Mitsubishi Electric Corporation

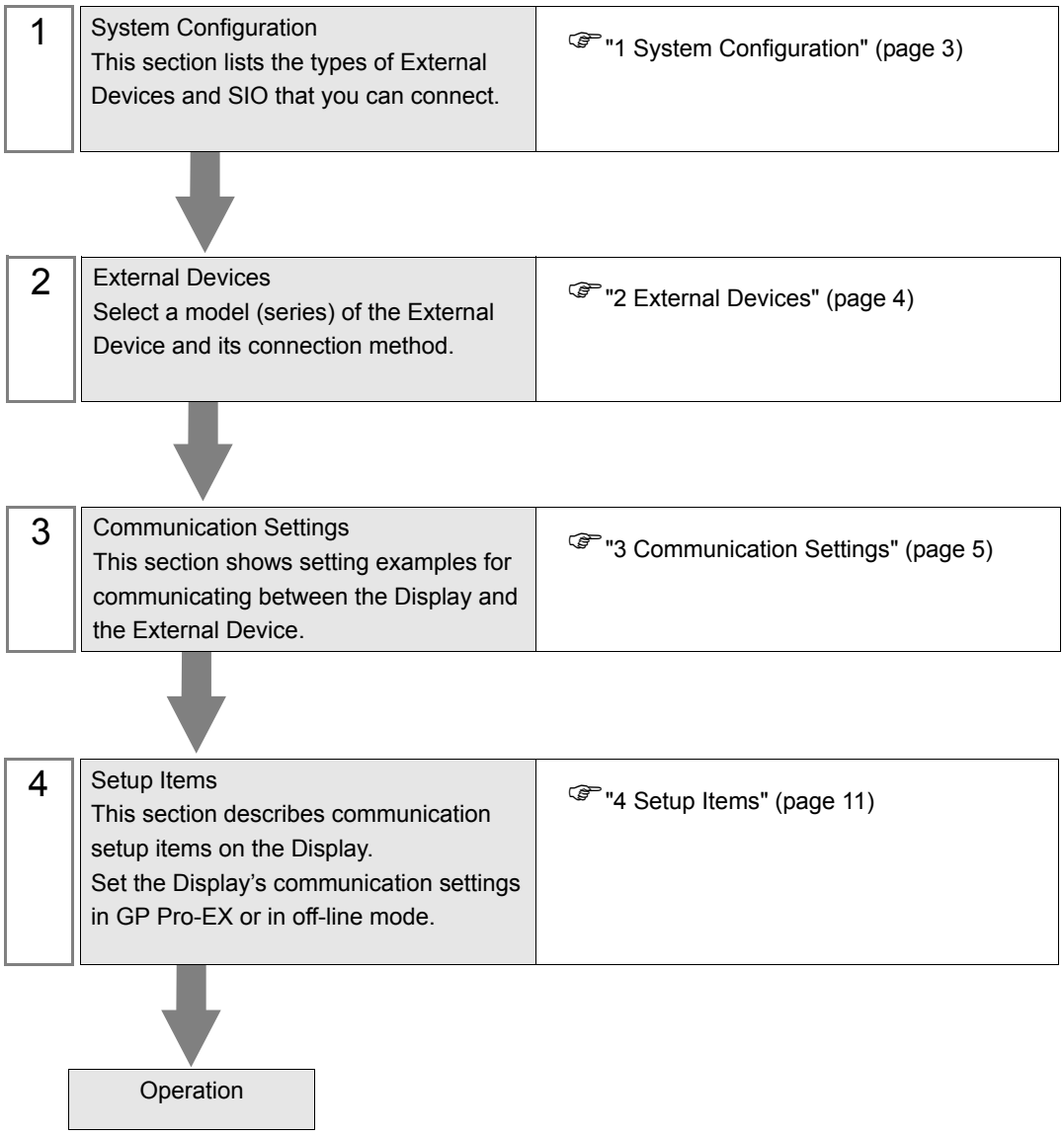
FX Series Ethernet Driver

1 System Configuration 3
2 External Devices 4
3 Communication Settings 5
4 Setup Items 11
5 Supported Devices 15
6 Device Code and Address Code 16
7 Error Messages 17

Introduction

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

In this manual, the connection procedure is described in the sections identified below:



1 System Configuration

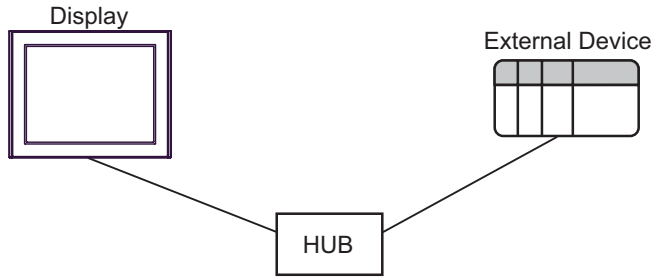
This section shows system configurations between the Mitsubishi Electric Corporation External Device and the Display.

Series	CPU	Link I/F	SIO Type	Setting Example	Series
MELSEC-FX	FX3U*1	FX3U-ENET	Ethernet (UDP)	UDP	"Setting Example 1" (page 5)
			Ethernet (TCP)	Unpassive	"Setting Example 2" (page 7)
			Ethernet (TCP)	Full passive	"Setting Example 3" (page 9)

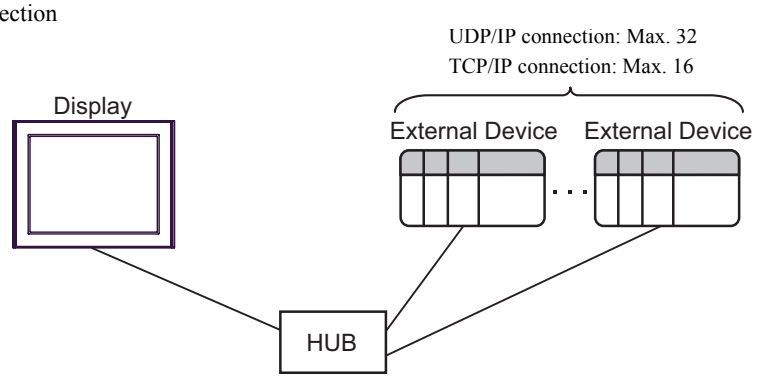
*1 Use a UPU with a system version 2.21 or greater.

■ Connection Configuration

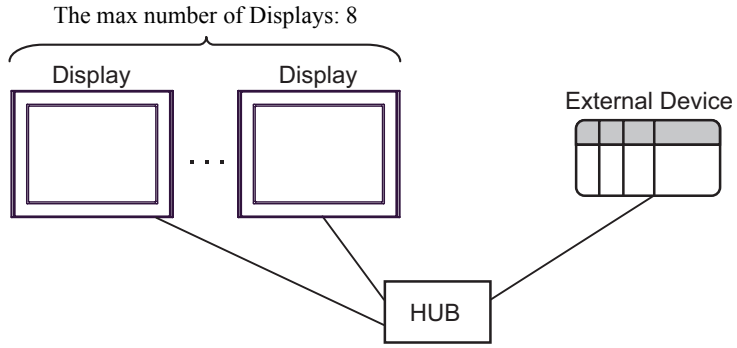
- 1:1 Connection



- 1:n Connection

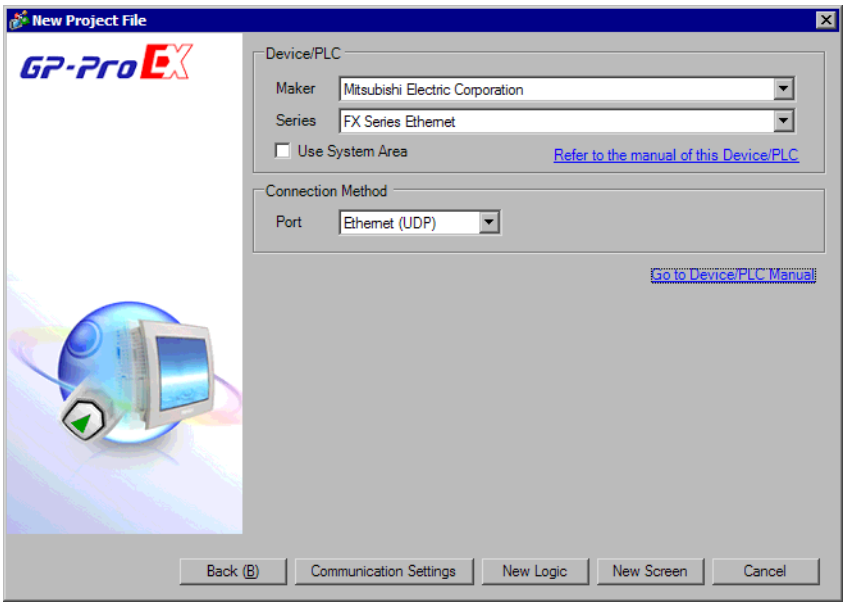


- n:1 Connection



2 External Devices

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 Electric Corporation".
Series	Select a model (series) of the External Device to be connected and connection method. Select "FX Series Ethernet". In System configuration, check to make sure the external device to which you are connecting is supported in "FX Series Ethernet". ☞ "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 " 5.14.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.14.1 Settings common to all Display models◆System Area Settings"
Port	Select the port of the Display to be connected to the External Device from “Ethernet (UDP)” and “Ethernet (TCP)”.

3 Communication Settings

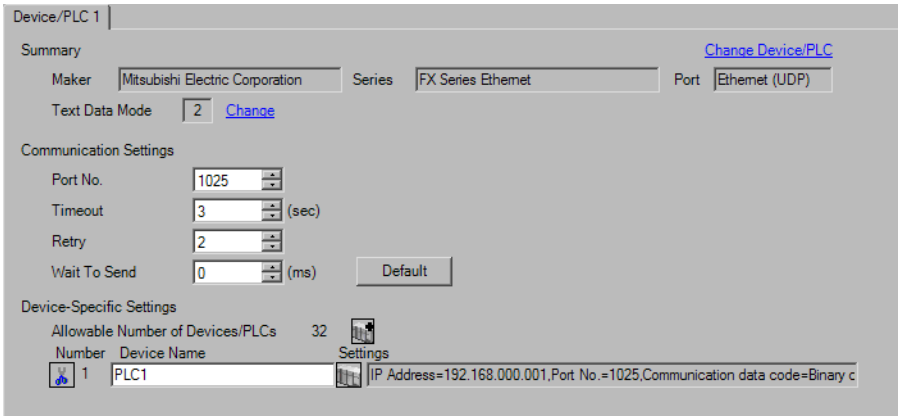
This section provides examples of communication settings recommended by Pro-face for the Display and the External Device.

3.1 Setting Example 1

■ GP Pro-EX Settings

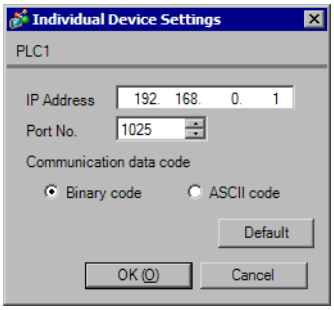
◆ Communication Settings

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



◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in off-line mode.

■ External Device Settings

Use the configuration tool (FX Configurator-EN) by Mitsubishi Electric Corporation for External Device communication settings. Refer to your External Device manual for details.

◆ Procedure

1 Start up the configuration tool.

2 From the [Ethernet Module Settings] drop-down menu, select the FX3U-ENET module number to be set.

3 Click [Operational settings], and set the setup items as follows.

Setup Items	Setting Value
Communication data code	Binary code
Initial timing	Always wait for OPEN
IP address	192.168.0.1
Send frame setting	Ethernet (V2.0)
TCP Existence setting	Arbitrary

4 Click [End].

5 Click [Open settings], and set the setup items as follows.

Setup Items	Setting Value
Protocol	UDP/IP
Fixed buffer	Send
Fixed buffer communication procedure	Procedure exist (MC)
Pairing open	Setting is unnecessary.
Existence confirmation	Arbitrary
Host station Port No.(DEC.)	1025
Transmission target device IP address	192.168.0.2
Transmission target device Port No.(DEC.)	1025

6 Click [End].

This completes the setting of the External Device.

◆ Notes

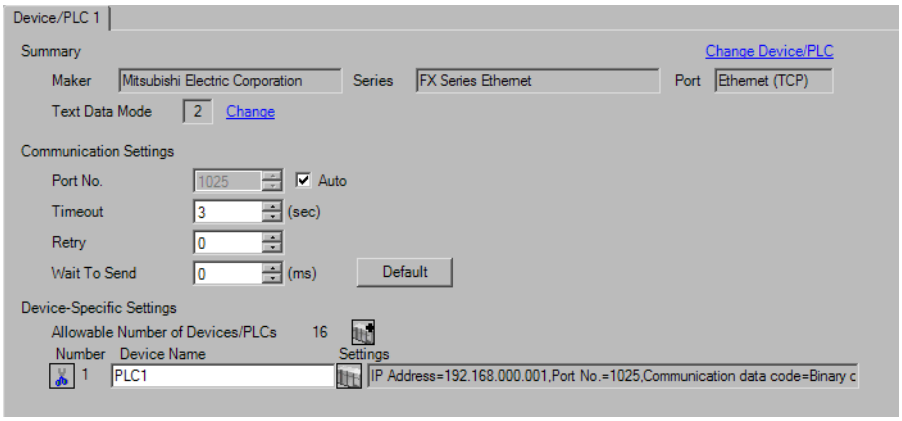
- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.

3.2 Setting Example 2

■ GP Pro-EX Settings

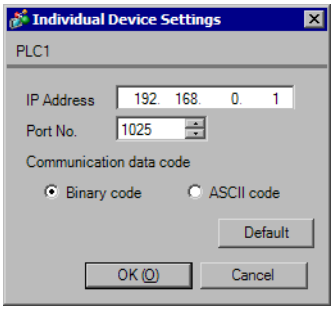
◆ Communication Settings

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



◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in off-line mode.

■ External Device Settings

Use the configuration tool (FX Configurator-EN) by Mitsubishi Electric Corporation for External Device communication settings. Refer to your External Device manual for details.

◆ Procedure

1 Start up the configuration tool.

2 From the [Ethernet Module Settings] drop-down menu, select the FX3U-ENET module number to be set.

3 Click [Operational settings], and set the setup items as follows.

Setup Items	Setting Value
Communication data code	Binary code
Initial timing	Always wait for OPEN
IP address	192.168.0.1
Send frame setting	Ethernet (V2.0)
TCP Existence setting	Arbitrary

4 Click [End].

5 Click [Open settings], and set the setup items as follows.

Setup Items	Setting Value
Protocol	TCP/IP
Open system	Unpassive
Fixed buffer	Send
Fixed buffer communication procedure	Procedure exist (MC)
Pairing open	Setting is unnecessary.
Existence confirmation	Arbitrary
Host station Port No.(DEC.)	1025
Transmission target device IP address	192.168.0.2
Transmission target device Port No.(DEC.)	1025

6 Click [End].

This completes the setting of the External Device.

◆ Notes

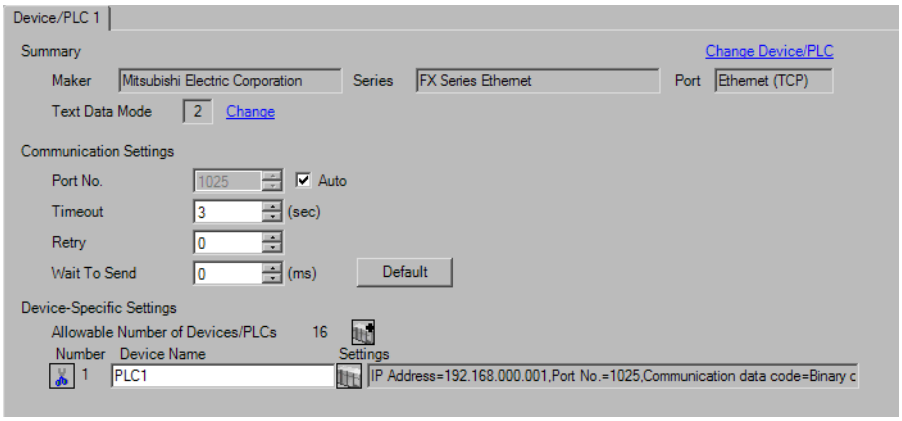
- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.

3.3 Setting Example 3

■ Settings of GP Pro-EX

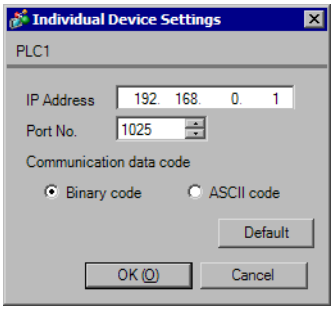
◆ Communication Settings

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



◆ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window. To connect multiple External Devices, click from [Device-Specific Settings] in the [Device/PLC] window to add another External Device.



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in off-line mode.

■ External Device Settings

Use the configuration tool (FX Configurator-EN) by Mitsubishi Electric Corporation for External Device communication settings. Refer to your External Device manual for details.

◆ Procedure

1 Start up the configuration tool.

2 From the [Ethernet Module Settings] drop-down menu, select the FX3U-ENET module number to be set.

3 Click [Operational settings], and set the setup items as follows.

Setup Items	Setting Value
Communication data code	Binary code
Initial timing	Always wait for OPEN
IP address	192.168.0.1
Send frame setting	Ethernet(V2.0)
TCP Existence setting	Arbitrary

4 Click [End].

5 Click [Open settings], and set the setup items as follows.

Setup Items	Setting Value
Protocol	TCP/IP
Open system	Full passive
Fixed buffer	Send
Fixed buffer communication procedure	Procedure exist (MC)
Pairing open	Setting is unnecessary.
Existence confirmation	Arbitrary
Host station Port No.(DEC.)	1025
Transmission target device IP address	192.168.0.2
Transmission target device Port No.(DEC.)	1025

6 Click [End].

This completes the setting of the External Device.

◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.

4 Setup Items

Set up the Display's communication settings in GP Pro-EX or in the Display's off-line mode.

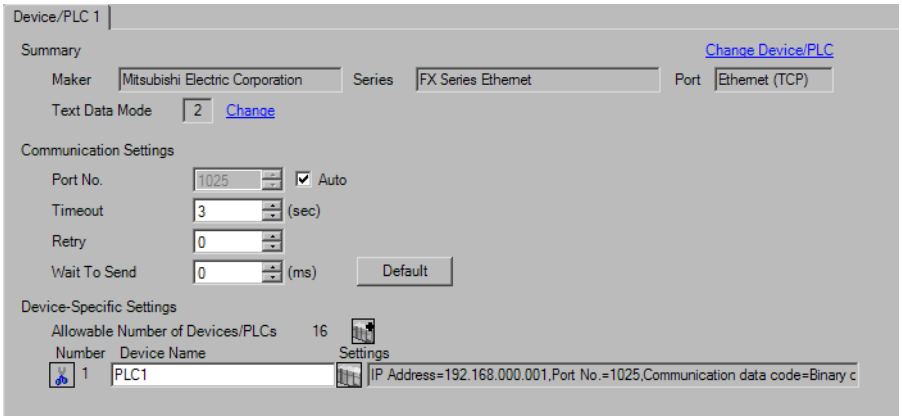
The setting of each parameter must match that of the External Device.

☞"3 Communication Settings" (page 5)

4.1 Setup Items in GP Pro-EX

■ Communication Settings

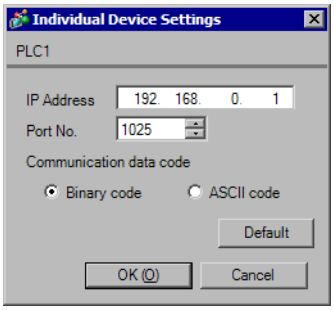
To display the setup screen, from the [System Settings] workspace, select [Device/PLC].



Setup Items	Setup Description
Port No.	Use an integer from 1024 to 65535 to enter the port number of the Display. If you check [Auto], the port number will be automatically set. **NOTE** • [Auto] option is available to set only when you select [Ethernet (TCP)] in [Connecting Method].
Timeout	Enter the time(s) for which the display unit waits for the response from the External Device, from 1 to 127.
Retry	If there is no response from the External Device, enter how many times the display unit retransmits the command, from 0 to 255
Wait To Send	Enter the standby time (ms) from when the display unit receives packets until it transmits the next command, from 0 to 255.

■ Device Setting

To display the [Individual Device Settings] dialog box, select the external device and click [Settings] from [Device-Specific Settings] in the [Device/PLC] window.



Setup Items	Setup Description
IP Address	Set the IP address of the External Device. **NOTE** • Check with your network administrator about the IP address you want to use. • Do not duplicate IP addresses on the same network.
Port No.	Use an integer from 1024 to 65535 to enter the port number of the External Device.
Communication data code	Select data code of communication data.

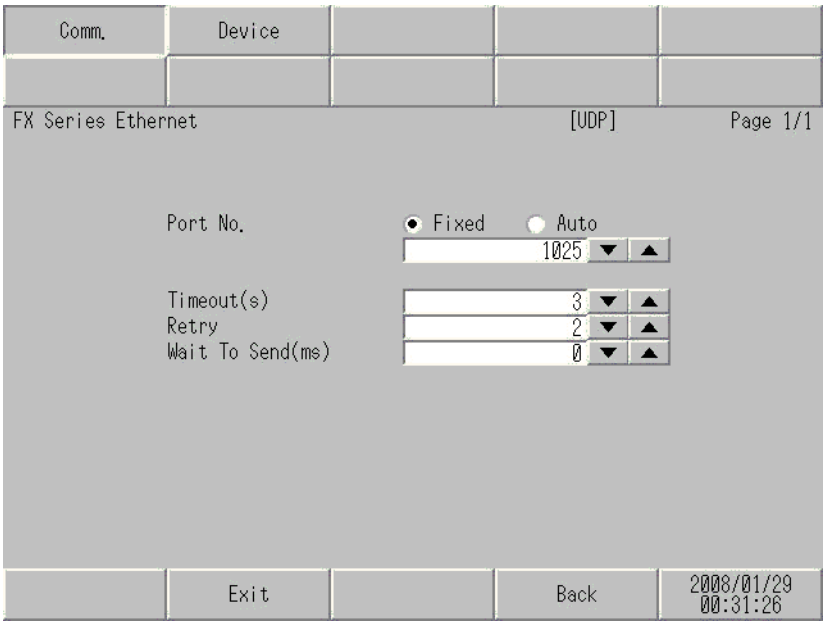
4.2 Setup Items in Off-line Mode

NOTE

- Refer to the Maintenance/Troubleshooting manual for information on how to enter off-line mode or about the operation.
  Cf. GP3000 Series User's Manual "Chapter 4 Setting"

■ Communication Settings

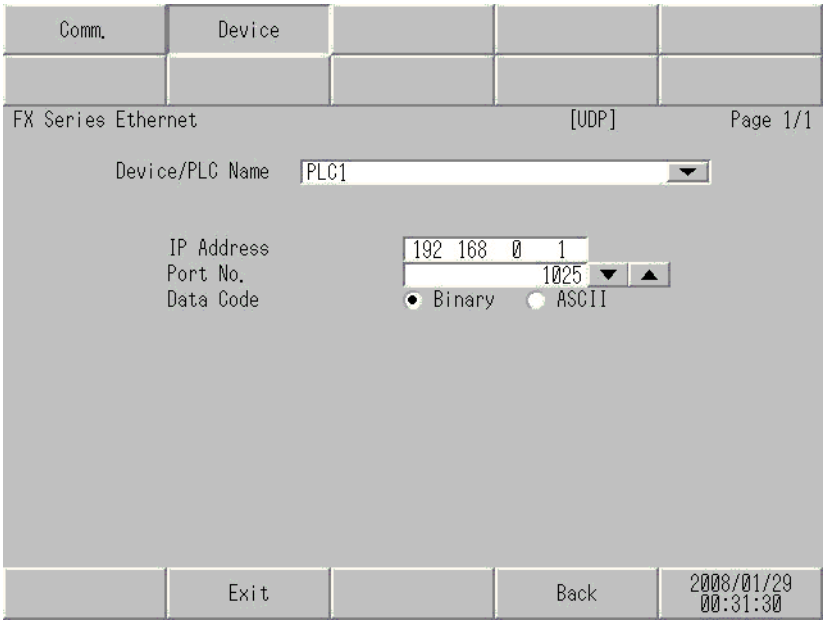
To display the setting screen, touch [Device/PLC Settings] from [Peripheral Equipment Settings] in off-line mode. Touch the External Device you want to set from the displayed list.



Setup Items	Setup Description
Port No.	Set the port number of the Display. In UDP connection, the entered port number will be assigned regardless of whether you select [Fixed] or [Auto]. In TCP connection, select either of [Fixed] or [Auto]. When you select [Fixed], use an integer from 1024 to 65535 to enter the port number of the Display. When you select [Auto], the port number will be automatically assigned regardless of the entered value.
Timeout(s)	Enter the time(s) for which the display unit waits for the response from the External Device, from 1 to 127.
Retry	If there is no response from the External Device, enter how many times the display unit retransmits the command, from 0 to 255.
Wait To Send (ms)	Enter the standby time (ms) from when the display unit receives packets until it transmits the next command, from 0 to 255.

■ 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].



Setup Items	Setup Description
Device/PLC name	Select the External Device to set. Device/PLC name is the title of the External Device set with GP Pro-EX. (Initial value [PLC1])
IP Address	Set the IP address of the External Device. **NOTE** • Check with your network administrator about the IP address you want to use. • Do not duplicate IP addresses on the same network.
Port No.	Use an integer from 1024 to 65535 to enter the port number of the External Device.
Communication data code	Select data code of communication data.

5 Supported Devices

The following table shows the range of supported device addresses.

This address can be specified as system data area.

Device	Bit Address	Word Address	32bits	Notes
Input Relay	X000 - X377	X000 - X360	L/H	OCT 8 *1
Output Relay	Y000 - Y377	Y000 - Y360		OCT 8 *1
Auxiliary Relay	M0000 - M7679	M0000 - M7664		÷16
Special Auxiliary Relay	M8000 - M8511	M8000 - M8496		÷16 *2
State	S0000 - S4095	S0000 - S4080		÷16
Timer (Contact)	TS000 - TS511	-		
Counter (Contact)	CS000 - CS255	-		
Timer (Current Value)	-	TN000 - TN511		
Counter (Current Value) 1	-	CN000 - CN199		*3
Counter (Current Value) 2	-	CN200 - CN255		*4
Data Register	-	D0000 - D7999		Bit F *5
Special Data Register	-	D8000 - D8511		Bit F *2
Extension Register	-	R00000 - R32767		Bit F

*1 Figures divisible by 20 (octal number) can be assigned to the word address.
For example, X0, X20, X40 ... X360

*2 Write protected addresses or unusable addresses (system usage) exist. If these addresses are written, the External Device may not function properly.

*3 Word addresses for Counter (Current Value) 1 and Counter (Current Value) 2 are not consecutive. Do not set word addresses to overlap Counter (Current Value) 1 and Counter (Current Value) 2. For example, if 2 words or more are written from CN199, an error occurs.

*4 Data length of CN200 to CN255 is 32 bit.

*5 Word addresses for Data Register and Special Data Register are not consecutive. Do not set word addresses to overlap data Register and Special Data Register. For example, if 2 words or more written from D7999, an error occurs.

NOTE

- 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)"
- Refer to the precautions on manual notation for icons in the table.
  ☞ "Manual Symbols and Terminology""Manual Symbols and Terminology"

6 Device Code and Address Code

Use device code and address code when you set "Device Type & Address" for the address type of the data display or other devices.

Device	Device Name	Device Code (HEX)	Address Code
Input Relay	X	0080	Value of word address divided by 0x10
Output Relay	Y	0081	Value of word address divided by 0x10
Auxiliary Relay	M	0082	Value of word address divided by 16
Special Auxiliary Relay	M	0083	Value of word address divided by 16
State	S	0087	Value of word address divided by 16
Timer (Current Value)	TN	0060	Word Address
Counter (Current Value) 1	CN	0061	Word Address
Counter (Current Value) 2	CN	0064	Word Address
Data Register	D	0000	Word Address
Special Data Register	D	0001	Word Address
Extension Register	R	000F	Word Address

7 Error Messages

Error messages are displayed on the Display screen as follows: "No. : Device Name: Error Message (Error Occurrence Area)". Each description is shown below.

Item	Description
No.	Error number
Device Name	Name of the External Device where an error has occurred. Device/PLC name is the title of the External Device set with GP Pro-EX. (Initial value [PLC1])
Error Message	Displays messages related to an error that has occurred.
Error Occurrence Area	Displays the IP address or device address of the External Device where an error has occurred, or error codes received from the External Device. NOTE • IP address is displayed as "IP address (Decimal): MAC address (Hex)". • Device address is displayed as "Address: Device address". • Received error codes are displayed 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 Codes Unique to External Device

Error Code	Description
0x57	Exceeds the maximum number of Device to be connected.
0x58	Device range is not correct.
0x5B	Following communications are not authorized. • PC number stored in the packet is not 0xFF. • Communication between PLC and Ethernet module is not authorized. • PLC status is CPU ERROR or PROG ERROR.