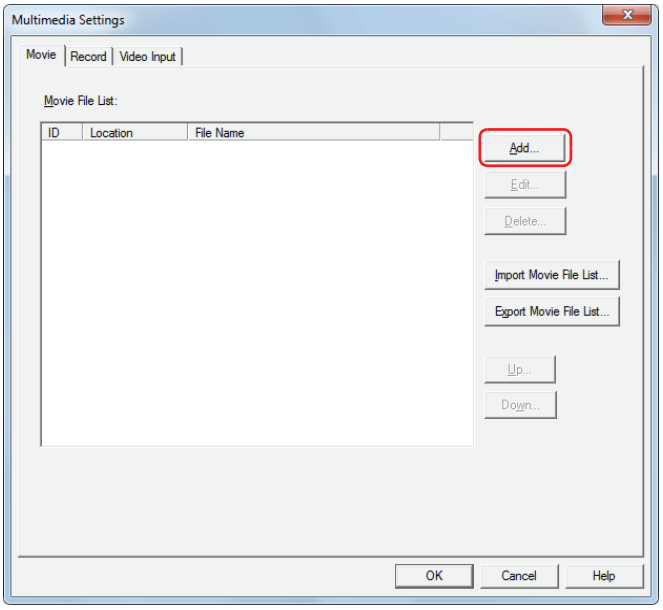
1 On the **Configuration** tab, in the **System Setup** group, click **Multimedia**.

The **Multimedia Settings** dialog box is displayed.



2 Click **Add** on the **Movie** tab.

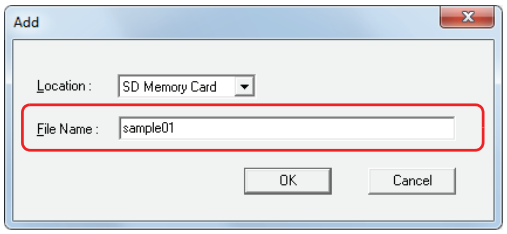
The **Add** dialog box is displayed.



3 Enter the file path of the movie file to register in **File Name**.

The maximum number is 248 alphanumeric characters.

Example: When specifying the movie file "sample01.mp4" that has been saved to the "MOVIE" folder in the memory card folder "HGDATA01"
Enter "sample01".



4 Click **OK**.

You are returned to the **Multimedia Settings** dialog box.

5 Repeat steps *2* through *4* to add all the movie files to play (1 to 64).

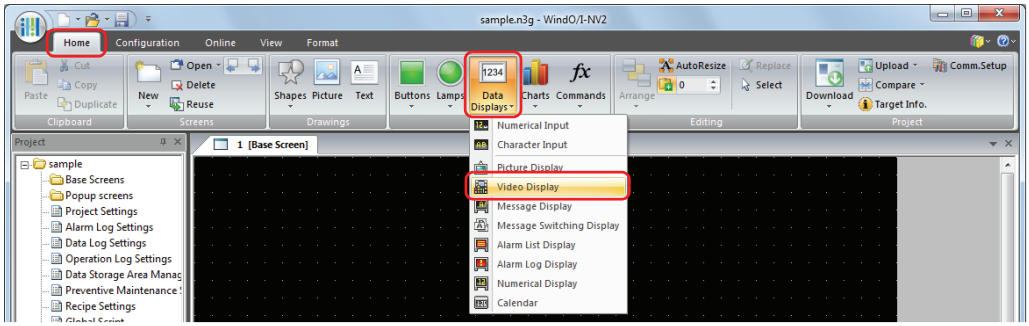
6 Click **OK**.

The **Multimedia Settings** dialog box closes.

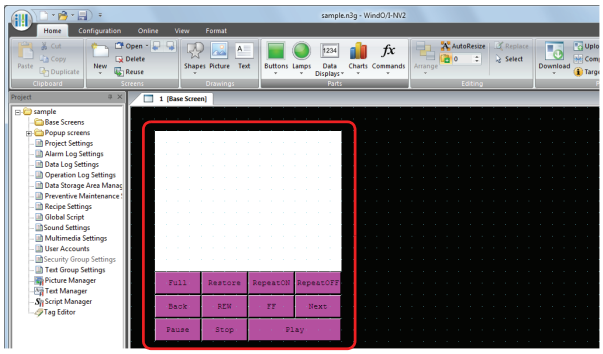
This concludes the configuration to register movie files.

● Playing a Movie File List on the Video Display

1. Following the procedure in "2.1 Registering Movie Files" on page 22-3, register the movie files to play on the Video Display.
2. On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Video Display**.

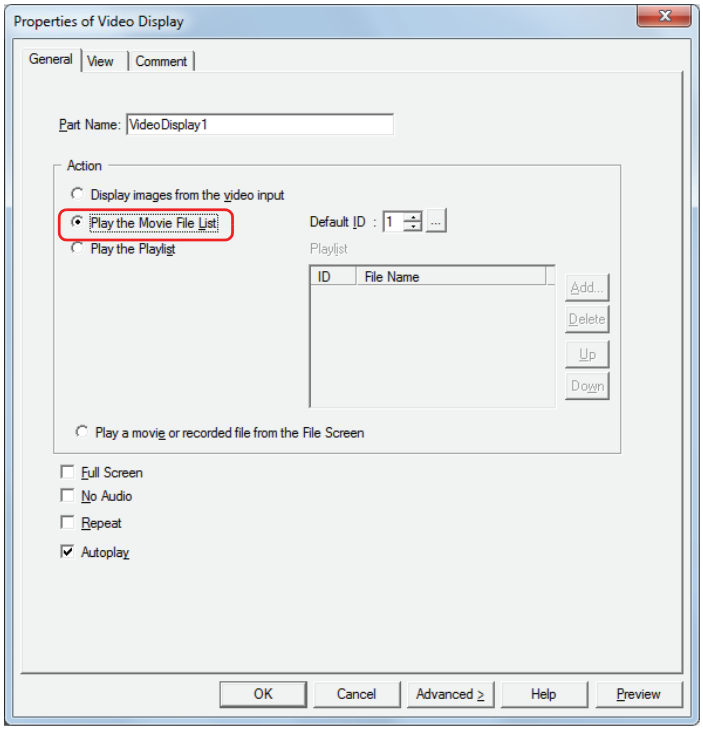


3. Click a point on the edit screen where you wish to place the Video Display.
4. Double-click the dropped Video Display and the Properties dialog box is displayed.



5. On the **General** tab, under **Source**, select **Media File List**.

   This option plays all the movies registered in **Movie File List** in the **Multimedia Settings** dialog box.



6 In **Default ID**, specify the ID number (1 to 64) of the movie file to play when the Play button is pressed.

Click ... to display the **Multimedia Settings** dialog box. Select the ID number from the movie file list. The movie files registered in the movie file list are played in order from the specified ID number.

7 Click **OK**.

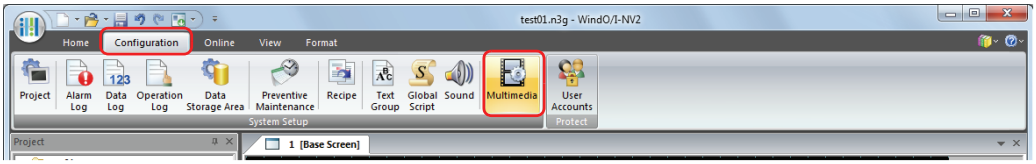
The Properties of Video Display dialog box closes.

This concludes the configuration to play a movie file list on the Video Display.

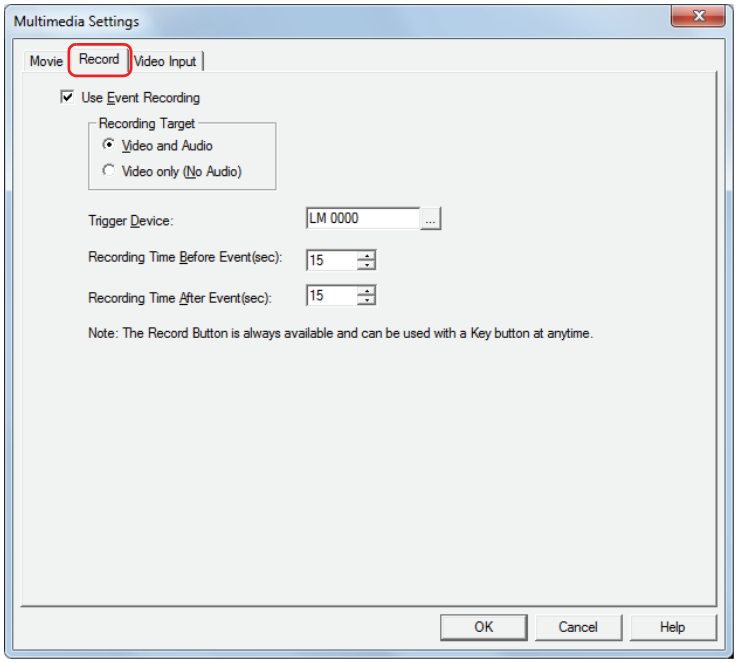
2.2 Configuring the Event Recording Function

1 On the **Configuration** tab, in the **System Setup** group, click **Multimedia**.

The **Multimedia Settings** dialog box is displayed.



2 Click the **Record** tab.



3 Select the **Use Event Recording** check box.

4 Select **Video and Audio** or **Video only (No Audio)** as the target to record out of the signals input from the device.

5 Specify the bit device that will trigger the start of recording in **Trigger Device**.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

6 Specify the recording time before and after the event occurs.

- **Recording Time Before Event(sec)**
  With the point in time when the trigger device value changes from 0 to 1 as the start point, this setting specifies how many seconds to record before the start point (1 to 15 sec.).

- **Recording Time After Event(sec)**
  Specifies the time (1 to 15 sec.) until recording stops from when the trigger device changed from 0 to 1.

7 Click **OK**.

The **Multimedia Settings** dialog box closes.

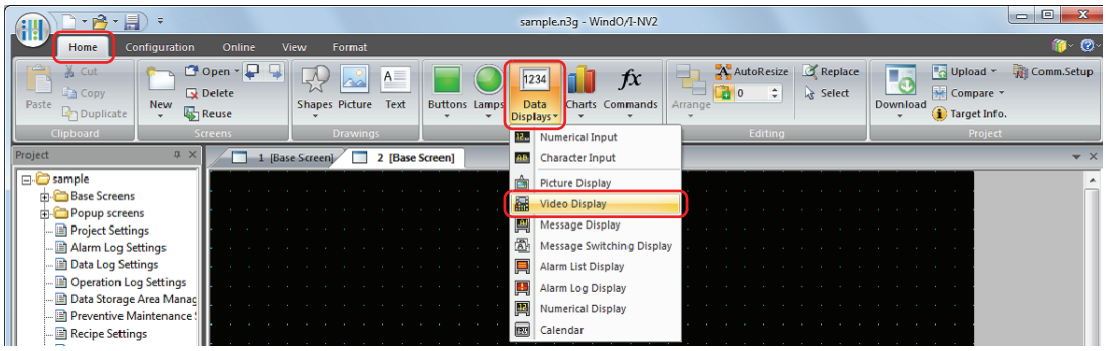
This concludes configuring the Record function.

● Playing Images Recorded with the Event Recording Function

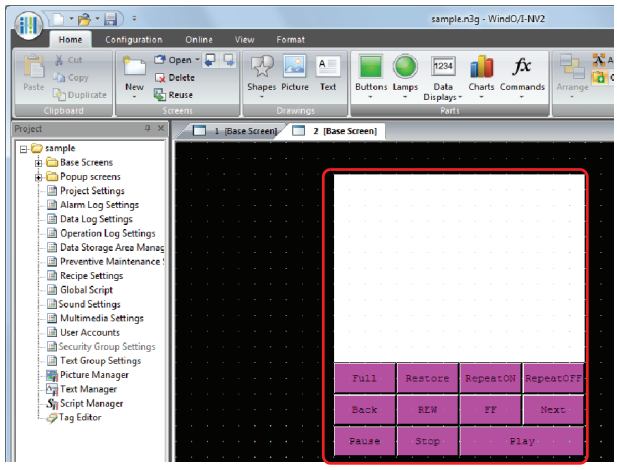
Play the recorded movie file on the Video Display.

Configuration Procedure

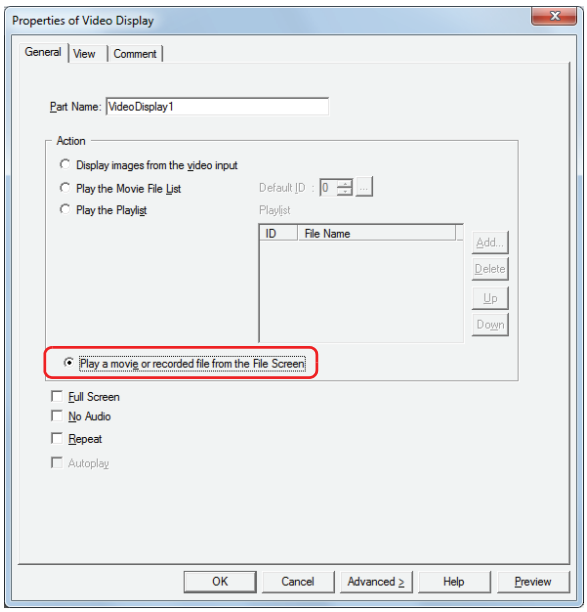
1. Create the Video Display to play the recorded images.
   On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Video Display**.



2. Click a point on the edit screen where you wish to place the Video Display.
3. Double-click the dropped Video Display and the Properties dialog box is displayed.



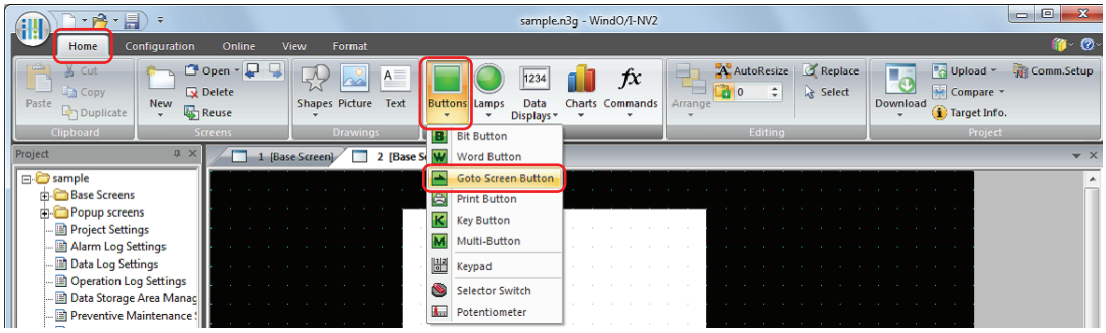
4. On the **General** tab, under **Action**, select **Play a movie or recorded file from the File Screen**.
   This option selects and plays movie files using the File Screen.



5 Click **OK**.

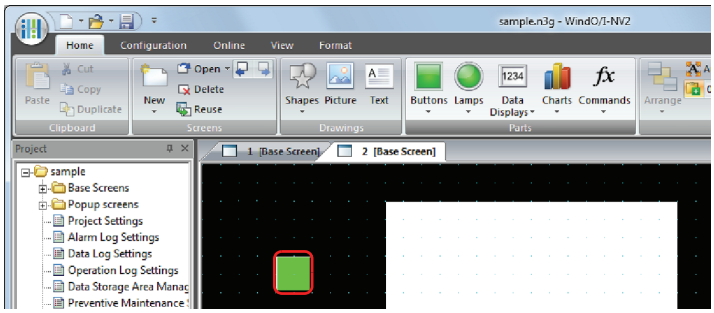
The Properties of Video Display dialog box closes.

6 Create a button to open the screen to select a recorded images.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.

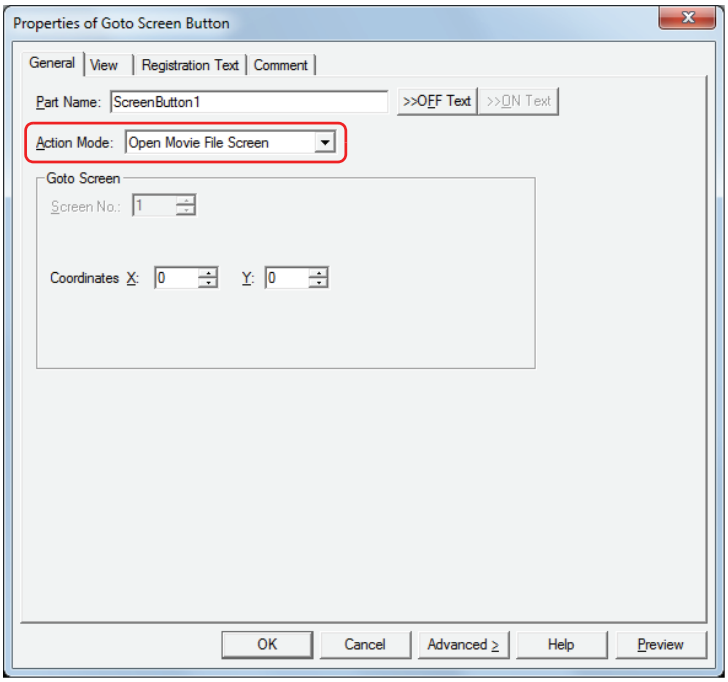


7 Click a point on the edit screen where you wish to place the Goto Screen Button.

8 Double-click the dropped Goto Screen Button and a Properties dialog box will be displayed.



9 Select **Open Movie File Screen** for **Action Mode**.



10 Specify the display location in coordinates for the movie file screen to open above the base screen with **Coordinates X, Y**.

With the upper-left corner of the screen as the origin, the upper-left corner of the window is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

11 Click **OK**.

Close the Properties of Goto Screen Button dialog box.
This concludes configuring playback of recorded images.

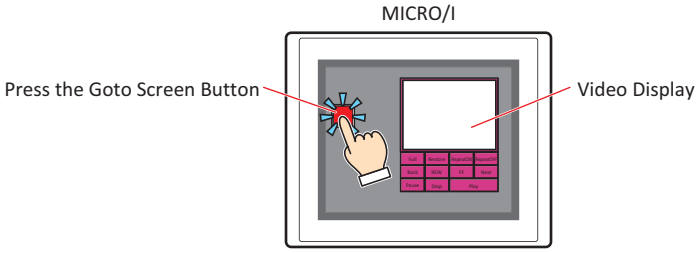
Operating Procedure

To play sound, the MICRO/I must be connected to speakers.

This section describes the example of playing the movie file "123000.mp4" located in the "20110313" folder under the "RECORD" folder when the memory card folder is "HGDATA01".

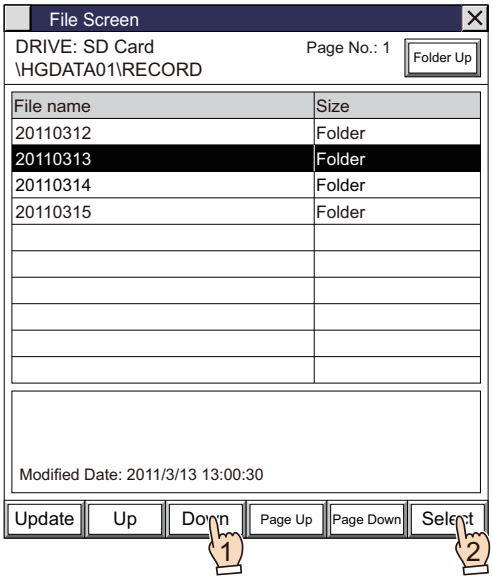
1 Press the Goto Screen Button set to **Open Movie File Screen**.

The File Screen is displayed.



2 Select the folder with the date of the recorded images.

Press **Down** to select "20110313" and then press **Select**.
The contents of the "20110313" folder will be displayed.

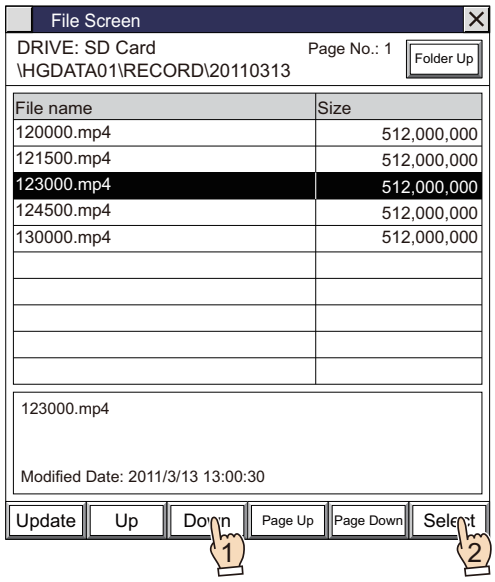


Once the File Screen is opened, the "RECORD" folder in the Memory Card Folder will be displayed.
If the "RECORD" folder does not exist, the Memory Card Folder will be displayed.

3 Select a movie file.

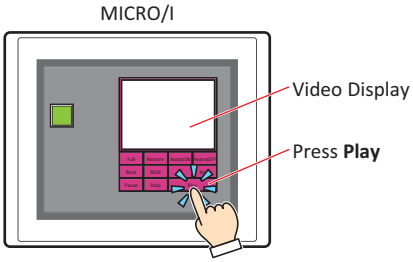
Press **Down** to select "123000.mp4" and then press **Select**.

The movie file will be selected and the File Screen will close.



4 Press **Play** on the Video Display.

The movie file is played.

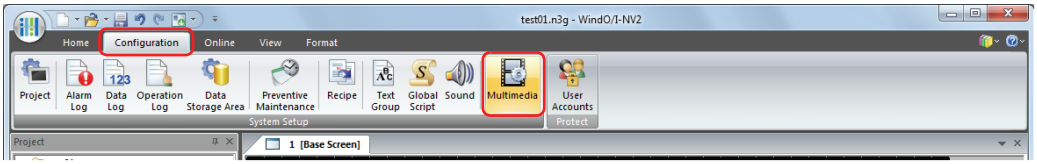


While data is being recorded after an event occurs with the event recording function, while data is being recorded with parts, and while data is being saved to the memory card, movie files cannot be played. While data is recording after an event occurs and while data is being saved to the memory card, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

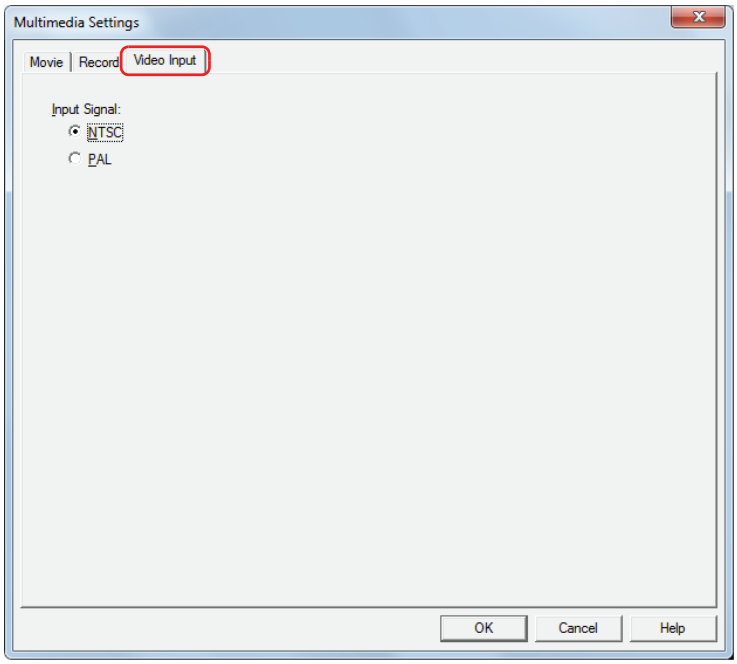
2.3 Configuring the Video Input

1 On the **Configuration** tab, in the **System Setup** group, click **Multimedia**.

The **Multimedia Settings** dialog box is displayed.



2 Click the **Video Input** tab.



3 Select **NTSC** or **PAL** for the signal standard of the device connected to the MICRO/I.

The adopted format for the signal standard differs according to the country or region.
NTSC: Japan, Korea, Taiwan, North America, Central America, South America, others
PAL: Europe, China, the Middle East, South East Asia, others

4 Click **OK**.

The **Multimedia Settings** dialog box closes.
This concludes configuring the video input.

3 Multimedia Settings Dialog Box

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

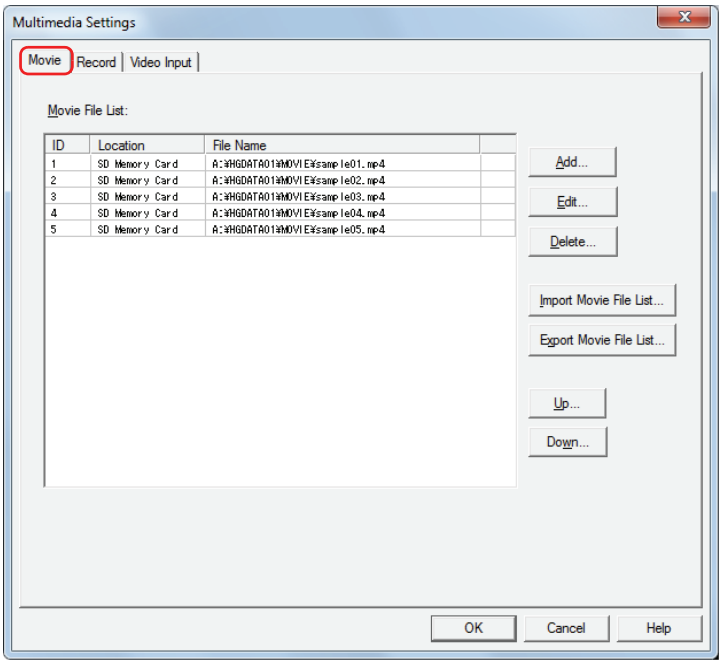
This section describes items and buttons on the **Multimedia Settings** dialog box.

3.1 Multimedia Settings Dialog Box

● **Movie** tab

Create and edit a list of movie files to be used with project data.

Based on the contents that have been set a movie file list, "movie.lst", is automatically created in the root folder of the Memory Card.



■ **Movie File List:**

Displays a list of movie files to be used with project data.

ID:	Displays the movie file list ID.
Location:	Displays the saved path movie file. Displays as SD Card.
File Name:	Displays the file path of the movie file.

■ **Add**

Adds a movie file (1 to 64 files) to the movie file list.

Click this button to display the **Add** dialog box. Enter the file path of the movie file that will be added using the **Add** dialog box. For details, refer to "Add dialog box and Edit dialog box" on page 22-13.

■ **Edit**

Changes movie files on the movie file list.

Click this button to display the **Edit** dialog box. Change the file path of the movie file using the **Edit** dialog box. For details, refer to "Add dialog box and Edit dialog box" on page 22-13.

■ **Delete**

Deletes movie files from the movie file list.

Select a movie file from the movie file list and then click this button.

Even if the file path of a movie file is deleted from the movie file list, the movie file itself will not be deleted.

■ **Import Movie File List**

Imports an exported movie file list.

Existing movie file lists will be overwritten.

■ **Export Movie File List**

Exports a movie file list with the file name "movie.lst".

■ **Up**

Shifts the selected movie file upward on this list.

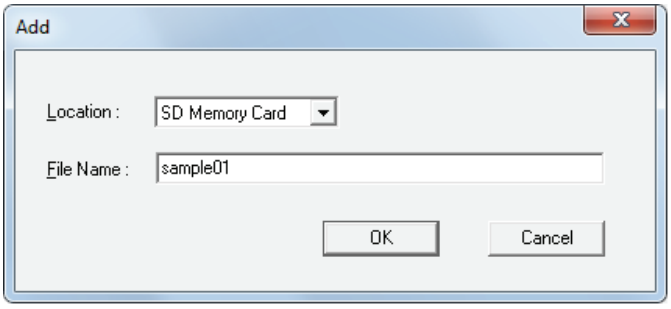
■ **Down**

Shifts the selected movie file downward on this list.

Add dialog box and **Edit** dialog box

In the **Add** dialog box, the file path for a movie file is added to the movie file list.

In the **Edit** dialog box, movie file paths that were added to the movie file list can be changed.



Location: Displays SD Memory Card.

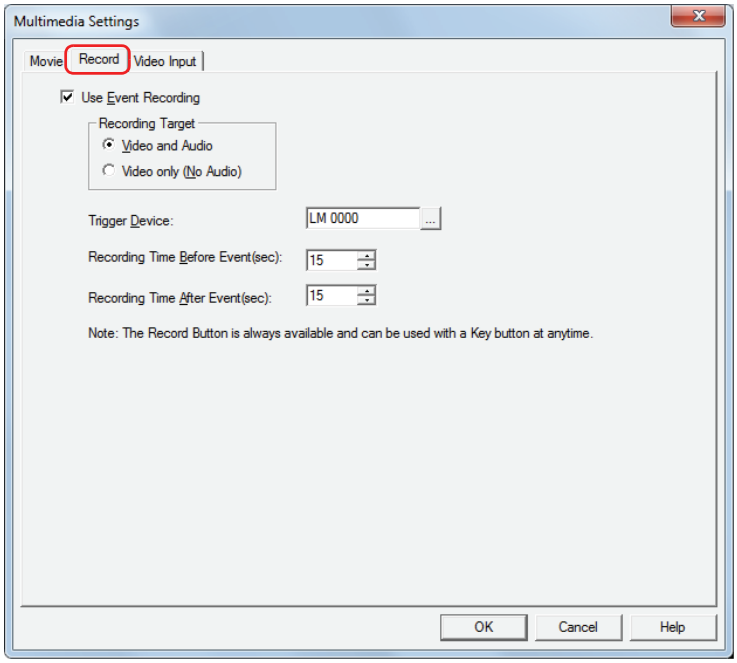
File Name: Enter the file path of the movie file that will be added or changed. Maximum number is 248 alphanumeric characters.

To specify a movie file saved in the "MOVIE" folder in the memory card folder configured on the **Memory Card** tab in the **Project Settings** dialog box, only enter the file name.

Example: When the name of the memory card folder is "HGDATA01"
Enter "sample01" and the file name is:
A:\HGDATA01\MOVIE\sample01.mp4

- If you enter a backslash (\) and folder name, a folder is specified.
- Example: Enter "\temp\sample01" and the file name is:
  A:\temp\sample01.mp4

● **Record** Tab



■ **Use Event Recording**

Select this check box to use the event recording function.

The event recording function has the MICRO/I monitor the state of a trigger device. When the device value changes from 0 to 1 (when an event occurs), the function records the video and audio before and after the event.

■ **Recording Target**

Select the target to record out of the signals input from the device.

Video and Audio:	Records images and sound.
Video only (No Audio):	Records images only.

■ **Trigger Device**

Specifies the bit device that will trigger the start of recording. This option can only be set when **Use Event Recording** is selected.

Click ... to display the **Device Address Settings** dialog box. For details, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

■ **Recording Time Before Event (sec)**

Specifies the amount of time (1 to 15 sec.) to record before the trigger device value changes from 0 to 1. This option can only be set when **Use Event Recording** is selected.

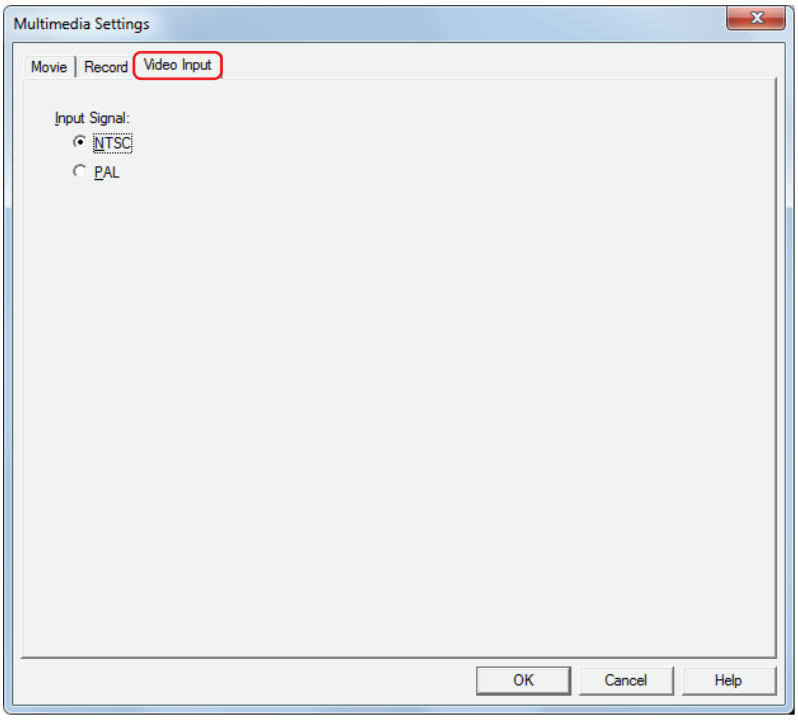
■ **Recording Time After Event (sec)**

Specifies the amount of time (1 to 15 sec.) to record after the trigger device value changes from 0 to 1. This option can only be set when **Use Event Recording** is selected.

While data is being recorded after an event occurs with the event recording function and while recorded data is being saved to the memory card, data cannot be recorded with parts and movie files cannot be played. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

● **Video Input** Tab

Set the signal standard for the device that will connect to the MICRO/I.



■ **Input Signal**

Select from **NTSC** or **PAL** for the signal standard of the device connected with the MICRO/I.

The adopted format for signal standards will differ depending on the country or region.
NTSC: Japan, Korea, Taiwan, North America, Central America, South America, etc.
PAL: Europe, China, The Middle East, South East Asia, etc.

4 Checking the Status of the Function

HG2G-S HG2G-5S HG2G-5F **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

You can check various kinds of information for the multimedia function through the values of the HG special registers. Details on HG special registers are given below:

LSD 155: Event Recording Function Status Information

Bit position	Description
0	While data is recording after an event occurs and while recorded data is being saved to the memory card, the value changes to 1.
1 to 15	Reserved

LSD 165: Error Information

Function name	Description	Parameters
Multimedia Function Error Information	Stores error information for the multimedia function.	0: Normal 1: Specified file does not exist 2: File format is incorrect 3: Specified parameter value is out of range

5 Restrictions

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

- When you have a movie file (.mp4) and a sound file (.WAV), you cannot play both of them at the same time.
- Movie files and sound files cannot be played while recording.
- Movie files cannot be played and video cannot be displayed while the Maintenance Screen is being displayed.
- If the zoom magnification for the movie file is greater than 2x, the zoom magnification is adjusted to 2x and the movie is centered and displayed.
- If **SIEMENS S7-MPI** is selected in Host I/F Driver, the speed of the MICRO/I scan process decreases by playing movie files and by displaying or recording video from video input.
- When using the Cyclic Script, movie file playback and displaying or recording video from video input may be interrupted.
- If the MICRO/I Installation direction is set to Vertical installation, movie file playback and displayed video is performed in the same direction as the Horizontal installation.
  To play movie files on a Vertical installation MICRO/I, use movie files with the display orientation rotated to match the installation direction.
- When using the event recording function, the event recording function is paused if you record with parts or play movie files, so take note of the following.
  - While recording with parts and while playing movie files, nothing is recorded if an event occurs.
  - When data was recorded with a part, it takes approximately 1 second after the data is finished being saved to the memory card until the event recording function resumes operating.
  - When a movie file was played, it takes approximately 1 second from stopping playback until the event recording function resumes operating.
- While data is being recorded after an event occurs with the event recording function and while recorded data is being saved to the memory card, data cannot be recorded with parts and movie files cannot be played. Also, during these situations, the value of HG special internal register LSD155-0 changes to 1. For details, refer to Chapter 32 "HG Special Registers (LSD)" on page 32-5.

The time to save data to the memory card varies based on the write speed of the memory card used.

Chapter 23 User Accounts and the Security Function

This chapter outlines user accounts and the Security function, how to configure them, and their operation on the MICRO/I and in WindO/I-NV2.

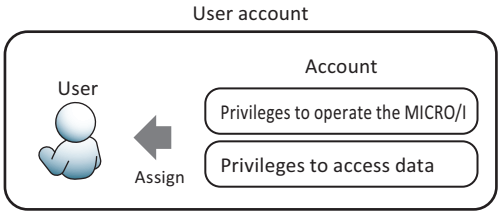
1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 User Accounts

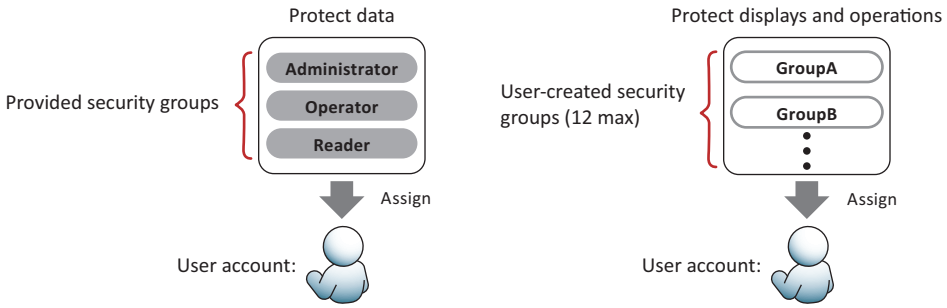
The Security function protects access to data and MICRO/I displays and operations using accounts. Accounts are the privileges to use the MICRO/I and data. By assigning accounts to users, you can protect the MICRO/I from being inappropriately operated and protect project data from alterations and misuse.

Accounts assigned to users are called user accounts.

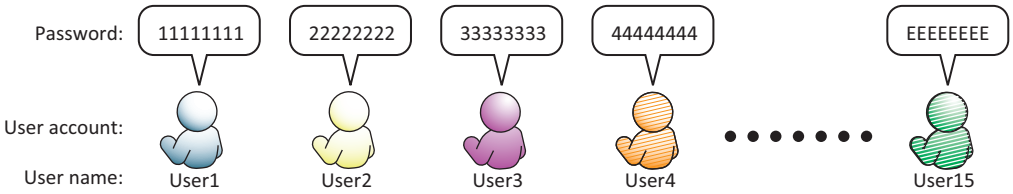


In WindO/I-NV2, security groups are used as accounts.

There are two types of security groups. One type protects access to data. The other type protects MICRO/I displays and operations. To protect access to data, assign one of the provided security groups to a user. To protect MICRO/I displays and operations, assign a user-created security group to a user.



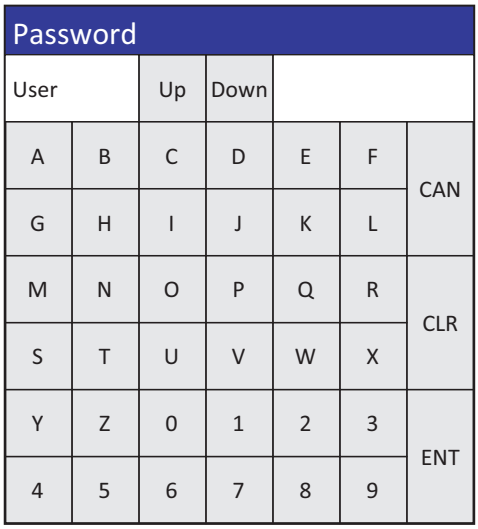
A user name and password are associated with a user account and up to 15 user accounts can be created.



If you configure a password for a user account assigned to a security group, access to data and MICRO/I displays and operations are password protected.

For password protected operations, users are prompted to enter their user name and password as necessary on the MICRO/I Password screen or the WindO/I-NV2 **Enter Password** dialog box.

Password screen



Enter Password dialog box

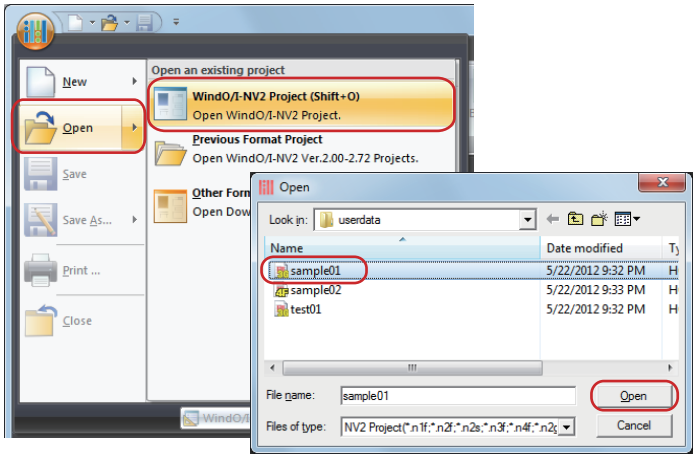
- For the HG2G-S/-5S/-5F and the HG3G/4G, you can set a dedicated password when opening the project. In the **Security** dialog box, on the **Options** tab, select the **Use Password to open a Project** check box, and then set the password.
- If a password is not configured for a user account, access to data and MICRO/I displays and operations cannot be protected.

1.2 Protecting Data

● Protecting Access to Data

Security groups that protect access to data can perform the following functions.

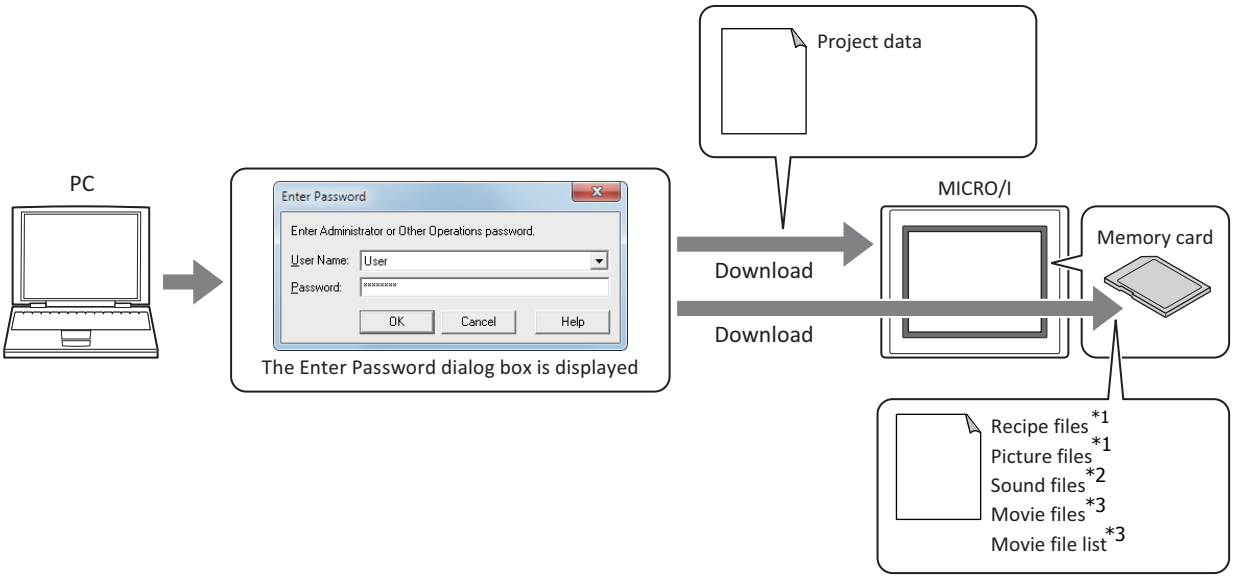
- Protect from changes by editing project data

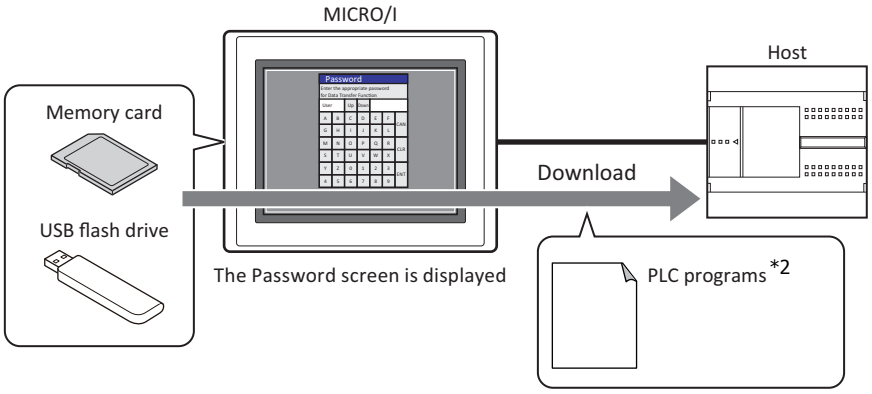


Opening project data

The Enter Password dialog box is displayed

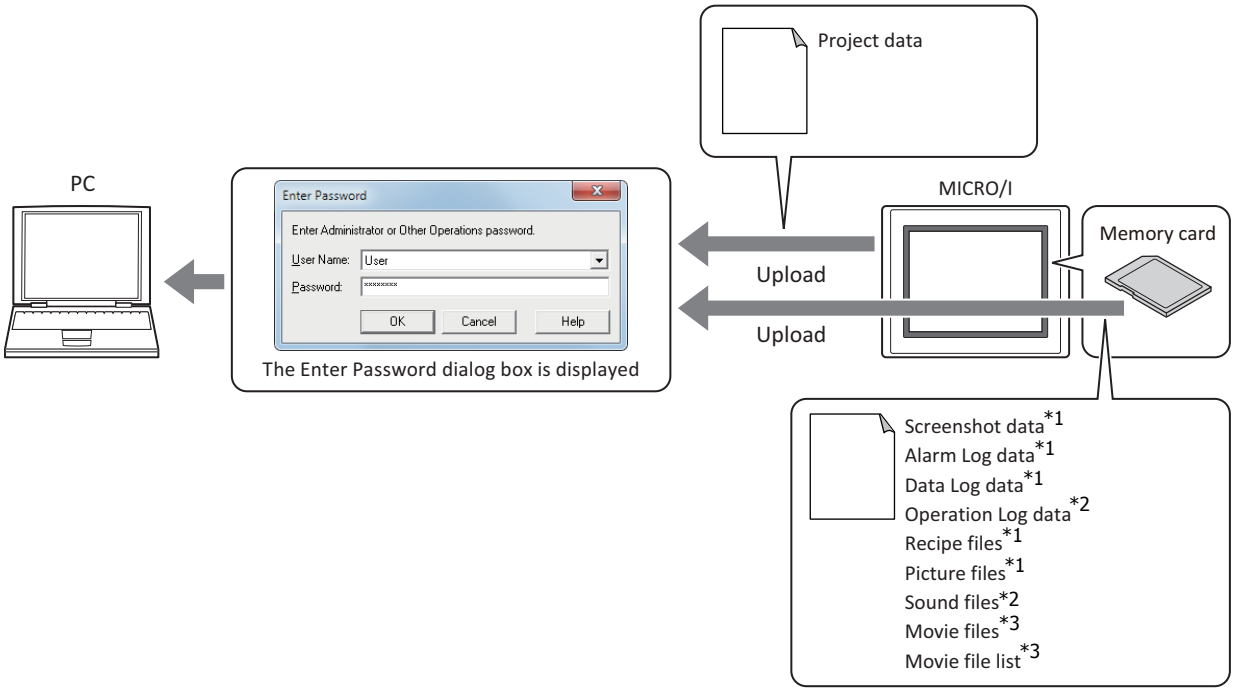
- Protect from alterations or misuse by downloading data

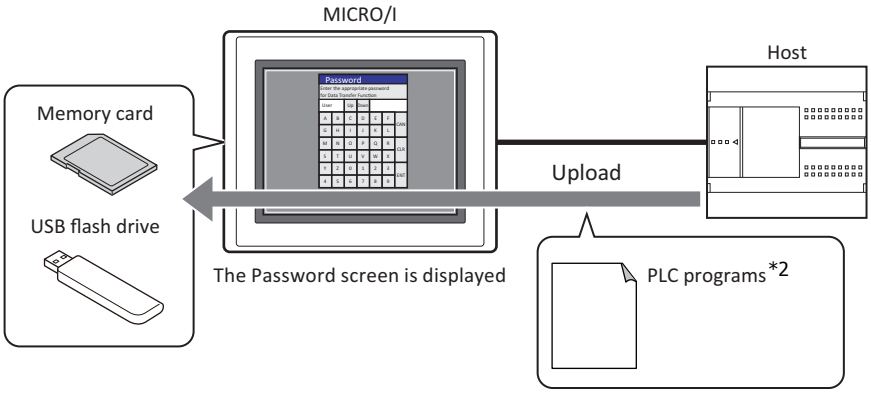




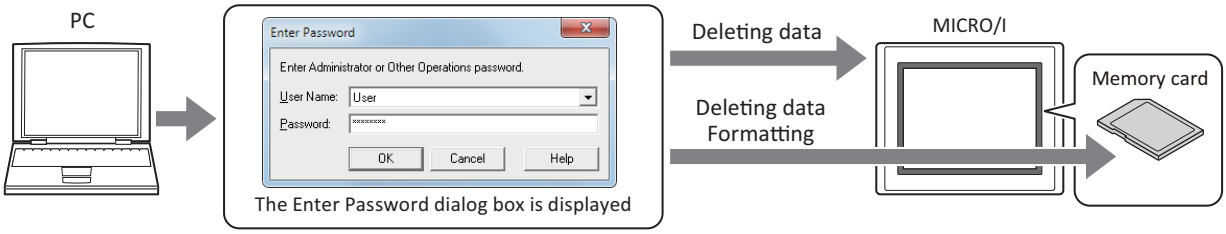
*1 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*2 HG2G-5F, HG3G/4G only
*3 This is applicable for models with a video interface only.

- Protect from the loss of data by upload

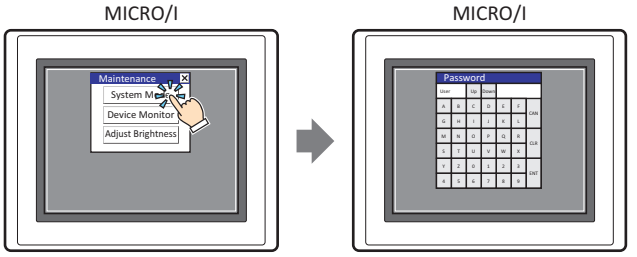




- Protect from data erasures and formatting external memory*1 by unauthorized access

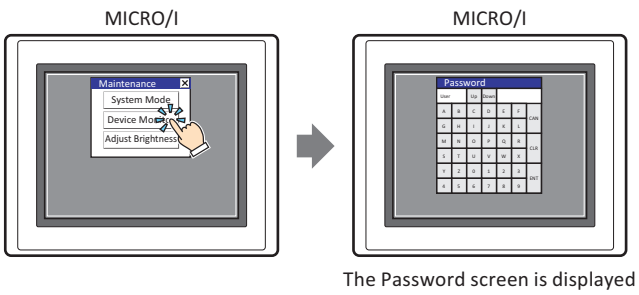


- Protect from alterations and misuse by changing the system menu

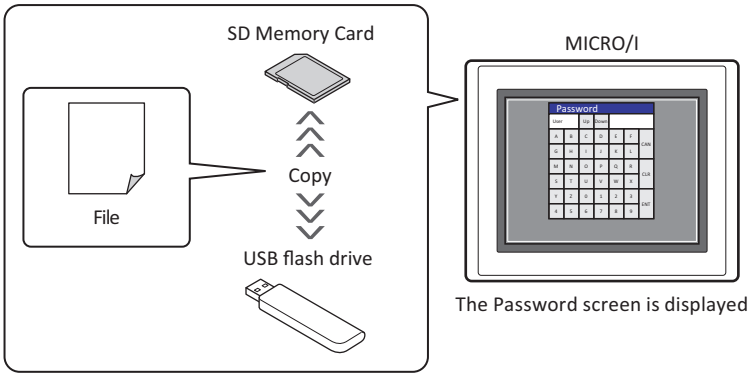


*1 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*2 HG2G-5F, HG3G/4G only
*3 This is applicable for models with a video interface only.

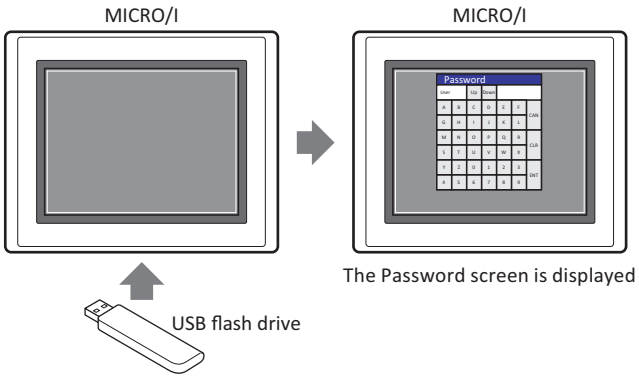
- Protect from unauthorized browsing by displaying Device Monitor



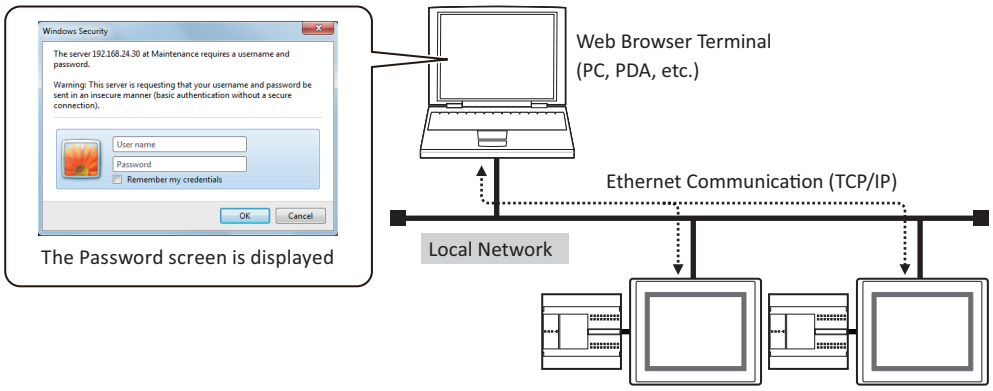
- Protect from the loss of data by copying files*2 between USB flash drives and SD memory cards



- Protect from the loss of data or alterations by the execution of the USB Autorun function*2



- Protect from remote*4 unauthorized browsing and unauthorized operations using a web browser terminal on a PC or PDA



*2 HG2G-5F, HG3G/4G only
*4 HG2G-5F, HG3G/4G, HG3F/4F only

● Security Groups that Protect Access to Data

Three security groups have been provided to protect access to data. These security groups are Administrator, Operator, and Reader. Each one of these security groups can only be assigned to a single user.

■ Administrator

The Administrator group possesses complete access rights to project data. This security group can execute all necessary operations including editing project data and changing MICRO/I project data.

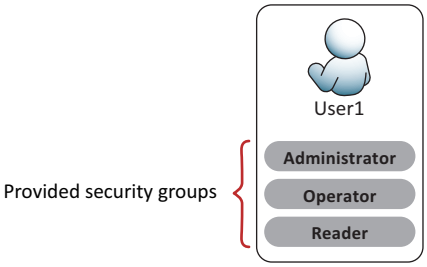
■ Operator

The Operator group can partially change project data by changing device values. This security group download data to external memory and copy files from USB flash drives to SD memory cards.

■ Reader

The Reader group can read data stored on external memory, copy files from SD memory cards to USB flash drives, and read device values with the Web Server function.

The provided user account has the security groups Administrator, Operator, and Reader allocated to it. Passwords have not been configured for this user account. To protect access to data, a password must be configured for the user account.



● Operations Subject to Password Protection

If you configure a password for a user account assigned to a security group to protect access to data, access to data is password protected. The operations that are subject to password protection and the security group that the password is valid for are as follows.

Operations subject to password protection		Security group that the password is valid for		
		Administrator	Operator	Reader
Data editing	Opening projects	YES	NO	NO
	Reusing screens	YES	NO	NO
Modifying data	Downloading project data	YES	NO	NO
	Downloading PLC programs*2 from external memory*1 to hosts	YES	NO	NO
	Downloading data to external memory*1	YES	NO	NO
	Downloading data to external memory*1 while the MICRO/I is running	YES	YES	NO
	Uploading project data	YES	NO	NO
	Uploading PLC programs*2 from hosts to external memory*1	YES	NO	NO
	Uploading external memory data*1	YES	YES	YES
	Deleting all data	YES	NO	NO
	Deleting external memory data*1	YES	NO	NO
	Formatting external memory*1	YES	NO	NO
	Switching to the system menu	YES	NO	NO
	Displaying Device Monitor	YES	YES	NO
	Copying files from a USB flash drive to an SD memory card*1	YES	YES	NO
	Copying files from an SD memory card to a USB flash drive*1	YES	YES	YES
	Executing the USB Autorun function*2	YES	NO	NO
	Remotely monitoring the MICRO/I state from a web browser terminal*2	YES	YES	YES
	Remotely operating the MICRO/I state from a web browser terminal*2	YES	YES	NO
	Opening Device Monitor on a web browser terminal and reading device values*3	YES	YES	YES
	Opening Device Monitor on a web browser terminal and changing the values of internal devices*3	YES	YES	NO

- For the HG2G-S/-5S/-5F and the HG3G/4G, you can set a dedicated password. In the **Security** dialog box, on the **Options** tab, select the **Use Password to open a Project** check box, and then set the password. The dedicated password is applicable to the following operations:
  - Opening projects
  - Reusing screens
  - Opening projects after uploading project data
  - Opening projects after uploading data on external memory*1
- To password protect operations, the lowest level security group out of the security groups enabled with a password must be assigned to a user account.
  The security levels, from highest to lowest, are Administrator > Operator > Reader.
  Example: To password protect the operation to display Device Monitor, assign the Operator security group to a user account. If a user account assigned to the Operator security group does not exist, the operation is not password protected.

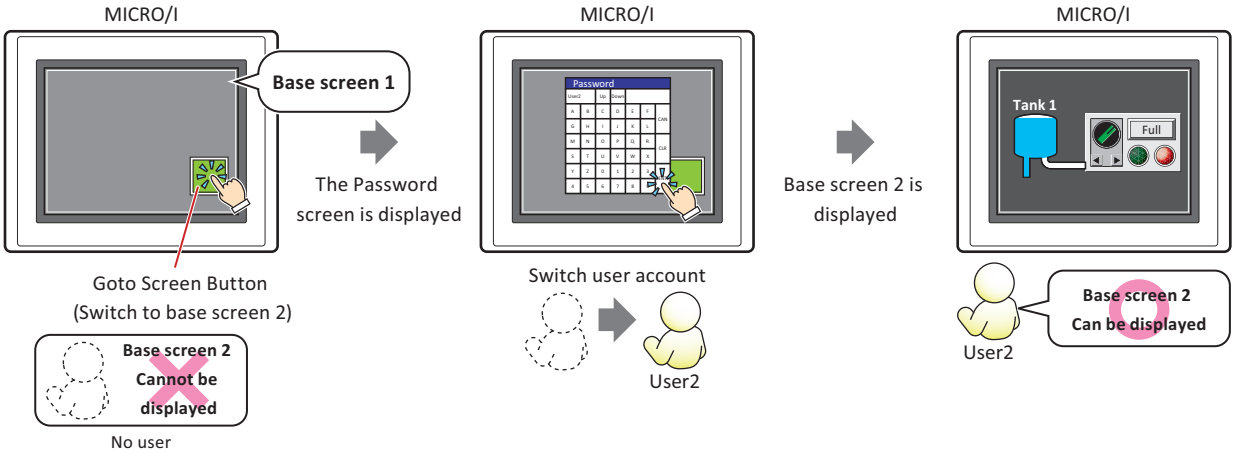
*1 External memory inserted into the MICRO/I (HG2G-5F, HG3G/4G, HG2F/3F/4F only)
*2 HG2G-5F, HG3G/4G only
*3 HG3F/4F only

1.3 Protecting Displays and Operations

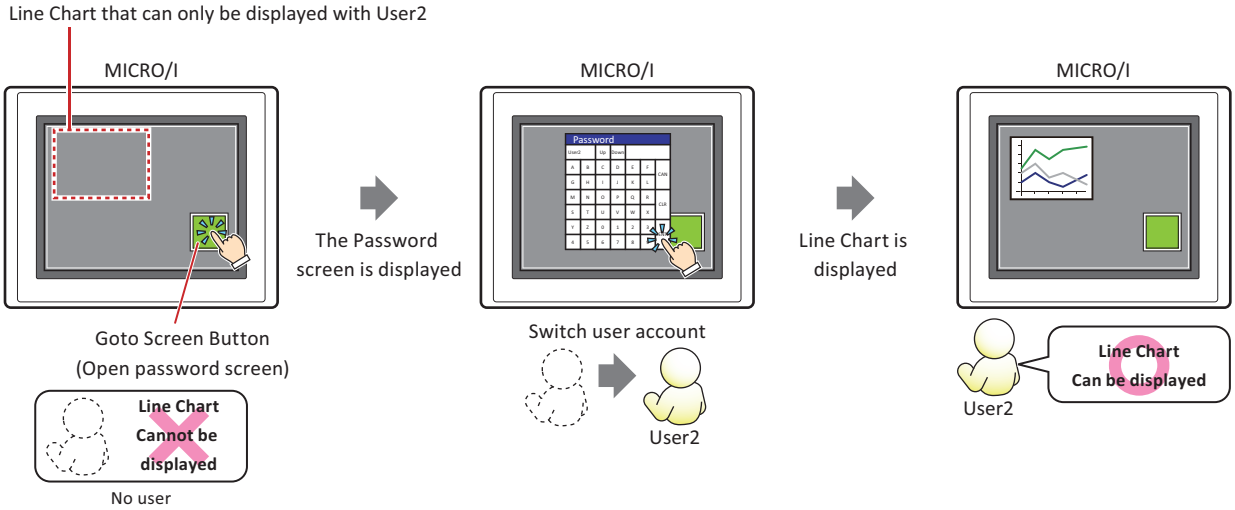
● Displays and Operations that can be Protected with the Security Function

Security groups can be assigned to users to protect MICRO/I displays and operations. These groups are capable of the following actions.

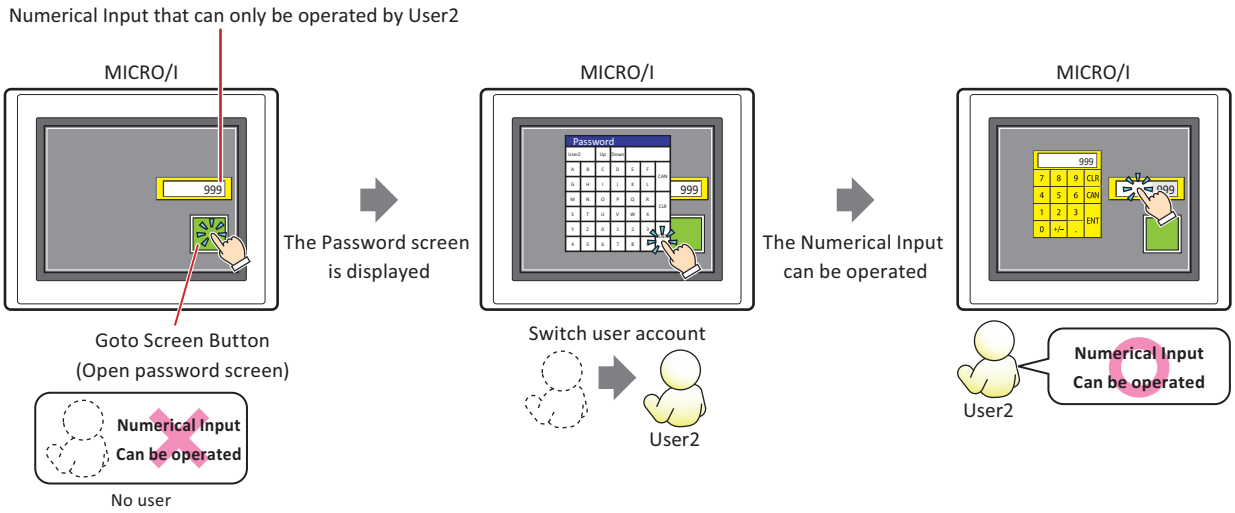
- Protecting the display of screens



- Protecting the display of parts



- Protecting the operation of parts



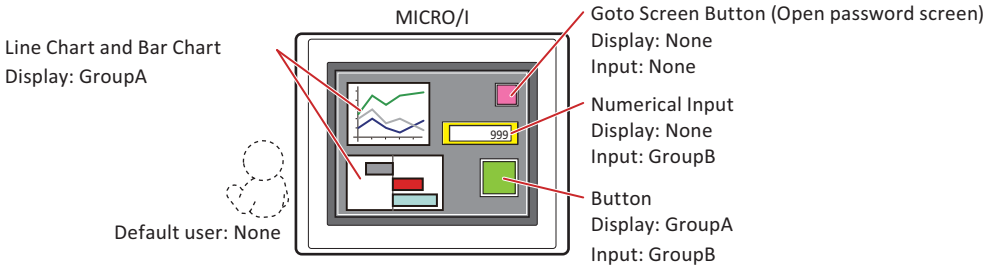
● Security Groups that Protect MICRO/I Displays and Operations

The security groups that protect the display and operation of screens and parts are user-created. Only the user accounts assigned to the same security group as the security group configured for the screens and parts can display and operate those screens and parts.

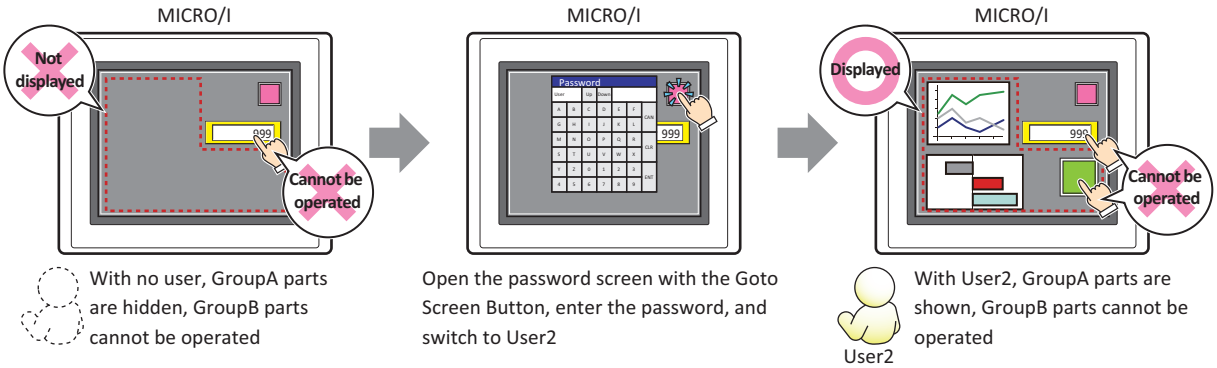
The security group for screens and parts is configured in the **Options** tab in the Properties dialog box for the screen or part. The input security group to protect operations can only be configured for parts with an input function.

Example: If the user and security group for the part are set as follows:

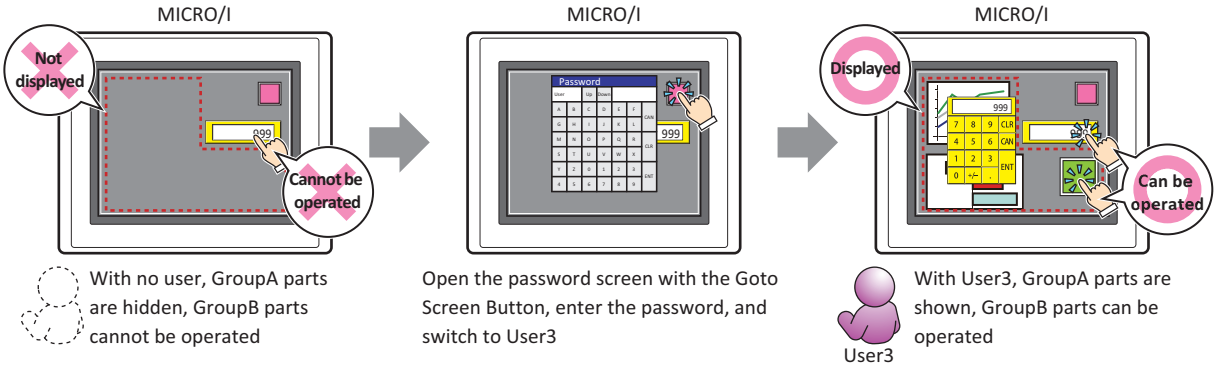
User Name	User2	User3	User4
Security Group	**GroupA**	**GroupA, GroupB**	**GroupB**



If the password screen is opened and the user switches to User2 in GroupA, the parts for GroupA are displayed. The parts for GroupB cannot be operated.

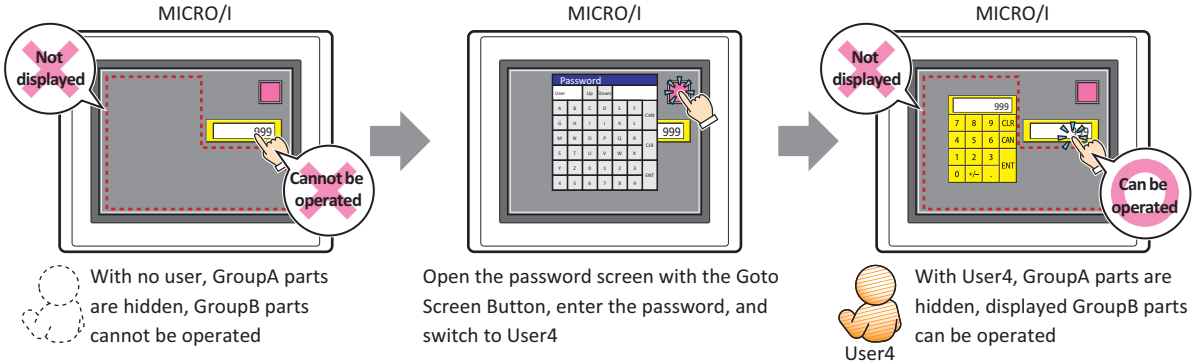


If the password screen is opened and the user switches to User3 in GroupA and GroupB, the parts for GroupA are displayed and the parts for GroupB can be operated.



Parts that are not displayed on the screen cannot be operated regardless of the input security group.

If the password screen is opened and the user switches to User4 in GroupB, only the displayed parts for GroupB can be operated. The GroupA parts are not displayed.



GroupA is not configured for User4, so the button in the lower right of the screen is not displayed. Parts that are not displayed on the screen cannot be operated, even by the user configured with the input security group.

2 Security Function Configuration Procedure

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes the configuration procedure for the Security function.

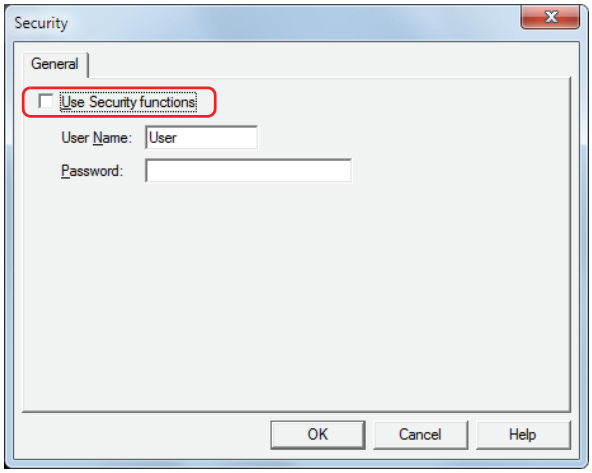
2.1 Creating and Editing User Accounts

● Creating a User Account

1 On the **Configuration** tab, in the **Protect** group, click **User Accounts**.

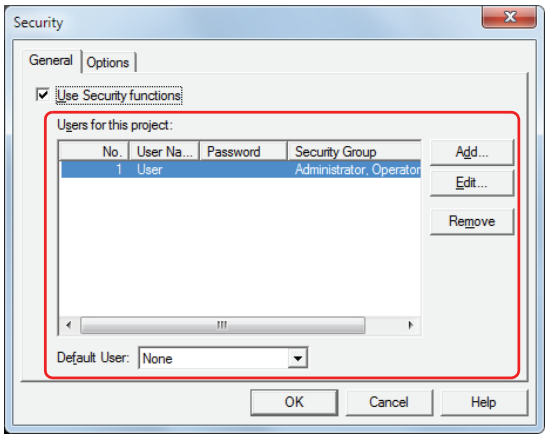
The **Security** dialog box is displayed.

2 Select the **Use Security functions** check box.



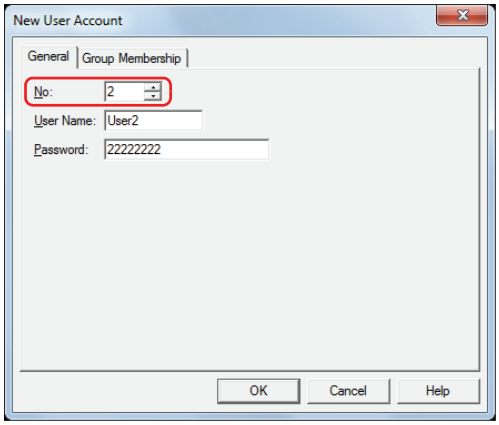
The settings related to user accounts are displayed.
The user account already provided with WindO/I-NV2 is as follows.

No.:	1
User Name:	User
Password:	(blank)
Security Group:	Administrator, Operator, Reader



3 Click **Add**.
The **New User Account** dialog box is displayed.

4 Specify the user number (1 to 15) in **No**.
This number is used when switching the user account via the value of a device.



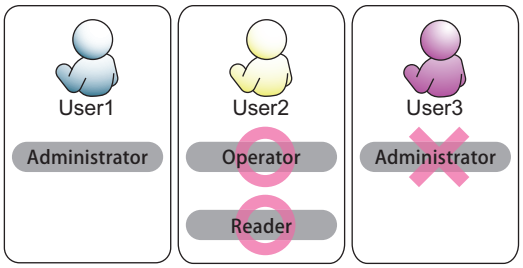
5 Enter the name for the new user in **User Name**.
The maximum number for the user name is 8 characters. Only alphanumeric characters and symbols can be used.

You cannot use the following characters in the user name.
\ / : * ? " < > |

6 Enter the password in **Password**.
The number for the password is 4 to 15. Only uppercase alphabetic characters and numbers can be used.

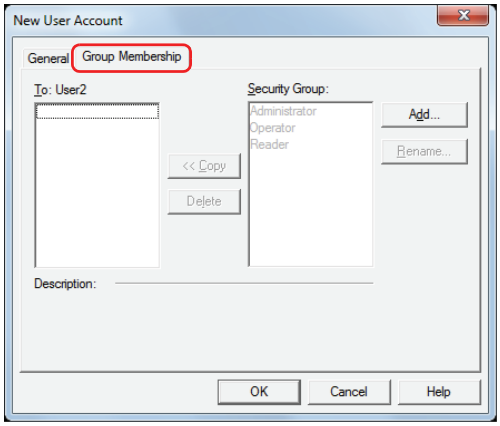
Write down the password so you do not forget it and save that note in a safe place.

7 Click the **Group Membership** tab.
Assign the security groups to the user being created.
Administrator, **Operator**, and **Reader** have already been provided in **Security Group**. These three security groups cannot be used in multiple user accounts. To use them with the user account being created, delete the security group from the user account they are assigned to beforehand.



If you will not add a new security group, proceed to step *11*.

If you will not assign a security group, proceed to step *12*.



8 Click **Add**.

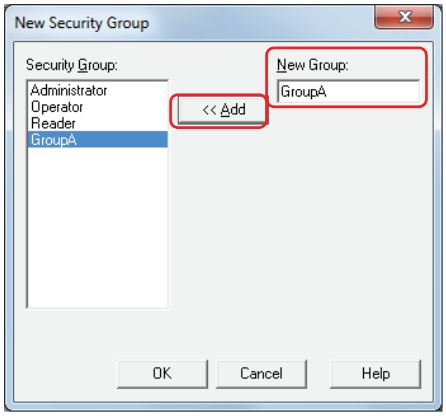
The **New Security Group** dialog box is displayed.

9 Enter the name of the new group in **New Group** and click **<< Add**.

The maximum number for the group name is 15 characters.

The created group name is added to **Security Group**. Repeat this procedure to create multiple security groups.

"なし" (Japanese), "None" (English), and "无" (Chinese) cannot be used for the group name.



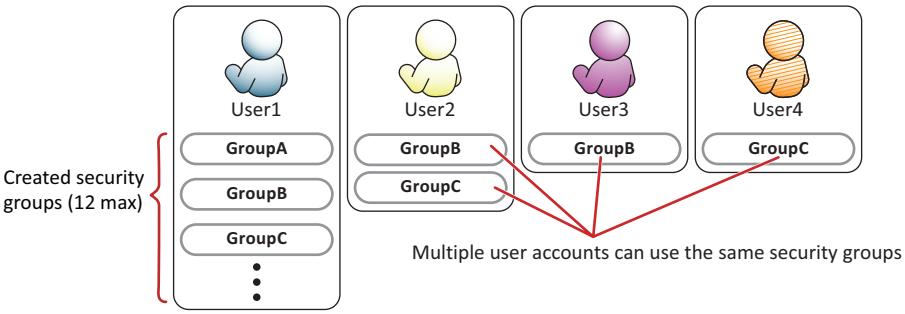
10 Click **OK**.

The group added is displayed in **Security Group**.

11 Select the security groups in **Security Group** on the **New User Account** dialog box to assign to the user being created, and then click **<< Copy**.

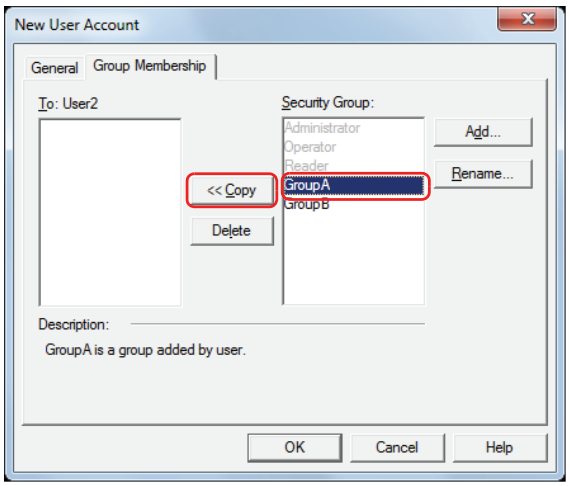
The security groups are copied to **To**.

The security groups that you create can be used in multiple user accounts.



To delete the security groups assigned to the user, select the security groups to delete in **To**, and then click **Delete**.

- To select multiple security groups, Shift key + click or Ctrl key + click.
- Select the security groups in **Security Group** and click **Delete** to delete the security groups. However, security groups configured for user accounts, screens, and parts cannot be deleted.

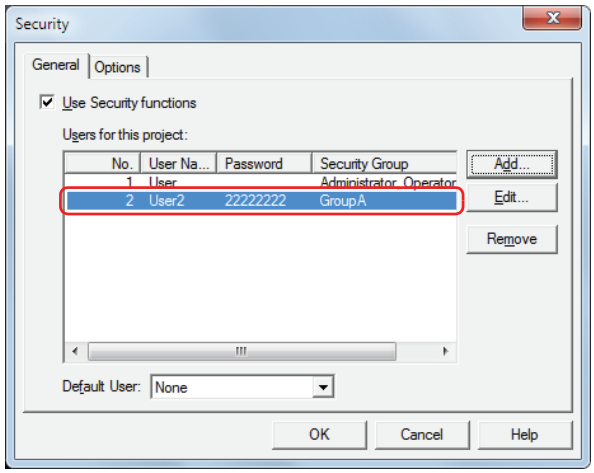


12 Click **OK**.

If you will not continue creating a user account, proceed to step *14*.

13 Repeat steps *3* to *12* and create all of the necessary user accounts.

You can configure a user account to be enabled when the MICRO/I power is turned on and when switching the operation mode in **Default User**.



14 Click **OK**.

The **Security** dialog box closes.

This concludes creating a user account.

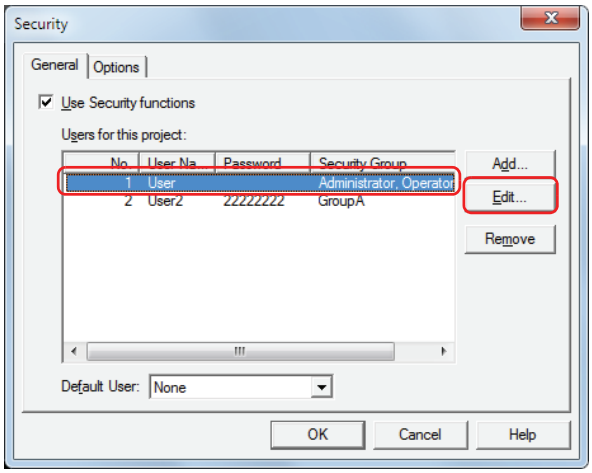
● Editing a User Account

1 On the **Configuration** tab, in the **Protect** group, click **User Accounts**.

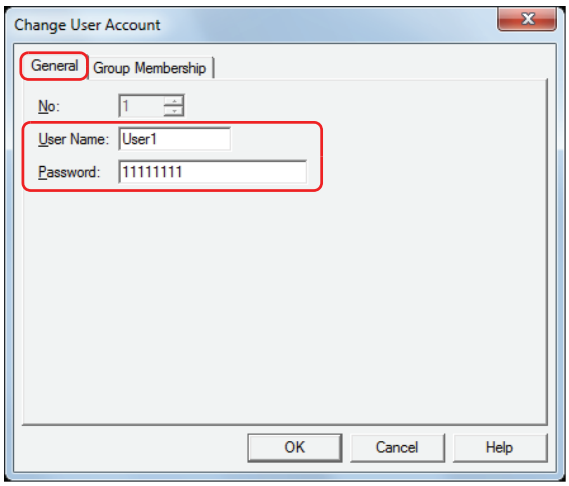
The **Security** dialog box is displayed.

2 Select the user account to edit and click **Edit**.

The **Change User Account** dialog box is displayed.



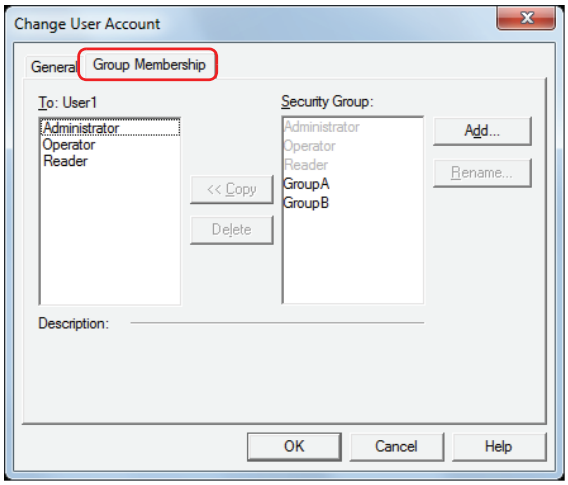
3 On the **General** tab, change **User Name** and **Password**.



4 Click the **Group Membership** tab.

Change the security groups assigned to the user.

If you will not assign a security group or you will not delete a security group, proceed to step *7*.



5 Select the security groups in **Security Group** to assign to the user being edited and click **<< Copy**.

The security groups are copied to **To**.

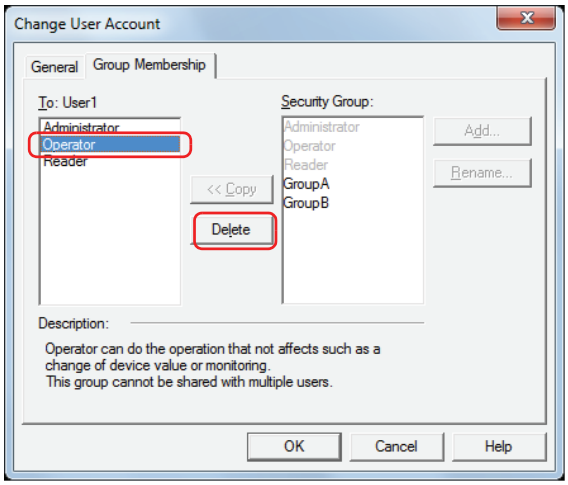
If you will not delete a security group, proceed to step *7*.

To select multiple security groups, Shift key + click or Ctrl key + click.

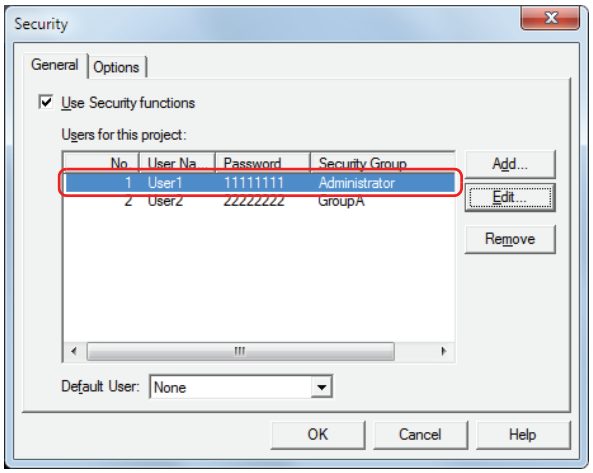
6 Select the security groups assigned to the user to delete in **To** and click **Delete**.

The security groups are deleted from **To**.

- To select multiple security groups, Shift key + click or Ctrl key + click.
- Select the security groups in **Security Group** and click **Delete** to delete the security groups. However, security groups configured for user accounts, screens, and parts cannot be deleted.



7 Click **OK**.



8 Click **OK** to close the **Security** dialog box.

This concludes editing a user account.

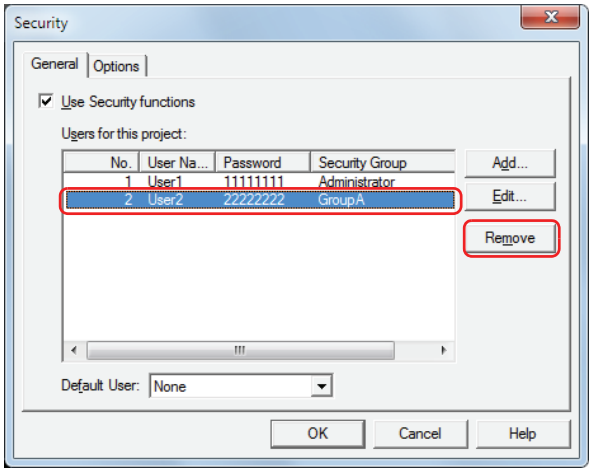
● Deleting a User Account

1 On the **Configuration** tab, in the **Protect** group, click **User Accounts**.

The **Security** dialog box is displayed.

2 Select the user account to delete and click **Remove**.

The user account is deleted.



3 Click **OK**.

The **Security** dialog box closes.

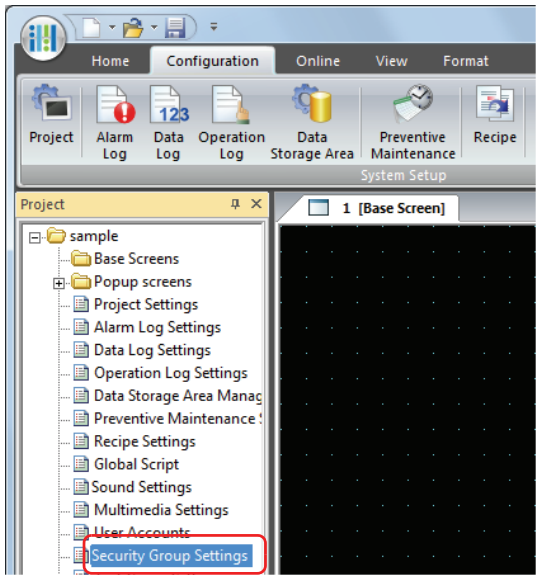
This concludes deleting a user account.

2.2 Adding and Editing Security Groups

● Adding a Security Group

1 On the **Project** window, double click **Security Group Settings**.

The **Security Group Settings** dialog box is displayed.

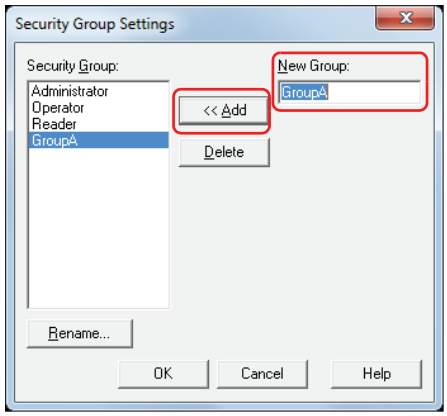


2 Enter the name of the new group in **New Group** and click **<< Add**.

The maximum number for the group name is 15 characters.

The created group name is added to **Security Group**. Repeat this procedure to create multiple security groups.

"なし" (Japanese), "None" (English), and "无" (Chinese) cannot be used for the group name.



3 Click **OK**.

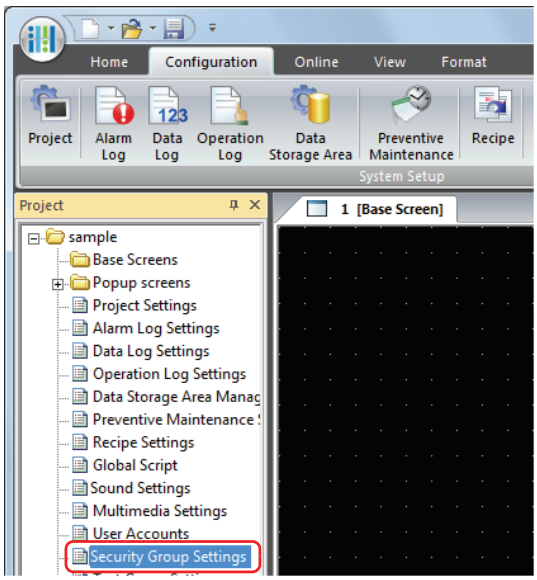
The **Security Group Settings** dialog box closes.

This concludes adding a security group.

● Changing the Name of a Security Group

1 On the **Project** window, double click **Security Group Settings**.

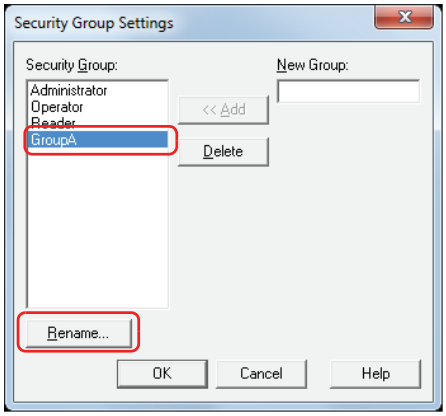
The **Security Group Settings** dialog box is displayed.



2 Select the security group in **Security Group** to change the name of and click **Rename**.

The **Change Security Group Name** dialog box is displayed.

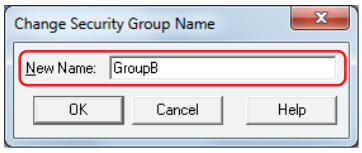
The group name for Administrator, Operator, and Reader cannot be changed.



3 Change the name of the security group to the new group name in **New Name**.

The maximum number for the group name is 15 characters.

"なし" (Japanese), "None" (English), and "无" (Chinese) cannot be used for the group name.



4 Click **OK**.

The **Change Security Group Name** dialog box closes.

5 Click **OK**.

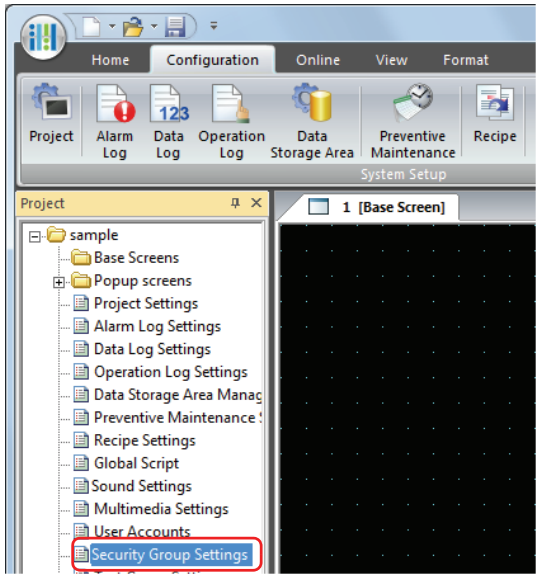
The **Security Group Settings** dialog box closes.

This concludes changing the name of a security group.

● Deleting a Security Group

1 On the **Project** window, double click **Security Group Settings**.

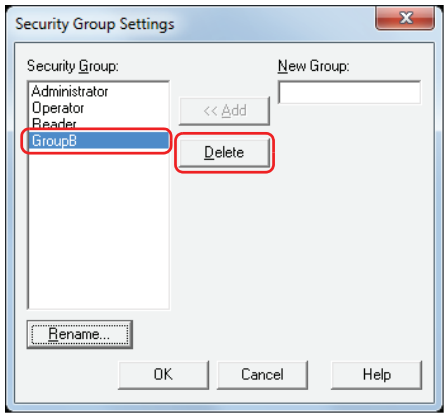
The **Security Group Settings** dialog box is displayed.



2 Select the security group in **Security Group** to delete and click **Delete**.

The security group is deleted.

To select multiple security groups, Shift key + click or Ctrl key + click.



- Security groups configured for user accounts, screens, and parts cannot be deleted.
- Administrator, Operator, and Reader cannot be deleted.

3 Click **OK**.

The **Security Group Settings** dialog box closes.

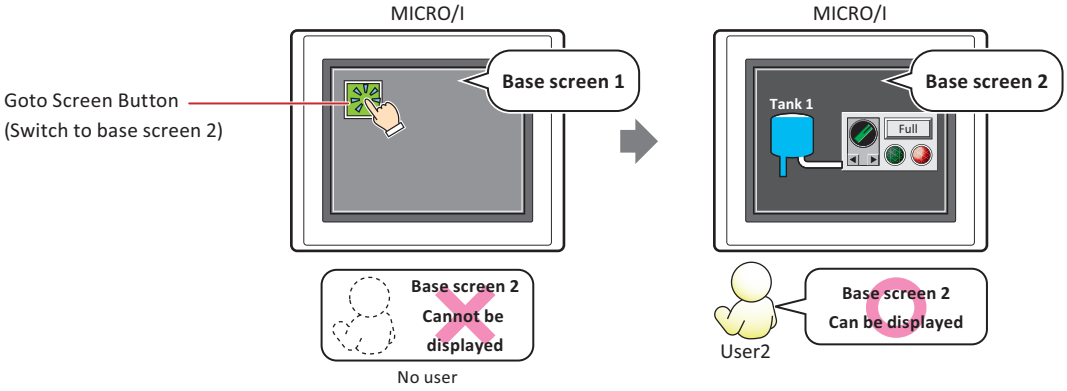
This concludes deleting a security group.

2.3 Protecting the Display and Operation of Screens and Parts

● Protecting the Display of Screens

Here you will configure the security group for a screen to protect the display of that screen.

This section describes an example where the display of base screen 2 is protected when switching to base screen 2 by pressing the Goto Screen Button.



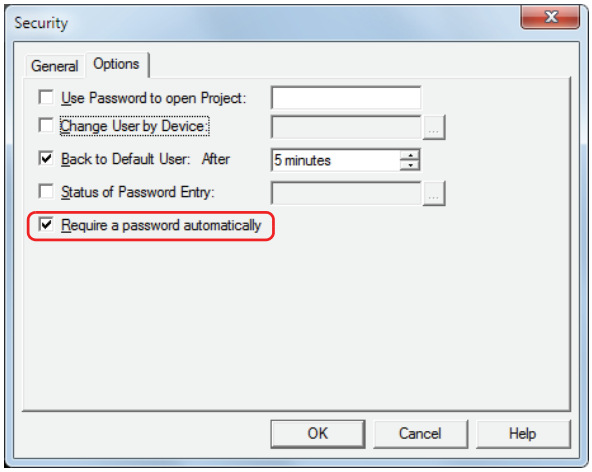
To change the user account, a button or command is required to open the Password screen.

Configuration Procedure

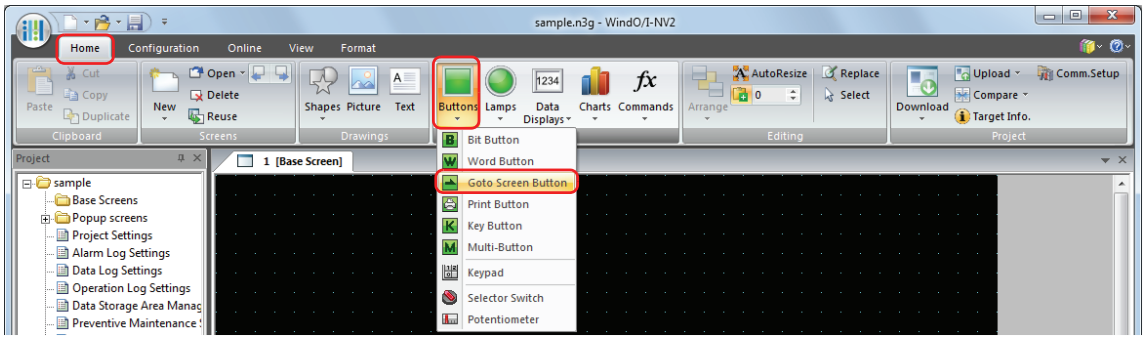
1 Following the procedure in "Creating a User Account" on page 23-11, create the following user account.

User Name	User2
Security Group	**GroupA**

To automatically display the Password screen when the user attempts to switch to a base screen they cannot access with the current user account using the Goto Screen Button, in the **Security** dialog box, in the **Options** tab, select the **Require a password automatically** check box. For displaying the Password screen, refer to "4.1 Entering the Password on the MICRO/I" on page 23-40.

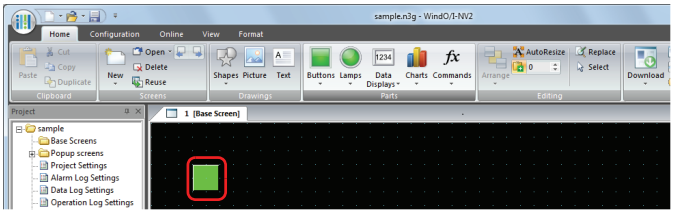


2 Place a Goto Screen Button on base screen 1.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.

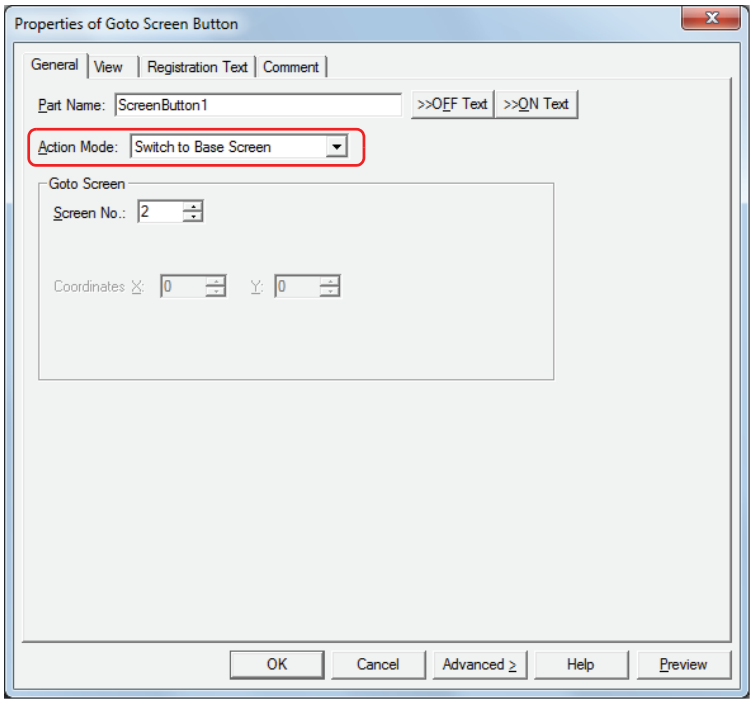


3 Click a point on the edit screen where you wish to place the Goto Screen Button.

4 Double-click the dropped Goto Screen Button and the Properties dialog box is displayed.



5 Select **Switch to Base Screen** for **Action Mode**.



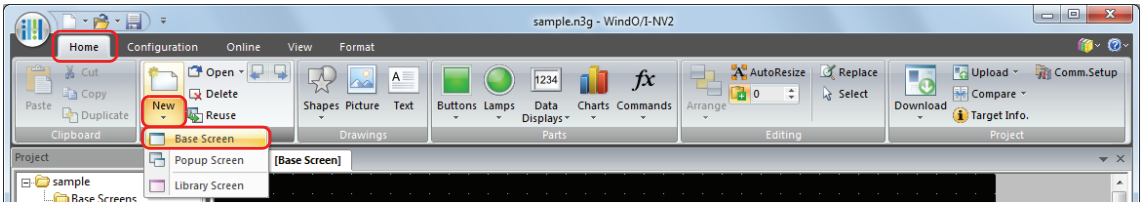
6 Specify the screen number of the base screen to switch to with **Screen No.** under **Goto Screen**.

2 is specified here.

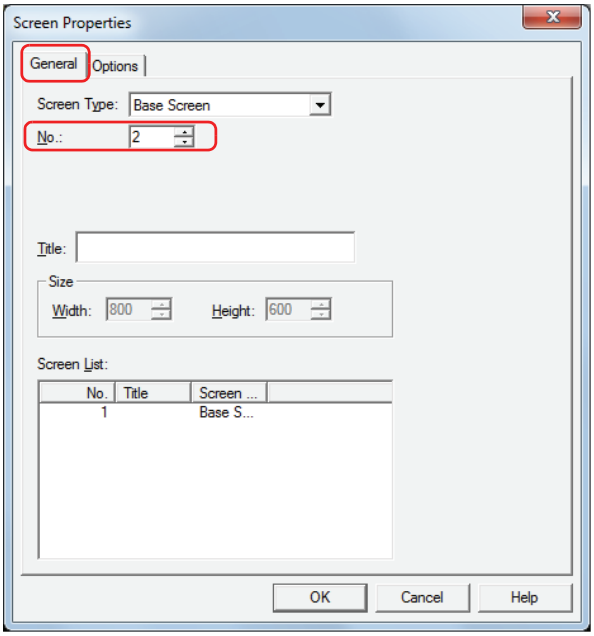
7 Click **OK**.

Close the Properties of Goto Screen Button dialog box.

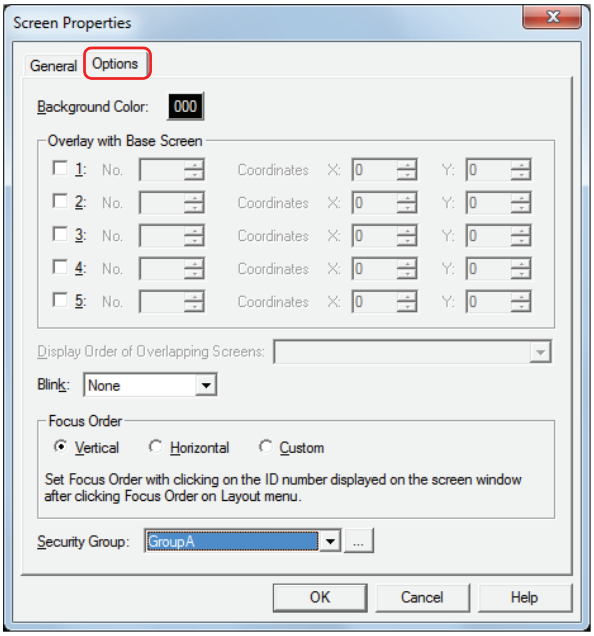
8 Create the base screen to switch to and configure the security group.
On the **Home** tab, in the **Screens** group, click the arrow under **New**, and then click **Base Screen**.
The Screen Properties dialog box is displayed.



9 Specify the screen number of the base screen to switch to with **No.** on the **General** tab.
This is the same screen number as the screen number specified in step *6*. **2** is specified here.



10 Click the **Options** tab.



11 With **Security Group**, select the security group to allow the display of the base screen.
GroupA is selected here.

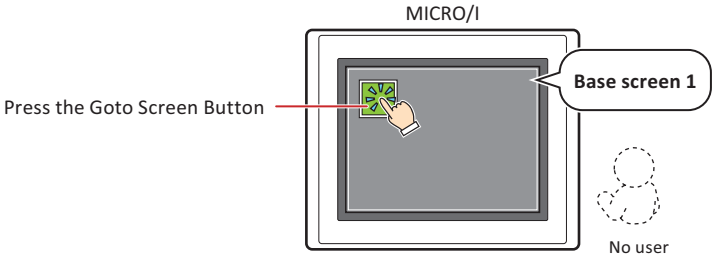
12 Configure the settings on each tab as necessary and click **OK**.
The Screen Properties dialog box closes.
This concludes configuring the project to protect the display of screens.

Operating Procedure

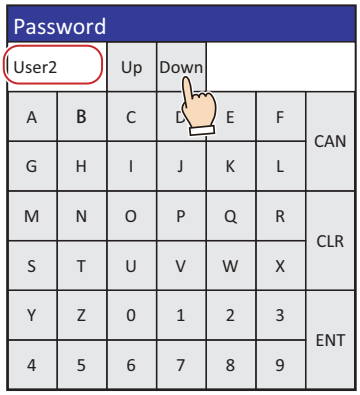
This section describes an example when the current user account has no default user.

1 Press the Goto Screen Button configured with **Switch to Base Screen**.

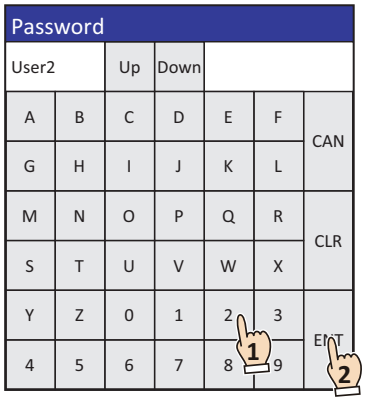
The Password screen is displayed.



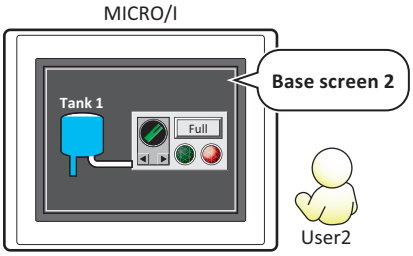
2 Press **Down** and select **User2**.



3 Enter the password and press **ENT**.

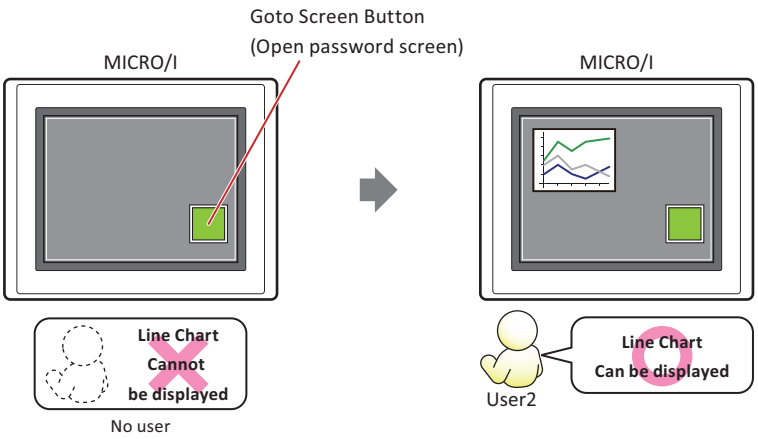


If the correct password is entered, the user account changes to **User2** and the Password screen closes. Base screen 2 is displayed.



● Protecting the Display of Parts

Here you will configure the security group for a part to protect the display of that part.
This section describes an example where the display of the Line Chart is protected.



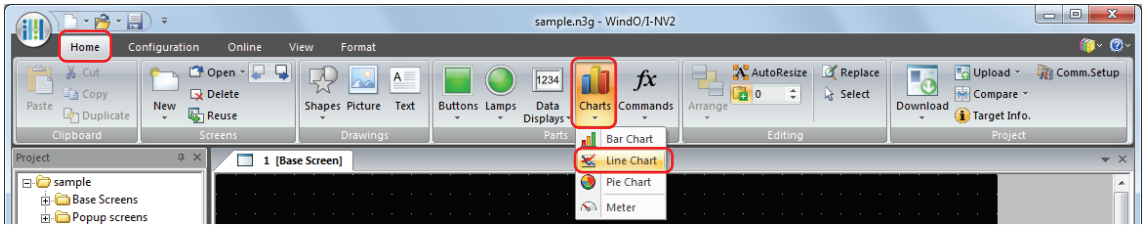
To change the user account, a button or command is required to open the Password screen.

Configuration Procedure

1 Following the procedure in "Creating a User Account" on page 23-11, create the following user account.

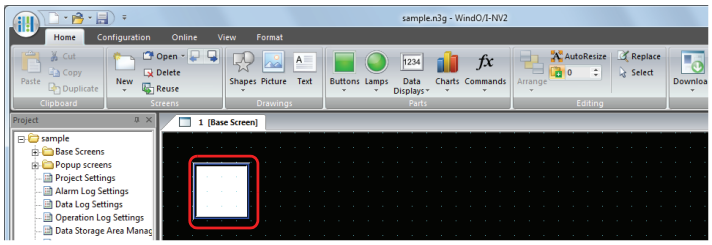
User Name	User2
Security Group	**GroupA**

2 Create a Line Chart and configure the display security group.
On the **Home** tab, in the **Parts** group, click **Charts**, and then click **Line Chart**.



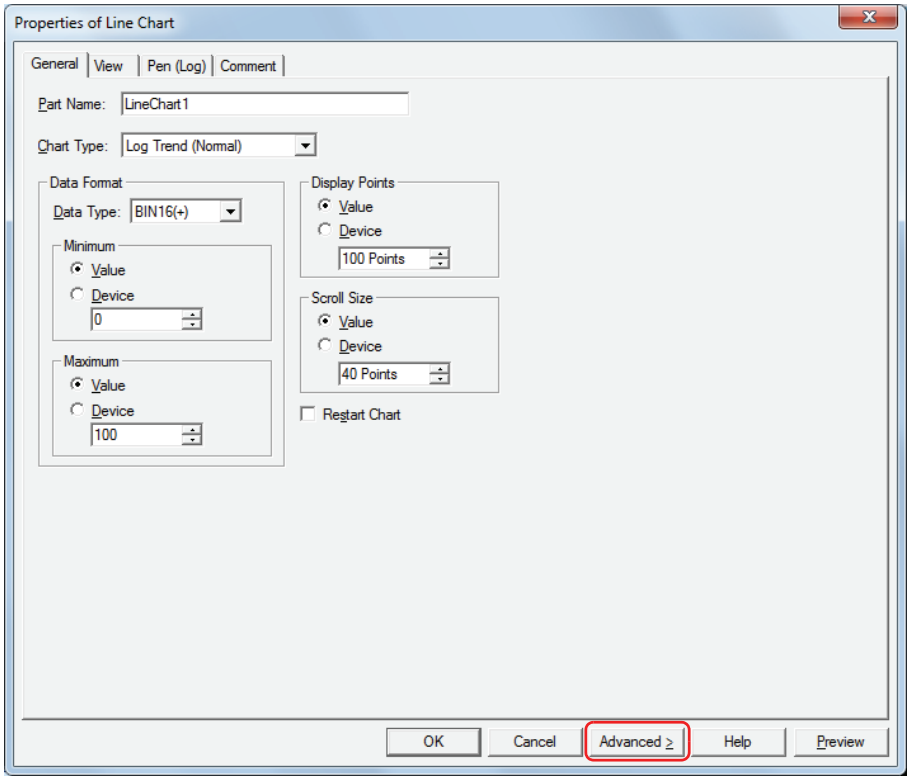
3 Click a point on the edit screen where you wish to place the Line Chart.

4 Double-click the dropped Line Chart and the Properties dialog box is displayed.

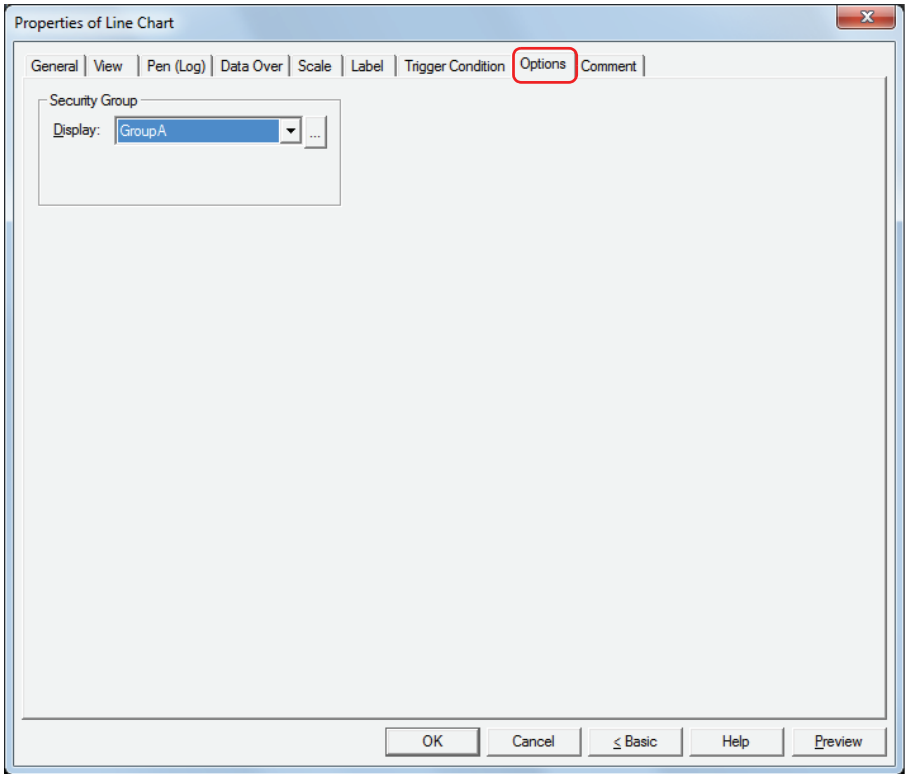


5 Click **Advanced**.

The **Options** tab is displayed.



6 Click the **Options** tab.



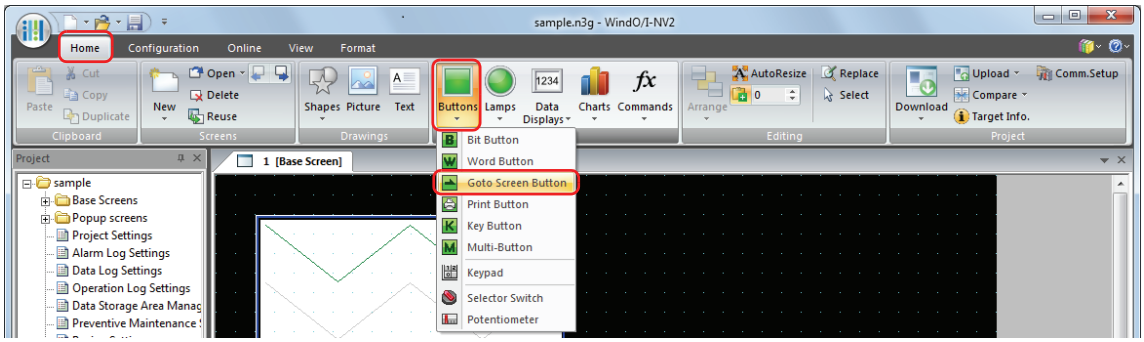
7 Select the security group to allow the display of the Line Chart with **Display** under **Security Group**.

GroupA is selected here.

8 Configure the settings on each tab as necessary and click **OK**.

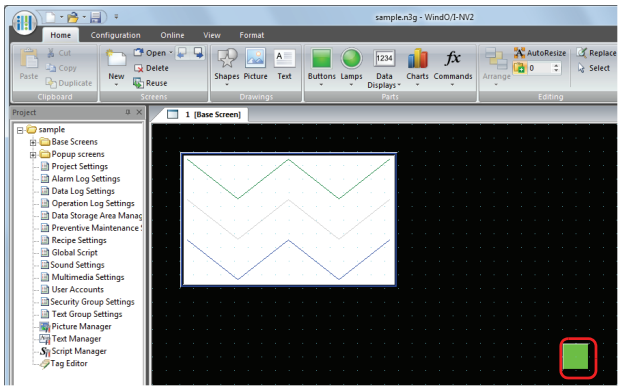
The Properties of Line Chart dialog box closes.

9 Place a Goto Screen Button to display the password screen on the base screen.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.

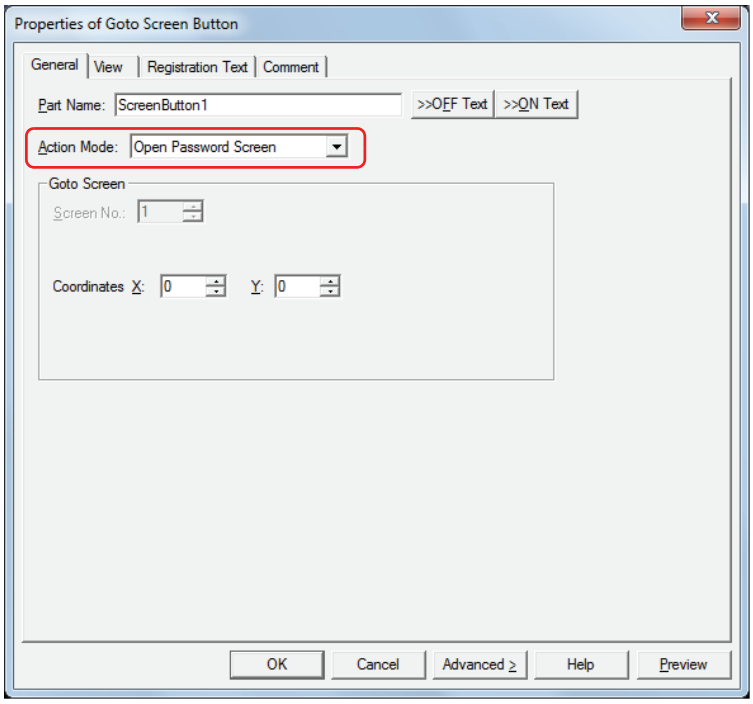


10 Click a point on the edit screen where you wish to place the Goto Screen Button.

11 Double-click the dropped Goto Screen Button and the Properties dialog box is displayed.



12 Select **Open Password Screen** for **Action Mode**.



13 Specify the display location in coordinates for the password screen to open above the base screen with **Coordinates X, Y**.

With the upper-left corner of the screen as the origin, the upper-left corner of the window is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

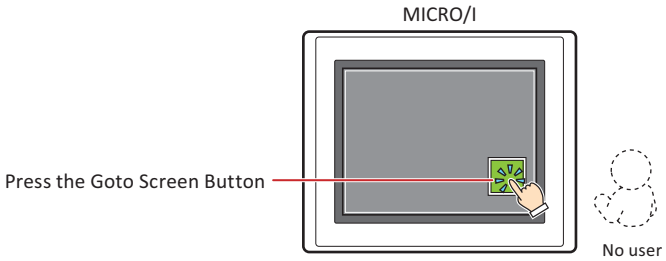
Y: 0 to (base screen vertical size - 1)

14 Click **OK**.
The Properties of Goto Screen Button dialog box closes.
This concludes configuring the project to protect the display of a part.

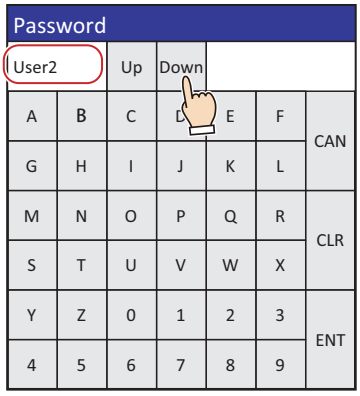
Operating Procedure

This section describes an example when the current user account has no default user.

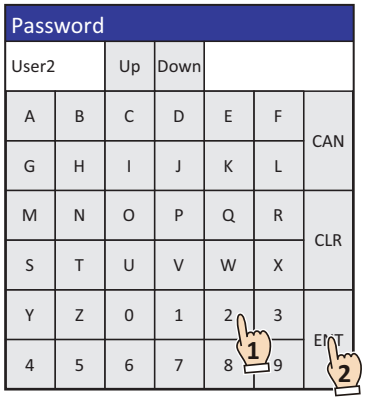
1 Press the Goto Screen Button configured with **Open Password Screen**.
The Password screen is displayed.



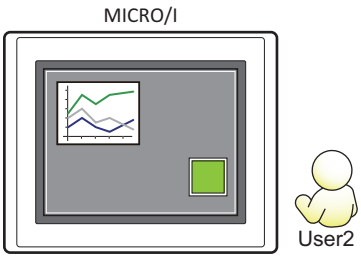
2 Press **Down** and select **User2**.



3 Enter the password and press **ENT**.

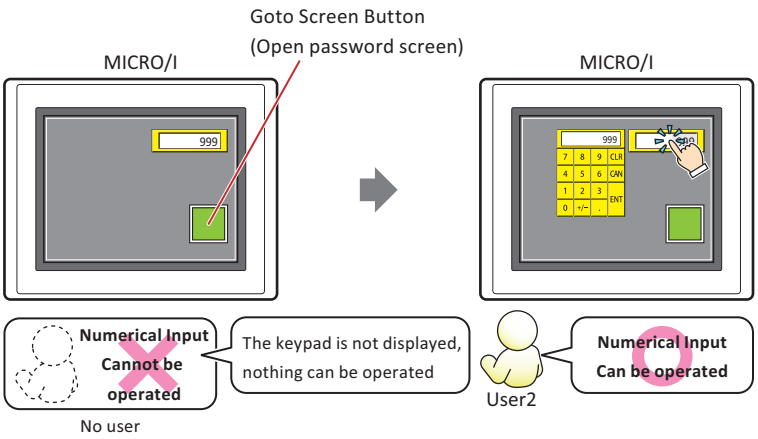


If the correct password is entered, the user account changes to **User2** from no default user and the Password screen closes.
The Line Chart is displayed.



● Protecting the Operation of Parts

Here you will configure the security group for a part to protect the operation of that part.
This section describes an example where the operation of the Numerical Input is protected.



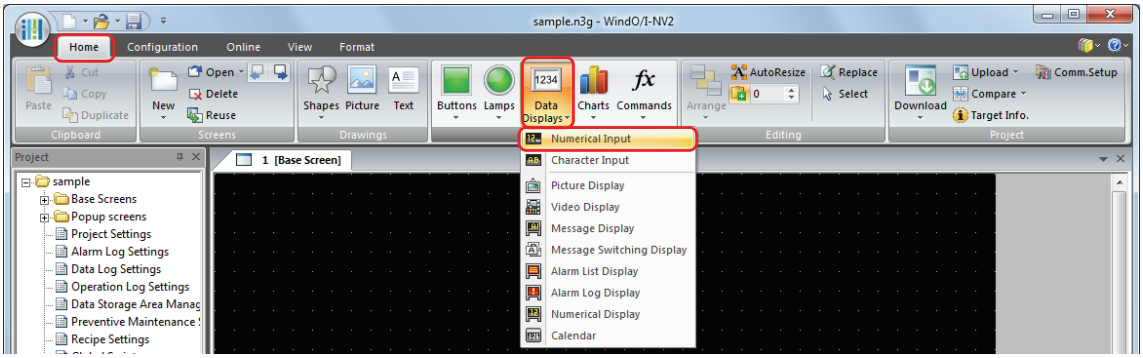
To change the user account, a button or command is required to open the Password screen.

Configuration Procedure

1 Following the procedure in "Creating a User Account" on page 23-11, create the following user account.

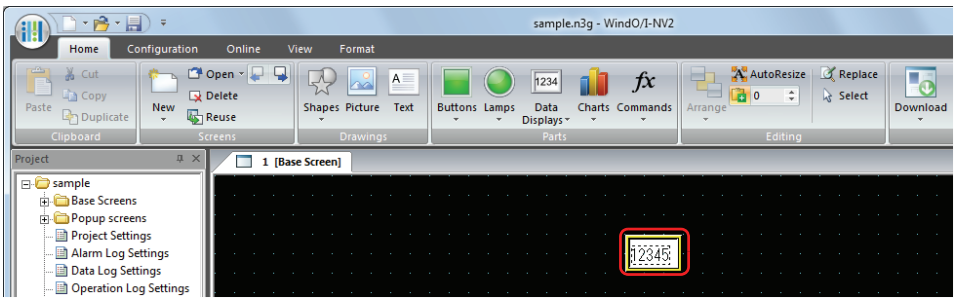
User Name	User2
Security Group	**GroupA**

2 Create a Numerical Input and configure the input security group.
On the **Home** tab, in the **Parts** group, click **Data Displays**, and then click **Numerical Input**.



3 Click a point on the edit screen where you wish to place the Numerical Input.

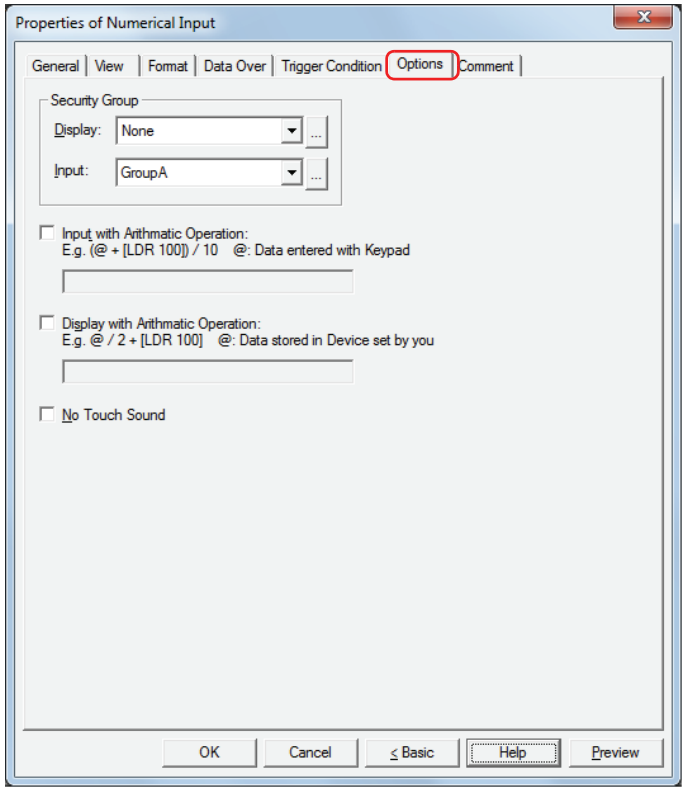
4 Double-click the dropped Numerical Input and the Properties dialog box is displayed.



5 Click **Advanced**.

The **Options** tab is displayed.

6 Click the **Options** tab.



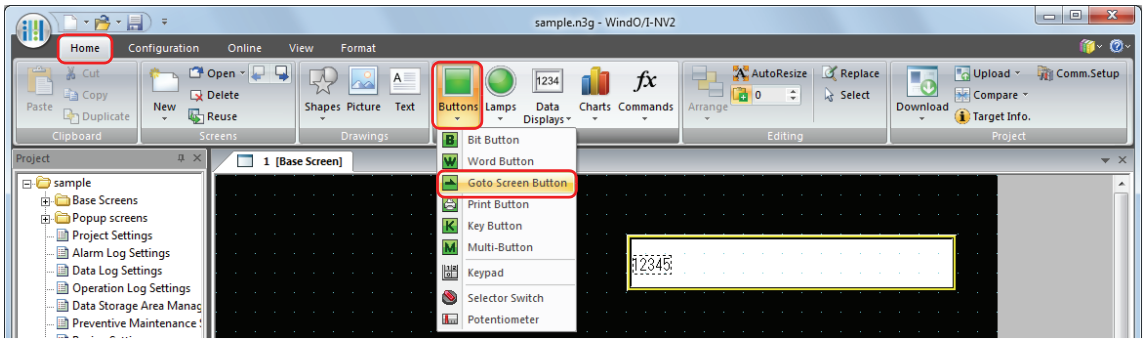
7 Select the security group to allow the operation of the Numerical Input with **Input** under **Security Group**.

GroupA is selected here.

8 Configure the settings on each tab as necessary and click **OK**.

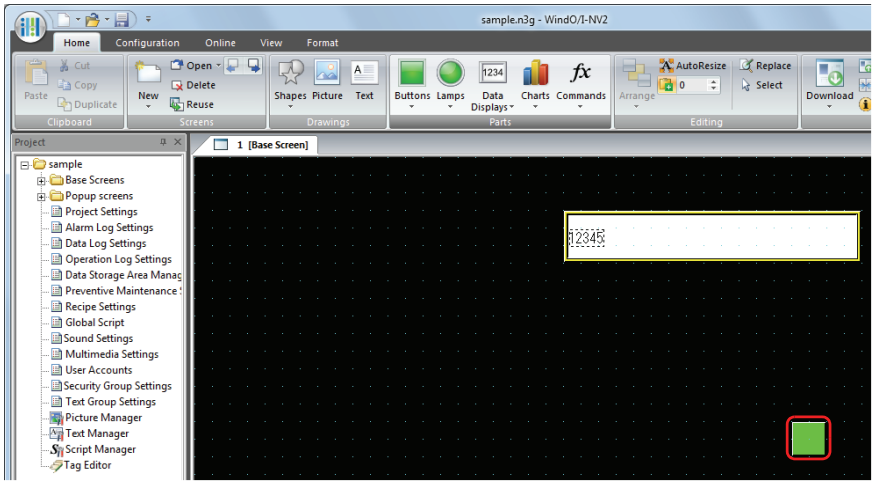
The Properties of Numerical Input dialog box closes.

9 Place a Goto Screen Button to display the password screen on the base screen.
On the **Home** tab, in the **Parts** group, click **Buttons**, and then click **Goto Screen Button**.

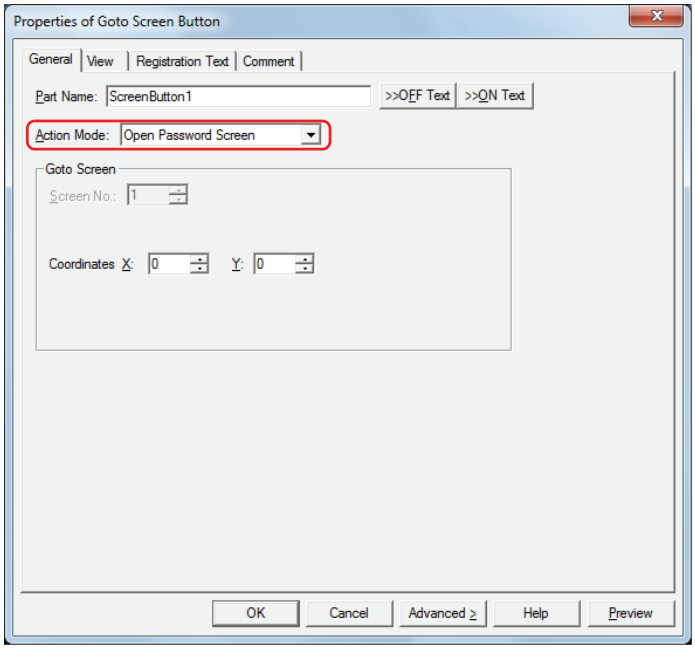


10 Click a point on the edit screen where you wish to place the Goto Screen Button.

11 Double-click the dropped Goto Screen Button and the Properties dialog box is displayed.



12 Select **Open Password Screen** for **Action Mode**.



13 Specify the display location in coordinates for the password screen to open above the base screen with **Coordinates X, Y**.

With the upper-left corner of the screen as the origin, the upper-left corner of the window is the X and Y coordinates.

X: 0 to (base screen horizontal size - 1)

Y: 0 to (base screen vertical size - 1)

14 Click **OK**.

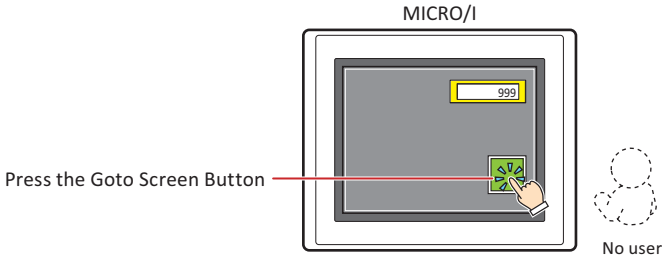
The Properties of Goto Screen Button dialog box closes.

This concludes configuring the project to protect the operation of a part.

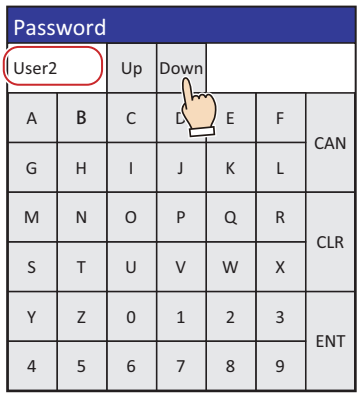
Operating Procedure

This section describes an example when the current user account has no default user.

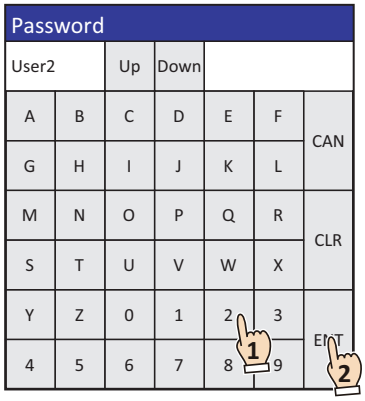
1 Press the Goto Screen Button configured with **Open Password Screen**.
The Password screen is displayed.



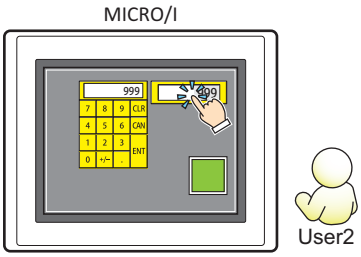
2 Press **Down** and select **User2**.



3 Enter the password and press **ENT**.



If the correct password is entered, the user account changes to **User2** from no default user and the Password screen closes.
The Numerical Input can be operated.



3 Security Dialog Box

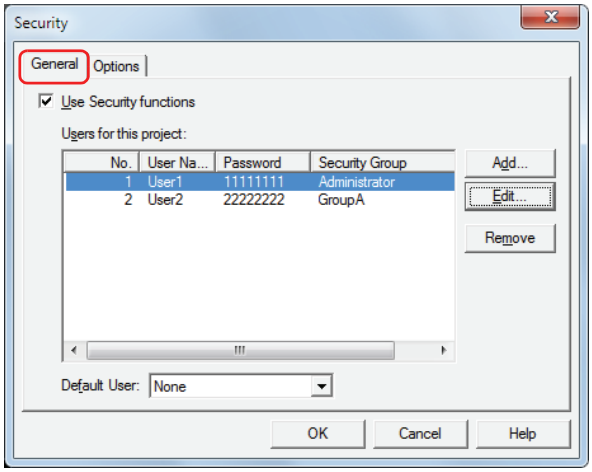
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This section describes items and buttons on the **Security** dialog box.

3.1 Security Dialog Box

The passwords and security groups assigned to user accounts are collectively managed in the **Security** dialog box.

● General Tab



■ **Use Security functions**

Select this check box to protect access to data and to protect MICRO/I displays and operations by accounts. The settings related to user accounts are displayed.

When this check box is cleared, the System Menu, monitor, download or upload data are protected by a single password. Note, the MICRO/I is not password protected if **Password** is left blank.

User Name: Enter the name for the user account.

The maximum number for the user name is 8 characters. Only alphanumeric characters and symbols can be used.

You cannot use the following characters in the user name.

\ / : * ? " < > |

Password: Enter the password.

The number of characters for the password is 4 to 15. Only uppercase alphabetic characters and numbers can be used.

Write down the password so you do not forget it and save that note in a safe place.

Users for this project

No.:	Displays the number (1 to 15) used when switching the user account via the value of a device. Double clicking the cell displays the **Change User Account** dialog box. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.
User Name:	Displays the name for the user account. Double clicking the cell displays the **Change User Account** dialog box. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.
Password:	Displays the password for the user account. Double clicking the cell displays the **Change User Account** dialog box. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.
Security Group:	Displays all of the security groups for user accounts. Double clicking the cell displays the **Change User Account** dialog box. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.

Add

This button adds a user account. You can create a maximum of 15. Click this button to display the **New User Account** dialog box. In the **New User Account** dialog box, the user name, password, and security groups are assigned to the user account. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.

Edit

Select a number in **Users for this project** and click this button to display the **Change User Account** dialog box. In the **Change User Account** dialog box, the user name, password, and security groups are changed. For details, refer to "New User Account Dialog Box and Change User Account Dialog Box" on page 23-35.

Remove

This button deletes the user account with the selected number. Select a number and click this button.

Default User

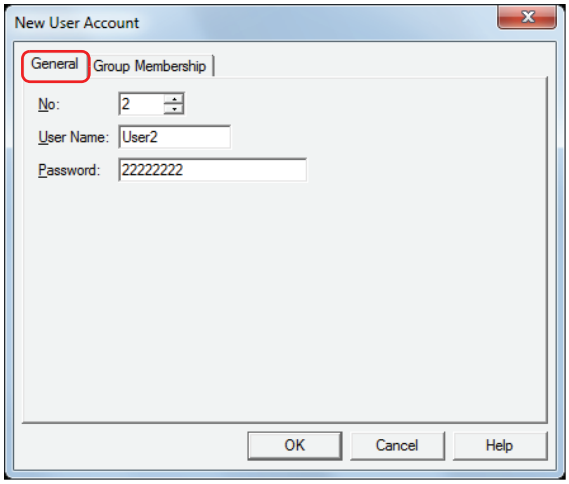
Select the user account to be enabled when the MICRO/I power is turned on and when switching the operation mode. If **None** is selected, no user account is selected when the MICRO/I power is turned on and when the operation mode is changed. Screens and parts cannot be displayed or operated that are protected by a security group.

New User Account Dialog Box and **Change User Account** Dialog Box

In the **New User Account** dialog box, the user name, password, and security groups are assigned to an account and that user account is added.

In the **Change User Account** dialog box, the user name, password, and security groups for the selected user account are changed.

General Tab



■ **No.**

In the **New User Account** dialog box, this setting specifies the number (1 to 15) when switching the account via the value of a device.

When **Edit** was clicked and the **Change User Account** dialog box was displayed, this item displays the selected user account number.

■ **User Name**

Enter the name for the user account.

The maximum number is 8 characters. Only alphanumeric characters and symbols can be used.

> You cannot use the following characters in the user name.
> \ / : * ? " < > |

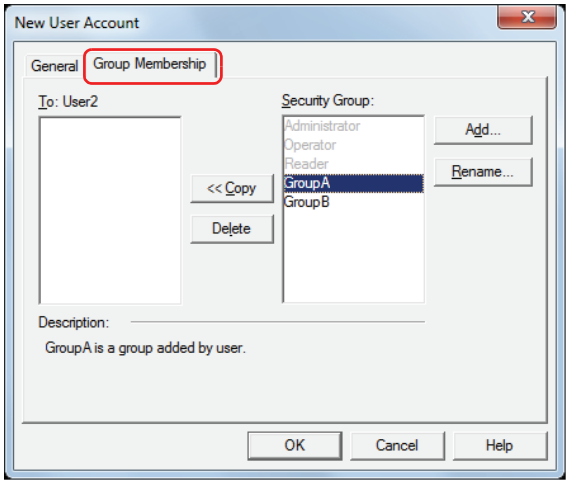
■ **Password**

Enter the password.

The number of characters for the password is 4 to 15. Only uppercase alphabetic characters and numbers can be used.

> Write down the password so you do not forget it and save that note in a safe place.

Group Membership Tab



- **To: (user name being configured)**
  Displays the user name and the list of security groups assigned to the user.

- **<< Copy**
  This button assigns the security groups to the user displayed in To.
  Select the security groups in **Security Group** and click this button to add them to **To**.

- **Delete**
  This button deletes the security groups assigned to the user.
  Select the security groups in **To** and click this button.

- **Security Group**
  This item displays a list of all the security groups. The provided security groups (Administrator, Operator, and Reader) are grayed out if assigned to another user account.

- **Add**
  This button adds a security group. You can create a maximum of 12.
  Click this button to display the **New Security Group** dialog box. New security groups are added in the **New Security Group** dialog box. For details, refer to "Adding a Security Group" on page 23-18.

- **Rename**
  Select a security group in **Security Group** and click this button to display the **Change Security Group Name** dialog box. Change the name of the security group in the **Change Security Group Name** dialog box. For details, refer to "Changing the Name of a Security Group" on page 23-19.

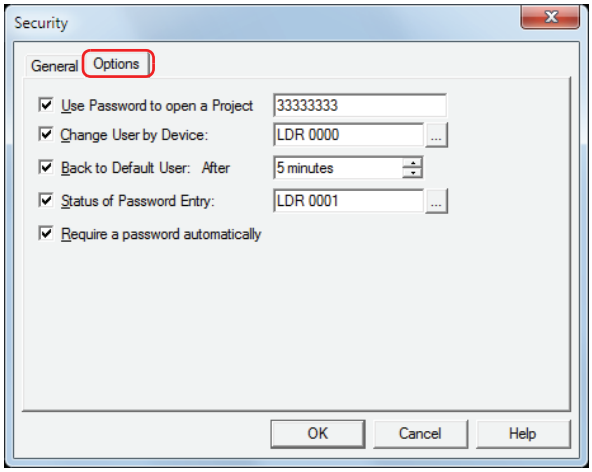
● **Options** Tab

The display of the **Options** tab varies based on the product series.

HG2G-S/-5S/-5F, HG3G/4G: The **Options** tab is always displayed, but the following settings are only displayed when the **Use Security functions** check box is selected on the **General** tab.

- Change User by Device
- Back to Default User
- Status of Password Entry
- Require a password automatically

HG1F/2F/2S/3F/4F: The **Options** tab is only displayed when the **Use Security functions** check box is selected on the **General** tab.



■ **Use Password to open a Project**[*1]

Select this check box to password protect the following type of operations:

- Opening projects
- Reusing screens
- Opening projects after uploading project data
- Opening projects after uploading data on external memory[*2]

(Password): Enter the password.
The number for the password is 4 to 15 characters. Only uppercase alphabetic characters and numbers can be used.

Write down the password so you do not forget it and save that note in a safe place. If you forget the password, contact the nearest IDEC branch office, sales office, or field office.

*1 HG2G-S/-5S/-5F, HG3G/4G only
*2 External memory inserted into the MICRO/I

Change User by Device

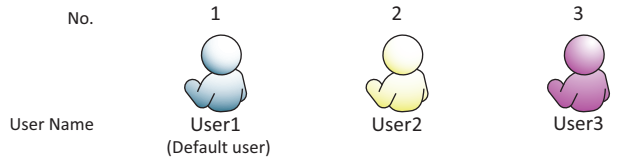
Select this check box to switch the user account according to the value of a device. These settings can only be configured when the **Use Security functions** check box is selected on the **General** tab.

The user account is specified by using the number on the **General** tab.

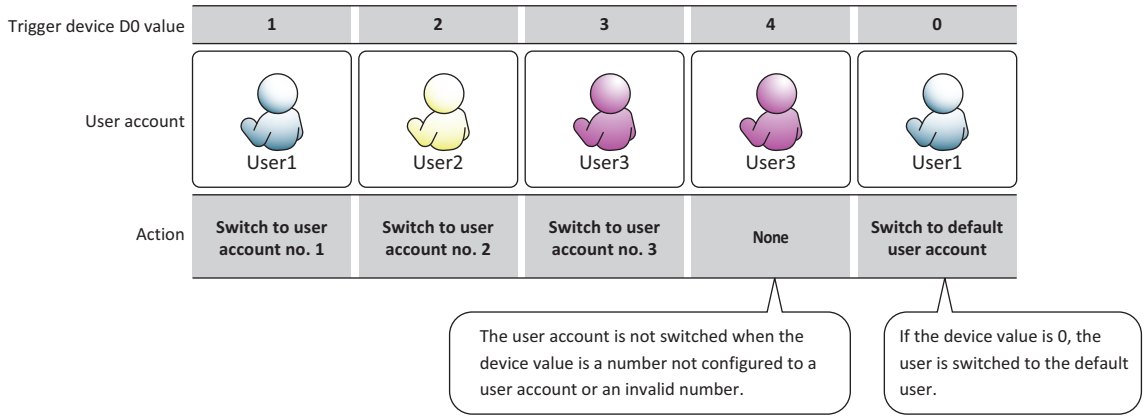
(Trigger device): Specifies the word device to write the number.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

Example: When the trigger device is D0 and the default user is selected as User1



The user account switches according to the value of the device.



Back to Default User

Select this check box to automatically switch to the default user when the MICRO/I is unused for an extended period of time. These settings can only be configured when the **Use Security functions** check box is selected on the **General** tab.

After: Specify the time (0 to 60 minutes) to switch to the default user after the MICRO/I is last used.

If 0 is set, the MICRO/I switches back to the default user immediately, even if the user account was changed.

■ **Status of Password Entry**

Select this check box to monitor the entry status of the password on the Password screen. These settings can only be configured when the **Use Security functions** check box is selected on the **General** tab.

(Destination device): Specifies a word device to write the password entry status.

Click ... to display the **Device Address Settings** dialog box. For the device address configuration procedure, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.

The following bits change to 1 depending on the password input status. These bits become 0 when the Password screen opens or when a button other than **ENT** or **CAN** is pressed on the Password screen.

Bit position	Function	Parameters
0	This bit stores the information when the correct password was entered on the Password screen and **ENT** was pressed.	0: Password being entered 1: Correct password entered
1	This bit stores the information when an incorrect password was entered on the Password screen and **ENT** was pressed.	0: Password being entered 1: Incorrect password entered
2	This bit stores the information when **CAN** was pressed on the Password screen.	0: Password being entered 1: Password entry canceled
3 to 7	Reserved	-

■ **Require a password automatically**

Select this check box to automatically display the Password screen when the user attempts to switch to a base screen that cannot be accessed with the current user account by using a Goto Screen Button or Goto Screen Command configured with **Switch to Base Screen** for the **Action Mode** in the Properties dialog box. These settings can only be configured when the **Use Security functions** check box is selected on the **General** tab.

4 Password Input

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

When a password is configured for a user account, the user is prompted to enter their password with the following operations.

- Accessing password protected data
- Executing password protected displays and operations

4.1 Entering the Password on the MICRO/I

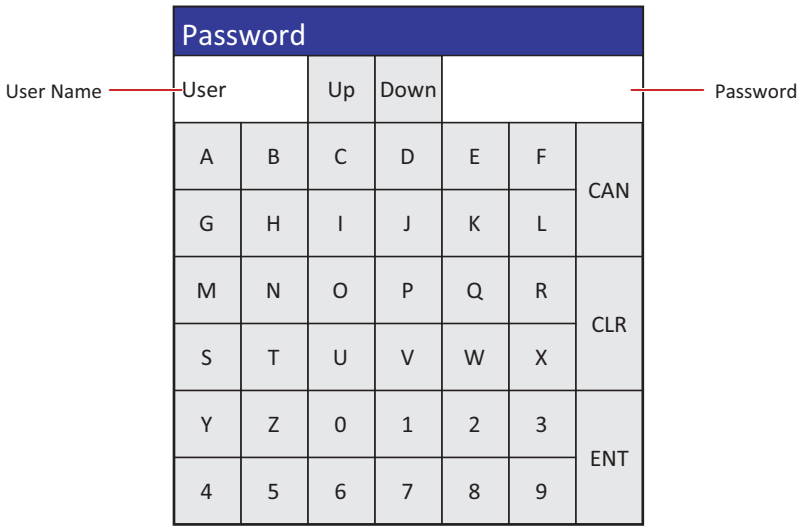
To execute password protected operations, the user must open the Password screen and switch the user account.

The Password screen is opened with a Goto Screen Button or Goto Screen Command configured with Password Screen. The Password screen is also automatically displayed on the MICRO/I when the following operations are executed.

- Switching to a base screen for a security group that cannot be displayed by the current user account with the Goto Screen Button, Multi-Button, Goto Screen Command, or Multi-Command when the **Require a password automatically** check box is selected on the **Options** tab in the **Security** dialog box
- Switching to the system menu or displaying the Device Monitor with the Maintenance screen, Goto Screen Button, Multi-Button, Goto Screen Command, or Multi-Command
- Downloading or uploading project data or PLC programs with a Key Button, Multi-Button, or Multi-Command
- Executing the USB Autorun function

- Operations where the Password screen is not displayed are as follows.
  - Switching the base screen using the System Area
  - Displaying the alarm screen for the alarm log
  - Opening the keypad with the Numerical Input or Character Input
  - Opening the Ref. screen with the Alarm Log Display
  - For screens that are already open when the user account was switched by opening the Password screen with the Goto Screen Button or Goto Screen Command
- When the user account is switched, the displayed base screen is reset. Popup screens and internal devices have the same behavior as when the base screen is switched. However, if the **Close while changing Base Screen** check box is selected on the **Options** tab in the Properties dialog box for the popup screen, the popup screen is closed when the base screen is switched. The behavior of the internal devices varies based on the internal devices. For details, refer to Chapter 32 “Internal Devices” on page 32-1.
- When the HG1F has been installed vertically, the password screen is displayed horizontally.

● Password Screen Configuration



■ **User Name**
Displays the selected user name.

■ **Up Down**
Switches the user name.

■ **Password**
The entered password is displayed as "*".

■ **A to Z, 0 to 9**
Enters A to Z, 0 to 9 in **Password**.

■ **CAN**
Clears the entered password and cancels input. The Password screen closes.

■ **CLR**
Clears the entered password and continues input.

■ **ENT**
Confirms the entered password and starts verifying the user name and password.
If the entered password is correct, the Password screen closes and the operation executes.
If the entered password was incorrect, the password entered on the Password screen is deleted and the screen returns to input mode.

4.2 Entering the Password in WindO/I-NV2

When a user account assigned with Administrator is configured with a password, or when a dedicated password for opening the project has been set, the **Enter Password** dialog box is displayed in WindO/I-NV2 as required and the user is prompted to enter their password.

The operations that display the **Enter Password** dialog box are as follows.

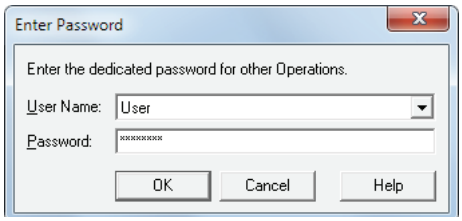
- Opening projects
- Reusing screens
- Downloading project data
- Downloading data to external memory*1
- Downloading data to external memory*1 while the MICRO/I is running
- Uploading project data
- Uploading external memory data*1
- Deleting all data
- Deleting external memory data*1
- Formatting external memory*1

● **Enter Password** Dialog Box

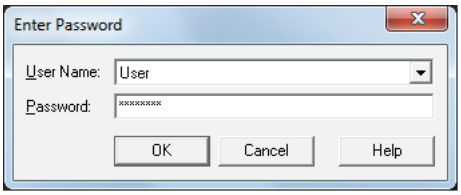
HG2G-S/-5S/-5F, HG3G/4G

If Administrator or Other Operation password is required, the following dialog box appears.

If dedicated password for opening project is required, the following dialog box appears.



HG1F/2F/2S/3F/4F



■ User Name

Selects the user name. This item can only be selected when multiple user accounts are registered.

■ Password

Enter the password. The entered password is displayed as "*".

■ OK

Confirms the entered password and starts verifying the user name and password.

If the entered password is correct, the **Enter Password** dialog box closes and the operation executes.

If the entered password is incorrect, a confirmation message is displayed.

■ Cancel

Cancels password input and closes the **Enter Password** dialog box.

*1 External memory inserted into the MICRO/I (HG2G-5F, HG3G/4G, HG2F/3F/4F only)

Chapter 24 Online Function

This chapter describes in detail on how to setup the online function and the operation of the MICRO/I.

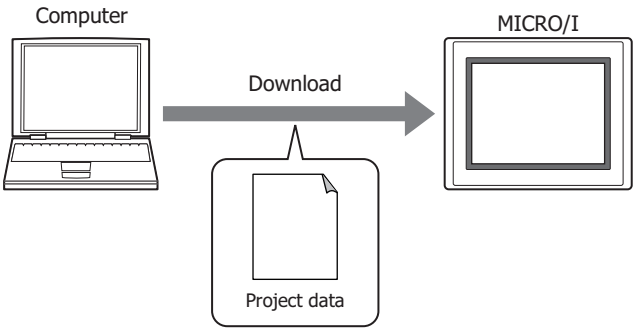
1 Communicating with the MICRO/I

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 How the Online Function is Used

The online function enables communication with the MICRO/I in WindO/I-NV2. This communication between WindO/I-NV2 and the MICRO/I, implemented using an exclusive protocol called maintenance communication.
The online function enables the following.

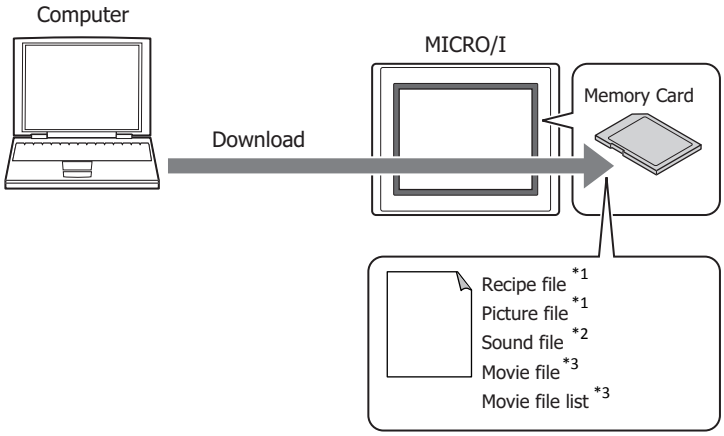
- Write a project data into the MICRO/I.



When project data is downloaded using the online function, the Alarm Log data, Data Log data, and Operation Log data in the data storage area are deleted. All internal devices except for the HG Keep Register (LKR) and HG Keep Relay (LK) are cleared.

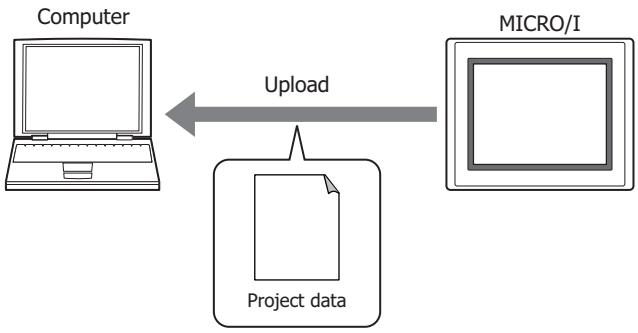
- The following functions can be executed with downloading of project data.
  - Download additional fonts.
  - Download the runtime system.
  - Download recipe files*1, picture files*1, and sound files*2 to the Memory Card Folder in the external memory inserted into the MICRO/I.
  - Clear the HG Keep Register (LKR) and HG Keep Relay (LK) after download.
  - Start running the control functions after download.
- For details on writing project data to an external memory inserted in the computer, refer to Chapter 30 "Downloading" on page 30-10.

- Write files to an external memory inserted in the MICRO/I.



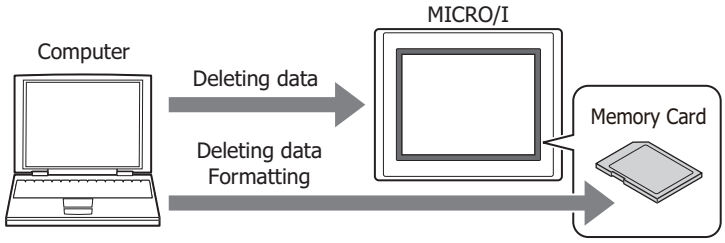
*1 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*2 HG2G-5F, HG3G/4G only
*3 This is applicable for models with a video interface only.

- Read the project data downloaded to the MICRO/I and then save it to a computer.

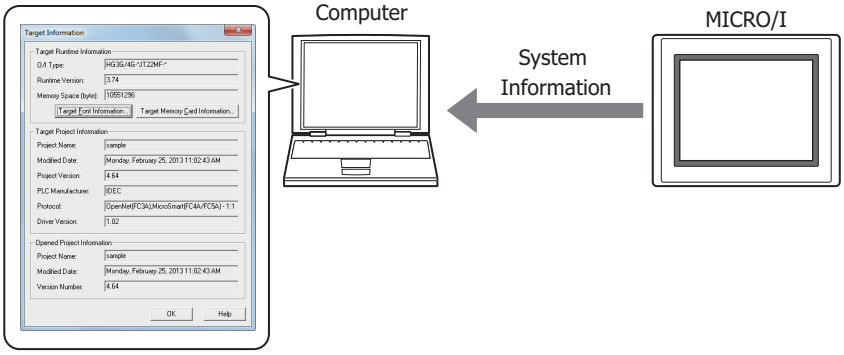


- It is possible to upload recipe files*1, picture files*1, and sound files*2 from the Memory Card Folder in the external memory inserted in the MICRO/I, together with uploading of project data.
- For details on reading project data saved on an external memory using WindO/I-NV2, refer to Chapter 30 "Uploading" on page 30-12.

- Delete the data stored in the internal memory or the external memory inserted in the MICRO/I and format the external memory inserted in the MICRO/I.

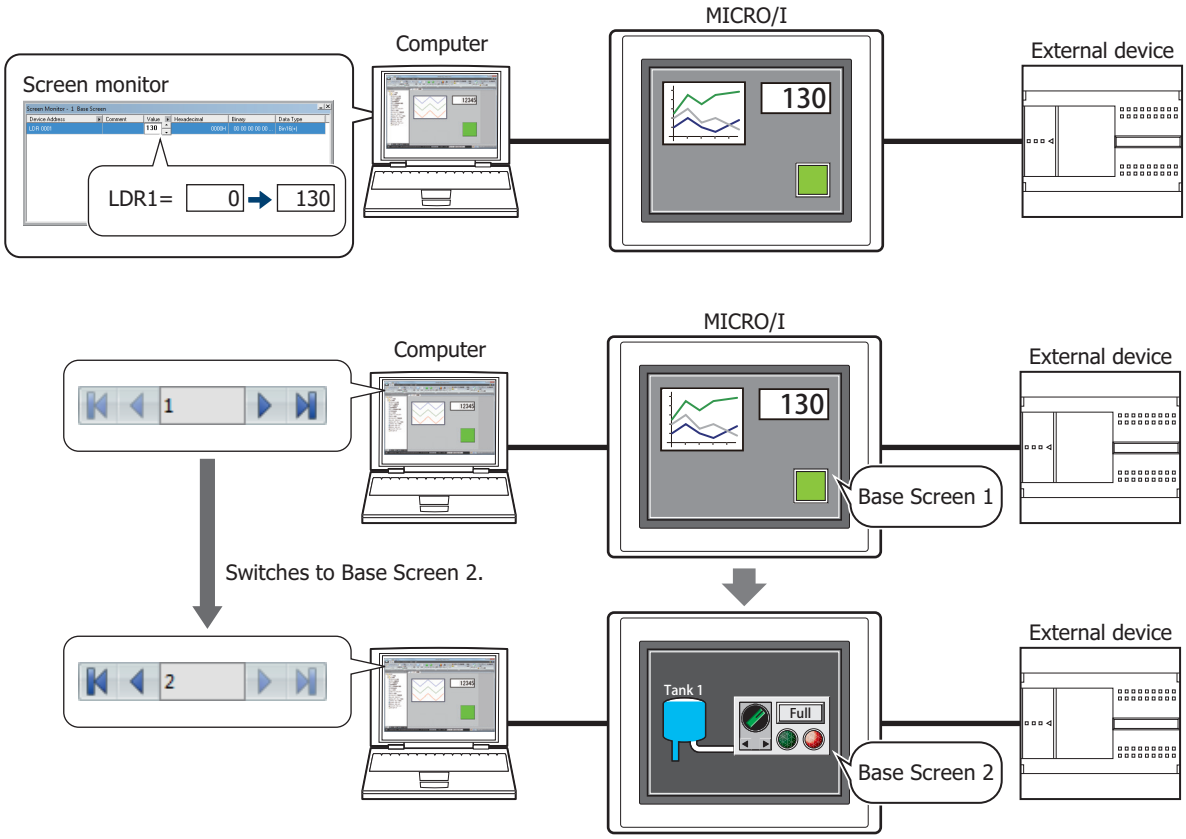


- Display the information about the runtime system and project data of the MICRO/I.



*1 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*2 HG2G-5F, HG3G/4G only

- Edit a project data in WindO/I-NV2 while checking MICRO/I operation by displaying and changing values of devices and switching screens using the monitor function.



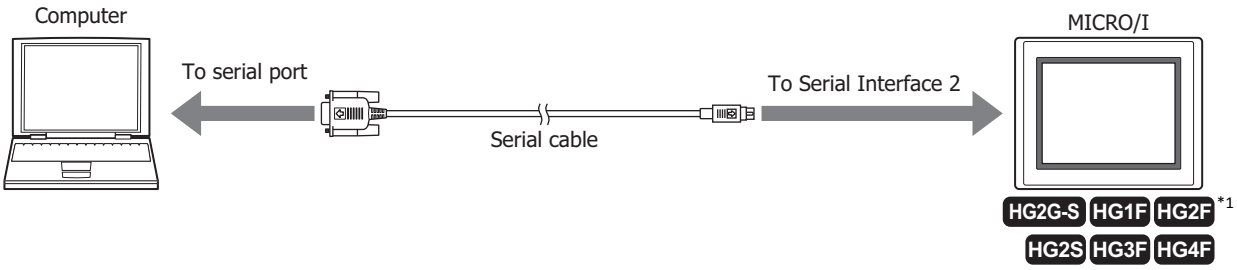
For details about monitor function, refer to Chapter 25 "1 Monitoring with WindO/I-NV2" on page 25-1.

1.2 Connect MICRO/I to a Computer

Connection type varies based on the interface between the MICRO/I and computer.

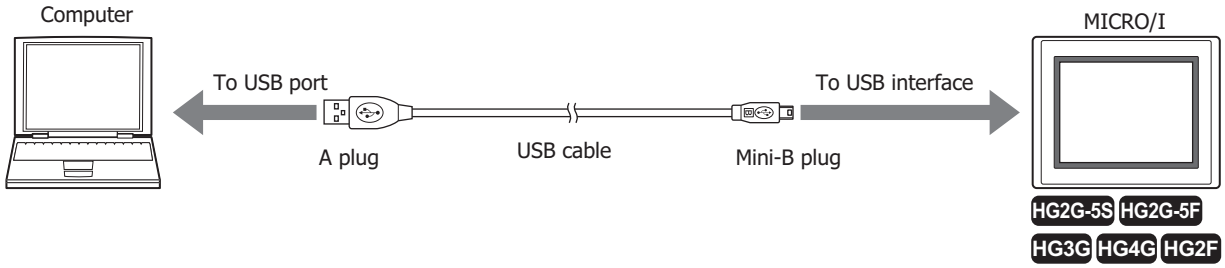
● Serial Connection

The computer has a serial port or a USB port. In the case of a USB port, use USB to RS232 converter.



● USB cable connection

The computer must be equipped with a USB port.



HG2G-5S/-5F, HG3G/4G:	The computer must be running Windows 7/8/10 (64-bit and 32-bit versions), and must have a USB 1.1/2.0 port.
HG2F*2:	The computer must be running Windows 7/8/10 (32-bit edition only), and must have a USB 1.1 port.

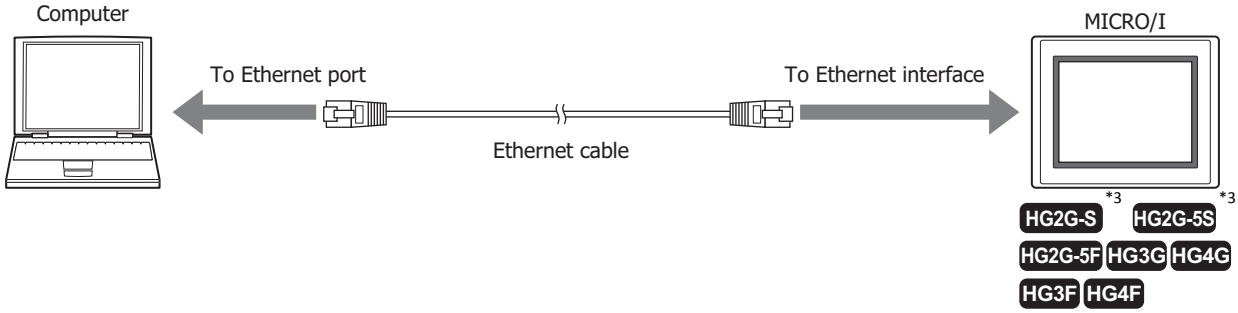
- A USB driver must be installed when connecting the MICRO/I to a computer with a USB cable. Install the USB driver when making the connection for the first time. For details, refer to "How to install USB driver".
  On the upper right corner, click on ▼ to the right of icon, and then click on the How to install USB driver to display the "How to install USB driver".
- The USB driver does not have to be installed for subsequent connections.
  Note, the connection must use the same USB port that was connected to when installing the USB driver. The computer will not recognize the MICRO/I immediately if the USB cable is connected to a different USB port.

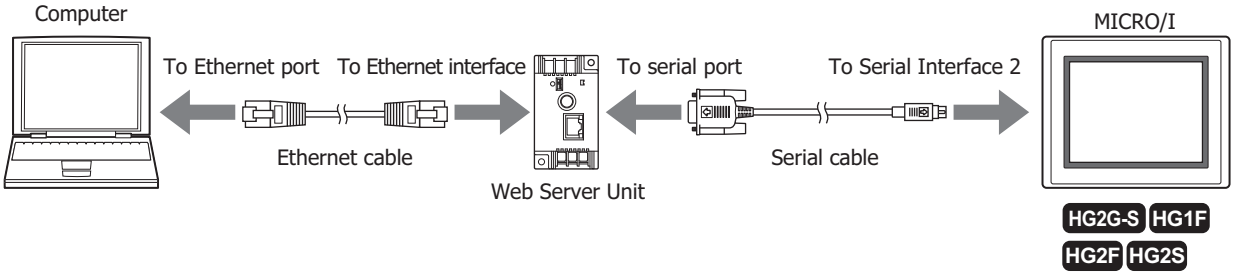
- Multiple MICRO/I connections using different USB ports on the same computer are not supported.
- The computer cannot be connected to the MICRO/I via a USB hub.

*1 This is applicable for models with Serial Interface 2 only.
*2 This is applicable for models with USB interface only.

● Ethernet cable connection

The computer must be equipped with an Ethernet port.





It is necessary to configure the MICRO/I according to the local network that is used.

On the **Communication Interface** tab in the Project Settings dialog box, specify the IP address, subnet mask, and default gateway, and clear the **Forbid Maintenance Communication** check box. For details, refer to Chapter 4 "3.2 Communication Interface Tab" on page 4-36.

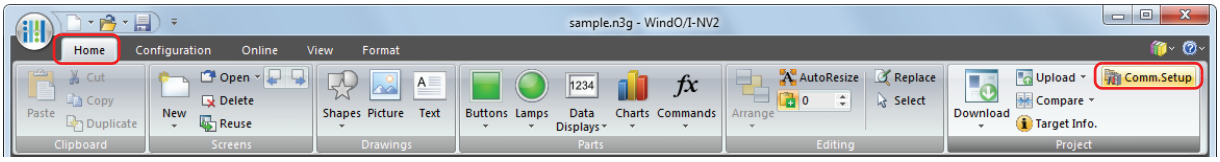
*3 This is applicable for models with Ethernet interface only.

1.3 Change Communication Settings

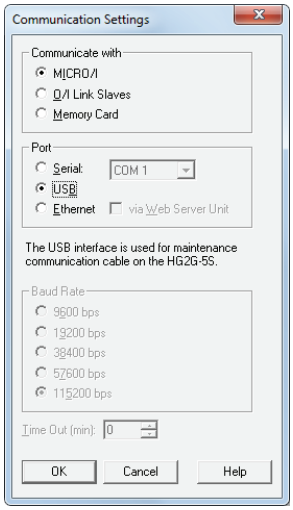
To communicate with the MICRO/I in WindO/I-NV2, configure the settings such as communication speed and port used to match the connection method for the MICRO/I.

1 On the **Home** tab, in the **Project** group, click **Comm.Setup**.

The Communication Settings dialog box is displayed.



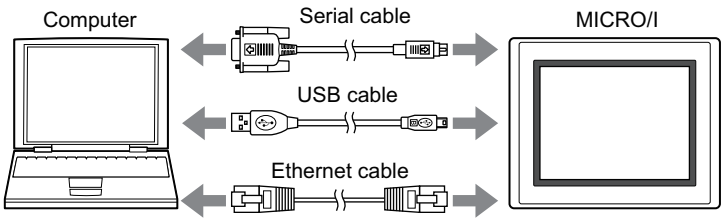
2 Change the settings on each tab as necessary and then click **OK**.



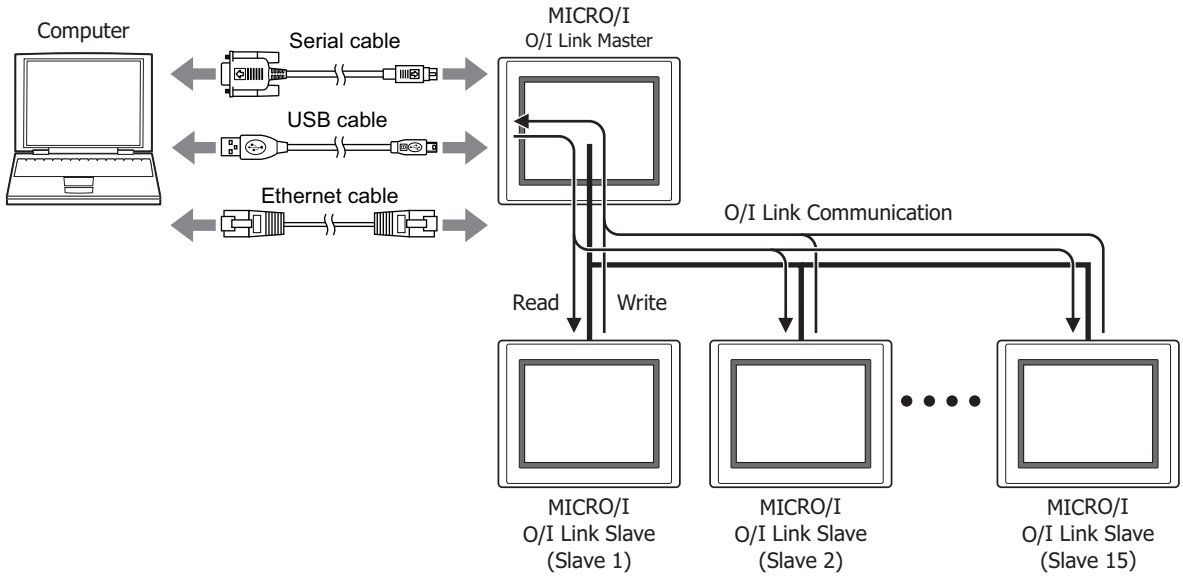
■ Communicate with

Select the device to communicate with from the following items.

MICRO/I: Communicate with the MICRO/I connected to the computer.
For details, refer to "Using the online function for Ethernet communication" on page 24-8.



O/I Link Slaves: Communicate with an O/I Link Slave MICRO/I via an O/I Link Master.
For details, refer to "Using the online function with an O/I Link Slave via an O/I Link Master" on page 24-9.



Memory Card: Read or write data to the external memory inserted in the computer.
For details, refer to Chapter 30 "1.4 Reading/Writing Data" on page 30-5.

■ Port

Select the communication port on the computer from the following items.

Serial: Connect the serial port on the computer to Serial Interface 2*1 on the MICRO/I.

(Serial port): Select from "COM 1" to "COM 256".

USB: Connect the USB port on the computer to the USB interface*2 on the MICRO/I.

Ethernet: Connect the Ethernet port on the computer to the Ethernet interface*3 on the MICRO/I.

via Web Server Unit: Ethernet communication is possible for MICRO/I types without an Ethernet interface. This is with the use of the IDEC Web Server Unit (FC4A-SX5ES1E).

The USB interface is used for Maintenance Communication on the HG2G-5S. Select **Serial** for **Port**.

- The port number is 2537 when connecting from WindO/I-NV2 to the MICRO/I via Ethernet.
- The default network settings configured on the MICRO/I are as follows.

IP Address: 192.168.0.1
Subnet Mask: 255.255.255.0

■ Baud Rate

Select the communication speed for the serial port of the computer from the following items.

9600 bps, **19200 bps**, **38400 bps**, **57600 bps**, **115200 bps**

This can only be set when **Serial** is selected for **Port** or when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected.

■ Time Out (min)

Specify the time to wait for a response from the MICRO/I (1 minute to 20 minutes).

*1 HG2G-S, HG1F/2F/2S/3F/4F only (This is applicable for HG2F models with Serial Interface 2 only.)
*2 HG2G-5S/-5F, HG3G/4G, HG2F only (This is applicable for HG2F models with USB interface only.)
*3 HG2G-S/-5S/-5F, HG3G/4G, HG3F/4F only

● Using the online function for Ethernet communication

Select **Ethernet** under **Port** on the Target IP Address dialog box.

It is necessary to configure the MICRO/I according to the local network that is used.
On the **Communication Interface** tab in the Project Settings dialog box, specify the IP address, subnet mask, and default gateway, and clear the **Forbid Maintenance Communication** check box. For details, refer to Chapter 4 "3.2 Communication Interface Tab" on page 4-36.

The default network settings configured on the MICRO/I are as follows.

IP Address:	192.168.0.1
Subnet Mask:	255.255.255.0

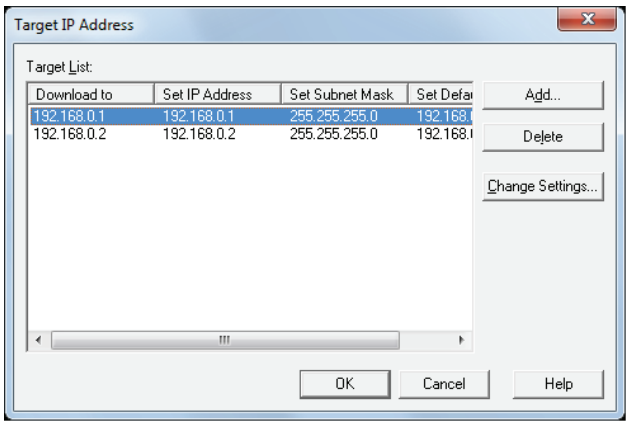
To download project data

Click **Download** in the Download dialog box to display the Target IP Address dialog box.

Specify the Ethernet settings (IP address, subnet mask, and default gateway) for the MICRO/I.

Select the MICRO/I IP addresses and you can batch download project data to multiple MICRO/I.

It is also possible to change the Ethernet settings (IP address, subnet mask, and default gateway) for the MICRO/I to which you are downloading after project data is downloaded.



■ Target List

Download to:	Shows the current IP address for the MICRO/I to download the project data to.
Set IP Address:	Shows the IP address for the MICRO/I after downloading the project data.
Set Subnet Mask:	Shows the subnet mask for the MICRO/I after downloading the project data.
Set Default Gateway:	Shows the default gateway for the MICRO/I after downloading the project data.
Port No.:	Shows the port number of the Web Server Unit connected to the MICRO/I to download the project data to. This can only be set when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected on the Communication Settings dialog box.

■ Add

Adds a download destination for project data to the list. Click this button to open IP Address Manager. Using **IP Address Manager**, specify the Ethernet settings for the MICRO/I to which you are downloading.

■ Delete

Deletes download destinations from the list.

■ Change Settings

Changes the Ethernet settings of the MICRO/I to which you are downloading after project data is downloaded.

Select a download destination from the list, and then click **Change Settings** to display **IP Address Manager**. Using **IP Address Manager**, specify the Ethernet settings of the MICRO/I after downloading.

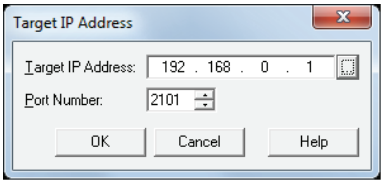
Even if the Ethernet settings of the MICRO/I are changed by using the Target IP Address dialog box when downloading a project, the Ethernet settings in the editing project data are not changed.

To execute any function except project data download

The Target IP Address dialog box will be displayed when any of the following functions are executed.

- Upload a project data.
- Upload data from an external memory inserted in the MICRO/I.
- Delete data stored in the internal memory.
- Delete data from or formatting an external memory inserted in the MICRO/I.
- Display information about runtime system and project data.
- Monitor the MICRO/I.

Specifies the IP address of the MICRO/I used for communication.



■ **Target IP Address**

Specify the IP address for the target MICRO/I to execute this function.

Click ... to display IP Address Manager. Specify the IP address for the target MICRO/I with IP Address Manager.

■ **Port Number**

Specify the port number (0 to 65535) of the Web Server Unit connected to the destination MICRO/I that will the operational target.

This can only be set when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

● Using the online function with an O/I Link Slave via an O/I Link Master

Select **O/I Link Slaves** under **Communicate with** on the Communication Settings dialog box. For details about O/I Link Communication, refer to Chapter 3 "2 O/I Link Communication" on page 3-3.

- When the MICRO/I used as an O/I Link Master or O/I Link Slave is connected with a computer, select **MICRO/I** in the Communication Settings dialog box.
- The HG2G-S/-5S/-5F, the HG3G/4G, and the HG1F/2F/2S/3F/4F use different O/I Link Communication, therefore they can not be connected on the same O/I Link Communication.
- During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.
- If the O/I Link Master is the HG1F/2F/3F/4F, the O/I Link Slave cannot be monitored.
- During the following states, maintenance communication is not possible via the O/I Link Master.
  - The O/I Link Slave is in Simulation Mode.
  - The HG1F is being used as the O/I Link Master.

To communicate with the O/I Link Slaves via the O/I Link Master, here are the conditions to follows.

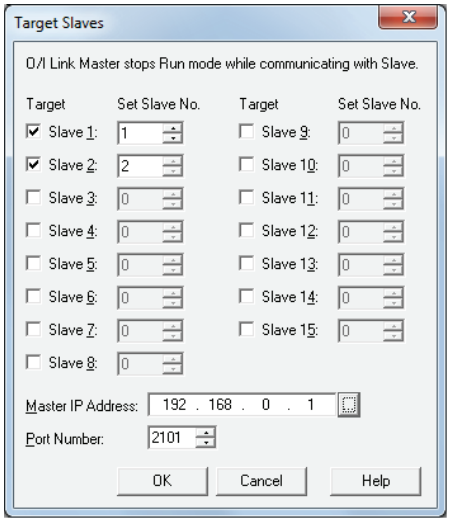
- A project configured with the O/I Link Slave settings is being downloaded.
- The WindO/I-NV2 runtime system version is Ver. 2.5 or later.
- If the O/I Link Slave is the HG1F/2F/3F/4F, from the System Menu, under **Initial Setting**, **O/I Link**, set to **Use**.

To download project data

Click **Download** in the Download dialog box to display the Target Slaves dialog box.

Specify the slave station number of the MICRO/I to which you are downloading. You can download project data to multiple MICRO/Is.

Also, it is possible to change the slave station number the MICRO/I to which you are downloading after project data is downloaded.



■ **Target**

Select slave stations (Slave 1 through Slave 15 of the download target).

■ **Set Slave No.**

The slave station number of the MICRO/I to which you are downloading is changed after project data is downloaded.

Specifies the new slave station number (1 to 15) applied to the MICRO/I after downloading a project data.

If the slave station number of the MICRO/I is duplicated after downloading, communication is not possible.

Even if the slave station number of the MICRO/I configured in the Target IP Address dialog box when downloading a project is rewritten, project data remains unchanged during editing.

■ **Master IP Address**

Specifies the IP address of the O/I Link Master that is used to communicate between the O/I Link Slave and the external device.

Click ... to display IP Address Manager. Specify the IP address for the O/I Link Master with IP Address Manager.

This option can only be displayed when **O/I Link Slave** is selected for **Communicate with** and **Ethernet** is selected for **Port** in the Communication Settings dialog box.

■ **Port Number**

Specify the port number (0 to 65535) of the Web Server Unit connected to the MICRO/I to download the project data to.

This can only be set when **O/I Link Slave** is selected for **Communicate with** and **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

To execute any function except project data download

The Target Slave dialog box will be displayed when any of the following functions are executed.

- Upload project data.
- Upload data from an external memory inserted in the MICRO/I.
- Delete data stored in the internal memory of the MICRO/I.
- Delete data from or format an external memory inserted in the MICRO/I.
- Display information about runtime system and project data.
- Monitor the MICRO/I.

Specifies the O/I Link Slave.

■ **Target Slave**

Select the slave station number (Slave 1 to Slave 15) that will be the subject of the operation.

■ **Master IP Address**

Specify the IP address of the O/I Link Master that is used to communicate between the O/I Link Slave and the external device.

Click ... to display IP Address Manager. Specify the IP address for the O/I Link Master with IP Address Manager.

This option can only be displayed when **O/I Link Slave** is selected for **Communicate with** and **Ethernet** is selected for **Port** in the Communication Settings dialog box.

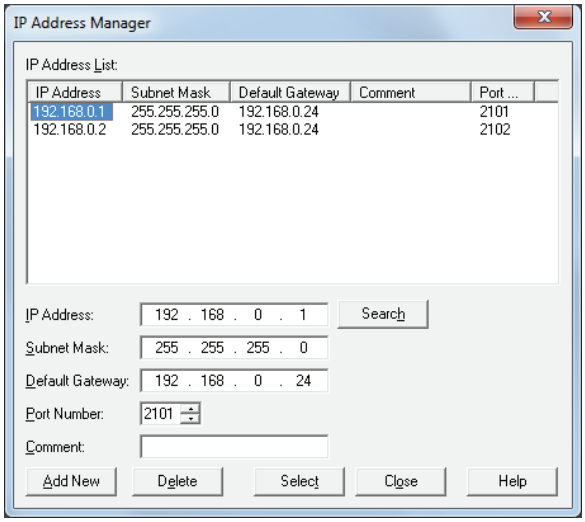
■ **Port Number**

Specify the port number (0 to 65535) of the Web Server Unit connected to the destination MICRO/I that will the operational target.

This can only be set when **O/I Link Slave** is selected for **Communicate with** and **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

● IP Address Manager

You can register target Ethernet settings for performing online function via Ethernet communication to the project data.



■ IP Address List

Ethernet settings registered in the project data are displayed in this list.

IP Address:	Displays the IP address.
Subnet Mask:	Displays the subnet mask.
Default Gateway:	Displays the default gateway.
Comment:	Displays comment.
Port No.:	Displays the port number of the Web Server Unit connected to the MICRO/I. This can only be set when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

■ IP Address

Enter the IP address to register in the project data.

Search:	Displays the Search IP Address dialog box. Searches for Web Server Units connected to MICRO/Is and shows the IP address of the Web Server Units. For details, refer to "Search IP Address dialog box" on page 24-13.

■ Subnet Mask

Enter the subnet mask to register in the project data.

■ Default Gateway

Enter the default gateway to register in the project data.

■ Comment

Enter comment to register in the project data.

■ Port Number

Specify the port number (0 to 65535) of the Web Server Unit connected to the destination MICRO/I that will the operational target.
This can only be set when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

■ Add New

Adds **IP Address**, **Subnet Mask**, **Default Gateway**, and **Comment** to the list.

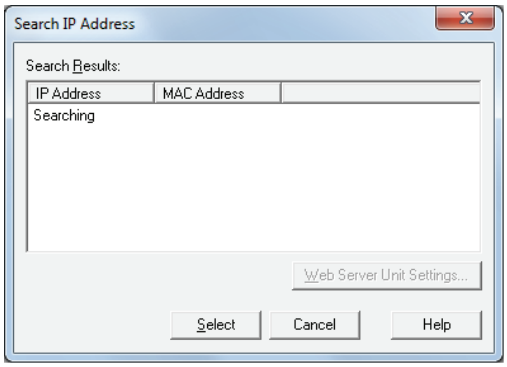
■ Delete

Deletes the selected IP address from the list.

■ Select

Closes IP Address Manager, and apply the Ethernet settings selected from the list.

● Search IP Address dialog box



■ **Search Results**

Searches for Web Server Units connected to MICRO/Is and shows the search results as a list.

IP Address:	Displays the IP address for that unit.
MAC Address	Displays the MAC address for that unit.

"Searching" is displayed when searching for the Web Server Unit and "Web Server Unit could not be found" is displayed when the Web Server Unit could not be found.

■ **Web Server Unit Settings**

Changes the Web Server Unit settings.

Select the IP address for a Web Server Unit from the **Search Results**, and then click this button.

■ **Select**

Select the IP address from the **Search Results** and register it in the IP Address Manager dialog box.

2 Downloading

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Downloading Project Data to the MICRO/I

1. Change communication settings according to the connection method between the computer and the MICRO/I.

   In the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

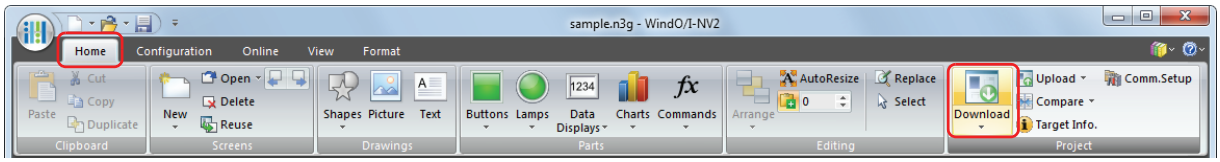
2. Open a project to download.

> To download a project without opening it, on the **Home** tab, in the **Project** group, click the **Download** icon. The Open dialog box is displayed. Select a file then click **Open**. The Download dialog box is displayed. Proceed to Step *4*.

> When project data is downloaded to the MICRO/I, the MICRO/I screen data is overwritten.

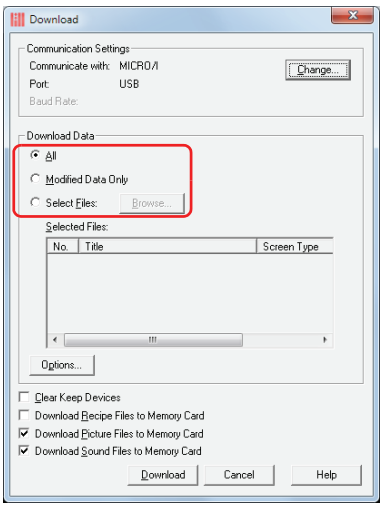
3. On the **Home** tab, in the **Project** group, click the **Download** icon.

   The Download dialog box is displayed.



> If the project data was changed, a confirmation message to save the project data is displayed.
> - Click **OK** to save the project data and display the Download dialog box.
> - Click **Cancel** to return to the editing screen without saving the project data.

4. Select data for download under **Download Data**.



- **All**
  Download the entire project data.

- **Modified Data Only**
  Downloads files modified since the previous download.
  If download fails, select **All** to download.

- **Select Files**
  Download the specified files. Click **Browse** to display the Open Screens dialog box. Select **Screen Type**, select the screen to be downloaded from **Screen List** and then click **OK**. The selected screen is added to the list.

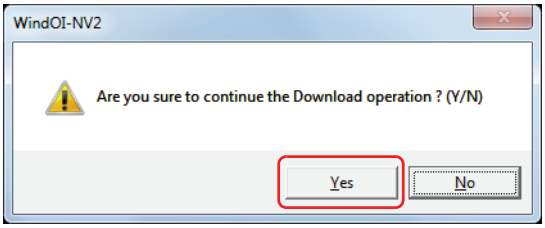
5 Click **Download**.

- When **Communicate with** is set to **MICRO/I** and **Port** to **USB** or **Serial**, the project data starts downloading.
- When **Communicate with** is set to **MICRO/I** and **Port** to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start the download. For details, refer to "To download project data" on page 24-8.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station number of the MICRO/I to download to, then click **OK** to start the download.
  If **Port** is set to **Ethernet**, specify the IP address of the O/I Link Master via which to download. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To download project data" on page 24-10.

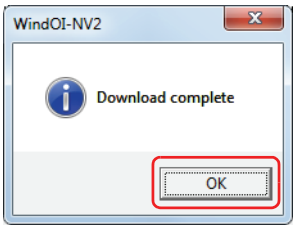
If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

6 Click **Yes**.

The Download Project dialog box is displayed and the project file starts downloading.
When finished downloading, a completion message is displayed.

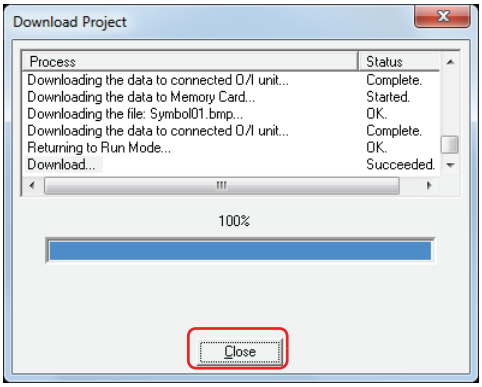


7 Click **OK**.



8 Click **Close** on the Download Project dialog box.

This concludes downloading project data.

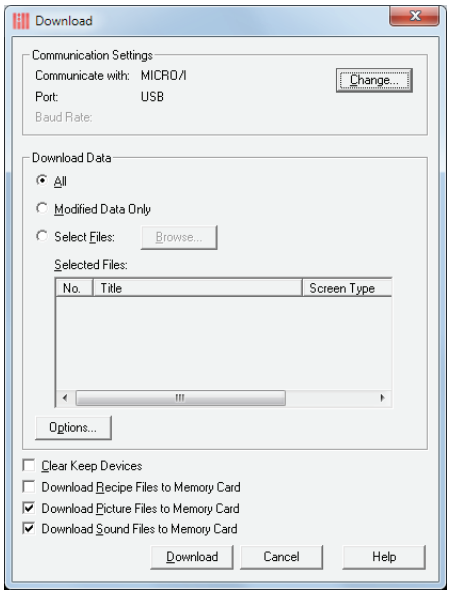


- Do not turn off the MICRO/I while project data is downloading.
- If project data downloading fails and communication is not possible, turn the MICRO/I off and on, then download the data once again.
- During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.
- If project data is repeatedly downloaded with **Modified Data Only**, the free space in the MICRO/I's internal memory will be used up and the download will fail. In this case, select **All** and attempt the download again.

For details on writing project data to an external memory inserted in the computer, refer to Chapter 30 "Downloading" on page 30-10.

2.2 Download Dialog Box

This section describes items and buttons of the Download dialog box.



■ Communication Settings

Communicate with: Available computer devices are displayed.

Port: Available communication ports on the computer are displayed.

Baud Rate: The communication speed when using the computer's serial port is displayed.
This is displayed only when **Serial** is selected for **Port** or when **Ethernet** is selected for **Port** and the **via Web Server Unit** check box is selected in the Communication Settings dialog box.

Change: Changes communication settings. Click this button to display the Communication Settings dialog box. For details, refer to "1.3 Change Communication Settings" on page 24-6.

■ Download Data

Selects data to be downloaded.

All: All project data is downloaded.

Modified Data Only: Only files that were updated since the previous download are downloaded.
If an upload fails, select **All** to download.

Select Files: Specifies a screen for download.

- Browse: The screen to be downloaded is added to the list. Click **Browse** to display the Open Screens dialog box. Select **Screen Type**, then select the screen to be downloaded from **Screen List**, and then click **OK**. The selected screen is then added to the list.
- Specific Data List: Lists the properties of the specified screen
  - No.: Displays the Screen No. of the specified screen
  - Title: Displays the title of the specified screen
  - Screen Type: Displays the screen type of the specified screen
  - File Name: Displays the file name of the specified screen

Options: Used for settings to download runtime system and additional fonts. Click to display the Options dialog box. For details, refer to "Options dialog box" on page 24-18.

■ **Clear Keep Devices**[*1]
Select this check box to clear the keep devices after the project data is downloaded. Note that when a project data with a changed data storage area setting is downloaded, the keep devices are always cleared.
For the HG1F/2F/2S/3F/4F, these are always cleared when downloading the project data.

■ **Download Recipe Files to Memory Card**[*2]
Select this check box to create a **RECIPE** folder or recipe files in the Memory Card Folder on an external memory inserted in the MICRO/I when downloading projects. Only on channels for which **Save to** in the Recipe Settings dialog box is set to **Memory Card**, and **Recipe Function** is set to **Use**.

- When **Download Data** is set to **All**, recipe files are created for all channels for which recipe data is set.
- When **Download Data** is set to **Modified Data Only**, only recipe files on channels where recipe data has changed are created.
- When **Download Data** is set to **Select Files**, no recipe file is created.

■ **Download Picture Files to Memory Card**[*2]
Select this check box to create the **PICTURE** folder under the Memory Card Folder on the external memory inserted in the MICRO/I and to save the picture files when downloading project. Out of the pictures registered in Picture Manager, the picture files that are saved are those picture files that have been selected with the check box on the picture list.

■ **Download Sound Files to Memory Card**[*3]
Select this check box to create the **SOUND** folder under the Memory Card Folder on the external memory inserted in the MICRO/I and to save the sound files when downloading project. The sound files that are saved are those with **Save To** set to **Memory Card** under settings in the Sound Settings dialog box.

■ **Download**

- When **Communicate with** is set to **MICRO/I** and **Port** to **USB** or **Serial**, the project data starts downloading.
- When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start the download. For details, refer to "To download project data" on page 24-8.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to download to, then click **OK** to start the download.
  If **Port** is set to **Ethernet**, specify the IP address of the master via which to download. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To download project data" on page 24-10.
- When **Communicate with** is set to **Memory Card**, the Select Drive dialog box is displayed. Select the external memory drive, then click **OK** to start the download. For details, refer to "2.3 Downloading Files to an External Memory Inserted in the MICRO/I" on page 24-19.

Do not turn off the MICRO/I while project data is downloading.

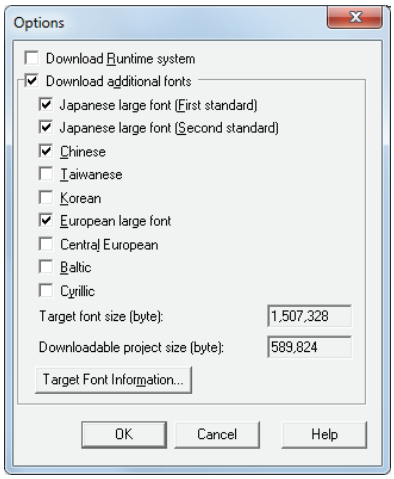
- If project data downloading fails and communication is not possible, turn the MICRO/I off and on then download the data once again.
- During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

■ **Cancel**
Stops downloading of project data.

*1 HG2G-S/-5S/-5F, HG3G/4G only
*2 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*3 HG2G-5F, HG3G/4G only

Options dialog box

Download runtime system and additional fonts.



■ **Download Runtime system**

Select this check box to force download runtime system, irrespective of the runtime system version of the MICRO/I, when downloading project data. Normally this option should not be used.

■ **Download additional fonts**

Select this check box to download additional fonts when downloading project data.

If this check box is selected, the following additional fonts can be selected for download to the MICRO/I.

Japanese Large Font (First standard), **Japanese Large Font (Second Standard)**, **Chinese**, **Taiwanese**, **Korean**, **European Large Font**, **Central European**, **Baltic**, and **Cyrillic**.

- For details about additional fonts, refer to Chapter 2 "Installed Fonts in the MICRO/I" on page 2-6.
- Clear the **Download Additional Fonts** check box, to delete all additional fonts that have been downloaded to the MICRO/I.
- The additional fonts downloaded to the MICRO/I whose check box is cleared will be deleted from the MICRO/I.

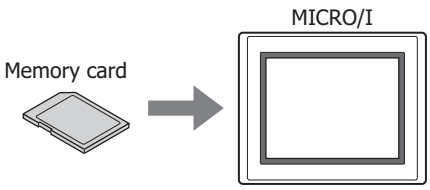
Target font size (byte):	Shows the total size of the basic fonts and selected additional fonts. If no additional fonts are selected for download to the MICRO/I, shows the size of the basic fonts.
Downloadable project size (byte):	Shows the amount of project data that can be downloaded. This figure varies according to the additional fonts selected.
Target Font Information:	Confirms the additional fonts installed on the MICRO/I.

2.3 Downloading Files to an External Memory Inserted in the MICRO/I

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Specified files can be downloaded to an external memory inserted in the MICRO/I. The files are downloaded to Memory Card Folder specified in the Project Settings dialog box for the current project.

1 Insert the external memory into the MICRO/I.



2 Change communication settings according to the connection method between the computer and the MICRO/I.

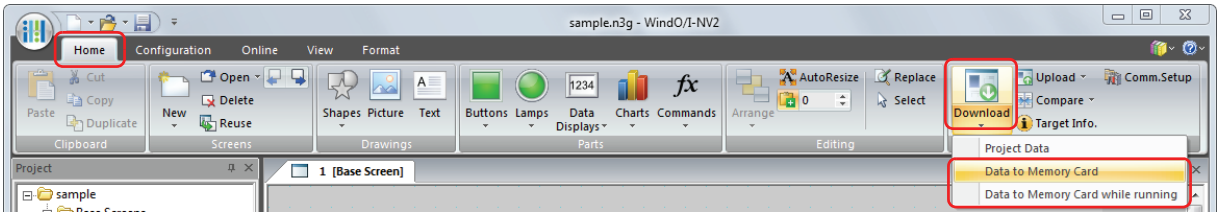
In the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

3 On the **Home** tab, in the **Project** group, click the arrow under **Download**.

While editing project data, even if you click the arrow under **Download** in the **Transfer** group on the **Online** tab, the download menu will be displayed.

4 Select the method for downloading the file to the external memory.

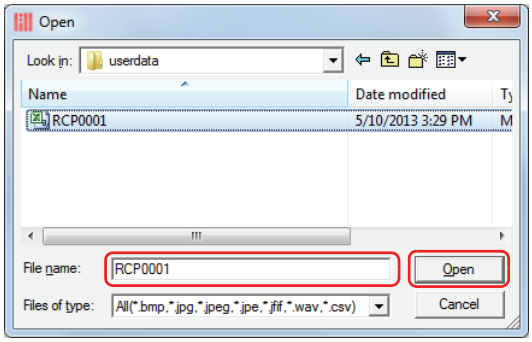
The Open dialog box is displayed.



■ **Data to Memory Card**
Stops operation of the MICRO/I and downloads the file to the external memory inserted in the MICRO/I. When the file download is complete, operation resumes.

■ **Data to Memory Card while running**
Downloads the file to the external memory inserted in the MICRO/I without stopping operation of the MICRO/I.

5 Select the file, and then click **Open**.

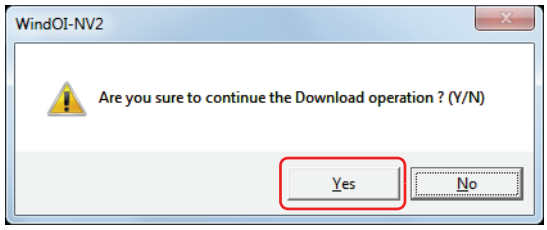


- When **Communicate with** is set to **MICRO/I** and **Port** to **USB** or **Serial**, the project data starts downloading.
- When **Communicate with** is set to **MICRO/I** and **Port** to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start the download. For details, refer to "To execute any function except project data download" on page 24-9.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to download to, then click **OK** to start the download.
  If **Port** is set to **Ethernet**, specify the IP address of the master via which to download. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

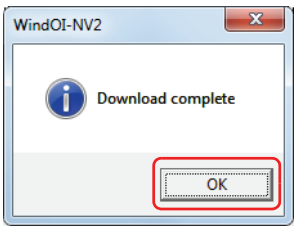
If security is enabled in the MICRO/I project, the Password Screen is displayed. Select the user name and enter the password.
For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

6 Click **Yes**.

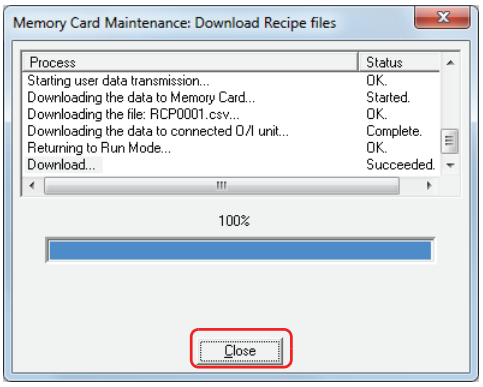
The Memory Card Maintenance dialog box is displayed and the file starts downloading.
When finished downloading, a completion message is displayed.



7 Click **OK**.



8 Click **Close** in the Memory Card Maintenance dialog box.



During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

To create a recipe file on an external memory inserted in the computer, use **Write Recipe Files to Memory Card** in the Recipe Settings dialog box. For details, refer to Chapter 18 "Creating Recipe Files in the Recipe Settings Dialog Box" on page 18-17.

3 Uploading

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Project data in the MICRO/I or in an external memory inserted in a computer can be read using WindO/I-NV2 and saved to the computer.

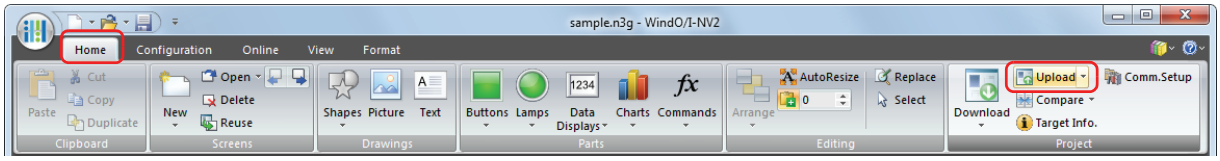
3.1 Upload Project Data from the MICRO/I

1. Change communication settings according to the connection method between the computer and the MICRO/I.

   In the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

2. On the **Home** tab, in the **Project** group, click the **Upload** icon.

While editing project data, project data can be uploaded from the MICRO/I even by clicking the **Upload** icon in the **Transfer** group on the **Online** tab.



If project data is being edited, project data will be closed. If the project data was changed, a confirmation message to save the project data is displayed.

- Click **Yes** to save the project data and display a dialog box corresponding to the communication settings.
- Click **No** to close the project data without saving changes and display a dialog box corresponding to the communication settings.
- Click **Cancel** to stop uploading and return to the editing screen without saving the project data.

- When **Communicate with** is set to **MICRO/I** and **Port** is set to **USB** or **Serial**, the Upload dialog box is displayed.
- When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start the upload. For details, refer to "To execute any function except project data download" on page 24-9.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to communicate with, and then click **OK** to display the Upload dialog box.
  If **Port** is set to **Ethernet**, specify the IP address of the master via which to upload. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

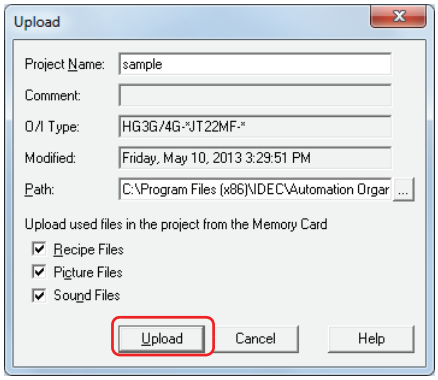
If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3 Check the project data details, and then click **Upload**.

If there is a project file with the same file name in the upload folder, an overwrite confirmation message is displayed.

- Click **Yes** to start uploading the project data.
- Click **Cancel** to stop uploading the project data.

When finished uploading, a completion message is displayed.



■ **Project Name**

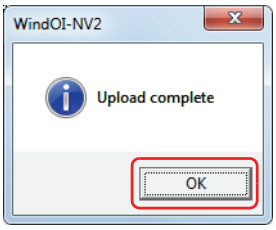
The project file is saved with the currently displayed name. To change the project name, enter a new name for the file. The maximum number is 50 characters.

> You cannot use the following characters in the project name.
> \ / : * ? " < > |

■ **Location**

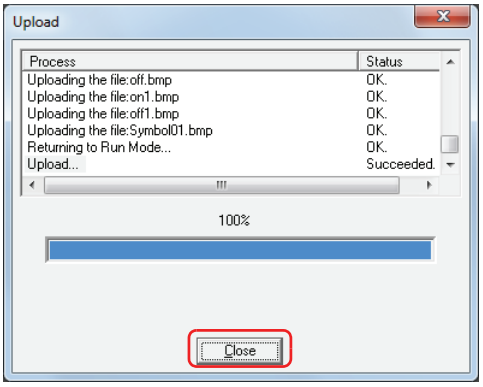
The uploaded project file is saved to the currently displayed location. To change the location of the saved file, click ... . The Save Project After Uploading dialog box is displayed. Select a location, and then click **Save**.

4 Click **OK**.



5 Click **Close** on the Upload dialog box.

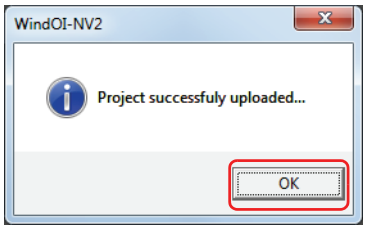
A confirmation message to open the project is displayed.



6 Click **OK**.

The uploaded project opens.

This concludes uploading of project data.



- During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.
- If a password has been configured for the project data, the Enter Password screen will be displayed.

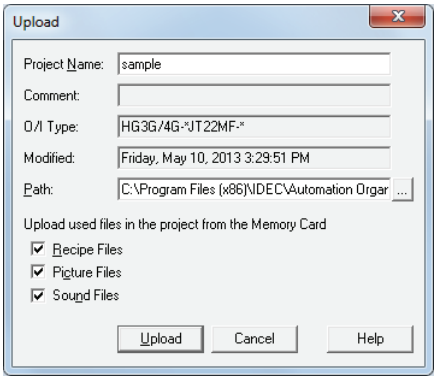
HG2G-S/-5S/-5F, HG3G/4G:	The password to enter varies based on the check box setting of the **Use Password to open a Project** found under the **Options** tab in the **Security** dialog box. When this check box is checked, enter the password for **Use Password to open a Project**. When this check box is unchecked, enter the password for the user account assigned to the Administrator security group.
HG1F/2F/2S/3F/4F:	Enter the password for the user account assigned to the Administrator security group.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

For details on reading project data saved on an external memory using WindO/I-NV2, refer to Chapter 30 "Uploading" on page 30-12.

3.2 Upload Dialog Box

This section describes the settings and buttons of the Upload dialog box.



■ **Project Name**
The project file is saved with the currently displayed name. To change the project name, enter a new name for the file. The maximum number is 50 characters.

> You cannot use the following characters in the project name.
> \ / : * ? " < > |

■ **Comment**
Displays comment on project data downloaded to the MICRO/I.

■ **Type Number**
Displays the type number selected in project data downloaded to the MICRO/I.

■ **Modified**
Displays the time that project data downloaded to the MICRO/I was last saved in WindO/I-NV2.

■ **Location**
Specifies the location for saving uploaded project files.

Click ... to display the Save Project After Uploading dialog box. Select the location for saving, then click **Save**.

■ **Upload files used in this project from the Memory Card**[*1]
To upload files located on an external memory inserted in the MICRO/I that are used by the project together with project data, select the file to be uploaded from the following.

Recipe Files

Picture Files

Sound Files[*2]

■ **Upload**
Starts uploading of project data.

■ **Cancel**
Stops uploading of project data.

*1 HG2G-5F, HG3G/4G, HG2F/3F/4F only
*2 HG2G-5F, HG3G/4G only

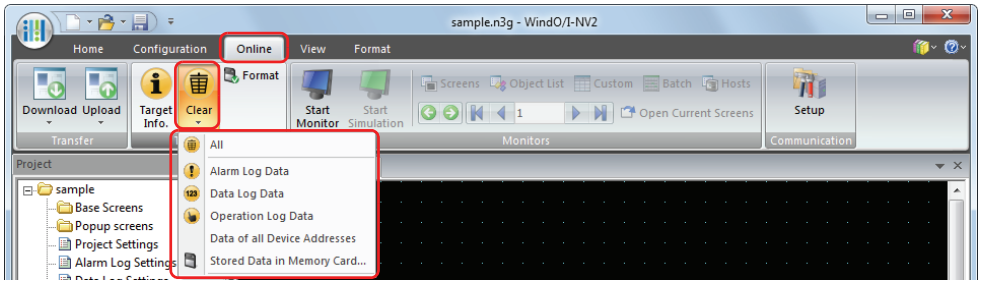
4 Clear

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Deletes data from the MICRO/I or from an external memory inserted in the MICRO/I.

4.1 Clear Data from the MICRO/I

1. Change communication settings according to the connection method between the computer and the MICRO/I. In the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.
2. Open project data.
3. On the **Online** tab, in the **Touch Screen** group, click **Clear**, then click the data to be deleted.



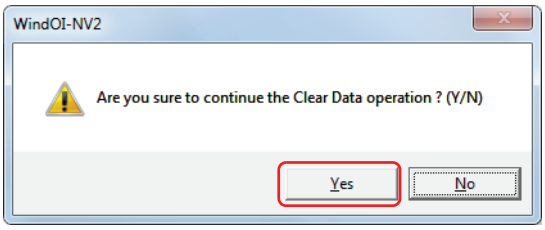
- **All**
  Deletes project data, Alarm Log data, Data Log data, and Operation Log data*1. It also clears the HG Keep Register (LKR) and HG Keep Relay (LK)*2.
- **Alarm Log Data**
  Deletes the data collected by the Alarm Log function.
- **Data Log Data**
  Deletes the data collected by the Data Log function.
- **Operation Log Data*1**
  Deletes the data collected by the Operation Log function.
- **Data of all Device Addresses*2**
  Clears the data of all device addresses.
- **Stored Data in Memory Card*3**
  After stopping operation, deletes data saved to the Memory Card Folder on an external memory.
  Click this to display the Clear Data dialog box. For details, refer to "4.2 Deleting Data from an External Memory Inserted in the MICRO/I" on page 24-28.

  - When **Communicate with** is set to **MICRO/I** and **Port** to **USB** or **Serial**, deletion of the data starts.
  - When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start deletion of the data. For details, refer to "To execute any function except project data download" on page 24-9.
  - When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to communicate with, and then click **OK** to start deletion of the data.
    If **Port** is set to **Ethernet**, specify the IP address of the master to be used. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

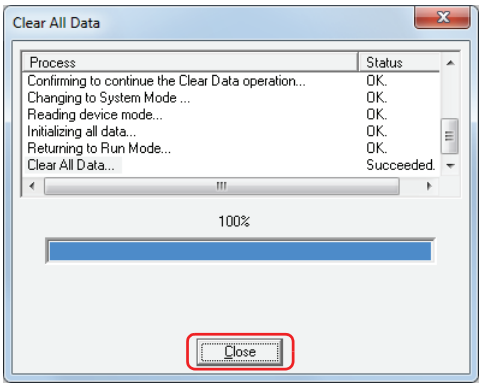
*1 HG2G-5F, HG3G/4G only
*2 HG2G-S/-5S/-5F, HG3G/4G only
*3 HG2G-5F, HG3G/4G, HG2F/3F/4F only

4 Click **Yes**.



5 Click **Close**.

This concludes clearing data.



During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

4.2 Deleting Data from an External Memory Inserted in the MICRO/I

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

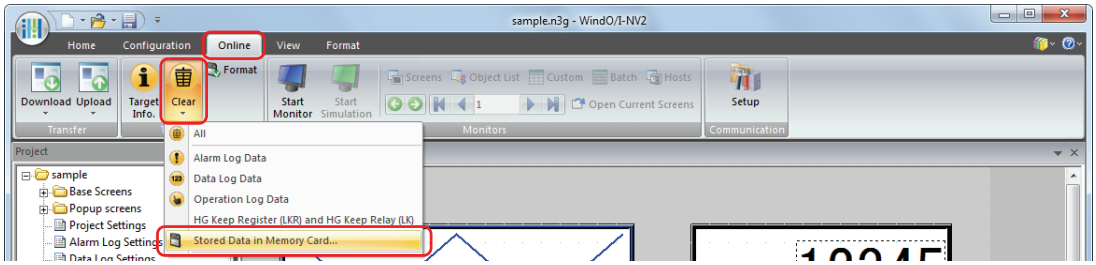
1 Change communication settings according to the connection method between the computer and the MICRO/I.

In the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

2 Open project data.

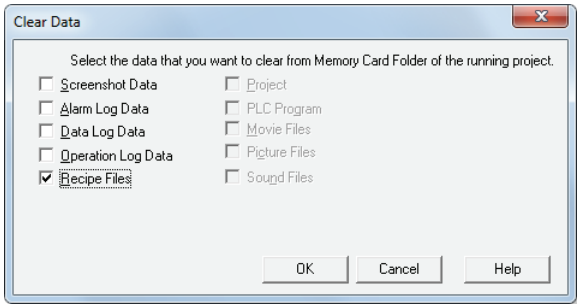
3 On the **Online** tab, in the **Touch Screen** group, click **Clear**, then click **Stored Data in Memory Card**.

The Clear Data dialog box is displayed.



4 Select the check box for the data items to be deleted from the Memory Card Folder.

Screenshot Data, Alarm Log Data, **Data Log Data**, **Operation Log Data**[*1], and **Recipe Files**



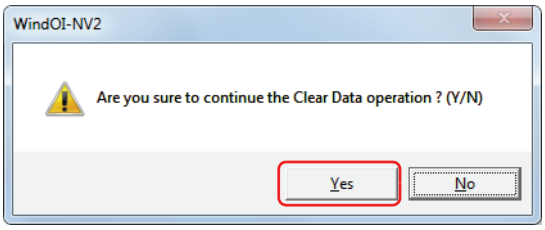
5 Click **OK**.

- When **Communicate with** is set to **MICRO/I** and **Port** to **USB** or **Serial**, deletion of the data starts.
- When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to start deletion of the data. For details, refer to "To execute any function except project data download" on page 24-9.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to communicate with, and then click **OK** to start deletion of the data.
  If **Port** is set to **Ethernet**, specify the IP address of the master to be used. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

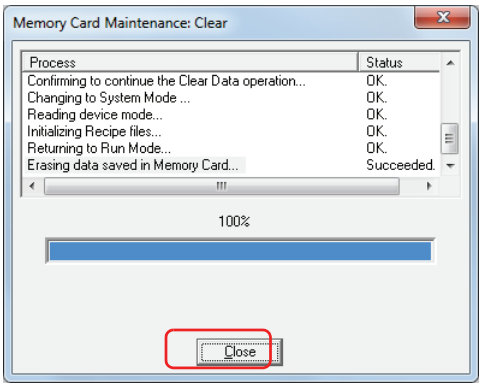
*1 HG2G-5F, HG3G/4G only

6 Click **Yes**.



7 Click **Close**.

This concludes clearing data on the external memory.



During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

5 Formatting

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Stops operation of the MICRO/I and formats an external memory inserted in the MICRO/I.

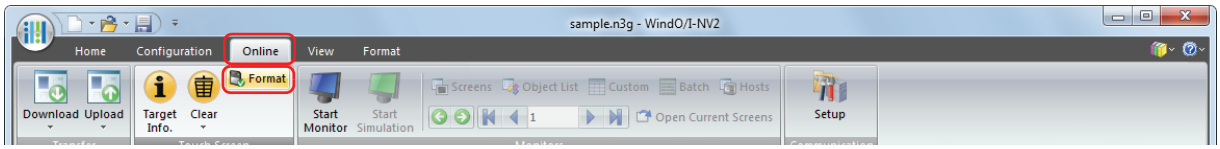
5.1 Formatting an External Memory Inserted in the MICRO/I

1. Change communication settings according to the connection method between the computer and the MICRO/I.

   If communicating with a MICRO/I inserted in a computer, in the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

2. Open project data.

3. On the **Online** tab, in the **Touch Screen** group, click **Format**.

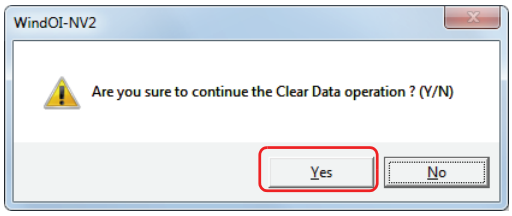


- When **Communicate with** is set to **MICRO/I** and **Port** is set to **USB** or **Serial**, a formatting confirmation message is displayed.
- When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to display the formatting confirmation message. For details, refer to "To execute any function except project data download" on page 24-9.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to communicate with, and then click **OK** to display the formatting confirmation message.

  If **Port** is set to **Ethernet**, specify the IP address of the master to be used. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

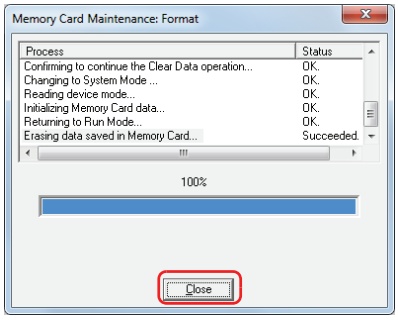
If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

4. Click **Yes**.



5. Click **Close**.

   This concludes formatting the external memory.



During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

6 System Information

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Displays information about the runtime system and downloaded project data of the MICRO/I.

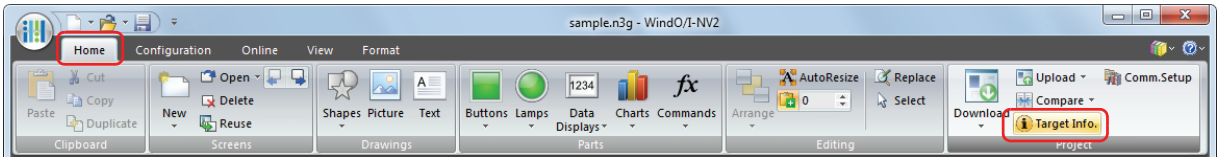
This function can be used to show information about project data during editing and to simultaneously check details of project data downloaded to the MICRO/I.

6.1 Displaying System Information

1 Change communication settings according to the connection method between the computer and the MICRO/I.

If communicating with a MICRO/I inserted in a computer, in the Communication Settings dialog box, select **MICRO/I** from **Communicate with**. To communicate with the MICRO/I as an O/I Link Slave via an O/I Link Master, select **O/I Link Slave**. For details, refer to "1.3 Change Communication Settings" on page 24-6.

2 On the **Home** tab, in the **Project** group, click **Target Info.**.

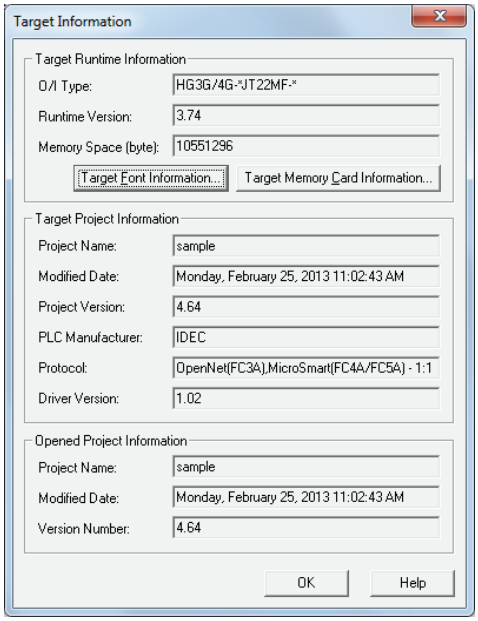


While editing project data, information about runtime system and project data can be displayed even by clicking **Target Info.** in the **Touch Screen** group on the **Online** tab.

- When **Communicate with** is set to **MICRO/I** and **Port** is set to **USB** or **Serial**, the System Information dialog box is displayed.
- When **Communicate with** is set to **MICRO/I** and **Port** is set to **Ethernet**, the Target IP Address dialog box is displayed. Specify the IP address of the MICRO/I, and then click **OK** to display the System Information dialog box. For details, refer to "To execute any function except project data download" on page 24-9.
- When **Communicate with** is set to **O/I Link Slave**, the Target Slave dialog box is displayed. Specify the slave station of the MICRO/I to communicate with, and then click **OK** to display the System Information dialog box. If **Port** is set to **Ethernet**, specify the IP address of the master to be used. If **Port** is **Ethernet** and the **via Web Server Unit** check box is selected, specify the port number of the Web Server Unit connected to the destination MICRO/I. For details, refer to "To execute any function except project data download" on page 24-11.

If security is enabled in the MICRO/I project, the Password Screen is displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3 Check information about the runtime system and project data.

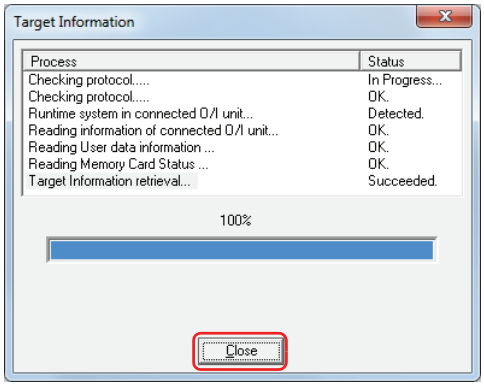


- To check the additional fonts installed on the MICRO/I, click **Target Font Information**. The Target Font Information dialog box is displayed. For details, refer to "Target Font Information Dialog Box" on page 24-34.
- To check information about the external memory inserted in the MICRO/I, click **Target Memory Card Information**. The Target Memory Card Information dialog box is displayed. For details, refer to "Target Memory Card Dialog Box" on page 24-34.

4 When you have finished checking the information, click **OK**.

5 Click **Close**.

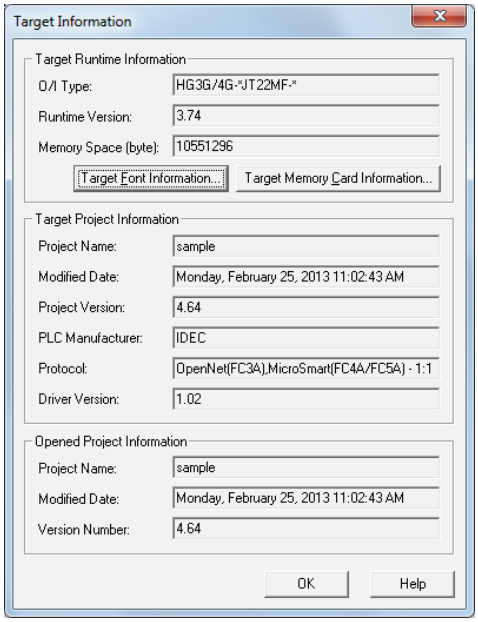
This concludes checking system information.



During communication with an O/I Link Slave using the online function, O/I Link Master operation is stopped.

6.2 Target Information Dialog Box

This section describes the settings and buttons of the Target Information dialog box.



■ Target Runtime Information

O/I Type: Shows the type number of MICRO/I

Runtime Version: Shows the runtime system version of the MICRO/I.

Memory Space (byte): Shows the maximum amount of project data (bytes) that can be downloaded to the MICRO/I.

Target Font Information: Checks the additional fonts currently installed on the MICRO/I. Click this button to display the Target Font Information dialog box. For details, refer to "Target Font Information Dialog Box" on page 24-34.

Target Memory Card Information: Checks the state of an external memory inserted in the MICRO/I, its total capacity, available capacity, and used capacity. Click this button to display the Target Memory Card Information dialog box. For details, refer to "Target Memory Card Dialog Box" on page 24-34.

■ Target Project Information

Project Name: Shows the project name of projects downloaded to the MICRO/I.

Modified Date: Displays the time that project data downloaded to the MICRO/I was last saved in WindO/I-NV2.

Project Version: Displays the version of WindO/I-NV2 used to create the project data downloaded to the MICRO/I.

PLC Manufacturer: Displays the external device manufacturer configured in the project downloaded to the MICRO/I.

Protocol: Displays the host I/F driver configured in the project downloaded to the MICRO/I.

Driver Version: Displays the version of the host I/F driver in the connected MICRO/I.

■ Opened Project Information

Project Name: Shows the project name of the project being edited.

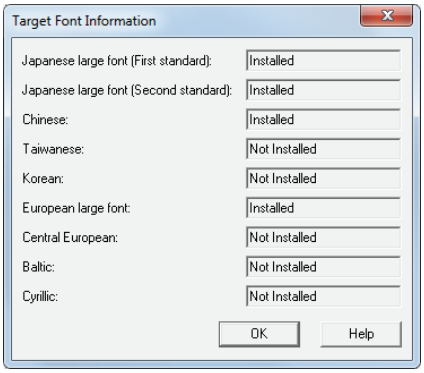
Modified Date: Displays the time that the project being edited was last saved in WindO/I-NV2.

Version Number: Displays the version of WindO/I-NV2 used to create the project being edited.

This function can be used to show information about a project that is being edited and simultaneously check information about project data downloaded to the MICRO/I.

Target Font Information Dialog Box

This dialog box is used to check the state of installed additional fonts.



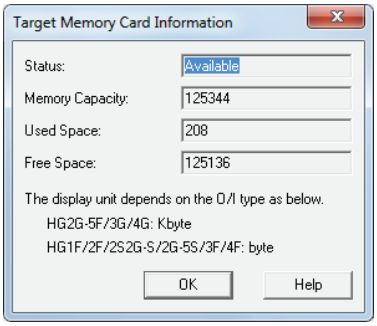
The installation status of each additional font is shown to the right of the font. The following additional fonts can be installed.

- Japanese Large Font (First standard)
- Japanese Large Font (Second standard)
- Chinese
- Taiwanese
- Korean
- European Large Font
- Central European
- Baltic
- Cyrillic

Target Memory Card Dialog Box

HG2G-S HG2G-5S **HG2G-5F** **HG3G** **HG4G** HG1F **HG2F** HG2S **HG3F** **HG4F**

Checks the state of an external memory inserted in the MICRO/I, its total capacity, available capacity, and used capacity.



State:	Shows the state of the external memory inserted in the MICRO/I.
Memory Capacity:	Shows the total capacity of the external memory inserted in the MICRO/I.
Used Space:	Shows how much of the capacity of the external memory inserted in the MICRO/I is currently in use.
Free Space:	Shows how much of the capacity of the external memory inserted in the MICRO/I is currently available for use.

Chapter 25 Monitor Function

This chapter describes the monitor function that checks operation of the created project data.

Monitor function enables the values of internal devices and the values of external devices to be checked and changed. This can be done in two ways: using WindO/I-NV2 on a computer connected to the MICRO/I, or directly on the screen of the MICRO/I.

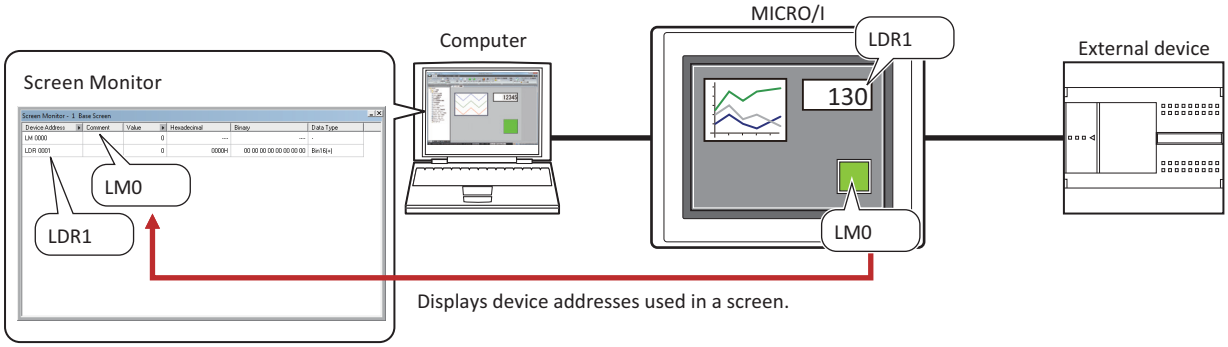
1 Monitoring with WindO/I-NV2

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

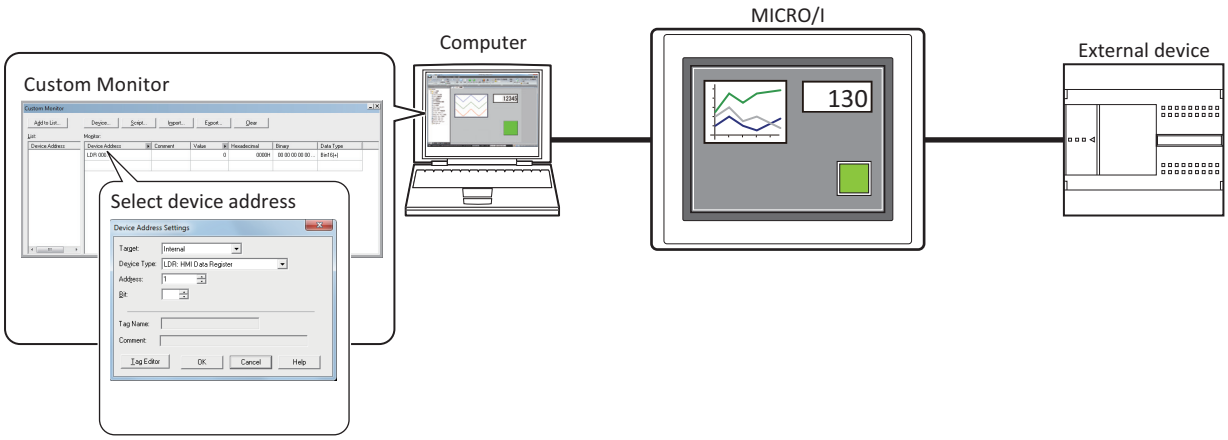
1.1 How the Monitor Function in WindO/I-NV2 is Used

Monitor function in WindO/I-NV2 can be performed as follows.

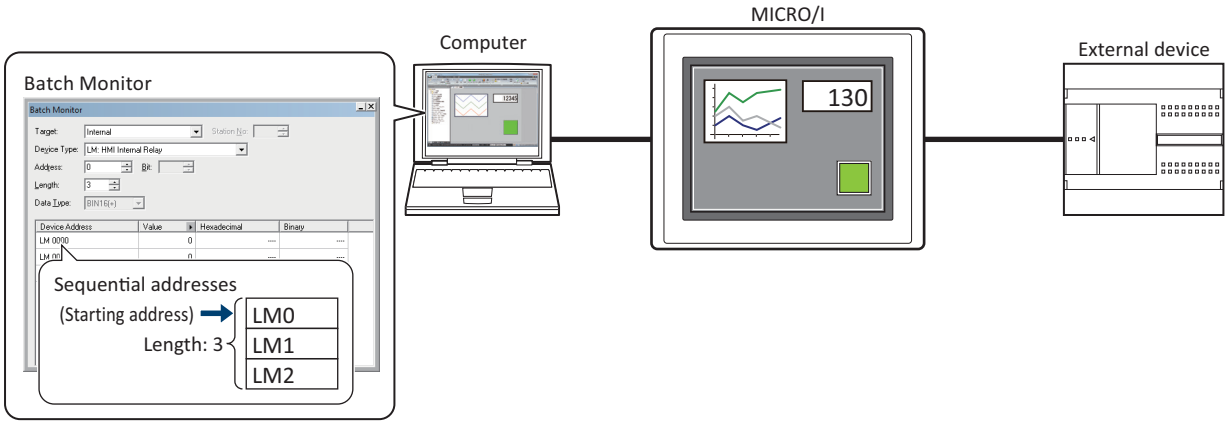
- Checking values of devices used on the screen of the MICRO/I



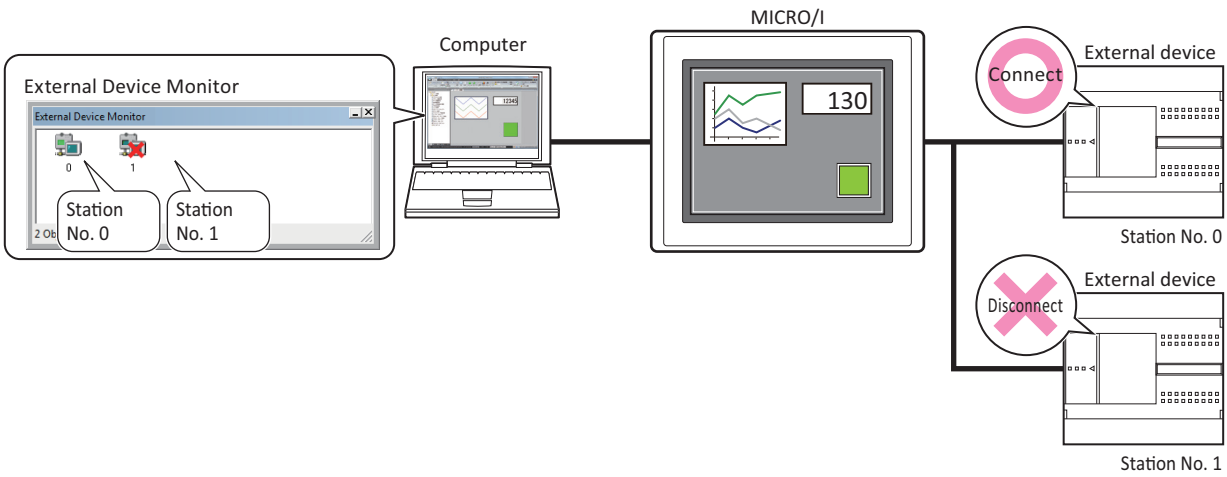
- Checking values of specified devices



- Checking values of devices of sequential addresses

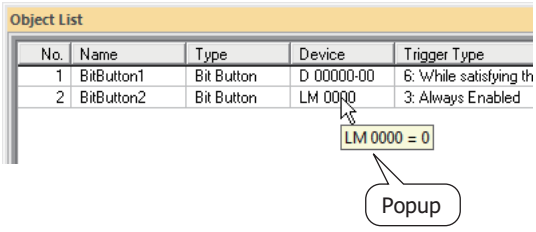


- Checking the state of external devices connected to the MICRO/I

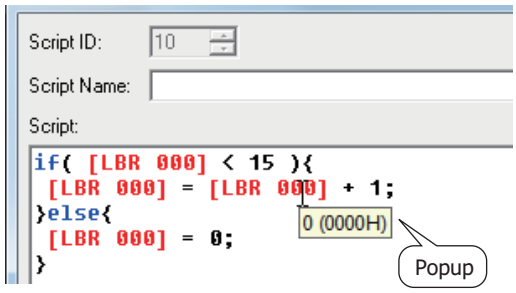


- Displaying the value of device in a popup

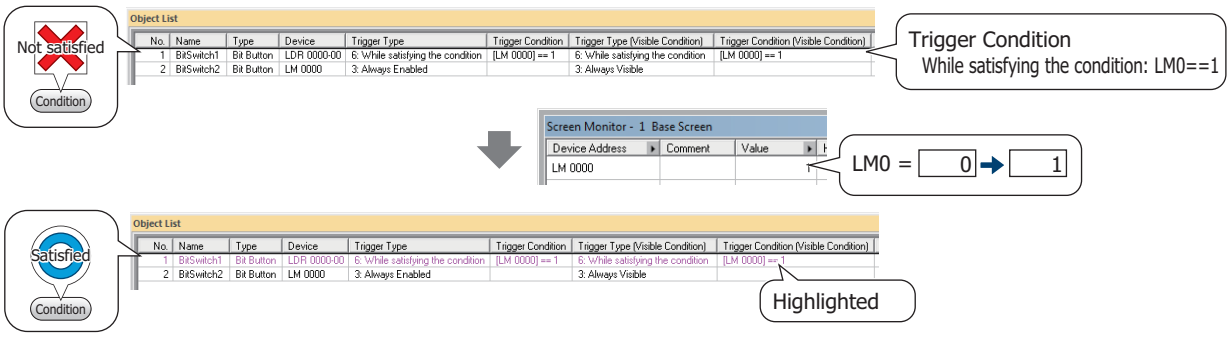
Object List window



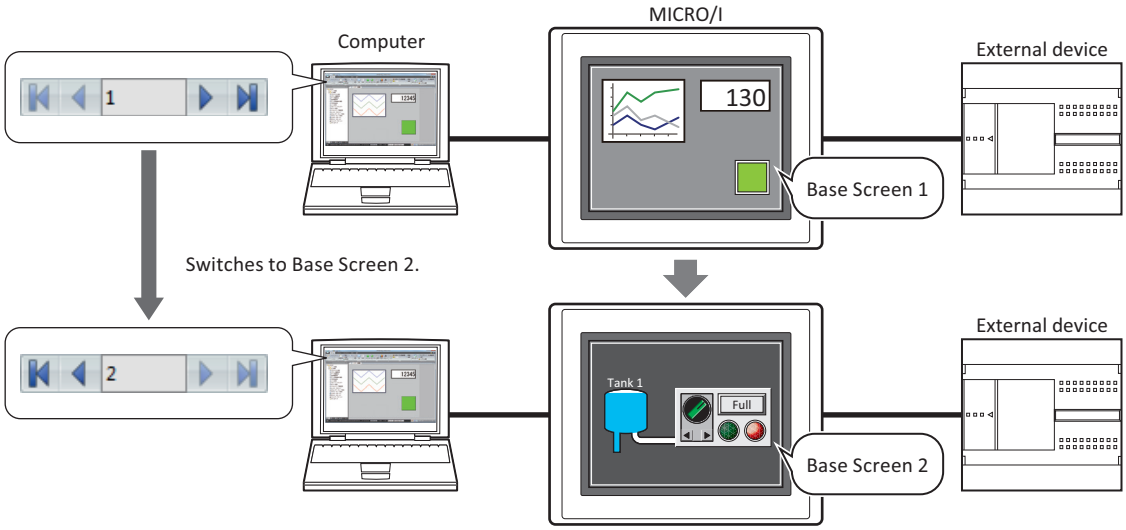
Script Editor



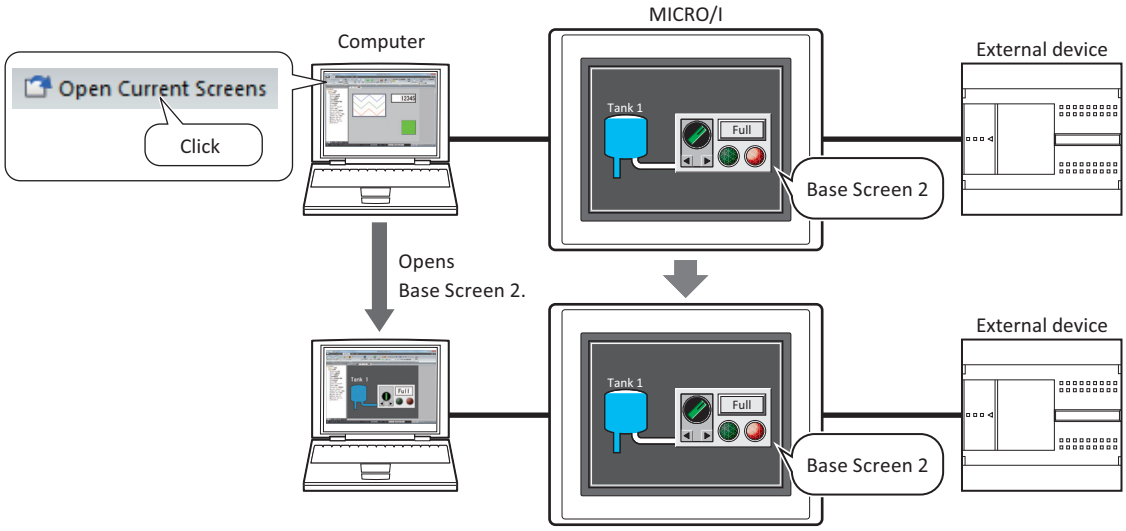
- Highlighting objects while satisfying conditions



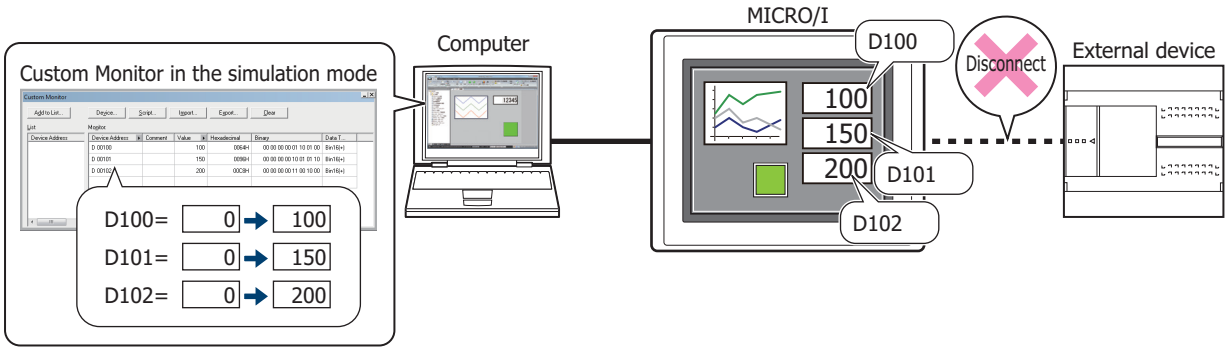
- Switching to the screen of the MICRO/I



- Opening current screen



- Simulating values of external devices on the MICRO/I alone



1.2 Debugging in WindO/I-NV2

This section describes the procedure for monitoring values of devices and debugging in WindO/I-NV2.

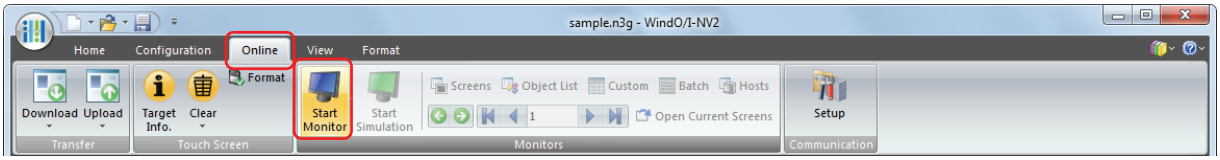
1 Change the communication setting to match the connection method between computer and MICRO/I.

For details, refer to Chapter 24 "1.3 Change Communication Settings" on page 24-6.

2 On the **Online** tab, in the **Monitors** group, click **Start Monitor**.

The MICRO/I switches to monitor mode and the following text flashes at the bottom left of the screen.

HG2G-S/-5S/-5F, HG3G/4G:	Monitor Mode
HG1F/2F/2S/3F/4F:	Debug Mode

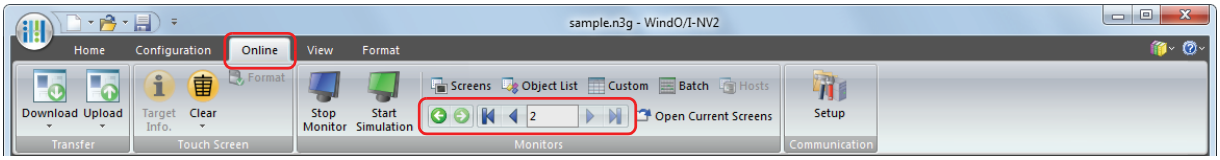


If a password has been configured for the project data, the Enter Password screen will be displayed. Enter the password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

To simulate values of external devices on the MICRO/I alone, after switching to monitor mode, on the **Online** tab, in the **Monitors** group, click **Start Simulation**.

The MICRO/I switches to simulation mode and "Simulation Mode" flashes at the bottom left of the screen.

3 On the **Online** tab, in the **Monitors** group, click the following button or enter the number to the text box to switch the screen displayed on the MICRO/I to the Monitor screen.



- **(Back)**
  You are returned to the Base Screen that was displayed immediately before the screen was switched.

- **(Forward)**
  Advances to the Base Screen that was displayed immediately before the screen was switched using (**Back**).

- **(First Screen)**
  Switches to the Base Screen of the lowest screen number in the project data.

- **(Previous Screen)**
  Switches to the Base Screen of screen number one lower than the Base Screen currently displayed. If the screen numbers are not sequential, switches to the screen of next lowest number.

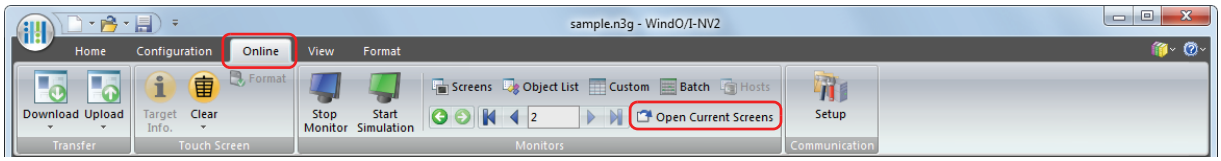
- 10 **(Specified Screen)**
  Switches to the Base Screen with the specified number.

- **(Next Screen)**
  Switches to the screen with screen number one higher than the Base Screen currently displayed. If the screen numbers are not consecutive, switches to the screen of next highest number.

- **(Last Screen)**
  Switches to the Base Screen of highest screen number in the project data.

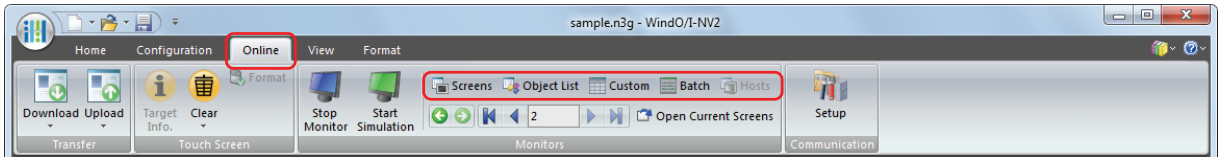
4 On the **Online** tab, in the **Monitors** group, click **Open Current Screens**.

The screen displayed on MICRO/I opens in the editing window.



5 On the **Online** tab, in the **Monitors** group, select the monitor being used.

When monitoring starts, the screen monitor is displayed.



■ **Screens**

Automatically checks device addresses used on the screen displayed on the MICRO/I. For details, refer to "Screen Monitor" on page 25-6.

■ **Object List**

Displays values of devices in a popup on the **Object List** window. It also highlights objects while satisfying conditions. For details, refer to "1.3 Display the Value of Device in Popup" on page 25-16, and "1.4 Highlighting Objects While Satisfying Conditions" on page 25-16.

■ **Custom**

Registers monitored devices individually and displays the value of devices. For details, refer to "Custom Monitor" on page 25-7.

■ **Batch**

Registers monitored devices as a batch for sequential addresses and displays the value of devices. For details, refer to "Batch Monitor" on page 25-14.

■ **Hosts**

Displays the state of external devices connected to the MICRO/I. For details, refer to "External Device Monitor" on page 25-15.

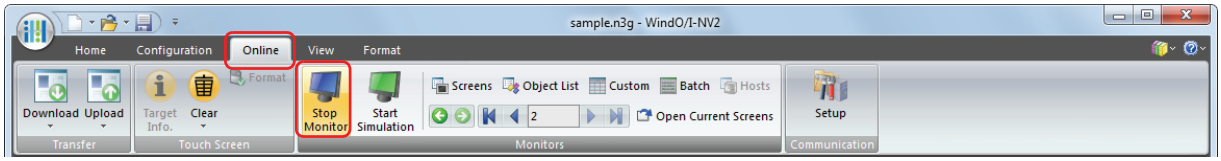
6 Check operation of project data by monitoring and changing values of devices, and edit project data if there is an error.

If the monitored screen is switches, repeat steps *3* through *4*.

7 Download the edited project data to the MICRO/I.

To reflect edits made during debugging, it is necessary to perform a download.

8 On the **Online** tab, in the **Monitors** group, click **Stop Monitor**.



To switch from simulation mode to monitor mode, on the **Online** tab, in the **Monitors** group, click **Stop Simulation**.

● Screen Monitor

Automatically displays device addresses used on the screen displayed on the MICRO/I. Enables values of devices to be monitored and changed.

Screen Monitor - 1 Operator Panel Base Screen

Device Address	Comment	Value	Hexadecimal	Binary	Data Type
LSD 051		31	001FH	00 00 00 00 00 01 11 11	Bin16(+)
LBR 020		60	003CH	00 00 00 00 00 11 11 00	Bin16(+)
LBR 012		90	005AH	00 00 00 00 01 01 10 10	Bin16(+)
LBR 011		0	0000H	00 00 00 00 00 00 00 00	Bin16(+)
LBR 010		128	0080H	00 00 00 00 10 00 00 00	Bin16(+)
LBR 004		0	0000H	00 00 00 00 00 00 00 00	Bin16(+)
LBR 003		33	0021H	00 00 00 00 00 10 00 01	Bin16(+)
LBR 002		21	0015H	00 00 00 00 00 01 01 01	Bin16(+)
LBR 001		3513	0DB9H	00 00 11 01 10 11 10 01	Bin16(+)
LBR 000		12345	3039H	00 11 00 00 00 11 10 01	Bin16(+)
LSM 01		0	----	----	-
LBM 020		0	----	----	-

■ Device Address

Displays the device addresses used on the screen displayed on the MICRO/I.

▸ next to **Comment** toggles between showing and hiding comments. When comments are displayed, click ▸ to display a popup menu, then click **Comment** and select the check box.

■ Comment

Displays comments on device addresses saved in Tag Editor. Comments are displayed only after you click ▸ next to **Device Address** to display a popup menu, then click **Comment** and select the check box.

■ Value

Displays the current value of device address in decimal format. To change a value, double-click a cell and then specify a value.

The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Click ▸ to toggle display of **HEX** and **BIN** format. To display **HEX** and **BIN** values, click ▸ to display a popup menu, then click **HEX and BIN** and select the check box.

■ Hexadecimal, Binary

Displays the current value of device address in hexadecimal and binary format. To change a value, double-click a cell and then specify a value.

The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Comments are displayed only after you click ▸ next to **Value** to display a popup menu and then select the **HEX** and **BIN** check box.

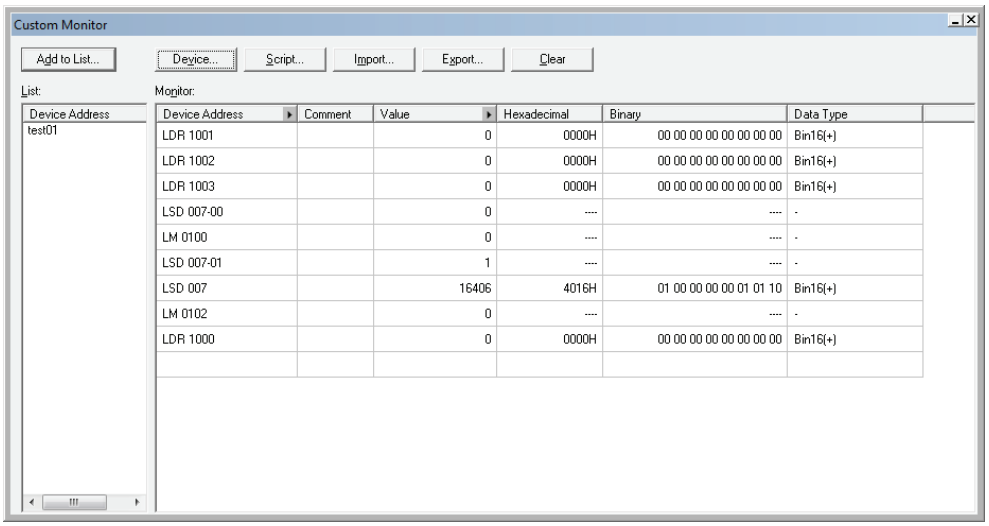
■ Data Type

Selects the data type of the selected value. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

- The values of device addresses configured as write-only, such as destination device address for bit buttons, cannot be monitored. "????" is displayed in this case.
- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type** for the address of highest number, the values stored in the device address are displayed repeatedly.
- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type**, sequential addresses (lower word to upper word) are used.

● Custom Monitor

Enables the values of registered device addresses to be monitored and changed.



■ Add to List

Saves device addresses registered in **Monitor** to project data as a custom monitor list. A saved lists can be monitored by selecting it from the List.

Click this button to display the Device List Name Setting dialog box. For details, refer to "Saving Registered Device Addresses to Project Data as a Custom Monitor List" on page 25-10.

■ Device

Registers the device addresses to monitor individually.

Click this button to display the Device Address Settings dialog box. For details, refer to "Registering the device addresses to monitor individually" on page 25-8.

■ Script

Batch saves all device addresses used in a script.

Click this button to display Script Manager. For details, refer to "Batch Saving Device Addresses Used in Scripts" on page 25-9.

■ Import

Imports the device addresses from a device list saved as a CSV text file.

Click this button to display the Open dialog box. For details, refer to "Importing Devices from a Device List" on page 25-12.

■ Export

Saves the device addresses displayed in **Monitor** as a CSV text file. This file is called a Device List.

Click this button to display the Save As dialog box. For details, refer to "Saving a Custom Monitor List as a CSV File" on page 25-11.

The saved device list can be imported using **Import**.

■ Clear

Deletes all the device addresses displayed in **Monitor**.

■ List

Displays a custom monitor list saved with the project data.

Select a list to clear the device addresses shown in **Monitor** and display the device addresses in the list.

Double-click a cell to display the Device List Name Setting dialog box. The name of the custom monitor list can be edited.

Select a list and press DELETE to delete it from the List.

Monitor

The registered device addresses are displayed in a list.

Select the custom monitor list from the List to show the device addresses registered in the list.

Device Address:	The registered device addresses are displayed. Double-click a cell to register or change a device address. Click ... to display the Device Address Settings dialog box. For details on how to configure device address settings, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66. ▸ toggles between showing and hiding comments. When comments are displayed, click ▸ to display a popup menu, then click **Comment** and select the check box.
Comment:	Displays comments on device addresses saved in Tag Editor. Comments are displayed only after you click ▸ next to **Device Address** to display a popup menu, then click **Comment** and select the check box.
Value:	Displays the current value of device address in decimal format. To change a value, double-click a cell and then enter a value. The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1. Click ▸ to toggle display of **HEX** and **BIN** format. To display **HEX** and **BIN** values, click ▸ to display a popup menu, then click **HEX and BIN** and select the check box.
Hexadecimal, Binary:	Displays the current value of device address in hexadecimal and binary format. To change a value, double-click a cell and then specify a value. The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1. Comments are displayed only after you click ▸ next to **Value** to display a popup menu and then select the **HEX** and **BIN** check box.
Data Type	Selects the data format of the displayed value. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

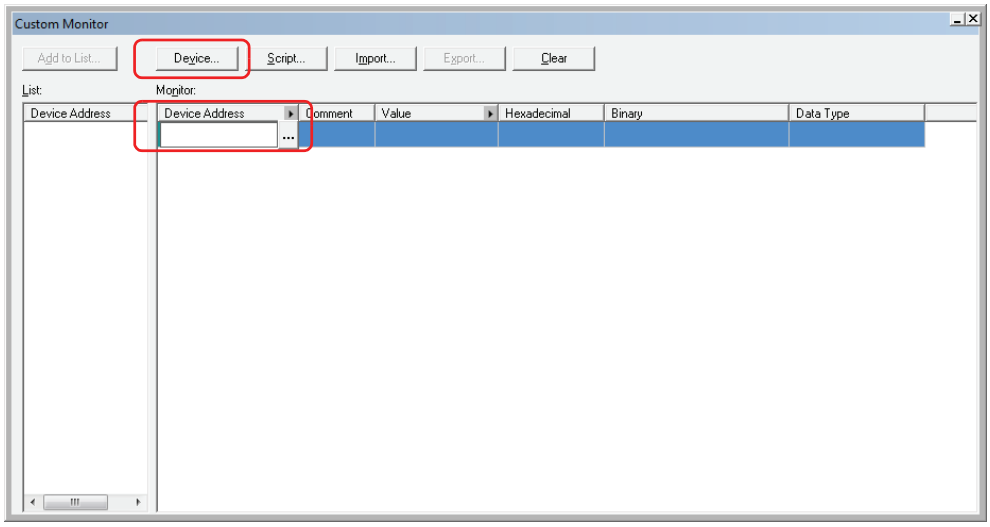
- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type** for the address of highest number, the values stored in the device address are displayed repeatedly.
- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type**, sequential addresses (lower word to upper word) are used.

Registering the device addresses to monitor

Registering the device addresses to monitor individually

Click **Device**. Or, double-click a cell under **Device Address** in **Monitor**, and then click ...

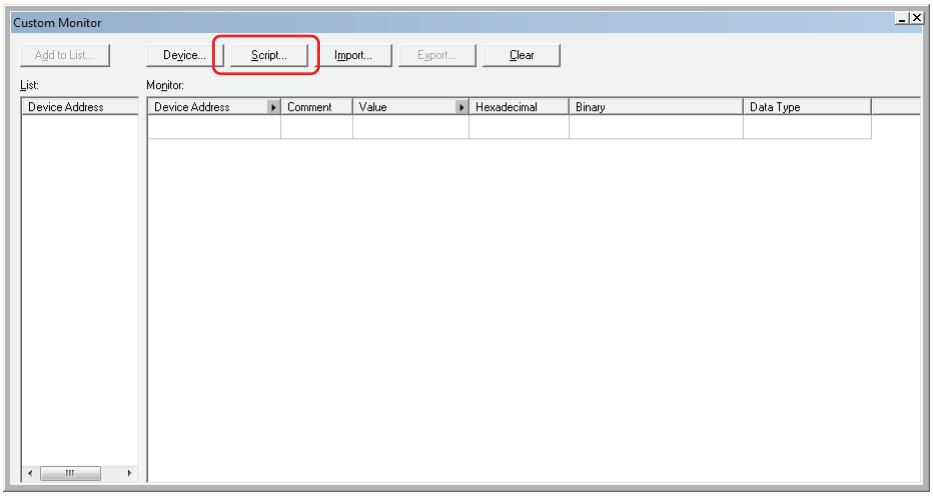
The Device Address Settings dialog box is displayed. For details on configuring device address settings, refer to Chapter 2 "5.1 Device Address Settings" on page 2-66.



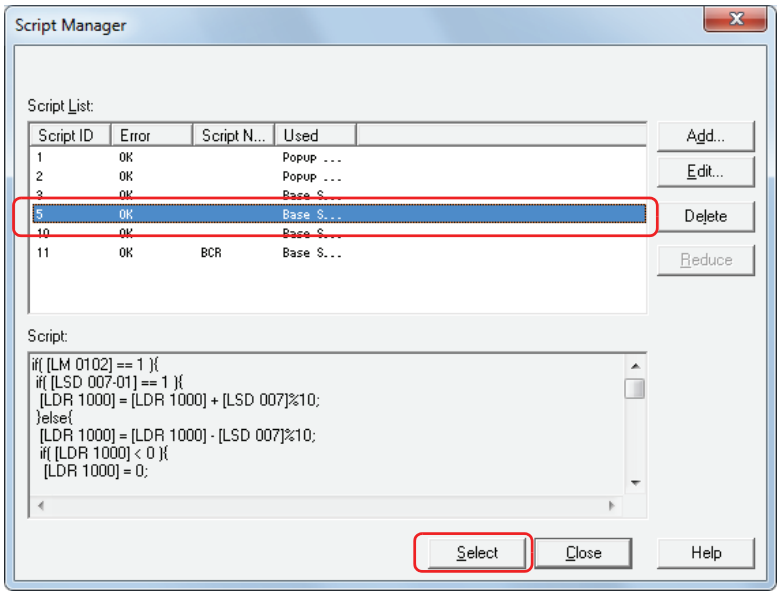
Batch Saving Device Addresses Used in Scripts

1 Click **Script**.

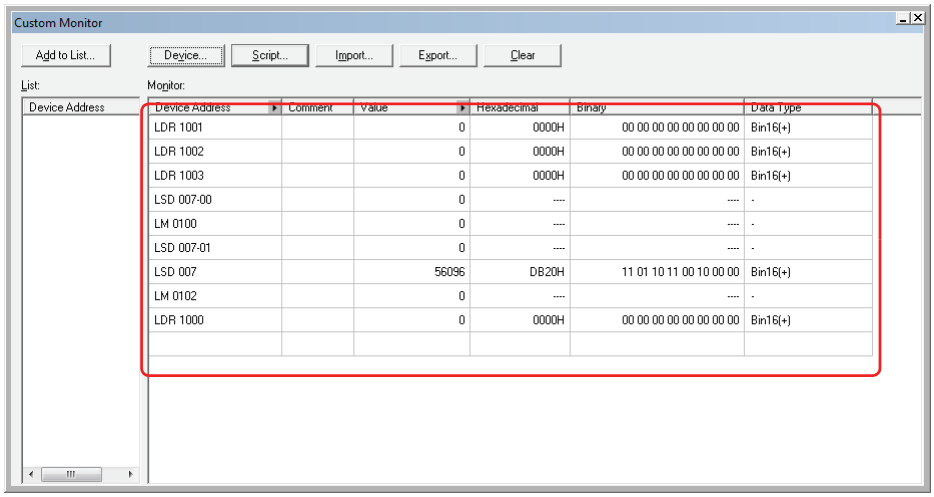
Script Manager is displayed.



2 Select the script ID of the script for the device address to be batch-saved, and then click **Select**.



All the device addresses used by the script are registered.

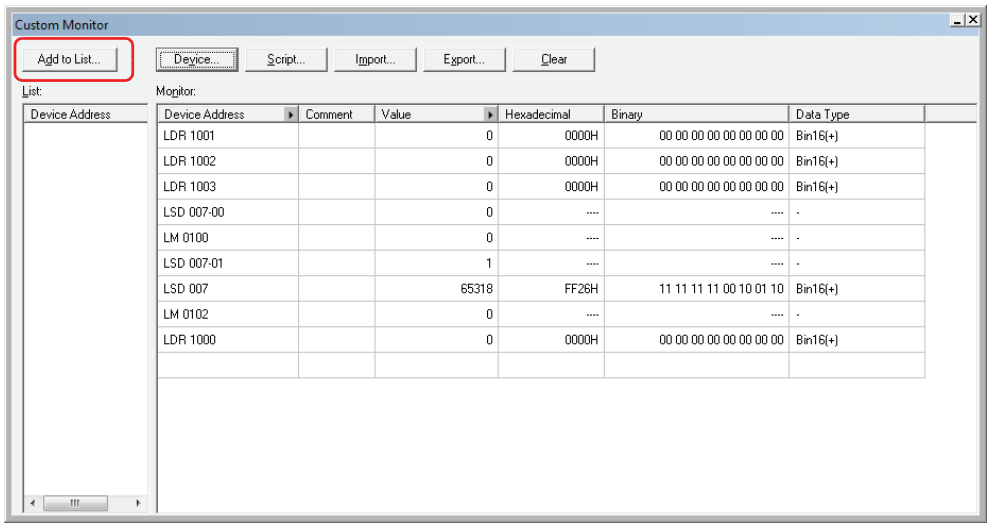


Saving Registered Device Addresses to Project Data as a Custom Monitor List

If registered device addresses are saved with project data as a list, then even when the project data is later reopened, the device addresses can be called from the List to be reutilized.

1 Click **Add to List**.

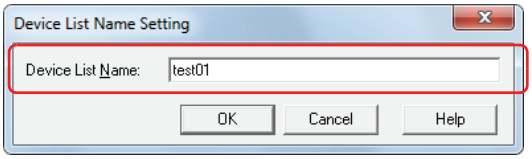
The Device List Name Setting dialog box is displayed.



2 Enter a name for the custom monitor list.

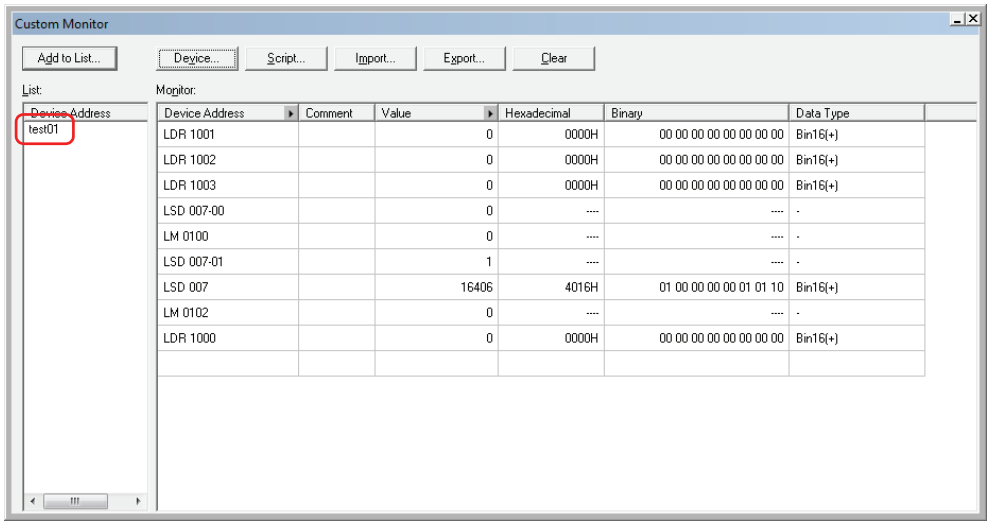
The maximum number is 40 characters. Only alphanumeric characters and symbols can be used.

> The following characters cannot be used for names of custom monitor list.
> \ / : * ? " < > |



3 Click **OK**.

The custom monitor list is added to the **List**.



4 Saving project data.

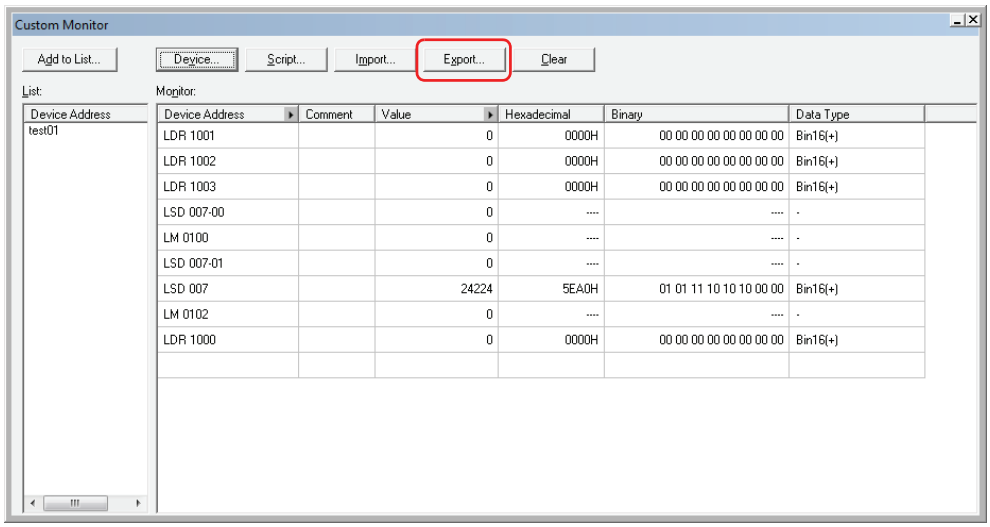
> If a project file is closed without saving, custom monitor lists will not be saved with the project data.

Saving a Custom Monitor List as a CSV File

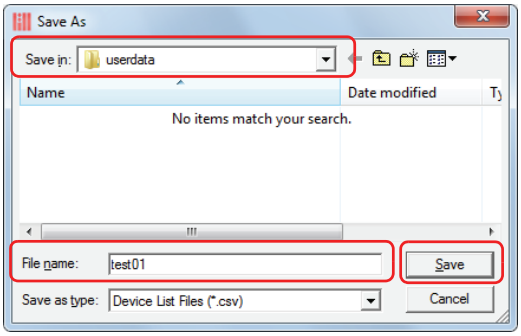
To use a custom monitor list (registered devices list) in another project, save it as a CSV text file. This file is called a Device List.

1 Click **Export**.

The Save As dialog box is displayed.



2 Select **Save in**, enter a **File name**, and then click **Save**.



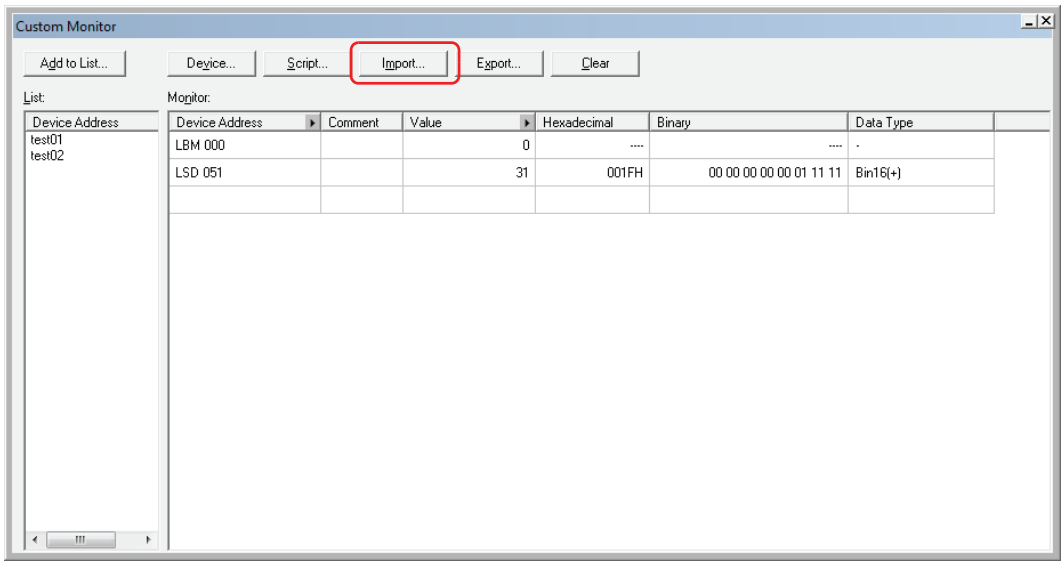
This concludes saving device list.

Importing Devices from a Device List

Imports the device addresses from a device list saved as a CSV text file into custom monitor.

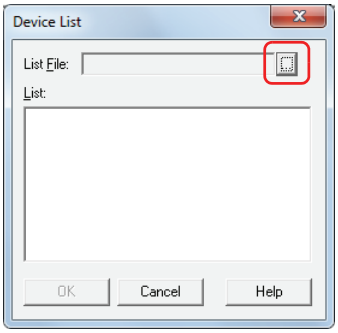
1 Click **Import**.

The Device List dialog box is displayed.



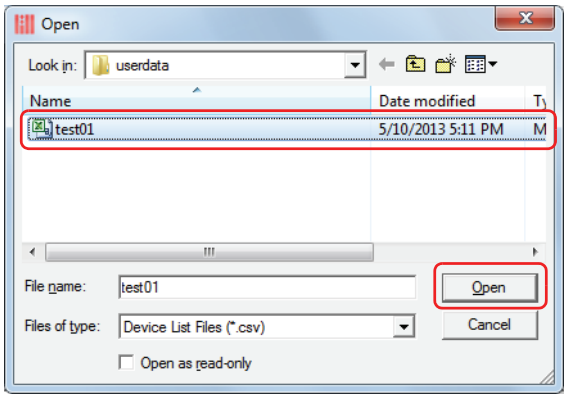
2 Click ... .

The Open dialog box is displayed.



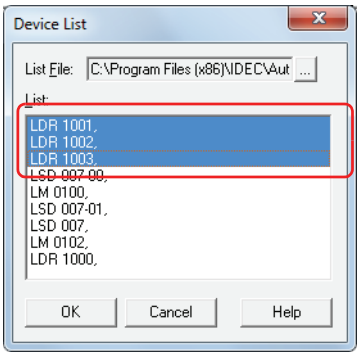
3 Select a saved device list, and then click **Open**.

The device addresses are listed.



4 Click the device address to import.

To select multiple items of text, press and hold SHIFT or CTRL while you click the specific items.

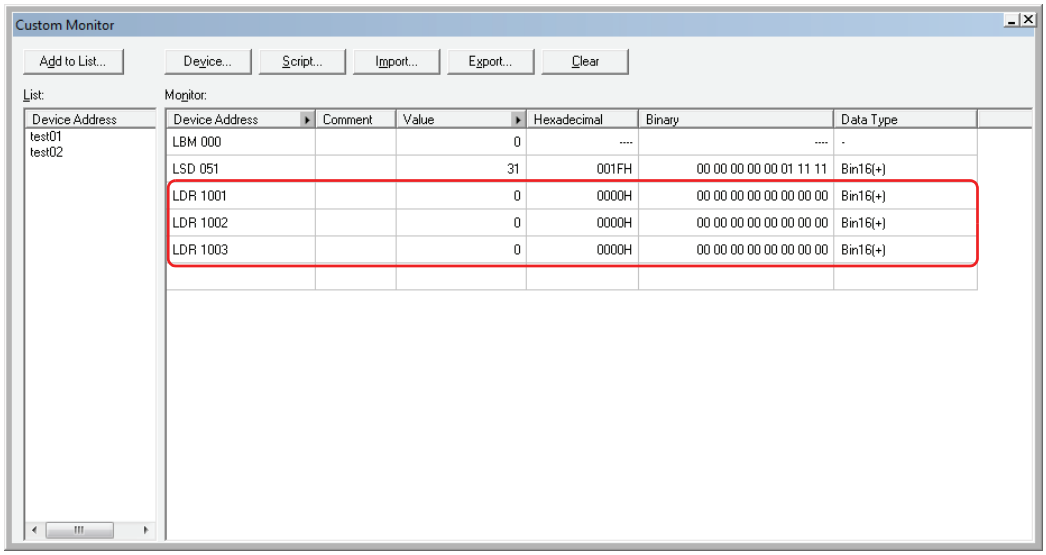


5 Click **OK**.

If there is an already registered device address on the Custom Monitor, an overwrite confirmation message is displayed.

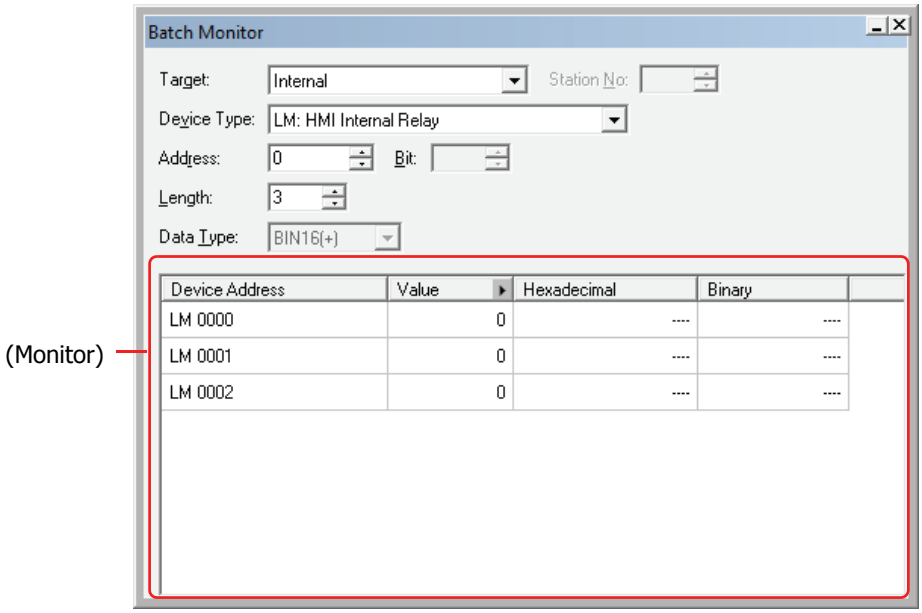
- Click **Yes** to overwrite the device address displayed in the confirmation message.
- Click **Yes To All** to overwrite all the device addresses.
- Click **No** to display the next confirmation message without overwriting the device address displayed in the confirmation message.
- Click **Cancel** to stop importing device addresses.

The device is added to **Monitor**.



● Batch Monitor

Displays sequential addresses as a batch.



■ **Target**

Select **MICRO/I** or **External Devices** from the device addresses that include the device addresses to be set.

■ **Station No.**

Specify the station number of the external device. The range of possible settings can be varies according to the selected Host I/F drivers.

This option can only be configured when **1:N Communication** is selected under **Connection** in the Select Host I/F Driver dialog box or the Change Host I/F Driver dialog box.

■ **Device Type**

Selects the device type.

The list only shows device types that can be used.

■ **Address**

Specify the address. The range that can be set varies based on the device type selected.

■ **Bit**

Specify the bit (0 to 15) of the word device when a word device is selected in **Device**.

■ **Length**

Specifies the number of device addresses displayed in the list (Bit number of the word device: 1 to 16, Bit Device or Word Device: 1 to 1000).

■ **Data Type**

Selects the data format of the displayed value. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

■ **(Monitor)**

Automatically displays the selected device addresses, in the number specified under **Length**, from top to bottom, consecutively.

Device Address: The specified device addresses are displayed.

▸ toggles between showing and hiding comments. When comments are displayed, click ▸ to display a popup menu, then click **Comment** and select the check box.

Value: Displays the current value of device address in decimal format. To change a value, double-click a cell and then specify a value.

The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

Click ▸ to toggle display of **HEX** and **BIN** format. To display **HEX** and **BIN** values, click ▸ to display a popup menu, then click **HEX and BIN** and select the check box.

Hexadecimal, Binary: Displays the current value of device address in hexadecimal and binary format. To change a value, double-click a cell and then specify a value.

The value range depends on the data type. For details, refer to Chapter 2 "1.1 Available Data" on page 2-1.

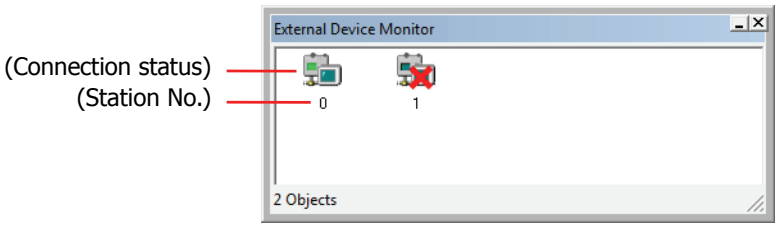
Comments are displayed only after you click ▸ next to **Value** to display a popup menu and then select the **HEX** and **BIN** check box.

- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type** for the address of highest number, the values stored in the device address are displayed repeatedly.
- If **BIN32**, **BCD8**, or **float32** is selected from **Data Type**, sequential addresses (lower word to upper word) are used.

● External Device Monitor

Displays the state of external devices connected to the MICRO/I.

Can be used only for 1:N communication devices.



■ (Connection status)

Displays the state of external devices connected to the MICRO/I. If a red cross appears over the icon of an external device (), communication is stopped.

Clicking the external device icon enables switching between connection and disconnection.

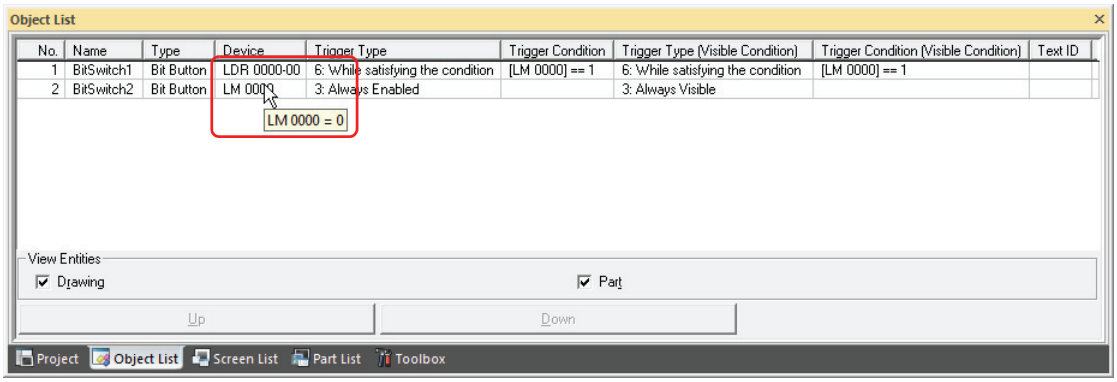
■ (Station No.)

Displays the station number of all external devices used in the project.

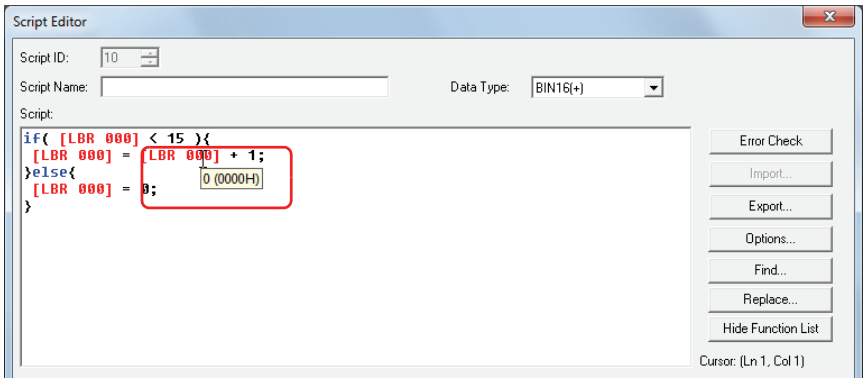
1.3 Display the Value of Device in Popup

During monitoring, mousing over device addresses displayed in the **Object List** window or device addresses in a script opened in Script Editor displays the current value in a popup window.

- **Object List** window



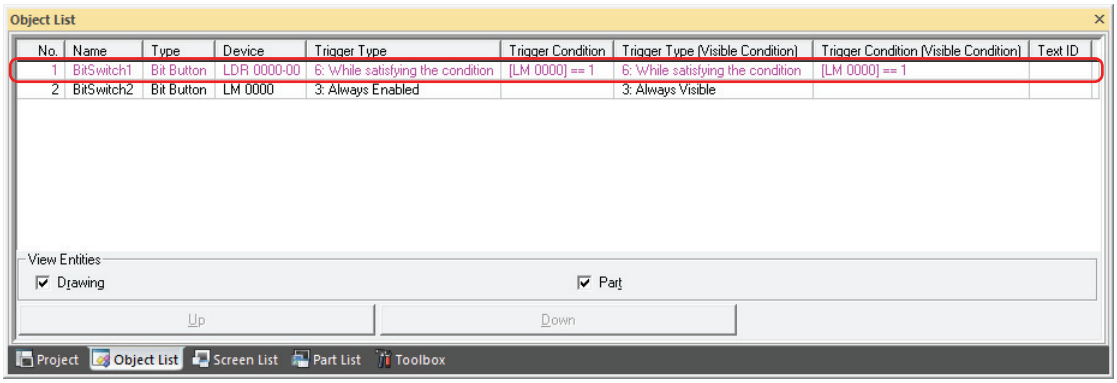
- Script Editor



- Popup viewing of values of devices in the **Object List** window works only if the screen displayed in the **Object List** window matches the screen displayed on the MICRO/I.
- Popup viewing of values of devices in Script Editor works only if the script during editing is being used by a global script command or a script command on the screen displayed on the MICRO/I.
- The maximum number for popup window is 80 characters. Any characters entered after the 80th will not be displayed.
- If 65 or more device addresses are displayed in the **Object List** window, monitor refreshing and popup message will slow down.

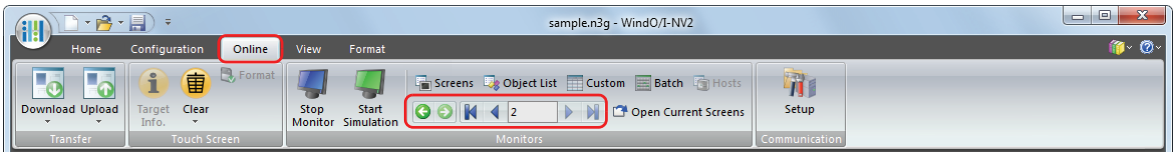
1.4 Highlighting Objects While Satisfying Conditions

When the Trigger Condition is satisfied during monitoring, the objects for which conditions are being satisfied are highlighted in the **Object List** window.



1.5 Switching the Screen of the MICRO/I

During monitoring, it is possible to switch to the screen displayed on the MICRO/I using a WindO/I-NV2 command.



- **(Back)**
  You are returned to the Base Screen that was displayed immediately before the screen was switched.

- **(Forward)**
  Advances to the Base Screen that was displayed immediately before the screen was switched using the (**Back**).

- **(First Screen)**
  Switches to the Base Screen with the lowest screen number in the project data.

- **(Previous Screen)**
  Switches to the Base Screen of screen number one lower than the Base Screen currently displayed. If the screen numbers are not consecutive numbers, this command switches to the closest number.

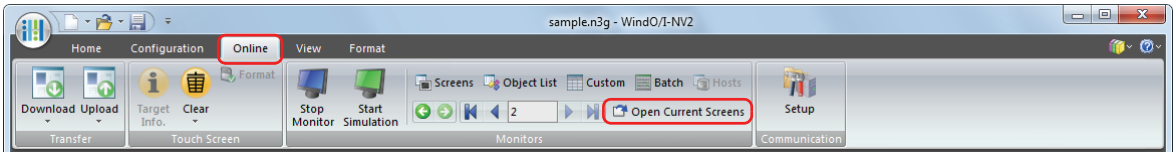
- 10 **(Specified Screen)**
  Switches to the Base Screen of a specified number.

- **(Next Screen)**
  Switches to the Base Screen of screen number one higher than the Base Screen currently displayed. If the screen numbers are not consecutive numbers, switches to the closest number.

- **(Last Screen)**
  Switches to the Base Screen of highest screen number in the project data.

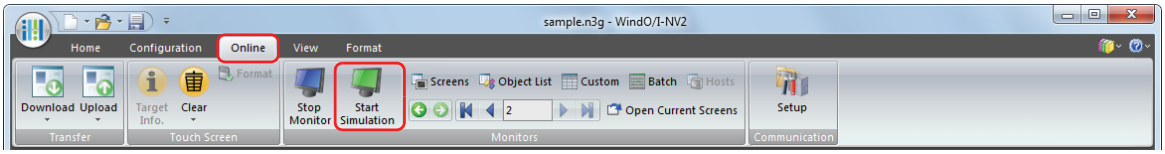
1.6 Open Current Screens

To automatically open the screen displayed on the MICRO/I during monitoring and put it into an active state, click **Open Current Screens**.



1.7 Simulating Values of External Devices

To simulate values of external devices on the MICRO/I alone, after switching to monitor mode, on the **Online** tab, in the **Monitors** group, click **Start Simulation**.



The MICRO/I switches to simulation mode and "Simulation Mode" flashes at the bottom left of the screen.

2 Monitoring on the MICRO/I

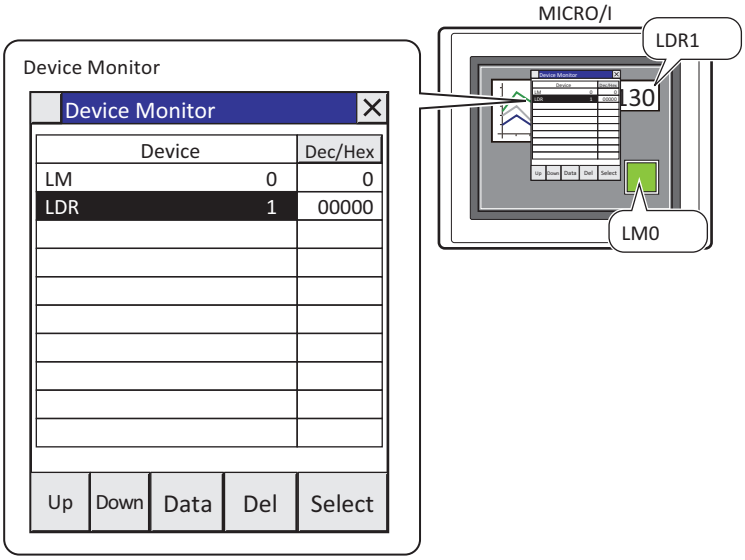
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

It is possible to change values of devices and check the operation on the MICRO/I.

2.1 How the Monitoring Function is Used

Monitoring in the MICRO/I can perform the following functions.

- Checking and changing the value of specified device



Device Monitor can be used in simulation mode. Values of external devices can be checked and changed with the MICRO/I alone.

2.2 Device Monitor

By registering device addresses in Run Mode, both data monitoring and changing can be conducted. Registered device addresses are listed in Device Monitor in ascending order (A to Z, 0 to 9). Registered device addresses are saved until power to the MICRO/I is turned OFF, or the mode is changed.

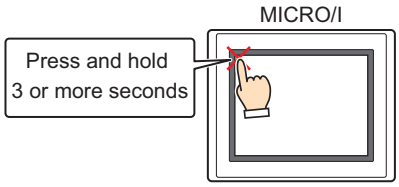
- Available device address range depends on types and settings of external devices. Selecting unavailable device address, "Communication error" happens and it can not be back in without reboot. For details, refer to Chapter 35 "1.1 Errors Displayed on the Screen" on page 35-1.
- If three Popup Screens are displayed on the screen (or if two Popup Screens are displayed in the Alarm Log Settings), in order to use Device Monitor in the same way on Popup Screens, the Device Monitor cannot be used.

● Displaying Device Monitor

For the HG2G-S/-5S/-5F, HG3G/4G and HG1F

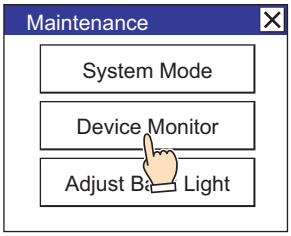
1 Press the upper-left corner of the screen on the MICRO/I for three seconds or more.

The Maintenance Screen is displayed.



2 Press **Device Monitor**.

Device Monitor is displayed.

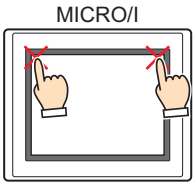


If a password has been configured for the project data, the Enter Password screen will be displayed. Select a user name and then enter a password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

For the HG2F/2S/3F/4F

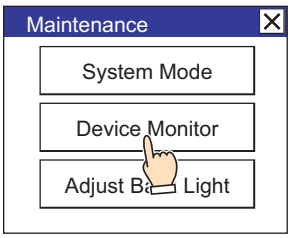
1 Press the upper-left edge and the upper-right edge of the MICRO/I screen simultaneously.

The Maintenance Screen is displayed.



2 Press **Device Monitor**.

Device Monitor is displayed.

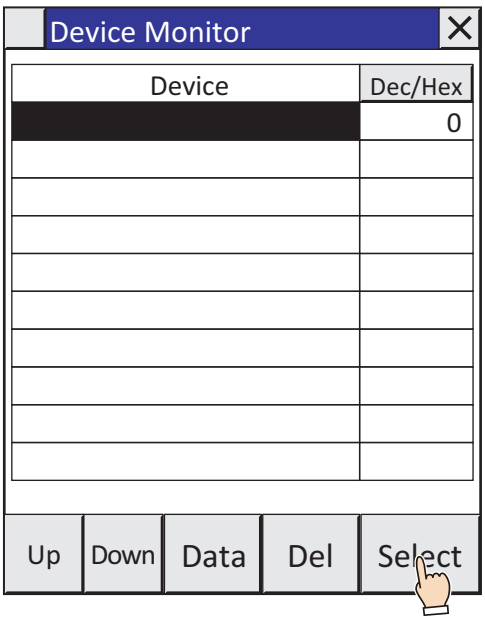


If a password has been configured for the project data, the Enter Password screen will be displayed. Select a user name and then enter a password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

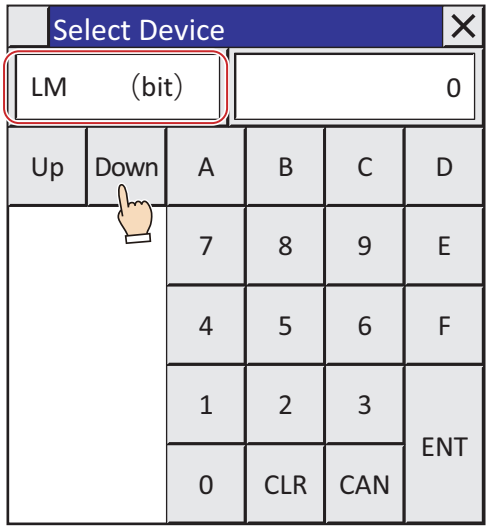
● Device Address Registration

1 Press **Select** on Device Monitor.

The Select Device screen is displayed.



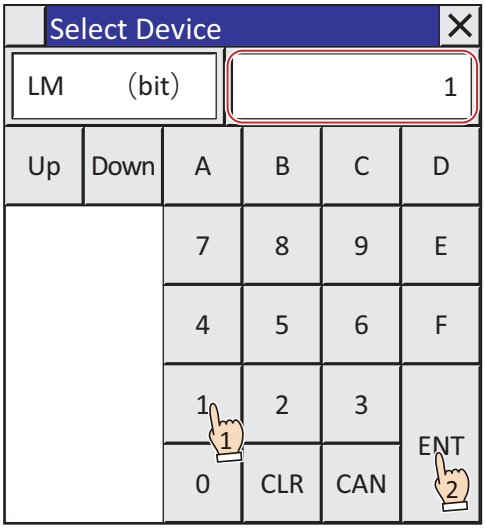
2 Press **Up** or **Down** to select the device type.



The next address of the device address entered previously is automatically displayed in the Select Device screen.

3 Enter the address and then press **ENT**.

- Press **CLR** to clear all values entered for the address.
- Press **CAN** to stop registering devices.



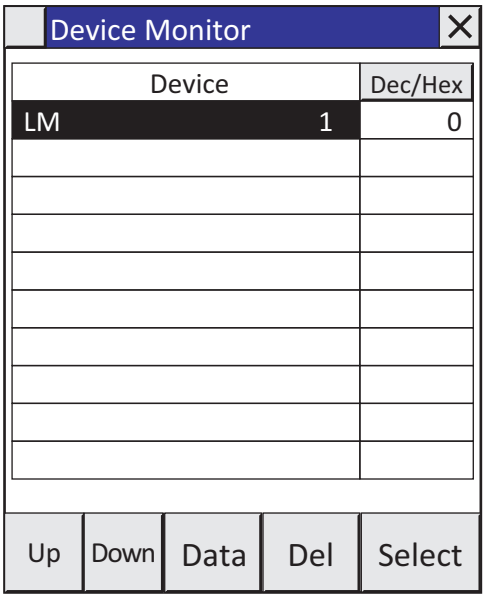
If a device address is invalid, pressing **ENT** will not return to Device Monitor.

If the connection is 1:N communication, No. (HG2G-S/-5S/-5F, HG3G/4G) or : (HG1F/2F/2S/3F/4F) is displayed.

The operating procedure is as follows.

1. Enter the station number as a hexadecimal value.
2. Press No. or :.
3. Enter the address.
4. Press **ENT**.

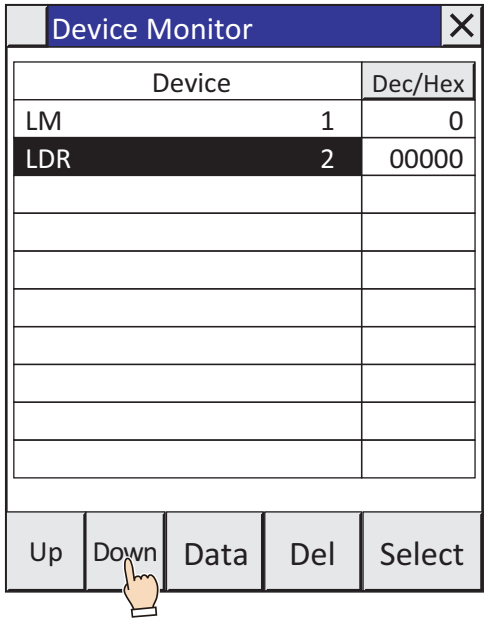
The device address is registered to Device Monitor.



4 Repeat steps *1* through *3* to register all device addresses to be monitored.

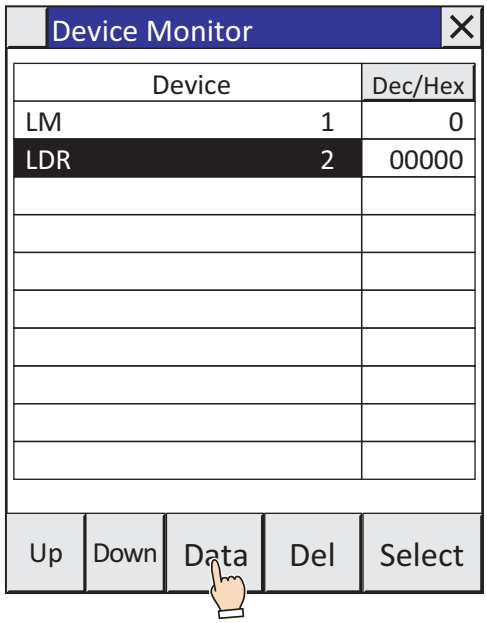
● Changing Value of Device

1 Press **Up** or **Down** to select the device to be changed the value.



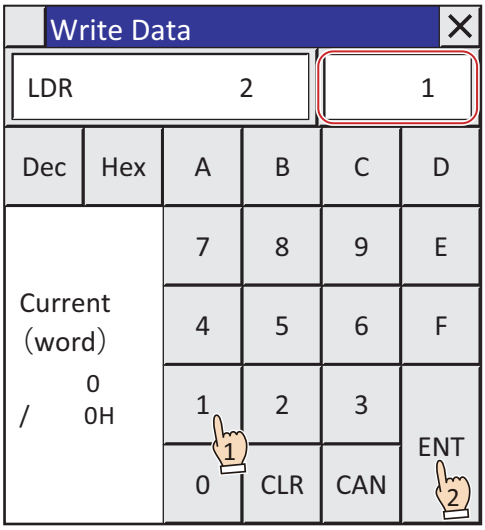
2 Press **Data** on Device Monitor.

The Write Data screen is displayed.



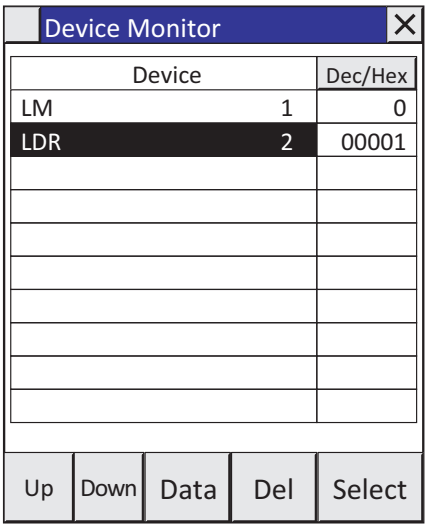
3 Enter the value of device and press **ENT**.

- Press **Dec** or **Hex** to change the display type for the value to enter.
- Press **CLR** to delete the entered value of device.
- Press **CAN** to stop entering the value of device.

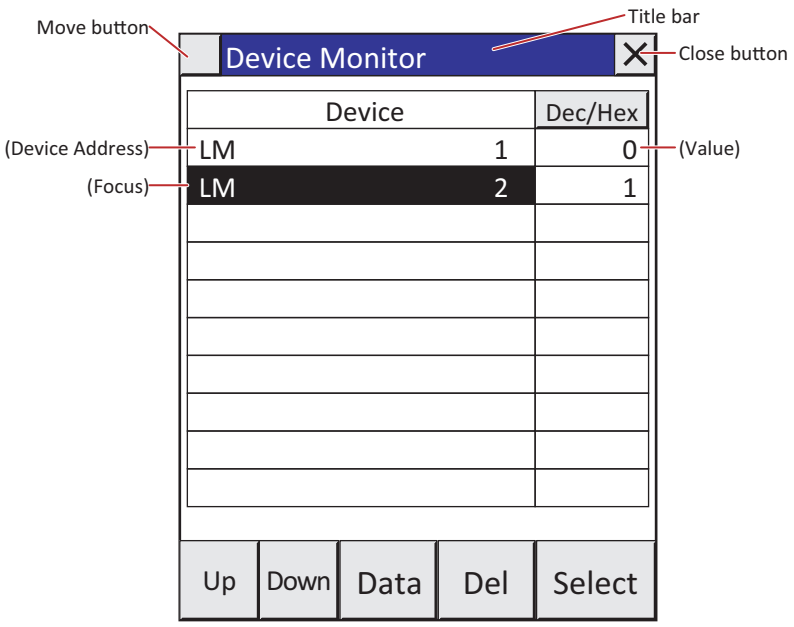


- If a value of device is invalid, pressing **ENT** will not return you to Device Monitor.
- If the display type is decimal, **A** to **F** cannot be used.

The value of device is changed.



● Device Monitor Configuration



■ **Title Bar**

Displays the title, ☐ or ⇔ (Move) button, and ✕(Close) button.

☐ or ⇔ (Move) button: Moves the Device Monitor.

Design of the move button varies based on the model.

HG2G-S/-5S/-5F, HG3G/4G: ☐

HG1F/2F/2S/3F/4F: ⇔

✕ (Close) button: Closes the Device Monitor.

■ Dec/Hex

Switches the display type for the current value of device. Switches between **DEC** and **HEX**.

■ **(Device Address)**

The registered device address is displayed.

■ **(Value)**

The current value of device is displayed.

■ **(Focus)**

Highlights the selected device address.

■ **Up**

Moves the focus up by one line.

■ **Down**

Moves the focus down by one line.

■ **Data**

Changes the value of the selected device address. Press to display the Write Data Screen. For details, refer to "Changing Value of Device" on page 25-22.

■ **Del**

Deletes the selected device address.

■ **Select**

Registers a selected device address. Press to display the Select Device Screen. For details, refer to "Device Address Registration" on page 25-20.

2.3 External Device Simulation

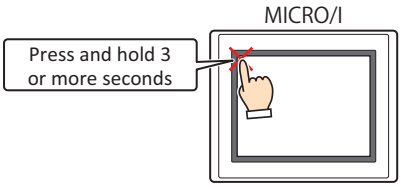
Simulation mode is a mode that simulates values of external devices on the MICRO/I alone for debugging. By possessing virtualized external devices inside the MICRO/I, you can efficiently debug using the Device Monitor function.

● Switching to Simulation Mode

For the HG2G-S/-5S/-5F, HG3G/4G

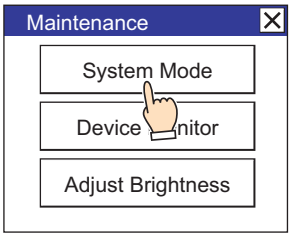
1 Press the upper-left corner of the screen on the MICRO/I for three seconds or more.

The Maintenance Screen is displayed.



2 Press **System Mode**.

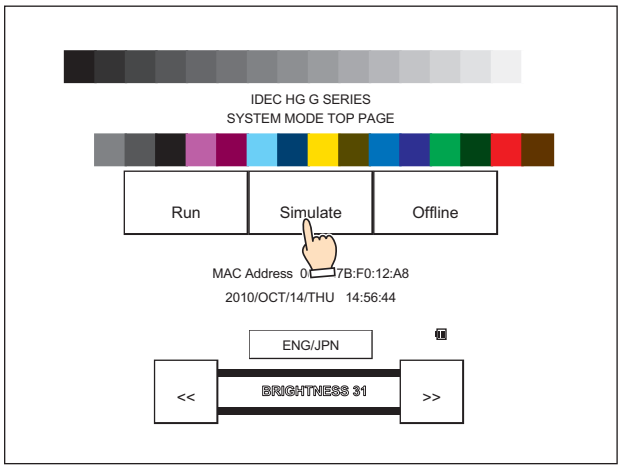
The MICRO/I switches to system mode.



If a password has been configured for the project data, the Enter Password screen will be displayed. Select a user name and then enter a password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3 Press **Simulate**.

The MICRO/I switches to simulation mode and "Simulation Mode" is displayed at the bottom left of the screen.



4 Monitor and change the values of devices with Device Monitor to check the operation of project data.

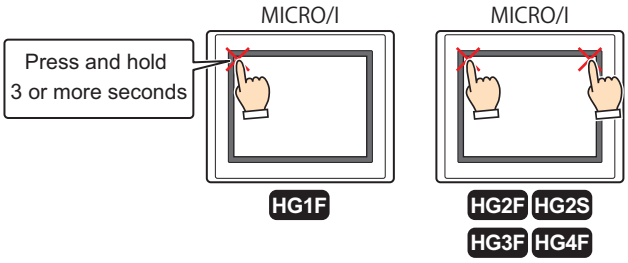
If there are any errors, edit the project data with WindO/I-NV2, and then download the edited project data to the MICRO/I.

To exit simulation mode, switch to system mode with the operations in steps *1* and *2*, and then press **Run** on the Top Page.

For the HG1F/2F/2S/3F/4F

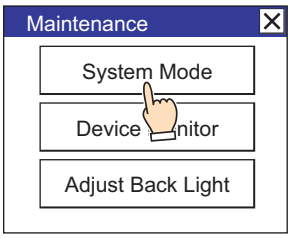
1 Press the upper-left corner of the HG1F screen for three seconds or more.
Press the upper-left edge and the upper-right edge of the HG2F/2S/3F/4F screen simultaneously.

The Maintenance Screen is displayed.



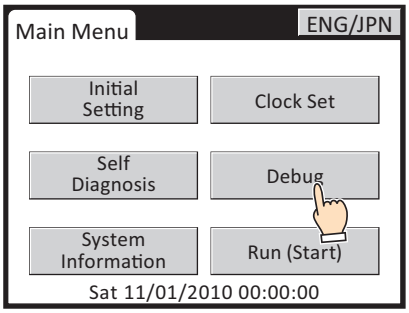
2 Press **System Mode**.

The MICRO/I switches to system mode.

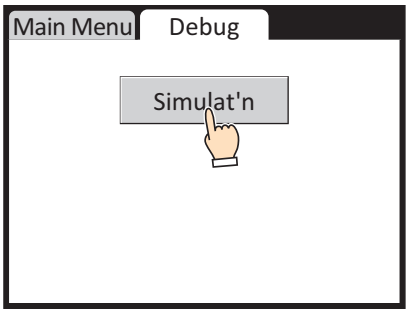


If a password has been configured for the project data, the Enter Password screen will be displayed. Select a user name and then enter a password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

3 Press **Debug**.

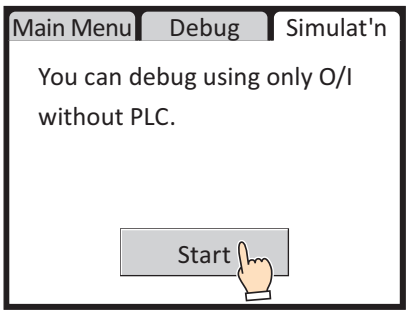


4 Press **Simulat'n**.



5 Press **Start**.

The MICRO/I switches to simulation mode and "Simulation Mode" is displayed at the bottom left of the screen.



6 Monitor and change the values of devices with Device Monitor to check the operation of project data.
If there are any errors, edit the project data with WindO/I-NV2, and then download the edited project data to the MICRO/I.
To exit simulation mode, switch to system mode with the operations in steps *1* and *2*, and then press **Run** on the System Menu.

Chapter 26 Pass-Through Function

The Pass-Through function enables the MICRO/I to relay communications between the programming software on the computer and the PLC. Therefore, connecting to the computer can perform communication with both of the MICRO/I and PLC.

1 Overview Pass-Through

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Features of the Pass-Through Function

- Communication with both of the MICRO/I and PLC can be performed by simply connecting the computer to the MICRO/I using a maintenance cable. It is not required to replace the cable connected to the PLC.
- Communication between the programming software on the computer and PLC can be performed without interrupting the operations of the MICRO/I.

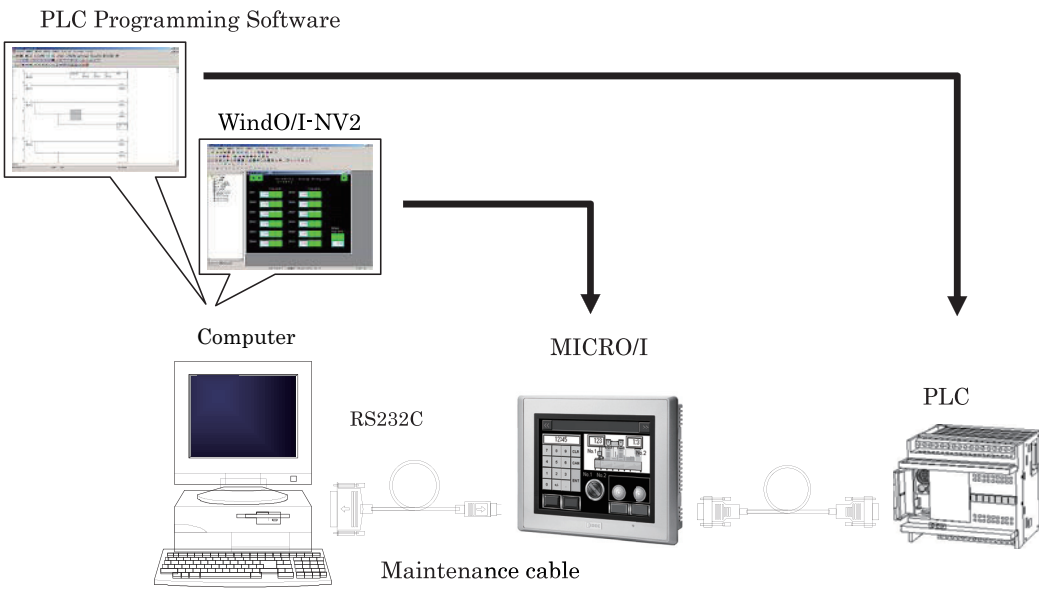
1.2 Operating Conditions for the Pass-Through Function

The Pass-Through function operates under the following conditions:

- The MICRO/I is in the Run Mode or Monitor mode.
- A host I/F driver that supports the Pass-Through operation.
- [Project Settings] - [Host I/F Driver] - [Enable Pass-Through] is selected.

Use the Pass-Through Tool with the HG2G-S/-5S/-5F, HG3G/4G series if you have the following:
- A compertitor's PLC.

Or
- Currently using WindLDR Ver. 5.0* - 6.0*.



2 Correspondence model Pass-Through

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 MICRO/I

The Pass-Through function can only be used with the following communication interfaces.

MICRO/I Type	Serial Interface	Ethernet Interface	USB Interface
HG2G-S/-5S	Supported*1	Supported	Supported*2
HG2G-5F, HG3G/4G	Not supported	Supported	Supported
HG1F	Supported	Not supported	Not supported
HG2F (Serial Interface 2: RS232C Type)	Supported	Not supported	Not supported
HG2F (Serial Interface 2: USB Type)	Not supported	Not supported	Not supported
HG2S	Supported	Not supported	Not supported
HG3F	Supported	Supported	Not supported
HG4F	Supported	Supported	Not supported

2.2 PLC

The Pass-Through function is available for the following PLC models.

Manufacturer	Series Name	System (CPU unit)	Host I/F Driver
IDEC	OpenNet Controller	FC3A	OpenNet,MicroSmart,SmartAXIS Pro/Lite(RS232C/485)*3
	MicroSmart	FC4A	
	MicroSmart Pentra	FC5A*4	
Mitsubishi*5	FX Series	FX0, FX0N, FX1, FX2, FX2C, FX1S	MELSEC-FX (CPU)
		FX2N, FX2NC, FX1N, FX1NC	MELSEC-FX2N (CPU)
		FX3U, FX3UC	MELSEC-FX3UC (CPU)
	QCPU	Q02CPU, Q02HCPU	MELSEC-Q (CPU)

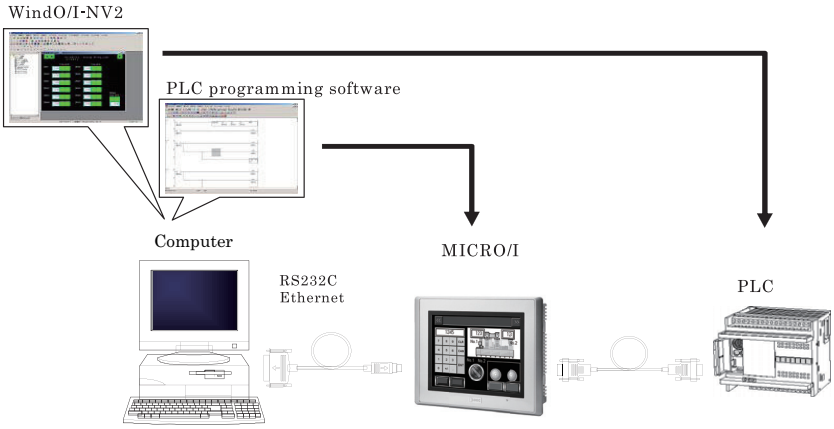
WindO/I-NV2 updates are available from the IDEC web site. Visit www.idec.com for the latest information and updates.

*1 HG2G-S only
*2 HG2G-5S only
*3 Use WindLDR Ver.5.00 or higher when you use the Ethernet Pass-Through functon.
*4 User programs cannot be downloaded and uploaded through FC5A-SIF2 with Pass-Through Function.
*5 We tested by GX Developer Version 8

3 Enable Pass-Through

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

To use the Pass-Through function, use a Host I/F Driver that supports the Pass-Through function, and select the "Enable Pass-Through" checkbox on [Configuration] - [System Setup] - [Project] - [Host I/F Driver] on the WindO/I-NV2.



3.1 Settings Pass-Through

The settings for the Pass-Through function can be changed from the WindO/I-NV2 or System Menu of the MICRO/I. Use a host I/F driver that supports the Pass-Through operation and follow the procedure below.

- Enabling the Pass-Through Function from the WindO/I-NV2
  Select [Configuration] - [System Setup] - [Project] - [Host I/F Driver], and select the "Use the Pass-Through function" checkbox to enable the Pass-Through function.
- Enabling the Pass-Through Function from the MICRO/I System Menu
  Select [Initial Setting] - [Host I/F Driver] - [Pass-Through Setting], and select "Enable" for the "Pass-Through Setting" setting to enable the Pass-Through function.

3.2 The Pass-Through Preference Function

When transferring data from a computer to PLC using the Pass-Through function, the data transmission speed of the computer and PLC is lower, because the transmission is performed simultaneously with the PLC-link communication of the MICRO/I.

In such a case, setting as follows will improve the data transmission speed from the computer. In that case, MICRO/I prioritizes the sent and received data from the computer, an error message "Host Communication Error" may appear on the MICRO/I because the MICRO/I is out of PLC-link communication with PLC for the meantime.

HG2G-S/-5S/-5F, HG3G/4G	Host Communication is stopped by Pass-Through Tool.
HG1F/2F/2S/3F/4F	The HG Special Relay LSM50 to ON position.

3.3 Restrictions and Precautions

When using all models

- Using the Pass-Through function will lower the baud rate of the PLC-link communication with the PLC.
- The Pass-Through function operates only in the "Run Mode" or "Monitor mode". The function will not operate in the "System Mode" or "Simulation Mode".
- When using Ver2.60 or earlier of WindO/I-NV2, change the mode to "System Mode" before using the Pass-Through function.
- Can not communicate with MICRO/I via Ethernet when use Pass-Through via serial port.
- Do not use communication with WindO/I-NV2 and Programming software at the same time.
- The Pass-Through function confirms the operation for Download/Upload User Program and Monitor on PLC Programming software. Other functions are not confirmed.

When using HG2G-S/-5S/-5F, HG3G/4G

- If you need to use the Pass-Through function and currently using WindLDR Ver.5.0* - Ver.6.0* or competitor's PLC programming software, then you must use the Pass-Through Tool. For more information, see the Pass-Through Tool mamual.
- If the communication via Pass-Through fails, change the settings such as Baud Rate, Timeout, Transfer Mode etc on PLC Programming software.

  In case of WindLDR, set as follows.
  Transfer Mode: ASCII
  Baud Rate: 9600
  Timeout: 5000

- When Host Communication was stopped by Pass-Through Tool, the Host Communication Error on HG2G-S/-5S/-5F, HG3G/4G is not recovered unless starting by Pass-Through Tool or resetting HG2G-S/-5S/-5F, HG3G/4G.

When using HG1F/2F/2S/3F/4F

- If the checkbox is selected for Enable Pass-Through Function, then other functions on Serial Interface 2 are disabled.
- When connect FX series with Pass-Through function, set up the baud rate as 9600bps in programming software.
- When connect MELSEC-QCPU with Pass-Through function, set up the baud rate of programming software to same baud rate as the communication between MICRO/I and PLC.
- Pass-Through via Ethernet is available to only FC3A/4A/5A. But Pass-Through function is not available if using Web Server Module (FC4A-SX5ES1).
- Set the following settings in "Communication Setting" dialog box when you communicate between WindLDR and PLC via Ethernet.

  Port Number: 2101
  The Maximum data size: 1
  Time delay between packets: 100 and over
  (Increase "Time delay between packets" setting value if the communication speed between MICRO/I and PLC is lower than 9600 bps.)

Chapter 27 Maintenance

This chapter describes the web server function used during maintenance and Downloader.

1 Web Server Function (HG2G-5F, HG3G/4G)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Web Server Function Overview

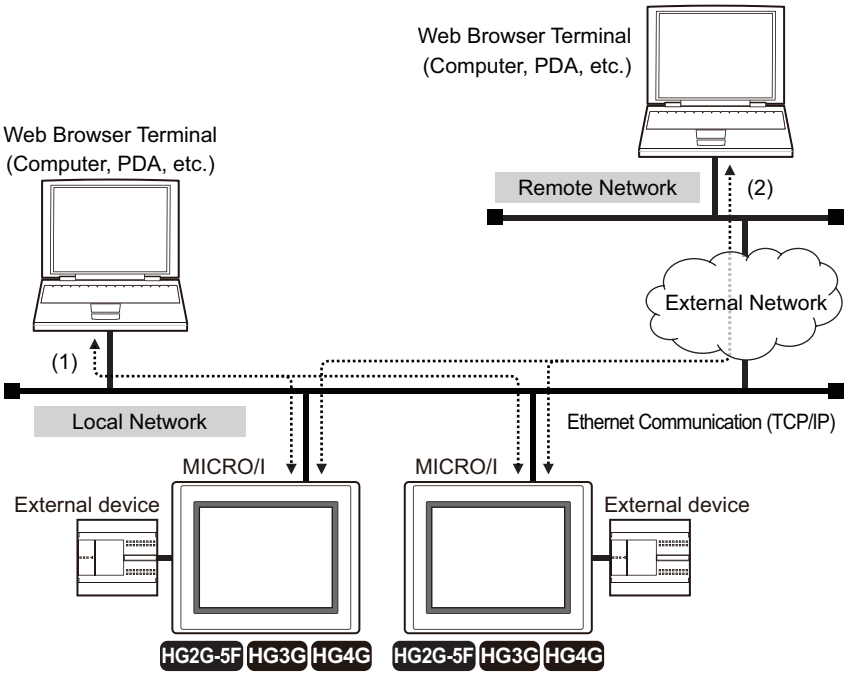
The web server function remotely performs HG2G-5F, HG3G/4G maintenance using a web browser terminal such as a computer or PDA.

- Monitoring
- Remote Control
- Remote Monitoring

1.2 System Composition

An example system configuration for using the web server function is shown below.

Configure the HG2G-5F, HG3G/4G Ethernet settings (IP address, netmask, default gateway) and connect to a local network.



(1) Access the HG2G-5F, HG3G/4G from a web browser connected to the local network to use the web server function.

(2) When the local network is connected to an external network, configure the web browser connected to the remote network with the local network's gateway, router, and other settings. Access the HG2G-5F, HG3G/4G from the remote web browser to use the web server function. For gateway, router, and other settings, contact the administrator of the network the HG2G-5F, HG3G/4G is connected to.

Both the HG2G-5F, HG3G/4G and HG3F/4F can exist on the same local network.
When accessing the HG3F/4F to use the web server function, refer to "2 Web Server Function (HG3F/4F)" on page 27-12.

1.3 Minimum System Requirements

Use of the following web browsers is recommended with the web server function.

- Internet Explorer 8.0 or higher
- Firefox 3.0 or higher

Web browsers other than those recommended can use the web server function, but problems may occur with features such as automatic updates and displaying images.

1.4 Settings and Access Method

Follow the procedure below to display the HG2G-5F, HG3G/4G web page (homepage) on a web browser.

1. Connect the HG2G-5F, HG3G/4G to a local network.

   Connect the HG2G-5F, HG3G/4G's Ethernet interface to the Ethernet port of the local network's router or hub with a LAN cable.

2. Configure the HG2G-5F, HG3G/4G.

   - Ethernet settings
     ☞ Refer to Chapter 4 " When Ethernet is selected under Interface Configuration" on page 4-40.
   - User account settings
     ☞ Refer to Chapter 23 "3 Security Dialog Box" on page 23-33.
   - Remote operation & monitoring function settings
     ☞ Refer to "Remote Control and Monitoring function settings" on page 27-3.

3. Access the HG2G-5F, HG3G/4G.

   Start the web browser on the web browser terminal and access the following URL.

   http://(HG2G-5F, HG3G/4G IP address)/

   Example 1: When the HG2G-5F, HG3G/4G's IP address is 192.168.0.1
   http://192.168.0.1/

   Example 2: When the HG2G-5F, HG3G/4G's IP address is 192.168.0.1 and the web server's port number is 8080
   http://192.168.0.1:8080/

   If successfully accessed, the HG2G-5F, HG3G/4G displays the password screen.

4. Enter the user name and password configured in the running project.

   Enter the user name and password for a user in the "Administrator", "Operator", or "Reader" security group.

   User name: The user name configured in the running project. (Default: User)

   Password: The alphanumeric password of 4 to 15 characters long configured in the running project. If a password is not set, leave the password blank.

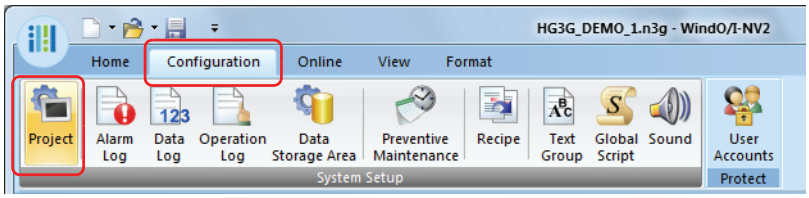
- An "Administrator" or "Operator" user account is required to open the remote operation page.
- If you do not access the HG2G-5F, HG3G/4G for 5 minutes or more after accessing it, you will be required to reenter your user name and password.
  Some web browsers will remember the user name and password you entered and automatically reenter them when required until the browser is closed. With this kind of web browser, you are not required to reenter your user name and password after 5 minutes or more have elapsed since accessing the HG2G-5F, HG3G/4G.
- The HG2G-5F, HG3G/4G can be accessed simultaneously from multiple web browser terminals. However, the maximum number of web browsers that can simultaneously access it is five.

When the user name and password are successfully verified, the HG2G-5F, HG3G/4G web page (homepage) is displayed.

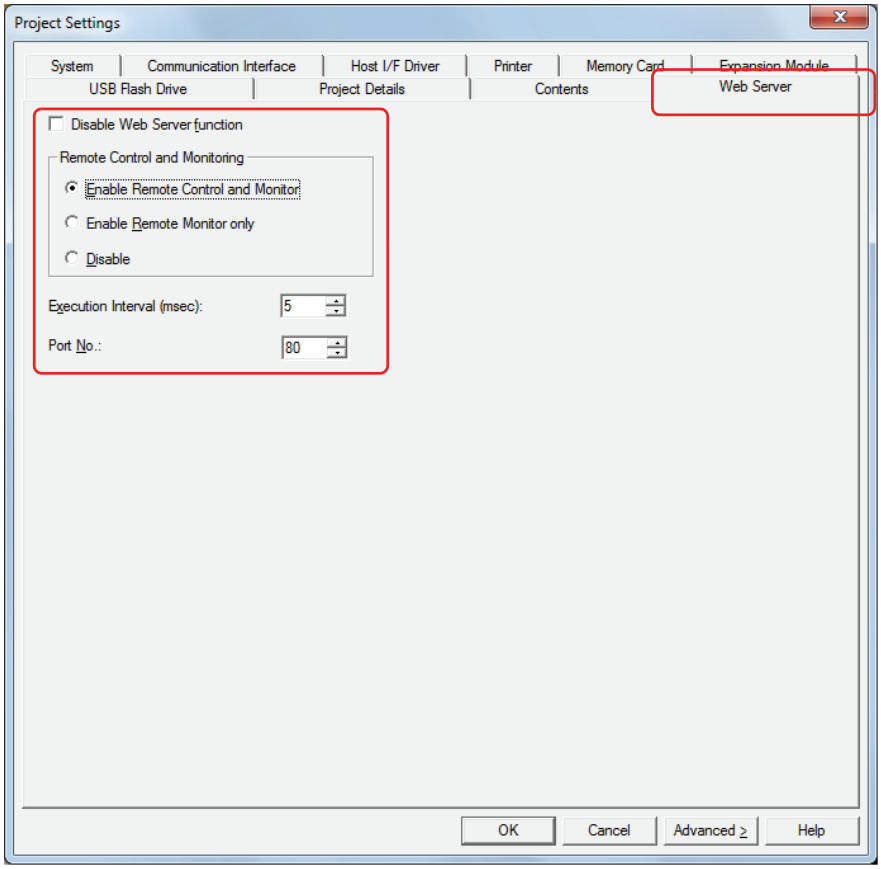
● Remote Control and Monitoring function settings

1 On the **Configuration** tab, in the **System Setup** group, click **Project**.

The Project Settings dialog box is displayed.



2 Configure the items on the **Web Server** tab.



■ **Disable Web Server function**

When the web server function is disabled, the web page for the IP address held by the display is not displayed, even when accessed.

(Default: Off)

■ **Remote Control and Monitoring**

Enables and disables remote monitoring and remote control. (Default: Disable)

■ **Execution Interval**

Specifies the interval (0 to 5000) for the HG2G-5F, HG3G/4G to return data.

When the remote control function and the remote monitoring function place a load on HG2G-5F, HG3G/4G operation, that load can be reduced by increasing this value.

However, the display update speed in the web browser will become slower. (Default: 5 (= 50 ms))

■ **Port No.**

Specifies the port number to use for the web server function. (Default: 80)

3 Click the **OK** button.

1.5 Web Page Configuration

● Web page configuration

The HG2G-5F, HG3G/4G web pages have the following page configuration.

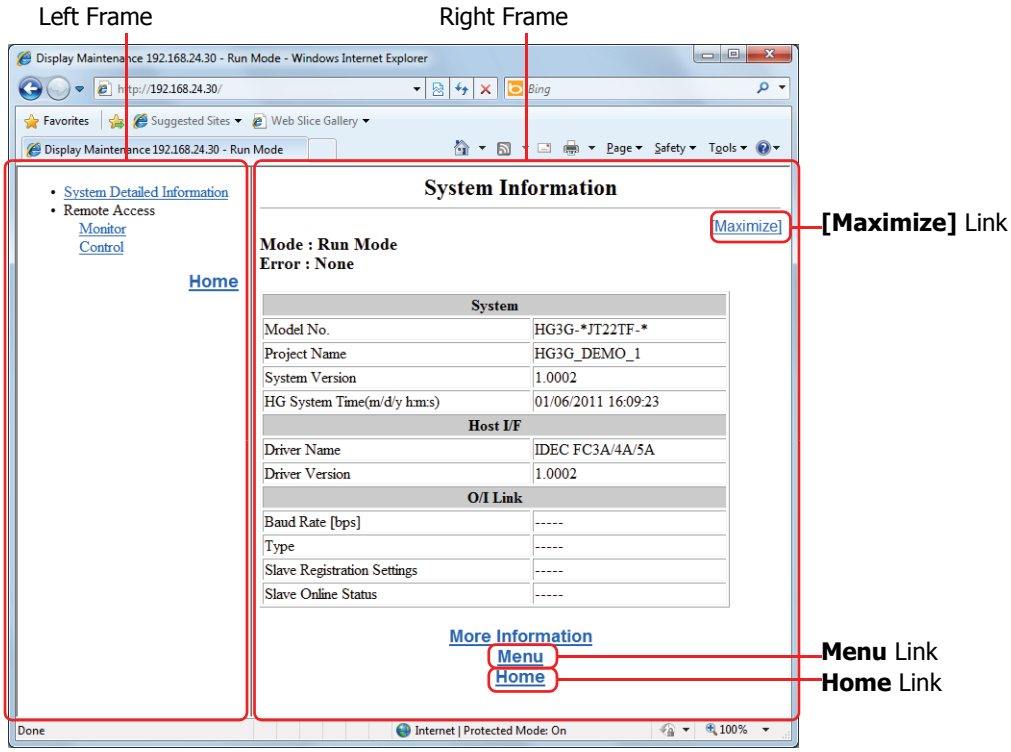
There are links to each page from the homepage (http://(IP address of HG2G-5F, HG3G/4G)/).

- Homepage http://(IP address of HG2G-5F, HG3G/4G)
  - System Detailed Information Page
  - Remote Functions Page
    - Remote Monitoring
    - Remote Operation

● Web page screen configuration

Each page can be displayed in either English or Japanese. When the web browser's preferred language is set to Japanese, the pages are displayed in Japanese. When the web browser's preferred language is set to a language other than Japanese, the pages are displayed in English.

All pages are displayed in a right-left two frame configuration on web browsers that support frames.
See example below.



■ Left frame

Links to each page are shown in this menu frame.

■ Right frame

Shows the function page.

Except for the full screen remote monitoring screen and remote operation screen, all of the pages shown in the right frame have a **Maximize** link, **Menu** link, and **Home** link.

[Maximize]:	Disables the frame display and shows the page in the full web browser screen.
Menu:	Shows the menu page. The content of the menu page is the same as the left frame (menu frame) when showing the frame.
Home:	Goes to the homepage. When going to the homepage, frames are always shown.

When using a web browser that does not support frames, the display position of items changes, but the content is the same.

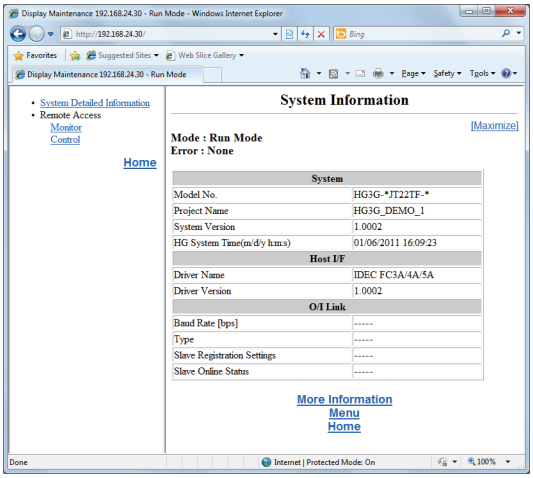
1.6 Monitoring

You can remotely monitor the state of the HG2G-5F, HG3G/4G from a web browser. Click the link for each page on the left frame to show the desired page.

● Homepage

If you successfully access the HG2G-5F, HG3G/4G, the homepage is displayed.

See example below.



The HG2G-5F, HG3G/4G information shown on the homepage is listed below.

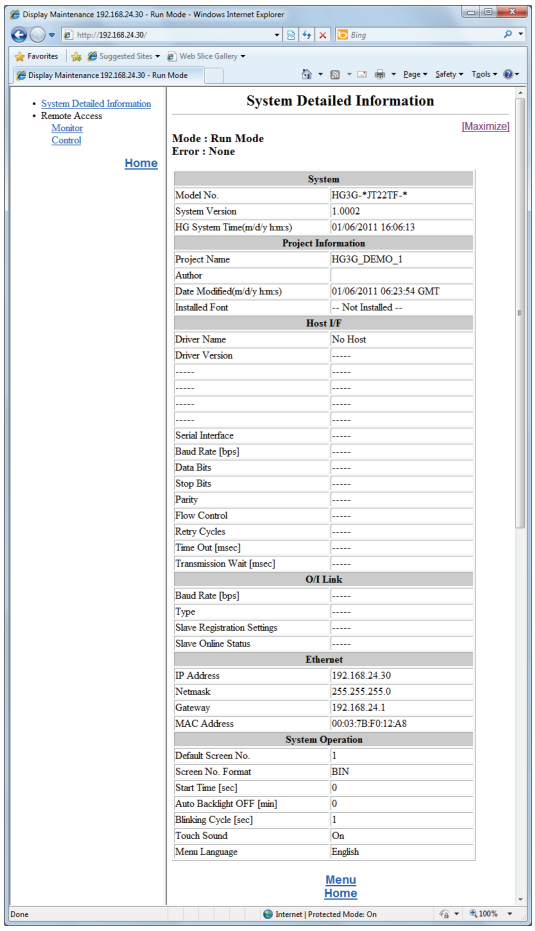
Display item		Description
Mode		Shows the system's current mode. • Run Mode • System Mode • Monitor Mode • Simulation Mode • Data Transfer Mode
Error		Shows the following errors. • Host Communication Error • No Screen Data • Waiting for Default Screen No. • Processing Error • Backup Data Lost • Network Off Line • Device Range Error • Script Error
System	**Model No.**	Shows the MICRO/I model number.
	Project Name	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
	System Version	Shows the MICRO/I system software version.
	HG System Time (m/d/y h:m:s)	Shows the date and time of the MICRO/I's internal clock when the page was acquired.
Host I/F	**Driver Name**	Shows the host interface driver name.
	Driver Version	Shows the host interface driver version.
O/I Link	**Baud Rate [bps]**	Shows the O/I link communication speed.
	Type	Shows the O/I link master station or slave station number.
	Slave Registration Settings	Shows the slave registration setting register for the O/I link communication master.
	Slave Online Status	Shows the slave online information register for the O/I link communication master.

- For details about error messages, refer to Chapter 35 "1.1 Errors Displayed on the Screen" on page 35-1.
- For details on O/I Link, see Chapter 3 "O/I Link Communication Interface" in the External Device Setup Manual.

● System detailed information page

Click the **System Detailed Information** link in the left frame or the **More Information** link in the homepage's right frame to show the system detailed information page.

See example below.



The HG2G-5F, HG3G/4G information shown on the system detailed information page is listed below.

Display item		Description
Mode		Shows the system's current mode. • Run Mode • System Mode • Monitor Mode • Simulation Mode • Data Transfer Mode
Error		Shows the following errors. • Host Communication Error • No Screen Data • Waiting for Default Screen No. • Processing Error • Backup Data Lost • Network Off Line • Device Range Error • Script Error
System	**Model No.**	Shows the MICRO/I type model number.
	System Version	Shows the MICRO/I system software version.
	HG System Time (m/d/y h:m:s)	Shows the date and time of the MICRO/I's internal clock when the page was acquired.

Display item		Description
Project Information	**Project Name**	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
	Author	Shows the project author.
	Date Modified (m/d/y h:m:s)	Shows the project's last modified date/time. The displayed date/time is Greenwich Mean Time (GMT).
	Installed Font	Shows the extension fonts installed in the HG2G-5F, HG3G/4G.
Host I/F	**Driver Name**	Shows the host interface driver name.
	Driver Version	Shows the host interface driver version.
	(Parameter unique to driver - 1)	The four items below the driver version show each driver's unique settings. The item names differ according to the drivers.
	(Parameter unique to driver - 2)	
	(Parameter unique to driver - 3)	
	(Parameter unique to driver - 4)	
	Serial Interface	Shows the serial interface used as the host interface.
	Baud Rate [bps]	Shows the host interface communication speed.
	Data Bits	Shows the host interface data length.
	Stop Bits	Shows the host interface stop bits.
	Parity	Shows the host interface parity.
	Flow Control	Shows the host interface flow control method.
	Retry Cycles	Shows the number of times to retry communication before displaying a host interface communication error.
	Time Out [msec]	Shows the response waiting time from the host.
	Transmission Wait [msec]	Shows the transmission interval for a host interface communication command.
O/I Link	**Baud Rate [bps]**	Shows the O/I link communication speed.
	Type	Shows the O/I link master station or slave station number.
	Slave Registration Settings	Shows the slave registration setting register for the O/I link communication master.
	Slave Online Status	Shows the slave online information register for the O/I link communication master.
Ethernet	**IP Address**	Shows the IP address.
	Netmask	Shows the netmask.
	Gateway	Shows the gateway address.
	MAC Address	Shows the Ethernet MAC address.
System Operation	**Default Screen No.**	Shows the screen number displayed when MICRO/I starts running.
	Screen No. Format	Shows the depiction method for the displayed screen number.
	Start Time [sec]	Shows the time until starting communication with the host.
	Auto Backlight OFF [min]	Shows the time for the backlight to turn off automatically.
	Blinking Cycle [sec]	Shows the blinking speed for parts and draw objects with the blinking attribute.
	Touch Sound	Shows **On** or **Off** for the touch panel confirmation sound.
	Menu Language	Shows the system screen's display language.

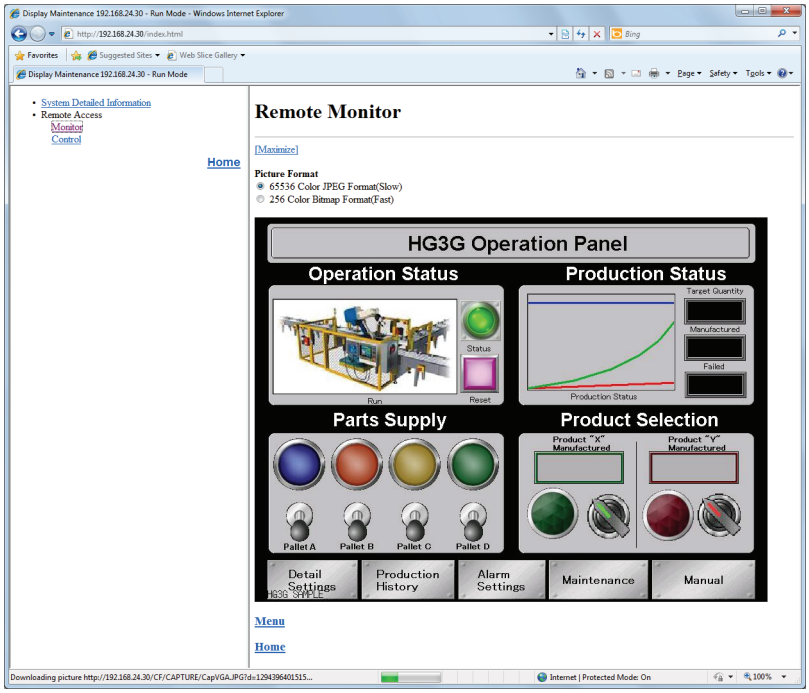
- The contents of the display items on the system detailed information page are the values set on the Project Settings dialog box displayed by clicking **Project** under **System Setup** on the **Configuration** tab in WindO/I-NV2.
- For host interface item details, see the External Device Setup Manual.

1.7 Remote Functions

You can remotely monitor and control the HG2G-5F, HG3G/4G from a web browser.
You can check the screen of HG2G-5F, HG3G/4G.

● Remote monitoring page

Click the **Monitor** link in the left frame to display the remote monitoring page.
A screen image of the screen displayed on the HG2G-5F, HG3G/4G is shown.
See example below.



- On the remote monitoring page, the HG2G-5F, HG3G/4G cannot be controlled even when the screen image displayed in the web browser is clicked. To control the HG2G-5F, HG3G/4G, please open the remote control page.
- If JavaScript is prohibited in the web browser settings, the web page will not operate correctly. Please enable JavaScript.
- The screen image cannot be displayed on web browsers that do not support the bitmap or JPEG format.
- The display may not be updated depending on the web browser's cache settings.

The following items can be specified on the remote monitoring page.

■ **Picture Format**

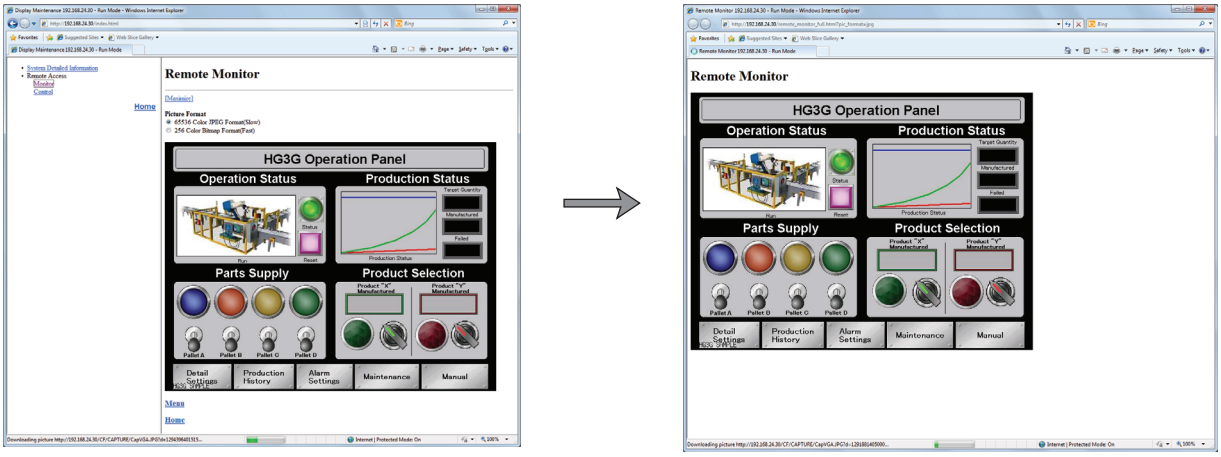
Specify the image format to use in remote monitoring.

65536 Color JPEG Format (Slow):	Capable of showing the screen image displayed on the HG2G-5F, HG3G/4G in the web browser without degradation. However, the update speed of the web browser display is slower than **256 Color Bitmap Format (Fast)** and the HG2G-5F, HG3G/4G screen update speed also slows down.
256 Color Bitmap Format (Fast):	Shows the screen image displayed on the HG2G-5F, HG3G/4G reduced to 256 colors. The screen image displayed on the HG2G-5F, HG3G/4G is somewhat degraded, but the update speed of the display on the web browser speeds up and the impact on the HG2G-5F, HG3G/4G screen update speed is reduced. (The screen update speed of the 256 color bitmap format tends to be faster than the 65536 color JPEG format, but it may be slower depending on the screen's displayed content.)

■ [Maximize] link

Hides the left frame, page title, and screen format settings, and shows only the HG2G-5F, HG3G/4G screen image. The screen format settings are the same as before clicking the **[Maximize]** link.

These screens are examples.

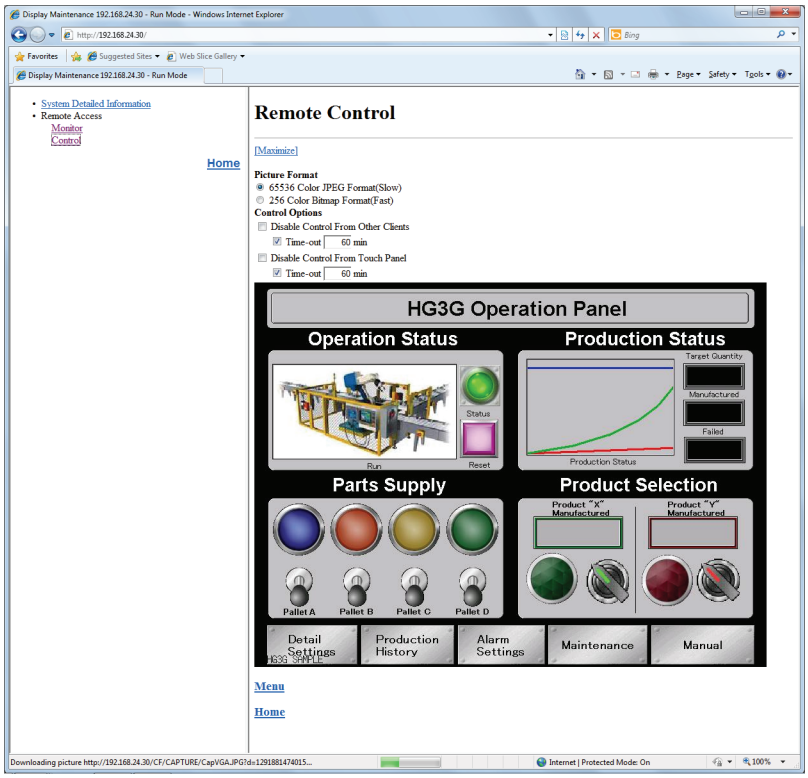


● Remote control page

Click the **Control** link in the left frame to display the remote control page.

An image of the screen displayed on the HG2G-5F, HG3G/4G is shown. You can also control the HG2G-5F, HG3G/4G by clicking on the displayed screen image.

This screen is an example.



- If JavaScript is prohibited in the web browser settings, the web page will not operate correctly. Please enable JavaScript.
- The screen image cannot be displayed on web browsers that do not support the bitmap or JPEG format.
- The display may not be updated depending on the web browser's cache settings.

The following items can be specified on the remote operation page.

Picture Format

Specify the image format to use in remote operation.

65536 Color JPEG Format (Slow):	Capable of showing the screen image displayed on the HG2G-5F, HG3G/4G in the web browser without degradation. However, the update speed of the web browser display is slower than **256 Color Bitmap Format (Fast)** and the HG2G-5F, HG3G/4G screen update speed also slows down.
256 Color Bitmap Format (Fast):	Shows the screen image displayed on the HG2G-5F, HG3G/4G reduced to 256 colors. The screen image displayed on the HG2G-5F, HG3G/4G is somewhat degraded, but the update speed of the display on the web browser speeds up and the impact on the HG2G-5F, HG3G/4G screen update speed is reduced. (The screen update speed of the 256 color bitmap format tends to be faster than the 65536 color JPEG format, but it may be slower depending on the screen's displayed content.)

Control Options

Operation restrictions prohibit operation from other computers or the touch panel of the HG2G-5F, HG3G/4G while the HG2G-5F, HG3G/4G is being remotely controlled.

Disable Control From Other Clients:	Check to prohibit remote control from other computers. When this function is enabled, if a web browser is already accessing the HG2G-5F, HG3G/4G, the message **Remote Control is disabled by other client** will be displayed on the other browser and access is denied. When disabled, the HG2G-5F, HG3G/4G can be accessed from multiple web browsers.
Disable Control From Touch Panel:	Check to prohibit control with the HG2G-5F, HG3G/4G touch panel. When this function is enabled, if a web browser is already accessing the HG2G-5F, HG3G/4G, the message **Touch panel is disabled by Remote Control Function** will be displayed on MICRO/I and operation by the MICRO/I touch panel is not possible. When disabled, control by the MICRO/I touch panel is possible.

[Maximize]

Hides the left frame, page title, and screen format settings, and shows only the HG2G-5F, HG3G/4G screen image. The screen format settings are the same as before clicking the **[Maximize]** link.

2 Web Server Function (HG3F/4F)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S **HG3F** **HG4F**

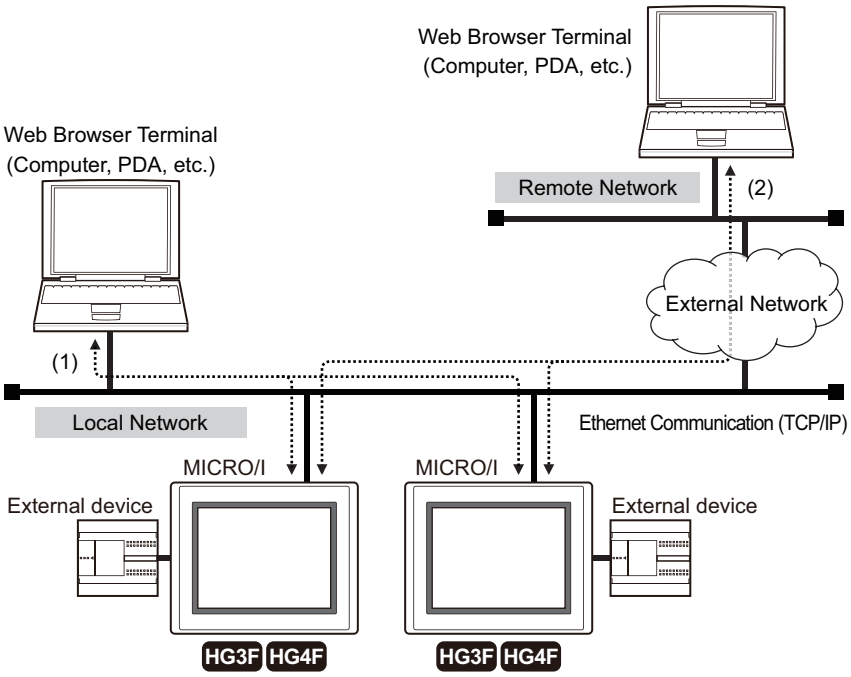
2.1 Web Server Function Overview

The web server function is a function to remotely perform HG3F/4F maintenance using a web browser terminal such as a computer or PDA. The following functions can be used just by configuring the Ethernet settings.

- Monitoring
- Displaying the alarm log
- Displaying the data log
- Reading and writing to the CF card
- Device Monitor

2.2 System Configuration

An example system configuration for using the web server function is shown below.
Configure the HG3F/4F Ethernet settings (IP address, netmask, default gateway) and connect to a local network.



(1) Access the HBodyBold_NumlistG3F/4F from a web browser terminal connected to the local network to use the web server function.

(2) When the lBodyBold_Numlistocal network is connected to an external network, configure the web browser terminal connected to the remote network with the local network's gateway, router, and other settings. Access the HG3F/4F from the remote web browser terminal to use the web server function. For gateway, router, and other settings, contact the administrator of the network the HG3F/4F is connected to.

Both the HG2G-5F, HG3G/4G and HG3F/4F can exist on the same local network.
When accessing the HG2G-5F, HG3G/4G to use the web server function, refer to "1 Web Server Function (HG2G-5F, HG3G/4G)" on page 27-1.

2.3 Minimum System Requirements

Use of the following web browsers is recommended with the web server function.

- Internet Explorer 4.0 or higher
- Netscape Navigator 6.1 or higher
- Pocket Internet Explorer 4 or higher

Web browsers other than those recommended can use the web server function, but problems may occur with features such as automatic updates and displaying images.

2.4 Settings and Access Method

Follow the procedure below to display the HG3F/4F web page (homepage) on a web browser terminal.

1. Connect the HG3F/4F to a local network.

   Connect the HG3F/4F's Ethernet interface to the Ethernet port of the local network's router or hub with a LAN cable.

2. Configure the HG3F/4F.

   - Ethernet settings

     ☞ Refer to Chapter 4 "When Ethernet is selected under Interface Configuration" on page 4-40.

   - User account settings

     ☞ Refer to Chapter 23 "3 Security Dialog Box" on page 23-33.

3. Access the HG3F/4F.

   Start the web browser on the web browser terminal and access the following URL.

   http://(IP address of HG3F/4F)/

   Example 1: When the HG3F/4F's IP address is 192.168.0.1
   http://192.168.0.1/

   Example 2: When the HG3F/4F's IP address is 192.168.0.1 and the web server's port number is 8080
   http://192.168.0.1:8080/

   If successfully accessed, the HG3F/4F displays the password screen.

4. Enter the user name and password in the running project.

   Enter the user name and password for a user in the "Administrator", "Operator", or "Reader" security group.

   User name: The user name in the running project. (Default: User)

   Password: An alphanumeric password of 4 to 15 characters long in the running project. If a password is not set, leave the password blank.

- If you do not access the HG3F/4F for 5 minutes or more after accessing it, you will be required to reenter your user name and password. Some web browsers will remember the user name and password you entered and automatically reenter them when required until the browser is closed. With this kind of web browser, you are not required to reenter your user name and password if 5 or more minutes elapse after accessing the HG3F/4F.
- The HG3F/4F can be accessed simultaneously from multiple web browser terminals. However, the maximum number of web browsers that can simultaneously connect to it is five.

When the user name and password are successfully verified, the HG3F/4F web page (homepage) is displayed.

2.5 Web Page Configuration

● Web page configuration

The HG3F/4F web pages have the following page configuration.

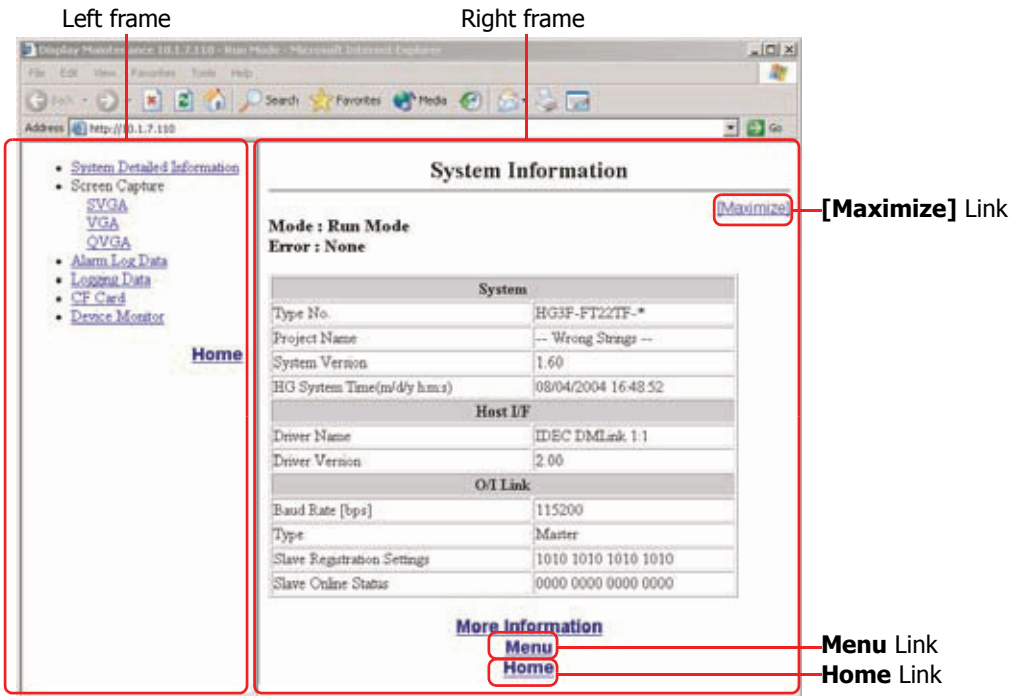
There are links to each page from the homepage (http://(IP address of HG3F/4F)/).

- Homepage http://(IP address of HG3F/4F)
  - System Detailed Information Page
  - Screen Capture Page
    - SVGA
    - VGA
    - QVGA
  - Alarm Log Data Request Form
    - Alarm Log Data Page
  - Logging Data Request Form
    - Logging Data Page
  - CF Card Page
    - File List Page
      - Files on CF
  - Device Monitor Request Form Page
    - Device Monitor Page
      - Internal Device Write Page

● Web page screen configuration

Each page can be displayed in either English or Japanese. When the web browser's preferred language is set to Japanese, the pages are displayed in Japanese. When the web browser's preferred language is set to a language other than Japanese, the pages are displayed in English.

All pages are displayed in a right-left two frame configuration on web browsers that support frames.
See example below.



■ Left frame

Links to each page are shown on the menu frame.

■ Right frame

Shows the function page.

All of the pages shown in the right frame have a **Maximize** link, **Menu** link, and **Home** link.

[Maximize]:	Disables the frame display and shows the page in the full web browser screen.
Menu:	Shows the menu page. The content of the menu page is the same as the left frame (menu frame) when showing the frame.
Home:	Goes to the homepage. When going to the homepage, frames are always shown.

When using a web browser that does not support frames, the display position of items changes, but the content is the same.

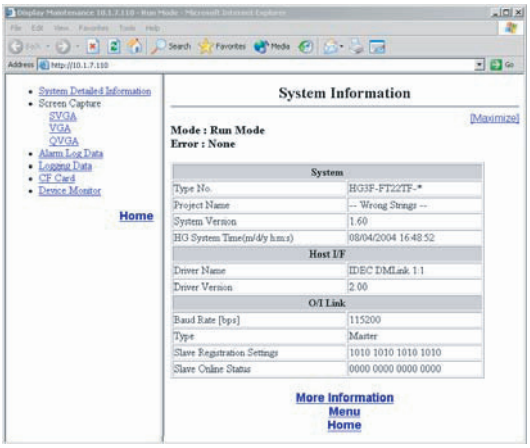
2.6 Monitoring

You can remotely monitor the state of the HG3F/4F from a web browser terminal. Click the link for each page on the left frame to show the desired page.

● Homepage

If you successfully access the HG3F/4F, the homepage is displayed.

See example below.



The HG3F/4F information shown on the homepage is listed below.

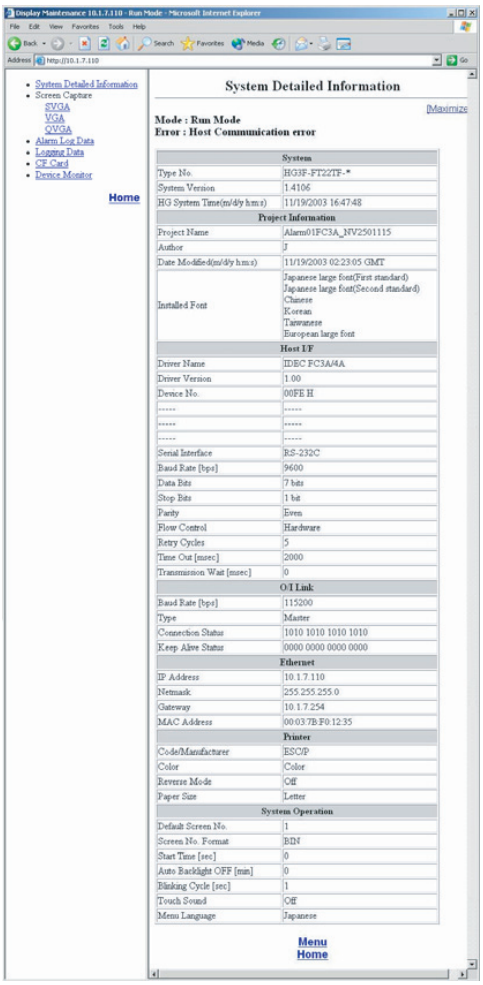
Display item		Description
Mode		Shows the system's current mode. • Run Mode • System Mode • Monitor Mode • Simulation Mode • Data Transfer Mode
Error		Shows the following errors. • Host Communication Error • No Screen Data • Waiting for Default Screen No. • Processing Error • Backup Data Lost • Network Off Line • Device Range Error • Script Error
System	**Type No.**	Shows the MICRO/I model number.
	Project Name	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
	System Version	Shows the MICRO/I system software version.
	HG System Time (m/d/y h:m:s)	Shows the date and time of the MICRO/I's internal clock when the page was acquired.
Host I/F	**Driver Name**	Shows the host interface driver name.
	Driver Version	Shows the host interface driver version.
O/I Link	**Baud Rate [bps]**	Shows the O/I link communication speed.
	Type	Shows the O/I link master station or slave station number.
	Slave Registration Settings	Shows the slave registration setting register for the O/I link communication master.
	Slave Online Status	Shows the slave online information register for the O/I link communication master.

- For details about error messages, refer to Chapter 35 "1.1 Errors Displayed on the Screen" on page 35-1.
- For details on O/I Link items, see Chapter 3 "O/I Link Communication Interface" in the External Device Setup Manual.

● System Detailed Information Page

Click the **System Detailed Information** link in the left frame or the **More Information** link in the homepage's right frame to show the system detailed information page.

See example below.



The HG3F/4F information shown on the system detailed information page is listed below.

Display item		Description
Mode		Shows the system's current mode. • Run Mode • System Mode • Monitor Mode • Simulation Mode • Data Transfer Mode
Error		Shows the following errors. • Host Communication Error • No Screen Data • Waiting for Default Screen No. • Processing Error • Backup Data Lost • Network Off Line • Device Range Error • Script Error
System	**Type No.**	Shows the MICRO/I model number.
	System Version	Shows the MICRO/I system software version.
	HG System Time (m/d/y h:m:s)	Shows the date and time of the MICRO/I's internal clock when the page was acquired.

Display item		Description
Project Information	**Project Name**	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
	Author	Shows the project author.
	Date Modified (m/d/y h:m:s)	Shows the project's last modified date/time. The displayed date/time is Greenwich Mean Time (GMT).
	Installed Font	Shows the extension fonts installed in the HG3F/4F.
Host I/F	**Driver Name**	Shows the host interface driver name.
	Driver Version	Shows the host interface driver version.
	Parameter unique to driver - 1	The four items below the driver version show each driver's unique settings. The item names differ according to the drivers.
	Parameter unique to driver - 2	
	Parameter unique to driver - 3	
	Parameter unique to driver - 4	
	Serial Interface	Shows the serial interface used as the host interface.
	Baud Rate [bps]	Shows the host interface communication speed.
	Data Bits	Shows the host interface data length.
	Stop Bits	Shows the host interface stop bits.
	Parity	Shows the host interface parity.
	Flow Control	Shows the host interface flow control method.
	Retry Cycles	Shows the number of times to retry communication before displaying a host interface communication error.
	Time Out [msec]	Shows the response waiting time from the host.
	Transmission Wait [msec]	Shows the transmission interval for a host interface communication command.
O/I Link	**Baud Rate [bps]**	Shows the O/I link communication speed.
	Type	Shows the O/I link master station or slave station number.
	Slave Registration Settings	Shows the slave registration setting register for the O/I link communication master.
	Slave Online Status	Shows the slave online information register for the O/I link communication master.
Ethernet	**IP Address**	Shows the IP address.
	Netmask	Shows the netmask.
	Gateway	Shows the gateway address.
	MAC Address	Shows the Ethernet MAC address.
Printer	**Code/Manufacturer**	Shows the printer control command.
	Color	Shows the printing color.
	Reverse Mode	Shows whether reverse is **On** or **Off**.
	Paper Size	Shows the paper size.
System Operation	**Default Screen No.**	Shows the screen number displayed when MICRO/I starts running.
	Screen No. Format	Shows the depiction method for the displayed screen number.
	Start Time [sec]	Shows the time until starting communication with the host.
	Auto Backlight OFF [min]	Shows the time for the backlight to turn off automatically.
	Blinking Cycle [sec]	Shows the blinking speed for parts and draw objects with the blinking attribute.
	Touch Sound	Shows **On** or **Off** for the touch panel confirmation sound.
	Menu Language	Shows the system screen's display language.

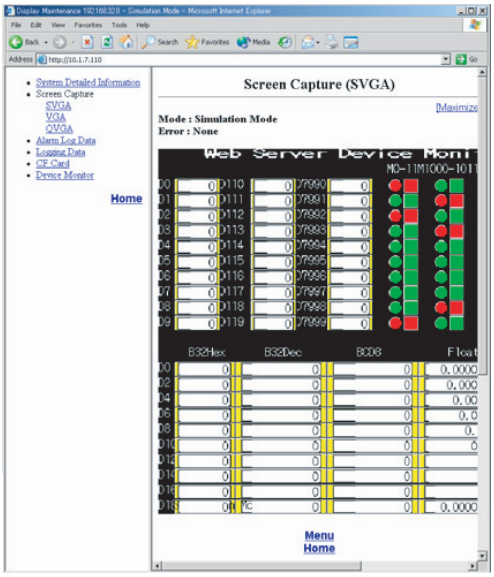
- The content of the display items on the system detailed information page is the values set on the Project Settings dialog box displayed by clicking **Project** under **System Setup** on the **Configuration** tab in WindO/I-NV2.
- For host interface item details, see the External Device Setup Manual.

● Screen capture page

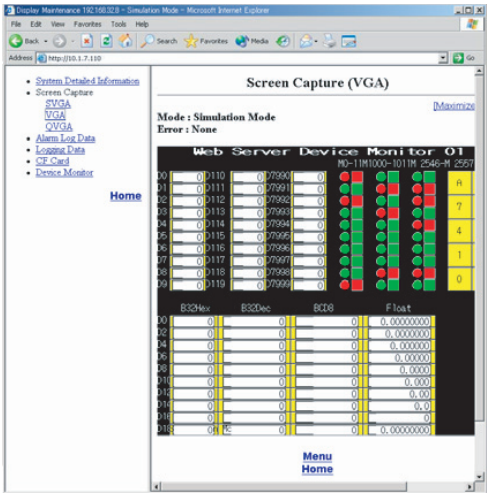
The screen capture page shows the screen image of the screen displayed on the HG3F/4F. Click on the **SVGA** link, **VGA** link, or **QVGA** link to select the screen image display size. The image format is bitmap.

For examples, please see the screen captures below.

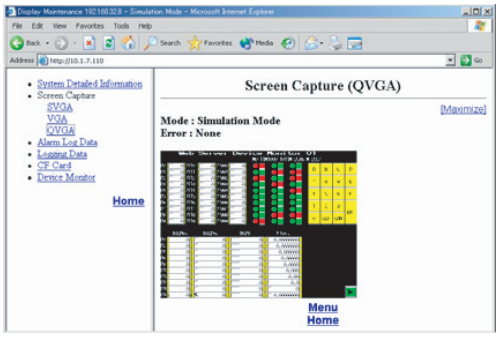
Screen Capture Page (SVGA)



Screen Capture Page (VGA)



Screen Capture Page (QVGA)



When a size is selected that is different than the HG3F/4F screen size, the image size is displayed bigger or smaller. This page also uses the HTML refresh tag to automatically update at preset intervals shown in the following table.

Size		Update interval
SVGA	800×600 pixels	60 seconds
VGA	640×480 pixels	60 seconds
QVGA	320×240 pixels	10 seconds

- The page is not automatically updated on web browsers that do not support the HTML refresh tag. To obtain the most recent state, manually refresh the browser.
- The screen image cannot be displayed on web browsers that do not support bitmap format.
- The display may not be updated depending on the web browser cache settings.

2.7 Data Display

The data display page shows the alarm log data and data log data saved on the HG3F/4F.

To show alarm log data and data log data on the CF card, use the CF card page. For details, refer to "2.8 CF Card" on page 27-26.

● Alarm log page

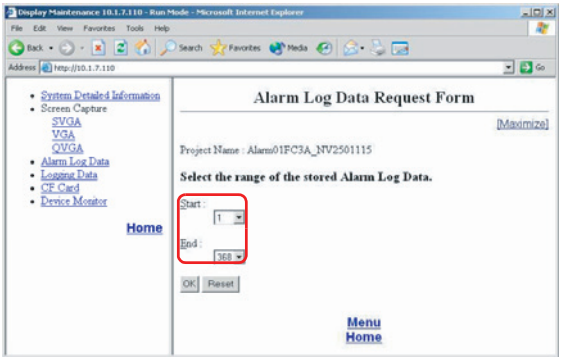
The alarm log page shows alarm log data using the following procedure.

(This function can only be used when the alarm log is set in the project.)

1. Click the **Alarm Log Data** link on the menu.

   The alarm log data request form is displayed.

2. Select the range to show with **Start** and **End**.



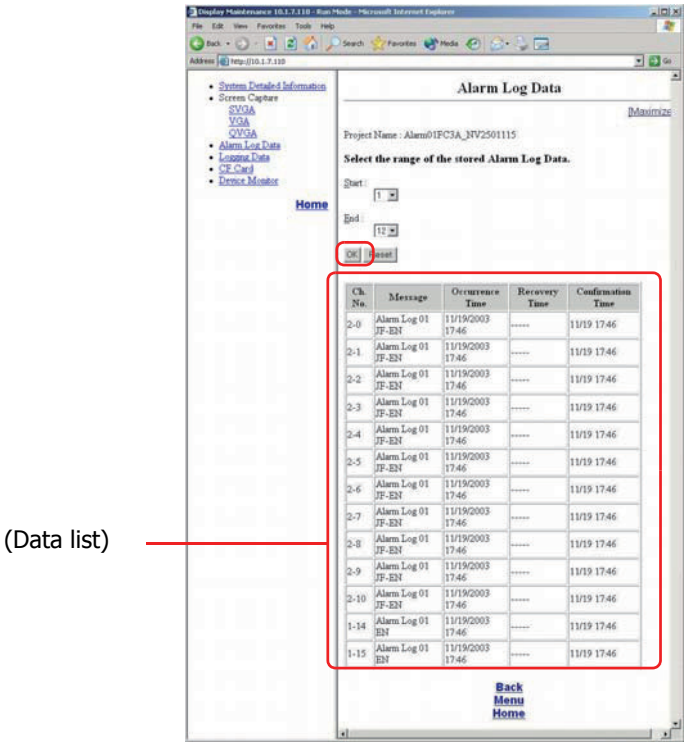
Display item	Description
Project Name	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
Start	Selects the start position (1 to 1024) for showing the alarm log. The larger the value, the more recent the data. When **Start** is smaller than **End**, the data is shown in ascending order (from old data to new data). When larger, the data is shown in descending order (from new data to old data). The display start position can only be selected when alarm log data exists.
End	Selects the end position (1 to 1024) for showing the alarm log. For details, refer to **Start** above.
OK button	Confirms the display range selected with **Start** and **End**, and shows the alarm log data in the range selected on the alarm log data page.
Reset button	Resets the display range selected with **Start** and **End** to the default values.

For details about the alarm log data, refer to Chapter 13 "Alarm Log Function" on page 13-1.

When using a web browser terminal with a slow processing speed such as a PDA, and if the alarm log display range is large, it may take a few minutes for the data to display.

3 Click the **OK** button.

The alarm log data page is displayed and shows the alarm log data in the selected range.
See example below.



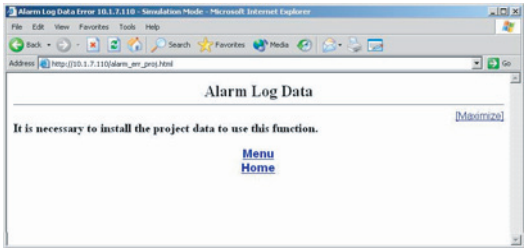
Display item		Description
Project Name		The same as the alarm log data request form. You can change the range to display the alarm log without returning to the alarm log data request form.
Start		
End		
OK button		
Reset button		
(Data list)	**Ch. No.**	Shows the channel number.
	Message	Shows the alarm message. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".) When characters other than half-width alphanumeric characters included on the Japanese page, the message language information is only shown when Japanese.)
	Occurrence Time	Shows the date and time the alarm occurred.
	Recovery Time	Shows the date and time the alarm was recovered.
	Confirmation Time	Shows the date and time the alarm was confirmed.

If an alarm occurs while processing the display of alarm log data in descending order, the oldest data is overwritten by the alarm that occurred. Therefore, the actual amount of alarm log data displayed may be less than the amount specified by the display range.

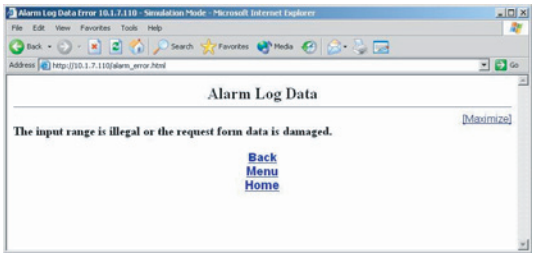
Alarm log data error page

If an error occurs while processing the alarm log data page display, the following page is displayed.

No project error page is displayed when project data was not downloaded to MICRO/I.



Input form error page is displayed when there is a problem in the form data received by the HG3F/4F.



● Data log page

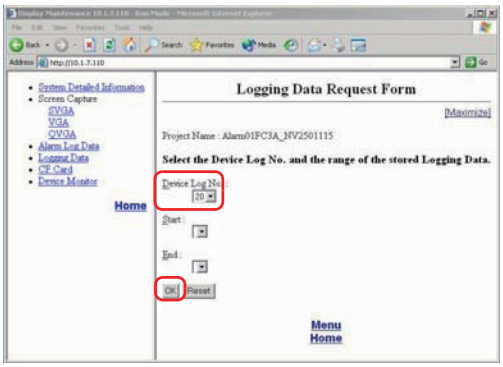
The data log page shows data log data using the following procedure.
(This function can only be used when the data log is set in the project.)

1 Click the **Logging Data** link on the menu.

The logging data request form is displayed.

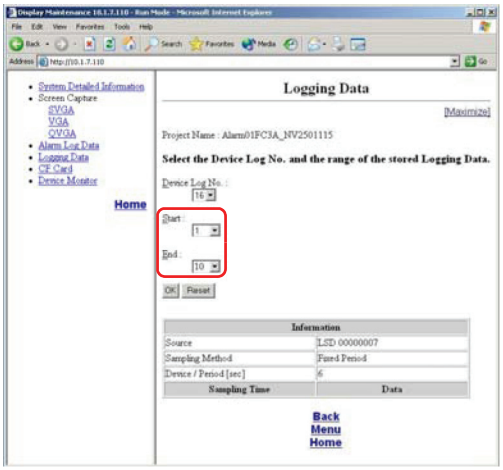
2 Select **Device Log No.** and click the **OK** button.

The logging data page is displayed showing the information set for the selected data number.



3 Select the range to show with **Start** and **End**.

This screen is an example.

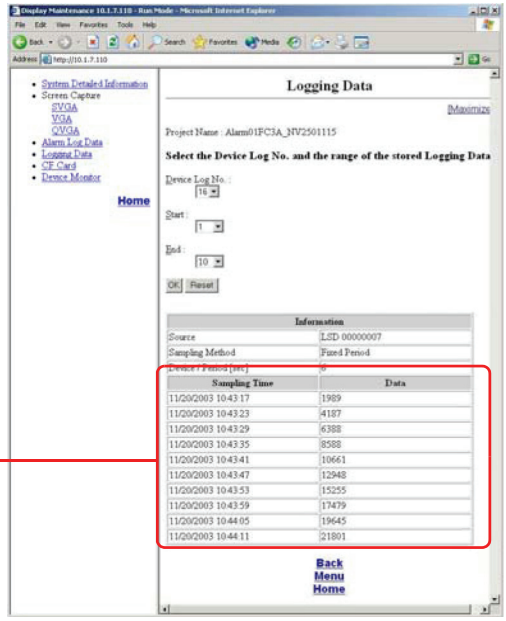


Display item	Description
Project Name	Shows the project name. (When characters other than half-width alphanumeric characters are included on the English page, the project name is shown as "-Wrong Strings-".)
Device Log No.	Selects the channel number in the data log. Only shows the numbers with **Enable** selected in the data log.
Start	Selects the start position (1 to 1024) for showing the data log. The larger the value, the more recent the data. When **Start** is smaller than **End**, the data is shown in ascending order (from old data to new data). When larger, the data is shown in descending order (from new data to old data). The display start position can only be selected when data log data exists.
End	Selects the end position (1 to 1024) for showing the data log. For details, refer to **Start** above.
OK button	Confirms **Device Log No.**. When confirming **Device Log No.**, the display range selected with **Start** and **End** confirmed and the alarm log data in the range selected on the alarm log data page is shown.
Reset button	Resets the display range selected with **Device Log No.**, **Start**, and **End** to the default values.

- "Data Log" is shown as "Logging" on the web page.
- For details about the data log data, refer to Chapter 14 "Data Log Function" on page 14-1.

4 Click the **OK** button.

The data for the data log in the selected range is displayed.
See example below.



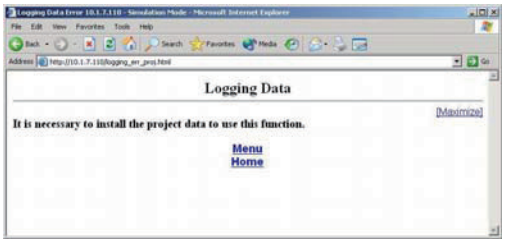
Display item		Description
Project Name		The same as the logging data request form. You can change the range to display the data log without returning to the logging data request form.
Device Log No.		
Start		
End		
OK		
Reset		
(Data list)	**Source**	Shows the device for the data log.
	Sampling Method	Shows the sampling method.
	Device / Period [sec]	The displayed content differs according to **Sampling Method**. When **Fixed Period**, it shows the cycle time to sample in seconds. Data is sampled per the specified cycle time (seconds). When **Event Bit** or **Event Word**, it shows the device for the sampling method. The data is sampled when the device's value changes.
	Sampling Time	Shows the date and time when the data was sampled.
	Data	Shows the sampled data.

When using a web browser terminal with a slow processing speed such as a PDA, and if the display range is large, it may take a few minutes for the data to display.

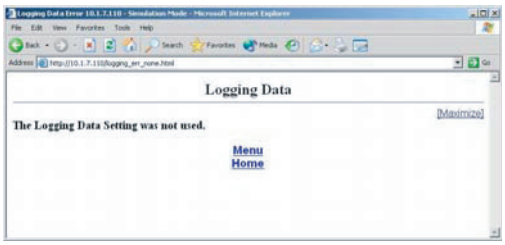
Data log data error page

If an error occurs while processing the logging data page display, the following page is displayed.

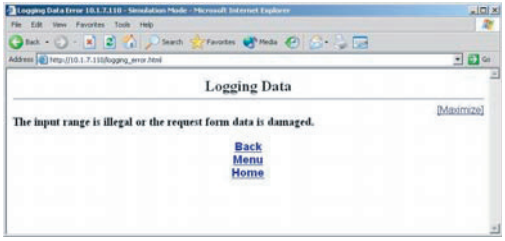
No project error page is displayed when project data was not downloaded to the HG3F/4F.



No data log error page is displayed when the data log is not configured.



Input form error page is displayed when there is a problem in the form data received by the HG3F/4F.



2.8 CF Card

The CF card page shows the following files in the memory card folders for the CF card inserted in the HG3F/4F.

- Bitmap files in the "CAPTURE" folder
- CSV files in the "ALARM" folder
- CSV files in the "LOG" folder
- CSV files in the "RECIPE" folder

This function can be used when the following conditions are satisfied.

- A CF card is inserted in the HG3F/4F
- A memory card folder exists in the CF card's root folder
- The number of memory card folders is 254 or less

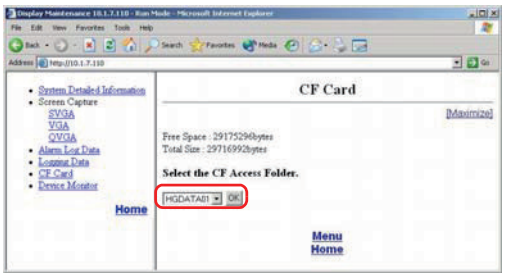
Memory card folders are shown as CF access folders in MICRO/I and in the web browser.
For the file configuration in the memory card folders, refer to Chapter 30 "1.2 CF Card" on page 30-1.

Display files in the memory card folders on the CF card page using the following procedure.

1. Click the **CF Card** link on the menu.

   The CF card page is displayed.

2. Select the Memory Card Folder.



Display item	Description
Free Space	Shows the free space on the inserted CF card.
Total Size	Shows the total size of the inserted CF card.
Select the CF Access Folder.	Select the memory card folder for files to be visible on the drop-down list.
OK	Confirms the selected memory card folder and displays the files in that folder.

3 Click the **OK** button.

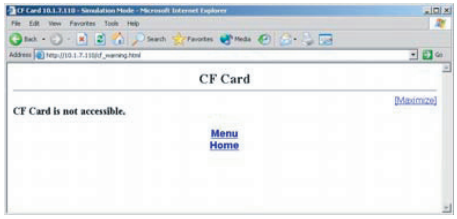
The memory card folder page is displayed and the file names (in the memory card folder) selected on the CF card page are displayed. The file names are links to the files. The files can be displayed and downloaded by clicking on the file name links.
See the example below.

CF card error page

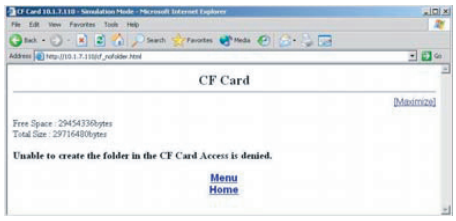
An error page is displayed if you click on the **CF Card** link on the homepage and one or more of the following conditions is applicable.

- A CF card is not inserted in the HG3F/4F
- No folder exists in the CF card's root folder
- The number of memory card folders is 255 or more

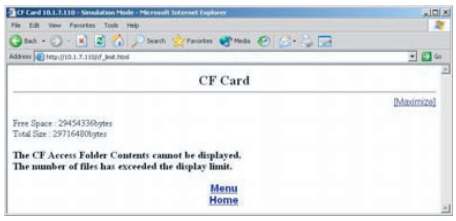
No CF card error page is displayed when there is no CF card.



No folder error page is displayed when no folder exists in the CF card's root folder.



Excessive folders error page is displayed when the number of folders in the CF card root folder is 255 or more.



2.9 Device Monitor

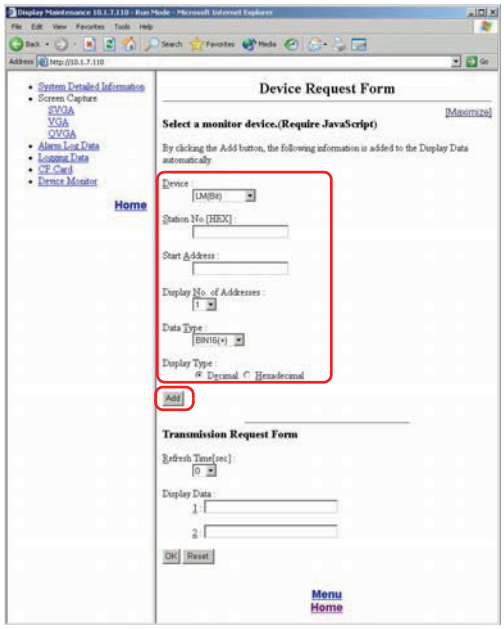
The device monitor page shows the values for specified HG3F/4F devices.
To monitor device values, send a request to the HG3F/4F using the following procedure.

1. Click the **Device Monitor** link on the menu.

   The device request form page is displayed.

2. Enter **Device**, **Station No.**, **Start Address**, **Display No. of Addresses**, **Data Type**, and **Display Type** for the device to monitor and click the **Add** button.

   The entered device information is converted to a request string and entered in **Display Data 1** or **Display Data 2**.

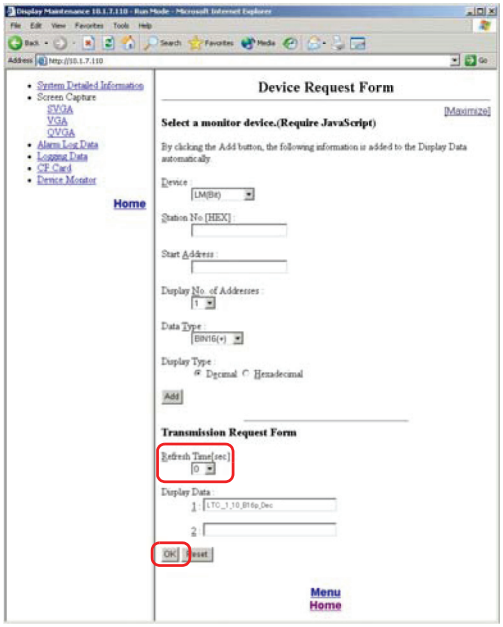


- JavaScript is used in the form from the **Add** button and above. You can use the device monitor function on web browsers that do not support JavaScript by referring to "Request string format" on page 27-30 and manually creating the request string.
- When Allen-Bradley is selected as the host I/F driver, always enter the device address notation in the WindO/I-NV2 format.
  For example, "B 10:123/5" in the Allen-Bradley format is (B 1012305) in the WindO/I-NV2 format.

Form item	Description
Device	Select the device from the drop-down list.
Station No.	Enter the station number of the host to monitor as a hexadecimal value (0 to FF). For a decimal host station number, convert it to hexadecimal value and then enter it. Valid when **Connection** for the host I/F driver is **1:N Communication**. When a value is not entered, 0 is entered.
Start Address	Enter the start address for the device to monitor. When the bit of a word device is specified, enter "-" after the address and then enter the bit as a decimal. Example 1: Address is 123, bit is 0 123-0 Example 2: Address is 12F, bit is 15 12F-15
Display No. of Addresses	Select the number of devices to monitor (1 to 10). The device monitor will show the number of devices selected here from the address set in **Start Address**.
Data Type	Select the data type from the drop-down list.
Display Type	Select the display type.
Add	Converts the device information entered in **Device**, **Station No.**, **Start Address**, **Display No. of Addresses**, **Data Type**, and **Display Type** to a request string and enters it in **Display Data 1** or **Display Data 2**. When both **Display Data 1** and **Display Data 2** are blank, the request string is entered in **Display Data 1**. When neither is blank, an error dialog box is displayed. For details about the request string, refer to "Request string format" on page 27-30.

3 Select the **Refresh Time** for the device being monitored and click the **OK** button.

The device monitor page for the requested device is displayed.



Form item	Description
Refresh Time [sec]	Selects the refresh time in seconds for the device monitor page. If 0 is selected, the page is not refreshed.
Display Data 1/ Display Data 2	Enter the request string. For the string format, refer to "Request string format" on page 27-30. You can monitor two types of devices on a single device monitor page. When monitoring one type of device, leave one of the text boxes blank.
OK	Sends the request form to the HG3F/4F.
Reset	Resets the request form to its default values.

The device monitor function can only be used when the HG3F/4F is in run mode.

Request string format

The request string entered in **Display Data** has the following format.

Device Symbol_Station No._Start Address_Display No. of Addresses_Data Type_Display Type

Form item	Description
Device Symbol	Enter the device symbol. Example: X, D, LDR, LM, and others
Station No.	When the **Connection** for the host I/F driver is **1:N Communication**, enter the host station number as a hexadecimal value (0 to FF). For a decimal host station number, convert it to a hexadecimal value and then enter it. For **1:1 Communication**, leave blank. The value is treated as 0.
Start Address	Enter the start address for the device to monitor. When the bit of a word device is specified, enter "-" after the address and then enter the bit as a decimal. Example 1: Address is 123, bit is 0 123-0 Example 2: Address is 12F, bit is 15 12F-15
Display No. of Addresses	Enter the number of devices to monitor (1 to 10). The device monitor will show the number of devices entered here from the address set in **Start Address**.
Data Type	Enter the data type. The string to enter the data type is shown below. Data type: String BIN16 (+): B16p BIN16 (+/-): B16 BIN32 (+): B32p BIN32 (+/-): B32 BCD4: BCD4 BCD8: BCD8 float32: FLT
Display Type	Enter the display type. The string to enter the display type is shown below. Display type: String Decimal value: Dec Hexadecimal value: Hex

■ **Example 1**

Device symbol: D, station number 15 (decimal), start address: 0000, number of devices 8, data type BIN16(+), display type: decimal

D_F_0000_8_B16p_Dec

■ **Example 2**

Device symbol: LDR, start address: 123 bit 15, number of devices 5

LDR__123-15_5_B16p_Dec

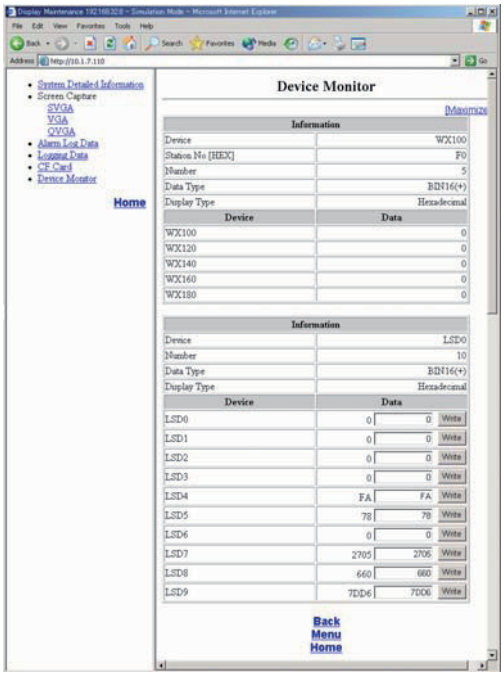
For bit devices, you must enter the appropriate parameter in data type and display type.
In Example 2 above, enter "B16p" for the data type and "Dec" for the display type.

● Device monitor page

The device monitor page shows the current values for devices requested using the device request form page.
When an internal device is requested, you can write to the internal device from this page.
To easily view a monitored device, you can bookmark the device monitor page.

> When bookmarking a page with frames enabled, bookmark the frame showing the device monitor. The homepage may be bookmarked depending on the web browser.

See the example below.



The details of the device monitor page are as follows.

Form item	Description
Device	Shows the requested start device.
Station No.	Shows the station number of the host to monitor as a hexadecimal value (0 to FF). Valid when the **Connection** for the host I/F driver is **1:N Communication**. For **1:1 Communication**, 0 is displayed.
Number	Shows the requested number of devices.
Data Type	Shows the data type for the currently displayed device.
Display Type	Shows the display type for the currently displayed device.
Data	Shows the device's current value. For a host device, "Host Communication Error" is displayed when a host communication error occurs. For values that cannot be displayed with the specified data type, when the data type is BCD4, BCD8, or float32, "Illegal Format" is displayed.

Write internal device

When the HG3F/4F is accessed with a user account in the "Administrator" or "Operator" security groups, you can write a value to an internal device on the device monitor page.

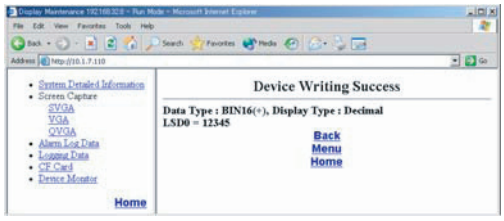
When the HG3F/4F is accessed with a user account in the "Reader" security group, you cannot write device values.
The security group can be set in WindO/I-NV2's **Security** dialog box. For details, refer to Chapter 23 "2.2 Adding and Editing Security Groups" on page 23-18.

When an internal device is requested on the device request form page, the input form and **OK** button are displayed on the device monitor page's **Data** area.

Display item	Description
Entry Form	Enter the value to write to the internal device. The entered value becomes the currently displayed data type and display type.
OK	Sends the input form value to the HG3F/4F.

Enter the value in the input form and click the **OK** button to send the write request.

Device Writing Success page is displayed when writing to the internal device was successful.
Click the **Back** link to return to the device monitor page.

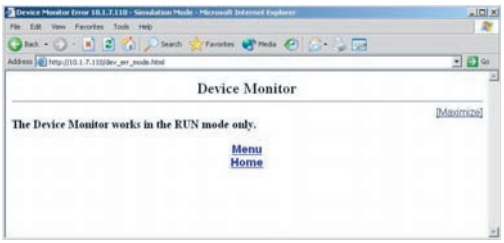


Device Writing Error page is displayed when writing to the internal device failed.
Click the **Back** link to return to the device monitor page.

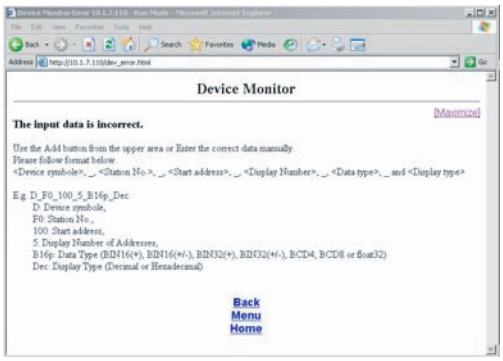
Device monitor error page

The following pages are displayed if an error occurs during device monitor processing.

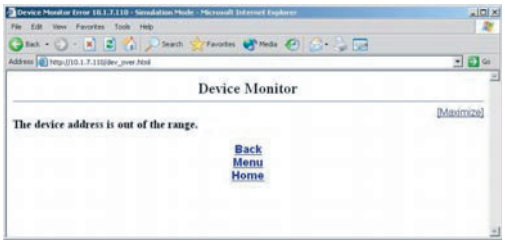
Mode error page is displayed when the HG3F/4F mode is not run mode.



Input form error page is displayed when there is a problem in the form data received by the HG3F/4F.



Device address range error page is displayed when the requested device address is an internal device and exceeds the address range.



Write password error page is displayed when a write request was performed to an internal device without a password configured in the project.

3 Downloader

This section describes the functions that can be used with Downloader.

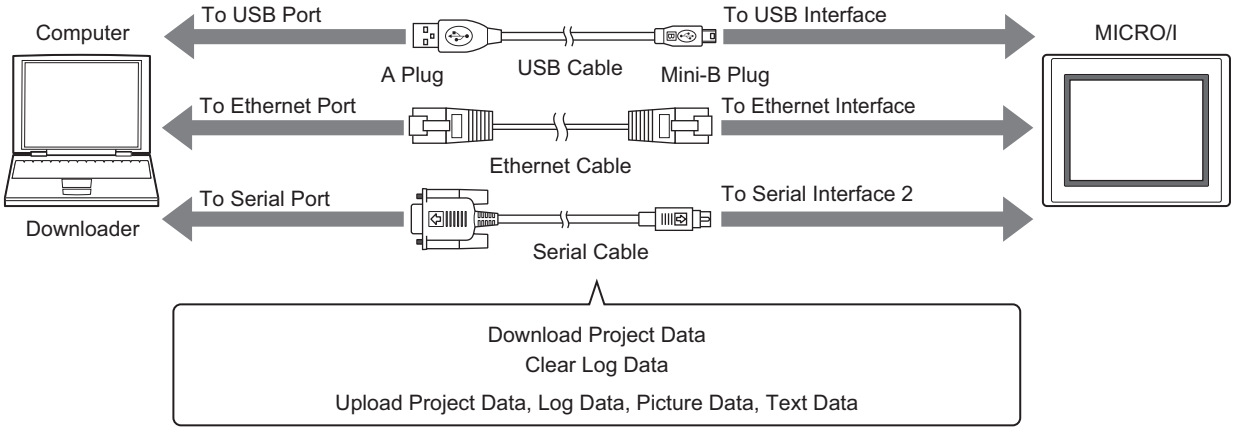
For Downloader details, see the Downloader manual.

3.1 What Can Be Done Connecting MICRO/I & a Computer

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Downloader functions that can be used by connecting MICRO/I and a computer are listed below.

Downloader function	HG2G-S/-5S	HG2G-5F, HG3G/4G	HG1F/2F/2S/3F/4F
Download Downloader project data created by WindO/I-NV2 to MICRO/I	YES	YES	YES
Upload project data and log data from MICRO/I	YES	YES	YES
Clear log data saved in MICRO/I's internal memory	YES	YES	YES
Modify project data pictures with Picture Manager	YES	NO	YES
Edit registered text in Text Manager	YES	YES	YES
Read and write a specified device	YES	YES	YES
Execute the operations above from other applications on the command line	YES	YES	YES



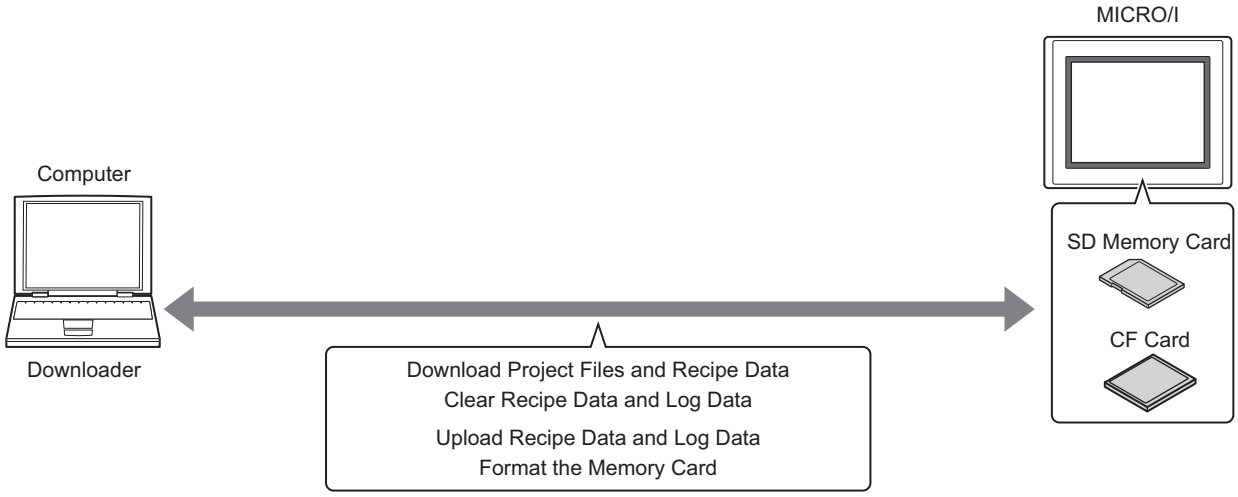
The connection method between the computer and MICRO/I differs depending on the MICRO/I model. For details, refer to Chapter 4 "3.2 Communication Interface Tab" on page 4-36.

3.2 What Can Be Done Using a Memory Card

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Downloader functions that can be used by using a memory card inserted in MICRO/I are listed below.

Downloader function	HG2G-5F, HG3G/4G	HG2F/3F/4F
Download project data and recipe data to the memory card	YES	YES
Download picture files, sound files, PLC program files to the memory card	YES	NO
Upload recipe data, log data, etc., from the memory card	YES	YES
Upload picture files, sound files, PLC program files from the memory card	YES	NO
Clear recipe data and log data on the memory card	YES	YES
Format the memory card	YES	YES
Execute the operations above from other applications on the command line	YES	YES



Memory cards can only be used on models that have the memory card interface. The memory cards that can be used also differ depending on the MICRO/I model. For details, refer to Chapter 30 "1.1 Supported Memory Cards" on page 30-1.

Chapter 28 Data Transfer Function

This chapter describes the project transfer function to upload and download project data to the MICRO/I, to upload and download PLC program files to a PLC connected to the MICRO/I, (both of which use a memory card or USB flash drive), as well as the function to copy files between an SD memory card and a USB flash drive.

These three functions for exchanging data using a memory card or USB flash drive are collectively called data transfer functions.

1 Project Transfer Function

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

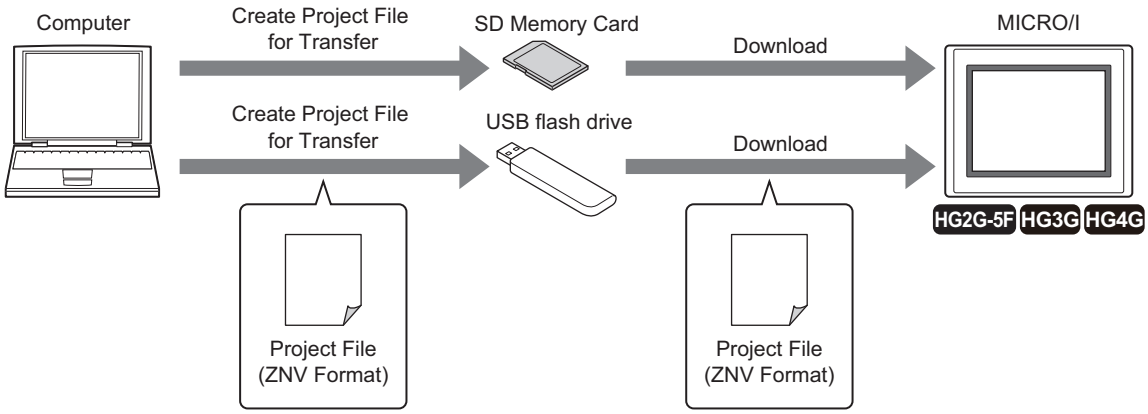
1.1 What Can Be Done with the Project Transfer Function

The project transfer function uploads or downloads project data between the MICRO/I and a memory card or USB flash drive inserted in the MICRO/I.

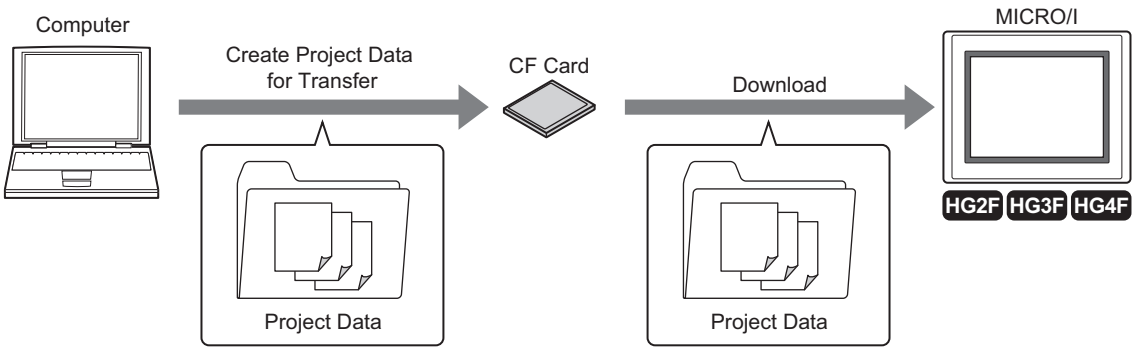
The Project Transfer function supports the project which name is used alphanumeric characters only.

● Download project data saved on a memory card or USB flash drive to the MICRO/I. However, you must create project data for transfer.

- HG2G-5F, HG3G/4G



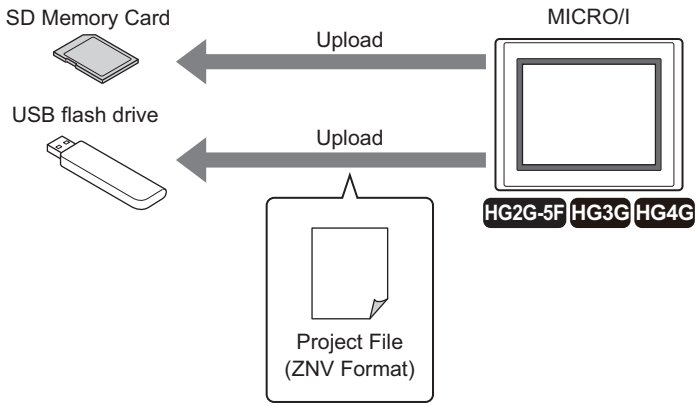
- HG2F/3F/4F



Memory cards can only be used on models that have the memory card interface.

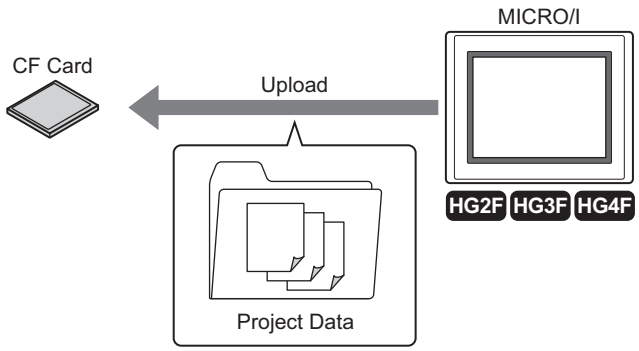
● Upload the project data used for operation on the MICRO/I and save it to a memory card or USB flash drive.

- HG2G-5F, HG3G/4G



When using the project transfer function and a project file is uploaded, the project file name is "project name + file extension (.ZNV)".

- HG2F/3F/4F



Memory cards can only be used on models that have the memory card interface.

1.2 Project Data Transfer Procedures

The following methods can be used to upload or download project data between the MICRO/I and a memory card or USB flash drive inserted in the MICRO/I.

- Using the USB Autorun function (HG2G-5F, HG3G/4G only)
  ☞ For details, refer to Chapter 30 "2 USB Flash Drives" on page 30-25.

- Using Key Buttons, Multi-Buttons, or multi-commands (HG2G-5F, HG3G/4G only)
  ☞ For details, refer to "1.4 Using Key Buttons, Multi-Buttons, or Multi-Commands to Transfer Project Data" on page 28-6.

- Using the MICRO/I system menu
  ☞ For details, refer to "1.5 Using the MICRO/I System Menu to Transfer Data" on page 28-7.

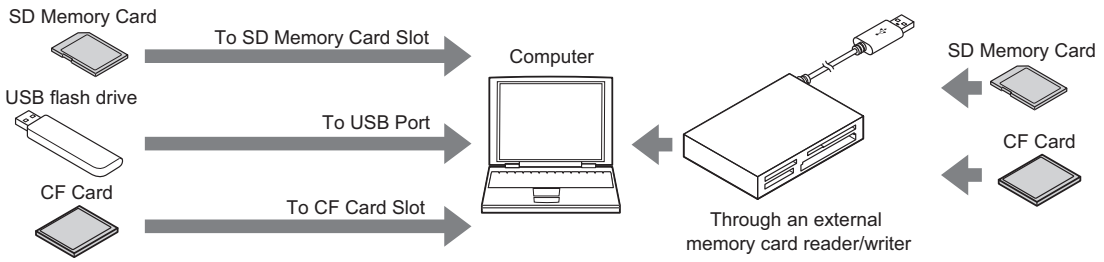
1.3 Converting Project Data for Transfer

Project data must be converted to dedicated data for transfer in order to download project data to the MICRO/I using the project transfer function.

Use the following procedure to create project data for transfer using a memory card or USB flash drive.

> The Project Transfer function supports the project which name is used alphanumeric characters only.

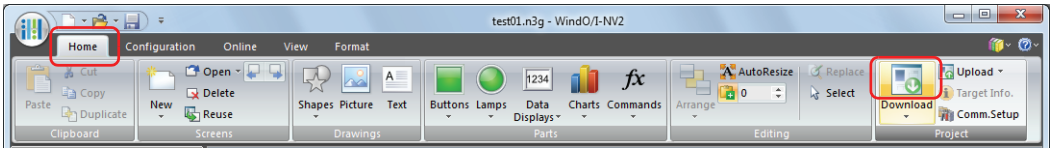
1. Insert a memory card or USB flash drive in the computer.
   - When using a memory card, insert it into the computer's memory card slot or via a memory card reader/writer.
   - When using a USB flash drive, insert the USB flash drive in the computer's USB port.



2. Open the project data to transfer using WindO/I-NV2.

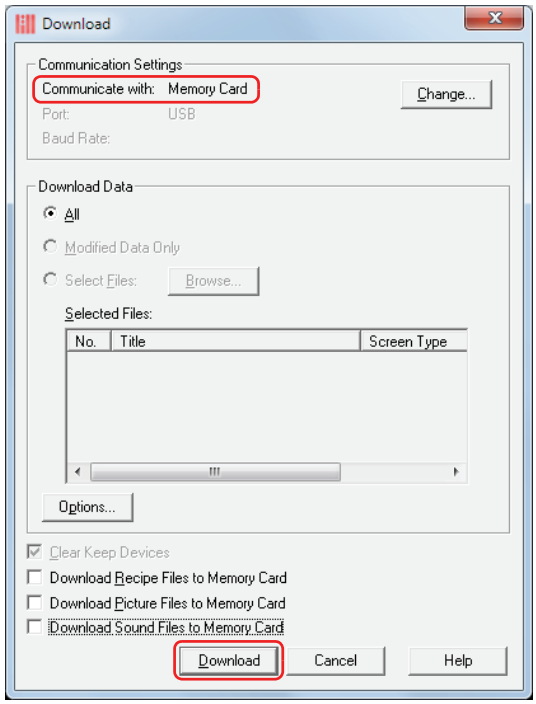
> To use the Project Transfer function, select the project which name is used alphanumeric characters only.

3. On the **Home** tab, in the **Project** group, click the **Download** icon.
   The Download dialog box is displayed.



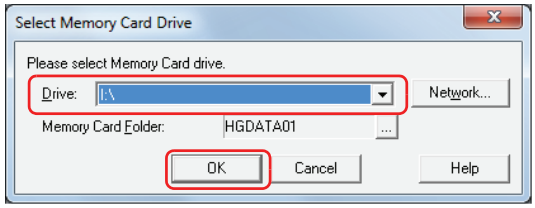
> When the project data has not been saved after it was opened, a save confirmation message is displayed.
> Click the **OK** button to save the project data and display the Download dialog box.
> Click on the **Cancel** button to return to the editing screen without saving the project data.

4 Check that **Communication Settings** is **Memory Card** and click the **Download** button.
The **Select Memory Card Drive** dialog box is displayed.



1. If **Communication Settings** is not **Memory Card**, click the **Change** button.
   The communication settings dialog box is displayed.
2. Select **Memory Card** for **Communicate with** and click the **OK** button.

5 Specify the drive for the memory card or the USB flash drive and click the **OK** button.
A continue download confirmation message is displayed.



■ **Drive**
Specify the drive assigned to the memory card or the USB flash drive.

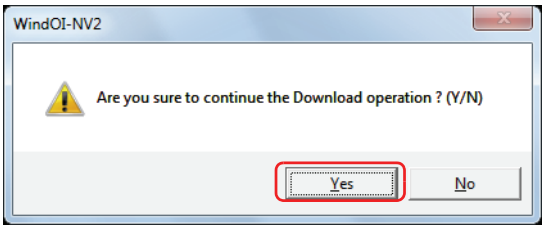
■ **Network**
Displays the network drive assignment dialog box. You can specify a drive on the network.

■ **Memory Card Folder**
Specify the folder where the project data is to be downloaded.

Click the ... button to display the Project Settings dialog box. You can specify a memory card folder as the download destination.

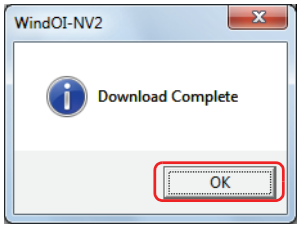
6 Click the **Yes** button.

A Download dialog box is displayed and the project data is now being saved.
When this process is complete, a message is displayed.



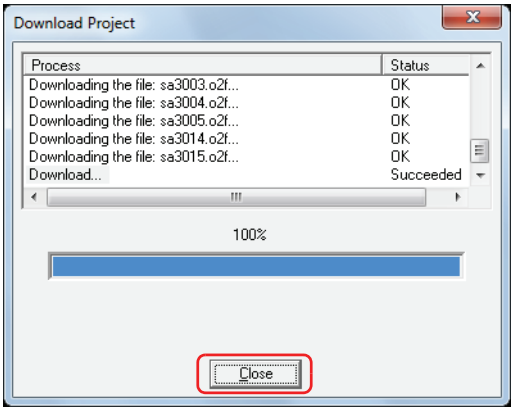
7 Click the **OK** button.

You are now taken back to the Download dialog box.



8 Click the **Close** button.

The project data for transfer is created in the Memory Card Folder on a memory card or USB flash drive.



For details about the created data folder and file structure, refer to Chapter 30 "External Memory Devices" on page 30-1. When the destination is a USB flash drive, the folder and file structure in the Memory Card Folder is the same as an SD memory card.

If the folder or file structure on the memory card folder is modified, the MICRO/I and WindO/I-NV2 will not be usable.

1.4 Using Key Buttons, Multi-Buttons, or Multi-Commands to Transfer Project Data

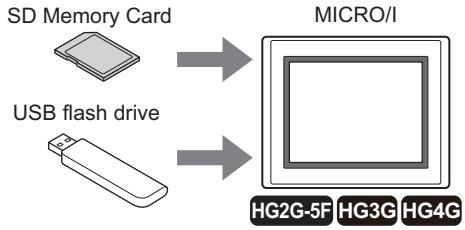
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Allocate a Key Button, Multi-Button, or Multi-Command configured with the project transfer function to the MICRO/I.

For details, refer to Chapter 8 "5 Key Button" on page 8-66.
For details, refer to Chapter 8 "6 Multi-Button" on page 8-98.
For details, refer to Chapter 12 "6 Multi-Command" on page 12-38.

● Download

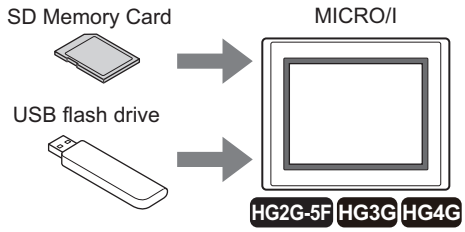
1. Create a project file for transfer (.ZNV) and save it on an SD memory card or USB flash drive.
   For details, refer to "1.3 Converting Project Data for Transfer" on page 28-3.
2. Insert an SD memory card or USB flash drive in the MICRO/I.



3. Press the Key Button or Multi-Button or execute the Multi-Command configured with **Download Project** under **Data Transfer** on the Key Browser dialog box.

● Upload

1. Insert an SD memory card or USB flash drive in the MICRO/I.



2. Press the Key Button or Multi-Button or execute the Multi-Command configured with **Upload Project** under **Data Transfer** on the Key Browser dialog box.

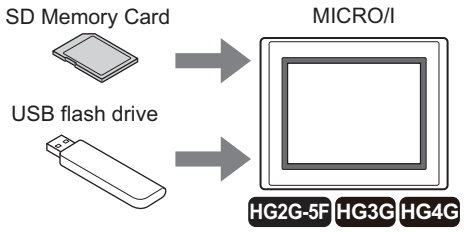
1.5 Using the MICRO/I System Menu to Transfer Data

When using the system menu, the operating procedure depends on the model.

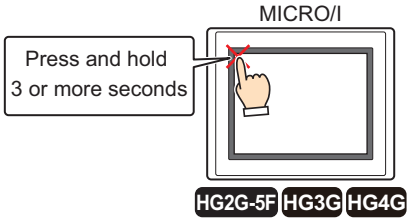
● Download

For the HG2G-5F, HG3G/4G

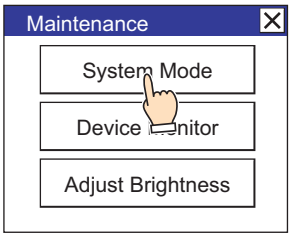
1. Create a project file for project transfer (.ZNV) and save it on an SD memory card or USB flash drive.
   For details, refer to "1.3 Converting Project Data for Transfer" on page 28-3.
2. Insert an SD memory card or USB flash drive in the MICRO/I.



3. Press the upper-left edge of the MICRO/I screen for three seconds or more.
   The maintenance screen is now displayed.



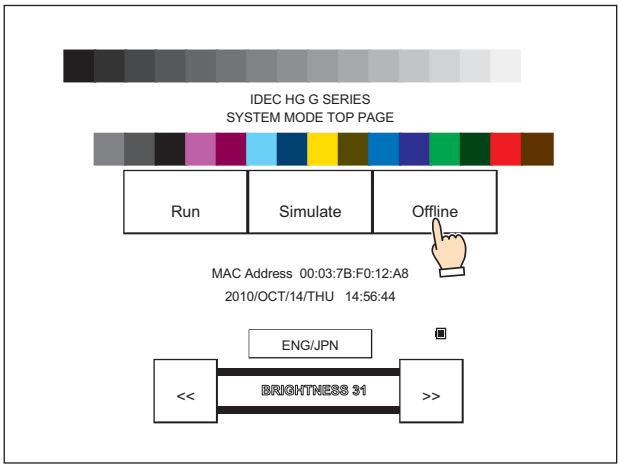
4. Press **System Mode**.
   MICRO/I switches to system mode.



When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

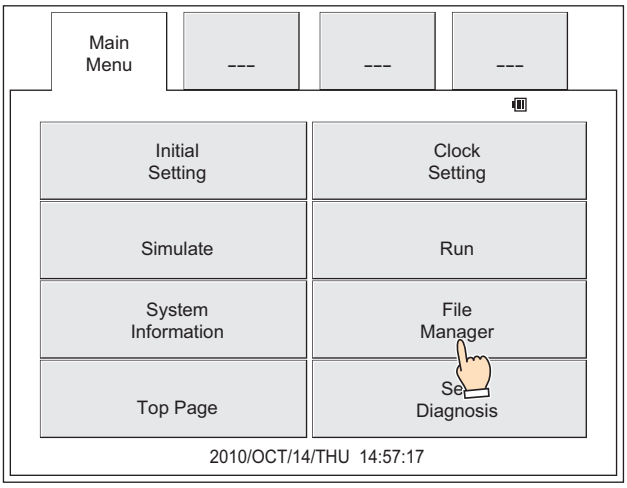
5 Press **Offline**.

The main menu is displayed.



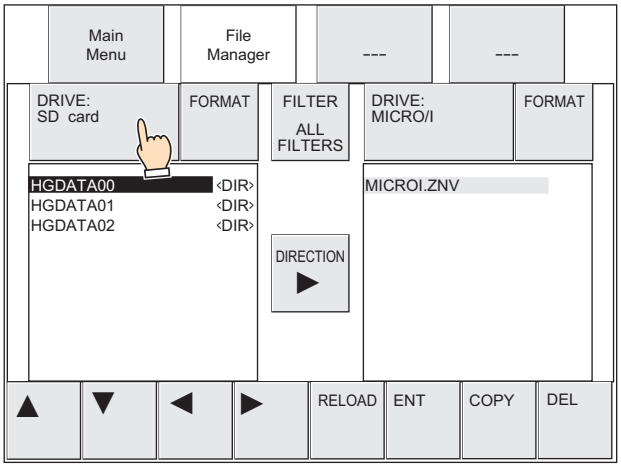
6 Press **File Manager**.

The file manager is displayed.



7 Press **DRIVE:** for the transfer source and select the SD memory card or USB flash drive inserted in the MICRO/I.

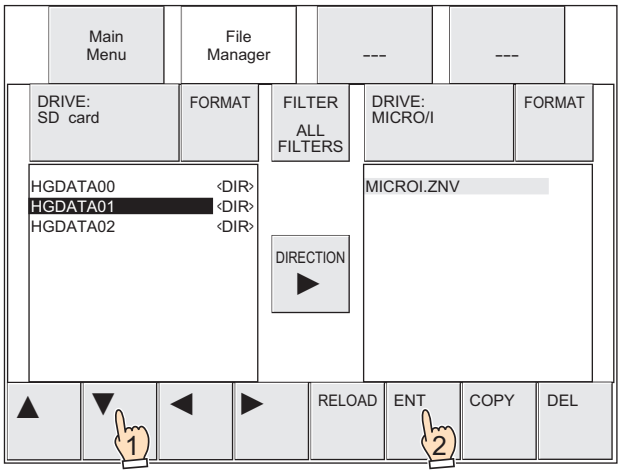
This example screen shows when an SD memory card is selected.



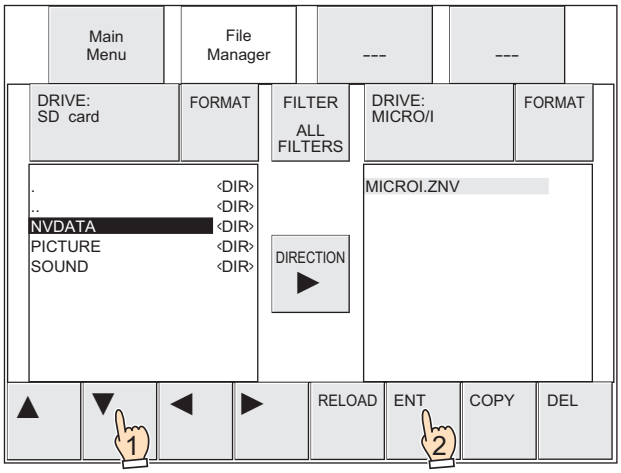
8 Select the project file for transfer (ZNV format) to download.

In this example, the project file (HG3G_DEMO_1.ZNV) saved in the Memory Card Folder (HGDATA01) is selected.

1. Press ▼ to select **HGDATA01** and then press **ENT**.

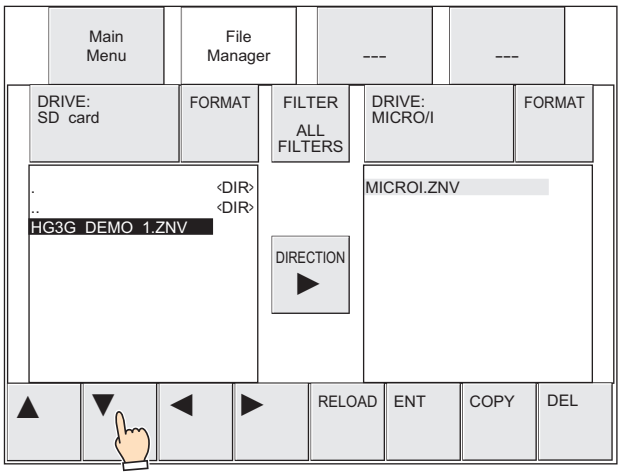


2. Press ▼ to select **NVDATA** and then press **ENT**.

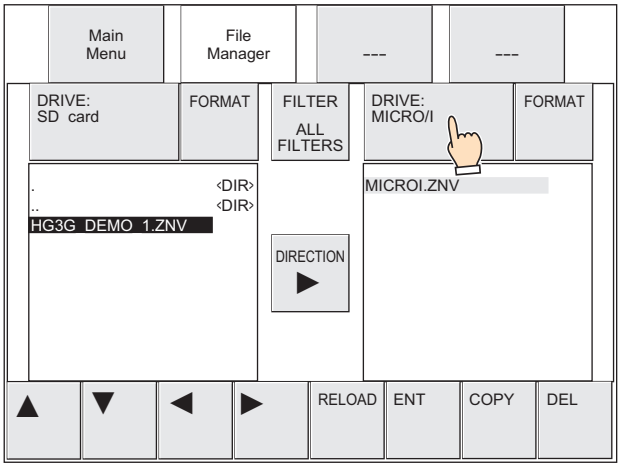


The **NVDATA** folder is automatically created when the memory card folder is created. For details, refer to Chapter 30 "File structure" on page 30-4.

3. Press ▼ to select **HG3G_DEMO_1.ZNV**.

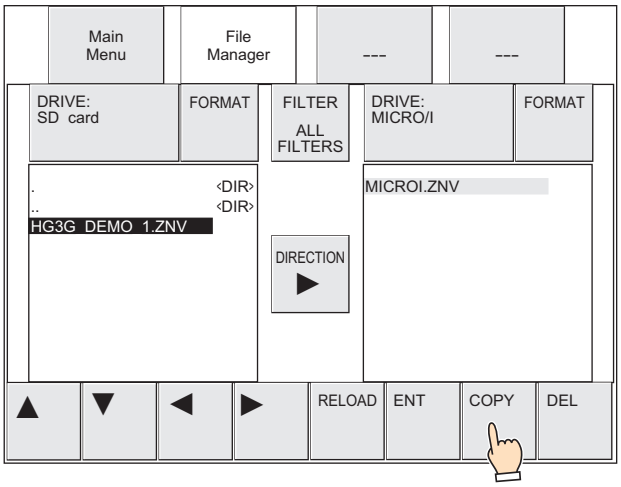


9 Press **DRIVE:** for the transfer destination and select **MICRO/I**.

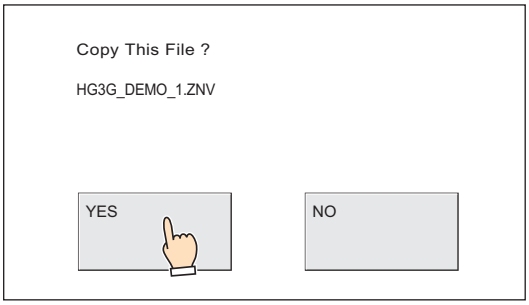


When **MICRO/I** is selected with **DRIVE:** in the file manager, **MICROI.ZNV** is always displayed. This is not the project name downloaded to the MICRO/I.

10 Press **COPY**.
A process confirmation message is displayed.

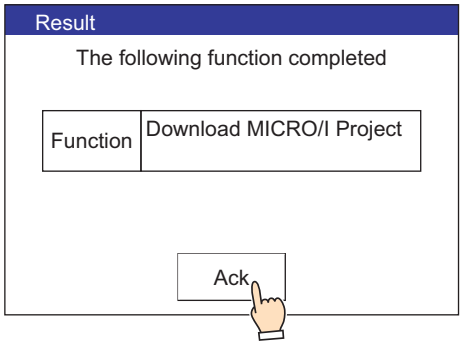


11 Press **YES**.
The project file (ZNV format) download starts.
When the download finishes, the results are displayed.



When the project file (ZNV format) to download is configured with security, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

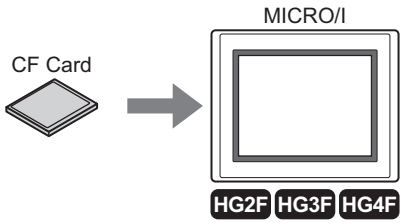
12 Press **Ack** to close the results screen.
You are returned to the top page of system mode.



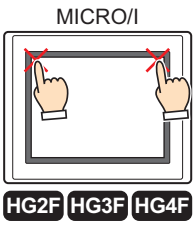
For the HG2F/3F/4F

1 Create project data for project transfer and save it to a CF card.
For details, refer to "1.3 Converting Project Data for Transfer" on page 28-3.

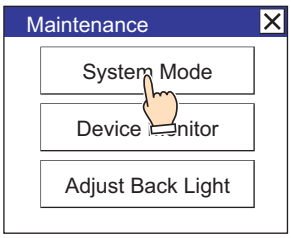
2 Insert the CF card in the MICRO/I.



3 Press the upper-left edge and the upper-right edge of the MICRO/I screen simultaneously.
The maintenance screen is displayed.

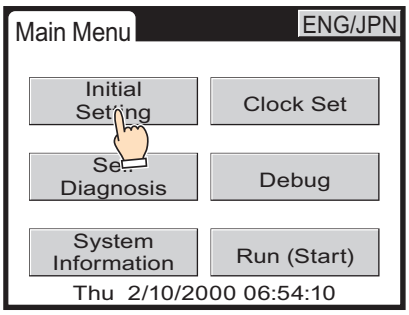


4 Press **System Mode**.
MICRO/I switches to system mode.

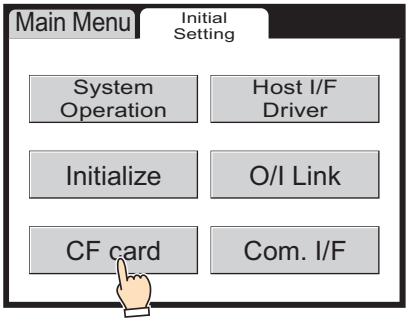


When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

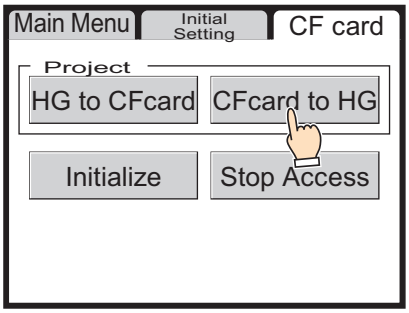
5 Press **Initial Setting**.



6 Press **CF card**.

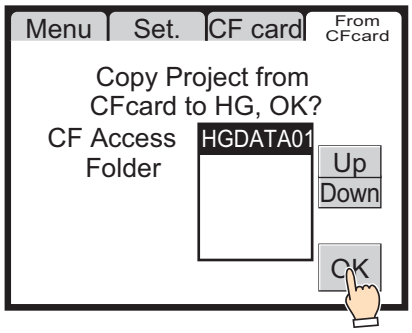


7 Press **CFcard to HG**.



8 Select the memory card folder where the project data to download is saved and press **OK**.

This example screen shows when the memory card folder name is **HGDATA01**.

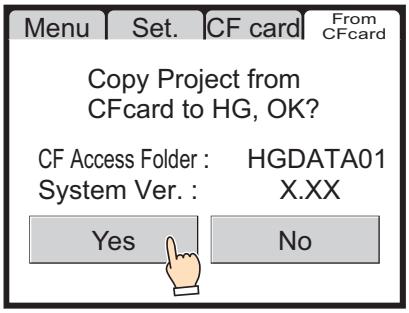


In the MICRO/I's system mode, memory card folders are shown as CF access folders.

9 Press **Yes**.

The project data download starts.

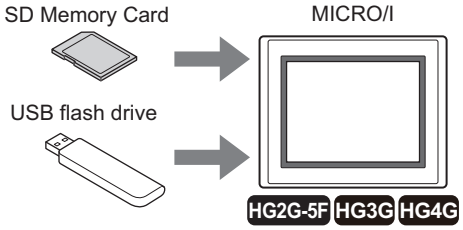
When the download is complete, you are returned to the top page of system mode.



● Upload

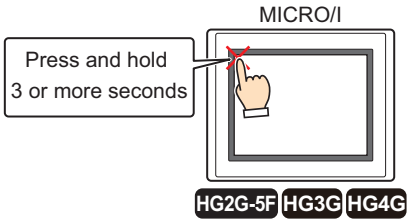
For the HG2G-5F, HG3G/4G

1 Insert an SD memory card or USB flash drive in the MICRO/I.



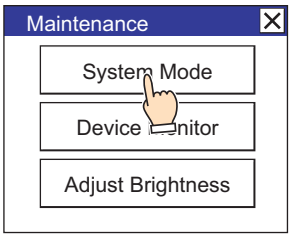
2 Press the upper-left edge of the MICRO/I screen for three seconds or more.

The maintenance screen is displayed.



3 Press **System Mode**.

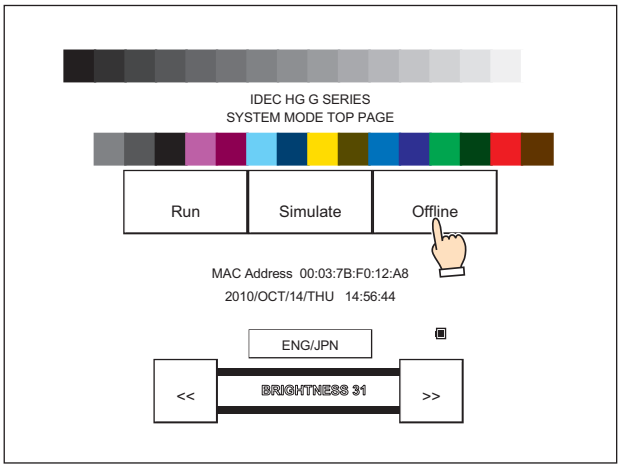
MICRO/I switches to system mode.



When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

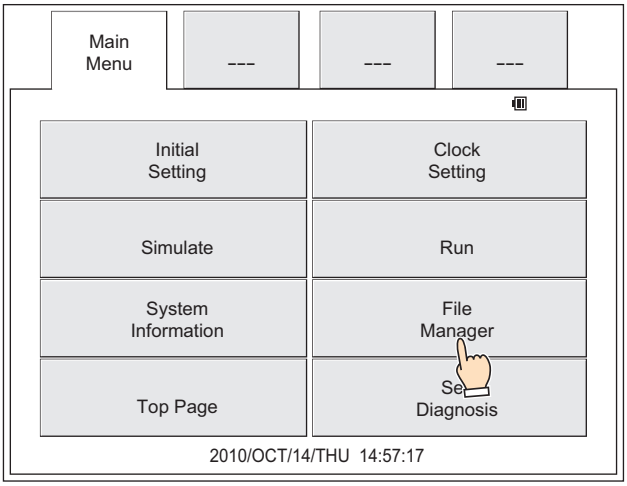
4 Press **Offline**.

The main menu is displayed.

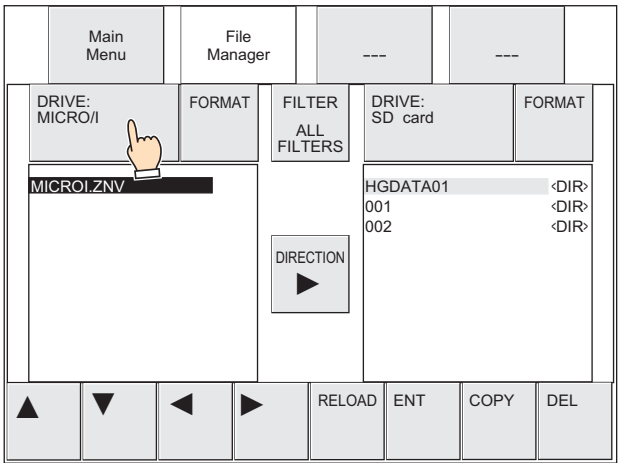


5 Press **File Manager**.

The file manager is displayed.

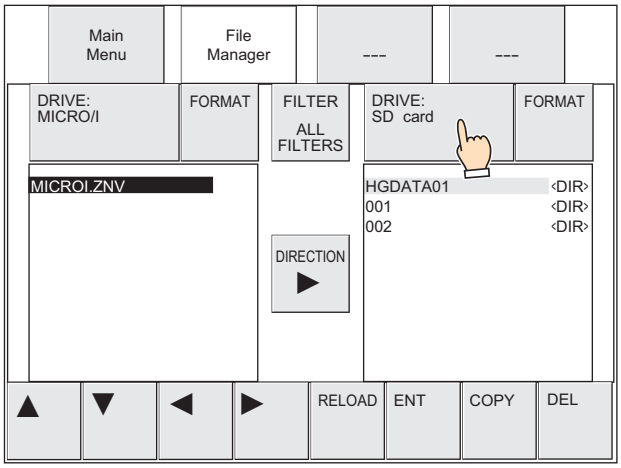


6 Press **DRIVE:** for the transfer source and select **MICRO/I**.



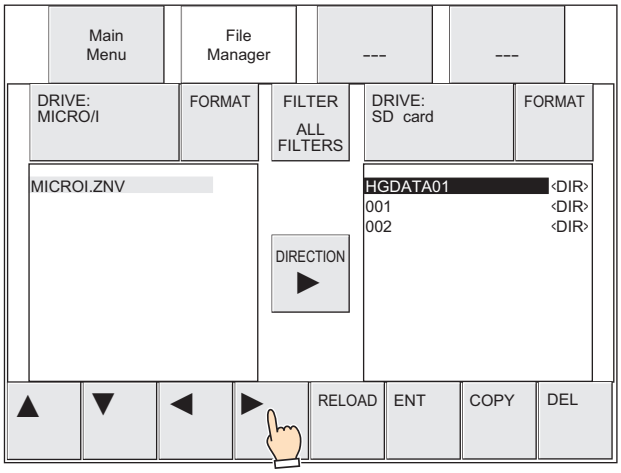
When **MICRO/I** is selected with **DRIVE:** in the file manager, **MICROI.ZNV** is always displayed. This is not the project name downloaded to the MICRO/I.

7 Press **DRIVE:** for the transfer destination and select the SD memory card or USB flash drive inserted in the MICRO/I. This example screen shows when an SD memory card is selected.

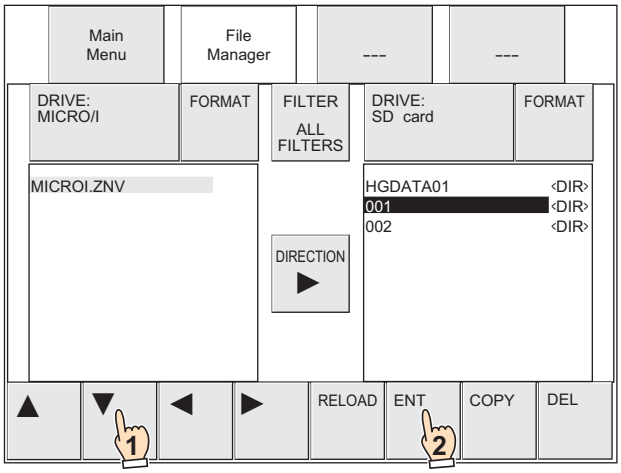


8 Select the save destination for the project file (ZNV format) to upload.
Folder (001) is selected in this example.

1. Press ▶ to move the cursor to the transfer destination on the SD memory card.

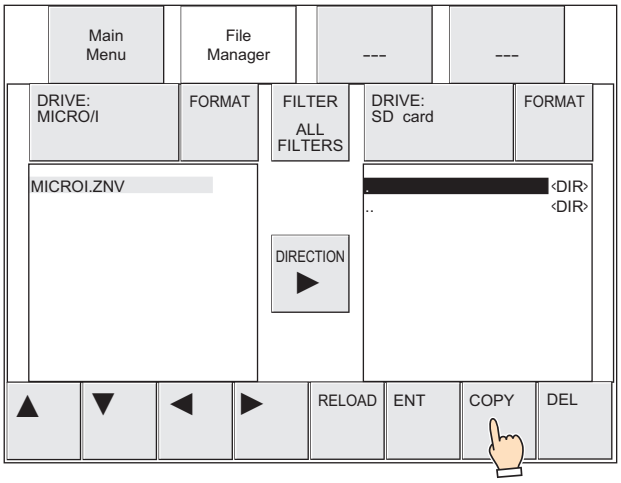


2. Press ▼ to select **001** and then press **ENT**.



9 Press **COPY**.

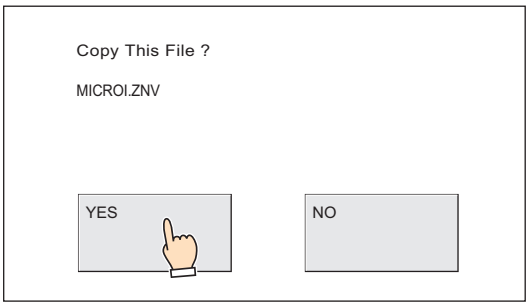
A process confirmation message is displayed.



10 Press **YES**.

The project file (ZNV format) upload starts.

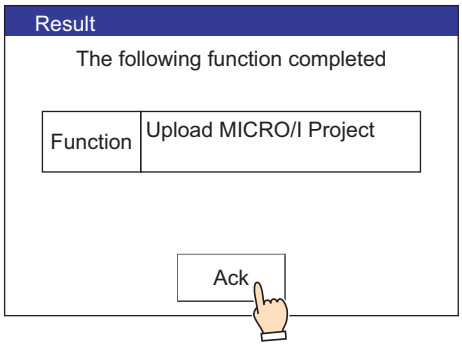
When the upload finishes, the results are displayed.



MICROI.ZNV is shown on the confirmation message, but the project file name after uploading is "Project name + Extension (.ZNV)".

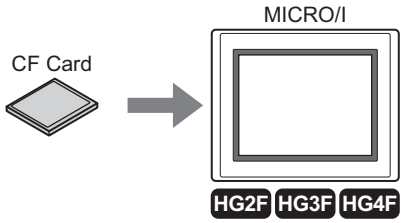
11 Press **Ack** to close the results screen.

You are returned to the top page of system mode.



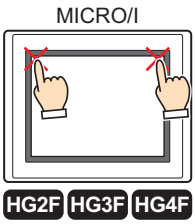
For the HG2F/3F/4F

1 Insert the CF card in the MICRO/I.



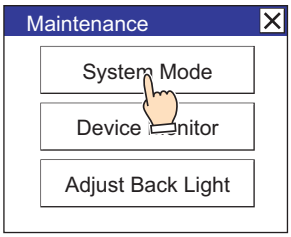
2 Press the upper-left edge and the upper-right edge of the MICRO/I screen simultaneously.

The maintenance screen is displayed.



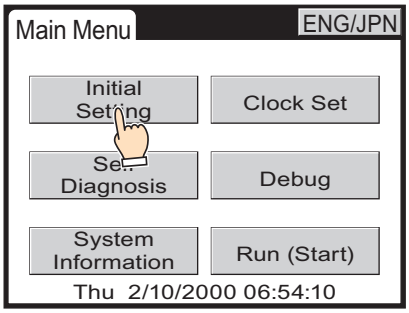
3 Press **System Mode**.

MICRO/I switches to system mode.

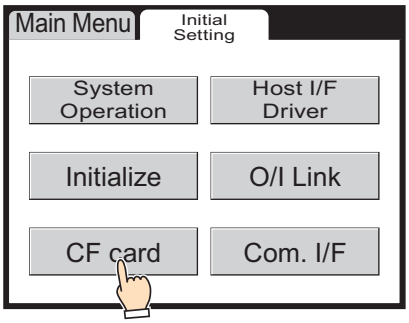


When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

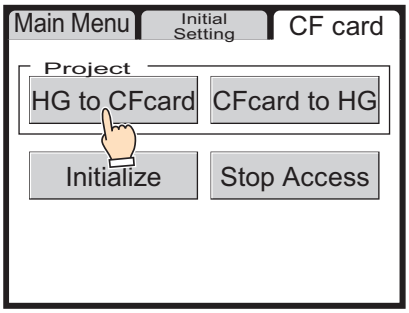
4 Press **Initial Setting**.



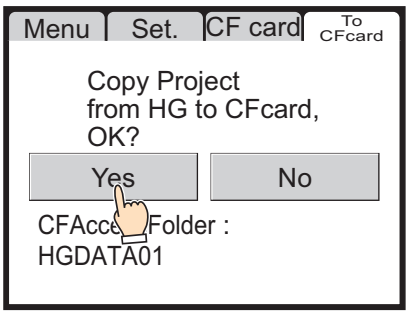
5 Press **CF card**.



6 Press **HG to CFcard**.



7 Press **Yes**.

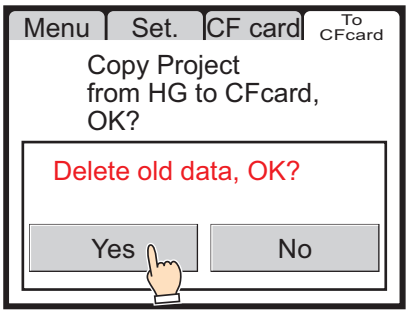


In the MICRO/I's system mode, memory card folders are shown as CF access folders.

8 Press **Yes**.

The project data upload starts.

When the upload is complete, a message is displayed and you are returned to the top page of system mode.



1.6 Precautions

- An error message is displayed if the project data upload or download fails.
  For details, refer to Chapter 35 "1.1 Errors Displayed on the Screen" on page 35-1.

- While the project transfer function is running, the MICRO/I stops processing other functions.

- When project data is downloaded using the project transfer function, the HG keep registers and the HG keep relays are cleared.

- On the HG2G-5F, HG3G/4G, if a project file (ZNV format) exists with the same name in the save destination when uploading a project file (ZNV format), the file is overwritten with the uploaded file without displaying an overwrite confirmation message.

- When using the project transfer function, make the project data file name half-width alphanumeric characters.

- While running the project transfer function using a Key Button, Multi-Button, or Multi-Command, if a data transfer function (project transfer, PLC program transfer, or file copy) is initiated, the only function that will work is the currently running function. If two or more data transfer functions are configured to a Multi-Button or Multi-Command, only the data transfer function displayed at the top of the function list on the parts property dialog box will run.

- When running the project transfer function, the external memory device must have enough free space equivalent to the size of the ZNV project file. Check that there is sufficient free space on the external memory device that will be used with the project transfer function. If the device does not have sufficient free space, the project upload or download may fail.

2 PLC Program Transfer Function

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Supported PLCs

PLCs that support the PLC program transfer function are listed below.

Manufacturer	Series name	Supported system (CPU unit)	Host I/F driver
IDEC	OpenNet Controller	FC3A	•Serial Interface: OpenNet, MicroSmart, SmartAXIS Pro/Lite (RS232C/485) • Ethernet Interface: OpenNet, MicroSmart, SmartAXIS Pro/Lite (Ethernet)
	MicroSmart	FC4A	
	MicroSmart Pentra	FC5A	

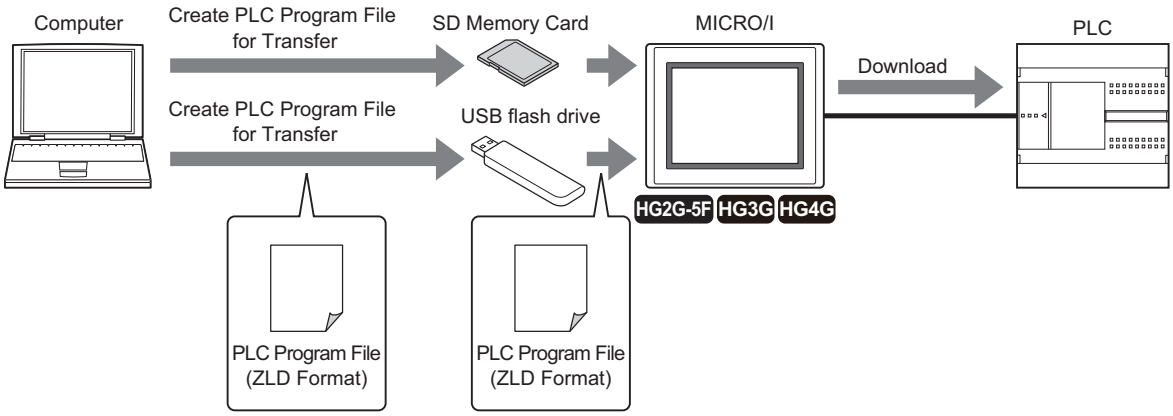
2.2 What Can Be Done using the PLC Program Transfer Function

The PLC program transfer function is used to upload or download PLC program files (ZLD format) between a PLC connected to the MICRO/I and an SD memory card or USB flash drive inserted in the MICRO/I.

● Downloading a PLC program

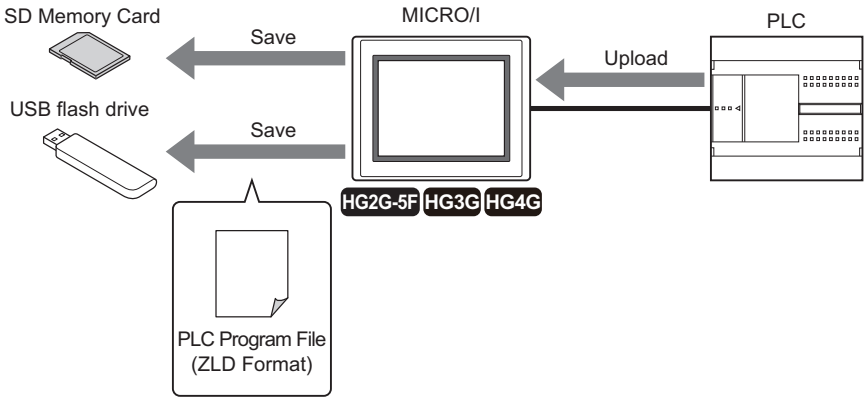
Download a PLC program file (ZLD format) saved on an SD memory card or USB flash drive to a PLC connected to the MICRO/I.

You must create a PLC program file for transfer (ZLD format).



● Uploading a PLC program

Upload a PLC program from the PLC connected to the MICRO/I and save the PLC program file (ZLD format) to an SD memory card or USB flash drive.



When a PLC program file is uploaded using the PLC program transfer function, the file name is "Model name_Port number_Station number_Year month day hours minutes seconds + File extension (.ZLD)".

2.3 PLC Program File Transfer Procedures

The following methods can be used to upload or download a PLC program file between a PLC connected to the MICRO/I and a memory card or USB flash drive inserted in the MICRO/I.

- Using the USB Autorun function
  ☞ For details, refer to Chapter 30 "2 USB Flash Drives" on page 30-25.

- Using Key Buttons, Multi-Buttons, or Multi-Commands
  ☞ For details, refer to "2.5 Using Key Buttons, Multi-Buttons, or Multi-Commands to Transfer PLC Programs" on page 28-23.

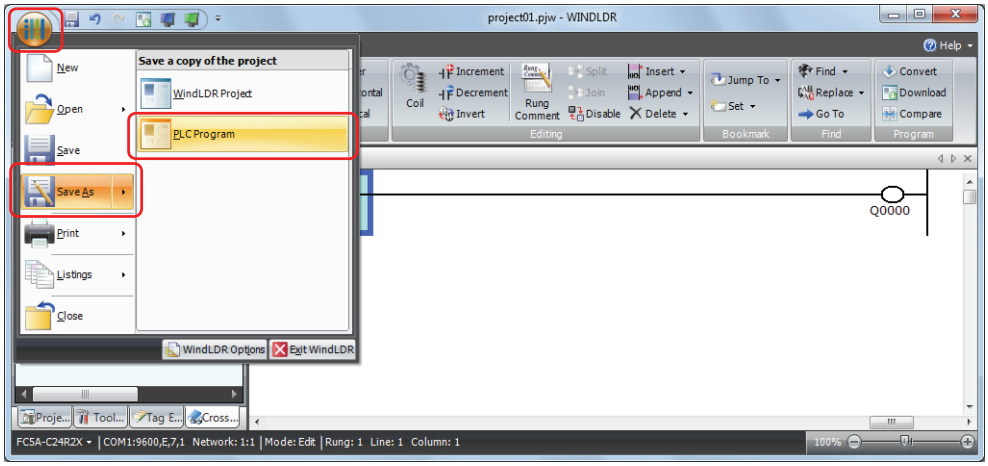
- Using the MICRO/I system menu
  ☞ For details, refer to "2.6 Using the MICRO/I System Menu to Transfer PLC Programs" on page 28-24.

2.4 Converting PLC Program Files for Transfer

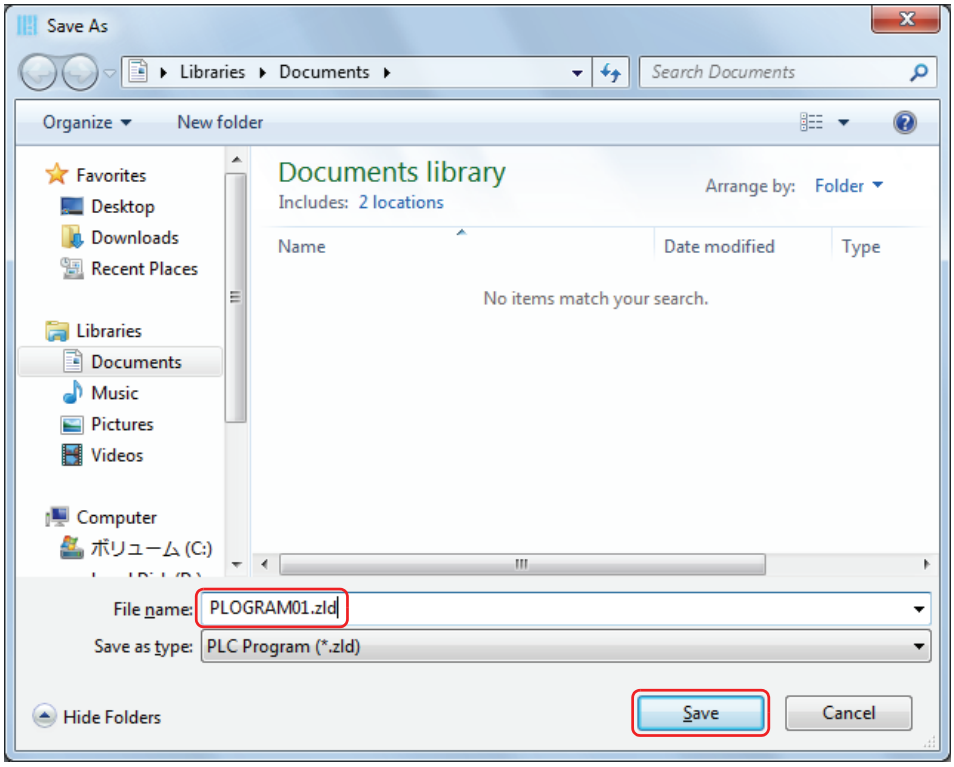
Before transferring a PLC program file, using the PLC Program Transfer Function, it must be converted to a (ZLD format).

1. Open the PLC program file to to be transferred using WindLDR.
2. Click ▶ to the right of **Save As** on the application menu and click **PLC Program**.

   The Save As dialog box is displayed.



3. Enter a file name and click **Save**.



When using a PLC program with the PLC program transfer function, always enter the file name as half-width alphanumeric characters.

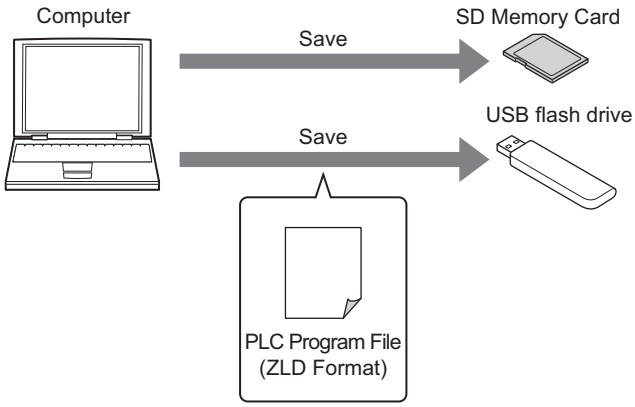
2.5 Using Key Buttons, Multi-Buttons, or Multi-Commands to Transfer PLC Programs

Allocate a Key Button, Multi-Button, or Multi-Command configured with the PLC program transfer function to the MICRO/I.

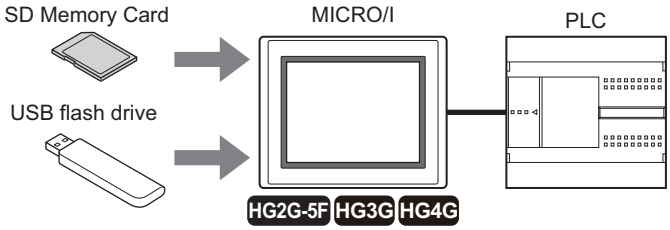
☞ For details, refer to Chapter 8 "5 Key Button" on page 8-66.
☞ For details, refer to Chapter 8 "6 Multi-Button" on page 8-98.
☞ For details, refer to Chapter 12 "6 Multi-Command" on page 12-38.

● Download

1. Convert a PLC program file for PLC program transfer.
   For details, refer to "2.4 Converting PLC Program Files for Transfer" on page 28-22.
2. Save it to an SD memory card or USB flash drive.



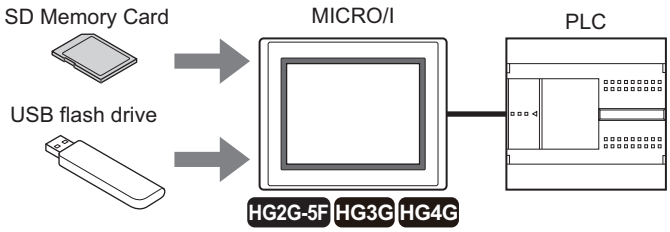
3. Insert an SD memory card or USB flash drive in the MICRO/I.



4. Press the Key Button or Multi-Button or execute the Multi-Command configured with **Download PLC Program** under **Data Transfer** on the Key Browser dialog box.

● Upload

1. Insert an SD memory card or USB flash drive in the MICRO/I.



2. Press the Key Button or Multi-Button or execute the Multi-Command configured with **Upload PLC Program** under **Data Transfer** on the Key Browser dialog box.

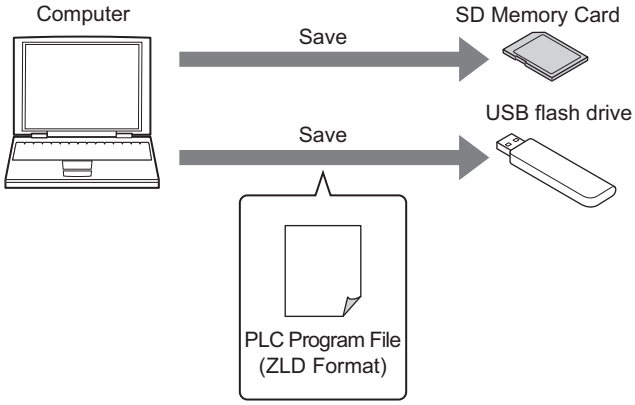
2.6 Using the MICRO/I System Menu to Transfer PLC Programs

● Download

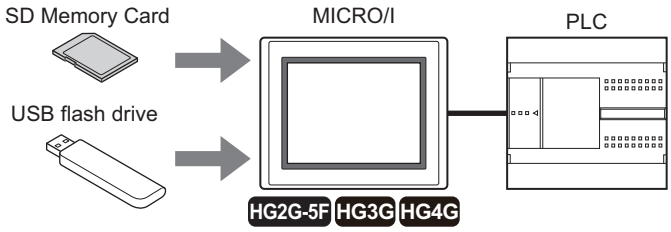
1 Convert a PLC program file for PLC program transfer.

For details, refer to "2.4 Converting PLC Program Files for Transfer" on page 28-22.

2 Save it to an SD memory card or USB flash drive.

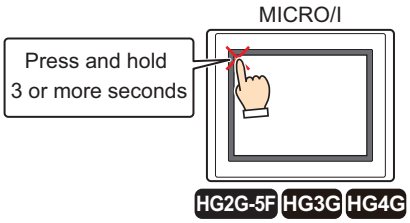


3 Insert an SD memory card or USB flash drive in the MICRO/I.



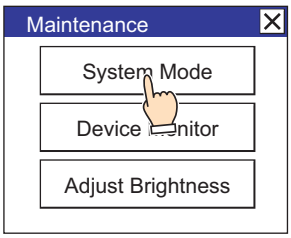
4 Press the upper-left edge of the MICRO/I screen for three seconds or more.

The maintenance screen is displayed.



5 Press **System Mode**.

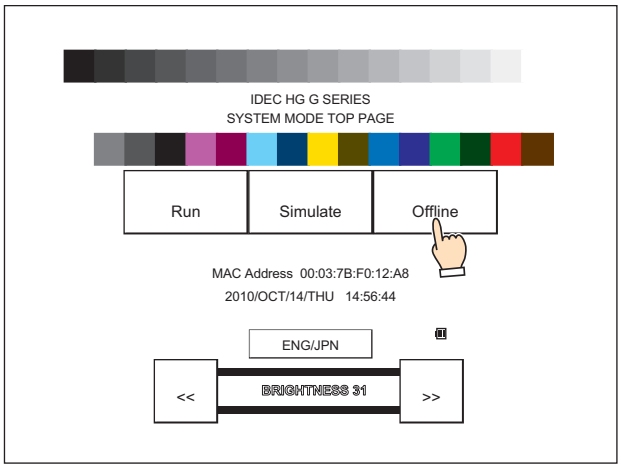
MICRO/I switches to system mode.



When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

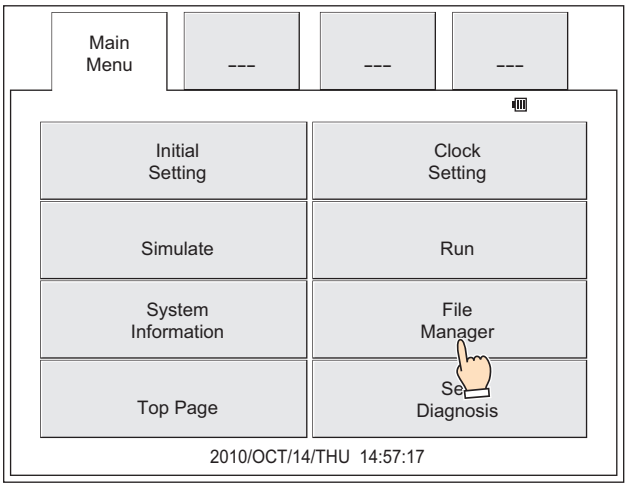
6 Press **Offline**.

The main menu is displayed.



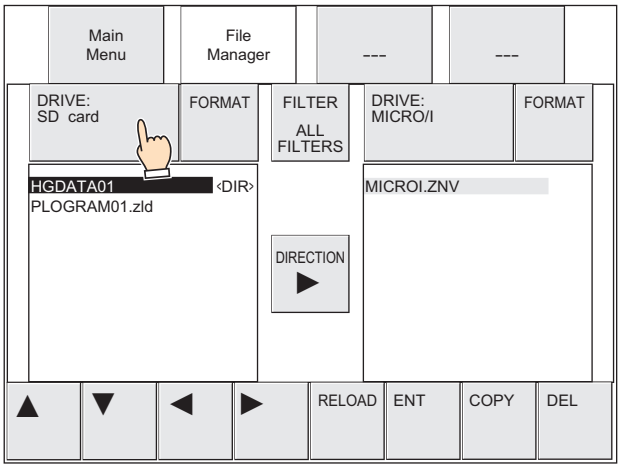
7 Press **File Manager**.

The file manager is displayed.



8 Press **DRIVE:** for the transfer source and select the SD memory card or USB flash drive inserted in the MICRO/I.

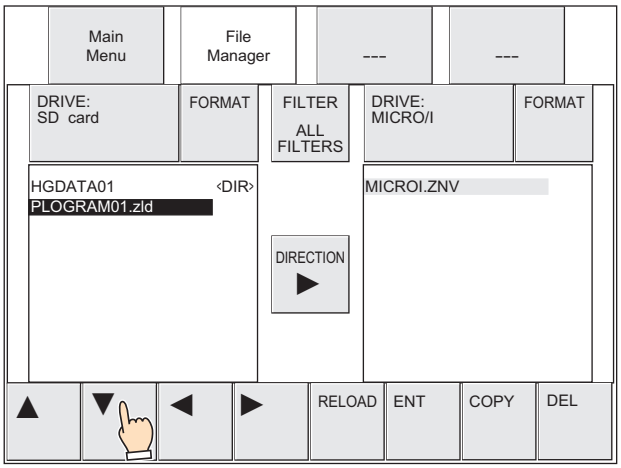
This example screen shows when an SD memory card is selected.



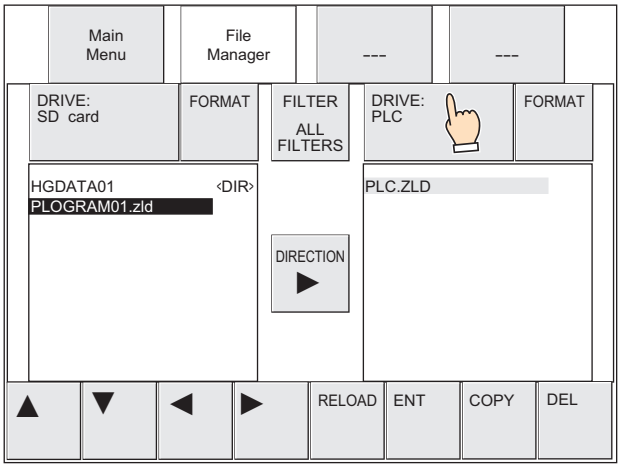
9 Select the PLC program file to download.

This example screen shows when the PLC program file is "PLOGRAM01.ZLD".

Press ▼ to select "PLOGRAM01.ZLD".

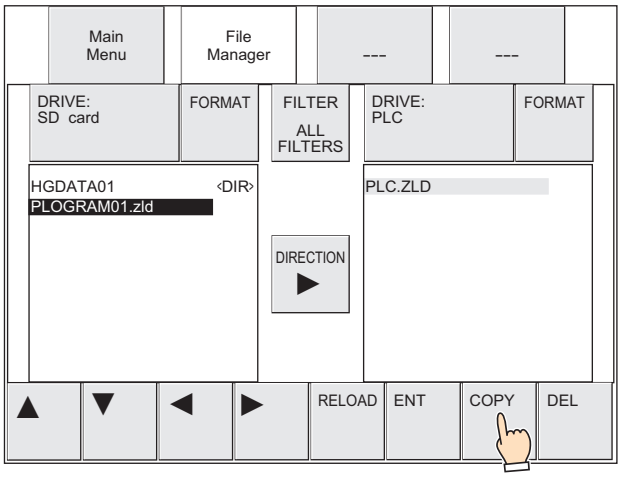


10 Press **DRIVE:** for the transfer destination and select **PLC**.

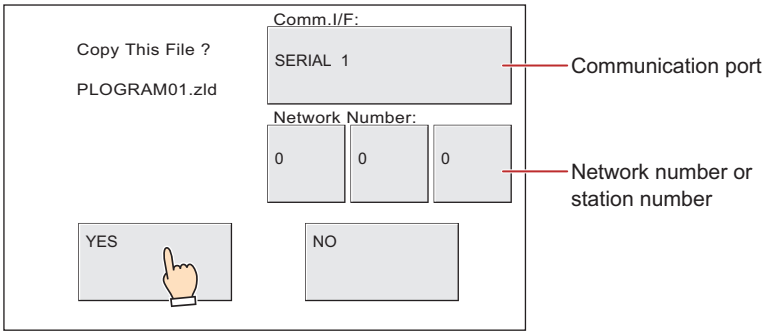


When **PLC** is selected with **DRIVE:** in the file manager, "PLC.ZLD" is always displayed. This is not the program file name for the PLC connected to the MICRO/I.

11 Press **COPY**.
A process confirmation message is displayed.

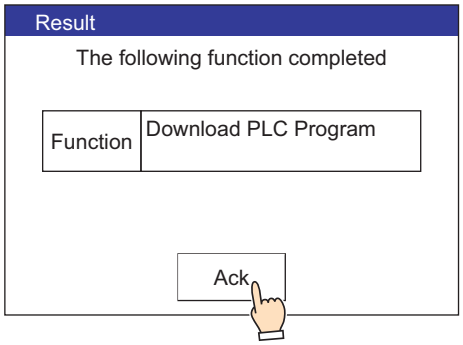


12 Specify the MICRO/I communication port and PLC network number or station number, and then press **YES**.
The PLC program file download starts.
When the download finishes, the results are displayed.



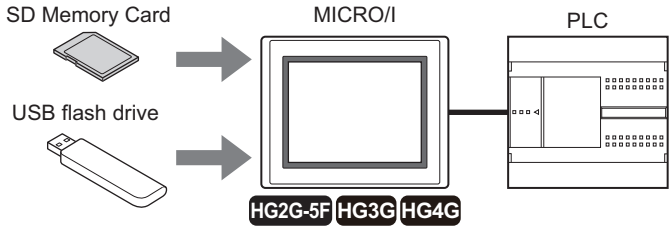
When downloading a PLC program file to a PLC configured with a password, the PLC password screen is displayed. Enter the password.

13 Press **Ack** to close the results screen.
You are returned to the top page of system mode.



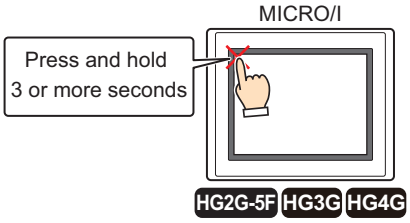
● Upload

1 Insert an SD memory card or USB flash drive in the MICRO/I.



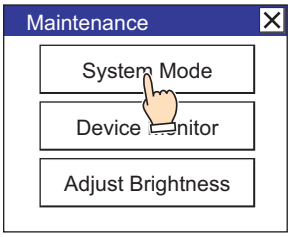
2 Press the upper-left edge of the MICRO/I screen for three seconds or more.

The maintenance screen is displayed.



3 Press **System Mode**.

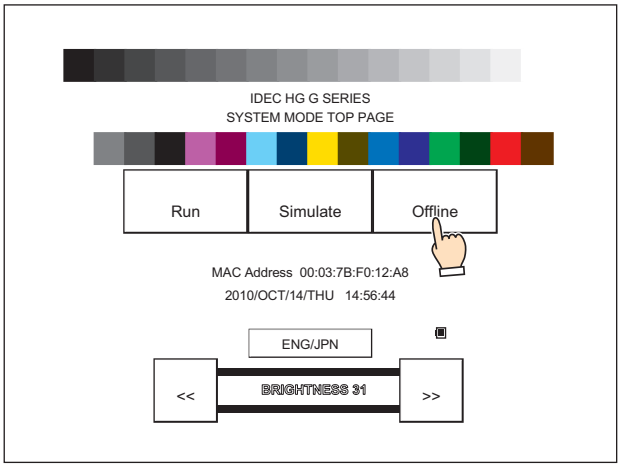
MICRO/I switches to system mode.



When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

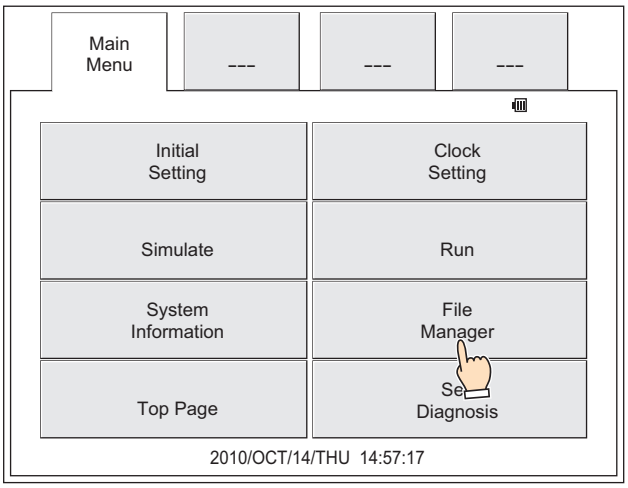
4 Press **Offline**.

The main menu is displayed.

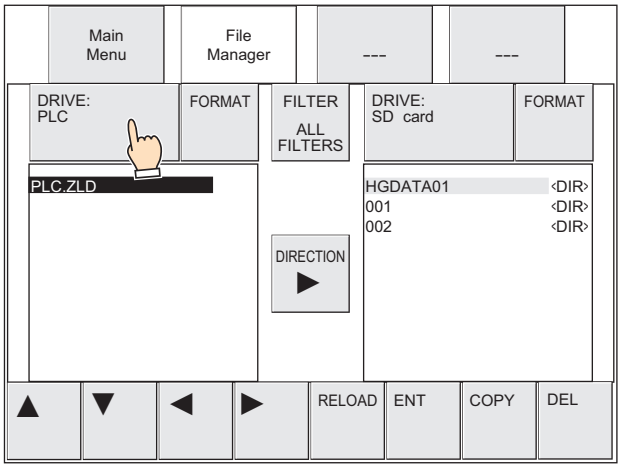


5 Press **File Manager**.

The file manager is displayed.



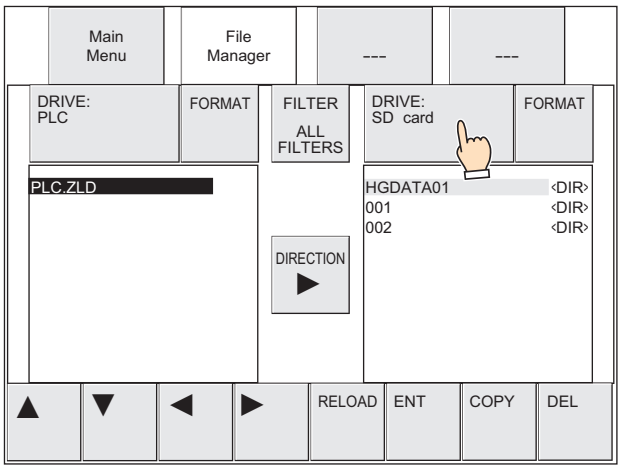
6 Press **DRIVE:** for the transfer source and select **PLC**.



When **PLC** is selected with **DRIVE:** in the file manager, "PLC.ZLD" is always displayed. This is not the program file name for the PLC connected to the MICRO/I.

7 Press **DRIVE:** for the transfer destination and select the SD memory card or USB flash drive inserted in the MICRO/I.

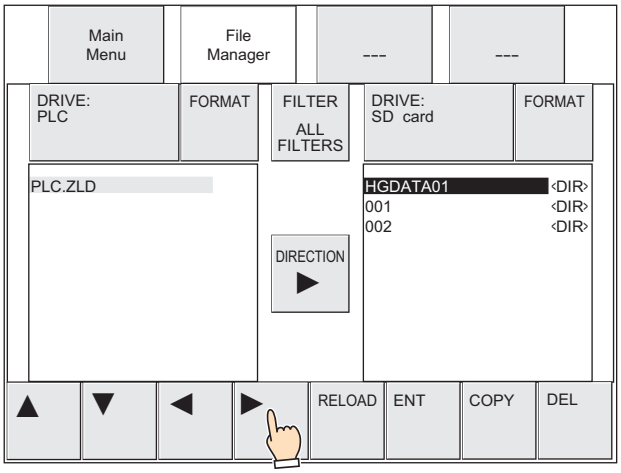
This example screen shows when an SD memory card is selected.



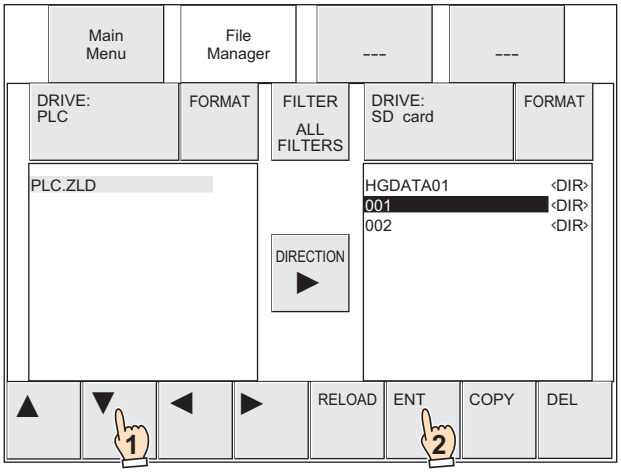
8 Select the save destination for the PLC program file to upload.

Folder (001) is selected in this example.

1. Press ▶ to move the cursor to the transfer destination on the SD memory card.

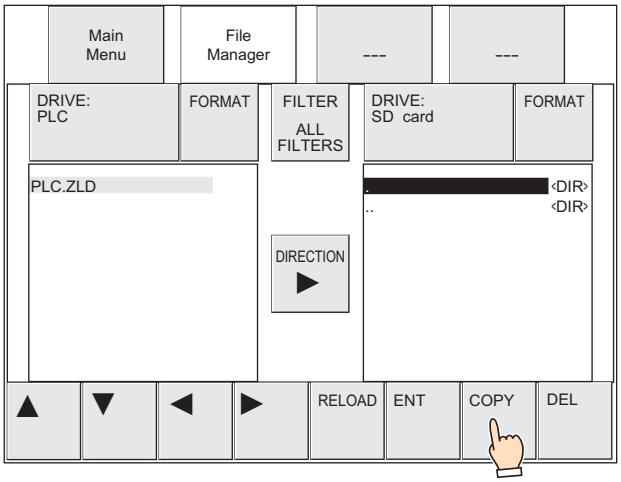


2. Press ▼ to select "001" and then press **ENT**.

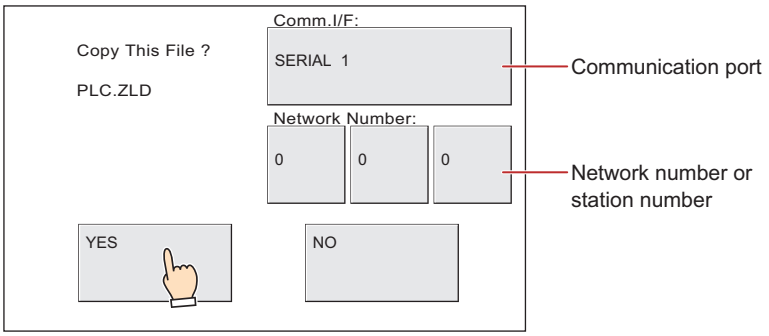


9 Press **COPY**.

A process confirmation message is displayed.



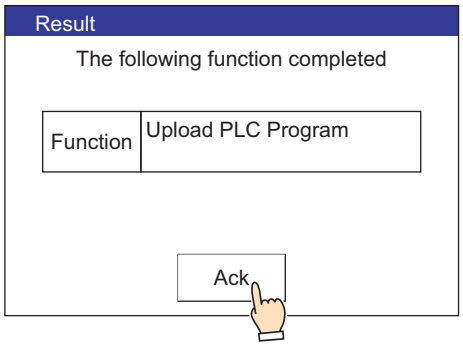
10 Specify the MICRO/I communication port and PLC network number or station number, and then press **YES**.
The PLC program file upload starts.
When the upload finishes, the results are displayed.



"PLC.ZLD" is displayed in the confirmation message, but the PLC program file name after uploading is "Model name_Port number_Station number_Year month day hours minutes seconds + File extension (.ZLD)".

When downloading a PLC program file to a PLC configured with a password, the PLC password screen is displayed. Enter the password.

11 Press **Ack** to close the screen.
You are returned to the top page of system mode.



2.7 Precautions

- An error message is displayed if the PLC program file upload or download fails.
  For details, refer to Chapter 35 "1.1 Errors Displayed on the Screen" on page 35-1.

- WindLDR Ver. 6.30 or later is required to create PLC program files.

- MICRO/I operation and PLC operation stops while the PLC program transfer function is running. After the PLC program file upload or download is completed, the MICRO/I returns to the mode immediately before running the PLC program transfer function and the PLC automatically starts running.

- Only passwords containing uppercase alphanumeric characters can be entered from the MICRO/I. When the PLC password is configured with characters other than uppercase alphanumeric characters, the password cannot be cleared.

- The PLC program transfer function cannot be run when the MICRO/I is in **Simulation Mode**. Switch to **Run Mode**, **Monitor Mode**, or **System Mode** before running the PLC program transfer function.

- If a PLC program file exists with the same name in the save destination when uploading a PLC program file, the file is overwritten with the uploaded file without displaying an overwrite confirmation message.

- While running the PLC program transfer function using a Key Button, Multi-Button, or Multi-Command, if a data transfer function (project transfer, PLC program transfer, or file copy) is initiated, the only function that will work is the currently running function. If two or more data transfer functions are configured to a Multi-Button or Multi-Command, only the data transfer function displayed at the top of the function list on the parts property dialog box is run.

3 File Copy Function

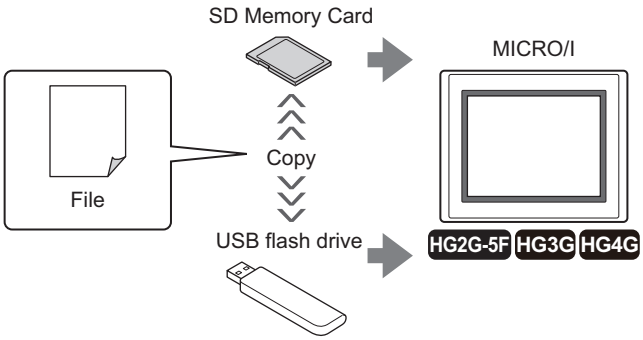
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

3.1 What Can Be Done with the File Copy Function?

The file copy function is used to copy files between an SD memory card and a USB flash drive inserted in the MICRO/I or to internally copy files on an SD memory card or on a USB flash drive.

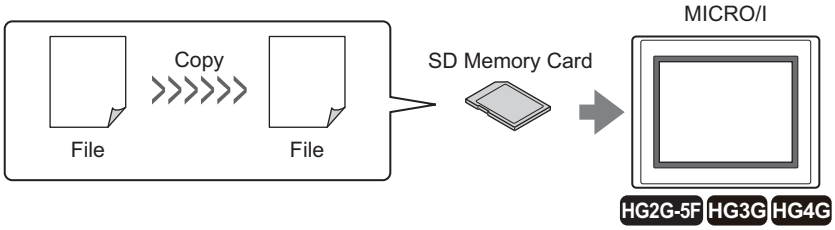
Copying from SD memory card to USB flash drive, or from USB flash drive to SD memory card

Copy files between an SD memory card and a USB flash drive inserted in the MICRO/I.



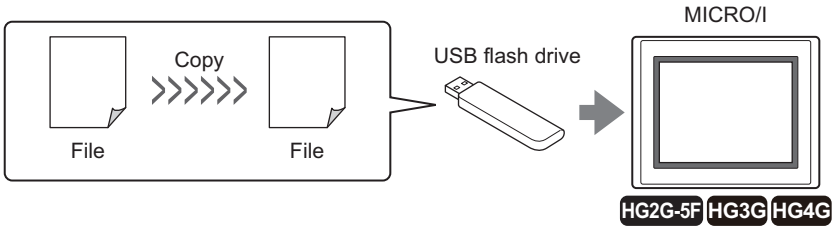
Internally copy files on an SD memory card

Internally copy files on an SD memory card inserted in the MICRO/I.



Internally copy files on a USB flash drive

Internally copy files on a USB flash drive inserted in the MICRO/I.



When running the file copy function outside of the MICRO/I system menu, HG special relay LSM23 is 1 while file copy is running.

3.2 File Copy Operating Procedures

The following methods can be used to copy files between an SD memory card and a USB flash drive inserted in the MICRO/I or to internally copy files on an SD memory card or on a USB flash drive.

- Using the USB Autorun function
  ☞ For details, refer to Chapter 30 "2 USB Flash Drives" on page 30-25.

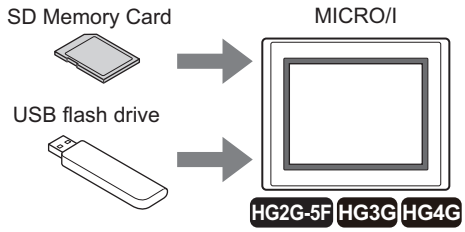
- Using Key Buttons, Multi-Buttons, or Multi-Commands
  ☞ For details, refer to "3.3 Using Key Buttons, Multi-Buttons, or Multi-Commands to Copy Files" on page 28-34.

- Using the MICRO/I system menu
  ☞ For details, refer to "3.4 Using the MICRO/I System Menu to Copy Files" on page 28-35.

3.3 Using Key Buttons, Multi-Buttons, or Multi-Commands to Copy Files

Allocate a Key Button, Multi-Button, or Multi-Command configured with the file copy function to the MICRO/I.
☞ For details, refer to Chapter 8 "5 Key Button" on page 8-66.
☞ For details, refer to Chapter 8 "6 Multi-Button" on page 8-98.
☞ For details, refer to Chapter 12 "6 Multi-Command" on page 12-38.

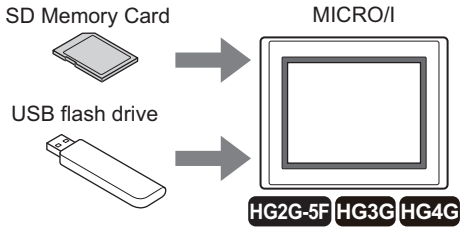
1 Insert an SD memory card and a USB flash drive in the MICRO/I.



2 Press the Key Button or Multi-Button or execute the Multi-Command configured with **File Copy** under **Data Transfer** in the Key Browser dialog box.

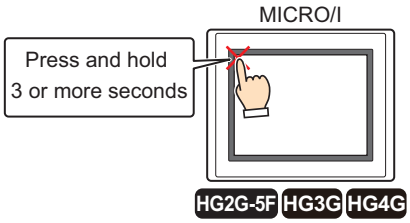
3.4 Using the MICRO/I System Menu to Copy Files

1 Insert an SD memory card or USB flash drive in the MICRO/I.



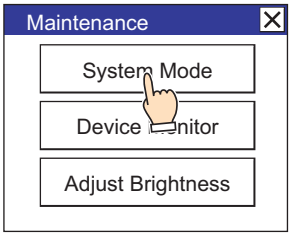
2 Press the upper-left edge of the MICRO/I screen for three seconds or more.

The maintenance screen is displayed.



3 Press **System Mode**.

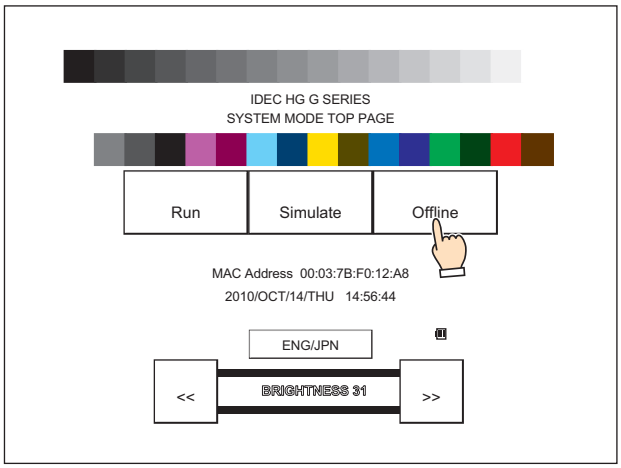
MICRO/I switches to system mode.



When downloading a project configured with security to the MICRO/I, the password screen is displayed. Select a user name and enter its password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

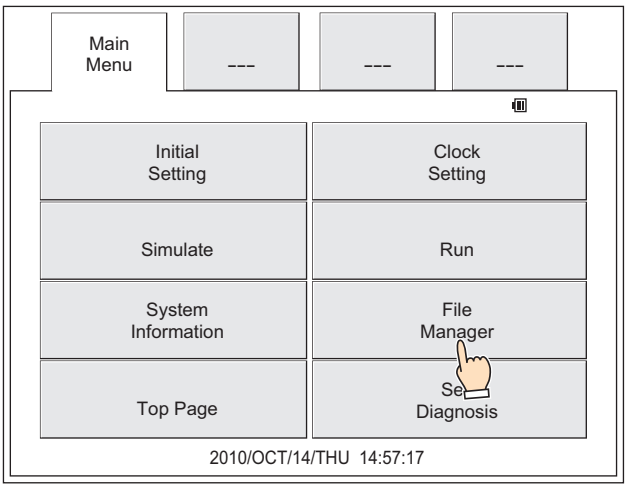
4 Press **Offline**.

The main menu is displayed.



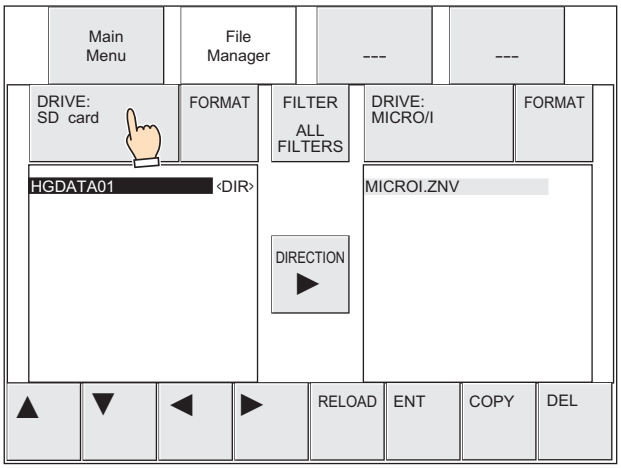
5 Press **File Manager**.

The file manager is displayed.



6 Press **DRIVE:** for the copy source and select the SD memory card or USB flash drive inserted in the MICRO/I.

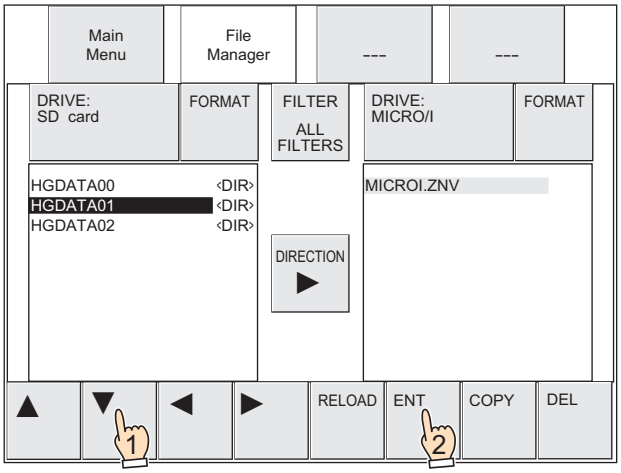
This example screen shows when an SD memory card is selected.



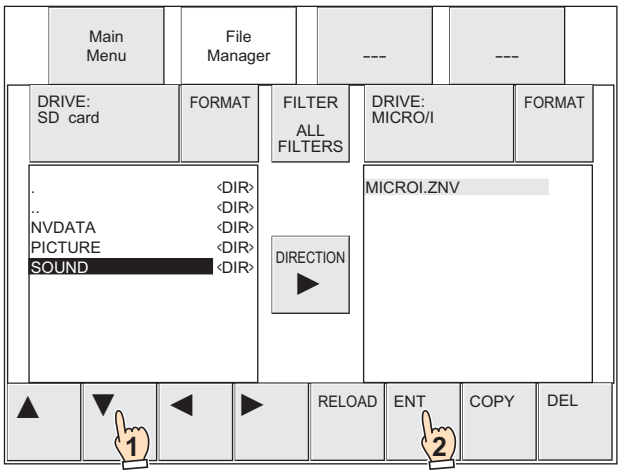
7 Select the file to copy.

In this example, the sound file (AUDIO1.WAV) saved in the memory card folder (HGDATA01) is selected.

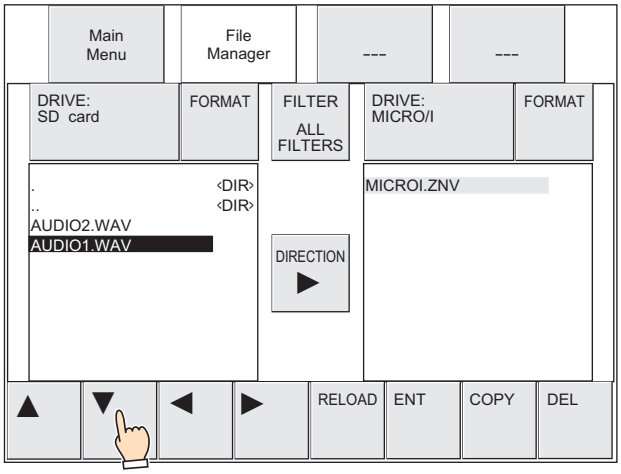
1. Press ▼ to select "HGDATA01" and then press **ENT**.



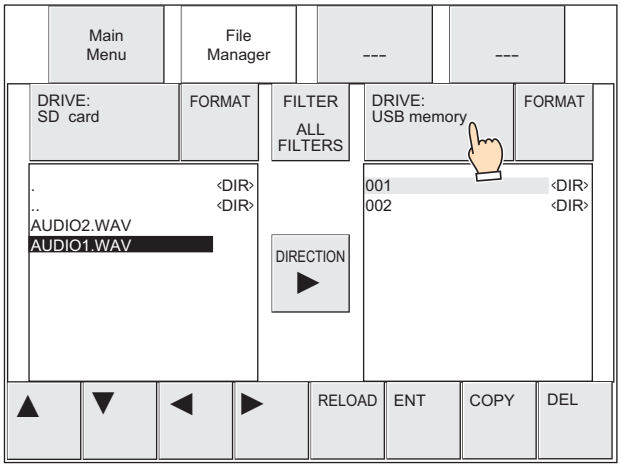
2. Press ▼ to select "SOUND" and then press **ENT**.



3. Press ▼ to select "AUDIO1.WAV".



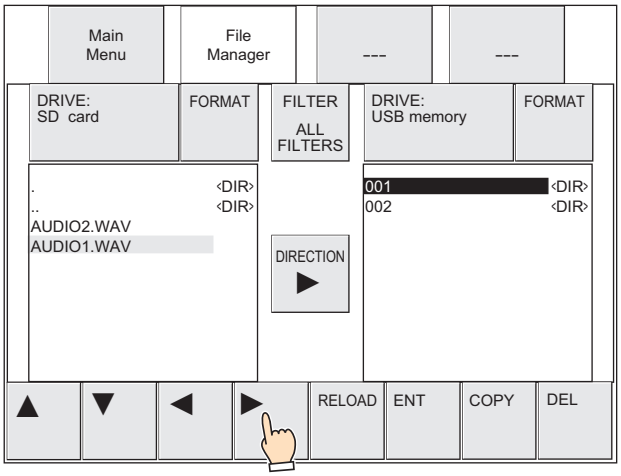
8 Press **DRIVE:** for the transfer destination and select the SD memory card or USB flash drive inserted in the MICRO/I. This example screen shows when a USB flash drive is selected.



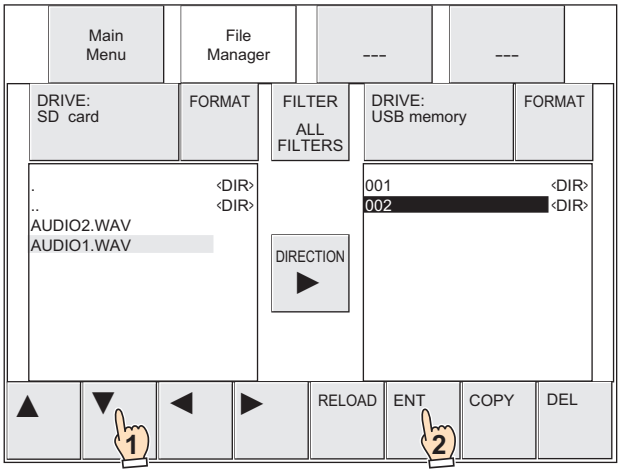
9 Select the save destination for the file to copy.

Folder (002) is selected in this example.

1. Press ▶ to move the cursor to the copy destination on the USB flash drive.

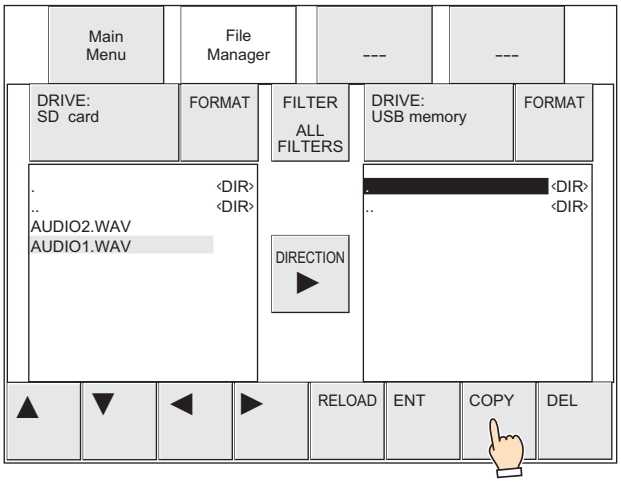


2. Press ▼ to select "002" and then press **ENT**.

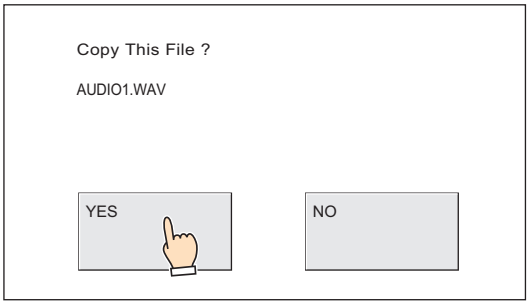


10 Press **COPY**.

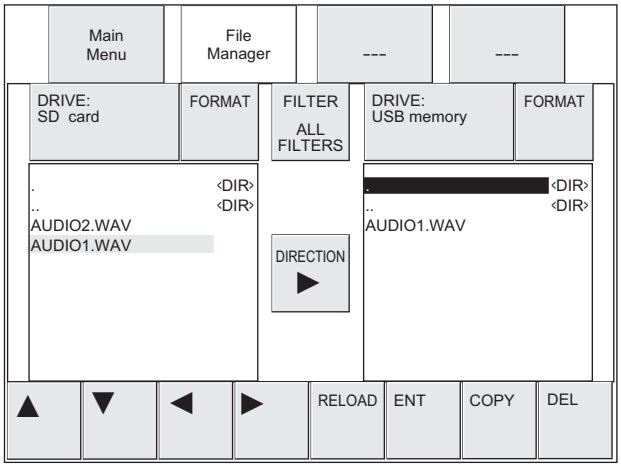
A process confirmation message is displayed.



11 Press **YES**.
The file is being copied.



When complete, the file is shown in the save destination.



3.5 Precautions

- When running the file copy function outside of the MICRO/I system menu, the maximum size per single file that can be read or written is 256 MB.

- Access to the file being copied is not allowed while the file copy function is running. Therefore, data may be missing when copying files used by the running project such as log data. When copying a file used by the running project, use **File Manager** on the MICRO/I system menu screen.

- While running the file copy function using a Key Button, Multi-Button, or Multi-Command, if a data transfer function (project transfer, PLC program transfer, or file copy) is initiated, the only function that will work is the currently running function. If two or more data transfer functions are configured to a Multi-Button or Multi-Command, only the data transfer function displayed at the top of the function list on the parts property dialog box is run.

Chapter 29 Expansion Modules

This chapter describes how to use the expansion modules and how they operate. It also explains how to write a Cyclic Script.

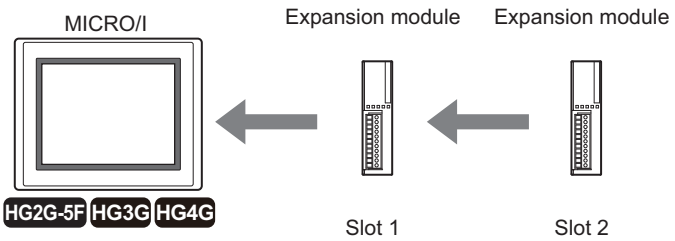
1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Overview of Expansion Modules

The MICRO/I has an expansion interface which allows you to add input and output functionality by adding expansion modules.

For the HG3G/4G, up to four IDEC MICROSmart PLC expansion I/O modules may be added. For the HG2G-5F, up to two IDEC MICROSmart PLC expansion I/O modules may be added.



Expansion I/O modules can be used to configure a display and I/O control system for small equipment with only a few I/O, or for applications with simple I/O control requirements.

Attached expansion modules are referred to as Slot 1 and Slot 2 in order from the module closest to the MICRO/I.

1.2 Applicable Expansion Modules

IDEC MicroSmart PLC expansion modules that can be attached as expansion modules are indicated below.

Type	Model No.
Digital Input Module	FC4A-N08A11
	FC4A-N08B1
	FC4A-N16B1
	FC4A-N16B3
	FC4A-N32B3
Relay Output Module	FC4A-R081
	FC4A-R161
Transistor Output Module	FC4A-T08K1
	FC4A-T08S1
	FC4A-T16K3
	FC4A-T16S3
	FC4A-T32K3
	FC4A-T32S3
Mixed I/O Module	FC4A-M08BR1
	FC4A-M24BR2

- Only one FC4A-M24BR2 can be used with each MICRO/I.
- Always turn the MICRO/I and the expansion module off before attaching or detaching an expansion module.
- Secure expansion modules using optional mounting brackets (sold separately).

2 Digital I/O Units

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Using Digital I/O Units

The inputs and outputs on the digital I/O units are mapped to internal memory locations within the MICRO/I. The inputs are mapped to LEX bits, while the outputs are mapped to LEY bits. These internal bits are used to monitor the inputs and control the outputs.

The LEX and LEY bits are octal-based, meaning that only numbers 0-7 are used in their addresses.

Addresses are assigned in ascending order from Slot 1. However, if a unit has four input/output ports, addresses 0 to 3 are assigned to each, and addresses 4 to 7 cannot be used.

Inputs and outputs of digital I/O units can also be controlled and monitored using the word devices WLEX and WLEY. WLEX and WLEY are useful for batch control of inputs and outputs. For details, refer to Chapter 32 "Internal Devices" on page 32-1.

2.2 Digital I/O Unit Operation

Digital I/O units can be controlled by switch parts, command parts and scripts. Processing priority should be determined based on the application.

- **Priority to display processing**

  In this mode, priority is given to the display and parts processing.

  This mode can be used for applications where the priority is on the processing speed of screen parts operation and screen switching.

  Read and write to the HG Digital Input (LEX) and HG Digital Output (LEY) using switch parts, command parts, and scripts.

  Users should understand that the processing time for drawing objects and communicating (the scan time of the screen) affects the control timing of the digital I/O unit.

  This means a time-consuming display process will slow the control time down and result in delayed input response.

- **Priority on control processing**

  This mode places priority on control processing speed.

  It can be used for screens where parts operation is minimal but have many data processing parts.

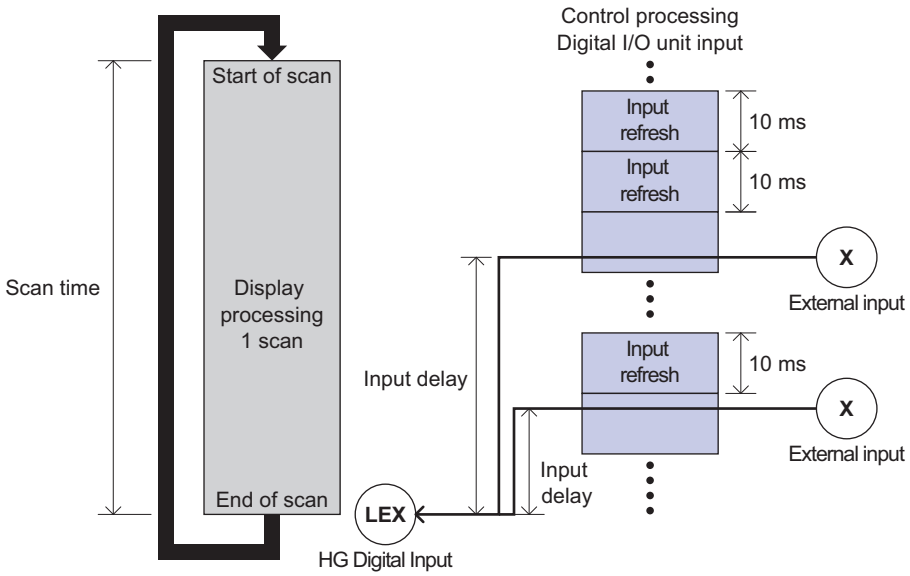
  Use the Cyclic Script to read and write to the HG Digital Input (LEX) and HG Digital Output (LEY).

  Refer to "3 Cyclic Script" on page 29-9 for programming information.

  Use the Cyclic Script, which executes in conjunction with the digital I/O unit, to provide I/O control at fixed intervals independent of the scan time of the screen.

● Operation with priority on display processing

When an external input occurs



■ Display processing

Parts placed on the screen are processed in order from the top down. This process constitutes a single scan.

When processing reaches the end, it returns to the beginning and starts the next scan.

The time for one scan depends on the number and type of parts used, as well as how they are configured.

■ Input refresh

Inputs are refreshed every 10 ms independent of the screen scan.

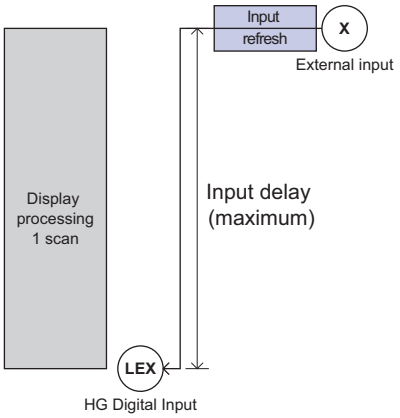
However, inputs at the digital I/O unit are not reflected in the HG Digital Input (LEX) until the screens scan ends.

■ Input delay

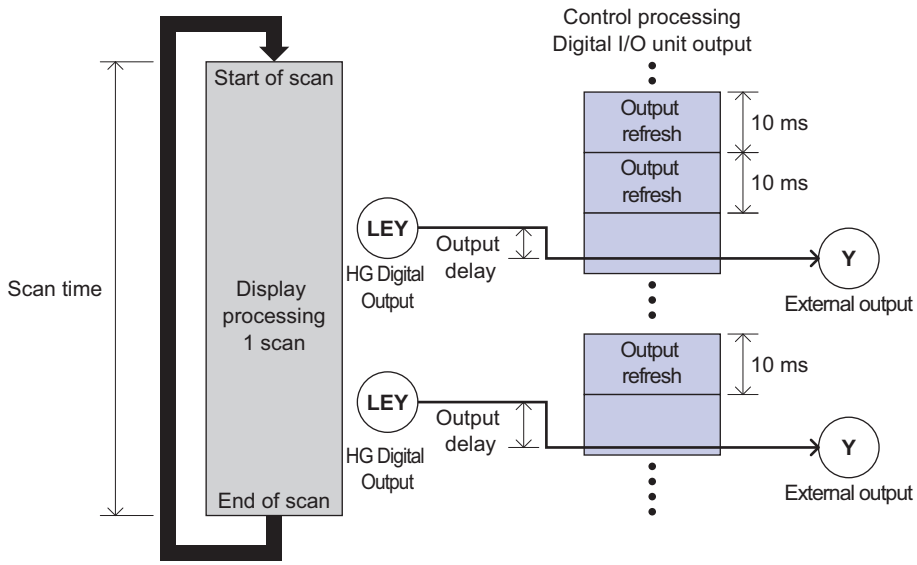
When an external input occurs on the digital I/O unit, the delay time until the input is reflected in the HG Digital Input (LEX) will be at least 5 ms or a maximum of 15 ms + the scan time (HG special registers LSD 4).

The longer display processing takes, the longer the delay.

Input delay is longest when an input occurs on the digital I/O unit immediately after the scan begins because it does not get reflected in the HG Digital Input (LEX) until the beginning of the next scan.



Writing to an external output



■ **Output refresh**

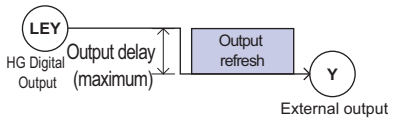
Outputs are refreshed every 10 ms independent of the screen scan.

HG Digital Output (LEY) are reflected in the digital I/O unit.

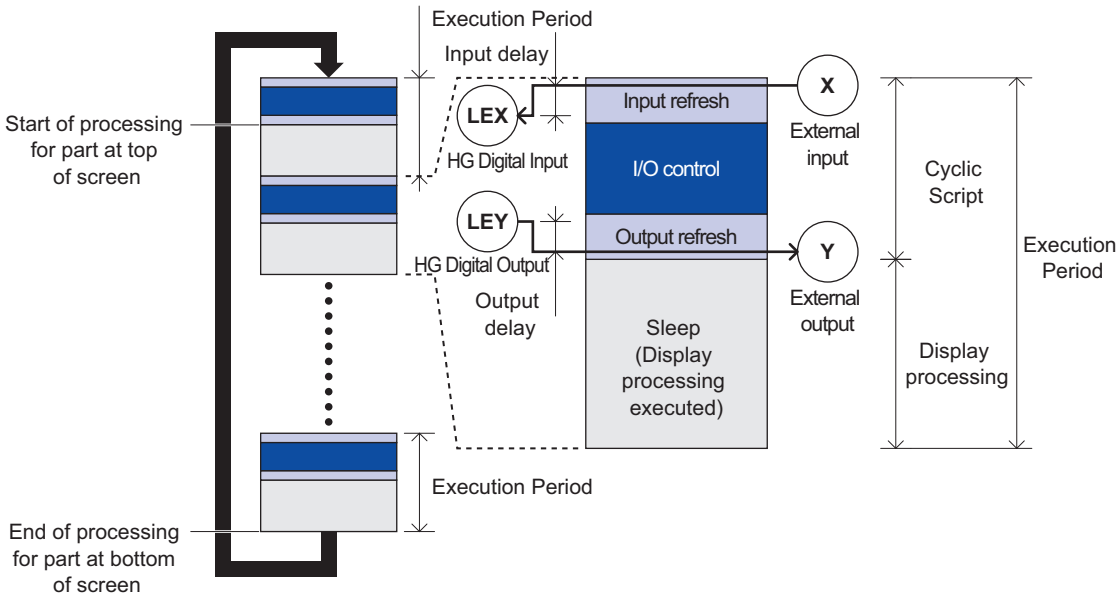
■ **Output delay**

The min-to-max delay time for HG Digital Output (LEY) to fire from the digital I/O unit is 1 ms to 11 ms. This does not affect the display processing

The maximum output delay is 11 ms, which is the operating time of the output refresh.



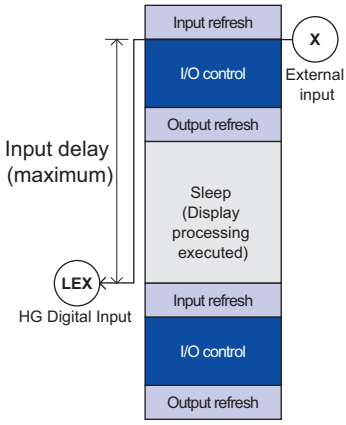
● Operation with priority on control processing



■ **Input refresh**
Inputs on the digital I/O unit are reflected in the HG Digital Input (LEX).

■ **Input delay**
There is a delay between the digital I/O unit input and the internal device HG Digital Input (LEX). The minimum delay is 5 microseconds, and the maximum delay period is calculated by the amount of 5 microseconds and the execution period.

When an input occurs in the digital I/O unit immediately after the input refresh ends, the input delay will be the longest because the processor waits for the input refresh in the next scan before reflecting the input to the HG Digital Input (LEX).



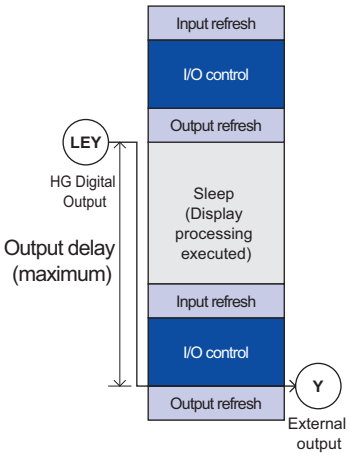
■ **I/O control**
The script specified as the Cyclic Script executes during I/O control.

■ **Output refresh**
HG Digital Output (LEY) are output to the digital I/O unit.

Output delay

The min-to-max delay time for HG Digital Output (LEY) to fire from the digital I/O unit is 1 ms to 1 ms + the Execution Period.

When an output is sent to the digital I/O unit immediately after the output refresh ends, the output delay will be the longest because the processor waits for the output refresh in the next scan before reflecting the output to the HG Digital Output (LEY).



Cyclic Script

A Cyclic Script refers to three processes: input refresh, I/O control (the specified script), and output refresh.

Refer to "3 Cyclic Script" on page 29-9 for programming information.

- Only internal devices can be used in the Cyclic Script.
- The actual execution time of the Cyclic Script is stored in HG special register LSD 38 (current value x ms), LSD 39 (max value x ms), and LSD 40 (min value x ms).
- Cannot use the LINE function, RECTANGLE function, CIRCLE function in the Cyclic Script.

Sleep

Sleep refers to the time used by the Cyclic Script subtracted from the Execution Period. This is when the processor executes display processing.

Execution Period

The Execution Period refers to one scan of the Cyclic Script (input refresh + I/O control + output refresh) and display processing time (sleep).

The Cyclic Script is executed once every specified execution interval.

- If execution of the Cyclic Script takes more than half of the time specified for the Execution Period, the processor automatically extends the Execution Period so that the Cyclic Script completes within 1/2 of the Execution Period. In this instance, error number 7 will be stored in HG special register LSD53.
- If the execution time of the Cyclic Script exceeds 3,000 milliseconds, it pauses to allow the output refresh to be executed. Thereafter, the script goes to sleep and the Cyclic Script executes on the next scan. In this instance, error number 6 will be stored in HG special register LSD53.

There is a delay in the I/O control. Take this delay time into consideration when specifying the Execution Period.

For instance, if it is necessary to capture external inputs within 100 ms, set the Execution Period to 80 ms.

Display processing

Parts laid out on the screen are processed from top to bottom only when the Cyclic Script is in sleep mode.

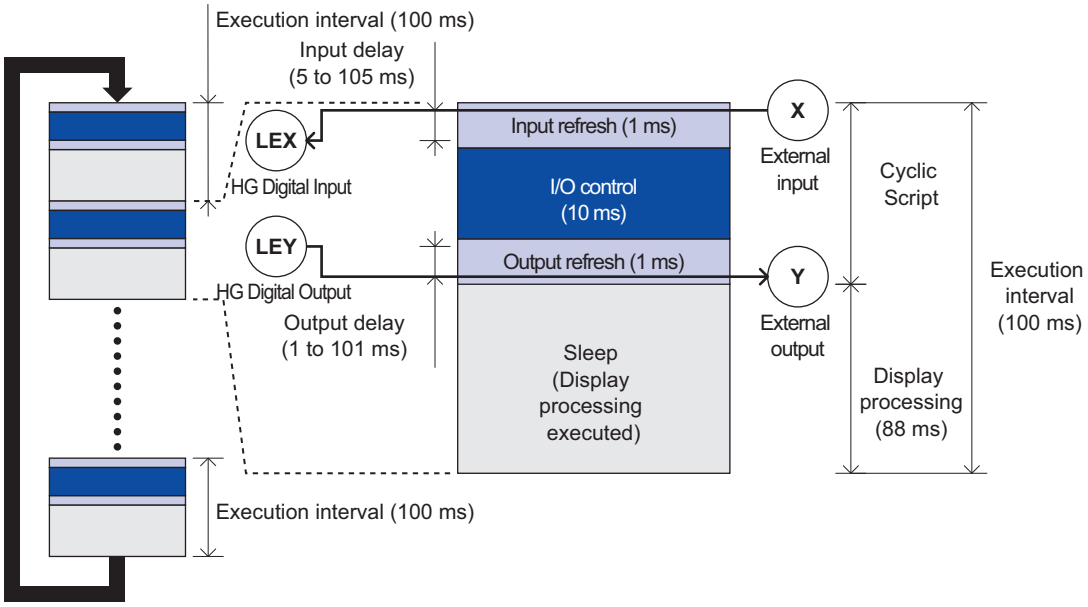
Display processing pauses when execution of the next Cyclic Script begins, and resumes when the script goes to sleep again.

When processing reaches the bottom of the screen, processing returns to the top of the screen.

Operation Example

Where,

- Execution interval: 100 ms
- Input refresh: 1 ms
- I/O control: 10 ms
- Output refresh: 1 ms



The execution time of the Cyclic Script is 1 + 10 + 1 = 12 ms, so the script executes normally.
The input delay can be from 5 to 105 ms, and the output delay can be from 1 to 101 ms.
Since the sleep time is 100 - 12 = 88 ms, display processing takes place every 88 ms of each scan.

3 Cyclic Script

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

A Cyclic Script is a script whose trigger condition can be set to a fixed interval (in increments of 10 ms). Only one Cyclic Script can be assigned to the project.

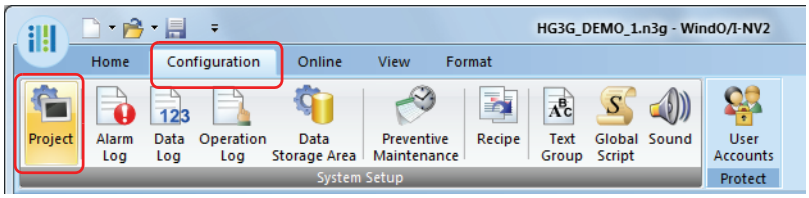
When a script is specified as a Cyclic Script, it executes at the specified fixed intervals independent of the scan time of the screen (processing time for parts on the screen).

3.1 Setting Procedures for Cyclic Script

Follow these steps to program a Cyclic Script.

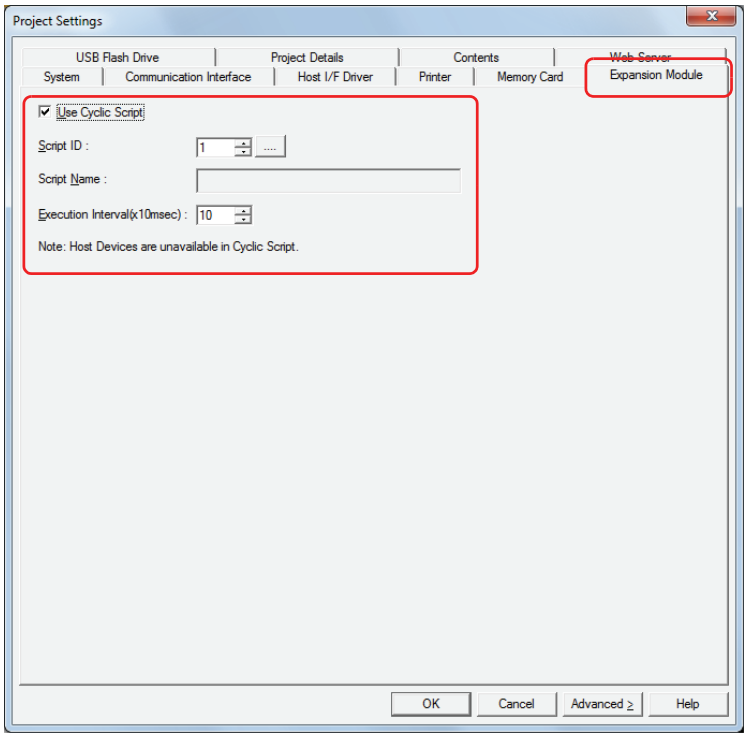
1 On the **Configuration** tab, in the **System Setup** group, click **Project.**

The Project Settings dialog box appears.



2 On the **Expansion Module** tab, select the **Use Cyclic Script** check box.

3 Specify the **Script ID** and **Execution Interval**.



■ **Script ID**

Specify the script ID to use (from 1 to 32000) as the Cyclic Script.

■ **Execution Interval(x 10msec)**

Specify the interval at which the script should execute from 10 to 1000 (10 ms increments).

The specified script will execute at the specified intervals.

4 Click **OK**.

Chapter 30 External Memory Devices

This chapter describes the specifications, functions, and notes to observe when using external memory devices with the MICRO/I.

1 Memory Cards

1.1 Supported Memory Cards

The supported memory cards is different for each MICRO/I model.

Memory Cards	HG2G-5F, HG3G/4G	HG2F/3F/4F
CF Card	NO	YES
SD Memory Card	YES	NO

Memory cards can only be used on models equipped with a memory card interface.

1.2 CF Card

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F **HG2F** HG2S **HG3F** **HG4F**

● CF Card Functions

The following functions are available when a CF card is inserted in the MICRO/I.

- Transfer projects
  ☞ Refer to Chapter 28 "1 Project Transfer Function" on page 28-1.
- Screenshot output
  ☞ Refer to Chapter 8 "4.2 Print Button Configuration Procedure" on page 8-52, and Chapter 12 "4.2 Print Command Configuration Procedure" on page 12-26.
- Alarm Log output
  ☞ Refer to Chapter 13 "Memory Card Output Tab" on page 13-21.
- Data Log output
  ☞ Refer to Chapter 14 "Memory Card Output Tab" on page 14-19.
- Reading/writing recipe data
  ☞ Refer to Chapter 18 "Recipe Function" on page 18-1.
- Displaying picture files
  ☞ Refer to Chapter 2 "Write Picture File to Memory Card" on page 2-32.

● Specifications

Models HG2F/3F/4F support CF cards with the following specifications:

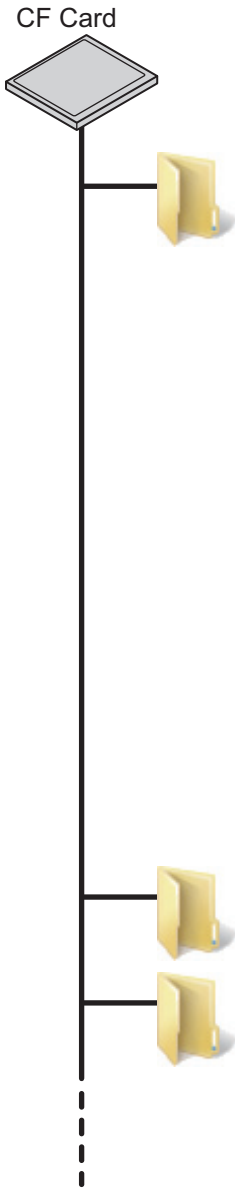
- Capacity 16 MB, 32 MB, 64 MB, 128 MB, 256 MB, 512 MB.
- Compatible with FAT16 or FAT32 formatting.
- Shift JIS support.
  Half-width kana characters are not supported for file and directory names. Full-width kana characters are supported.

Use of IDEC, HG9Z-MF128 CF Card (128 MB capacity) is recommended.

● File structure

When downloading or uploading data using the System Menu on the MICRO/I, or WindO/I-NV2, the following files and folders are accessible.

By default, the Memory Card Folder on the memory card is named "HGDATA01". For details, refer to "1.5 Setting the Memory Card Folder" on page 30-16.



Folder name	File name	Description
CAPTURE	CAP001.BMP to CAP999.BMP	Screenshot data (file name is assigned automatically)
ALARM	ALMHTO.CSV	Alarm log data (batch)
	ALMHTA.CSV	Alarm log data (real time)
LOG	LOGO01.CSV to LOGO020.CSV	Data log data (batch) (the sequential number assigned corresponds to the data number)
	LOGA01.CSV to LOGA020.CSV	Data log data (real time) (the sequential number assigned corresponds to the data number)
RECIPE	RCP0001.CSV to RCP1024.CSV	Recipe data (the sequential number assigned corresponds to the recipe number)
PICTURE	N/A	Picture files
USRDAT	N/A	Project data

Users can create multiple memory card folders for different projects on a single CF card. Note, the Memory Card Folder on the memory card must reside on the root directory.

Do not move, delete, or edit files inside the PICTURE and USRDAT folders. Altered files cannot be used with MICRO/I or WindO/I-NV2.

1.3 SD Memory Card

HG2G-S HG2G-5S **HG2G-5F** **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

● SD Memory Card Functions

The following functions are available when an SD memory card is inserted in the MICRO/I.

- Transferring projects and PLC programs, copying files
  ☞ Refer to Chapter 28 "Data Transfer Function" on page 28-1.
- Screenshots
  ☞ Refer to Chapter 8 "4.2 Print Button Configuration Procedure" on page 8-52, and Chapter 12 "4.2 Print Command Configuration Procedure" on page 12-26.
- Alarm Log output
  ☞ Refer to Chapter 13 "Memory Card Output Tab" on page 13-21.
- Data Log output
  ☞ Refer to Chapter 14 "Memory Card Output Tab" on page 14-19.
- Reading/writing recipe data
  ☞ Refer to Chapter 18 "Recipe Function" on page 18-1.
- Displaying picture files
  ☞ Refer to Chapter 2 "(Write Picture Files to Memory Card)" on page 2-27.
- Playing sound files
  ☞ Refer to Chapter 21 "Sound Function" on page 21-1.
- Recording video camera images and microphone sounds.
  ☞ Refer to Chapter 22 "Multimedia Function" on page 22-1.
- Playing movie files
  ☞ Refer to Chapter 22 "Multimedia Function" on page 22-1.

● Specifications

Models HG2G-5F, HG3G/4G support SD memory cards with the following specifications:

- SD memory cards: max capacity 2 GB. SDHC memory cards: 2 GB to 32 GB.
- Compatible with FAT16 or FAT32 formatting.
  Note, SD memory cards with less than 2 GB of capacity must be FAT16 formatted. FAT32 formatted cards cannot be recognized.
- The maximum size of files that can be read and written is 256 MB.
- Character set support only for alphanumeric characters.
- File names may be up to 120 characters long. (Includes file extensions.)
- File paths may be up to 250 characters long. (Includes file extensions and drive letters.)
- Drive letters must not contain the following characters:
  \ " & ( ) * + , . / : ; < > [ ] = | ^
- File and directory names must not contain the following characters:
  \ / : * ? " < > |

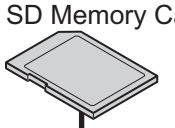
Use of IDEC, HG9Z-XMS2 SD memory card (2 GB capacity) is recommended.
Check the IDEC web site for more information about compatible SD memory cards.

● File structure

When downloading or uploading data using the System Menu on the MICRO/I, or WindO/I-NV2, the following files and folders are accessible.

By default, the Memory Card Folder on the memory card is named "HGDATA01". For details, refer to "1.5 Setting the Memory Card Folder" on page 30-16.

SD Memory Card



HGDATA01 (Memory Card Folder)

Folder name	File name	Description
CAPTURE	CAP[date/time].JPGs Date/time format: YYMMDD_HHMMSS	Screenshot data (file name is assigned automatically)
ALARMLOG	[user-defined].CSV Default file name Batch: ALMHTO.CSV Real time: ALMHTA.CSV	Alarm Log data
DATALOG	[user-defined].CSV Default file name Batch: LOGO**.CSV Real time: LOGA**.CSV	Data Log data (** corresponds to the data number)
OPERATIONLOG	[user-defined].CSV Default file name Batch: OPLOGO.CSV Real time: OPLOGA.CSV	Operation Log data
RECIPE	[user-defined].CSV Default: RCP****.CSV	Recipe data (*** corresponds to the recipe number)
PICTURE	[user-defined].bmp/jpg	Picture files
SOUND	[user-defined].wav	Sound files
RECORD	[Date] \ [Time].mp4 Date format: YYYYMMDD Time format: HHMMSS	Movie file saved to dated folder (Folder and file name included automatically)
MOVIE	[Custom].mp4	Movie Files
NVDATA	[Project name].ZNV	Project files
LDRDATA	[Model + port + Station No. + date/time].ZLD	PLC program files

HGDATA02

HGDATA03

Users can create multiple memory card folders for different projects on a single SD memory card. Note, the Memory Card Folder on the memory card must reside on the root directory.

Do not alter project files (ZNV format) and PLC program files (ZLD format). Altered files cannot be used with MICRO/I or PLCs.

1.4 Reading/Writing Data

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

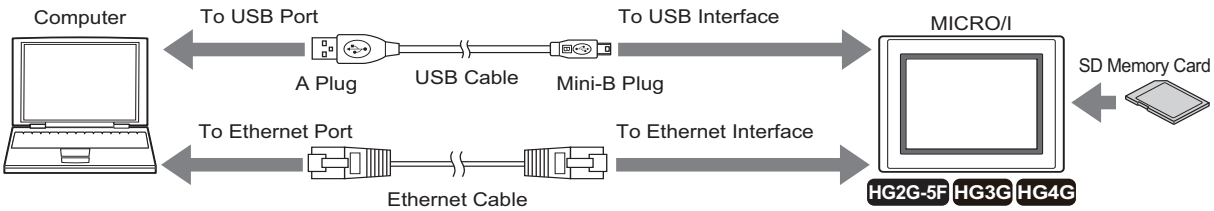
● Using WindO/I-NV2 to read and write to a memory card inserted in the MICRO/I

This procedure shows how to read and write data to the memory card folder specified for the project currently running on the MICRO/I.

■ HG2G-5F, HG3G/4G

Use either method below to make the connection.

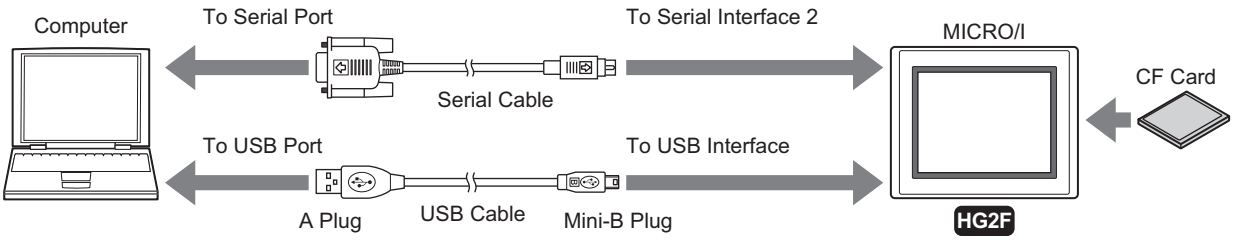
- Connect a USB cable to the USB port on the computer and the USB interface on the MICRO/I.
- Connect an Ethernet cable to the Ethernet port on the computer and the Ethernet interface on the MICRO/I.



■ HG2F

Use either method below to make the connection.

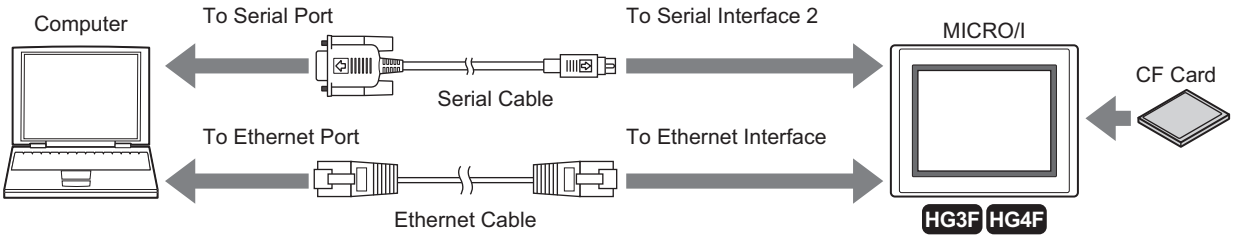
- Connect a serial cable to the serial port on the computer and the serial interface 2 on the MICRO/I.
- For USB-ready models, connect a USB cable to the USB port on the computer and the USB interface on the MICRO/I.



■ HG3F/4F

Use either method below to make the connection.

- Connect a serial cable to the serial port on the computer and the serial interface 2 on the MICRO/I.
- Connect an Ethernet cable to the Ethernet port on the computer and the Ethernet interface on the MICRO/I.

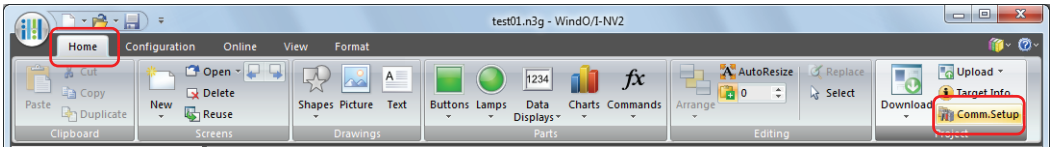


Communication settings

Follow these procedures to configure the communication device and port to allow reading and writing to the memory card inserted in the MICRO/I.

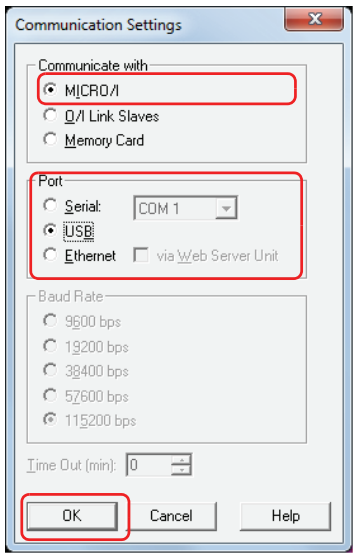
1 On the **Home** tab, in the **Project** group, click **Comm. Setup**.

The Communication Settings dialog box appears.



2 Select **MICRO/I** under **Communicate with**.

3 Select the type of connection under **Port**, then click **OK**.



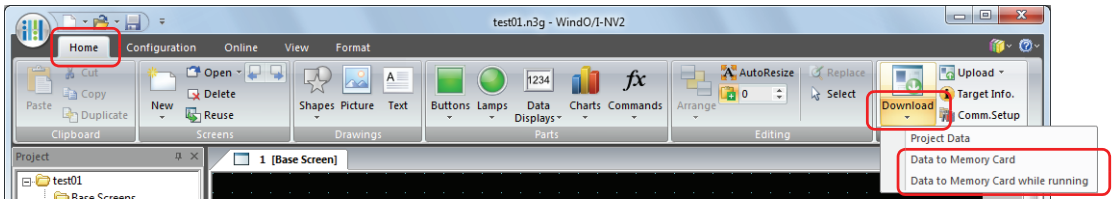
Downloading

This procedure shows how to download a specified file into a folder on the memory card for the currently running project.

1 On the **Home** tab, in the **Project** group, click the arrow under **Download**.

2 Click **Data to Memory Card** or **Data to Memory Card while running**.

The File Open dialog box appears.



■ **Data to Memory Card**

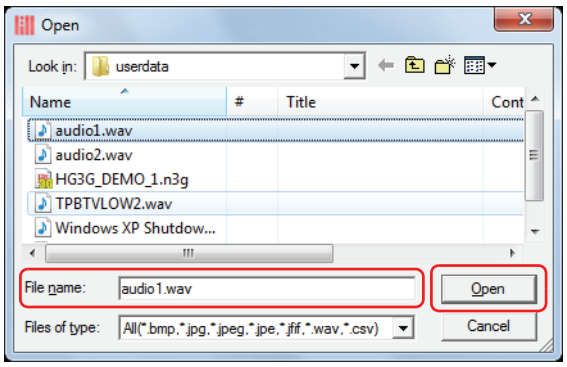
This function temporarily stops the MICRO/I and then downloads files to the memory card inserted in the MICRO/I. MICRO/I resumes running when files have been downloaded.

■ **Data to Memory Card while running**

This function downloads files to the memory card inserted in the MICRO/I without stopping the MICRO/I.

3 Specify the file name and click **Open**.

A confirmation message appears.



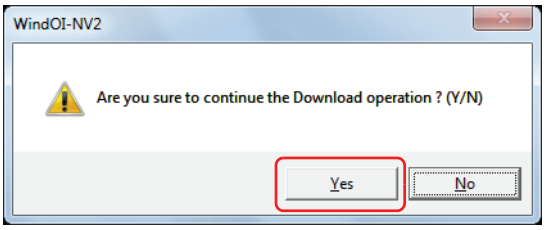
If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

4 Click **Yes**.

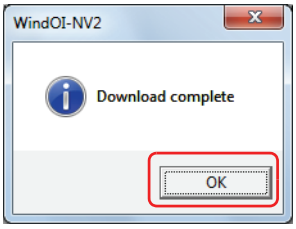
The Memory Card Maintenance dialog box appears and the file download begins.

When the download is complete, a message box appears.

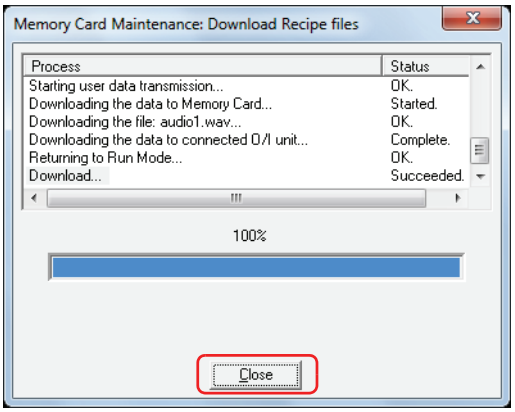


5 Click **OK**.

The display returns to the Memory Card Maintenance dialog box.



6 Click **Close**.



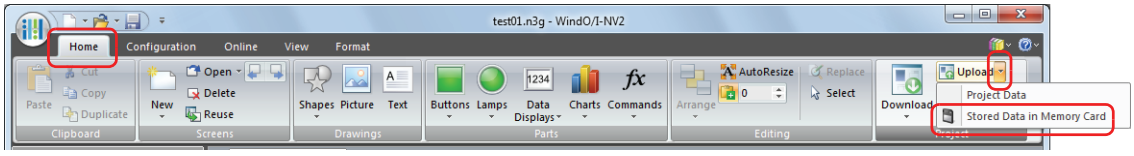
Uploading

This procedure shows how to upload specified data from the Memory Card Folder on the memory card for the currently running project.

1 On the **Home** tab, in the **Project** group, click the arrow next to **Upload**.

2 Click **Stored Data in Memory Card**.

The Upload from Memory Card dialog box appears.

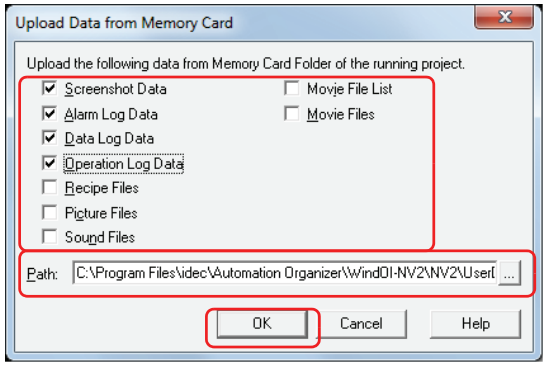


3 Specify the type of data to upload by checking the appropriate items.

4 Specify the destination folder in the **Path** box.

5 Click **OK**.

The Memory Card Maintenance dialog box appears and the data upload begins.
A message box appears when the data upload is complete.



Uploadable data differs depending on the model type.

Data to upload	HG2G-5F, HG3G/4G	HG2F	HG3F/4F
Screenshot Data	YES	YES	YES
Alarm Log Data	YES	YES	YES
Data Log Data	YES	YES	YES
Operation Log Data	YES	NO	NO
Recipe Files	YES	YES	YES
Picture Files	YES	NO	NO
Sound Files	YES	NO	NO
Movie File List	YES*1	NO	NO
Movie Files	YES*1	NO	NO

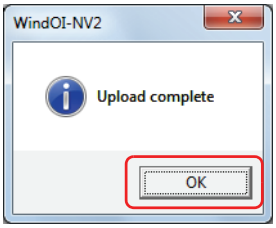
- Click ... to call up the Select a Folder dialog box and specify the destination folder for uploading.
- After starting WindO/I-NV2, screen shots, alarm log data, data log data, and recipe files can be uploaded from a memory card folder without opening project data.

If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password.
For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

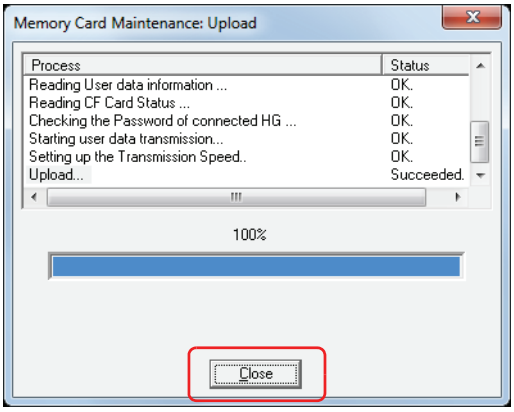
*1 This is applicable for models with a video interface only.

6 Click **OK**.

The display returns to the Memory Card Maintenance dialog box.



7 Click **Close**.



● Using Downloader to read and write to a memory card inserted in the MICRO/I

Maintenance is performed on data in the Memory Card Folder on the memory card specified for the project currently running on the MICRO/I.

Downloading

This procedure shows how to download a specified file into the Memory Card Folder on the memory card for the currently running project.

1 In Downloader, under the **Memory Card Maintenance**, click **Data to Memory Card** or **Data to Memory Card while running**.

The File Open dialog box appears.

2 Specify the file name and click **Open**.

This procedure saves the data to the Memory Card Folder on the memory card inserted in the MICRO/I.

Uploading

This procedures shows how to upload specified data from the Memory Card Folder on the memory card for the currently running project.

1 In Downloader, under **Memory Card Maintenance**, click **Upload**.

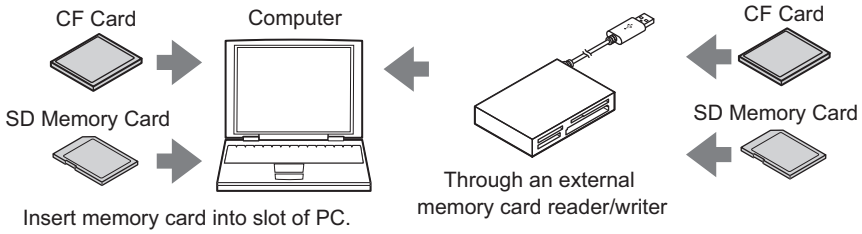
The Upload from Memory Card dialog box appears.

2 Specify the data to upload and where to save it to, then click **OK**.

This procedure uploads data to the Memory Card Folder on the memory card inserted in the MICRO/I and saves it in the user-specified location.

● Using WindO/I-NV2 to read and write to a memory card inserted in the computer

This procedure shows how to read and write from a memory card inserted in the computer's memory card slot. If the computer does not have a memory card slot, use an external memory card reader/writer or similar device.

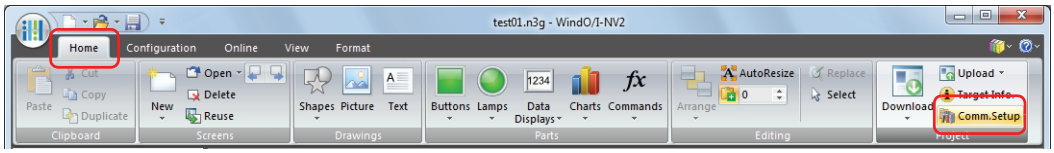


Communication settings

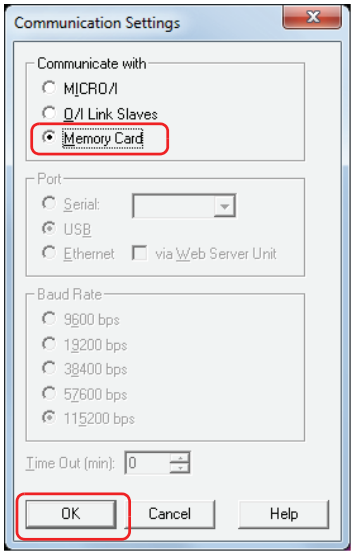
To read and write to the memory card inserted in the computer, the memory card must be specified as the communication device. Configure the communication settings as follows before downloading or uploading.

1 On the **Home** tab, in the **Project** group, click **Comm. Setup**.

The Communication Settings dialog box appears.



2 Under **Communicate with**, select **Memory Card**, then click **OK**.



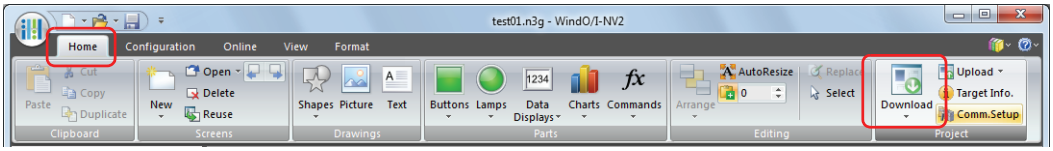
Downloading

This procedure shows how to download the project data to the Memory Card Folder on the memory card.

1 Open the project data to download using WindO/I-NV2.

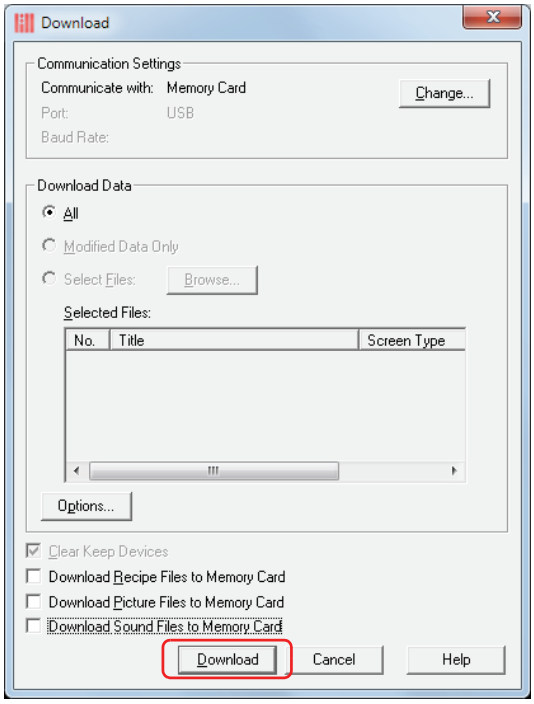
2 On the **Home** tab, in the **Project** group, click the icon above **Download**.

The Download dialog box appears.



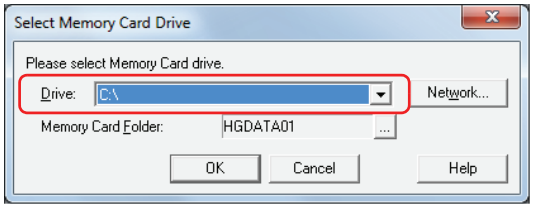
3 Click **Download**.

The **Select Memory Card Drive** dialog box appears.



4 Select the memory card drive, then click **OK**.

A confirmation message appears.



■ **Drive**

Specify the drive assigned as the memory card drive.

■ **Network**

Displays the Network Drive Assignment dialog box. This dialog allows you to specify a drive on the network.

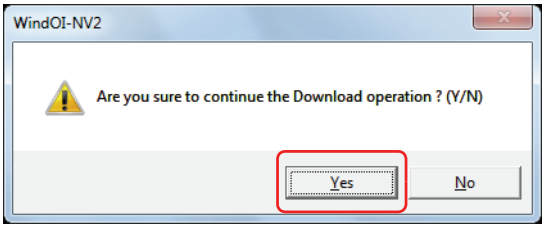
■ **Memory Card Folder**

Specify the destination folder for downloading project data.

Click ... to call up the Project Settings dialog box. This procedure allows you to specify the Memory Card Folder on the memory card where the download will be stored.

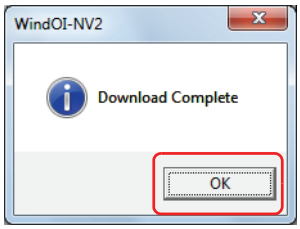
5 Click **Yes**.

The Download dialog box appears and the file download begins.
When the download is complete, a message box appears.

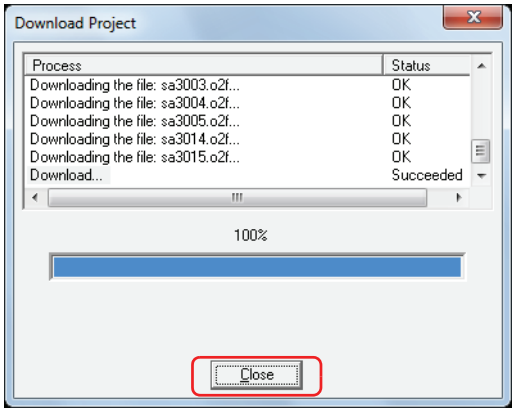


6 Click **OK**.

The display returns to the Download dialog box.



7 Click **Close**.

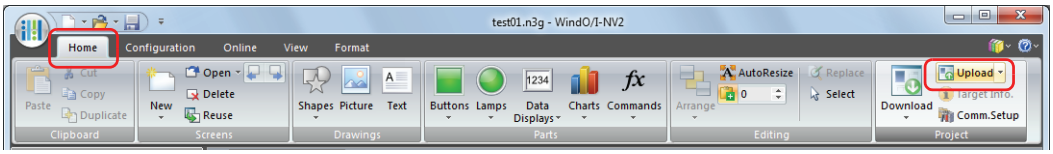


Uploading

This procedure shows how to upload the project data from the Memory Card Folder on the memory card inserted in the computer, to the computer.

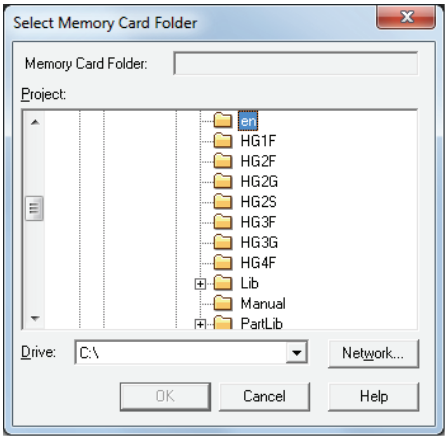
1 On the **Home** tab, in the **Project** group, click **Upload**.

The Select Memory Card Folder dialog box appears.



2 Select the memory card drive, then click **OK**.

The Upload dialog box appears.

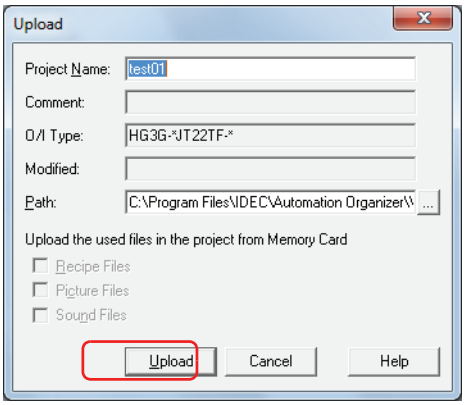


- **Memory Card Folder**
  Displays the folder specified in the **Project** tree described next.
- **Project**
  Specify the source folder for uploading the project data.
- **Drive**
  Specify the drive assigned as the memory card drive.
- **Network**
  Displays the Network Drive Assignment dialog box. This dialog allows you to specify a drive on the network.

3 Click **Upload**.

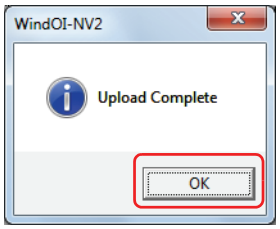
The Upload dialog box appears and the file upload begins.

When the upload is complete, a message box appears.



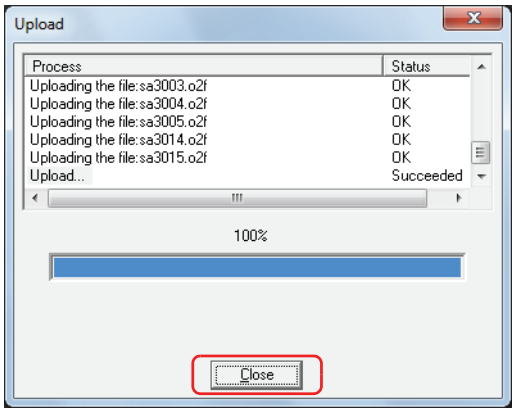
4 Click **OK**.

The display returns to the Upload dialog box.



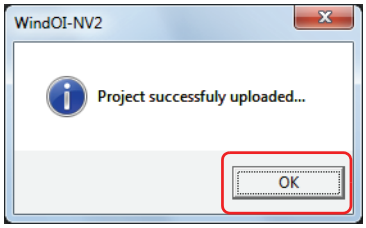
5 Click **Close**.

A confirmation message appears indicating the project will be opened.



6 Click **OK**.

The uploaded project opens.



If a password has been configured for the project data, the Enter Password screen will be displayed.

HG2G-S/-5S/-5F, HG3G/4G:	The password to enter varies based on the check box setting of the **Use Password to open a Project** found under the **Options** tab in the **Security** dialog box. When this check box is checked, enter the password for **Use Password to open a Project**. When this check box is unchecked, enter the password for the user account assigned to the Administrator security group.
HG1F/2F/2S/3F/4F:	Enter the password for the user account assigned to the Administrator security group.

For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

● Manipulating files using the file management functions provided with the OS

It is possible to use Explorer or any other program provided with the Windows OS to replace the recipe data that MICRO/I uses. When using models HG2G-5F, HG3G/4G, the picture and sound files may also be replaced.

Insert the memory card into the computer and save the new file(s) using the same name as the existing files in each folder under the Memory Card Folder.

For the picture files that can be used with the MICRO/I, refer to Chapter 2 "1.4 Available Image Files" on page 2-19.
For the sound files that can be used with the MICRO/I, refer to Chapter 2 "1.5 Available Sound Files" on page 2-37.

● Memory card writing timing

If the write timing setting for Alarm Log, Data Log, and Operation Log data is set to **Real Time**, the data is stored in the file output buffer once.

The writing timing from the file output buffer to the memory card is as follows.

- Within 3 minutes of an output event to the memory card.
- When the HG Special Relay LSM20 changes to 1.
- When switching to the System Menu.
- When downloading/uploading project data.
- When the Access Pause button is pressed.

In the following events, WindO/I-NV2 writes the data in the file output buffer to the memory card once, and then moves on to the next process. This creates a processing delay which can cause WindO/I-NV2 to raise a communication error when downloading or uploading a project file. If a communication error occurs, try downloading/uploading the project file again.

- When data exists in the file output buffer
- When attempting to switch to the System Menu while reading/writing to the memory card.
- When downloading/uploading project data.

● Memory card access status

Models HG2G-5F, HG3G/4G, HG2F/3F/4F are equipped with a memory card interface and therefore have an Access Lamp (LED).

The access lamp (LED) indicates the access status to the memory card. This status can also be read by monitoring HG Special Relay LSM21.

The access lamp states and status descriptions of the HG Special Relay LSM21 are as follows.

Memory card access status	Access lamp state	LSM21 state	Status generation conditions	Operation
Read/write access stopped	OFF	0	No memory card is inserted. The inserted memory card is not supported. The inserted memory card is unformatted. Read/write to the memory card is not possible because the access stop button*1 has been pressed.	The memory card can be removed.
Recognizing memory card	Slow blink (ON/OFF every 0.5 seconds)	0	When a memory card is inserted. When the power is switched ON with a memory card inserted (slow blink -> ON).	
Read/write access standing by.		1	When LSM20 changes to 1. When the Access Pause button*1 is pressed. (slow blink -> OFF)	Do not remove the memory card.
Read/write in progress	Rapid blink (ON/OFF every 0.2 seconds)	1	Reading/writing data to the inserted memory card. (Note, the LED stays lit when reading or writing to the memory card while using the project transfer function, or waiting for the operating mode to change.)	
Standby	ON	1	A usable memory card is inserted and can be read or written to.	

Access lamp states

Operation	State
At power up	OFF -> slow blink -> Lit
A memory card is inserted.	
LSM20 changed to 1.	Lit -> slow blink -> OFF
The Access Pause button is pressed	
Data is read/written to the memory card (screenshot data, etc.)	Lit -> rapid blink -> Lit (reading/writing completed)

*1 HG2F/3F/4F only

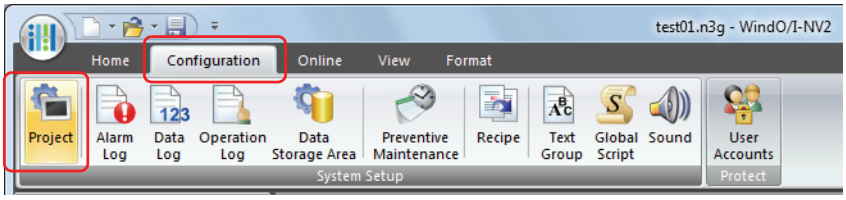
1.5 Setting the Memory Card Folder

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The Memory Card Folder on the memory card can be renamed using WindO/I-NV2.

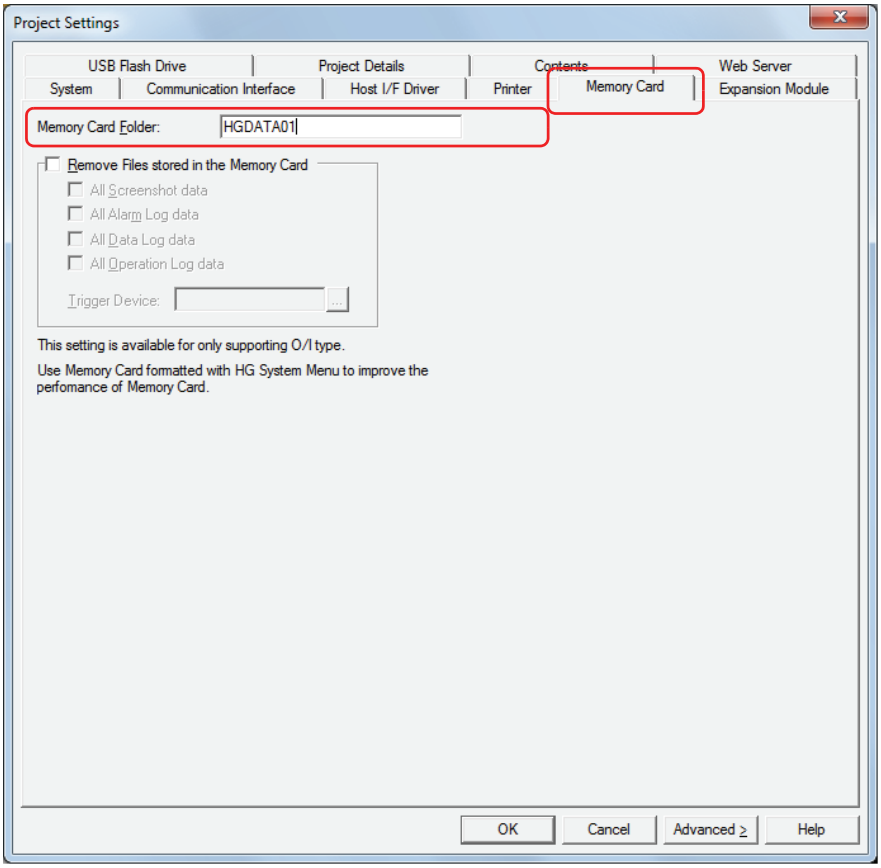
1 On the **Configuration** tab, in the **System Setup** group, click **Project**.

The Project Settings dialog box appears.



2 On the **Memory Card** tab, enter the desired name in the **Memory Card Folder** text box.

Use only alphabetic characters (A to Z) and numbers (0 to 9) and the maximum is 8 characters.



3 Click **OK**.

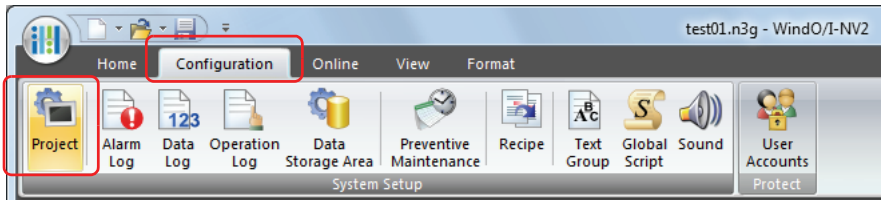
- It is not possible to change folder names and file names other than the Memory Card Folder.
- The Memory Card Folder is named "HGDATA01" if project data has never been downloaded to the MICRO/I.

1.6 Deleting Files on the Memory Card

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

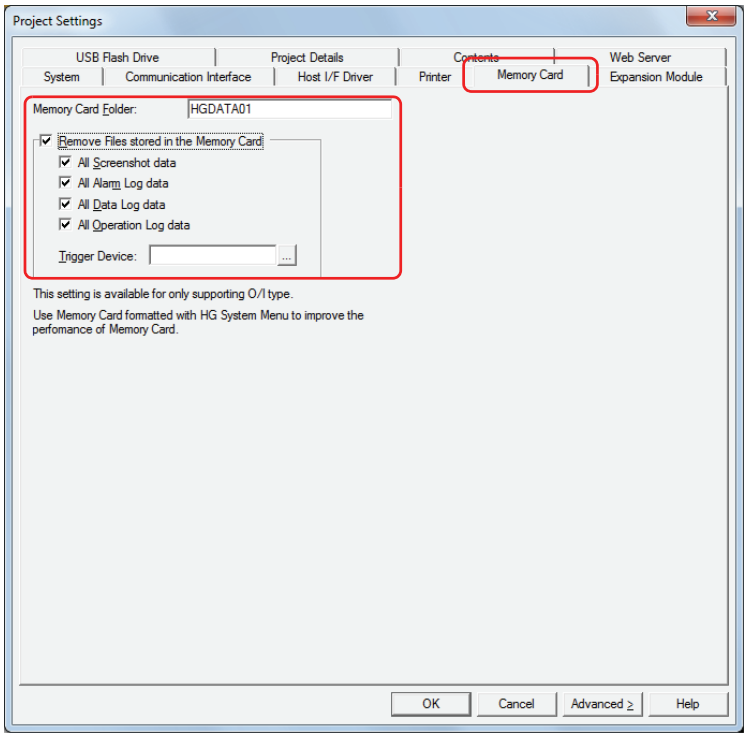
Files in the Memory Card Folder of the memory card inserted in the MICRO/I can be deleted using WindO/I-NV2.

1 On the **Configuration** tab, in the **System Setup** group, click **Project**.
The Project Settings dialog box appears.



2 On the **Memory Card** tab, select the **Remove Files stored in Memory Card** check box.

3 Specify the range of files to delete by checking the appropriate items.



- **All Screenshot data**
  Deletes all files in the CAPTURE folder.
- **All Alarm Log data**
  Deletes all files in the following folders.
  HG2G-5F, HG3G/4G: ALARMLOG
  HG2F/3F/4F: ALARM
- **All Data Log data**
  Deletes all files in the following folders.
  HG2G-5F, HG3G/4G: DATALOG
  HG2F/3F/4F: LOG
- **All Operation Log data***1
  Deletes all files in the OPERATIONLOG folder.

4 Click **OK**.

The online function in WindO/I-NV2 can also be used to delete files on the memory card.
For details, refer to Chapter 24 "4 Clear" on page 24-26.

*1 HG2G-5F, HG3G/4G only

1.7 Formatting the Memory Card

Always format the memory card before using it.

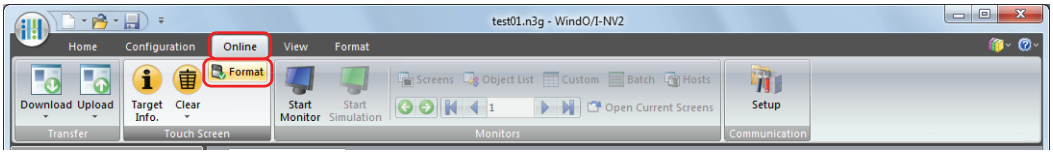
● Formatting a memory card using the Online Function in WindO/I-NV2

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The memory card inserted in the MICRO/I can be formatted with the WindO/I-NV2 online function.

1 On the **Online** tab, in the **Touch Screen** group, click **Format**.

A confirmation message appears warning that existing data will be deleted.



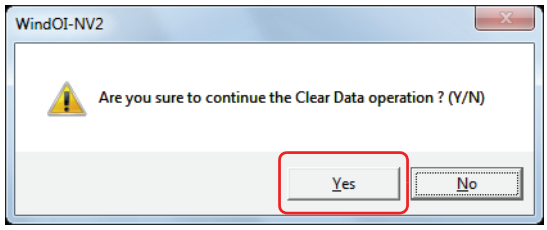
In **Communication Settings**, **Communicate with** must be set to **MICRO/I** in advance, and **Port** must be set to **USB** in advance. For details on how to configure these settings, refer to "Communication settings" on page 30-6.

If a project has been saved on the memory card with security enabled, a dialog appears for you to enter a user name and password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

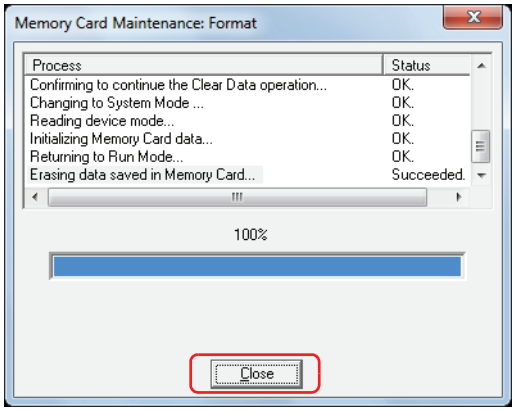
2 Click **Yes**.

The Memory Card Maintenance dialog box appears and formatting begins.

When the memory card has been formatted, the display returns to the memory card maintenance dialog box.



3 Click **Close**.



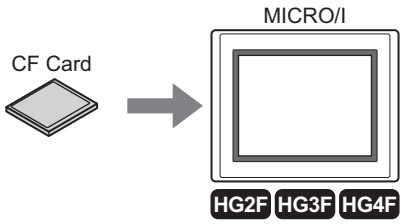
● Formatting a memory card using the System Menu on the MICRO/I

Memory cards inserted in MICRO/I can be formatted by using the System Menu on the MICRO/I.

CF cards

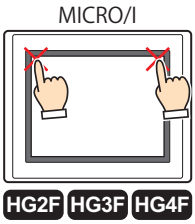
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F **HG2F** HG2S **HG3F** **HG4F**

1 Insert the CF card in the MICRO/I.



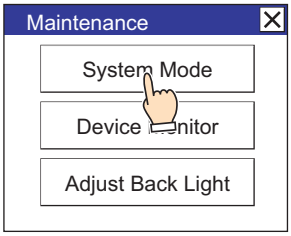
2 Simultaneously press the upper left and right corners of the MICRO/I screen.

The Maintenance Screen appears.



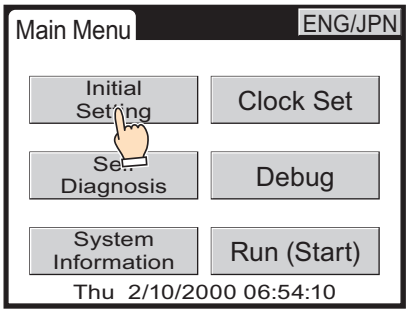
3 Press **System Mode**.

MICRO/I switches to System Mode.

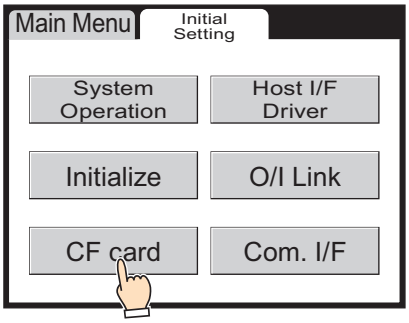


If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

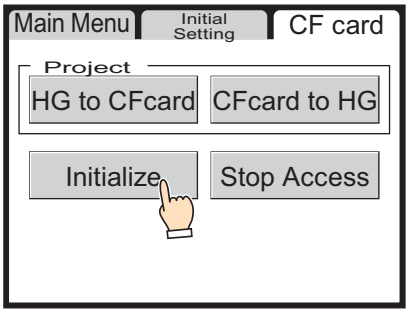
4 Press **Initial Setting**.



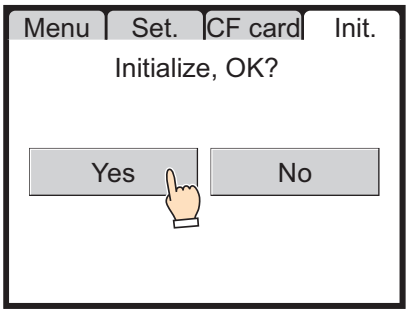
5 Press **CF card**.



6 Press **Initialize**.

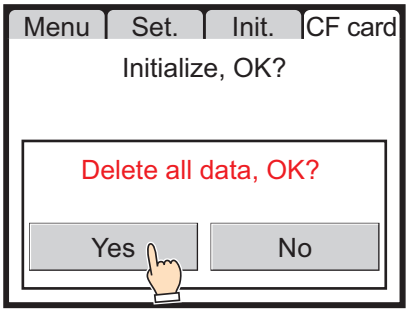


7 Press **Yes**.

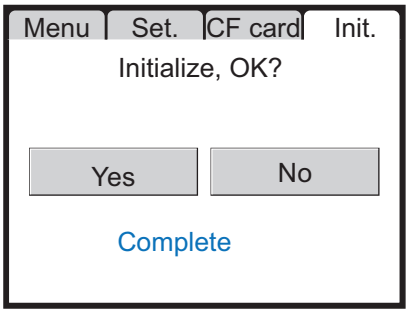


8 Press **Yes**.

MICRO/I starts formatting the CF card.



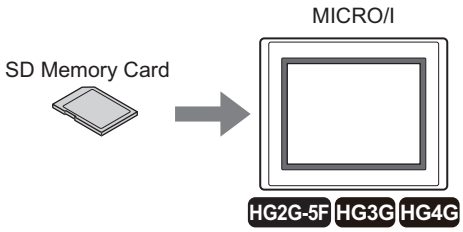
When formatting is complete, a message appears.



SD memory card

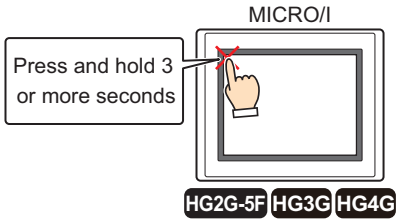
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1 Insert the SD memory card into the MICRO/I.



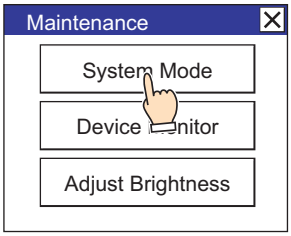
2 Press and hold the upper left corner of the MICRO/I screen for 3 or more seconds.

The Maintenance Screen appears.



3 Press **System Mode**.

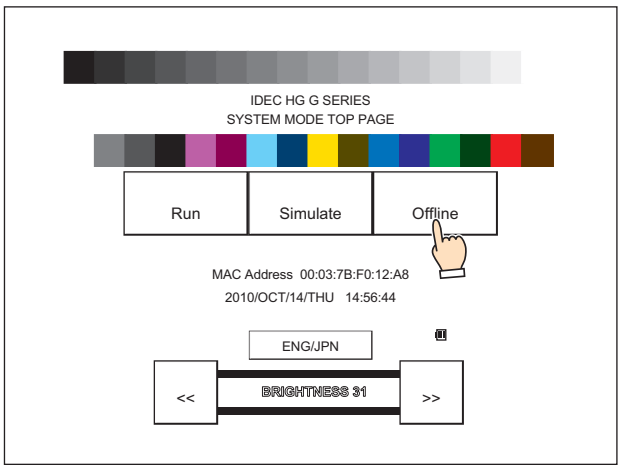
MICRO/I switches to System Mode.



If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

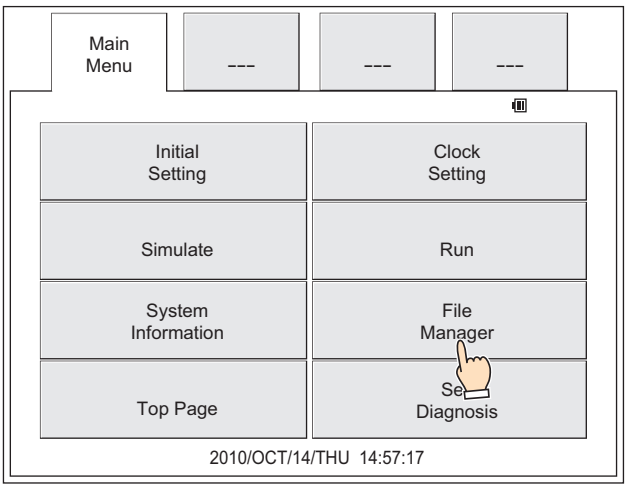
4 Press **Offline**.

The System Menu appears.

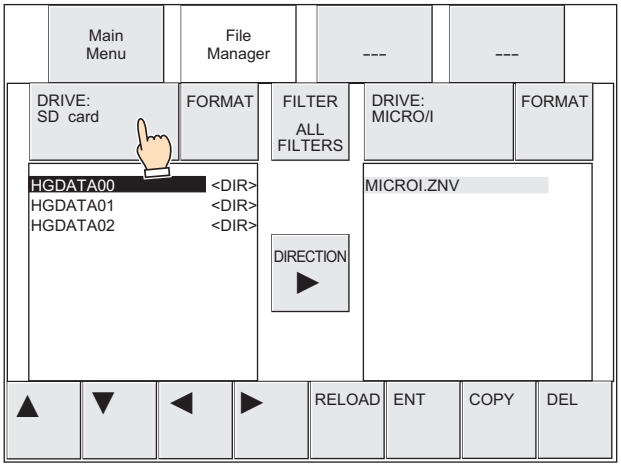


5 Press **File Manager**.

File Manager appears.

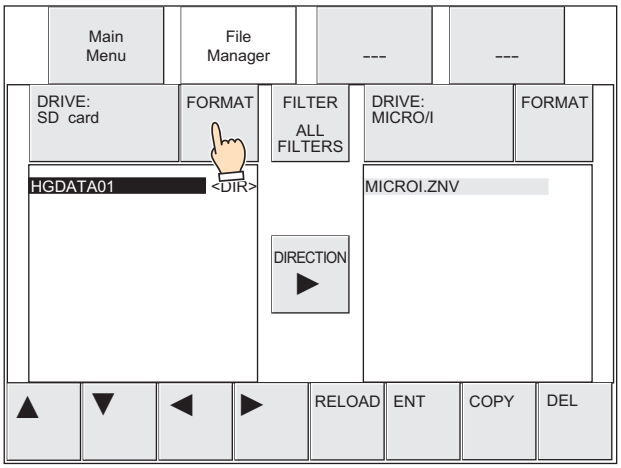


6 Press the source **DRIVE:** and select **SD card**.



7 Press **FORMAT**.

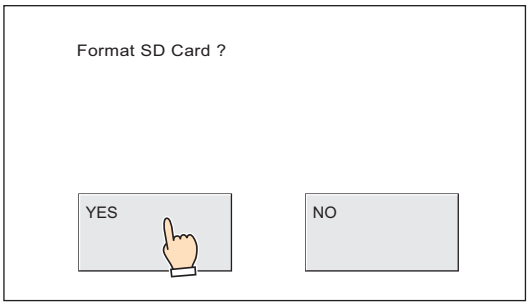
A confirmation message appears.



8 Press **YES**.

MICRO/I starts formatting the SD memory card.

When formatting is complete, the display returns to the File Manager.



1.8 Precautions

- For projects that use memory cards, always insert the memory card before turning the MICRO/I on.
- The maximum number of screenshots that can be captured can be set in HG Special Registers LSD65.
- Memory cards have a limitation on the number of writes allowed. Regularly backup data on the memory card.
- Never turn the power off or remove the memory card while reading/writing to it. Otherwise, the data on the memory card may be destroyed. Should this occur, reformat the memory card.
- Perform one of the following actions before turning power off to the MICRO/I, or removing the memory card.
  - After setting HG special relay LSM20 to 1, check that HG special relay LSM21 is 0. Then remove the memory card.
  - For models HG2F/3F/4F, press the Access Pause button. The Access Lamp begins to blink and when reading/writing to the CF card stops, the lamp goes out. Then, remove the CF card.
- When a read/write failure occurs with the memory card, HG special register LSD42 is set with the error status. For details about the error, refer to Chapter 32 "2 Internal MICRO/I Devices" on page 32-2.
- If your computer does not have a memory card slot, an external memory card reader is required to read/write to the memory card.
- If an unusable memory card is inserted, the error message "This CF card (SD Memory Card) not available" appears.
- Altering folders and files in the Memory Card Folder on the memory card will make the memory card unusable in MICRO/I and WindO/I-NV2.

2 USB Flash Drives

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 USB Flash Drive Functions

The following functions are available when a USB flash drive is inserted in the MICRO/I.

- USB Autorun function
  ☞ Refer to "2.3 Overview of the USB Autorun Function" on page 30-26.

- USB Popup Screen function
  ☞ Refer to "2.7 USB Popup Screen Function" on page 30-40.

- Transferring projects and PLC programs, and copying files
  ☞ Refer to Chapter 28 "Data Transfer Function" on page 28-1.

2.2 Specifications

Models HG2G-5F, HG3G/4G support USB flash drives with the following specifications:

- Max capacity 32 GB.

- Compatible with FAT16 or FAT32 formatted USB flash drives.

- The maximum file size that can be read and written is 256 MB.

- Character set support only for alphanumeric characters.

- File names may be up to 120 characters long. (Includes file extensions.)

- File paths may be up to 250 characters long. (Includes file extensions and drive characters.)

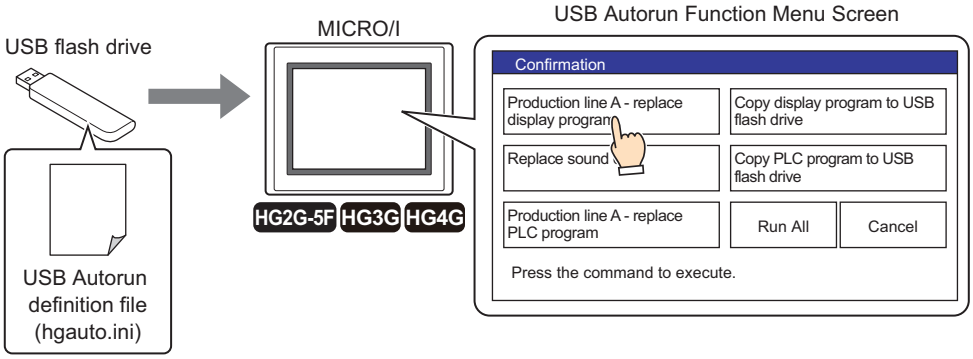
- Drive letters cannot contain the following characters:
  \ " & ( ) * + , . / : ; < > [ ] = | ^

- File and directory names cannot contain the following characters:
  \ / : * ? " < > |

Check the IDEC web site for more information about compatible USB flash drives.

2.3 Overview of the USB Autorun Function

The USB Autorun function automatically displays a menu screen from which the user can execute predefined commands when a USB flash drive is inserted into the MICRO/I.

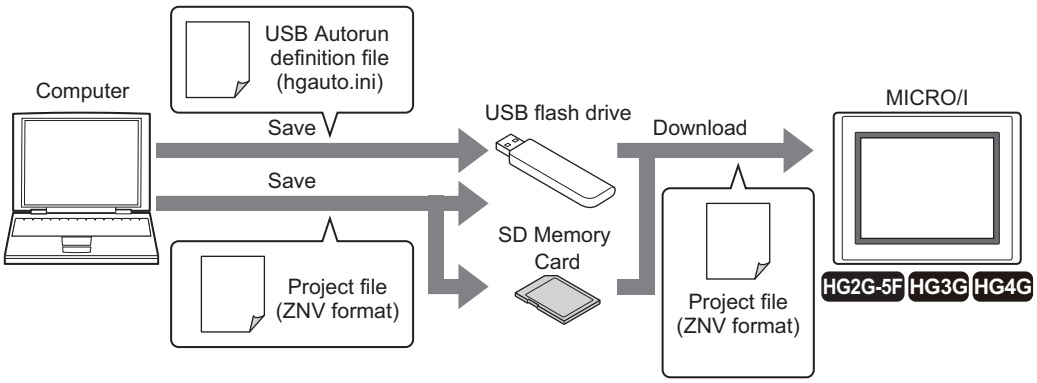


- This allows operators to change project files and PLC programs without using a computer.
- These defined processes are called commands, and the file that contains the details of the command and menu screen is called the USB Autorun definition file (hgauto.ini).
- A USB Autorun definition file (hgauto.ini) must be stored on the USB flash drive to use the USB Autorun function.
- An SD memory card can be used as the destination for saving project files (ZNV format) , PLC program files (ZLD format), and for copying files.

The commands that can be executed with the USB Autorun function are as follows.

● Downloading a project file

Downloads a project file (ZNV format) saved on a USB flash drive or an SD memory card to the MICRO/I.

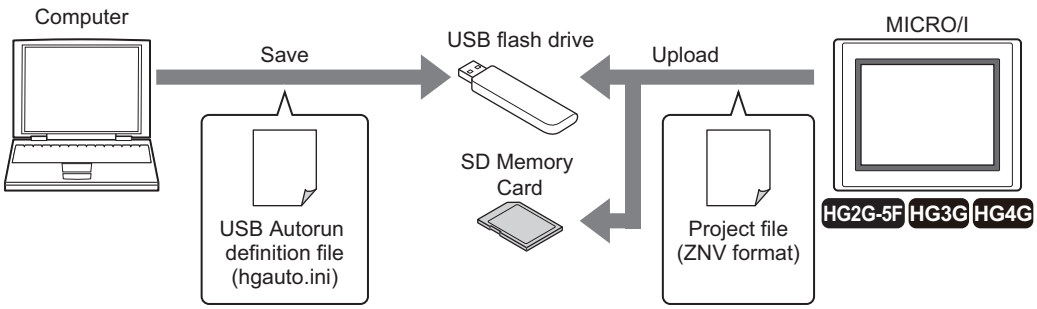


When the download is complete, the MICRO/I will reset and start running from the beginning of the project that was just downloaded.

Refer to Chapter 28 "1 Project Transfer Function" on page 28-1 for important notes and limitations.

● Uploading a project file

Uploads the project file (ZNV format) used to operate the MICRO/I and saves it to a USB flash drive or an SD memory card.

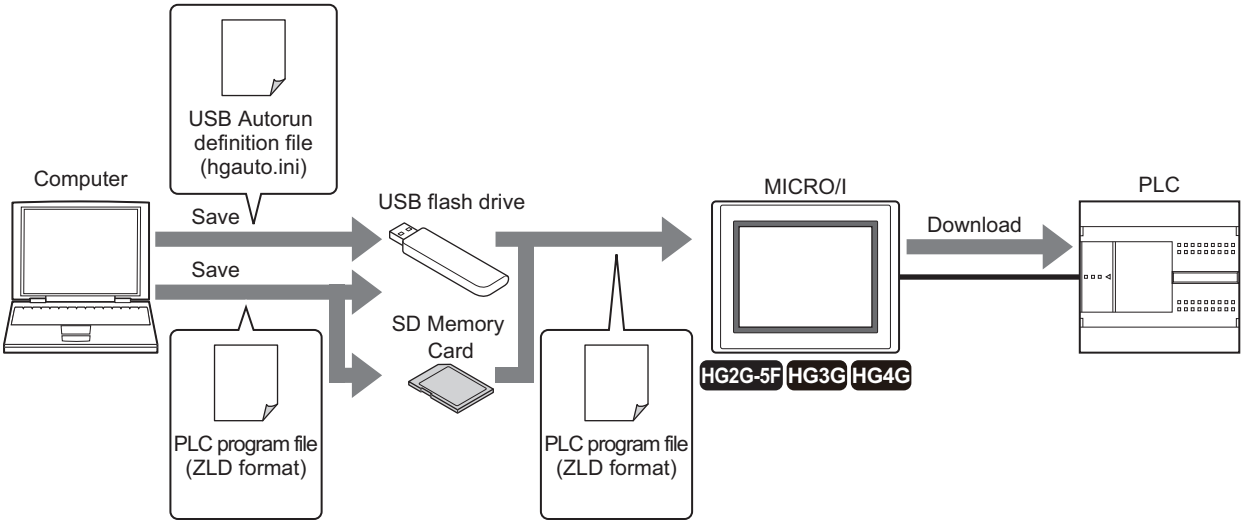


When the upload is complete, the MICRO/I will reset and start over at the beginning of the project.

Refer to Chapter 28 "1 Project Transfer Function" on page 28-1 for important notes and limitations.

● Downloading a PLC program file

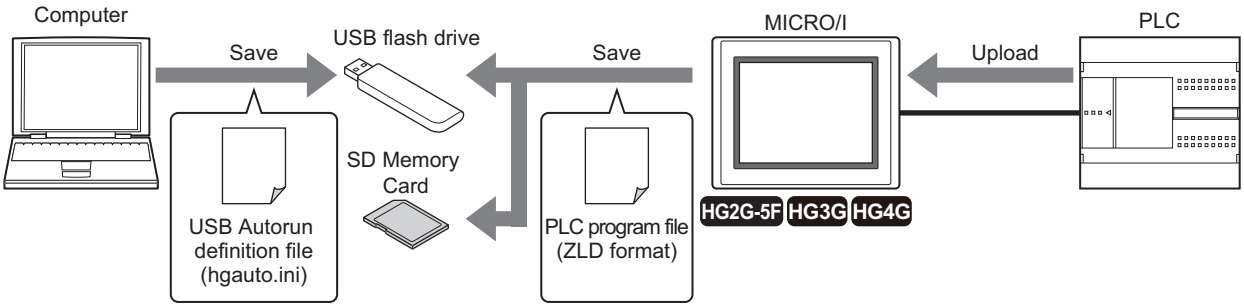
Downloads a PLC program file (ZLD format) saved on a USB flash drive or an SD memory card to the PLC connected to the MICRO/I.



Refer to Chapter 28 "2 PLC Program Transfer Function" on page 28-20 for compatible PLCs, important notes, and limitations.

● Uploading a PLC program file

Uploads the PLC program from the PLC connected to the MICRO/I and saves it in ZLD format to an SD memory card or a USB flash drive.



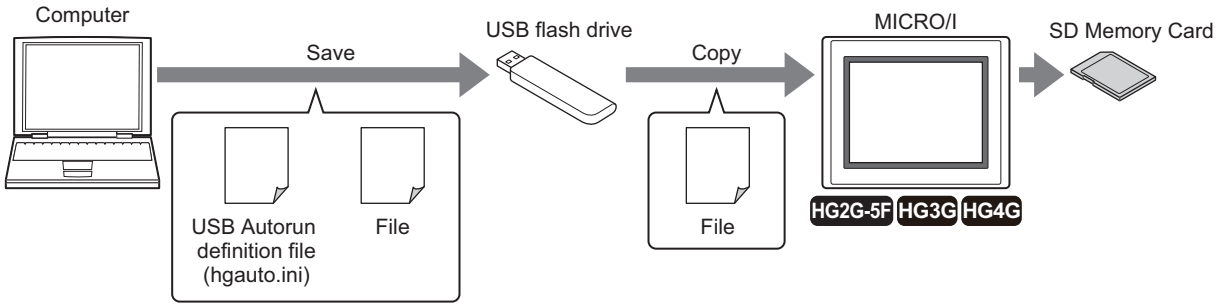
Refer to Chapter 28 "2 PLC Program Transfer Function" on page 28-20 for compatible PLCs, important notes, and limitations.

● Copy files

Copies files between the USB flash drive and SD memory card inserted in the MICRO/I.

USB flash drive -> SD memory card

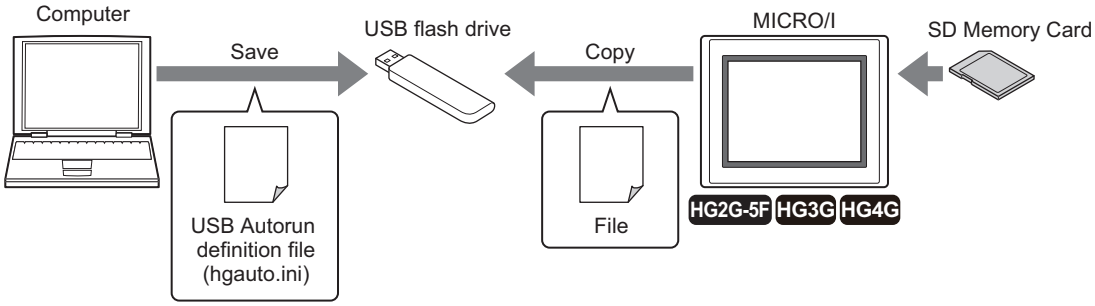
Copies files saved on the USB flash drive to the SD memory card inserted in the MICRO/I.



Refer to Chapter 28 "3 File Copy Function" on page 28-33 for important notes and limitations.

SD memory card -> USB flash drive

Copies files saved on the SD memory card inserted in the MICRO/I to the USB flash drive.



Refer to Chapter 28 "3 File Copy Function" on page 28-33 for important notes and limitations.

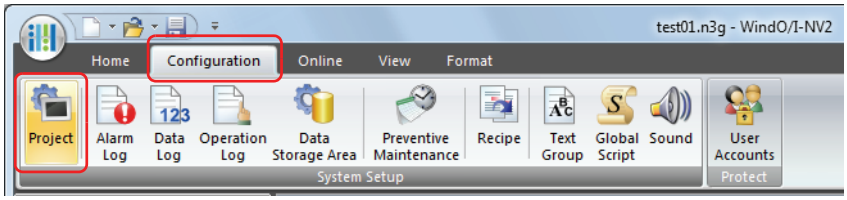
2.4 USB Autorun Function Configuration Procedure

● Executing commands using the USB Autorun function

Configuration Procedure

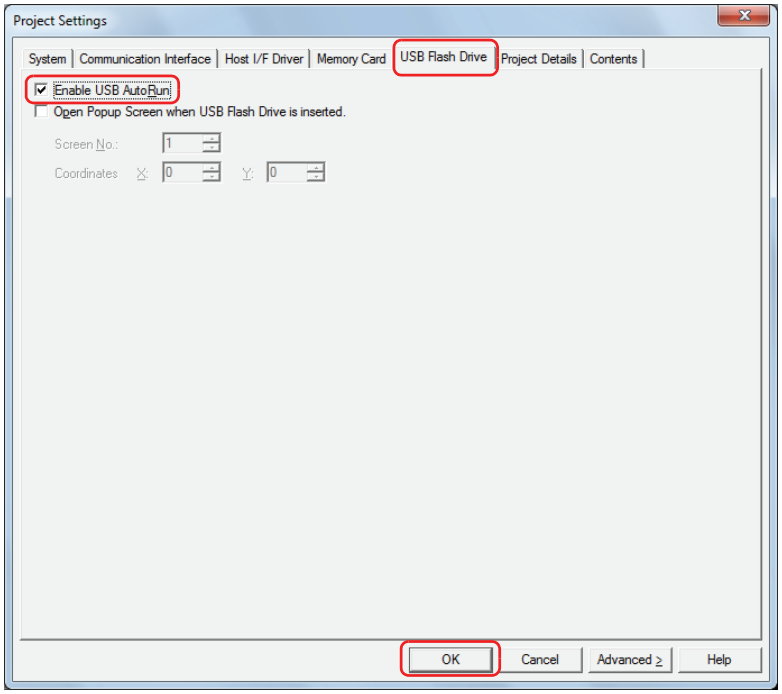
1 On the **Configuration** tab, in the **System Setup** group, click **Project**.

The Project Settings dialog box appears.



2 On the **USB Flash Drive** tab, select the **Enable USB Autorun** check box and click **OK**.

For details, refer to Chapter 4 "3.11 USB Flash Drive Tab" on page 4-58.

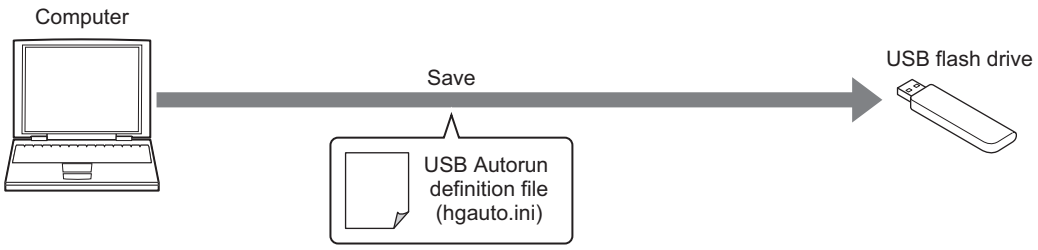


- If the USB Autorun function of the MICRO/I is not enabled, the menu screen will not be displayed, even if a USB flash drive is inserted into the MICRO/I.
- Once the USB Autorun function of the MICRO/I is enabled, the function will remain enabled until either a project file with the **Enable USB Autorun** check box unchecked is downloaded, or the function is disabled via the System Mode.

When enabling the USB Autorun function using the MICRO/I, on the Top Page in the System Mode, press **Offline**, **Initial Setting**, **System Operation**, and then press **Autorun**.

3 Create a USB Autorun definition file (hgauto.ini) and save it on the USB flash drive.

For details, refer to "2.5 Creating a USB Autorun Definition File" on page 30-32.



4 Prepare the necessary files and store them on the USB flash drive or SD memory card.

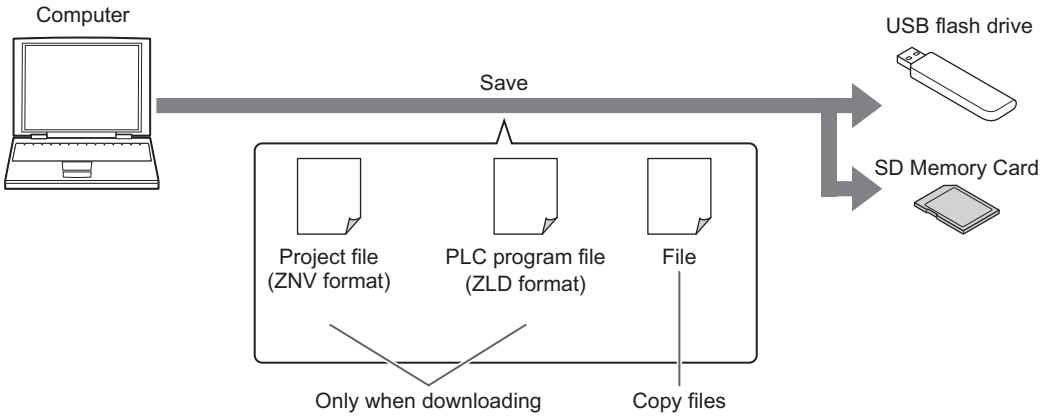
If the necessary files are stored on an SD memory card, make sure to insert it into the MICRO/I before using it for uploading or copying.

The necessary files are as follows.

- To download a project file
  Create a project file (ZNV format).
  For details, refer to Chapter 28 "1.3 Converting Project Data for Transfer" on page 28-3.

- To download an IDEC PLC program
  Create a PLC program file (ZLD format).
  For details, refer to Chapter 28 "2.4 Converting PLC Program Files for Transfer" on page 28-22.

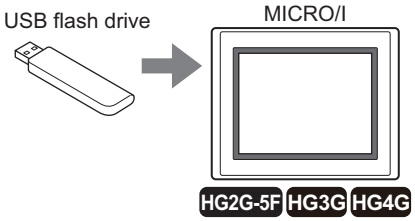
- To copy files
  Create the file to be copied.



Operating Procedure

1 Insert the USB flash drive into the MICRO/I.

The menu for the USB Autorun function appears.

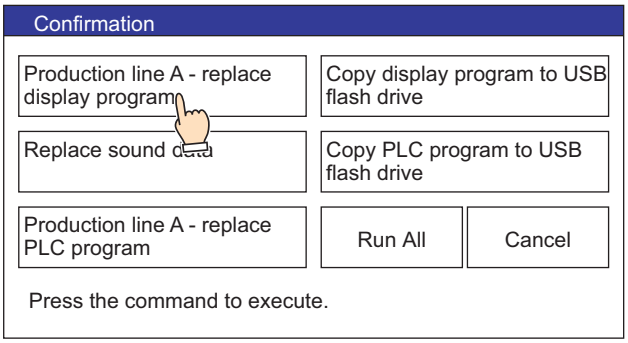


If the menu screen does not appear, follow these troubleshooting tips. Correct the problem and re-insert the USB flash drive.

Cause:	USB Autorun definition file (hgauto.ini) does not exist on the USB flash drive.
Correction:	Create a USB Autorun definition file and save it on the USB flash drive. For details, refer to "2.5 Creating a USB Autorun Definition File" on page 30-32.
Cause:	The USB Autorun definition file (hgauto.ini) contains an error.
Correction:	For details, refer to "2.5 Creating a USB Autorun Definition File" on page 30-32.
Cause:	The USB Autorun function is disabled in the MICRO/I settings.
Correction:	Enable the USB Autorun function by referring to Steps *1* and *2* on page 30-29.

2 Press the command to execute.

The command executes.

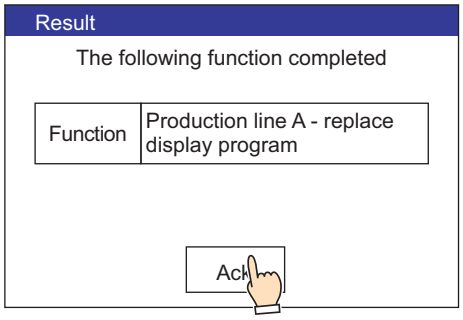


Pressing **Run All** causes all commands defined in the USB Autorun definition file (hgauto.ini) to execute one by one.

- If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password.
  For details, refer to "2.6 USB Autorun Function Security" on page 30-39.
- When uploading/downloading IDEC PLC program files to a password-protected PLC, a dialog appears for you to enter the password.
- Do not remove the USB flash drive or SD memory card while command is executing.

3 When the command finishes executing, a screen appears indicating the execution result.

Press **Ack** to close the execution result screen and display the menu screen.



If a command executes with a button (except the **Run All**), the menu screen is displayed after pressing **Ack** on the execution result dialog.

2.5 Creating a USB Autorun Definition File

The menu screen that appears when a USB flash drive inserted in the MICRO/I is defined in the USB Autorun definition file.

The USB Autorun definition file is created using the following methods.

- Created with the USB Autorun definition file creation tool
  ☞ Refer to USB Autorun Definition File Creation Tool manual.

- Created with the text editor
  ☞ Refer to "Created using the text editor" on page 30-32.

● Created using the text editor

You create this file using Notepad or any commercially available text editor. Fill in the items in each section and save the file with the name "hgauto.ini".

The USB Autorun definition file has these 3 sections.

Enter the items and definitions for each section.

[AUTORUN] section (required)
Specify the number of command items, enable/disable the buttons, and the display language to use.

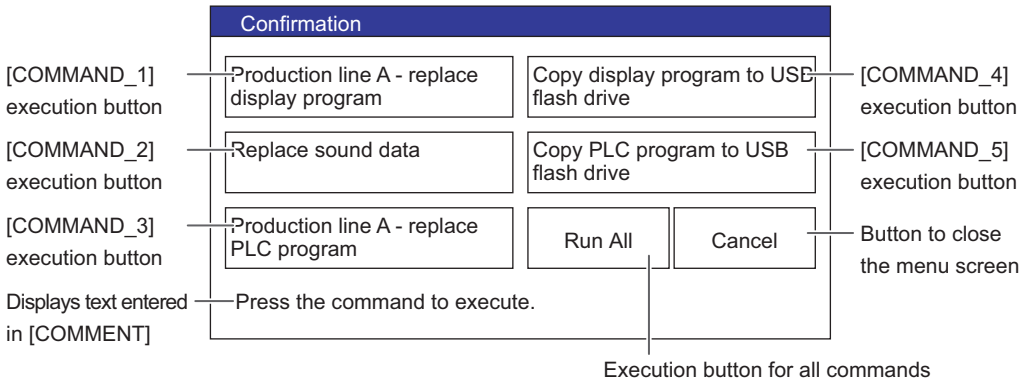
```
[AUTORUN]
item = 5
button_command = Enable
button_runall = Enable
language = English
```

[COMMAND] section (required)
Specify the command to execute and its parameters. Create buttons to execute the number of commands specified in the [AUTORUN]: section from [COMMAND_1] to [COMMAND_5], in that order.

```
[COMMAND_1]
command = PRO_DOWNLOAD
src_path = "B:\NV2DATA\HG_PROJECT.ZNV"
reset_keep_device = Enable
title = "Production line A - replace display program"
.
:
:
:
[COMMAND_5]
command = LDR_UPLOAD
dst_path = "B:\Uploaded_Program"
src_port = COM1
src_net_no = 0
title = "Copy PLC program to USB flash drive"
```

[COMMENT] section
Enter text to display, as necessary, at the bottom of the menu screen.

```
[COMMENT]
comment = "Press the command to execute."
```



[AUTORUN] section

■ **item (required)**

Specify the number of commands used from 1 to 5. The USB Autorun function will fail to execute if a value other than 1 to 5 is specified.

■ **button_command**

Specify whether to enable/disable the execution buttons for [COMMAND_1] to [COMMAND_5].

Enable: enables the button.
Disable: disables the button.

If this item is left blank or contains an illegal value, the MICRO/I assumes "Enable".

■ **button_runall**

Specify whether to enable/disable the execution buttons for **Run All**.

Enable: enables the button.
Disable: disables the button.

If this item is left blank or contains an illegal value, the MICRO/I assumes "Enable".

■ **language**

Specify the language to use for the button labels and messages.

Japanese: Shift-JIS
European: English
Chinese: GB2312
Taiwanese: BIG5
Korean
Central European
Baltic
Cyrillic

If this item is left blank or contains an illegal value, the MICRO/I assumes "Japanese".

[COMMAND] section

■ **command (required)**

Specify the command to execute.

PRO_DOWNLOAD: Download a project file
PRO_UPLOAD: Upload a project file
LDR_DOWNLOAD: Download a PLC program file
LDR_UPLOAD: Upload a PLC program file
FILE_COPY: Copy a file

The items required differ for each command except for the "title" item.

command = PRO_DOWNLOAD

- **src_path (required)**
  Specify the path (250 or less characters) where the project file is to be downloaded.
  Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

- **reset_keep_device**
  Specify whether to initialize the keep devices or not when the project file is downloaded. However, when project data that changes the settings of the data storage area is downloaded, the keep devices are always initialized.

Enable:	Initializes the keep devices.
Disable:	Does not initialize the keep devices.

If this item is left blank or contains an illegal value, the MICRO/I assumes "Enable".

command = PRO_UPLOAD

- **dst_path (required)**
  Specify the path to the folder (250 or less characters) where the uploaded project file will be saved.
  Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

command = LDR_DOWNLOAD

- **src_path (required)**
  Specify the path (250 or less characters) where the PLC program file is to be downloaded.
  Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

- **dst_port (required)**

  Specify the name of the MICRO/I port to which the PLC to download from is connected.

COM1:	Serial interface (COM1) (D-sub 9-pin)
COM2:	Serial interface (COM2) (terminals)
ETHER:	Ethernet interface (LAN)

- **dst_net_no (required when specifying the destination as a network number or station number)**
  Specify the network number or station number of the download destination PLC. Specify the same number set as the network number or station number for the PLC.

- **dst_plc_ip (required when specifying the destination as an IP address)**
  Specify the IP address of the download destination PLC.
  Example: dst_plc_ip = 192.168.0.1

- **dst_plc_port**
  Specify the port number of the download destination PLC.
  Example: dst_plc_port = 2101

When specifying the destination as an IP address and this item is left blank or contains an illegal value, the MICRO/I assumes that the value is "2101". This item is not required when specifying the destination as a network number or station number.

command = LDR_UPLOAD

■ **dst_path (required)**
Specify the path to the folder (250 or less characters) where the uploaded PLC program file will be saved.
Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

■ **src_port (required)**

Specify the name of the MICRO/I port to which the PLC to upload from is connected.

COM1:	Serial interface (COM1) (D-sub 9-pin)
COM2:	Serial interface (COM2) (terminals)
ETHER:	Ethernet interface (LAN)

■ **src_net_no (required when specifying the destination as a network number or station number)**
Specify the network number or station number of the upload source PLC. Specify the same number set as the network number or station number for the PLC.

■ **src_plc_ip (required when specifying the destination as an IP address)**
Specify the IP address of the upload source PLC.
Example: src_plc_ip = 192.168.0.1

■ **src_plc_port**
Specify the port number of the upload source PLC.
Example: src_plc_port = 2101

When specifying the destination as an IP address and this item is left blank or contains an illegal value, the MICRO/I assumes that the value is "2101". This item is not required when specifying the destination as a network number or station number.

command = FILE_COPY

■ **src_path (required)**
Specify the path (250 or less characters) of a source file or folder to copy.
Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

- If a file name is specified as the source path name, the specified file is copied.
  If a folder name is specified, all of the files and subfolders contained in the folder, and all of the files in the subfolders, are copied.
- The subfolders can be copied up to five levels.
- To prevent copying the subfolders and the files contained in the subfolders, LSM30 must be set to 1 before executing the copy.
- To stop copying files during the copy operation, write 1 to LSM31. However, it will continue to copy the file until it is finished then it will stop copying.

■ **dst_path (required)**
Specify the destination path in 250 or less characters.
Use "A:\" for an SD memory card and "B:\" for a USB flash drive.

Common items

■ **title**
Enter a title for the button label using 2 lines of 26 characters (total 52 characters) or less.
- A line feed will automatically be added and it can be added where desired. When added in a desired location, \n will be inserted automatically and is thus calculated as 2 single-byte characters.
- When using a semicolon (;), backslash (\), or double quotations ("), an escape character (\) will be automatically inserted before those characters and will thus be calculated as 2 single-byte characters.

[COMMENT] section

■ **comment**
Enter a comment using 6 lines of 54 characters (total 324 characters) or less.
- A line feed will automatically be added but can be added where desired. When added in a desired location, \n will be inserted automatically and is thus calculated as 2 single-byte characters.
- When using a semicolon (;), backslash (\), or double quotations ("), an escape character (\) will be automatically inserted before those characters and will thus be calculated as 2 single-byte characters.

Notes on comments

To add comments to the USB Autorun definition file, use a semicolon (;).

All text after the semicolon (;) and up to the line feed will be treated as a non-executable comments.

Restrictions

- The maximum number of characters per line is 512 single-byte characters including line feed codes.
  All the text on the line will be ignored if there are more than 512 single-byte characters on the line.
- Each item must be described as a single line. If a line feed occurs before the end of the description, all characters after the line feed are ignored.
- The maximum size of the USB Autorun definition file (hgauto.ini) is 512 KB. The file cannot be used if it exceeds this limit.
- Only line feed codes of the format generally supported by Windows (CR+LF) are supported. If any other format is used, the USB Autorun definition file (hgauto.ini) will fail to run properly.

Sample definition file and explanation

Sample definition

```
; sample hgauto.ini
(1) [AUTORUN]
    item = 5                                          ; number of items
    button_command = Enable                           ; enable individual command buttons
    button_runall = Enable                            : enable the "Run All" button.
    language =English                                 ; use English
(2) [COMMAND_1]
    command = PRO_DOWNLOAD                            ; download the project file
    src_path = "B:\HG3G_DEMO_1.ZNV"                   ; source path
    reset_keep_device = Enable                        ; initialize the keep devices
    title = "Production line A - replace display program"  ; button label
(3) [COMMAND_2]
    command = FILE_COPY                               ; copy a file
    src_path = "B:\Error.wav"                         ; source path
    dst_path = "A:\HGDATA01\SOUND"                    ; destination path
    title = "Replace sound data"                      ; button label
(4) [COMMAND_3]
    command = LDR_DOWNLOAD                            ; download PLC program file
    src_path = "B:\LDRDATA\LDR_PROGRAM.ZLD"           ; source path
    dst_port = COM1                                   ; destination port number
    dst_net_no = 0                                    ; destination station number
    title = "Production line A - replace PLC program" ; button label
(5) [COMMAND_4]
    command = PRO_UPLOAD                              ; upload a project file
    dst_path = "B:\Uploaded_Project"                  ; destination path
    title = "Copy display program to USB flash drive" ; button label
(6) [COMMAND_5]
    command = LDR_UPLOAD                              ; Upload a PLC program file
    dst_path = "B:\Uploaded_Program"                  ; destnation path
    src_port = COM1                                   ; source port number
    src_net_no = 0                                    ; source station number
    title = "Copy PLC program to USB flash drive"     ; button label
(7) [COMMENT]
    comment = " Press the command to execute."        ; Message shown at bottom of screen.
```

Explanation

(1) This definition file displays five command execution buttons on the menu screen displayed by the USB Autorun function. It also enables the **Run All** button. All button labels and messages are displayed in English.

[AUTORUN]	Defines the number of commands to use and details about the menu screen.
item = 5	Specifies that five commands will be used.
button_command = Enable	Enables execution buttons for each command from [COMMAND_1] to [COMMAND_5].
button_runall = Enable	Enables the **Run All** button.
language = English	Displays all button labels and messages in English.

(2) Downloading a project file from a USB flash drive to the MICRO/I.

[COMMAND_1]	Defines the command assigned to execution button [COMMAND_1]. This is the first command that executes when **Run All** is pressed.
command = PRO_DOWNLOAD	Executes "Download a project file".
src_path = "B:\HG3G_DEMO_1.ZNV"	Downloads the project file "HG3G_DEMO_1.ZNV" saved on the USB flash drive (B:) to the MICRO/I.
reset_keep_device = Enable	Initializes the keep devices.
title = "Production line A - replace display program"	Displays the text "Production line A - replace display program" as the button label.

(3) Copying a sound file from a USB flash drive to an SD memory card.

[COMMAND_2]	Defines the command assigned to execution button [COMMAND_2]. This is the second command that executes when **Run All** is pressed.
command = FILE_COPY	Executes "File Copy".
src_path = "B:\Error.wav"	Copies the sound file "Error.wav", saved on the root directory of the USB flash drive (B:), to the "SOUND" folder under "HGDATA01" on the SD memory card (A:) inserted in the MICRO/I.
dst_path = "A:\HGDATA01\SOUND"	
title = "Replace sound data"	Displays the text "Replace sound data" as the button label.

(4) Downloading a PLC program from the USB flash drive to the PLC connected to the MICRO/I.

[COMMAND_3]	Defines the command assigned to execution button [COMMAND_3]. This is the third command that executes when **Run All** is pressed.
command = LDR_DOWNLOAD	Executes "Download a PLC program".
src_path = "B:\LDRDATA\LDR_PROGRAM.ZLD"	Downloads the "LDR_PROGRAM.ZLD" PLC user program stored in the "LDRDATA" folder of the USB flash drive (B:) to the PLC (station number 0) connected to the MICRO/I's COM1 port.
dst_port = COM1	
dst_net_no = 0	
title = "Production line A - replace PLC program"	Displays the text "Production line A - replace PLC program" as the button label.

(5) Uploading a project to a USB flash drive.

[COMMAND_4]	Defines the command assigned to execution button [COMMAND_4]. This is the fourth command that executes when **Run All** is pressed.
command = PRO_UPLOAD	Executes "Upload a project file".
dst_path = "B:\Uploaded_Project"	Uploads the project file used to operate the MICRO/I and saves it to the folder "Uploaded_Project" on the USB flash drive (B:).
title = "Copy display program to USB flash drive"	Displays the text "Copy display program to USB flash drive" as the button label.

(6) Uploading a PLC program file to a USB flash drive.

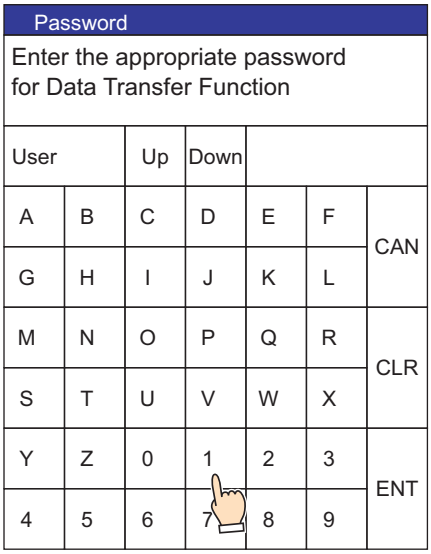
[COMMAND_5]	Defines the command assigned to execution button [COMMAND_5]. This is the fifth command that executes when **Run All** is pressed.
command = LDR_UPLOAD	Executes “Upload a PLC program file”.
dst_path = "B:\Uploaded_Program"	Uploads the PLC program file running on the PLC (station number 0) connected to the MICRO/I's COM1 port, and saves it in the folder “Uploaded_Program” on the USB flash drive (B:).
src_port = COM1	
src_net_no = 0	
title = "Copy PLC program to USB flash drive"	Displays the text “Copy PLC program to USB flash drive” as the button label.

(7) Displays messages below the menu screen for the USB Autorun function.

[COMMENT]	Defines the number of commands to use and details about the menu screen.
comment = "Press the command to execute."	Displays the text “Press the command to execute.” below the menu screen.

2.6 USB Autorun Function Security

If security has been enabled for the MICRO/I project, MICRO/I displays a password entry dialog box when the USB Autorun function runs.



Select the user name from the security group that has command execution permissions, enter the password, and press **ENT**.

● Execution privileges by security groups

The commands that can be executed differ depending on the security group.

Command	Security Group		
	Administrator	**Operator**	**Reader**
Downloading a project file	YES	NO	NO
Uploading a project file	YES	NO	NO
Downloading a PLC program file	YES	NO	NO
Uploading a PLC program file	YES	NO	NO
Copying files (USB flash drive to SD memory card)	YES	YES	NO
Copying files (SD memory card to USB flash drive)	YES	YES	YES

■ **Example 1: If these two commands are used in the USB Autorun definition file (hgauto.ini).**

Downloading a project file

Copying files (SD memory card to USB flash drive)

The types of user accounts required to execute these commands is given below.

Downloading a project file:	Administrator
File copying (SD memory card to USB flash drive):	Administrator, Operator, or Reader
Pressing the **Run All** button:	Administrator

The password for the command with the highest security level listed in the USB Autorun definition file (hgauto.ini) must be entered to execute all commands by pressing the **Run All** button. In the example above, a user account from the Administrator security group is required.

■ **Example 2: If the USB Autorun definition file (hgauto.ini) only contains the file copy command (SD memory card -> USB flash drive)**

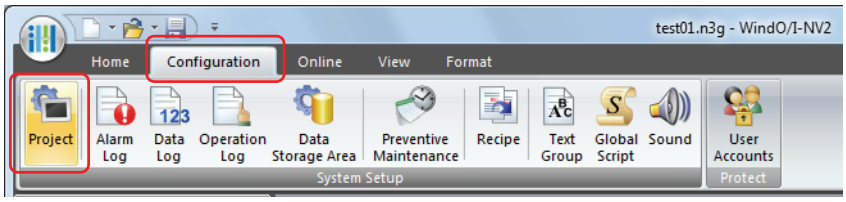
A user account from the Administrator, Operator, or Reader security group is required.

If operator presses **CAN** instead of entering a password, no commands are executed and the menu screen closes. To re-execute the USB Autorun function, insert the USB flash drive again.

2.7 USB Popup Screen Function

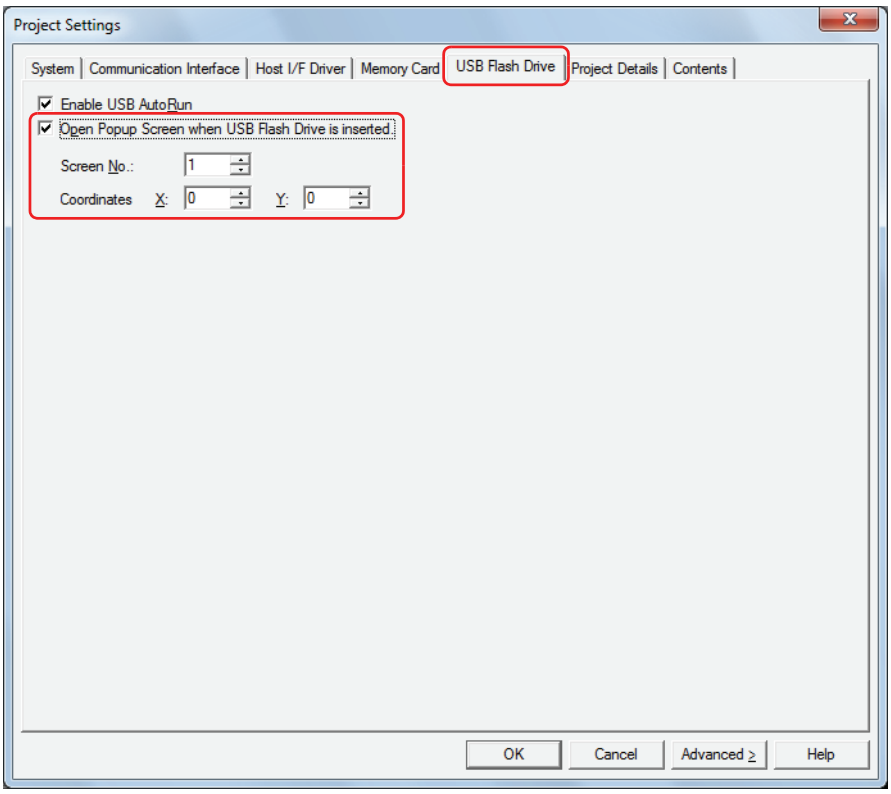
The USB Popup Screen function displays a specific screen by simply inserting a USB flash drive in the MICRO/I. This provides an easy way to display a message when the operator inserts a USB flash drive.

1 On the **Configuration** tab, in the **System Setup** group, click the **Project**.
The Project Settings dialog box appears.

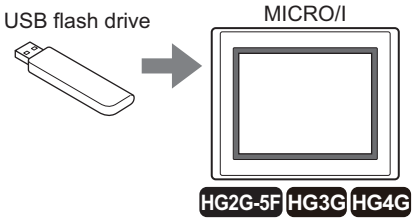


2 On the **USB Flash Drive** tab, select the **Open Popup Screen when USB Flash Drive is inserted** check box.

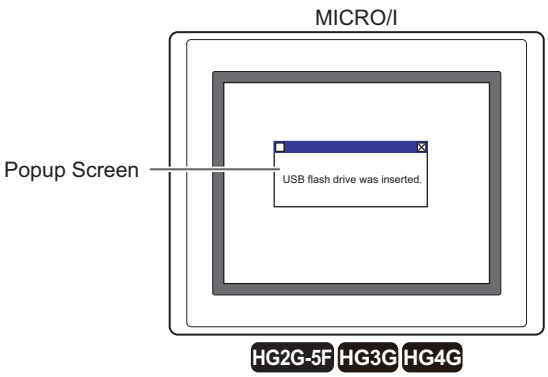
3 Specify the **Screen No.** of the Popup Screen to display, and the **Coordinates**, then click **OK**.
For details, refer to Chapter 4 "3.11 USB Flash Drive Tab" on page 4-58.



4 Insert the USB flash drive into the MICRO/I.



The Popup Screen appears.



If security is enabled for the Popup Screen that is displayed by the USB Popup Screen function, a dialog appears for you to enter a user name and password.
For details, refer to "2.6 USB Autorun Function Security" on page 30-39.

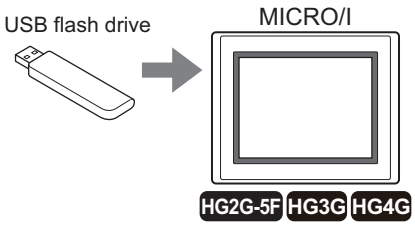
When the USB Popup Screen function is enabled, if the USB flash drive contains a definition file (hgauto.ini) for use with the USB Autorun function, both functions will appear on the menu screen.

2.8 Formatting the USB Flash Drive

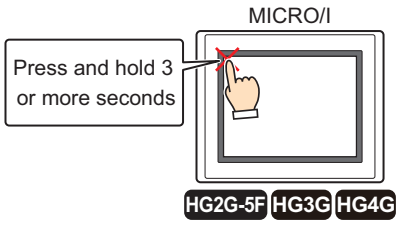
USB flash drives inserted in MICRO/I can be formatted by using the System Menu on the MICRO/I.

Always format the USB flash drive using the format command on the System Menu on the MICRO/I.

1 Insert the USB flash drive into the MICRO/I.

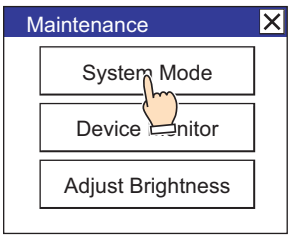


2 Press and hold the upper left corner of the MICRO/I screen for 3 or more seconds.
The Maintenance Screen appears.



3 Press the **System Mode**.

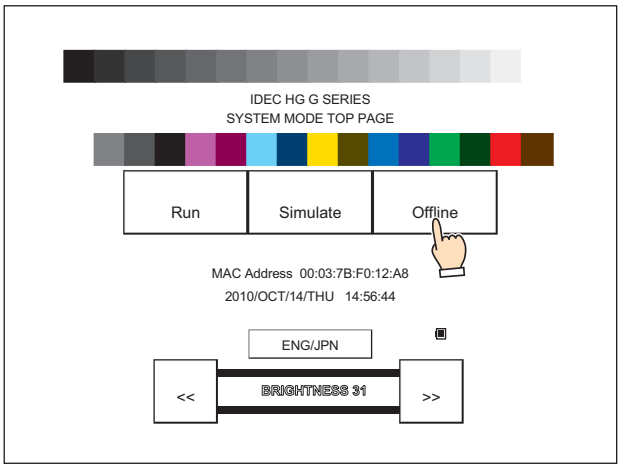
MICRO/I switches to System Mode.



If security is enabled for the project on MICRO/I, a dialog appears for you to enter a user name and password.
For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

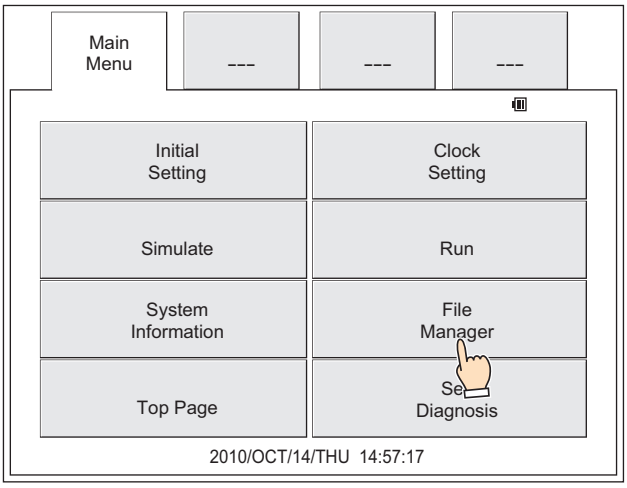
4 Press the **Offline**.

The System Menu appears.

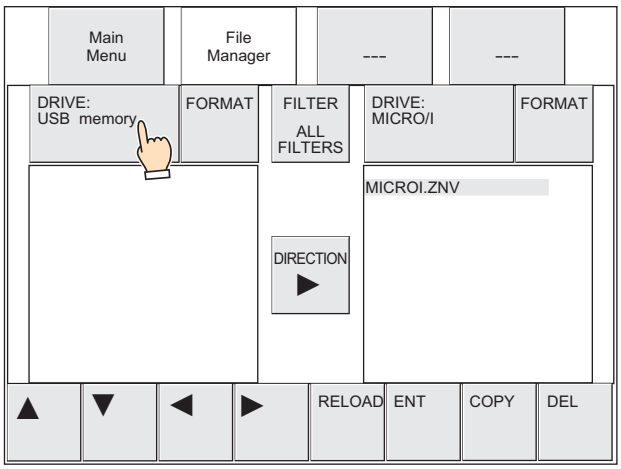


5 Press the **File Manager**.

File Manager appears.

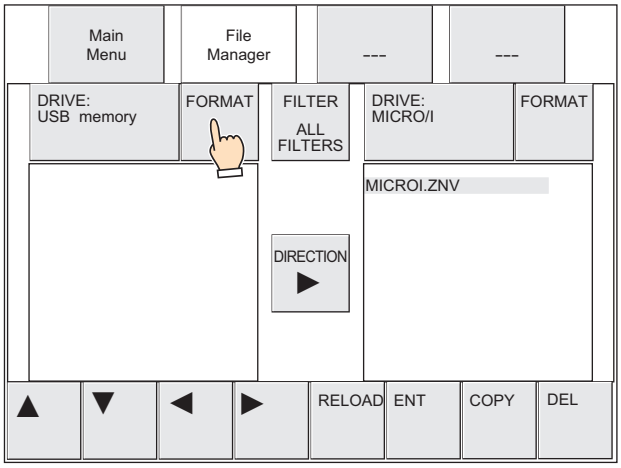


6 Press the source **DRIVE:** and select **USB memory**.



7 Press **FORMAT**.

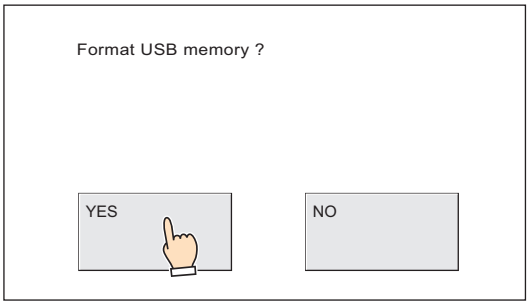
A confirmation message appears.



8 Press **YES**.

MICRO/I starts formatting the USB flash drive.

When formatting is completed, the display returns to the File Manager.



2.9 Precautions

- USB flash drives have a limitation on the number of times they can be written to.
  Regularly backup data on the USB flash drive.
- Never turn the power off or remove the USB flash drive while reading/writing to it. Otherwise, the data on the USB flash drive may be destroyed. Should this occur, reformat the USB flash drive.
- Multiple USB flash drives cannot be used at the same time.
- Before turning off the power to the MICRO/I or before removing the USB flash drive, set HG special relay LSM18 to 1 and check that HG special relay LSM19 is 0.
- The message **Saving USB flash drive** appears while reading or until writing stops.
  To resume reading/writing to the USB flash drive, re-insert it.
- If an unusable USB flash drive is inserted, the error message **USB flash drive not available** appears.
- Do not alter project files (ZNV format) and PLC program files (ZLD format). Altered files cannot be used with MICRO/I or PLCs.
- Do not connect the USB flash drive to the MICRO/I through a USB hub.

Chapter 31 Printer

This chapter describes the functions of the MICRO/I when using a printer, and how to connect it.

1 Functions and Connections

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Functions Available with the Printer

These functions are available when a printer is connected to the MICRO/I.

- Printing screenshots
  ☞ Refer to Chapter 8 "4 Print Button" on page 8-51, and Chapter 12 "4 Print Command" on page 12-25.

- Printing alarm logs
  ☞ Refer to Chapter 13 "Alarm Log Function" on page 13-1.

1.2 Functions by MICRO/I Model

The functions available differ depending on the MICRO/I model.

MICRO/I functions	HG2G-5F, HG3G/4G	HG1F/2S	HG2F		HG3F/4F	
	USB	Serial Interface 2	Serial Interface 2	USB	Serial Interface 2	Parallel Interface
Printing screenshots	YES	YES	YES	YES	YES	YES
Printing alarm logs (Batch output)						
Printing alarm logs (Real Time output)	NO					

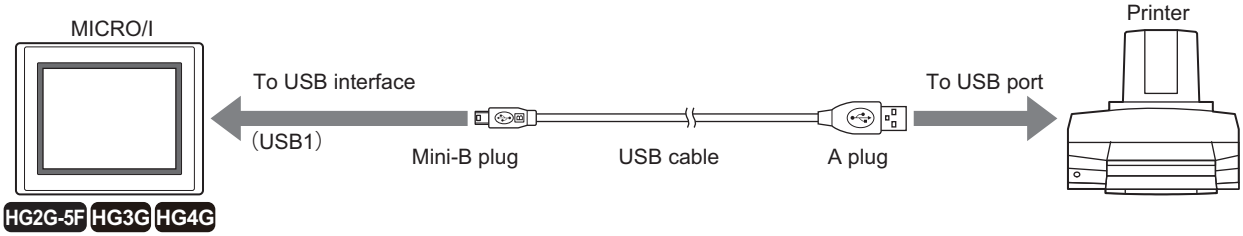
1.3 Connecting a Printer to MICRO/I

The connection method differs depending on the model of the MICRO/I and the interfaces supported on the MICRO/I and printer.

Do not disconnect the cable between the MICRO/I and printer while printing.

● HG2G-5F, HG3G/4G

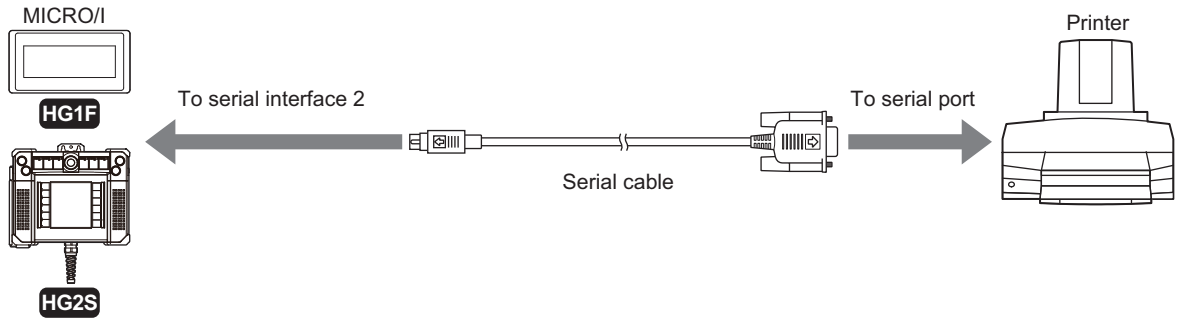
Connect the USB interface (USB1) on the MICRO/I and the USB port on the printer with a USB cable.



- Do not use a USB hub when connecting to the printer with a USB cable.
- Printed images may appear differently depending on the printer used. Always check the image by printing an actual image.

● HG1F/2S

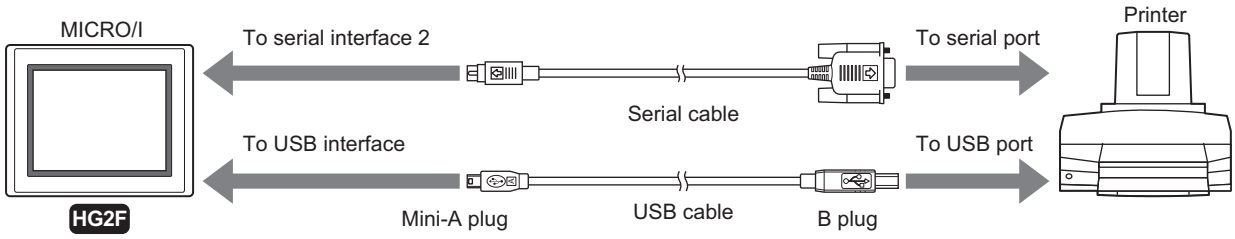
Connect serial interface 2 on the MICRO/I and the serial port on the printer with a serial cable.



● HG2F

Use either method below to make the connection.

- Connect the USB interface on the MICRO/I and the USB port on the printer with a USB cable.
- Connect serial interface 2 on the MICRO/I and the serial port on the printer with a serial cable.

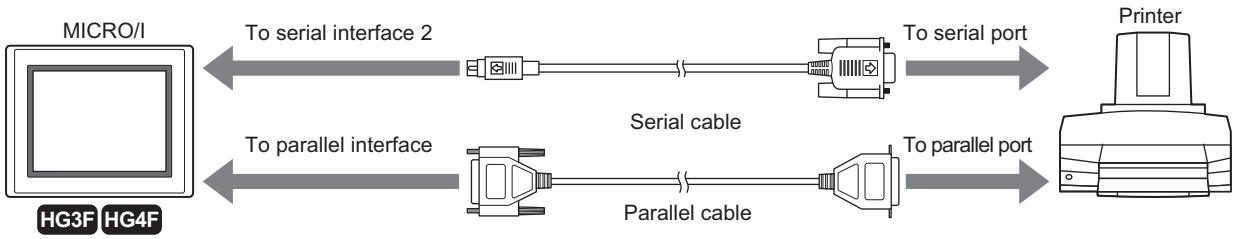


Do not use a USB hub when connecting to the printer with a USB cable.

● HG3F/4F

Use either method below to make the connection.

- Connect serial interface 2 on the MICRO/I and the serial port on the printer with a serial cable.
- Connect the parallel interface on the MICRO/I and the parallel port on the printer with a parallel cable.



1.4 Supported Printers

Printers supported differ based on the MICRO/I model.

Control codes/ Manufacturer/ Standard	Supported printers	HG2G-5F, HG3G/4G	HG1F/2S	HG2F		HG3F/4F	
		USB	Serial Interface 2	Serial Interface 2	USB	Serial Interface 2	Parallel Interface
ESC/P	Printers supporting ESC/P control codes Tested printers (As of Sep. 2006) • Seiko Epson MJ-6000C, LP-2500, VP-700 • Canon BJ M70	NO	YES (VP-700)	YES (VP-700)	NO	YES (VP-700)	YES
PC-PR	Printers supporting PC/PR control codes Tested printers (As of Sep. 2006) • Seiko Epson MJ-6000C, VP-700	NO	YES (VP-700)	YES (VP-700)	NO	YES (VP-700)	YES
PCL	Printers supporting PCL control codes Tested printers (As of Sep. 2006) • Hewlett-Packard Company deskjet 3820	NO	NO	NO	NO	NO	YES
SII	Seiko Instruments (As of Sep. 2006) DPU-414	NO	YES	YES	NO	YES	YES
ESC/P Raster	Seiko Epson PX-V600, PX-V630 (EPSON Stylus C83, C84, C87, C88, D88) Tested printers (As of Sep. 2006) • PX-600, PX-V630, Stylus C84	NO	NO	NO	YES	NO	YES
PictBridge	Printers certified with the PictBridge logo	YES	NO	NO	NO	NO	NO

Always test any printer not listed in the above chart before using it.

2 Setting and Monitoring the Printer

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 Setting the Printer

When printing, specify printer settings such as; control code, paper size, and ink color on the **Printer** tab of the Project Settings dialog box.

For details, refer to Chapter 4 "3.9 Printer Tab" on page 4-55.

Some functions may not be available depending on how the **Printer Code/Manufacturer** options are configured.

- Color printing is not supported when **PCL** is selected. Pages are not ejected on HP printers if printing is canceled after starting it with the Print Button or print command. Eject the page using the printer controls before continuing. Otherwise, printing will resume from where it was canceled.
- If **SII** is selected, print color is always set to monochrome even if **Print Color** is set to **Color** or **Gray Scale**.
- If **ESC/P** is selected, a 24-pin dot matrix printer can be used. 9-pin dot matrix printers are not supported. ESC/P2 and ESC/Page control codes are also supported.
- If **PictBridge** is selected, use a PictBridge printer that supports A4 or Letter paper sizes.
  When the edge of the data is not printed, enable **No Trimming** and **Bordered** in the printer's settings.
  The color cannot be configured. To print in monochrome, configure the print color on the printer that is used.
- When connecting the HG2G-5F, HG3G/4G to a printer, an error may occur on the printer side as an unsupported device, but data is sent that satisfies the PictBridge standard when printing, so it can be printed correctly.

2.2 Monitoring the Printer

To monitor the status of the printer, use the System Area.

For details, refer to Chapter 4 "System Area 2" on page 4-34.

Printer busy

When the printer is printing, bit 3 at the system area address +3 will turn ON.

Printing timeout error

If an error occurs while the printer is printing, bit 9 at the system area address +2 will turn ON.

Chapter 32 Internal Devices

1 Overview

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The display operation of the MICRO/I is generally set to be controlled by the state of the host devices, and the MICRO/I devices are not normally used.

However, since the data resulting from commands and parts are stored temporarily in internal relays and registers, the MICRO/I does required internal devices of its own.

2 Internal MICRO/I Devices

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The MICRO/I contains the following internal devices.

Internal Device Name	Symbol	B/W	R/W	Address Range	Base
HG Internal Relay	LM	B	R/W	0 to 2047	10
HG Keep Relay	LK	B	R/W	Variable	10
HG Temporary Relay	LBM	B	R/W	0 to 127	10
HG Special Relay	LSM	B	R/W	0 to 63	10
HG Timer Relay	LTC	B	R	0 to 31	10
HG Expansion Input (Bit)	LPX	B	R	0 to F	16
HG Expansion Output (Bit)	LPY	B	R/W	0 to F	16
HG Input (Bit)*1	LX	B	R	0 to 3	16
HG Output (Bit)*1	LY	B	R/W	0 to 1	16
HG Digital Input (Bit)*2	LEX	B	R	0 to 77	8
HG Digital Output (Bit)*2	LEY	B	R/W	0 to 77	8
HG Data Register	LDR	W	R/W	0 to 8191	10
HG Keep Register	LKR	W	R/W	Variable	10
HG Temporary Register	LBR	W	R/W	0 to 127	10
HG Timer (Current)	LTD	W	R	0 to 31	10
HG Special Internal Register	LSD	W	R/W	0 to 255	10
HG Link Register	LLR	W	R/W	0 to 63	10
HG Expansion Input (Word)	WLPX	W	R	0	16
HG Expansion Output (Word)	WLPY	W	R/W	0	16
HG Input (Word)*1	WLX	W	R	0	16
HG Output (Word)*1	WLY	W	R/W	0	16
HG Digital Input (Word)*2	WLEX	W	R	0,20,40,60	10
HG Digital Output (Word)*2	WLEY	W	R/W	0,20,40,60	10

- B/W is an abbreviation of Bit/Word.
  R/W is an abbreviation of Read/Write.
  R/W indicate that both reading and writing are possible, while R indicates that only reading is possible.
- In the HG2S expansion input bits 0 to 7 and expansion output bits 0 to 7 are usable.

HG Internal Relay (LM)

The HG internal relay is an internal relay contained within the MICRO/I. There are 2048 points relay.

HG Keep Relay (LK)

The HG Keep Relays are internal MICRO/I relays. The state of these relays is retained during power OFF. The maximum number of HG keep relays depends upon the number set in WindO/I-NV2. For details, refer to Chapter 16 "Minimum and Maximum Amount of Data Storage and Number of Addresses" on page 16-2.

HG Temporary Relay (LBM)

The HG temporary relay is a temporary relay contained within the MICRO/I. A value of 0 is written in the HG temporary relays when the screen, text group or user account is changed, and when the display screen is reset. There are 128 temporary relay points.

*1 HG2S only
*2 HG2G-5F, HG3G/4G only

■ HG Special Relay (LSM)

The 64 points of the HG special relay are used to perform the following special operations.

HG Special Relay	Function/Part
LSM0	Normally set to 1.
LSM1	1 only on the second scan when Base Screen is switched. It also operates when switching text group or user account, or resetting the display screen.
LSM2	1 only on the first scan when Base Screen is switched. It also operates when switching text group or user account, or resetting the display screen.
LSM3	0 only on the first scan when Base Screen is switched. It also operates when switching text group or user account, or resetting the display screen.
LSM4	Alternates between 0 and 1 with each scan.
LSM5	1 only on the first scan when Popup Screen is opened.
LSM6	1 while touch panel is pressed.
LSM7	Alternates between 0 and 1 each time data is read (read scan) from all the external devices being used.
LSM8	After powering ON value is 1 until the initially displayed screen switches to another screen.
LSM9	When value changes from 0 to 1, the backup data stored in flash memory is restored. When it becomes 1 value does not become 0 until the Touch is reset or 0 is written.
LSM10	When switched from 0 to 1, the current backlight setting and the following data are transferred to the flash memory: •Keep relays and keep register data configured in the data storage area*2 •Keep relays 0 through 1013 and keep registers 0 through 1023*3 Once LSM10 switches to 1, it does not change to 0 until MICRO/I recycles power or 0 is written to LSM10.
LSM11	Changes from 0 to 1 when the Base Screen is switched, after the values of all the external devices being used are read, and remains 1 until there is a switch to another screen. It also operates when switching text group or user account, or resetting the display screen.
LSM12	1 only on the first scan when Popup Screen is closed.
LSM13	Value becomes 0 when Popup Screen is opened, and then changes from 0 to 1 after all the values of all the external devices being used by that Popup Screen are read.
LSM14 to 17	Reserved
LSM18*2	When value changes from 0 to 1, access to USB flash drive is stopped. The access state can be checked with the value of LSM19. When it becomes 1 value does not become 0 until the MICRO/I is reset or 0 is written.
LSM19*2	Value is 1 while there is access to USB flash drive. If value is 0 the USB flash drive can be safely ejected.
LSM20*2	Access to the Memory Card stops when this bit is switched from 0 to 1. The access state can be checked with the value of LSM21.
LSM21*2	Bit is 1 during Memory Card access. When 0, the memory card can be removed.
LSM22*2	This is the Operation Log function. When data in excess of the amount that can be recorded in one operation occurs, the value becomes 1. When it becomes 1 value does not become 0 until the MICRO/I is reset or 0 is written.
LSM23*2	This bit is 1 while copied.
LSM24*2	This bit is 1 while outputting the data to the Memory Card.
LSM25 to 26	Reserved
LSM27*2	Stops playing the sound file when this bit is turned from 0 to 1.
LSM28 to 29	Reserved
LSM30*2	If LSM30 is OFF, all files (including the subfolders with files) under the source folder will be copied to the destination folder. If LSM30 is ON, only the files (excluding the subfolders with files) under the source folder will be copied to the destination folder.
LSM31*2	If LSM31 is turned ON while copying the files (excluding the subfolders with files) from the source folder to the destination folder, MICRO/I will complete the copy process of the file while remaining files in the source folder will not be copied.

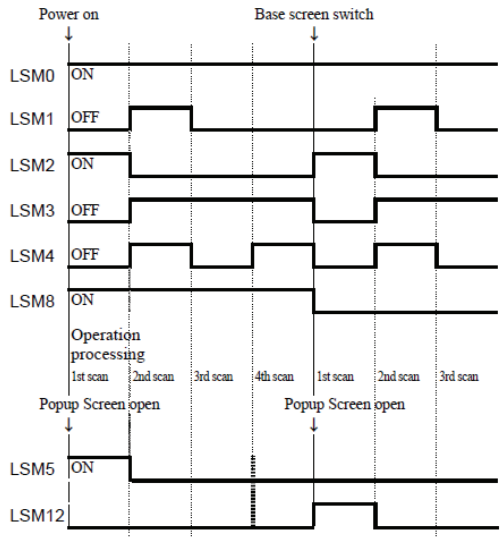
*2 HG2G-5F, HG3G/4G only
*3 HG2G-S/-5S, HG1F/2F/2S only

HG Special Relay	Function/Part
LSM32 to 47	Reserved
LSM48	200 millisecond clock (alternates between 0 and 1 every 100 milliseconds)
LSM49	1 second clock (alternates between 0 and 1 every 500 milliseconds)
LSM50	When switched to 1, limits the host communications and gives priority to the communications between the computer and PLC. (Enabled only when using the Pass-Through function.)
LSM51	Reserved
LSM52*2	While in remote monitor/control, LSM52 switches to 1 (ON) in just one scan. This bit can be used to check if the touchscreen is being controlled by the remote PC. You may also use this bit as a trigger condition in a button to forbid the control from the remote PC.
LSM53*4	When the value changes to 1, the preset values for IP address, subnet mask, and default gateway (LSD192 to 203) are written to the MICRO/I, then it automatically resets. After the MICRO/I is reset, value becomes 0.
LSM54*4	When the value changes to 1, the preset values for external device station number and IP address (LSD204 to 208) are written to the MICRO/I, then it automatically resets. After the MICRO/I is reset, value becomes 0.
LSM55 to 63	Reserved

- Transfer of the LSM10 Keep Relay and Keep Register to the flash memory can take an excess of one second. Writing to the Flash Memory can be repeated a maximum of 100,000 times. Keep writing to the Flash Memory to a minimum.
- When there is no remaining battery power or when using the HG2G-5ST22VF-*, data transferred with LSM10 will be restored once the power to the MICRO/I has been turned on.
- Do not turn off the power for the MICRO/I for three seconds immediately after adjusting brightness with the HG2G-5ST22VF-* and pressing the **Save** button. Immediately turning off the power for the MICRO/I may erase the keep relay and keep register values that were transferred to the flash memory with LSM10.
- LSM1, 2, 3 and 11 also operates when switches the Text Group.
- Once LSM18, 20 and 22 turns ON, it will remain ON until MICRO/I recycles power or 0 is manually written to LSM18, 20 and 22.

A scan refers to a period during which all parts placed on a screen are processed. It is not related to the period of reading values of host devices.

This operation of this relay is illustrated in the timing chart below.



*2 HG2G-5F, HG3G/4G only
*4 HG2G-S/-5S/-5F, HG3G/4G only

HG Timer Relay (LTC)

The HG Timer (single-bit I/O point) is a relay switched on by a part timer.
The Display Timer can use 32 points.

HG Expansion Input (LPX), HG Expansion Output (LPY)

With the HG2F/3F/4F these are expansion module input and output relays installed at the back. You can use 16-point (bit device) or 1-point (word device) expansion input and expansion output.
With the HG2S these are input and output relays that are used with models that have L6 series square-type switches on the upper switch block. You can use 8-point (bit device) or 1-point (word device) expansion input and expansion output.

Refer to Chapter 34 "MICRO/I Specifications" on page 34-1 for the correspondence between the push-button switches and the expansion I/O.

HG Input (LX), HG Output (LY)

These are the HG2S input and output relays.
With a bit device 4 external input points and 3 external output points can be used, and with a word device 1 point of external input and output can be used.

HG Digital Input (LEX), HG Digital Output (LEY)

Digital input/output relay for expansion module connected to HG2G-5F, HG3G/4G.
For details, refer to Chapter 29 "2.1 Using Digital I/O Units" on page 29-3.

HG Data Register (LDR)

The HG Data Register is an internal MICRO/I register. 8192 points are available.

HG Keep Register (LKR)

The HG Keep Registers are internal MICRO/I registers. The value in these registers is retained during power OFF. The maximum number of HG Keep Register depends upon the number set in WindO/I-NV2. For details, refer to Chapter 16 "Minimum and Maximum Amount of Data Storage and Number of Addresses" on page 16-2.

HG Temporary Register (LBR)

HG temporary register can be used to store value as temporary. This register value will be cleared to 0 when a text group or user account is changed, when a screen is reset or the screen is changed. 128 points are available.

HG Timer (Current) (LTD)

Timer registers store the current value of a Timer. 32 points are available.

HG Link Register (LLR)

An area that stores device address data for the registered PLC during Sub Host Communication. 64 points are available. This register can also be used as an internal register like LDR when Sub Host Communication is not used.

HG Special Registers (LSD)

The Special Registers (256 points) perform the following special operations.

HG Special Register	Function/Part
LSD0 to 3	Reserved
LSD4	Scan time Maximum value (msec.)
LSD5	Screen switch response time (msec.)
LSD6	Read scan communication time (msec.)
LSD7	Scan counter (incremented at each scan)
LSD8	1 second counter (incremented each second)
LSD9	10 msec. counter (increments every 10 msec.)
LSD10	100 msec. counter (incremented every 100 msec.)
LSD11	200 msec. counter (incremented every 200 msec.)
LSD12	500 msec. counter (incremented every 500 msec.)
LSD13	Stores the current Year data from the MICRO/I. "Year" (4 BCD digits)
LSD14	Stores current time data from MICRO/I. "Month" (2 BCD digits)
LSD15	Stores current time data from MICRO/I. "Day" (2 BCD digits)
LSD16	Stores current time data from MICRO/I. "Hour" (2 BCD digits)

HG Special Register	Function/Part
LSD17	Stores current time data from MICRO/I. "Minute" (2 BCD digits)
LSD18	Stores current time data from MICRO/I. "Second" (2 BCD digits)
LSD19	Stores current time data from MICRO/I. "Day-of-week" (1 BCD digit)
LSD20	When a value of "1" is written into this special register, the Internal clock in MICRO/I is updated according to the data stored in LSD21-26. It automatically resets to "0" after the update.
LSD21	Write a "Year" value to store in the MICRO/I internal clock. (2 BCD digits)
LSD22	Stores set value for "Month" in MICRO/I internal clock. (2 BCD digits)
LSD23	Stores set value for "Day" in MICRO/I internal clock. (2 BCD digits)
LSD24	Stores set value for "Hour" in MICRO/I internal clock. (2 BCD digits)
LSD25	Stores set value for "Minute" in MICRO/I internal clock. (2 BCD digits)
LSD26	Stores set value for "Second" in MICRO/I internal clock. (2 BCD digits)
LSD27	Scan time Current value (msec.)
LSD28	Scan time Minimum value (msec.)
LSD29, 30	Reserved
LSD31*4	Stores the currently displayed screen number.
LSD32*4	Set a value (in reference to a Base Screen number you want to switch to) and it will automatically switch to a specified Base Screen number. Note, after switching to a Base Screen, the value stored automatically resets to 0.
LSD33 to 37	Reserved
LSD38*2	Execution time of the Cyclic Script (Current value) (msec.)
LSD39*2	Execution time of the Cyclic Script (Maximum value) (msec.)
LSD40*2	Execution time of the Cyclic Script (Minimum value) (msec.)
LSD41	Reserved
LSD42	Memory Card error status
LSD43	Memory Card free memory capacity Lower word (CF Card: bytes, SD Memory Card: Kbytes)
LSD44	Memory Card free memory capacity Upper word (CF Card: bytes, SD Memory Card: Kbytes)
LSD45	Memory Card total memory capacity Lower word (CF Card: bytes, SD Memory Card: Kbytes)
LSD46	Memory Card total memory capacity Upper word (CF Card: bytes, SD Memory Card: Kbytes)
LSD47	Reserved (for Host I/F driver)
LSD48	Reserved
LSD49	Stores the O/I Link slave station number. (Read-only)
LSD50	The sequence value of the message number (or channel number if the alarm function is being used) selected by the cursor in the Alarm List Display is stored. A value of between 1 and 1024 (allocated using ((Block No. - 1) x 16 + bit position + 1)) is stored for the number.
LSD51	Contrast level: 0 to 31*5 Backlight level: 0 or 31*6 Brightness level: -16 to 31*2 Appropriate level of contrast changes by individual difference of MICRO/I.
LSD52	The ID number of the script for which the error occurred.
LSD53	Script error status
LSD54	Reserved (for Script)
LSD55	Color brightness adjustment MICRO/I color brightness is adjusted in four increments. 0 - 7: Dark, 8 - 15: Slightly dark, 16 - 23: Slightly bright, 24 - 31: Bright

*2 HG2G-5F, HG3G/4G only
*4 HG2G-S/-5S/-5F, HG3G/4G only
*5 HG2G-S/-5S, HG1F/2F/2S only
*6 HG3F/4F only

HG Special Register	Function/Part
LSD56	The number of lines of data from the start line to the line currently selected with the cursor displayed in the Alarm List Display/Alarm Log Display is stored.
LSD57	The number of log data pieces stored in the Data Storage Area by the alarm log function is stored. (0 to 1024)
LSD58	Reserved
LSD59	Memory Card download status
LSD60	Reserved (for Line Chart)
LSD61	Reserved (for Trigger Condition)
LSD62	Reserved (for TCP/IP)
LSD63 to 64	Reserved
LSD65	The maximum number of screenshots in the Memory Card.
LSD66	Reserved
LSD 67	Stores the connection status for TCP clients and the TCP server for the User Communication set to the Ethernet interface. Bit 0: User Communication 1 Bit 1: User Communication 2 Bit 2: User Communication 3
LSD 68	When the value changes from 0 to 1, the connections for the TCP clients and the TCP server for the User Communication set to the Ethernet interface are forcibly disconnected. Bit 0: User Communication 1 Bit 1: User Communication 2 Bit 2: User Communication 3
LSD69 to 71	Reserved
LSD72	Stores the currently played sound file number.
LSD73	Stores the sound ID which could not be played by any errors.
LSD74 to 78	Reserved
LSD79	Quantity of Expansion I/O Modules
LSD80 to 99	Reserved
LSD100	Reserved (for O/I Link Communication)
LSD101	Polling period register for the O/I Link Slave
LSD102	Slave registration setting register for O/I Link Master
LSD103	Reserved (for O/I Link communication)
LSD104	Slave online information register for O/I Link Master
LSD105	Reserved (for O/I Link communication)
LSD106	Slave error information register for O/I Link Master
LSD107	Reserved (for O/I Link communication)
LSD108 to109	Reserved
LSD110	Reserved (for Host I/F driver)
LSD111	Reserved (for Host I/F driver)
LSD112 to 127	Register for Host I/F driver See the External Device Setup Manual for details.
LSD128 to 154	Reserved
LSD155*7	Event Recording Function Status Information While data is being recorded after an event occurs with the event recording function or while recorded data is being saved to the memory card, the value of bit 0 changes to 1. It changes to 0 when the saving operation completes.
LSD156 to 164	Reserved
LSD165*7	Multimedia Function Error Information
LSD166 to 191	Reserved

*7 HG3G/4G only

HG Special Register	Function/Part
LSD192 to 195*4	The preset value for IP address of the MICRO/I. When the value of LSM53 is changed to 1, the values of these devices are written to the MICRO/I. When the power is turned on, the set values of the project are read to these devices. Example: When the IP address is 192.168.0.1 LSD192=192, LSD193=168, LSD194=0, LSD195=1
LSD196 to 199*4	The preset value for subnet mask of the MICRO/I. When the value of LSM53 is changed to 1, the values of these devices are written to the MICRO/I. When the power is turned on, the set values of the project are read to these devices. Example: When the subnet mask is 255.255.254.0 LSD196=255, LSD197=255, LSD198=254, LSD199=0
LSD200 to 203*4	The preset value for default gateway of the MICRO/I. When the value of LSM53 is changed to 1, the values of these devices are written to the MICRO/I. When the power is turned on, the set values of the project are read to these devices. Example: When the default gateway is 192.168.0.24 LSD200=192, LSD201=168, LSD202=0, LSD203=24
LSD204*4	Station number of the external device to change the IP address
LSD205 to 208*4	The preset value for IP address of external device. When the LSM54 is changed to 1, the values of these devices are written to the MICRO/I. When the value of LSD204 changes, the set values of the project are read to these devices. Example: When the IP address is 192.168.0.2 LSD205=192, LSD206=168, LSD207=0, LSD208=2
LSD209 to 255	Reserved

- LSD4 and 6 store the maximum value, and when the Base Screen is switched, they are reset.
- The values of LSD4 to 6 are included errors of +/- 10 msec.
- The values of LSD38 to 40 are included errors of +/- 10 msec.
- When registers LSD7, 8, 9, 10, 11 or 12 contain FFFF (H) and are incremented, the value becomes 0.
- When you reckon time by using LSD9, the time difference (in 10ms units) from the previous value can be calculated.
- The range for the "Year" in LSD13 is 2000 to 2099, and reverts to 2000 after 2099.
- When "1" is written to LSD20, internal clock is updated by the contents of LSD21-26. After setting the year, month, day, hour, minute, and second data in LSD21 to 26, writes a "1" to LSD20.
- The display format for LSD31 is set under "Screen No. Format" in Project Settings. (BCD, BIN)
- This data format for LSD32 is the same as "Screen No. Format" in Project Settings. (BCD, BIN)
  If the screen number is not exist in the project, "No Screen Data" message will appear.
  If 0xFFFF(Hex) is written to LSD32, MICRO/I will display System Menu Screen.
  In case that the current screen is changed by System Area1 and LSD32 at the same instant, the screen number of the System Area1 will be displayed.
- LSD42 stores Memory card error status. Error descriptions are as follows.
  0: Normal
  1: Card not inserted/Incompatible card
  2: Format error
  3: Access error/Insufficient memory in Memory card/Reading or writing failure.
  4: Unsuccessful read of picture data
- For HG2G-5F, HG3G/4G, the data stored in LSD43 to 46 are stored in kilobytes. 1 K byte is 1024 bytes. Values of less than 1 K byte are rounded up.
- By using the LSD50 value in the Message Switch Display you can display the message that corresponds to the cursor in the Alarm List Display.
- Refer to Chapter 20 "1.4 Script Error" on page 20-4 for details regarding LSD52 and LSD53.
- LSD 55 is not supported by the HG2G-5F, HG3G/4G
- The following bit switched to ON while downloading to Memory card by WindO/I-NV2 or Downloader. The bit switched to OFF after downloading.
  Bit2: Recipe data
  Bit4: Project data
  Bit5: Picture data
  Bit8: Sound data
  Bit9: PLC Program
- LSM7 and LSD6, 102 to 107 are not available for Slave units when using O/I link communication.
- The maximum number of the Screen Captures stored in the Memory Card is set in LSD 65. The value in LSD 65 can be anywhere from 1 to 999. (The default value is 99.)
- The error status for the multimedia function is stored in LSD 165. The error details are listed below.
  0: Normal
  1: Specified file does not exist
  2: File format is incorrect
  3: Specified parameter value is out of range

*4 HG2G-S/-5S/-5F, HG3G/4G only

Chapter 33 MICRO/I Setup

This chapter describes the MICRO/I setup screen and how to perform setup.

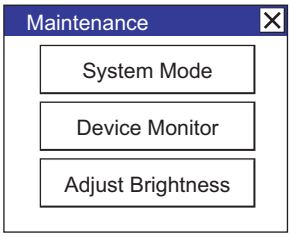
1 Maintenance Screen

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

1.1 Maintenance Screen Overview

Using the screen that is displayed when the MICRO/I is in Run Mode, you can switch from Run Mode to System Mode and load a screen to adjust device monitor and screen brightness.

Example: HG2G-5F, HG3G/4G



Maintenance screen functions are indicated below:

Button	Description
System Mode	Switch the MICRO/I to System Mode. In System Mode, the MICRO/I can be changed to its initial settings and data can be initialized. For details, refer to "2 System Mode Overview" on page 33-3.
Device Monitor	Shows the Device Monitor. This screen can be used to register devices and monitor and change device values. For details, refer to Chapter 25 "2.2 Device Monitor" on page 25-19.
Adjust Brightness	Shows the adjust brightness screen. This screen is used to adjust the brightness of the HG2G-5S/-5F, HG3G/4G.
Contrast Adjust	Shows the contrast adjust screen. This screen is used to adjust the contrast of the HG2G-S, HG1F/2F/2S.
Adjust Back Light	Shows the adjust back light screen. This screen is used to adjust the backlight for the HG3F/4F.

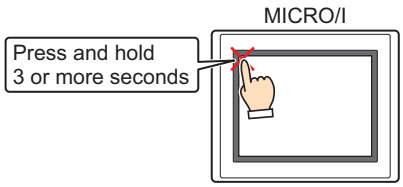
If a password has been configured for the project data and press System Mode or Device Monitor, the Enter Password screen will be displayed. Select a user name and then enter a password. For details, refer to Chapter 23 "User Accounts and the Security Function" on page 23-1.

1.2 Displaying the Maintenance Screen

● HG2G-S/-5S/-5F, HG3G/4G, HG1F

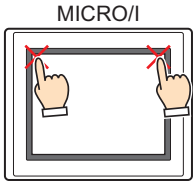
Press the upper-left corner of the MICRO/I screen for three seconds or more.

If the Base Screen is switched before three seconds have elapsed, the load operation for the maintenance screen will be canceled. Please press it again.



● HG2F/2S/3F/4F

Simultaneously press the upper left and right corners of the MICRO/I screen.

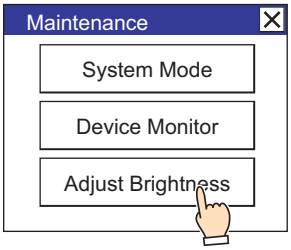


- To display the maintenance screen, select the **Enable Maintenance** check box under the **System** tab in the Project Settings dialog box.
- If a touch switch is placed in the upper-left corner of the screen (HG2G-S/-5S/-5F, HG3G/4G, HG1F) or in both the upper left and right corners of the screen (HG2F/2S/3F/4F), switching to the maintenance screen will not be possible.
- When the HG1F has been installed vertically, the maintenance screen will be displayed horizontally.

1.3 Adjusting Screen Brightness

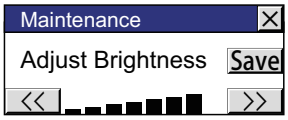
1 On the maintenance screen, press **Adjust Brightness** (HG2G-5S/-5F, HG3G/4G), **Contrast Adjust** (HG2G-S, HG1F/2F/2S), or **Adjust Back Light** (HG3F/4F).

Example: HG2G-5S/-5F, HG3G/4G

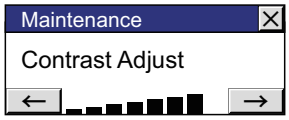


2 Also, press << or >> (adjust brightness screen) and ← or → (contrast screen and backlight screen) to adjust to your preferred brightness.

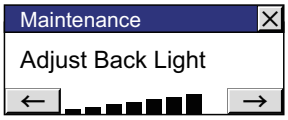
Adjust Brightness Screen



Contrast Adjustment Screen



Adjust Back Light Screen



Only the HG2G-5ST22VF-* has the **Save** button.

Always press the **Save** button after changing the brightness on the HG2G-5ST22VF-*. The setting will be written to flash memory.

- With the HG1F/2F/2S, the MICRO/I automatically adjusts the contrast of the screen in regard to the ambient temperature, so the screen may become brighter and darker. When adjusting the contrast, we recommend adjusting after turning the MICRO/I on and waiting for about 10 minutes.
- On the HG2G-5ST22VF-*, do not turn off the MICRO/I for three seconds after you adjust the brightness and press the **Save** button. If you turn off the MICRO/I within three seconds, the keep relay, keep register, and brightness setting stored in flash memory at LSM10 are cleared.

Screen brightness can be adjusted using methods other than the ones listed above.

- Adjusting from System Mode.
  When using System Mode, the adjustment screen will differ by model. Those differences are as follows:
  - HG2G-S/-5S/-5F, HG3G/4G: Top page of System Mode
  - HG2F/3F/4F: The screen that is displayed when both the upper left and right corners of the screen are pressed simultaneously
  - HG1F: The screen that is displayed when the upper-left corner of the screen is pressed for three seconds or more
- Changing the values for HG Special Registers LSD 51.

2 System Mode Overview

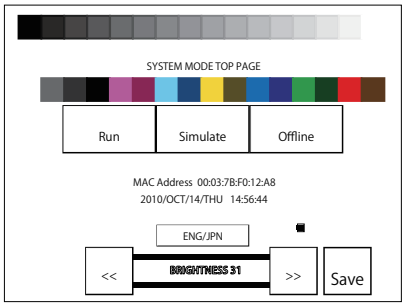
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The System Mode allows you to access the internal MICRO/I initial settings, self diagnosis, and clearing logged data. In this mode, the project in the MICRO/I will not be running.

2.1 System Mode Screens

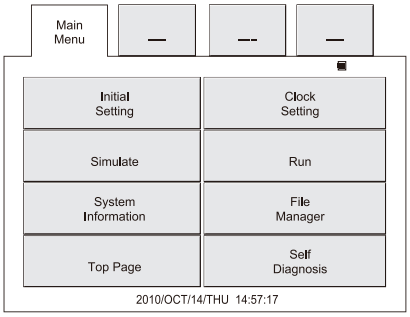
In the System mode, the System Menu screen appears (as shown below).

HG2G-S/-5S/-5F, HG3G/4G Top Page

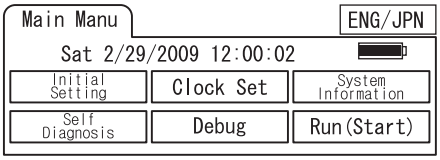


Press the "Offline" button to display the System Menu shown in the left figure.
Only the HG2G-5ST22VF-* has the **Save** button.

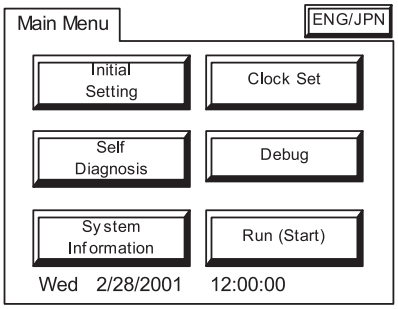
HG2G-S/-5S/-5F, HG3G/4G System Menu screen



HG1F System Menu screen



HG2F/2S/3F/4F System Menu screen



For information on accessing the MICRO/I System Mode, refer to "1.2 Displaying the Maintenance Screen" on page 33-1. Design may change slightly depending on model.

The Top Page and System Menu displays two symbols: Maintenance Cable Status*1, and Battery Level Status*2.

■ Maintenance Cable Status

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

	Connected
	Disconnected

*1 HG2G-S only
*2 HG2G-S/-5S/-5F, HG3G/4G and HG1F only

Battery Level Status

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Full ↓ Empty		Battery level is full.
		Battery level is running low. (The "Battery Level Low" message appears at the top of the screen.)
		Battery level is almost empty, or not inserted. (The "Replace Battery. Battery Level Low" message appears at the top of the screen.)

The Symbols depend on MICRO/I model. Since the HG2G-5ST22VF-* has no backup battery, X is displayed in the icon.

The Top Page*3 and System Menu have the items shown below. Pressing each button switches to the corresponding setting or operation screen.

Top page

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Item	Descriptions	See page
Run	Switches to Run Mode.	Page 33-15
Simulate	Switches to Simulation Mode	Page 33-15
Offline	Displays the System Menu screen.	Page 33-4

System Menu screen

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Item		Descriptions	See page
HG2G-S/-5S/-5F, HG3G/4G	HG1F/2F/2S/3F/4F		
Initial Setting		Allows adjustment of settings relating to operation, communication parameters, and log data of the MICRO/I.	Page 33-8
Clock Setting	Clock Set	Allows setting of the internal clock of the MICRO/I.	Page 33-14
Simulate	Debug	Switches to simulation mode.	Page 33-15
Run	Run (Start)	Switches to run mode.	Page 33-15
System Information		Displays information relating to the type No., projects, as well as system software of the current MICRO/I.	Page 33-15
File Manager*4	—	Manage the files saved in SD Memory Cards, USB flash drives, and the internal memory of the MICRO/I.	Page 33-16
Top Page	—	Moves to Top Page.	Page 33-16
Self Diagnosis		Executes self diagnosis of memory, the clock, the touch panel, display, communication, expansion interface and others.	Page 33-16

- HG2G-S/-5S can only display the System Menu screen in English. The following O/I types can switch the display language.

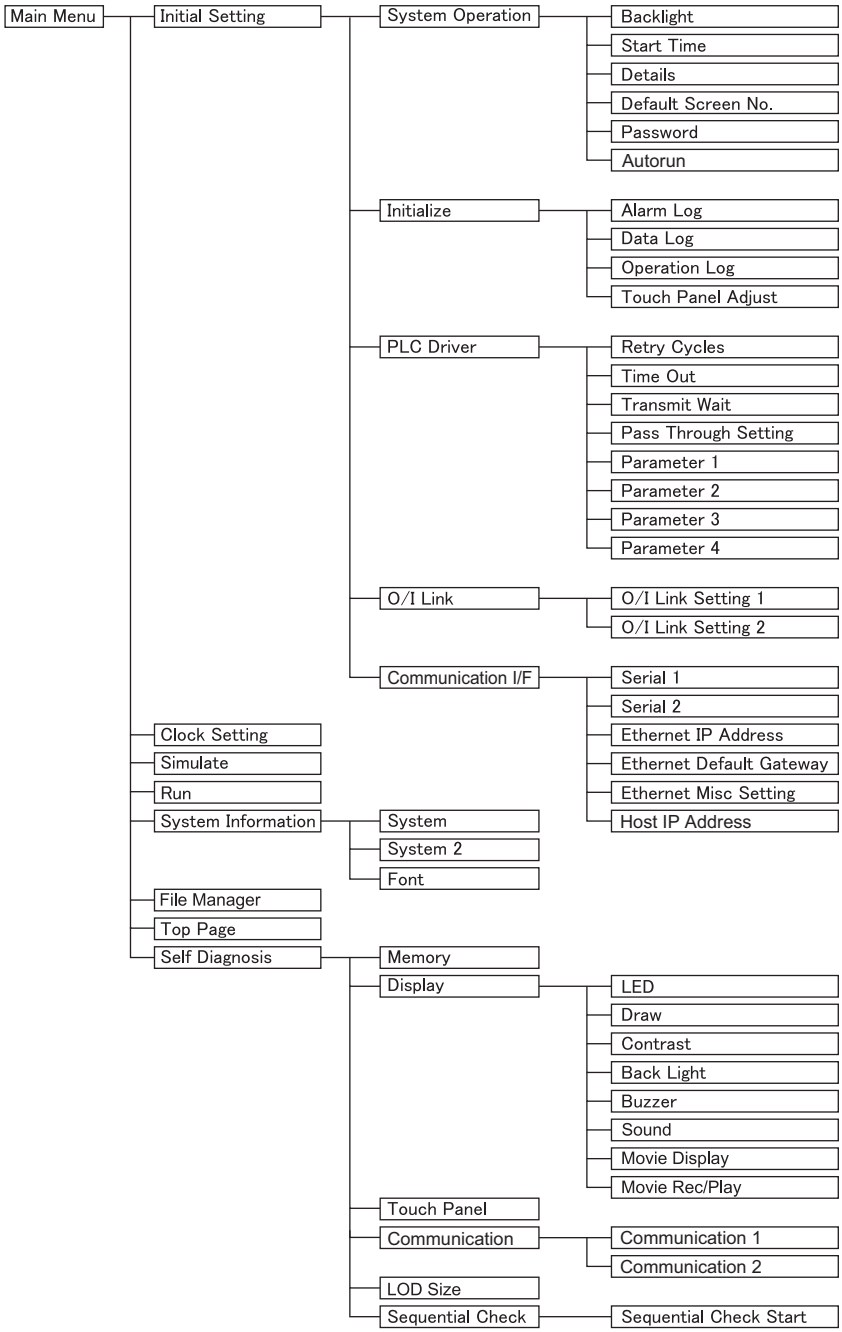
  HG2G-5F, HG3G/4G: ENG/JPN button

  HG1F/2F/2S/3F/4F: JPN/ENG button
- File Manager only supports HG2G-5F, HG3G/4G.

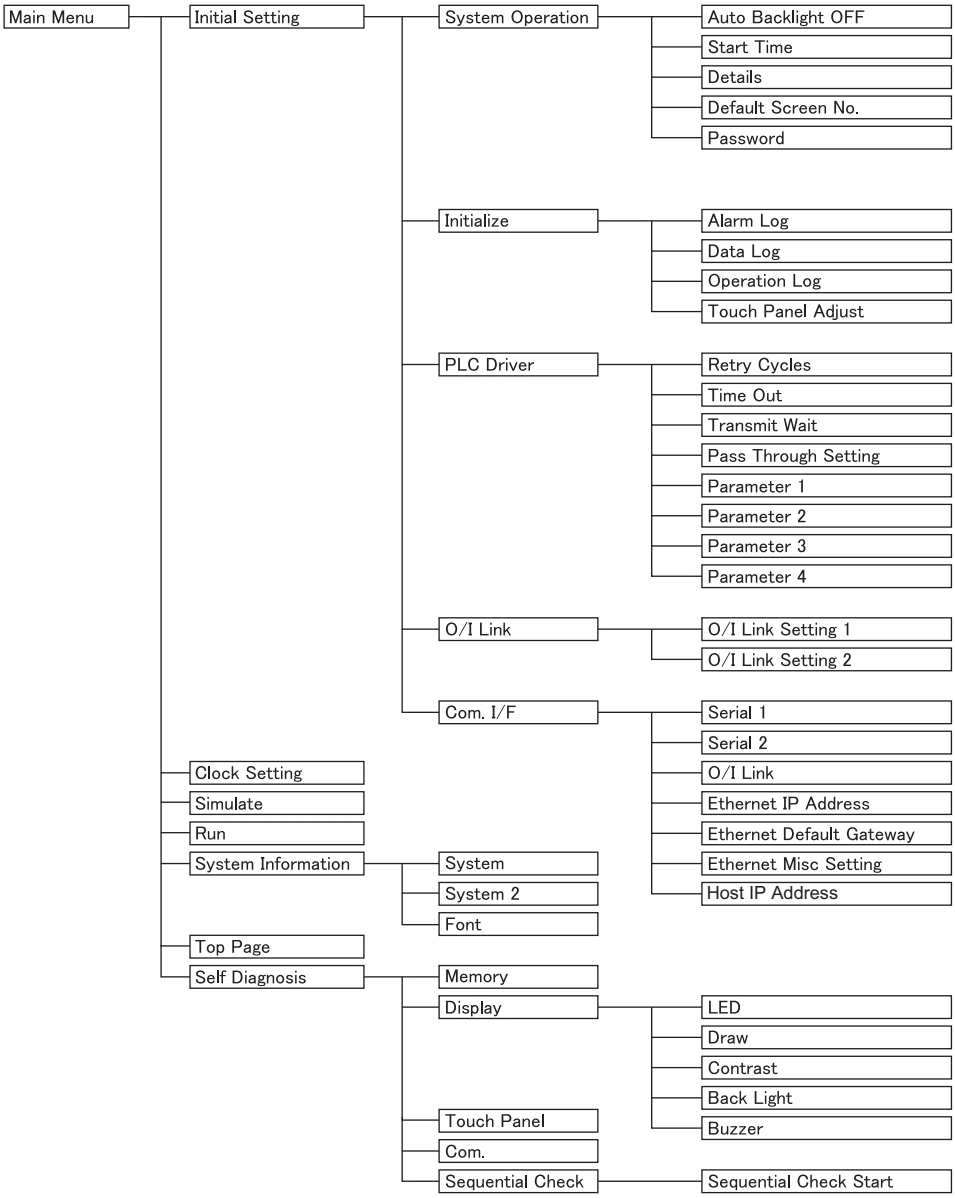
*3 HG2G-S/-5S/-5F, HG3G/4G only
*4 HG2G-5F, HG3G/4G only

2.2 Names and Layout of Setup Menus

■ HG2G-5F, HG3G/4G

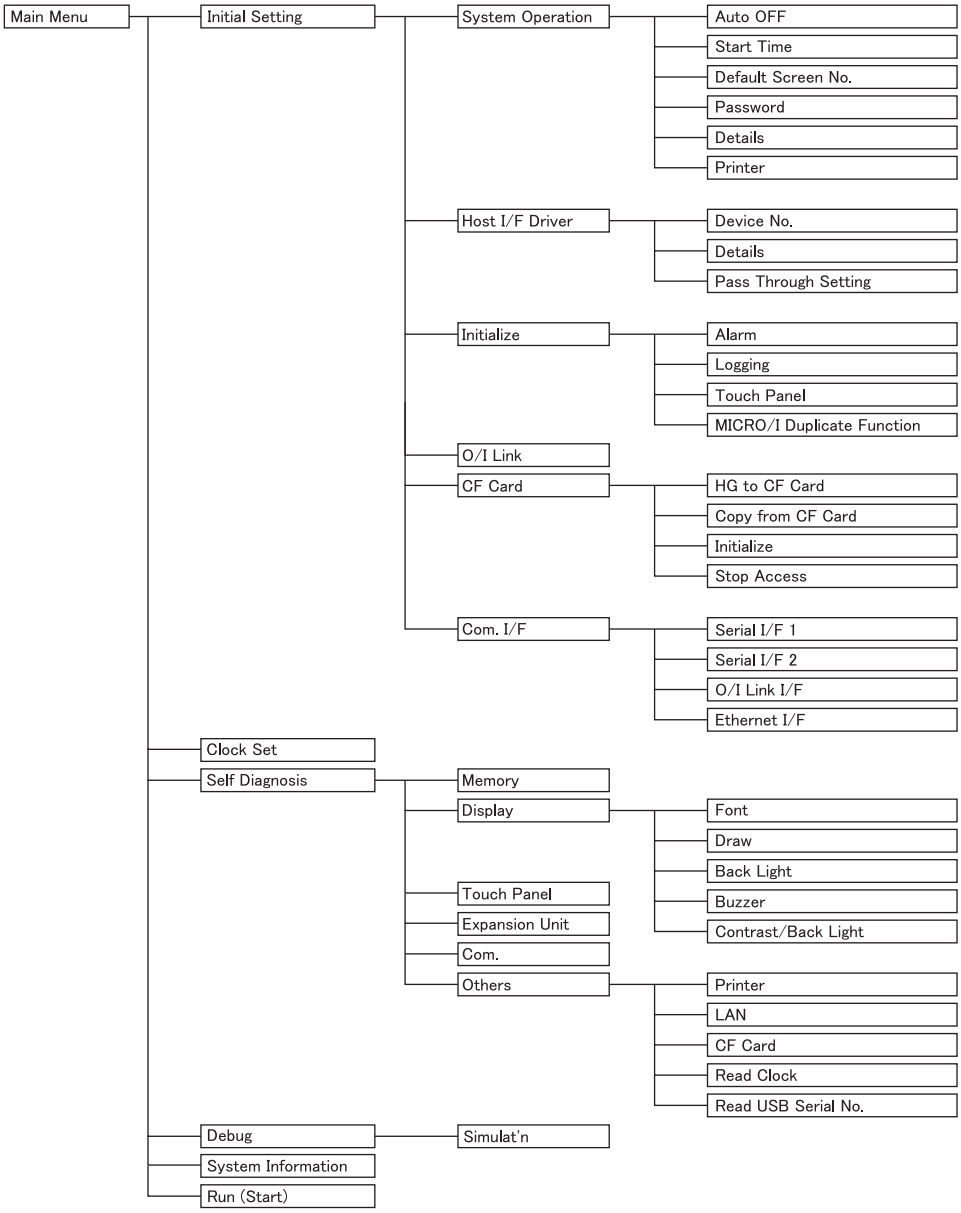


■ HG2G-S/-5S



Only models with an Ethernet port support "Ethernet IP Address", "Ethernet Default Gateway", and "Ethernet Misc Setting".

■ HG1F/2F/2S/3F/4F



- Only models with a compact flash interface support the "CF Card".
- Only models with an Ethernet port support "Ethernet I/F".
- Only HG2F with a USB port support "Read USB Serial No.".
- Only models with an analog touch panel support "Initial Settings"-"Initialize"-"Touch Panel Adjust".
- Only HG1F supports "MICRO/I Duplicate Function".

3 Settings

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The followings are displayed in the HG2G-S/-5S/-5F, HG3G/4G. Description between the parentheses are displayed in the HG1F/2F/2S/3F/4F.

3.1 Initial Setting (Initial Setting)

Pressing the "Initial Setting" button in the System Menu screen displays the setup screen. You can use this screen to input the settings for MICRO/I operation and communication parameters, and to clear the logs. To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

● System Operation (System Operation)

Pressing the "System Operation" button displays the system operation menu screen. You can use this screen to set the items below. Press the button for each item to set it.

- To return to the initial settings screen, press the "Init Set" button at the top of the screen.
- To return to the system operation menu screen from any of the settings screens below, press the "System Opn" button at the top of the screen.

■ Backlight

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Backlight Control

Set the amount of time (in minutes) until the backlight brightness is reduced automatically when the screen is not touched or switched.

Auto Backlight OFF

Set the amount of time (in minutes) until the backlight turns off automatically when the screen is not touched or switched.

Procedure

1. Press the left/right buttons to select the item, and then enter the time until the backlight brightness is reduced automatically with the numeric keys.
2. Press the "ENT" button to confirm the entered value. The value set for Backlight Control is displayed.
3. Press the left/right buttons to select the item, and then enter the time until the backlight automatically turns off with the numeric keys.
4. Press the "ENT" button to confirm the entered value. The value set for Auto Backlight OFF is displayed.
5. Press the "SAVE" button to save the settings.

- If you switch to another screen or change the value before pressing the "SAVE" button, the settings are not saved.
- Functions with the time set to 0 are disabled.

■ Auto Backlight OFF (Auto OFF)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This item sets the amount of time (in minutes) until the backlight turns off automatically when the screen is not touched or switched for a preset amount of time. Set the time using the Keypad. Then press "ENTER". Press the "CANCEL" button to cancel the entered value and display the currently set value.

- The setting is not updated if you display another screen before pressing the "ENTER" button.
- Setting a time of 0 disables the backlight auto OFF function.

Start Time (Start Time)

This item sets the amount of time (in minutes) until communication with the host device starts after MICRO/I power ON. This can be used to synchronize boot times with the host machine. Press the "ENTER" button to apply the entered value. Press the "CANCEL" button to cancel the entered value and display the currently set value.

> The setting is not updated if you display another screen before applying the setting.

Details (Details)

The following items can be set.

- Whether or not to have a sound made when a touch switch is pressed.
- Select the screen number to be displayed as a binary number or BCD (binary coded decimal).
- To set blink cycle.
- Display the error message in Japanese or English.

Select the item to change using the POSN UP (▲) or POSN DOWN (▼) buttons. The selected item is highlighted. Each press of the [CHNG UP] or [CHNG DOWN] button changes the property of the selected item. Repeat this procedure until the desired properties are displayed. Press the "ENTER" button to apply the entered value.

> The setting is not updated if you display another screen before applying the setting.

Default Screen No. (Default Screen No.)

This item sets the No. (as a decimal value) of the screen to display after power ON. Use the Keypad to enter the value. Press the "ENTER" button to apply the entered value. Press the "CANCEL" button to cancel the entered value and display the currently set value.

> - The setting is not updated if you display another screen before applying the setting.
> - If the Default Screen No. is set to 0, MICRO/I will display the screen set in the host device instead of the internal initial screen. For details, refer to Chapter 4 "System Area 1" on page 4-32.

Password (Password)

Changes the password set for the user account.

HG2G-S/-5S/-5F, HG3G/4G: If security function is used, you will be able to change the password for the selected user account (either as an administrator or other users registered in the security group) from the touchscreen.

HG1F/2F/2S/3F/4F: You can change the password if you are the "Administrator" in the security group.

For the HG2G-S/-5S/-5F and the HG3G/4G, press **<-** and **->** to switch the user account.

Press the "Change Password" button to display the password input screen. Use the password input keys to enter a password from 4 to 15 characters. Pressing the "ENTER (ENT)" button applies the entered password and closes the password input screen. Pressing the "CLR" button clears the password input field.

> - If you press "CAN" on the Password Screen, the setting is not updated and you return to the Password Screen.
> - Pressing the "ENTER (ENT)" button without entering a password disables the password function.

> - When you do not assign a password to a project data, the Password is blank.
> - If you forget your password, contact for sales representative.

Autorun

HG2G-S HG2G-5S **HG2G-5F** **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

When Autorun is enabled, Autorun function will be executed when a USB flash drive is inserted to MICRO/I. You have the option to enable or disable the USB Autorun function.

> The setting is not updated if you display another screen before applying the setting.

(Printer)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G **HG1F** **HG2F** **HG2S** **HG3F** **HG4F**

The following items can be set.

- Specify the printer code
- Color or greyscale
- Black and white reversed
- Paper size

Select the item to change using the [▲] or [▼] buttons. The selected item is highlighted. The condition changes each time you press the "Change" button. Press the "Change" button several times until the condition you want appears. When you press the Save button, the settings are stored and the completion message appears.

> The setting is not updated if you display another screen before applying the setting.

Initialize (Initialize)

Pressing the "Initialize" button displays the initialization menu screen. You can use this screen to set the following items. Press the button for each item to set it.

> - To return to the initial settings screen, press the "Init Set" button at the top of the screen.
> - To return to the initialization menu screen from any of the settings screens below, press the "Init" button at the top of the screen.

Alarm Log (Alarm)

Clears all the alarm log data. Set as directed by the confirmation message that appears. Pressing the "NO" button will return you to the initialization menu screen without clearing the alarm log data.

Data Log (Logging)

Clears all the data logged from Data Log. Set as directed by the confirmation message that appears. Pressing the "NO" button will return you to the initialization menu screen without clearing the data log data.

Operation Log

HG2G-S **HG2G-5S** **HG2G-5F** **HG3G** **HG4G** HG1F HG2F HG2S HG3F HG4F

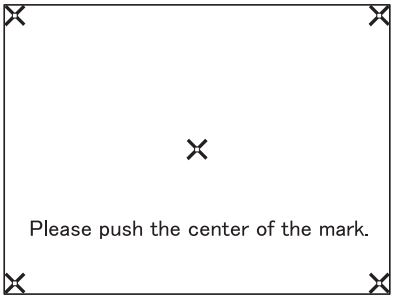
Clears all the operation log data. Pressing the "Yes." button begins the initialization.

■ Touch Panel Adjust (Touch Panel)

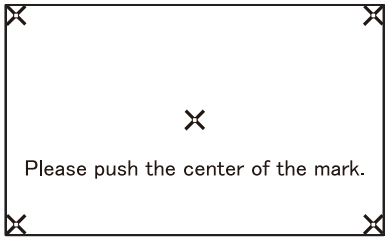
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Adjusts the analog touch panel. It is supported by HG2G-S/-5S/-5F, HG3G/4G and HG1F. Press the "Yes" button.

HG2G-S/-5S/-5F, HG3G/4G



HG1F



Press the center of each × symbol displayed on the screen, in the following order: Top-left, top-right, bottom-right, bottom-left, center. The position of the analog touch panel is properly adjusted and set.

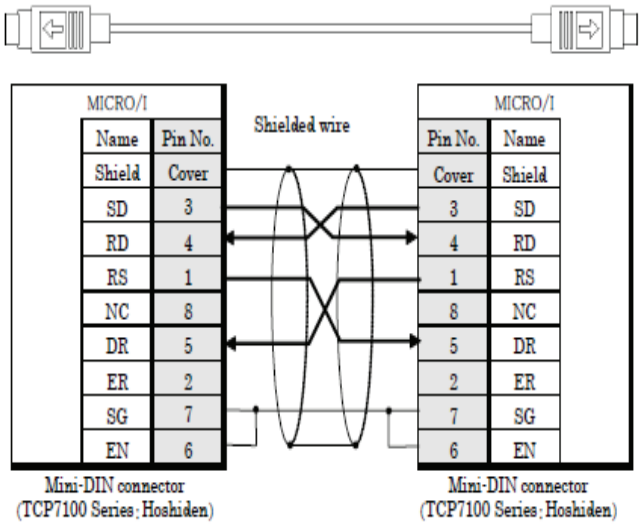
■ (MICRO/I Duplicate Function)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Use this function to copy project data between two HG1F displays connected by a cable.

Execute the process as directed by the displayed messages. The project data, font data, system software and Data Storage Area data are read from the source HG1F display and copied to the connected HG1F display.

Cable



- Do not remove the cable or do not turn off MICRO/I while data is being transferred. If transfer fails, download the project from WindO/I-NV2 to recover the data.
- Data transfer takes about 5 minutes.
- When transference fails, the following Error information is shown.
  ERR NO.1 = Time out
  ERR NO.2 = Received data is invalid
  ERR NO.3 = Unavailable version
  ERR NO.4 = Unavailable model
  ERR NO.5 = Save data is invalid
  ERR NO.6 = Password is invalid

If a password has been set to the connected MICRO/I, set the same password to the MICRO/I executing data transfer. Copying will not start unless the password matches.

● PLC Driver (Host I/F Driver)

Pressing the "PLC Driver" button (In case of HG1F/2F/2S/3F/4F, press the "Host I/F Driver" button) displays the host interface driver menu screen. Available host I/F settings will differ based on the currently connected host device. For detailed on individual settings, see the External Device Setup Manual. When no project exists, or "No Host" is selected for the Communication Method, the Host I/F Driver setting screen cannot be entered.

To return to the initial settings screen, press the "Init Set" button at the top of the screen.

● O/I Link (O/I Link)

Pressing the "O/I Link" button displays the O/I link menu screen. This screen presents information on the O/I Link. (On the HG2G-S/-5S/-5F, HG3G/4G, various settings can be made by pressing the "O/I Link Setting 1" and "O/I Link Setting 2" buttons.)

- To return to the initial settings screen, press the "Init Set" button at the top of the screen.
- See the External Device Setup Manual for details.

■ O/I Link Setting 1

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

■ O/I Link Setting 2

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

● Communication I/F (Com. I/F)

Pressing the "Communication I/F (Com. I/F)" button displays the communication interface settings menu screen. You can use this screen to set the items below. Press the button for each item to set.

- To return to the initial settings screen, press the "Init Set" button at the top of the screen.
- Press the "Comm. I/F" button at the top of the screen to return to the communication interface settings menu.

■ Serial 1 (Serial I/F 1)

Allows the setting of communication parameters for the Serial Interface 1.

■ Serial 2 (Serial I/F 2)

Allows the setting of communication parameters for the Serial Interface 2.

■ O/I Link (O/I Link I/F)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Allows the setting of communication parameters for the O/I Link Interface.

Ethernet IP Address (Ethernet I/F - IP Address, Subnet Mask)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Use the following procedure to set the IP address/ Subnet mask settings.

Press the left/right buttons to select an item, then use the Keypad to enter the IP address and subnet mask values. Press the "ENTER" button to apply the entered values.

> The setting is not updated if you display another screen before applying the setting.

Ethernet Default Gateway (Ethernet I/F - Default Gateway)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Specify the default gateway.

Press the left/right buttons to select an item, then use the Keypad to enter the default gateway value. Press the "ENTER" button to apply the entered value.

> The setting is not updated if you display another screen before applying the setting.

Ethernet Misc Setting (Ethernet I/F - Maintenance Communication)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Specify whether to allow or prohibit Maintenance Communication via TCP/IP (refer to Chapter 24 "Using the online function for Ethernet communication" on page 24-8).

Select the item to set using the POSN UP (▲) or POSN DOWN (▼) buttons. The selected item is highlighted. Each press of the [CHNG UP] or [CHNG DOWN] button changes the property of the selected item. Repeat this procedure until the desired properties are displayed. Press the "ENTER" button to apply the entered value.

> The setting is not updated if you display another screen before applying the setting.

Host IP Address

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Changes the IP addresses for the host station numbers.

Procedure

1. Press the left/right buttons to select the station number, and then enter the station number value with the numeric keys.
2. Press the "ENT" button to confirm the entered value. The IP address for the selected station number is displayed.
3. Press the left/right buttons to select the item, and then enter the IP address with the numeric keys.
4. Press the "ENT" button to confirm the entered value.
5. Press the "SAVE" button to save the settings.

> If you switch to another screen or change the station number before pressing the "SAVE" button, the settings are not saved.

● (CF Card)

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F **HG2F** HG2S **HG3F** **HG4F**

Press the "CF Card" button to display the CF card menu screen. You can set the items below from this screen. Press the button for each item to set it. This feature is only supported by models with a compact flash interface.

- To return to the initial settings screen, press the "Init Set" button at the top of the screen.
- To return to the CF card menu screen, press the "CF Card" button at the top of the screen.

■ **(HG to CF Card)**

Copies project data, font data, and runtime system software from the operator interface to the CF Card.

Set as directed by the confirmation message that appears. Pressing the "NO" button will return you to the CF card menu screen without executing the copy operation.

The CF access folder is set using the WindO/I-NV2 project settings.

■ **(Copy from CF Card)**

Copies the project data, font data and system software from the CF card to MICRO/I's internal memory. Press the ▲ or ▼ button to select the CF card access folder containing the project data.

Set as directed by the confirmation message that appears. Pressing the "NO" button will return you to the CF card menu screen without executing the copy operation.

The project data can not be read if the data was copied from computer to CF card using Windows Explorer. In order to download a project to a CF card, use [Home] - [Project] - [Upload] - [Stored Data in Memory Card].

■ **(Initialize)**

Formats the CF card.

Set as directed by the confirmation message that appears. Pressing the "NO" button will return you to the CF card menu screen without executing the copy operation.

■ **(Stop Access)**

Press the "Stop Access" button to stop accessing to the CF card.

The CF access lamp will flash and then go off, and then MICRO/I will stop accessing to the CF card.

The Access Stop Switch (red button) at the rear of the operator has the same function.

3.2 Clock Setting (Clock Set)

Press the "Clock Setting (Clock Set)" button in the System Menu screen to display the clock settings screen. Use this screen to set MICRO/I's internal clock. To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

Procedure

1. Press the left/right buttons to select an item, then use the Keypad to enter the date or time.
2. Press the "ENT" or "Enter" button to apply the new setting.
3. Press the "SAVE" button to save the date/time setting. (HG2G-S/-5S/-5F, HG3G/4G)

- The setting is not updated if you display another screen before applying the setting.
- Since the HG2G-5ST22VF-* has no backup battery, the clock data is initialized when the MICRO/I is turned off.

3.3 Simulate (Debug)

Simulation Mode is used for debugging, and can only be executed on the MICRO/I machine. To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

Press the "Simulation" button to run the simulation.

● (Simulation)

You can use this screen to run the Monitor mode with simulation function. Press the "Simulation" button to begin.

To return to the debugging settings screen, press the "Debug" button at the top of the screen.

Press the Start button to run the simulation.

Using the Device Monitor Function in conjunction with the Monitor function is a more efficient means of debugging. (For details, refer to Chapter 25 "2.2 Device Monitor" on page 25-19.)

When the communication setting on the HG1F/2F/2S/3F/4F is set to 1:1, the host device values are retained even after the screen is changed. However, if set to 1:N, or when using the HG2G-S/-5S/-5F, HG3G/4G, the host device values are not retained.

3.4 Run (Run (Start))

Switches to run mode.

3.5 System Information (System Information)

Pressing the "System Information" button in the System Menu screen displays the system information screen. This screen displays information such as the MICRO/I type No., stored system software type and version No. (HG2G-S/-5S/-5F, HG3G/4G displays this information when the "System" or "System 2" button described below is pressed.) To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

Only the first 15 characters of the project name are displayed.

HG3F/4F displays the MAC address (Media Access Control address) set at time of factory shipment at the bottom of the screen.

● System

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Displays the MICRO/I type No., MAC address (Media Access Control address), stored system software version No. To return to the system information screen, press the "System Info." button at the top of the screen.

● System 2

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Displays the file name of the project and the manufacturer, protocol, and version no. of PLC. To return to the system information screen, press the "System Info." button at the top of the screen.

● Font

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Displays the font type stored in MICRO/I. To return to the system information screen, press the "System Info." button at the top of the screen.

3.6 File Manager

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

File Manager manages files stored on USB flash drives, SD Memory Cards, and MICRO/I internal memory. It can format external memory devices, copy and delete files, and run associated applications. To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

- Format
  Select the drive you want to format, and then press the "FORMAT" button.
- Copy
  Select the file you want to copy, and then press the "COPY" button.
  If USB Flash Drive or SD Memory Card is selected as the source and the destination device, the selected file will be copied to the device. If the source or the destination device is MICRO/I, "Project Data Transfer" function will be executed and MICRO/I project will be downloaded or uploaded. If the source or the destination device is PLC, "PLC Program Data Transfer" function will be executed and PLC Program will be downloaded or uploaded. (Refer to Chapter 28 "1 Project Transfer Function" on page 28-1.)
- Delete
  Select the files you want to delete, and then press the "DELETE" button.

If the external memory device is not recognized correctly, press the "RELOAD" button to reload it.

3.7 Top Page

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Moves to Top Page.

3.8 Self Diagnosis (Self Diagnosis)

Pressing the "Self Diagnosis" button in the System Menu screen displays the self-diagnosis screen. Use this screen to run MICRO/I internal self-diagnosis. To execute an operation, press the corresponding button. To return to the System Menu screen, press the "Main Menu" button at the top of the screen.

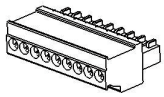
- You need inspection jigs to run self-diagnosis.
- Self Diagnosis is a special screen for factory inspections. Do not use without due reason.

Chapter 34 MICRO/I Specifications

1 HG2G-S/-5S

1.1 Packing content

Before installing the HG2G-S/-5S, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

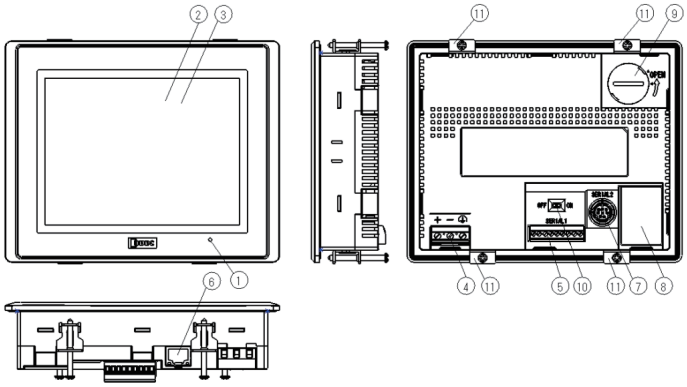
Name	Pcs/pack	
HG2G-S/-5S Unit	1	
Instruction Sheet (Japanese/English)	1	
Mounting clips	4	
Host communication plug	1	

1.2 Type No.

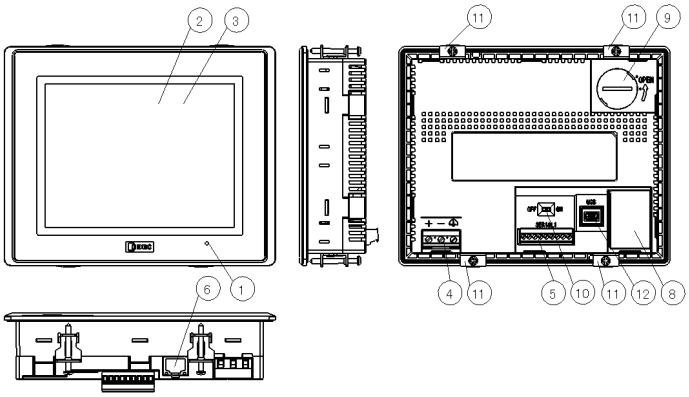
LCD size	Power supply	Interface	Bezel color	Type No.
5.7 inch STN Color	24V DC	RS232C/485(422)	Light gray	HG2G-SS22VF-W
			Dark gray	HG2G-SS22VF-B
			Silver	HG2G-SS22VF-S
		RS232C/485(422) & Ethernet	Light gray	HG2G-SS22TF-W
			Dark gray	HG2G-SS22TF-B
			Silver	HG2G-SS22TF-S
	12V DC	RS232C/485(422)	Light gray	HG2G-SS21VF-W
			Dark gray	HG2G-SS21VF-B
			Silver	HG2G-SS21VF-S
		RS232C/485(422) & Ethernet	Light gray	HG2G-SS21TF-W
			Dark gray	HG2G-SS21TF-B
			Silver	HG2G-SS21TF-S
5.7 inch STN Monochrome	24V DC	RS232C/485(422)	Light gray	HG2G-SB22VF-W
			Dark gray	HG2G-SB22VF-B
			Silver	HG2G-SB22VF-S
		RS232C/485(422) & Ethernet	Light gray	HG2G-SB22TF-W
			Dark gray	HG2G-SB22TF-B
			Silver	HG2G-SB22TF-S
	12V DC	RS232C/485(422)	Light gray	HG2G-SB21VF-W
			Dark gray	HG2G-SB21VF-B
			Silver	HG2G-SB21VF-S
		RS232C/485(422) & Ethernet	Light gray	HG2G-SB21TF-W
			Dark gray	HG2G-SB21TF-B
			Silver	HG2G-SB21TF-S
5.7 inch TFT Color	12V DC / 24V DC	RS232C/485(422)	Light gray	HG2G-5ST22VF-W
			Dark gray	HG2G-5ST22VF-B
			Silver	HG2G-5ST22VF-S
		RS232C/485(422) & Ethernet	Light gray	HG2G-5ST22TF-W
			Dark gray	HG2G-5ST22TF-B
			Silver	HG2G-5ST22TF-S

1.3 Part Names

■ HG2G-S



■ HG2G-5S



No.	Name	Description
(1)	POWER LED	Green (lit) : Normal Operation (Power is ON.) Not lit : Power is off.
(2)	Display	
(3)	Touch Panel	
(4)	Power Supply Terminal	
(5)	Serial Interface 1	RS232C/485(422) Connector : Terminal Block 9 pin
(6)	Ethernet Interface (LAN)	IEEE802.3u 10BASE-T/100BASE-TX Connector : RJ-45
(7)	Serial Interface 2	RS232C Connector : Mini DIN 8 pin
(8)	O/I Link interface	For O/I Link Unit
(9)	Battery Cover (Except for HG2G-5ST22VF)	
(10)	Terminating Resistor Selector Switch	For RS485(422) interface
(11)	Mounting Clip Position	
(12)	USB Interface	USB2.0 (Device) Connector : Mini-B

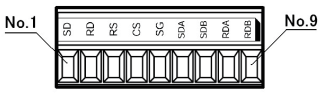
1.4 External Interfaces

CAUTION

- **Make sure to turn off the power to the HG2G-S/-5S before wiring each interface or switching the terminating resistor selector Switch.**
- **Note that only one of the RS232C or RS485(422) interfaces can be used at one time. Wiring both interfaces will result in failure of the HG2G-S/-5S. Wire only the interface used.**

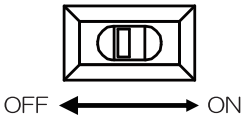
● Serial Interface 1

Interface Specification	RS232C/485(422)
Connector	Detachable Terminal Block 9 pin
Applicable cable	AWG16 to AWG28
Recommended Pressure Terminal	AI 0.25-6 BU AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD (Phoenix Contact)
Tightening Torque	0.22 to 0.25 N·m



No.	Name	I/O	Function	Communication type	
1	SD	OUT	Send Data	RS232C	
2	RD	IN	Receive Data		
3	RS	OUT	Request to Send		
4	CS	IN	Clear to Send		
5	SG	-	Signal Ground		RS485(422)
6	SDA	OUT	Send Data (+)		
7	SDB	OUT	Send Data (-)		
8	RDA	IN	Receive Data (+)		
9	RDB	IN	Receive Data (-)		

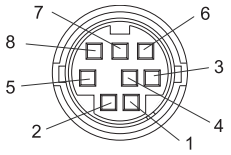
- **Terminating Resistor Selector Switch (for RS485(422) interface)**



When using RS485(422) interface, set the Terminating Resistor Selector Switch to the ON side. This will connect the internal terminating resistor (100Ω) between RDA and RDB.

● Serial Interface 2

Interface Specification	RS232C
Connector	Mini DIN 8 pin



No.	Name	I/O	Function
1	RS	OUT	Request to Send
2	ER	OUT	Data terminal ready
3	SD	OUT	Send Data
4	RD	IN	Receive Data
5	DR	IN	Data set ready
6	EN	IN	Use set ready
7	SG	-	Signal Ground
8	NC	-	No connection

- Do not connect pin 6 (EN) with any other pins except when performing maintenance communications for downloading project data.

● O/I Link Interface

The HG2G-S/-5S Operator Interface can be connected to an O/I Link Unit for 1:N communication with a PLC. This allows high-speed communication with the PLC host.

1.5 Specifications

Applicable Standards

Safety Standard	UL508, ANSI/ISA-12.12.01 CSA C22.2 No.142 (c-UL) CSA C22.2 No.213 (c-UL)
EMC Standard	IEC/EN 61131-2

Environmental Specifications

Operating Ambient Temperature	0 to 50°C
Operating Relative Humidity	10 to 90% RH (no condensation)
Storage Ambient Temperature	-20 to +60°C
Storage Relative Humidity	10 to 90% RH (no condensation)
Altitude (Operation)	0 to 2000m
Pollution Degree	2
Corrosion Immunity	Free from corrosive gases

Electrical Specifications

Type No.	HG2G-S	HG2G-5S
Rated Operating Voltage	HG2G-S*22 : 24V DC HG2G-S*21 : 12V DC	12V DC / 24V DC
Power Consumption	10W maximum	8W maximum
Power Voltage Range	HG2G-S*22 : 20.4V DC to 28.8V DC HG2G-S*21 : 10.2V DC to 18.0V DC	10.2V DC to 28.8V DC
Allowable Momentary Power Interruption	10 ms maximum	10 ms maximum
Inrush Current	HG2G-S*22 : 20A maximum HG2G-S*21 : 40A maximum	40A maximum
Dielectric Strength	AC1000V, 10mA, 1 minute (between power and earth terminals)	
Insulation Resistance	50 MΩ minimum (500V DC megger) (between power and earth terminals)	

Construction Specifications

Vibration Resistance	5 to 8.4Hz amplitude 3.5mm, 8.4 to 150Hz acceleration 9.8m/s^2 10 times on each of three mutually perpendicular axes (100 minutes) (IEC61131-2)
Shock Resistance	147m/s^2, 11ms (5 shocks on each of three mutually perpendicular axes) (IEC61131-2)

■ Performance Specifications

Type No.		HG2G-S	HG2G-5S
Display	LCD Type	HG2G-SS : STN color LCD HG2G-SB : STN monochrome LCD	TFT color LCD
	Display Colors	HG2G-SS : 256 Colors HG2G-SB : 2 Colors (15 tones)	256 Colors
	Effective Display Area [mm]	115.2 (W) × 86.4 (H)	
	Display Resolution	320 (W) × 240 (H) pixels	
	View angle	HG2G-SS : Left/Right: 55°, Top: 65°, Bottom: 70° HG2G-SB : Left/Right: 45°, Top: 25°, Bottom: 45°	Left/Right: 70°, Top: 70°, Bottom: 60°
	Brightness of LCD only	HG2G-SS : 350 [cd/m^2] HG2G-SB : 500 [cd/m^2]	400 [cd/m^2]
	Contrast /Brightness Adjustment	32 levels	
	Backlight	Cold-cathode tube	LED
	Backlight Life*1	75,000 hours minimum	50,000 hours minimum
Touch Panel	Switch Type	Analog Resistive Film	
	Operating Force	0.2 to 0.8 N	
	Multiple Operations	Impossible	
	Life	1,000,000 operations	
User Memory		2MB	
Backup Battery		CR2032 lithium primary battery Guarantee Period: 1 Year (at 25°C) Recommended Replacement Span: Every 4 Years (at 25°C) (Except for HG2G-5ST22VF)	
Backup Data		Calendar, Log Data, Keep Internal relay/resister (Except for HG2G-5ST22VF)	
Buzzer output		Single tone (tone length is adjustable)	
Degree of Protection		IP65 (IEC60529)*2 TYPE 13*3	IP66 (IEC60529)*2 TYPE 4X TYPE 13*3
Weight (approx.)		500g	

■ EMC Specifications

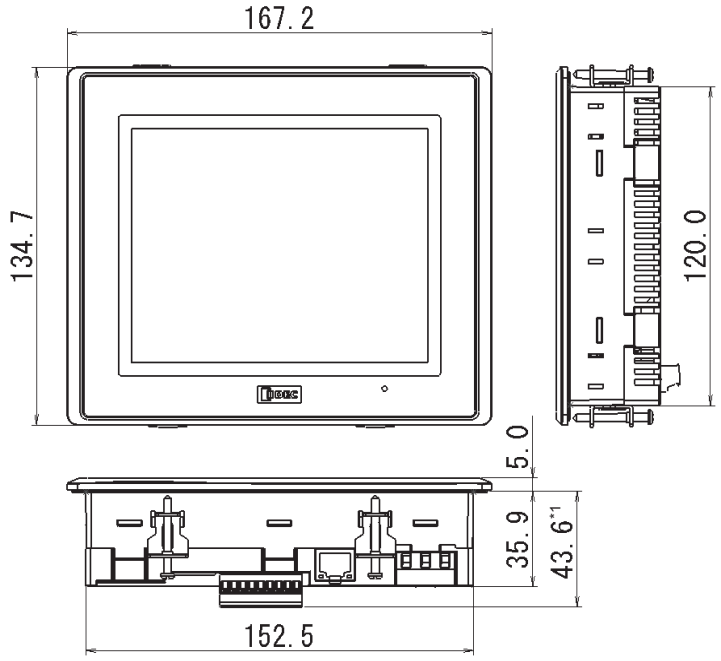
Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz) 3V/m (1.4 to 2.0 GHz) 1V/m (2.0 to 2.7 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V-0V) ±1kV (between +24V-FE, 0V-FE)
Conducted Radio Frequency Immunity	3V (Power, Communication cable) (150kHz to 80MHz) 80% AM (1kHz)

*1 The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures.
*2 The degree of protection for the operating section after the panel is attached. The compliance test has been passed, but this is not a guarantee of operation in all environments.
*3 Not a guarantee in all usage environments with oil materials.

1.6 Dimensions

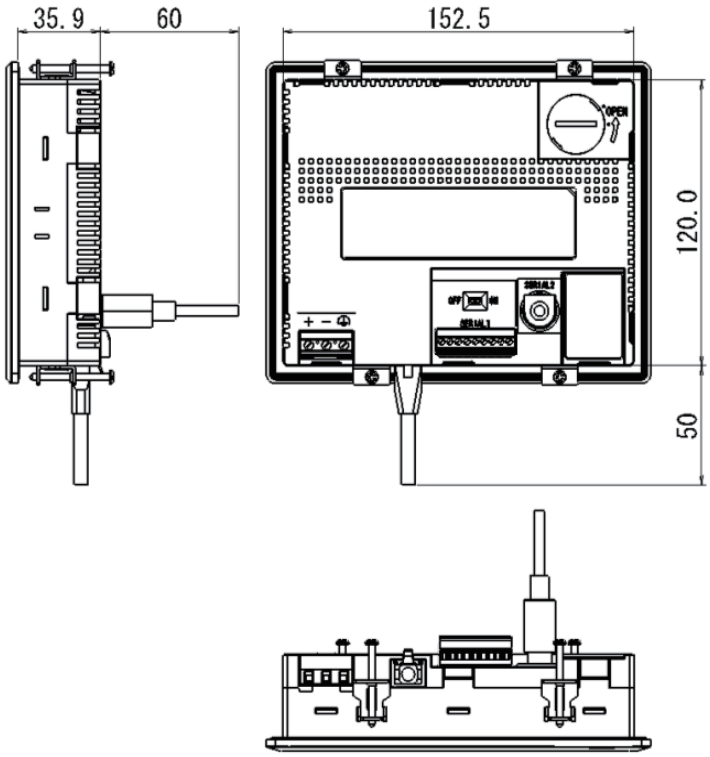
■ HG2G-S

Unit: mm



<Cable Attached Dimensions>

Unit: mm

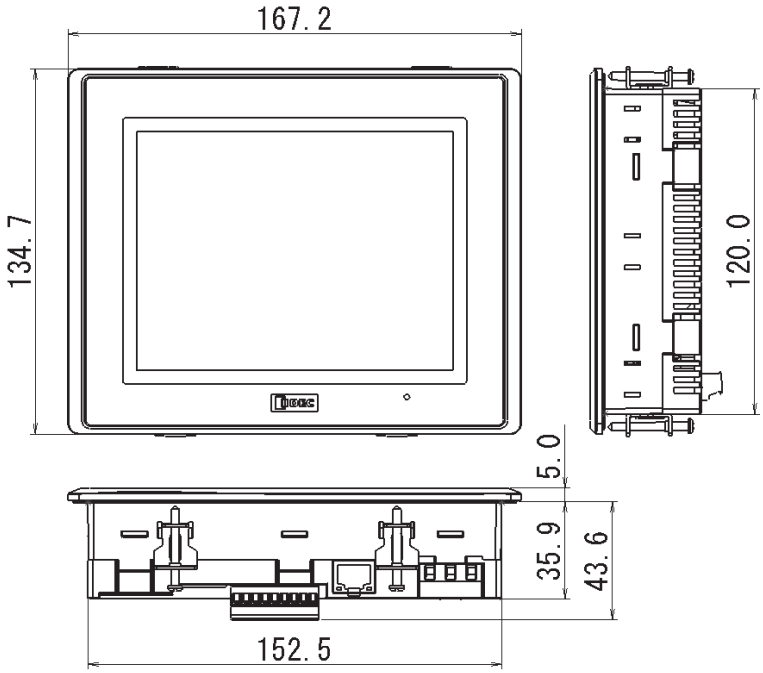


Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

*1 The depth measurement for shipments from the IDEC factory before December 2011 is 40.1 mm.

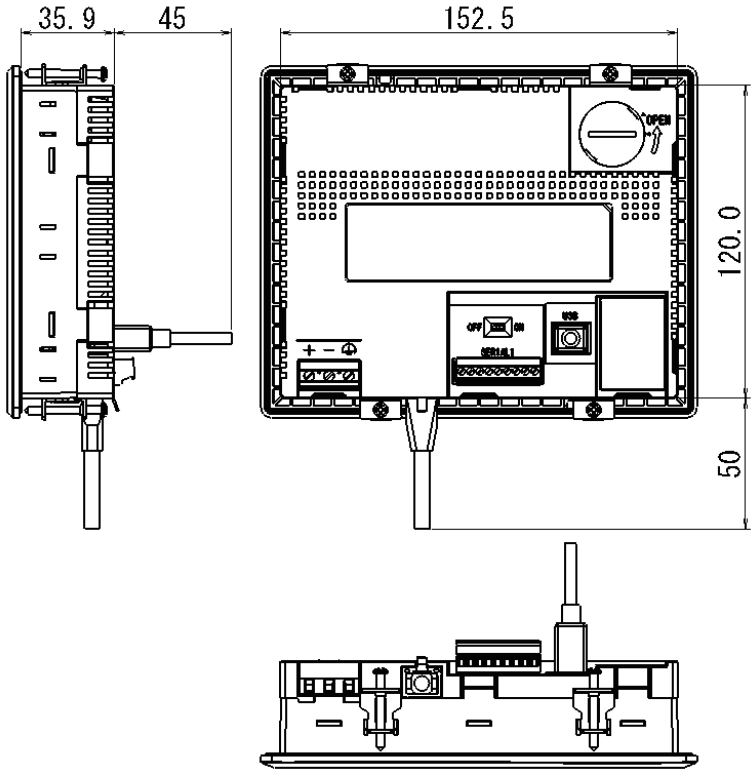
■ **HG2G-5S**

Unit: mm



<Cable Attached Dimensions>

Unit: mm



Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

1.7 Installation

● Operating Environment

For designed performance and safety of the HG2G-S/-5S, do not install the HG2G-S/-5S in the following environments:

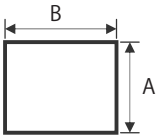
- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG2G-S/-5S.
- Where strong ultraviolet rays fall on the HG2G-S/-5S.
- Where corrosive or combustible gasses exist.
- Where the HG2G-S/-5S is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

● Ambient Temperature

- Allow sufficient space for ventilation, and install the equipment away from heat sources.
- Allow at least 100mm between the HG2G-S/-5S and walls or other equipment.
- Do not install the HG2G-S/-5S where the ambient temperature exceeds the rated operating ambient temperature range. When mounting the HG2G-S/-5S in such locations, provide a forced air-cooling fan or air-conditioner to keep the ambient temperature within the rated temperature range.

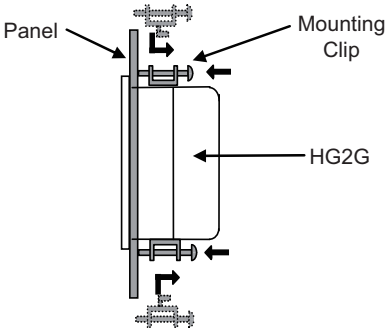
● HG2G-S/-5S Installation

- Make a panel cut-out on the panel with the dimensions shown below.



A	B	Panel Cut-out
121.0 $^{+2.0}_{0}$	153.0 $^{+2.0}_{0}$	1.6 to 5.0

- The HG2G-S/-5S has the mounting clip positions not only on the top and bottom side but also on the left and right side. But when fasten with the attached mounting clips at the left and right side, the HG2G-S/-5S may impair the waterproof, the vibration resistance, and the shock resistance characteristics.



Unit : N•m

Type	Specified Torque
HG2G-S	0.12 to 0.17
HG2G-5S	0.2 to 0.3

⚠ CAUTION

- **Do not tighten excessively, otherwise the HG2G-S/-5S may warp and cause wrinkle on the display, or impair the waterproof characteristics.**
- **If the mounting clips are tightened obliquely to the panel, the HG2G-S/-5S may fall off the panel.**
- **When installing the HG2G-S/-5S into a panel cut-out, make sure that the gasket is not twisted. Especially when re-installing, take special care because any twists in the gasket will impair the waterproof characteristics.**

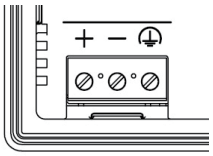
1.8 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG2G-S/-5S.**
- **Separate the HG2G-S/-5S power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Power Supply Terminal

- Pin assignment is shown in the following table.



+	Power supply HG2G-S*22 : 24V DC (+24V) HG2G-S*21 : 12V DC (+12V) HG2G-5ST22 : 12V DC / 24V DC
-	Power supply 0V (0V)
⏚	Functional Earth (FE)

- Use applicable cables for wiring and recommended ferrules (made by Phoenix Contact) as follows.

Applicable cable	AWG18 to AWG22
Recommended Pressure Terminal	AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD AI-TWIN 2×0.5-8 WH (TWIN Pressure Terminal) (Phoenix Contact)
Tightening Torque	0.5 to 0.6 N•m

● Grounding Cautions

If you decide to use a single power supply for the HG2G-S/-5S with more than one external device, take extra precautions. Some external devices may produce electrical noise and short circuit the entire system setup, therefore, damaging the communication circuit of the HG2G-S/-5S and non-isolated Communication Device (i.e. PLC).
To prevent such damage, choose a proper solution depending on your system setup.

- Use a separate earth ground from the external noise source device.
- The wire for grounding should be thick and short in order to direct the noise from the noise source device to the earth ground.
- Use a separate power supply from the external noise source device.
- Insert an isolator on the communication line of the HG2G-S/-5S and the non-isolated communication device (i.e. PLC) to prevent damage.

● Cautions for using the HG2G-S/-5S connected to a personal computer

When connecting the HG2G-S/-5S to a personal computer via the USB Interfaces, the HG2G-S/-5S or the personal computer may break down depending on the conditions of the personal computer. Make sure of the following cautions, in order to prevent an accident.

- If the personal computer has a 3-pin power plug or power plug with a ground lead type, make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
- If the personal computer has a 2-pin power plug without ground lead, follow the procedure below when connect the HG2G-S/-5S to the personal computer.
  (1) Pull out the power plug of the personal computer from the AC outlet.
  (2) Connect the HG2G-S/-5S to the personal computer.
  (3) Insert the power plug of the personal computer into the AC outlet.

1.9 Maintenance and Inspection

Maintain and inspect the HG2G-S/-5S periodically to ensure the best performance. Do not disassemble, repair, or modify the HG2G-S/-5S during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Terminals, Connectors	Check the terminals and connectors to make sure of no loose screws, incomplete insertion, or disconnected lines.
Mounting Clips	Make sure that all mounting clips and screws are tightened sufficiently. If the mounting clips are loose, tighten the screw to the recommended tightening torque.
Backlight	The HG2G-S/-5S's backlight cannot be replaced by the customer. When the backlight needs to be replaced, Contact IDEC.
Backup Battery	The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.
Touch Panel	A gap may be caused in the operation accuracy of the touch panel by the secular distortion, etc. Readjust the touch panel according to the following procedure when there is a gap in the operation of the touch panel.

● Replacing the Backup Battery

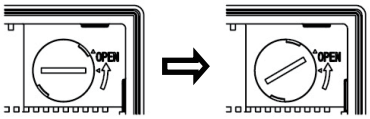
A backup battery is built into the HG2G-S/-5S (expect for HG2G-5ST22VF) to retain the internal backup data (log data, keep resister, and keep relay) and clock data.

When the "Replace the battery" message is displayed, replace the backup battery by following the procedure below.

When the "Battery level LOW" message is displayed, replace the battery immediately; otherwise, the backup data and clock data may be lost.

Whether or not to display the reminder message for battery replacement can be specified with the configuration software. Refer to Chapter 4 "3.1 System Tab" on page 4-26 for details.

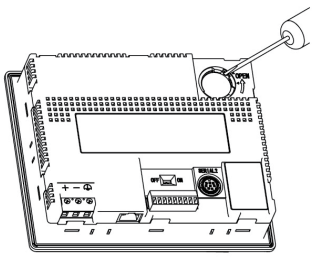
1 Remove the battery holder cover.



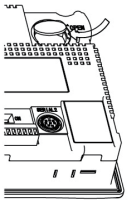
2 Turn on the power to the HG2G-S/-5S, wait for approximately one minute, and then turn off the power again.

After turning off the power to the HG2G-S/-5S in step *2*, complete the steps through *4* within 30 seconds to replace the battery without losing the backup data and clock data. However, it is recommended that the backup data be transferred to flash memory as a precautionary measure. For the procedure to transfer the data to flash memory, refer to Chapter 32 "Internal Devices" on page 32-1. If it is not necessary to save the data, step *2* can be skipped.

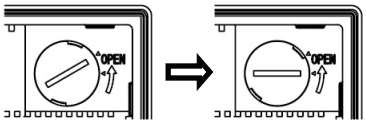
3 Insert a flathead screwdriver into the battery holder as shown in the figure, and remove the battery. The battery may pop out from the battery holder.



4 Put a new replacement battery into the battery holder.



5 Replace the battery holder cover into the original position. Replace the battery holder cover on the HG2G-S/-5S, and turn it clockwise to lock the cover.



- The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.
- IDEC provides replacement service for the battery (at customer's expense). Contact IDEC.

WARNING

The battery may be regulated by national or local regulation. Observe the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with insulating tape before disposal.

CAUTION

When replacing the battery, use the specified battery only. Note that any problems and failures arising from or in connection with the use of a battery other than the specified battery is not guaranteed.

Handling of Batteries and Devices with Built-in Batteries in EU Member States

Note) The following symbol mark is for EU countries only and is according to the directive 2006/66/EC Article 20 information for end-users and Annex II.

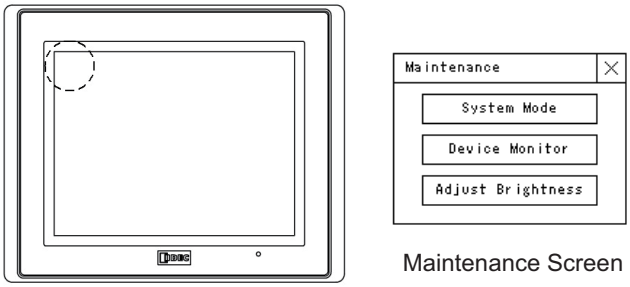
This symbol mark means that batteries and accumulators, at their end-of life, should be disposed of separately from your household waste.

If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows :
Hg : mercury (0.0005%), Cd : cadmium (0.002%), Pd : lead (0.004%)

In the European Union there are separate collection systems for used batteries and accumulators.
Please dispose of batteries and accumulators correctly in accordance with each country or local regulation.

● Maintenance Screen

Turn on the power to the HG2G-S/-5S, then press and hold the touch panel on the upper-left corner of the screen for three seconds or longer. The Maintenance Screen appears on the screen.

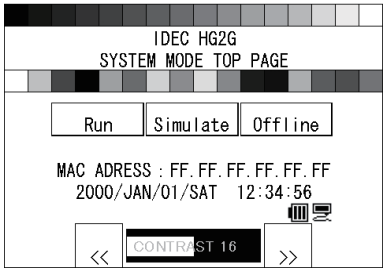


Maintenance Screen

- Permission to show the Maintenance Screen can be set using the configuration software. Refer to Chapter 4 "3.1 System Tab" on page 4-26 for details.
- The Maintenance Screen is not displayed in the System Mode.

● System Mode

Press the [System Mode] at the top of the Maintenance Screen. The Top page Screen appears.



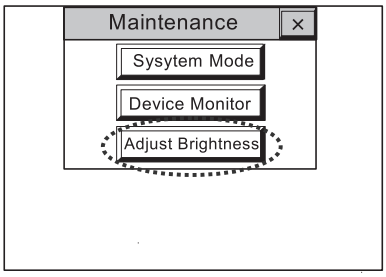
System Mode Top Page Screen

- Initial Setting, Self Diagnosis and Initialization of the data, etc can be executed in the System mode.

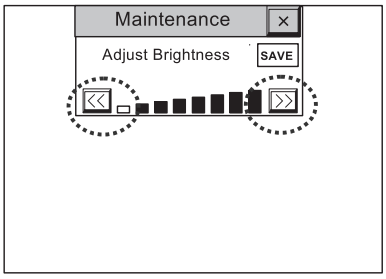
● Adjusting the Contrast / Brightness

The contrast / brightness of the HG2G-S/-5S display can be adjusted on the Adjust Contrast / Brightness Screen. Adjust the contrast / brightness to the best condition as required.

1 Press the [Adjust Contrast] or the [Adjust Brightness] at the bottom of the Maintenance Screen.
The Adjust Contrasst / Brightness Screen appears.

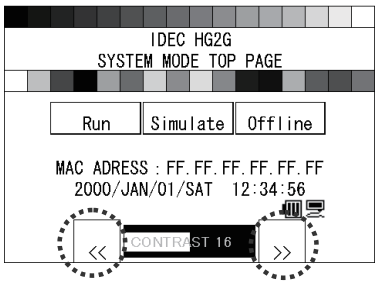


2 Press the [<<] and [>>] at the bottom the Adjust Contrast / Brightness Screen to adjust the contrast / brightness to the optimal setting. The HG2G-5ST22VF does not have a backup battery, but the brightness is retained by pressing the SAVE button after the adjustment of the brightness.



3 Press the [X] to close the Adjust Contrast / Brightness Screen.

To adjust the contrast / brightness in the System Mode, use the [<<] and [>>] buttons located at the bottom of the top page.



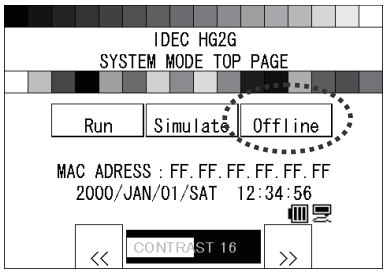
The HG2G-5ST22VF retains the brightness by pressing the SAVE button located at the bottom right of the top page.

● Adjusting the Touch Panel

A gap may be caused in the operation accuracy of the touch panel by the secular distortion, etc. Readjust the touch panel according to the following procedure when there is a gap in the operation of the touch panel.

- Touch panel adjustment procedure

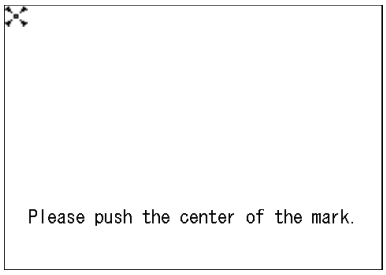
1 Press the [Offline], then the Main Menu Screen appears.



2 Press in order of [Initial Setting] → [Initialize] → [Touch Panel Adjust]. The confirmation screen appears and asks "Adjust Touch Panel setting?"

Press the [Yes], then the Touch Panel Adjust screen appears.

3 Press the center of the **X** mark, then the position of the mark changes one after another. Press five marks sequentially.



Make sure to press the center of the mark. This will ensure the accuracy of the touch panel operation.

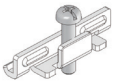
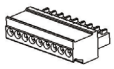
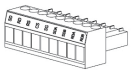
4 When normally recognized, the confirmation screen of *2* is restored.

At procedure *3*, when pressing a point away from the center of the **X** mark, a recognition error will result. Then the **X** mark returns to the initial position, then repeat the procedure of *3* again.

2 HG2G-5F, HG3G/4G

2.1 Packing content

Before installing the HG2G-5F, HG3G/4G, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

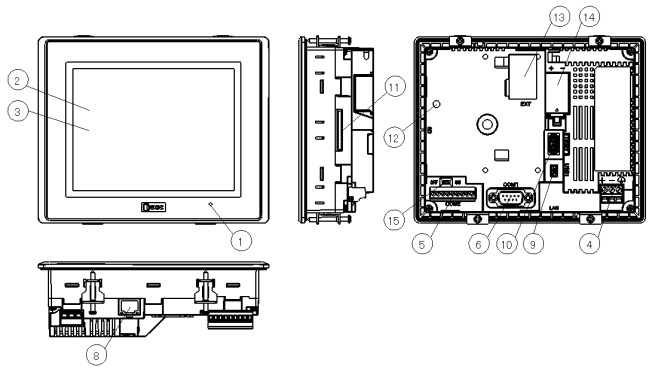
Name	Pcs/pack		
HG2G-5F, HG3G/4G Unit	1		
Instruction Sheet	1		
Mounting clips	4	HG2G-5F	 HG3G/4G
Host communication plug (Attached to the HG2G-5F, HG3G/4G)	1	 HG2G-5F	 HG3G/4G
USB Cable Lock Pin	1		
USB Clamp Band	1		
Screw lock bracket Metric Screw Thread M2.6 x 0.45	2		

2.2 Type No.

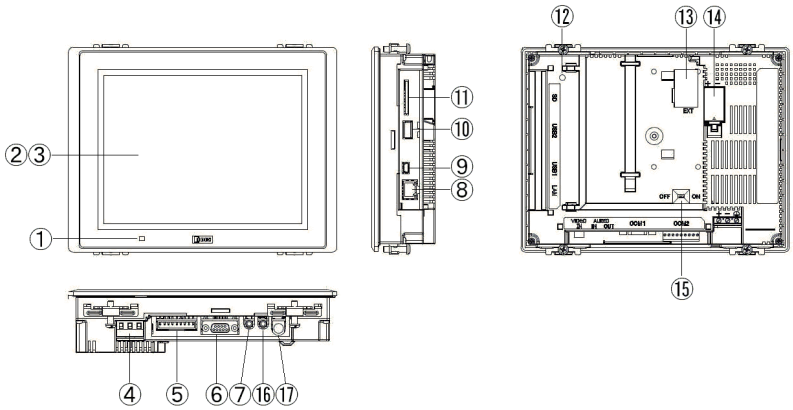
LCD size	AUDIO IN/VIDEO IN	Bezel color	Type No.
5.7 inch	Without	Light gray	HG2G-5FT22TF-W
		Dark gray	HG2G-5FT22TF-B
		Silver	HG2G-5FT22TF-S
8.4 inch	Without	Light gray	HG3G-8JT22TF-W
		Dark gray	HG3G-8JT22TF-B
	With	Light gray	HG3G-8JT22MF-W
		Dark gray	HG3G-8JT22MF-B
10.4 inch	Without	Light gray	HG3G-AJT22TF-W
		Dark gray	HG3G-AJT22TF-B
	With	Light gray	HG3G-AJT22MF-W
		Dark gray	HG3G-AJT22MF-B
12.1 inch	Without	Dark gray	HG4G-CJT22TF-B
	With	Dark gray	HG4G-CJT22MF-B

2.3 Part Names

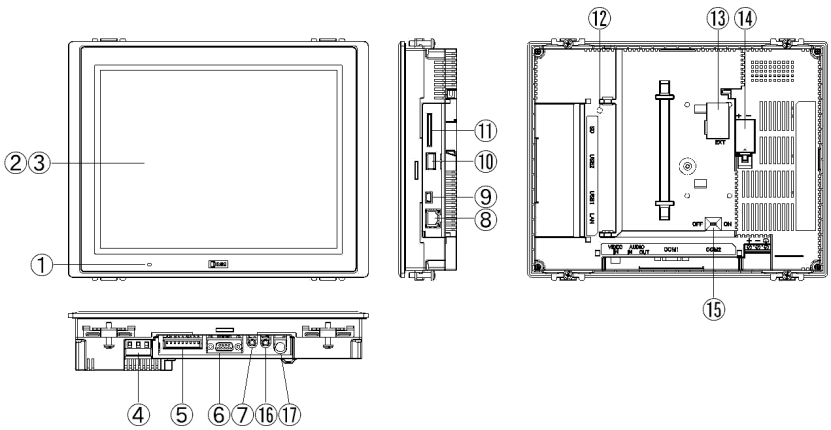
■ HG2G-5F (5.7inch)



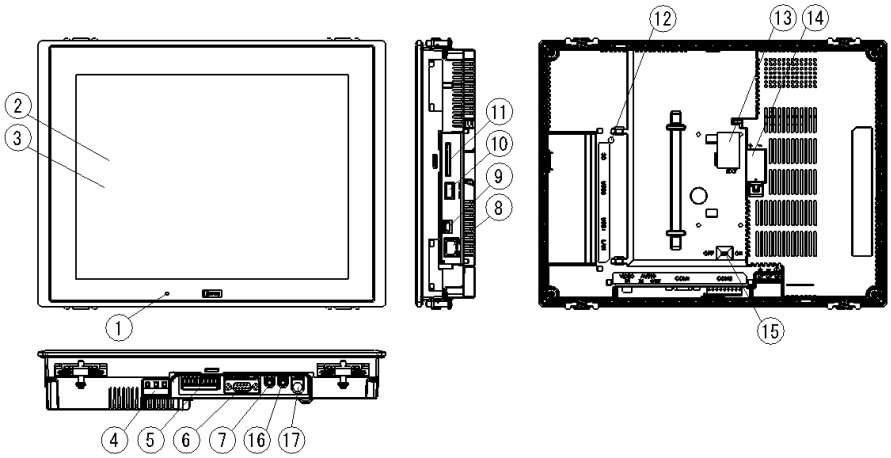
■ HG3G-8 (8.4inch)



■ HG3G-A (10.4inch)



■ **HG4G (12.1inch)**



No.	Name	Description
(1)	POWER LED	Green (lit) : Normal Operation (Power is ON.) Not lit : Power is off.
(2)	Display	
(3)	Touch Panel	
(4)	Power Supply Terminal	
(5)	Serial Interface (COM2)	RS232C/485(422) Connector : Terminal Block 9 pin
(6)	Serial Interface (COM1)	RS232C/485(422) Connector : D-sub 9 pin
(7)	Audio Interface (AUDIO OUT)	LINE OUT (Stereo) Connector : Mini Jack (φ3.5mm) (Except for HG2G-5F)
(8)	Ethernet Interface (LAN)	IEEE802.3u 10BASE-T/100BASE-TX Connector : RJ-45
(9)	USB Interface (USB1)	USB2.0 (Device) Connector : Mini-B
(10)	USB Interface (USB2)	USB2.0 (Host) Connector : Type A
(11)	Memory Card Interface (SD)	For SD Memory Card
(12)	SD Memory Card Access Lamp	
(13)	Expansion Module Interface (EXT)	For IDEC MICROSmart Expansion Modules
(14)	Battery Cover	
(15)	Terminating Resistor Selector Switch	For COM2 RS485(422) interface
(16)	Audio Interface (AUDIO IN)	LINE IN (Stereo) Connector : Mini Jack (φ3.5mm)
(17)	Video Interface (VIDEO IN)	NTSC/PAL Connector : Pin Jack

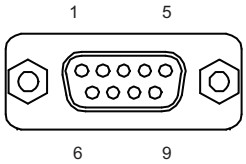
2.4 External Interfaces

CAUTION

- **Make sure to turn off the power to the HG2G-5F, HG3G/4G before wiring each interface or switching the terminating resistor selector Switch.**
- **Note that only one of the RS232C or RS485(422) interfaces can be used at one time. Wiring both interfaces will result in failure of the HG2G-5F, HG3G/4G. Wire only the interface used.**

● Serial Interface (COM1)

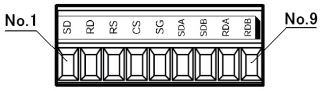
Interface Specification	RS232C/485(422)
Connector	D-sub 9 pin (Plug)
Screw lock bracket	Inch Screw Thread #4-40 UNC



No.	Name	I/O	Function	Communication type
1	4W-RDA/2W-A	IN/INOUT	Receive Data (+) [4W]/ Send and Receive Data (+) [2W]	RS485(422)
2	RD	IN	Receive Data	RS232C
3	SD	OUT	Send Data	RS232C
4	4W-SDA	OUT	Send Data (+) [4W]	RS485(422)
5	SG	-	Signal Ground	-
6	4W-RDB/2W-B	IN/INOUT	Receive Data (-) [4W]/ Send and Receive Data (-) [2W]	RS485(422)
7	RS	OUT	Request to Send	RS232C
8	CS	IN	Clear to Send	RS232C
9	4W-SDB	OUT	Send Data (-) [4W]	RS485(422)

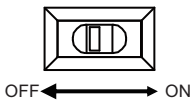
● Serial Interface (COM2)

Interface Specification	RS232C/485(422)
Connector	Detachable Terminal Block 9 pin
Applicable cable	AWG16 to AWG28
Recommended Pressure Terminal	AI 0.25-6 BU AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD (Phoenix Contact)
Tightening Torque	0.22 to 0.25 N•m



No.	Name	I/O	Function	Communication type	
1	SD	OUT	Send Data	RS232C	
2	RD	IN	Receive Data		
3	RS	OUT	Request to Send		
4	CS	IN	Clear to Send		
5	SG	—	Signal Ground		RS485(422)
6	4W-SDA	OUT	Send Data (+) [4W]		
7	4W-SDB	OUT	Send Data (-) [4W]		
8	4W-RDA/2W-A	IN/INOUT	Receive Data (+) [4W]/ Send and Receive Data (+) [2W]		
9	4W-RDB/2W-B	IN/INOUT	Receive Data (-) [4W]/ Send and Receive Data (-) [2W]		

- Terminating Resistor Selector Switch (for RS485(422) interface)



When using RS485(422) interface, set the Terminating Resistor Selector Switch to the ON side. This will connect the internal terminating resistor (120Ω) between RDA and RDB.

● Expansion Module Interface (EXT)

IDEC MICROSmart expansion modules can be connected to the HG2G-5F, HG3G/4G.

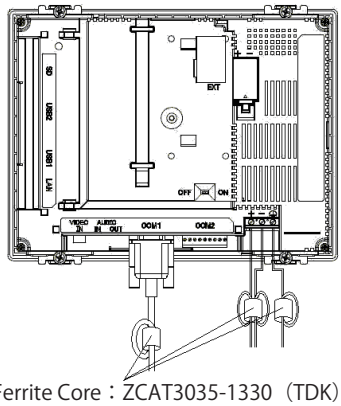
HG2G: Up to two modules
HG3G/4G: Up to four modules

Refer to Chapter 29 "1.2 Applicable Expansion Modules" on page 29-2 for the types and the combination of the expansion modules that can be installed.

2.5 Specifications

Applicable Standards

Safety Standard	UL508, ANSI/ISA 12.12.01 CSA C22.2 No.142 (c-UL) CSA C22.2 No.213 (c-UL)
EMC Standard*1	IEC/EN 61131-2
Ship Classification Standard *1	ABS, DNV, LR, NK



Ferrite Core：ZCAT3035-1330（TDK）

Environmental Specifications

Operating Ambient Temperature	0 to 50°C
Operating Relative Humidity	10 to 90% RH (no condensation)
Storage Ambient Temperature	-20 to +60°C
Storage Relative Humidity	10 to 90% RH (no condensation)
Altitude (Operation)	0 to 2000m
Pollution Degree	2
Corrosion Immunity	Free from corrosive gases

Electrical Specifications

Type No.	HG2G-5F	HG3G-8	HG3G-A	HG4G
Rated Operating Voltage	24V DC			
Power Consumption	19W maximum	25W maximum		27W maximum
When not using USB2 and EXT	10W maximum	15W maximum		18W maximum
Power Voltage Range	20.4 to 28.8V DC			
Allowable Momentary Power Interruption	10 ms maximum			
Inrush Current	30A maximum			
Dielectric Strength	AC1000V, 10mA, 1 minute (between power and earth terminals)			
Insulation Resistance	10 MΩ minimum (500V DC megger) (between power and earth terminals)			

Construction Specifications

Vibration Resistance	5 to 8.4Hz amplitude 3.5mm, 8.4 to 150Hz acceleration 9.8m/s^2 10 times on each of three mutually perpendicular axes (100 minutes) (IEC61131-2)
Shock Resistance	147m/s^2, 11ms (5 shocks on each of three mutually perpendicular axes) (IEC61131-2)

*1 When using the HG2G-5F, HG4G as the EMC Standard Approved Products, or when using the HG2G-5F, HG3G/4G as the Ship Classification Standard Approved Products, attach a ferrite core (ZCAT3035-1330 manufactured by TDK Corporation) to the power cables and the communication cables.

Performance Specifications

Type No.		HG2G-5F	HG3G-8	HG3G-A	HG4G
Display	LCD Type	TFT color LCD			
	Display Colors	65536 Colors			
	Effective Display Area [mm]	115.2 (W) × 86.4 (H)	170.4 (W) × 127.8 (H)	211.2 (W) × 158.4 (H)	246.0 (W) × 184.5 (H)
	Display Resolution	640W × 480H pixels	800W × 600H pixels		
	View angle	Left/Right/Top/ Bottom: 80°	Left/Right: 80°, Top: 80°, Bottom: 60°		
	Brightness of LCD only	800 [cd/m^2]	600 [cd/m^2]	700 [cd/m^2]	550 [cd/m^2]
	Brightness Adjustment	48 levels			
	Backlight	LED			
	Backlight Life*2	50,000 hours nominal	60000 hours minimum		
Touch Panel	Switch Type	Analog Resistive Film			
	Operating Force	3N maximum	0.55 to 2.3 N		3N maximum
	Multiple Operations	Impossible			
	Life	1,000,000 operations			
User Memory		12MB			
Backup Battery		CR2032 lithium primary battery Guarantee Period: 1 Year (at 25°C) Recommended Replacement Span: Every 4 Years (at 25°C)			
Backup Data		Calendar, Log Data, Keep Internal relay/resister			
Buzzer output		Single tone (tone length is adjustable)			
Degree of Protection		IP66 (IEC60529)*3 TYPE 4X TYPE 13*4			
Weight (approx.)		0.65 kg	1.25 kg	1.65 kg	2.1kg

EMC Specifications

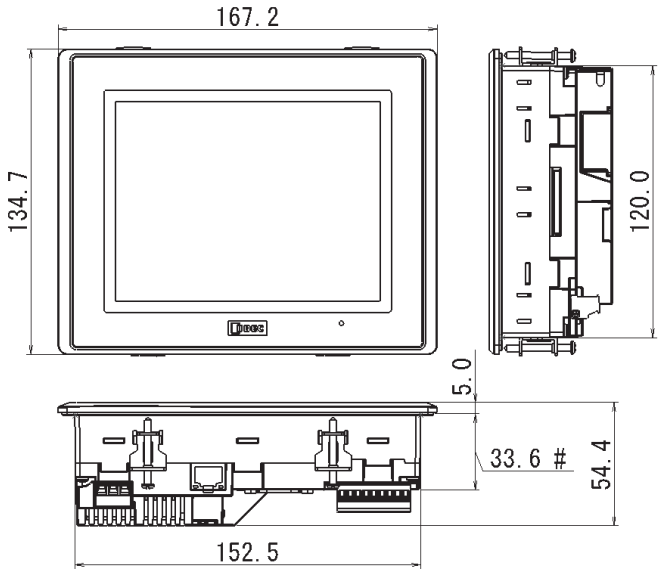
Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz) 3V/m (1.4 to 2.0 GHz) 1V/m (2.0 to 2.7 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V-0V) ±1kV (between +24V-FE, 0V-FE)
Conducted Radio Frequency Immunity	3V (Power, Communication cable) (150kHz to 80MHz) 80% AM (1kHz)

*2 The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures.
*3 The degree of protection for the operating section after the panel is attached. The compliance test has been passed, but this is not a guarantee of operation in all environments.
*4 Not a guarantee in all usage environments with oil materials.

2.6 Dimensions

■ **HG2G-5F (5.7inch)**

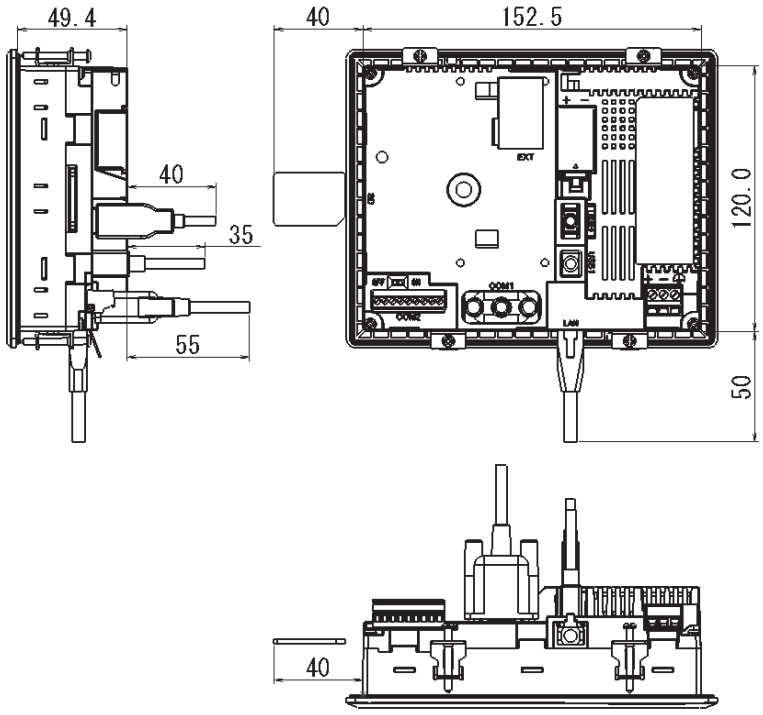
Unit: mm



The size to the expansion module installation side

<Cable Attached Dimensions>

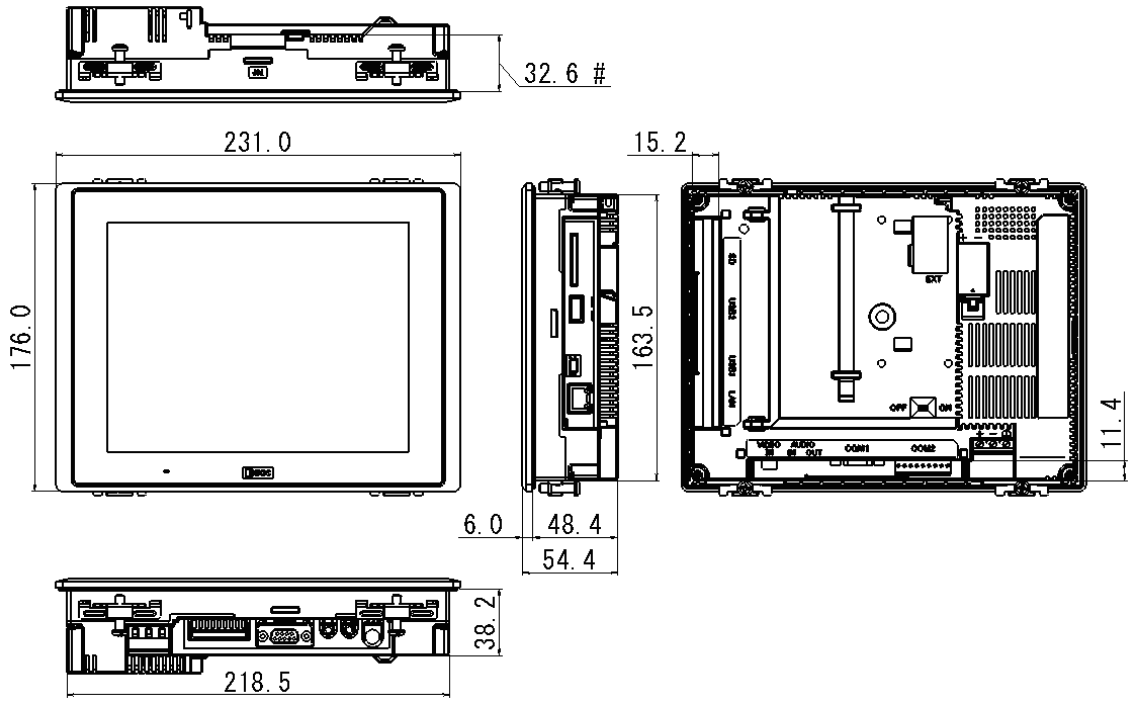
Unit: mm



Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

■ **HG3G-8 (8.4inch)**

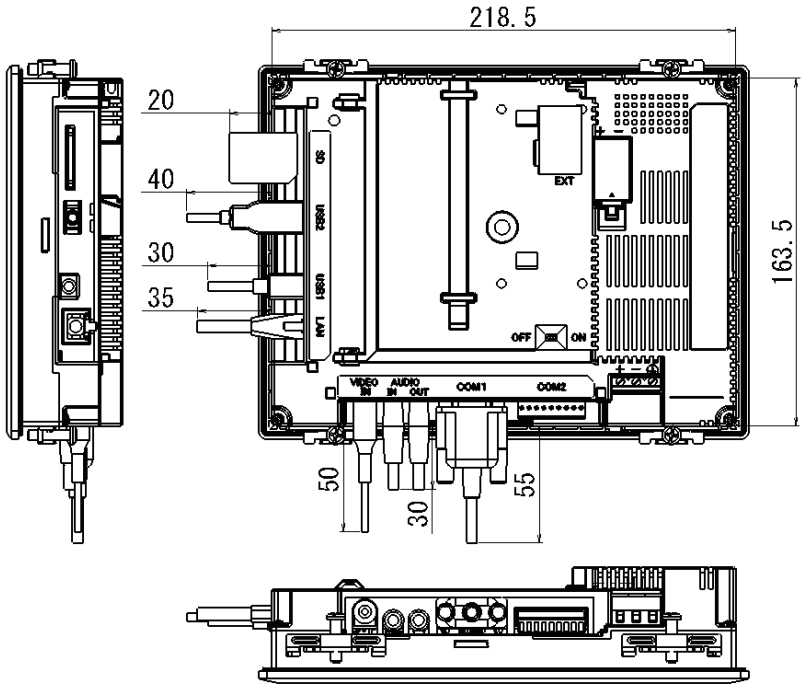
Unit: mm



The size to the expansion module installation side

<Cable Attached Dimensions>

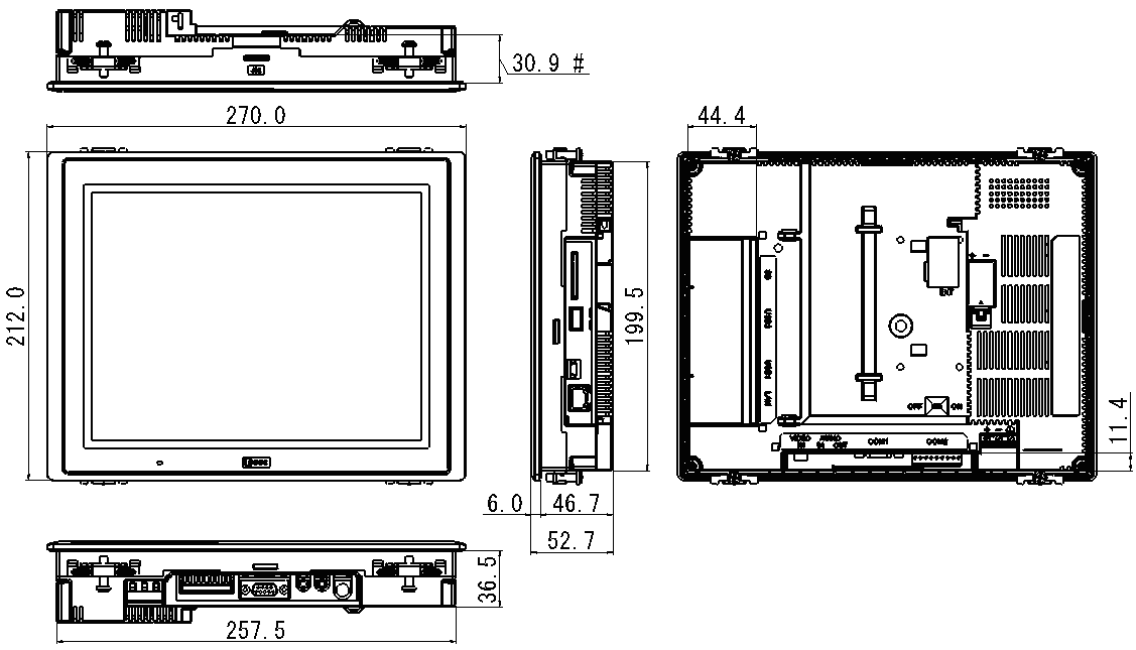
Unit: mm



Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

■ **HG3G-A (10.4inch)**

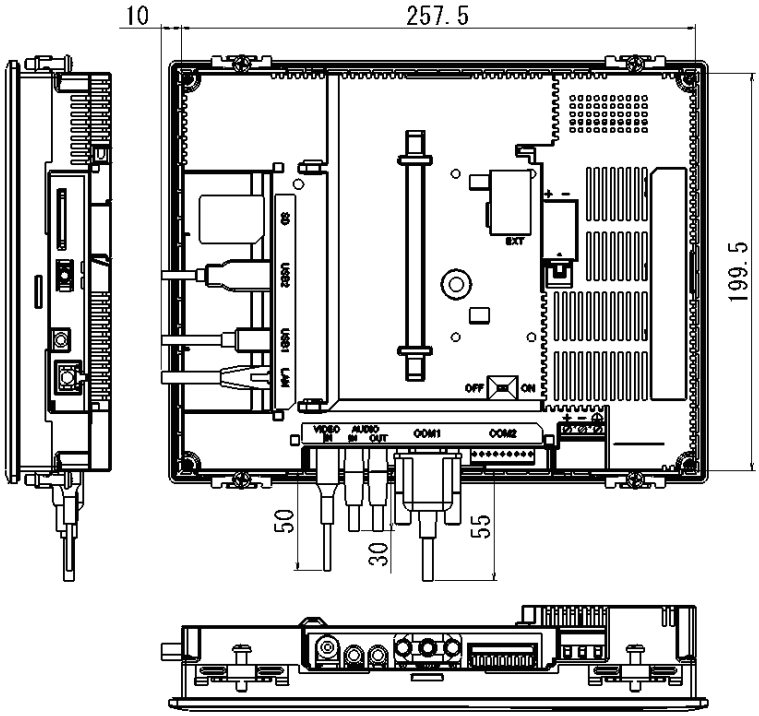
Unit: mm



The size to the expansion module installation side

<Cable Attached Dimensions>

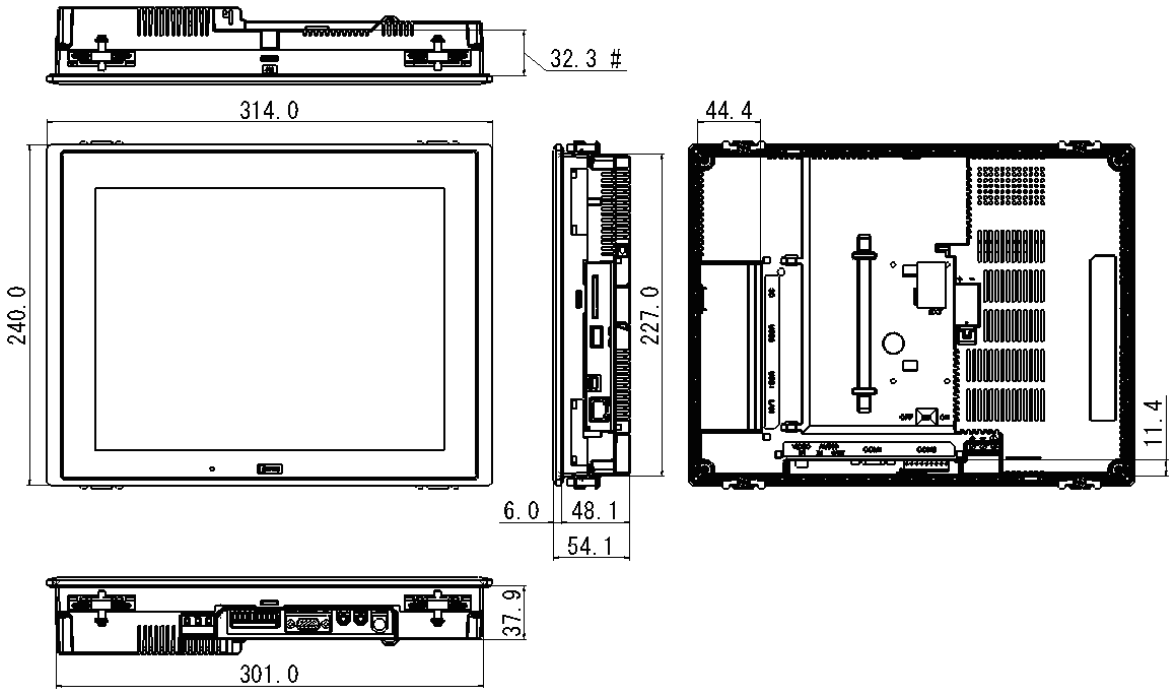
Unit: mm



Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

■ **HG4G (12.1inch)**

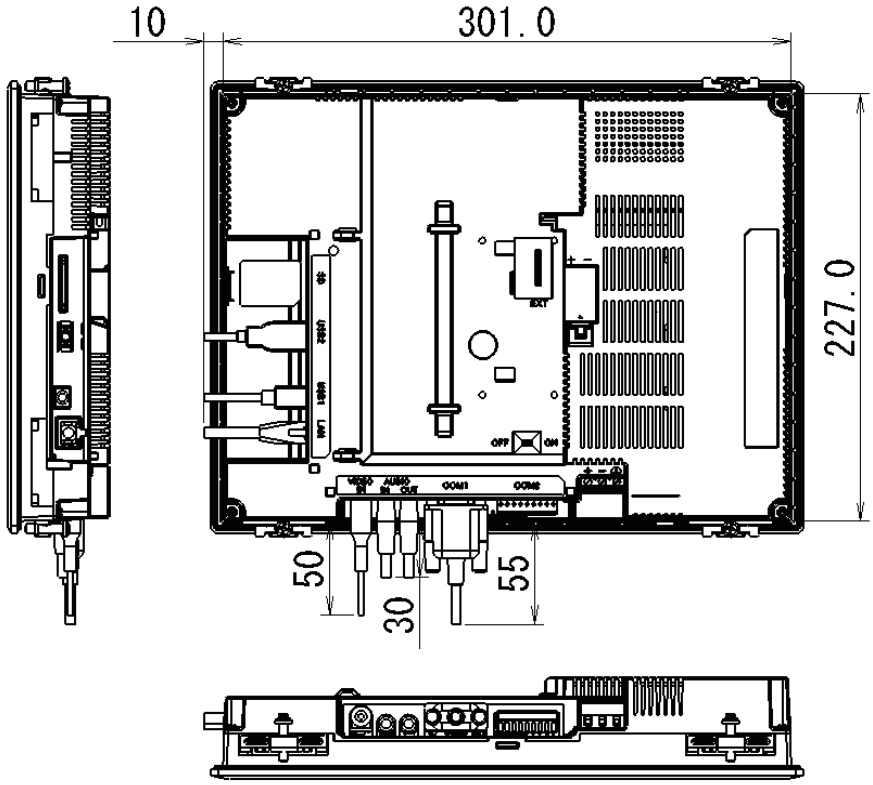
Unit: mm



The size to the expansion module installation side

<Cable Attached Dimensions>

Unit: mm



Depending on the type of connection cable used the dimensions shown above will change.
The dimensions given here are representative values and are intended for reference only.

2.7 Installation

● Operating Environment

For designed performance and safety of the HG2G-5F, HG3G/4G, do not install the HG2G-5F, HG3G/4G in the following environments:

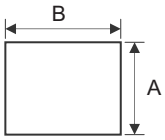
- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for a long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG2G-5F, HG3G/4G.
- Where strong ultraviolet rays fall on the HG2G-5F, HG3G/4G.
- Where corrosive or combustible gasses exist.
- Where the HG2G-5F, HG3G/4G is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

● Ambient Temperature

- Allow sufficient space for ventilation, and install the equipment away from heat sources.
- Allow at least 100mm between the HG2G-5F, HG3G/4G and walls or other equipment.
- Do not install the HG2G-5F, HG3G/4G where the ambient temperature exceeds the rated operating ambient temperature range. When mounting the HG2G-5F, HG3G/4G in such locations, provide a forced air-cooling fan or air-conditioner to keep the ambient temperature within the rated temperature range.
- The HG2G-5F, HG3G/4G is designed to install on a vertical plane so that natural air-cooling is provided. If you install it using any other orientation, use forced-air cooling, or lower the ambient operating temperature.

● HG2G-5F, HG3G/4G Installation

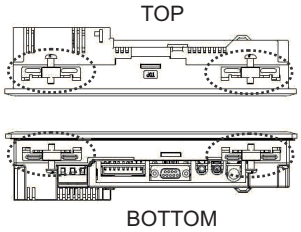
- Make a panel cut-out on the panel with the dimensions shown below.

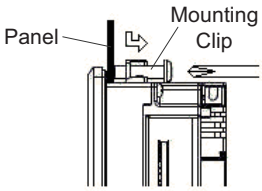


Unit: mm

Type No.	A	B	Panel Cut-out
HG2G-5F	121.0 $^{+2.0}_{0}$	153.0 $^{+2.0}_{0}$	1.6 to 5.0
HG3G-8	164.0 $^{+2.0}_{0}$	219.0 $^{+2.0}_{0}$	2.0 to 5.0
HG3G-A	200.0 $^{+2.0}_{0}$	258.0 $^{+2.0}_{0}$	2.0 to 5.0
HG4G	227.5 $^{+2.0}_{0}$	301.5 $^{+2.0}_{0}$	2.0 to 5.0

- The HG2G-5F, HG3G/4G has the mounting clip positions not only on the top and bottom side but also on the left and right side. But when fasten with the attached mounting clips at the left and right side, the HG2G-5F, HG3G/4G may impair the waterproof, the vibration resistance, and the shock resistance characteristics.





Unit : N·m

Type	Specified Torque
HG2G-5F	0.2 to 0.3
HG3G-8	0.5 to 0.6
HG3G-A	0.5 to 0.6
HG4G	0.5 to 0.6

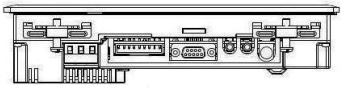
Mounting Clip Position ex) HG3G-8 (8.4 inch)

⚠ CAUTION

- **Do not tighten excessively, otherwise the HG2G-5F, HG3G/4G may warp and cause wrinkle on the display, or impair the waterproof characteristics.**
- **If the mounting clips are tightened obliquely to the panel, the HG2G-5F, HG3G/4G may fall off the panel.**
- **When installing the HG2G-5F, HG3G/4G into a panel cut-out, make sure that the gasket is not twisted. Especially when re-installing, take special care because any twists in the gasket will impair the waterproof characteristics.**

● HG2G-5F, HG3G/4G Orientation

The HG2G-5F, HG3G/4G is designed to install on a vertical landscape. If you install it using any other orientation, confirm the limitations about operating ambient temperature and the use of MICROSmart expansion modules.

Orientation			Operating Ambient Temperature	
			w/o expansion modules	**w/ expansion modules**
Vertical	Landscape	HG2G-5F	0 to 50°C	0 to 40°C*1
		HG3G	0 to 50°C	0 to 45°C
		HG4G	0 to 50°C	0 to 50°C
	Portrait (Clockwise)	HG2G-5F	0 to 50°C	unavailable
		HG3G	0 to 50°C	
		HG4G	0 to 50°C	
	Portrait(Counter Clockwise)	HG2G-5F	0 to 45°C	0 to 35°C
		HG3G	0 to 45°C	0 to 40°C*1
		HG4G	0 to 50°C	0 to 45°C
 Horizontal		HG2G-5F	0 to 45°C	unavailable
		HG3G	0 to 45°C	
		HG4G	0 to 50°C	

- When installing the HG2G-5F, HG3G/4G in a diagonal, the limitations are same as a horizontal.
- Confirm the visibility of the display in a final installation.

*1 When I/O Simultaneous ON Ratio is 50% or less, the Ambient Temperature is 0 to 45°C.

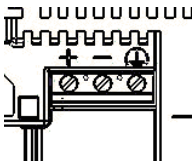
2.8 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG2G-5F, HG3G/4G.**
- **Separate the HG2G-5F, HG3G/4G power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Power Supply Terminal

- Pin assignment is shown in the following table.



+	Power supply 24V DC (+24V)
-	Power supply 0V (0V)
⏚	Functional Earth (FE)

- Use applicable cables for wiring and recommended ferrules (made by Phoenix Contact) as follows.

Applicable cable	AWG18 to AWG22
Recommended Pressure Terminal	AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD AI-TWIN 2×0.5-8 WH (TWIN Pressure Terminal) (Phoenix Contact)
Tightening Torque	0.5 to 0.6 N·m

● Grounding Cautions

If you decide to use a single power supply for the HG2G-5F, HG3G/4G with more than one external device, take extra precautions. Some external devices may produce electrical noise and short circuit the entire system setup, therefore, damaging the communication circuit of the HG2G-5F, HG3G/4G and non-isolated Communication Device (i.e. PLC).

To prevent such damage, choose a proper solution depending on your system setup.

- Use a separate earth ground from the external noise source device.
- The wire for grounding should be thick and short in order to direct the noise from the noise source device to the earth ground.
- Use a separate power supply from the external noise source device.
- Insert an isolator on the communication line of the HG2G-5F, HG3G/4G and the non-isolated communication device (i.e. PLC) to prevent damage.

● Cautions for using the HG2G-5F, HG3G/4G connected to a personal computer

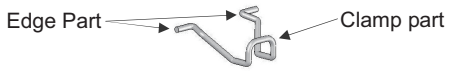
When connecting the HG2G-5F, HG3G/4G to a personal computer via the Serial Interface(COM1) or USB Interface, the HG2G-5F, HG3G/4G or the personal computer may break down depending on the conditions of the personal computer. Make sure of the following cautions, in order to prevent an accident.

- If the personal computer has a 3-pin power plug or power plug with a ground lead type. make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
- If the personal computer has a 2-pin power plug without ground lead, follow the procedure below when connect the HG2G-5F, HG3G/4G to the personal computer.
  (1) Pull out the power plug of the personal computer from the AC outlet.
  (2) Connect the HG2G-5F, HG3G/4G to the personal computer.
  (3) Insert the power plug of the personal computer into the AC outlet.

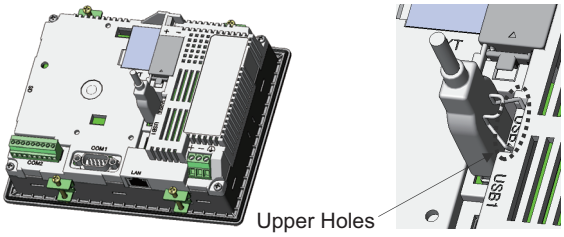
2.9 USB Cable Lock Pin Attachment

When using the USB device, attach the USB Cable Lock Pin to prevent disconnecting the USB cable from the HG2G-5F, HG3G/4G.

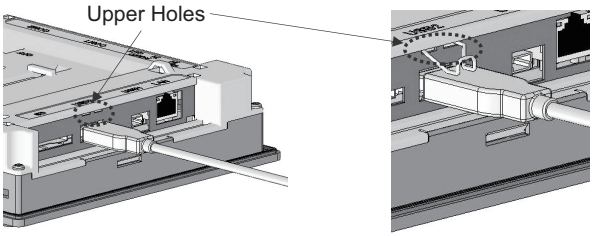
1. Insert the USB cable into the USB2 port.
2. Strain the [Edge part] of the USB Cable Lock Pin, and insert the [Edge part] to the 2 holes upper the USB2 port.



- **HG2G-5F**

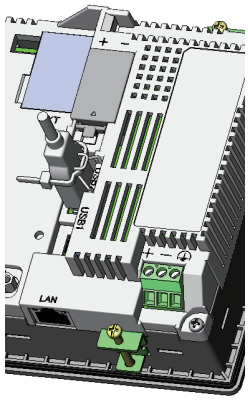


- **HG3G/4G**

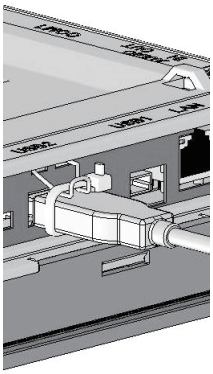


3. Fasten the USB Clamp Band around the USB cable and the [Clamp part], secure them tightly.

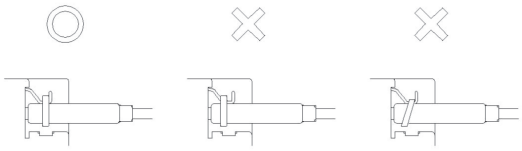
- **HG2G-5F**



- **HG3G/4G**



Fasten the USB Clamp Band without the space between the [Clamp part] and it, and the inclination.



2.10 Maintenance and Inspection

Maintain and inspect the HG2G-5F, HG3G/4G periodically to ensure the best performance. Do not disassemble, repair, or modify the HG2G-5F, HG3G/4G during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Terminals, Connectors	Check the terminals and connectors to make sure of no loose screws, incomplete insertion, or disconnected lines.
Mounting Clips	Make sure that all mounting clips and screws are tightened sufficiently. If the mounting clips are loose, tighten the screw to the recommended tightening torque.
Backlight	The HG2G-5F, HG3G/4G's backlight cannot be replaced by the customer. When the backlight needs to be replaced, Contact IDEC.
Backup Battery	The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.
Touch Panel	A gap may be caused in the operation accuracy of the touch panel by the secular distortion, etc. Readjust the touch panel according to the following procedure when there is a gap in the operation of the touch panel.

● Replacing the Backup Battery

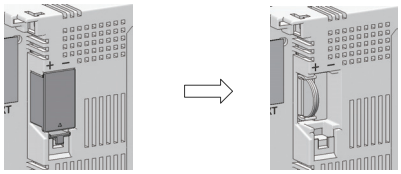
A backup battery is built into the HG2G-5F, HG3G/4G to retain the internal backup data (log data, keep resister, and keep relay) and clock data.

When the "Replace the battery" message is displayed, replace the backup battery by following the procedure below.

When the "Battery level LOW" message is displayed, replace the battery immediately; otherwise, the backup data and clock data may be lost.

Whether or not to display the reminder message for battery replacement can be specified with the configuration software. Refer to Chapter 4 "3.1 System Tab" on page 4-26 for details.

1 Remove the battery holder cover.

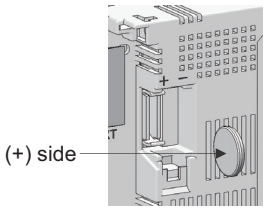


2 Turn on the power to the HG2G-5F, HG3G/4G, wait for approximately one minute, and then turn off the power again.

After turning off the power to the HG2G-5F, HG3G/4G in step *2*, complete the steps through *4* within 30 seconds to replace the battery without losing the backup data and clock data. However, it is recommended that the backup data be transferred to flash memory as a precautionary measure. For the procedure to transfer the data to flash memory, refer to Chapter 32 "Internal Devices" on page 32-1. If it is not necessary to save the data, step *2* can be skipped.

3 Remove the battery from the battery holder.

4 Put a new replacement battery into the battery holder. Do not insert the battery reversely.



5 Replace the battery holder cover into the original position.

- The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.
- IDEC provides replacement service for the battery (at customer's expense). Contact IDEC.

WARNING

The battery may be regulated by national or local regulation. Observe the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with insulating tape before disposal.

CAUTION

When replacing the battery, use the specified battery only. Note that any problems and failures arising from or in connection with the use of a battery other than the specified battery is not guaranteed.

Handling of Batteries and Devices with Built-in Batteries in EU Member States

Note) The following symbol mark is for EU countries only and is according to the directive 2006/66/EC Article 20 information for end-users and Annex II.

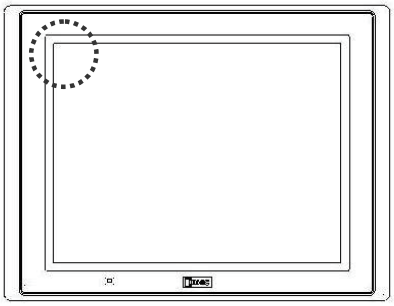
This symbol mark means that batteries and accumulators, at their end-of life, should be disposed of separately from your household waste.

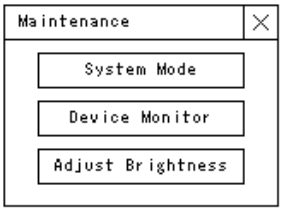
If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows :
Hg : mercury (0.0005%), Cd : cadmium (0.002%), Pd : lead (0.004%)

In the European Union there are separate collection systems for used batteries and accumulators.
Please dispose of batteries and accumulators correctly in accordance with each country or local regulation.

● Maintenance Screen

Turn on the power to the HG2G-5F, HG3G/4G, then press and hold the touch panel on the upper-left corner of the screen for three seconds or longer. The Maintenance Screen appears on the screen.



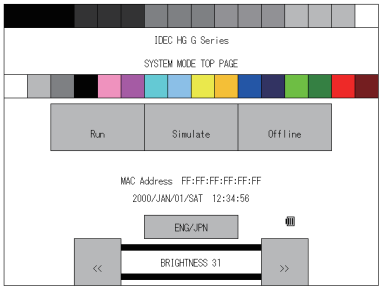


Maintenance Screen

- Permission to show the Maintenance Screen can be set using the configuration software. Refer to Chapter 4 "3.1 System Tab" on page 4-26 for details.
- The Maintenance Screen is not displayed in the System Mode.

● System Mode

Press the [System Mode] at the top of the Maintenance Screen. The Top page Screen appears.



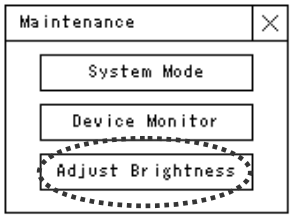
System Mode Top Page Screen

- Initial Setting, Self Diagnosis and Initialization of the data, etc can be executed in the System mode.

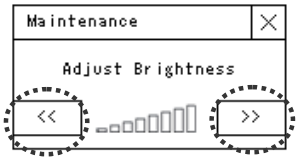
● Adjusting the Brightness

The brightness of the HG2G-5F, HG3G/4G display can be adjusted on the Adjust Brightness Screen. Adjust the brightness to the best condition as required.

1. Press the [Adjust Brightness] at the bottom of the Maintenance Screen. The Adjust Brightness Screen appears.

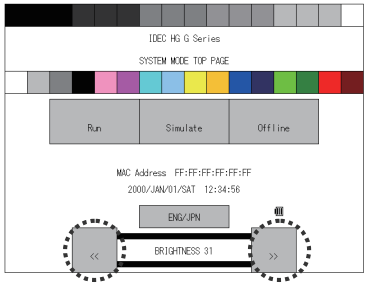


2. Press the [<<] and [>>] at the bottom the Adjust Brightness Screen to adjust the contrast to the optimal setting.



3. Press the [X] to close the Adjust Brightness Screen.

To adjust the brightness in the System Mode, use the [<<] and [>>] buttons located at the bottom of the top page.

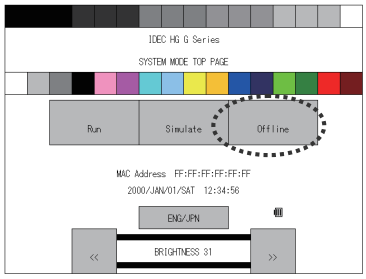


● Adjusting the Touch Panel

A gap may be caused in the operation accuracy of the touch panel by the secular distortion, etc. Readjust the touch panel according to the following procedure when there is a gap in the operation of the touch panel.

- Touch panel adjustment procedure

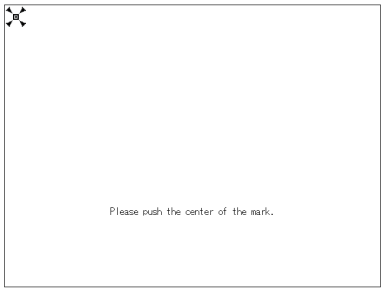
1 Press the [Offline], then the Main Menu Screen appears.



2 Press in order of [Initial Setting] → [Initialize] → [Touch Panel Adjust]. The confirmation screen appears and asks "Adjust Touch Panel setting?"

Press the [Yes], then the Touch Panel Adjust screen appears.

3 Press the center of the X mark, then the position of the mark changes one after another. Press five marks sequentially.



Make sure to press the center of the mark. This will ensure the accuracy of the touch panel operation.

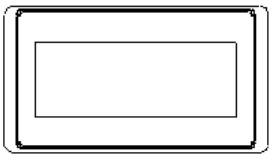
4 When normally recognized, the confirmation screen of *2* is restored.

At procedure *3*, when pressing a point away from the center of the X mark, a recognition error will result. Then the X mark returns to the initial position, then repeat the procedure of *3* again.

3 HG1F

3.1 Packing content

Before installing the HG1F, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

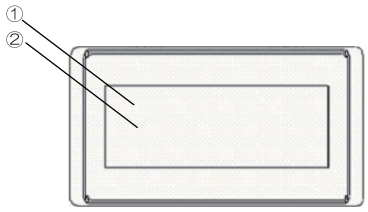
Name	Pcs/pack	
HG1F Unit	1	
Instruction Sheet (Japanese/English)	1	
Mounting clips	4	
Screw lock bracket Inch screw thread type (RS232C type only)	2	

3.2 Type No.

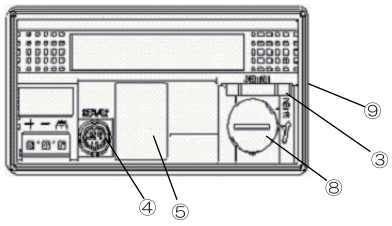
Display Device	Interface	Body color	Model No.
4.6-inch STN monochrome LCD	RS232C	Light gray	HG1F-SB22BF-W
		Dark gray	HG1F-SB22BF-B
		Silver*1	HG1F-SB22BF-S
	RS485/422	Light gray	HG1F-SB22YF-W
		Dark gray	HG1F-SB22YF-B
		Silver*1	HG1F-SB22YF-S

*1 Unapproved by UL

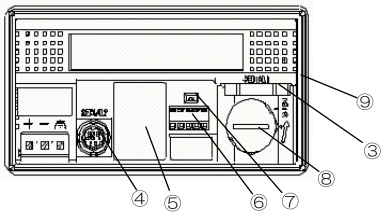
3.3 Part Names



■ **HG1F-SB22BF**



■ **HG1F-SB22YF**



No.	Name	Description
(1)	Display	
(2)	Touch Panel	
(3)	Serial Interface 1	Connects the host PLC
(4)	Serial Interface 2	Connects the maintenance computer
(5)	O/I Link interface	
(6)	Communication Terminal Block (RS485/422 type only)	Communication terminal block for RS485/422
(7)	Terminating Resistance Selector SW (RS485/422 type only)	Switches between presence/absence of terminating resistance.
(8)	Battery Holder Cover	

3.4 External Interfaces

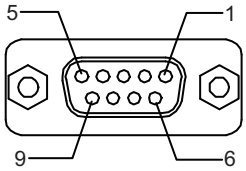
CAUTION

Make sure to turn off the power to the HG1F before wiring each interface or switching the terminating resistor selector Switch.

● Serial Interface 1

■ **D-sub Connector**

Interface Specification	RS232C/485(422)
Connector	D-sub 9 pin (Plug)
Screw lock bracket	Metric screw thread (M2.6×0.45p)



● **RS232C type (Type No.HG1F-SB22BF)**

No.	Name	Function
1	FG	Frame Ground
2	SD	Send Data
3	RD	Receive Data
4	NC	No connection
5	NC	No connection
6	DR	Data set ready
7	SG	Signal Ground
8	NC	No connection
9	ER	Data terminal ready

Screw lock brackets of inch screw thread type (#4-4OUNC) are provided with the RS232C type. Use them as required.

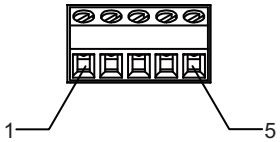
● **RS485/422 type (Type No.HG1F-SB22YF)**

No.	Name	Function
1	SD+	Send Data (+)
2	RD+	Receive Data (+)
3	RS+	Request to Send (+)
4	CS+	Clear to Send (+)
5	SG	Signal Ground
6	SD−	Send Data (−)
7	RD−	Receive Data (−)
8	RS−	Request to Send (−)
9	CS−	Clear to Send (−)

Note that this D-sub connector cannot be used simultaneously with the terminal block.

■ Communication Terminal Block (RS485/422 type: Model No.HG1F-SB22YF only)

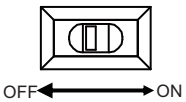
Interface Specification	RS485/422
Connector	Terminal Block 5 pin
Recommended cable	0.3mm^2 Twisted-pair shielded cable Conductor resistance: 85Ω/km maximum Shield resistance: 20Ω/km maximum



No.	Name	Function
1	SDA	Send Data A
2	SDB	Send Data B
3	RDA	Receive Data A
4	RDB	Receive Data B
5	SG	Signal Ground

Note that this terminal block cannot be used simultaneously with the D-sub connector.

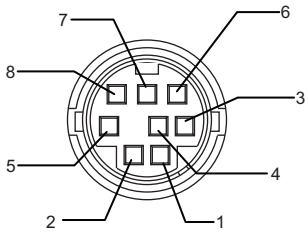
■ Terminating Resistance Selector SW (RS485/422 type: Model No.HG1F-SB22YF only)



Setting the Terminating Resistance Selector SW to the ON side will insert and connect the terminating resistance (330Ω) between RDA and RDB.

● Serial interface 2

Interface Specification	RS232C
Connector	Mini DIN 8 pin



No.	Name	I/O	Function
1	RS	OUT	Request to Send
2	ER	OUT	Data terminal ready
3	SD	OUT	Send Data
4	RD	IN	Receive Data
5	DR	IN	Data set ready
6	EN	IN	Use set ready
7	SG	-	Signal Ground
8	NC	-	No connection

Do not connect pin 6 (EN) with any other pins except when performing maintenance communications for downloading project data.
Connecting the maintenance communications cable to Serial interface 2 will stop the O/I Link communications.

● O/I Link Interface

The HG1F Operator Interface can be connected to an O/I Link Unit for 1:N communication with a PLC. This allows high-speed communication with the PLC host.
Connecting the maintenance communications cable to Serial interface 2 will stop the O/I Link communications.

Recommended cable	0.3mm^2 Twisted-pair shielded cable Conductor resistance: 85Ω/km maximum Shield resistance: 20Ω/km maximum

3.5 Specifications

Applicable Standards

Safety Standard	UL508, ANSI/ISA 12.12.01, CSA C22.2 No.213
EMC Standard	IEC/EN 61000-6-4, IEC/EN 61131-2:2007

Environmental Specifications

Operating Ambient Temperature	0 to 50°C
Operating Relative Humidity	10 to 90% RH (no condensation)
Storage Ambient Temperature	-20 to +60°C
Storage Relative Humidity	10 to 90% RH (no condensation)
Altitude (Operation)	0 to 2000m
Pollution Degree	2
Corrosion Immunity	Free from corrosive gases

Electrical Specifications

Rated Operating Voltage	24V DC
Power Consumption	10W maximum
Power Voltage Range	20.4V DC to 28.8V DC
Allowable Momentary Power Interruption	10 ms maximum
Inrush Current	20A maximum
Dielectric Strength	AC1000V, 10mA, 1 minute (between power and earth terminals)
Insulation Resistance	50 MΩ minimum (500V DC megger) (between power and earth terminals)

Construction Specifications

Vibration Resistance	10 to 20 Hz, amplitude 0.625mm 20 to 55 Hz, 9.8 m/s^2 [2 hours each in 3 axes] (IEC60068-2-6)
Shock Resistance	147 m/s^2, 11 ms [5 shocks each in 3 axes] (IEC60062-2-27)

Performance Specifications

Display	LCD Type	STN monochrome LCD
	Display Colors	2 Colors(16 Tones)
	Effective Display Area [mm]	115.0(W) × 39.0(H)
	Display Resolution	300 (W) × 100 (H) pixels
	Brightness of LCD only	500 [cd/m^2]
	Contrast Adjustment	32 levels
	Backlight	Cold-cathode tube
	Backlight Life*1	50,000 hours minimum
Touch Panel	Switch Type	Analog Resistive Film
	Operating Force	0.2 to 0.8 N
	Multiple Operations	Impossible
	Life	1,000,000 operations
User Memory		1MB
Backup Battery		CR2032 lithium primary battery Guarantee Period: 1 Year (at 25°C) Recommended Replacement Span: Every 4 Years (at 25°C)
Backup Data		Calendar, Log Data, Keep Internal relay/resister
Buzzer output		Single tone (tone length is adjustable)
Degree of Protection		IP65 (operator) TYPE 13*2
Weight (approx.)		280g

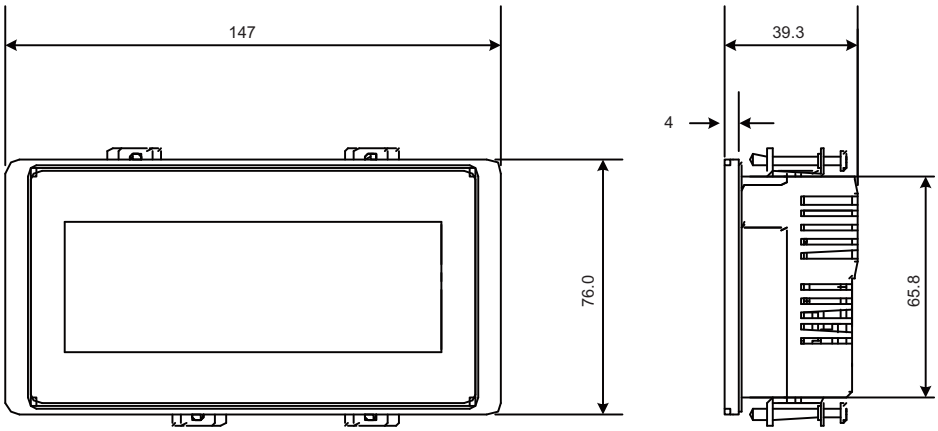
EMC Specifications

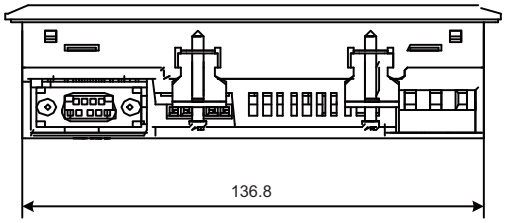
Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz, 1.4 to 2.0 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V-0V) ±1kV (between +24V-FE, 0V-FE)
Conducted Radio Frequency Immunity	3V (Power, Communication cable) (150kHz to 80MHz) 80% AM (1kHz)

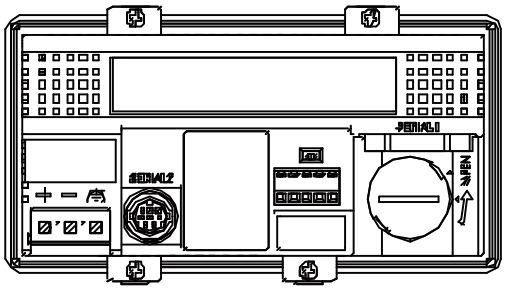
*1 The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures.
*2 Not a guarantee in all usage environments with oil materials.

3.6 Dimensions

Unit: mm







3.7 Installation

● Operating Environment

For designed performance and safety of the HG1F, do not install the HG1F in the following environments:

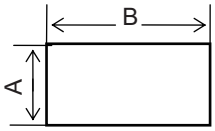
- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for a long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG1F.
- Where strong ultraviolet rays fall on the HG1F.
- Where corrosive or combustible gasses exist.
- Where the HG1F is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

● Ambient Temperature

- Allow sufficient space for ventilation, and install the equipment away from heat sources.
- Allow at least 100mm between the HG1F and walls or other equipment.
- Do not install the HG1F where the ambient temperature exceeds the rated operating ambient temperature range. When mounting the HG1F in such locations, provide a forced air-cooling fan or air-conditioner to keep the ambient temperature within the rated temperature range.
- The HG1F is designed to install on a vertical plane so that natural air-cooling is provided. If you install it using any other orientation, use forced-air cooling, or lower the ambient operating temperature.

● HG1F Installation

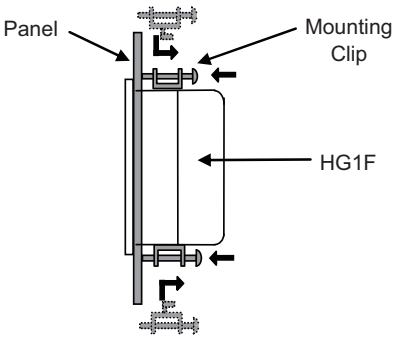
- Make a panel cut-out on the panel with the dimensions shown below.



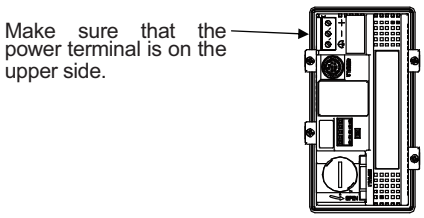
Unit: mm

A	B	Panel Cut-out
66.0 $^{+1.0}_{0}$	137.0 $^{+1.5}_{0}$	1.6 to 5.0

- Place the HG1F in a panel cut-out and fasten with the attached mounting clips at four places to a torque of 0.12 to 0.15 N•m uniformly.



- When installing the HG1F vertically, make sure that the power input terminal is on the upper side.



⚠ CAUTION

- **Do not tighten excessively, otherwise the HG1F may warp and cause wrinkle on the display, or impair the waterproof characteristics.**
- **If the mounting clips are tightened obliquely to the panel, the HG1F may fall off the panel.**
- **When installing the HG1F into a panel cut-out, make sure that the gasket is not twisted. Especially when re-installing, take special care because any twists in the gasket will impair the waterproof characteristics.**

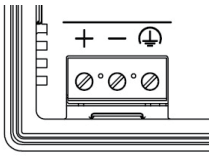
3.8 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG1F.**
- **Separate the HG1F power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Power Supply Terminal

- Pin assignment is shown in the following table.



+	Power supply 24V DC (+24V)
-	Power supply 0V (0V)
⏚	Functional Earth (FE)

- Use applicable cables for wiring and recommended ferrules (made by Phoenix Contact) as follows.

Applicable cable	AWG18 to AWG22
Recommended Pressure Terminal	AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD AI-TWIN 2×0.5-8 WH (TWIN Pressure Terminal) (Phoenix Contact)
Tightening Torque	0.5 to 0.6 N•m

● Grounding Cautions

If you decide to use a single power supply for the HG1F with more than one external device, take extra precautions. Some external devices may produce electrical noise and short circuit the entire system setup, therefore, damaging the communication circuit of the HG1F and non-isolated Communication Device (i.e. PLC).

To prevent such damage, choose a proper solution depending on your system setup.

- Use a separate earth ground from the external noise source device.
- The wire for grounding should be thick and short in order to direct the noise from the noise source device to the earth ground.
- Use a separate power supply from the external noise source device.
- Insert an isolator on the communication line of the HG1F and the non-isolated communication device (i.e. PLC) to prevent damage.

● Cautions for using the HG1F connected to a personal computer

When connecting the HG1F to a personal computer via the Serial Interface the HG1F or the personal computer may break down depending on the conditions of the personal computer. Make sure of the following cautions, in order to prevent an accident.

- If the personal computer has a 3-pin power plug or power plug with a ground lead type. make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
- If the personal computer has a 2-pin power plug without ground lead, follow the procedure below when connect the HG1F to the personal computer.
  (1) Pull out the power plug of the personal computer from the AC outlet.
  (2) Connect the HG1F to the personal computer.
  (3) Insert the power plug of the personal computer into the AC outlet.

3.9 Maintenance and Inspection

Maintain and inspect the HG1F periodically to ensure the best performance. Do not disassemble, repair, or modify the HG1F during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Terminals, Connectors	Check the terminals and connectors to make sure of no loose screws, incomplete insertion, or disconnected lines.
Mounting Clips	Make sure that all mounting clips and screws are tightened sufficiently. If the mounting clips are loose, tighten the screw to the recommended tightening torque.
Backup Battery	The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.

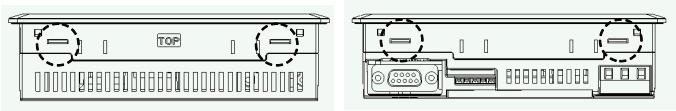
● Replacing the Backlight

⚠ WARNING

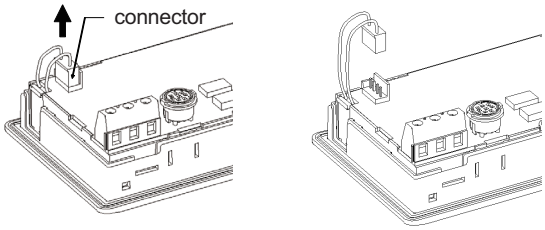
- **Make sure to turn off the power to the HG1F before replacing the backlight; otherwise, product breakdown, electric shock, or fire may occur.**
- **The backlight may be hot. Make sure to wear gloves when performing the replacement work.**

Follow the procedures below to replace the backlight.

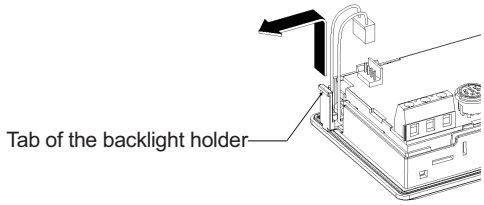
1. Turn off the power to the HG1F, disconnect the cable, and remove the main unit from the panel.
2. Unlock the tabs (4) securing the rear case, and remove the rear case.



3. Remove the connector that is connected to the PWB.

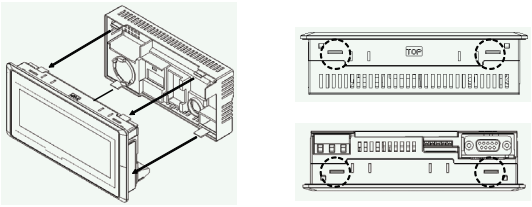


4. Pull out the backlight while lifting the tab of the backlight holder.



5. Attach the new replacement backlight by following step *4* in reverse.
6. Connect the connector for the replacement backlight.

7 Align the tabs (4) of the rear case in place, and close the rear case.



IDEC provides replacement service for the backlight (for a fee). Please contact our offices, sales branches, or local offices for details.

● Replacing the Backup Battery

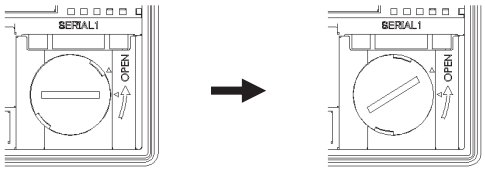
A backup battery is built into the HG1F to retain the internal backup data (log data, keep resister, and keep relay) and clock data.

When the "Replace the battery" message is displayed, replace the backup battery by following the procedure below.

When the "Battery level LOW" message is displayed, replace the battery immediately; otherwise, the backup data and clock data may be lost.

Whether or not to display the reminder message for battery replacement can be specified with the configuration software. Refer to Chapter 4 "3.1 System Tab" on page 4-26 for details.

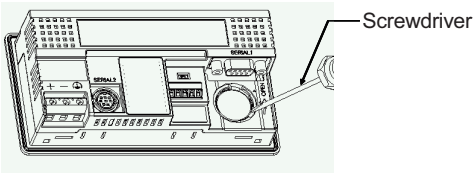
1 Remove the battery holder cover.



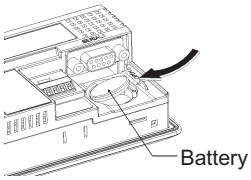
2 Turn on the power to the HG1F, wait for approximately one minute, and then turn off the power again.

After turning off the power to the HG1F in step *2*, complete the steps through *4* within 30 seconds in order to replace the battery without losing the backup data and clock data. However, it is recommended that the backup data be transferred to flash memory as a precautionary measure. For how to transfer the data to flash memory, refer to Chapter 32 "Internal Devices" on page 32-1. If it is not necessary to save the data, step *2* can be skipped.

3 Insert a flathead screwdriver into the battery holder as shown in the figure, and remove the battery. Please be careful because the battery may pop out from the battery holder.



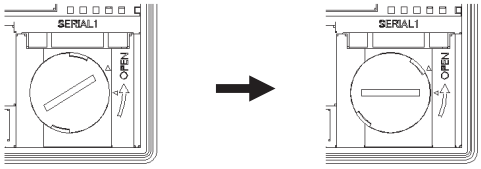
4 Attach a new replacement battery to the battery holder.



Insert the battery from the direction indicated above.

5 Replace the battery holder cover into the original position.

Replace the battery holder cover on the HG1F, and turn it clockwise to lock the cover.



- The operating life of the internal battery is approximately four years. It is recommended to replace the battery every four years even before the reminder message for battery replacement is displayed.
- IDEC provides replacement service for the battery (for a fee). Please contact our offices, sales branches, or local offices for details.

WARNING

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

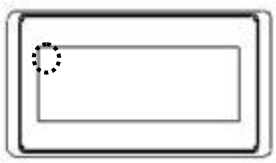
CAUTION

When replacing the battery, use the specified battery. Please be forewarned that any problems and failures arising from or in connection with the use of a battery other than the specified battery shall not be guaranteed.

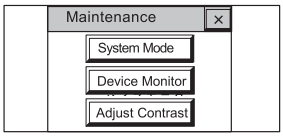
● Adjusting the Contrast

The contrast of the HG1F display can be adjusted on the Adjust Contrast Screen.Adjust the contrast to the best condition as required. To ensure the best contrast, adjust the contrast approximately 10 minutes after turning on the power.

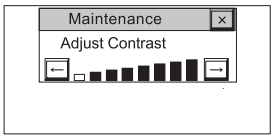
1 Turn on the power to the HG1F, then press and hold the touch switch on the upper-left corner of the screen for three seconds or longer. The Maintenance Screen appears on the screen.



2 Press the [Adjust Contrast] button at the bottom of the Maintenance Screen. The Adjust Contrast Screen appears.



3 Press the [←] or [→] button at the bottom the Adjust Contrast Screen to adjust the contrast to the optimal setting.

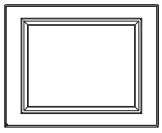
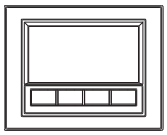


4 Press the [x] button to close the Adjust Contrast Screen.

4 HG2F

4.1 Packing content

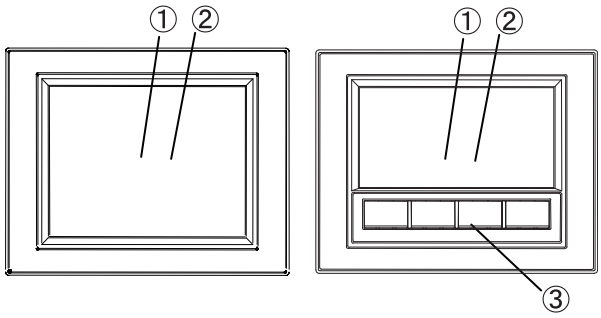
Before installing the HG2F, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

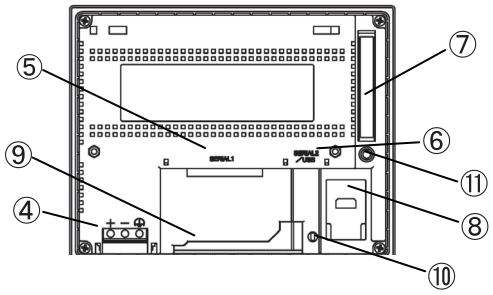
Name	Pcs/pack	HG2F-S*22	HG2F-S*52
HG2F Unit	1		
Instruction Sheet (Japanese/English)	1		
Mounting clips	4		

4.2 Type No.

Display Device	Operating Type	CF Slot	Maintenance port	Model No.
5.7-inch STN Color LCD	Touch switch	-	RS232C	HG2F-SS22VF
		1Slot	RS232C	HG2F-SS22VCF
		1Slot	USB	HG2F-SS22VDF
	Touch switch & CC-switch	-	RS232C	HG2F-SS52VF
		1Slot	RS232C	HG2F-SS52VCF
		1Slot	USB	HG2F-SS52VDF
5.7-inch STN monochrome LCD	Touch switch	-	RS232C	HG2F-SB22VF
		1Slot	RS232C	HG2F-SB22VCF
		1Slot	USB	HG2F-SB22VDF
	Touch switch & CC-switch	-	RS232C	HG2F-SB52VF
		1Slot	RS232C	HG2F-SB52VCF
		1Slot	USB	HG2F-SB52VDF

4.3 Part Names





No.	Name	Description
(1)	Display	
(2)	Touch Panel	
(3)	CC-switch	
(4)	Power Supply Terminal	
(5)	Serial Interface 1	Connects the host PLC
(6)	Serial Interface 2	Connects the maintenance computer
	USB Interface	Connects the maintenance computer
(7)	Expansion Unit Interface	For Expansion Unit
(8)	O/I Link interface	For O/I Link Unit
(9)	CF Interface	For Compact Flash
(10)	Access Lamp	CF state display lamp
(11)	Access Stop Switch	CF extraction permission switch

4.4 External Interfaces

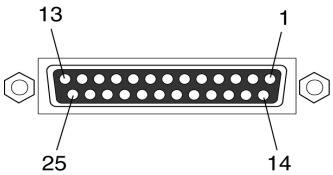
CAUTION

Make sure to turn off the power to the HG2F before wiring each interface.

● Serial Interface 1

■ **D-sub Connector**

Interface Specification	RS232C/485(422)
Connector	D-sub 25 pin

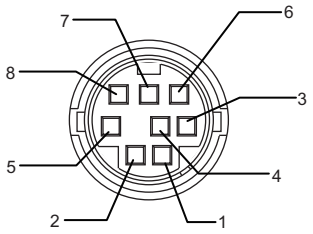


No.	Name	Function		
1	FG	Frame Ground		
2	SD	Send Data (RS232C)		
3	RD	Receive Data (RS232C)		
4	RS	Request to Send (RS232C)		
5	CS	Clear to Send (RS232C)		
6	-	-		
7	SG	Signal Ground		
8	-	-		
	RS485		RS422	
9	TERM	Terminator	TERM	Terminator
10	RDA	Receive Data A	RD+	Receive Data (+)
11	SDA	Send Data A	SD+	Send Data (+)
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	SDB	Send Data B	SD-	Send Data (-)
16	RDB	Receive Data B	RD-	Receive Data (-)
17	-	-	-	-
18	-	-	CS-	Clear to Send (-)
19	-	-	RS-	Request to Send (-)
20	ER	Data Terminal Ready (RS232C)		
21	-	-	CS+	Clear to Send (+)
22	-	-	RS+	Request to Send (+)
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-

To enable the 330Ω built-in terminator, connect terminal No. 9 [TERM] and terminal No. 10 [RDA/RD (+)] together.

● Serial interface 2

Interface Specification	RS232C
Connector	Mini DIN 8 pin



No.	Name	I/O	Function
1	RS	OUT	Request to Send
2	ER	OUT	Data terminal ready
3	SD	OUT	Send Data
4	RD	IN	Receive Data
5	DR	IN	Data set ready
6	EN	IN	Use set ready
7	SG	—	Signal Ground
8	NC	—	No connection

- Connect pin 6(EN) and pin 2(ER) unless performing maintenance communications for downloading project data.

● Expansion Unit Interface (EXT)

The HG2F can be used in conjunction with dedicated HG Series option units. Refer to the Expansion Unit instruction manual for details.

● O/I Link Interface

The HG2F Operator Interface can be connected to an O/I Link Unit for 1:N communication with a PLC. This allows high-speed communication with the PLC host.

4.5 Specifications

Applicable Standards

Safety Standard	UL508, UL1604, CSA C22.2 No.213 (c-UL)
EMC Standard	IEC/EN 61000-6-4, IEC/EN 61131-2

Environmental Specifications

Operating Ambient Temperature	0 to 50°C
Operating Relative Humidity	10 to 95% RH (no condensation)
Storage Ambient Temperature	-20 to +60°C
Storage Relative Humidity	10 to 95% RH (no condensation)
Altitude (Operation)	0 to 2000m
Pollution Degree	2
Corrosion Immunity	Free from corrosive gases

Electrical Specifications

Rated Operating Voltage	24V DC
Power Consumption	10W maximum
Power Voltage Range	20.4V DC to 28.8V DC
Allowable Momentary Power Interruption	10 ms maximum
Inrush Current	20A maximum
Dielectric Strength	AC1000V, 10mA, 1 minute (between power and earth terminals)
Insulation Resistance	50 MΩ minimum (500V DC megger) (between power and earth terminals)

Construction Specifications

Vibration Resistance	10 to 20 Hz, amplitude 0.625mm 20 to 55 Hz, 9.8 m/s^2 [2 hours each in 3 axes] (IEC60068-2-6)
Shock Resistance	147 m/s^2, 11 ms [5 shocks each in 3 axes] (IEC60062-2-27)

Performance Specifications

Type No.		HG2F-SS*2	HG2F-SB*2
Display	LCD Type	STN Color LCD	STN monochrome LCD
	Display Colors	256 Colors	2 Colors (16 Tones)
	Effective Display Area [mm]	118.2(W) × 89.4(H)	
	Display Resolution	320 (W) x 240 (H) pixels	
	Contrast Adjustment	32 levels	
	Backlight	Cold-cathode tube	
	Backlight Life*1	40,000 hours type	
Touch	Switch Type	Matrix Resistive Film	
	Composition	16 x 12 (16 x 8 for the CC SWITCH type)	
	Operating Force	0.2 to 0.8 N	
	Multiple Operations	Possible	
	Life	1,000,000 operations	
CC-switch	Quantity (per screen)	4	
	Operating Force	2.5 to 5.0 N	
	Stroke	0.5mm (approx.)	
	Life	1,000,000 operations	
User Memory		2MB	
Power failure maintenance	Maintenance object	Calendar, Log Data, Keep Internal relay/resister	
	Maintenance period	1 month (at 25°C)	
Buzzer output		Single tone (tone length is adjustable)	
Degree of Protection		IP65 (operator) TYPE 13*2	
Weight (approx.)		800g	

EMC Specifications

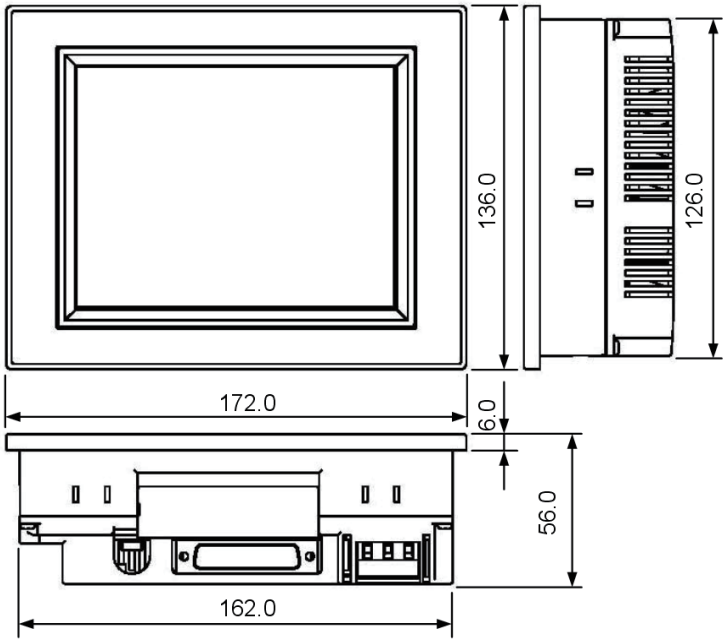
Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz, 1.4 to 2.0 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V - FE, 0V - FE)
Damped Oscillatory Wave	Serial mode Power : ± 1kV

*1 The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures.
*2 Not a guarantee in all usage environments with oil materials.

4.6 Dimensions

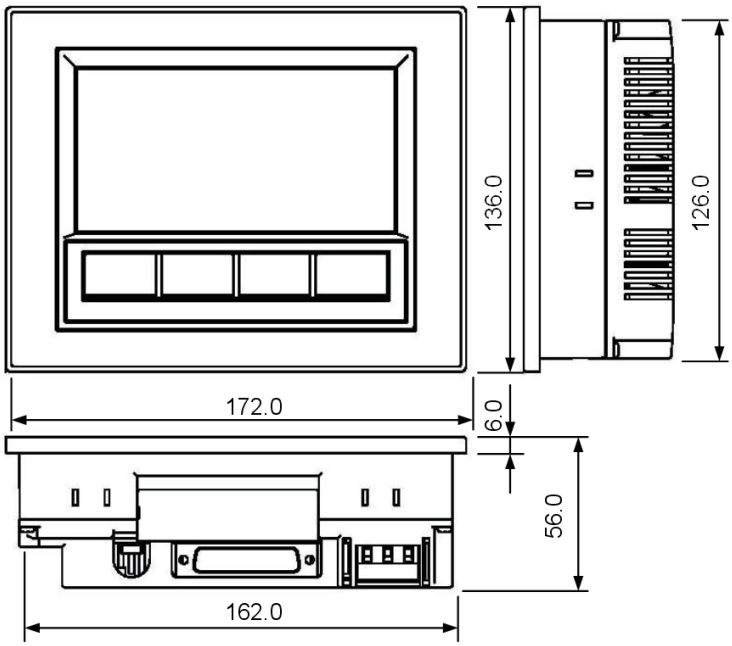
■ **HG2F-S*22**

Unit: mm



■ **HG2F-S*52**

Unit: mm



4.7 Installation

● Operating Environment

For designed performance and safety of the HG2F, do not install the HG2F in the following environments:

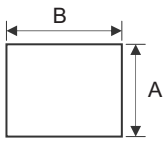
- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for a long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG2F.
- Where strong ultraviolet rays fall on the HG2F.
- Where corrosive or combustible gasses exist.
- Where the HG2F is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

● Ambient Temperature

- Allow sufficient space for ventilation, and install the equipment away from heat sources.
- Allow at least 100mm between the HG2F and walls or other equipment.
- Do not install the HG2F where the ambient temperature exceeds the rated operating ambient temperature range. When mounting the HG2F in such locations, provide a forced air-cooling fan or air-conditioner to keep the ambient temperature within the rated temperature range.
- The HG2F is designed to install on a vertical plane so that natural air-cooling is provided. If you install it using any other orientation, use forced-air cooling, or lower the ambient operating temperature.

● HG2F Installation

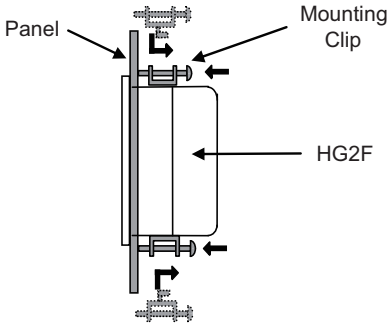
- Make a panel cut-out on the panel with the dimensions shown below.



Unit: mm

A	B	Panel Cut-out
126.5 $^{+0.5}_{0}$	162.5 $^{+0.5}_{0}$	1.6 to 5.0

- Place the HG2F in a panel cut-out and fasten with the attached mounting clips at four places to a torque of 0.15 to 0.2 N•m uniformly.



CAUTION

- **Do not tighten excessively, otherwise the HG2F may warp and cause wrinkle on the display, or impair the waterproof characteristics.**
- **If the mounting clips are tightened obliquely to the panel, the HG2F may fall off the panel.**
- **When installing the HG2F into a panel cut-out, make sure that the gasket is not twisted. Especially when re-installing, take special care because any twists in the gasket will impair the waterproof characteristics.**

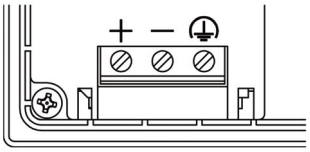
4.8 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG2F.**
- **Separate the HG2F power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Power Supply Terminal

- Pin assignment is shown in the following table.



+	Power supply 24V DC (+24V)
-	Power supply 0V (0V)
⏚	Functional Earth (FE)

- Use applicable cables for wiring and recommended ferrules (made by Phoenix Contact) as follows.

Applicable cable	AWG18 to AWG22
Recommended Pressure Terminal	AI 0.34-6 TQ AI 0.5-8 WH AI 0.75-8 GY AI 1-8 RD AI-TWIN 2×0.5-8 WH (TWIN Pressure Terminal) (Phoenix Contact)
Tightening Torque	0.5 to 0.6 N·m

● Grounding Cautions

If you decide to use a single power supply for the HG2F with more than one external device, take extra precautions. Some external devices may produce electrical noise and short circuit the entire system setup, therefore, damaging the communication circuit of the HG2F and non-isolated Communication Device (i.e. PLC).

To prevent such damage, choose a proper solution depending on your system setup.

- Use a separate earth ground from the external noise source device.
- The wire for grounding should be thick and short in order to direct the noise from the noise source device to the earth ground.
- Use a separate power supply from the external noise source device.
- Insert an isolator on the communication line of the HG2F and the non-isolated communication device (i.e. PLC) to prevent damage.

● Cautions for using the HG2F connected to a personal computer

When connecting the HG2F to a personal computer via the USB Interfaces, the HG2F or the personal computer may break down depending on the conditions of the personal computer. Make sure of the following cautions, in order to prevent an accident.

- If the personal computer has a 3-pin power plug or power plug with a ground lead type. make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
- If the personal computer has a 2-pin power plug without ground lead, follow the procedure below when connect the HG2F to the personal computer.
  (1) Pull out the power plug of the personal computer from the AC outlet.
  (2) Connect the HG2F to the personal computer.
  (3) Insert the power plug of the personal computer into the AC outlet.

4.9 Maintenance and Inspection

Maintain and inspect the HG2F periodically to ensure the best performance. Do not disassemble, repair, or modify the HG2F during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Terminals, Connectors	Check the terminals and connectors to make sure of no loose screws, incomplete insertion, or disconnected lines.
Mounting Clips	Make sure that all mounting clips and screws are tightened sufficiently. If the mounting clips are loose, tighten the screw to the recommended tightening torque.

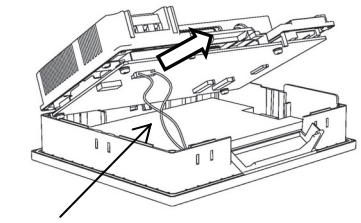
● Replacing the Backlight

WARNING

- **Make sure to turn off the power to the HG2F before replacing the backlight; otherwise, product breakdown, electric shock, or fire may occur.**
- **The backlight may be hot. Make sure to wear gloves when performing the replacement work.**

Replace the backlight according to the procedure as follows:

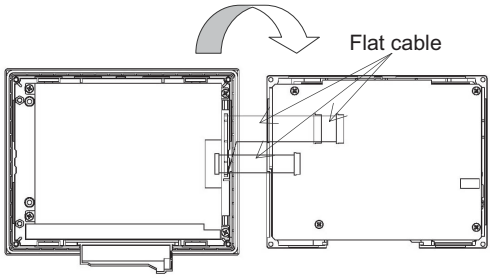
1. Turn off the power to the HG2F, and disconnect the power supply cable.
2. Loosen and remove four screws from the corners on the rear case.
3. Disconnect the backlight cable from the rear case as below !



CAUTION

Hold the connecter when disconnecting the cable. Do not pull the cable.

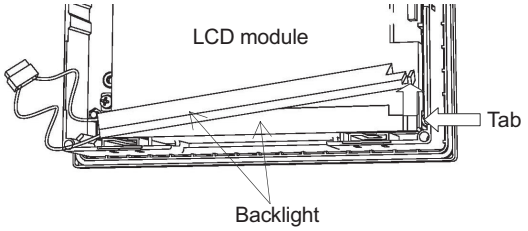
4. Open the case.



CAUTION

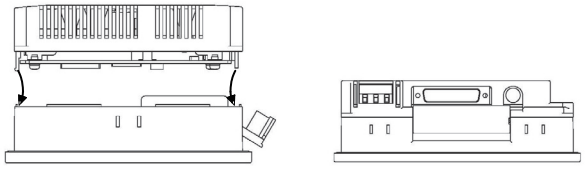
When opening the case, make sure that three flat cables are not disconnected.

5 Press the lock tab at the lower right of the LCD module, and lift the backlight to remove .



6 Mount the replacement backlight into the front case.

7 Re-connect the cable to the connector on the rear case and align three contacts located above and below of the HG2F, then close the case.



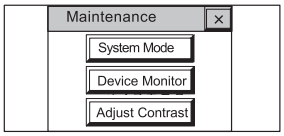
8 Tighten four screws on the corners to a torque of 0.6 to 0.7 N·m.

● Adjust Contrast

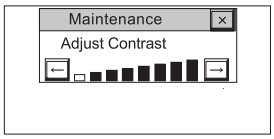
The contrast of the HG2F display can be adjusted on the Adjust Contrast Screen. Adjust the contrast to the best condition as required. To ensure the best contrast, adjust the contrast approximately 10 minutes after turning on the power.

1 Turn on the power to the HG2F, and press the upper-right and -left corners simultaneously, then the Maintenance Screen will appear.

2 Press the [Adjust Contrast] button at the bottom of the Maintenance Screen. The Adjust Contrast Screen appears.



3 Press the [←] or [→] button at the bottom the Adjust Contrast Screen to adjust the contrast to the optimal setting.

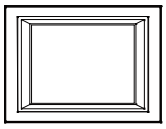
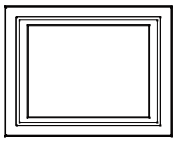


4 Press the [x] button to close the Adjust Contrast Screen.

5 HG3F/4F

5.1 Packing content

Before installing the HG3F/4F, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

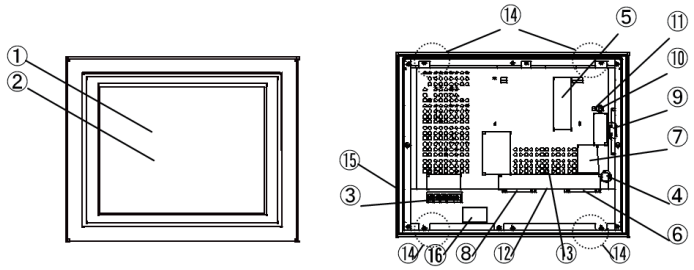
Name	Pcs/pack	HG3F	HG4F
HG3/4F Unit	1		
Instruction Sheet (Japanese/English)	1		
Mounting clips	4		

5.2 Type No.

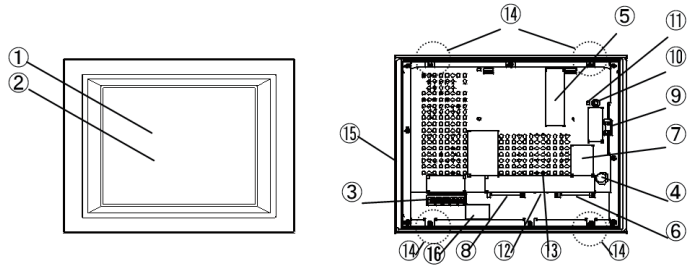
Display Device	Interface	Body color	Model No.
10.4-inch TFT Color LCD	RS232C/485(422) Ethernet Compact Flash	Light gray	HG3F-FT22TF-W
		Dark gray	HG3F-FT22TF-B
	RS232C/485(422)	Light gray	HG3F-FT22VF-W
		Dark gray	HG3F-FT22VF-B
12.1-inch TFT Color LCD	RS232C/485(422) Ethernet Compact Flash	Light gray	HG4F-JT22TF-W
		Dark gray	HG4F-JT22TF-B
	RS232C/485(422)	Light gray	HG4F-JT22VF-W
		Dark gray	HG4F-JT22VF-B

5.3 Part Names

■ **HG3F**



■ **HG4F**



No.	Name	Description
(1)	Display	
(2)	Touch Panel	
(3)	Power Supply Terminal	
(4)	Serial Interface 2	Connects the maintenance computer
(5)	Expansion Unit Interface	For Expansion Unit
(6)	Serial Interface 1	Connects the host PLC
(7)	O/I Link interface	For O/I Link Unit
(8)	Parallel Interface	Connects the printer
(9)	CF Interface	For Compact Flash
(10)	Access Stop Switch	CF extraction permission switch
(11)	Access Lamp	CF state display lamp
(12)	Ethernet Interface (LAN)	IEEE802.3 10BASE-T Connector : RJ-45
(13)	Ethernet state lamp	Ethernet state display lamp
(14)	Mounting Clip Position	
(15	Packing	Waterproof ability is secured at the time of panel attachment
(16)	Replacement Backlight Type No. Label	Indicates the replacement backlight Type No.

5.4 External Interfaces

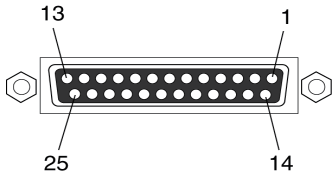
CAUTION

Make sure to turn off the power to the HG3/4F before wiring each interface.

● Serial Interface 1

■ **D-sub Connector**

Interface Specification	RS232C/485(422)
Connector	D-sub 25 pin
Screw lock bracket	Metric screw thread

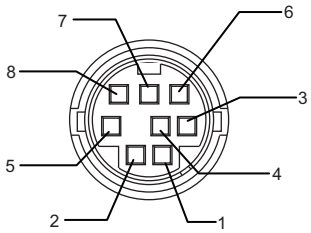


No.	Name	Function		
1	FG	Frame Ground		
2	SD	Send Data (RS232C)		
3	RD	Receive Data (RS232C)		
4	RS	Request to Send (RS232C)		
5	CS	Clear to Send (RS232C)		
6	—	—		
7	SG	Signal Ground		
8	—	—		
	RS485		RS422	
9	TERM	Terminator	TERM	Terminator
10	RDA	Receive Data A	RD+	Receive Data (+)
11	SDA	Send Data A	SD+	Send Data (+)
12	—	—	—	—
13	—	—	—	—
14	—	—	—	—
15	SDB	Send Data B	SD-	Send Data (-)
16	RDB	Receive Data B	RD-	Receive Data (-)
17	—	—	—	—
18	—	—	CS-	Clear to Send (-)
19	—	—	RS-	Request to Send (-)
20	ER	Data Terminal Ready (RS232C)		
21	—	—	CS+	Clear to Send (+)
22	—	—	RS+	Request to Send (+)
23	—	—	—	—
24	—	—	—	—
25	—	—	—	—

To enable the 330Ω built-in terminator, connect terminal No. 9 [TERM] and terminal No. 10 [RDA/RD (+)] together.

● Serial interface 2

Interface Specification	RS232C
Connector	Mini DIN 8 pin



No.	Name	I/O	Function
1	RS	OUT	Request to Send
2	ER	OUT	Data terminal ready
3	SD	OUT	Send Data
4	RD	IN	Receive Data
5	DR	IN	Data set ready
6	EN	IN	Use set ready
7	SG	—	Signal Ground
8	NC	—	No connection

- Do not connect pin 6 (EN) with any other pins except when performing maintenance communications for downloading project data.

● Expansion Unit Interface (EXT)

The HG3F/4F can be used in conjunction with dedicated HG Series option units. Refer to the Expansion Unit instruction manual for details.

● O/I Link Interface

The HG3F/4F Operator Interface can be connected to an O/I Link Unit for 1:N communication with a PLC. This allows high-speed communication with the PLC host.

5.5 Specifications

Applicable Standards

Safety Standard	UL508, UL1604, CSA C22.2 No.213 (c-UL)
EMC Standard	IEC/EN 61000-6-4, IEC/EN 61131-2

Environmental Specifications

Type No.	HG3F	HG4F
Operating Ambient Temperature	0 to 50°C	0 to 45°C
Operating Relative Humidity	20 to 85% RH (no condensation)	
Storage Ambient Temperature	-20 to +60°C	
Storage Relative Humidity	20 to 85% RH (no condensation)	
Altitude (Operation)	0 to 2000m	
Pollution Degree	2	
Corrosion Immunity	Free from corrosive gases	

Electrical Specifications

Rated Operating Voltage	24V DC
Power Consumption	25W maximum
Power Voltage Range	19.2V DC to 28.8V DC
Allowable Momentary Power Interruption	10 ms maximum
Inrush Current	15A maximum (cold start)
Dielectric Strength	AC1500V, 10mA, 1 minute (between power and earth terminals)
Insulation Resistance	10 MΩ minimum (500V DC megger) (between power and earth terminals)

Construction Specifications

Vibration Resistance	10 to 55 Hz, 9.8 m/s^2 [2 hours each in 3 axes] (IEC60068-2-6)
Shock Resistance	147 m/s^2, 11 ms [5 shocks each in 3 axes] (IEC60062-2-27)

Performance Specifications

Type No.		HG3F	HG4F
Display	LCD Type	STN Color LCD	
	Display Colors	256 Colors	
	Effective Display Area [mm]	221(W) × 158(H)	246(W) × 184(H)
	Display Resolution	640 (W) × 480 (H) pixels	800 (W) × 600 (H) pixels
	Brightness Adjustment	2 levels	
	Backlight	Cold-cathode tube	
	Backlight Life	50,000 hours type	
Touch	Switch Type	Matrix Resistive Film	
	Composition	24 × 32	30 × 40
	Operating Force	0.2 to 0.8 N	
	Multiple Operations	Possible	
	Life	1,000,000 operations	
User Memory		6MB	
Power failure maintenance	Maintenance object	Calendar, Log Data, Keep Internal relay/resister	
	Maintenance period	1 month (at 25°C)	
Buzzer output		Single tone	
Degree of Protection		IP66 (operator) TYPE 4, 4x TYPE 13*1	
Weight (approx.)		2.8kg	3.4kg

EMC Specifications

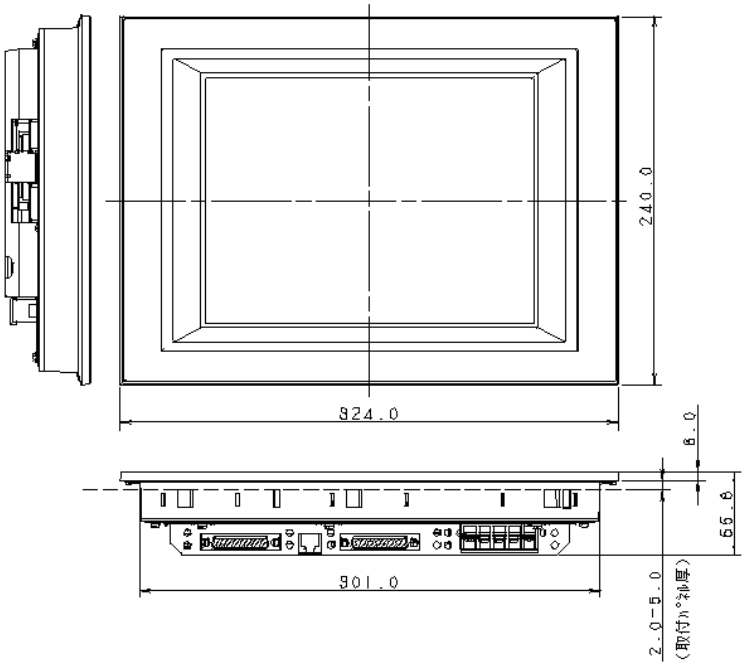
Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz, 1.4 to 2.0 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V -FE, 0V - FE)
Damped Oscillatory Wave	Serial mode Power : ± 1kV

*1 The degree of protection for the operating section after the panel is attached. The compliance test has been passed, but this is not a guarantee of operation in all environments.

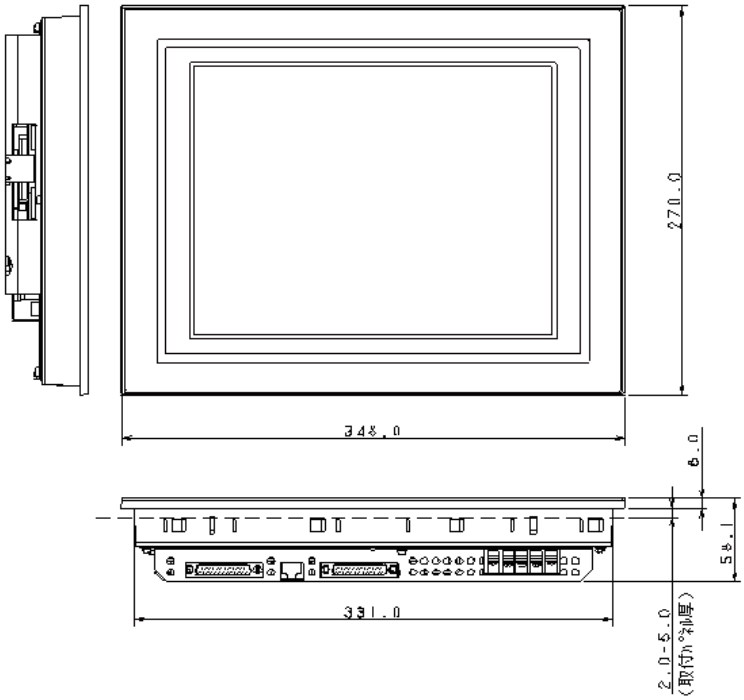
5.6 Dimensions

Unit: mm

■ **HG3F**



■ **HG4F**



5.7 Installation

● Operating Environment

For designed performance and safety of the HG3/4F, do not install the HG3/4F in the following environments:

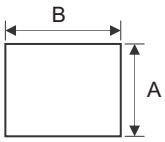
- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for a long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG3/4F.
- Where strong ultraviolet rays fall on the HG3/4F.
- Where corrosive or combustible gasses exist.
- Where the HG3/4F is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

● Ambient Temperature

- Allow sufficient space for ventilation, and install the equipment away from heat sources.
- Allow at least 100mm between the HG3/4F and walls or other equipment.
- Do not install the HG3/4F where the ambient temperature exceeds the rated operating ambient temperature range. When mounting the HG3/4F in such locations, provide a forced air-cooling fan or air-conditioner to keep the ambient temperature within the rated temperature range.

● HG3/4F Installation

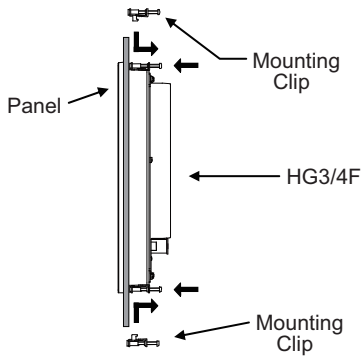
- Make a panel cut-out on the panel with the dimensions shown below.



Unit: mm

Type No.	A		B		Panel Cut-out
HG3F	228.0	+0.5 0	302.0	+0.5 0	2.0 to 5.0
HG4F	258.0	+1.0 0	332.0	+1.0 0	2.0 to 5.0

- Place the HG3/4F in a panel cut-out and fasten with the attached mounting clips at four places to a torque of 0.4 to 0.6 N•m uniformly.



⚠ CAUTION

- **Do not tighten excessively, otherwise the HG3/4F may warp and cause wrinkle on the display, or impair the waterproof characteristics.**
- **If the mounting clips are tightened obliquely to the panel, the HG3/4F may fall off the panel.**
- **When installing the HG3/4F into a panel cut-out, make sure that the gasket is not twisted. Especially when re-installing, take special care because any twists in the gasket will impair the waterproof characteristics.**

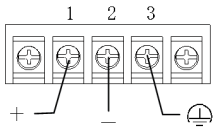
5.8 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG3/4F.**
- **Separate the HG3/4F power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Power Supply Terminal

- Pin assignment is shown in the following table.



+	Power supply 24V DC (+24V)
-	Power supply 0V (0V)
⏚	Functional Earth (FE)

- Use applicable cables for wiring and recommended ferrules (made by JST) as follows.

Applicable cable	AWG14 to AWG18
Recommended Pressure Terminal	V1.25(RAV1.25-4), V2-P4 Equivalent
Tightening Torque	1.0 to 1.3 N·m

● Grounding Cautions

If you decide to use a single power supply for the HG3/4F with more than one external device, take extra precautions. Some external devices may produce electrical noise and short circuit the entire system setup, therefore, damaging the communication circuit of the HG3/4F and non-isolated Communication Device (i.e. PLC).

To prevent such damage, choose a proper solution depending on your system setup.

- Use a separate earth ground from the external noise source device.
- The wire for grounding should be thick and short in order to direct the noise from the noise source device to the earth ground.
- Use a separate power supply from the external noise source device.
- Insert an isolator on the communication line of the HG3/4F and the non-isolated communication device (i.e. PLC) to prevent damage.

● Cautions for using the HG3/4F connected to a personal computer

When connecting the HG3/4F to a personal computer via the Serial Interface, the HG3/4F or the personal computer may break down depending on the conditions of the personal computer. Make sure of the following cautions, in order to prevent an accident.

- If the personal computer has a 3-pin power plug or power plug with a ground lead type. make sure to use a plug socket including a ground input electrode or ground the earth lead, respectively.
- If the personal computer has a 2-pin power plug without ground lead, follow the procedure below when connect the HG3/4F to the personal computer.
  (1) Pull out the power plug of the personal computer from the AC outlet.
  (2) Connect the HG3/4F to the personal computer.
  (3) Insert the power plug of the personal computer into the AC outlet.

5.9 Maintenance and Inspection

Maintain and inspect the HG3/4F periodically to ensure the best performance. Do not disassemble, repair, or modify the HG3/4F during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Terminals, Connectors	Check the terminals and connectors to make sure of no loose screws, incomplete insertion, or disconnected lines.
Mounting Clips	Make sure that all mounting clips and screws are tightened sufficiently. If the mounting clips are loose, tighten the screw to the recommended tightening torque.

● Replacing the Backlight

WARNING

- **Make sure to turn off the power to the HG3/4F before replacing the backlight; otherwise, product breakdown, electric shock, or fire may occur.**
- **The backlight may be hot. Make sure to wear gloves when performing the replacement work.**

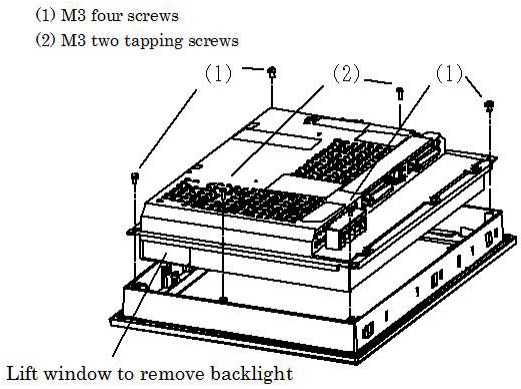
CAUTION

Take extra care during this process. Otherwise, dust particle may enter between the surface sheet and the touch panel during backlight exchange. Therefore, make sure the environment is clean. When in doubt please ask your nearest sales representative

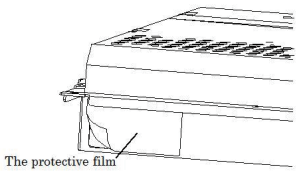
To replace backlight please follow the procedure below:

■ **HG3F**

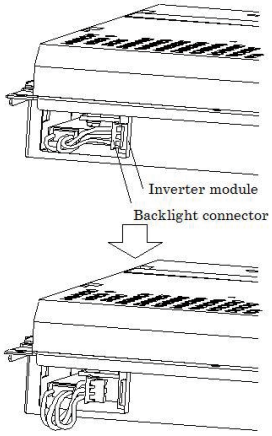
1. Turn off the power to the HG3F, and disconnect the power supply cable.
2. Remove the screws from the main unit rear panel, and carefully separate the rear case from the front case.



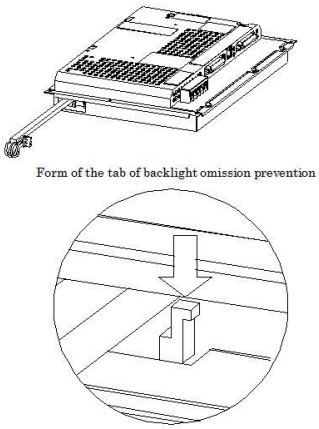
3. Peel the protective film on the window.



4 Remove the backlight connector from the inverter module.



5 Draw out the backlight , pushing the tab of backlight omission prevention.



6 Connect the replacement backlight by following the procedure in step *5* in reverse.

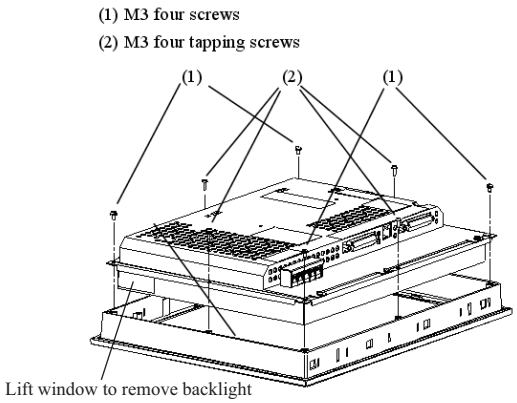
7 Follow the procedure in step *4* in reverse to connect the connector, then follow the procedure in step *3* in reverse to stick an attached protection film.

8 Follow the procedure in step *2* in reverse to front and rear cases, then tighten the screws at the rear panel (torque: 0.5 N•m to 0.6 N•m)

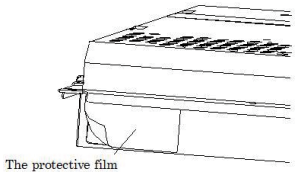
■ HG4F

1 Turn off the power to the HG4F, and disconnect the power supply cable.

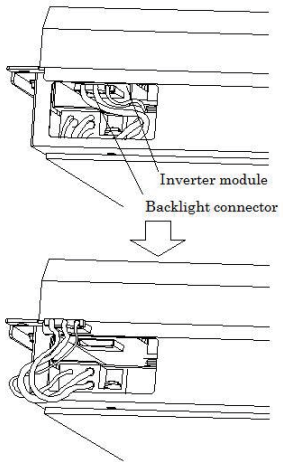
2 Remove the screws from the main unit rear panel, and carefully separate the rear case from the front case.



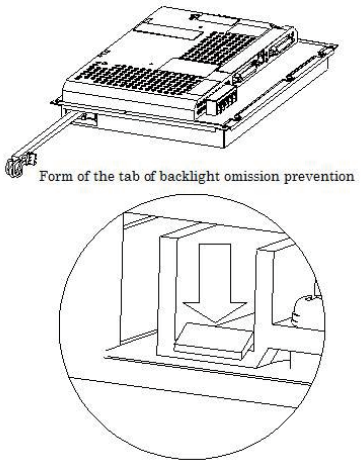
3 Peel the protective film on the window.



4 Remove the backlight connector from the inverter module.



5 Draw out the backlight , pushing the tab of backlight omission prevention.



6 Connect the replacement backlight by following the procedure in step ***5*** in reverse.

7 Follow the procedure in step ***4*** in reverse to connect the connector, then follow the procedure in step ***3*** in reverse to stick an attached protection film.

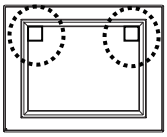
8 Follow the procedure in step ***2*** in reverse to front and rear cases, then tighten the screws at the rear panel (torque: 0.5 N•m to 0.6N•m)

The HG4F uses two different types of replacement backlights depending on the production date. When ordering a replacement backlight, look for the Replacement Backlight Type No. label on the back of the HG4F. For the label position, see the figure of "5.3 Part Names" on page 34-59. When the label is found, specify HG9Z-4FB1 or HG9Z-4FB2 indicated on the label. If the label is not found, specify HG9Z-4FB1.

● Adjust Backlight

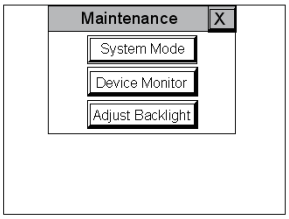
The backlight of the HG3/4F display can be adjusted by following the procedure below.

1 Turn on the power to the HG2F, and press the upper-right and -left corners simultaneously, then the Maintenance Screen will appear.

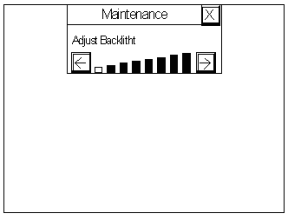


Press 2 corners simultaneously.

2 Press the [Adjust Backlight] button at the bottom of the Maintenance Screen. The Adjust Backlight Screen appears.



3 Press the [←] or [→] button at the bottom the Adjust Backlight Screen to adjust luminosity. Luminosity adjustments are two stages. Moreover, a setting value is memorized.

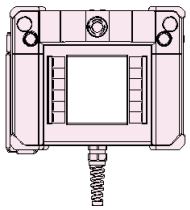
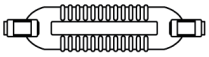
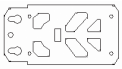


4 Press the [x] button to close the Adjust Contrast Screen.

6 HG2S

6.1 Packing content

Before installing the HG2S, make sure that the specifications of the product conform to your requirements, and that no parts are missing or damaged due to accidents during transportation.

Name	Pcs/pack	
HG2S Unit	1	
Instruction Sheet (Japanese/English)	1	
Hand strap for the hand-held type (installed at factory)	1	
Mounting bracket	1	

To prevent the HG2S from falling, hold the hand strap during operation.

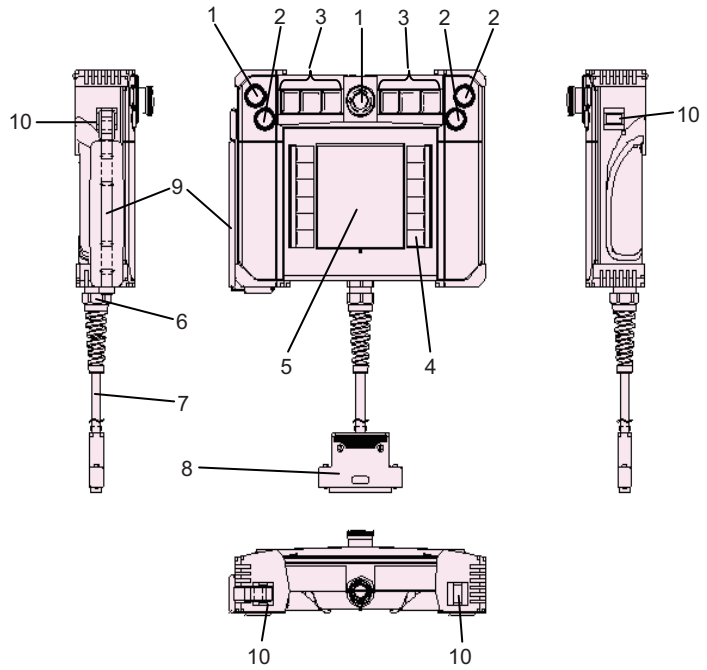
6.2 Type No.

	Display type	Host I/F	Type No.
CC SWITCH type	Color	RS232C	HG2S-SS62BH-A△△
			HG2S-SS62BH-S△-▲***
		RS485 / RS422	HG2S-SS62YH-A△△
			HG2S-SS62YH-S△-▲***
	Monochrome	RS232C	HG2S-SB62BH-A△△
			HG2S-SB62BH-S△-▲***
		RS485 / RS422	HG2S-SB62YH-A△△
			HG2S-SB62YH-S△-▲***
Touch switch type	Color	RS232C	HG2S-SS32BH-A△△
			HG2S-SS32BH-S△-▲***
		RS485 / RS422	HG2S-SS32YH-A△△
			HG2S-SS32YH-S△-▲***
	Monochrome	RS232C	HG2S-SB32BH-A△△
			HG2S-SB32BH-S△-▲***
		RS485 / RS422	HG2S-SB32YH-A△△
			HG2S-SB32YH-S△-▲***

Note: Specify a cable length code in place of △ : 3 or 5 or 10: 3m or 5m or 10m
Note: Type"-A" can't have an expansion switch block, and pushbutton switches have dummy caps.
Note: If △ is "blank", the HG2S is equipped with an emergency stop switch (red). If △ is "N," it is equipped with a stop switch (gray).
Note: If ▲ is "R," the HG2S is equipped with an emergency stop switch (red). If ▲ is "N," it is equipped with a stop switch (gray).
Note: A serial number comes in place of ***, which represents the types and layout of the installed mechanical switches.

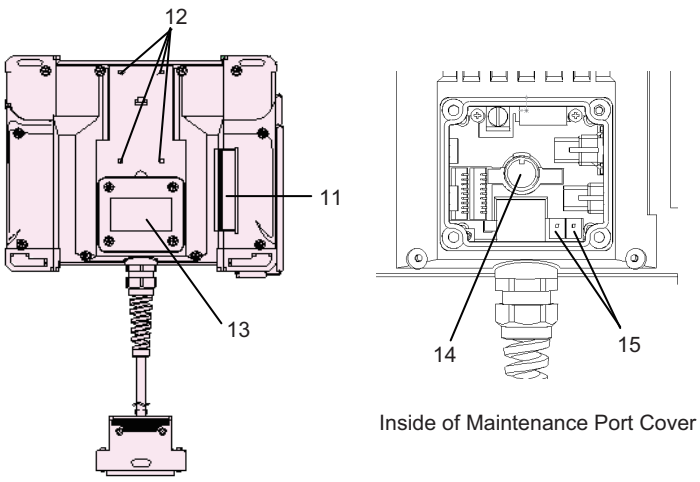
6.3 Part Names

Front



No.	Name	Description	
1	Emergency stop switch or Stop switch	When an emergency stop switch or a stop switch is not specified, a dummy cap is installed.	
2	Push-button switch	Switches are installed as designated on the specification sheet.	
3	Expansion switch block		
4	CC SWITCH	6 x two columns (right and left)	Without CC SWITCH, 12x16 touch switches are available.
5	Touch switch	12 x 10 switches	
6	Cable gland		
7	Cable	3m or 5m or 10m	
8	D-sub 37-pin connector	Plug type	
9	Hand strap		
10	Strap hole		

■ **Rear**



No.	Name	Description
11	Enabling switch	When an enabling switch is not specified, only the button is installed without contacts.
12	Mounting Bracket screw holes	M3 x 6 tapped holes
13	Maintenance port cover	
14	Maintenance port	Mini DIN8P connector (Serial interface2)
15	Communication switch	For setting the property of serial intarface1

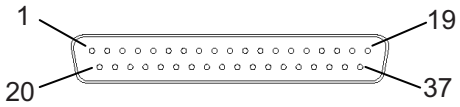
6.4 External Interfaces

CAUTION

When using the maintenance port (Serial interface2) or setting up communication switches, remove the maintenance port cover. After setting up, screw down the cover using four M3 screws. To ensure that the water-resistance characteristics are maintained, tighten the screws to a torque of 0.6 to 0.7N•m.

● Serial Interface1

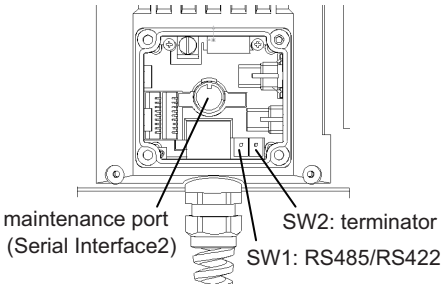
- Connector Pin Layout



- Connector Pin Functions

	RS232C		RS485		RS422	
No.	**Name**	**Function**	**Name**	**Function**	**Name**	**Function**
29	SG	Signal Ground	SG	Signal Ground	SG	Signal Ground
30	SD1	Send Data 1	SDA	Send Data A	SD+	Send Data (+)
31	---	Reserved	SDB	Send Data B	SD-	Send Data (-)
32	RD1	Receive Data 1	RDA	Receive Data A	RD+	Receive Data (+)
33	---	Reserved	RDB	Receive Data B	RD-	Receive Data (-)
34	ER	Data terminal ready	---	---	RS+	Request to Send (+)
35	NC	---	---	---	RS-	Request to Send (-)
36	DR	Data set ready	---	---	CS+	Clear to Send (+)
37	NC	---	---	---	CS-	Clear to Send (-)

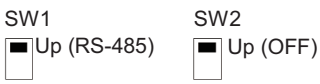
- Communication switch settings



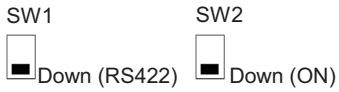
Inside of Maintenance Port Cover

- RS232C (Set at factory)

- RS485C (Set at factory)

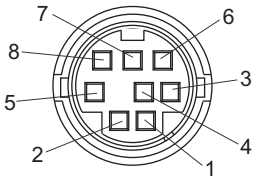


- RS422 (Change setting)



● Serial Interface2

Interface Specification	RS232C
Connector	Mini DIN 8P



No.	Name	I/O	Function
1	RS	OUT	Request to Send
2	ER	OUT	Data terminal ready
3	SD	OUT	Send Data
4	RD	IN	Receive Data
5	DR	IN	Data set ready
6	EN	IN	Use set ready
7	SG	-	Signal Ground
8	NC	-	No connection

- Connect pin 6 (EN) and pin 2 (ER) unless performing maintenance communications for downloading project data. Use Printer connection cable (FC2A-KP1C) when the HG2S be connected with the printer. (Refer to the printer Instruction Manual for details.)

● External Input/Output Interface

Input	Input Points	4
	Rated Input Voltage	12 to 24 V DC (Allowable Voltage Range: 10 to 28V)
	Isolation	Photocoupler isolated
	Input Impedance / Input Current	Approx. 3.9k ohm / Approx. 6mA Input voltage: 24V DC
	Input Voltage Level	ON voltage: 8V or more OFF voltage: 4V or less
Output	Output Points	3 (Included Run output)
	Rated Load Voltage	12 to 24 V DC (Allowable Voltage Range: 10 to 28V)
	Isolation	Photocoupler isolated
	Output Type / ON Voltage	NPN open collector / 1.6V maximum
	Maximum Load Current	50 mA per output point

- Connector Pin Functions

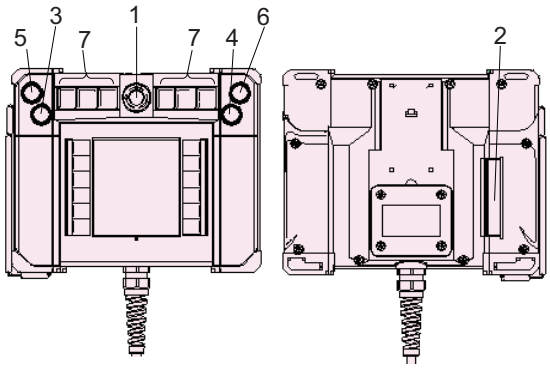
No.	Name	Function
11	I/O+	External I/O power +
12	I/O-	External I/O power -
13	Y0	External output (LY0)
14	Y1	External output (LY1)
15	O RUN	Run output (LY2)
16	X0	External input0 (LX0)
17	X1	External input1 (LX1)
18	X2	External input2 (LX2)
19	X3	External input3 (LX3)

6.5 Mechanical Switches

CAUTION

The emergency stop switch or stop switch and enabling switch incorporated in the HG2S function as either a category 0 or a category 1 stop in accordance with IEC/EN60204-1. When the switch is used to shut down power directly, make sure the switching current is within the rated value. For switching a current over the rated value, use a safety relay or other provision.

● The standard switch layout and functions are described below:



No.	Name	Contact	Rating
1	HA1E-V2S2R [Emergency Stop SW(red)] HA1E-V2S2N-TK2128 [Push Lock Turn Reset SW(gray)]	2NC	24V DC 1A
2	HE1B-M1 [Enabling switch]	1NO (2 pcs)	24V DC 50mA
3 to 6	LA1B-*1T*V* [Pushbutton] LA1S-**T*V [Selector] LA1K-**T*V* [Key selector]	1NO or 2NO	24V DC 50mA
7	LA2B-*1T*V* [Pushbutton] LA2L-*1T*1V* [ill.pushbutton] LA2P-1TO*V* [Pilot light] LA1S-**T*V [Selector] LA1K-**T*V* [Key selector] LA2F-**T*1V* [ill.selector]	1NO or 2NO	Note

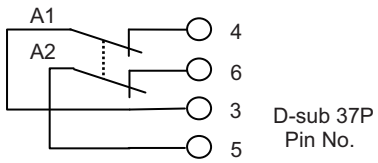
Note: Specify switch operation, contact configuration, and color code in place of * in the Type No.

● Connector Pin Functions

No.	Name	Function
1	FG	Frame ground
2	NC	
3	A1	A1 Emergency stop SW or Stop SW
4		
5	A2	A2 Emergency stop SW or Stop SW
6		
7	24V DC+	Power supply input
8	24V DC+	Power supply input
9	24V DC-	Power supply ground
10	24V DC-	Power supply ground
20	B1	B1 Enabling Sw
21		
22	B2	B2 Enabling Sw
23		
24	D1 NO1 (C1 NO2)	D1 Contact 1 (C1 Contact 2)
25	D2 NO1 (C2 NO2)	D2 Contact 1 (C2 Contact 2)
26	C1 NO1 (D1 NO2)	C1 Contact 1 (D1 Contact 2)
27	C2 NO1 (D2 NO2)	C2 Contact 1 (D2 Contact 2)
28	SW COM	C1, C2, D1, D2 common

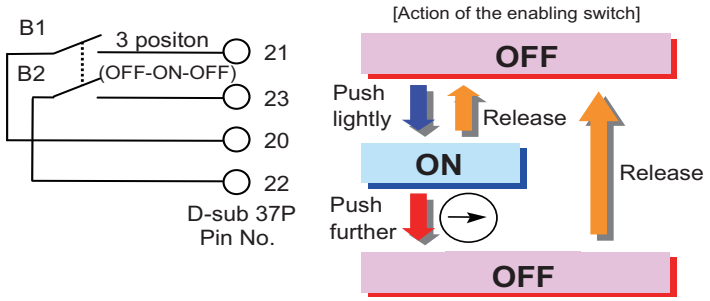
● Construction of Contact

1. Emergency stop switch or Stop switch (Direct opening action) (A1, A2)



Emergency stop switch or stop switch is available to connect to an emergency stop circuit. It remains locked when operated. Contacts do not open the operator is locked (safety locking mechanism). Direct opening circuit function ensures to open contacts even if contacts are welded.

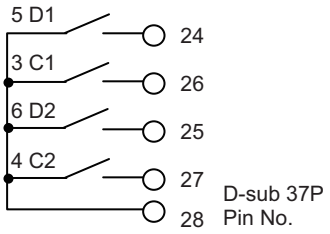
2. Enabling switch (Direct opening action) (B1, B2)



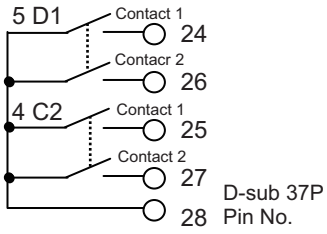
The enabling switch consists of two contacts (OFF-ON-OFF). They can be wired so that the contacts can be monitored mutually using two input points. Each contact works independently, so the end of the switch at operation, a time difference between the two contacts may occur. Wire the enabling switch so that the contacts can be mutually monitored using two input points. Design a sequence program in consideration of the time difference.

3 to 6. Push-button Switchse (C1, C2, D1, D2)

Example: When switches with 1NO contact are installed at C1, C2, D1, and D2.

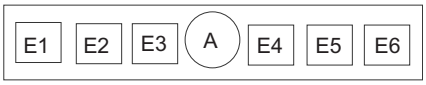


Example: When selector or key selector switches with 2NO contacts are installed at C2 and D1.



● Expansion Switch Block

Switches at E1 through E6 are allocated to expansion I/O relays in the CPU and correspond to relay signals shown in the table below. These signals are not sent out to the cable.



Switch Position	Expansion Input Relay		Expansion Output Relay*2
	Contact 1	Contact 2	LED Lighting
E1	LPX0	LPX3*1	LPY0
E2	LPX1		LPY1
E3	LPX2		LPY2
E4	LPX4	LPX7*1	LPY4
E5	LPX5		LPY5
E6	LPX6		LPY6

*1 One 2NO switch can be installed in each of the left switch block (E1 to E3) and the right switch block (E4 to E6). Contacts 1 of 1NO switches at E1 to E6 are allocated to expansion input relays LPX0 to LPX2 and LPX4 to LPX6. Contacts 2 of the only 2NO switches in the left and right switch blocks are allocated to LPX3 and LPX7, respectively.

*2 External output relays can be used to light the LED in illumi-nated pushbuttons and pilot lights installed at E1 to E6.

6.6 Specifications

Applicable Standards

Type No.	This type is used for an emergency stop SW (red).	This type is used for a stop SW (gray).
Safety Standard	UL508, UL1740 CSA C22.2 No.14 IEC/EN60950 IEC/EN60204-1	IEC/EN60950 IEC/EN60204-1 (compliant)
EMC Standard	IEC61000-6-4 IEC/EN 61131-2 FCC Part15 Class A	IEC61000-6-4 IEC/EN 61131-2 FCC Part15 Class A

Note: These standards are applicable to only the HG2S models equipped with both an emergency stop switch or a stop switch and an enabling switch.

Environmental Specifications

Operating Ambient Temperature	0 to 40°C (no freezing)
Operating Relative Humidity	20 to 85% RH (no condensation)
Storage Ambient Temperature	-20 to +60°C (no freezing)
Storage Relative Humidity	20 to 85% RH (no condensation)
Altitude (Operation)	0 to 2000m
Pollution Degree	2
Corrosion Immunity	Free from corrosive gases

Electrical Specifications

Rated Operating Voltage	24V DC
Power Consumption	10W maximum
Power Voltage Range	21.6 to 26.4V DC
Allowable Momentary Power Interruption	10 ms maximum
Inrush Current	10 ms maximum
Dielectric Strength	AC500V, 10mA, 1 minute (between power and earth terminals)
Insulation Resistance	10 MΩ minimum (500V DC megger) (between power and earth terminals)

Construction Specifications

Vibration Resistance	10 to 55Hz acceleration 9.8m/s^2 2 hours on each of three mutually perpendicular axes (IEC/EB60068-2-6)
Shock Resistance	98m/s^2, 11ms (5 shocks on each of three mutually perpendicular axes) (IEC/EN60068-2-27)

Performance Specifications

		Color	Monochrome
Display	LCD Type	STN color LCD	STN monochrome LCD
	Display Colors	256 Colors	2 Colors
	Effective Display Area [mm]	118.2(W) x 89.4(H) [mm]	
	Display Resolution	320 (W) x 240 (H) pixels	
	View angle	Left / Right : 50°, Top : 45°, Bottom : 35°	Left / Right : 30°, Top : 20°, Bottom : 30°
	Brightness of LCD only	250 [cd/m^2]	200 [cd/m^2]
	Contrast Adjustment	Can be adjusted from the front touch panel	
	Backlight	Cold-cathode tube	Cold-cathode tube
	Backlight Life	40000 hours (The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures).	25000 hours (The backlight life refers to the time until the surface brightness reduces to a half after using continuously at room temperatures).
Touch switch	Switch Type	Digital Resistive Film	
	Operating Force	0.2 to 0.8 N	
	Composition	12 × 16 (12 x 10 for the CC SWITCH type)	
	Life	1,000,000 operations	
CC SWITCH	Switch Type	Digital Resistive Film	
	Operating Force	2.5 to 5.0 N	
	Quantity (per screen)	6 x two columns (total: 12) (right and left)	
	Life	1,000,000 operations	
User Memory		2MB	
Backup Data		Calendar, Log Data, Keep Internal relay/resister (Maintenance period: 1 month at 25°C)	
Buzzer output		Single tone	
Installation structure		Hand-held type	
Degree of Protection		CC SWITCH type TYPE 1, IP20 (housing: IP65) (excluding D-sub connector part) Touch switch type TYPE 4, 4X and IP65 TYPE 13*1 (excluding D-sub connector part)	
Weight (approx.)		1.2kg (excluding cable)	

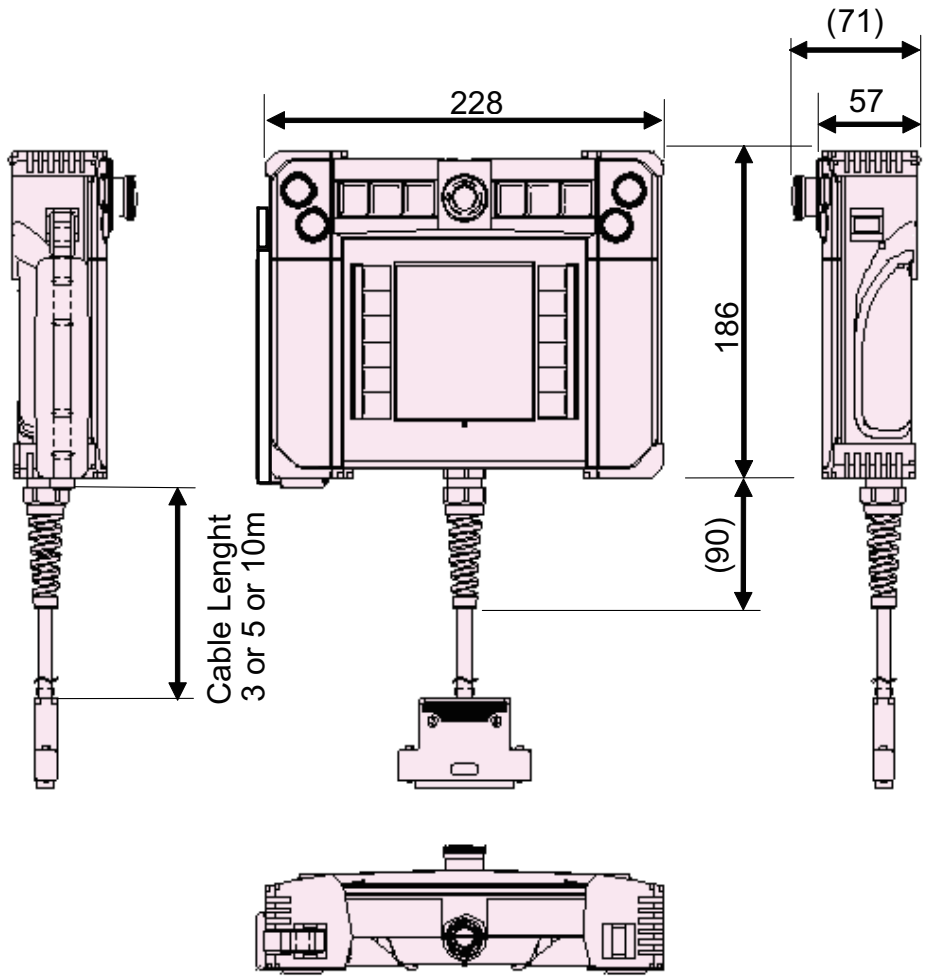
EMC Specifications

Radiated Emission	Class A : 10m 40dBμV/m quasi-peak (30M to 230MHz) 47dBμV/m quasi-peak (230M to 1GHz)
Electrostatic Discharge	Contact : ±6kV Air : ±8kV
Electromagnetic Field	10V/m (80 to 1000 MHz) 3V/m (1.4 to 2.0 GHz) 1V/m (2.0 to 2.7 GHz) 80% AM (1kHz)
Fast Transient Burst	Power : ±2kV Communication cable : ±1kV
Surge Immunity	±500V (between +24V-0V) ±500V (between +24V-FE, 0V-FE)
Conducted Radio Frequency Immunity	3V (Power, Communication cable) (150kHz to 80MHz) 80% AM (1kHz)

*1 Not a guarantee in all usage environments with oil materials.

6.7 Dimensions

Unit: mm



6.8 Installation

● Operating Environment

For designed performance and safety of the HG2S, do not install the HG2S in the following environments:

- Where dust, briny air, or iron particles exist.
- Where oil or chemical splashes for a long time.
- Where oil mist is filled.
- Where direct sunlight falls on the HG2S.
- Where strong ultraviolet rays fall on the HG2S.
- Where corrosive or combustible gasses exist.
- Where the HG2S is subjected to shocks or vibrations.
- Where condensation occurs due to rapid temperature change.
- Where high-voltage or arc-generating equipment (electromagnetic contactors or circuit protectors) exists in the vicinity.

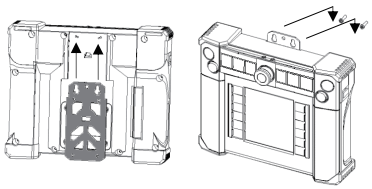
● Ambient Temperature

- Install the HG2S in such a way that it will not be exposed to heat generated by other equipment.
- If there is no need to operate the HG2S, mount it onto a wall or a stand. Use the attached mounting bracket for wall mounting.
- Do not apply force to the D-sub connector directly.

● Installation

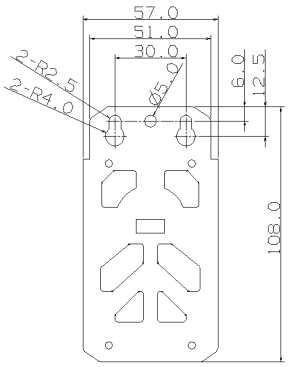
Use the attached mounting bracket and follow the procedure given below to mount the HG2S onto a wall.

- Install the mounting bracket (HG9Z-PK2) to the HG2S as shown in the figure below.
- Drive in two screws on a wall to hang the HG2S.
- Hang the HG2S on the screws as shown below.



- When installing the attached mounting bracket, tighten the four screws to a torque of 0.4 to 0.5 N-m uniformly. Excessive tightening of the screws will deform and damage the HG2S.

- Mounting Bracket (HG9Z-PK2) [Unit: mm]



CAUTION

Do not tighten excessively, otherwise the HG2S may warp and cause wrinkle on the display, or impair the waterproof characteristics.

6.9 Wiring

CAUTION

- **Turn off the power supply before wiring.**
- **Make the wiring as short as possible and run all wires as far away as possible from high-voltage and large-current cables. Follow all the procedures and precautions when wiring the HG2S.**
- **Separate the HG2S power supply wiring from the power lines of I/O devices and motor equipment.**
- **Ground the functional earth terminal to make sure of correct operation.**

● Connector classification

D-sub 37P connector (plug): DC-37-PF-N (JAE)

D-sub 37P connector (hood): DC-C8-J13-F1-1 (JAE)

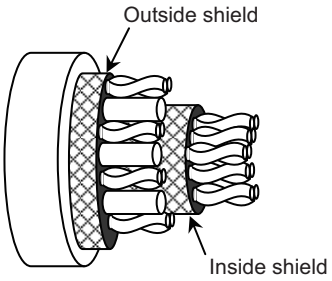
● Connector wiring table

No.	Name	Function	Cable Color
1	FG	Frame ground	Cable shield (In, Out)
2	NC	No connection	
3	A1	A1 Emergency stop SW or Stop SW	Out Single 7: Blue (Thick)
4			Out Single 8: Gray (Thick)
5	A2	A2 Emergency stop SW or Stop SW	Out Single 9: Pink (Thick)
6			Out Single10:Orange (Thick)
7	DC24+	Power supply input	Out Single 2: White (Thick)
8	DC24+	Power supply input	Out Single 3: Red (Thick)
9	24V DC-	Power supply ground	Out Single 1: Black (Thick)
10	24V DC-	Power supply ground	Out Single 4: Green (Thick)
11	I/O +	External I/O power	Out Single 5: Yellow (Thick)
12	I/O -	External I/O power	Out Single 6: Brown (Thick)
13	Y0	External output 0 (LY0)	Out Pair 1: Blue (Thin)
14	Y1	External output 1 (LY1)	Out Pair 2: Yellow (Thin)
15	O RUN	Run output (LY2)	Out Pair 2: Brown (Thin)
16	X0	External input 0 (LX0)	Out Pair 3: Green (Thin)
17	X1	External input 1 (LX1)	Out Pair 3: Brown (Thin)
18	X2	External input 2 (LX2)	Out Pair 4: Red (Thin)
19	X3	External input 3 (LX3)	Out Pair 4: Brown (Thin)
20	B1	B1 Enabling SW	Out Pair 7: Yellow (Thin)
21			Out Pair 7: Black (Thin)
22	B2	B2 Enabling SW	Out Pair 8: Green (Thin)
23			Out Pair 8: Black (Thin)
24	D1 NO1 (C1 NO2)	D1 Contact 1 (C1 Contact 2)	Out Pair 5: Purple (Thin)
25	D2 NO1 (C2 NO2)	D2 Contact 1 (C2 Contact 2)	Out Pair 5: Brown (Thin)
26	C1 NO1 (D1 NO2)	C1 Contact 1 (D1 Contact 2)	Out Pair 6: Blue (Thin)

No.	Name		Function				Cable Color
27	C2 NO1 (D2 NO2)		C2 Contact 1 (D2 Contact 2)				Out Pair 6: Black (Thin)
28	SWCOM		C1, C2, D1, D2 common				Out Pair 1: Brown (Thin)
	RS232C		RS485		RS422		
29	SG	Signal ground	SG	Signal ground	SG	Signal ground	In Pair 5: Purple (Thin)
30	SD1	Semd data 1	SDA	Semd data A	SD+	Semd data (+)	In Pair 1: Blue (Thin)
31	Reserve	———	SDB	Semd data B	SD-	Semd data (-)	In Pair 1: White (Thin)
32	RD1	Receive data 1	RDA	Receive data A	RD+	Receive data (+)	In Pair 2: Yellow (Thin)
33	Reserve	———	RDB	Receive data B	RD-	Receive data (-)	In Pair 2: White (Thin)
34	ER	Data terminal ready	—	———	RS+	Request to send (+)	In Pair 3: Green (Thin)
35	NC	———	—	———	RS-	Request to send (-)	In Pair 3: White (Thin)
36	DR	Data set ready	—	———	CS+	Clear to send (+)	In Pair 4: Red (Thin)
37	NC	———	—	———	CS-	Clear to send (-)	In Pair 4: White (Thin)

● Cable Specification

Connection cable		Double-shielded cable
Inside configuration	Inside shield	AWG28 × 5 Pair
	Outside shield	AWG28 × 8 Pair
		AWG24 × 10 Cores



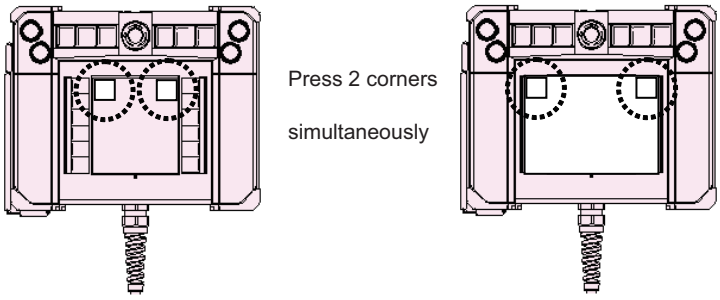
6.10 Maintenance and Inspection

Maintain and inspect the HG2S periodically to ensure the best performance. Do not disassemble, repair, or modify the HG2S during inspection.

Display	Wipe any stain of the display using a soft cloth slightly dampened with neutral detergent or alcoholic solvent. Do not use solvents such as thinner, ammonia, strong acid, and strong alkaline.
Backlight	The HG2S's backlight cannot be replaced by the customer. When the backlight needs to be replaced, Contact IDEC.

● Maintenance Screen

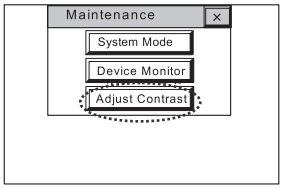
Turn on the power to the HG2S, and press the upper-right and -left corners simultaneously, then the Maintenance Screen will appear.



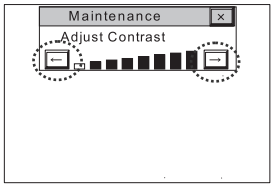
● Adjusting the Contrast

The brightness of the HG2S display can be adjusted on the Adjust Contrast Screen. Adjust the contrast to the best condition as required.

1. Press the [Adjust Contrast] at the bottom of the Maintenance Screen. The Adjust Contrast Screen appears.



2. Press the [←] and [→] at the bottom the Adjust Contrast Screen to adjust the contrast to the optimal setting.



3. Press the [X] to close the Adjust Contrast Screen.

7 Options

7.1 HG1F

● Options

Name	Type No.	Description
Maintenance Cable	HG9Z-XCM22	D-sub 9pin female connector to connect to computer Length: 2m
PLC Connection Cable	FC4A-KC1C	For IDEC MicroSmart programming port (Port 1) Communication Mode: RS232C Length: 5m
	HG9Z-XC115	For IDEC FA-3S SIF2 Communication Mode: RS232C Length: 5m
	HG9Z-XC145	For Mitsubishi computer link unit (D-sub 25pin) Communication Mode: RS232C Length: 5m
	HG9Z-XC155	For Omron Host link unit (D-sub 25pin) Communication Mode: RS232C Length: 5m
	HG9Z-XC183	For IDEC OpenNet Controller, MicroSmart Port2 Communication Mode: RS232C Length: 3m
	HG9Z-XC203	For Mitsubishi computer link unit (D-sub 9pin) Communication Mode: RS232C Length: 3m
	HG9Z-XC213	For Omron RS232S I/F (except for C20H/28H/40H) Communication Mode: RS232C Length: 3m
	HG9Z-XC245	For Mitsubishi FX series Communication Mode: RS422 Length: 5m
	HG9Z-XC255	For Mitsubishi A/QnA series Communication Mode: RS422 Length: 5m
	HG9Z-XC265	For Mitsubishi Q series Communication Mode: RS232C Length: 5m
O/I Link Unit	HG9Z-2G1	Communication unit for O/I Link
Protective Sheet	HG9Z-1DPN05	5 pcs/pack

● Replacement Parts

Name	Type No.	Description
Mounting Clip	SLD-K02PN10	10 pcs/pack
Replacement Battery	HG9Z-XR1	CR2032 lithium primary battery
Replacement Backlight	HG9Z-1FB	

7.2 HG2F/3F/4F

● Options

Name	Type No.	Description
Maintenance Cable	HG9Z-XCM22	D-sub 9pin female connector to connect to computer Length: 2m
PLC Connection Cable	PF3S-KS1	For IDEC FA3S Link Unit Length: 5m
	HG9Z-3C115	For IDEC MICRO^3 Length: 5m
	HG9Z-3C125	For IDEC MICRO^{3}C Length: 5m
	HG9Z-3C135	For Mitsubishi, Omron, etc. link unit (D-sub 25pin) Communication Mode: RS232C Length: 5m
	HG9Z-3C145	For Mitsubishi, etc. link unit (D-sub 9pin) Communication Mode: RS232C Length: 5m
	HG9Z-3C155	For Omron etc. RS232C I/F (D-sub 9pin) Communication Mode: RS232C Length: 5m
	HG9Z-3C165	For Mitsubishi A and FX series programming port Length: 5m
Expansion Unit	HG9Z-2P101	For HG2F Digital I/O (16 inputs and 16 outputs)
	HG9Z-3P102	For HG3F/4F Digital I/O (16 inputs and 16 outputs)
	HG9Z-2PNL1	For HG2F LONWORKS network unit
O/I Link Unit	HG9Z-2G1	Communication unit for O/I Link
Protective Sheet	HG9Z-2D2	For HG2F 5 pcs/pack
	HG9Z-3DAPN02	For HG3F 2 pcs/pack
	HG9Z-4DAPN02	For HG4F 2 pcs/pack
Memory Card	HG9Z-MF128	CF Card (128MB)

● Replacement Parts

Name	Type No.	Description
Mounting Clip	HG9Z-2K1PN04	For HG2F 4 pcs/pack
	HG9Z-4K1PN10	For HG3F/4F 10 pcs/pack
Replacement Backlight	HG9Z-2B1	For HG2F
	HG9Z-3FB	For HG3F
	HG9Z-4FB1 or HG9Z-4FB2*1	For HG4F

*1 Type No. of Replacement Backlight
The HG4F uses two different types of replacement backlights depending on the production date. When ordering a replacement backlight, look for the Replacement Backlight Type No. label on the back of the HG4F. For the label position, see the figure of "5.3 Part Names" on page 34-59. When the label is found, specify HG9Z-4FB1 or HG9Z-4FB2 indicated on the label. If the label is not found, specify HG9Z-4FB1.

7.3 HG2S

● Options

Name	Type No.	Description
Maintenance Cable	HG9Z-XCM22	D-sub 9pin female connector to connect to computer Length: 2m
Strap	HG9Z-PS1	For hand-held operation
	HG9Z-PS3	For suspending
Protective Sheet	HG9Z-PE1	Water-and dust-proof

● Replacement Parts

Name	Type No.	Description
Strap	HG9Z-PS2	For the hand-held type
Mounting Clip	HG9Z-PK2	Mounting bracket

7.4 HG2G-S/-5S

● Options

Name	Type No.	Description
Maintenance Cable	HG9Z-XCM22	For HG2G-S D-sub 9pin female connector to connect to computer Length: 2m
	HG9Z-XCM42	For HG2G-5S USB cable to connect to a computer Length: 2m <Connector> HG: USB Mini-B Computer: USB Type-A
USB Panel-Mount Extension Cable	HG9Z-XCE21	For HG2G-5S Extension cable for attaching to USB (Mini-B) port on front panel Length: 1m Length: 1m
PLC Connection Cable	FC2A-KP1C	For IDEC · MICROSmart, OpenNet controller Length: 2.4m <Connector> HG: Parted Wire Host: Mini-DIN 8pin
	HG9Z-XC275	For IDEC · MICROSmart, OpenNet controller Length: 5m <Connector> HG: Parted Wire Host: Mini-DIN 8pin
O/I Link Unit	HG9Z-2G1	Communication unit for O/I Link
Protective Sheet *1	HG9Z-2D5PN05	5 pcs/pack
Protective Cover	HG9Z-2E2PN03	To Cover the front of HG, and to protect Display from chemicals 3 pcs/pack

● Replacement Parts

Name	Type No.	Description
Mounting Clip	SLD-K02PN10	10 pcs/pack
Replacement Battery	HG9Z-XR1	CR2032 lithium primary battery
Host Communication Plug	HG9Z-XT09V	Vertical type Wiring Direction: Bottom of HG
	HG9Z-XT09*2	Horizontal type Wiring Direction: Backside of HG

*1 The protective sheet is UV resistant, however, resistance against direct sunlight in outdoor usage is not guaranteed.
*2 The HG9Z-XT09 was included with all HG2G-S shipments from the IDEC factory before December 2011.

7.5 HG2G-5F, HG3G/4G

● Options

Name	Type No.	Description
Maintenance Cable	HG9Z-XCM42	USB cable to connect to a computer Length: 2m <Connector> HG: USB Mini-B Computer: USB Type-A
USB Panel-Mount Extension Cable	HG9Z-XCE11	Extension cable for attaching to USB2 (Type-A) port on front panel Length: 1m
	HG9Z-XCE21	Extension cable for attaching to USB1 (Mini-B) port on front panel Length: 1m
PLC Connection Cable	FC2A-KP1C	For IDEC - MICROSmart, OpenNet controller Length: 2.4m <Connector> HG: Parted Wire Host: Mini-DIN 8pin
	HG9Z-XC275	For IDEC - MICROSmart, OpenNet controller Length: 5m <Connector> HG: Parted Wire Host: Mini-DIN 8pin
	HG9Z-XC295	For IDEC - MICROSmart, OpenNet controller Communication Mode: RS232C Length: 5m <Connector> HG: D-sub 9pin Host: Mini-DIN 8pin
	HG9Z-XC305	For Mitsubishi FX series direct connection Communication Mode: RS422 Length: 5m <Connector> HG: D-sub 9pin Host: Mini-DIN 8pin
	HG9Z-XC315	For Mitsubishi Q series direct connection Communication Mode: RS232C Length: 5m <Connector> HG: D-sub 9pin Host: Mini-DIN 6pin
Connector Conversion Cable	HG9Z-XCT11	To convert from D-sub 25pin to 9pin (used when replacing from HG2F/3F/4F to HG2G-5F, HG3G/4G) Length: 16cm
Protective Sheet *1	HG9Z-2D5PN05	For HG2G-5FT 5 pcs/pack
	HG9Z-3D8PN02	For HG3G-8 2 pcs/pack
	HG9Z-3DA2PN02	For HG3G-A 2 pcs/pack
	HG9Z-4DCPN02	For HG4G 2 pcs/pack

*1 The protective sheet is UV resistant, however, resistance against direct sunlight in outdoor usage is not guaranteed.

Name	Type No.	Description
Protective Cover	HG9Z-2E2PN03	For HG2G-5FT To Cover the front of HG, and to protect Display from chemicals 3 pcs/pack
Memory Card	HG9Z-XMS2	SD Memory Card (2GB, Class6)
Expansion Module Clamp	HG9Z-XJ3PN05	For installing the expansion modules on the back of the HG (Short). 5 pcs/pack
	HG9Z-XJ4PN05	For installing the expansion modules on the back of the HG (Long). 5 pcs/pack
	HG9Z-XJ5PN05	For installing the expansion modules on the back of the HG (Extra-Long). 5 pcs/pack
L-shaped Terminal Block Connector for I/O Module	HG9Z-PMT10LPN02	For MicroSmart I/O Module (10-pole) 2 pcs/pack
	HG9Z-PMT11LPN02	For MicroSmart I/O Module (11-pole) 2 pcs/pack

● Replacement Parts

Name	Type No.	Description
Mounting Clip	SLD-K02PN10	For HG2G-5FT 10 pcs/pack
	HG9Z-4K2PN4	For HG3G/4G 4 pcs/pack
Replacement Battery	HG9Z-XR1	CR2032 lithium primary battery
Host Communication Plug	HG9Z-XT09V	Vertical type Wiring Direction: Bottom of HG
	HG9Z-XT09	Horizontal type Wiring Direction: Backside of HG
USB Cable Lock Pin	HG9Z-XU1PN05	For USB2 (Type-A) port 5 pcs/pack

Chapter 35 Troubleshooting

This chapter describes the errors that may occur with the MICRO/I and the measures necessary to correct these errors.

1 Error Messages

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The MICRO/I displays a variety of error messages in order to assist you in quickly analyze and resolve problems with the hardware, communications system, and user screen data.

1.1 Errors Displayed on the Screen

The following error messages are displayed in the event of communication system problems and problems with user screen data. When an error occurs, take the appropriate indicated action. If an error persists despite your attempts to correct it, contact your nearest sales representative.

Error Message	Cause	Solution
Waiting for default screen No.	The default screen number is set at 0.	Either write the screen number to the System Area display screen number region, or set the initial screen number to a number other than 0.
No screen data	The specified Base Screen does not exist.	Set the Base Screen and download it to the MICRO/I.
Processing error	• This message is displayed when a value is divided by 0. • There is data which cannot be handled with the BCD4, BCD8, or float32 data types. • There is invalid clock data which is used in Calendar parts.	Check the calculation or settings.
Host Communication Error	An error occurred during communication with the host.	Check the communication lines and the communication settings. During 1: N communications, the port number of the host device on which the Host Communication error has occurred.
Device range error	• The data is written to the device with the address out of the range. • The number of devices exceeds the limitation.	Check the device settings.
Access was denied	There is no CF card in the MICRO/I, therefore, access of the CF card was denied.	Insert a CF card.
No SD Memory Card exists	No SD Memory Card inserted when the unit attempted to access the SD Memory Card.	Insert a SD Memory Card.
No USB flash drive exists	No USB flash drive inserted when the unit attempted to access the USB flash drive.	Insert a USB flash drive.
This CF Card not available	• The type of inserted CF card is not recognized with HG2F/3F/4F • The CF card is broken.	Please use a new recommended CF card.
This SD Memory Card not available	• The type of inserted SD Memory Card is not recognized with HG2G-5F, HG3G/4G. • The SD Memory Card is broken.	Please use a new recommended SD Memory Card.
This USB flash is not available	• The type of USB flash drive is not recognized by the HG2G-5F, HG3G/4G. • The USB flash drive is broken.	Please use a new recommended USB flash drive.
SD Memory Card Access Error	When the unit attempted to access the SD Memory Card: • The SD Memory Card did not have enough free space. • The SD Memory Card was removed partway through. • The SD Memory Card was broken.	Create some free space on the SD Memory Card or get a new one.
USB flash Drive Access Error	When the unit attempted to access the USB flash drive: • The USB flash drive did not have enough free space. • The USB flash drive was removed partway through. • The USB flash drive was broken.	Create some free space on the USB flash drive or get a new one.

Error Message	Cause	Solution
ZNV file is not found	The project file (ZNV format) was not in the specified location on the external memory device when a download was made using the Project Data Transfer function.	Check whether or not the file is in the specified location on the external memory device.
ZLD file is not found	The PLC Program file (ZNV format) was not in the specified location on the external memory device when a download was made using the PLC Program Transfer function.	Check whether or not the file is in the specified location on the external memory device.
ZNV file format Error	When a download was made using the Project Data Transfer function: • The project file is not in ZNV format. • The file is corrupt.	Remake the project file (ZNV format).
ZLD file format Error	When a download was made using the PLC Program Transfer function: • The PLC Program file is not in ZLD format. • The file is corrupt.	Remake the PLC Program file (ZLD format).
O/I type is not correct	When a download was made using the Project Data Transfer function, the model of the downloaded project and the model of the destination MICRO/I were different	Check that the model name that is set in the file you want to download is the same as the model name of the destination MICRO/I.
PLC Type is not correct	When a download or upload was made using the PLC Program Transfer function: • The model of the downloaded PLC Program and the model of the destination PLC were different. • The runtime program version using the downloaded PLC Program and the one of the destination PLC were different.	Check PLC models and runtime program versions.
PLC Password is not valid	When a download or upload was made using the PLC Program Transfer function, the password you entered was incorrect.	Enter the correct password.
PLC communication Error	When a download or upload was made using the PLC Program Transfer function, a communication problem with the PLC occurred.	It is possible that there is a problem with the connection with the PLC. Check the connection between MICRO/I and the PLC.
The specified files are not found	The specified files were not in the specified location on the external memory device when the File Copy function was executed.	Check whether or not the file is in the specified location on the external memory device.
File Size Error	The size of the source file exceeded the limit when the File Copy function was executed.	Check the source file size. For the maximum file size that can be copied, refer to Chapter 28 "3.5 Precautions" on page 28-40.
Script error	An error occurred for a process in execution of the script.	Check the value of LSD52 and LSD53, and correct the script. For details, refer to Chapter 20 "Script" on page 20-1.
Device write error	The script generated a lot of write data, and the write operation failed.	Reduce the number of write operations to be performed at the same time.
Insufficient memory error	The resource memory of the HG is insufficient because of the use of a large number of the following parts. • Pilot Lamps, Multi-State Lamps, and Picture Displays with the "Recover Background" checkbox is selected. • Message Display, Message Switching Display, and Alarm List Display with the "Scroll" checkbox is selected. • Line Chart with the "Display cursor" checkbox is selected. • Parts over the number limit of parts that can be set per screen by overlapping Base Screen.	Clear the "Recover Background" , "Scroll" or "Display cursor" checkbox, or delete parts to reduce memory resource utilization.
Check Interface settings	MICRO/I cannot change into the Run mode because the Interface settings are not correct.	Download the project data after modifying the Interface settings in by selecting [Configuration] - [System Setup] - [Project] - [Communication Interface]tab from the WindO/I-NV2 menu.
Network off-line	This error message is only displayed when O/I Link is being used.	See the External Device Setup Manual for details.

1.2 Low Battery Voltage

An internal battery maintains clock settings and log data in the MICRO/I. When the battery runs out, keep register data, log data and other backup data will be cleared, and the contrast is reset to the default value. If this happens, the following message is displayed when the MICRO/I is powered up, so take the indicated action.

This message does not show when [Battery warning message] is not set in [Configuration] - [System Setup] - [Project] - [Communication Interface].

In this case, Bit 14 (backup data error) of Address + 2 in System Area 2 is set, and it is reset when MICRO/I is powered on.

Message	Description
Backup data lost	The Log Data and Calendar Data are lost. Set the clock again. Keep the power ON for about two days to charge the battery (HG2F/2S/3F/4F), or replace the battery (HG2G-S/-5S/-5F, HG3G/4G, HG1F).

In case of storing Keep Memory or Keep Relay to the flash memory using HG Special Relay (LSM 10), stored data is transferred to the memory automatically when Backup data is lost.

When using HG2G-S/-5S/-5F, HG3G/4G, HG1F type, the following warning messages will be displayed before the battery is dead.

In this case, the Bit 12 (Replace battery error) or Bit 13 (Replace battery error) of Address + 2 in the System Area 2 is set, and it is set whenever the MICRO/I is powered on.

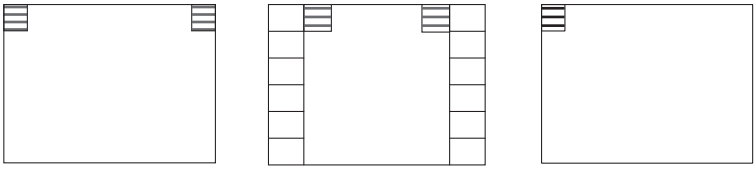
Message	Description
Replace battery	The remaining battery revel is low. Replace the battery in a short time.
Replace battery (Battery level LOW)	The remaining battery revel is lowest. Replace the battery immediately, otherwise backup data will be lost.

2 Handling Problems

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

2.1 When You Cannot Download Project Data

If you are unable to download project data from the WindO/I-NV2, press the two points on the touch panel of the HG2F/2S/3F/4F while at the same time turning the power off and back on again. When using the HG2G-S/-5S/-5F, HG3G/4G, HG1F, press the top left corner of the panel for three seconds or longer while at the same time turning the power off and back on again. press the top left corner of the panel for three seconds or longer. (See the illustrations below.)



HG2F/2S/3F/4F

HG2S
(CC SWITCH™ type)

HG2G-S/-5S/-5F, HG3G/4G
HG1F

The screen in the system mode is displayed, and then MICRO/I becomes downloadable status. If you download using Ethernet and O/I Link, check again each setting of TCP/IP and O/I Link before executing the download.

Also, when MICRO/I does not show the system mode screen and continues a blackout having a bleep each second, be sure to download using Serial Interface 2 or port for USB.

2.2 When the MICRO/I cannot perform Maintenance Communication via the Ethernet interface or the O/I Link Master

Maintenance communication via the Ethernet interface or the O/I link master is supported with the WindO/I-NV2 Ver. 2.5 or later system software. Download the project data via the serial interface and update the system software version.

2.3 If the backlight is OFF and the buzzer sounds

If you fail to download the runtime program to MICRO/I, the backlight may turn to OFF and a beep may sound continuously every second, even after the power has been turned off and on again. If this happens, rectify the situation by doing the following:

- HG2G-5F, HG3G/4G:
  Download the project and the standard fonts by using WindO/I-NV2 via USB cable. When the MICRO/I is in this state, projects cannot be downloaded via Ethernet or using a memory card.
  To download the standard fonts, select "Download fonts" under "Options" on "Download" in WindO/I-NV2.
- HG2G-S/-5S:
  Download the project by using WindO/I-NV2 via the option cable (HG9Z-XCM22). Use a USB cable if using an HG2F with a USB interface. When the MICRO/I is in this state, projects cannot be downloaded via Ethernet or using a memory card.

2.4 Touch Panel Does Not Respond Correctly

If the touch panel needs to be readjusted, use the MICRO/I System Menu to readjust the touch panel. For details, refer to Chapter 33 "Touch Panel Adjust (Touch Panel)" on page 33-11.

2.5 Power LED light is OFF

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The HG2G-S/-5S/-5F, HG3G/4G has an LED on the front panel that indicates if power is supplied.

If the LED does not light up when power is turned ON, it may indicate a problem exists in the main unit. Contact your vendor or nearest IDEC Corporation.

Appendix

This chapter contains the Color Number Correspondence Table, and describes details about the Color Palette and other settings used in WindO/I-NV2.

1 Color Number Correspondence Table

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

This table is used when using Message Display and Script. Select a value from the Data column of the table and you can change the display color of an object.

Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data	Color No.	Data
		041	0x29	083	0x53	125	0x7D	167	0xA7	209	0xD1
000	0x00	042	0x2A	084	0x54	126	0x7E	168	0xA8	210	0xD2
001	0x01	043	0x2B	085	0x55	127	0x7F	169	0xA9	211	0xD3
002	0x02	044	0x2C	086	0x56	128	0x80	170	0xAA	212	0xD4
003	0x03	045	0x2D	087	0x57	129	0x81	171	0xAB	213	0xD5
004	0x04	046	0x2E	088	0x58	130	0x82	172	0xAC	214	0xD6
005	0x05	047	0x2F	089	0x59	131	0x83	173	0xAD	215	0xD7
006	0x06	048	0x30	090	0x5A	132	0x84	174	0xAE	216	0xD8
007	0x07	049	0x31	091	0x5B	133	0x85	175	0xAF	217	0xD9
008	0x08	050	0x32	092	0x5C	134	0x86	176	0xB0	218	0xDA
009	0x09	051	0x33	093	0x5D	135	0x87	177	0xB1	219	0xDB
010	0x0A	052	0x34	094	0x5E	136	0x88	178	0xB2	220	0xDC
011	0x0B	053	0x35	095	0x5F	137	0x89	179	0xB3	221	0xDD
012	0x0C	054	0x36	096	0x60	138	0x8A	180	0xB4	222	0xDE
013	0x0D	055	0x37	097	0x61	139	0x8B	181	0xB5	223	0xDF
014	0x0E	056	0x38	098	0x62	140	0x8C	182	0xB6	224	0xE0
015	0x0F	057	0x39	099	0x63	141	0x8D	183	0xB7	225	0xE1
016	0x10	058	0x3A	100	0x64	142	0x8E	184	0xB8	226	0xE2
017	0x11	059	0x3B	101	0x65	143	0x8F	185	0xB9	227	0xE3
018	0x12	060	0x3C	102	0x66	144	0x90	186	0xBA	228	0xE4
019	0x13	061	0x3D	103	0x67	145	0x91	187	0xBB	229	0xE5
020	0x14	062	0x3E	104	0x68	146	0x92	188	0xBC	230	0xE6
021	0x15	063	0x3F	105	0x69	147	0x93	189	0xBD	231	0xE7
022	0x16	064	0x40	106	0x6A	148	0x94	190	0xBE	232	0xE8
023	0x17	065	0x41	107	0x6B	149	0x95	191	0xBF	233	0xE9
024	0x18	066	0x42	108	0x6C	150	0x96	192	0xC0	234	0xEA
025	0x19	067	0x43	109	0x6D	151	0x97	193	0xC1	235	0xEB
026	0x1A	068	0x44	110	0x6E	152	0x98	194	0xC2	236	0xEC
027	0x1B	069	0x45	111	0x6F	153	0x99	195	0xC3	237	0xED
028	0x1C	070	0x46	112	0x70	154	0x9A	196	0xC4	238	0xEE
029	0x1D	071	0x47	113	0x71	155	0x9B	197	0xC5	239	0xEF
030	0x1E	072	0x48	114	0x72	156	0x9C	198	0xC6	240	0xF0
031	0x1F	073	0x49	115	0x73	157	0x9D	199	0xC7	241	0xF1
032	0x20	074	0x4A	116	0x74	158	0x9E	200	0xC8	242	0xF2
033	0x21	075	0x4B	117	0x75	159	0x9F	201	0xC9	243	0xF3
034	0x22	076	0x4C	118	0x76	160	0xA0	202	0xCA	244	0xF4
035	0x23	077	0x4D	119	0x77	161	0xA1	203	0xCB	245	0xF5
036	0x24	078	0x4E	120	0x78	162	0xA2	204	0xCC	246	0xF6
037	0x25	079	0x4F	121	0x79	163	0xA3	205	0xCD	255	0xF7
038	0x26	080	0x50	122	0x7A	164	0xA4	206	0xCE		
039	0x27	081	0x51	123	0x7B	165	0xA5	207	0xCF		
040	0x28	082	0x52	124	0x7C	166	0xA6	208	0xD0		

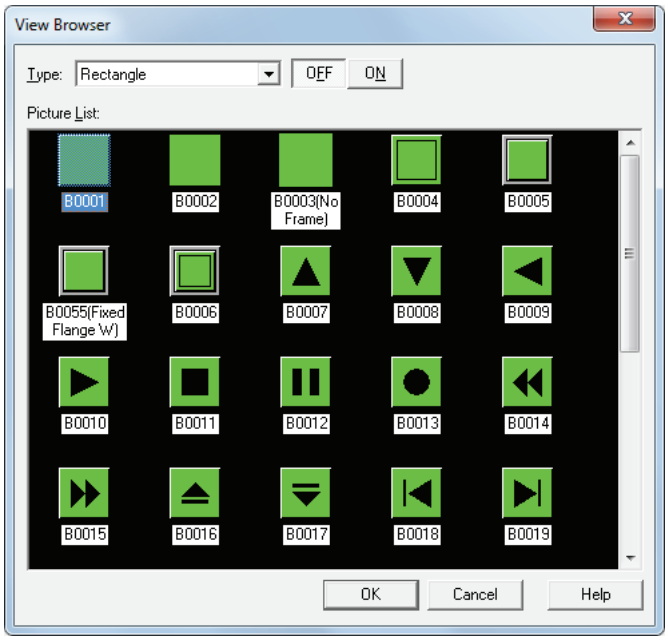
2 View Browser

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The View Browser displays the list of graphics that have been prepared in advance in WindO/I-NV2. The settings displayed on View Browser vary based on the parts.

These graphics can be used as the outline of parts.

Example: Bit Button



- **Type**
  Selects the category of graphics.
- **OFF, ON**
  Displays the graphic when OFF or ON. Click **ON** or **OFF** to switch the graphics displayed on the list.
- **Picture List**
  Displays the list of registered graphics. Select the graphic to use as the outline of the part.
- **OK**
  Closes the View Browser and sets the selected graphic to the caller.

3 Color Palette

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The Color Palette is used to select colors for drawing objects, text on parts, outlines, flanges, plates and other objects. The Color Palette appears when you click on the **Color** button in the object's Properties dialog box.

● Functions of Color Palette buttons

■ Color

Selects a color. Clicking these buttons sets the **Color** button to the selected color.

■ >>More, <<Less

Switches the palette display. Clicking **>> More** shows all the colors assignable to the **Color** button. Clicking **>> Less** shows only the basic colors assignable to the **Color** button.

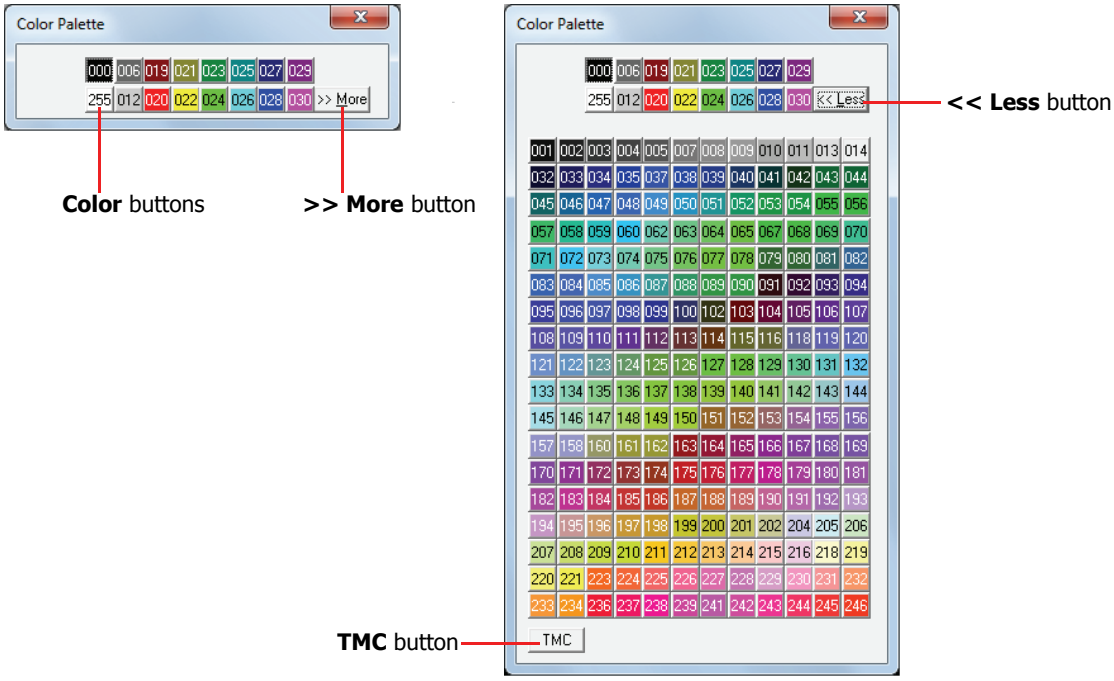
■ TMC

This feature allows use of the text color specified in the Text Manager. Click this button to use the text color specified in the Text Manager. The **TMC** button appears on the Color Palette only if the **Use Text Manager** check box is selected.

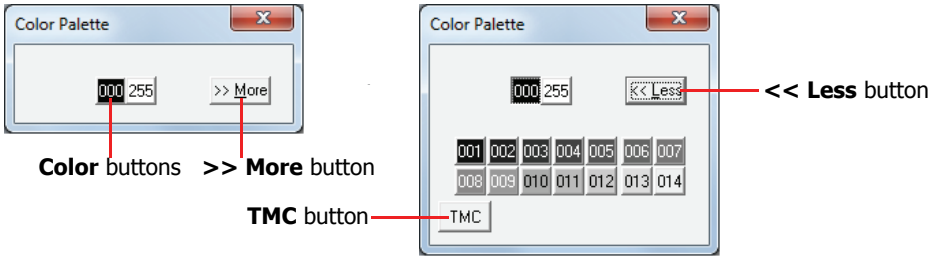
● Color Palette Types

The type of color palette shown depends on the series being used.

■ 256 Color Palette*1



■ 16-level Monochrome Palette*2



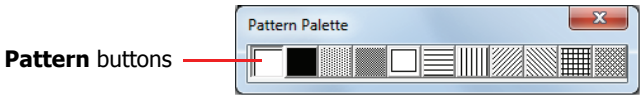
1 HG2G-S/-5S/-5F, HG3G/4G, HG2F*/2S*/3F/4F (*Color LCD models only)
2 HG2G-S, HG1F/HG2F*/HG2S* (*Monochrome LCD models only)

4 Pattern Palette

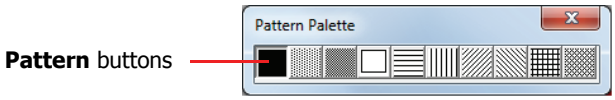
HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

The Pattern Palette is used to select patterns for drawing and part objects.
The Pattern Palette appears when you click **Pattern** in the object's Properties dialog box.
Click **Pattern** and select a pattern.

Drawings



Parts



● Foreground and Background Colors

Drawing and part objects are formed by foreground and background colors.

■ Pattern

The selected pattern is applied to the foreground color.

The background color is visible through the unpainted parts of the foreground color.

● Patterns

■ Patterns

These patterns are available on WindO/I-NV2.

Pattern name	None*1	Foreground 100%	Foreground 25%	Foreground 50%	Background 100%
Pattern buttons					
Display sample					

Pattern name	Horizontal lines	Vertical lines	Slant Upwards	Slant Downwards	Crosshatch	Tint
Pattern buttons						
Display sample						

*1 **None** can only be applied to drawing objects. Selecting **None** is the same as not applying any color at all.

5 Text Alignment

HG2G-S HG2G-5S HG2G-5F HG3G HG4G HG1F HG2F HG2S HG3F HG4F

Text Alignment is used to adjust the way text appears on Drawing Objects and Parts.

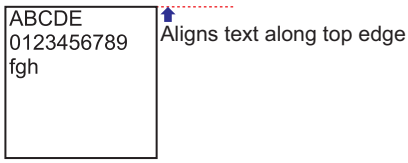
● Horizontal Writing

These examples show how text appears using different combinations of the **Align Text Horizontal** and **Align Text Vertical** properties.

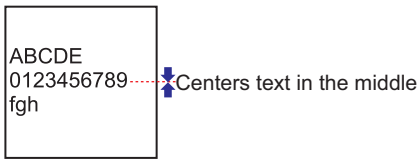
		Align Text Horizontal			
		Left	**Center**	**Right**	**Center-Left**
Align Text Vertical	**Top**				---
	Center (Center-Top)				
	Bottom				---

■ Align Text Vertical

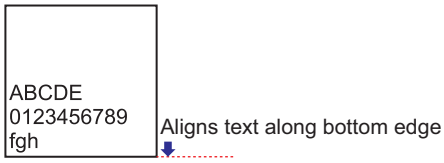
Top: Aligns the text along the top edge.



Center (Center-Top): Centers the text vertically in the center.

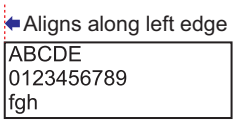


Bottom: Aligns the text along the bottom edge.

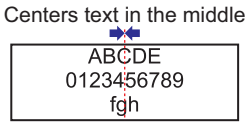


Align Text Horizontal

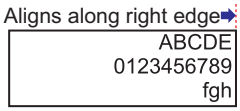
Left: Aligns the text along the left edge.



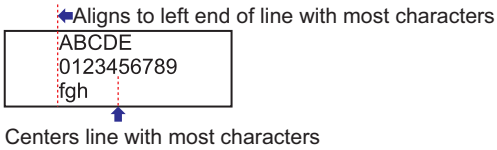
Center: Centers the text horizontally in the center.



Right: Aligns the text along the right edge.



Center-Left: Centers the line containing the most number of characters, and then aligns the other lines to the left end of that line.

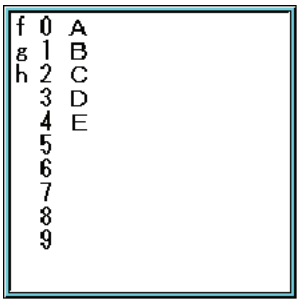
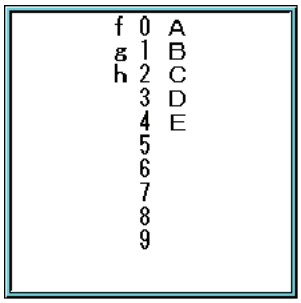


If **Align Text Horizontal** is set to **Center-Left**, **Align Text Vertical** will automatically be set to **Center-Top**. **Center-Top** results in the same display as **Center**.

Vertical Writing

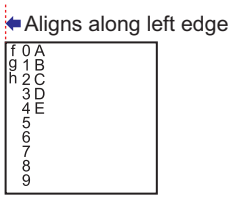
These examples show how text appears for **Align Text Horizontal**.

Align Text Vertical defaults to **Top**.

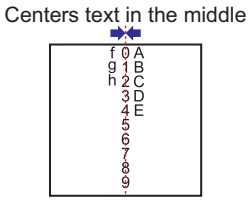
		Align Text Horizontal		
		Left	**Center**	**Right**
Align Text Vertical	**Top**			

Align Text Horizontal

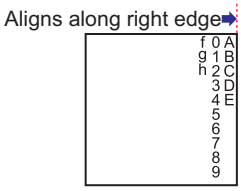
Left: Aligns the text along the left edge.



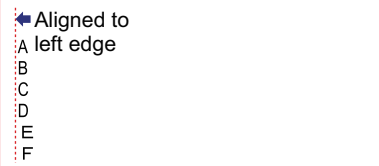
Center: Centers the text horizontally in the center.



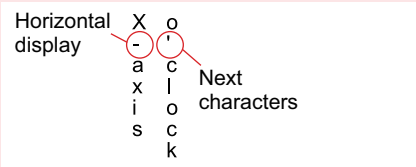
Right: Aligns the text along the right edge.



- Vertical text cannot be set if **Font** is set to **Stroke**.
- Take note of these points when the **Vertical Writing** check box is selected:
  - When there is a mixture of double-byte and single-byte characters, the half-width characters are leftaligned.



  - Dashes are displayed horizontally. Symbols representing voiced and semi-voiced sounds of single-byte characters are shown as follows.



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