Pro-face
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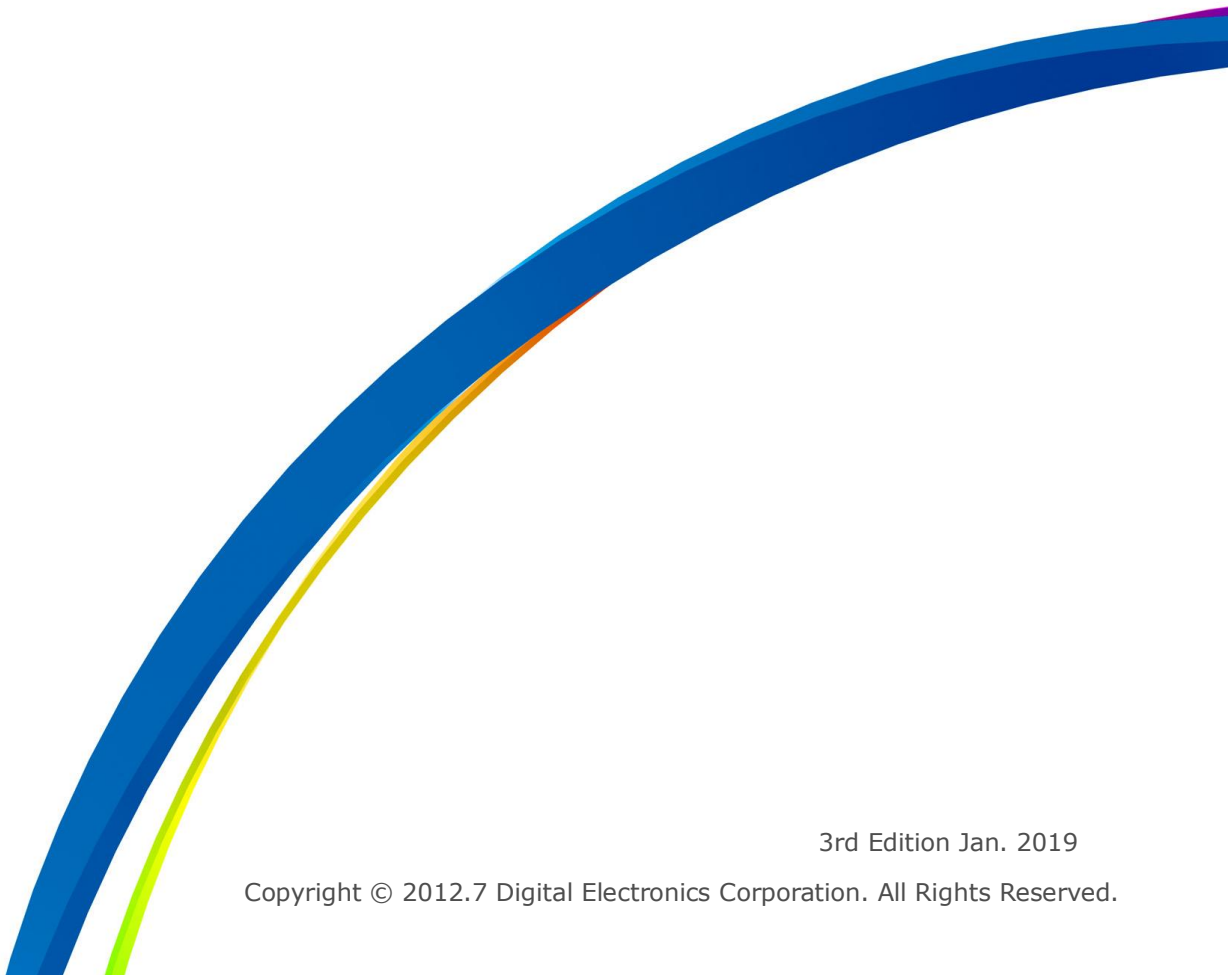
Easy! Smooth!
ST3200 Series->GP4000M Series
Replacement Guidebook



3rd Edition Jan. 2019

Preface

This guidebook introduces the procedures to replace a unit in ST3200 series with a GP-4201TM unit.

Model in use	Model No.	Recommended Substitution
ST-3201A	AST3201-A1-D24	**GP-4201TM**

Safety Information

HAZARD OF OPERATOR INJURY, OR UNINTENDED EQUIPMENT DAMAGE

Before operating any of these products, be sure to read all related manuals thoroughly.

Failure to follow these instructions can result in death, serious injury or unintended equipment damage.

Contents

Chapter 1 Specification Comparison

1.1 Specifications of ST-3201A and GP-4201TM

		ST-3201A	GP-4201TM
			
Display Type		Monochrome Amber/Red LCD	**NEW!** TFT Color LCD
Display Colors, Levels		Monochrome, 8 levels	**UP!** 65,536 colors
Display Resolution		QVGA (320x240 pixels)	
Panle Cutout Dimensions (mm)		W118.5xH92.5mm	**NEW!** φ22mm ->See 2.4
External Dimensions (mm)		W130xH104xD40mm	**NEW!** W118xH98.15xD56.3mm *The rear module is included. ->See 2.5
Touch Panel Type		Resistive film (Analog) ->See 2.2	
Memory	**Application**	6MB	**UP!** 8MB
	Backup	320KB	128KB ->See 2.11
Backup Battery		Secondary Battery (Rechargeable Lithium battery)	-
Rated Input Voltage		DC 24V	
Serial I/F	**COM1**	D-Sub 9 pin (plug) RS-232C	D-Sub 9 pin (plug) RS-232C/422/485
	COM2	D-Sub 9 pin (plug) RS-422/485	- ->See 2.7.1 / Chapter 4

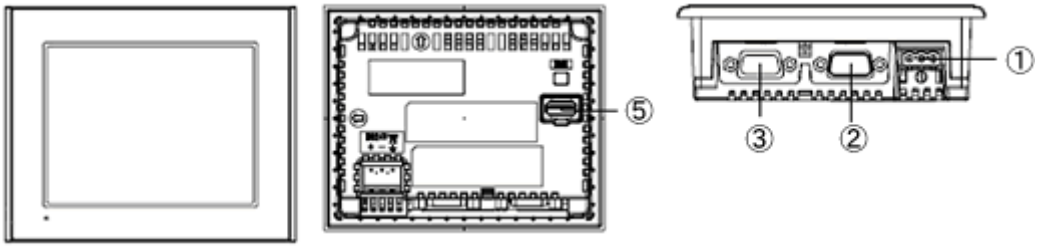
Ethernet I/F	-	**NEW!** 10BASE-T/100BASE-TX
Printer I/F	USB	- ->See 2.8.2
USB Type A	✔	✔ ->See 2.6
USB Type mini B	-	

Chapter 2 Compatibility of Hardware

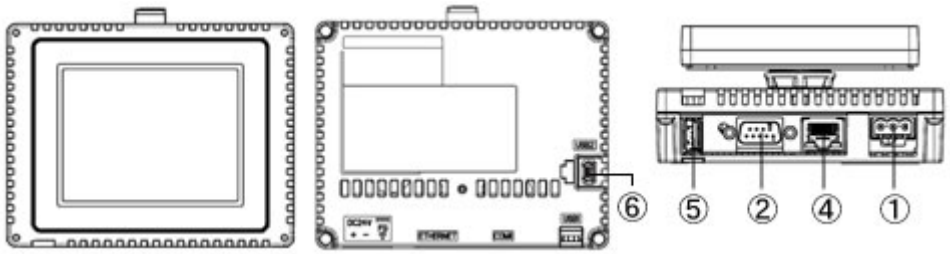
2.1 Locations of connectors

Connector locations on ST3000 series and GP-4201TM are as follows:

ST-3201A



GP-4201TM



Interface names

	ST-3201A	GP-4201TM
1	Power Connector	
2	Serial Interface (COM1)	
3	Serial Interface (COM2)	-
4	-	Ethernet Interface
5	USB Interface (Type A)	
6	-	USB Interface (Type miniB)

2.2 Touch panel Specifications

GP-4201TM adopts Analog resistive film type.
Because of it, GP-4201TM doesn't support 2-point touch input (touching 2 points on the screen at the same time). Even if two different points are touched at the same time, that's recognized as touch input on the middle coordinates between those two points.

2.3 Display Colors (for GP-3301L/3302B and ST-3301B only)

2.3.1 Blink

GP-4201TM does not have a Blink feature.

Replace ST-3201A with GP-4201TW if feature is nedded.

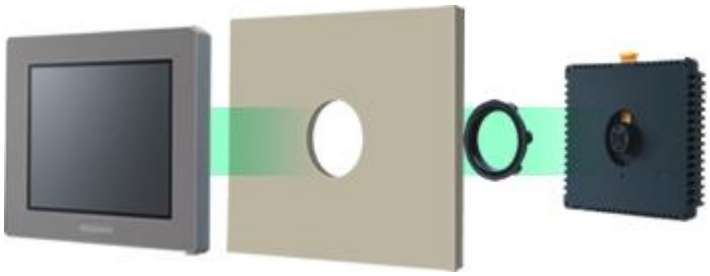
2.3.2 Display Colors

ST-3201A has monochrome LCD, but GP-4201TM has TFT color LCD. After replacement, the black and white display changes to the color display.

When data of a monochrome model are converted to a color model with GP-Pro EX, the data may be displayed in colors except black and white depending on a setting of GP-Pro EX. After conversion, please confirm the display colors of drawing or parts on screens just in case.

2.4 Panel cutout dimensions

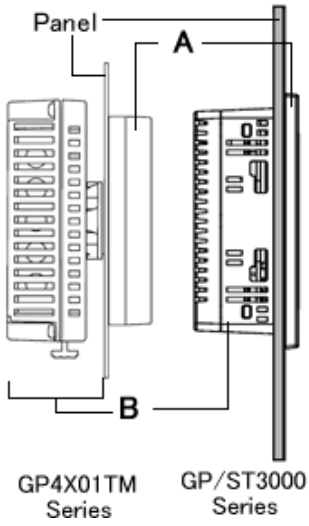
The panel cutout of GP-4201TM is a φ22-mm circular hole. The panel cutout shape and dimensions of GP-4201TM are different from those of ST3000 series.



2.5 External Dimensions

For GP-4201TM, the front face display module (display part) and the back face main module are separated. Compared with ST3000 series, the tickness of the part appearing on the installation panel differs.

	ST-3201A	GP-4201TM
A (the thickness of the front bezel)	5mm	16.2mm
B (the depth of the back face)	35mm	40.1mm



2.6 Transfer cable

To transfer screen data to GP-4201TM, use a USB transfer cable or Ethernet. Use a USB data-transfer cable (model: ZC9USCBMB1) or a commercial USB cable (USB A/mini-B). Please note that the cables (CA3-USBCB-01) for ST3000 series cannot be used for GP-4201TM.

2.7 Interface

2.7.1 Serial Interface

For the COM ports of ST3000 series and GP-4201TM, the signal of the serial port is different. To know the details about them, see [4.2 Shapes of COM ports] and [4.3 Signals of COM ports].

Because of it, the existing PLC connection cables cannot be used as they are. If you use the existing connection cables, see [4.5 Cable Diagram at the time of replacemet].

When the both COM1 and COM2 ports on ST3000 series have setting, devices can be connected to the COM1 port only after replacement with GP-4201TM.

- When the COM1 port is used for RS-232C connection and the COM2 port for RS-422/485 connection:
  Replace with GP-4201TW instead of GP-4201TM.
- When the both COM1 and COM2 ports are used for RS-422/485 connection:
  Please contact our sales office in your region.
  (http://www.pro-face.com/customer/contact.html)

2.7.2 CF Card Interface

GP-4201TM is not equipped with a CF card slot. You can use an USB storage device instead of a CF card but GP-4201TM supports the function of saving sampled data in CSV only (GP-Pro EX Ver. 3.01 or later is required).

You can use the storage devices below instead after replacement:

GP-4301T	SD card
GP-4301TW	USB storage device

2.8 Clock

There's no battery in GP-4201TM. When the GP's power is turned OFF, the clock data is reset. Using the Clock Update Settings of GP-Pro EX allows you to take in the clock data of the connected device. For details, refer to 5.2 Adjusting the Time in the GP-Pro EX Reference Manual.

2.9 Peripheral units and option units

2.9.1 Barcode reader connectoin

GP-4201TM allows you to connect a barcode reader on its USB interface (Type A) in the same as ST3000 series.

For the models GP-4201TM supports, see [OtasukePro!] (http://www.pro-face.com/otasuke/qa/3000/0056_connect_e.html).

And if you connect a barcode reader to GP-4201TM, be sure to supply power to the barcode reader from an external power source (such as a USB hub supporting self-power supply). When no power is supplied from an external power source, if the barcode reader consumes more electricity than expected, operation of GP-4201TM will become unstable and reset may be activated.

2.9.2 Printer connection

GP-4201TM does not support printer connection. A printer for ST3000 series cannot be used.

2.9.3 Expansion Unit

GP-4201TM is not equipped with an expansion bus unit. The expansion units (such as CC-LINK) used for ST3000 series cannot be used.

2.9.4 Isolation Unit

The isolation unit for ST3000 series (CA3-ISO232-01, CA3-ISO485-01) cannot be used for GP-4201TM.

2.10 Power Consumption

The power consumption of ST3000 series is different from that of GP-4201TM.

ST-3201A	GP-4201TM
13W or less	6.5W or less

For the detailed electric specifications, see the hardware manual.

2.11 Backup Memory (SRAM)

GP-4201TM does not have SRAM, but uses a part of application memory as a backup area. Data in the backup area is retained even after power off or reset of GP-4201TM in the same way as SRAM. The functions possible for backup on GP-4201TM are as follows:

- Alarm History (Up to 768)
- Recipe (Filing data)
- Brightness/Contrast values

* For the functions above, data is saved in the backup area at the time of "Save".
* Sampling and clock data is not backed up. If you need these functions, replace ST3000 series with GP-4201TW (SRAM size: 128KB) or GP-4201T (SRAM size: 320KB) instead.

2.12 About Ladder Monitor

PLC Lader monitor tool cannot be used for SP5000 series.

2.13 About Pro-Server

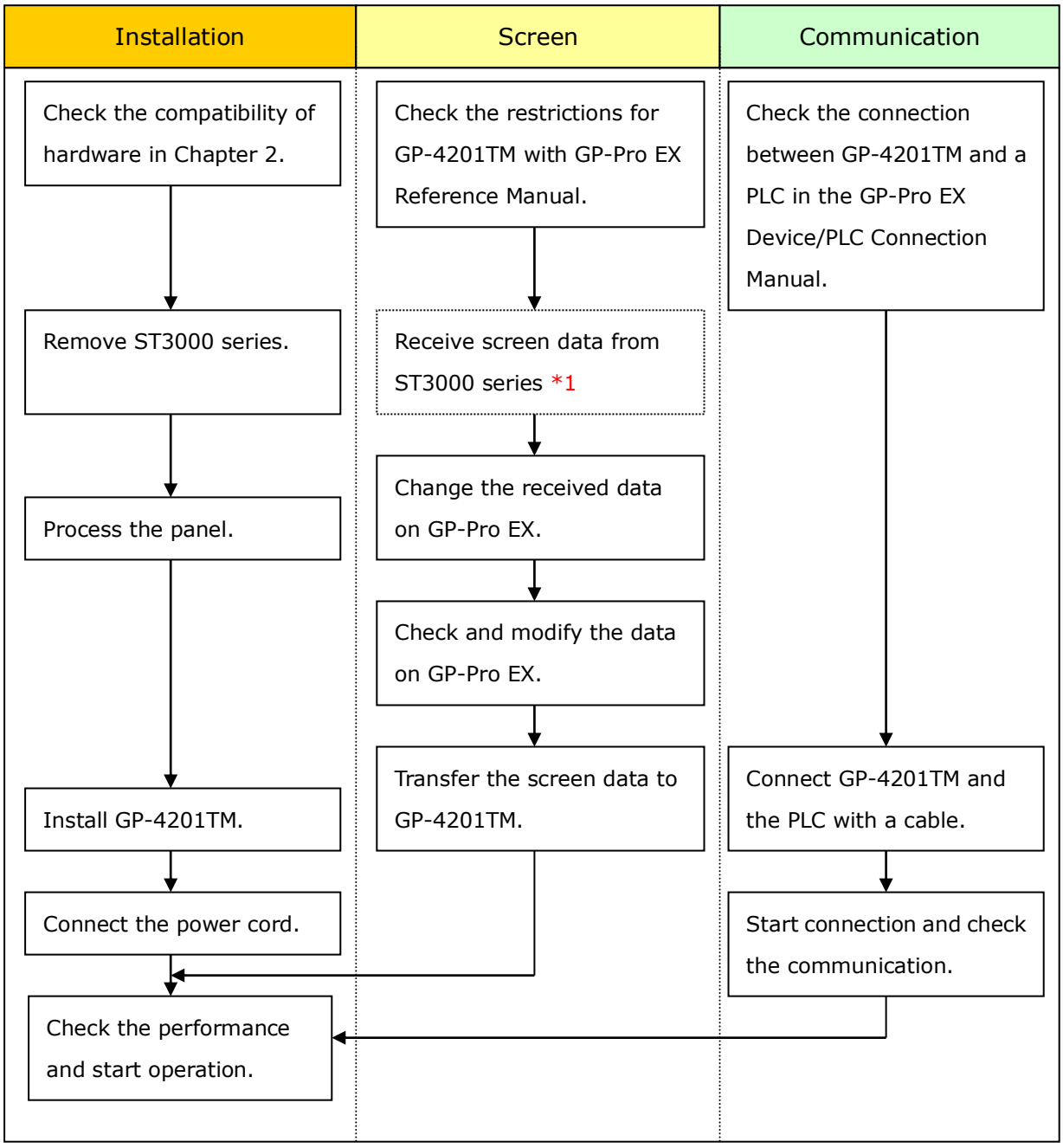
If the Pro-Server EX is used, please use Ver.1.32 or later. For details of the installation, refer to the http://www.pro-face.com/otasuke/download/update/server_ex/.

2.14 Other Notes

- Do not expose GP4000M series to direct sunlight.
- Do not use GP4000M series outdoors.
- Do not turn on GP4000M series if condensation has occurred inside the device.
- When you are continuously using GP4000M series without oxygen, the brightness might decrease. Please ventilate the control panel periodically.

Chapter 3 Replacement Procedure

3.1 Work Flow



*1: This step is required if screen data is saved only in the display unit, not in any other device.

3.2 Preparation

Requirements for receiving screen data from ST3000 series *1	PC in which GP-Pro EX Transfer Tool is installed *2
	A USB data-transfer cable (model: CA3-USBCB-01) *ST3000 series also allows you to transfer screen data with a CF card/USB flash drive, or Ethernet.
Requirements for converting screen data of ST3000 series and transferring them to GP-4201TM	PC in which GP-Pro EX Ver.2.71 or later is installed.
	A USB datda-transfer cable (model: ZC9USCBMB1) or A commercial USB cable (USB A/mini-B) * GP-4201TM also allows you to transfer screen data via USB flash drive or on Ethernet.

*1: This step is required if screen data is saved only in the display unit, not in any other device

*2: The software version must be the same as or higher than the version that you used when creating screen data for ST3000 series.

We recommend you upgrade to the latest version if you don't know the version you use. Upgrade it on our website OtasukePro! (http://www.pro-face.com/otasuke/).

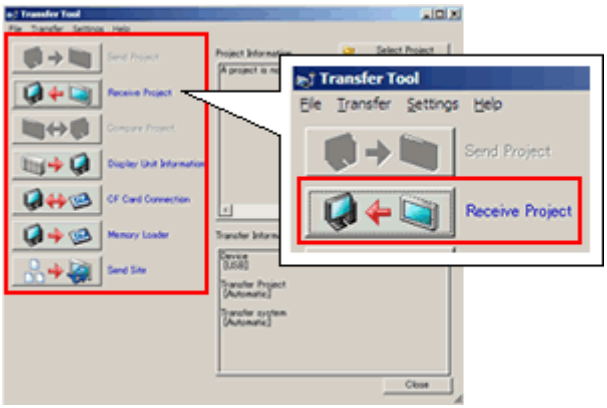
3.3 Receive screen data from GP/ST3000 series

This section explains, as an example, how to receive screen data from ST3000 series using a transfer cable, CA3-USBCB-01. If you have backed up screen data, this step is unnecessary; skip to the next section [3.4 Change the Display Unit type].

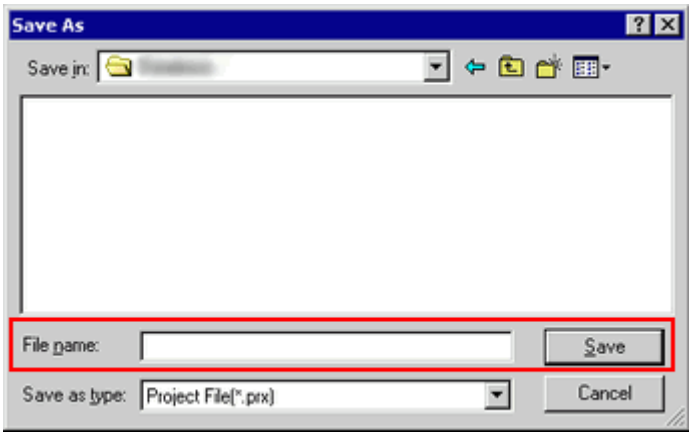
(1) Connect a USB transfer cable to a unit of ST3000 series.

(2) Make sure that the [Device] in the "Transfer Settings Information" is set to [USB]. If not, click the [Transfer Setting] button to open the "Transfer Setting" dialog box. Select [USB] in the Communication Port Settings field and click [OK].

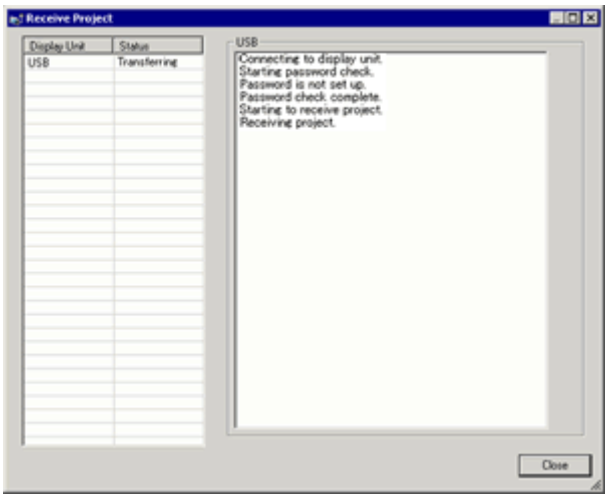
(3) Start GP-Pro EX Transfer Tool and click the [Receive Project] button.



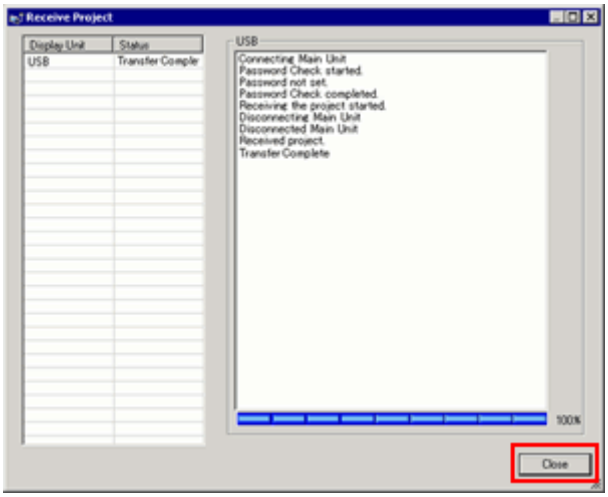
(4) Click [Receive Project], and the following dialog box will appear. Specify a place to save the received data in and a project file name, and then click [Save] to start transfer.

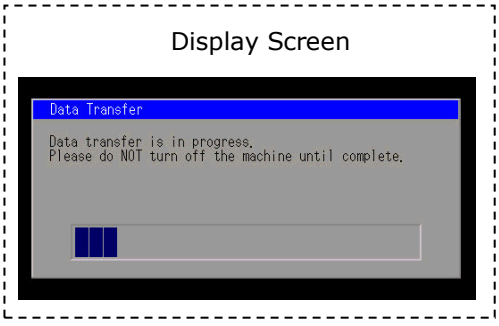


The following dialog box appears during transfer and you can check the communication status. (The display unit enters the Transferring mode and communication with the device such as a PLC is terminated.)



(5) When transfer is completed, the status displayed in the dialog box will change from [Transferring] to [Complete Transfer]. Click [Close] to close the dialog box.

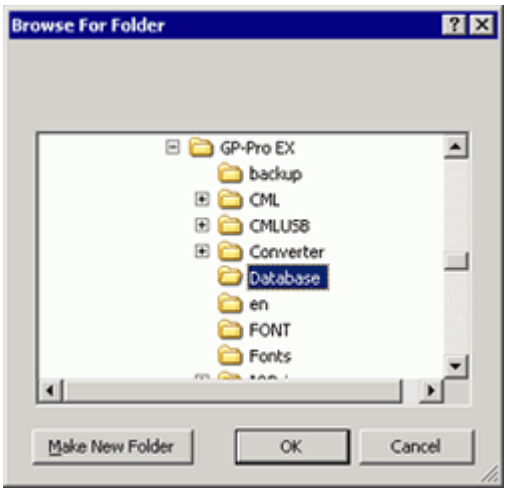




(6) Close the Transfer Tool.

NOTE

If you receive the project files that use CF card data such as Recipe Function (CSV data), the following dialog box will appear during transfer. Specify a place to save the CF card data in. Click [OK], and the [Receive Project] dialog box will return and transfer will be completed.



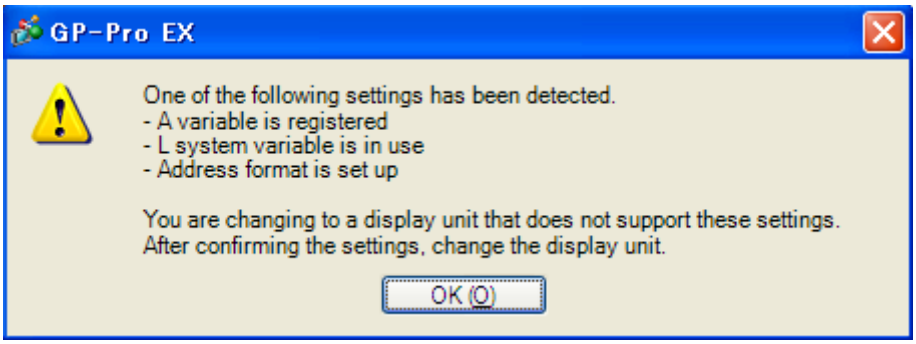
3.4 Change the Display Unit type

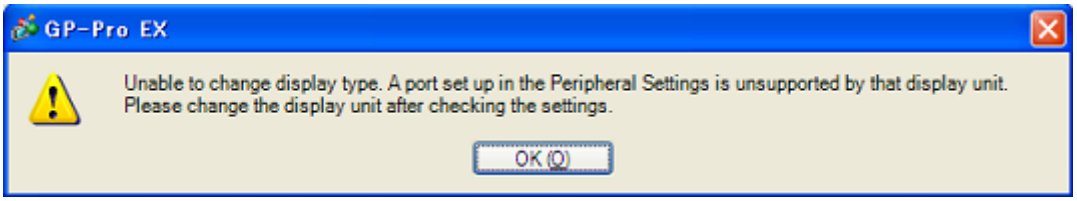
Open the received project file (*.prx) of ST3000 series with GP-Pro EX and change the display unit type to GP-4201TM.

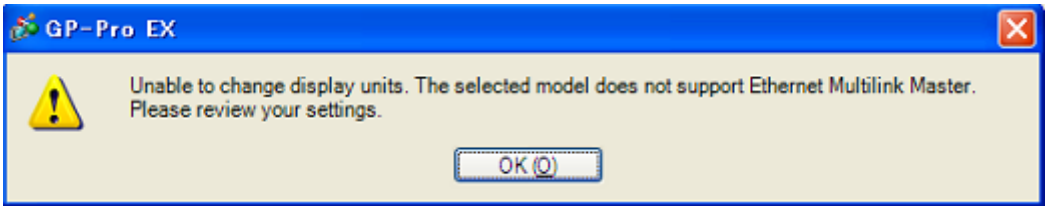
(1) Open the received project file (*.prx) with GP-Pro EX.
(2) Change the Display Unit type to GP-4201TM in [Display] on [System Settings] of GP-Pro EX.

NOTE

- If you change the Display Unit type, the parts or the function settings that do not support GP-4201TM are deleted, initialized, or changed.
  For the functions GP-4201TM doesn't support and the important notes, see [3.6 Differences of software].
- Depending on a setting of the project file, the message as shown below appears, the Display Unit may not change to GP-4201TM.
  When the message appears, check the cause and the solution in [5.1 When the Display Unit cannot be changed] and then change the Display Unit again.







3.5 Transfer screen data to GP-4201TM

Transfer the project file after display unit type change to GP-4201TM.
You can transfer data to GP-4201TM via;

- A USB data transfer cable (model: ZC9USCBMB1)
- A commercial USB cable (USB Type A/mini B)
- USB storage device
- Ethernet

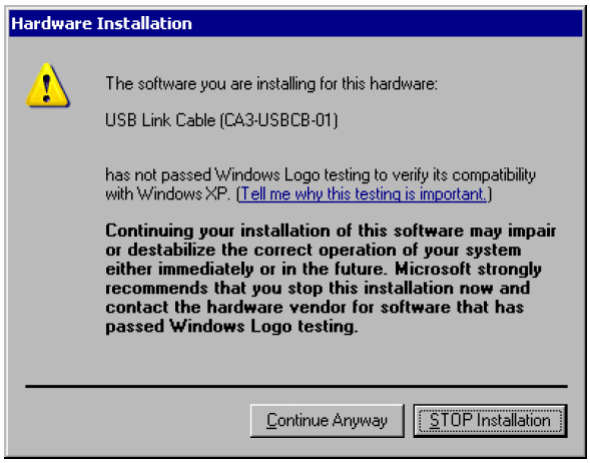
But this section explains, as an example, how to transfer screen data with a USB transfer cable (model: ZC9USCBMB1).

(1) Connect your PC and the GP unit with a USB transfer cable (model: ZC9USCBMB1).
If the driver of the cable has not been installed on you PC, a dialog box will appear. Please follow the instructions.

(2)

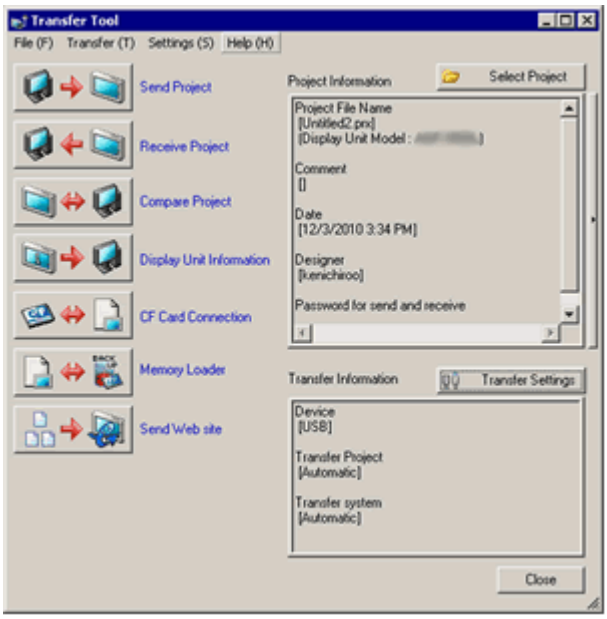
NOTE

The "Hardware Installation" dialog box as follows may appear during installing the driver of a USB depending on the security level of Windows XP. Click [Continue Anyway] to start installing the driver. When installation is completed, click [Finish].



(3) Turn on the power of GP-4201TM. The "Initial Start Mode" screen will appear on the display unit. After transferring a project file once, this screen will not appear again.

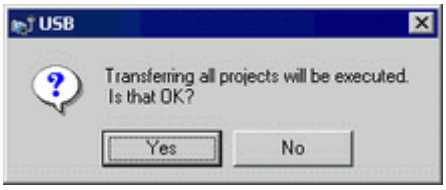
(4) On the GP-Pro EX's State Toolbar, click the [Transfer Project] icon to open the Transfer Tool.



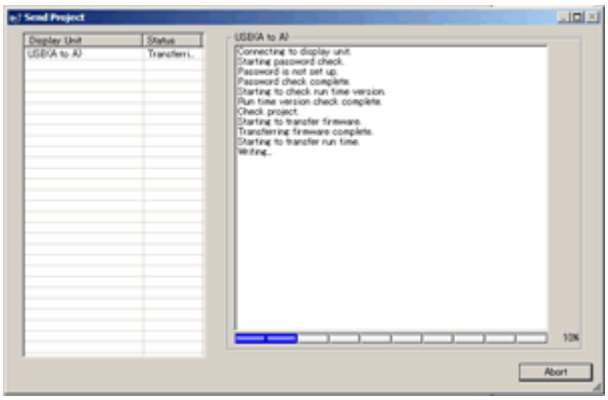
To transfer a different project file, click the [Select Project] button and select a project file.

(5) Make sure that the [Device] in the "Transfer Settings Information" is set to [USB]. If not, click the [Transfer Setting] button to open the "Transfer Setting" dialog box. Select [USB] in the Communication Port Settings field and click [OK].

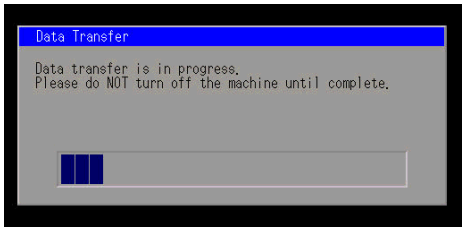
(6) Click [Send Project] to start transfer. When the following dialog box appears, click [Yes]. This dialog box doesn't appear when the same project file is sent again.



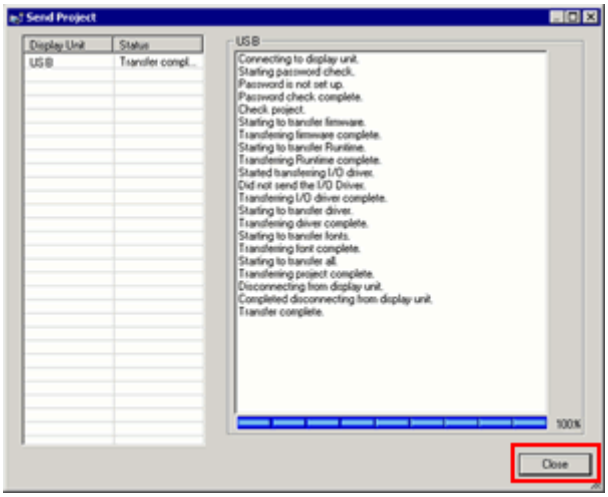
(7) The following dialog box appears during transfer and you can check the communication status. (The display unit enters the Transferring mode and communication with the device such as a PLC is terminated.)



Display Screen



(8) When transfer is completed, the status displayed in the dialog box will change from [Transferring] to [Transfer Complete]. Click [Close] to close the dialog box.



The display unit will be reset and a screen of the transferred project file will be displayed.

(9) Close the Transfer Tool.

(10) Click the [X] mark on top right of the screen or [Project]->[Exit] to close GP-Pro EX.

3.6 Differences of software

If you change the Display Unit to GP-4201TM on GP-Pro EX after receiving data from ST3000 series, the function settings GP-4201TM does not support are deleted from the project file.

The functions to be deleted from the GP-Pro EX's project files.

Parts	Text Alarm
	Alarm
	VM Unit Display (Image Unit Display)
	Special Data Display
	Sampling Data Display
	Special Data Display
The other functions	Sound Settings
	Transfer CSV Data on Recipe
	Sampling Setting *1

*1: In the Sampling settings, only the [Display/Save As CSV, Printing Language] setting that is not supported by GP-4201TM is deleted.

NOTE
For details of GP-Pro EX's parts and functions that cannot be used or have restrictions on GP-4201TM, refer to [For Those Using GP-4*01TM] in the GP-Pro EX Reference Manual. (http://www.pro-face.com/otasuke/files/manual/soft/gpproex/new/refer/mergedProjects/welcome/welcome_rr_gm4000.htm)

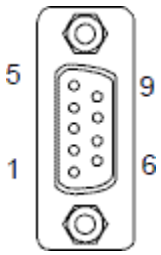
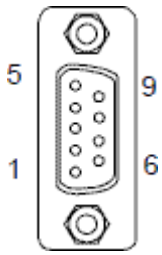
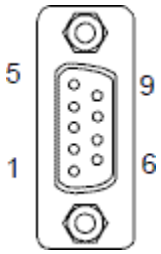
Chapter 4 Communication with Device/PLC

4.1 Drivers

More connectable drivers will be added.

For the devices/PLC each driver supports, see [Connectable Devices] (http://www.pro-face.com/product/soft/gpproex/driver/driver.html).

4.2 Shapes of COM ports

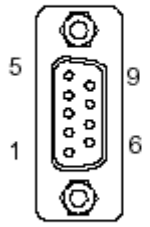
<table>
<tr><th></th><th>ST-3201A</th><th>GP-4201TM</th></tr>
<tr><td rowspan="2">COM1</td><td>D-Sub 9 pin (plug)
RS-232C/422/485</td><td>D-Sub 9 pin (plug)
RS-232C/422/485</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">COM2</td><td>D-Sub 9 pin (plug)
RS-422/485</td><td rowspan="2">-</td></tr>
<tr><td> 
</td></tr>
</table>

4.3 Signals of COM ports

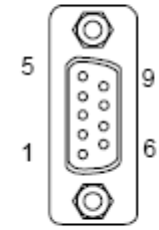
4.3.1 Differences of COM1 signals

For ST-3201A

RS-232C (plug)

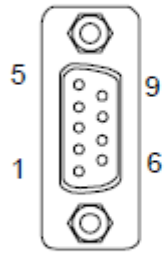
Pin Arrangement	Pin No.	RS232C		
		Signal Name	Direction	Meaning
 (GP unit side)	1	CD	Input	Carrier Detect
	2	RD(RXD)	Input	Receive Data
	3	SD(TXD)	Output	Send Data
	4	ER(DTR)	Output	Data Terminal Ready
	5	SG	-	Signal Ground
	6	DR(DSR)	Input	Data Set Ready
	7	RS(RTS)	Output	Request to Send
	8	CS(CTS)	Input	Send Possible
	9	CI(RI)/VCC	Input/-	Called status display +5V±5% Output 0.25A *2
	Shell	FG	-	Frame Ground (Common with SG)

RS-422/485 (plug)

Pin Arrangement	Pin No.	RS422/RS485		
		Signal Name	Direction	Meaning
 (GP unit side)	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

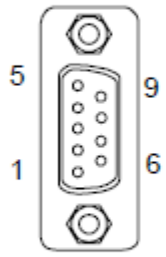
For GP-4201TM

RS-232C (plug)

Pin Arrangement	Pin No.	RS-232C		
		Signal Name	Direction	Meaning
 (GP unit side)	1	CD	Input	Carrier Detect
	2	RD(RXD)	Input	Receive Data
	3	SD(TXD)	Output	Send Data
	4	ER(DTR)	Output	Data Terminal Ready
	5	SG	-	Signal Ground
	6	DR(DSR)	Input	Data Set Ready
	7	RS(RTS)	Output	Request to Send
	8	CS(CTS)	Input	Send Possible
	9	CI(RI)	Input	Called status display
	Shell	FG	-	Frame Ground (Common with SG)

* There’s no VCC output.

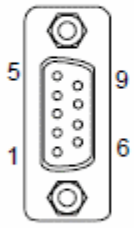
RS-422/485 (plug)

Pin Arrangement	Pin No.	RS-422/RS-485		
		Signal Name	Direction	Meaning
 (GP unit side)	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

4.3.2 Difference of COM2 signals

For ST-3201A

RS-422/485 (plug)

Pin Arrangement	Pin No.	RS422/RS485 *		
		Signal Name	Direction	Meaning
 (male)	1	RDA	Input	Receive Data A(+)
	2	RDB	Input	Receive Data B(-)
	3	SDA	Output	Send Data A(+)
	4	ERA	Output	Data Terminal Ready A(+)
	5	SG	-	Signal Ground
	6	CSB	Input	Send Possible B(-)
	7	SDB	Output	Send Data B(-)
	8	CSA	Input	Send Possible A(+)
	9	ERB	Output	Data Terminal Ready B(-)
	Shell	FG	-	Frame Ground (Common with SG)

For GP-4201TM

None

4.4 Multilink Connection

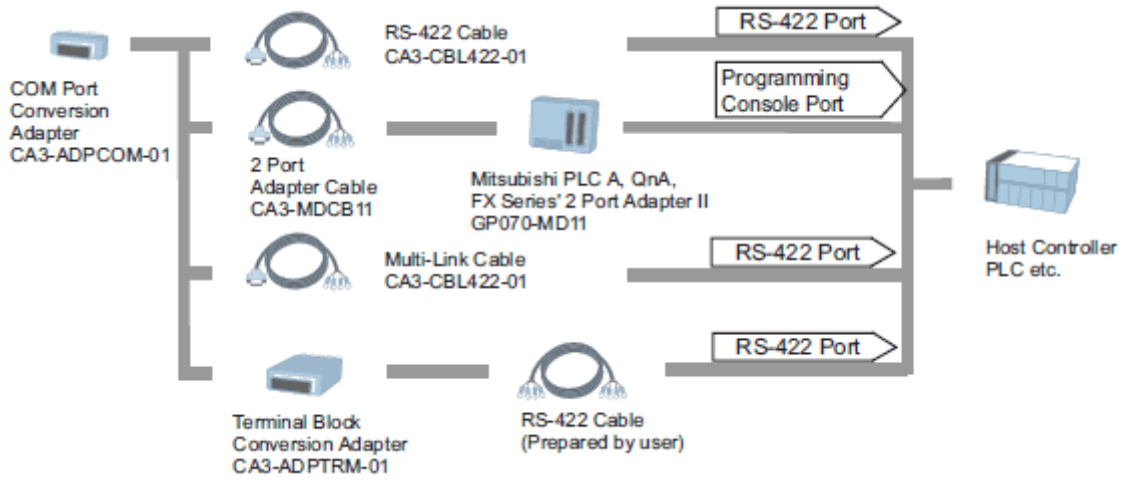
For the communication drivers that support serial multi-link, see [Which drivers support serial multilink communication?] (http://www.pro-face.com/otasuke/files/manual/gpproex/new/device/com_mlnk.htm).

4.5 Cable Diagram at the time of replacement

The connetion cable used for ST3000 series can be also used for GP-4201TM. But, please note that there are the precautions and restrictions as described below.

- Please check the connection configurations GP-4201TM supports with GP-Pro EX Device/PLC Connection Manual before using the connection cable. (http://www.pro-face.com/otasuke/files/manual/gpproex/new/device/index.htm)

- The cable used for connection to **ST3000 series via COM2** can be used for GP-4201TM with a COM Port Conversion Adapter (CA3-ADPCOM-01) added in the following cases;

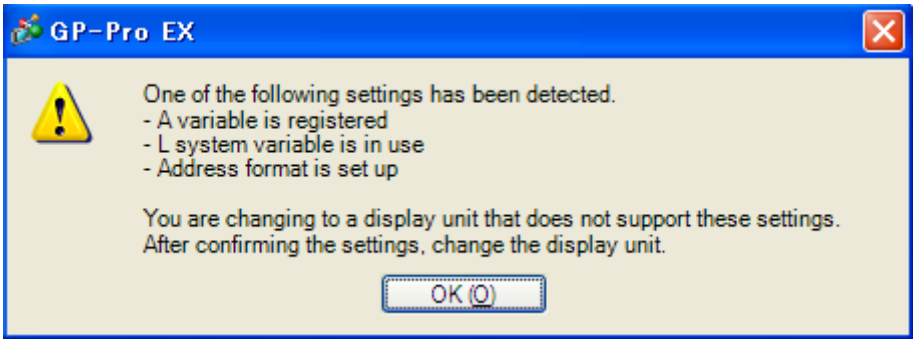


In all other cases, the operation is not guaranteed and it's recommended to prepare a new connection cable. To check the cable diagram, please refer to GP-Pro EX Device/PLC Connection Manual.

Chapter 5 Appendix

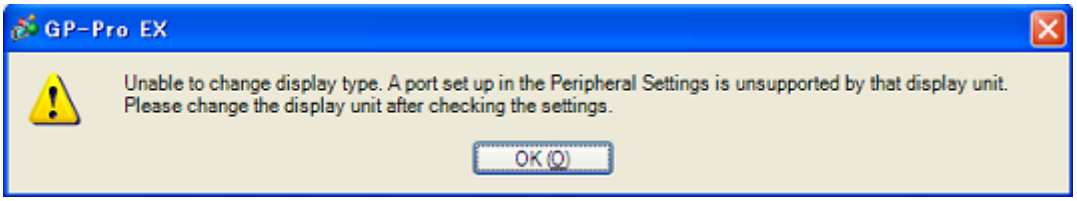
5.1 When the Display Unit type cannot be changed,

Depending on a project file's function setting, the following message may appear and the Display Unit may not be able to be changed to GP-4201TM.



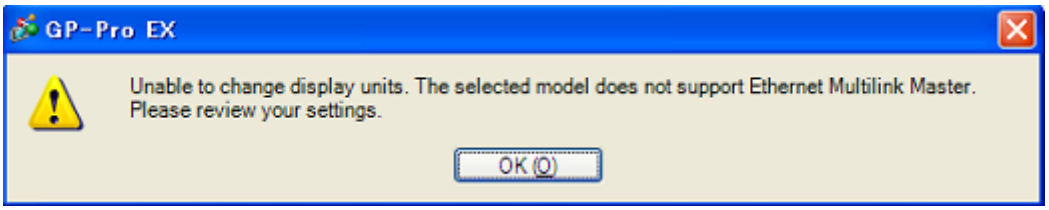
[Cause]

- Logic settings are made.-> Solution (1)-1
- L system variables are used.-> Solution (1)-2
- I/O Settings are made.-> Solution (1)-3
- Unsupported variables are registered in Symbol Variable Setting.-> Solution (1)-4
- In Logic Programs Setting, [Address Format] is selected.-> Solution (1)-5



[Cause]

- In Device/PLC Setting, multiple communication drivers are registered.
  -> Solution (2)-1
- A communication driver that is not supported is set.-> Solution (2)-2
- The function using the unsupported port (COM2) is set. -> Solution (2)-3



[Cause]

[Master] is selected in [Ether Multilink Settings].-> Solution (3)-1

[Solutions]

(1)-1: Logic settings are made.

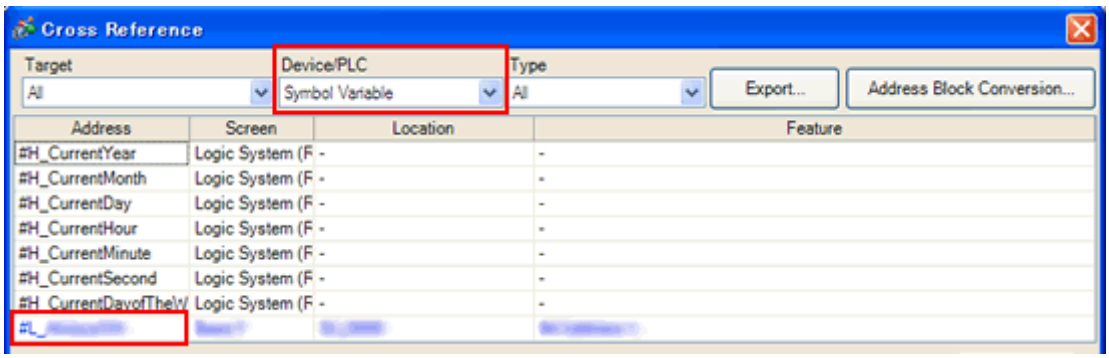
Because GP-4201TM does not support Logic Function, if logic settings are made, the Display Unit cannot be changed. Open the logic screens, check the logic settings, and delete them.

(1)-2: L system variables are used.

[L System Variable] is a logic variable starting with [#L_].

Because GP-4201TM does not support Logic Function, [L System Variable] cannot be used. When [L System Variable] is used, the Display Unit cannot be changed. Check where the address is used and delete it or replace it with another address.

1. Click [Project]->[Utility]->[Cross Reference].
2. Select [Symbol Variable] for [Device/PLC].
   If a L system variable is used, an address starting with [#L_] is displayed.



(1)-3: I/O settings are made.

GP-4201TM does not support I/O Connection. If I/O Settings are made, the Display Unit cannot be changed.

Click [Project]->[System Settings]->[I/O Driver] and check the displayed I/O settings.

(1)-4: Unsupported variables are registered in Symbol Variable Setting.

GP-4201TM supports only the variables of [Word Address] or [Bit Address].

Click [Common Settings]->[Symbol Variable]. If variables except [Word Address] or [Bit Address] are registered, the Display Unit cannot be changed. If a variable except these 2 types is registered, change the type to [Word Address] or [Bit Address], or replace it with another address.

(1)-5: In Logic Programs Setting, [Address Format] is selected.

GP-4201TM does not support Logic Function. When [Address Format] is selected for [Register Variable] in the Logic Programs Setting, even if no logic setting is made, the Display Unit cannot be changed.

Click [Project]->[System Settings]->[Logic Programs]. If [Address Format] is selected for [Register Variable], change it to [Variable Format].

(2)-1: In Device/PLC Setting, multiple communication drivers are registered.

For GP-4201TM, only one communication driver can be set. (But, if [Enable Ethernet Multilink] is selected, and GP-4201TM is used as a slave, up to 2 can be set.) If the Device/PLC setting exceeds the upper limit, the Display Unit cannot be changed.

Click [Project]->[System Settings]->[Device/PLC]. Check the displayed Device/PLC setting.

(2)-2: A communication driver that is not supported is set.

If a communicaton driver that cannot be used for GP-4201TM is set, the Display Unit cannot be chagned.

Click [Project]->[System Settings]->[Device/PLC] and check the displayed Device/PLC setting and change the communication driver setting.

For the communication drivers that are supported by GP-4201TM, see [4.1 Driver List].

(2)-3: The function using the unsupported port (COM2) is set.

COM1 is the only one port that GP-4201TM has. If COM2 is selected for [Port] in the [Script] setting, the Display Unit cannot be changed.

Click [Project]->[System Settings]->[Script]. Check the displayed port setting of Script.

(3)-1: [Master] is selected in [Ether Multilink Settings].

GP-4201TM cannot be a master at the time of Ether multilink connection (can be a slave only.). If [Master] is selected in [Ether Multilink Settings], the Display Unit cannot be changed.

After disabling the Ether multilink setting, change the Display Unit.

1. Click [Project]->[System Settings]->[Display Unit].
2. In [Ether Multilink Settings] in the [Extended Settings] tab, uncheck [Enable Ether Multilink].