



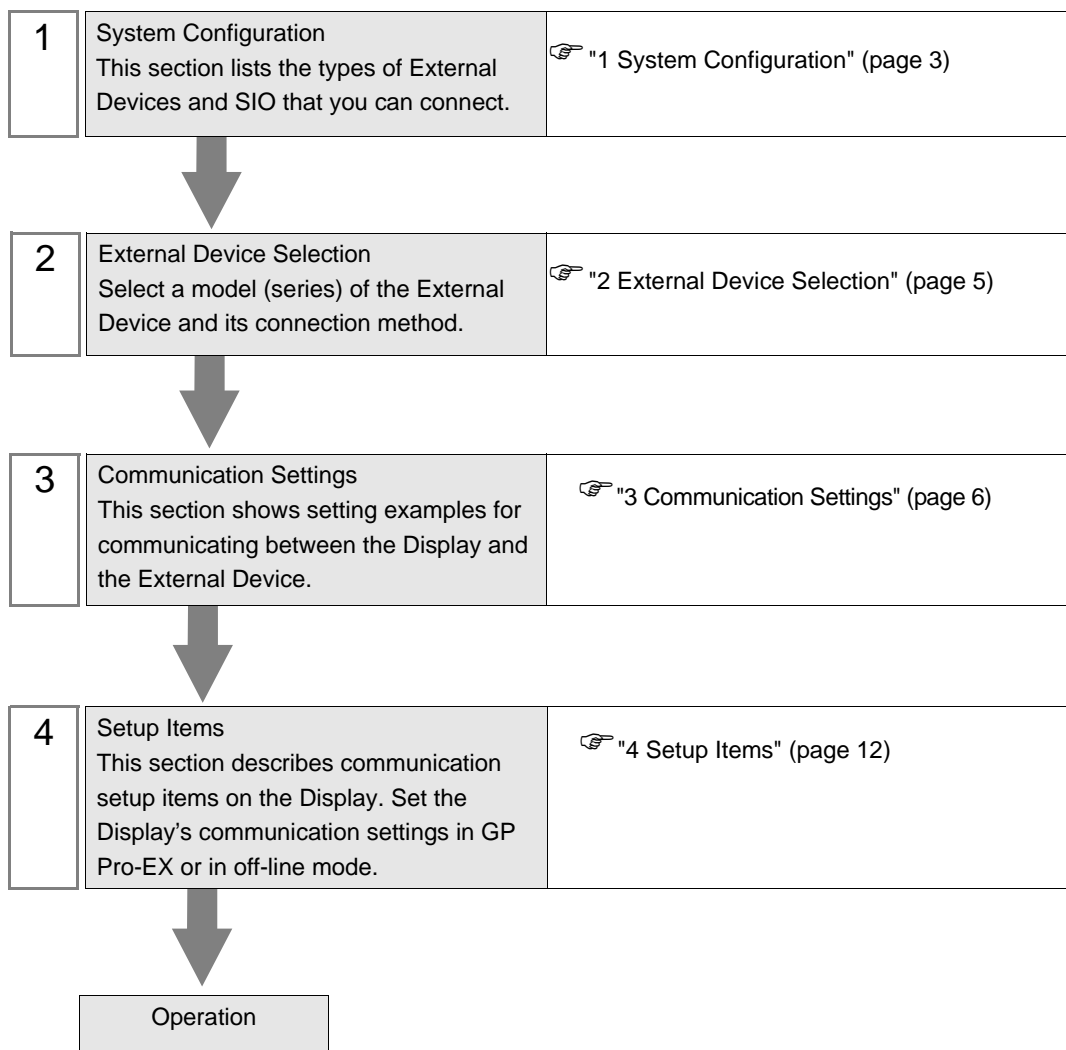
TwinCAT ADS/ AMS Driver

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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:



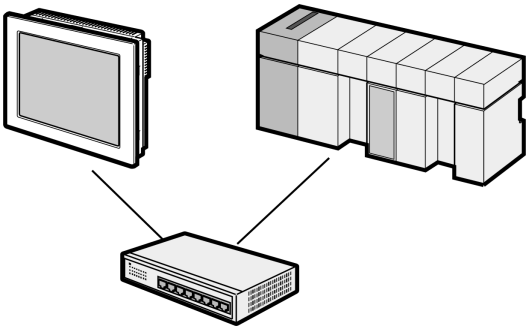
1 System Configuration

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

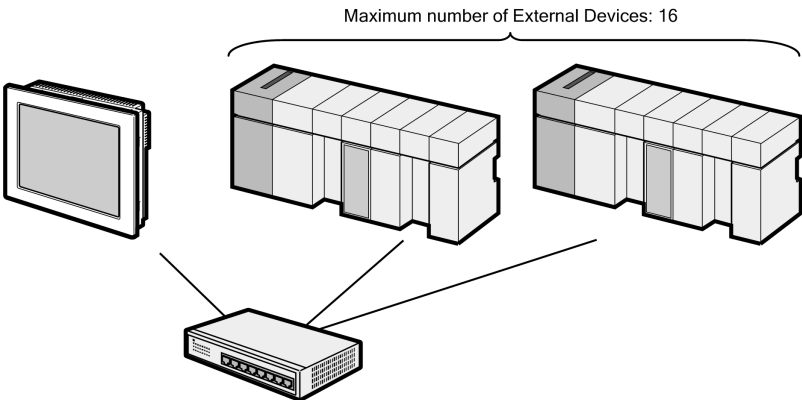
Series	CPU	Link I/F	SIO Type	Setting Example
Bus Terminal Controller	BC9000 BC9100 BX9000	RJ45 on CPU unit	Ethernet (TCP)	"Setting Example 1" (page 6)
		X900	Ethernet (TCP)	"Setting Example 1" (page 6)
Embedded PC	CX1000	X01	Ethernet (TCP)	"Setting Example 2" (page 8)
	CX1010	X001	Ethernet (TCP)	"Setting Example 2" (page 8)
	CX1020	X01 or X02	Ethernet (TCP)	"Setting Example 2" (page 8)
	CX9000	X001 or X02	Ethernet (TCP)	"Setting Example 2" (page 8)
IPC/TwinCAT-SoftPLC	-	RJ45	Ethernet (TCP)	"Setting Example 3" (page 10)

■ Connection Configuration

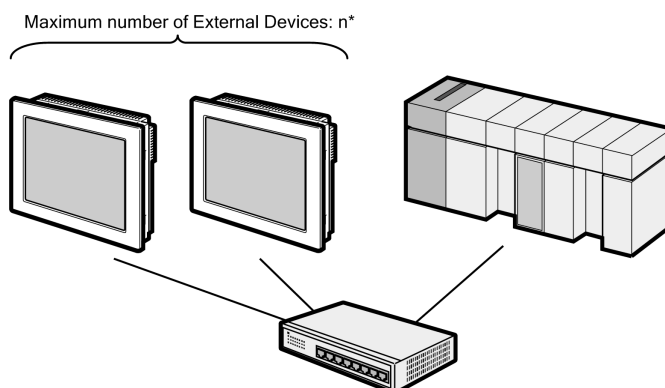
- 1:1 Connection



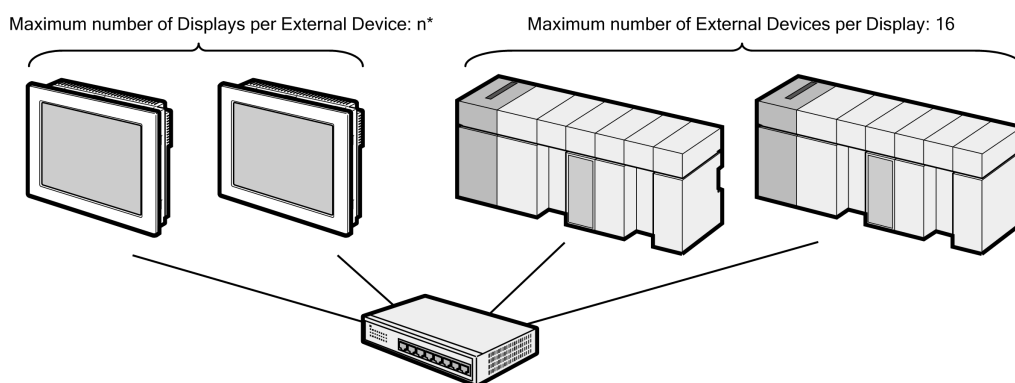
- 1:n Connection



- n:1 Connection



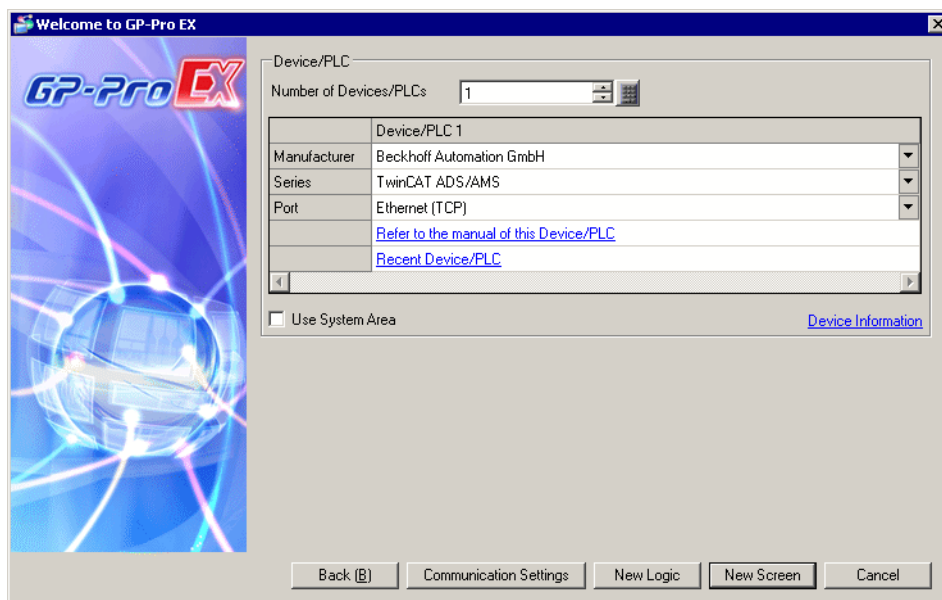
- n:m Connection



- * The number of Displays you can connect depends on the External Device. Check the specifications of the External Device. Adding more External Devices increases the load, which may require adjustments to the Timeout time.

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 "Beckhoff Automation GmbH".
Series	Select a model (series) of the External Device to be connected and connection method. Select "TwinCAT ADS/AMS". Check the External Device which can be connected in "TwinCAT ADS/AMS" 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

Manufacturer: Series: Port: [Change Device/PLC](#)

Text Data Mode: [Change](#)

Communication Settings

Port No.: ☒ Auto

Timeout: (sec)

Retry:

Wait To Send: (ms)

Device-Specific Settings

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

No.	Device Name	Settings	Add Indirect Device
1	PLC1	Series=Bus Terminal Controller, IP Address=192.168.0.1	<input type="button" value="Add 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.

Individual Device Settings

PLC1

Series:

IP Address:

AMS NetId:

ADS Port:

AMS Router Port:

TPY Setting

TPY File:

MEMO

- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

■ Settings of External Device

Use the TwinCAT for setting up communication with the External Device. Please refer to the manual of the External Device for more details.

- 1 Set up the External Device as in the following table, and add to the TwinCAT system. Please refer to the manual of the External Device for more details.

Setup Items	Setting Value
Address	192.168.0.1
AMS Net Id	192.168.0.1.1.1

- 2 Add the Display's IP address and AMS NetId to the TwinCAT system.
Right click the TwinCAT icon in the Notification Area, and select [Properties].
- 3 In the [AMS Router] tab, click [Add].
- 4 Enter the following settings and click [OK].

Setup Items	Setting Value
AMS Net Id	192.168.0.2.1.1
Address	192.168.0.2
Transport	TCP/IP

MEMO

- In the AMS Net Id, set up a value that appends 1.1 to the IP address.

- 5 Restart the TwinCAT system.
- 6 Create the project in TwinCAT PLC Control, and download to the External Device.

MEMO

- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

3.2 Setting Example 2

■ 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 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.

MEMO

- When using Embedded PC/IPC, in the [TPY File] field define the TPY file (tag data) output by TwinCAT ADS/AMS.
- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

■ Settings of External Device

Use the TwinCAT for communication settings of the External Device. Please refer to the manual of the External Device for more details.

- 1 Set up the External Device as in the following table. Please refer to the manual of the External Device for more details.

Setup Items	Setting Value
Address	192.168.0.1
AMS Net Id	192.168.0.1.1.1

- 2 Change the target to External Device.

From the TwinCAT System Manager's tree view, select [SYSTEM - Configuration].

- 3 From the [General] tab, click [Choose Target] to display a dialog box. Select the External Device. When selecting the target, set the [Target Route] and [Remote Route] to [Static].

- 4 Set up the Display's IP address and AMS NetId on the External Device.

From the TwinCAT System Manager's tree view, select [SYSTEM - Configuration] and then [Route Settings] to display a screen.

- 5 Select the [Static Route] tab and click [Add].

- 6 Enter the following settings and click [Add Route].

Setup Items	Setting Value
AmsNetId	192.168.0.2.1.1
Transport Type	TCP/IP
Address Info	192.168.0.2 (IP Address)
Target Route	Static
Remote Route	none

MEMO

- In the AmsNetId, set up a value that appends 1.1 to the IP address.

- 7 Create the project in TwinCAT PLC Control, and download to the External Device.

MEMO

- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

3.3 Setting Example 3

■ 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 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.

MEMO

- When using Embedded PC/IPC, in the [TPY File] field define the TPY file (tag data) output by TwinCAT ADS/AMS.
- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

■ Settings of External Device

Use the TwinCAT for communication settings of the External Device. Please refer to the manual of the External Device for more details.

- 1 In the TwinCAT system, enter the following settings. Please refer to the manual of the External Device for more details.

Setup Items	Setting Value
Address	192.168.0.1
AMS Net Id	192.168.0.1.1.1

- 2 Add the Display's IP address and AMS NetId to the TwinCAT system.
Right click the TwinCAT icon in the Notification Area, and select [Properties].
- 3 In the [AMS Router] tab, click [Add].
- 4 Enter the following settings and click [OK].

Setup Items	Setting Value
AMS Net Id	192.168.0.2.1.1
Address	192.168.0.2
Transport	TCP/IP

MEMO

- In the AMS Net Id, set up a value that appends 1.1 to the IP address.

- 5 Restart the TwinCAT system.

MEMO

- Check with a network administrator about IP address. Do not set the duplicate IP address in the same network.
- Set IP address and Port Number on the External Device in the [Individual Device Settings] dialog box.
- You need to set IP address on the Display in offline mode.

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 9)

MEMO

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

Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

- To use this driver, open TCP port 48898.

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.	Enter a port number of the Display, using 1024 to 65535. Check into [Auto], and a port number is set automatically.
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.

MEMO

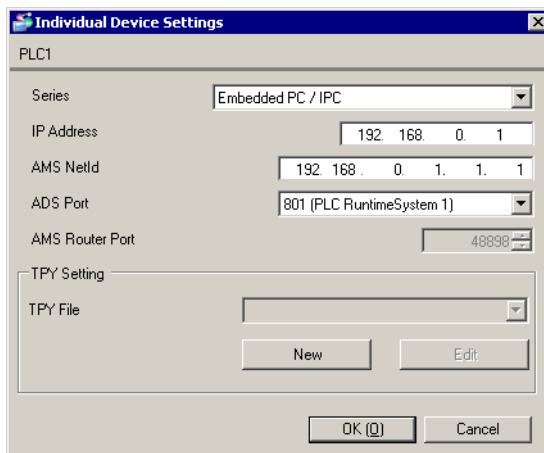
- Refer to the GP-Pro EX Reference Manual for Indirect Device.



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.



Setup Items	Setup Description
Series	Set series of the External Device.
IP Address	Set IP address of the External Device. <div style="border: 1px solid black; padding: 2px; display: inline-block;">MEMO</div> <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address.
AMS NetId	Enter the External Device's AMS NetId. AMS NetId is the IP Address with 1.1 appended.
ADS Port	Set up the ADS Port.
AMS Router Port	Displays the AMS Router Port. AMS Router Port is fixed to 48898.
TPY File	When the [Series] is set to [Embedded PC/IPC], select the tag data that defines the TPY file for the External Device. When creating new tag data, click [New].  "5.2 Embedded PC Series / IPC/TwinCAT-SoftPLC (Tag)" (page 17)  "5.3 Embedded PC Series / IPC/TwinCAT-SoftPLC (Symbol)" (page 22)

4.2 Setup Items in Offline Mode

MEMO

- 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			
TwinCAT ADS/AMS [TCP] Page 1/1				
Port No.	<input type="radio"/> Fixed <input checked="" type="radio"/> Auto <div>1024 ▼ ▲</div>			
Timeout(s)	<div>3 ▼ ▲</div>			
Retry	<div>0 ▼ ▲</div>			
Wait To Send(ms)	<div>0 ▼ ▲</div>			
Exit		Back		2013/02/26 18:00:54

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


Comm.	Device			
TwinCAT ADS/AMS		[TCP]		Page 1/1
Device/PLC Name <input type="text" value="PLC1"/>				
Series		Bus Terminal Controller		
IP Address		<input type="text" value="192.168.0.1"/>		
AMS NetId		<input type="text" value="192.168.000.001.1.1"/>		
ADS Port		<input type="text" value="8000"/>		
AMS Router Port		<input type="text" value="48898"/>		
Exit		Back		2013/02/26 18:01:04


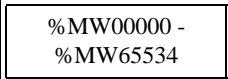
Setup Items	Setup Description
Device/PLC Name	Select the External Device for device setting. Device name is a title of External Device set with GP-Pro EX.(Initial value [PLC1])
Series	Displays the External Device model.
IP Address	Set IP address of the External Device. <div style="border: 1px solid black; padding: 2px; display: inline-block;">MEMO</div> <ul style="list-style-type: none"> Check with a network administrator about IP address. Do not set the duplicate IP address.
AMS NetId	Enter the External Device's AMS NetId. AMS NetId is the IP Address with 1.1 appended.
ADS Port	Set up the ADS Port.
AMS Router Port	Displays the AMS Router Port. AMS Router Port is fixed to 48898.

5 Supported Devices

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 connecting equipment.

5.1 Bus Terminal Controller

 This address can be specified as system data area.

Device	Bit Address	Word Address	32 bit	Group Index	
				Bit Address	Word Address
Input Relay	%IX00000.0 - %IX65535.7	%IW00000 - %IW65534	 L / H	0x0000 F021	0x0000 F020
Output Relay	%QX00000.0 - %QX65535.7	%QW00000 - %QW65534		0x0000 F031	0x0000 F030
Internal Relay	%MX00000.0 - %MX65535.7	 %MW00000 - %MW65534		0x0000 4021	0x0000 4020
Data Area	%DX00000000 - %DX16777215	%DW00000000 - %DW16777214		0x0000 4040	0x0000 4040

MEMO

- 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 Embedded PC Series / IPC/TwinCAT-SoftPLC (Tag)

You can import tag data from projects created using TwinCAT.

L/H 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	<TAGMNAME>[xl,y] - <TAGNAME>[xh,yh]	-		
	3D Array	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh,zh]	-		
BYTE SINT USINT	Single	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	L/H	*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].07	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].07	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].07	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
INT WORD UINT	Single	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>		*1*2
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].15	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].15	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].15	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
DINT DWORD UDINT	Single	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>		*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].31	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].31	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].31	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
DATE REAL ^{*3} TIME TIME_OF_ DAY DATE_AND _TIME ^{*4}	Single	-	<TAGNAME>		*1
	1D Array	-	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	-	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	-	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		

Device		Bit Address	Word Address	32 bit	Notes
STRING	Single	-	<TAGNAME>	-	*1*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]		

*1 <TAGNAME>: TagName including structure name in case of structure. The maximum number of characters for Symbol Name is 255 including delimiters and element number. In addition, maximum number of characters when using D-Script, limited to 54 characters.

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 The system data area is initially set up with 16 words of items. If you set up less than 16 words of items, after allocating a 16 word or larger array of tags in the system data area, select only the necessary items.

*3 32 bit type

*4 DATE_AND_TIME is a 64-bit data type in the Display, and a 32-bit data type on the External Device. Bit conversion is handled by the protocol.

The Display supports precision to the milliseconds. The External Device supports precision to the seconds.

*5 Up to 1414 single-byte characters are supported by the STRING data type. Characters 1415 or higher are ignored.

MEMO

- You cannot use tags with nested arrays (for example, Array[x][y].Structure) in GP-Pro EX. Design your tags using multidimensional arrays (for example, Array[x,y].Structure) so you can use them in GP-Pro EX.
- You can use tags on supported Displays. To check if tags are supported by your Display, in the GP-Pro EX Reference Manual's "Supported Features", see "Import Device/PLC tags".
- 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"

- Importing Tag File

- 1 In GP-Pro EX, open the [Individual Device Settings] dialog box, and from the [Series] drop-down list, select "Embedded PC/IPC".

Individual Device Settings

PLC1

Series: Embedded PC / IPC

IP Address: 192 168 0 1

AMS NetId: 192 168 0 1 1

ADS Port: 801 (PLC RuntimeSystem 1)

AMS Router Port: 48898

TPY Setting

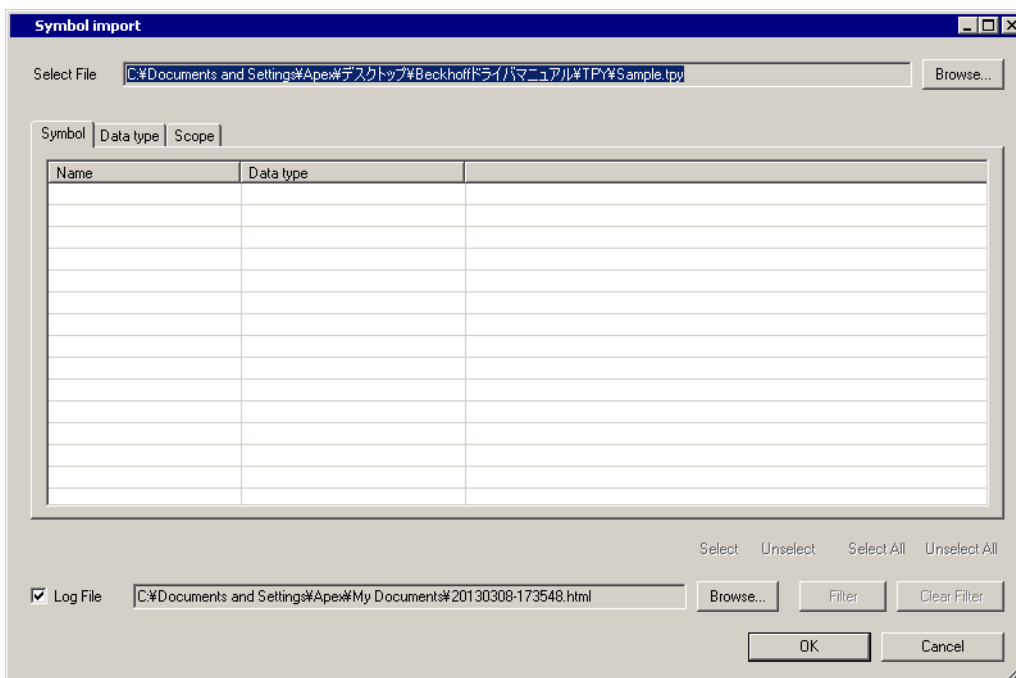
TPY File:

New Edit

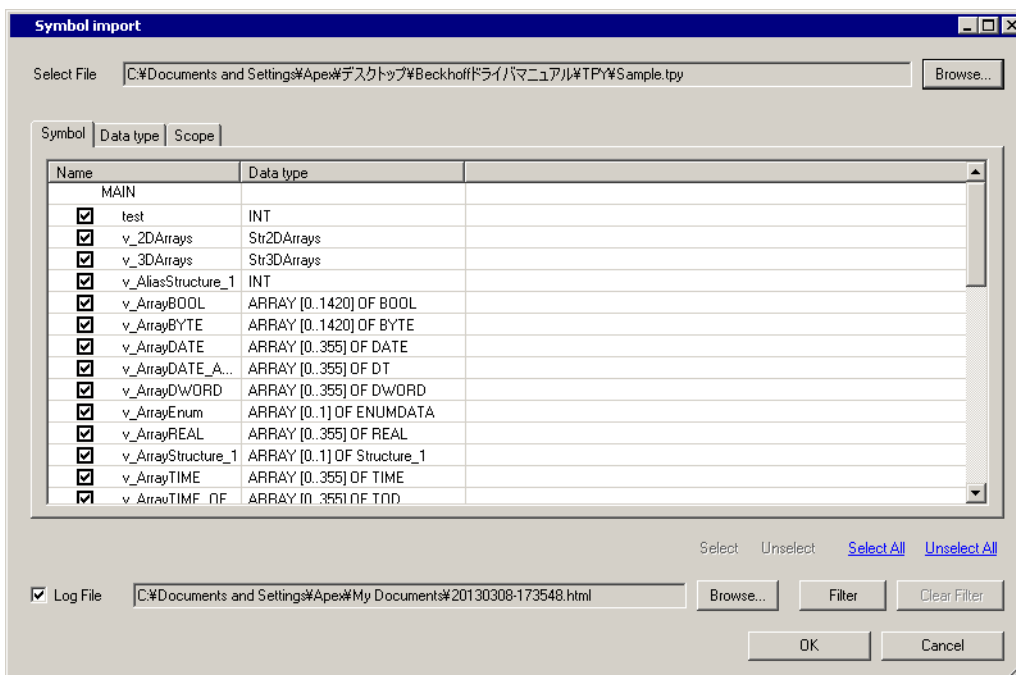
OK Cancel

- 2** Click [New].

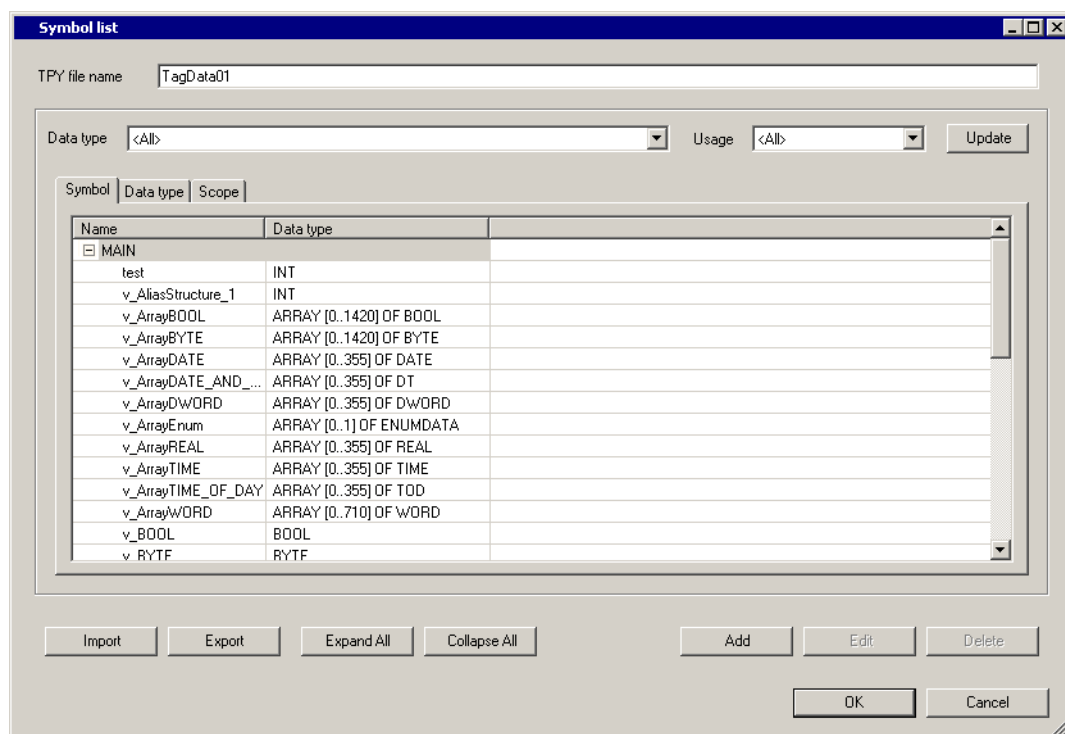
3 Click [Import].



4 From the [Select File] field, click [Browse..], and then select the TPY file.



5 Check the tags to import, and click [OK].



MEMO

- For details on importing tags, see "Using Device/PLC Tags" in the GP-Pro EX Reference Manual.
- GP-Pro EX does not support editing or deleting global scope symbols. To modify those symbols, please override them by TPY file import or create a new symbol list by selecting [New].

5.3 Embedded PC Series / IPC/TwinCAT-SoftPLC (Symbol)

You can import symbols only from projects created using TwinCAT. You cannot create symbols in GP-Pro EX.

L/H 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	<TAGMNAME>[xl,y] - <TAGNAME>[xh,yh]	-		
	3D Array	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh,zh]	-		
BYTE SINT USINT	Single	<TAGNAME>.00 - <TAGNAME>.07	<TAGNAME>	L/H	*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].07	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].07	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].07	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
INT WORD UINT	Single	<TAGNAME>.00 - <TAGNAME>.15	<TAGNAME>		*1*2
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].15	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].15	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].15	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
DINT DWORD UDINT	Single	<TAGNAME>.00 - <TAGNAME>.31	<TAGNAME>		*1
	1D Array	<TAGNAME>[xl].00 - <TAGNAME>[xh].31	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	<TAGNAME>[xl,y].00 - <TAGNAME>[xh,yh].31	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	<TAGNAME>[xl,y,z].00 - <TAGNAME>[xh,yh,zh].31	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		
DATE REAL ^{*3} TIME TIME_OF_ DAY DATE_AND _TIME	Single	-	<TAGNAME>		*1
	1D Array	-	<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array	-	<TAGNAME>[xl,y] - <TAGNAME>[xh,yh]		
	3D Array	-	<TAGNAME>[xl,y,z] - <TAGNAME>[xh,yh,zh]		

Device		Bit Address	Word Address	32 bit	Notes
STRING	Single	-	<TAGNAME>	-	*1*4
	1D Array		<TAGNAME>[xl] - <TAGNAME>[xh]		
	2D Array		<TAGNAME>[xl,yl] - <TAGNAME>[xh,yh]		
	3D Array		<TAGNAME>[xl,yl,zl] - <TAGNAME>[xh,yh,zh]		

*1 <TAGNAME>: TagName including structure name in case of structure. The maximum number of characters for Symbol Name is 255 including delimiters and element number. In addition, maximum number of characters when using D-Script, limited to 54 characters.

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 The system data area is initially set up with 16 words of items. If you set up less than 16 words of items, after allocating a 16 word or larger array of tags in the system data area, select only the necessary items.

*3 32 bit type

*4 Up to 1414 single-byte characters are supported by the STRING data type. Characters 1415 or higher are ignored.

MEMO

- You can use symbols on Displays that do not support tags. To check if tags are supported by your Display, in the GP-Pro EX Reference Manual's "Supported Features", see "Import Device/PLC tags".
- Imported LREAL symbols use the bottom 32 bits only.
- Imported POINTER symbols display the associated address.
- Imported DATE, TIME, TIME_OF_DAY, and DATE_AND_TIME symbols display 32-bit data.
- 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.

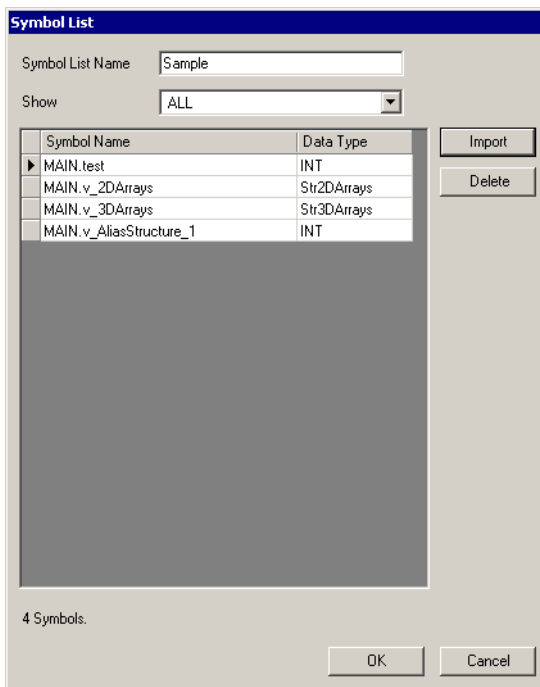


"Manual Symbols and Terminology"

■ Symbol List Dialog Box Settings

- Symbol List

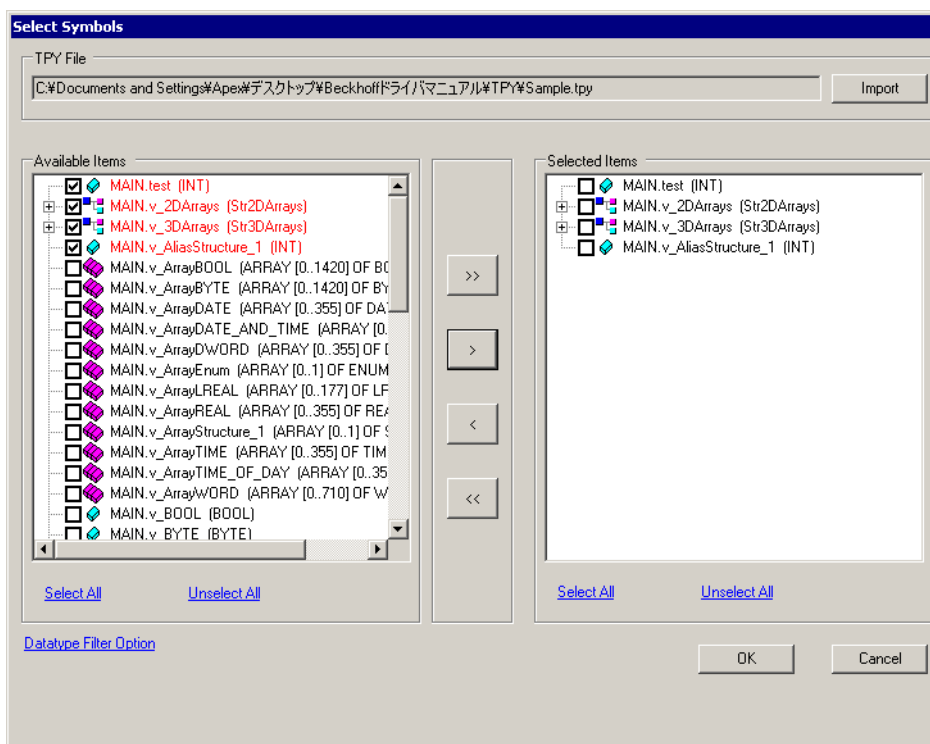
To use a symbol in GP-Pro EX, the symbol needs to be registered in the [Symbol List].



Setup Items	Setup Description
Symbol List Name	Enter the name of the Symbol List.
Show	Filters the symbols displayed in the list.
Import	Imports a TPY file into the current Symbol List.
Delete	Deletes the selected symbol.

- Select Symbols

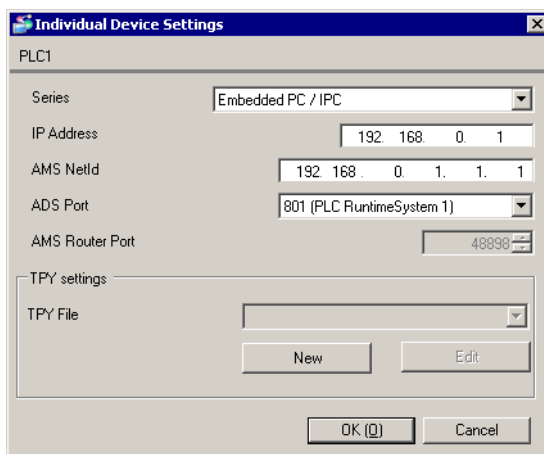
Select the TPY file to import, and the individual symbols to import into GP-Pro EX.



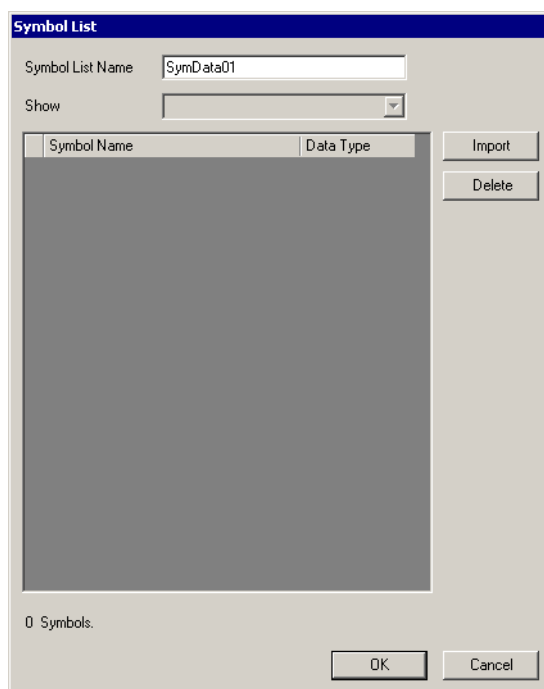
Setup Items	Setup Description
TPY File	Select the TPY file to import.
Available Items	Among all the symbols in the TPY file, displays only those symbols that you can import.
Selected Items	Displays the symbols to import.
[>>] [>]	Move to [Selected Items]. Click [>] to move symbols selected with a check mark. Click [>>] to move all symbols.
[<<] [<]	Remove from [Selected Items]. Click [<] to remove symbols selected with a check mark. Click [<<] to remove all symbols.
Datatype Filter Option	Filter the symbols displayed in the [Available Items] area.

■ Importing Symbols

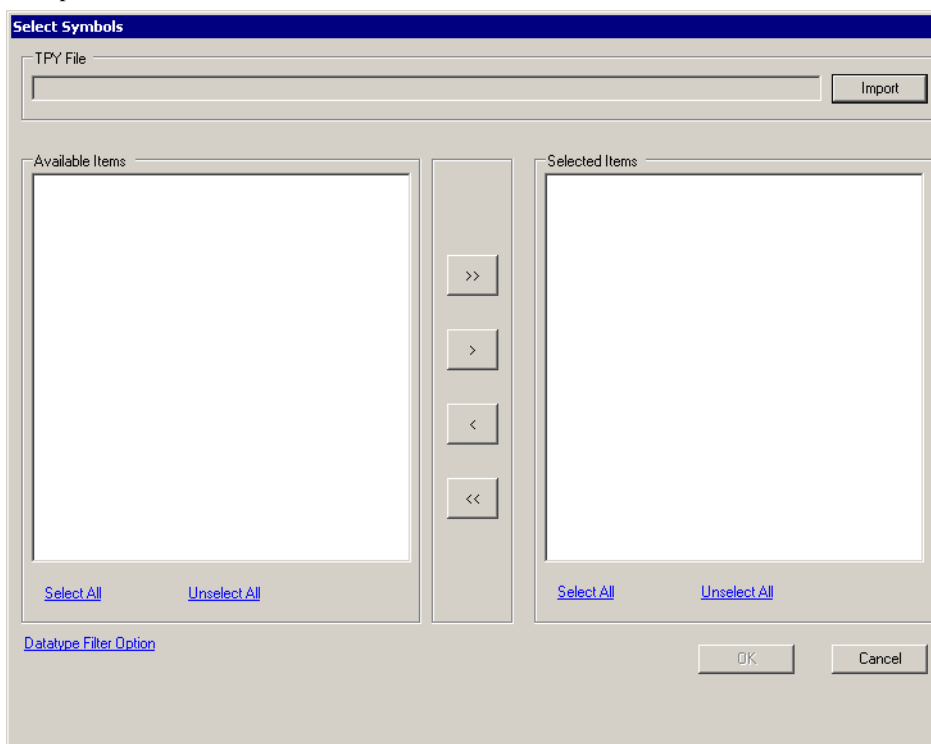
- 1 In GP-Pro EX, open the [Individual Device Settings] dialog box, and from the [Series] drop-down list, select "Embedded PC/IPC".



- 2 Click [New].



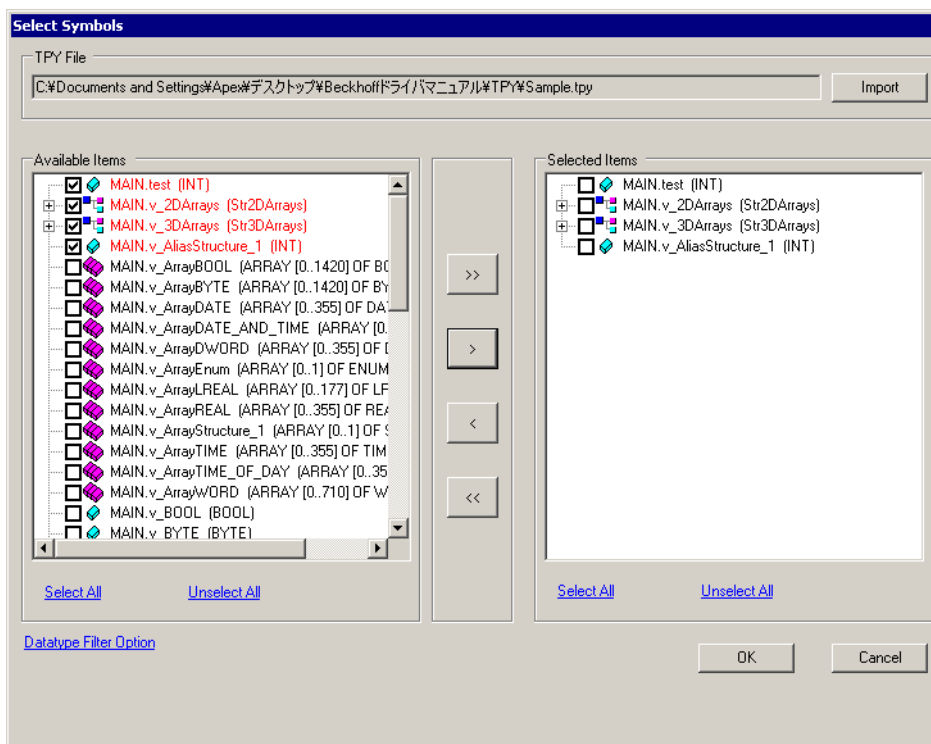
3 Click [Import].



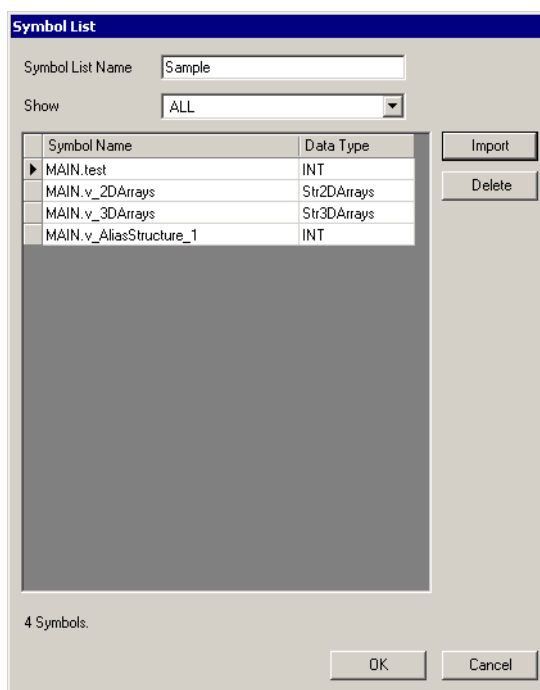
4 From the [TPY file] field, click [Import].

5 Select the TPY file to import.

6 In the [Available Items] area, select the symbols to import and click [>]. The symbols to import are added to the [Selected Items] area.



7 Click [OK] to import. Import results appear in the [Symbol List].



The 'Symbol List' dialog box is shown. It has a title bar 'Symbol List'. Below the title bar, there is a 'Symbol List Name' field with the text 'Sample' and a 'Show' dropdown menu set to 'ALL'. A table with two columns, 'Symbol Name' and 'Data Type', contains the following entries:

Symbol Name	Data Type
MAIN.test	INT
MAIN.v_2DArrays	Str2DArrays
MAIN.v_3DArrays	Str3DArrays
MAIN.v_AliasStructure_1	INT

To the right of the table are 'Import' and 'Delete' buttons. At the bottom left, it says '4 Symbols.' and at the bottom right are 'OK' and 'Cancel' buttons.

MEMO • When there are symbols that failed to import, you can save the generated error log.

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.

MEMO

- When select [Embedded PC/IPC] in series of the External Device, cannot use a device code and the address code.

Device	Device Name	Device Code (HEX)	Address Code
Input	%I	0001	Word address
Output	%Q	0002	Word address
Marker	%M	0003	Word address
Data	%D	0000	Word address

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> <div style="border: 1px solid black; padding: 2px; width: fit-content;">MEMO</div> <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])"

MEMO

- 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	NodeName:Out of range value in write request (Address: %s)	This message appears when writing out of range values from the Display to DATE, TOD, or DT data types on the External Device.