



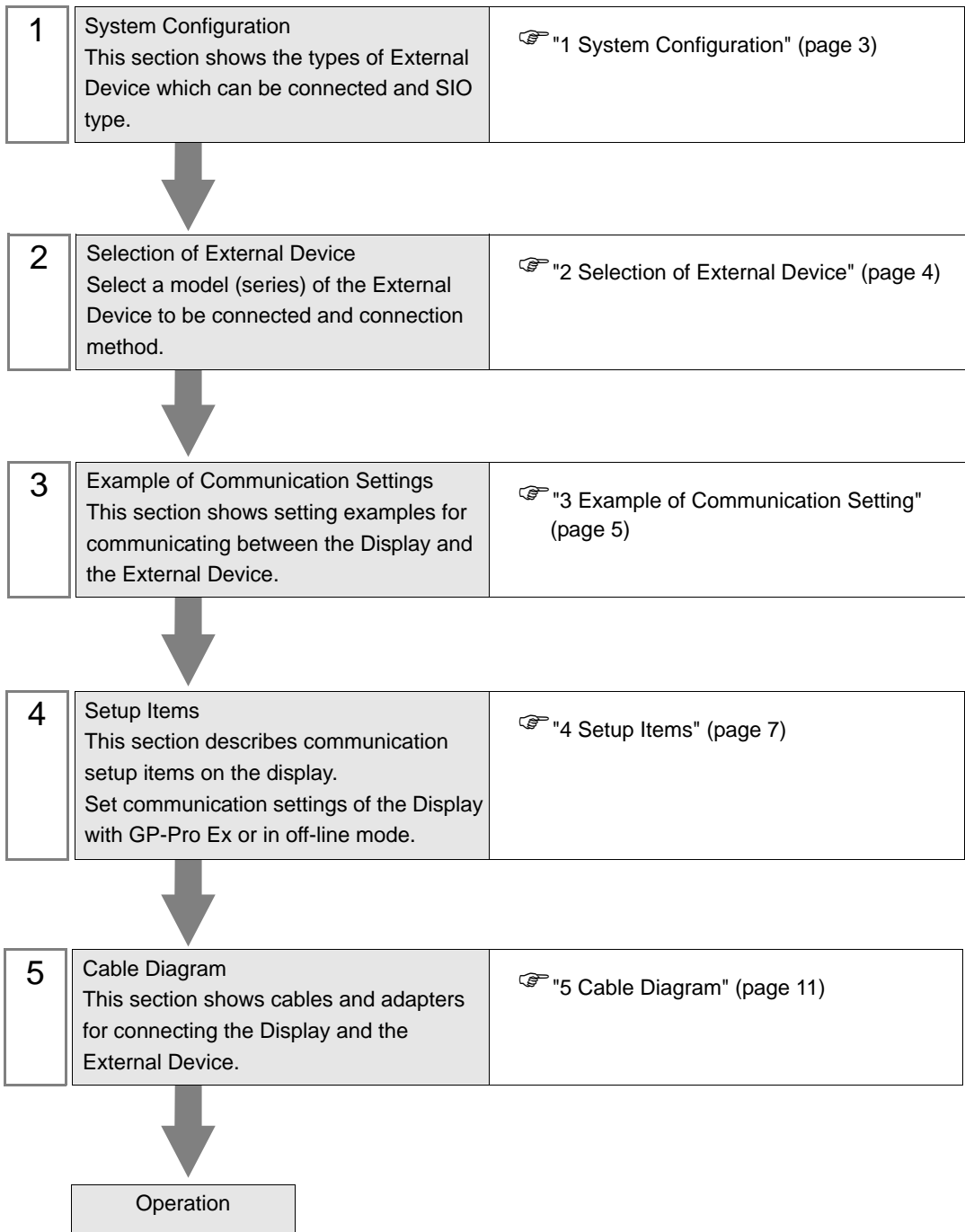
# QnA Series CPU Direct Driver

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## Introduction

This manual describes how to connect the Display (GP3000 series) and the External Device (target PLC).

In this manual, the connection procedure will be described by following the below sections:



# 1 System Configuration

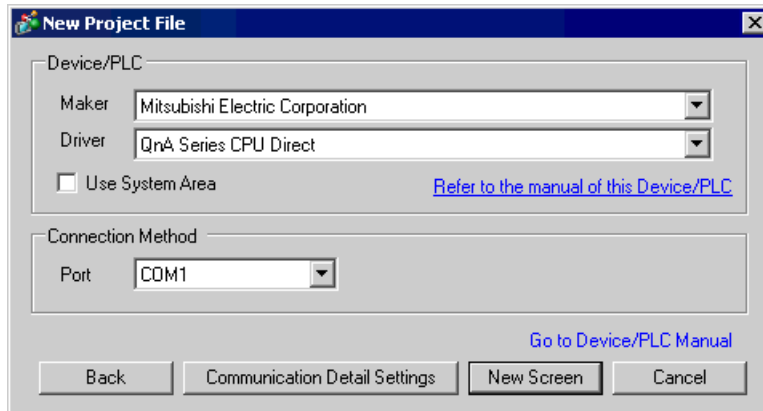
The system configuration in the case when the External Device of Mitsubishi Electric Corp. and the Display are connected is shown.

Series	CPU	Link I/F	SIO Type	Setting Example	Cable Diagram
MELSEC QnA Series	Q4A CPU Q3A CPU Q2A CPU -S1	CPU Direct	RS232C	Setting Example 1 (page 5)	Cable Diagram 1 (page 11)
	Q2A CPU Q2ASH CPU -S1 Q2ASH CPU Q2AS CPU -S1		RS422/485 (4wire)	Setting Example 2 (page 6)	Cable Diagram 2 (page 12)
	Q2AS CPU Q4AR CPU	2-port adapter II by Pro-face *1 (Model: GP070-MD11)	RS422/485 (4wire)	Setting Example 2 (page 6)	Cable Diagram 3 (page 13)

\*1 Supported by 2-port adapter II Rev. B or later. 2-port adapter II does not support the communication in 38,400. Please use it in 19,200.

## 2 Selection of External Device

Select the External Device to be connected to the Display.



Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "Mitsubishi Electric Corporation".
Driver	Select a model (series) of the External Device to be connected and connection method. Select " QnA Series CPU Direct". Check the External Device which can be connected in " QnA Series CPU Direct" in system configuration. ☞ "1 System Configuration" (page 3)
Use System Area	Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 6.13.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. GP3000 Series User Manual "4.3.6 System Area Setting"
Port	Select the Display port to be connected to the External Device.

## 3 Example of Communication Setting

Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

### 3.1 Setting Example 1

#### ■ Setting of GP-Pro EX

##### ◆ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Device/PLC 1 [Change Device/PLC](#)

Summary

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

RS232C   
  RS422/485(2wire)   
  RS422/485(4wire)

Speed

Data Length  7     8

Parity  NONE     EVEN     ODD

Stop Bit  1     2

Flow Control  NONE     ER(DTR/CTS)     XON/XOFF

Timeout  (sec)

Retry

Wait To Send  (ms)

RI / VCC   
  VCC

In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (5V Power Supply). If you use the Digital's RS232C Isolation Unit or CPU I/F Cable for Mitsubishi PLC A Series (Digital's:GP430-IP10-0), please select it to VCC.

Device-Specific Settings

Allowable No. of Device/PLCs 1 Unit(s)

No.	Device Name	Settings
1	PLC1	<input type="button" value="Settings"/>

#### ■ Settings of External Device

There is no setting on the External Device. The speed automatically switches according to the Display setting.

## 3.2 Setting Example 2

### ■ Setting of GP-Pro EX

#### ◆ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Device/PLC 1

Summary [Change Device/PLC](#)

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

SID Type  RS232C  RS422/485(2wire)  RS422/485(4wire)

Speed

Data Length  7  8

Parity  NONE  EVEN  ODD

Stop Bit  1  2

Flow Control  NONE  ER(DTR/CTS)  XON/XOFF

Timeout  (sec)

Retry

Wait To Send  (ms)

RI / VCC  RI  VCC

In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (5V Power Supply). If you use the Digital's RS232C Isolation Unit or CPU I/F Cable for Mitsubishi PLC A Series (Digital's:GP430HP10-0), please select it to VCC.

Device-Specific Settings

Allowable No. of Device/PLCs: 1 Unit(s)

No.	Device Name	Settings
1	PLC1	

### ■ Device Setting

There is no setting on the External Device. The speed automatically switches according to the Display setting.

## 4 Setup Items

Set communication settings of the Display with GP-Pro Ex or in off-line mode of the Display.

The setting of each parameter must be identical to that of External Device.

☞ "3 Example of Communication Setting" (page 5)

### 4.1 Setup Items in GP-Pro EX

#### ■ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device.
Speed	Select speed between the External Device and the Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.

continued to next page

Setup Items	Setup Description
Timeout	Use an integer from 1 to 127 to enter the time (s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait To Send	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for SIO type.



## 4.2 Settings in Off-Line Mode

**NOTE**

- Please refer to GP3000 Series User Manual for more information on how to enter off-line mode or about operation.

Cf. GP3000 Series User Manual "Chapter 4 Settings"

### ■ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in off-line mode. Touch the External Device you want to set from the displayed list.

(Page 1/2)

Comm.				
QnA Series CPU Direct		[COM1]	Page 1/2	
SIO Type	RS232C			
Speed	19200			
Data Length	8			
Parity	ODD			
Stop Bit	1			
Flow Control	NONE			
Timeout(s)		3	▼▲	
Retry		2	▼▲	
Wait to Send(ms)		0	▼▲	
				➔
Exit		Back		2005/09/02 12:42:15

Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device.
Speed	Select speed between the External Device and the Display.
Data Length	Data length is displayed.
Parity	The parity check method is displayed.
Stop Bit	Stop bit length is displayed.
Flow Control	The communication control method to prevent overflow of transmission and reception data is displayed.
Timeout (s)	Use an integer from 1 to 127 to enter the time (s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait to Send (ms)	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.

(Page 2/2)

Comm.				
QnA Series CPU Direct		[COM1]	Page 2/2	
Use CPU I/F Cable for Mitsubishi PLC A Series(Digital's:GP430-IP10-0)				
<input checked="" type="radio"/> OFF <input type="radio"/> ON				
When this setting is turned on, RI/VCC is used as VCC. Only when SIOType:RS232C, it is effective.				
				←
Exit		Back		2005/09/02 12:42:17

Setup Items	Setup Description
RI/VCC	You can switch RI/VCC of the 9th pin when you select RS232C for SIO type.

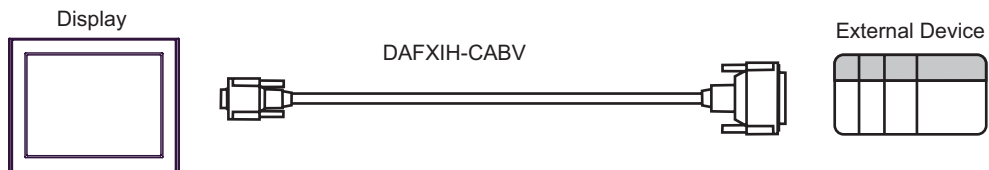
## 5 Cable Diagram

The cable diagram shown below may be different from the cable diagram recommended by Mitsubishi Electric Corp. Please be assured there is no operational problem in applying the cable diagram shown in this manual.

- The FG pin of the main body of the External Device must be D-class grounded. Please refer to the manual of the External Device for more details.
- SG and FG are connected inside the Display. When connecting SG to the External Device, design the system not to form short-circuit loop.

Cable Diagram 1

Display (Connection Port)	Cable	Notes
GP (COM1)	Interface internal cable for Mitsubishi FA equipments by Diatrend Corp. DAFXIH-CABV (3m)	Available to order the length up to 15 m

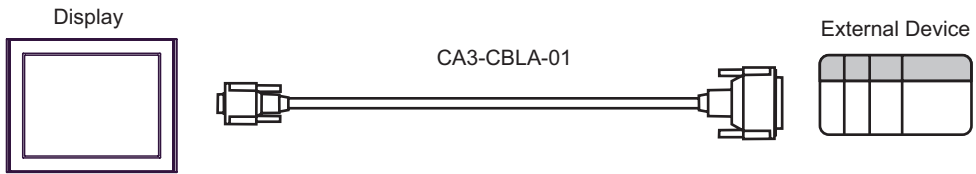


Cable Diagram 2

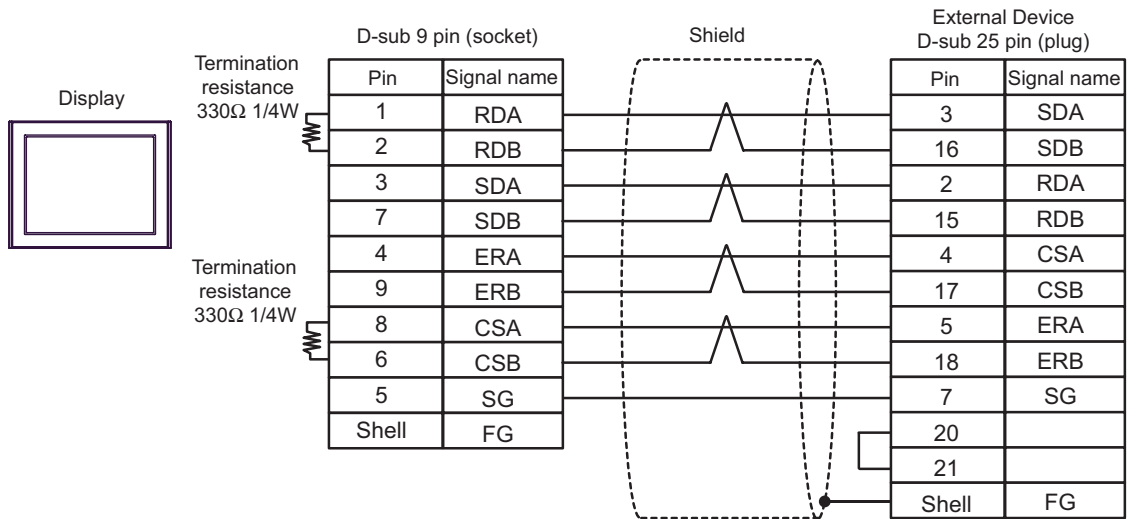
Display (Connection Port)	Cable		Notes
GP*1 (COM1) AGP-3302 (COM2)	A	Mitsubishi A connection cable by Pro-face CA3-CBLA-01 (5m)	
	B	Your own cable	The cable length must be 5m or less.

\*1 All GP models except AGP-3302

A) When using Mitsubishi A connection cable (CA3-CBLA-01) by Pro-face.



B) When using your own cable

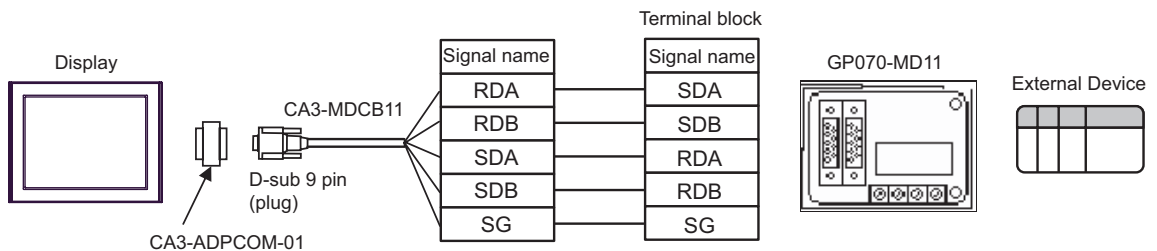


Cable Diagram 3

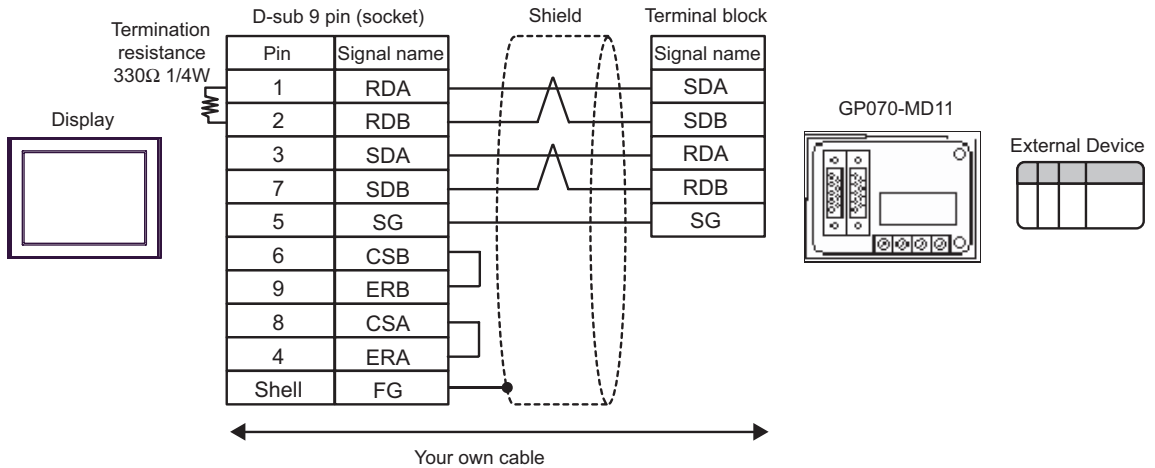
Display (Connection Port)	Cable		Notes
GP*1 (COM1) AGP-3302 (COM2)	A	COM port conversion adapter by Pro-face CA3-ADPCOM-01 + 2-port adapter cable for AGP by Pro-face CA3-MDCB11 (5m) + 2-port adapter II by Pro-face GP070-MD11	
	B	Your own cable + 2-port adapter II by Pro-face GP070-MD11	The cable length must be 600m or less.
GP*1(COM2)	C	Online adapter by Pro-face CA4-ADPONL-01 + 2-port adapter cable for AGP by Pro-face CA3-MDCB11 (5m) + 2-port adapter II by Pro-face GP070-MD11	
	D	Online adapter by Pro-face CA4-ADPONL-01 + Your own cable + 2-port adapter II by Pro-face GP070-MD11	The cable length must be 600m or less.

\*1 All GP models except AGP-3302

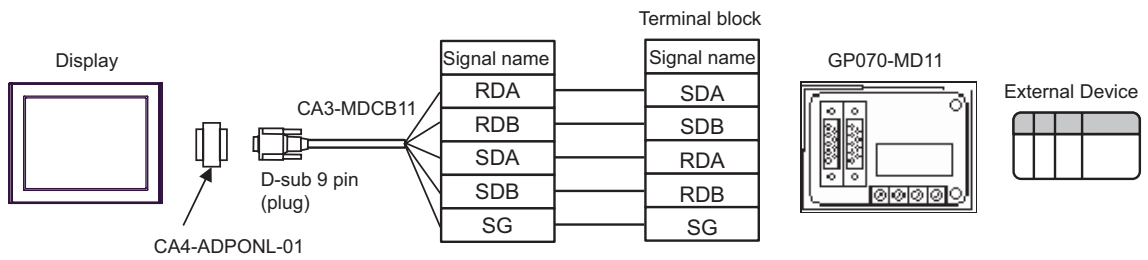
A) When using COM port conversion adapter (CA3-ADPCOM-01), 2-port adapter cable for AGP (CA3-MDCB11) by Pro-face and 2-port adapter II (GP070-MD11) by Pro-face



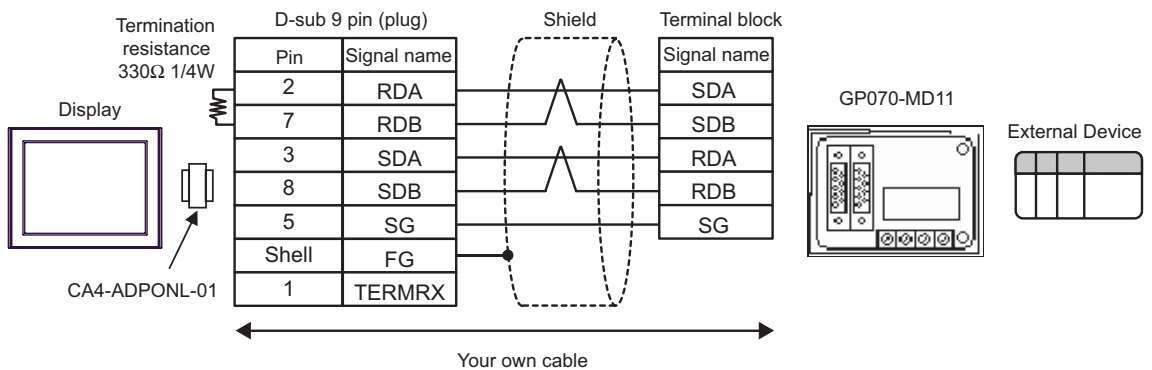
B) When using your own cable and 2-port adapter II (GP070-MD11) by Pro-face.



C) When using online adapter (CA4-ADPONL-01), 2-port adapter cable for AGP (CA3-MDCB11) by Pro-face and 2-port adapter II (GP070-MD11) by Pro-face.



D) When using online adapter (CA4-ADPONL-01) by Pro-face, your own cable and 2-port adapter II (GP070-MD11) by Pro-face.






## 6 Supported Device

Range of supported device address is shown in the table below.

     This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Notes
Input Relay	X0000 - X1FFF	X0000 - X1FF0	[ L / H ]	<span style="border: 1px solid black; padding: 2px;">...0</span>
Output Relay	Y00000 - Y1FFF	Y0000 - Y1FF0		<span style="border: 1px solid black; padding: 2px;">...0</span>
Internal Relay	M00000 - M32767	M00000 - M32752		<span style="border: 1px solid black; padding: 2px;">+16</span>
Special Relay	SM0000 - SM2047	SM0000 - SM2032		<span style="border: 1px solid black; padding: 2px;">+16</span>
Latch Relay	L000000 - L32767	L00000 - L32752		<span style="border: 1px solid black; padding: 2px;">+16</span>
Annunciator	F00000 - F32767	F00000 - F32752		<span style="border: 1px solid black; padding: 2px;">+16</span>
Edge Relay	V00000 - V32767	V00000 - V32752		<span style="border: 1px solid black; padding: 2px;">+16</span>
Step Relay	S0000 - S8191	S0000 - S8176		<span style="border: 1px solid black; padding: 2px;">+16</span>
Link Relay	B0000 - B7FFF	B0000 - B7FF0		<span style="border: 1px solid black; padding: 2px;">...0</span>
Special Link Relay	SB000 - SB7FF	SB000 - SB7F0		<span style="border: 1px solid black; padding: 2px;">...0</span>
Timer (Contact)	TS00000 - TS23087	-----		
Timer (Coil)	TC00000 - TC23087	-----		
Retentive Timer (Contact)	SS00000 - SS23087	-----		
Retentive Timer (Coil)	SC00000 - SC23087	-----		
Counter (Contact)	CS00000 - CS23087	-----		
Counter (Coil)	CC00000 - CC23087	-----		
Timer (Current Value)	-----	TN0000 - TN23087		
Retentive Timer (Current Value)	-----	SN0000 - SN23087		
Counter (Current Value)	-----	CN0000 - CN23087		
Data Register	-----	D0000 - D25983		<span style="border: 1px solid black; padding: 2px;">Bit F</span>
Special Register	-----	SD0000 - SD2047		
Link Register	-----	W0000 - W657F		
Special Link Register	-----	SW000 - SW7FF	<span style="border: 1px solid black; padding: 2px;">Bit F</span>	


continued to next page

Device	Bit Address	Word Address	32 bits	Notes
File Register (Normal)	-----	R00000 - R32767	<b>[L/H]</b>	 *1
File Register (Block switching is not necessary)	-----	ZR0000000 - ZR1042431		 *1
File Register*2 (0R - 31R)	-----	0R00000 - 0R32767		 *1
	-----	1R00000 - 1R32767		
	-----	2R00000 - 2R32767		
	-----	3R00000 - 3R32767		
	:	:		
	-----	28R00000 - 28R32767		
	-----	29R00000 - 29R32767		
	-----	30R00000 - 30R32767		
-----	31R00000 - 31R26623			

\*1 You need the memory card when using the file register.

\*2 Set the block No. on the head of device name. This is the device name for conversion with GP-Pro/PB III for Windows. When you newly specify the device, we recommend that you should use the file register (Block switching is not necessary).

**NOTE**

- Please refer to the GP-Pro EX Reference Manual for system data area.  
Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)"
- Please refer to the precautions on manual notation for icons in the table.  
 "Manual Symbols and Terminology"
- Even if you use an address not existing in the External Device, no read error may be displayed. In this case, the read-out data keeps 0.  
In writing, an error is displayed.



## 7 Device Code and Address Code

Use device code and address code when you select "Device Type & Address" for the address type in data displays.

Device	Device Name	Device Code (HEX)	Address Code
Input Relay	X	0080	Value of word address divided by 0x10
Output Relay	Y	0081	Value of word address divided by 0x10
Internal Relay	M	0082	Value of word address divided by 16
Special Relay	SM	0083	Value of word address divided by 16
Latch Relay	L	0084	Value of word address divided by 16
Annunciator	F	0085	Value of word address divided by 16
Edge Relay	V	0086	Value of word address divided by 16
Step Relay	S	0087	Value of word address divided by 16
Link Relay	B	0088	Value of word address divided by 0x10
Special Link Relay	SB	0089	Value of word address divided by 0x10
Timer (Current Value)	TN	0060	Word Address
Retentive Timer (Current Value)	SN	0062	Word Address
Counter (Current Value)	CN	0061	Word Address
Data Register	D	0000	Word Address
Special Register	SD	0001	Word Address
Link Register	W	0002	Word Address
Special Link Register	SW	0003	Word Address
File Register (Normal)	R	000F	Word Address
File Register (Block switching is not necessary)	ZR	000E	Word Address
File Register (0R - 31R)	0R	0010	Word Address
	1R	0011	Word Address
	2R	0012	Word Address
	3R	0013	Word Address
	:	:	:
	28R	002C	Word Address
	29R	002D	Word Address
	30R	002E	Word Address
	31R	002F	Word Address

## 8 Error Messages

Error messages are displayed on the screen of Display as follows: "No. : Device Name: Error Message (Error Occurrence Area)". Each description is shown below.

Item	Description
No.	Error No.
Device Name	Name of External Device where error occurs. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	<p>Displays IP address or device address of External Device where error occurs, or error codes received from External Device.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>Received error codes are displayed such as "Decimal [Hex]".</li> <li>IP address is displayed such as "IP address (Decimal): MAC address (Hex)".</li> </ul>

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 2 [02])"

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**NOTE** • Please refer to the manual of External Device for more detail of received error codes.

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