Pro-face

Digital Human Machine Interface

Device/PLC Connection Manuals

About the Device/PLC Connection Manuals

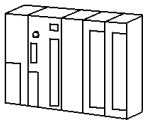
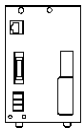
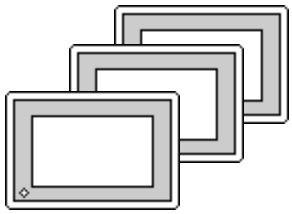
Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file. Furthermore, be sure to keep all manual-related data in a safe, easy-to-find location.

7.4 Yokogawa Electric

7.4.1 System Structure

This section explains the system structure for the Ethernet connection between a PLC made by Yokogawa Electric Corp. and the GP.

■ FACTORY ACE Series/FA-M3 (Using Ethernet Unit)

CPU	Link I/F	Cable	Unit	GP/GLC
	Ethernet Unit 			
F3SP20-0N F3SP21-0N F3SP25-2N F3SP30-0N F3SP35-0N F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S	F3LE01-5T F3LE11-0T	Ethernet Cable IEEE802.3 standard	Digital's GP Ethernet I/F unit (GP070-ET11/GP070-ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP-377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series *1

**1 When using GP/GLC and the optional Ethernet I/F unit, refer to the following List of Connectable GP/GLC Units.*

Series Name		Product Name	Optional Ethernet I/F Unit	Built-in Ethernet Port
GP70 Series	GP-470 Series	GP-470E	❍	x
	GP-570 Series	GP-570S	❍	x
		GP-570T	❍	x
		GP-57JS	❍	x
		GP-570VM	❍	x
	GP-571 Series	GP-571T	❍	x
	GP-675 Series	GP-675S	❍	x
		GP-675T	❍	x
	GP-870 Series	GP-870VM	❍	x
GP77R Series	GP-377R Series	GP-377RT	❍ *1 *2	x
	GP-477R Series	GP-477RE	❍ *2	x
	GP-577R Series	GP-577RS	❍ *2	x
		GP-577RT	❍ *2	x
GP2000 Series	GP-2300 Series	GP-2300L	x	❍
		GP-2300S	x	❍
		GP-2300T	x	❍
	GP-2400 Series	GP-2400T	x	❍
	GP-2500 Series	GP-2500L	❍ *3 *4	❍
		GP-2500S	❍ *3 *4	❍
		GP-2500T	❍ *3 *4	❍
	GP-2501 Series	GP-2501L	❍ *2 *3	x
		GP-2501S	❍ *2 *3	x
		GP-2501T	❍ *2 *3	x
	GP-2600 Series	GP-2600T	❍ *3 *4	❍
	GP-2601 Series	GP-2601T	❍ *2 *3	x
GLC2000 Series	GLC-2300 Series	GLC-2300L	x	❍
		GLC-2300T	x	❍
	GLC-2400 Series	GLC-2400T	x	❍
	GLC-2500 Series	GLC-2500T	❍ *3 *4	❍
	GLC-2600 Series	GLC-2600T	❍ *3 *4	❍
ST Seires		ST403	x	❍

**1 Only the Multi unit can be used.*

**2 The 2-Way Driver (Pro-Server, GP-Web and others) cannot be used.*

**3 When using the optional Ethernet I/F unit, a bus conversion unit (PSL-CONV00) is required.*

**4 Using the optional Ethernet I/F Unit allows you to set up separate Class and Net No.s for 2-Way Driver applications (Pro-Server, GP-Web and others) and the PLC. When doing this, data transfer with the PLC is performed through the optional Ethernet I/F Unit.*

7.4.2 Supported Devices

The following list shows the range of devices supported by the GP.

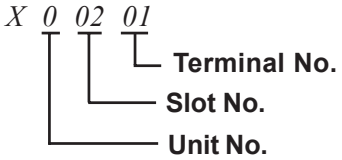
■ FA-M3 Series

Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input Relay	X00201 ~ X71664	X00201 ~ X71649	÷16+1 *1 *2	L/H
Output Relay	Y00201 ~ Y71664	Y00201 ~ Y71649	÷16+1 *1	
Internal Relay	I00001 ~ I65535	I00001 ~ I65521	÷16+1	
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	÷16+1	
Special Relay	M0001 ~ M9984	M0001 ~ M9969	÷16+1	
Link Relay	L00001 ~ L78192	L00001 ~ L78177	÷16+1 *5	
Timer (contact)	T0001 ~ T3072	---		
Counter (contact)	C0001 ~ C3072	---		
Timer (current value)	---	TP0001 ~ TP3072		
Timer (setup value)	---	TS0001 ~ TS3072	*2	
Counter (current value)	---	CP0001 ~ CP3072		
Counter (setup value)	---	CS0001 ~ CS3072	*2	
Data Register	---	D0001 ~ D65535	Bit 5	
File Register	---	B00001 ~ B065536	Bit 5 *3	
		B065537 ~ B131072		
		B131073 ~ B196608		
		B196609 ~ B262144		
Joint Register	---	R0001 ~ R4096	Bit 5	
Special Register	---	Z001 ~ Z1024	Bit 5	
Link Register	---	W00001 ~ W74096	Bit 5 *4 *5	

*1 The value of the terminal number (bit), 01~49, of the last two digits for the Input Relay and Output Relay can only be a multiple of 16 +1.

E.g. For X00201



*2 Cannot perform data write.

*3 File registers are each 65,535 words on your GP application.

You cannot extend over more than a single data "block" when performing the following features.

Be sure to set these features' settings so they are within a single data block.

1) "a-tag " settings

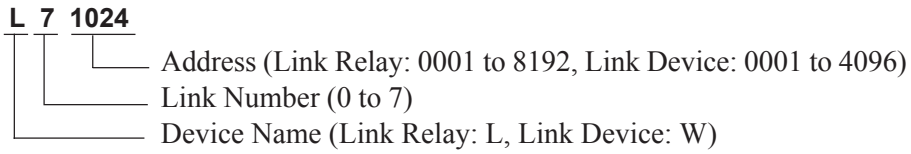
2) Performing Block read/write from Pro-Server

3) Designating the "Convert from" and "Convert to" address for the "Address Conversion" features

**4 Up to 4,096 link registers can be used.*

**5 Enter Link Relay (L) and Link Register (W) data as follows:*

(Ex.) When entering Link Relay "L71024" data.

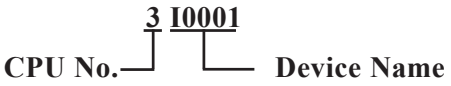


The address data's left-most digit is the Link Number, and the next four digits are the address.

Note:

• Write the CPU Number (1~4) in front of the device name.

E.g. For Internal Relay I0001, CPU #3:



- **The range of device that can be used will vary depending on the type of PLC.**

  For detailed information refer to the Yokogawa's Sequnce CPU manual.

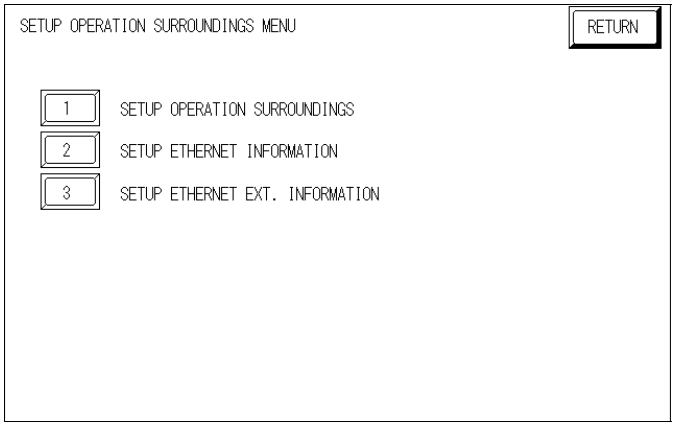
- **The Device fields used will differ depending on the type of PLC. Refer to the Yokogawa PLC's manual for the range allowed for the device address area.**

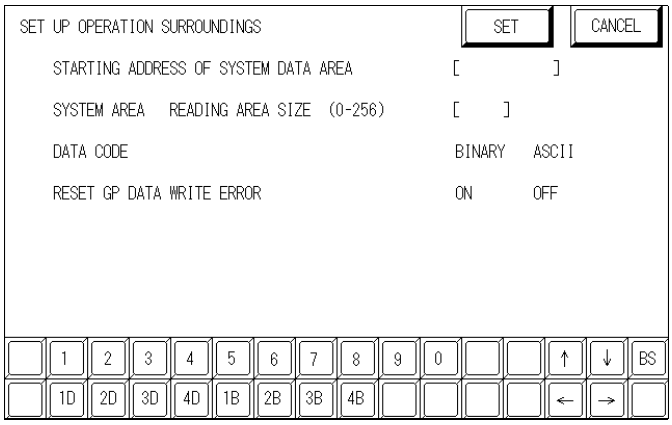
7.4.3 Environment Setup

■ GP Settings

The GP's required Ethernet communication settings are shown below.

◆SETUP OPERATION SURROUNDINGS MENU



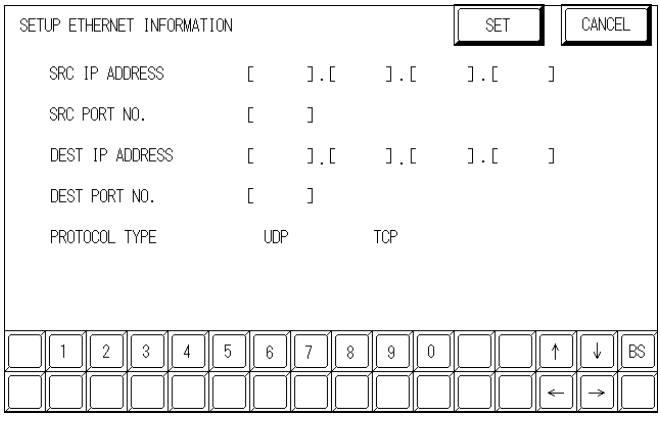


DATA CODE

This selection controls the date code settings. Select either BINARY or ASCII. Be sure this value is the same as the current PLC setting.

◆SETUP ETHERNET INFORMATION

Select "SET UP ETHERNET INFORMATION," from the above screen and enter the necessary information for each item shown below.



SRC IP ADDRESS

Enter the IP address for your GP here. The IP address 32 bits are separated into four segments of eight bits each, delimited with a dot. All are decimal numbers.

SRC PORT NO.

Enter your station's port number here, from 1024 to 65535.

DEST IP ADDRESS

Enter the IP address of the other station (PLC).

DEST PORT NO.

Enter the port number for the other station. In this case, 12289.

PROTOCOL TYPE

You can select either UDP or TCP communication. If the power will be turned ON/OFF asynchronously, it is recommended that you use UDP communications.

When using UDP communication, there is no specific limit to the number of units that can be connected. With TCP communication, the number of GP/GLC units is limited to 8.

Do not specify duplicate IP addresses. Contact the network manager about IP addresses.

When using the built-in Ethernet port on a GP2000 or GLC2000 series unit, be sure not to set any duplicate "SRC PORT No." values.

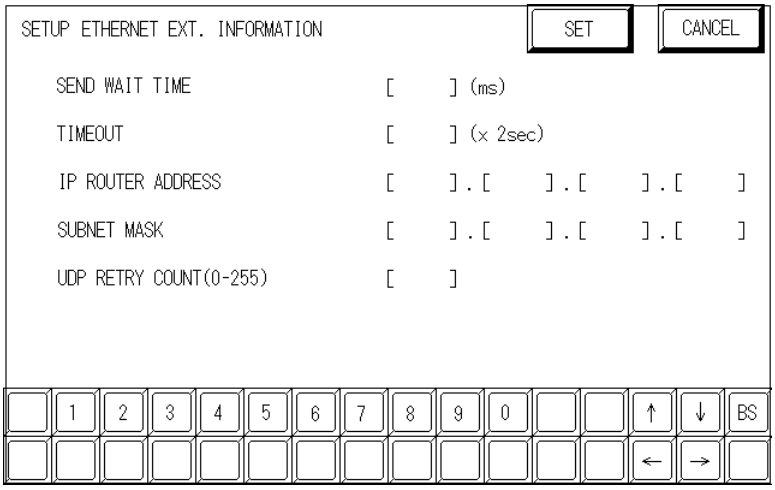
Check the 2-Way driver's "SRC PORT No." setting via the following menu:

GP OFFLINE mode's Main menu [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-Way driver uses this port and the following 9 ports.

Even though an unlimited number of units can be connected using UDP communication, the more units that are used, the slower the PLC unit's response time will become. Be sure to test your system using the actual number of expected units to confirm if the speed obtained is acceptable.

- **SET UP ETHERNET EXT. INFORMATION**



SEND WAIT TIME (0 to 255)

Wait time can be added when a command is transmitted from the GP. Use the wait time if the traffic on the communications line is heavy. If no wait time is required, enter "0."

TIMEOUT (0 to 65535)

Enter the desired timeout value. If no response is received from the other station within the specified time, a timeout occurs. If "0" is specified, the default time is 15 seconds when using TCP, and 5 seconds when using UDP.

IP ROUTER ADDRESS

Enter the IP address of the router (one only). If no router is used, enter a "0" in each of the four fields.

SUBNET MASK

Enter the subnet mask data. If no subnet mask is used, enter a "0" in each of the four fields.

UDP RETRY COUNT (0 to 255)

Designates the number of times the GP re-sends a command when there is no reply from the other port and a timeout occurs. When no reply is received after the re-try setting number is reached, an error message will appear on the GP screen.

Important

If the GP's memory is initialized in OFFLINE mode, random values may appear in these settings. Be sure to check all displayed values after performing initialization.

■ PLC Settings

The PLC's required Ethernet communication settings are shown below. Designate the setting via the Ethernet module's side face switch.

PLC Settings	
Data Code Switch	ON (Binary)/OFF(ASCII)
Write Protect	OFF (Not Protected)
TCP Timeout	OFF (Close)
Run Mode	OFF (RUN)
IP Address	Set via Rotary Switch

7.9 Protocol Stack Error Codes

Protocol Stack Error Codes are displayed on the GP as follows.

Host communication error (02:FE:**)

** represents one of the following error codes, from 00 to F0.

Error Code	Description	Notes
00	There is a setup error related to the IP address of your station at initialization.	
05	Initialization has failed.	
06	Cancelling of communications has failed.	
07	An attempt was made to establish a connection before initialization was successfully completed.	
08	Your station's port number is incorrect	
09	The destination station's port number is incorrect.	
0A	The IP address of the other station is incorrectl.	
0B	The same port number is already being used by UDP for establishing the connection.	
0C	The same port number is already being used by TCP for establishing the connection.	
0D	Protocol stack has refused connection establishment.	
0E	Protocol stack has returned the unsuccessful establishment of a connection.	
0F	The connection has been shut down.	
10	All connections are busy. No connection is available.	
13	Your station was aborted by a different station.	
30	There was no reply from the protocol stack.	
32	There was no reply from the other station.	*1 *2
40	No network infofmation exists for the designated node.	*1
41	I/O memory type of the random read-out response data is incorrect.	*1
42	Network information does not exist.	
F0	Undefined error.	

*1 When using an OMRON Corporation CS1/CJ/CJ1M Series unit, the error code will appear on the GP screen as shown below. Also, behind the Ethernet error code will appear the designated Network and Node addresses.

Host Communication Error (02:FE:**:###:###)

- Node Address (Decimal)
- Network Address (Decimal)
- Ethernet Error Code (Hex)

*2 When using a Hitachi Industrial Equipment Corporation's HIDIC H Series or a Schneider Corporation MODBUS TCP unit, the error code will appear on the GP screen as shown below. Also, behind the Ethernet error code will appear the designated Node address.

Host Communication Error (02:FE:**:###:###)

- Node Address (Decimal)
- Ethernet Error Code (Hex)