Siemens AG

SIMATIC S7 Ethernet Driver

Introduction

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

In this manual, the connection procedure will be described by following the below sections:
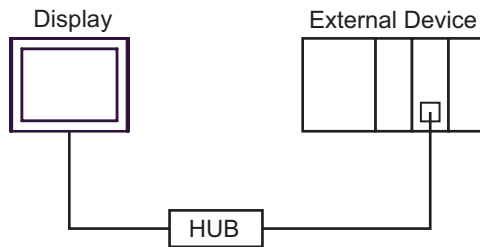
| 1 | System Configuration
This section shows the types of External Devices which can be connected and SIO type. | ☞ "1 System Configuration" (page 3) |

| 2 | Selection of External Device
Select a model (series) of the External Device to be connected and connection method. | ☞ "2 External Device Selection" (page 6) |

| 3 | Example of Communication Settings
This section shows setting examples for communicating between the Display and the External Device. | ☞ "3 Communication Settings" (page 7) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set communication settings of the Display with GP-Pro Ex or in offline mode. | ☞ "4 Setup Items" (page 22) |

Operation

1　　System Configuration

The system configuration in the case when the External Device of Siemens AG and the Display are connected is shown.

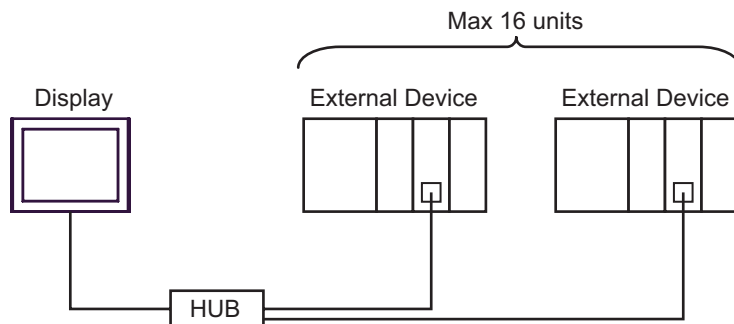| Series	CPU	Link I/F	SIO Type[1]	Setting Example
SIMATIC S7-200 Series	CPU222 CPU224 CPU224 XP CPU226	CP 243-1 IT[2] CP 243-1	Ethernet (TCP) (OP Communication)	Setting Example 3 (page 13)
SIMATIC S7-300 Series	CPU312IFM CPU313 CPU314 CPU314IFM CPU315 CPU315-2 DP CPU316 CPU316-2 DP CPU318-2 CPU315-2 PN/DP CPU317-2 PN/DP CPU319-3 PN/DP	CP 343-1 IT CP 343-1	Ethernet (TCP) (FETCH/WRITE)	Setting Example 1 (page 7)
			Ethernet (TCP) (OP Communication)	Setting Example 2 (page 10)
	CPU315-2 PN/DP CPU317-2 PN/DP CPU319-3 PN/DP	Ethernet interface on CPU[3]	Ethernet (TCP) (OP Communication)	Setting Example 2 (page 10)
SIMATIC S7-400 Series	CPU412-1 CPU412-2 DP CPU413-1 CPU413-2 DP CPU414-1 CPU414-2 DP CPU414-3 DP CPU416-1 CPU416-2 DP CPU416-3 DP CPU417-4 CPU414-3PN/DP CPU416-3PN/DP	CP 443-1 IT CP 443-1	Ethernet (TCP) (FETCH/WRITE)	Setting Example 1 (page 7)
			Ethernet (TCP) (OP Communication)	Setting Example 2 (page 10)
	CPU414-3PN/DP CPU416-3PN/DP	Ethernet interface on CPU[3]	Ethernet (TCP) (OP Communication)	Setting Example 2 (page 10)
SIMATIC S7-1200 Series	CPU1211C CPU1212C CPU1214C	PROFINET interface on CPU[4]	Ethernet (TCP) (OP Communication)	Setting Example 4 (page 16)
LOGO! Series	OBA7	Ethernet interface on CPU[3]	Ethernet (TCP) (OP Communication)	Setting Example 5 (page 19)

*1   OP Communication has a larger address range of usable devices as that of FETCH/WRITE, so we recommend use of OP Communication.

)"5 Supported Device Addresses" (page 31)

*2   CP 243-1 IT and CP 243-1 can use the version of CPU above Rel.1.20.

*3   The Ethernet interface in the CPU only supports OP Communication. FETCH/WRITE cannot be used.

*4   The PROFINET interface in the CPU only supports OP Communication. FETCH/WRITE cannot be used.
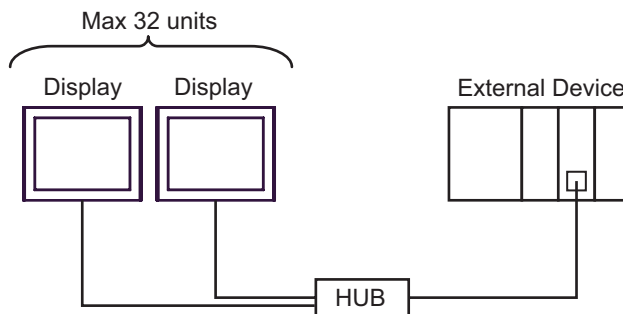
■ Connection Configuration

• 1:1 Connection

Display

External Device

HUB

• 1:n Connection

Max 16 units

Display

External Device

External Device

HUB

• n:1 Connection

Max 32 units

Display

Display

External Device

HUB

| NOTE | • The number of connectable Displays depends on the External Device. |

Please refer to the External Device manual for more details.

• The following limitations apply when using the LOGO! series:

• 1:n connections require a network switch.

• n:1 connection is not supported.

• You cannot use the Display if the ladder software is online.

2 External Device Selection

Select the External Device to be connected to the Display.

Setup Items	Setup Description
Number of Devices/PLCs	Enter an integer from 1 to 4 for the number of series to set.
Manufacturer	Select the manufacturer of the External Device to be connected. Select "Siemens AG".
Series	Select a model (series) of the External Device to be connected and connection method. Select "SIMATIC S7 Ethernet". Check the External Device which can be connected in "SIMATIC S7 Ethernet" in system configuration.)"1 System Configuration" (page 3)
Port	Select the Display port to be connected to the External Device.
Use System Area	Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. 　Cf.　GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)" This can also be set in GP-Pro EX or in the Display's offline mode. 　Cf.　GP-Pro EX Reference Manual "Display Unit (System Area) Settings Guide" 　Cf.　Maintenance/Troubleshooting Manual "Main Unit - System Area Settings"

3　　　　Communication Settings

This section provides communication setting examples recommended by Pro-face for communications between the Display and the External Device.

3.1　　　　Setting Example 1

■ GP-Pro EX Settings

◆ Communication Settings

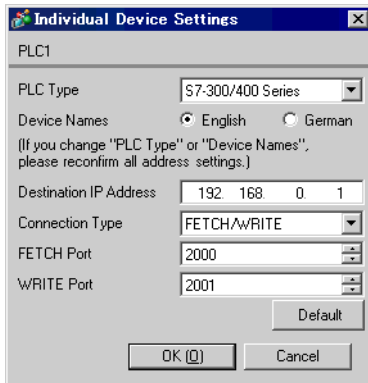To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
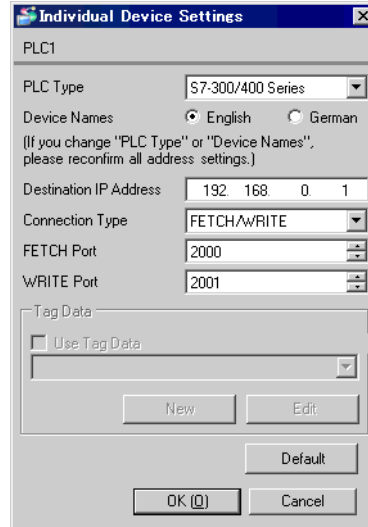
◆ Device Settings

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

• GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

• GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

• Set IP address on the External Device for IP address in Device-specific settings.

• You need to set IP address on the Display in the offline mode of the Display.

■ External Device Settings

Use the FETCH TCP protocol and WRITE TCP protocol so that the Ethernet driver can read and write data for the External Device. Setting example is shown below. Please refer to the manual of the External Device for more details.

(1) Select CP343-1/443-1 from hardware configuration menu in the ladder software "STEP 7" by Siemens AG. When the dialog box is displayed, set [IP address] and [Subnet mask] in the [Parameters] tab.

(2) Start up "NetPro" from "STEP7", and select the CPU to which CP343-1/443-1 is connected. Right-click to select [Insert New Connection].

(3) Select [TCP connection] for [Type] in the displayed dialog box, and leaving [Unspecified] selected for [Station], click [OK].

(4) Click the [Options] tab in the displayed dialog box, and select [Fetch passive] in [Mode].

(5) Click the [Address] tab, and enter the port No. (FETCH PORT No. Default 2000) Do not set the duplicate port No.

(6) Click [OK].

(7) Select the CPU again to which CP343-1/443-1 is connected. Right-click to select [Insert New Connection].

(8) Select [TCP connection] for [Type] in the displayed dialog box, and leaving [Unspecified] selected for [Station], click [OK].

(9) Click the [Options] tab in the displayed dialog box, and select [Write passive] in [Mode].

(10)Select the [Address] tab and enter the port No. (WRITE PORT No. Default 2001) Do not set the duplicate port No.

(11)Click [OK].

(12)Save the above setting contents and download to the External Device.

◆ Notes

- The FETCH port's Partner that is set in the ladder software communication setting dialog box must be the same as the [Port No. (FETCH)] set in the GP-Pro EX communication settings. Likewise, the WRITE port's Partner must be the same as the [Port No. (WRITE)].
  If each Partner of the FETCH port and the WRITE port is blank, the [Port No.] can be also set to [Auto].
- Check with a network administrator about IP address. Do not set the duplicate IP address.
- The "Keep Alive" feature of Siemens CP Module is not supported. Please set the "Keep Alive" to 0.
- When the Display is turned off and on again during communication with the External Device or is switched to offline mode and then back to online mode, it may take several tens of seconds before the communication is resumed.

3.2 Setting Example 2

■ GP-Pro EX Settings

◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
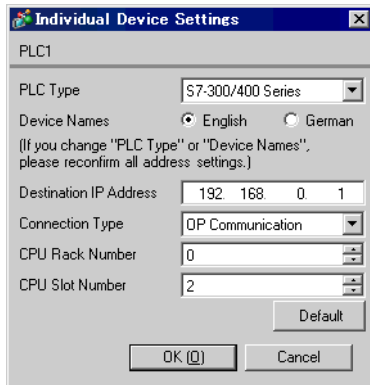

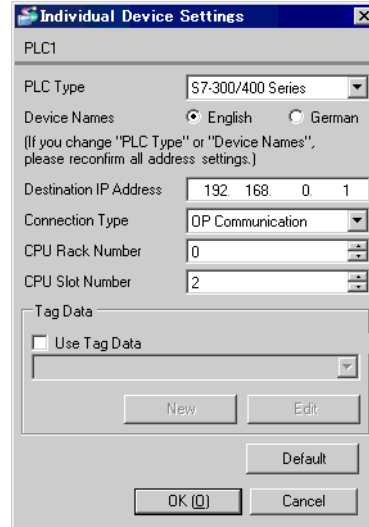| NOTE | • Port No. that is set to [Port No. (FETCH)] performs communication in OP Communication. Port No. that is set to [Port No. (WRITE)] is not used. |

◆ Device Settings

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

- GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

- GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the offline mode of the Display.

■ External Device Settings

The Communication setting for the External Device is executed using ladder software (STEP 7).

Please refer to the manual of the External Device for more details.

(1) Start up ladder software.

(2) Select [New Project Wizard] of [File] menu and make a project. Set the CPU, Organization Block, and project name to be used following the instruction provided by the wizard.

(3) Start up Hardware setting.

(4) Select the module to be used from the catalog view and allocate it to the slot of the mounted module number.

(5) After allocating the module, [Property] dialog box is displayed. Set IP address and subnet mask to [Property] dialog box of the module to be used for communication.

(6) Select [New] from [Subnet] of [Property] dialog box.

(7) Confirm displayed Subnet property and click [OK].

(8) Select Subnet property displayed in [Subnet] of [Property] dialog box. Click [OK] to close [Property] dialog box.

(9) Select [Save and Compile] from [Station] menu and save the contents of the settings. After saving, end Hardware setting.

(10)Start up NetPro and download the contents for setting to the External Device. After the download is completed, reboot the power of the External Device.

◆ Notes

- Check that the CPU rack number and CPU slot number to be used for communication are the same as the GP-ProEX setting. If the setting is not the same, communication cannot be conducted.
- Check with a network administrator about IP address. Do not set the duplicate IP address.
- When the Display is turned off and on again during communication with the External Device or is switched to offline mode and then back to online mode, it may take several tens of seconds before the communication is resumed.

3.3   Setting Example 3

■ GP-Pro EX Settings

◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
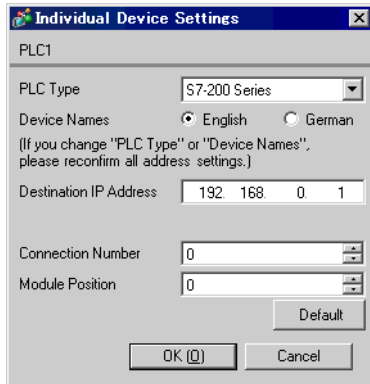

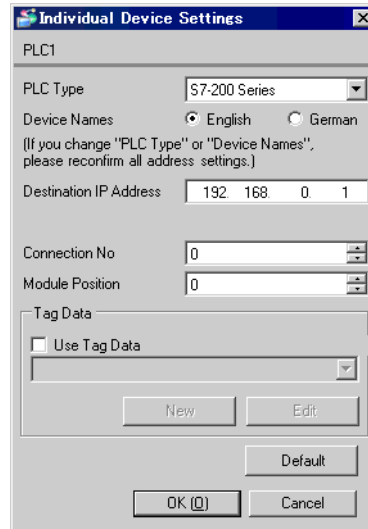| NOTE	• Port No. that is set to [Port No. (FETCH)] performs communication in OP Communication. Port No. that is set to [Port No. (WRITE)] is not used.
	• Set the "Timeout" value to "3" (sec) or more.

◆ Device Settings

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

- GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

- GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the offline mode of the Display.

■ External Device Settings

Use the ladder software (STEP 7 Micro/Win32) for communication settings of the External Device. Please refer to the manual of the External Device for details.

(1) Start up the ladder software.

(2) From the [Tool] menu, select [Ethernet Wizard].

(3) Click [Next].

(4) Click [Read Module] to detect the installed Ethernet module.

(5) Enter the [Position] value of the detected module in [Module Position], and then click [Next].

(6) Set [IP Address] and [Subnet Mask], and then click [Next].

(7) Enter "1" (the number of the Displays to be connected) in "Number of connections to configure for this module.", and then click [Next].

(8) Follow the steps below to set the Display, and then click [OK].

- Select "This is a Server Connection" to connect the External Device to the Display.
- In the "Local Properties (Server)" area, select "Accept all connection requests." to allow connections from all IP addresses.
- In the "Remote Properties (Client)" area, enter "10.00" in "TSAP".
- Clear the "Enable the Keep Alive function for this connection." check box because the Display does not support KeepAlive.

| NOTE | • The connection number is displayed in this dialog box. If the connection number is "1", for example, [Connection 1] is displayed. |

(9) Click [Next].

(10)To save the module configuration, set the memory address of the External Device, and then click [Next].

(11)Click [Finish].

(12)Click [Yes] for the confirmation message.

(13)Select [Save] from [File], and download the configuration to the External Device.

◆ Notes

- Check with your network administrator about the IP address. Do not duplicate IP addresses.
- The subroutine "ETH0_CTRL" must be called by the ladder program every scan.
- When the Display is turned off and on again during communication with the External Device or is switched to offline mode and then back to online mode, it may take several tens of seconds before the communication is resumed.

3.4　　　　Setting Example 4

■ GP-Pro EX Settings

◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
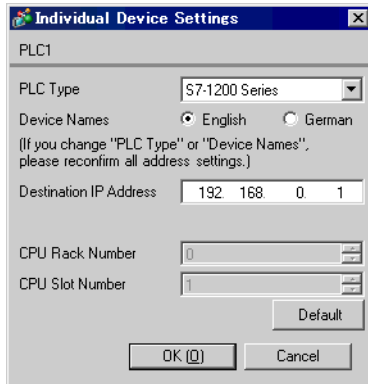

NOTE • Port No. that is set to [Port No. (FETCH)] performs communication in OP Communication. Port No. that is set to [Port No. (WRITE)] is not used.

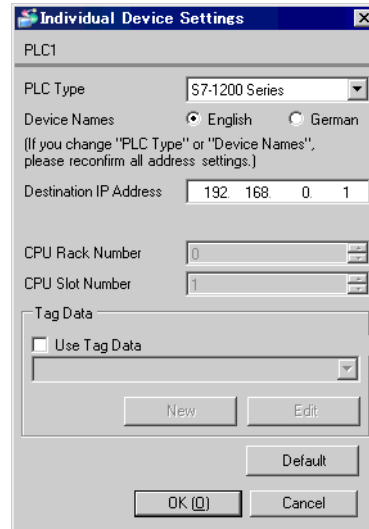　　　• Set the "Timeout" value to "3" (sec) or more.

◆ Device Settings

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

• GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

• GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the offline mode of the Display.

■ External Device Settings

Use the ladder software (STEP 7 BASIC) to configure the External Device communication settings. Please refer to the External Device manual for details.

(1) Start up the ladder software.

(2) Create a project and select the External Device.

(3) Select the PROFINET interface on the CPU and display the setup screen.

(4) Select [Ethernet address] and set up as follows.

Setup Items	Setting Value
IP address	192.168.0.1
Subnet mask	255.255.255.0

(5) Save and transfer the project to the External Device.

3.5　　　　Setting Example 5

■ GP-Pro EX Settings

◆ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].

NOTE	• Port No. that is set to [Port No. (FETCH)] performs communication in OP Communication. Port No. that is set to [Port No. (WRITE)] is not used.
	• Set the "Timeout" value to "3" (sec) or more.

◆ Device Settings

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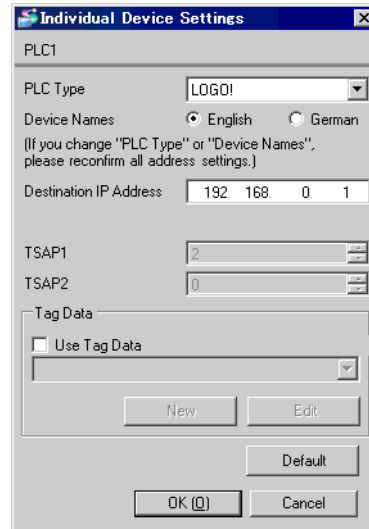d click [Settings] 🔳 . To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

• GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

• GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

◆ Notes

• Check with a network administrator about IP address. Do not set the duplicate IP address.

• Set IP address on the External Device for IP address in Device-specific settings.

• You need to set IP address on the Display in the offline mode of the Display.

■ External Device Settings

Use the ladder software (LOGO!Soft Comfort V7.0) to configure the External Device communication settings. Please refer to the External Device manual for details.

(1) Start up the ladder software.

(2) Create the ladder diagram.

(3) From the [Tools] menu select [Ethernet connections], and define the setup items as follows:

Setup Items	Setting Value
IP address	192.168.0.1
Subnet mask	255.255.255.0
Gateway	192.168.0.10

(4) From [Peer-to-Peer Connections], right-click [Ethernet Connections] and from the shortcut menu select [Add Connection].

(5) Double-click the added connection and select [Server Connection].

(6) In [Local Properties (Server)], select the [Connect with an Operator Panel (OP)] and [Accept all connection requests] check boxes. In [Remote Properties (Client)], set [TSAP] to "02.00".

(7) Click [OK] to close the dialog box.

(8) Update the Parameter VM Mapping and then download the communication setting to the External Device.

4 Setup Items

Set communication settings of the Display with GP-Pro EX or in offline mode of the Display.

The setting of each parameter must be identical to that of External Device.

)"3 Communication Settings" (page 7)

NOTE • Set the Display's IP address in offline mode.

Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

4.1 Setup Items in GP-Pro EX

■ Communication Settings

To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].

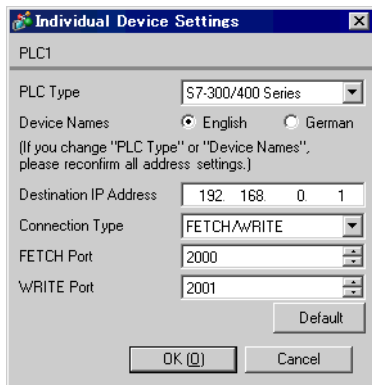| Setup Items	Setup Description
Port No.	Use an integer from 1024 to 65535 to enter FETCH port number and WRITE number of display. If a check is put in [Auto], port number is set automatically. When the connection type is OP Communication, the port number set to [Port No. (FETCH)] implements communication.
Timeout	Use an integer from 1 to 127 to enter the time (s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait To Send	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.

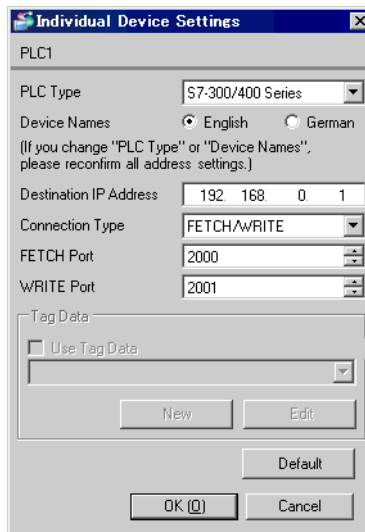NOTE • Refer to the GP-Pro EX Reference Manual for Indirect Device.

■ Device Setting

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

Setting contents of device setting differs depending on the connection type (SIMATIC S7-300/400 Series only).

<S7-300/400 Series Connection type: FETCH/WRITE>

• GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

• GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

Setup Items	Setup Description
PLC Type	Select the External Device series.
Device Names	Select the display language of device names, either English or German.
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
Connection Type	Select the connection type.
FETCH Port	Use an integer from 1024 to 65535 to enter the FETCH port No. of the External Device.
WRITE Port	Use an integer from 1024 to 65535 to enter the WRITE port No. of the External Device.

<S7-300/400 Series Connection type: OP Communication>

• GP3000, GP-4100 Series, GP-4*01TM and
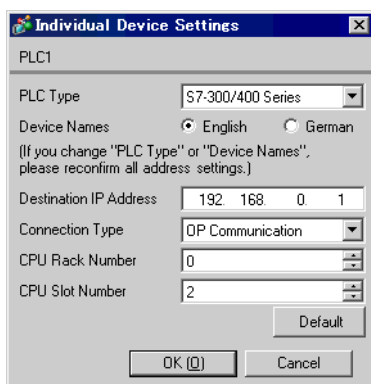LT3000 Series

• GP4000 (excluding GP-4100 Series and
GP-4*01TM)Series and IPC Series(PC/AT)

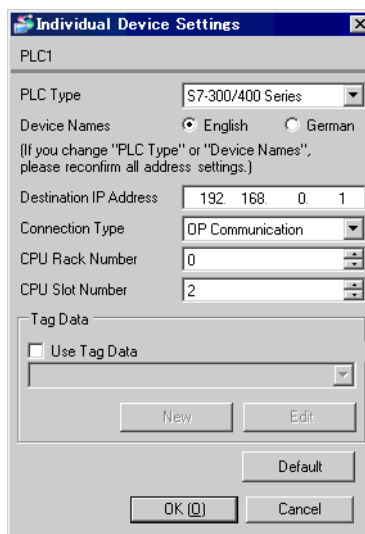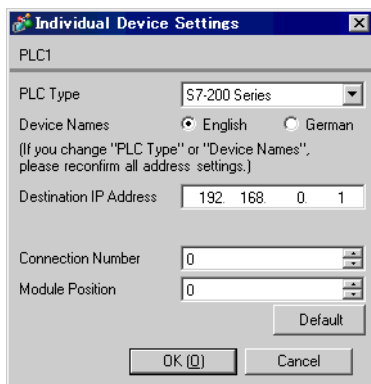| Setup Items	Setup Description
PLC Type	Select the External Device series.
Device Names	Select the display language of device names, either English or German.
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
Connection Type	Select the connection type.
CPU Rack Number	Use an integer from 0 to 7 to enter the CPU rack number of the External Device.
CPU Slot Number	Use an integer from 0 to 31 to enter the CPU slot number of the External Device.
Use Tag Data	Select the check box when using tag data (symbol addresses). This will enable you to select the tags you want to use. ☞ "5.5 When Using a Tag" (page 35)

<S7-200 Series>

• GP3000, GP-4100 Series, GP-4*01TM and
  LT3000 Series

• GP4000 (excluding GP-4100 Series and
  GP-4*01TM)Series and IPC Series(PC/AT)

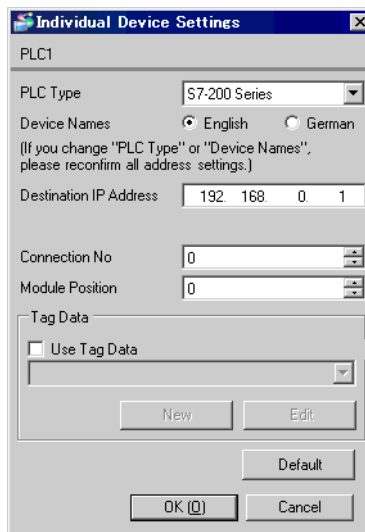| Setup Items	Setup Description
PLC Type	Select the External Device series.
Device Names	Select the display language of device names, either English or German.
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
Connection Number	Use an integer from 0 to 7 to enter the connection number of the External Device.
Module Position	Use an integer from 0 to 6 to enter the module position of the External Device.
Use Tag Data	Select the check box when using tag data (symbol addresses). This will enable you to select the tags you want to use. ☞ "5.5 When Using a Tag" (page 35)

<S7-1200 Series>

• GP3000, GP-4100 Series, GP-4*01TM and LT3000 Series

• GP4000 (excluding GP-4100 Series and GP-4*01TM)Series and IPC Series(PC/AT)

Setup Items	Setup Description
PLC Type	Select the External Device series.
Device Names	Select the display language of device names, either English or German.
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
Use Tag Data	Select the check box when using tag data (symbol addresses). This will enable you to select the tags you want to use.)"5.5 When Using a Tag" (page 35)

<LOGO! Series>

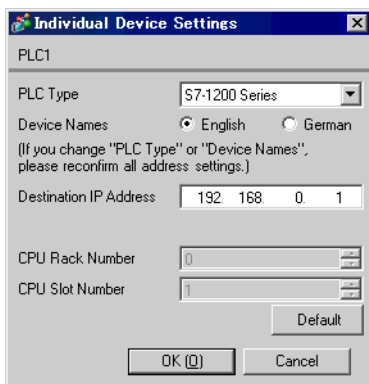• GP3000, GP-4100 Series, GP-4*01TM and
LT3000 Series

• GP4000 (excluding GP-4100 Series and
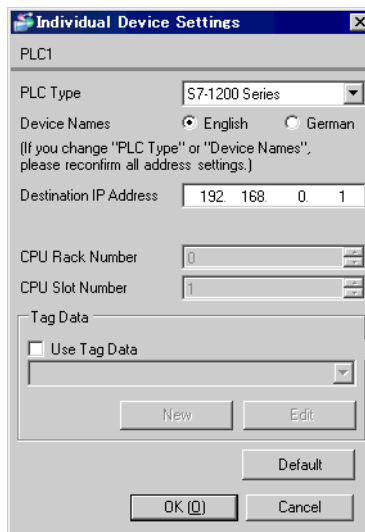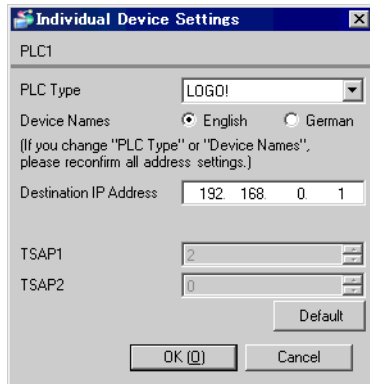GP-4*01TM)Series and IPC Series(PC/AT)

Setup Items	Setup Description
PLC Type	Select the External Device series.
Device Names	Select the display language of device names, either English or German.
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
Use Tag Data	Select the check box when using tag data (symbol addresses). This will enable you to select the tags you want to use.)"5.5 When Using a Tag" (page 35)

4.2　　　Setup Items in Offline Mode

NOTE • Refer to the Maintenance/Troubleshooting guide for information on how to enter offline mode or about the operation.

　　　Cf.　Maintenance/Troubleshooting Guide "Offline Mode"

■ Communication Settings

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

Setup Items	Setup Description
Port No.	Set the FETCH port No. and WRITE port No. of the Display. Select either [Fixed] or [Auto]. When you select [Fixed], use an integer from 1024 to 65535 to enter the port No. of the Display. When you select [Auto], the port No. will be automatically assigned regardless of the entered value. When the connection type is OP Communication, the port number set to [Port No. (FETCH)] implements communication.
Timeout (s)	Use an integer from 1 to 127 to enter the time (s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, use an integer from 0 to 255 to enter how many times the Display retransmits the command.
Wait To Send (ms)	Use an integer from 0 to 255 to enter standby time (ms) for the Display from receiving packets to transmitting next commands.

■ Device Setting

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings]. Touch the External Device you want to set from the displayed list, and touch [Device].

Comm.	Device			

SIMATIC S7 Ethernet   [TCP]   Page 1/1

Device/PLC Name [PLC1 ▼]

```
PLCTYPE              S7-300/400 English
DEST IP ADDR         192 168  0   1
CONNECTION TYPE      OP COMMUNICATION
FETCH PORT NO.                    2000  ▼  ▲
WRITE PORT NO.                    2001  ▼  ▲
CPU RACK NO.                         0  ▼  ▲
CPU SLOT NO.                         2  ▼  ▲
CONNECTION NO.                       0  ▼  ▲
MODULE POSITION                      0  ▼  ▲
```

	Exit		Back	2007/06/28 12:13:09

Setup Items	Setup Description
Device/PLC Name	Select the External Device for device setting. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
PLC TYPE	Display the PLC type. **NOTE** • Please make a change of the PLC type by [Device Setting] of GP-Pro EX.
DEST IP ADDR	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
CONNECTION TYPE	Display the connection type. **NOTE** • Please make a change of the connection type by [Device Setting] of GP-Pro EX.
FETCH PORT NO.	Use an integer from 1024 to 65535 to enter the FETCH port No. of the External Device. Available only if the PLC type is "S7-300/400 Series". Valid only when the connection type is [FETH/WRITE].
WRITE PORT NO.	Use an integer from 1024 to 65535 to enter the WRITE port No. of the External Device. Available only if the PLC type is "S7-300/400 Series". Valid only when the connection type is [FETH/WRITE].
CPU RACK NO.	Use an integer from 0 to 7 to enter the rack number that External Device is mounted to. Available only if the PLC type is "S7-300/400 Series". Valid only when the connection type is [OP Communication].

| Setup Items	Setup Description
CPU SLOT NO.	Use an integer from 0 to 31 to enter the slot number that External Device is mounted to. Available only if the PLC type is "S7-300/400 Series". Valid only when the connection type is [OP Communication].
CONNECTION NO.	Use an integer from 0 to 7 to enter the connection number of the External Device. Available only if the PLC type is "S7-200 Series".
MODULE POSITION	Use an integer from 0 to 6 to enter the module position of the External Device. Available only if the PLC type is "S7-200 Series".

5 Supported Device Addresses

Range of supported device address is shown in the table below. Please note that the actually supported range of the devices varies depending on the External Device to be used. Please check the actual range in the manual of your External Device.

5.1 S7-300/400 Series

[▭▭▭] This address can be specified as system data area.

Device	Bit Address		Word Address		32 bits	Remarks
	English	German	English	German		
Data Block (OP Communication)	DB00001.DBX00000.0 - DB65535.DBX65535.7		DB00001.DBW00000 - DB65535.DBW65534			[÷2]
Data Block (FETCH/WRITE)	DB00001.DBX00000.0 - DB00255.DBX16383.7		DB00001.DBW00000 - DB00255.DBW16382			[÷2]*1
Input	I00000.0 - I00127.7	E00000.0 - E00127.7	IW00000 - IW00126	EW00000 - EW00126	[H/L]	[÷2]*1
Output	Q00000.0 - Q00127.7	A00000.0 - A00127.7	QW00000 - QW00126	AW00000 - AW00126		[÷2]*1
Marker	M00000.0 - M00255.7		MW00000 - MW00254			[÷2]*1
Timer	-----		T00000 - T00255			*2 *3
Counter	-----		C00000 - C00255	Z00000 - Z00255		*2 *3

*1 When you write the bit address, the Display reads the word address corresponding to that of the External Device first. Change only the target bit address among the word data once read, and write the word data to the External Device.
Note that the correct data may not be written if you change the word address value in the ladder program while the Display reads the data of the External Device and writes it to the External Device.

*2 Write disable.

*3 Data Type varies depending on the connection type. When the connection type is OP Communication, Data Type is BCD. When it is FETCH/WRITE, Data Type is binary.

NOTE	• Please refer to the GP-Pro EX Reference Manual for system data area.

    Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
    • Please refer to the precautions on manual notation for icons in the table.

    ☞ "Manual Symbols and Terminology"

5.2 S7-200 Series

▭▭▭ This address can be specified as system data area.

Device	Bit Address		Word Address		32 bits	Remarks
	English	German	English	German		
Variable	V00000.0 - V10239.7		VW00000 - VW10238			$\div 2$
Input	I00000.0 - I00015.7	E00000.0 - E00015.7	IW00000 - IW00014	EW00000 - EW00014		$\div 2$ *1
Output	Q00000.0 - Q00015.7	A00000.0 - A00015.7	QW00000 - QW00014	AW00000 - AW00014	⌈H/L⌋	$\div 2$ *2
Marker	M00000.0 - M00031.7		MW00000 - MW00030			$\div 2$
Timer	-----		T00000 - T00255			*3
Counter	-----		C00000 - C00255	Z00000 - Z00255		*3

*1 Writing to the addresses IW0 to IW2 is disabled, depending on the CPU type. These addresses are reserved for onboard I/O.

*2 Only when the External Device is in the EXECUTION mode, writing to the output device is enabled. When the External Device switches to the STOP mode, the output device is reset.

*3 Write disable.

NOTE

- Please refer to the GP-Pro EX Reference Manual for system data area.

    Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.

    ☞ "Manual Symbols and Terminology"

5.3 S7-1200 Series

 This address can be specified as system data area.

Device	Bit Address		Word Address		32 bits	Remarks
	English	German	English	German		
Data Block	DB00001.DBX00000.0 - DB65535.DBX65535.7		DB00001.DBW00000 - DB65535.DBW65534		⌈H/L⌋	[÷2] *1
Input	I00000.0 - I01023.7	E00000.0 - E01023.7	IW00000 - IW01022	EW00000 - EW01022		[÷2]
Output	Q00000.0 - Q01023.7	A00000.0 - A01023.7	QW00000 - QW01022	AW00000 - AW01022		[÷2]
Marker	M00000.0 - M08191.7		MW00000 - MW08190			[÷2]

*1 When you write the bit address, the Display reads the word address corresponding to that of the External Device first. Change only the target bit address among the word data once read, and write the word data to the External Device.
Note that the correct data may not be written if you change the word address value in the ladder program while the Display reads the data of the External Device and writes it to the External Device.

NOTE
• Please refer to the GP-Pro EX Reference Manual for system data area.
   Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
• Please refer to the precautions on manual notation for icons in the table.
   ☞ "Manual Symbols and Terminology"

5.4 LOGO! Series

⬚⬚⬚⬚ This address can be specified as system data area.

Device		Bit Address		Word Address		32 bits	Remarks
		English	German	English	German		
Variable		V00000.0 - V00849.7		VW00000 - VW00848			$\div 2$
Input	Read	I00000.0 - I00003.7	E00000.0 - E00003.7	IW00000 - IW00002	EW00000 - EW00002	H / L	$\div 2$
	Write	I00000.0 - I00002.7	E00000.0 - E00002.7				
Output		Q00000.0 - Q00001.7	A00000.0 - A00001.7	QW00000	AW00000		$\div 2$
Marker		M00000.0 - M00003.7		MW00000 - MW00002			$\div 2$

NOTE
- Please refer to the GP-Pro EX Reference Manual for system data area.

  Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.

)"Manual Symbols and Terminology"

5.5 When Using a Tag

◼ S7-300/400 Series

[▭▭▭] This address can be specified as system data area.

Device			Bit Address	Word Address	32 bits	Remarks
BOOL		Single Tag	<TAGNAME>	-	-	*1 *2
		1D Array	<TAGNAME>[xl] - <TAGNAME>[xh]			
		2D Array	<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]			
		3D Array	<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]			
		4D Array	<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]			
		5D Array	<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]			
		6D Array	<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]			
BYTE		Single Tag	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	[H / L]	*1 *2
		1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].07	<TAGNAME>[xl] - <TAGNAME>[xh]		
		2D Array	<TAGNAME>[xl,yl].00 - <TAGNAME>[xh,yh].07	<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
		3D Array	<TAGNAME>[xl,yl,zl].00 - <TAGNAME>[xh,yh,zh].07	<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
		4D Array	<TAGNAME>[xl,yl,zl,wl].00 - <TAGNAME>[xh,yh,zh,wh].07	<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
		5D Array	<TAGNAME>[xl,yl,zl,vl,wl].00 - <TAGNAME>[xh,yh,zh,vh,wh].07	<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
		6D Array	<TAGNAME>[xl,yl,zl,ul,vl,wl].00 - <TAGNAME>[xh,yh,zh,uh,vh,wh].07	<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		
SINT USINT		Single Tag	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	[H / L]	*1

Device		Bit Address	Word Address	32 bits	Remarks
INT WORD	Single Tag	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>	H/L	*1 *2 *3
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].15	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,yl].00 - <TAGNAME>[xh,yh].15	<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,yl,zl].00 - <TAGNAME>[xh,yh,zh].15	<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
	4D Array	<TAGNAME>[xl,yl,zl,wl].00 - <TAGNAME>[xh,yh,zh,wh].15	<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
	5D Array	<TAGNAME>[xl,yl,zl,vl,wl].00 - <TAGNAME>[xh,yh,zh,vh,wh].15	<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
	6D Array	<TAGNAME>[xl,yl,zl,ul,vl,wl].00 - <TAGNAME>[xh,yh,zh,uh,vh,wh].15	<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		
UINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>	H/L	*1
DINT DWORD	Single Tag	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>	H/L	*1 *2
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].31	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,yl].00 - <TAGNAME>[xh,yh].31	<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,yl,zl].00 - <TAGNAME>[xh,yh,zh].31	<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
	4D Array	<TAGNAME>[xl,yl,zl,wl].00 - <TAGNAME>[xh,yh,zh,wh].31	<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
	5D Array	<TAGNAME>[xl,yl,zl,vl,wl].00 - <TAGNAME>[xh,yh,zh,vh,wh].31	<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
	6D Array	<TAGNAME>[xl,yl,zl,ul,vl,wl].00 - <TAGNAME>[xh,yh,zh,uh,vh,wh].31	<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		
UDINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>	H/L	*1

Device		Bit Address	Word Address	32 bits	Remarks
DATE[*4] REAL TIME TIME_OF_DAY	Single Tag	-	<TAGNAME>	[H/L]	*1 *2
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
	4D Array		<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
	5D Array		<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
	6D Array		<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		
DATE_AND_ TIME	Single Tag	-	<TAGNAME>	-	*1 *2 *5
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
	4D Array		<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
	5D Array		<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
	6D Array		<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		

Device			Bit Address	Word Address	32 bits	Remarks
STRING	Single Tag	-	-	<TAGNAME>	-	*1 *2
	1D Array			<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array			<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array			<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		
	4D Array			<TAGNAME>[xl,yl,zl,wl] - <TAGNAME>[xh,yh,zh,wh]		
	5D Array			<TAGNAME>[xl,yl,zl,vl,wl] - <TAGNAME>[xh,yh,zh,vh,wh]		
	6D Array			<TAGNAME>[xl,yl,zl,ul,vl,wl] - <TAGNAME>[xh,yh,zh,uh,vh,wh]		

*1   <TAGNAME>: For structures, Tag Name includes the structure name. The maximum length of the Tag Name is 255 characters, which includes delimiters and the element number.

Example

BOOL type single tag:	"BOOLSYMBOL"
BOOL type 1D array:	"BOOL1D[10]"
WORD type 2D array:	"WORD2D[10,10]"
UDINT type 3D array:	"UDINT[0,1,2]"
User-defined structure:	"STRUCT001.STRINGSYM"

*2   The number of elements for each dimension is shown from "l" (Number of minimum element) to "h" (Number of maximum element).

*3   By default, the system data area is set up with 16 words. Even if you want to use less than 16 words for the system data area, you have to map a 16 word (or larger) array tag and then select the items for the system data area.

*4   Handled as 16-bit devices in the External Device, but as 32-bit devices in GP-Pro EX.

*5   64-bit device

IMPORTANT
- To use tags, you need to import Tag Data (symbol addresses).
  For information about how to import, please refer to GP-Pro EX Reference Manual.
  Cf.   GP-Pro EX Reference Manual, "Using Device/PLC Tags"
- When the tag of the "S5TIME" data type is imported, the data type is changed to "WORD". When the tag of the "CHAR" data type is imported, the data type is changed to "STRING (CHAR)".
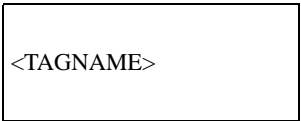
NOTE
- Please refer to the GP-Pro EX Reference Manual for system data area.
  Cf.   GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
- Please refer to the precautions on manual notation for icons in the table.
  ☞ "Manual Symbols and Terminology"

■ S7-200/1200/LOGO! Series

⬜⬜⬜⬜ This address can be specified as system data area.

Device		Bit Address	Word Address	32 bits	Remarks
BOOL	Single Tag	<TAGNAME>	-	-	*1
BYTE SINT USINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	-	*1
INT WORD UINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>	⌐H / L⌐	*1 *2
DINT DWORD UDINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>	⌐H / L⌐	*1
DATE*3 REAL TIME TIME_OF_DAY	Single Tag	-	<TAGNAME>	⌐H / L⌐	*1
DATE_AND_TIME	Single Tag	-	<TAGNAME>	-	*1 *4
STRING	Single Tag	-	<TAGNAME>	-	*1

*1   <TAGNAME>: For structures, Tag Name includes the structure name. The maximum length of the Tag Name is 255 characters, which includes delimiters and the element number.

　　　Example:
　　　　　BOOL type single tag:　　　　　　"BOOLSYMBOL"
　　　　　User-defined structure:　　　　　　"STRUCT001.STRINGSYM"

*2   Only one of the system data area items can be used.

*3   Handled as 16-bit devices in the External Device, but as 32-bit devices in GP-Pro EX.

*4   64-bit device

IMPORTANT   • You cannot import S7-200/1200/LOGO! series tag data (symbol addresses).

NOTE   • Please refer to the GP-Pro EX Reference Manual for system data area.

　　　　Cf.　GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"
　　　• Please refer to the precautions on manual notation for icons in the table.

　　　☞ "Manual Symbols and Terminology"

6 Device Code and Address Code

Use device code and address code when you select "Device Type & Address" for the address type in data displays.

Device	Device Name		Device Code (HEX)	Address Code
	English	German		
Data Block	DB	DB	0000	(Data Block No. x 0x10000) + Value of (word address divided by 2)
Input	I	E	0080	Value of word address divided by 2
Output	Q	A	0081	Value of word address divided by 2
Marker	M	M	0082	Value of word address divided by 2
Timer	T	T	0060	Word Address
Counter	C	Z	0061	Word Address
Variable	V	V	0001	Value of word address divided by 2

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 No.
Device Name	Name of the External Device where error occurs. Device name is a title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	Displays IP address or device address of the External Device where error occurs, or error codes received from the External Device. **NOTE** • IP address is displayed such as "IP address (Decimal): MAC address (Hex)". • Device address is displayed such as "Address: Device address". • Received error codes are displayed such 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 "Display-related errors" in "Maintenance/Troubleshooting Guide" for details on the error messages common to the driver.

■ Error Code Peculiar to External Device

<Connection type: FETCH/WRITE>

Error Code	Description	Comment
0x09	Address Error: Trying to access an address that does not exist.	Check the address and correct it. It may be out of the address range, or DB may not be set to the External Device.

<Connection type: OP Communication>

Error Code	Description	Comment
0x05	Trying to access an address that does not exist.	Check the address range.
0x0A	Trying to access a DB that does not exist.	Check that DB is set.