

Device/PLC Connection Manuals



About the Device/PLC Connection Manuals

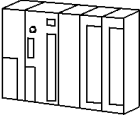
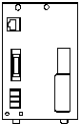
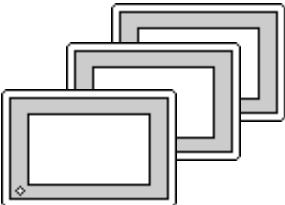
Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file. 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 extended units, refer to

Reference *Yokogawa Electric Connectable Devices.*



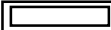
Note:

- ii For cable connections, refer to the user's manual for each optional unit. For the GP2000 and GLC2000 series, however, refer to the user's manual for the main 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	$\div 16 + 1$ *1*2
Output Relay	Y00201 ~ Y71664	Y00201 ~ Y71649	$\div 16 + 1$ *1
Internal Relay	I00001 ~ I65535	I00001 ~ I65521	$\div 16 + 1$
Joint Relay	E0001 ~ E4096	E0001 ~ E4081	$\div 16 + 1$
Special Relay	M0001 ~ M9984	M0001 ~ M9969	$\div 16 + 1$
Link Relay	L00001 ~ L78192	L00001 ~ L78177	$\div 16 + 1$
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

L/H

*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

$$\begin{array}{c}
 X \quad 002 \quad 01 \\
 \text{Slot No.} \quad \downarrow \quad \downarrow \quad \text{Terminal No.}
 \end{array}$$

*2 Cannot perform data write.

(Continued on next page)

*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 "Conver to" address for the "Address Conversion" features

*4 When using a PC Link module, only Link Register up to B99999 can be used.

*5 A total of up to 4,096 link registers can be used.



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

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

	3	I0001	
CPU No.			Device Name

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

For detailed information refer to the Yokogawa's Sequence 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

1

2

3

SETUP OPERATION SURROUNDINGS

SETUP ETHERNET INFORMATION

SETUP ETHERNET EXT. INFORMATION

RETURN

SET UP OPERATION SURROUNDINGS

SET

CANCEL

STARTING ADDRESS OF SYSTEM DATA AREA

[]

SYSTEM AREA READING AREA SIZE (0-256)

[]

DATA CODE

BINARY ASCII

RESET GP DATA WRITE ERROR

ON OFF

1

2

3

4

5

6

7

8

9

0

1D

2D

3D

4D

1B

2B

3B

4B

↑

↓

BS

←

→

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.

SETUP ETHERNET INFORMATION

SET

CANCEL

SRC IP ADDRESS

[] . [] . [] . []

SRC PORT NO.

[]

DEST IP ADDRESS

[] . [] . [] . []

DEST PORT NO.

[]

PROTOCOL TYPE

UDP TCP

1

2

3

4

5

6

7

8

9

0

↑

↓

BS

←

→

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.



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.

• SET UP ETHERNET EXT. INFORMATION

SETUP ETHERNET EXT. INFORMATION															SET		CANCEL				
SEND WAIT TIME															[]		(ms)				
TIMEOUT															[]		(× 2sec)				
IP ROUTER ADDRESS															[]	.	[]	.	[]	.	[]
SUBNET MASK															[]	.	[]	.	[]	.	[]
UDP RETRY COUNT(0-255)															[]						

	1	2	3	4	5	6	7	8	9	0			↑	↓	BS
													←	→	

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.



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



7.7 Protocol Stack Error Codes

The error codes related to the protocol stack are displayed on the GP screen as follows:

PLC COM. ERROR (02:FE:**)

“**” represents any of the error codes 00 to F0 shown in the above table.

Error code	Description	Other
00	There is a setup error related to the IP address of your station at initialization.	
05	Initialization has failed.	
06	Abortion of communications has failed.	
07	An attempt was made to establish a connection before initialization was successfully completed.	
08	The port number of your station is abnormal.	
09	The port number of the destination station is abnormal.	
0A	The IP address of the other station is abnormal.	
0B	The same port number is already being used by the UDP for establishing the connection.	
0C	The same port number is already being used by the TCP for establishing the connection.	
0D	The protocol stack has refused connection establishment.	
0E	The protocol stack has returned the unsuccessful establishment of a connection.	
0F	The connection has been shut down.	
10	All the connections are busy. No connection is available.	
13	Your station is aborted by the other station	
30	There is no reply from the protocol stack	
32	There is no reply from the other station	*1
40	The designated Node Addresses do not exist in Network Information.	*1
41	I/O Memory Type for Random Read Out response data is wrong.	*1
42	Network Information does not exist.	
F0	Undefined error.	

*1 When using an Omron CS1 Series unit, the error code display is as shown below. The Network Addresses and Node Addresses also are displayed.

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



