



SCIGATE AUTOMATION (S) PTE LTD

No.1 Bukit Batok Street 22 #01-01 Singapore 659592

Tel: (65) 6561 0488

Fax: (65) 6562 0588

Email: sales@scigate.com.sg

Web: www.scigate.com.sg

Business Hours: Monday - Friday 8.30am - 6.15pm

# 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.

## 7.6 Siemens PLC




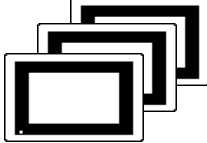


**With Siemens S7-300/400 Ethernet Protocol units, when the same project file is used on multiple GP/GLC units, the system may malfunction. When using multiple GP/GLC units, create and maintain only one unique project file for each GP/GLC unit.**

### 7.6.1 Ethernet System Design

This section explains the system design for the Ethernet connection between Siemens PLCs and GP/GLC units.

#### ■ Siemens SIMATIC S7-300/400 Series

CPU	Link I/F	Cables	GP/GLC
			
CPU312IFM CPU313 CPU314 CPU314IFM CPU315 CPU315-2DP CPU316 CPU316-2DP CPU318-2	CP 343-1 IT CP 343-1	Cable conforming to IEEE802.3	GP/GLC Series units *1
CPU412-1 CPU412-2DP CPU413-1 CPU413-2DP CPU414-1 CPU414-2DP CPU414-3DP CPU416-1 CPU416-2DP CPU416-3DP CPU417-4	CP 443-1 IT CP 443-1		

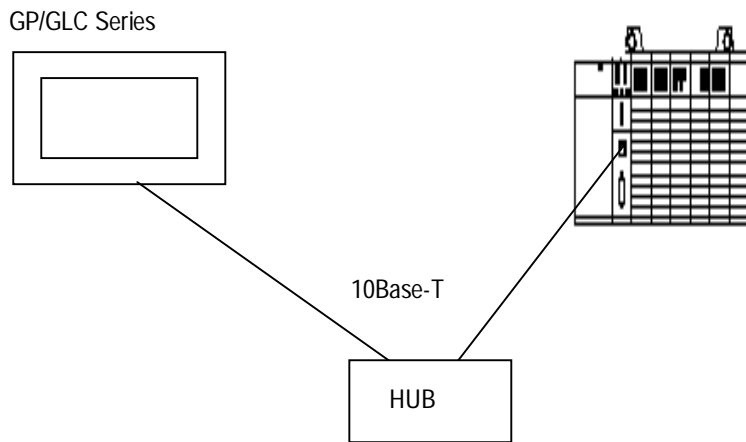
\*1 Refer to the next page for compatible GP/GLC units.

■ **Compatible GP/GLC Types**

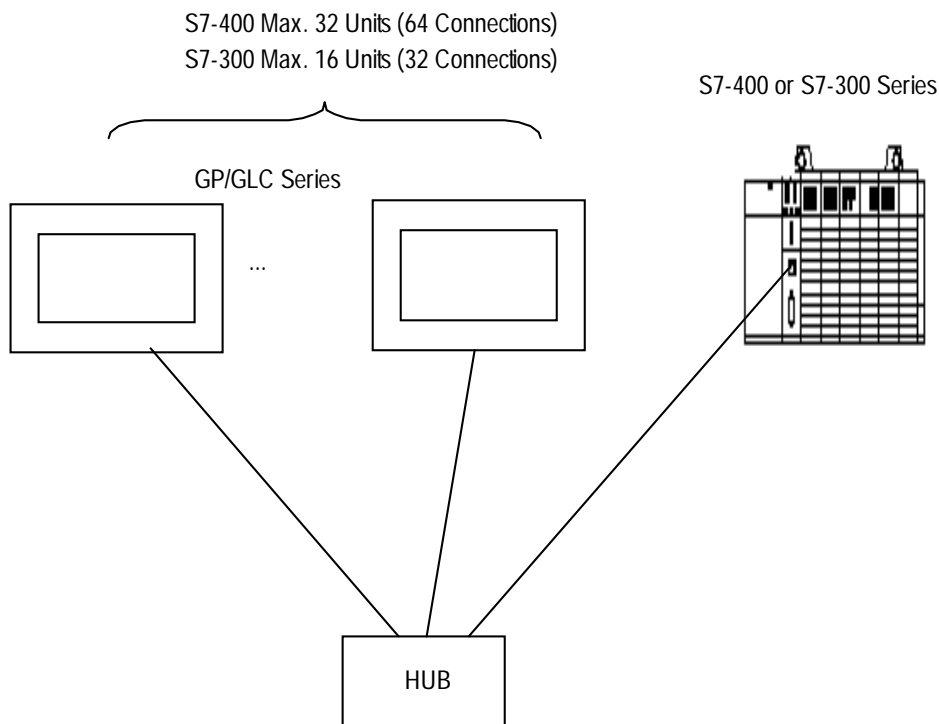
Series Name		Model	Support
GP2000 Series	GP-2300	GP-2300T	○
		GP-2300L	○
		GP-2300S	○
	GP-2400	GP-2400T	○
	GP-2500	GP-2500T	○
		GP-2500S	○
		GP-2500L	○
	GP-2501	GP-2501T	X
		GP-2501S	X
	GP-2600	GP-2600T	○
GP-2601	GP-2601T	X	
GLC2000 Series	GLC2000	GLC2400T	○
		GLC2300T	○
		GLC2300L	○
		GLC2500T	○
		GLC2600T	○
ST Series		ST403	○

## ■ Connection Structure

### ■ 1:1 Connection



### ■ n:1 Connection



- The Max. No. of units indicated is when only GP Series units are connected. Connecting a single GP Series unit requires two connections.
- Connecting other devices via an ethernet connection will further reduce the maximum number of GP Series units that can be connected. Be sure to check the number of connections required before connecting a device. Also, since the number of usable connections vary depending on the PLC model, be sure to refer to your PLC Manual for details.

## 7.6.2 Supported Devices

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

### ■ SIMATIC S7-300/S7-400 Series

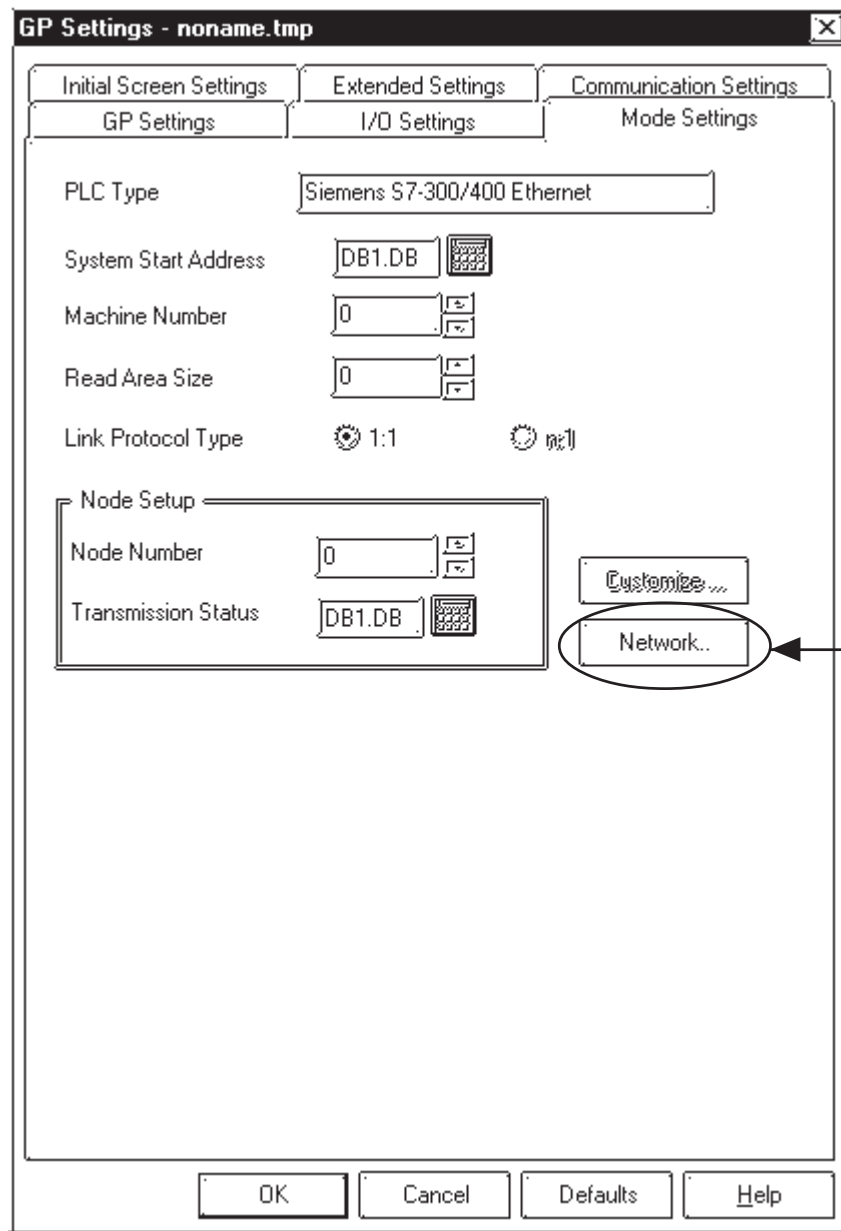
Setup System Area here

Device	Bit Address	Word Address	Particulars	
Input	E000.0 ~ E127.7	EW000 ~ EW126	<input type="text" value="÷ 2"/>	H/L
Output	A000.0 ~ A127.7	AW000 ~ AW126	<input type="text" value="÷ 2"/>	
Internal	M000.0 ~ M255.7	MW000 ~ MW254	<input type="text" value="÷ 2"/>	
Timer	_____	T000 ~ T127	*1	
Counter	_____	Z00 ~ Z63	*1	
Data Block	DB1.DBX0.0 ~ DB255.DBX65533.7	DB1.DBW0 ~ DB255.DBW65532	<input type="text" value="÷ 2"/>	

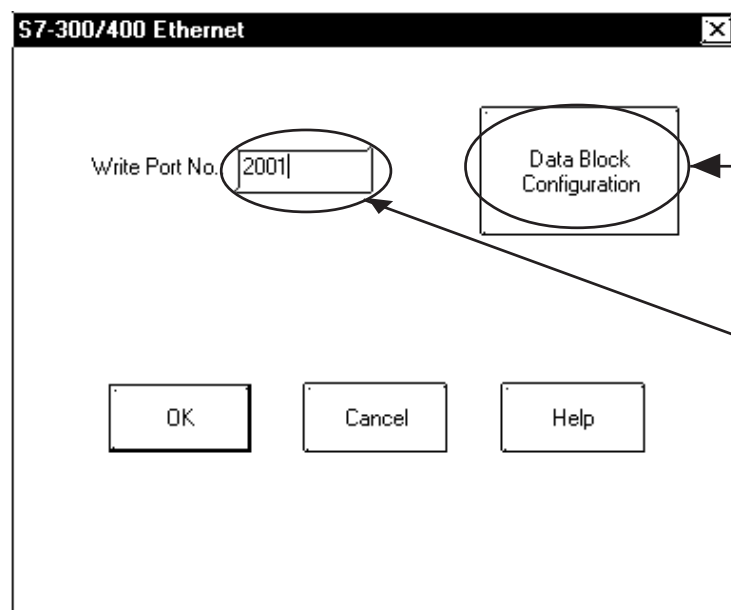
\*1 Data Write is not possible. When writing to this device, the “Host Communication Error (02:FB)” is displayed.

\*2 Only block numbers that have already been registered via the screen editor’s [GP Setup] -> [Mode Settings] -> [Network] -> [Data Block Configuration] feature can be used for the Data Block. A maximum of 40 blocks can be set up at a time.

• **Mode Settings**



Write Port No. and Data Block Configuration settings

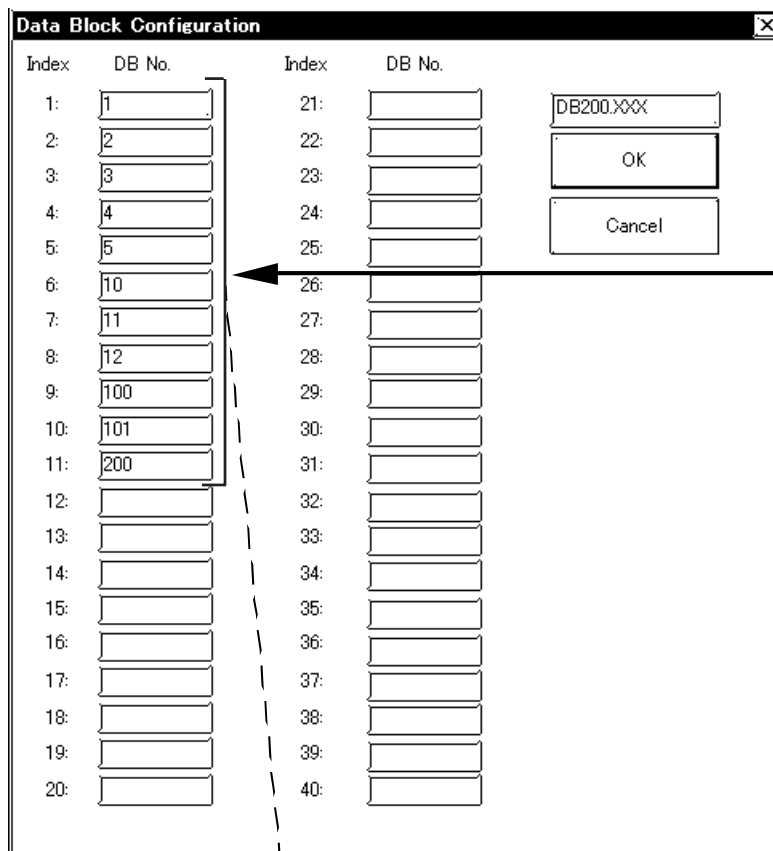


Data Block Configuration settings

Write Port No. settings.  
Input Range:  
1024 to 65535  
Default: 2001

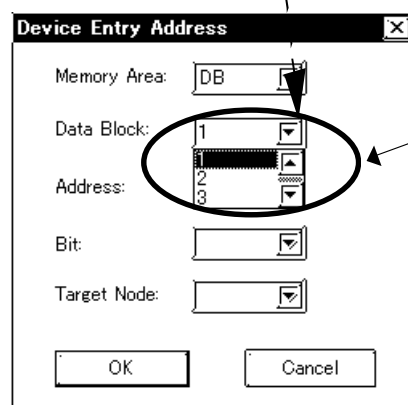
• **Data Block Configuration Settings**

The [Data Block Configuration] screen allows you to designate the Data Block Nos. to be used on your GP unit. A maximum of 40 blocks can be set up at a time. Addressed can be designated only for Data Block Nos. set up via this screen.



Set up the Data Block No. you want to use.

<When setting the tag address>



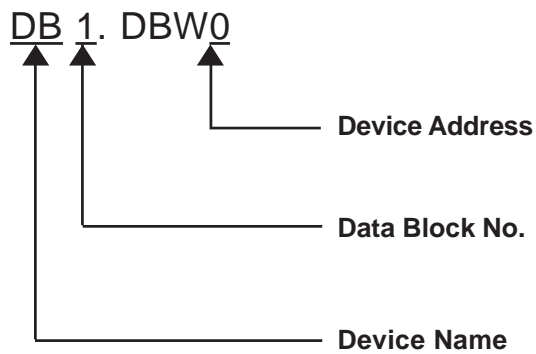
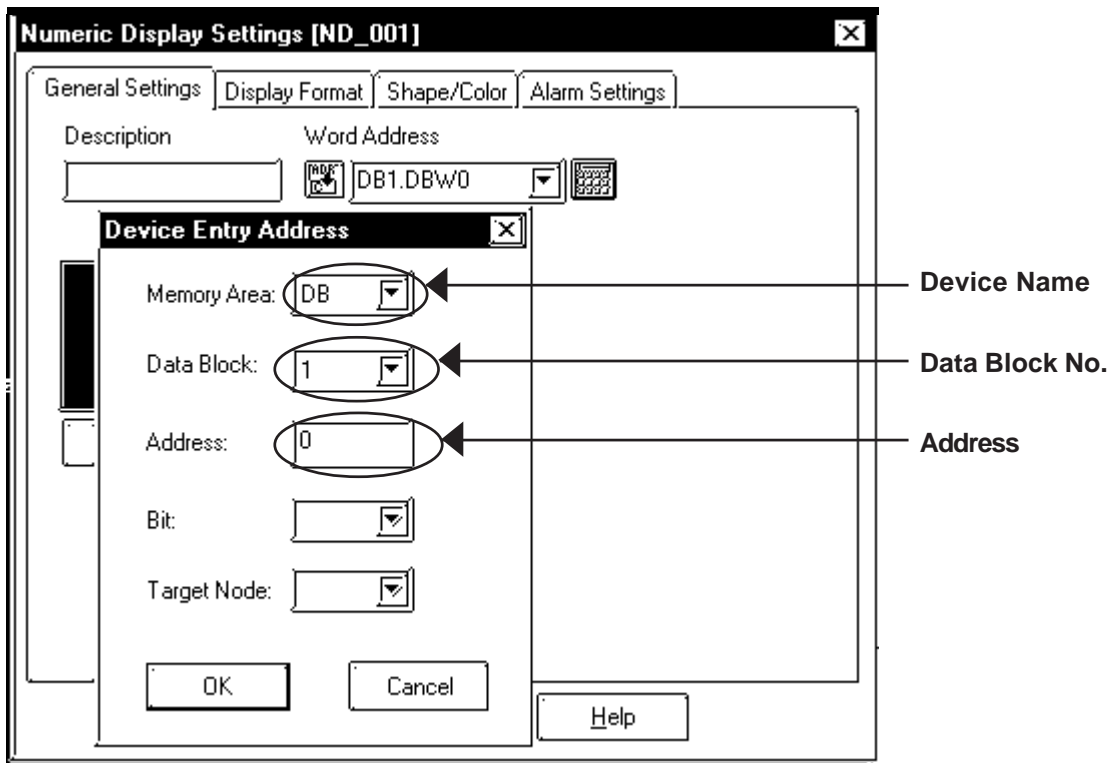
Only the Data Block Nos. set up via the above screen are displayed here.



- **Pro-Server Usage Restrictions:** When accessing devices from Pro-Server, be sure to symbolically define the device address you want to access. Create a screen and import the symbol to this screen via Pro-Server. For details, **Reference** your Pro-Server Operation Manual
- When connecting to multiple GP units, be sure to set the starting address such that no GP unit's system area overlaps with that of the other.

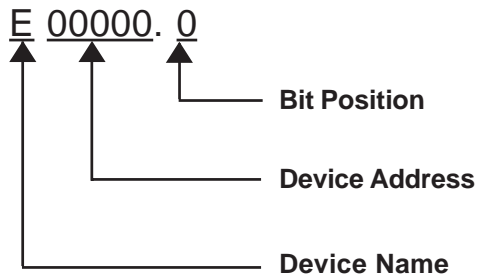
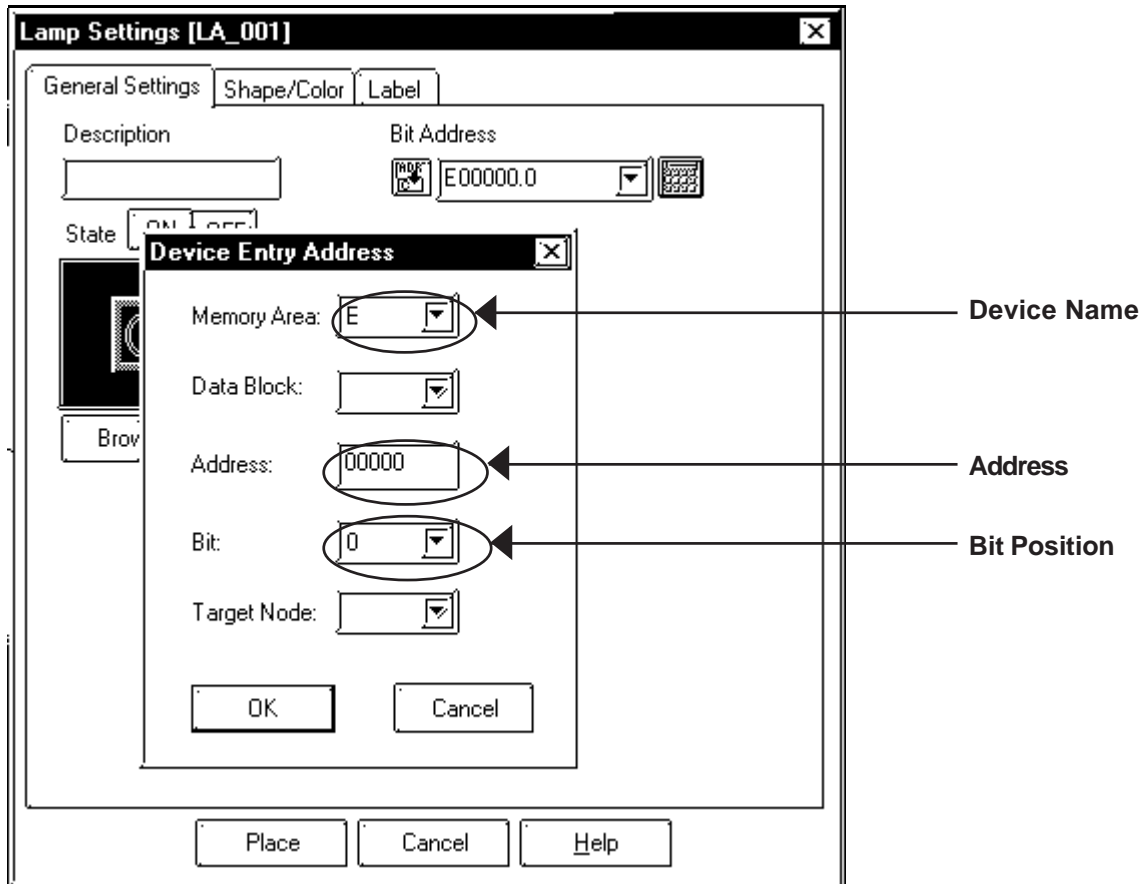
◆ Part and Tag Settings

- Word Devices





- Bit Devices



### 7.6.3 Environment Setup

The following table lists the recommended GP/GLC communication settings required for ethernet communication.

GP Settings		PLC Settings <sup>*3</sup>	
SRC IP Address	GP's IP Address <sup>*1</sup>	Partner: IP address	GP's IP Address <sup>*1</sup>
SRC Port No.	GP's Port No. <sup>*2</sup>	Partner: Port	GP's Port No. <sup>*2</sup>
DEST IP Address	PLC's IP Address <sup>*1</sup>	Local: IP address	PLC's IP Address
DEST Port No.	PLC's FETCH Port No.	FETCH port No.	PLC's FETCH Port No.
Write Port No.	PLC's Write Port No.	Write Port No.	PLC's Write Port No.

*\*1 Contact your network administrator for setting values.*

*\*2 When using the following functions on a GP2000 or GLC2000 series unit, be sure not to use duplicate port number values. Check the 2-way driver's port number setting via the following menu:*

*GP/GLC OFFLINE mode's [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].*

*The default value is 8000. The 2-way driver uses this port and the following nine ports for a total of 10 (8000 ~ 8009).*

*\*3 Perform PLC settings via the NetPro ladder software.*

Port number's offset	Function
+1	For MtoMLan (GP-PRO/PBIII for Windows Screen Transfer)
+2	For ProNet (Pro-Server with Pro-Studio for Windows)
+3	Reserved
+4	For GP-Web
+5	Reserved
+6	For Pro-Control Editor
+7	Reserved
+8	For GP-PRO/PBIII for Windows Simulation
+9	Reserved



**Note:** The communication format used is TCP (fixed).

■ **GP Setup Operation Surroundings Menu (OFFLINE)**

The following screens show the GP unit settings necessary for communication via ethernet connection.

SETUP OPERATION SURROUNDINGS MENU		RETURN
1	SETUP OPERATION SURROUNDINGS	
2	SETUP ETHERNET INFORMATION	
3	SETUP ETHERNET EXT. INFORMATION	

◆ **Operation Surroundings Setup (Large-sized GP)**

SETUP OPERATION SURROUNDINGS		SET	CANCEL						
SYSTEMDATA AREA START DB		[DB 1 ]							
START DW		[ 0 ]							
READING AREA SIZE (0-256)		[ 0 ]							
RESET GP ON DATA WRITE ERROR	ON	OFF							
<p>Note!</p> <p>The system start address cannot be changed on GP.</p> <p>Please use GP-PRO/PB3 to set this data and re-send to the GP</p>									
1	2	3	4	5	6	7	8	9	0

System Area related settings and On Data Write Error settings are performed via this menu. The system area start address cannot be changed via the GP unit. Be sure to use GP-PRO/PBIII Screen Editor software to change this data and resend it to the GP unit.

• **Operation Surroundings Setup (Medium-sized GP)**

SETUP OPERATION SURROUNDINGS		SET	ESC
SYSTEM DATA AREA START DB		1	
START DW		0	
SYSTEM AREA READ SIZE		0	
RESET GP ON WRITE ERROR		OFF	
<p>Please use GP-PRO/PB3 to modify the DB for system area</p>			

### ◆ Ethernet Information Settings

SETUP NETWORK INFORMATION									
SRC IP ADDRESS [ 0].[ 0].[ 0].[ 0]									
SRC PORT NO. [ 1024]									
DEST IP ADDRESS [ 0].[ 0].[ 0].[ 0]									
DEST PORT NO. (FETCH) [ 2000]									
DEST PORT NO. (WRITE) [ 2001]									
1	2	3	4	5	6	7	8	9	0

- **SRC IP ADDRESS**

Enter the IP address for the GP at your station. To do this, separate the 32 bits of the IP address into four segments of eight bits each, delimit those segments with a dot, and then enter them as decimal numbers.

- **SRC PORT NO.**

Enter your station port number in the range from 1024 to 65535.

- **DEST IP ADDRESS**

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

- **DEST PORT NO. (FETCH)**

Enter the FETCH Port No. of the PLC in the range from 1024 to 65535.

- **DEST PORT NO. (WRITE)**

Enter the WRITE Port No. of the PLC in the range from 1024 to 65535.



When using the GP2000/GLC2000 series unit's built-in ethernet port, be sure the SRC IP ADDRESS value is not the same as the 2-Way driver's port number. The 2-Way driver's port number setting can be checked via GP OFFLINE mode's [INITIALIZE] -> [SETUP OPERATION SURROUNDINGS] -> [EXTENDED SETTINGS] -> [SETUP ETHERNET INFORMATION].

The default value is 8000. The 2-Way driver uses this port and the following nine ports for a total of 10 (8000 ~ 8009). If the SRC IP ADDRESS is 0.0.0.0, the IP address set up via the 2-Way driver's [SETUP ETHERNET INFORMATION] will be enabled.

◆ Ethernet Information Extended Settings

SETUP NETWORK EXT. INFORMATION										SET	CANCEL
SEND WAIT TIME		[ 0 ](ms)									
TIMEOUT		[ 0 ](x 2sec)									
IP ROUTER ADDRESS		[ 0].[ 0].[ 0].[ 0]									
SUBNET MASK		[ 0].[ 0].[ 0].[ 0]									
1	2	3	4	5	6	7	8	9	0		

- **SEND WAIT TIME**

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**

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 it is TCP communication, and is 5 seconds when it is UDP communication.

- **IP ROUTER ADDRESS**

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

- **SUBNET MASK**

Enter subnet masks. If no subnet mask is used, enter "0" in all fields.

## ■ Screen Editor Settings

Screen Editor settings are performed via the [GP Setup] -> [Communication Settings] feature. The setting items are described below.

**GP Settings - noname.tmp**

GP Settings	I/O Settings	Mode Settings
Initial Screen Settings	Extended Settings	Communication Settings
Source IP Address	0.0.0.0	
Source IP Port No.	1024	
Destination IP Address	0.0.0.0	
Destination IP Port No.	2000	
Protocol Type	<input checked="" type="radio"/> UDP	<input checked="" type="radio"/> TCP
Data Code	<input checked="" type="radio"/> BINARY	<input checked="" type="radio"/> ASCII
Advanced ...		
<input type="button" value="OK"/> <input type="button" value="Cancel"/> <input type="button" value="Defaults"/> <input type="button" value="Help"/>		

- **Source IP Address**

Enter the IP address for the GP at your station. To do this, separate the 32 bits of the IP address into four segments of eight bits each, delimit those segments with a dot, and then enter them as decimal numbers.

- **Source IP Port No.**

Enter your station port number in the range from 1024 to 65535.

- **Destination IP Address**

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

- **Destination IP Port No.**

Enter the FETCH Port No. of the PLC in the range from 1024 to 65535.  
Default: 2000.



**Note:** Protocol Type and Data Code settings cannot be performed.

### ◆ Advanced Communication Setup

The [Advanced Communication Setup] screen is as shown below.

Advanced Communication Setup		
Send Wait Time	0 msec	OK Cancel Help
Time Out	1 x2 sec	
IP Router Address	0.0.0.0	
Subnet Mask	0.0.0.0	
UDP Retry Count	2	

- **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”.

- **Time Out (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.

- **IP Router Address**

Enter the IP address of the router (only one). If no router is used, enter “0” in all fields.

- **Subnet Mask**

Enter subnet masks. If no subnet mask is used, enter “0” in all fields.



**Note:** UDP Retry Count value setting cannot be performed.

## 7.6.4 Error Codes

### ■ PLC SPECIFIC ERROR CODES

PLC error codes are displayed in the left lower corner of the GP screen in the format shown below. \*\* indicates PLC specific error codes.

**Host Communication Error (02:\*\*)**



Error Code	Cause
09	Trying to read data from / write data to a non-existing PLC address.



## 7.9 Protocol Stack Error Codes

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

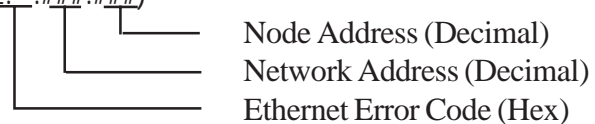
Host communication error (02:FE:\*\*)

\*\* 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 incorrect.	
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 information 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:\*\*:###:###)



\*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:\*\*:###:###)

