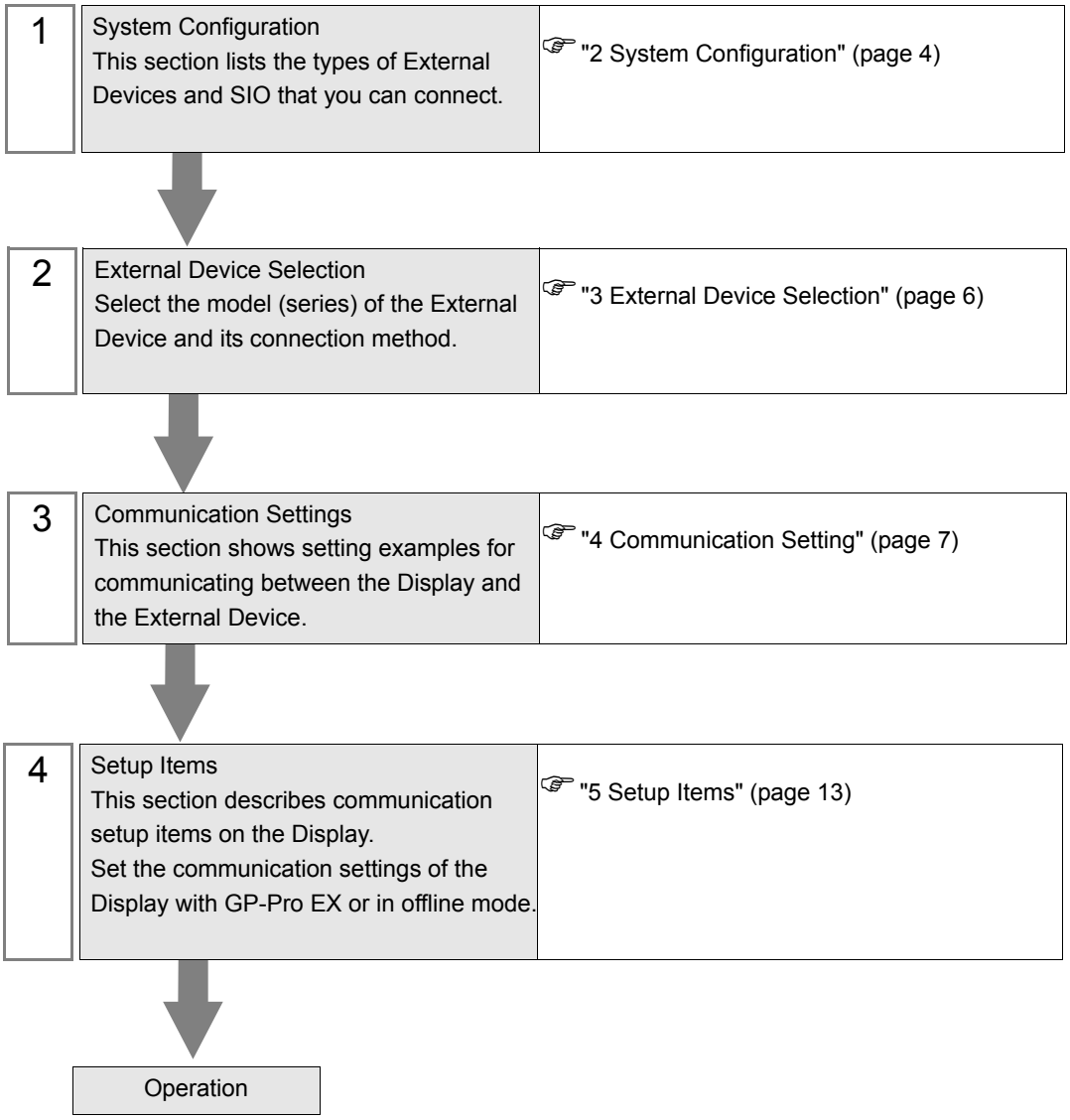
General MODBUS TCP Master Driver

Introduction

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

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



1 General MODBUS TCP Master Driver

The general MODBUS TCP Master Driver is used to connect the Display to a MODBUS-compatible External Device for general purpose.
The function code and boundary required for communication can be changed according to the External Device.

2 System Configuration

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

Series	CPU	Link I/F	SIO Type	Setting Example
MODBUS Slave Device*1			Ethernet (TCP)	Setting Example 1 (page 7)

*1 To connect with External Device using the Modbus protocol, configure the [Device Setting] to match the specifications on the External Device.

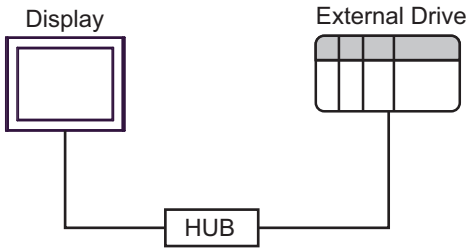
☞ Setup Items (page 13)

- External Device used to confirm connection

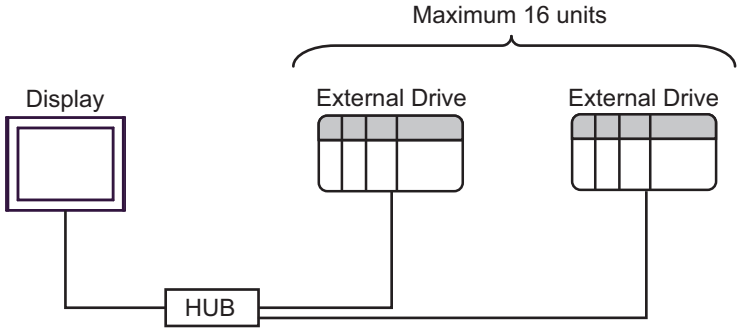
Series	CPU	Link I/F	SIO Type	Setting Example
Hitachi Industrial Equipment Systems Co., Ltd. MICRO-EHV	MVH-A64□□ MVH-D64□□ MVH-A40□□ MVH-D40□□	Ethernet port on basic unit	Ethernet (TCP)	Setting Example 2 (page 9)
			Ethernet (TCP) (Modbus Gateway)	Setting Example 3 (page 11)

■ Connection Configuration

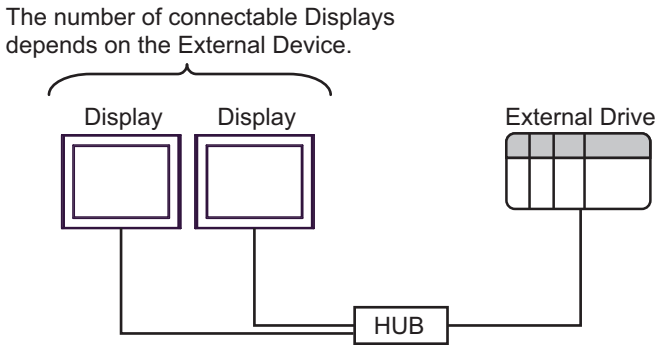
◆ 1:1 Connection



◆ 1: n Connection

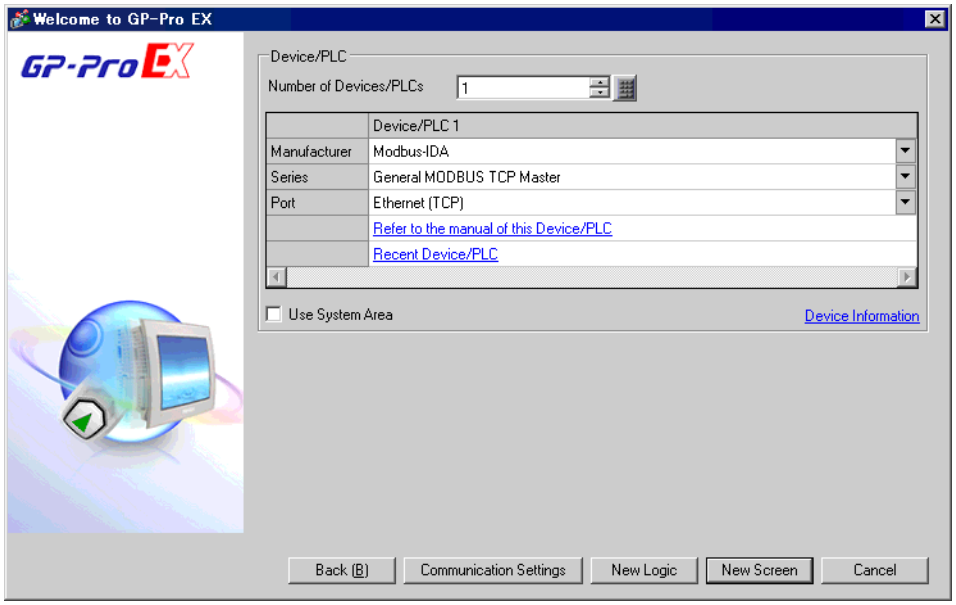


◆ n: 1 Connection



3 External Device Selection

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 "Modbus-IDA".
Series	Select the External Device model (series) and the connection method. Select "General MODBUS TCP Master". In System configuration, make sure the External Device you are connecting is supported by "General MODBUS TCP Master". ☞ "2 System Configuration" (page 4)
Port	Select the Display port to connect to the External Device.
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"

4 Communication Setting

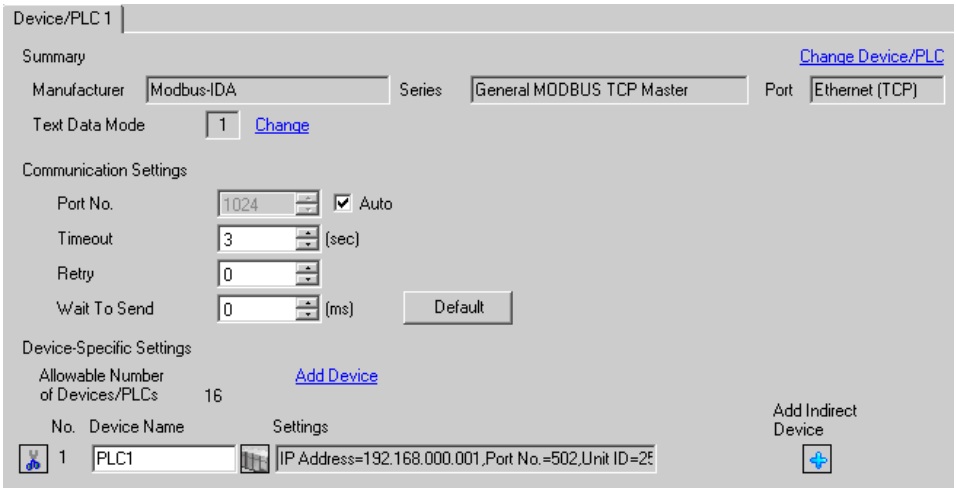
Examples of communication settings of the Display and the External Device, recommended by Pro-face, are shown.

4.1 Setting Example 1

■ GP-Pro EX Settings

◆ Communication Settings

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

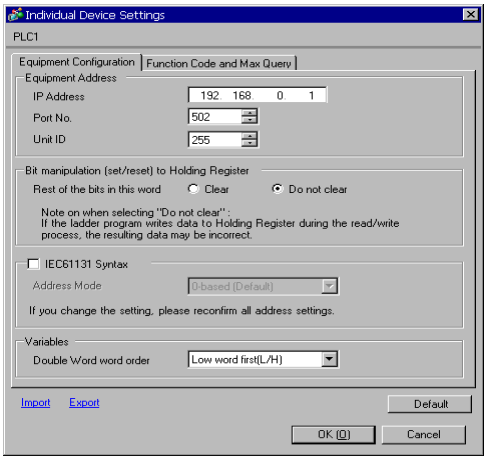


◆ Device Setting

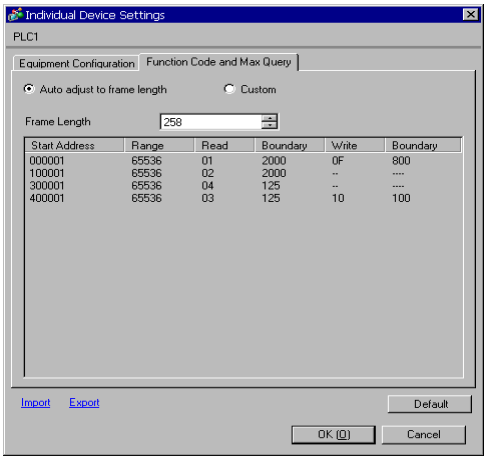
To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] .

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

[Equipment Configuration] Tab



[Function Code and Max Query] Tab



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in offline mode.

■ External Device Settings

External Device settings vary depending on the device. Refer to your External Device manual for details.

◆ Notes

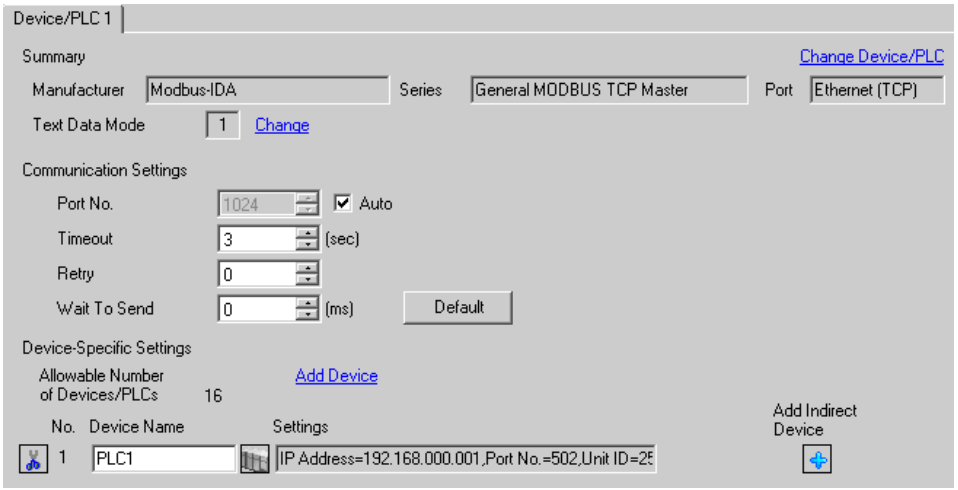
- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.

4.2 Setting Example 2

■ GP-Pro EX Settings

◆ Communication Settings

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

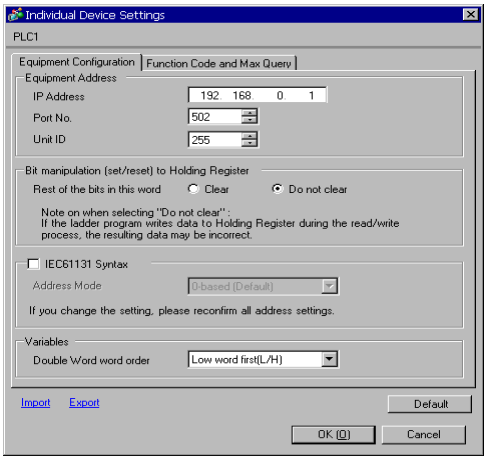


◆ Device Setting

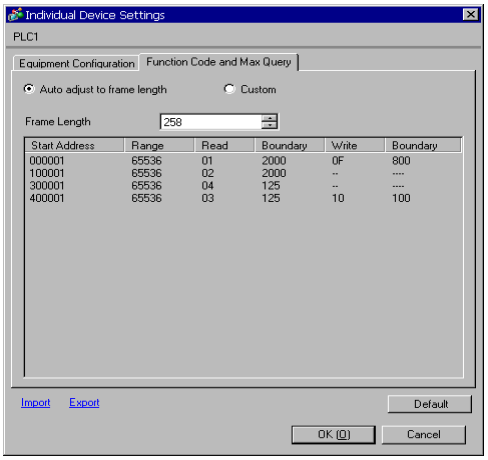
To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] .

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

[Equipment Configuration] Tab



[Function Code and Max Query] Tab



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in offline mode.

■ External Device Settings (Ethernet port on basic unit)

Use the programming software (Control Editor) for communication settings. Please refer to the manual of the External Device for more details.

◆ Procedure

1. Start the programming software and create a project. The project appears in offline mode.
2. In the tree view, from [CPU Parameters] double-click [CPU settings] and [IP address]. The [CPU Communication Setting (IP Address)] dialog box appears.
3. Set the following items and click [Set].

Setup Items	Setting
IP Address	192.168.0.1
Subnet mask	255.255.255.0
Default gateway	0.0.0.0
Link Speed / Duplex	Auto Negotiation

4. In the tree view, from [CPU Parameters] double-click [CPU settings] and [Modbus-TCP/RTU]. The [CPU communication settings (Modbus-TCP/RTU)] dialog box appears.
5. Set the following items and click [Set].

Setup Items	Setting	Remarks
Port No.	502	
Enable gateway	OFF	
Ethernet timeout	3000	Set to 0 when not using timeout.

6. Enter online mode, and transfer the settings to the External Device.
7. Restart the External Device.

◆ Notes

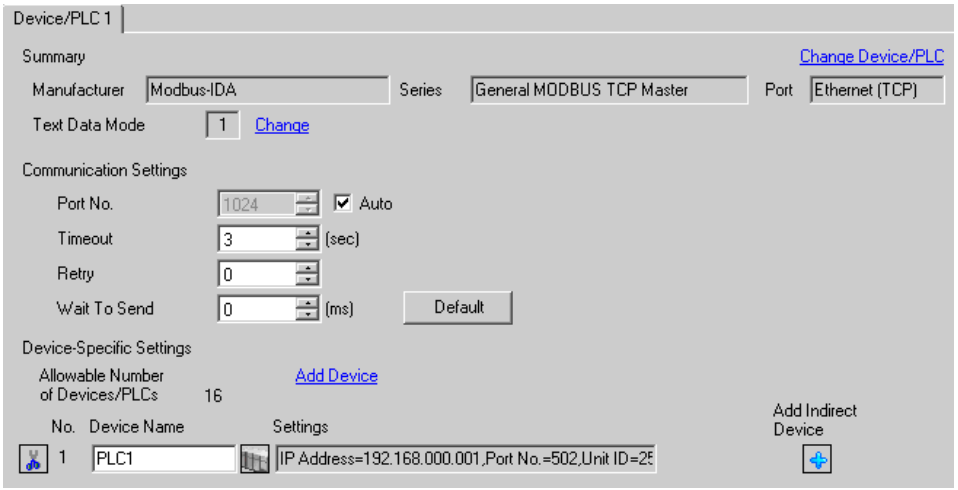
- Check with your network administrator about the IP address you want to use. Do not duplicate IP addresses on the same network.

4.3 Setting Example 3

■ GP-Pro EX Settings

◆ Communication Settings

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

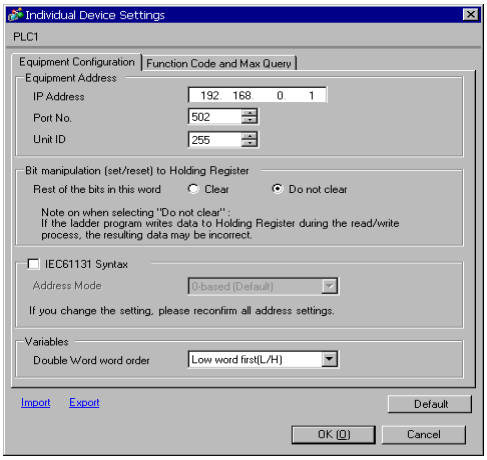


◆ Device Setting

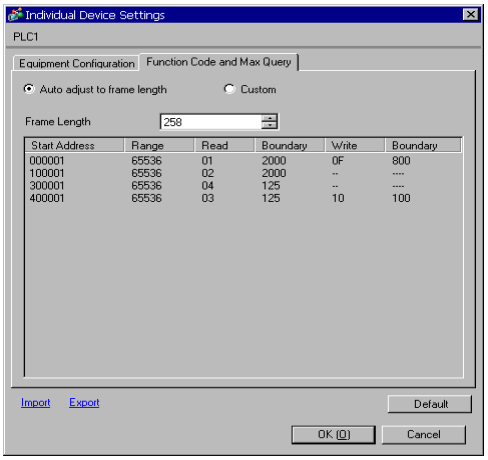
To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] .

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

[Equipment Configuration] Tab



[Function Code and Max Query] Tab



◆ Notes

- Check with your network administrator about the IP address you want to use.
- Do not duplicate IP addresses on the same network.
- In [Individual Device Settings], set the IP address of the External Device.
- Set the Display's IP address in offline mode.

■ External Device Settings (Ethernet port on basic unit)

Use the programming software (Control Editor) for communication settings. Please refer to the manual of the External Device for more details.

◆ Procedure

1. Start the programming software and create a project. The project appears in the offline mode.
2. In the tree view, from [CPU Parameters] double-click [CPU settings] and [IP address]. The [CPU Communication Setting (IP Address)] dialog box appears.
3. Set the following items and click [Set].

Setup Items	Setting
IP Address	192.168.0.1
Subnet mask	255.255.255.0
Default gateway	0.0.0.0
Link Speed / Duplex	Auto Negotiation

4. In the tree view, from [CPU Parameters] double-click [CPU settings] and [Modbus-TCP/RTU]. The [CPU communication settings (Modbus-TCP/RTU)] dialog box appears.
5. Set the following items and click [Set].
   - Modbus-TCP Settings

Setup Items	Setting	Remarks
Port No.	502	
Enable gateway	OFF	
Ethernet timeout	3000	Set to 0 when not using timeout.

   - Modbus-RTU Settings

Setup Items	Setting	Remarks
Serial com. Baudrate	115.2kbps	Match the settings of Modbus Slave devices.
Serial com. Format	8-E-1	Data length: 8-bit, Even parity, Stop bit: 1-bit Match the settings of Modbus Slave devices.
Serial com. Timeout	100	Set to 0 when not using timeout.

6. Enter online mode, and transfer the settings to the External Device.
7. Restart the External Device.

◆ Notes

- Check with your network administrator about the IP address you want to use. Do not duplicate IP addresses on the same network.

5 Setup Items

Set up the Display's communication settings in GP-Pro EX or in the Display's offline mode.

The setting of each parameter must match that of the External Device.

☞"4 Communication Setting" (page 7)

NOTE

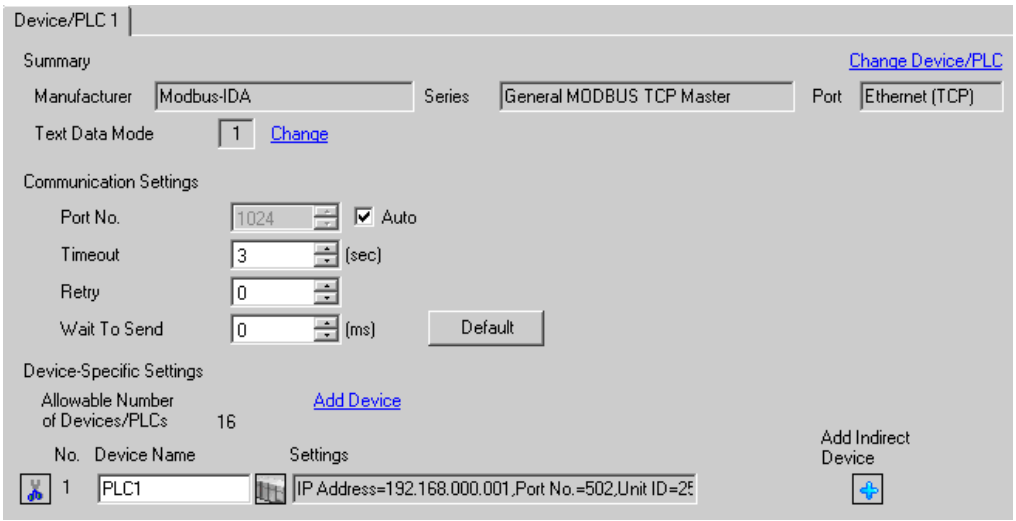
- Set the Display's IP address in offline mode.

  Cf. Maintenance/Troubleshooting Guide "Ethernet Settings"

5.1 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.	Use an integer from "1024 to 65535" to enter the port number of the Display. If you check [Auto], the port number will be automatically set.
Timeout	Use an integer from 1 to 127 to enter the time(s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, enter how many times the Display retransmits the command, from "0 to 255".
Wait To Send	Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 5000".

NOTE

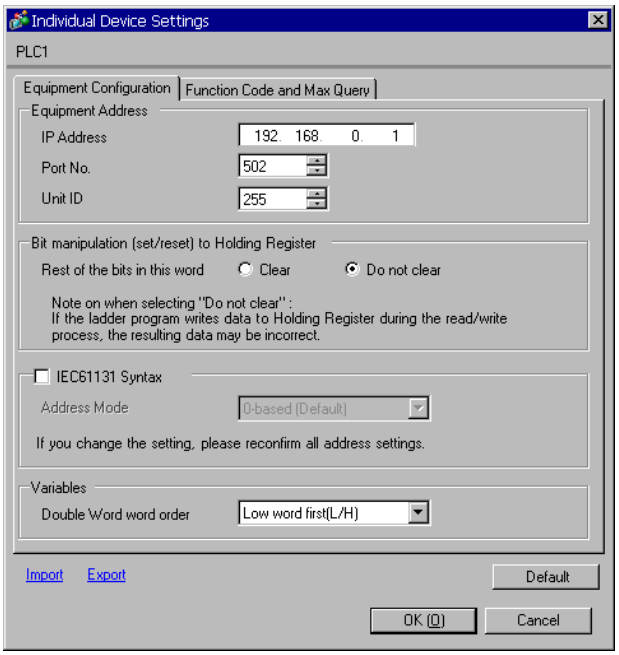
- Refer to the GP-Pro EX Reference Manual for Indirect Device.

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

■ Device Setting

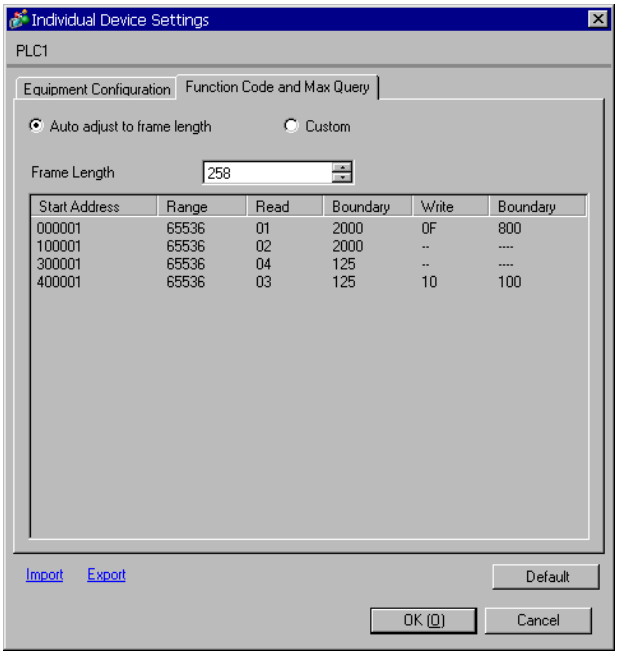
To display the [Individual Device Settings] dialog box, from [Device-Specific Settings] in the [Device/PLC] window, select the external device and click [Settings] . To connect multiple External Devices, from [Device-Specific Settings] in the [Device/PLC] window, click [Add Device] to add another External Device.

- [Equipment Configuration] Tab



Setup Items	Setup Description
IP Address	Set the IP address of the External Device. **NOTE** • Check with your network administrator about the IP address you want to use. • Do not duplicate IP addresses on the same network.
Port No.	Use an integer from "1 to 65535" to enter the port number of the External Device.
Unit ID	Use an integer from 1 to 247 (or 255) to enter the unit ID of the External Device.
Bit manipulation (set/reset) to Holding Register Rest of the bits in this word	Select how other bits in the same word are handled when you manipulate bits in the holding register, from "Clear" or "Do not clear".
IEC61131 Syntax	Select this item to use the IEC61131 syntax for variables. If you check this item, select the address mode from "0-based" or "1-based".
Double Word word order	Select the order of storing double word data from "Low word first" or "High word first".
Import	Import the device settings described in the xml file. ☞ " ◆ Import Procedure in the Device Setting" (page 18)
Export	Export the device settings into the xml file. ☞ " ◆ Export Procedure in the Device Setting" (page 18)

- [Function Code and Max Query] Tab (when "Auto adjust to frame length" is selected)



Setup Items	Setup Description
Auto adjust to frame length	Automatically set each function code and the boundary for one communication according to the frame length. Function codes cannot be changed. To change a function code, use "Custom".
Frame Length	Set the frame length from "10 to 258". After setting, click the device list to display the boundary.
Import	Import the device settings described in the xml file. ☞ " ◆ Import Procedure in the Device Setting" (page 18)
Export	Export the device settings into the xml file. ☞ " ◆ Export Procedure in the Device Setting" (page 18)

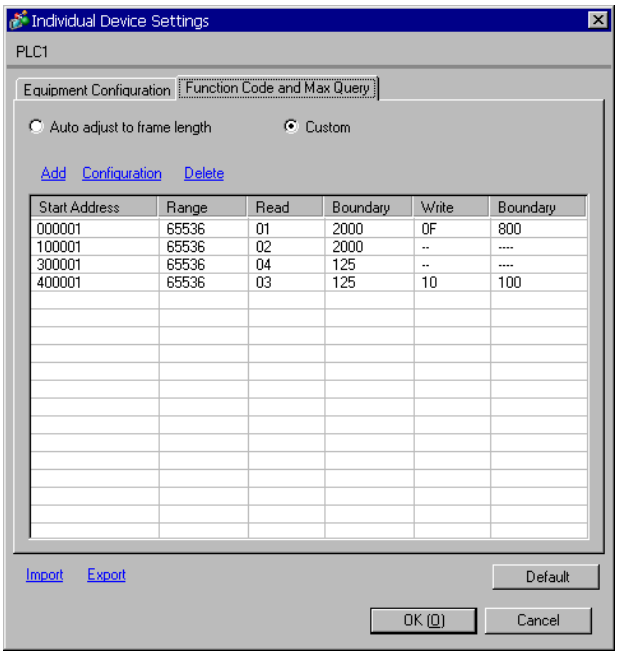
NOTE

- When "Auto adjust to frame length" is selected, use the following function codes. The read/write boundary is automatically calculated according to "Frame Length".

Device	Function Code	
	Read	Write
Coil	01	0F: Force Multiple Coils
Discrete Input	02	Disabled
Input Register	04	Disabled
Holding Register	03	10: Preset Multiple Register

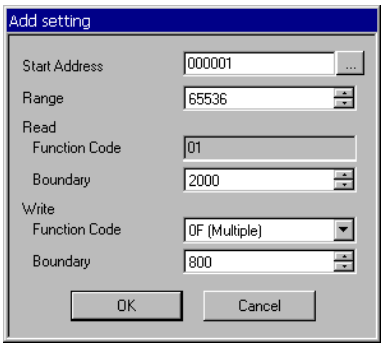
- Use "Custom" in the following cases:
  - When you use a different function code depending on an address.
  - When you use the function code "05: Force Single Coil" or "06: Preset Single Register".
  - When the read/write boundary depends on the device.

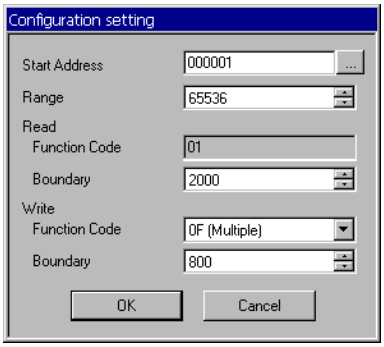
- [Function Code and Max Query] Tab (when "Custom" is selected)



Setup Items	Setup Description
Custom	Manually set each function code and the boundary for one communication.
Add	Add the function code and its data boundary settings. Up to 20 settings can be added. Add the settings in the [Add setting] dialog box.
Configuration	Change the selected device settings. Change the settings in the [Configuration setting] dialog box.
Delete	Delete the selected device settings.
Import	Import the device settings described in the xml file. ☞" ◆ Import Procedure in the Device Setting" (page 18)
Export	Export the device settings into the xml file. ☞" ◆ Export Procedure in the Device Setting" (page 18)

- [Add setting] Dialog Box / [Configuration setting] Dialog Box





Setup Items		Setup Description
Start Address		Set the start address of the device.
Range		Set the range of the device specified in the start address.
Read		Set the function codes to be used for read and the read boundary in one communication.
	Function Code	The function code is assigned by the specified start address.
	Boundary	The boundary depends on the device. Refer to the following table for details.
Write		Set the function code to be used for write and the write boundary in one communication.
	Function Code	The function code depends on the device. Refer to the following table for details.
	Boundary	The boundary depends on the device. Refer to the following table for details.

NOTE

- When "Custom" is selected, use the following function codes.

Device	Function Code (Boundary)		
	Read	Write	
		Multiple	Single
Coil	01(2000)	0F: Force Multiple Coils (800)	05: Force Single Coil (Fixed to 1)
Discrete Input	02(2000)	Disabled	Disabled
Input Register	04(125)	Disabled	Disabled
Holding Register	03(125)	10: Preset Multiple Register (100)	06: Preset Single Register (Fixed to 1)

- If the set device address is disabled to write, you cannot set the write function code and boundary.
- When you select the function code "05" or "06", the write boundary will be fixed to "1", and cannot be changed.

◆ Import Procedure in the Device Setting

1 Create the xml file based on the following format sample.

- Format sample when "Auto adjust to frame length" is selected

```
<?xml version="1.0" encoding="utf-8" ?>
<ModbusConfiguration version="1">
 <ClearBits>OFF</ClearBits>
 <AddressMode>ModiconSyntax</AddressMode>
 <DWORD>L/H</DWORD>
 <FunctionCode>
  <Mode>AutoAdjust</Mode>
  <FrameLength>258</FrameLength>
 </FunctionCode>
</ModbusConfiguration>
```

Bit manipulation to Holding Register
Address Mode
Double Word word order

Mode
Frame Length

- Format sample when "Custom" is selected

```
<?xml version="1.0" encoding="utf-8" ?>
<ModbusConfiguration version="1">
 <ClearBits>OFF</ClearBits>
 <AddressMode>ModiconSyntax</AddressMode>
 <DWORD>L/H</DWORD>
 <FunctionCode>
  <Mode>Custom</Mode>
  <Setting>
   <Address>000001</Address>
   <Range>65535</Range>
   <Read>
    <FunctionCode>01</FunctionCode>
    <Boundary>2000</Boundary>
   </Read>
   <Write>
    <FunctionCode>0F</FunctionCode>
    <Boundary>800</Boundary>
   </Write>
  </Setting>
 </FunctionCode>
</ModbusConfiguration>
```

Bit manipulation to Holding Register
Address Mode
Double Word word order

Mode

Start Address
Range

Read Function Code
Read Boundary

Write Function Code
Write Boundary

2 Click [Import] on the [Individual Device Settings] dialog box to display the [Open] dialog box.

3 Select the created xml file and click [Open].

◆ Export Procedure in the Device Setting

1 Click [Export] on the [Individual Device Settings] dialog box to display the [Save as] dialog box.

2 Enter a name and click [Save].

5.2 Setup Items in Offline Mode

NOTE

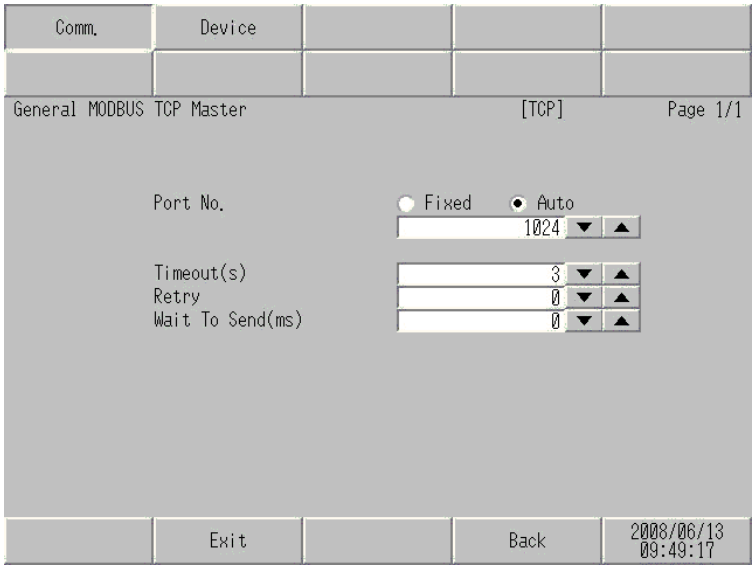
- Refer to the Maintenance/Troubleshooting guide for information on how to enter offline mode or about the operation.

  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.

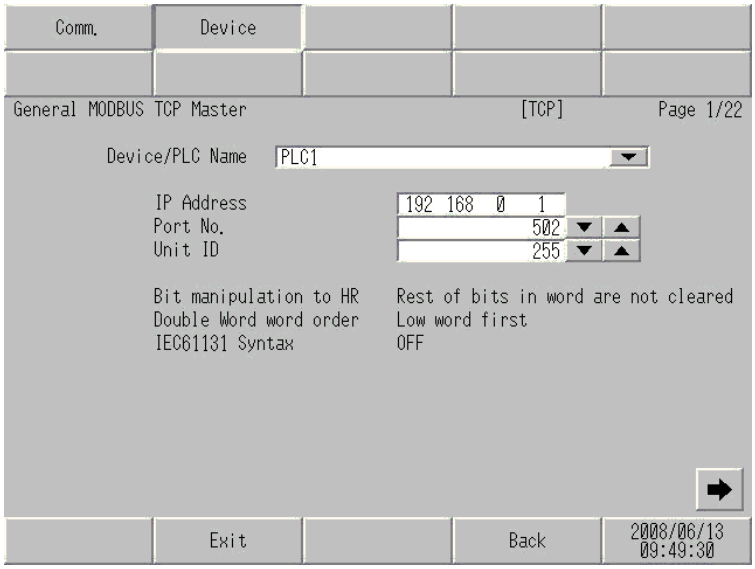


Setup Items	Setup Description
Port No.	Set the Port No. of the Display. Select either of [Fixed] or [Auto]. When you select [Fixed], use an integer from "1024 to 65535" to enter the port number of the Display.When you select [Auto], the port number will be automatically assigned regardless of the entered 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, enter how many times the Display retransmits the command, from "0 to 255".
Wait To Send	Enter the standby time (ms) from when the Display receives packets until it transmits the next command, from "0 to 5000".

◆ Device Setting

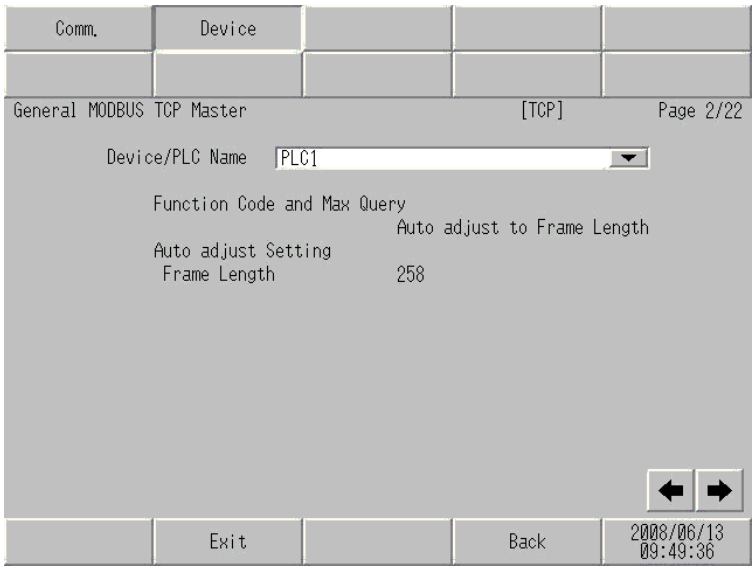
To display the setting screen, touch [Device/PLC Settings] from [Peripheral Settings]. Touch the External Device you want to set from the displayed list, and touch [Device].

(Page 1/22)



Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. The device name is the title of the External Device set with GP-Pro EX.(Initial value [PLC1])
IP Address	Set the IP address of the External Device. **NOTE** • Check with your network administrator about the IP address you want to use. • Do not duplicate IP addresses on the same network.
Port No.	Use an integer from "1 to 65535" to enter the port number of the External Device.
Unit ID	Use an integer from 1 to 247 (or 255) to enter the unit ID of the External Device.
Bit manipulation to HR	Displays how other bits in the same word are handled when you manipulate bits in the holding register, as "Rest of bits in word are cleared" or "Rest of bits in word are not cleared". (Not available to set in offline mode.)
Double Word word order	Displays the currently set order of storing double word data as "Low word first" or "High word first". (Not available to set in offline mode.)
IEC61131 Syntax	Displays the usage status of the currently set IEC61131 syntax in ON/OFF. (Not available in offline mode.)

(Page 2/22)

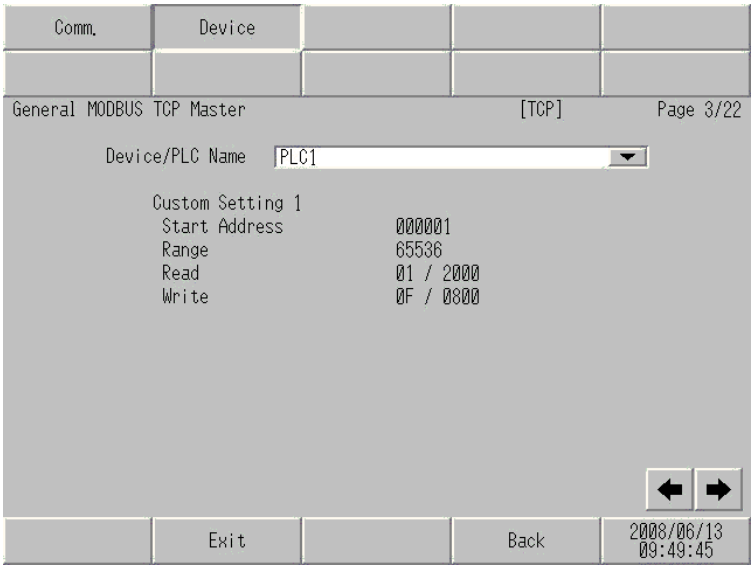


Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. The device name is the title of the External Device set with GP-Pro EX.(Initial value [PLC1])
Function Code and Max Query	Displays the option to set the function code and boundary. (Not available to set in offline mode.)
Auto adjust Setting Frame Length	Displays the set frame length when "Auto adjust to frame length" is selected in the online mode. (Not available to set in offline mode.)

NOTE

- When "Custom" is selected, the setup items of the frame length are invalid.

(Page 3/22 to 22/22)



Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. The device name is the title of the External Device set with GP-Pro EX. (Initial value [PLC1])
Start Address	Displays the start address of the device. (Not available to set in offline mode.)
Range	Displays the range of the device specified in the start address. (Not available to set in offline mode.)
Read	Displays the device function codes and boundaries to be read for one communication. (Not available to set in offline mode.)
Write	Displays the device function codes and boundaries to be written for one communication. (Not available to set in offline mode.)

NOTE

- Page 3 and the following pages display the set descriptions in order.
- When "Auto adjust to frame length" is selected, the Custom setup items are invalid.

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 MODBUS Slave Device

: This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Remarks
Coil	000001 - 065536	000001 - 065521		16bit
Discrete Input	100001 - 165536	100001 - 165521	L/H	16bit *2
Input Register	-----	300001 - 365536	or	Bit 15 *2
Holding Register	400001,00 - 465536,15	400001 - 465536	H/L	Bit 15 *3
Input Register	-----	D300001 - D365535	*1	Bit 31 *2
Holding Register	D400001,00 - D465535,31	D400001 - D465535		Bit 31 *4

*1 Whether the data is stored as higher or lower is determined by the [Double Word word order] setting in [Device Setting].
"5.1 Setup Items in GP-Pro EX" (page 13)

*2 Write disable.

*3 An access method at the time of Bit Set varies depending on the [Rest of the bits in this word] setting of [Device Setting].

"Clear"..... Bit 15

"Do not clear"..... 400001,00 - 465536,15

*4 An access method at the time of Bit Set varies depending on the [Rest of the bits in this word] setting of [Device Setting].

"Clear"..... Bit 31

"Do not clear"..... D400001,00 - D465535,31

NOTE
- GP-Pro EX simulation does not synchronize the coil bit address and word address values.

■ IEC61131 Syntax Address Description

The following table compares IEC61131 and MODBUS syntax address descriptions.

Device	MODBUS Syntax			IEC61131 Syntax				
				Format	0-based		1-based	
	Format	Range	First element		Range	First element	Range	First element
Coil	000001+i	i = 0 to 65535	000001	%Mi	i = 0 to 65535	%M00000	i = 1 to 65536	%M00001
Discrete Input	100001+i	i = 0 to 65535	100001	-	-	-	-	-
Input Register (Word)	300001+i	i = 0 to 65535	300001	-	-	-	-	-
Input Register (Word bit)	300001+i,j	i = 0 to 65535 j = 0 to 15	300001,00	-	-	-	-	-
Holding Register (Word)	400001+i	i = 0 to 65535	400001	%MWi	i = 0 to 65535	%MW00000	i = 1 to 65536	%MW00001
Holding Register (Word bit)	400001+i,j	i = 0 to 65535 j = 0 to 15	400001,00	%Mwi: Xj	i = 0 to 65535 j=0 to 15	%MW00000 :X00	i = 1 to 65536 j=0 to 15	%MW00001 :X00
Input Register (D Word)	D300001+i	i = 0 to 65534	D300001	-	-	-	-	-
Input Register (D Word bit)	D300001+i,j	i = 0 to 65534 j = 0 to 31	D300001,00	-	-	-	-	-
Holding Register (D Word)	D400001+i	i = 0 to 65534	D400001	%MDi	i = 0 to 65534	%MD00000	i = 1 to 65535	%MD00001
Holding Register (D Word bit)	D400001+i,j	i = 0 to 65534 j = 0 to 31	D400001,00	%MDi:Xj	i = 0 to 65534 j=0 to 31	%MD00000 :X00	i = 1 to 65535 j=0 to 31	%MD00001 :X00

NOTE

- The addresses 100000 and 300000 cannot be accessed using IEC61131 syntax.
- If you apply IEC61131 syntax to a project that has a discrete input or input register already set, the addresses become "-Undefined-" and invalid.

NOTE

- Refer to the GP-Pro EX Reference Manual for system data area.

  Cf. GP-Pro EXReference 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 MICRO-EHV Series

: This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Remarks
Coil	000257 - 00288	000257 - 000273		
Discrete Input	100001 - 100047	100001 - 100002		*1
Input Register	-----	300001 - 302048		*1
Holding Register	400001.00 - 432768.15	400001 - 432768	L / H	
Input Register	-----	D300001 - D302047		*1
Holding Register	D400001.00 - D432767.31	D400001 - D432767		

*1 Write disable

If you use Control Editor's I/O Monitor to monitor Modbus devices, use the following supported addresses table when specifying addresses.

Modbus Device		External Device	
Device	Range	Device	Range
Coil	000257 - 00288	External output	Y0100 - Y0131
Discrete Input	100001 - 100048	External input	X0000 - X0047
Input Register	300001 - 302048	Data area	WM000 - WM7FF
Holding Register	400001 - 432768	Word inner output	WR0000 - WR7FFF
Input Register	D300001 - D302047	Data area	DM000 - DM7FE
Holding Register	D400001 - D432767	Word inner output	DR0000 - DR7FFE

NOTE

- GP-Pro EX simulation does not synchronize the coil bit address and word address values.
- Refer to the GP-Pro EX Reference Manual for system data area.

  Cf. GP-Pro EXReference 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 set "Device Type & Address" for the address type of the data display or other devices.

Device	Device Name	Device Code (HEX)	Address Code
Coil	0	0080	Value of (word address -1) divided by 16
Discrete Input	1	0081	Value of (word address -1) divided by 16
Input Register	3	0001	Value of (word address - 1)
Holding Register	4	0000	Value of (word address - 1)
Input Register	D3	0002	Value of (word address -1) divided by 2
Holding Register	D4	0003	Value of (word address -1) divided by 2

8 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 Number.
Device Name	Name of the External Device where an error has occurred. The Device name is the title of the External Device set with GP-Pro EX.(Initial value [PLC1])
Error Message	Displays messages related to an error that has occurred.
Error Occurrence Area	Displays the IP address or device address of the External Device where an error has occurred, 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

- 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 Codes Specific to the External Device

Please refer to the manual of the External Device for error codes specific to the External Device.

General MODBUS error codes are shown below.

Error Code (HEX)	Description
01	Does not support the corresponding Function Code.
02	The specified data address does not exist.
03	Data value error.

■ Error Messages Specific to the External Device

ID	Error Message	Description
RHxx128	(Node Name): (Device Address) can't be read because of the limitation of the Read boundary	When reading the coil or discrete input as a word address while the boundary is less than 16 bits, or accessing the input or holding register as a double word while the boundary is set to 1 word, an error will be displayed.
RHxx129	(Node Name): (Device Address) can't be written because of the limitation of the Write boundary	When writing the coil as a word address while the boundary is less than 16 bits, or accessing the holding register as a double word while the boundary is set to 1 word, an error will be displayed.
RHxx130	(Node Name): (Device Address) is not defined on Function Code and Max Query setting	When accessing the device out of the defined area, an error will be displayed.
RHxx131	(Node Name): (Device Address) can't be read because of the limitation of the Device Range setting	When reading the coil or discrete input as a word address while the range is less than 16 bits, or accessing the input or holding register as a double word while the range is set to 1 word, an error will be displayed.
RHxx132	(Node Name): (Device Address) can't be written because of the limitation of the Device Range setting	When writing the coil as a word address while the range is less than 16 bits, or accessing the holding register as a double word while the range is set to 1 word, an error will be displayed.