YASKAWA Electric Corporation

MP Series Ethernet (Extension) Driver

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 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 4)

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 5)

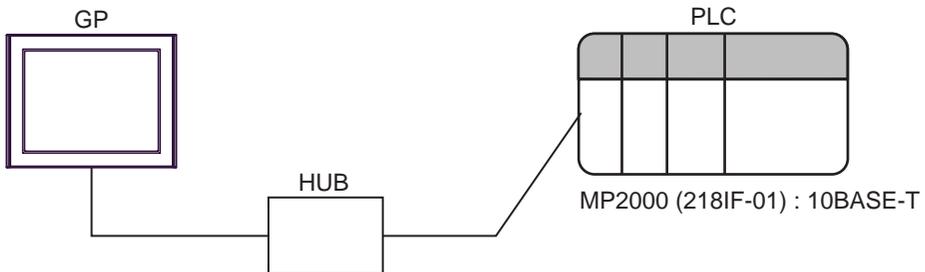| 4	Setup Items This section describes communication setup items on the Display. Set communication settings of the Display with GP-Pro Ex or in off-line mode.	☞ "4 Setup Items" (page 13)

Operation

1   System Configuration

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

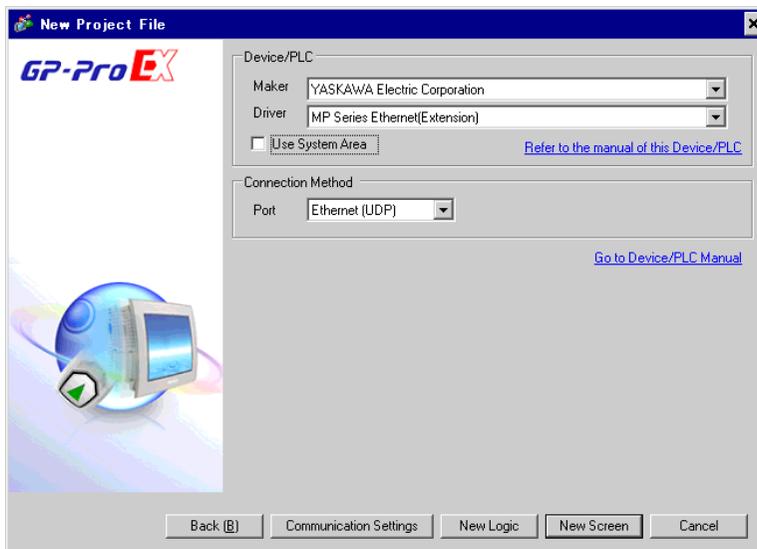| Series	CPU	Link I/F	SIO Type	Setting Example
MP2000	MP2300 MP2200	Ethernet port on 218IF-01	Ethernet (UDP)	"3.1 Setting Example 1" (page 5)
		Ethernet port on 218IF-02	Ethernet (UDP)	"3.4 Setting Example 4" (page 11)
	MP2310 MP2300S	Ethernet Connector on CPU unit	Ethernet (UDP)	"3.2 Setting Example 2" (page 7)
		Ethernet port on 218IF-01	Ethernet (UDP)	"3.3 Setting Example 3" (page 9)
		Ethernet port on 218IF-02	Ethernet (UDP)	"3.4 Setting Example 4" (page 11)
	MP2400	Ethernet Connector on CPU unit	Ethernet (UDP)	"3.2 Setting Example 2" (page 7)

■ Connection Configuration

• 1:1 Connection

MP2000 (218IF-01) : 10BASE-T

• 1:n Connection

The max number of PLC : 32

MP2000 (218IF-01) : 10BASE-T
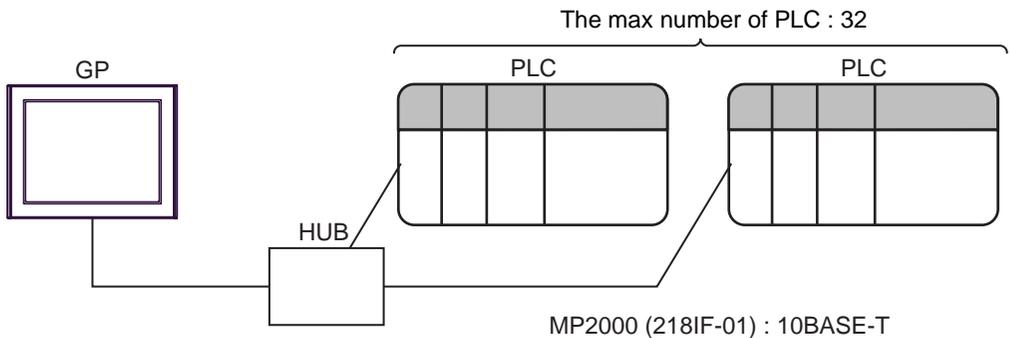
2　　　　Selection of External Device

Select the External Device to be connected to the Display.

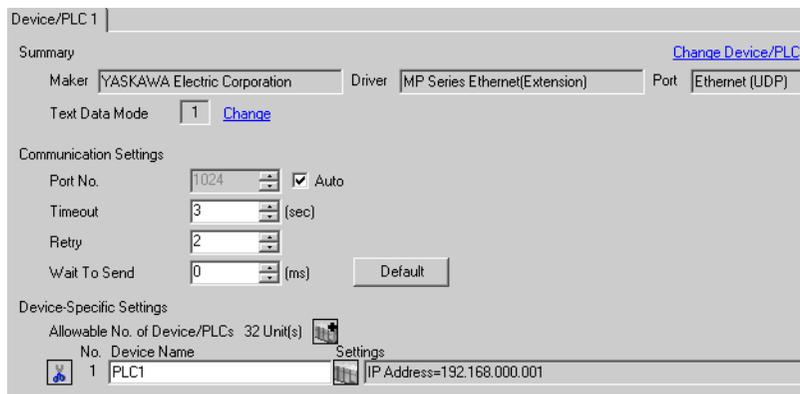| Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "YASKAWA Electric Corporation".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "MP Series Ethernet(Extension)". Check the External Device which can be connected in "MP Series Ethernet(Extension)" 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 (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 " 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 1

■ Settings of GP-Pro EX
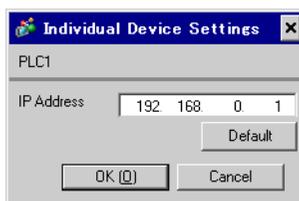
◆ Communication Settings

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 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

Communication setting of communication module 218IF-01 by ladder software (MPE720).

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

◆ Ladder Software Setting

1 Start ladder software, make an order folder and a PLC folder in a root folder.

2 Click the right button of the PLC which select logon in the displayed menu.

> NOTE
>
> • Logon after confirming that a check does not begin [online] of a displayed menu.
> • Refer to User's Manual of the PLC about a method of logon.

3 Double-click the [Definition folder]-[Module constitution] of the PLC folder, and display [Engineering Manager].

4 Select the rack classification and communication module, the pull-down menu in [Controller] of [Engineerring Manager].

Set the number corresponding to the slot number that a communication module uses.

Select the communication module, setting contents are displayed to [Module details] of [Enginnering Manager].

5 Double-click the number part at No. in [Module details].

Double-click the slot number connecting the ethernet unit.

Setup Items		Setup Description
Transmission parameter	This Station IP address	PLC IP address

> IMPORTANT
>
> • Please make the connection parameter a blank.
>   When the connection parameter is set, it cannot communicate.

6 Double-click the "No.1", and set serial communication.

Use serial communication setting to forward communication setting and the ladder program to the PLC.

7 Save setting content and finish [Engineering Manager].

8 DIP switch "INIT" of a communication module is ON and spend a power supply.

9 Forward communication setting to a communication module.

10 Logon the PLC at online and write in the data which transferred at flash memory.

11 Power supply of PLC is OFF and DIP switch of the INIT is OFF, after spend the power supply of PLC.
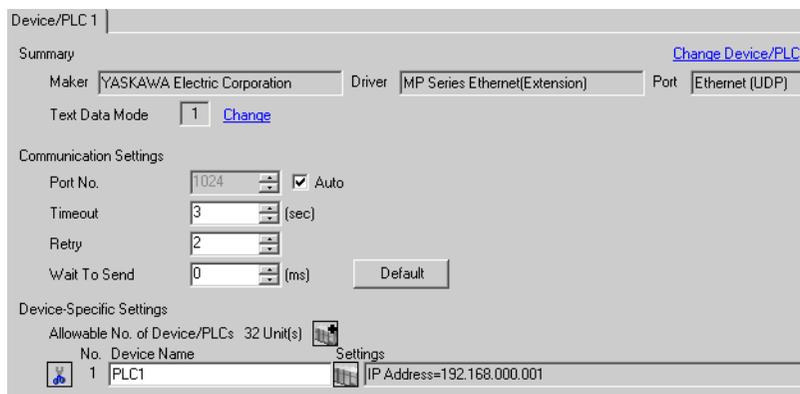
◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

3.2　　　　Setting Example 2

■ Settings of GP-Pro EX
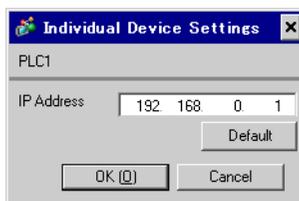
◆ Communication Settings

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 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

Communication setting of communication module CPU unit by ladder software (MPE720).

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

◆ Ladder Software Setting

1 Start ladder software, make an order folder and a PLC folder in a root folder.

2 Click the right button of the PLC which select logon in the displayed menu.

| NOTE | • Logon after confirming that a check does not begin [online] of a displayed menu.
• Refer to User's Manual of the PLC about a method of logon. |

3 Double-click the [Definition folder]-[Module constitution] of the PLC folder, and display [Engineering Manager].

4 Select the rack classification and communication module, the pull-down menu in [Controller] of [Engineerring Manager].

Set the number corresponding to the slot number that a communication module uses.

Select the communication module, setting contents are displayed to [Module details] of [Enginnering Manager].

5 Double-click the number part at No. in [Module details].

Double-click the slot number connecting the ethernet unit.

Setup Items		Setup Description
Transmission parameter	This Station IP address	PLC IP address

| IMPORTANT | • Please make the connection parameter a blank.
When the connection parameter is set, it cannot communicate. |

6 Save setting content and finish [Engineering Manager].

7 DIP switch "INIT" of a communication module is ON and spend a power supply.

8 Forward communication setting to a communication module.

9 Logon the PLC at online and write in the data which transferred at flash memory.

10 Power supply of PLC is OFF and DIP switch of the INIT is OFF, after spend the power supply of PLC.
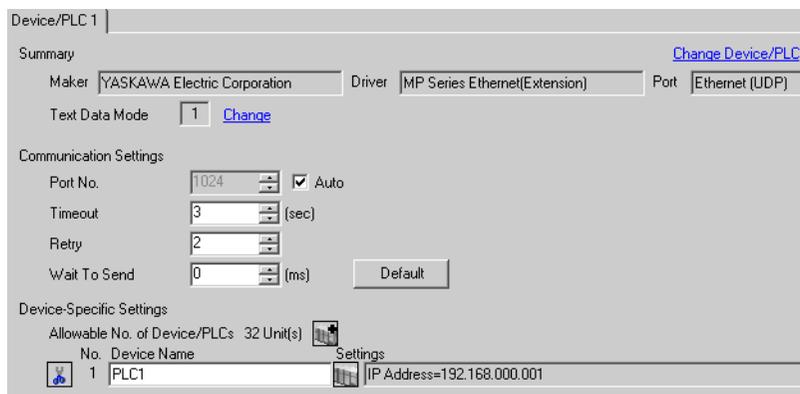
◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

3.3   Setting Example 3

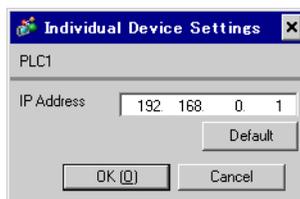■ Settings of GP-Pro EX

◆ 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 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

Communication setting of communication module 218IF-01 by ladder software (MPE720).

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

◆ Ladder Software Setting

1 Start ladder software, make an order folder and a PLC folder in a root folder.

2 Click the right button of the PLC which select logon in the displayed menu.

NOTE	• Logon after confirming that a check does not begin [online] of a displayed menu.
	• Refer to User's Manual of the PLC about a method of logon.

3 Double-click the [Definition folder]-[Module constitution] of the PLC folder, and display [Engineering Manager].

4 Select the rack classification and communication module, the pull-down menu in [Controller] of [Engineerring Manager].

Set the number corresponding to the slot number that a communication module uses.

Select the communication module, setting contents are displayed to [Module details] of [Enginnering Manager].

5 Double-click the number part at No. in [Module details].

Double-click the slot number connecting the ethernet unit.

Setup Items		Setup Description
Transmission parameter	This Station IP address	PLC IP address

IMPORTANT	• Please make the connection parameter a blank.
	When the connection parameter is set, it cannot communicate.

6 Save setting content and finish [Engineering Manager].

7 DIP switch "INIT" of a communication module is ON and spend a power supply.

8 Forward communication setting to a communication module.

9 Logon the PLC at online and write in the data which transferred at flash memory.

10 Power supply of PLC is OFF and DIP switch of the INIT is OFF, after spend the power supply of PLC.
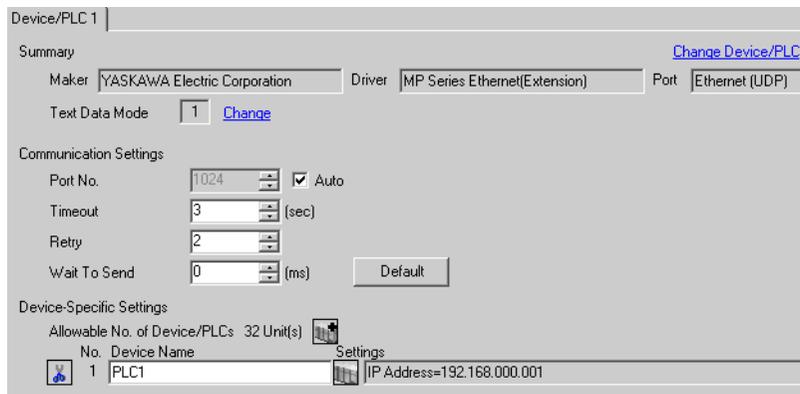
◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

3.4 Setting Example 4

■ Settings of GP-Pro EX
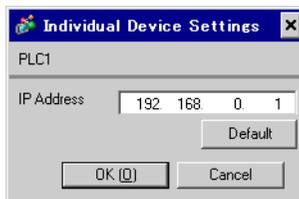
◆ Communication Settings

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

Communication setting of communication module 218IF-02 by ladder software (MPE720).

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

◆ Ladder Software Setting

1 Start ladder software, make an order folder and a PLC folder in a root folder.

2 Click the right button of the PLC which select logon in the displayed menu.

NOTE	• Logon after confirming that a check does not begin [online] of a displayed menu.
	• Refer to User's Manual of the PLC about a method of logon.

3 Double-click the [Definition folder]-[Module constitution] of the PLC folder, and display [Engineering Manager].

4 Select the rack classification and communication module, the pull-down menu in [Controller] of [Engineerring Manager].

Set the number corresponding to the slot number that a communication module uses.

Select the communication module, setting contents are displayed to [Module details] of [Enginnering Manager].

5 Double-click the number part at No. in [Module details].

Double-click the slot number connecting the ethernet unit.

Setup Items		Setup Description
Transmission parameter	This Station IP address	PLC IP address

IMPORTANT	• Please make the connection parameter a blank. When the connection parameter is set, it cannot communicate.

6 Save setting content and finish [Engineering Manager].

7 DIP switch "INIT" of a communication module is ON and spend a power supply.

8 Forward communication setting to a communication module.

9 Logon the PLC at online and write in the data which transferred at flash memory.

10 Power supply of PLC is OFF and DIP switch of the INIT is OFF, after spend the power supply of PLC.

◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

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)

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.

Setup Items	Setup Description
Port No.	Enter a port number of the External Device, using 1024 to 65535. Check into [Auto], and a port number is set automatically.
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
IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.

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.

| Setup Items	Setup Description
Port No.	Enter a port number of the GP-Pro EX. Select either of "Fixed" "Auto". Enter a port number of the GP-Pro EX with "1024-65535", when select "Fixed". Assign automatically without affecting the input value, when select "Auto".
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].
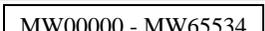
Comm.	Device			

MP Series Ethernet(Extension)　　　　　　　　　　[UDP]　　　　Page 1/1

　　　　　Device/PLC Name　┌PLC1　　　　　　　　　　　▼┐

　　　　　　　　　　　IP Address　　　　┌192 168　0　1┐

	Exit		Back	2038/08/01 14:38:00

Setup Items	Setup Description
Device/PLC Name	Select the External Device for device setting. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.

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.
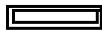
⬚⬚⬚ This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Notes
System registers	SB000000 - SB08191F	SW00000 - SW08191		
Input registers	IB00000 - IBFFFFF	IW0000 - IWFFFF	⌐L / H⌐	*1
Output registers	OB00000 - OBFFFFF	OW0000 - OWFFFF		*1
Data registers	MB000000 - MB65534F	MW00000 - MW65534		

*1   As for Input and Output registers, device 0x9000-0xFFFF cannot be written.

NOTE

• Please refer to the GP-Pro EX Reference Manual for system data area.

   Cf.   GP-Pro EXReference 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
System registers	SW/SB	0080	Word address
Input registers	IW/IB	0001	Word address
Output registers	OW/OB	0081	Word address
Data registers	MW/MB	0000	Word address

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: 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.

■ Error Code Peculiar to PLC

The error code peculiar to PLC is as follows.

Error code	Description
0x90	Transfer error.
0x92	Illegal parameter.
0x96	Register No. over.
0x9C	File is modified.
0x9D	Data access error.

■ Error Messages Specific to the External Device

Message ID	Error Message	Description
RHxx128	"(Node Name):PLC is busy now(Error Code: [Hex])"	PLC is "Busy"
RHxx129	"(Node Name):Option module is not mounted(Error Code: [Hex])"	Option module not mount.
RHxx130	"(Node Name):Module is not ready(Error Code: [Hex])"	Module is not ready
RHxx131	"(Node Name):CPU is stopped(Error Code: [Hex])"	CPU is stopped
RHxx132	"(Node Name): Write protected(Error Code: [Hex])"	Write protected