PROFIBUS DP Slave Driver

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Introduction

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

In this manual, the connection procedure will be described by following the below sections:

1	System Configuration This section shows the types of External Devices which can be connected and SIO type.	☞"1 System Configuration" (page 3)
2	Selection of External Device Select a model (series) of 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 off-line mode.	☞"4 Setup Items" (page 11)

Operation

1 System Configuration

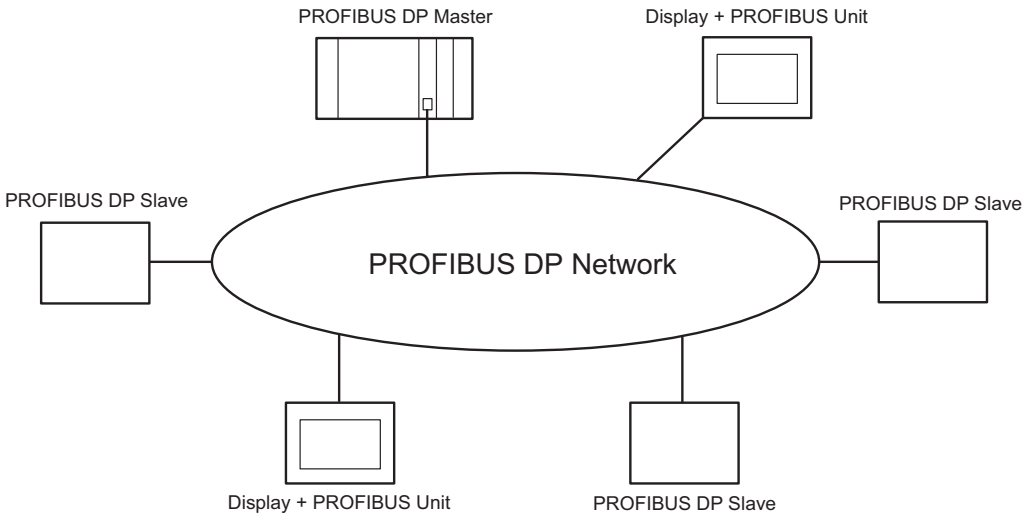
The system configuration in the case when the External Device of PROFIBUS DP Master and the Display are connected is shown.

Series	CPU	Link I/F	Setting Example	SIO Type
Siemens SIMATC S7-300/400 Series	All CPUs that have the DP port	PROFIBUS DP port on the External Device	Setting Example 1 (page 7)	PROFIBUS
			Setting Example 2 (page 9)*1	
Other company devices which support PROFIBUS DP Master		PROFIBUS DP port	Setting Example 1 (page 7)	

*1 Setting example when you use packet transfer.

IMPORTANT
- To use the PROFIBUS DP Slave Driver, you need the PROFIBUS unit (CA5-PFSALL/EX-01) for GP3000 Series by Pro-face. For more information about the cable diagram between the Display (PROFIBUS unit) and PROFIBUS DP Master and more details on the PROFIBUS unit, please refer to "PROFIBUS Unit for GP3000 Series User Manual".

■ Connection Configuration



The I/O memory size of the PROFIBUS DP Master specifies maximum number of the Display which can connect to the PROFIBUS DP Master.

For example, when the I/O memory size of the PROFIBUS DP Master is 64 words, assuming the PROFIBUS slave uses 16 words (total of input and output area) per unit, maximum number of the connectable Display will be 4 units.

Please refer to each maker's manual of the External Device for more detail on memory size.

■ Data Transfer through PROFIBUS DP

◆ Settings of PROFIBUS Slave

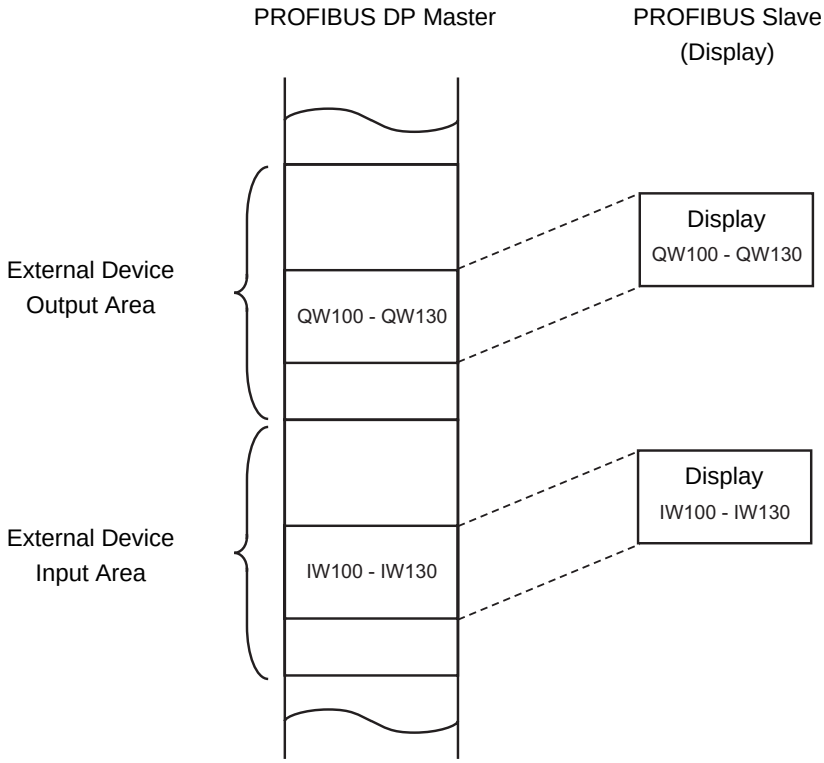
To communicate the Display with the PROFIBUS DP Master, you need to register the Display as the PROFIBUS slave. Please refer to each maker's manual of the External Device for more detail on how to register as slave.
When you select the Siemens SIMATIC Series for the PROFIBUS DP Master, the necessary files for the slave settings are included in the [FIELDBUS] folder in the CD-ROM of GP-Pro EX. Please refer to "README.TXT" in the same folder for each file description and the setting method.

◆ Direct I/O

The Display can communicate with the PROFIBUS DP Master by simple method called Direct I/O.
In this method, input and output area in the Display will be mapped into input and output area in the PROFIBUS DP Master respectively.
The figure below shows the example when taking Siemens SIMATIC Series as the PROFIBUS DP Master, and using 16 words each for input and output area size.
The input and output area size in the Display must be identical to those in the PROFIBUS DP Master.
Use GP-Pro EX to set the input and output area size in the Display.

☞"4.1 Setup Items in GP-Pro EX ■ Device Setting"(Page.1-12)

Use the ladder software to set slave input of the Display, the address on the PROFIBUS DP Master which will be the start address for slave output (shown as IW100, QW100 in the figure below), the input and output area size on the PROFIBUS DP Master. Please refer to each maker's manual of the External Device for more detail on the settings.



◆ Packet Transfer

You can perform the packet transfer in Siemens SIMATIC Series.

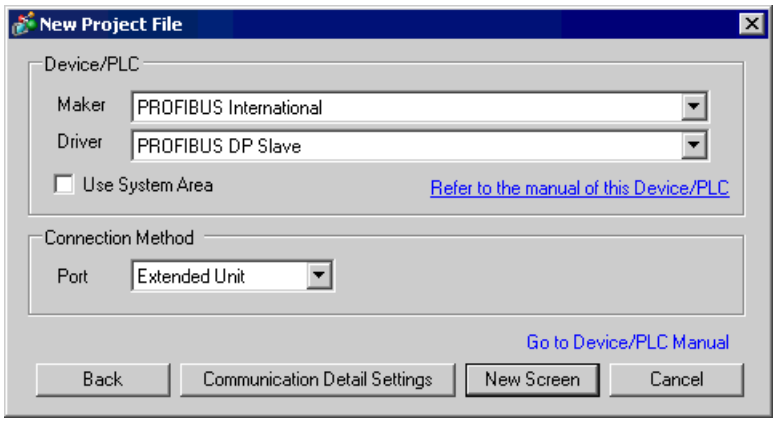
For the packet transfer, you need the interpreter program corresponding to the Siemens SIMATIC Series. The interpreter program is included in the [FIELDBUS] folder in the CD-ROM of GP-Pro EX. Please refer to "README.TXT" in the same folder for each file description and the setting method.

NOTE

- You can not use packet transfer in the PROFIBUS DP Master except the Siemens SIMATIC Series.
- Please note that the data update speed in packet communication is slower than in direct I/O. This depends the processing time of the ladder program.

2 Selection of External Device

Select the External Device to be connected to the Display.



Setup Items	Setup Description
Maker	Select the maker of the External Device to be connected. Select "PROFIBUS International".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "PROFIBUS DP Slave". Check the External Device which can be connected in "PROFIBUS DP Slave" in system configuration. ☞"1 System Configuration" (page 3)
Use System Area	Check this option when you synchronize the system data area of Display and the device (memory) of External Device. When synchronized, you can use the ladder program of External Device to switch the display or display the window on the display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)" This can be also set with GP-Pro EX or in off-line mode of Display. Cf. GP-Pro EX Reference Manual " 5.14.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. Maintenance/Troubleshooting "2.14.1 Settings common to all Display models◆System Area Settings" **NOTE** • You can use the system data area and the read area for the packet transfer only.
Port	Select the Display port to be connected to the External Device.

3 Example of Communication Setting

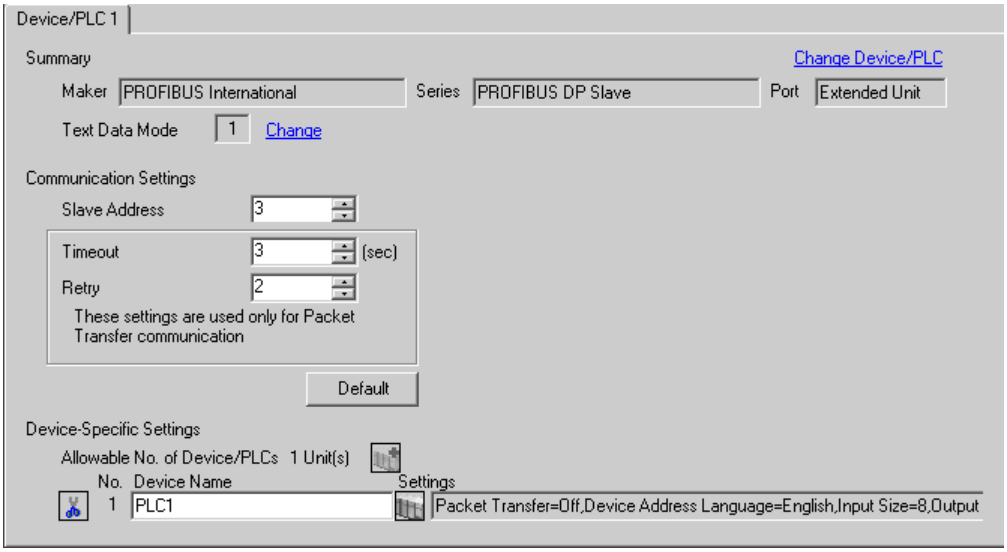
Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

3.1 Setting Example 1

■ Setting of GP-Pro EX

◆ Communication Settings

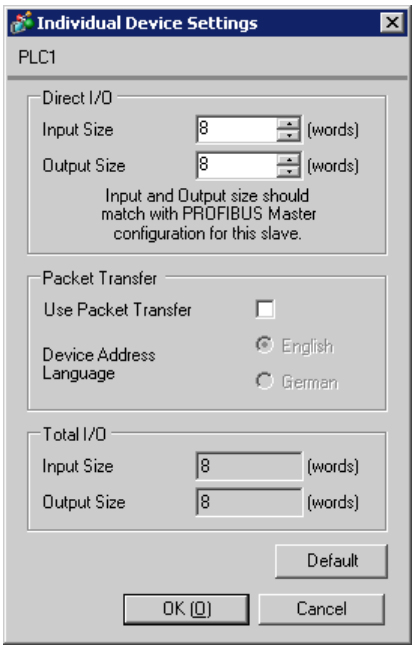
To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.



◆ Device Setting

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

When [Allowable No. of Device/PLCs] is multiple, you can click from [Device-Specific Settings] of [Device/PLC Settings] to add External Device which is available to set.



◆ Notes

- The input and output area size in the Display must be identical to the settings on the PROFIBUS DP Master.

■ Setting of External Device

Use the ladder software of the External Device which will be the PROFIBUS DP Master to register the Display (PROFIBUS unit) as the PROFIBUS DP Master slave and conform the input and output area sizes in the PROFIBUS DP Master to the settings on the Display.

☞"1 System Configuration ■ Data Transfer through PROFIBUS DP" (page 4)

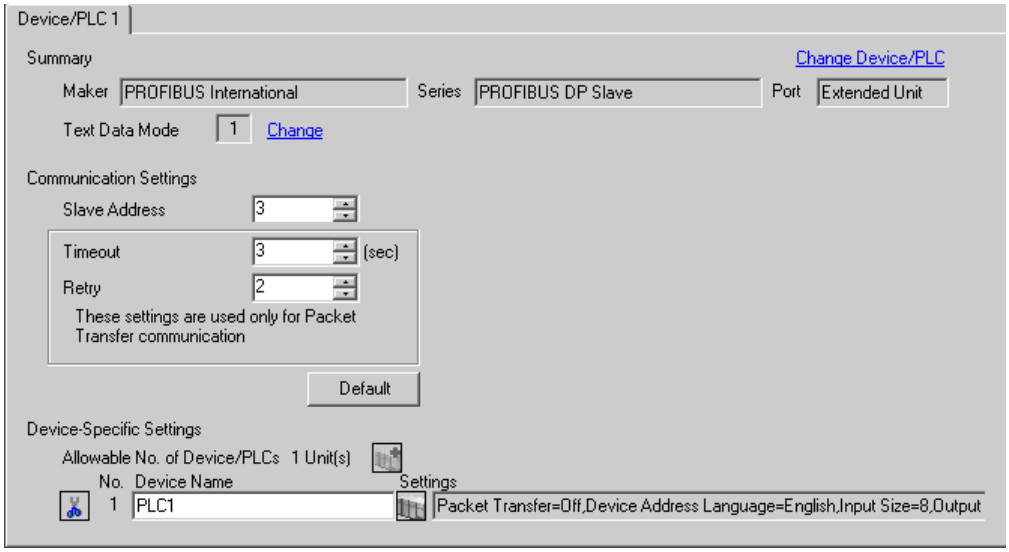
3.2 Setting Example 2

Setting example when you use packet transfer in Siemens SIMATIC Series is shown below.

■ Setting of GP-Pro EX

◆ Communication Settings

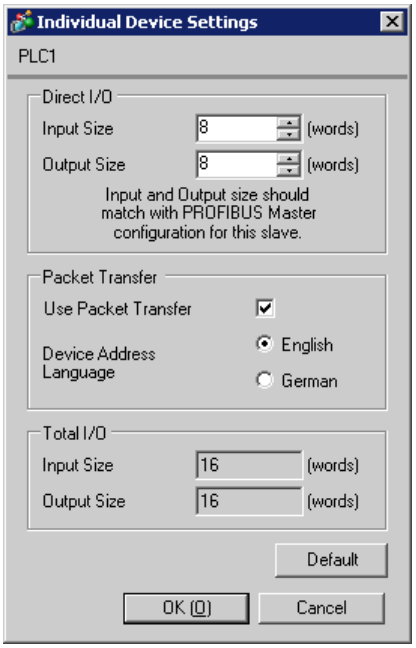
To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.



◆ Device Setting

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

When [Allowable No. of Device/PLCs] is multiple, you can click from [Device-Specific Settings] of [Device/PLC Settings] to add External Device which is available to set.



◆ Notes

- The input and output area size in the Display must be identical to the settings on the PROFIBUS DP Master. When you use packet transfer, the actual input and output sizes will be the values added by 8 words to the each size entered in [Direct I/O]. This is because the PROFIBUS unit is recognized as I/O device for the packet transfer and 8 words of the External Device memory must be assigned to both input and output sizes. Therefore, conform the input and output sizes displayed in [Total I/O] to the settings on the PROFIBUS DP Master.

■ Setting of External Device

Use the ladder software of the External Device which will be the PROFIBUS DP Master to register the Display (PROFIBUS unit) as the PROFIBUS DP Master slave and conform the input and output area sizes in the PROFIBUS DP Master to the settings on the Display.

☞"1 System Configuration ■ Data Transfer through PROFIBUS DP" (page 4)

For the packet transfer, you need the interpreter program corresponding to the Siemens SIMATIC Series. The interpreter program is included in the [FIELDBUS] folder in the CD-ROM of GP-Pro EX. Please refer to "README.TXT" in the same folder for each file description and the setting method.

◆ Notes

- When using the packet transfer, use OB122 and OB86 in the ladder program of the External Device. When you do not use OB122 and OB86, you need to manually operate the RUN switch of the External Device as "RUN, STOP, RUN" in this order upon restarting the Display. When you use OB122 and OB86, the communication will be automatically recovered even if you restart the Display.

4 Setup Items

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

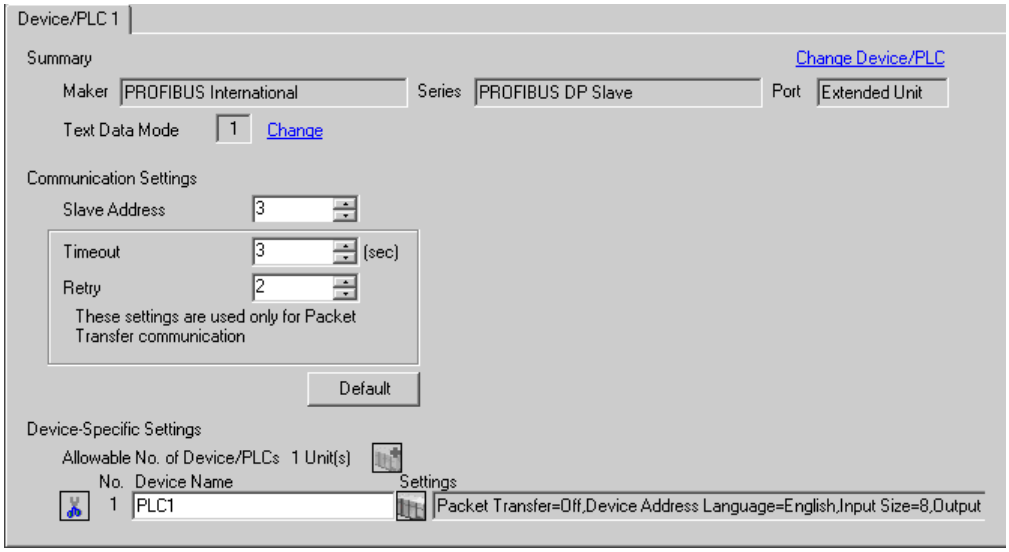
The setting of each parameter must be identical to that of External Device.

☞"3 Example of Communication Setting" (page 7)

4.1 Setup Items in GP-Pro EX

■ Communication Settings

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

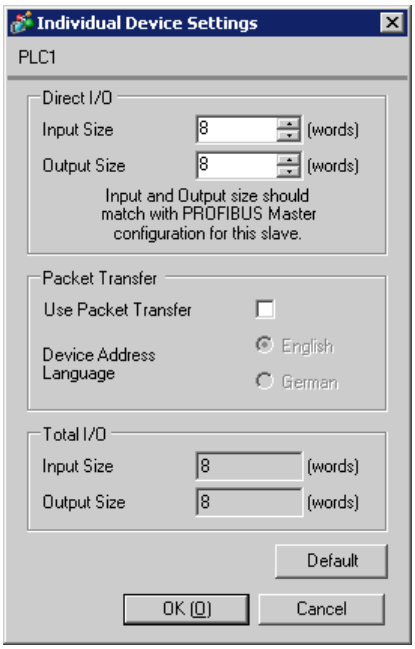


Setup Items	Setup Description
Slave Address	Use an integer 0 to 125 to enter the slave address.
Timeout	Use an integer from 1 to 127 to enter the time (s) for which the Display waits for the response from the External Device. This is effective only when you use packet transfer in Siemens SIMATIC Series.
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. This is effective only when you use packet transfer in Siemens SIMATIC Series.

■ Device Setting

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

When [Allowable No. of Device/PLCs] is multiple, you can click from [Device-Specific Settings] of [Device/PLC Settings] to add External Device which is available to set.



Setup Items		Setup Description
Direct I/O	Input Size	Set the input area size in word unit. Use an integer 1 to 112 to enter when you do not use packet transfer. Use an integer 0 to 104 to enter when you use packet transfer.
	Output Size	Set the output area size in word unit. Use an integer 1 to 112 to enter when you do not use packet transfer. Use an integer 0 to 104 to enter when you use packet transfer.
Use Packet Transfer		Check this option when you use packet transfer. You can use packet transfer only in Simemns SIMATIC Series.
Device Address Language		Select whether the device name is described in English or German.
Total I/O	Input Size	Total size of input area is described. When you use packet transfer, the value added by 8 words to the value entered in [Input Size] is described.
	Output Size	Total size of output area is described. When you use packet transfer, the value added by 8 words to the value entered in [Output Size] is described.

IMPORTANT

- The input and output area size in the Display must be identical to the settings on the PROFIBUS DP Master. Use the ladder software of each External Device to perform the settings on the PROFIBUS DP Master. When you use packet transfer, the actual input and output sizes will be the values added by 8 words to the each size entered in [Direct I/O]. This is because the PROFIBUS unit is recognized as I/O device for the packet transfer and 8 words of the External Device memory must be assigned to both input and output sizes. Therefore, conform the input and output sizes displayed in [Total I/O] to the settings on the PROFIBUS DP Master.

4.2 Setup Items in Off-Line Mode

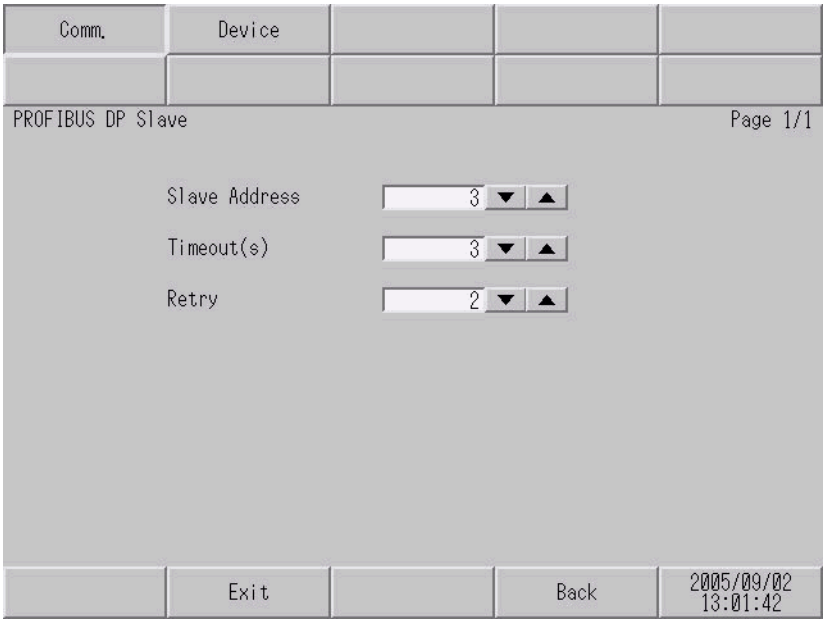
NOTE

- Please refer to Maintenance/Troubleshooting for more information on how to enter off-line mode or about operation.

  Cf. Maintenance/Troubleshooting "2.2 Offline Mode"

■ Communication Settings

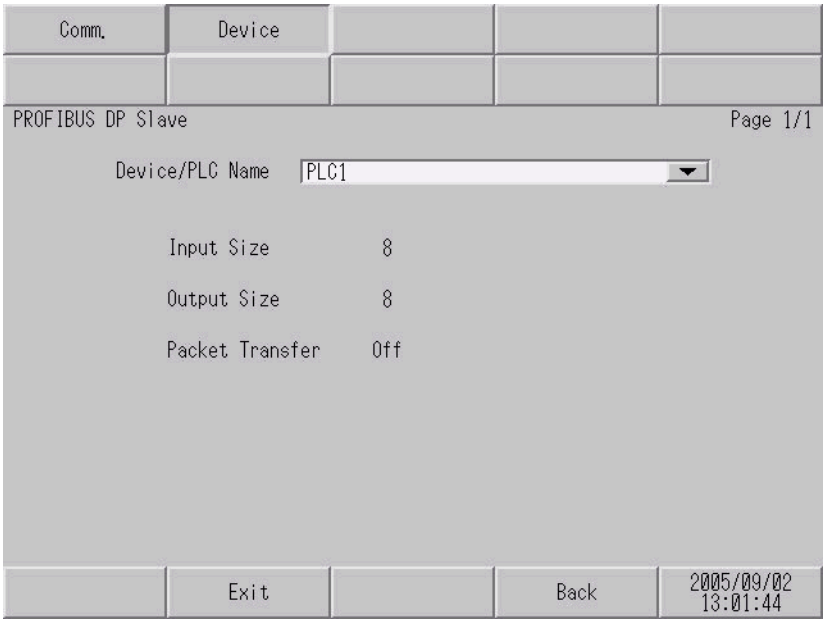
To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings] in off-line mode. Touch the External Device you want to set from the displayed list.



Setup Items	Setup Description
Slave Address	Use an integer 0 to 125 to enter the slave address.
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. This is effective only when you use packet transfer in Siemens SIMATIC Series.
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. This is effective only when you use packet transfer in Siemens SIMATIC Series.

■ 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].



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])
Input Size	Total size of input area is described. You cannot change input size in [Device Setting] in off-line mode.
Output Size	Total size of output area is described. You cannot change output size in [Device Setting] in off-line mode.
Packet Transfer	Whether you use packet transfer or not is described. You cannot change the usage selection in [Device Setting] in off-line mode.

NOTE

- Perform the settings for input size, output size and packet transfer in [Device Setting] of GP-Pro EX.

☞ "4.1 Setup Items in GP-Pro EX ■ Device Setting"(Page.1-12)

5 Supported Device

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

■ Direct I/O

Device	Bit Address	Word Address	32bits	Notes
Direct I/O Input	PI00000.0 - PI00223.7	PIW00000 - PIW00222	L/H	÷2
Direct I/O Output	PQ000000.0 - PQ00223.7	PQW00000 - PQW00222		÷2 *1

*1 Write disable

■ Direct I/O (Packet Transfer)

This address can be specified as system data area.

Device	Bit Address		Word Address		32 bits	Notes
	English	German	English	German		
Data Block	DB001.DBX00000.0 - DB255.DBX65535.7		DB001.DBW00000 - DB255.DBW65534		L/H	÷2
Input	I00000.0 - I65535.7	E00000.0 - E65535.7	IW00000 - IW65534	EW00000 - EW65534		÷2 *1
Output	Q00000.0 - Q65535.7	A00000.0 - A65535.7	QW00000 - QW65534	AW00000 - AW65534		÷2
Internal Marker	M00000.0 - M65535.7		MW00000 - MW65534			÷2

*1 Write disable.

NOTE

- Please refer to the GP-Pro EX Reference Manual for system data area.
  Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (only for direct access method)"
- Please refer to the precautions on manual notation for icons in the table.
  ☞ "Manual Symbols and Terminology"
- You can use the system data area and the read area for the packet transfer only.

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.

■ Direct I/O

Device	Word Address		Device Code (HEX)	Address Code
	English	German		
Direct I/O Input	PI	PI	0083	Value of word address divided by 2
Direct I/O Output	PQ	PQ	0084	Value of word address divided by 2

■ Direct I/O (Packet Transfer)

Device	Word Address		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

7 Error Messages

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

Item	Description
No.	Error No.
Device Name	Name of the External Device where error occurs. Device name is a title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to the error which occurs.
Error Occurrence Area	Displays IP address or device address of the External Device where error occurs, or error codes received from the External Device. **NOTE** • IP address is displayed such as "IP address(Decimal): MAC address(Hex)". • Device address is diplayed 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 [02])"

NOTE
- Please refer to the manual of the External Device for more detail of received error codes.
- Please refer to "When an error message is displayed (Error code list)" of "Maintenance/ Troubleshooting" for a common error message to the driver.

Error No.	Message	Solution
RHxx144	Waiting for PROFIBUS master	Check the master is powered on and the cable is properly connected.
RHxx145	Wrong configuration received from PROFIBUS master	Check the input/output settings on the master and slave.
RHxx146	Watchdog failed	Check the connection.
RHxx147	Unknown error	Restart the system. if error occurs again, please contact customer support.
RHxx148	Wrong parameter data received from PROFIBUS Master	Verify the User_Prm_Data with the original GSD file.
RHxx128	PROFIBUS master is not in RUN mode or Packet interpreter program (FB99) is not running.	Check the External Device status and that FB99 is being called.
RHxx129	Packet interpreter program (FB99) from PLC reports device error (Address:%s)	Check the device with error display.
RHxx130	Packet interpreter program (FB99) from PLC reports datablock error (Address:%s)	Check the data block size.

Error No.	Message	Solution
RHxx131	Packet interpreter program (FB99) from PLC reports access error (Address:%s)	You cannot write in the input device. Check the project.
RHxx132	Packet interpreter program (FB99) from PLC reports command error (Address:%s)	Restart the system. if error occurs again, please contact customer support.