



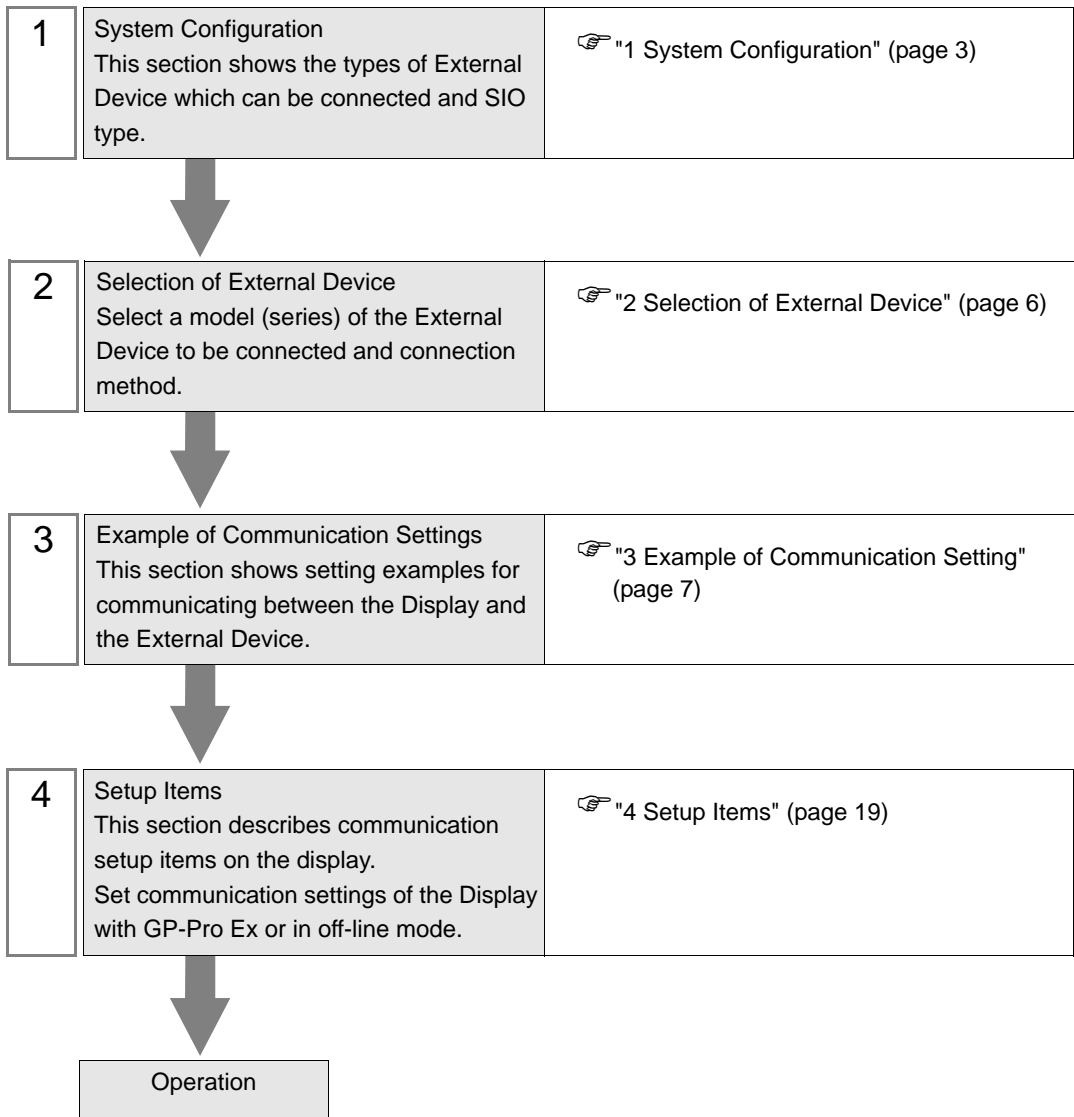
# CS/CJ Series Ethernet Driver

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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

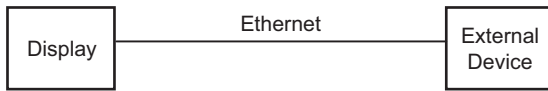
The system configuration in the case when the External Device of OMRON Corporation and the Display are connected is shown.

Series	CPU	Link I/F	SIO Type	Setting Example			
CS Series	CS1H-CPU67 CS1H-CPU66 CS1H-CPU65 CS1H-CPU64 CS1G-CPU45 CS1G-CPU44 CS1G-CPU43 CS1G-CPU42	CS1W-ETN01	Ethernet (UDP)	Setting Example 1 (page 7)			
	CS1H-CPU67H CS1H-CPU66H CS1H-CPU65H CS1H-CPU64H CS1H-CPU63H CS1G-CPU45H CS1G-CPU44H CS1G-CPU43H CS1G-CPU42H	CS1W-ETN11					
	CS1H-CPU67-V1 CS1H-CPU66-V1 CS1H-CPU65-V1 CS1H-CPU64-V1 CS1H-CPU63-V1 CS1G-CPU45-V1 CS1G-CPU44-V1 CS1G-CPU43-V1 CS1G-CPU42-V1	CS1W-ETN21*1			Ethernet (UDP)	Setting Example 3 (page 13)	
					Ethernet (TCP)	Setting Example 4 (page 16)	
	CJ Series	CJ1G-CPU45 CJ1G-CPU44 CJ1M-CPU23 CJ1M-CPU22 CJ1M-CPU21 CJ1M-CPU13 CJ1M-CPU12 CJ1M-CPU11			CJ1W-ETN01	Ethernet (UDP)	Setting Example 2 (page 10)
		CJ1H-CPU66H CJ1H-CPU65H			CJ1W-ETN11		
		CJ1G-CPU45H CJ1G-CPU44H CJ1G-CPU43H CJ1G-CPU42H	CJ1W-ETN21*1	Ethernet (UDP)	Setting Example 3 (page 13)		
				Ethernet (TCP)	Setting Example 4 (page 16)		

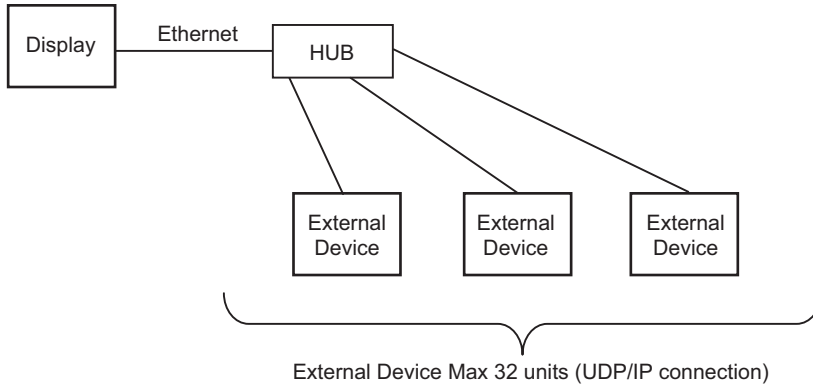
\*1 Supporting TCP/IP

## ■ Device Configuration

- 1:1 Connection

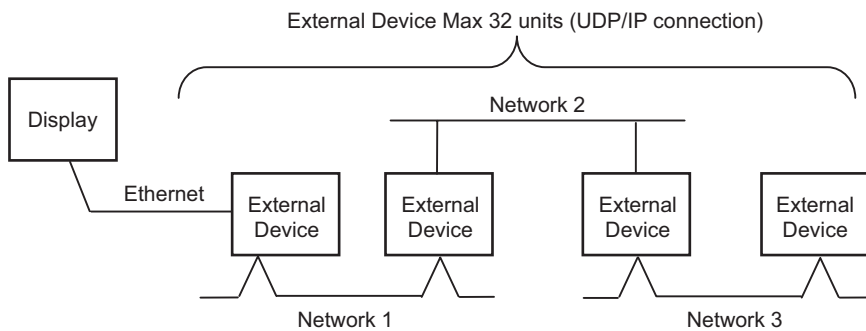


- 1:n Connection

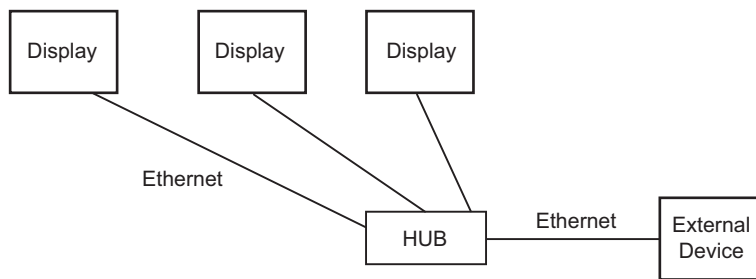


- 1:n Connection (access beyond network)

Set the relay node between networks to allow you to access the PLC with the different network address. You can access beyond maximum 3 levels of network.



- m:1 Connection

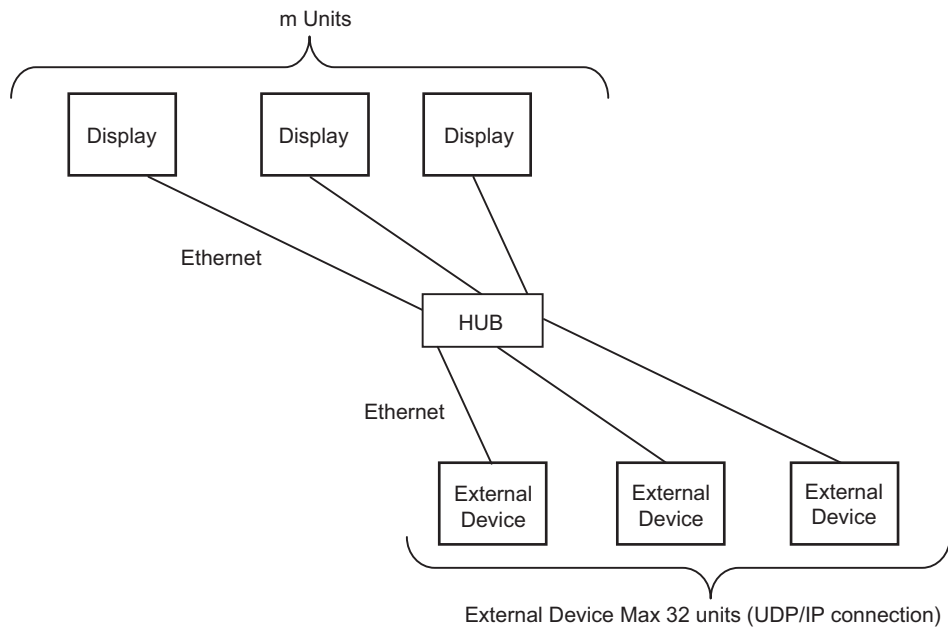



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**NOTE** • The number of GP units has no limit. Note that more number of connecting units will result in increasing the communication load.

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- m:n Connection



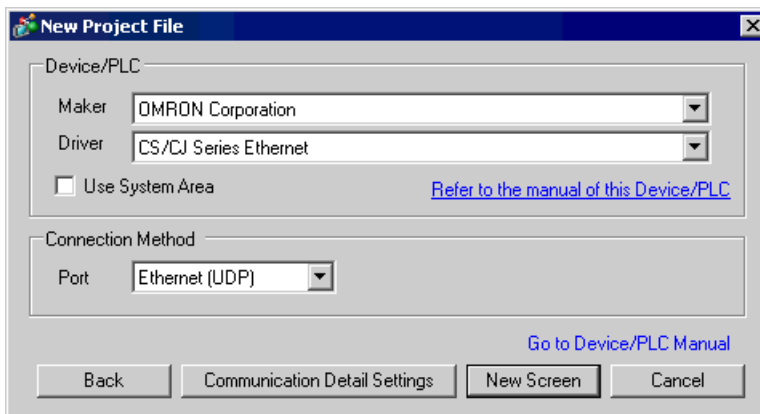

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**NOTE** • The number of GP units has no limit. Note that more number of connecting units will result in increasing the communication load.

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## 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 "OMRON Corporation".
Driver	Select a model (series) of the External Device to be connected and connection method. Select "CS/CJ Series Ethernet". Check the External Device which can be connected in "CS/CJ Series Ethernet" 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 " 6.13.6 Setting Guide of [System Setting Window]■[Main Unit Settings] Settings Guide◆System Area Setting" Cf. GP3000 Series User Manual "4.3.6 System Area Setting"
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.

When you use the CS/CJ Series, use GP-Pro EX and the ladder software to set as below.

### 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/PLC 1

Summary [Change Device/PLC](#)

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

Port No.

Timeout  (sec)

Retry

Wait To Send  (ms)

Source Address

Network

Node


Device-Specific Settings

Allowable No. of Device/PLCs 32 Unit(s)

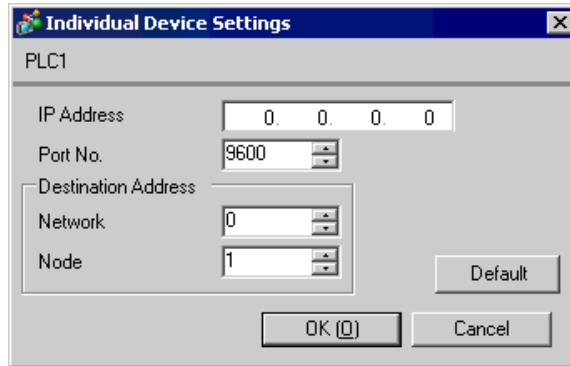
No.	Device Name	Settings
<input type="button" value="▲"/> 1	<input type="text" value="PLC1"/>	<input type="text" value="IP Address=000.000.000.000,Port No.=9600,Network=0,Node=1"/>

- NOTE**
- Set the optional network address of the Display in [Network].
  - Set the optional node address of the Display in [Node].

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



#### NOTE

- Set the IP address you set for the External Device in [IP address].
- Set the network address you set for the External Device in [Network].
- Set the node address you set for the External Device in [Node].

### ◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the off-line mode of the Display.
- The default port No. of the External Device is 9600. Always perform the same settings for the port No. of the Display and the External Device.



## ■ Setting of External Device

Double-click [I/O Table] in the project window to display the [PC I/O Table] window. Select [Unit Settings] from the menu displayed by right-clicking on the Ethernet unit in the window to select the Ethernet Unit Setting Screen.

Setup Items	Settings
IP Address Conversion	IP Address Table Method
IP Address Table	Node address and IP address you set in the Display.
IP Address Setting Rotary Switch <sup>*2</sup>	Option
Source Network Address <sup>*1</sup>	Option
Node Address Setting Rotary Switch <sup>*2</sup>	Option
Unit No. Setting Rotary Switch <sup>*2</sup>	0
FINS/UDP Port	9600

\*1 Parameter used when you access beyond network.  
Set in the routing table of "CX-Net Network Configuration". Please refer to the manual of the External Device for more details.

\*2 Set with the rotary switch on the front of the Ethernet unit.

### ◆ Notes

- Check with a network administrator about IP address and subnet mask. Do not set the duplicate IP address.
- Always perform the same settings for the port No. of the Display and the External Device.

## 3.2 Setting Example 2

### ■ Setting of GP-Pro EX

#### ◆ Communication Settings

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

Device/PLC 1

Summary [Change Device/PLC](#)

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

Port No.

Timeout  (sec)

Retry

Wait To Send  (ms)

Source Address

Network

Node

Device-Specific Settings


Allowable No. of Device/PLCs 32 Unit(s)

No.	Device Name	Settings
<input type="button" value="Settings"/> 1	<input type="text" value="PLC1"/>	<input type="text" value="IP Address=000.000.000.000,Port No.=9600,Network=0,Node=1"/>

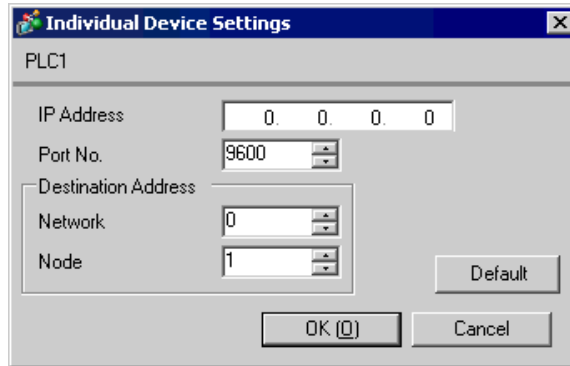
#### NOTE

- Set the optional network address of the Display in [Network].
- Set the optional node address of the Display in [Node].

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



#### NOTE

- Set the IP address you set for the External Device in [IP address].
- Set the network address you set for the External Device in [Network].
- Set the node address you set for the External Device in [Node].

### ◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the off-line mode of the Display.
- The default port No. of the External Device is 9600. Always perform the same settings for the port No. of the Display and the External Device.

## ■ Setting of External Device

Double-click [I/O Table] in the project window to display the [PC I/O Table] window. Select [Unit Settings] from the menu displayed by right-clicking on the Ethernet unit in the window to select the Ethernet Unit Setting Screen.

Setup Items	Settings
IP Address Conversion	IP Address Table Method
IP Address Table	Node address and IP address you set in the Display.
IP Address	Option
Source Network Address <sup>*1</sup>	Option
Node Address Setting Rotary Switch <sup>*2</sup>	Option
Unit No. Setting Rotary Switch <sup>*2</sup>	0
FINS/UDP Port	9600

\*1 Parameter used when you access beyond network.  
Set in the routing table of "CX-Net Network Configuration". Please refer to the manual of the External Device for more details.

\*2 Set with the rotary switch on the front of the Ethernet unit.

### ◆ Notes

- Check with a network administrator about IP address and subnet mask. Do not set the duplicate IP address.
- Always perform the same settings for the port No. of the Display and the External Device.

### 3.3 Setting Example 3

#### ■ Setting of GP-Pro EX

##### ◆ Communication Settings

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

Device/PLC 1

Summary [Change Device/PLC](#)

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

Port No.

Timeout  (sec)

Retry

Wait To Send  (ms)

Source Address

Network

Node

Device-Specific Settings


Allowable No. of Device/PLCs 32 Unit(s)

No.	Device Name	Settings
<input type="button" value="Add"/> 1	<input type="text" value="PLC1"/>	<input type="text" value="IP Address=000.000.000.000,Port No.=9600,Network=0,Node=1"/>

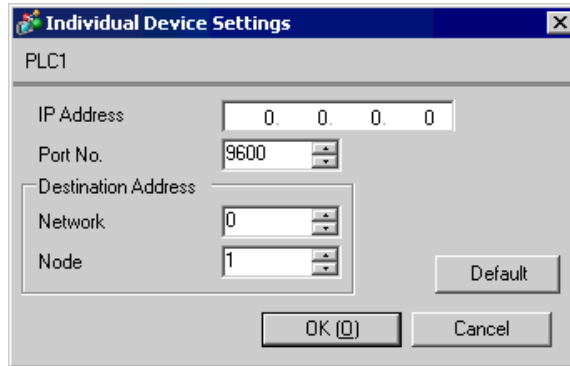
#### NOTE

- Set the optional network address of the Display in [Network].
- Set the optional node address of the Display in [Node].

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



#### NOTE

- Set the IP address you set for the External Device in [IP address].
- Set the network address you set for the External Device in [Network].
- Set the node address you set for the External Device in [Node].

### ◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the off-line mode of the Display.
- The default port No. of the PLC is 9600. For UDP connection, always perform the same settings for the port No. of the Display and the External Device.

## ■ Setting of External Device

Double-click [I/O Table] in the project window to display the [PC I/O Table] window. Select [Unit Settings] from the menu displayed by right-clicking on the Ethernet unit in the window to select the Ethernet Unit Setting Screen.

Setup Items	Settings
IP Address Conversion	Auto Creation Method (dynamic)
Line Speed	Auto Detection
IP Address	Option
Source Network Address <sup>*1</sup>	Option
Node Address Setting Rotary Switch <sup>*2</sup>	Option
Unit No. Setting Rotary Switch <sup>*2</sup>	0
FINS/UDP Port	9600

\*1 Parameter used when you access beyond network.  
Set in the routing table of "CX-Net Network Configuration". Please refer to the manual of the External Device for more details.

\*2 Set with the rotary switch on the front of the Ethernet unit.

### ◆ Notes

- Check with a network administrator about IP address and subnet mask. Do not set the duplicate IP address.
- For UDP connection, always perform the same settings for the port No. of the Display and the External Device.

## 3.4 Setting Example 4

### ■ Setting of GP-Pro EX

#### ◆ Communication Settings

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

Device/PLC 1

Summary [Change Device/PLC](#)

Maker  Series  Port

Text Data Mode  [Change](#)

Communication Settings

Port No.

Timeout  (sec)

Retry

Wait To Send  (ms)

Source Address

Network

Node

Device-Specific Settings


Allowable No. of Device/PLCs 16 Unit(s)

No.	Device Name	Settings
1	PLC1	IP Address=000.000.000.000,Port No.=9600,Network=0,Node=1

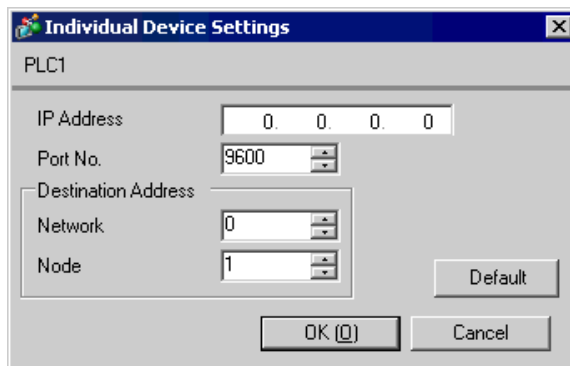
- 
- NOTE**
- Set the optional network address of the Display in [Network].
  - Set the optional node address of the Display in [Node].
-



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



#### NOTE

- Set the IP address you set for the External Device in [IP address].
- Set the network address you set for the External Device in [Network].
- Set the node address you set for the External Device in [Node].

### ◆ Notes

- Check with a network administrator about IP address. Do not set the duplicate IP address.
- Set IP address on the External Device for IP address in Device-specific settings.
- You need to set IP address on the Display in the off-line mode of the Display.
- The default port No. of the External Device is 9600. For UDP connection, always perform the same settings for the port No. of the Display and the External Device.

## ■ Setting of External Device

To communicate GP and SYSMAC-CS1 Series (EtherNet Unit: CS1W-ETN21), CJ Series (EtherNet Unit: CJ1W-ETN21), you need to set the EtherNet Unit of PLC.

Double-click [I/O Table] in the project window to display the [PC I/O Table] window. Select [Unit Settings] from the menu displayed by right-clicking on the Ethernet unit in the window to select the Ethernet Unit Setting Screen.

Setup Items	Settings
IP Address Conversion	Auto Creation Method (dynamic)
Line Speed	Auto Detection
IP Address	Option
Source Network Address <sup>*1</sup>	Option
Node Address Setting Rotary Switch <sup>*2</sup>	Option
Unit No. Setting Rotary Switch <sup>*2</sup>	0
FINS/TCP Port	9600

\*1 Parameter used when you access beyond network.  
Set in the routing table of "CX-Net Network Configuration". Please refer to the manual of the External Device for more details.

\*2 Set with the rotary switch on the front of the Ethernet unit.

### ◆ Notes

- Check with a network administrator about IP address and subnet mask. Do not set the duplicate IP address.

## 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 5)

- 
- IMPORTANT** • You need to set IP address on the display in the off-line mode of the display.  
Cf. GP3000 Series User Manual "4.3.7 Ethernet Settings"
- 


### 4.1 Setup Items in GP-Pro EX

#### ■ Communication Settings

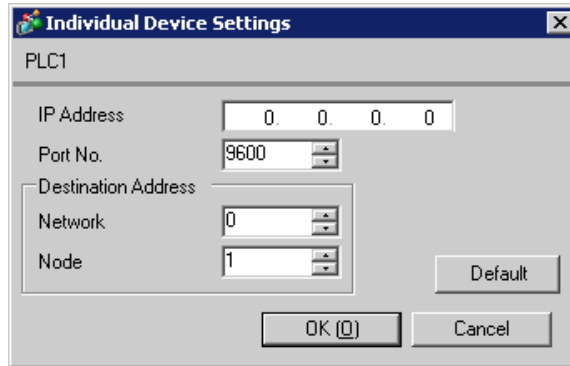
To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace.

Setup Items		Setup Description
Port No.		For UDP connection, use an integer from 1024 to 65535 to enter the port No. of the Display. For TCP connection, the port No. of the Display is fixed to "Auto Assign", and it will be automatically assigned.
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.
Source Address	Network	Enter the network address of the Display, using 0 to 127.
	Node	Enter the node address of the Display, using 1 to 254.

## ■ 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 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 IP address of the External Device. <b>NOTE</b> <ul style="list-style-type: none"> <li>Check with a network administrator about IP address. Do not set the duplicate IP address.</li> </ul>
Port No.		Enter the port No. of the External Device, using 1 to 65535. <b>NOTE</b> <ul style="list-style-type: none"> <li>UDP connection: Do not use the port No. 53/123, which are reserved in the system.</li> <li>TCP connection: Do not use the port No. 20/21/25/53/110, which are reserved in the system.</li> </ul>
Destination Address	Network	Enter the network address of the External Device, using 0 to 127.
	Node	Enter the node address of the External Device, using 1 to 254.

## 4.2 Setup Items in Off-Line Mode

**NOTE**

- Please refer to GP3000 Series User Manual for more information on how to enter off-line mode or about operation.

Cf. GP3000 Series User Manual "Chapter 4 Settings"

### ■ 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.

Comm.	Device			
CS/CJ Series Ethernet			[UDP]	Page 1/1
Port No.		9600	▼ ▲	
(Case of TCP: Allocated Automatically)				
Timeout(s)		3	▼ ▲	
Retry		2	▼ ▲	
Wait To Send(ms)		0	▼ ▲	
Network Address		0	▼ ▲	
Node Address		1	▼ ▲	
	Exit		Back	2005/09/02 12:45:50

Setup Items	Setup Description
Port No.	For UDP connection, use an integer from 1024 to 65535 to enter the port No. of the Display. For TCP connection, the port No. of the Display 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.
Network Address	Enter the network address of the Display, using 0 to 127.
Node Address	Enter the node address of the Display, using 1 to 254.

## ■ 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			
CS/CJ Series Ethernet		[UDP]	Page 1/1	
Device/PLC Name		PLC1		
IP Address	0 0 0 0			
Port No.	9600			
Network Address	0			
Node Address	1			
Exit		Back		2005/09/02 12:45:52

Setup Items	Setup Description
Device/PLC Name	Select the External Device to set. Device/PLC name is a title of the External Device set with GP-Pro EX. (Initial value [PLC1])
IP Address	Set IP address of the External Device. <b>NOTE</b> <ul style="list-style-type: none"> <li>Check with a network administrator about IP address. Do not set the duplicate IP address.</li> </ul>
Port No.	Enter the port No. of the External Device, using 1 to 65535.
Network Address	Enter the network address of the External Device, using 0 to 127.
Node Address	Enter the node address of the External Device, using 1 to 254.

## 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.

 This address can be specified as system data area.

Device	Bit Address	Word Address	32 bits	Notes
Channel I/O	0000.00 - 6143.15	0000 - 6143		*1
Internal Auxiliary Relay	W000.00 - W511.15	W000 - W511		
Special Auxiliary Relay	A000.00 - A959.15	A000 - A959		*2
Latch Relay	H000.00 - H511.15	H000 - H511		
Timer (Time Up Flag)	T0000 - T4095	-		*3
Counter (Count Up Flag)	C0000 - C4095	-		*3
Timer (Current Value)	-	T0000 - T4095		
Counter (Current Value)	-	C0000 - C4095		
Data Memory	D00000.00 - D32767.15	D00000 - D32767		*1
Extension Data Memory (E0-EC)	E000000.00 - EC32767.15	E000000 - EC32767		*4 *5
Extension Data Memory (Current Bank)	-	EM00000 - EM32767		 *6
Task Flag (Bit)	TKB00 - TKB31	-		*3
Task Flag (Status)	TK00.00 - TK31.07	TK00 - TK30		 *3
Index Register	-	IR00 - IR15		 *7
Data Register	-	DR00 - DR15		 *7

\*1 Do not write in Channel I/O address 1500-1899 and Data Memory address D30000-D31599 from the Display. Because those address are used for setting the system on the External Device.

\*2 Write disable in A000 to A447.

\*3 Write disable


\*4 Max 13 bank (E0 to EC) can be used. 1 bank is 32768 words. Available bank number is different depending on the CPU unit.

\*5 CJM1 Series does not include the extension data memory (E0 to EC, current bank EM).

\*6 CJ Series does not include the extension data memory (Current bank EM).

\*7 Write disable during RUN

**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"
-



## 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
Channel I/O	-	0080	Word Address
Internal Auxiliary Relay	W	0082	Word Address
Special Auxiliary Relay	A	0085	Word Address
Latch Relay	H	0084	Word Address
Timer (Current Value)	T	0060	Word Address
Counter (Current Value)	C	0061	Word Address
Data Memory	D	0000	Word Address
Extension Data Memory (E0-EC)	E0	0010	Word Address
	E1	0011	Word Address
	E2	0012	Word Address
	E3	0013	Word Address
	E4	0014	Word Address
	E5	0015	Word Address
	E6	0016	Word Address
	E7	0017	Word Address
	E8	0018	Word Address
	E9	0019	Word Address
	EA	001A	Word Address
	EB	001B	Word Address
	EC	001C	Word Address
Extension Data Memory (Current Bank)	EM	0001	Word Address
Task Flag (Status)	TK	0002	Word Address
Index Register	IR	0003	Word Address
Data Register	DR	0004	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	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>Received error codes are displayed such as "Decimal [Hex]".</li> <li>IP address is displayed such as "IP address (Decimal): MAC address (Hex)".</li> </ul>

Display Examples of Error Messages

"RHAA035: PLC1: Error has been responded for device write command (Error Code: 2 [02])"

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**NOTE** • Please refer to the manual of External Device for more detail of received error codes.

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