

Think Automation and beyond...



From HG4G/3G to HG4G/3G-V series

From HG2G-5F to HG2G-V series

Replacement Manual



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Introduction

About this document

This document is a manual for replacing HG4G/3G series and HG2G-5G series with HG4G/3G/2G-V series. Please read this document together with WindO/I-NV4 User's Manual (HG9Y-B1700).

Acronyms, general terms, and words used in this document

Items	Definition
MICRO/I	A general term for programmable display: HG5G/4G/3G/2G-V series, HG4G/3G series, HG2G-5F/-5T series, and HG1G/1P series.
WindO/I-NV4	A software that can create operator interfaces for MICRO/I.
External Device	A general term for a device that communicates with MICRO/I. (PLC, Microcomputer, etc.)
Device Address	A memory installed in MICRO/I and External Device that can store values in bit or word unit.

Replacing with HG4G/3G/2G-V

- Please use WindO/I-NV4 Ver. 1.11.1 or later for HG4G/3G/2G-V.
- Click [Change Product Series] button on WindO/I-NV4 then select replacement product on [Change Product Series] Dialog to convert project file. Please refer to [Converting a project file] in this document for more information.
- Display resolution is different. Thus, when converting a program, objects' sizes will get magnified, and they may look different. Please refer to [Display Resolution] for more information.
- Improvements on performance made scan speed faster than before. Thus, display's movements linked to scan may act differently. Please refer to [Performance] in this document for more information.
- Expansion module's types and settings are different. Please refer to [Expansion module] in this document for more information.
- Video input's restriction, video file format, and audio output volume are different.

Please refer to [Multimedia] in this document for more information.

- Available device address types are different. Replacement of such device address is necessary. Please refer to [Device Address] in this document for more information.
- Wiring for connecting serial interfaces via RS422/485 (2-wire type) is different. Please refer to [Serial Interface RS422 / 485 (2-wire type)] in this document for more information.
- Please contact us if any failure occurs after the replacement.

Compatibility overview

HG4G/3G/2G-V is upper compatible with HG4G/3G series and HG2G-5F series for functions that are not listed below.

Hardware compatibility

〈HG4G series and HG4G-V series compatibility〉

Specification	HG4G series	HG4G-V series
External Dimension	314.0(W) x 240.0(H) x 54.1(D) mm	No change
Panel cut-out	301.5(W) x 227.5(H) mm	No change
Display Resolution (*1)	800 x 600 dots	1024 x 768 dots
Interface	AUDIO IN 1ch VIDEO IN 1ch	AUDIO IN none VIDEO IN 2ch
Bezel color	Dark gray	Black

〈HG3G-A series and HG3G-VA series compatibility〉

Specification	HG3G-A series	HG3G-VA series
External Dimension	270.0(W) x 212.0(H) x 52.7(D) mm	No change
Panel cut-out	258.0(W) x 200.0(H) mm	No change
Display Resolution (*1)	800 x 600 dots	1024 x 768 dots
Interface	AUDIO IN 1ch VIDEO IN 1ch	AUDIO IN none VIDEO IN 2ch
Bezel color	Light gray, Dark gray	Light gray, Black

〈HG3G-8 series and HG3G-V8 series compatibility〉

Specification	HG3G-8 series	HG3G-V8 series
External Dimension	231.0(W) x 176.0(H) x 54.4(D) mm	No change
Panel cut-out	219.0(W) x 164.0(H) mm	No change
Display Resolution (*1)	800 x 600 dots	1024 x 768 dots
Interface	AUDIO IN 1ch VIDEO IN 1ch	AUDIO IN none VIDEO IN 2ch

Bezel color	Light gray, Dark gray	Light gray, Black
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(*1) Please refer to [Replacement procedures] for adjustment of display resolution after converting a project file.

<HG2G-5F series and HG2G-V series compatibility>

Specification	HG2G-5F series	HG2G-V series
External Dimension	167.2(W) x 134.7(H) x 54.4(D) mm	No change
Panel cut-out	153.0(W) x 121.0(H) mm	No change
Display Resolution (*1)	640 x 480 dots	No change
Interface	Refer to[MICRO/I Specification]	No change
Bezel color	Light gray, Dark gray, Silver	Light gray, Black

Functional compatibility

<HG4G/3G series and HG4G/3G-V series compatibility>

Function	HG4G/3G series	HG4G/3G-V series
BACnet Communication	Incompatible	Compatible
Sound	Compatible with sound input and output	Compatible with sound output only
Video Display	Compatible with MP4 only (*1)	Compatible with AVI only.
Expansion Module	Please refer to expansion module table.	

(*1) Video Display can be only used on HG4G/3G series equipped with video interface.

<HG2G-5F series and HG2G-V series compatibility>

Function	HG2G-5F series	HG2G-V series
BACnet Communication	Incompatible	Compatible
Expansion Module	Please refer to expansion module table.	

<Expansion module comparison table>

Expansion module	HG4G/3G series, HG2G-5F series	HG4G/3G/2G-V series
FC4A series Digital I/O Module	Compatible	Incompatible
FC6A series Digital I/O Module	Compatible (*2)	Compatible
FC6A series Analog I/O Module	Incompatible	Compatible

(*2) WindO/I-NV4 Ver.1.4.0 or later

Replacement procedures

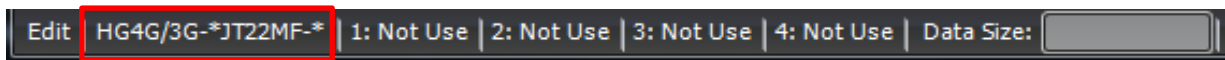
Converting a project file

[Important Note]

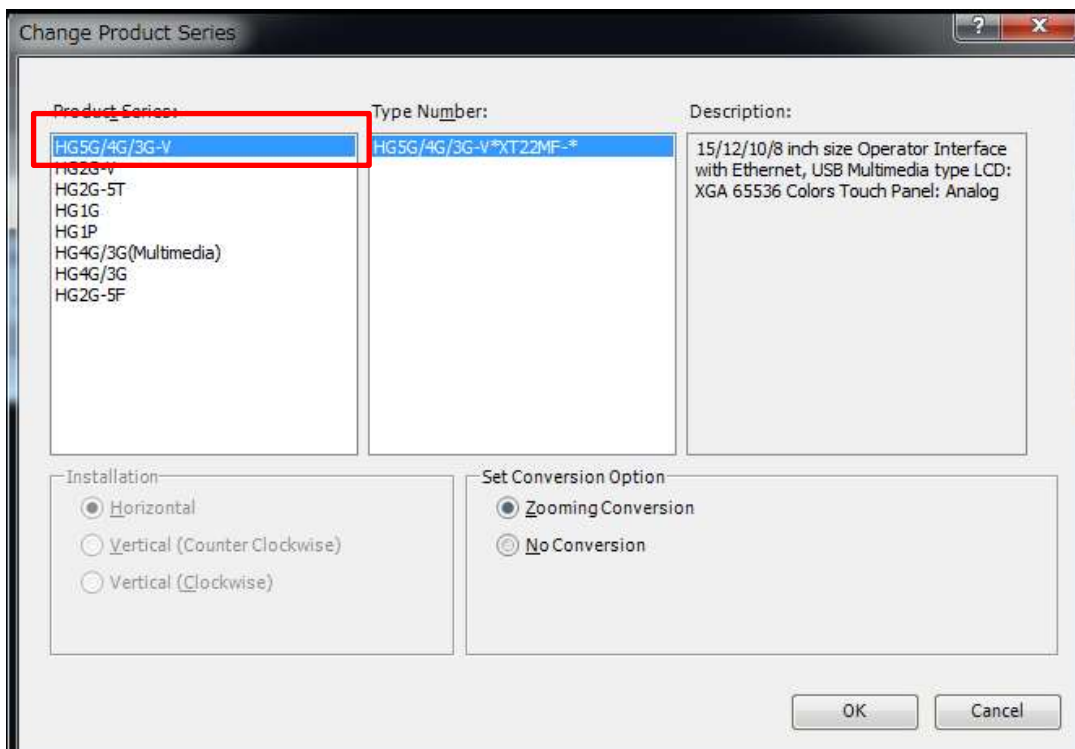
Please backup PN4 file before converting a project file. HG4G/3G series and HG2G-5F series can be converted to HG4G/3G/2G-V. HG4G/3G/2G-V series; however, cannot be converted to HG4G/3G series or HG2G-5F.

[Procedures]

1. Launch WindO/I NV4 with Ver1.11.1 or later.
2. Open PN4 file. (If PN4 file is not found, then please upload the file from MICRO/I.)
3. Click on [Change Product Series] button on the status bar that is on the bottom of the WindO/I-NV4 window.



4. Select product series for replacement from [Product Series] list.



5. Click [OK] button.

Adjustment of a project file after the conversion

Display Resolution

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Unnecessary

[Summary]

Display resolution of HG4G/3G-V series is 1.28 times that of HG4G/3G series.

Product series	Display Resolution
HG4G/3G series	800 x 600 dots
HG4G/3G-V series	1024 x 768 dots

If [Set Conversion Option] in the 2nd procedure of [Converting a project file] is set to [Zooming Conversion], then size and axis of converted project's parts get stretched and converted accordingly to the display resolution.

(Example) Apply following settings to the text parts and convert them.

Text parts 1: Font: Japanese, Magnification: 2 x 2

Text parts 2: Font: Windows (MS UI Gothic), Size: 28

Text parts 3: Font: Stroke, Size: 20

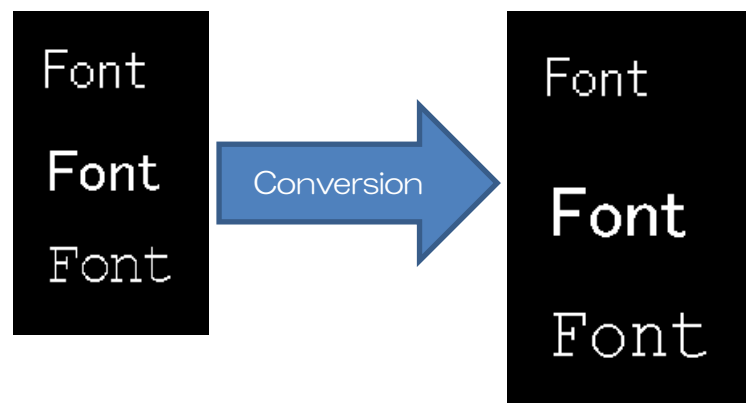
↓ Conversion

Text parts 1: Font: Japanese, Magnification: 2 x 2

Text parts 2: Font: Windows (MS UI Gothic), Size: 34

Text parts 3: Font: Stroke, Size: 25

Following is the conversion image.



- About text parts 1

Each value that represents size is multiplied accordingly to the display resolution; each value is multiplied by 1.28.

$$2 \times 1.28 = 2.56$$

Since figures below decimal point are omitted, size stays at “2” after the conversion.

- About text parts 2

Each value that represents size is multiplied accordingly to the display resolution; each value is multiplied by 1.28. However, if font is set to Windows font, text string's width and height is multiplied by 1.28, and closest size gets selected instead of multiplying the size value. The result for above case is “34.”

- About text parts 3

Each value that represents size is multiplied accordingly to the display resolution; each value is multiplied by 1.28.

$$20 \times 1.28 = 25.6$$

Since figure below decimal points are omitted, size is set to “25” .

[Important Note1]

<Detail>

Placement and size of texts on the display may not be converted accordingly to the conversion rate as shown above. For this reason, texts in HG4G/3G-V series may look different compare to that of HG4G/3G series.

<Solution>

Please adjust placement and size of texts accordingly to the display size of HG4G/3G-V.

[Important 2]

<Detail>

Picture may get stretched accordingly to the display resolution. Stretched picture may look blurry depending on the original data.

<Solution>

Please recreate images accordingly to the size of HG4G/3G-V series, then save them.

Performance

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Necessary

[Summary]

HG4G/3G/2G-V series have better operating performance compare to that of HG3G/4G series and HG2G-5F series. This makes scan speed much faster.

[Important Note 1]

<Detail>

If device addresses linked to a scan is used for performing image processing, time until the objects starts operating and operation cycle of the objects may change. Typical device addresses are shown below.

Device Address	Function
LSM4	Alternates between 0 and 1 with each scan
LSD7	Incremented at each scan

Example: A part that operates when LSD7 value equals to or greater than 10000
Since the scan speed of HG4G/3G/2G-V is faster than that of HG4G/3G/2G-5F, the time until LSD7 reaches 10000 becomes shorter. For this reason, HG4G/3G/2G-V objects operate at earlier timing than that of HG4G/3G/2G-5F.

<Solution>

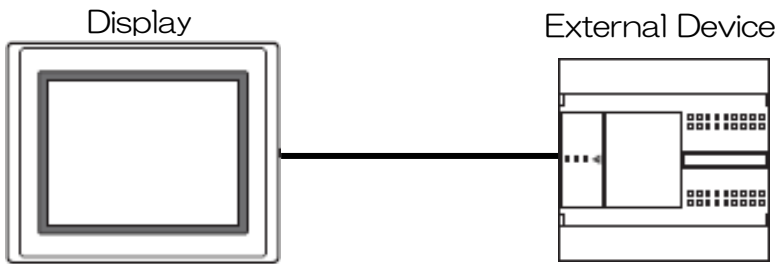
The scan speed depends on the number of parts placed on the display and the number of device addresses used. Please change the trigger conditions accordingly to the scan speed of each screen.

[Important Note 2]

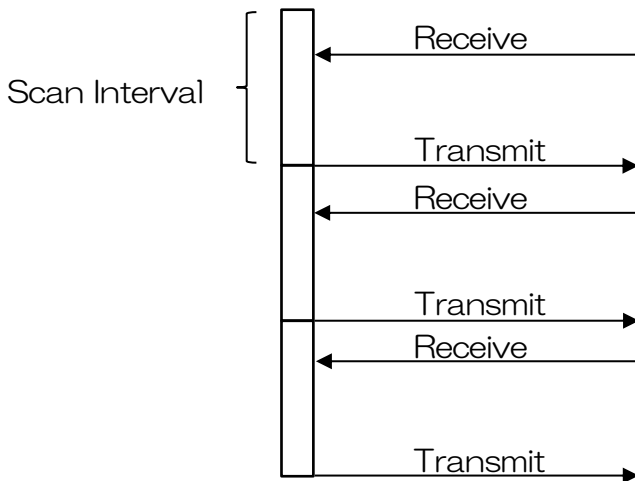
<Detail>

User communication checks the trigger conditions of commands for each scan. Thus, as scanning speed becomes faster, the response to external devices may become faster as well.

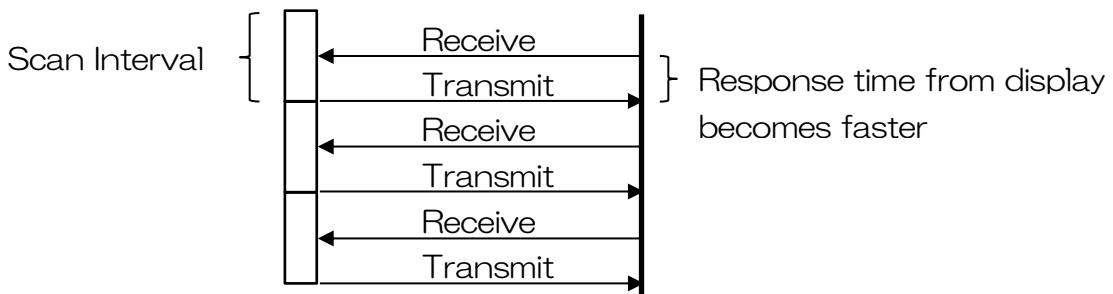
Example: User communication is set to return a response when a command is received from an external device.



In case scan time is long



In case scan time is short



<Solution>

Set [Transmission wait] to transmission commands to adjust wait time. Wait time is a time between trigger condition's fulfilment and data transmission.

Expansion Module

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Necessary

[Summary]

HG4G/3G/2G-V series' corresponding expansion modules' types and setting methods have changed.

[Restriction]

The FC4A digital I/O module cannot be used with HG4G/3G/2G-V series. Please use FC6A digital I/O module.

[Important Note 1]

<Detail>

LEX and LEY device addresses in the project are automatically and respectively replaced by #I and #Q device addresses at the time of conversion. Device addresses that are written in comment for parts and scripts; however, do not get replaced automatically.

<Solution>

Change comment for parts and scripts. Device addresses will not get replaced for WLEX and WLEY. So please manually replace WLEX and WLEY with #WI and #WQ.

[Important Note 2]

<Detail>

Module configuration dialog box has been added to WindO/I-NV4.

<Solution>

If only FC6A series digital I/O module is used, then there is no need for changing the settings in the Module Configuration dialog box as it will operate properly. When using FC6A series analog I/O module, open Module Configuration dialog box from [Project Settings]-[Expansion Modules]. Then select FC6A series analog I/O module to connect and download project to HG4G/3G/2G-V series.

Multimedia

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Unnecessary

[Summary]

There is no more audio input, and playable video format has been changed.

[Restriction]

Audio cannot be recorded while recording.

[Important Note 1]

HG4G/3G series video interface equipped model's file format is MP4 file, but the file format for HG4G/3G-V series is changed to AVI file.

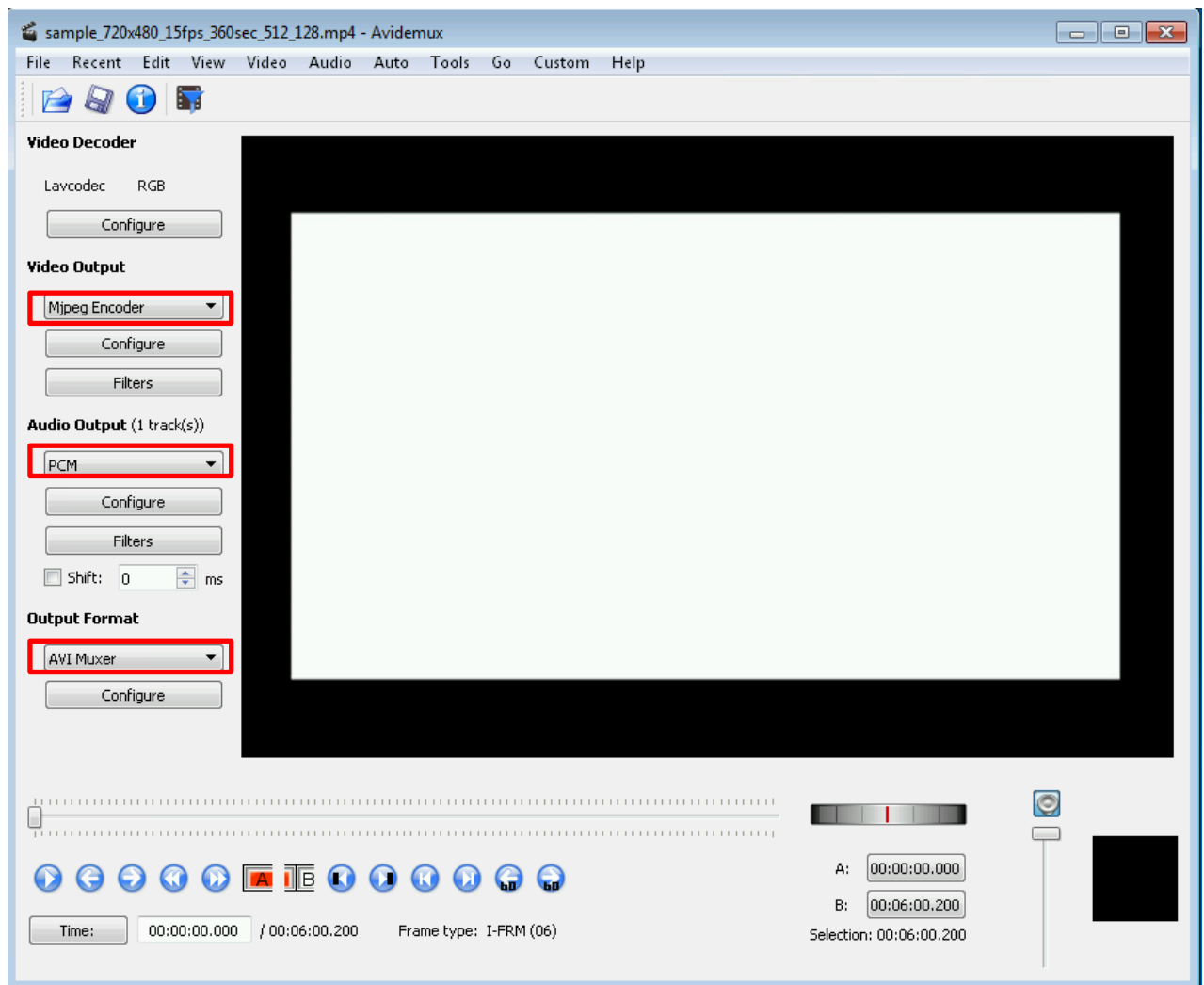
<Solution>

When using MP4 file that was used on HG4G/3G video interface equipped model, on HG4G/3G-V series, convert MP4 file to AVI file using file conversion software. Please read the instruction on next page for using Avidemux. Avidemux is free software that can be downloaded from the following URL.

(<http://avidemux.sourceforge.net/download.html>)

Procedures for converting MP4 file to AVI file

1. Launch Avidemux and select MP4 file from [File]-[Open].



2. Change the setting on the left side of Avidemux as follows.

Video Output: Mjpeg Encoder

Audio Output: PCM

Output Format: AVI Muxer

3. Select [File]-[Save] and save as AVI file.

[Important Note 2]

<Detail>

There are restrictions when using a video display as [Display images from the Video Input] due to the combination of the video display size and input signal. Restrictions are as follows.

HG4G/3G series

Input Signal	Restriction
NTSC	If the size of the video display plate is smaller than 90 x 60 dots, the video from the video input will not be displayed.
PAL	If the size of the plate on the video display is smaller than 90 x 72 dots, the video from the video input will not be displayed.

HG4G/3G-V Series

Input Signal	Restriction
NTSC	If the size of the video display plate is smaller than 368 x 240 dots, the video from the video input will not be displayed.
PAL	If the size of the video display plate is smaller than 368 x 288 dots, the video from the video input will not be displayed.

<Solution>

Please make the size of the video display plate bigger and place it on display.

[Important Note 3]

The volume of the HG4G/3G-V series' sound function and playback function is louder than that of the HG4G/3G series. Therefore, even if the volume value (minimum: 0 maximum: 31), which is specified by the device address in "Change Volume Level" of Sound Settings, is the same, HG4G/3G-V series sounds louder. Following is the setting for making both series sound volume about the same.

HG4G/3G series volume level	HG4G/3G-V series volume level
Volume level 31	Volume level 7 to 8
Volume level 15	Volume level 2 to 3

<Solution>

Adjust the device address value in "Change Volume Level" of Sound Setting. Also, adjust the volume of the speaker or amplifier connected to the audio output terminal.

Device Address

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Necessary

[Summary]

No adjustment is needed for bit devices. Replace WLEX with #WI and WLEY with #WQ for word devices. Please see the following table for the detail of differences.

[Internal Device]

<Bit Device>

Device Name	Symbol	HG4G/3G series HG2G-5F series	HG4G/3G/2G-V series	Need for replacement
		Compatibility		
HMI Internal Relay	LM	Compatible	Compatible	No
HMI Keep Relay	LK	Compatible	Compatible	No
HMI Timer Relay	LTC	Compatible	Compatible	No
Digital Input (bit)	LEX	Compatible	Incompatible	No(*1)
Digital Output (bit)	LEY	Compatible	Incompatible	No(*1)
HMI Temporary Relay	LBM	Compatible	Compatible	No
HMI Special Internal Relay	LSM	Compatible	Compatible	No
Expansion Inputs	#I	Incompatible	Compatible	No
Expansion Outputs	#Q	Incompatible	Compatible	No
Internal relays	#M	Incompatible	Compatible	No

(*1) LEX and LEY will be automatically replaced by #I and #Q, respectively when changing product series.

<Word Device>

Device Name	Symbol	HG4G/3G series	HG4G/3G/2G-V series	Need for replacement
		HG2G-5F series		
Compatibility				
HMI Data Register	LDR	Compatible	Compatible	No
HMI Keep Register	LKR	Compatible	Compatible	No
HMI Timer Current Value	LTD	Compatible	Compatible	No
Digital Input (word)	WLEX	Compatible	Incompatible	Please replace with #WI.
Digital Output (word)	WLEY	Compatible	Incompatible	Please replace with #WQ.
HMI Temporary Register	LBR	Compatible	Compatible	No
HMI Link Register	LLR	Compatible	Compatible	No
HMI Special Data Register	LSD	Compatible	Compatible	No
Expansion Inputs	#WI	Incompatible	Compatible	No
Expansion Outputs	#WQ	Incompatible	Compatible	No
Internal relays	#WM	Incompatible	Compatible	No
Data Register	#D	Incompatible	Compatible	No

[External Device Address]

<DM Link>

Device address range extends from DM 0 - DM8191 to DMO - DM16383. No replacement is needed.

Serial Interface RS422 / 485 (2-wire type)

[Adjustment by hand]

Replacement	Necessity
HG4G/3G series ⇒ HG4G/3G-V series	Necessary
HG2G-5F series ⇒ HG2G-V series	Necessary

[Summary]

There is a difference in wiring when connecting with RS422 / 485 (2-wire type). Please wire as follows.

<Wiring HG3G/4G series and HG2G-5F series>

HG4G/3G series and HG2G-5F series perform RS422/485 (2-wire type) communications with RDA and RDB only, so it is not necessary to connect SDA and SDB.

External Device

Name
FG
A
B
SG

Shield Wire

HG4G/3G, HG2G-5F: D-sub 9-pin Male Connector

Pin No.	Name
Cover	FG
1	RDA(RD+)
6	RDB(RD-)
4	SDA(SD+)
9	SDB(SD-)
5	SG

External Device

Name
FG
A
B
SG

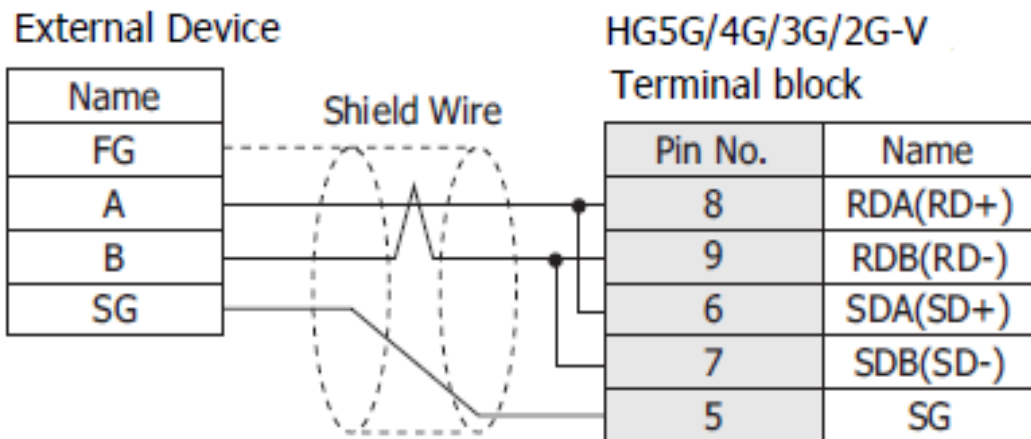
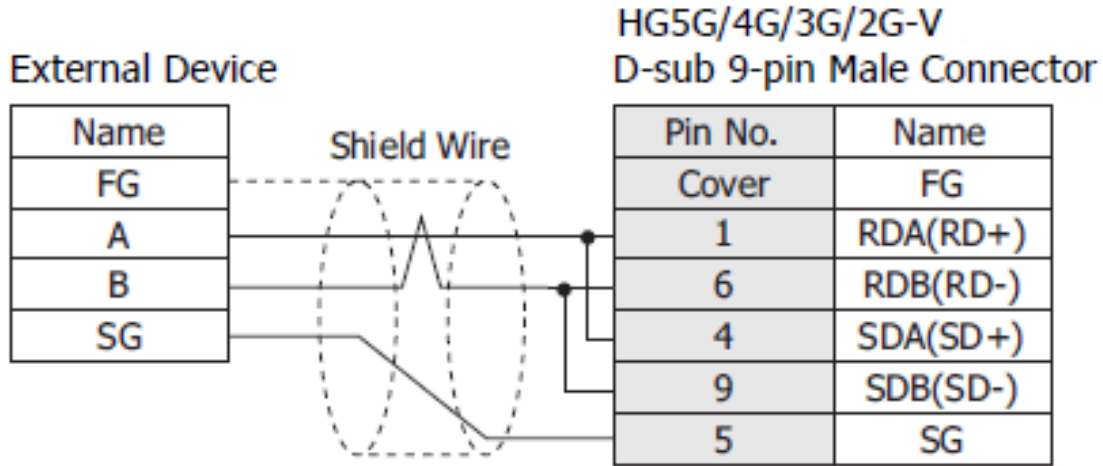
Shield Wire

HG4G/3G, HG2G-5F Terminal block

Pin No.	Name
8	RDA(RD+)
9	RDB(RD-)
6	SDA(SD+)
7	SDB(SD-)
5	SG

<Wiring for HG4G/3G/2G-V series>

Wire HG4G/3G/2G-V series so that RDA and SDA as well as the RDB and SDB are shorted respectively.



MICRO/I Specification

[Summary]

The hardware has the following differences. Please check the table below and select the right replacement model.

<HG4G/3G series and HG4G/3G-V series comparison table>

Type	Item	HG4G/3G series	HG4G/3G-V series
Display specification	LCD Type	TFT color LCD (TN Type)	TFT color LCD (IPS Type)
	Effective Display Area	HG4G: 246,000 x 184,500 mm HG3G-A: 211,200 x 158,400 mm HG3G-8: 170,400 x 127,800 mm	HG4G-V: 245,760 x 184,320 mm HG3G-VA: 210,400 x 157,800 mm HG3G-V8: 170,496 x 127,872 mm
	Display Resolution	800 x 600 dots	1024 x 768 dots
	Brightness of LCD only	HG4G: 550 cd/m ² HG3G-A: 700 cd/m ² HG3G-8: 600 cd/m ²	HG4G-V: 600 cd/m ² HG3G-VA: 700 cd/m ² HG3G-V8: 800 cd/m ²
	Backlight life	Approx. 100,000 hours	
Interface specification	Number of serial ports	2 ports	3 ports
	Serial Interface (*1)	D-sub 9 pin (RS232C or RS422/485)	D-sub 9 pin (RS232C or RS422/485)
		Detachable Terminal Block 9-pin (RS232C or RS422/485)	Detachable Terminal Block 9-pin for 2 ports (RS232C, RS422/485)
	O/I Link Communication	Uses RS422/485 to communicate	
	Ethernet (LAN)	Supported	
	USB Mini-B (USB1)	Supported	
	USB Type A (USB2)	Supported	
	Memory Card Interface (SD)	Supported	
	Expansion Module Interface (EXT)	Supported	
	Audio Interface	AUDIO IN 1ch AUDIO OUT 1ch	AUDIO OUT 1ch
Video Interface	VIDEO IN 1ch	VIDEO IN 2ch	

Type	Item	HG4G/3G series	HG4G/3G-V series
General	Rated Voltage	DC24V	
Specification	Operating Temperature	0 to +50 °C	-20 to +60 °C
	External Dimension	HG4G, HG4G-V: 314.0(W)x240.0(H)x54.1(D) mm HG3G-A, HG3G-VA: 270.0(W)x212.0(H)x52.7(D) mm HG3G-8, HG3G-V8: 231.0(W)x176.0(H)x54.4(D) mm	
	Panel cut-out	HG4G, HG4G-V: 301.5(W)x227.5(H) mm HG3G-A, HG3G-VA: 258.0(W)x200.0(H) mm HG3G-8, HG3G-V8: 219.0(W)x164.0(H) mm	

(*1) Option cable for HG4G/3G series or HG2G-5F series can be used for HG4G/3G/2G-V series as well.

<HG2G-5F series and HG2G-Vseries comparison table>

Type	Item	HG2G-5F series	HG2G-V series
Display Specification	LCD Type	TFT color LCD (TN Type)	
	Effective Display Area	115.2 x 86.4 mm	
	Display Resolution	640 x 480 dots	
	Brightness of LCD only	800 cd/m2	
	Backlight life	Approx. 50,000 hours	Approx. 100,000 hours
Interface Specification	Number of serial ports	2 port	3 port
	Serial Interface (*1)	D-sub 9 pin (RS232C or RS422/485)	D-sub 9 pin (RS232C or RS422/485)
		Detachable Terminal Block 9-pin (RS232C or RS422/485)	Detachable Terminal Block 9-pin for 2 ports (RS232C, RS422/485)
	O/I Link Communication	Uses RS422/485 to communicate	
	Ethernet	Supported	
	USB Mini-B	Supported	
	USB Type A	Supported	
	Memory Card Interface (SD)	Supported	
	Expansion Module Interface (EXT)	Supported	
General Specification	Rated Voltage	DC24V	
	Operating Temperature	0 to +50 °C	-20 to +60 °C
	External Dimension	167.2(W)x134.7(H)x54.4(D) mm	
	Panel cut-out	153.0(W)x121.0(H) mm	

(*1) Option cable for HG4G/3G series or HG2G-5F series can be used for HG4G/3G/2G-V series as well.



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