Pro-face

Digital Human Machine Interface

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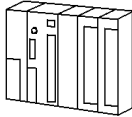
About the Device/PLC Connection Manuals
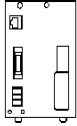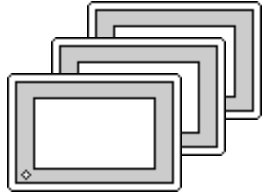
Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file.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

7.3 Toshiba

7.3.1 System Structure

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

■ PROSEC T Series (using Ethernet unit)

CPU	Link I/F	Cables	Unit	GP/GLC
	Ethernet Unit			
T3H	EN311	Ethernet cable (conforms to the IEEE802.3)	Digital's GP Ethernet I/F unit (GP070-ET11/GP070-ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series *1
T2N	PU-235N PU-245N			
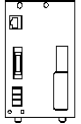
*1 When using GP/GLC and extended units, refer to

▼Reference◣ *Toshiba Connectable Devices.*

📝*Note:*

ï **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.**
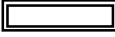
■ V Series (using CPU unit Link I/F)

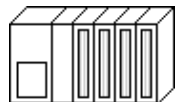| CPU	Link I/F	Cable	Unit	GP/GLC
	Ethernet Unit			
S3PU45A S3PU55A S3PU65A S2PU72A S2PU72D	EN711 EN721 EN731 EN741 EN751 EN761 EN611 EN621 EB621 EN631 EN641 EB641	Ethernet cable (conforms to the IEEE802.3)	Digital's GP Ethernet I/F unit (GP070-ET11/GP070-ET41) GP77R Series Multi Unit E (GP077-MLTE11) GP377R Series Multi Unit (GP377-MLTE11)	GP/GLC Series

7.3.2 Supported Devices

The following describes the range of devices supported by the GP.

■ PROSEC T Series (T3H)

Setup System Area here.

Device	Bit Address	Word Address	Particular	
Input Device	X0000 ~ X511F	XW000 ~ XW511		
Output Device	Y0000 ~ Y511F	YW000 ~ YW511		
Auxiliary Relay	R0000 ~ R999F	RW000 ~ RW999		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z999F	-		
Link Relay	L0000 ~ L255F	LW000 ~ LW255		
Timer (contact)	T000 ~ T999	-	Read only	L/H
Counter (contact)	C000 ~ C511	-	Read only	
Timer (current value)	-	T000 ~ T999		
Counter (current value)	-	C000 ~ C511		
Data Register	-	D0000 ~ D8191	Bit 15	
Link Register	-	W0000 ~ W2047	Bit 15	
File Register	-	F00000 ~ F32767	Bit 15	

Note: **The range of supported devices may be different depending on your CPU. For details, refer to Toshiba PLC's user's manual.**

Important *If you Write in Read Only Timer (contact) device or in Read Only Counter (contact) device, the "PLC COM. ERROR (02:10)" message will appear.*

■ PROSEC T Series (T2N)

☐ Setup System Area here.

Device	Bit Address	Word Address	Particular	
Input Device	X0000 ~ X127F	XW000 ~ XW127		
Output Device	Y0000 ~ Y127F	YW000 ~ YW127		
Auxiliary Relay	R0000 ~ R255F	RW000 ~ RW255		
Special Relay	S0000 ~ S255F	SW000 ~ SW255		
Link Register Relay	Z0000 ~ Z999F	-		
Link Relay	L0000 ~ L255F	LW000 ~ LW255		
Timer (contact)	T000 ~ T511	-	Read Only	L/H
Counter (contact)	C000 ~ C511	-	Read Only	
Timer (current value)	-	T000 ~ T511		
Counter (current value)	-	C000 ~ C511	Bit 15	
Data Register	-	D0000 ~ D8191	Bit 15	
Link Register	-	W0000 ~ W2047	Bit 15	
File Register	-	F0000 ~ F1023		

⚠ **Important** ***If you Write in Read Only Timer (contact) device or in Read Only Counter (contact) device, the "PLC COM. ERROR (02:10)" message will appear.***

■ V Series

☐ Setup System Area here.

Device	Bit Address	Word Address	Particulars	
External Input	X00000 ~ X8191FF	XW0000 ~ XW8191		
External Output	Y00000 ~ Y8191F	YW0000 ~ YW8191		
Auxilary Relay	R00000 ~ R4095F	RW0000 ~ RW4095		L/H
Special Relay	S00000 ~ S511F	SW000 ~ SW511		
Data Register	---	D00000 ~ D4095	Bit 15	

Note: **The Device Range may differ depending on the CPU type. For the details, refer to the Toshiba's PLC manual.**

⚠ Important
- *PLC I/O and Controller Internal Memory data is treated as a variable. The variables that the GP unit can handle are as follows. When handling all PLC variables with the GP, use the following variables in the ladder program.*

Please note that memory variables differ from GP unit's device name.

GP Device Name		PLC Controller Memory Valiable Name	Details
X, XW	←→	I/O Valiable (IQ)	X, XW and Y, YW use the same memory area (have the same range).
Y, YW			
R, RW	←→	Data Register Variable (DW)	R, RW device and D device use the same area. Designate the R device when doing bit write from the GP unit.
D			
S, SW	←→	Special Register Variable	

* *Although local variables, control global variables and station global variables exist outside of the above-mentioned device, they are not accessible from the GP unit.*

7.3.3 ▶ **Environment Setup**

■ GP Unit Setup

The following describes GP settings for using Ethernet communicaiton.

```
SETUP OPERATION SURROUNDINGS MENU                    [ RETURN ]

      [ 1 ]   SETUP OPERATION SURROUNDINGS
      [ 2 ]   SETUP ETHERNET INFORMATION
      [ 3 ]   SETUP ETHERNET EXT. INFORMATION
```
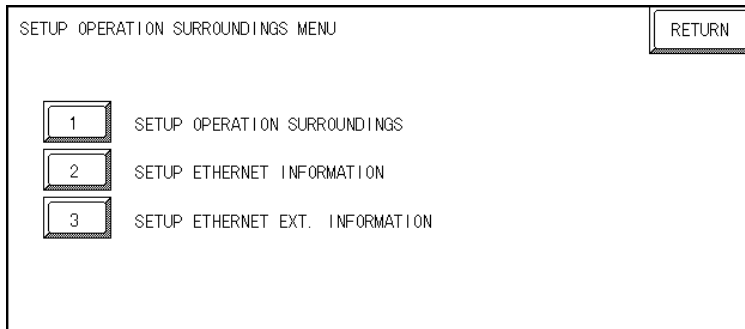
⚠**!**⚠
Important   ***Set the station No. to "0" for [1] SET UP OPERATION SUR-ROUNDINGS.***

```
SETUP ETHERNET INFORMATION                  [ SET ]  [ CANCEL ]

   SRC IP ADDRESS         [    ].[    ].[    ].[    ]

   SRC PORT NO.           [    ]

   DEST IP ADDRESS        [    ].[    ].[    ].[    ]

   DEST PORT NO.          [    ]



 [  ][ 1 ][ 2 ][ 3 ][ 4 ][ 5 ][ 6 ][ 7 ][ 8 ][ 9 ][ 0 ][  ][  ][ ↑ ][ ↓ ][ BS ]
 [  ][  ][  ][  ][  ][  ][  ][  ][  ][  ][  ][  ][  ][ ← ][ → ][  ]
```
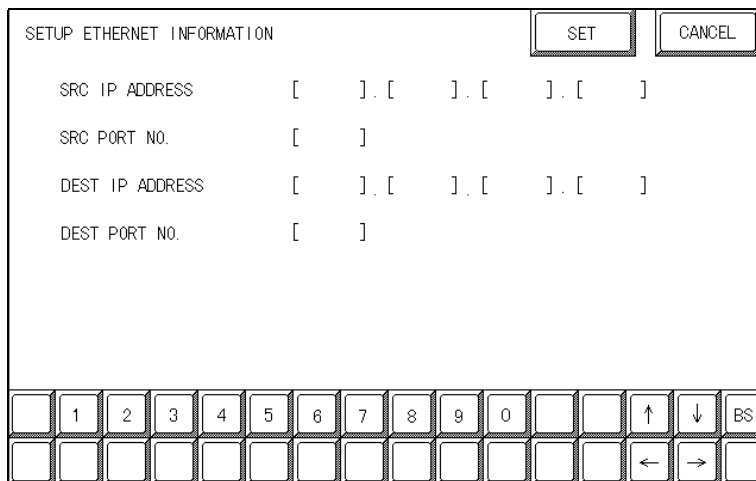
Select "SETUP ETHERNET INFOR-MATION" and set up the Addresses and Port Numbers.

• SRC IP ADDRESS

> Enter GP's SRC IP Address. Input a dot between every 8 bits to divide the IP Address (32 bits all together) into four gorups, and enter decimal numbers in each groups.

• SRC PORT NO.

> Set the SRC Port No. between 1024 and 65535.

• DEST IP ADDRESS

> Set the PROSEC's DST IP Address.

• DEST PORT NO.

> Set the DEST Port No. between 1024 and 65535.

✎*Note:* **The communication method is UDP format.**

⚠️ *Important*
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.

🛑 STOP
Regarding the IP Address and the Port No., please confirm these points with your Network supervisor. You must not duplicate the number you have already used for an IP Address setting.

```
SETUP ETHERNET EXT. INFORMATION          [ SET ]  [ CANCEL ]

   SEND WAIT TIME          [     ] (ms)

   TIMEOUT                 [     ] (x 2sec)

   IP ROUTER ADDRESS       [     ] . [     ] . [     ] . [     ]

   SUBNET MASK             [     ] . [     ] . [     ] . [     ]

   UDP RETRY COUNT (0 to 255)  [     ]



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

SEND WAIT TIME

You can display the waiting time while GP's command is actually sent. This function is useful when there is a lot of traffic in your system. If not using, set it to "0".

TIMEOUT

You can set time for waiting for a replay from the destination. If any replay is not made by the destination within time you set to, the communication will be timeout. "0" setting is the default value as 15 second-setting for timeout.

IP ROUTER ADDRESS

Set Router's IP Address. (There is only one setting for Router.) If not using, set all values to "0".

SUBNET MASK

Set the Subnet Mask . If not using, set all values to "0".

UDP RETRY COUNT (0 to 255)

- *If you intialize the memory from the OFFLINE mode, some values might be automatically set to the factory settings. Please confirm all values after intialization.*

- *Refer to the PLC's users manual for PLC settings.*

- *Set the Ethernet module to the RUN mode after you have set the IP Address and the Port No.*

■ PLC Setup

◆PROSEC T Series

The following is the Sample Program shown in the Toshiba's Ethernet Module Users Manual.

IP Address \ Port No. settings

```
  | R0502                                                                        R0602      |
1 |---||--------------------------------------------------------------------------------( )-----------------|
  |                                                                    /*  Parameter setting request  */
  | R0602
2 |---||----------- +[12544 MOV  RW000 ] [00018 MOV  RW001 ]----------------------------------- |
  |      |                                                             /* Set Module and CMD No.*/
  |      |                                                                                          |
  |      |        +[**** MOV RW002] [**** MOV RW003] [**** MOV  RW004]----------------------- |
  |      |                                                             /* Set IP Address and Port No.*/
  |      |                                                                                          |
  |      |        +[RW000 SEND RW010] [RST R0502]-------------------------------------------------- |
  |      |                                                             /* Set Request              */
  |                                                                                                 |
```

Please contact your computer network supervisor to confirm your IP Address and Port No.

◆**Operation Mode control**

```
     | R0503                                                                          R0603      |
  1  |---||-------------------------------------------------------------------------------( )-----------------|
     |                                                              /*  Control request        */
     | R0603
  2  |---||---------- +[12544 MOV RW000 ] [00019 MOV RW001 ]------------------------------------- |
     |     |                                                        /* Set Module and CMD No.*/
     |     |                                                                                     |
     |     |     +[04144 MOV RW002]-------------------------------------------------------------- |
     |     |                                                        /* Set designation data*/
     |     |                                                                                     |
     |     |     +[RW000 SEND RW010] [RST R0503]---------------------------------------------- |
     |     |                                                        /* Set Request            */
     |     |                                                                                     |
```
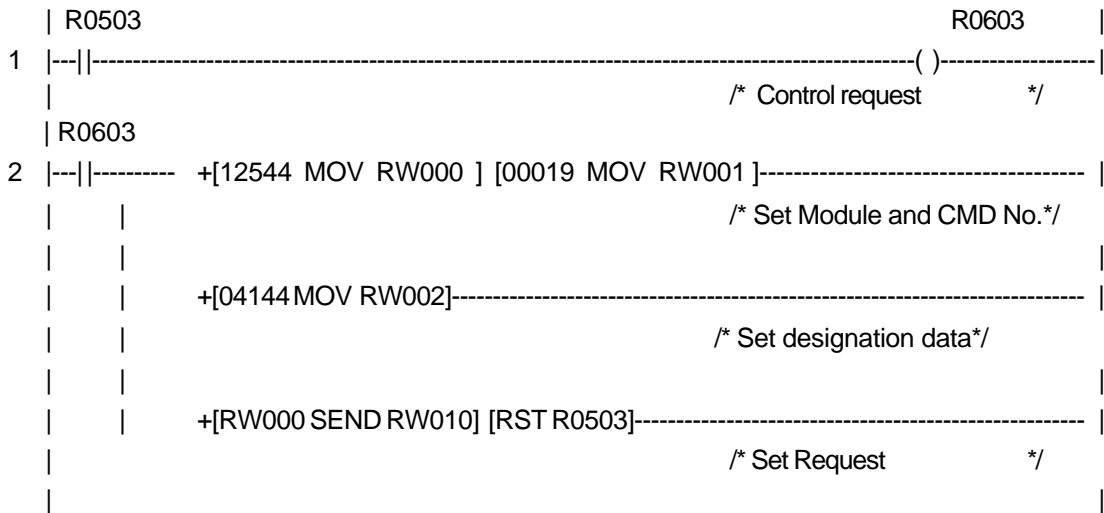
⚠ **Important**   ***After setting an IP Address, you need to switch the system to LINE Mode.***

◆**V Series**

To perform the following settings, use a ladder program.

Items	PLC Setup
IP Address Primary	PLC IP Address [*1]
UDP Port No.	PLC Port No.

*1 Set the IP Address last byte (192. 168, 0, 1) from the rotary switch on the side of PLC Ethernet Module.

⚠ **Important**   • ***For Ethernet communication with the GP unit, use the Ethernet module's EN-A connector.***

   It is not possible to communicate with the GP unit using the EN-B connector.

   • ***Note that for the V Series, it is possible to connect up to 8 GP units to a single PLC.***

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 Randam 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::###:###)"**

└─── **Node Address (Dec)**
└───── **Network Address (Dec)**
└─────── **Ethernet Error Code (HEX)**

MEMO