



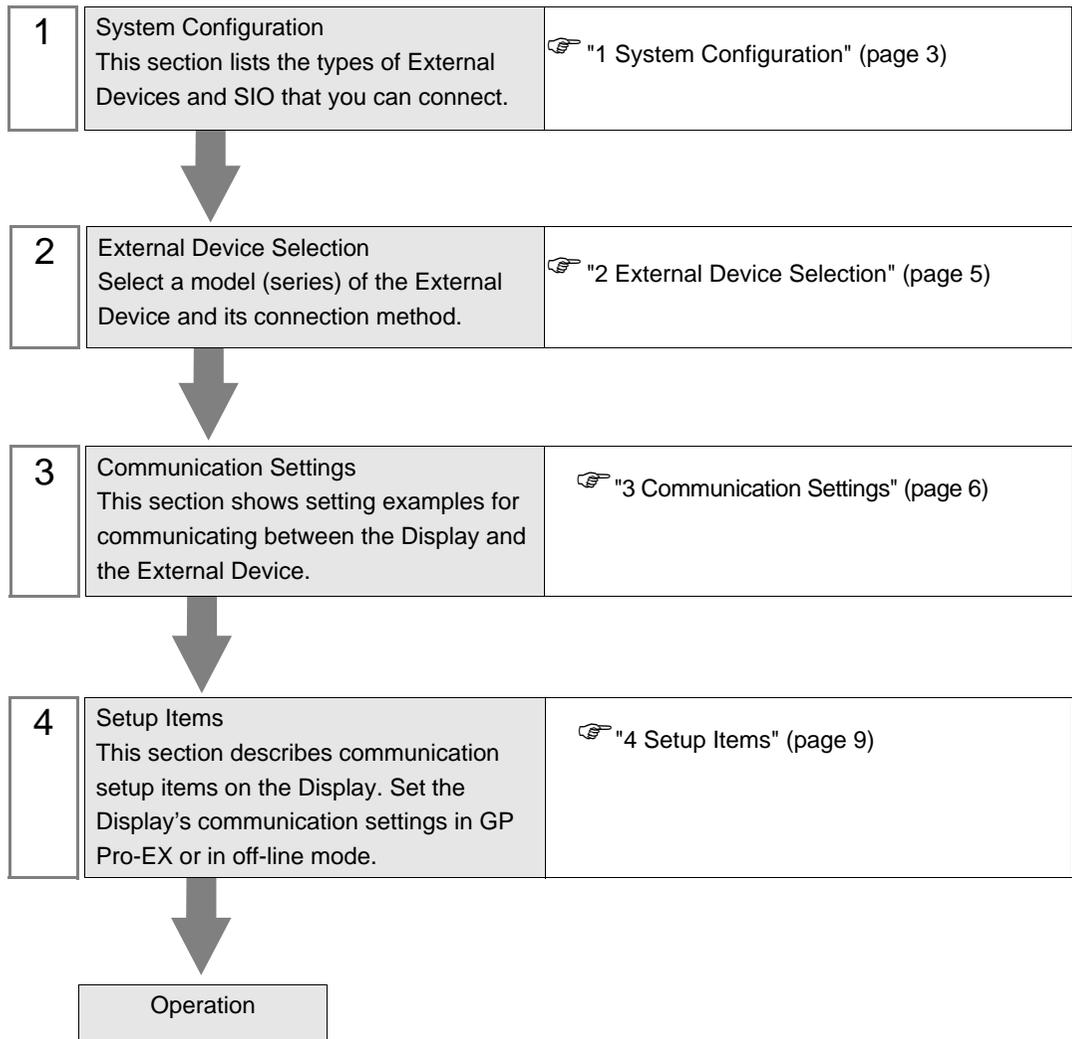
CoDeSys V3 Ethernet Driver

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Introduction

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

In this manual, the connection procedure will be described in the sections identified below:



1 System Configuration

The system configuration for the Display connected to the CoDeSys Automation Alliance External Device is shown below.

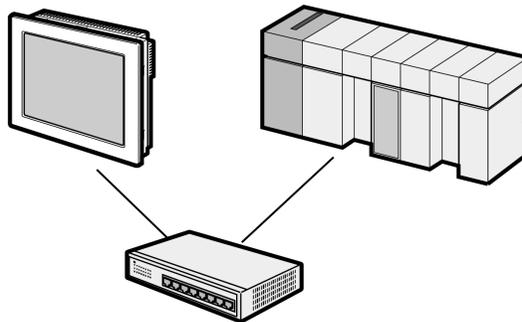
Series	CPU	Link I/F	Communication Method	Setting Example
3S-Smart Software Solutions GmbH CODESYS Control Win V3	PC/AT	Ethernet Interface	Ethernet (TCP)	"Setting Example 1" (page 6)
Hitachi Industrial Equipment Systems Co., Ltd. EHV+	1006 1025 1051 1102	Ethernet Interface	Ethernet (TCP)	"Setting Example 1" (page 6)
Lenze Vertrieb GmbH Controller 3200C	3200C	Ethernet Interface	Ethernet (TCP)	"Setting Example 1" (page 6)

NOTE

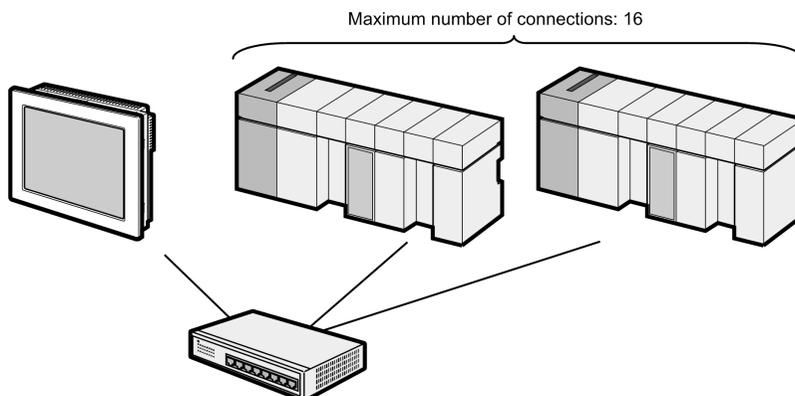
- Please refer to the latest list of the External Device to be supported by this driver on the Pro-face's website.
<http://www.pro-face.com/product/soft/gproex/driver/driver.html>
- This driver does not support GP3000 Series, LT3000 Series, GP-4100 Series and GP-4*0ITM.

■ Connection Configuration

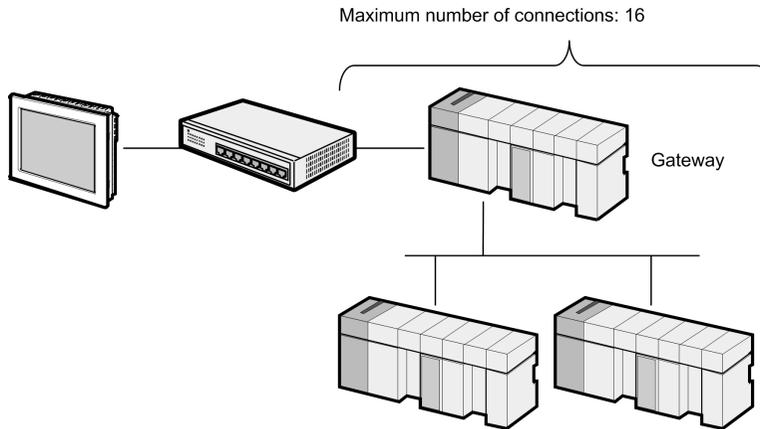
- 1:1 Connection



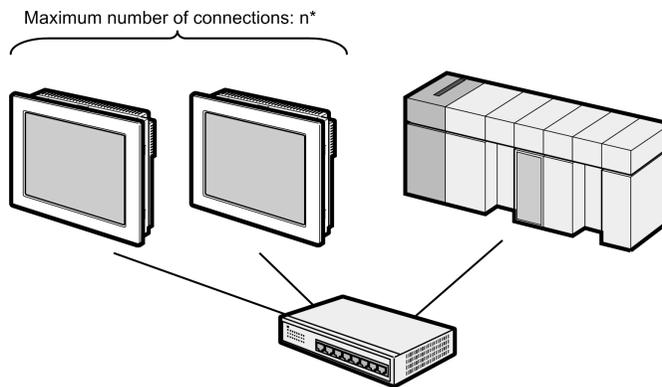
- 1:n Connection



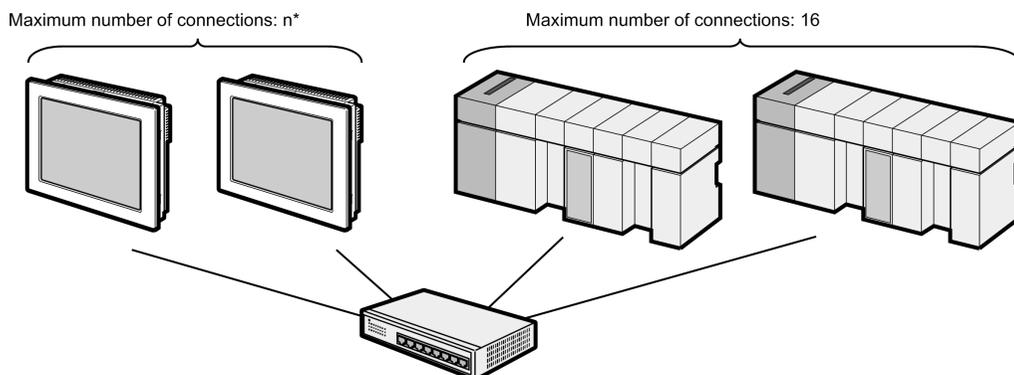
- 1:n Connection (Gateway connection)



- n:1 Connection



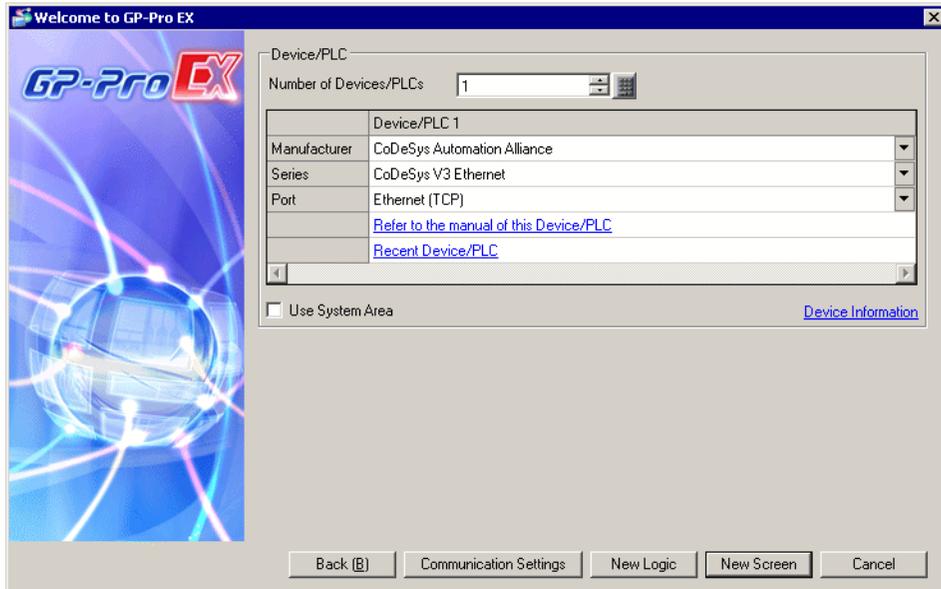
- n:m Connection



- * The number of Displays you can connect depends on the External Device. Check the specifications of the External Device.

2 External Device Selection

Select the External Device to be connected to the Display.



Setup Items	Setup Description
Number of Devices/PLCs	Use an integer from 1 to 4 to enter the number of Devices/PLCs to connect to the display.
Manufacturer	Select the manufacturer of the External Device to be connected. Select "CoDeSys Automation Alliance".
Series	Select a model (series) of the External Device to be connected and connection method. Select "CoDeSys V3 Ethernet". Check the External Device which can be connected in "CoDeSys V3 Ethernet" in system configuration. ☞ "1 System Configuration" (page 3)
Port	Select the Display port to be connected to the External Device. Select [Ethernet (TCP)].
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 Communication Settings

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

3.1 Setting Example 1

■ Settings of GP-Pro EX

◆ Communication Settings

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

Device/PLC 1

Summary [Change Device/PLC](#)

Manufacturer: CoDeSys Automation Alliance Series: CoDeSys V3 Ethernet Port: Ethernet (TCP)

Text Data Mode: 2 [Change](#)

Communication Settings

Port No.: 1024 Auto

Timeout: 10 (sec)

Retry: 0

Wait To Send: 0 (ms) [Default](#)

Device-Specific Settings

Allowable Number of Devices/PLCs: 16 [Add Device](#)

No.	Device Name	Settings	Add Indirect Device
1	PLC1	Node Name (or) Address=NodeName,Use Tcp/Ip=OFF	

◆ 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.

NOTE

- When using a gateway, select the [Connect via Gateway] check box and set the gateway's IP address and port number.
- Use the programming software for the External Device to check the gateway's node name, node address and IP address.
- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set up the External Device's IP address and Port Number in the [Individual Device Settings] dialog box.
- Set up the Display's IP address in offline mode.

■ Settings of External Device

Use the programming software for the External Device to define its communication settings. Please refer to the manual of the External Device for more details.

- 1 In the programming software, create a project.
- 2 Select [Device] from the [Devices] tree view.
- 3 Click [Scan network] and search for the External Device to use.

NOTE

- When searching for External Devices, the External Device and host must exist on the same network. Please refer to the manual of the External Device for more details.
-

- 4 Select the added External Device, and confirm the [Node Name] or [Node Address].

NOTE

- When using a gateway, check the gateway's IP address and port number.
-

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 6)

NOTE

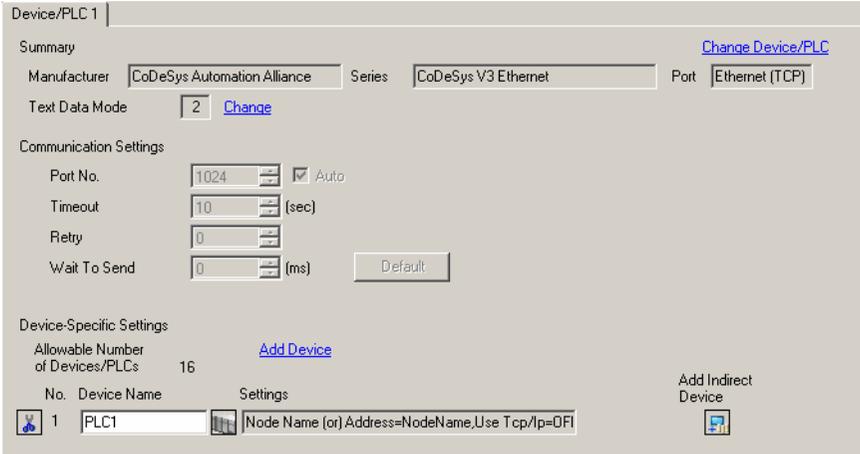
- Set the Display's IP address in off-line mode.

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].



Device/PLC 1

Summary [Change Device/PLC](#)

Manufacturer: CoDeSys Automation Alliance Series: CoDeSys V3 Ethernet Port: Ethernet (TCP)

Text Data Mode: 2 [Change](#)

Communication Settings

Port No.: 1024 Auto

Timeout: 10 (sec)

Retry: 0

Wait To Send: 0 (ms) [Default](#)

Device-Specific Settings

Allowable Number of Devices/PLCs: 16 [Add Device](#)

No.	Device Name	Settings	Add Indirect Device
1	PLC1	Node Name (or) Address=NodeName,Use Tcp/Ip=OFF	

Setup Items	Setup Description
Port No.	Displays the port number of the Display, from 1024 to 65535. The port number is set automatically.
Timeout	Time (in seconds) that the Display waits for a response from the External Device, from 1 to 127.
Retry	Number of times, from 0 to 255, the Display will re-transmit a command when it does not receive a response from the External Device.
Wait To Send	Amount of time, from 0 to 255 milliseconds, the Display waits after receiving a communication packet before transmitting the next command.

NOTE

- Refer to the GP-Pro EX Reference Manual for information on Indirect Devices.

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.

Setup Items	Setup Description
Node Name (or) Address	Enter the node name or node address of the connected External Device. When you enter the node name or node number, settings such as the IP address become unnecessary.
Use Tcp/Ip	Select this check box to specify the External Device's IP address and port number.
IP Address	Set the External Device's IP address. NOTE • Check with a network administrator about IP address. Do not set the duplicate IP address.
Port No.	Enter the External Device's port number.
Connect via Gateway	When using a gateway, select this check box.
IP Address	Set the gateway's IP address. NOTE • Check with a network administrator about IP address. Do not set the duplicate IP address.
Port No.	Enter the gateway's port number.
Use Tag Data	Select this check box. Click [New], and import the tag data to use.  " ■ Importing Tag File" (page 16)

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.

Comm.	Device			
CoDeSys V3 Ethernet			[TCP]	Page 1/1
Port No.	Auto			
	1024			
Timeout(s)	10			
Retry	0			
Wait To Send(ms)	0			
	Exit		Back	2013/04/03 16:57:22

Setup Items	Setup Description
Port No.	Displays the port number of the Display, from 1024 to 65535. The port number is set automatically.
Timeout	Time (in seconds) that the Display waits for a response from the External Device, from 1 to 127.
Retry	Number of times, from 0 to 255, the Display will re-transmit a command when it does not receive a response from the External Device.
Wait To Send	Amount of time, from 0 to 255 milliseconds, the Display waits after receiving a communication packet before transmitting the next command.

■ 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			
CoDeSys V3 Ethernet		[TCP]	Page 1/1	
Device/PLC Name [PLC1]				
Node Address		NodeName		
TCP Connection		<input checked="" type="radio"/> Disable <input type="radio"/> Enable		
IP Address(Tcp)		[0 0 0 0]		
Tcp Port		11740 [▼] [▲]		
Gateway		<input checked="" type="radio"/> Disable <input type="radio"/> Enable		
Gateway IP		[0 0 0 0]		
Gateway Port		1217 [▼] [▲]		
Exit		Back		2013/04/03 16:57:29

Setup Items	Setup Description
Device/PLC Name	Select the External Device to set up. The device name is the name of the External Device defined in GP-Pro EX. The initial value is [PLC1].
Node Address	Displays the node name or node address of the connected External Device.
TCP Connection	Select [Enable] to specify the External Device's IP address and port number. When you select [Disable], the [IP Address (Tcp)] and [Tcp Port] properties are disabled.
IP Address(Tcp)	Set the External Device's IP Address. NOTE <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address.
Tcp Port	Enter the External Device's port number.
Gateway	When using a gateway, select [Enable]. When you select [Disable], the [Gateway IP] and [Gateway Port] properties are disabled.
Gateway IP	Set the gateway's IP address. NOTE <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address.
Gateway Port	Enter the gateway's port number.

5 Supported Devices

Range of supported device addresses is shown in the table below. Please note that the actual supported range of devices varies on the External Device in use. Please check the actual range in the manual for your connected equipment.

You can import tag data from the project created by your programming software.

 This address can be specified as system data area.

Device		Bit Address	Word Address	32 bit	Notes
BOOL	Single	<TAGNAME>	-	-	*1
	1D Array	<TAGNAME>[xl] - <TAGNAME>[xh]			
	2D Array	<TAGNAME>[xl,y1] - <TAGNAME>[xh,yh]			
	3D Array	<TAGNAME>[xl,y1,z1] - <TAGNAME>[xh,yh,zh]			
BYTE SINT USINT	Single	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>		*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].07	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y1].00 - <TAGNAME>[xh,yh].07	<TAGNAME>[xl,y1] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y1,z1].00 - <TAGNAME>[xh,yh,zh].07	<TAGNAME>[xl,y1,z1] - <TAGNAME>[xh,yh,zh]		
INT UINT WORD	Single	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>		*1*2
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].15	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y1].00 - <TAGNAME>[xh,yh].15	<TAGNAME>[xl,y1] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y1,z1].00 - <TAGNAME>[xh,yh,zh].15	<TAGNAME>[xl,y1,z1] - <TAGNAME>[xh,yh,zh]		
DINT UDINT DWORD	Single	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>		*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].31	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y1].00 - <TAGNAME>[xh,yh].31	<TAGNAME>[xl,y1] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y1,z1].00 - <TAGNAME>[xh,yh,zh].31	<TAGNAME>[xl,y1,z1] - <TAGNAME>[xh,yh,zh]		

Device		Bit Address	Word Address	32 bit	Notes
DATE REAL TIME TOD TIME_OF_ DAY	Single	-	<TAGNAME>	H/L	*1
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		
DATE_AND _TIME DT	Single	-	<TAGNAME>	-	*1*3
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		
STRING	Single	-	<TAGNAME>	-	*1
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		
LINT LWORD ULINT	Single	<TAGNAME>.00 - <TAGNAME>.63	<TAGNAME>	-	*4
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].63	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].63	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,l,z].00 - <TAGNAME>[xh,yh,zh].63	<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		
LREAL	Single	-	<TAGNAME>	-	*4
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		
LTIME	Single	-	<TAGNAME>	-	*4
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,y,l,z] - <TAGNAME>[xh,yh,zh]		

Device		Bit Address	Word Address	32 bit	Notes
WSTRING	Single	-	<TAGNAME>	-	*5
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,yll] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,yll,zll] - <TAGNAME>[xh,yh,zh]		

*1 <TAGNAME>: When referring to structures, the TagName includes the structure name. The maximum number of characters for the Tag Name is 255, which includes delimiters and elements.

Example)

BOOL type single symbol	"BOOLSMBOL"
BOOL type 1D Array	"BOOL1D[10]"
WORD type 2D Array	"WORD2D[10,10]"
UDINT type 3D Array	"UDINT3D[0,1,2]"
STRING in User Defined Structure [STRUCT001]	"STRUCT001.STRINGSYM"

*2 Initially, 16 words of items are selected for the system data area. When selecting less than 16 words, set up a tag array with more than 16 words, allocate it to the system data area, and select the items.

*3 64-bit data type on the Display, 32-bit data type on the External Device.

*4 64-bit data type on the External Device, 32-bit data type on the Display. (The Display uses just the bottom 4 bytes and the top 4 bytes are ignored.)

When a bit is specified, normal writing cannot be performed for 31-bit to 63-bit.

*5 Tag data can be imported. Do not use it, however, since it is the data type which is not supported by the Display.

IMPORTANT

- When connecting with EHV+ Series, arrays cannot be used for the Display.

NOTE

- Sub-Scope is shown on the Display as 'Scope'\$'Sub-Scope'. ('\$' is delimiter)
- When importing ENUM data types, the member name is converted to ENUM0. The value "0" is assigned to ENUM0.
- Naming rules for the Tag Name, Data type name and Scope name are as follows:
 - Special characters are not allowed.
 - Consecutive underscore '_' are not allowed.
 - Maximum 255 characters.
- Please refer to the GP-Pro EX Reference Manual on the system data area.

Cf. GP-Pro EX Reference Manual "LS Area (Direct Access Method Area)"

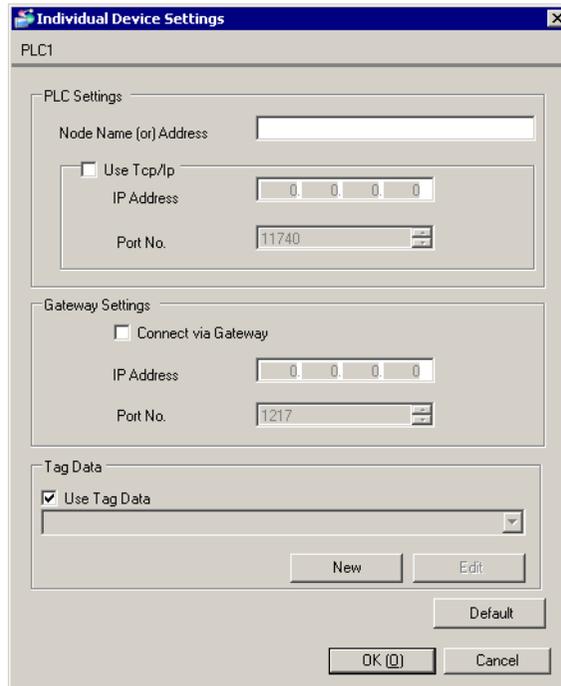
- Please refer to the precautions on manual notation for icons in the table.



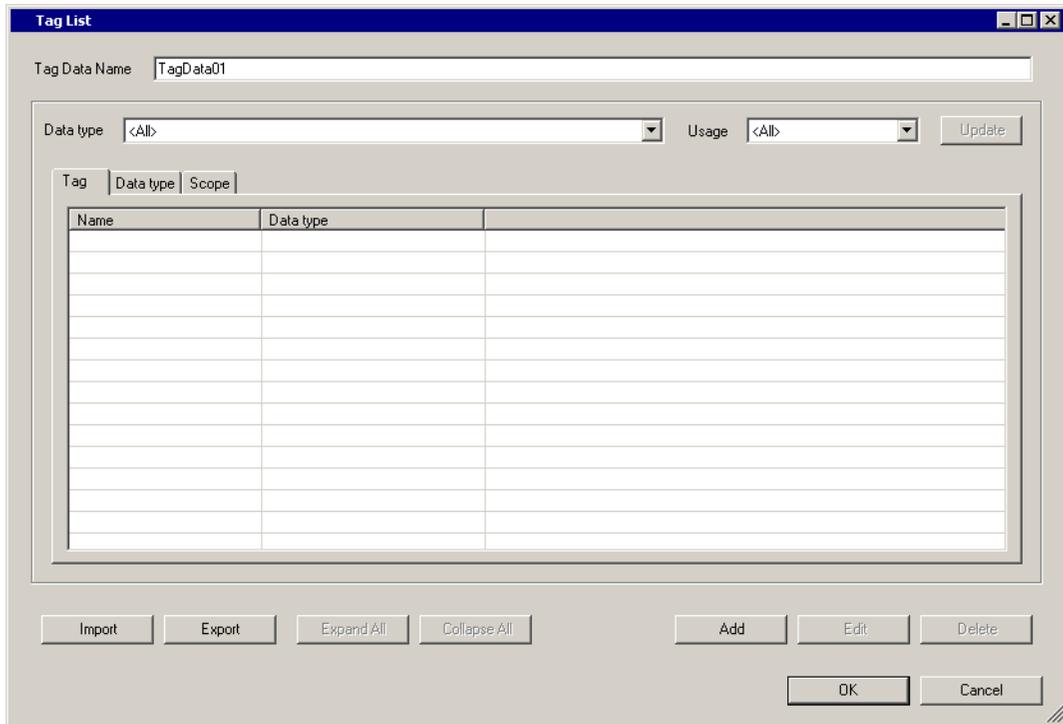
"Manual Symbols and Terminology"

■ Importing Tag File

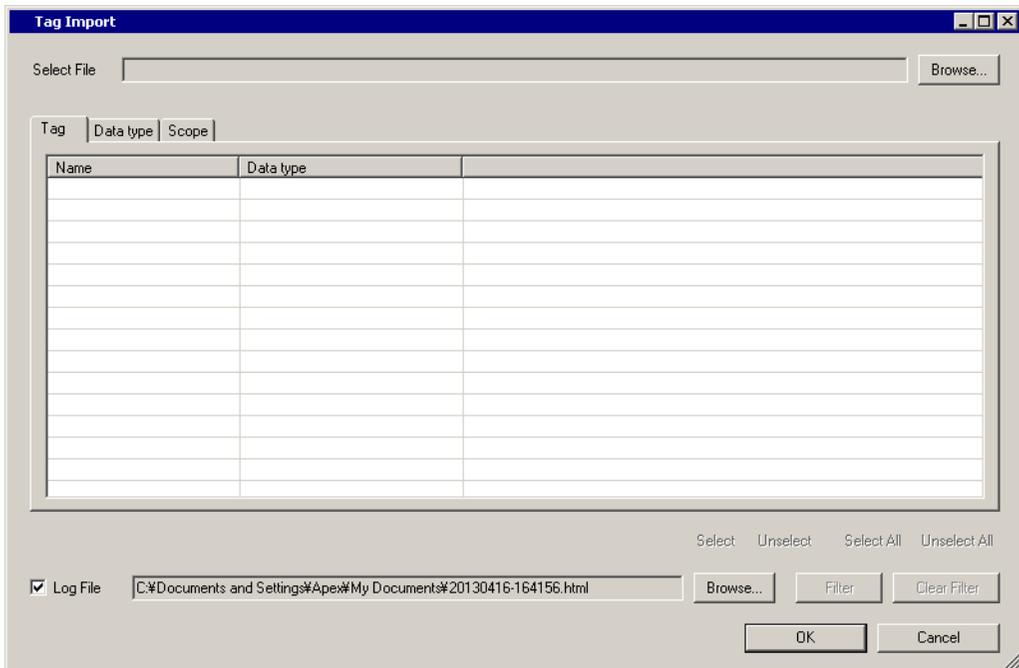
- 1 Use the programming software to create symbols.
- 2 In the [Devices] tree view, right-click [Application].
- 3 From the menu select [Add Object]-[Symbol configuration].
- 4 Move symbols you want to use on the Display to the [Selected variables] area.
- 5 Build the project and download to the External Device. Symbol data (xml file) is created when downloading.
- 6 In GP-Pro EX, display the [Individual Device Settings] dialog box and select the [Use Tag Data] check box.



7 Click [New] to display the [Tag List] window.



8 Click [Import].



6 Device Code and Address Code

Device code and address code cannot be used.

7 Error Messages

Error messages are displayed on the screen of Display as follows: "No. : Device Name: Error Message (Error Occurrence Area)". Each description is shown below.

Item	Description
No.	Error No.
Device Name	Name of External Device where error occurs. Device name is a title of External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	<p>Displays IP address or device address of External Device where error occurs, or error codes received from External Device.</p> <p>NOTE</p> <ul style="list-style-type: none"> • 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 Messages Unique to External Device

Message ID	Error Message	Description
RHxx128	(Node Name): Connection open error (Node: %s)	This message appears when the Display cannot communicate with the External Device, or when communication is interrupted. Check the External Device settings. (This message appears when using the node address or the node name for communication with the External Device.)
RHxx129	(Node Name): %s:Symbol mismatch with Device/PLC. Please update TagData in the project.	This message appears when accessing a symbol that does not exist. Make sure the tag data matches the symbol file.
RHxx130	(Node Name): %s:Out of range value in write request (Address:%s)	This message appears when writing an out of range value. Check the write values.