Siemens AG

SIMATIC S7 Ethernet Driver

Introduction

This manual describes how to connect the Display (GP3000 series) and the External Device (target PLC).

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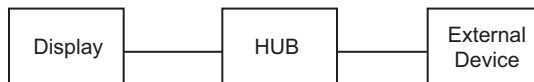
| 1 | System Configuration
This section shows the types of External Devices which can be connected and SIO type. |)"1 System Configuration" (page 3) |

| 2 | Selection of External Device
Select a model (series) of the External Device to be connected and connection method. |)"2 Selection of External Device" (page 4) |

| 3 | Example of Communication Settings
This section shows setting examples for communicating between the Display and the External Device. |)"3 Example of Communication Setting" (page 5) |

| 4 | Setup Items
This section describes communication setup items on the Display.
Set communication settings of the Display with GP-Pro Ex or in off-line mode. |)"4 Setup Items" (page 7) |

Operation

1　　　System Configuration

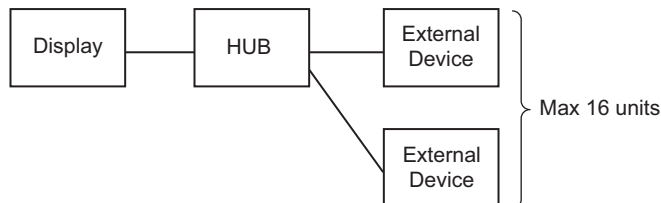The system configuration in the case when the External Device of Siemens AG and the Display are connected is shown.

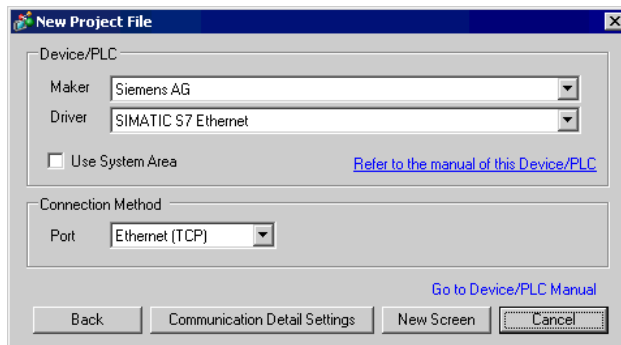| Series	CPU	Link I/F	SIO Type	Setting Example
SIMATIC S7-300 Series	CPU312IFM CPU313 CPU314 CPU314IFM CPU315 CPU315-2 DP CPU316 CPU316-2 DP CPU318-2	CP 343-1 IT CP 343-1	Ethernet	Setting Example 1 (page 5)
SIMATIC S7-400 Series	CPU412-1 CPU412-2 DP CPU413-1 CPU413-2 DP CPU414-1 CPU414-2 DP CPU414-3 DP CPU416-1 CPU416-2 DP CPU416-3 DP CPU417-4	CP 443-1 IT CP 443-1		

■ Connection Configuration

- 1:1 Connection

Display — HUB — External Device

- 1:n Connection

Display — HUB — External Device / External Device } Max 16 units

2 Selection of External Device

Select the External Device to be connected to the Display.

Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "Siemens AG".
Driver	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)
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 "Appendix 1.4 LS Area (only for direct access method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 6.13.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. GP3000 Series User Manual "4.3.6 System Area Setting"
Port	Select the Display port to be connected to the External Device.

3   Example of Communication Setting

Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.
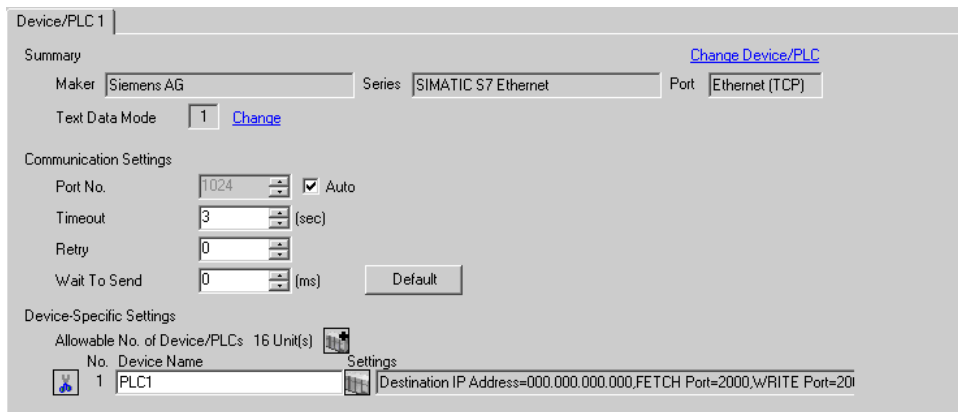
When you use the SIMATIC S7 300/400 Series, use GP-Pro EX and the ladder software to set as below.

3.1   Setting Example 1

■ Settings of GP-Pro EX

#### ◆ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

◆ Device Setting

To display the setting screen, click ([Setting]) of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

When you connect multipleExternal Device, click from [Device-Specific Settings] of [Device/PLC Settings] to add another External Device.
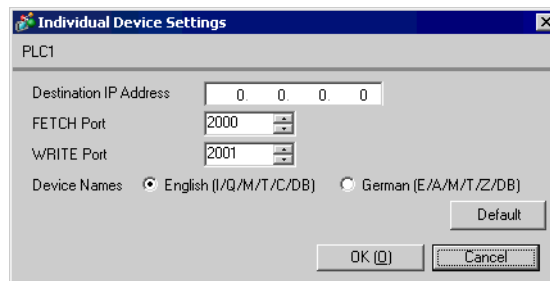
◆ Notes

• 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 off-line mode of the Display.

■ Setting of External Device

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) Startup "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 [OK] in the warning dialog box displayed next.

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

(6) Next, click the [Options] tab and select [Fetch passive] in [Mode].

(7) Select the [Address] tab and enter the port No. (WRITE PORT No. Default 2000) Do not set the duplicate port No.

(8) Click the [Options] tab again and select [Write passive] in [Mode].

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

◆ Notes

• 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.
• During communication with an External Device, if the GP is turned off and then on, or if it goes offline and then online, it may take several tens of seconds before communication with the External Device starts again.

4   Setup Items

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

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

)"3 Example of Communication Setting" (page 5)

IMPORTANT	• You need to set IP address on the display in the off-line mode of the display.
	Cf. GP3000 Series User Manual "4.3.7 Ethernet Settings"

4.1   Setup Items in GP-Pro EX

■ Communication Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Setup Items	Setup Description
Port No.	Use an integer from 1024 to 65535 to enter the port No. of the Display. When you check the option of [Auto Assign], the port No. will be automatically set.
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.

■ Device Setting

To display the setting screen, click ▥ ([Setting]) of the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings].

When [Allowable No. of Device/PLCs] is multiple, you can click ▥ from [Device-Specific Settings] of [Device/PLC Settings] to add the External Device which is available to set.
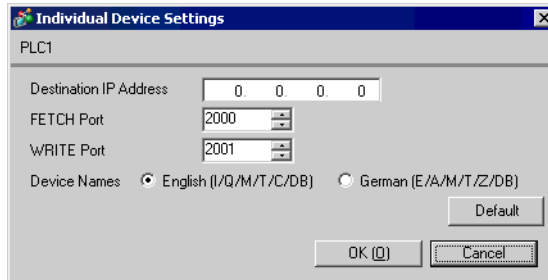
Setup Items	Setup Description
Destination IP Address	Set IP address of the External Device. **NOTE** • Check with a network administrator about IP address. Do not set the duplicate IP address.
FETCH Port	Use an integer from 1024 to 65535 to enter the FETCH port No. of the External Device.
WRITE Port	Use an integer from 1024 to 65535 to enter the WRITE port No. of the External Device.
Device Names	Select whether the device name is described in English (I/Q/M/T/C/DB) or German (E/A/M/T/Z/DB).

4.2 Setup Items in Off-Line Mode

NOTE • Please refer to GP3000 Series User Manual for more information on how to enter off-line mode or about operation.
Cf. GP3000 Series User Manual "Chapter 4 Settings"

■ Communication Settings

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

| Comm. | Device | | | |

SIMATIC S7 Ethernet [TCP] Page 1/1

Port No.   ○ Fixed   ● Auto
1024 ▼ ▲

Timeout(s)   3 ▼ ▲
Retry   0 ▼ ▲
Wait To Send(ms)   0 ▼ ▲

Exit   Back   2005/09/02 13:06:43

Setup Items	Setup Description
Port No.	Set the 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.
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   ▼

DEST IP ADDR   0   0   0   0
FETCH PORT NO.   2000   ▼ ▲
WRITE PORT NO.   2001   ▼ ▲

	Exit		Back	2005/09/02 13:06:45

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])
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.
FETCH PORT NO.	Use an integer from 1024 to 65535 to enter the FETCH port No. of the External Device.
WRITE PORT NO.	Use an integer from 1024 to 65535 to enter the WRITE port No. of the External Device.

5 Supported Device

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.

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

Device	Bit Address		Word Address		32 bits	Remarks
	English	German	English	German		
Data Block	DB001.DBX00000.0 - DB255.DBX16383.7		DB001.DBW00000 - DB255.DBW16382			[÷2]*1
Input	I00000.0 - I00127.7	E00000.0 - E00127.7	IW00000 - IW00126	EW00000 - EW00126		[÷2]
Output	Q00000.0 - Q00127.7	A00000.0 - A00127.7	QW00000 - QW00126	AW00000 - AW00126	[H/L]	[÷2]
Internal Marker	M00000.0 - M00255.7		MW00000 - MW00254			[÷2]
Timer	-----		T00000 - T00255			*2
Counter	-----		C00000 - C00255	Z00000 - Z00255		*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.

*2 Write disable

NOTE
• Please refer to the GP-Pro EX Reference Manual for system data area.
   Cf.   GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)"
• 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
Internal Marker	M	M	0082	Value of word address divided by 2
Timer	T	T	0060	Word Address
Counter	C	Z	0061	Word Address

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** • Received error codes are displayed such as "Decimal [Hex]". • IP address is displayed such as "IP address (Decimal): MAC address (Hex)".

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 2 [02])"

NOTE　• Please refer to the manual of the External Device for more detail of received error codes.

Memo