

DIASYS Netmation MODBUS TCP Driver

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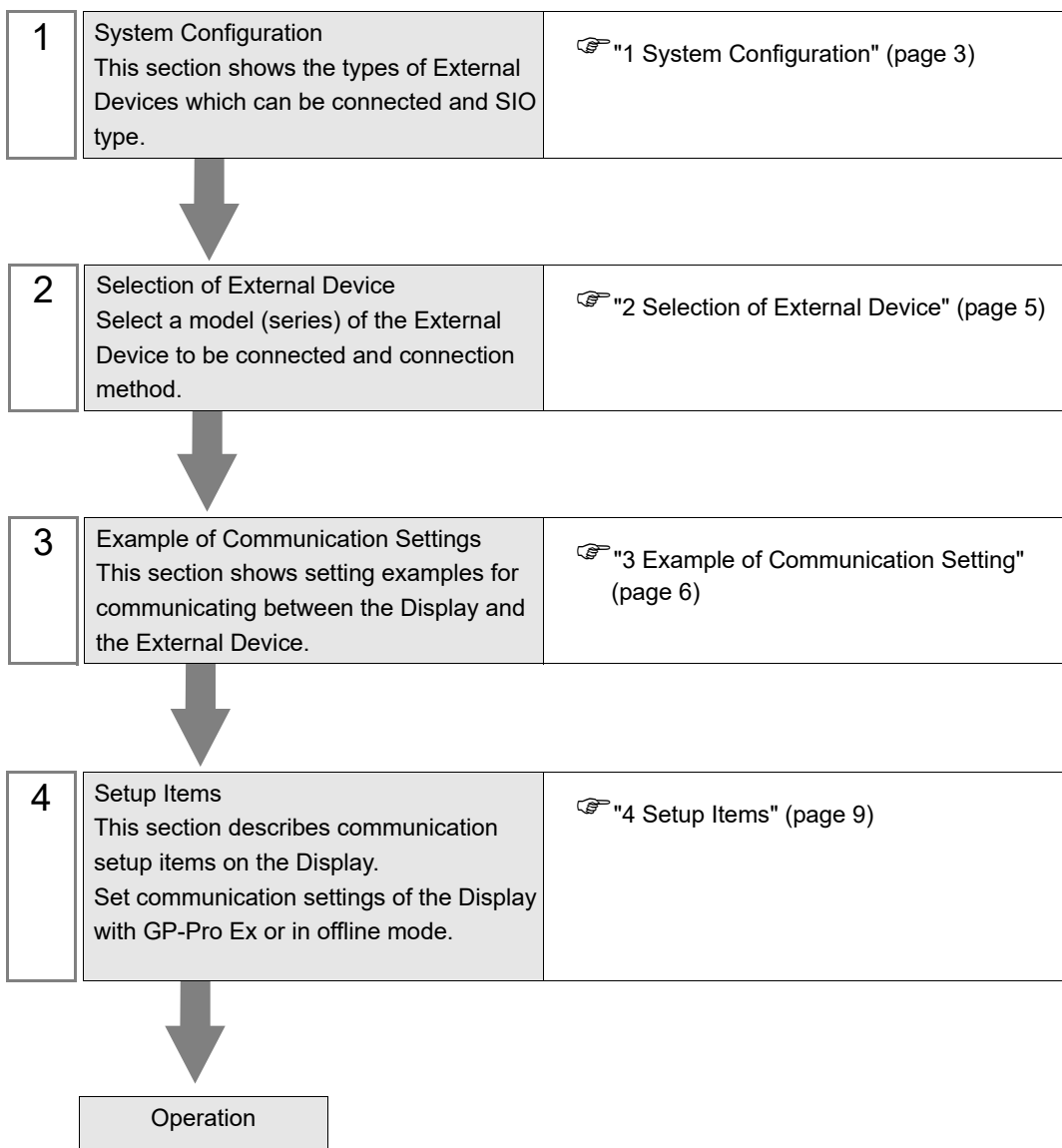
IMPORTANT

- The below Displays are no longer sold nor maintained by Pro-face. To reduce unplanned downtime due to aged hardware and to maximize your cyber security environment we recommend replacing your devices with a new, successor model. For details, please visit our homepage for "Recommended Substitution".
Discontinued from GP-Pro EX 5.00 onwards: GP3000 Series, LT3000 Series, ST3000 Series, GP-4100 Series (Monochrome model), PL Series, PS3000/4000 Series, PE4000 Series.
- For details on the Displays supported by the driver, please check the "Connectable Devices" on our website.
<http://www.pro-face.com/trans/en/manual/1064.html>

Introduction

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

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



1 System Configuration

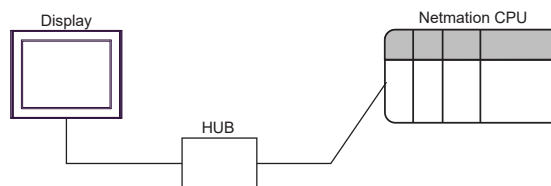
The system configuration in the case when the External Device of Mitsubishi Heavy Industries, Ltd. and the Display are connected is shown.

CPU	Interface	Setting Example	Notes
Netmotion CPU	Ethernet (TCP)	Setting Example (page 6)	The communication method that DIASYS Netmotion system supports is a external device of MODBUS TCP conformity.

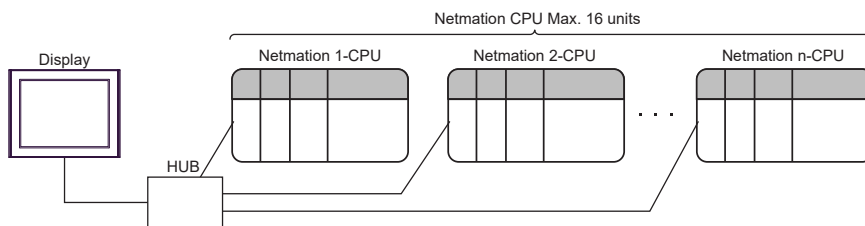
NOTE • This driver does not support GP-4100 series (Monochrome Model).

■ Connection Configuration

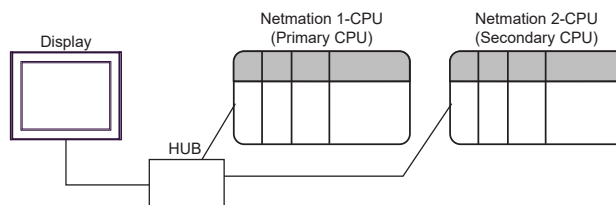
- 1:1 Connection (Ethernet single/Netmotion CPU single)



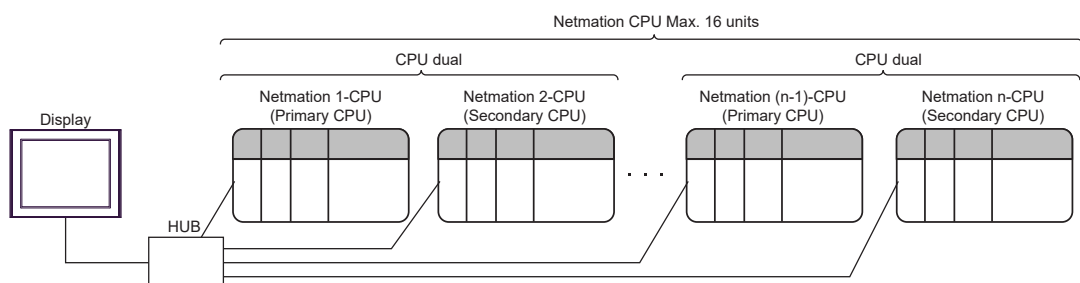
- 1:n Connection (Ethernet single/Netmotion CPU single)



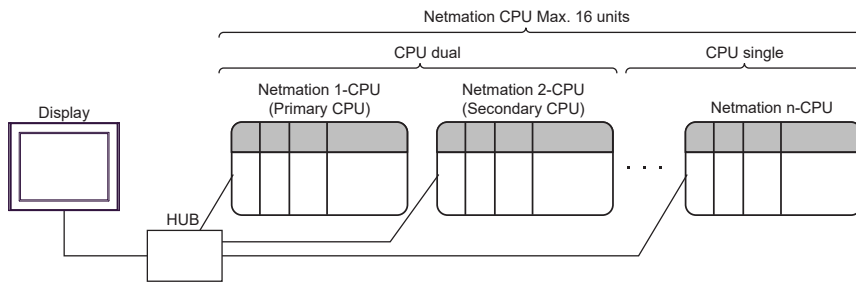
- 1:1 Connection (Ethernet single/Netmotion CPU dual)



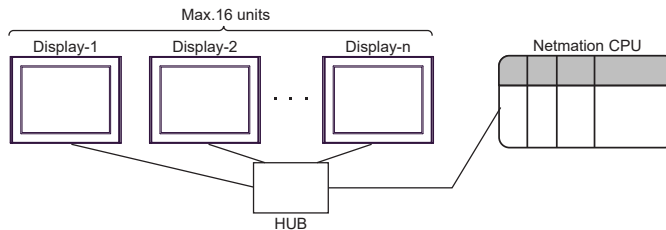
- 1:n Connection (Ethernet single/Netmotion CPU dual)



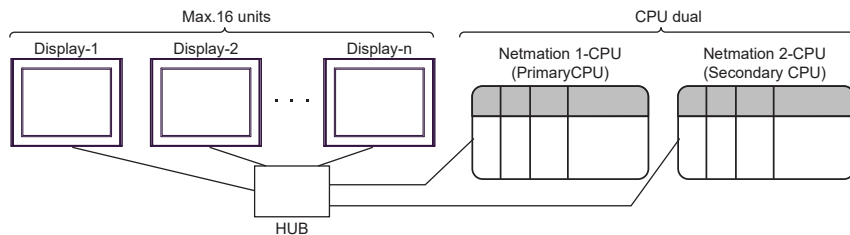
- 1:n Connection (Ethernet single/Netmaton CPU single/dual mixed)



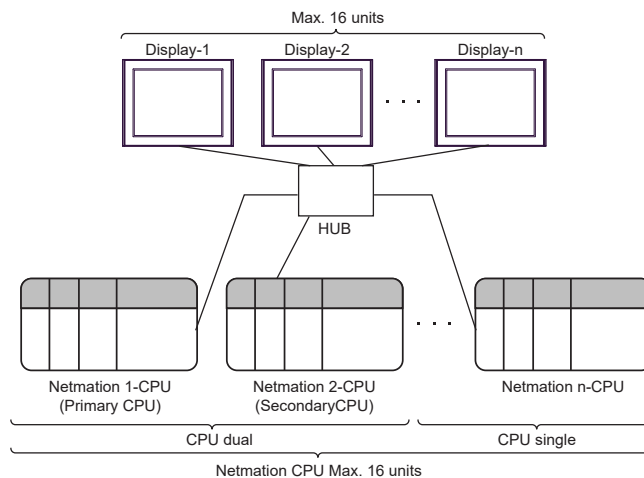
- n:1 Connection (Ethernet single/Netmaton CPU single)



- n:1 Connection (Ethernet single/Netmaton CPU dual)



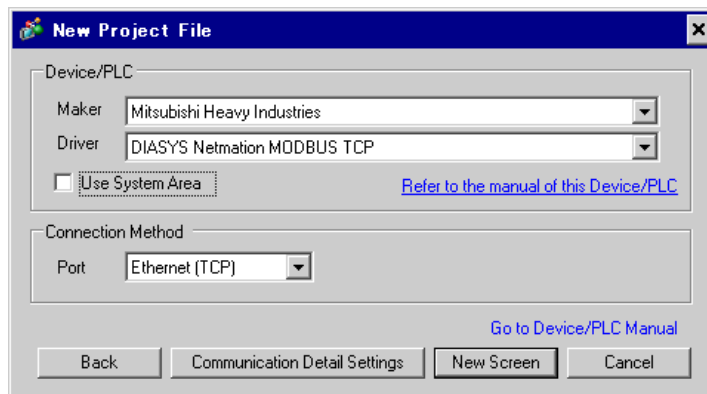
- n:m Connection (Ethernet single/Netmaton CPU single/dual mixed)



NOTE • Please refer to the manual of the Netmaton for more detail on Dual System.

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 Heavy Industries".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "DIASYS Netmotion MODBUS TCP". Check the External Device which can be connected in "DIASYS Netmotion MODBUS TCP" 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 "LS Area (Direct Access Method Area)" This can also be set in GP-Pro EX or in the Display's offline mode. Cf. GP-Pro EX Reference Manual "Display Unit (System Area) Settings Guide" Cf. Maintenance/Troubleshooting Guide "Main Unit - System Area Settings"
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

■ Settings 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

Maker: Mitsubishi Heavy Industries Driver: DIASYS Netmation MODBUS TCP Port: Ethernet (TCP) [Change Device/PLC](#)

Text Data Mode: 1 [Change](#)

Communication Settings

Port No.: 59710

Timeout: 3 (sec)

Retry: 0


Wait To Send: 0 (ms) [Default](#)

Device-Specific Settings

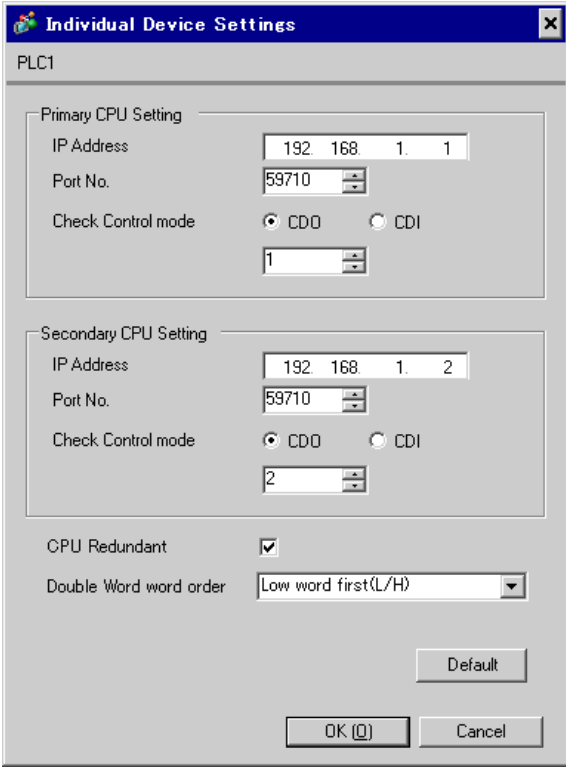
Allowable No. of Device/PLCs: 16 Unit(s)

No.	Device Name	Settings
1	PLC1	IP Address=192.168.001.001, Port No.=59710, Check Control mode=CDO, Che

◆ Device Setting

To display the setting screen, click  ([Setting]) of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

When you connect multiple External Device, click  from [Device-Specific Settings] of [Device/PLC Settings] to add another External Device.



The dialog box titled "Individual Device Settings" for "PLC1" contains the following settings:

- Primary CPU Setting**
 - IP Address: 192 168 1 1
 - Port No.: 59710
 - Check Control mode: ☒ CDD ☐ CDI
 - Value: 1
- Secondary CPU Setting**
 - IP Address: 192 168 1 2
 - Port No.: 59710
 - Check Control mode: ☒ CDD ☐ CDI
 - Value: 2
- CPU Redundant**: ☒
- Double Word word order**: Low word first(L/H)
- Buttons**: Default, OK (O), Cancel

◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the display in the offline mode of the display.

■ Settings of External Device

Use the dedicated software of Netmation for communication settings.

Please refer to the manual of the external device for more detail.

◆ Setup Items

Setup Items	Setup Description
Netmation CPU IP address	192.168.1.1
Netmation CPU port No.	59710
Netmation CPU control state storage address*1	CDO0001

*1 The control state storage address is necessary at the time of use of dual system.

4 Setup Items

Set communication settings of the Display with GP-Pro EX or in offline mode of the Display.

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

☞ "3 Example of Communication Setting" (page 6)

NOTE • Set the Display's IP address in offline mode.

Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

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.

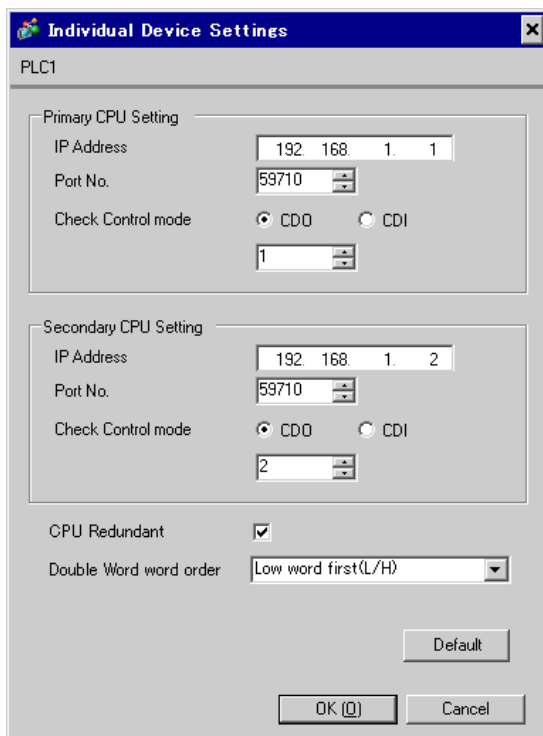
The screenshot shows the 'Device/PLC 1' settings window. It has a 'Summary' section with fields for 'Maker' (Mitsubishi Heavy Industries Ltd.), 'Driver' (DIASYS Netmaton MODBUS TCP), and 'Port' (Ethernet (TCP)). There is a 'Text Data Mode' set to '1' with a 'Change' link. Below is the 'Communication Settings' section with 'Port No.' (59710), 'Timeout' (3 sec), 'Retry' (0), and 'Wait To Send' (0 ms), along with a 'Default' button. The 'Device-Specific Settings' section shows 'Allowable No. of Device/PLCs' (16 Unit(s)) and a table with one entry: '1' for 'PLC1'. At the bottom, a status bar shows 'IP Address=192.168.001.001, Port No.=59710, Check Control mode=CDD, Che'.

Setup Items	Setup Description
Port No.	Enter a port number of the Display with "1024-65535". (Initial value [59710])
Timeout	Use an integer from 1 to 127 to enter the time (s) for which Display waits for the response from 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.

◆ Device Setting

To display the setting screen, click  ([Setting]) of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

When you connect multiple External Device, click  from [Device-Specific Settings] of [Device/PLC Settings] to add another External Device.



Individual Device Settings

PLC1

Primary CPU Setting

IP Address: 192.168.1.1

Port No.: 59710

Check Control mode: ☒ CDO ☐ CDI

1

Secondary CPU Setting

IP Address: 192.168.1.2

Port No.: 59710

Check Control mode: ☒ CDO ☐ CDI

2

CPU Redundant: ☒

Double Word word order: Low word first(L/H)

Default

OK (O) Cancel

Setup Items	Setup Description
Primary CPU Setting	Setting of each setup item for primary CPU.
Secondary CPU Setting	Setting of each setup item for secondary CPU. When add a check to [CPU Redundant] check box, becomes input possible.
IP Address	Setting of Netmation CPU IP Address Input range is "000.000.000.000 to 255.255.255.255". However, when it sets other than 192.168.NNN.XXX, the message which urges the note outside the range is indicated. (It does not become error.) NNN is network number, and XXX is node number. The range together "000 to 255".
Port No.	Setting of Netmation CPU Port No. Setting between "1 to 65535". (Initial value [59710])
Check Control mode	Select device [CDO] to use for check of control mode and input an address. Control mode check command is transmitted in 1 second period for the device address, control state of CPU is watched. When add a check to [CPU Redundant] check box, becomes input possible.
CPU Redundant	Setting of CPU Redundant. When add a check to check box, Check Control mode column of primary CPU and Secondary CPU of secondary CPU Setting item become input possible.
Double Word word order	Setting of order to store away data. Select the order of storing double word data from "Low word first" or "High word first".

4.2 Setup Items in Offline Mode

NOTE

- Refer to the Maintenance/Troubleshooting guide for information on how to enter offline mode or about the operation.

Cf. Maintenance/Troubleshooting Guide "Offline Mode"

◆ Communication Settings

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

Comm.	Device			
DIASYS Netmation MODBUS TCP [TCP] Page 1/1				
Port No.	59710 ▼ ▲			
Timeout(s)	3 ▼ ▲			
Retry	0 ▼ ▲			
Wait To Send(ms)	0 ▼ ▲			
Exit		Back		2006/03/27 17:26:33

Setup Items	Setup Description
Port No.	Enter a port number of the Display with "1024 to 65535". (Initial value [59710])
Timeout	Use an integer from 1 to 127 to enter the time (s) for which Display waits for the response from 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.

◆ Device Setting


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




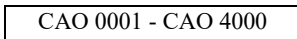
Comm.	Device			
DIASYS Netmaton MODBUS TCP [TCP] Page 1/1				
Device/PLC Name <input type="text" value="PLC1"/>				
CPU Redundant <input type="radio"/> Single <input checked="" type="radio"/> Redundant				
Primary CPU Setting				
IP Address	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="1"/>			
Port No.	<input type="text" value="59710"/> ▼ ▲			
Check Control mode	<input checked="" type="radio"/> CDO <input type="radio"/> CDI			
	<input type="text" value="1"/> ▼ ▲			
Secondary CPU Setting				
IP Address	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="2"/>			
Port No.	<input type="text" value="59710"/> ▼ ▲			
Check Control mode	<input checked="" type="radio"/> CDO <input type="radio"/> CDI			
	<input type="text" value="2"/> ▼ ▲			
Dword word order Low word first				
Exit		Back		2006/03/27 17:26:37

Setup Items	Setup Description
Primary CPU Setting	Setting of each setup item for primary CPU.
Secondary CPU Setting	Setting of each setup item for secondary CPU. When add a check to [CPU Redundant] check box, becomes input possible.
IP Address	Enter a Netmaton CPU IP Address between "192.168.0.0 to 192.168.255.255".
Port No.	Setting of Netmaton CPU Port No. Setting between "1 to 65535". (Initial value [59710])
Check Control mode	Select device [CDO] to use for check of control mode and input an address. Control mode check command is transmitted in 1 second period for the device address, control state of CPU is watched. When add a check to [CPU Redundant] check box, becomes input possible.
CPU Redundant	Setting of CPU Redundant. When add a check to check box, Check Control mode column of primary CPU and Secondary CPU of secondary CPU Setting item become input possible.
Double Word word order	Setting of order to store away data. Select the order of storing double word data from "Low word first" or "High word first".

5 Supported Device


Range of supported device address is shown in the table below. Please note that the actually supported range of the devices varies depending on the External Device to be used. Please check the actual range in the manual of your connecting equipment.

 This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Notes
Digital Output	CDO 0001 - CDO 8000	CDO 0001 - CDO 7985		
Digital Input	CDI 0001 - CDI 8000	CDI 0001 - CDI 7985		*1 
Analog Output	-----	 CAO 0001 - CAO 4000		
Analog Input	-----	CAI 0001 - CAI 4000		*1

*1 Write disable

NOTE

- Please refer to the GP-Pro EX Reference Manual for system data area.
Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.
 "Manual Symbols and Terminology"

6 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
Digital Output	CDO	0080	(Word Address - 1)/16
Digital Input	CDI	0081	(Word Address - 1)/16
Analog Output	CAO	0000	Word Address - 1
Analog Input	CAI	0001	Word Address - 1

7 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> <div style="border: 1px solid black; padding: 2px; display: inline-block;">NOTE</div> <ul style="list-style-type: none"> • IP address is displayed such as "IP address (Decimal); MAC address (Hex)". • Device address is displayed such as "Address: Device address". • Received error codes are displayed such as "Decimal [Hex]".

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 1 [01])"

- NOTE**
- Refer to your External Device manual for details on received error codes.
 - Refer to "Display-related errors" in "Maintenance/Troubleshooting Guide" for details on the error messages common to the driver.

■ Error Code Peculiar to PLC

The error code peculiar to PLC is as follows.

Error	Code cause	Notes
01	Appropriate function code is not supported.	RHxx034 / RHxx035
02	Appointed data address is nonexistent data address.	RHxx036 / RHxx037
03	Appointed data is not admitted.	RHxx034 / RHxx035

■ Error Message Peculiar to PLC

Error Code	Error Message	Description
RHxx128	There is two primary CPU	This error message is displayed when there are two primary CPU.
RHxx129	There is not primary CPU	This error message is displayed when there is no primary CPU.
RHxx130	This project data has too many nodes	This error message is displayed when the connectable number (16 connections) is exceeded.

