

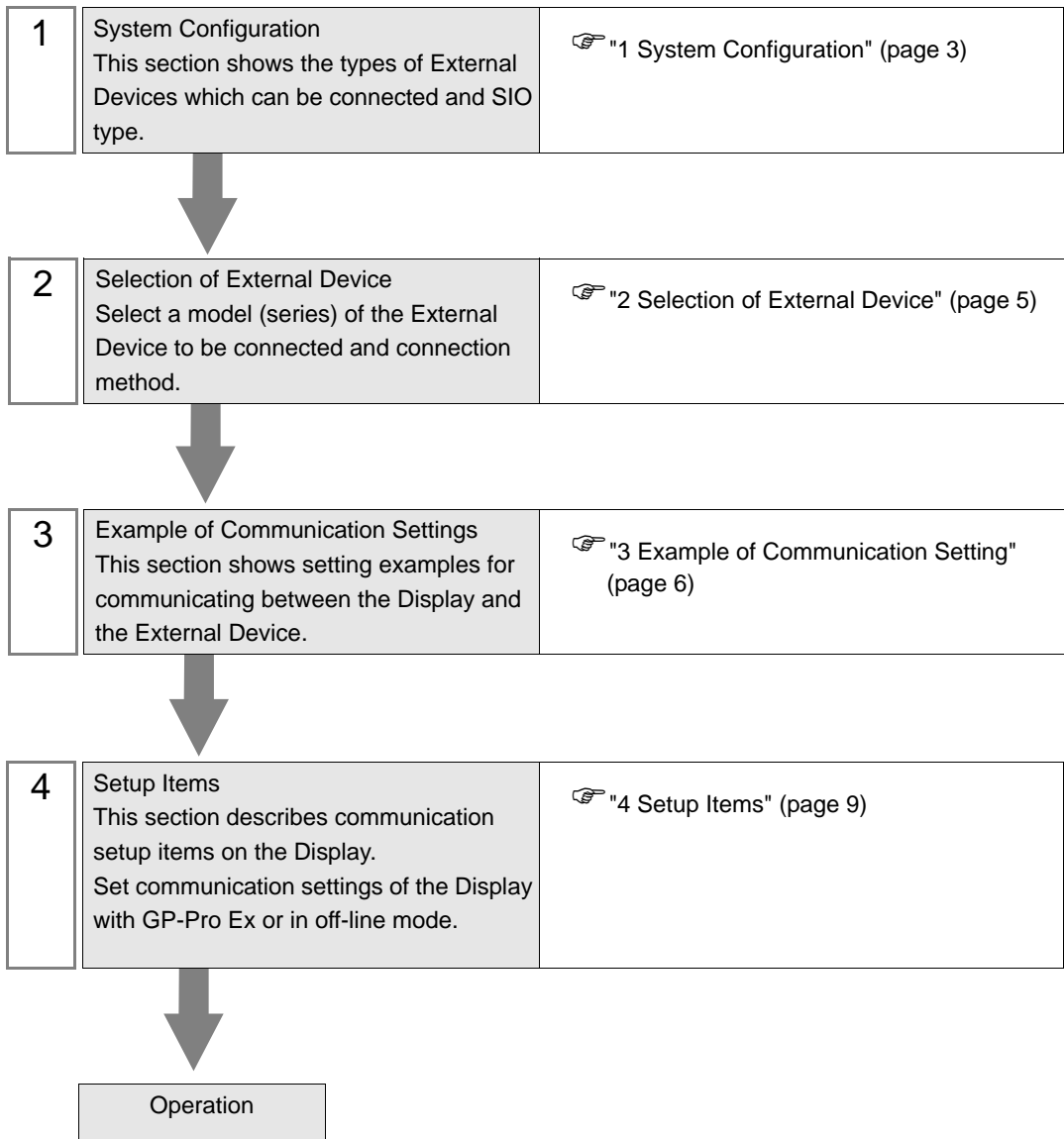
DIASYS Netmation MODBUS TCP Driver

| | | |
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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:



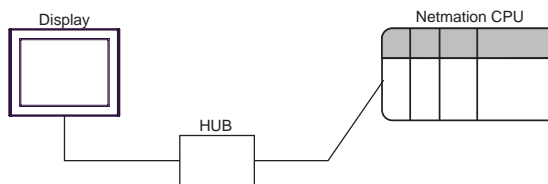
1 System Configuration

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

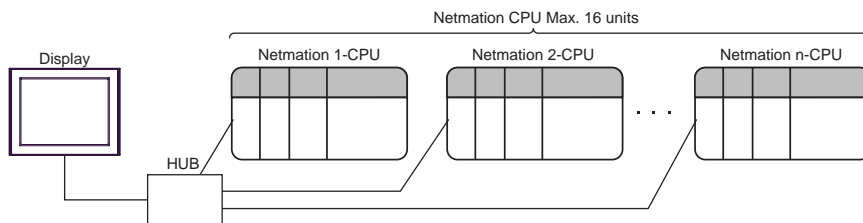
| CPU | Interface | Setting Example | Notes |
|---------------|----------------|-----------------------------|--|
| Netmotion CPU | Ethernet (TCP) | Setting Example (page 6) | The communication method that DIASYS Netmotion system supports is an external device of MODBUS TCP conformity. |

■ Connection Configuration

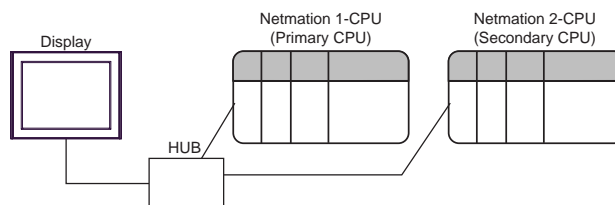
- 1:1 Connection (Ethernet single/Netmotion CPU single)



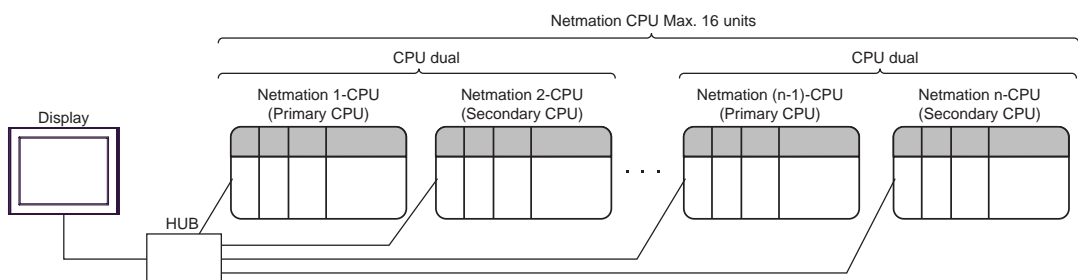
- 1:n Connection (Ethernet single/Netmotion CPU single)



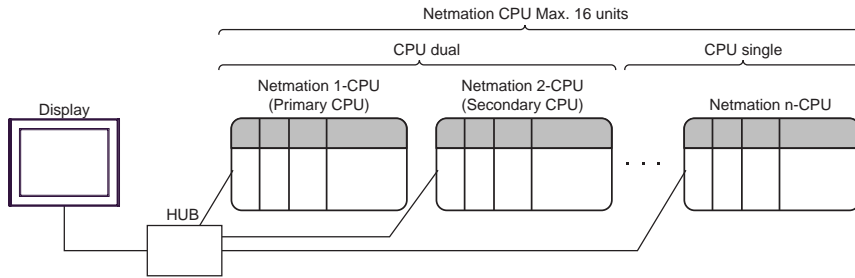
- 1:1 Connection (Ethernet single/Netmotion CPU dual)



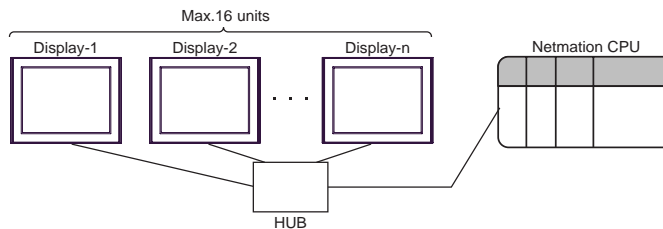
- 1:n Connection (Ethernet single/Netmotion CPU dual)



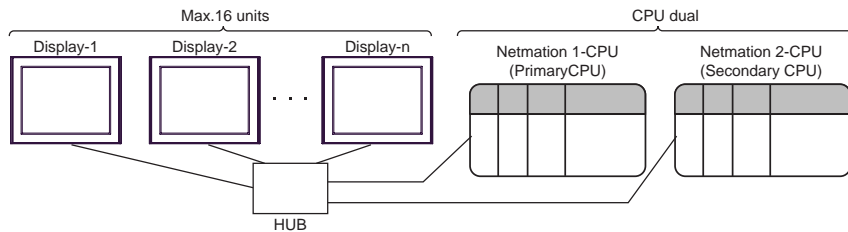
- 1:n Connection (Ethernet single/Netmation CPU single/dual mixed)



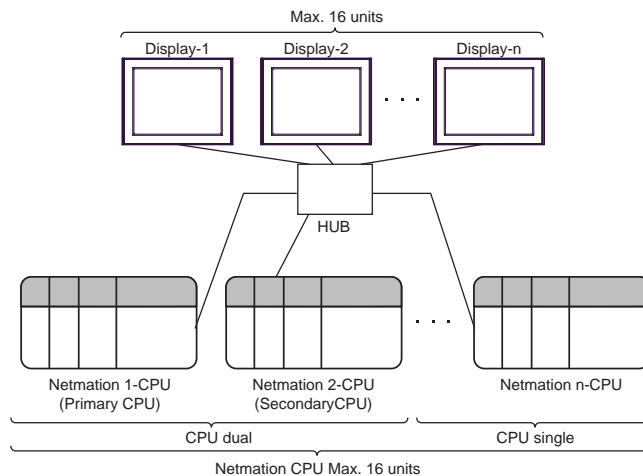
- n:1 Connection (Ethernet single/Netmation CPU single)



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



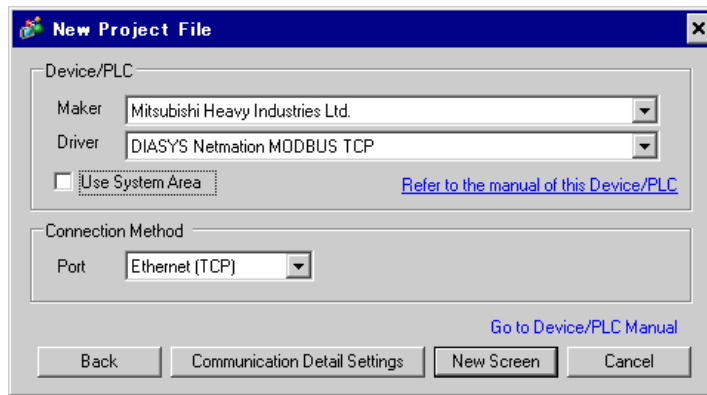
- n:m Connection (Ethernet single/Netmation CPU single/dual mixed)

**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 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 the Display and the device (memory) of the External Device. When they are synchronized, you can use the ladder program of the External Device to change screens or to pop up a window on the Display. Cf. GP Pro-EX Reference Manual "Appendix 1.4 LS Area (Direct Access Method)" This can also be set with GP Pro-EX or in the Display off-line mode. Cf. GP Pro-EX Reference Manual " 5.17.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.15.1 Settings common to all Display models◆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 Ltd. 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

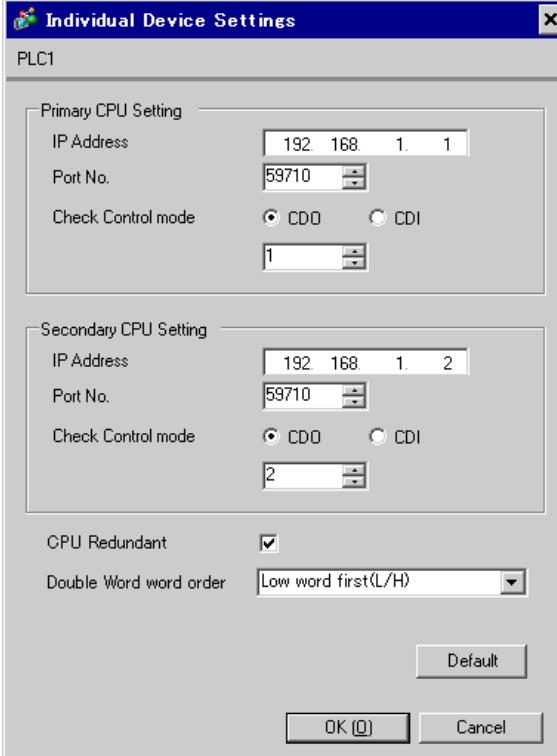
Allowable No. of Device/PLCs: 16 Unit(s)

| 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
 - 1
- Secondary CPU Setting**
 - IP Address: 192 168 1 2
 - Port No.: 59710
 - Check Control mode: ☒ CDD ☐ CDI
 - 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 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)

NOTE • Set the Display's IP address in off-line mode.

Cf. Maintenance/Troubleshooting Manual "2.5 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.

Device/PLC 1

Summary [Change Device/PLC](#)

Maker Driver Port

Text Data Mode [Change](#)

Communication Settings

Port No.

Timeout (sec)

Retry

Wait To Send (ms)


Device-Specific Settings

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

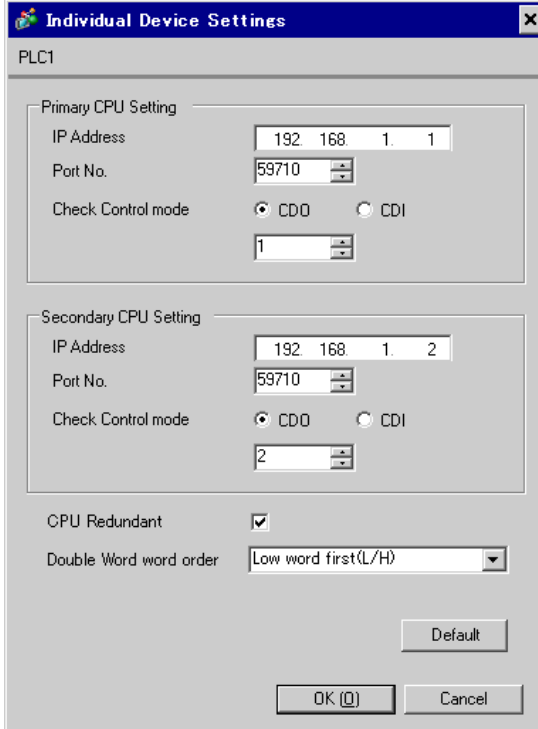
| No. | Device Name | Settings |
|-----|-------------|---|
| 1 | PLC1 | IP Address=192.168.001.001, Port No.=59710, Check Control mode=CDD, Che |

| 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 Off-Line Mode

NOTE

- Refer to the Maintenance/Troubleshooting manual for information on how to enter off-line mode or about the operation.

Cf. Maintenance/Troubleshooting Manual "2.2 Off-line Mode"

◆ 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.

| 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].




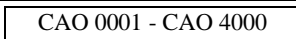
| | | | | |
|---|--|---|--|---------------------|
| Comm. | Device | | | |
| DIASYS Netmation MODBUS TCP [TCP] Page 1/1 | | | | |
| Device/PLC Name <input type="text" value="PLC1"/> | | | | |
| CPU Redundant | | <input type="radio"/> Single <input checked="" type="radio"/> Redundant | | |
| Primary CPU Setting | | | | |
| IP Address | <input type="text" value="192.168.1.1"/> | | | |
| 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="192.168.1.2"/> | | | |
| 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 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 |  |  |
| 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 "Appendix 1.4 LS Area (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 |
| 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; width: fit-content;"> 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 [01H])"

NOTE

- Refer to your External Device manual for details on received error codes.
- Refer to "When an error is displayed (Error Code List)" in "Maintenance/Troubleshooting Manual" 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. |

