Mitsubishi Heavy Industries Ltd.

DIASYS Netmation MODBUS TCP 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 This section shows the types of External Devices which can be connected and SIO type.	☞"1 System Configuration" (page 3)
2	Selection of External Device Select a model (series) of the External Device to be connected and connection method.	☞"2 Selection of External Device" (page 5)
3	Example of Communication Settings This section shows setting examples for communicating between the Display and the External Device.	☞"3 Example of Communication Setting" (page 6)
4	Setup Items This section describes communication setup items on the Display. Set communication settings of the Display with GP-Pro Ex or in off-line mode.	☞"4 Setup Items" (page 9)

Operation

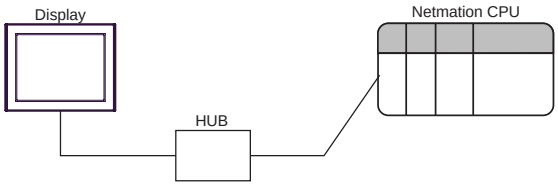
1 System Configuration

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

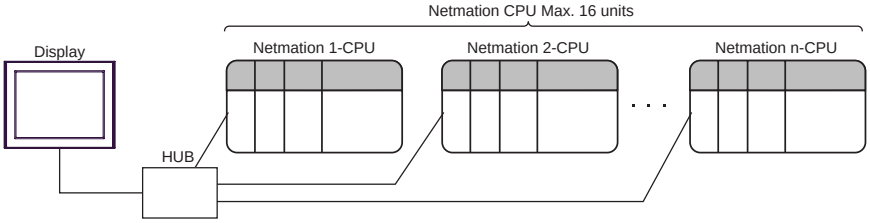
CPU	Interface	Setting Example	Notes
Netmation CPU	Ethernet (TCP)	Setting Example (page 6)	The communication method that DIASYS Netmation system supports is a external device of MODBUS TCP conformity.

■ Connection Configuration

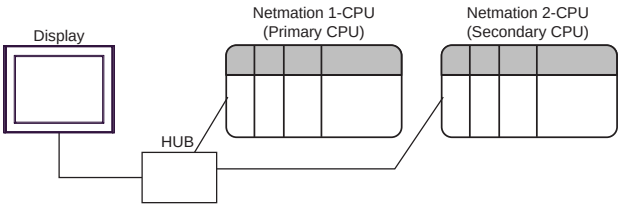
- 1:1 Connection (Ethernet single/Netmation CPU single)



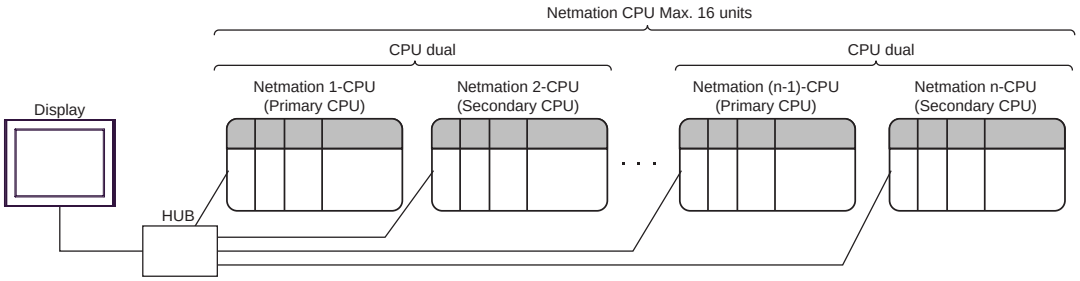
- 1:n Connection (Ethernet single/Netmation CPU single)



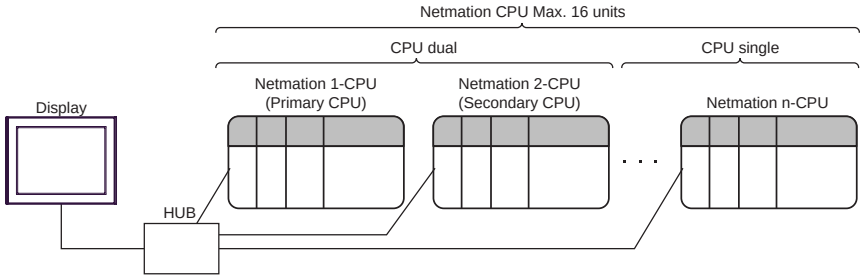
- 1:1 Connection (Ethernet single/Netmation CPU dual)



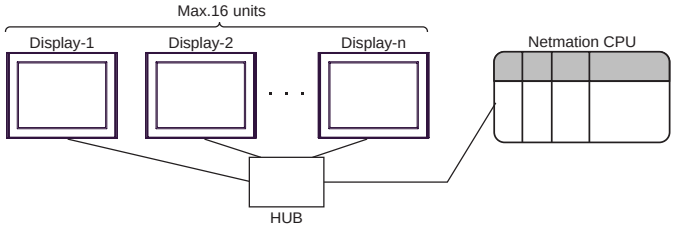
- 1:n Connection (Ethernet single/Netmation CPU dual)



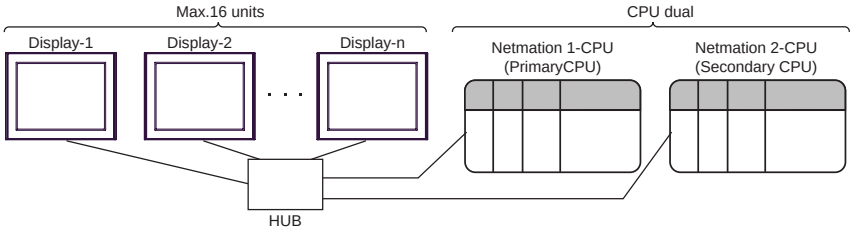
- 1:n Connection (Ethernet single/Netmation CPU single/dual mixed)



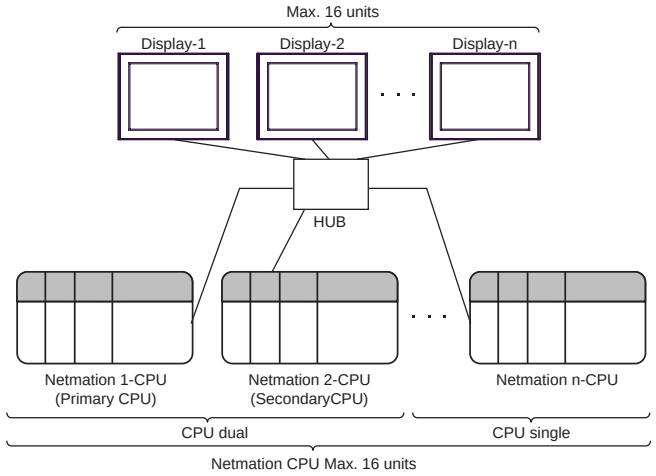
- n:1 Connection (Ethernet single/Netmation CPU single)



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



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

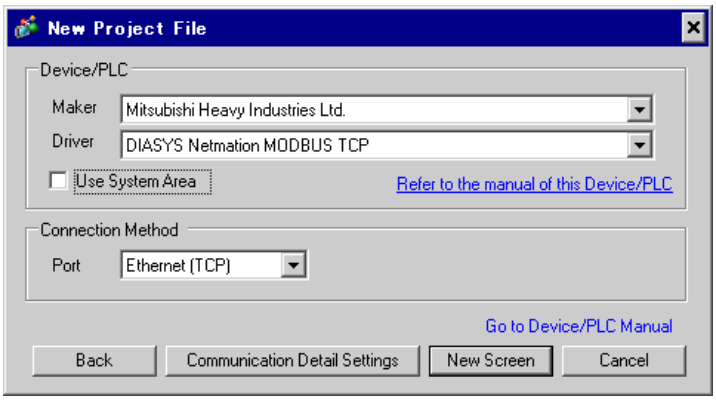


NOTE

- Please refer to the manual of the Netmation 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 Ltd.".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "DIASYS Netmation MODBUS TCP". Check the External Device which can be connected in "DIASYS Netmation 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 "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

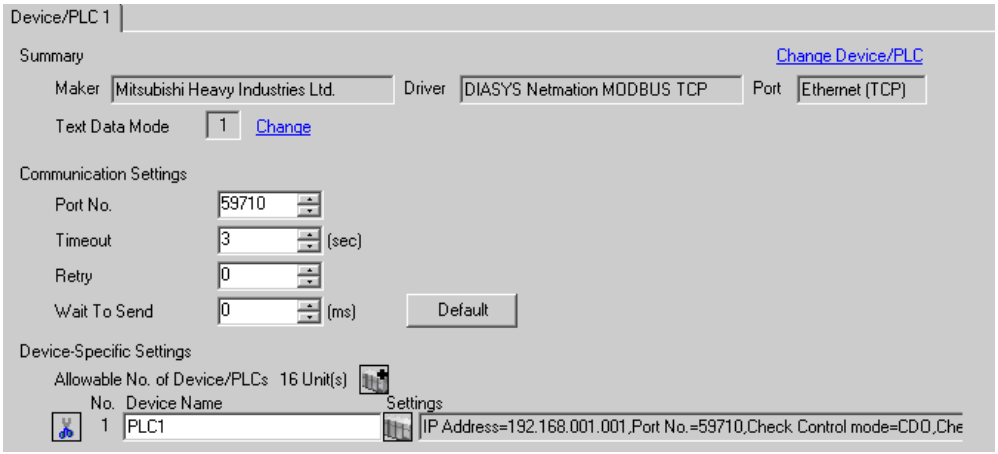
Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

3.1 Setting Example

■ Settings of GP-Pro EX

◆ Communication Settings

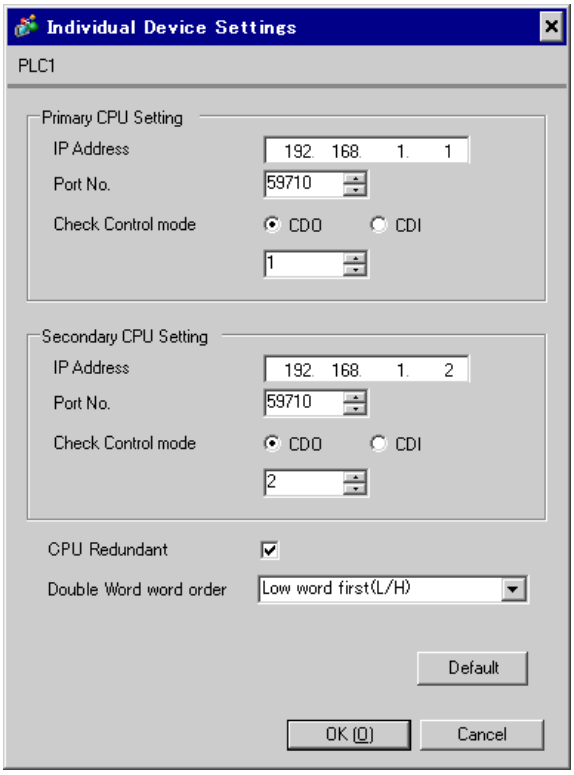
To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.



◆ 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.



◆ 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 off-line 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 off-line mode of the Display.

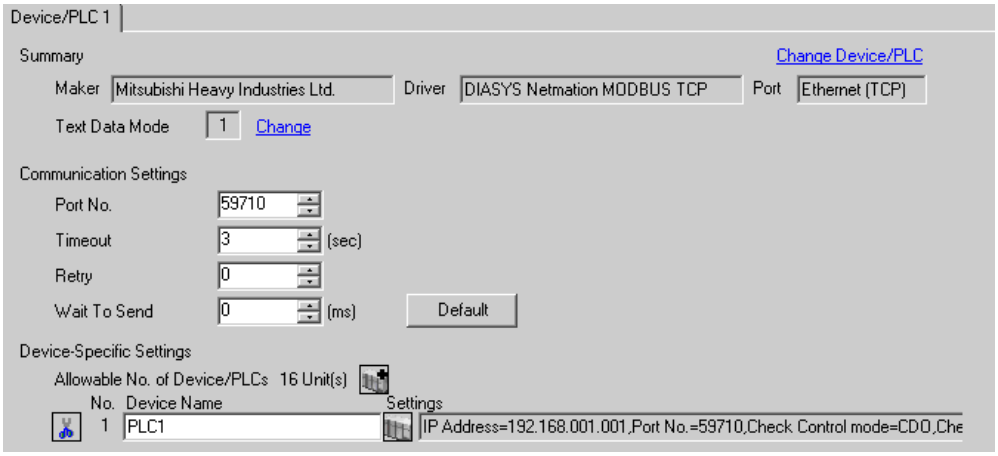
The setting of each parameter must be identical to that of External Device.

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

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.

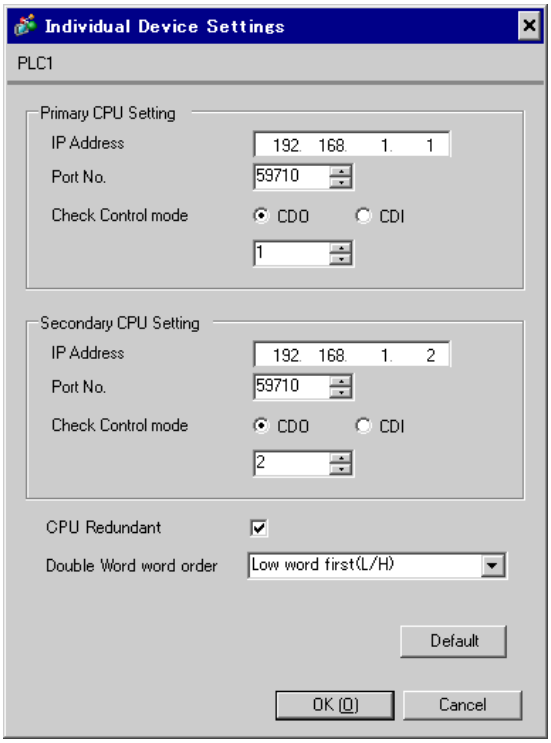


Setup Items	Setup Description
Port No.	Enter a port number of the Display with "1024-65535". (Initial value [59710])
Timeout	Use an integer from 1 to 127 to enter the time (s) for which Display waits for the response from External Device.
Retry	In case of no response from the External Device, use an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



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 Off-Line Mode

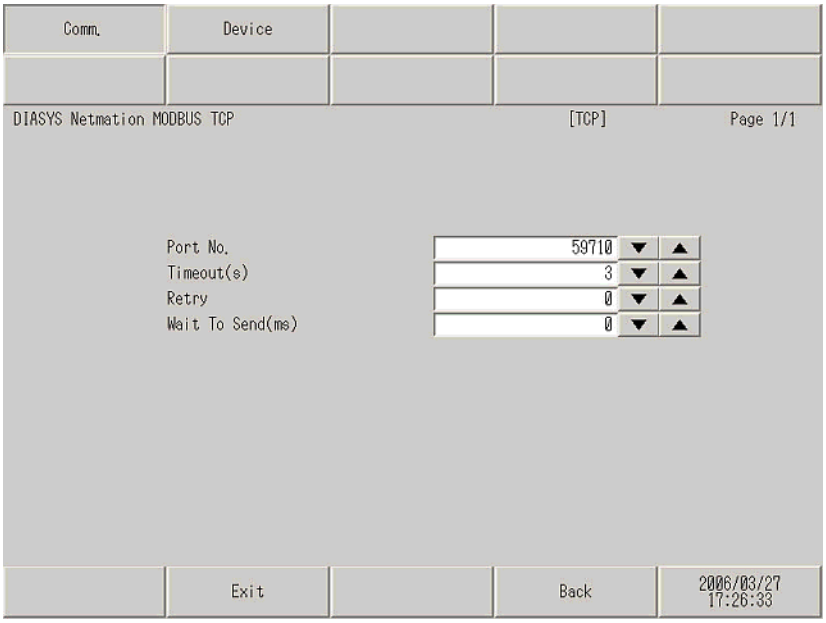
NOTE

- 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

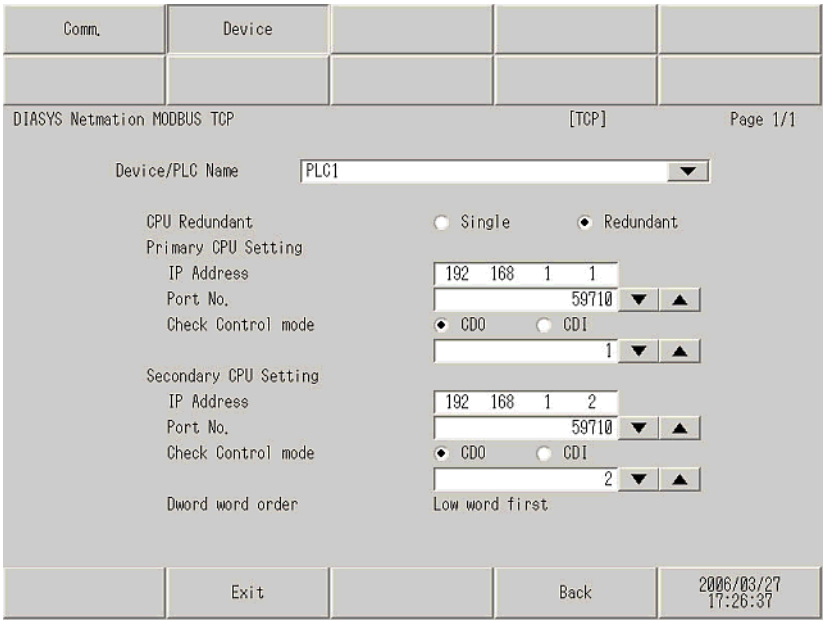
To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in off-line mode. Touch the External Device you want to set from the displayed list.



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].



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 Netmation CPU IP Address between "192.168.0.0 to 192.168.255.255".
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".

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	L/H	÷16+1
Digital Input	CDI 0001 - CDI 8000	CDI 0001 - CDI 7985		*1 ÷16+1
Analor 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 EXReference 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"

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
Analor 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	Displays IP address or device address of External Device where error occurs, or error codes received from External Device. **NOTE** • 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 [01H])"

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

■ 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.