



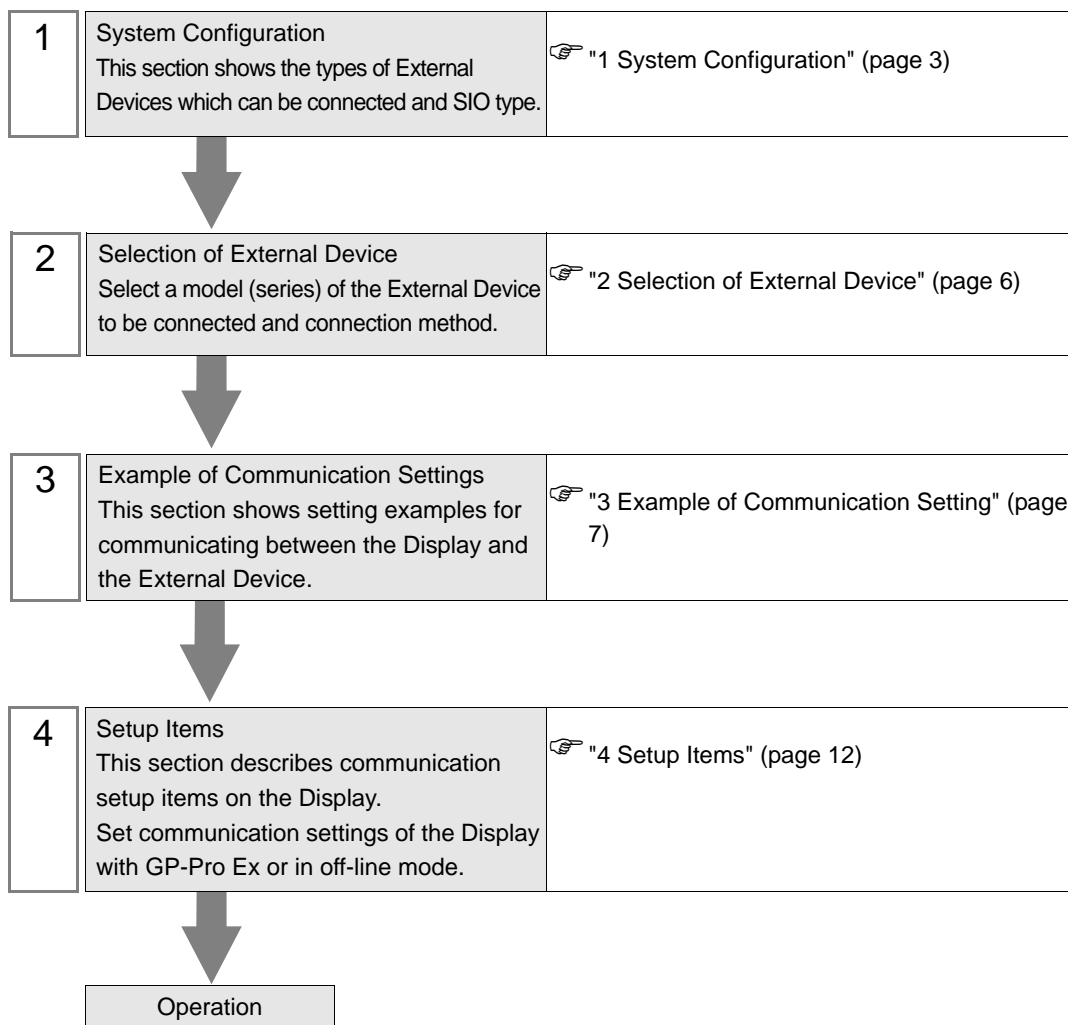
Series 90 Ethernet Driver

| | | |
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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:



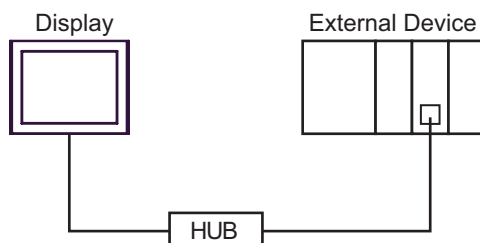
1 System Configuration

The system configuration in the case when the External Device of GE Fanuc Automation and the Display are connected is shown.

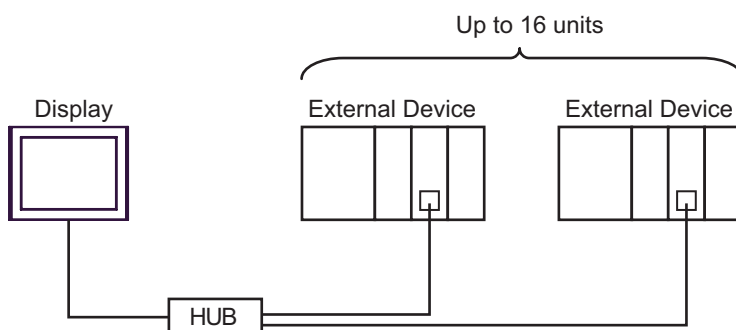
| Series Name | CPU | Link I/F | SIO Type | Setting Example |
|-----------------|--|---------------------------|----------------|----------------------------------|
| Series 90-30 | CPU311 CPU313 CPU323 CPU331 CPU340 CPU341 CPU350 CPU351 CPU352 CPU360 CPU363 CSE311 CSE313 CSE323 CSE331 CSE340 | IC693CMM321 | Ethernet (TCP) | "Setting Example 1" (page 7) |
| | CPU364 CPU374 | Ethernet interface on CPU | | "Setting Example 2" (page 9) |
| Series 90-70 | CPU731 CPU771 CPU772 CPU780 CPU781 CPU782 CPU788 CPU789 CPM790 CPM915 CPM925 CSE784 CSE924 CSE925 CPX772 CPX782 CPX928 CPX935 CGR772 CGR935 | IC697CMM742(Type2) | | "Setting Example 1" (page 7) |
| PACSystems RX7i | CPE010 CPE020 CRE020 | Ethernet interface on CPU | | "Setting Example 3" (page 10) |

■ Connection Configuration

- 1:1 Connection

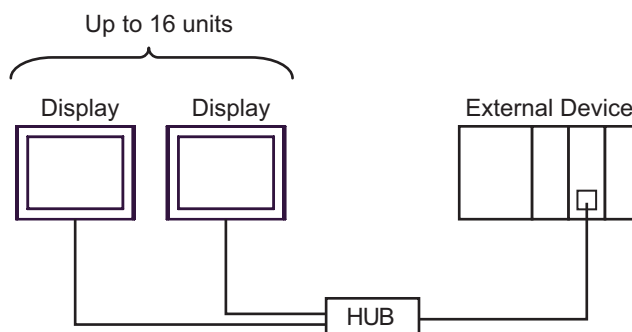


- 1:n Connection

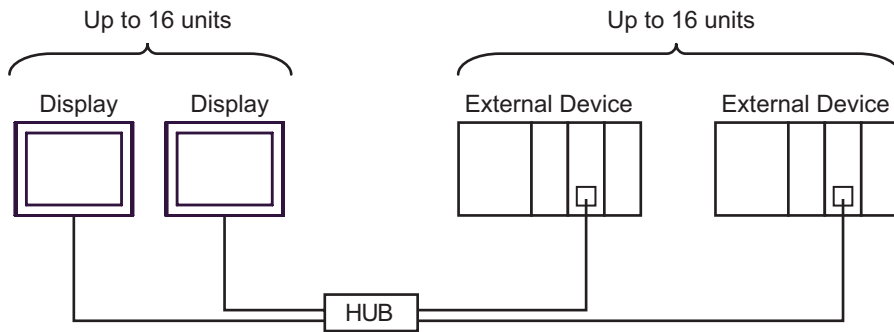


NOTE • Connecting multiple Series 90-30 devices requires a V6.50 or higher CPU. Check the version of the CPU in the dialog box displayed by clicking [Online Commands]-[Show Status] from the [Target] menu of the ladder software.

- n:1 Connection



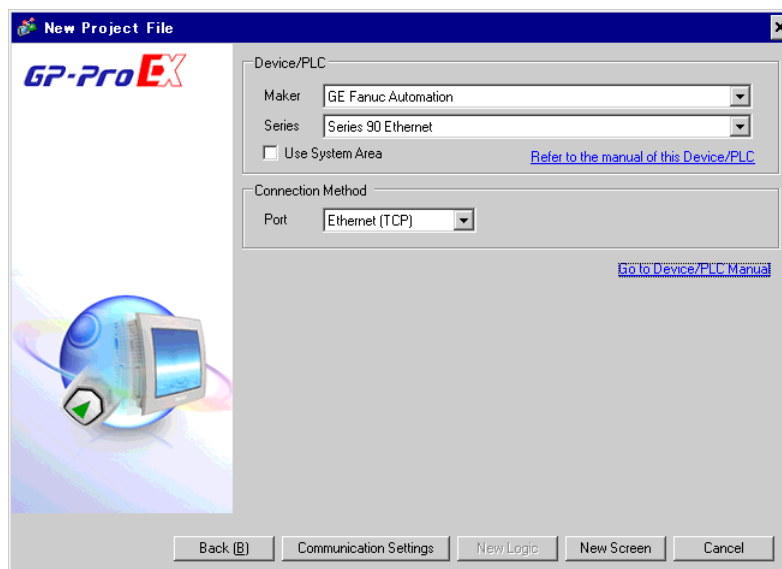
- n:m Connection

**NOTE**

- Connecting multiple Series 90-30 devices requires a V6.50 or higher CPU. Check the version of the CPU in the dialog box displayed by clicking [Online Commands]-[Show Status] from the [Target] menu of the ladder software.

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 "GE Fanuc Automation". |
| Series | Select a model (series) of the External Device to be connected and connection method. Select "Series 90 Ethernet". Check the External Device which can be connected in "Series 90 Ethernet" 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 synchronized, you can use the ladder program of the External Device to switch the display or display the window on the Display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (Direct Access Method)" This can be also set with GP-Pro EX or in off-line mode of the Display. Cf. GP-Pro EX Reference Manual "5.17.6 Setting Guide of [System Setting Window], Setting Guide of [Main Unit Settings], System Area Setting" Cf. Maintenance/Troubleshooting manual "2.15.1 Common to the Display", Setting Guide of [Main Unit Settings], System Area Setting" |
| Port | Select the Display port to be connected to the External Device. |

3 Example of Communication Setting

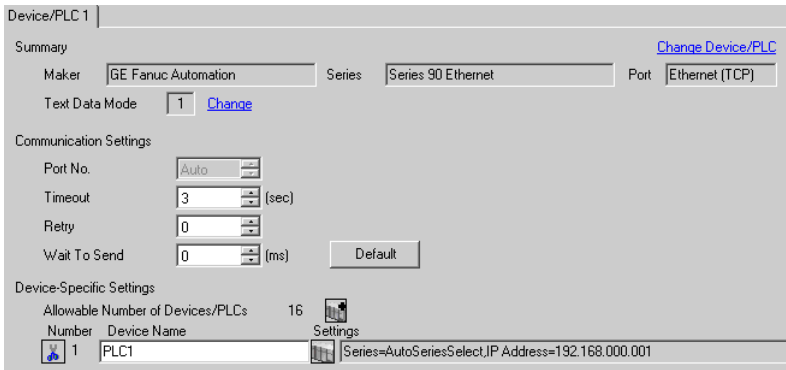
Examples of communication settings of the Display and the External Device, recommended by Digital Electronics Corp., are shown.

3.1 Setting Example 1


■ Settings of GP-Pro EX

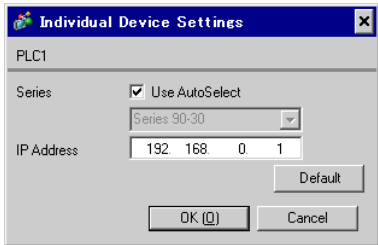
◆ Communication Settings

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 the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].



■ Settings of External Device

Use the ladder software for communication setting. (Operation confirmed using CIMPLICITY Machine Edition V4.50)

1. Select "GE Fanuc PLC" of "Add Target" from "Project" in the tool bar.
2. When the target is displayed in the project, open "Main Rack" from "Hardware Configuration" in the tree view and assign the using link I/F to the Slot.

NOTE • Rack or Slot number to be assigned varies depending on your environment. Check the environment before assignment.

3. Double-click the assigned link I/F to display the setting window.
4. Set IP Address and other items.
5. Download the setting in the External Device and restart the 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.
- Please refer to the manual of the ladder software for more detail on other setting description.

3.2 Setting Example 2

■ 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 the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

■ Settings of External Device

Use the ladder software for communication setting. (Operation confirmed using CIMPLICITY Machine Edition V4.50)

1. Select "GE Fanuc PLC" of "Add Target" from "Project" in the tool bar.
2. When the selected Series are displayed in the project, open "Main Rack" from "Hardware Configuration" in the tree view and assign the using CPU to the Slot.

NOTE • Rack or Slot number to be assigned varies depending on your environment. Check the environment before assignment.

3. Double-click the assigned CPU to display the CPU setting window.
4. Click the [Ethernet] tab to set IP address and other items.
5. Download the setting in the External Device and restart the External Device.

◆ Notes

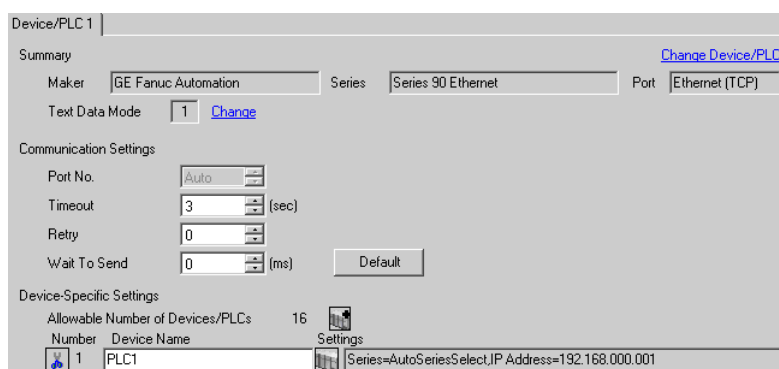
- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the display in the off-line mode of the Display.
- Please refer to the manual of the ladder software for more detail on other setting description.

3.3 Setting Example 3


■ Settings of GP-Pro EX

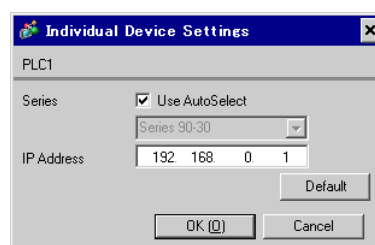
◆ Communication Settings

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 the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].



■ Settings of External Device

Use the ladder software for communication settings. (Operation confirmed using CIMPLICITY Machine Edition V4.50)

Confirm the MAC address of the External Device before setting. You can find the MAC address in [BATTERY ACCESS] on the front of the External Device.

1. Start the ladder software and create a new file.
2. Right-click [Target] in the tree view, and then select [Offline Commands]-[Set Temporary IP Address] from the menu that appears.
3. Enter the MAC address and IP address of the CPU in [MAC Address] and [IP Address to Set], respectively.
4. Click [Set IP] to write the configuration into the External Device.
This completes the IP address settings. Go on to the port settings.
5. Select [Target] in the tree view to display the configuration list.
6. Select "ETHERNET" from [Physical Port].
7. Download the above configuration to the 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.
- Please refer to the manual of the ladder software for details on other settings.

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 7)

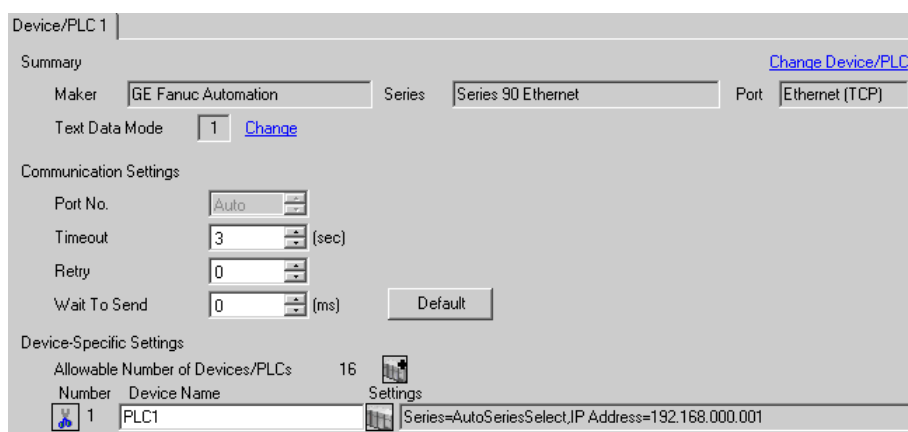
NOTE • Set the Display's IP address in off-line mode.

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.




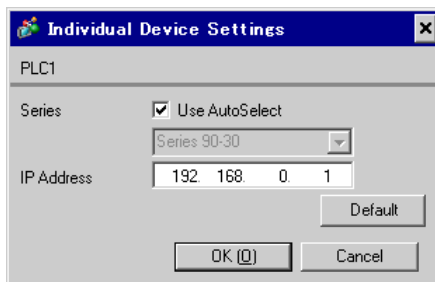
The screenshot shows the 'Device/PLC 1' settings window. It has a 'Summary' section with fields for 'Maker' (GE Fanuc Automation), 'Series' (Series 90 Ethernet), and 'Port' (Ethernet (TCP)). There is a 'Text Data Mode' set to '1' with a 'Change' link. The 'Communication Settings' section includes 'Port No.' (Auto), 'Timeout' (3 sec), 'Retry' (0), and 'Wait To Send' (0 ms) with a 'Default' button. The 'Device-Specific Settings' section shows 'Allowable Number of Devices/PLCs' (16) and a table with columns 'Number', 'Device Name', and 'Settings'. The table contains one entry: '1', 'PLC1', and 'Series=AutoSeriesSelect,IP Address=192.168.000.001'.

| Setup Items | Setup Description |
|--------------|--|
| Port No. | Assign the port No. of the External Device automatically. |
| 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. |

■ Device Setting

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

When connecting multiple External Devices, you can click  from [Device-Specific Settings] of [Device/PLC Settings] to add the External Device which is available to set.



| Setup Items | Setup Description |
|-------------|---|
| Series | To let the system automatically detect the series of the External Device, check [Use AutoSelect]. To set the series manually, clear [Use AutoSelect] and then select the series from the pull-down menu. |
| IP Address | Set IP address of the External Device. NOTE <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address. |

4.2 Settings 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 Equipment Settings] in off-line mode. Touch the External Device you want to set from the displayed list.

| Comm. | Device | | | |
|--|--------|------|--|------------------------|
| Series 90 Ethernet [TCP] Page 1/1 | | | | |
| <div>Port No. Auto</div> <div>Timeout(s) <input type="text" value="3"/> ▼ ▲</div> <div>Retry <input type="text" value="0"/> ▼ ▲</div> <div>Wait To Send(ms) <input type="text" value="0"/> ▼ ▲</div> | | | | |
| Exit | | Back | | 2006/01/17 17:20:24 |

| Setup Items | Setup Description |
|--------------|--|
| Port No. | Assign the port No. of the External Device automatically. |
| 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. |

■ Device Setting


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











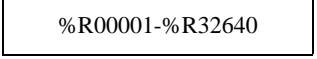




| | | | | |
|-----------------------------------|--------|------------------|--|------------------------|
| Comm. | Device | | | |
| Series 90 Ethernet [TCP] Page 1/1 | | | | |
| Device/PLC Name | | [PLC1] ▼ | | |
| Series | | AutoSeriesSelect | | |
| IP Address | | 192 168 0 1 | | |
| Exit | | Back | | 2007/07/20 15:39:59 |

| Setup Items | Setup Description |
|-----------------|---|
| Device/PLC name | Select the External Device to set. Device name is a title of the External Device set with GP-Pro EX. (Default value [PLC1]) |
| Series | Displays the series of the External Device. Use GP-Pro EX to set the series. |
| IP Address | Set IP address of the External Device. <div> NOTE <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address. </div> |

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 External Device.

 This address can be specified as system data area.

| Device | Bit Address | Word Address | 32 bit | Remarks |
|--------------------------|-------------------|--|---|--|
| Input Relay(%I) | %I00001-%I32768 | %I00001-%I32753 |  |  |
| Output Relay(%Q) | %Q00001-%Q32768 | %Q00001-%Q32753 | |  |
| Global Relay(%G) | %G00001-%G07680 | %G00001-%G07665 | |  |
| Internal Relay(%M) | %M00001-%M32768 | %M00001-%M32753 | |  |
| Temporary Relay(%T) | %T00001-%T01024 | %T00001-%T01009 | |  |
| System Status Relay(%S) | %S00001-%S00128 | %S00001-%S00113 | |  *1 |
| System Status Relay(%SA) | %SA00001-%SA00128 | %SA00001-%SA00113 | |  |
| System Status Relay(%SB) | %SB00001-%SB00128 | %SB00001-%SB00113 | |  |
| System Status Relay(%SC) | %SC00001-%SC00128 | %SC00001-%SC00113 | |  |
| Register(%R) | - |  %R00001-%R32640 | |  |
| Analog Input(%AI) | - | %AI00001-%AI32640 | |  |
| Analog Output(%AQ) | - | %AQ00001-%AQ32640 | |  |
| Word(%W)*2 | - | %W00000001-%W05224448 | |  |

*1 Write disable

*2 Available to use only in RX7i.

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 |
|---------------------|-------------|-------------------|------------------------|
| Input Relay | %I | 0080 | (Word Address - 1) /16 |
| Output Relay | %Q | 0081 | (Word Address - 1) /16 |
| Global Relay | %G | 0082 | (Word Address - 1) /16 |
| Internal Relay | %M | 0083 | (Word Address - 1) /16 |
| Temporary Relay | %T | 0084 | (Word Address - 1) /16 |
| System Status Relay | %S | 0085 | (Word Address - 1) /16 |
| | %SA | 0086 | (Word Address - 1) /16 |
| | %SB | 0087 | (Word Address - 1) /16 |
| | %SC | 0088 | (Word Address - 1) /16 |
| Register | %R | 0000 | Word Address - 1 |
| Analog Input | %AI | 0001 | Word Address - 1 |
| Analog Output | %AQ | 0002 | Word Address - 1 |
| Word ^{*1} | %W | 0010 | Word Address - 1 |

*1 Available to use only in RX7i.

7 Error Messages

Error messages are displayed on the screen of the 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 the External Device where error occurs. Name of External Device is a title of External Device set with GP-Pro EX.(Initial value[PLC1]) |
| Error Message | Displays messages related to the error which occurred. |
| Error Occurrence Area | Displays IP address or device address of External Device where error occurs, or error codes received from External Device. <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 addressi. • 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: 2[02H])"

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.

■ Driver-Specific Error Messages

Driver-specific error code is displayed in 2 Bytes; "Major Error Status Code(1 Byte)" and "Minor Error Status Code(1 Byte)". When receiving the error code from the External Device, added to the following message, "Major Error Status Code" followed by "Major" and followed by "Minor" are displayed. Please refer to the manual of the External Device for more detail on error codes.

Driver-specific error messages are shown below.

| MessageID | Error Message | Description |
|-----------|--|---|
| RHxx130 | (Device name): Error has been responded for device read command(Major: [Hex], Minor: [Hex]) | Displayed when error occurs by device read command. |
| RHxx131 | (Device name): Error has been responded for device write command(Major: [Hex], Minor: [Hex]) | Displayed when error occurs by device write command. |
| RHxx145 | (Device name): Unsupported devices exist in read devices | Displayed when trying to read "%W" device for PLC except RX7i. |
| RHxx146 | (Device name): Unsupported devices exist in write devices | Displayed when trying to write "%W" device for PLC except RX7i. |