Siemens AG

SIMATIC S7 MPI Direct 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 External Device to be connected and connection method. | ☞"2 Selection of External Device" (page 6) |

| 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 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 19) |

| 5 | Cable Diagram
This section shows cables and adapters for connecting the Display and the External Device. | ☞"5 Cable Diagram" (page 26) |

Operation

1   System Configuration

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

Series	CPU Module	Connection Port	SIO Type	Setting Example	Cable Diagram
SIMATIC S7-200 Series	CPU214 CPU215 CPU216 CPU221 CPU222 CPU224 CPU226	Port 0/1 on the CPU unit	RS422/485 (2wire)	Setting Example 1 (page 7)	Cable Diagram 1 (page 26)
	CPU222 CPU224 CPU224XP CPU226	EM 277 PROFIBUS-DP slave module	RS422/485 (2wire)	Setting Example 3 (page 14)	Cable Diagram 1 (page 26)
SIMATIC S7-300 Series	CPU312IFM CPU313 CPU314 CPU314IFM CPU315 CPU315-2 DP CPU316 CPU316-2 DP CPU318-2	MPI port on the CPU unit	RS422/485 (2wire)	Setting Example 2 (page 10)	Cable Diagram 1 (page 26)
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	MPI port on the CPU unit	RS422/485 (2wire)	Setting Example 2 (page 10)	Cable Diagram 1 (page 26)
SIMATIC S7-1200 Series	CPU1211C CPU1212C CPU1214C	PROFIBUS DP Master Port on CM-1243-5	RS422/485 (2wire)	Setting Example 4 (page 16)	Cable Diagram 1 (page 26)

NOTE

• The following CPU versions are required to use the EM 277 PROFIBUS-DP slave module.

CPU	Supported versions
CPU222	Release 1.10 or later
CPU224	Release 1.10 or later
CPU224XP	Release 2.0 or later
CPU226	Release 1.00 or later

IMPORTANT

• This manual is targeting at the SIMATIC S7 MPI Direct Driver (Ver.1.01.00 or higher).
• You can confirm the driver version using GP-Pro EX as follows:
  From [System Setting window] in the workspace, select [Peripheral List] to display the version.
• When a driver version is older than Ver.1.01.00, please download the latest driver from our support site "Otasuke Pro!".

Pro-face's support site "Otasuke Pro!"
http://www.pro-face.com/otasuke/

■ Connection Configuration

| IMPORTANT	• When using more than one driver with one Display, there are the following limitations as listed below.
	    • The MODBUS slave driver (communication speed: 38400 or more) of Schneider Electric Industries cannot be used simultaneously.
	    • The DH-485 Driver of Rockwell Automation, Inc. cannot be used simultaneously.
	    • This driver cannot be used with both COM1 and COM2.

NOTE	• You can mix the S7-300/400 Series, the S7-200 Series and the S7-1200 Series to use in one connection configuration. • It is not recommended to mix the DP corresponding device and the MPI corresponding device for one connection constitution.

• 1:1 Connection

• n:m Connection
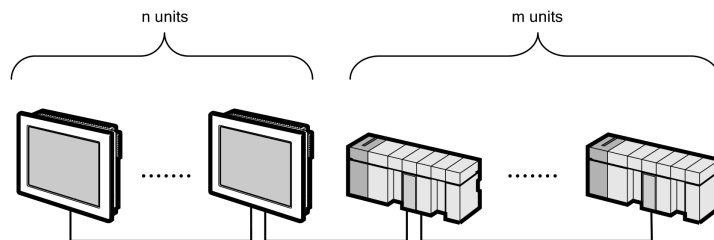
NOTE	• For n:m connection, the unit number of Display and External Device needs to be within the range which satisfies the conditions below.
	    • You can connect max 16 units of the External Device to 1 unit of the Display.
	    • Maximum unit number of the Display that can be connected to 1 unit of the External Device varies depending on the type of the External Device. Please refer to the manual of each External Device for checking.

2 Selection of External Device

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 to define the number of Devices/PLCs to connect to the display.
Manufacturer	Select the manufacturer of the External Device to connect. Select "Siemens AG".
Series	Select the External Device model (series) and the connection method. Select "SIMATIC S7 MPI Direct". In System configuration, make sure the External Device you are connecting is supported by "SIMATIC S7 MPI Direct".)"1 System Configuration" (page 3)
Port	Select the Display port to be connected to the External Device. **NOTE** • Supported maximum speed depends on the COM port.)"4 Setup Items" (page 19)
Use System Area	Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When synchronized, you can use the External Device's ladder program to switch the display or display the window on the Display. 　Cf.　GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)" This feature can also be set in GP-Pro EX or in the Display's offline mode. 　Cf.　GP-Pro EX Reference Manual "System Settings [Display Unit] - [System Area] Settings Guide" 　Cf.　Maintenance/Troubleshooting Guide "Main Unit - System Area Settings"

3   Example of Communication Setting

Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

3.1   Setting Example 1

■ Setting of GP-Pro EX

◆ Communication Settings

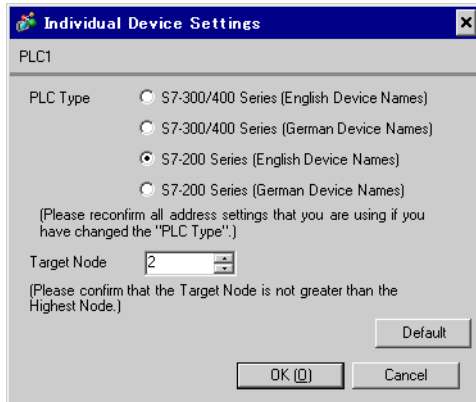To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
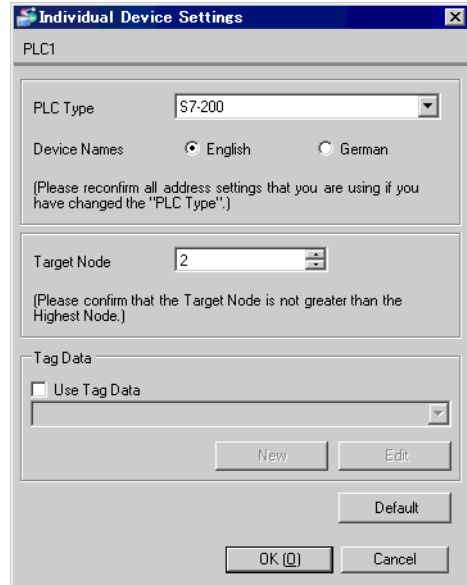
◆ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] ▦ .

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

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

• GP4000 (excluding GP-4100 Series and GP-4*01TM) Series

■ Settings of External Device

Use the ladder software "STEP 7 Micro/WIN 32" to perform the communication settings for the S7-200 Series.

(1) Click [Communication] in the menu list. Check the connection among PLC (PORT0), the ladder cable (PC/PPI Cable) and the PC, and double-click [Double-Click to Refresh].

(2) The [Search for Addresses] dialog box is displayed, and the software automatically scans the PLC. The dialog box is closed when the connection is checked.

(3) Select [Type] from [PLC] on the menu bar.

(4) The [PLC Type] dialog box is displayed. Select according to the connected PLC type, and click [OK].

(5) Click [System Block] in the menu list, and set according to the port (Port0/Port1) to be actually connected to the Display as below.

Item	Setup Description
PLC Address	2
Highest Address	31
Baud Rate	187.5k
Retry Count	2
Gap Update Factor	10

(6) When you finish setting, click [OK] and close the dialog box.

(7) Click the [Down load] button in the command menu.

(8) The [Download] dialog box is displayed. Click [OK].

3.2　　　Setting Example 2

■ Setting of GP-Pro EX

◆ Communication Settings

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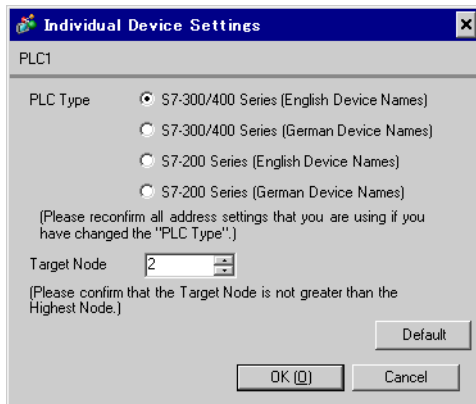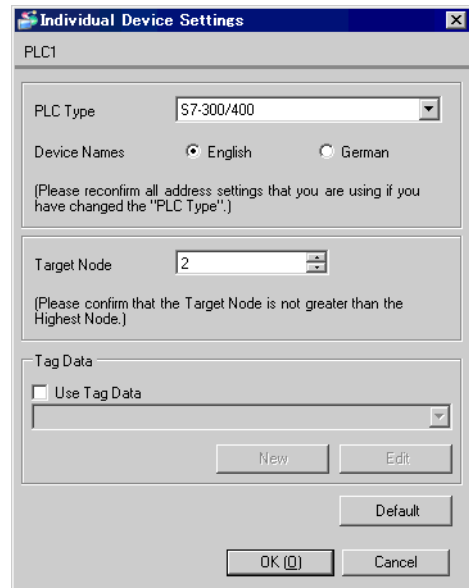
◆ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] 　.

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

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

- GP4000 (excluding GP-4100 Series and GP-4*01TM) Series

■ Settings of External Device

Use the ladder software "SIMATIC Manager" to perform the communication settings for the S7-300/400 Series. Set as below, following the steps.

Setup Items	Setup Description
Speed	187500 bps
Destination Node No.	2
Source Node No.	1 (Option: Set the smaller value than Max Value of Node No.)
Max Value of Node No.	31

(1) Click the icon of [New Project].

(2) Put the optional name and click [OK].

(3) From the menu bar, select [Insert], [Station], [1 SIMATIC 400 Station] in this order.

NOTE • When using the S7-300 Series, select [2 SIMATIC 300 Station].

(4) "SIMATIC 400(1)" is created in the project. Double-click [Hardware] in the CPU.

(5) The "HW Config" screen is displayed. From the left tree, open [RACK- 400] from [SIMATIC 400], and select the base unit of the using model, then drag & drop to the upper right window.

(6) Drag & drop the using power unit in the preset rack.

(7) Similarly, drag & drop the using CPU unit.

(8) Double-click the preset CPU unit "CPU xxx-xxx".

(9) The dialog box for the MPI port setting is displayed. Open [Properties].

(10) Check that "MPI(1)...187.5Kbps" is set as default. In addition, set [Address] which will be the destination node number (PLC Address) you set in GP-Pro EX (the default value "2" is used this time). Select "MPI(1)...187.5Kbps" and open [Properties].

(11) Click the [Network Settings] tab.

(12) You can change the transmission rate and the highest MPI address of the node No. in the dialog displayed (select [187.5Kbps] for the transmission rate). When you change the highest MPI address of the node No. (set to [31] this time), check the [Change] box to allow you to select the item. When you finish setting, click [OK].

(13) Click [OK] in the dialog box displayed in step 12.

(14) Click [OK] in the MPI port setting dialog box displayed in step 9.

(15) Check the connection between the PLC and the ladder software. Open [Set PG/PC Interface] from [Options] in the menu bar.

(16) The [Set PG/PC Interface] dialog box is displayed. Click [Properties].

(17) Set [Transmission] to [187.5Kbps], and [Highest Node Address] to [31]. Click [OK].

(18) Next click [Diagnostics].

(19)Click [Test] and [Read].

(20)If "OK" is displayed and other items than [0-0] of [Bus Nodes] are checked, the connection with the PLC is established. Click [OK] and close the dialog box.

(21)Open "Configure Network". Select the using CPU unit and click the [Download] button.

(22)When the "PLC Download Selected Stations" is displayed, click "Yes" and continue to download.

(23)When you finish downloading, the dialog box is closed.

(24)Close the [Configure Network] window. When the [Network Save and Compile] dialog box is displayed, click [Yes].

(25)When the [Save and Compile] dialog box is displayed, click [OK].

PLC setting is completed at above.

3.3 Setting Example 3

■ Setting of GP-Pro EX

◆ Communication Settings

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

◆ 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] ▐▐▐ .

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

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

• GP4000 (excluding GP-4100 Series and GP-4*01TM) Series

■ Settings of External Device

MPI address of the External Device is set with the Rotary switch of the EM 277 PROFIBUS-DP slave module. For the communication speed of the External Device, the same value as that of the connected MPI master unit is automatically set. When two or more MPI master units are connected, the same communication speed is set for all MPI master units.

For details, refer to External Device Manual.

• Rotary Switch

Rotary Switch	Setup Description
x10	0
x1	2

3.4   Setting Example 4

■ Setting of GP-Pro EX

◆ Communication Settings

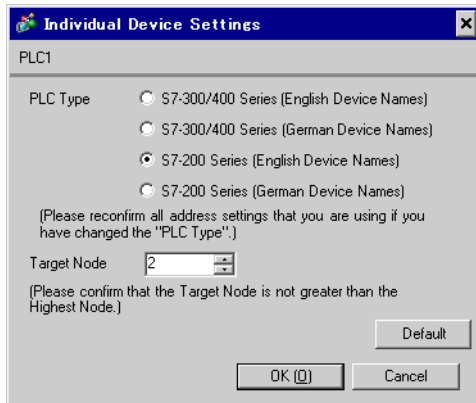To display the setup screen, from the [Project] menu, point to [System Settings] and select [Device/PLC].
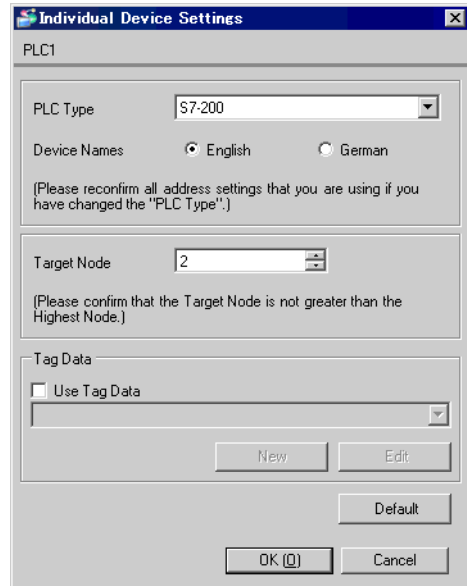
◆ Device Setting

To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] 🔣 .

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

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

• GP4000 (excluding GP-4100 Series and GP-4*01TM) Series

◆ Note

• If you are using a S7-1200 Series device, from the [PLC Type] list select [S7-300/400].

■ Settings of External Device

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 the ladder software.

(2) Create a project, and define the link interface.

(3) Select the defined link interface.

(4) In the [Properties] tab, define the [PROFIBUS address] as follows:

Setup Items	Setting Value
Address	2

(5) Click the [Network view] tab, and select the network connection for the defined link interface.

(6) In the [Properties] tab, define the [Network settings] as follows:

Setup Items	Setting Value
Highest PROFIBUS address	31
Transmission speed	187.5 kbps
Profile	DP

(7) In [Bus parameters] of the [Properties] tab, change the settings according to the communication speed as shown below.

Setup Items	187.5 kbps	19200 bps	9600 bps
Tslot_Init	415	100	
Max Tsdr	400	60	
Min Tsdr	20	22	
Tset	12	1	
Tqui	0	0	Unchanged
Gap factor	5	10	
Retry limit	2	1	
Ttr	5888	34304	

(8) Save the project, and download 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 Example of Communication Setting" (page 7)

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
SIO Type	Select the SIO type to communicate with the External Device.
Speed	Select speed between the External Device and the Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
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.

Setup Items	Setup Description
Local Node	Use an integer from 0 to 126 to enter the local node No. of the Display.
Highest Node Number	Select any of [15], [31], [63] and [126] for the highest value of the node No.
Clock Synchronization on MPI (as Slave)	Selecting (check mark) this checkbox enables the Time Master settings.When the Time Master is enabled with the Time Interval set via the External Device, the time data of Display Device will be overwritten by the Master External Device. Select the [H/W Configuration] → CPU menu's [Diagnostics Properties] → Diagnostics/Clock feature. For details, refer to your external device's Operation Manual

IMPORTANT • Supported maximum speed depends on the COM port.

Series		The COM port	
		COM1	COM2
GP3000	AGP-3302B	-	187500
	GP-3200 Series	187500	-
	GP3000 Series except above	19200	187500
GP4000	GP-4107 GP-4203T	187500	-
	GP-4*03T	-	187500
	GP-4*01TM GP-4201T	187500	-
	GP4000 Series except above	-	187500
SP5000	SP-5B10	19200	187500
ST		-	187500
LT3000		19200	-

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

　　Cf.　GP-Pro EX Reference Manual "Changing the Device/PLC at Runtime (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] 🔢 .

To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

• GP3000, ST, GP-4100 Series, GP-4*01TM and LT3000 Series
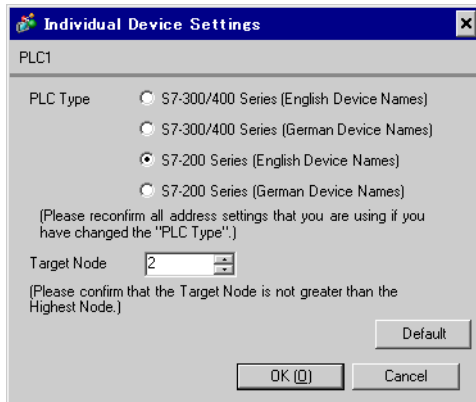
• GP4000 (excluding GP-4100 Series and GP-4*01TM) Series

Setup Items	Setup Description
PLC Type	For the type of External Device to communicate, select any of [S-7-300/400 Series [English Device Names]], [S-7-300/400 Series [German Device Names]], [S-7-200 Series [English Device Names]] and [S-7-200 Series [German Device Names]]. Select [English Device Name] or [German Device Name] depending on whether the device name is described in English or German. When using GP4000 Series display units (except for GP-4100 Series and GP04*01TM), set the PLC Type and the Device Name.
Target Node	Use an integer from 0 to 126 to enter the node No. of the External Device. Be sure to set the node No. within the range which does not exceed the value set in [Highest Node Number] of [Communication Settings].
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.)☞ "6.4 When Using a Tag" (page 37)

4.2 Setup Items in Offline Mode

NOTE • Please refer to Maintenance/Troubleshooting Guide for more information on how to enter offline mode or about operation.

Cf. Maintenance/Troubleshooting Guide "Offline Mode"

• The number of the setup items to be displayed for 1 page in the offline mode depends on the Display in use. Please refer to the Reference manual for details.

■ 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, and touch [Communication Settings].

(Page 1/2)

Comm.	Device			

SIMATIC S7 MPI Direct   [COM2]   Page 1/2

SIO Type   RS422/485(2wire)
Speed   187500
Data Length   8
Parity   EVEN
Stop Bit   1
Flow Control   NONE

Timeout(s)   3
Retry   2
Wait to Send(ms)   0

(Maximum supported speed is 187500 for COM2 & 19200 for COM1
Please confirm that it is not greater than supported speed.)

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Setup Items	Setup Description
SIO Type	Select the SIO type to communicate with the External Device.
Speed	Select speed between the External Device and the Display.
Data Length	Select data length.
Parity	Select how to check parity.
Stop Bit	Select stop bit length.
Flow Control	Select the communication control method to prevent overflow of transmission and reception data.
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.

IMPORTANT • Supported maximum speed depends on the COM port.

Series		The COM port	
		COM1	COM2
GP3000	AGP-3302B	-	187500
	GP-3200 Series	187500	-
	GP3000 Series except above	19200	187500
GP4000	GP-4107 GP-4203T	187500	-
	GP-4*03T	-	187500
	GP-4*01TM GP-4201T	187500	-
	GP4000 Series except above	-	187500
SP5000	SP-5B10	19200	187500
ST		-	187500
LT3000		19200	-

(Page 2/2)

Setup Items	Setup Description
Local Node	Use an integer from 0 to 126 to enter the local node No. of the Display.
Highest Node	Select any of [15], [31], [63] and [126] for the highest value of the node No.
Clock Synchronization	Selecting [ON] enables the Time Master settings.When the Time Master is enabled with the Time Interval set via the External Device, the time data of Display Device will be overwritten by the Master External Device. Select the [H/W Configuration] → CPU menu's [Diagnostics Properties] → Diagnostics/Clock feature. For details, refer to your external device's Operation Manual

■ 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 MPI Direct   [COM2]   Page 1/1

Device/PLC Name   PLC1   ▼

Series   S7-300/400 English Device Names
Target Node   2 ▼ ▲

(Please confirm that the Target Node
is not greater than the Highest Node.)

| | Exit | | Back | 2006/11/16
19:02:56 |
|--|------|--|------|-----------|

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])
Series	Displays the PLC type selected in [Device Setting] of GP-Pro EX. You cannot change the PLC type in [Device Setting] in offline mode. ☞ "4.1 Setup Items in GP-Pro EX ■ Device Setting" (page 21)
Target Node	Use an integer from 0 to 126 to enter the node No. of the External Device. Be sure to set the node No. within the range which does not exceed the value set in [Highest Node] of [Communication Settings].

5   Cable Diagram

The following cable diagrams may be different from cable diagrams recommended by External Device Manufacturer.

Please be assured there is no operational problem in applying the cable diagram shown in this manual.

- The FG pin of the External Device body must be grounded according to your country's applicable standard. Refer to your External Device manual for details.
- SG and FG are connected inside the Display. When connecting the External Device to SG, design your system to avoid short-circuit loops.
- Connect an isolation unit if the communication is not stable due to noise or other factors.

5.1   Cable Diagram 1

Display (Connection Port)		Cable	Notes
GP3000[*1] (COM1) AGP-3302B[*2] (COM2) GP4000[*3] (COM2) GP-4201T (COM1) GP-4*01TM (COM1) SP-5B10 (COM1/2) ST[*4] (COM2) LT3000 (COM1)	1A	MPI Cable (3.5m) by Pro-face ST03-A2B-MPI21-PFE[*5]	The cable length must be 50m or less in one segment.
GP3000[*6] (COM2)	1B	Online Adapter by Pro-face CA4-ADPONL-01 [*7] + MPI Cable (3.5m) by Pro-face GP3000-MPI21-PFE[*8]	The cable length must be 50m or less in one segment.
	1C	Siemens COM Port Conversion Adapter by Pro-face CA3-ADPSEI-01 + PROFIBUS compliant connector[*9] + PROFIBUS compliant cable[*10]	
GP3000[*11] (COM2)	1D	Siemens COM Port Conversion Adapter by Pro-face CA3-ADPSEI-01 + MPI Cable (3.5m) by Pro-face CA3-MPI-PGN-PFE or MPI Cable (3.5m) by Pro-face CA3-MPI-PG1-PFE	The cable length must be 50m or less in one segment.
GP-4107 (COM1) GP-4*03T[*12] (COM2) GP-4203T (COM1) AST-3211A (COM2) AST-3302B (COM2)	1E	PROFIBUS compliant connector[*9] + PROFIBUS compliant cable[*10]	The cable length must be 50m or less in one segment.
	1F	MPI Cable (3.5m) by Pro-face CA3-MPI-PGN-PFE or MPI Cable (3.5m) by Pro-face CA3-MPI-PG1-PFE	

*1   All GP3000 models except AGP-3302B

*2   When using AGP-3302B, please install a ferrite core.

Recommended ferrite core: E04SR401938 (Seiwa Electric Mfg Co., Ltd.)
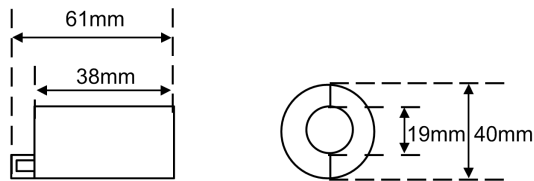
**NOTE**   If size is the same, you can use a ferrite core made by other companies.

*3   All GP4000 models except GP-4100 series, GP-4*01TM, GP-4201T and GP-4*03T

*4   All ST models except AST-3211A and AST-3302B

*5   There are Display side connector and the External Device side connector on the MPI cable (ST03-A2B-MPI21-PFE).
Check the Display side and the External Device side, and please connect correctly.
When connecting Display side and External Device side adversely, it may be the reason for the destruction and the failure of the CPU unit.

*6   All GP3000 models except GP-3200 series and AGP-3302B

*7   The online adapter is supplied with the MPI cable (GP3000-MPI21-PFE).

*8   There are Display side connector and the External Device side connector on the MPI cable (GP3000-MPI21-PFE).
Check the Display side and the External Device side, and please connect correctly.
When connecting Display side and External Device side adversely, it may be the reason for the destruction and the failure of the CPU unit.

*9   When using GP-3400/3500/3600 series, please use the PROFIBUS compliant connector (0-180-degree cable output). 90-degree cable output connector and 35-degree cable output connector cannot be used.

*10   Please be aware that certain PROFIBUS compliant cable have restriction on baudrate.

*11   All GP3000 models except GP-3200/3400/3500/3600 series and AGP-3302B

*12   Except GP-4203T

IMPORTANT   • Use a cable manufactured from Pro-face or a PROFIBUS compliant cable/connector for connecting with the External Device.
If a user-created cable is used and cable connection is incorrect, the Display may be broken down.

1A)

- 1:1 Connection

External Device

Display

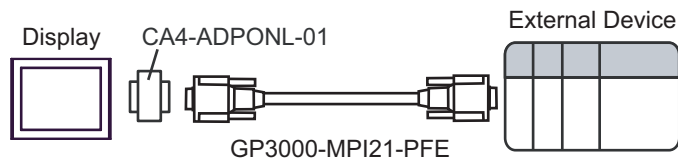ST03-A2B-MPI21-PFE
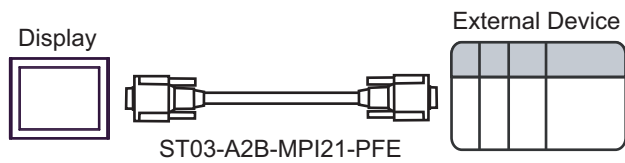
NOTE • The cable length must be 50m or less in one segment.

IMPORTANT • There are Display side connector and the External Device side connector on the MPI cable.
Check the Display side and the External Device side, and please connect correctly.
When connecting Display side and External Device side adversely, it may be the reason for the destruction and the failure of the CPU unit.

1B)

- 1:1 Connection

| NOTE | • The cable length must be 50m or less in one segment. |

| IMPORTANT | • Please do not connect online adapter and isolation unit to External Device side, as it may be the reason for destruction and the failure of the External Device.
• There are Display side connector and the External Device side connector on the MPI cable.
Check the Display side and the External Device side, and please connect correctly.
When connecting Display side and External Device side adversely, it may be the reason for the destruction and the failure of the CPU unit. |

1C)

- 1:1 Connection
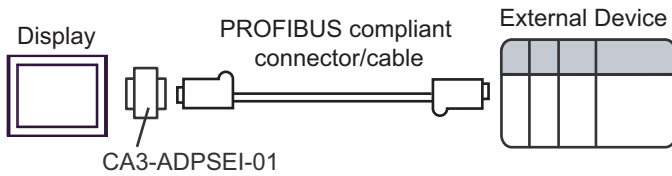
- 1:m Connection

- n:1 Connection

| NOTE | • The cable length must be 50m or less in one segment. |

| IMPORTANT | • Please turn ON the terminator switch on the PROFIBUS compliant connector that becomes a terminal on the network.
• Please do not connect Siemens COM conversion adapter and isolation unit to External Device side, as it may be the reason for destruction and the failure of the External Device. |

1D)

- 1:1 Connection

- 1:m Connection

- n:1 Connection

| NOTE | • The cable length must be 50m or less in one segment. |

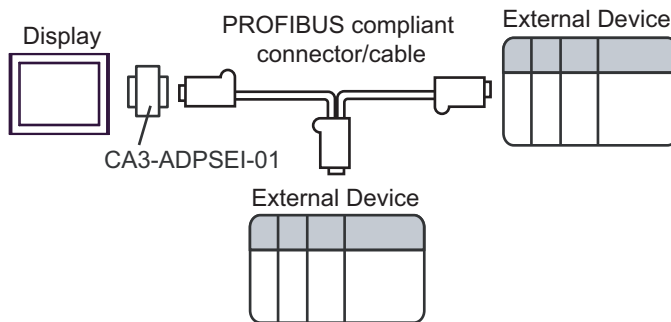| IMPORTANT | • Please turn ON the terminator switch on the connector of the MPI cable that becomes a terminal on the network. |
| | • Please do not connect Siemens COM conversion adapter and isolation unit to External Device side, as it may be the reason for destruction and the failure of the External Device. |

1E)

- 1:1 Connection

- 1:m Connection

- n:1 Connection

| NOTE | • The cable length must be 50m or less in one segment. |

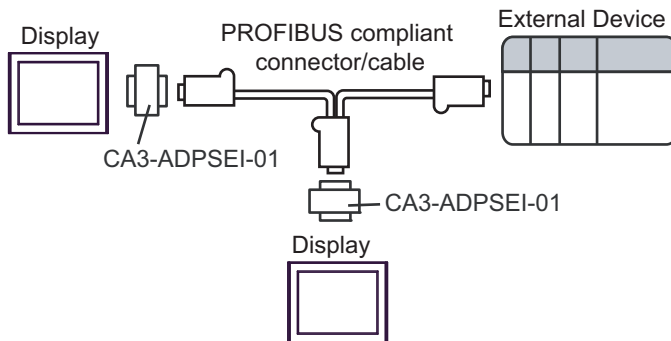| IMPORTANT | • Please turn ON the terminator switch on the PROFIBUS compliant connector that becomes a terminal on the network. |

1F)

- 1:1 Connection
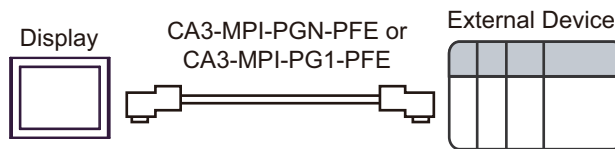
- 1:m Connection
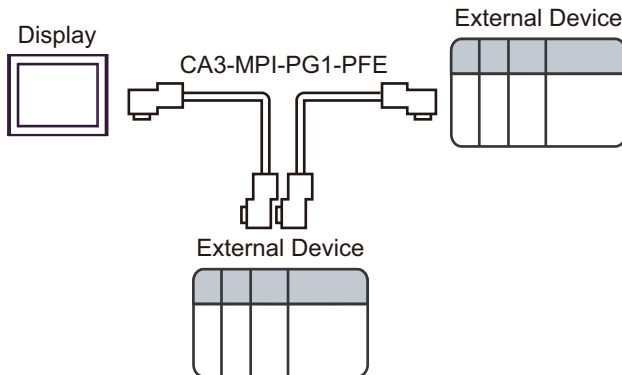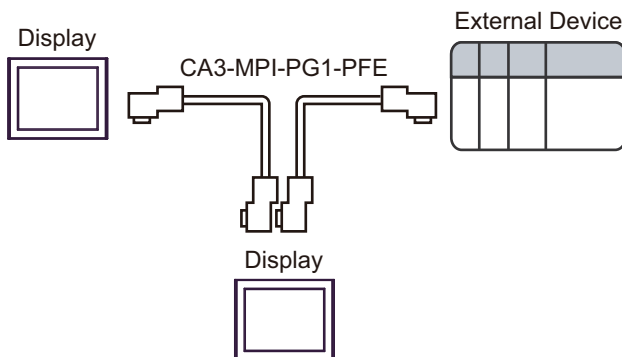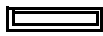
- n:1 Connection

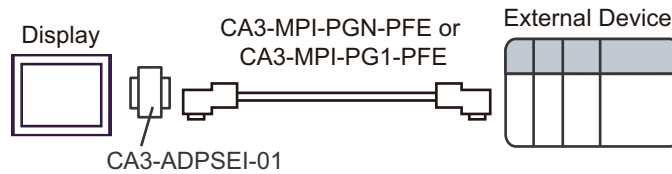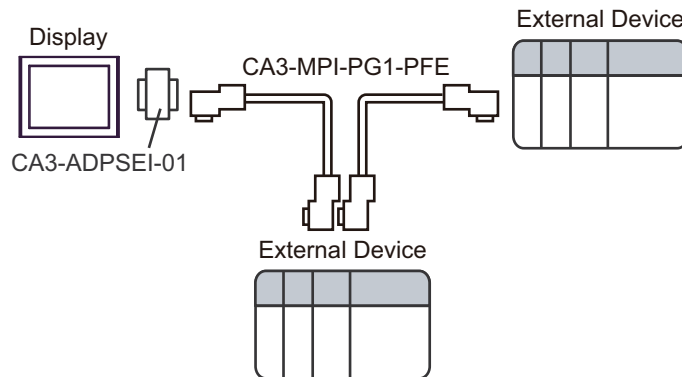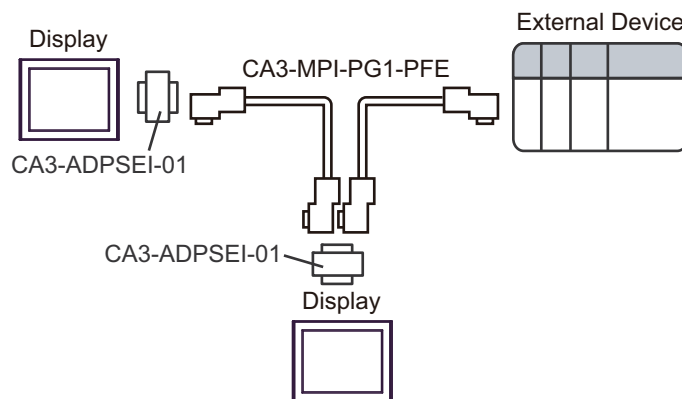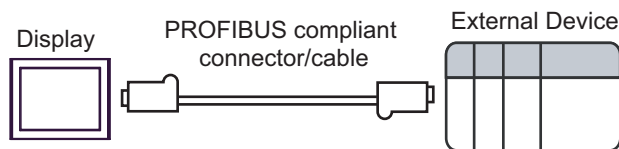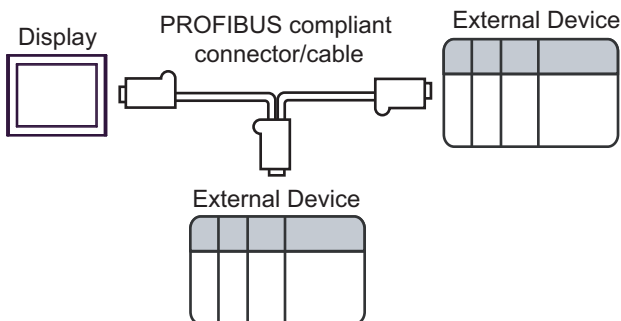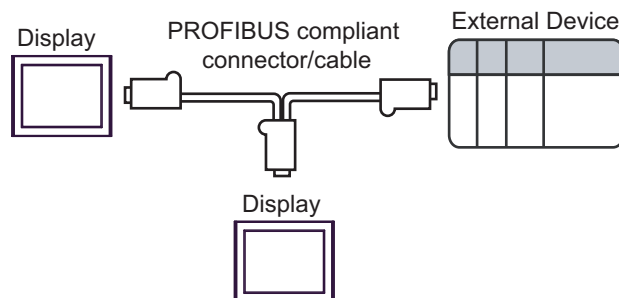| NOTE | • The cable length must be 50m or less in one segment. |

| IMPORTANT | • Please turn ON the terminator switch on the connector of the MPI cable that becomes a terminal on the network. |

6 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.

6.1 S7-200 Series

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

Device	Bit Address		Word Address		32 bits	Remarks
	English	German	English	German		
Variables	-		VW00000-VW05118			$\div$ **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]
Internal Marker	M00000.0-M00031.7		MW00000-MW00030			$\div$ **2**
Timer	-		T00000-T00255			[*3]
Counter	-		C00000-C00255	Z00000-Z00255		[*3]

*1   You cannot write to IW0 to IW2 depending on the CPU type. These addresses are reserved for onboard I/O. Please refer to the manual of your External Device for checking.

*2   You can write in the QW and Q devices only when theExternal Device is in RUN mode. When the External Device moves to the STOP mode, the output will be 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"

6.2 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	DB00001.DBX00000.0- DB65535.DBX65533.7		DB00001.DBW00000- DB65535.DBW65532		⌐H / L⌐	÷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		÷2┐
Internal Marker	M00000.0-M00511.7		MW00000-MW00510			÷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 "LS Area (Direct Access Method Area)"
• Please refer to the precautions on manual notation for icons in the table.
☞ "Manual Symbols and Terminology"

6.3 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.DBX0000.0-DB65535.DBX9999.7		DB00001.DBW0000-DB65535.DBW9998			÷ 2] *1
Input	I00000.00-I01023.07	E00000.00-E01023.07	IW00000-IW01022	EW00000-EW01022		÷ 2]
Output	Q00000.00-Q01023.07	A00000.00-A01023.07	QW00000-QW01022	AW00000-AW01022	H / L	÷ 2]
Internal Marker	M00000.0-M04095.07		MW00000-MW04094			÷ 2]
Timer	-		-			*2
Counter	-		-			*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   Unable to use Timer and Counter addresses. An error will display if you use these.

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"

6.4   When Using a Tag

NOTE

• The tag data which can be imported with GP-Pro EX is a project created with STEP7 V5 or an xml file exported with GP-Pro EX.

S7-200 Series

⬚ This address can be specified as system data area.

| Device		Bit Address	Word Address	32 bits	Remarks
BOOL	Single Tag	<TAGNAME>	-	-	*1
BYTE	Single Tag	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	-	*1
SINT USINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	-	*1
INT WORD	Single Tag	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>	[H/L]	*1 *2
UINT	Single Tag	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>	[H/L]	*1
DINT DWORD	Single Tag	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>	[H/L]	*1
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"

*2   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.

*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 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"

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"

S7-1200 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_DA Y	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
- You cannot import S7-1200 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"

7 Device Code and Address Code

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

NOTE • When using a tag, device code and address code cannot be used.

7.1 S7-200 Series

Device	Device Name		Device Code (HEX)	Address Code
	English	German		
Variables	V	V	0001	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

7.2 S7-300/400 Series

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

7.3 S7-1200 Series

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

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

Display Examples of Error Messages

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

NOTE • Please refer to the manual of the External Device for more detail of received error codes.
• Please refer to "Display-related errors" of "Maintenance/Troubleshooting Guide" for a common error message to the driver.

■ Peculiar Error Message Displayed with GP-ProEX

Message	Description
This version does not support speed higher than 187500 bps. Speed is changed to 187500. Please save the project.	When the project is made with an older driver than Ver.1.01.00 and set transmission rate faster than 187500bps, this error is displayed. The error can be avoided by saving the project.

■ Peculiar Error Message to Driver

Error Code	Error Message	Description
RHxx130	No MPI Token ring detected[*1]	The display does not detect the presence of the token ring. Check Baud Rate settings and cable etc..
RHxx131	Target Node Not Found (PLC%d)	The requested target node is not in the token ring. Verify that the target node number is correct and that the target is connected to the network.
RHxx132	Connection refused	The target node refuses the connection request. The Target External Device resources are full. Too many nodes are connected to this External Device.
RHxx133	Duplicate Node Detected	A duplicated node has been detected on the network. Reassign the node numbers.
RHxx134	Illegal Highest Node	The Highest Node parameter is illegal. Change it to 15/31/63 or 126 numbers.
RHxx135	Illegal Node No.	A Node exists that exceeds the Highest Node Number. Fix the Node number of Highest Node parameter.
RHxx136	MPI Send Error	There was an error during sending data via the MPI H/W feature. Check SIO parameters and Cables etc..
RHxx137	MPI Receive Error	There was an error during the receive of data via the MPI H/W feature. Check the SIO parameters and Cables etc..
RHxx138	Speed setting is wrong(%s). Maximum possible speed is 187500. Please change it and restart the system.	When the old project with higher baud rates is downloaded to AGP, it can not be used with this version. User has to change the baud rate and download the project again. In addition, MPI network baud rates have to be changed (in all PLCs/Devices).
RHxx139	MPI driver can not be used with COM1 and COM2 at the same time	This version can not be used with COM1 and COM2. One of the port has to be removed from the project and download is required.
RHxx140	The driver(in COM%d) can not be used together with MPI.	The other driver used in COM 1 or COM2 can not be used together with MPI direct driver. Other driver has to be removed from the project and project download is required.
RHxx141	(Node Name) : Out of range value inwrite request (Address: %s)	This message displays when the display unit writes an out-of-range value to a DATE, TIME_OF_DAY, or DATE_AND_TIME device. Please write values that fall within the associated device range.

*1   When it connects with the S7-200 series in the network where there is not a master device besides Display, it may be displayed.
When this error is displayed more than three seconds, please reset the display device.