



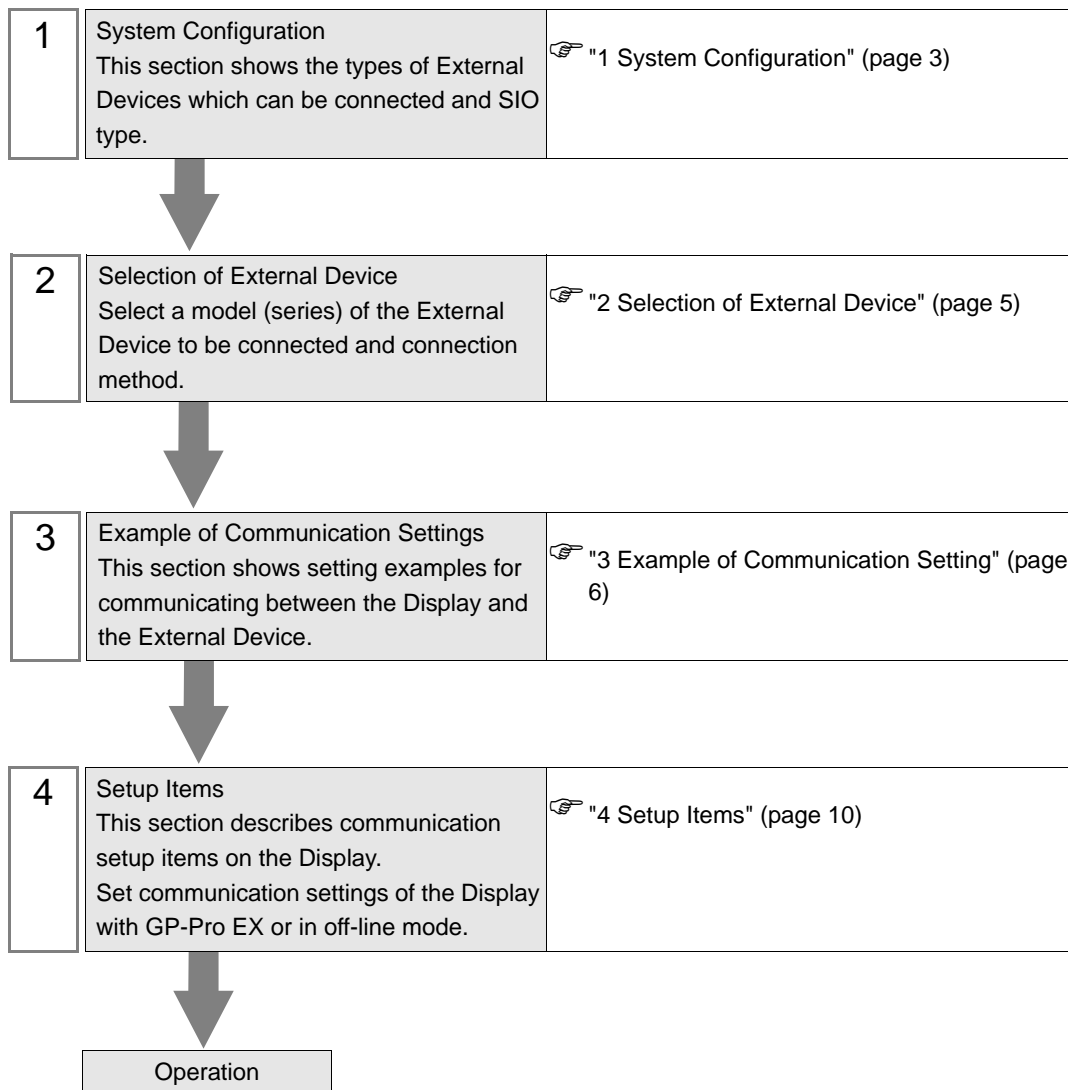
# S10V Series Ethernet Driver

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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 by following the sections below:



# 1 System Configuration

The following shows the system configuration where the External Device of Hitachi, Ltd. and the Display are connected.

Series	CPU	Link I/F	SIO Type	Setting Example
S10V	LQP510	LQE520	Ethernet (TCP)	Setting Example 1 (page 6)
		LQE720 <sup>*1</sup>		
	LQP520 <sup>*2</sup>	LQE520	Ethernet (TCP)	Setting Example 1 (page 6)
		LQE720 <sup>*3</sup>		
		Ethernet I/F on the CPU unit	Ethernet (TCP)	Setting Example 2 (page 8)

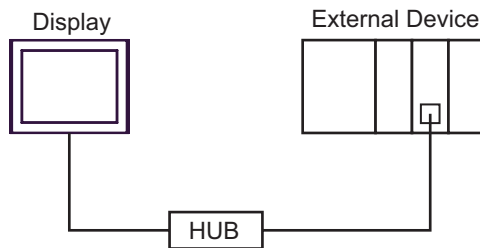
\*1 For LQE720, LQP510 (Revision.H or later) is required.

\*2 For LQP520, LQP510 is also required.

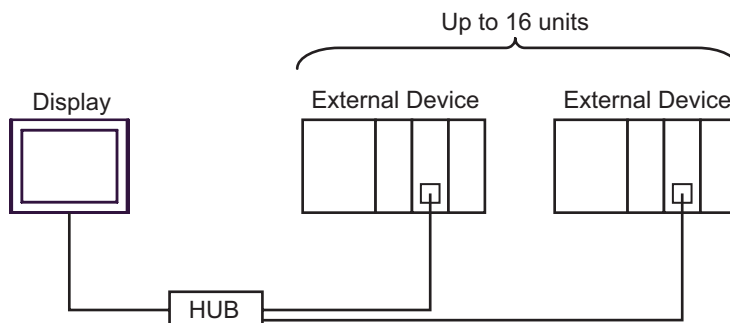
\*3 For LQE720, LQP520 (Revision.F or later) is required.

## ■ Connection Configuration

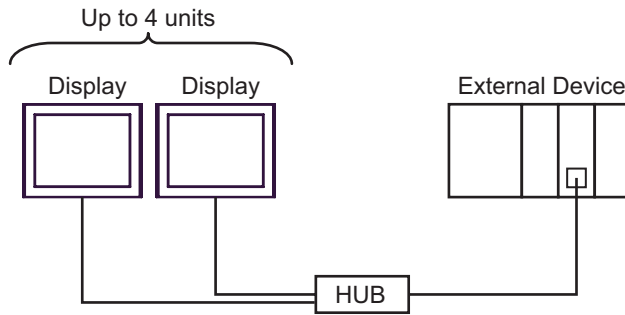
- 1:1 Connection



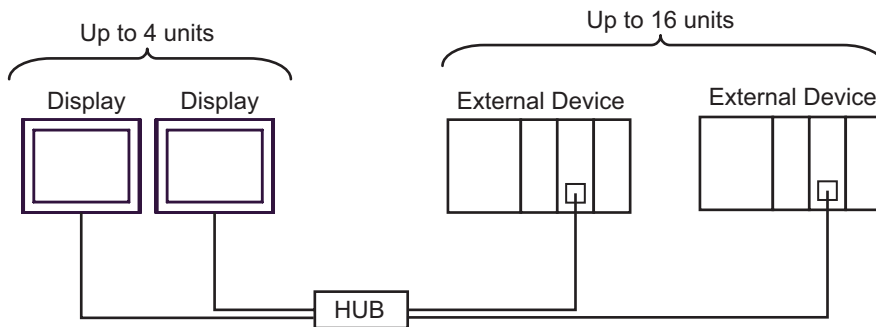
- 1:n Connection



- n:1 Connection

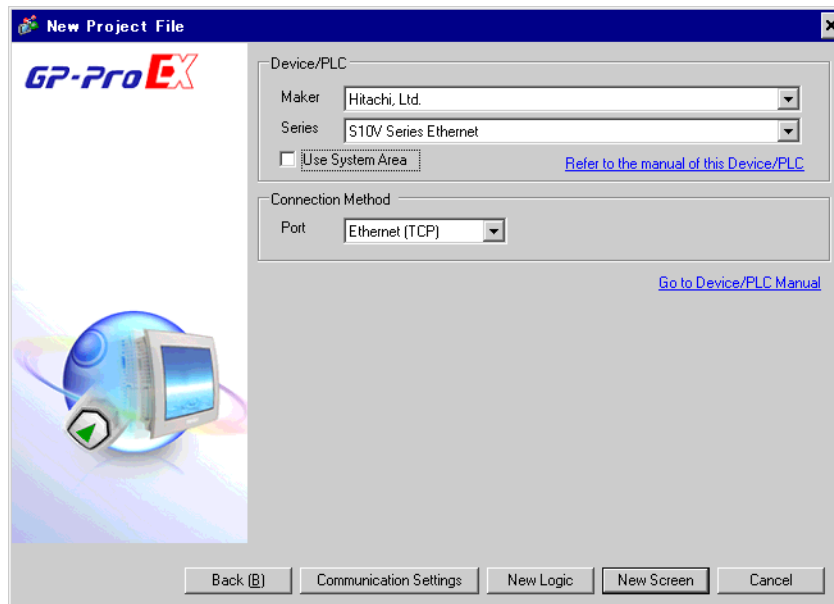



- n:m Connection



## 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 "Hitachi, Ltd."
Series	Select a model (series) of the External Device to be connected and connection method. Select "S10V Series Ethernet". Check the External Device which can be connected in "S10V Series Ethernet" in system configuration.  "1 System Configuration" (page 3)
Use System Area	Check this option to synchronize the system data area of the Display and the device (memory) of the External Device. When they are synchronized, you can use the ladder program of the External Device to switch the display or to display a window on the Display. Cf. GP-Pro EX Reference Manual "Appendix 1.4 LS Area (Direct Access Method)" This can also be set in GP-Pro EX or in the Display's off-line mode. Cf. GP-Pro EX Reference Manual "5.17.6 [System Settings] Setting Guide, [Display Unit] Settings Guide, System Area Settings" Cf. Maintenance/Troubleshooting Manual "2.15.1 Settings common to all Display models, [Main Unit Settings] Settings Guide, System Area Settings"
Port	Select the Display port to be connected to the External Device.

### 3 Example of Communication Setting

The following shows examples of communication settings of the Display and the External Device, which is recommended by Digital Electronics Corp.



#### 3.1 Setting Example 1

##### ■ Settings 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 the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings]. When you connect multiple External Device, click  from [Device-Specific Settings] of [ Device/PLC Settings] to add another External Device.

## ■ Setting of External Device

Use the configuration tool (S10V ET.NET SYSTEM) for communication settings of the External Device.

- 1 Set the [MODU No.] rotary switch on the link I/F unit to "2", and then activate the External Device.
- 2 Connect an RS-232C cable from your PC to the CPU unit of the External Device, and then start up the configuration tool.
- 3 Select "RS-232C" from [Setup by module], and then click [OK].
- 4 Click [Set IP Address] in the [Setup by module] dialog box displayed.
- 5 Set the communication settings in the [Set IP Address] dialog box displayed.

Setup Items	Setup Description
Module	ET.NET (Main)
IP Address	192.168.0.1
Subnetmask	255.255.255.0

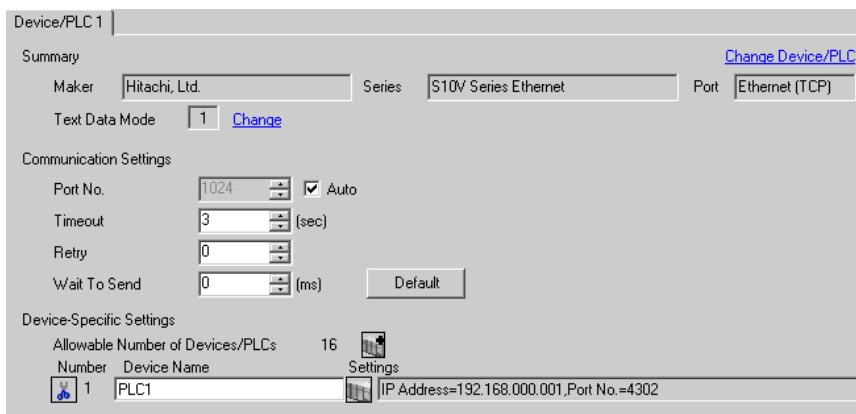
- 6 Click [Register].

## 3.2 Setting Example 2



### ■ Settings of GP-Pro EX

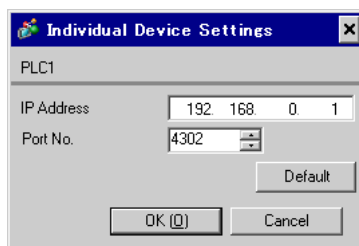
#### ◆ Communication Settings

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 the External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings]. When you connect multiple External Device, click  from [Device-Specific Settings] of [ Device/PLC Settings] to add another External Device.





## ■ Setting of External Device

Use the configuration tool (S10V BASE SYSTEM) for communication settings of the External Device.

- 1 Set the [ST No.] rotary switch on the CPU unit to "0,0", and then activate the External Device.
- 2 Connect an RS-232C cable from your PC to the CPU unit of the External Device, and then start up the configuration tool.
- 3 Click [ONLINE] of [Connection status].
- 4 Click [Set IP Address] of [CMU].
- 5 Set the communication settings in the [Set IP Address] dialog box displayed.

Setup Items	Setup Description
Module	ET.NET (Main)
IP Address	192.168.0.1
Subnetmask	255.255.255.0

- 6 Restart the External Device.

## 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 the External Device.

 "3 Example of Communication Setting" (page 6)

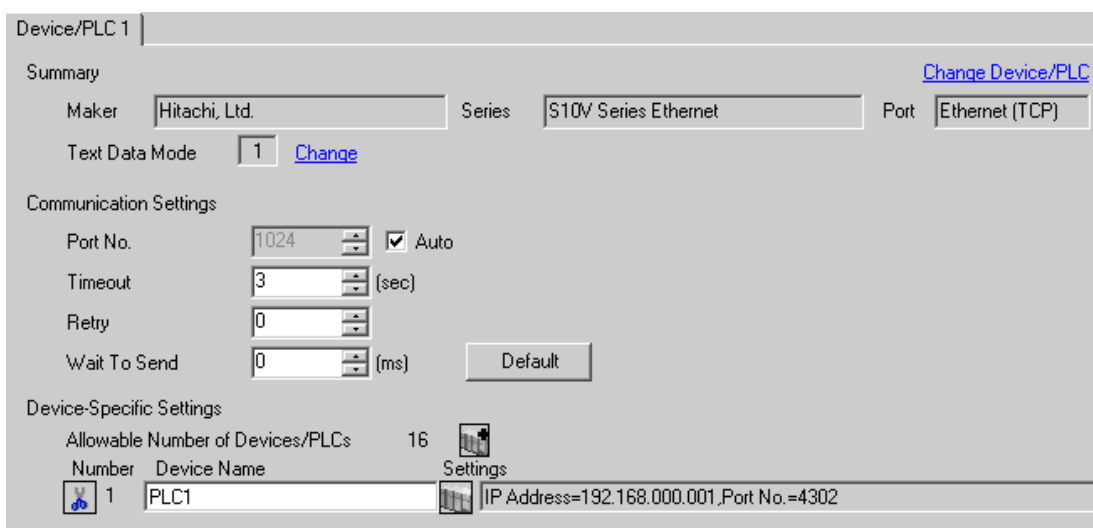
**NOTE** • Set the Display's IP address in off-line mode.

Cf. Maintenance/Troubleshooting Manual "2.5 Ethernet Settings"

### 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.

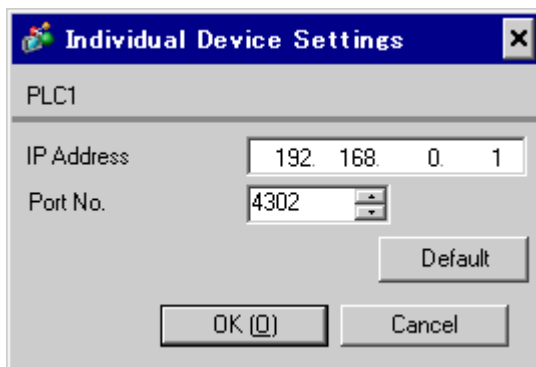


Setup Items	Setup Description
Port No.	Use an integer from "1024 to 65535" to enter the port No. of the Display. If you check [Auto], the port No. will be automatically set.
Timeout	Use an integer from "1 to 127" to enter the time (s) for which the Display waits for the response from the External Device.
Retry	In case of no response from the External Device, 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 the next command.

## ■ Device Setting

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

When you connect multiple External Device, click  from [Device-Specific Settings] of [ Device/PLC Settings] to add another External Device.



Setup Items	Setup Description
IP Address	Set the IP address of the External Device. <b>NOTE</b> Check with the network administrator about the IP address. Be sure not to duplicate IP addresses.
Port No.	Use an integer from "4302 to 4305" to enter the port No. of the External Device. <b>IMPORTANT</b> <ul style="list-style-type: none"> <li>The Display which can be connected to one Port No. is only one.</li> </ul>

## 4.2 Setup Items in Off-Line Mode

**NOTE**

- Refer to the Maintenance/Troubleshooting manual for information on how to enter off-line mode or about the operation.

Cf. Maintenance/Troubleshooting Manual "2.2 Off-line Mode"

### ■ Communication Settings

To display the setting screen, touch [Device/PLC Settings] from [Peripheral Equipment Settings] in off-line mode.

Touch the External Device you want to set from the displayed list.

Comm.	Device			
S10V Series Ethernet			[TCP]	Page 1/1
Port No.	<input type="radio"/> Fixed <input checked="" type="radio"/> Auto	<input type="text" value="1024"/> ▼ ▲		
Timeout(s)		<input type="text" value="3"/> ▼ ▲		
Retry		<input type="text" value="0"/> ▼ ▲		
Wait To Send(ms)		<input type="text" value="0"/> ▼ ▲		
Exit		Back		2007/02/08 15:06:51

Setup Items	Setup Description
Port No.	Set the Port No. of the Display. Select either [Fixed] or [Auto]. If you select [Fixed], use an integer from "1024 to 65535" to enter the port No. of the Display. If 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 the next command.

## ■ Device Setting

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

Comm.	Device			
S10V Series Ethernet		[TCP]	Page 1/1	
Device/PLC Name		PLC1		
IP Address		192 168 0 1		
Port No.		4302		
Exit		Back		2007/02/08 15:06:56

Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. Device name is a title of the External Device set with GP-Pro EX. (Initial value [PLC1])
IP Address	Set the IP address of the External Device. <b>NOTE</b> Check with the network administrator about the IP address. Be sure not to duplicate IP addresses.
Port No.	Use an integer from "4302 to 4305" to enter the port No. of the External Device. <b>IMPORTANT</b> <ul style="list-style-type: none"> <li>The Display which can be connected to one Port No. is only one.</li> </ul>

## 5 Supported Device

Range of supported device address is shown in the table below. 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.

     : This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Remarks
External Input	X000 - XFFF	XW000 - XWFFF0	[H/L]	<span style="border: 1px solid black; padding: 2px;">***0</span> *1
External Output	Y000 - YFFF	YW000 - YWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Internal Register	R000 - RFFF	RW000 - RWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Global Link Register	G000 - GFFF	GW000 - GWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Event Register	E000 - EFFF	EW000 - EWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Keep Relay	K000 - KFFF	KW000 - KWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
System Register	S000 - SBFF	SW000 - SWBFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
On-delay Register	T000 - T1FF	TW000 - TW1FF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
One-shot Timer	U000 - U0FF	UW000 - UW0FF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Up/Down Counter	C000 - C0FF	CW000 - CW0FF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Transfer Register	J000 - JFFF	JW000 - JWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Receive Register	Q000 - QFFF	QW000 - QWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Extended Internal Register	M000 - MFFF	MW000 - MWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Extended Internal Register	A000 - AFFF	AW000 - AWFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span> *1
Timer Calculation Value	----	TC000 - TC1FF		
Timer Setting Value	----	TS000 - TS1FF		
One-shot Timer Calculation Value	----	UC000 - UC0FF		
One-shot Timer Setting Value	----	US000 - US0FF		
Counter Calculation Value	----	CC000 - CC0FF		
Counter Setting Value	----	CS000 - CS0FF		
Work Register	----	FW000 - FWBFF		<span style="border: 1px solid black; padding: 2px;">Bit F</span>
Data Register	----	DW000 - DWFFF		<span style="border: 1px solid black; padding: 2px;">Bit F</span>
Work Register	LB0000 - LBFFFF	LBW0000 - LBWFFFF0		<span style="border: 1px solid black; padding: 2px;">***0</span>

Device	Bit Address	Word Address	32 bits	Remarks
Ladder Converter Special Work Register	LR0000 - LR0FFF	LRW0000 - LRW0FF0	<b>[H/L]</b>	
Ladder Converter Special Work Register (Edge)	LV0000 - LV0FFF	LVW0000 - LVW0FF0		
Word Special Work Register	----	LWW0000 - LWWFFFF		
Long Word Special Work Register	----	LLL0000 - LLL1FFF		*2
Single Precision Floating Decimal Point Work Register	----	LF0000 - LF1FFF		*2, *3
Word Special Work Register (Power-cut Retain)	----	LXW0000 - LXW3FFF		
Long Word Special Work Register (Power-cut Retain)	----	LML0000 - LML1FFF		*2
Single Precision Floating Decimal Point Work Register (Power-cut Retain)	----	LG0000 - LG1FFF		*2, *3
Direct Memory Address <sup>*4</sup>	----	DM00000000 - DMFFFFFFFE		 

\*1 Based on the specifications of the External Device, 0th bit is assigned as the most significant bit (MSB), and 15th bit as the least significant bit (LSB). Therefore, if you set the 0th bit to ON, 32768 (0x8000) is written into the word device with the bit at the beginning.

If you set X000 to ON when assigning bits to the Display, the bit device X000 on the External Device will be set to ON.

The word device XW000 of the Display and External Device is set to "32768 (0x8000)".

\*2 32-bit device.

\*3 Single-precision floating point device.

\*4 Used to access the memory address of the External Device.

**IMPORTANT**

- When you access the External Device using the Direct Memory Address, do not access the memory address that the system uses. If you conduct it, an error may occur. For details concerning the address, refer to the manual attached to the External Device.

**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 (Direct Access Method)"
- Please refer to the precautions on manual notation for icons in the table.

"Manual Symbols and Terminology"

## 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.

Device	Device Name	Device Code (HEX)	Address Code
External Input	X, XW	0080	Value of word address divided by 0x10
External Output	Y, YW	0081	Value of word address divided by 0x10
Internal Register	R, RW	0082	Value of word address divided by 0x10
Global Link Register	G, GW	0083	Value of word address divided by 0x10
Event Register	E, EW	0084	Value of word address divided by 0x10
Keep Relay	K, KW	0085	Value of word address divided by 0x10
System Register	S, SW	0086	Value of word address divided by 0x10
On-delay Register	T, TW	0087	Value of word address divided by 0x10
One-shot Timer	U, UW	0088	Value of word address divided by 0x10
Up/Down Counter	C, CW	0089	Value of word address divided by 0x10
Transfer Register	J, JW	008A	Value of word address divided by 0x10
Receive Register	Q, QW	008B	Value of word address divided by 0x10
Extended Internal Register	M, MW	008C	Value of word address divided by 0x10
Extended Internal Register	A, AW	008D	Value of word address divided by 0x10
Timer Calculation Value	TC	0060	Word Address
Timer Setting Value	TS	0061	Word Address
One-shot Timer Calculation Value	UC	0062	Word Address
One-shot Timer Setting Value	US	0063	Word Address
Counter Calculation Value	CC	0064	Word Address



Device	Device Name	Device Code (HEX)	Address Code
Counter Setting Value	CS	0065	Word Address
Work Register	FW	0001	Word Address
Data Register	DW	0000	Word Address
Work Register	LB, LBW	008E	Value of word address divided by 0x10
Ladder Converter Special Work Register	LR, LRW	008F	Value of word address divided by 0x10
Ladder Converter Special Work Register (Edge)	LV, LVW	0090	Value of word address divided by 0x10
Word Special Work Register	LWW	0002	Word Address
Long Word Special Work Register	LLL	0003	Word Address
Single Precision Floating Decimal Point Work Register	LF	0066	Word Address
Word Special Work Register (Power-cut Retain)	LXW	0004	Word Address
Long Word Special Work Register (Power-cut Retain)	LML	0005	Word Address
Single Precision Floating Decimal Point Work Register (Power-cut Retain)	LG	0067	Word Address
Direct Memory Address (DM00000000 - DM0FFFFFFE)	DM	0007	Value of word address divided by 2
Direct Memory Address (DM10000000 - DM1FFFFFFE)		0008	
Direct Memory Address (DM20000000 - DM2FFFFFFE)		0009	

Device	Device Name	Device Code (HEX)	Address Code
Direct Memory Address (DM30000000 - DM3FFFFFFE)	DM	000A	Value of word address divided by 2
Direct Memory Address (DM40000000 - DM4FFFFFFE)		000B	
Direct Memory Address (DM50000000 - DM5FFFFFFE)		000C	
Direct Memory Address (DM60000000 - DM6FFFFFFE)		000D	
Direct Memory Address (DM70000000 - DM7FFFFFFE)		000E	
Direct Memory Address (DM80000000 - DM8FFFFFFE)		000F	
Direct Memory Address (DM90000000 - DM9FFFFFFE)		0010	
Direct Memory Address (DMA0000000 - DMAFFFFFFE)		0011	
Direct Memory Address (DMB0000000 - DMBFFFFFFE)		0012	
Direct Memory Address (DMC0000000 - DMCFFFFFFE)		0013	
Direct Memory Address (DMD0000000 - DMDFFFFFFE)		0014	

Continued to next page.

Device	Device Name	Device Code (HEX)	Address Code
Direct Memory Address (DME0000000 - DMEFFFFFFE)	DM	0015	Value of word address divided by 2
Direct Memory Address (DMF0000000 - DMFFFFFFE)		0016	

## 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 an error occurs. Name of External Device is a title of External Device set with GP-Pro EX. (Initial value [PLC1])
Error Message	Displays messages related to the error that has occurred.
Error Occurrence Area	Displays IP address or device address of External Device where error occurs, or error codes received from External Device. <b>NOTE</b> <ul style="list-style-type: none"> <li>• IP address is displayed as "IP address (Decimal); MAC address (Hex)".</li> <li>• Device address is displayed as "Address: Device address".</li> <li>• Received error codes are displayed as "Decimal [Hex]".</li> </ul>

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 "When an error is displayed (Error Code List)" in "Maintenance/Troubleshooting Manual" for details on the error messages common to the driver.