

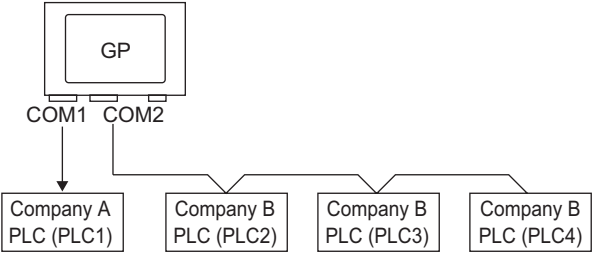
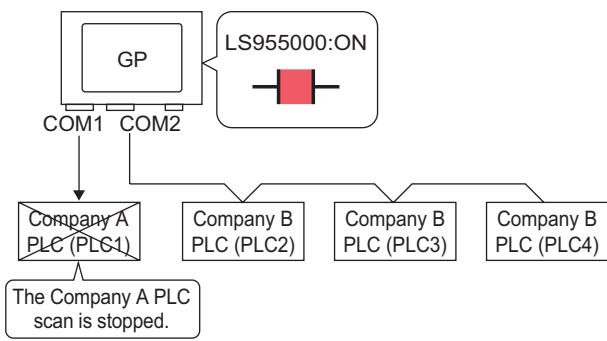
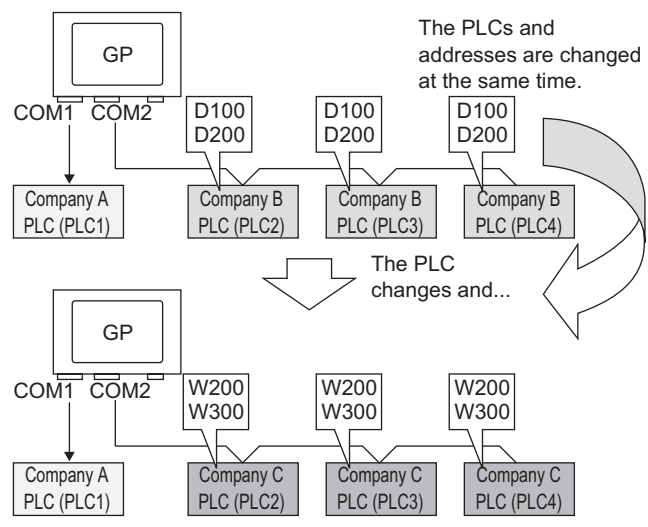
7 | Device/PLC Communication

This chapter explains how to use the display unit to communicate with multiple devices/PLCs. Procedures for stopping communications and changing devices/PLCs are also discussed.

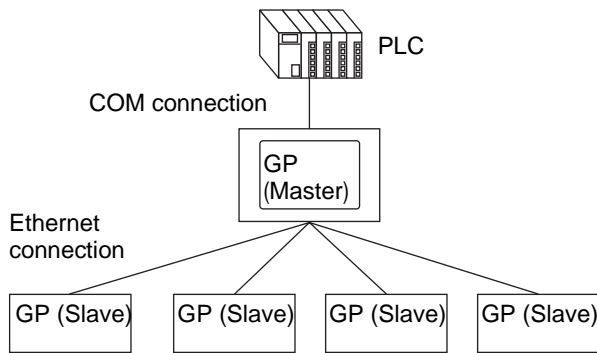
Please start by reading "7.1 Settings Menu" (page 7-2), and then turn to the corresponding page.

7.1	Settings Menu	7-2
7.2	Connecting to Multiple Device/PLCs.....	7-4
7.3	Disconnecting Multiple Connected Devices/PLCs	7-12
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7.1 Settings Menu

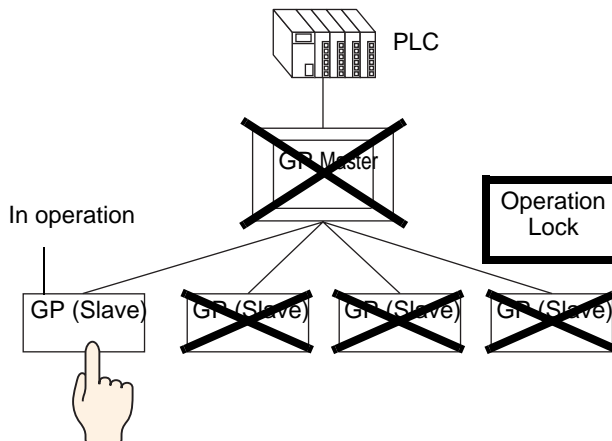
Connecting Multiple GPs to One PLC (Ethernet Multilink)	
 <p>The diagram shows a GP (Gateway Processor) at the top with two communication ports, COM1 and COM2. COM1 is connected to Company A PLC (PLC1). COM2 is connected to three Company B PLCs (PLC2, PLC3, and PLC4).</p>	<ul style="list-style-type: none"> ☞ Setup Procedure (page 7-5) ☞ Introduction (page 7-4)
Disconnecting Multiple Connected Devices/PLCs	
 <p>The diagram shows the GP with a callout box indicating 'LS955000:ON' with a red square symbol. Below, the Company A PLC (PLC1) is crossed out with an 'X'. A note below it says 'The Company A PLC scan is stopped.' The other three Company B PLCs remain connected.</p>	<ul style="list-style-type: none"> ☞ Setup Procedure (page 7-12) ☞ Introduction (page 7-12)
<p>To stop the GP from scanning for a device/PLC, set the communication bit to OFF.</p>	
Changing a Device/PLC	
 <p>The diagram shows two stages of a change. In the top stage, three Company B PLCs (PLC2, PLC3, PLC4) are connected to the GP. Each has a callout box with 'D100' and 'D200'. A text box above says 'The PLCs and addresses are changed at the same time.' In the bottom stage, three Company C PLCs (PLC2, PLC3, PLC4) are connected. Each has a callout box with 'W200' and 'W300'. A text box between the stages says 'The PLC changes and...'. Large curved arrows indicate the transition between the two states.</p>	<ul style="list-style-type: none"> ☞ Setup Procedure (page 7-19) ☞ Introduction (page 7-18)

Connecting Multiple GPs to One PLC (Ethernet Multilink)



- ☞ Setup Procedure (page 7-31)
- ☞ Introduction (page 7-27)

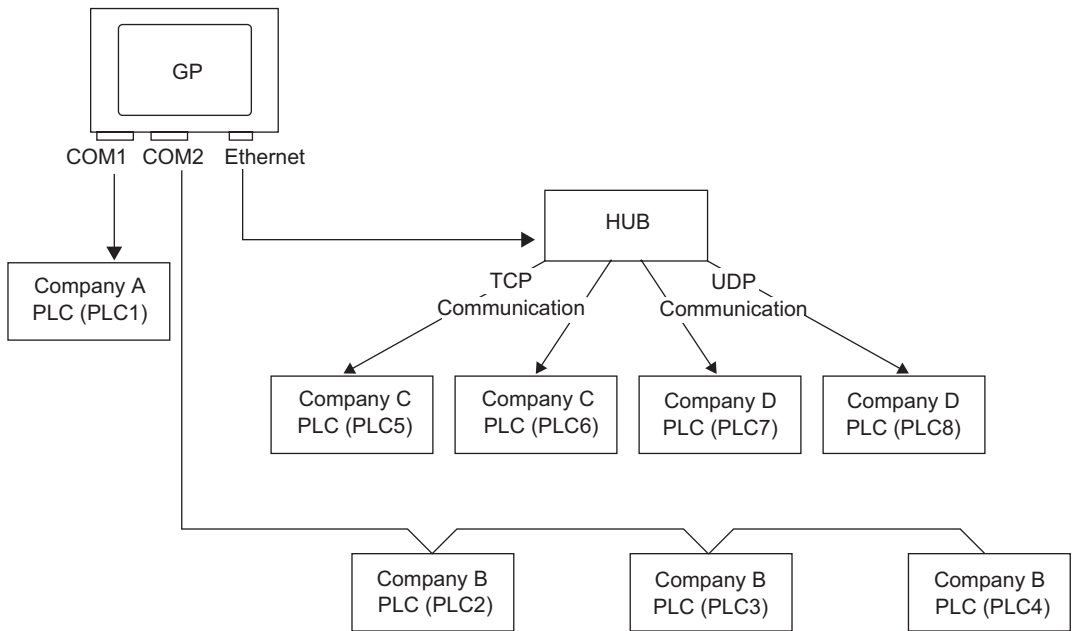
In a Multiple GP Environment, Make Only One GP Active



- ☞ Settings Guide (page 7-36)
- ☞ Introduction (page 7-35)

7.2 Connecting to Multiple Device/PLCs

7.2.1 Introduction



Multiple devices/PLCs can be connected simultaneously to one GP using four drivers (COM1, COM2 and Ethernet (UDP/TCP)).

NOTE

- There are two types of models: one model can have two drivers and one model can have four drivers.
 ☞ "1.3 Supported Features" (page 1-5)

7.2.2 Setup Procedure

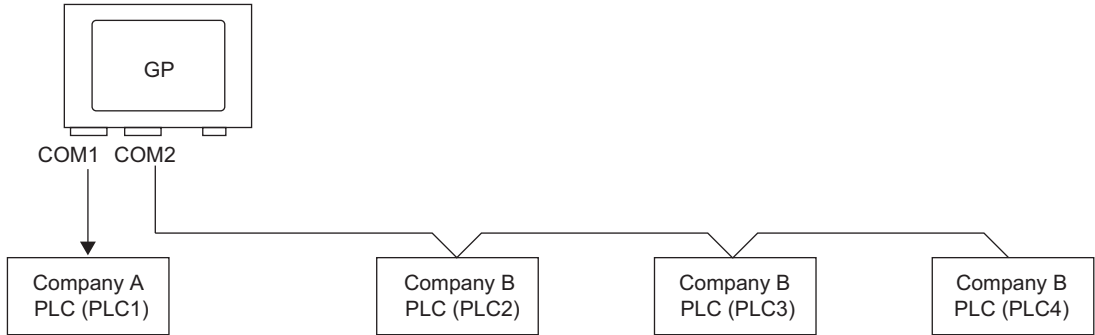
NOTE


- Please refer to the Settings Guide for details.
 ☞ "5.17.2 [New] Settings Guide" (page 5-102)

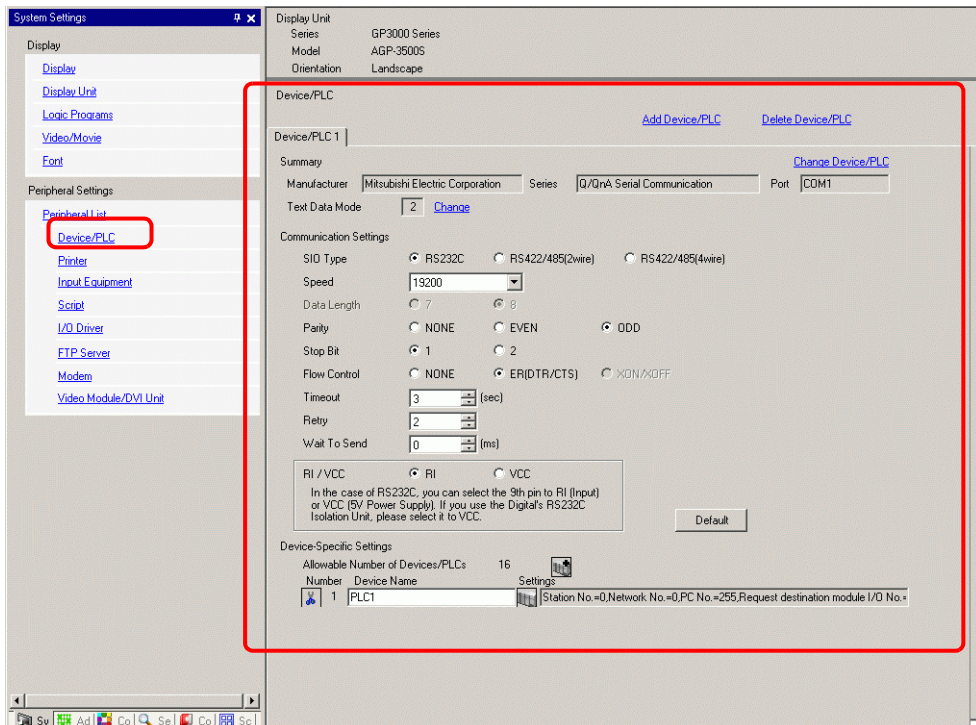
For example:

COM1: Company A's PLC, PLC1 (Omron, CS/CJ Series HOST Link)

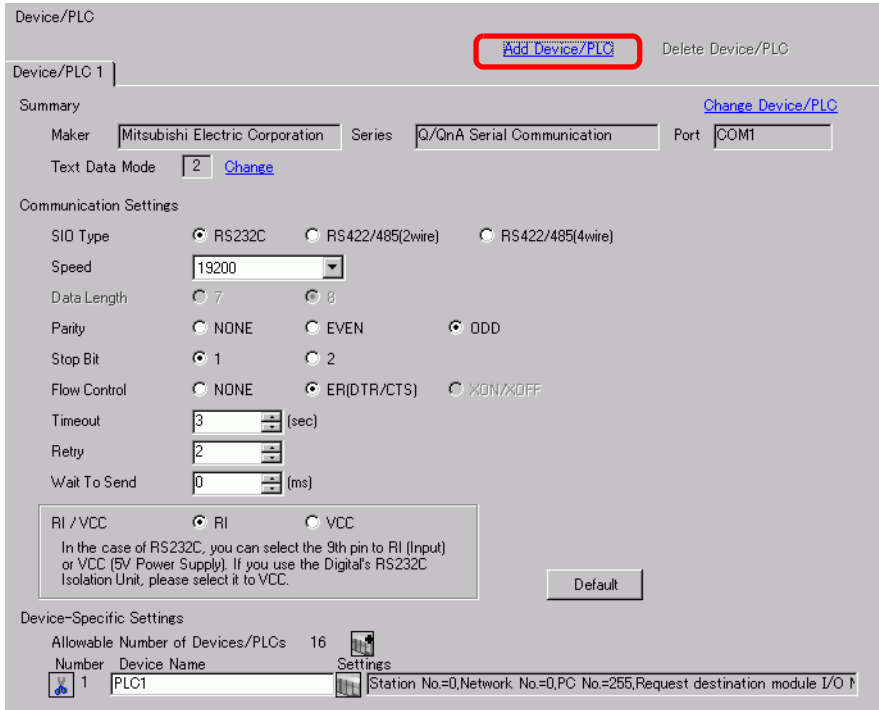
COM2: Company B's PLCs, PLC2, PLC3, PLC4 (3 units of Mitsubishi, A Series Computer Link). Configure settings to add these PLCs.



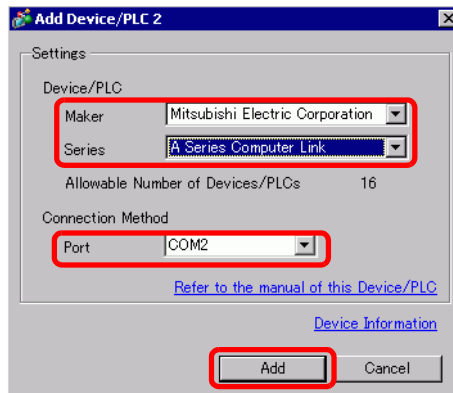
- 1 From the [Project (F)] menu, point to [System settings (C)] and select [Device/PLC] or click . The [Device/PLC] screen appears.




2 Click [Add Device/PLC].




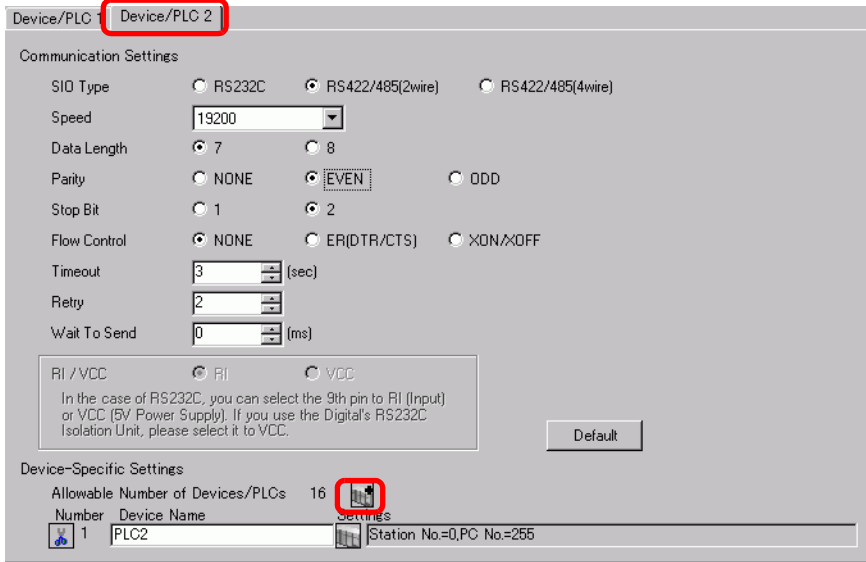
3 When the [Add Device/PLC 2] dialog box appears, select options from the [Maker], [Series], and [Port] and click [Add].




NOTE

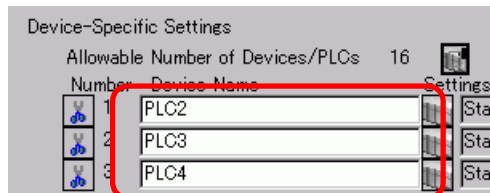
- Make sure not to choose a port that is already used by another PLC. If the port has multiple PLCs,  appears to the right of the [Device/PLC] screen's [Port] label.

4 When the [Device/PLC2] tab appears, click [Add Device] . Add 2 PLCs.




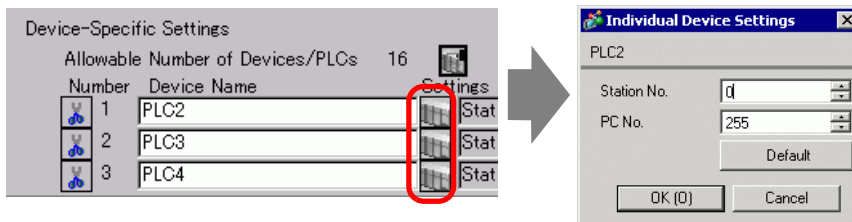
NOTE • Every time [Add Device]  is clicked, one PLC is added.

5 Set the name of each added PLC with up to 20 single-byte characters.



NOTE • When adding the desired [Device Name], ensure not to repeat names.

6 Click [Device/PLC] . The [Individual Device Settings] dialog box appears. Set each corresponding PLC. The following image shows the [Individual Device Settings] dialog box used for the Mitsubishi A Series Computer Link type.



NOTE • The [Individual Display Unit] differ depending on the PLC. For details on the settings of the device/PLC, see "GP-Pro EX Device Connection Manual."

7 Confirm that multiple PLCs have been added.

7.2.3 Structure

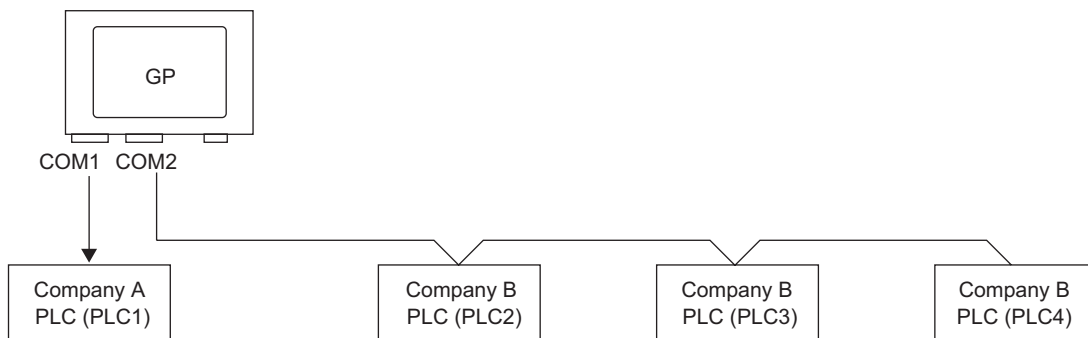
■ Multiple PLC Connection Methods

◆ Direct Access Method

- Multiple PLCs can be connected.

(1) When using COM1 and COM2.

For example, Company A's driver (serial communication) is set to COM1 and Company B's driver is set to COM2 (serial communication).

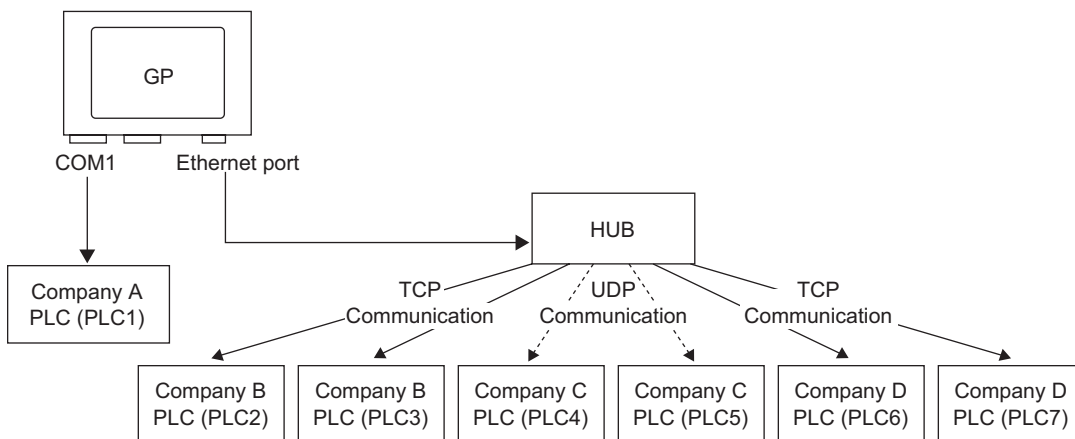


NOTE

- A different driver can be designated for each COM port. However, each COM port can only have a single driver.
- You can connect multiple devices with the same driver to each COM Port. However, the allowable number of devices/PLCs varies depending on the driver. Refer to the "GP-Pro EX Device/PLC Manual" for the allowable number of devices/PLCs.

(2) When using COM1 and Ethernet port ([UDP] / [TCP] communication).

For example, Company A's driver (serial communication) is set to COM1, and Company B, C, and D's drivers are set to the Ethernet port (Ethernet communication).



NOTE

- A maximum of four drivers can be used by the ports. However, one driver can be configured per COM port, and the remainder be used by the Ethernet port, or all 4 can be used by the Ethernet port and none by the COM ports. In the above example, COM1 has one driver set up (Company A's PLC), so the Ethernet port can handle three additional types of drivers (Company B, C, and D).

NOTE

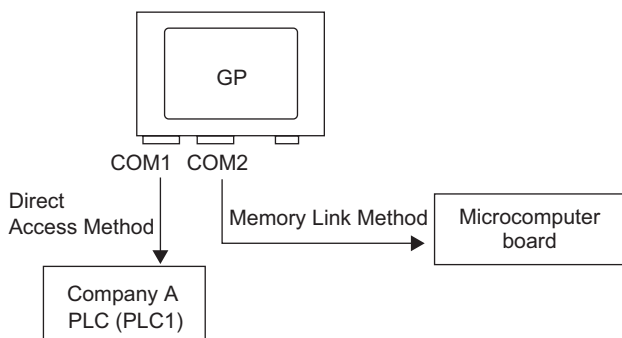
- When using an Ethernet communication driver with multiple connections, [UDP] or [TCP] cannot be set up in the same driver. For example, when [Device/PLC1] has been set to MELSEC A Ethernet [UDP] type, [Device/PLC2] cannot be set to MELSEC A Ethernet [TCP] type.

◆ Direct Access Method + Memory Link Method

- Devices/PLCs and hosts (PCs, Microcomputer boards, etc.) can be connected at the same time.

(3) When using Direct Access Method and Memory Link Method

For example, Company A's PLC is connected to COM1 by the direct access method, and the micro-computer board is connected to COM2 by the memory link method.



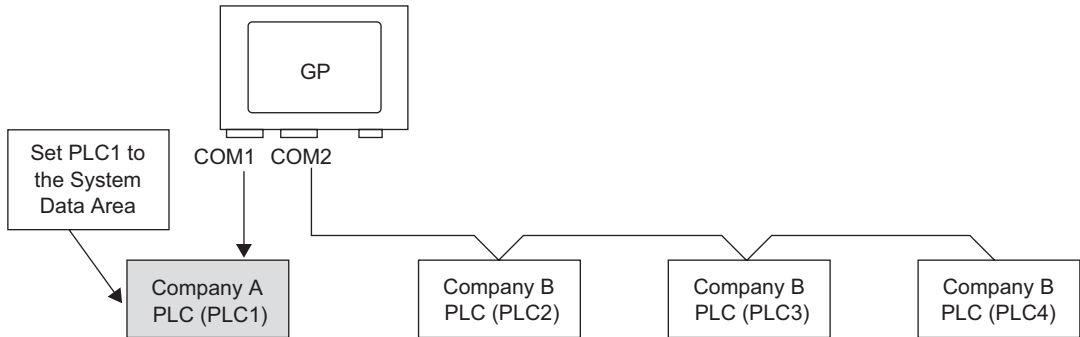
■ System Data Area/LS Area for Use with Multiple Devices/PLCs

Refer to the "A.1.4.4 Device/PLC System Data Area Allocation Procedure" (page A-27) or "GP-Pro EX Device/PLC manual" for details on the system data area.

◆ Direct Access Method

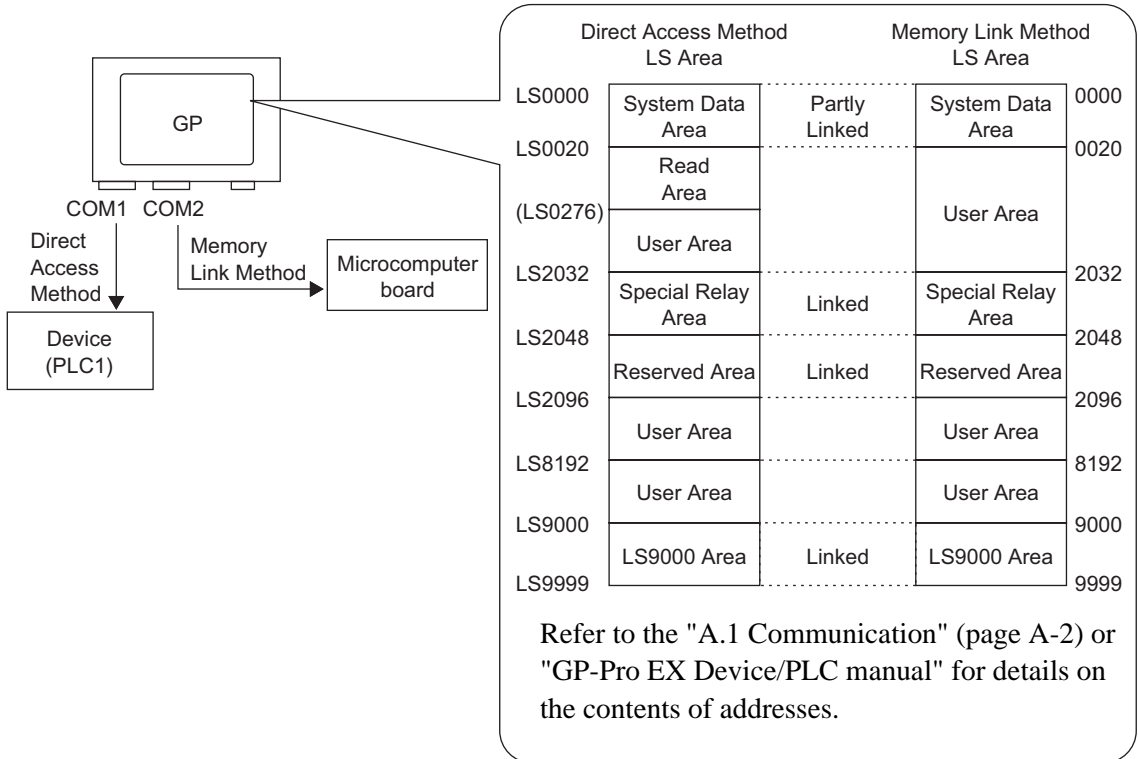
When multiple PLCs are connected to the GP, the system data area can only have one PLC connected to it.

For example, in the following image, when four PLCs are connected to the GP, only one of PLC1 to PLC4 can be set to the system data area.



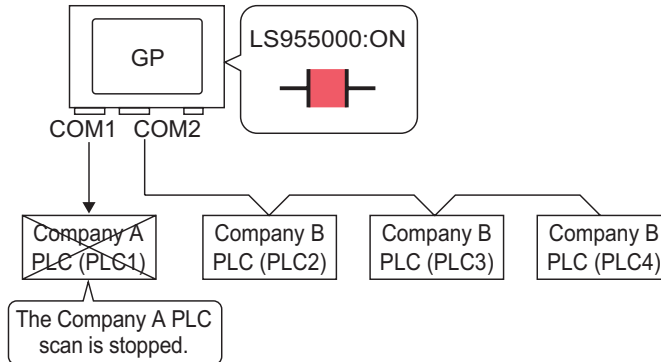
◆ **Direct Access Method + Memory Link Method**

When communicating by direct access and memory link, each method uses a separate LS area. However, the system data area, the special relay area, and the LS9000 area are shared. For example, in the following image, a PLC and microcomputer board are both connected to the GP, the GP has a direct access method LS area and a memory link method LS area.



7.3 Disconnecting Multiple Connected Devices/PLCs

7.3.1 Introduction

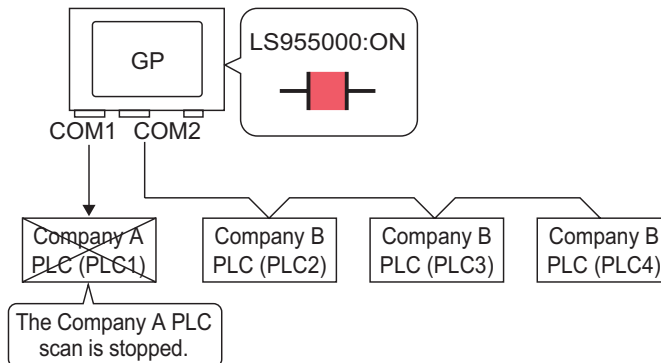


To stop the GP from scanning for a device/PLC, set the communication bit to OFF.

7.3.2 Setup Procedure

NOTE


- Please refer to the Settings Guide for details.
 - ☞ "10.15.1 Bit Switch" (page 10-51)
 - ☞ "7.7 Settings Guide" (page 7-41)
- For details of the part placement method and the address, shape, color, and label setting method, refer to the "Part Editing Procedure".
 - ☞ "8.6.1 Editing Parts" (page 8-44)

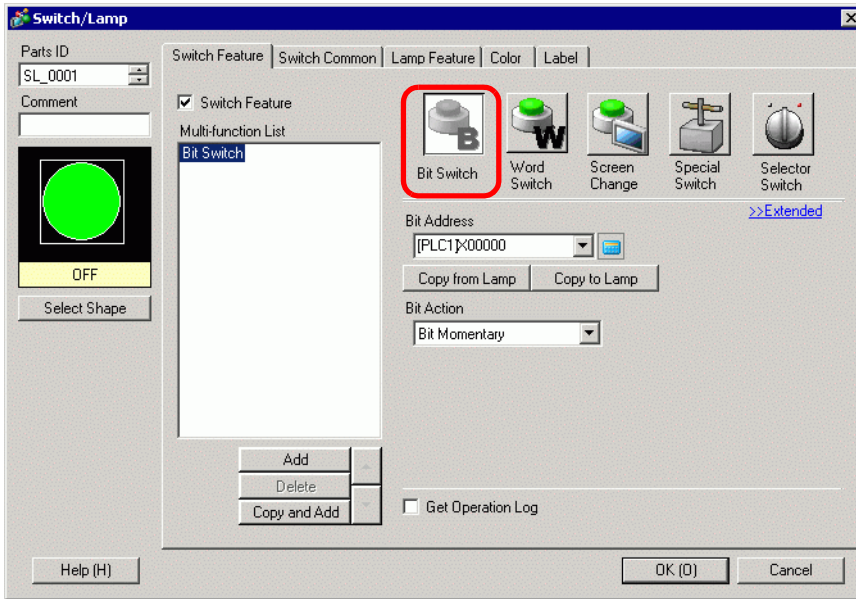


To stop the GP from scanning for a device/PLC, set the communication bit to OFF.

■ Stop Communications


Create a touch switch to reverse the ON/OFF bit address that controls each device/PLC's communication scan.

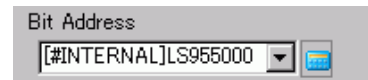
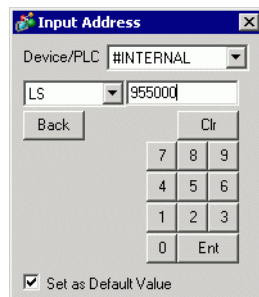
- 1 On the [Parts (P)] menu, point to [Switch Lamp], and select [Bit Switch (B)], or click  to place a switch on the screen.
- 2 Double-click the placed Switch part. The following dialog box appears.



- 3 In [Select Shape], select the Switch shape.
- 4 Set the address (for example, LS955000) to control the start/stop of communication scan in [Bit Address].

Select [#INTERNAL] for the [Device/PLC] and "LS" for the Device, input "955000" in the address, and press the "Ent" key.

Click  to display an address input keypad.

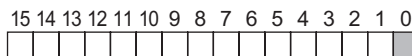


NOTE

- Use the internal device address LS9550 - LS9557 to control the start or stop of the communication scan.

LS Area	
LS9550	Driver 1 Machine 1 to 16
LS9551	Driver 1 Machine 17 to 32
LS9552	Driver 2 Machine 1 to 16
LS9553	Driver 2 Machine 17 to 32
LS9554	Driver 3 Machine 1 to 16
LS9555	Driver 3 Machine 17 to 32
LS9556	Driver 4 Machine 1 to 16
LS9557	Driver 4 Machine 17 to 32
LS9558	Reserved
LS9559	Reserved

For example, control up to 16 communication scans for Driver1 using LS9550.
[LS9550]



Bit 0: Scans ON/OFF Driver1 PLC1.

Turning ON bit 0 stops the scan of the first device/PLC controlled by Driver 1. Turn OFF Bit 0 to resume the scan.

- You cannot stop the communication scan of a device specified with the System Area Start Address. However, if you are not using the System Data Area, you can stop the communication scan.
- ☞ "5.17.6 [System Settings] Setting Guide" (page 5-175)
- If you designate a 32-bit device in [System Area Start Address], you can set 32 bits in the LS area. However, you can use only the lower 16 bits to control the communication scan.
- When you turn OFF the communication scan, the displayed device/PLC data will remain. However, if you change screens and then display the screen again, the device/PLC data will not be displayed.

5 From [Bit Action], choose [Bit Invert].




6 As needed, set the color and display text on the [Color] tab and [Label] tab, and click [OK].

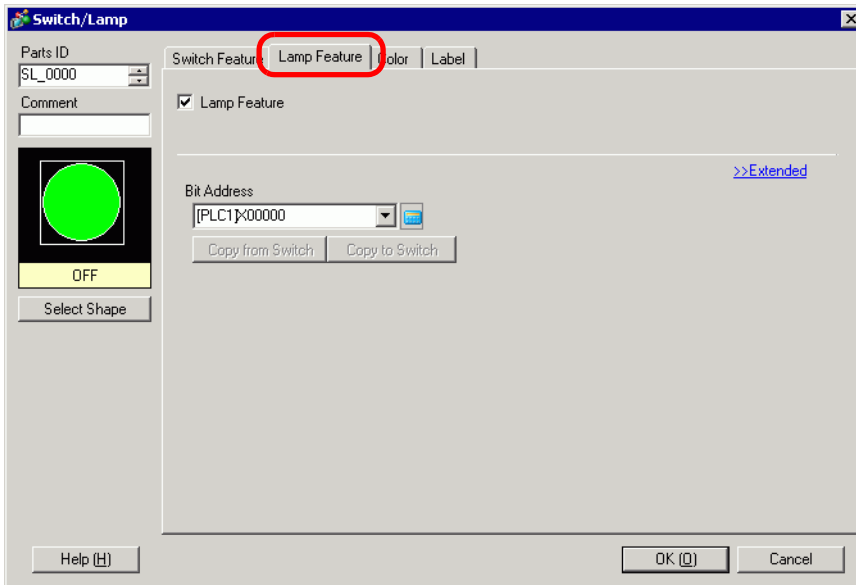
NOTE

- Depending on the shape, you may not be able to change the color.
- Select the switch and press the [F2] key, and you can directly edit the text on the label.

■ Confirming the Communication State


Create a lamp to acknowledge when a communication scan is running.

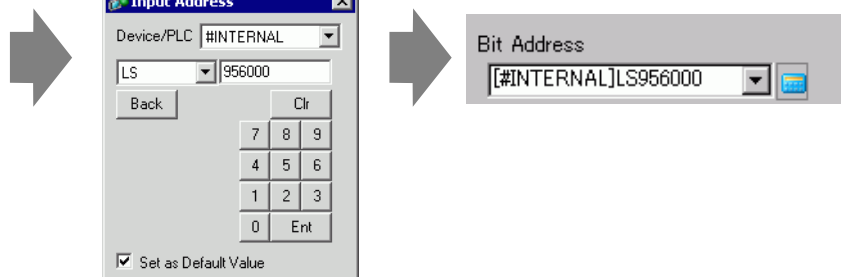
- 1 From the [Parts (P)] menu, point to [Switch Lamp (C)] and select [Lamp (L)] or click  to place a lamp on the screen.
- 2 Double-click the placed lamp. The Switch/Lamp dialog box appears.



- 3 Use [Select Shape] to define the frame of the lamp.
- 4 Set the bit address to acknowledge the exclusive state of the communication scan in [Bit Address] (For example, LS956000).

Select [#INTERNAL] for the [Device/PLC] and "LS" for the Device, input "956000" in the address, and press the "Ent" key.

Click  to display an address input keypad.

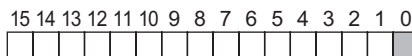


NOTE

- Use the internal device address LS9560 - LS9567 to acknowledge the execution or stop of the communication scan.

LS Area	
LS9560	Driver 1 Machine 1 to 16
LS9561	Driver 1 Machine 17 to 32
LS9562	Driver 2 Machine 1 to 16
LS9563	Driver 2 Machine 17 to 32
LS9564	Driver 3 Machine 1 to 16
LS9565	Driver 3 Machine 17 to 32
LS9566	Driver 4 Machine 1 to 16
LS9567	Driver 4 Machine 17 to 32
LS9568	Reserved
LS9569	Reserved

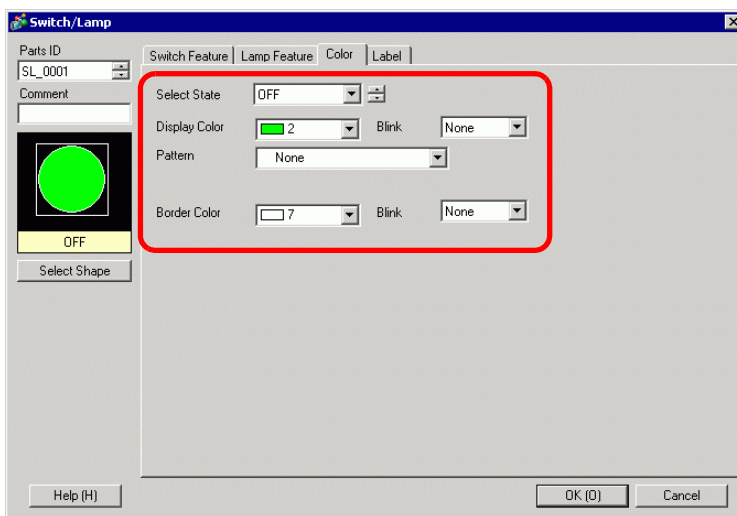
For example, acknowledge up to 16 communication scans of driver 1 using LS9560.
[LS9560]



Bit 0: OFF when the first I/O Driver1 is scanning. ON when the scan is stopped.

- If you designate a 32-bit device in [System Area Start Address], you can set 32 bits in the LS area. However, you can only use the lower 16 bits to acknowledge the execution of the communication scan.

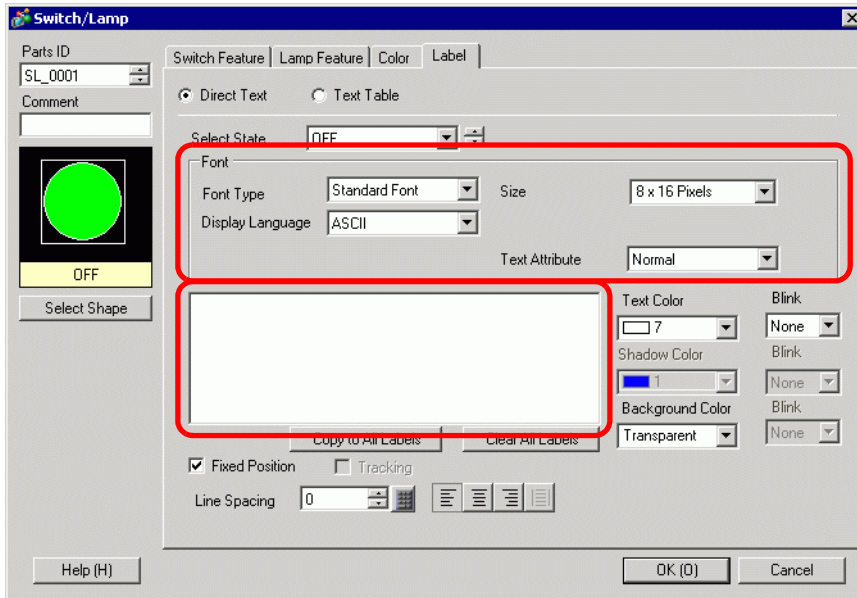
5 Click the [Color] tab and set the Lamp display colors. Set a [Display Color], [Pattern] and [Border Color] for each case where the [Select State] is ON or OFF.



NOTE

- Depending on the shape, you may not be able to change the color and pattern.

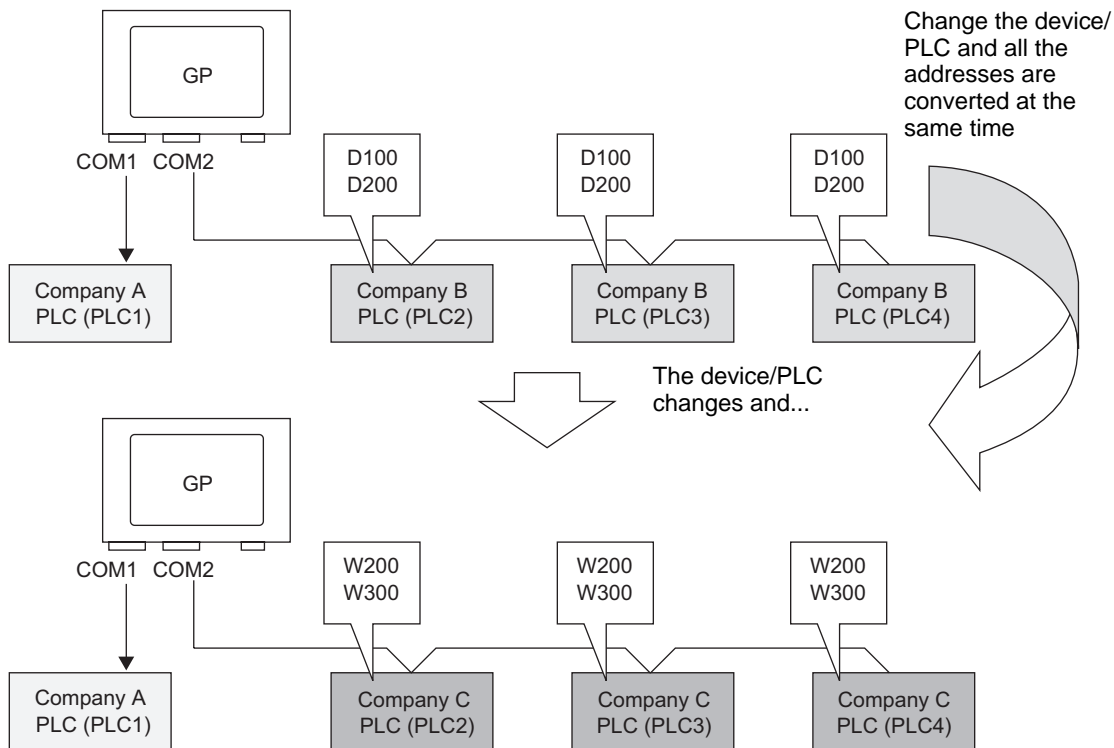
- Click the [Label] tab. Define the label to appear on the Lamp. Specify the font type and size, and then in the rectangular field type the text to display. Click [OK].

**NOTE**

- Select the switch and press the [F2] key, and you can directly edit the text on the label.

7.4 Changing a Device/PLC

7.4.1 Introduction



When changing the type of PLC, addresses can be modified for multiple PLCs at the same time.

There are two methods for converting addresses when changing a device/PLC model: converting the PLC type without designating an Address Conversion Range, or Converting the PLC type and Designating an Address Conversion Range.

7.4.2 Setup Procedure

■ Converting the PLC type without designating an Address Conversion Range

Change the type of device without specifying an address conversion pattern at the time of conversion.

NOTE

- Please refer to the Settings Guide for details.
☞ "7.7.1 [Change Device/PLC] Settings Guide" (page 7-41)
-

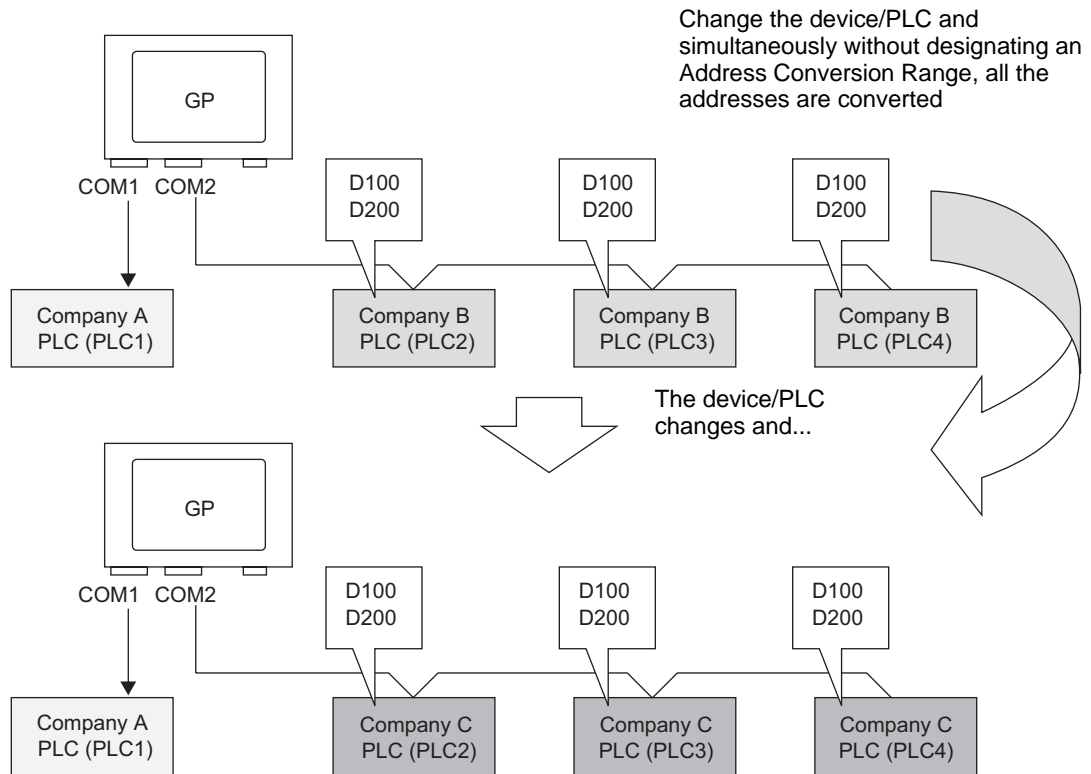
For example:

COM1: Company A's PLC, PLC1 (for example, Omron, CS/CJ Series HOST Link)
COM2: Company B's PLCs, PLC2, PLC3, PLC4 (for example, 3 units of Mitsubishi, A Series Computer Link)


Device Conversion

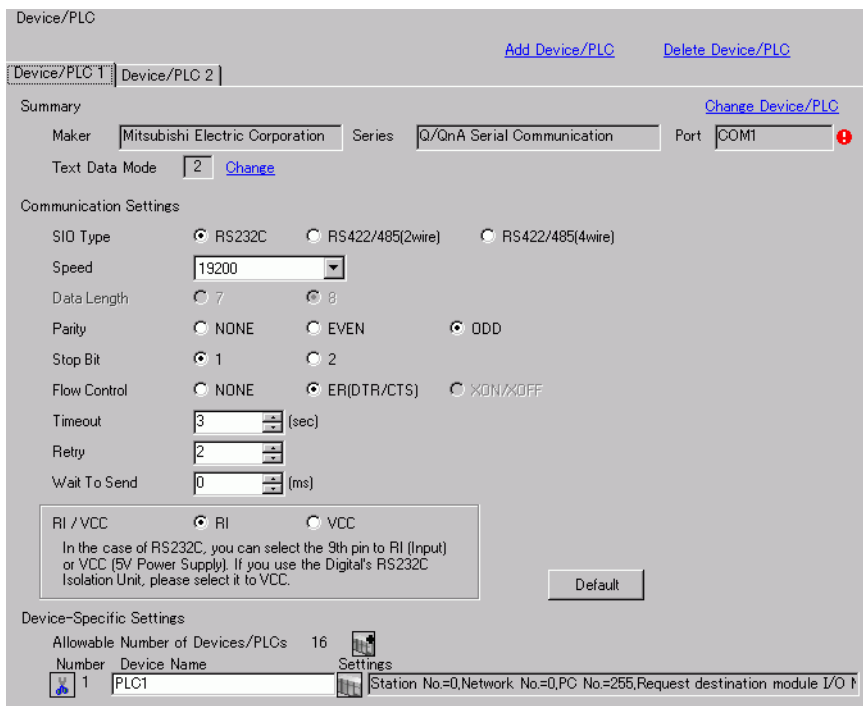


COM1: Company A's PLC, PLC1 (for example, Omron, CS/CJ Series HOST Link)
COM2: Company C's 3 PLCs, (for example, 3 units of Yokogawa Electric Corp., Computer Link SIO)

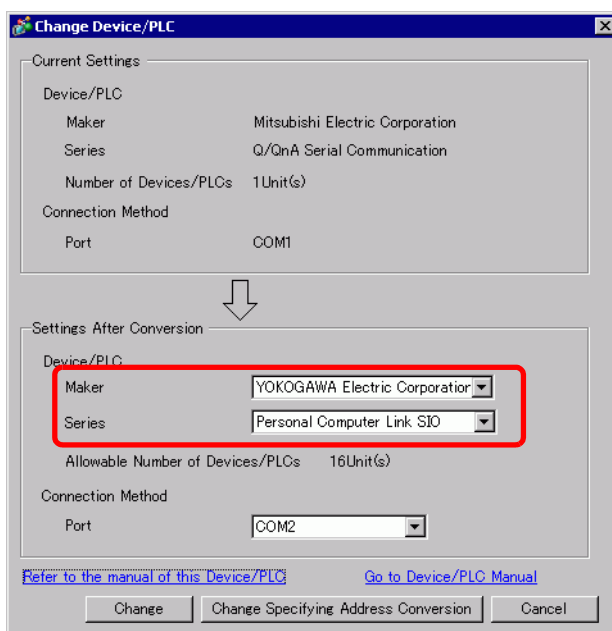
**NOTE**

- If there is no Convert Destination device code, the address may not display correctly. After converting a device/PLC, confirm all device addresses used in the project and correct the relevant addresses.

- 1 From the [Project (F)] menu, point to [System settings (C)] and select [Device/PLC] or click . The [Device/PLC] screen appears.

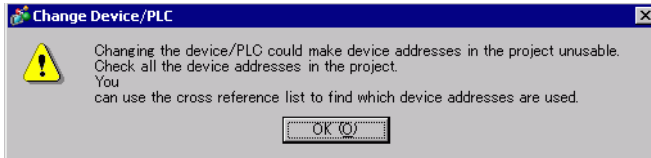


- 2 Click the [Device/PLC2] tab, and click [Change Device/PLC].
- 3 When the [Change Device/PLC] dialog box appears, set the [Maker] and [Series] of the device/PLC you want to change to.



- 4 Click [Change].

5 The following message appears. Click [OK (O)] and the settings are complete.



NOTE

- If you change the device/PLC by clicking the [Change] button in the [Change Device/PLC] dialog box, the address conversion pattern may not display correctly if there is no device code at the destination. Confirm all device addresses used in the project and correct the relevant addresses.
 - After converting a device/PLC, parts, D-Scripts, and alarms must have their device addresses set again. In addition, if any screens use a [Screen Change] switch, that screen has to be saved again.
 - If using an Ethernet communication driver when converting multiple device/PLCs, [UDP] and [TCP] cannot be set up in the same driver. For example, when [Device/PLC1] has been set to MELSEC A Ethernet [UDP] type, [Device/PLC2] cannot be set to MELSEC A Ethernet [TCP] type.
-

■ Changing Device Type using Address Conversion Pattern

Change the type of device by specifying an address conversion pattern. Designate the previous address range and the top address of the destination device/PLC.

NOTE

- Please refer to the Settings Guide for details.
 - ☞ "7.7.1 [Change Device/PLC] Settings Guide" (page 7-41)
 - ☞ "7.7.2 [Address Conversion Method] Settings Guide" (page 7-42)

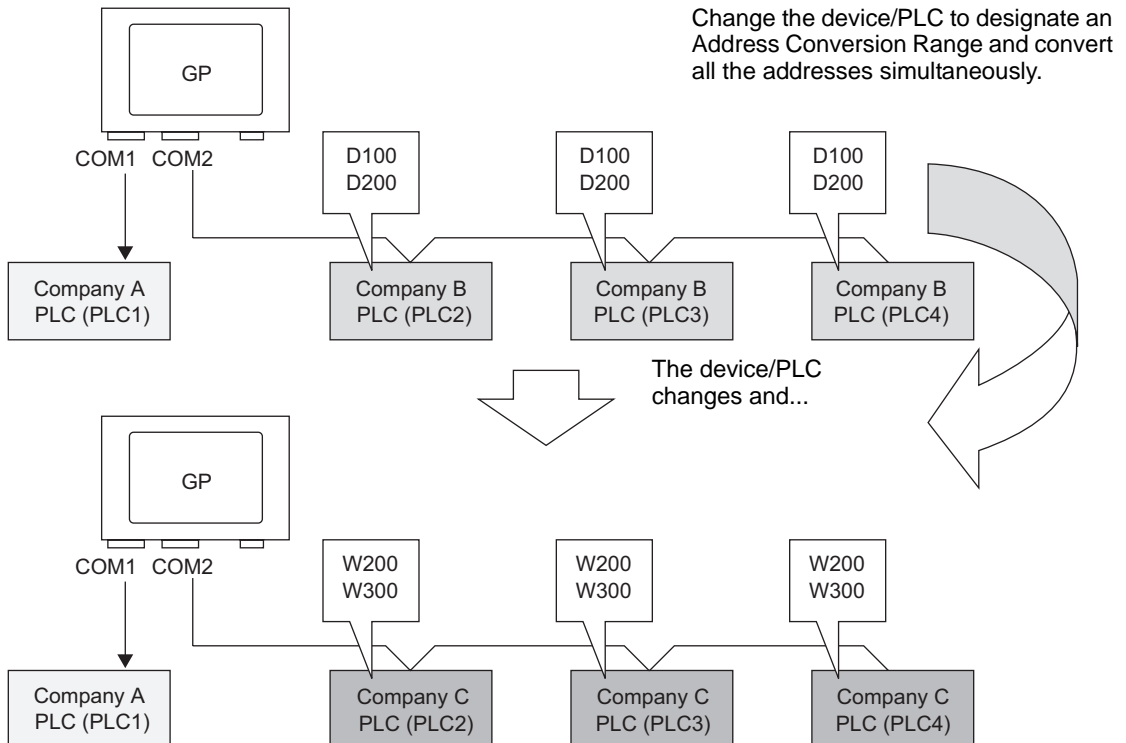
For example:

COM1: Company A's PLC, PLC1 (for example, Omron, CS/CJ Series HOST Link)
 COM2: Company B's PLCs, PLC2, PLC3, PLC4 (for example, 3 units of Mitsubishi, A Series Computer Link)

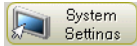
Device Conversion



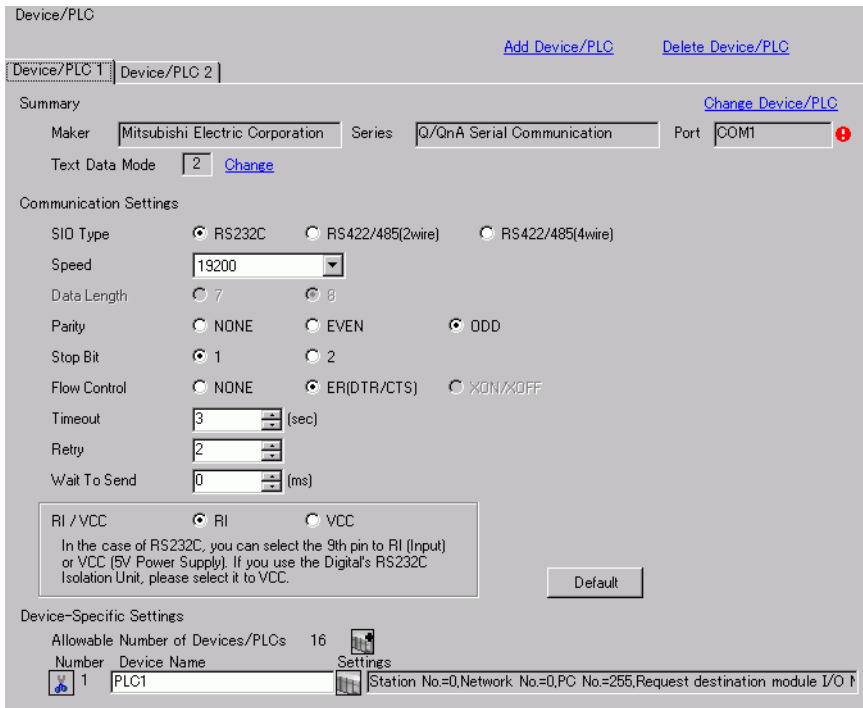
COM1: Company A's PLC, PLC1 (for example, Omron, CS/CJ Series HOST Link)
 COM2: Company C's 3 PLCs, (for example, 3 units of Yokogawa Electric Corp., Computer Link SIO)



1 From the [Project (F)] menu, point to [System settings (C)] and select [Device/PLC] or click

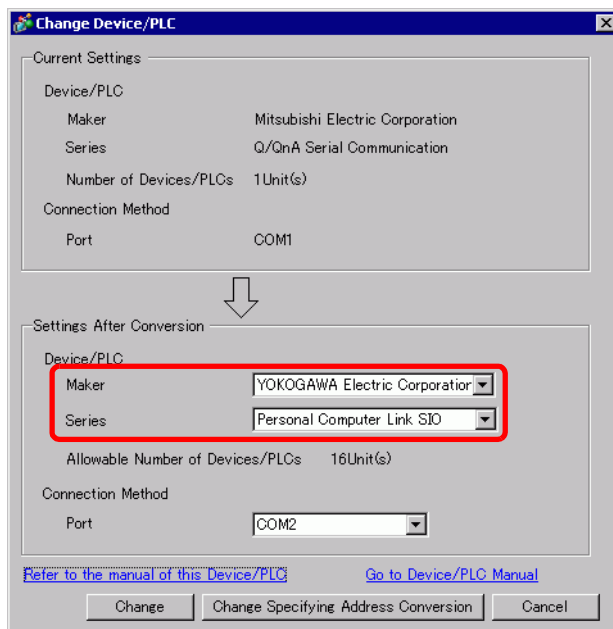


. The [Device/PLC] screen appears.



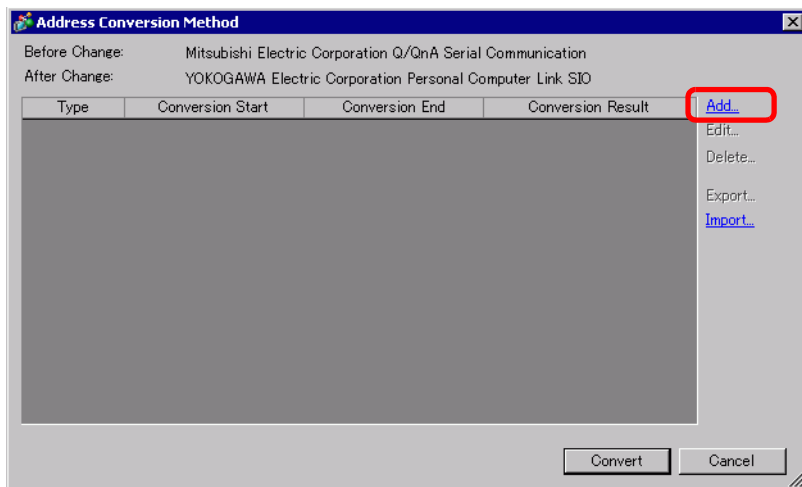
2 Click the [Device/PLC2] tab, and click [Change Device/PLC].

3 When the [Change Device/PLC] dialog box appears, set the [Maker] and [Series] of the device/PLC you want to change to.

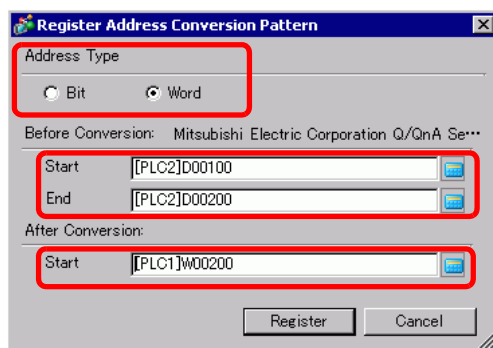


4 Click [Change Specifying Address Conversion].

5 When the [Address Conversion Method] dialog box appears, click [Add].

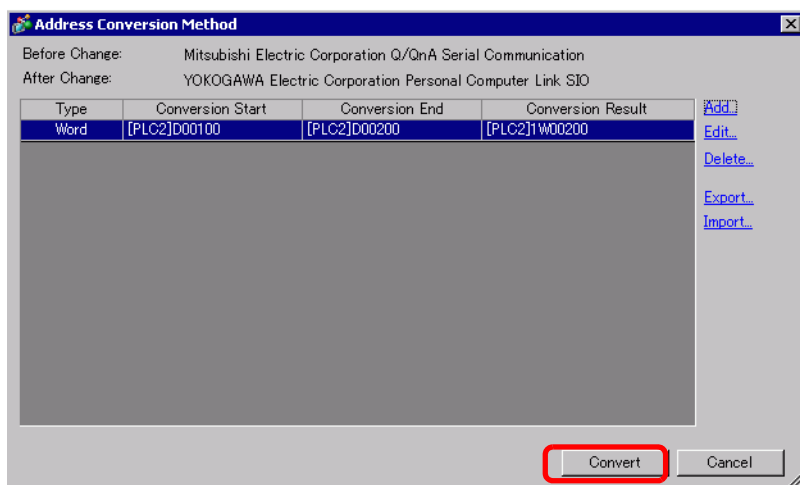


6 When the [Register Address Conversion Pattern] dialog box appears, set the [Address Type], the Before Conversion [Start] and [End] address, and the After Conversion [Start] address.



7 Click [Register].

8 When the [Address Conversion Method] dialog box appears and the conversion pattern is added, click [Convert].

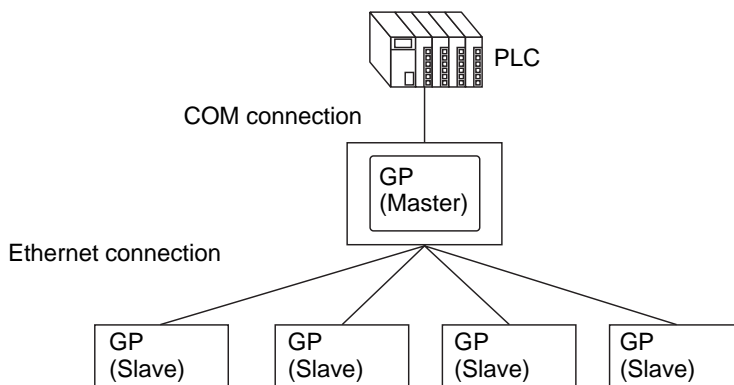


NOTE

- After converting a device/PLC, any parts, D-Scripts, Alarms, etc., must have their device addresses set again. Also, please save any screens that use a Special Switch set to [Screen Change].
 - If using an Ethernet communication driver when converting multiple device/PLCs, [UDP] and [TCP] cannot be set up in the same driver.
For example, when [Device/PLC1 has been set to MELSEC A Ethernet [UDP] type, [Device/PLC2] cannot be set to MELSEC A Ethernet [TCP] type.
-

7.5 Connecting Multiple GPs to One PLC (Ethernet Multilink)

7.5.1 Introduction



One master GP and 16 slave GPs can be connected to one PLC simultaneously. Only the master GP communicates with the PLC. Slave GPs communicate with the master GP.

NOTE

- GP-Viewer EX can be connected only to the master. Refer to the following for information on GP-Viewer EX.
 ☞ Chapter 37 "Use the Computer to Display and Operate GP Data", page 37-1
- Using the same control device address (Device/PLC) on multiple GP units for parts may not operate correctly. For example, if the same address is set to the control word address of Data Block Display Graphs, even if the update graph action is initiated on the master GP, the graph on the master GP may not be updated and instead the graph on a slave GP gets updated. If this type of error occurs, set up a unique address for each GP.
- In the [System Settings] window, [Display Unit] page's [Display] tab, select the [Reflect in Device/PLC] check box, and the same System Area Start Address is used for the master and slaves, all the GP units will share these values. For example, by sharing the [Current Screen Number] you can simultaneously change all the screens on the master and slave GPs.

■ **Compatible Models**

Series	Model	Model Number	
GP-3000 Series	GP3200A	AGP3200-A1-D24	
	GP3200T	AGP3200-T1-D24	
	GP-3300HL	AGP3300H-L1-D24	
	GP-3300HS	AGP3300H-S1-D24	
	GP-3310HT	AGP3310H-T1-D24	
	GP3300L		AGP3300-L1-D24 Rev.4 or later
			AGP3300-L1-D24-D81K Rev.4 or later
			AGP3300-L1-D24-D81C Rev.4 or later
			AGP3300-L1-D24-FN1M Rev.4 or later
			AGP3300-L1-D24-CA1M Rev.4 or later
	GP3300S		AGP3300-S1-D24 Rev.4 or later
			AGP3300-S1-D24-D81K Rev.4 or later
			AGP3300-S1-D24-D81C Rev.4 or later
			AGP3300-S1-D24-CA1M Rev.4 or later
	GP3300T		AGP3300-T1-D24 Rev.4 or later
			AGP3300-T1-D24-D81K Rev.4 or later
			AGP3300-T1-D24-D81C Rev.4 or later
			AGP3300-T1-D24-FN1M Rev.4 or later
			AGP3300-T1-D24-CA1M Rev.4 or later
	GP3400S		AGP3400-S1-D24
			AGP3400-S1-D24-D81K
			AGP3400-S1-D24-D81C
			AGP3400-S1-D24-CA1M
	GP3400T		AGP3400-T1-D24
			AGP3400-T1-D24-D81K
			AGP3400-T1-D24-D81C
			AGP3400-T1-D24-FN1M
			AGP3400-T1-D24-CA1M
	GP3450T		AGP3450-T1-D24
	GP3500L		AGP3500-L1-D24
			AGP3500-L1-D24-D81C
	GP3500S		AGP3500-S1-D24
			AGP3500-S1-D24-D81K
			AGP3500-S1-D24-D81C
			AGP3500-S1-AF
			AGP3500-S1-AF-D81K
			AGP3500-S1-AF-D81C
			AGP3500-S1-D24-CA1M
			AGP3500-S1-AF-CA1M

Continued

Series	Model	Model Number
GP-3000 Series	GP3500T	AGP3500-T1-D24
		AGP3500-T1-D24-D81K
		AGP3500-T1-D24-D81C
		AGP3500-T1-D24-FN1M
		AGP3500-T1-AF
		AGP3500-T1-AF-D81K
		AGP3500-T1-AF-D81C
		AGP3500-T1-AF-FN1M
		AGP3500-T1-D24-CA1M
		AGP3500-T1-AF-CA1M
		GP3510T
	AGP3510-T1-AF-CA1M	
	GP3550T	AGP3550-T1-AF
	GP3560T	AGP3560-T1-AF
	GP3600T	AGP3600-T1-AF
		AGP3600-T1-AF-D81K
		AGP3600-T1-AF-D81C
		AGP3600-T1-AF-FN1M
		AGP3600-T1-D24
		AGP3600-T1-D24-D81K
		AGP3600-T1-D24-D81C
		AGP3600-T1-D24-FN1M
		AGP3600-T1-D24-CA1M
		AGP3600-T1-AF-CA1M
	GP3650T	AGP3650-T1-AF
	GP3750T	AGP3750-T1-AF
		AGP3750-T1-D24

Continued

Series	Model	Model Number
IPC Series	PS-2000B	PS2000B-41
	PS-3450A	PS3450A-T41
		PS3450A-24V
	PS-3451A	PS3451A-T41-24V
	PS-3650A	PS3650A-T41
	PS-3651A	PS3651A-T41
	PS-3700A	PS3700A-T41-ASU-P41
	PS-3710A	PS3710A-T41
		PS3710A-T41-PA1
	PS-3711A	PS3711A-T41-24V
	APL-3*00	APL3000-BA
		APL3000-BD
		APL3600-TA
		APL3600-TD
		APL3600-KA
		APL3600-KD
		APL3700-TA
		APL3700-TD
APL3700-KA		
APL3700-KD		
APL3900-TA		
APL3900-TD		


7.5.2 Setup Procedure

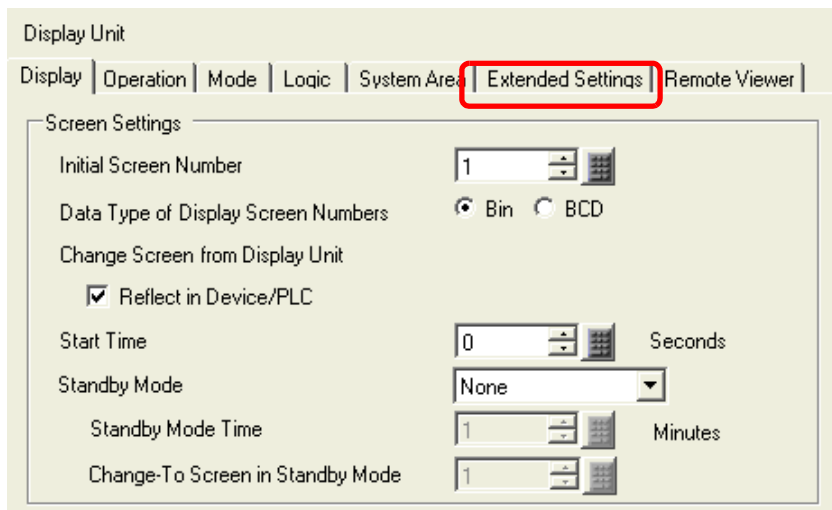
IMPORTANT

- If the total communications traffic of the connected GP exceeds the upper limit of the maximum constant communications traffic, the slave that has attempted connection will be refused access. In addition, if the upper limit is exceeded by the master GP only, slave GPs cannot be connected. Create project data considering data traffic. For the upper limit of data traffic and how to calculate it, refer to the following: ["7.5.3 How to Calculate Communication Traffic" \(page 7-33\)](#)

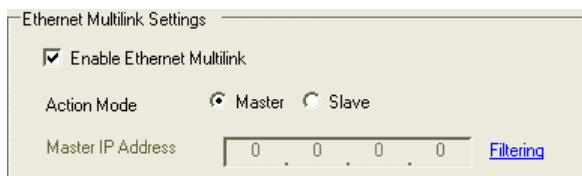
NOTE

- Prepare to transfer projects for all associated GPs. Create all the projects in the same version of GP-Pro EX, and set up the same settings in the [System Settings] workspace's [Device/PLC] page.
- Please refer to the Settings Guide for details. ["7.7.3 System Settings \[Display Unit\] - \[Extended Settings\] - \[Ethernet Multilink Settings\] Settings Guide" \(page 7-47\)](#)

- 1 From the [Project (F)] menu, select [System Settings (S)] or click  to click [Display Unit] in the system settings window. The [Display Unit] screen appears. Click the [Extended Settings] tab.



- 2 From [Ethernet Multilink Settings], select the [Enable Ethernet Multilink] check box. From [Action Mode], select Master or Slave GP to transfer this project, and input the IP address of the master GP in [Master IP Address].



NOTE

- When setting so that only the slave GPs with a particular IP address can be connected, click [Filtering] and set from the [Filtering Settings] dialog box.
☞ "7.7.3 System Settings [Display Unit] - [Extended Settings] - [Ethernet Multilink Settings] Settings Guide" (page 7-47)

3 Create screen data and transfer it to the GP.

7.5.3 How to Calculate Communication Traffic

IMPORTANT

- Create a screen (PRX) so that the total station constant communications traffic of Master GP, GP-Viewer EX and Slave GPs will not exceed 8090. If the total station constant communications traffic exceeds the upper limit, the slave that has attempted connection will be refused access. In addition, if the upper limit is exceeded by the master GP only, slave GPs cannot be connected.

Use the following to check the total communication traffic during the screen drawing process.

- 1 First, for each GP, the total number of addresses set up in parts and D-Scripts should not exceed 475.
From the [Screen (S)] menu, select [Screen Information (I)] to view the number of addresses.

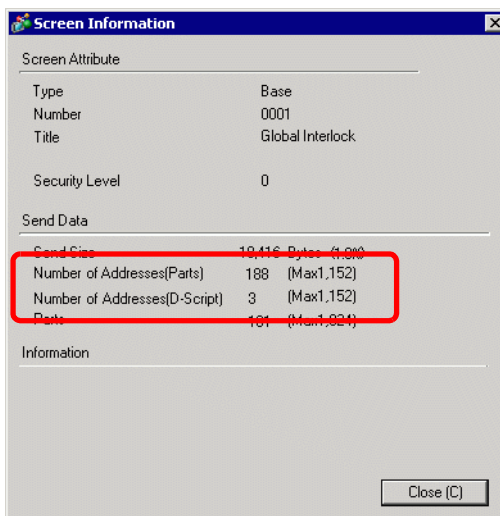
The master GP receives requests from slave GPs, GP-Viewer EX, and the master GP. Its constant communication traffic is calculated as being 475 addresses, even if the number of addresses on the screen does not exceed 475. Except when addresses exceed 475. Design your system so the total number of addresses for parts and D-scripts on the screen does not exceed 475. Performance deteriorates when the total number of addresses exceed 475.

IMPORTANT

- For all screens, ensure that the total of Number of Addresses (Parts) and Number of Addresses (D-Script) does not exceed 475.

NOTE

- The total constant communication traffic for the nodes is stored in #H_EtherLink_ConstCommuniMemInfo on the master GP.



- 2 Calculate the station constant communications traffic of each GP.

Station Constant Communications Traffic =

475 + Sound Constant Communications Traffic + Alarm Constant Communications Traffic + Sampling Constant Communications Traffic

NOTE

- If the constant communication traffic for sound, alarms and sampling exceeds the maximum limit, an error appears when saving the project.
 - The GP Viewer node's constant communication traffic does not include the constant communication traffic of sound, alarms and sampling.
-

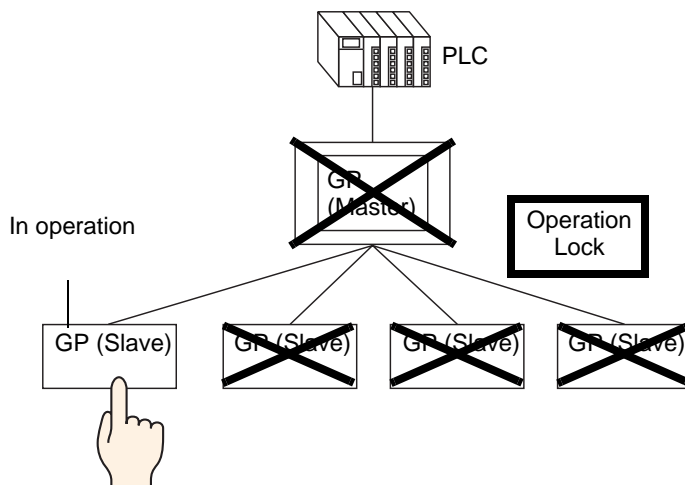
3 Total the station constant communications traffic of each GP.

NOTE

- If the total station constant communications traffic exceeds the upper limit and connection fails, reduce the sound, alarms or sampling data before transferring, and connect again.
-

7.6 In a Multiple GP Environment, Make Only One GP Active

7.6.1 Introduction



When multiple GPs are connected to the PLC, an operation lock can be set so that touch operation of other GPs is disabled while one GP is operating.

NOTE

- For information on compatible models, see the following.
 - ☞ "7.5.1 Introduction" (page 7-28)
- With the operation lock function, regardless of whether it is a Master GP, Slave GP or GP-Viewer, the first GP operated will be the lock-from GP and touch operation of the other GPs will be locked.
- For details when the Operation Lock feature is enabled in GP-Viewer EX, please refer to the following:
 - ☞ Chapter 36 "Display or Operate a Computer from the GP", page 36-1
- While the operation lock is engaged, touch will not work on GPs other than the lock-from GP, but within the Master and Slave GPs, D-Script, Trigger, Ladder program and PLC Logic Program will be executed.
- Depending on the communication status and system configuration, other touch operations may be disabled and responsiveness may be slow while the lock is being retrieved/updated with screen touch and/or the operation lock switch.
- If screen touch is operated immediately after connecting, or immediately after recovering a disconnected connection, an error may occur.

In case of Ethernet Multilink, values are not written to the master station when an error occurs. Similarly, when the Operation Lock feature is used in GP-Viewer EX, values are not written to the Display, either.
- The function key set for handy type GPs is also subject to the Operation Lock.
- Station constant communications traffic processed by a Master can be checked by referring to the system variable #H_EtherLink_ConstCommuniMemInfo).
- Lock information appears on the standby GP screen.
 - ☞ "7.6.3 GP Screen While Operation Lock Is Engaged" (page 7-39)

7.6.2 Setup Procedure

There are two methods for setting an operation lock as follows.


- Touch the screen to set an Operation Lock
- Place [Operation Lock Switch]

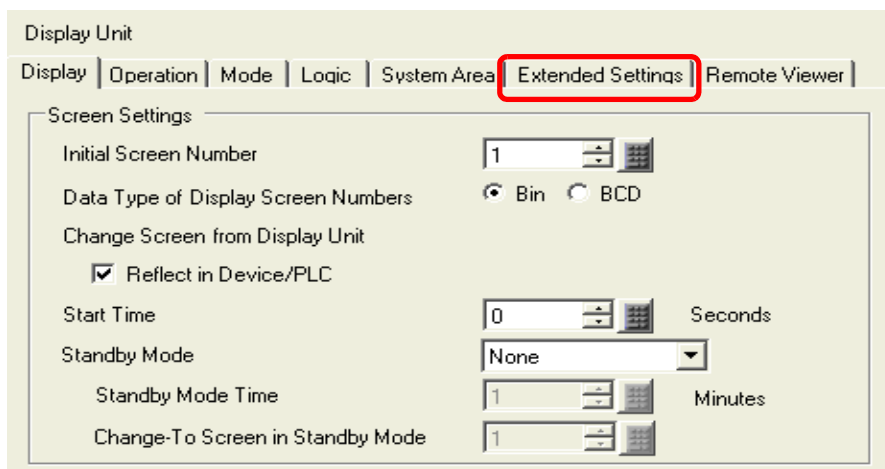
■ Touch the screen to set an Operation Lock

When the screen of one GP is touched, touch operation is disabled on other GPs.

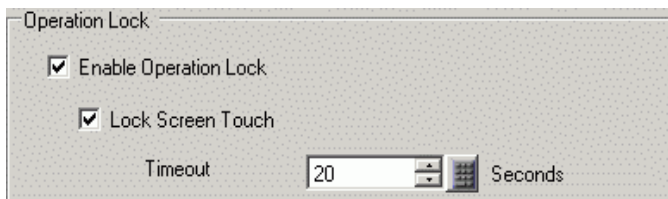
NOTE

- Please refer to the Settings Guide for detailed settings.
 ↳ "7.7.3 System Settings [Display Unit] - [Extended Settings] - [Ethernet Multilink Settings] Settings Guide" (page 7-47)

- 1 From the [Project (F)] menu, select [System Settings (S)] or click  to click [Display Unit] in the system settings window. The [Display Unit] screen appears. Click the [Extended Settings] tab.



- 2 In [Operation Lock], select the [Enable Operation Lock] and [Lock Screen Touch] check boxes.



- 3 Set the number of seconds until the lock is automatically unlocked when there is no new touch operation in the lock—from GP in [Timeout].


■ Place an [Operation Lock Switch]

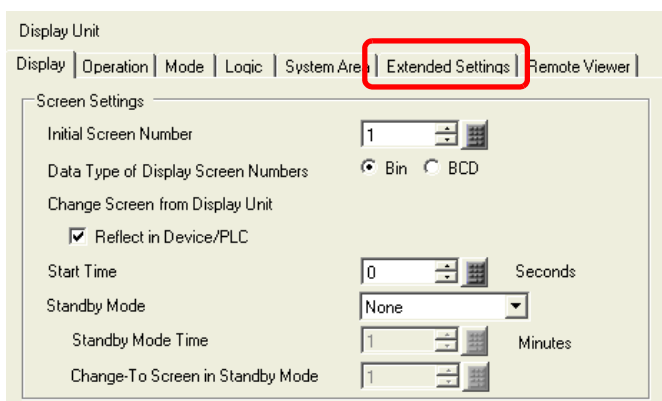
Touching the Operation Lock Switch sets and unlocks an Operation Lock.

A GP on which an Operation Lock Switch is touched for executing the lock will become the lock-from GP. To unlock the lock, the Unlock Switch needs to be touched on the lock-from GP.

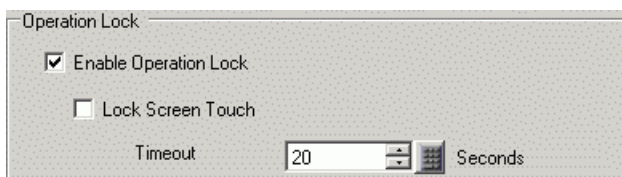
NOTE


- Please refer to the Settings Guide for detailed settings.
☞ "10.15.4 Special Switch" (page 10-70)
- For details of the part placement method and the address, shape, color, and label setting method, refer to the "Part Editing Procedure".
☞ "8.6.1 Editing Parts" (page 8-44)

- 1 From the [Project (F)] menu, select [System Settings (S)] or click  to click [Display Unit] in the system settings window. The [Display Unit] screen appears. Click the [Extended Settings] tab.

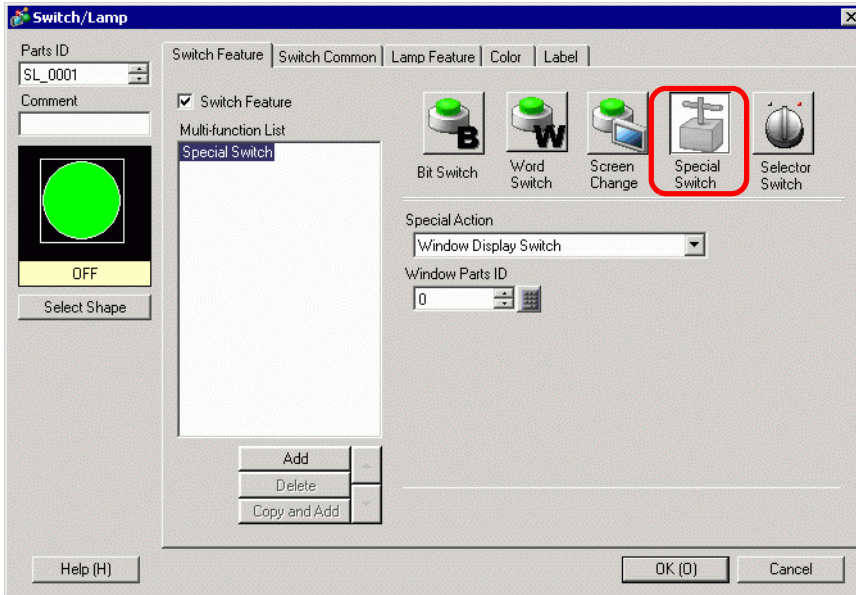


- 2 In [Operation Lock], select the [Enable Operation Lock] check box.



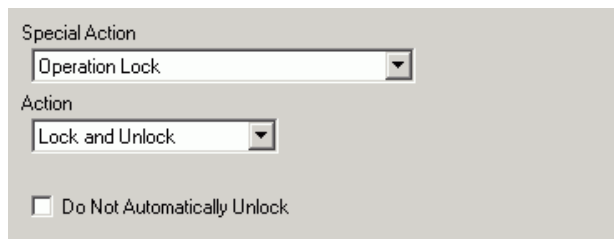
- 3 In [Timeout], set the number of seconds until the lock is automatically unlocked when there is no new touch operation on the lock-from GP.
- 4 On the [Parts (P)] menu, point to [Switch Lamp (C)], and then click [Special Switch (P)] or click  to place the switch.

5 Double-click the placed Switch part. The following dialog box appears.



6 In [Select Shape], select the Switch shape.

7 In [Special Action], select [Operation Lock], and in [Action], select the switch type that you want to set.



NOTE

- Select the [Do Not Automatically Unlock] check box, and the lock will not be unlocked even if the time set in [Timeout] has passed. To unlock, [Action] needs to be [Lock and Unlock], or a Special Switch set for [Unlock] needs to be placed.

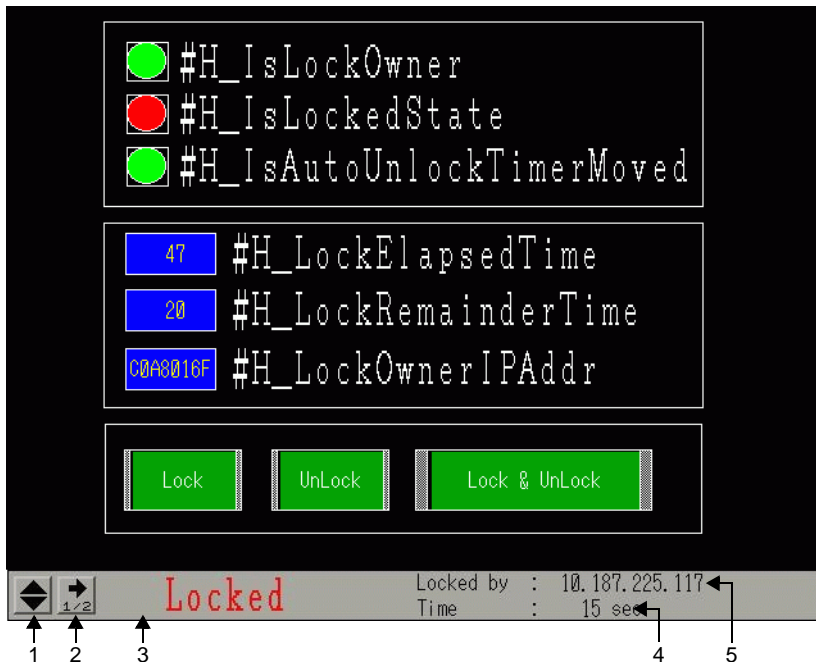
8 As needed, define the switch color and the text to display in the [Color] tab and [Label] tab, and click [OK].

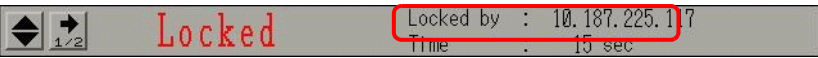
NOTE

- Depending on the shape, you may not be able to change the color.
- Select the switch and press the [F2] key, and you can directly edit the text on the label.

7.6.3 GP Screen While Operation Lock Is Engaged

While an Operation Lock is engaged, the following screen appears on GPs other than the lock-from GP, and operation by touch is disabled.



Display content	
1	Changes the display position of the label between the top and the bottom of the screen.
2	Changes the screen to the second screen page.  On the second screen page, the station name of the lock-from GP appears. If the lock-from GP is GP-Viewer, nothing appears.
3	Shows that Operation Lock. has been engaged for the screen. Blinks during an Operation Lock.
4	Shows the time until the Operation Lock is automatically unlocked. When the remaining time is 0, the Operation Lock is unlocked. When moved to the second page, the time elapsed since engagement of the Operation Lock appears.
5	Displays the IP address of the lock-from GP.

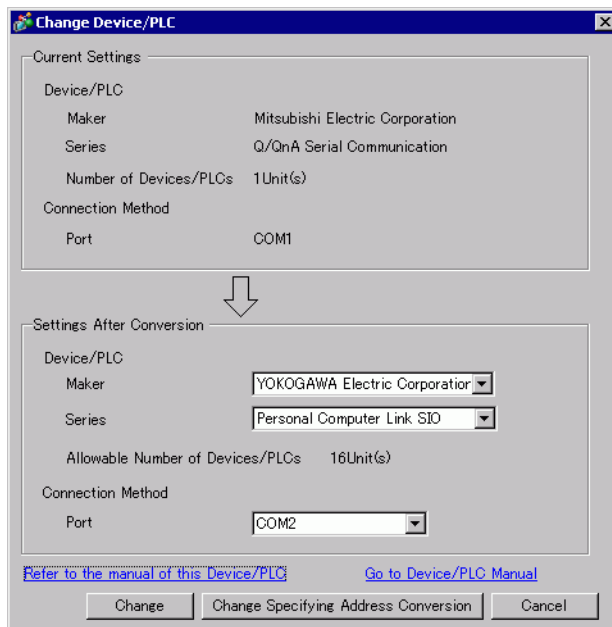
NOTE

- Because the lock status is not shown in the lock-from GP, it cannot be checked from the GP even if it is locked unintentionally. To check the status in the lock-from GP, add Lamp Feature to Operation Lock Switch. Assign the system variable "#H_IsLockOwner" to Lamp Feature to set the status so that lock and unlock can be switched, and you can check the lock status from the lock-from GP.
 - For the station name, text that can be displayed is dependent on the screen size.
 - QVGA display: up to 17 characters
 - VGA display: up to 26 characters
-

7.7 Settings Guide

7.7.1 [Change Device/PLC] Settings Guide

In the [Device/PLC] page click [Change Device/PLC] and the following dialog box appears. Select the model of the Device/PLC you want to change.



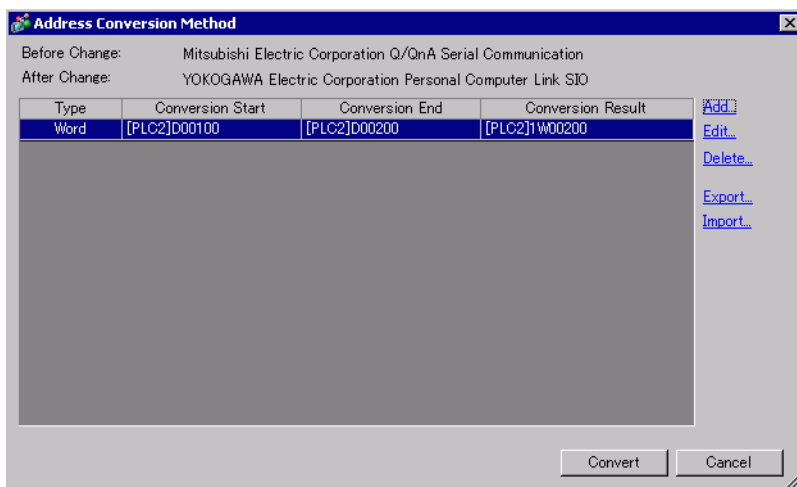
	Setting	Description
Current Settings	Maker	Displays the maker of the currently set device/PLC.
	Series	Displays the series for the currently specified PLC.
	Number of Device/PLCs	Displays the number of connected devices for the currently set PLC.
	Port	Displays the connection port of the currently specified device/PLC.
Settings After Conversion	Maker	Sets the maker of the new PLC.
	Series	Sets the series of the new PLC.
	Allowable Number of Devices/PLCs	Displays the number of devices that can be connected with the new PLC.
	Port	Select a connection port for the new PLC from among [COM1], [COM2], [Ethernet UDP], and [Ethernet TCP].
	Refer to this Device/PLC manual.	Displays the page for a changed device/PLC in the "GP-Pro EX Device/PLC Manual".
	Go to Device/PLC Manual	Displays the top page of the "GP-Pro EX Device/PLC Manual".

Continued

Change	<p>Changes the model of device without specifying an address conversion pattern.</p> <p>NOTE</p> <ul style="list-style-type: none"> Because no address conversion pattern is specified, if there is no destination address code, the address may not display correctly.
Change Specifying Address Conversion	<p>Changes the model of device by specifying an address conversion pattern. Designate the previous address range and the top address of the destination device/PLC.</p>
Cancel	<p>Cancels the settings of the new device/PLC.</p>

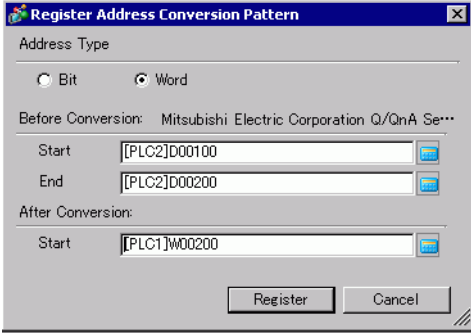
7.7.2 [Address Conversion Method] Settings Guide

On the [Change Device/PLC] dialog box, click [Change Specifying Address Conversion], and the following dialog box appears. You can specify an Address Conversion Range when changing device/PLC models.

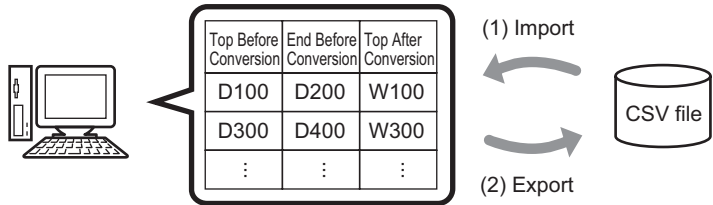
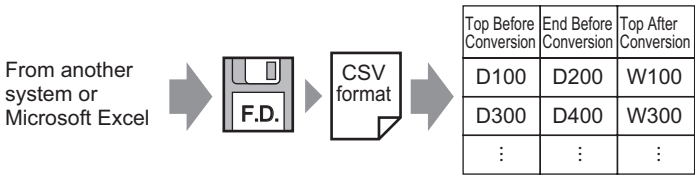
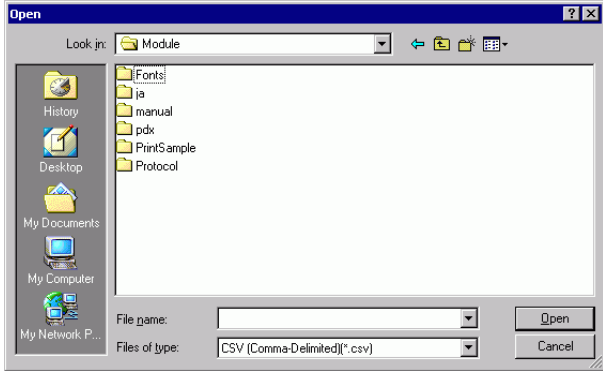


Setting	Description
Before Change	Displays the maker and series of the old PLC.
After Change	Displays the maker and series of the new PLC.
Type	Displays [Word] or [Bit], depending on which is the conversion address type.
Conversion Start	Displays the start value of the device address used before the address conversion.
Conversion End	Displays the end value of the device address used before the address conversion.
Conversion Result	Displays the start value of the device address used after the address conversion.


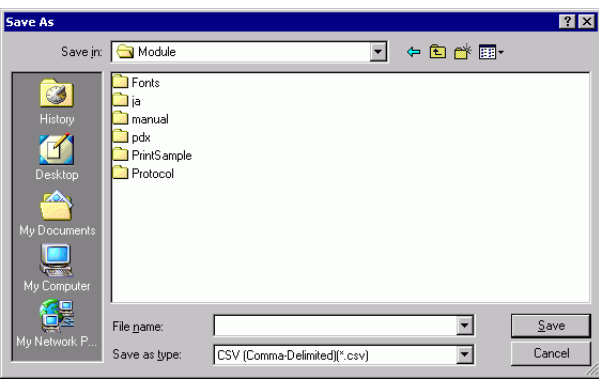
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Setting	Description
Add/Edit	<p>Add/edit new settings for an address conversion pattern. The following dialog box appears.</p> 
Address Type	Choose conversion address type from [Bit] or [Word].
Before Conversion	Displays the maker and series of the old PLC.
Start	Set the source PLC and the start address.
End	Set the source PLC and the end address.
After Conversion	Displays the maker and series of the new PLC.
Start	Set the destination PLC and the start address.
Delete	Delete the address conversion pattern.

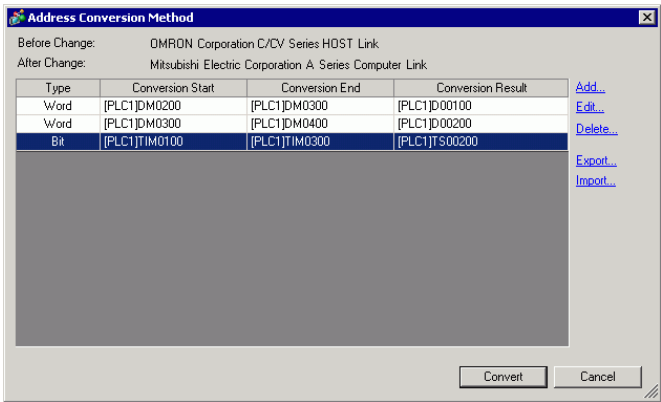
Continued

Setting	Description
Export/Import	<p>Read (Import) or output (Export) the contents of an Address Conversion Pattern.</p> <div style="text-align: center;">  </div> <p>Import You can use a previously saved file in CSV format to create an address conversion pattern file (see (2)). Address conversion pattern files can be used in a different project by importing them.</p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • Click on [Import] and the following [Open File] dialog box appears. Select the location and file name, click [Open] and the file will be imported. <div style="text-align: center;">  </div> <p>NOTE</p> <ul style="list-style-type: none"> • When importing a CSV file, make sure it matches the address conversion pattern format. If the formats do not match, the file will not be successfully imported.

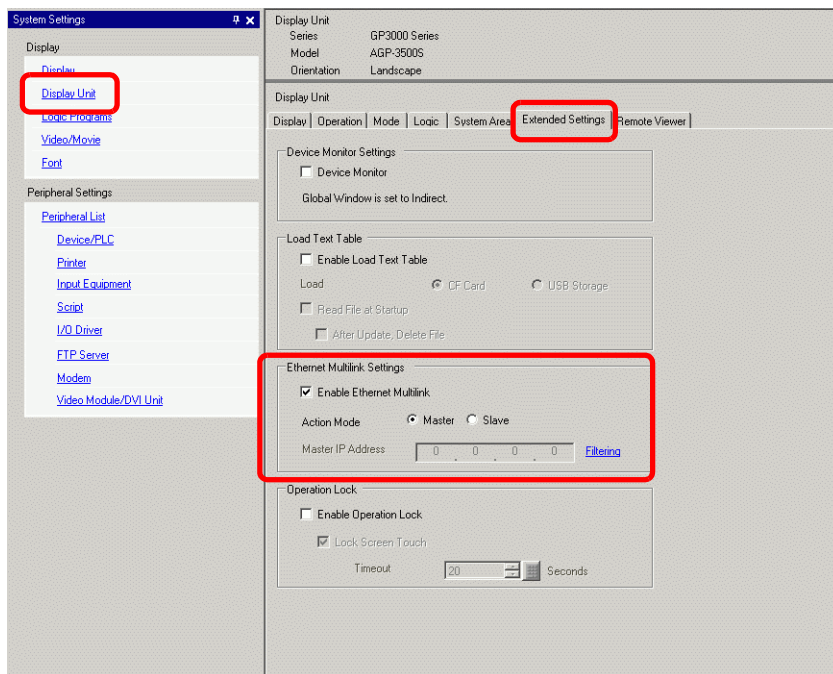
Continued

Setting	Description												
<p>Export/Import</p>	<p>Export</p> <p>You can export registered address conversion patterns to other applications by saving them in CSV format.</p> <p>The saved file can then be edited in Microsoft Excel or in other spreadsheet software.</p> <div style="text-align: center;"> <table border="1" data-bbox="473 357 706 531"> <thead> <tr> <th>Top Before Conversion</th> <th>End Before Conversion</th> <th>Top After Conversion</th> </tr> </thead> <tbody> <tr> <td>D100</td> <td>D200</td> <td>W100</td> </tr> <tr> <td>D300</td> <td>D400</td> <td>W300</td> </tr> <tr> <td>⋮</td> <td>⋮</td> <td>⋮</td> </tr> </tbody> </table>  </div> <ul style="list-style-type: none"> • Click on [Export] and the following [Save As] dialog box appears. Select the location and file name, click [Save] and the file will be exported. <div style="text-align: center;">  </div> <p>NOTE</p> <ul style="list-style-type: none"> • This setting can be used when there are multiple address conversion patterns. • The exported CSV file can be edited in a spreadsheet program such as Microsoft Excel. 	Top Before Conversion	End Before Conversion	Top After Conversion	D100	D200	W100	D300	D400	W300	⋮	⋮	⋮
Top Before Conversion	End Before Conversion	Top After Conversion											
D100	D200	W100											
D300	D400	W300											
⋮	⋮	⋮											

Continued

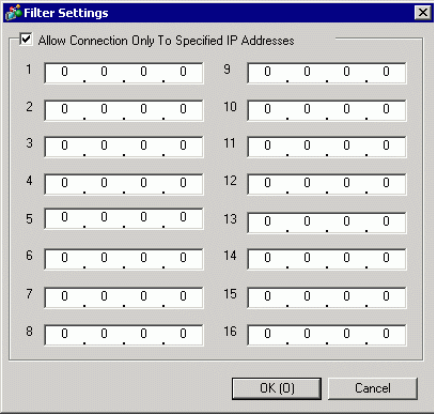
Setting	Description																														
<p>Export/Import</p>	<ul style="list-style-type: none"> • Sample Output to a CSV File Export data's CSV format is displayed as follows. Address conversion patterns before export  <p>The CSV file created by exporting the above file</p> <pre> Pattern List Key Name *1 OMR_CSIO Convert-From driver MIT_ACPU Convert-To driver 0,[PLC1]DM0200,[PLC1]DM0300,[PLC1]D0100..... [Type] *2, [Device/PLC Name] Convert-From Start Address, [Device/PLC Name] Convert-From End Address, [Device/PLC Name] Convert-To Start Address 0,[PLC1]DM0300,[PLC1]DM0400,[PLC1]D0200..... [Type]*2, [Device/PLC Name] Convert-From Start Address, [Device/PLC Name] Convert-From End Address, [Device/PLC Name] Convert-To Start Address 1,[PLC1]TIM0100,[PLC1]TIM0300,[PLC1]TS0200..... [Type]*2 [Device/PLC Name] Convert-From Start Address, [Device/PLC Name] Convert-From End Address, [Device/PLC Name] Convert-To Start Address </pre> <p>When the above CSV file is represented in tabular format, it looks as follows.</p> <table border="1" data-bbox="389 1425 1146 1634"> <tr> <td>Pattern List</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><u>OMR_CSIO</u></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><u>MIT_ACPU</u></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>0</td> <td>[PLC1]DM0200</td> <td>[PLC1]DM0300</td> <td>[PLC1]D0100</td> </tr> <tr> <td></td> <td>0</td> <td>[PLC1]DM0300</td> <td>[PLC1]DM0400</td> <td>[PLC1]D0200</td> </tr> <tr> <td></td> <td>1</td> <td>[PLC1]TIM0100</td> <td>[PLC1]TIM0300</td> <td>[PLC1]TS0200</td> </tr> </table> <p>*1 This is the special text used to identify the address conversion pattern's CSV file.</p>	Pattern List					<u>OMR_CSIO</u>					<u>MIT_ACPU</u>						0	[PLC1]DM0200	[PLC1]DM0300	[PLC1]D0100		0	[PLC1]DM0300	[PLC1]DM0400	[PLC1]D0200		1	[PLC1]TIM0100	[PLC1]TIM0300	[PLC1]TS0200
Pattern List																															
<u>OMR_CSIO</u>																															
<u>MIT_ACPU</u>																															
	0	[PLC1]DM0200	[PLC1]DM0300	[PLC1]D0100																											
	0	[PLC1]DM0300	[PLC1]DM0400	[PLC1]D0200																											
	1	[PLC1]TIM0100	[PLC1]TIM0300	[PLC1]TS0200																											

7.7.3 System Settings [Display Unit] - [Extended Settings] - [Ethernet Multilink Settings] Settings Guide

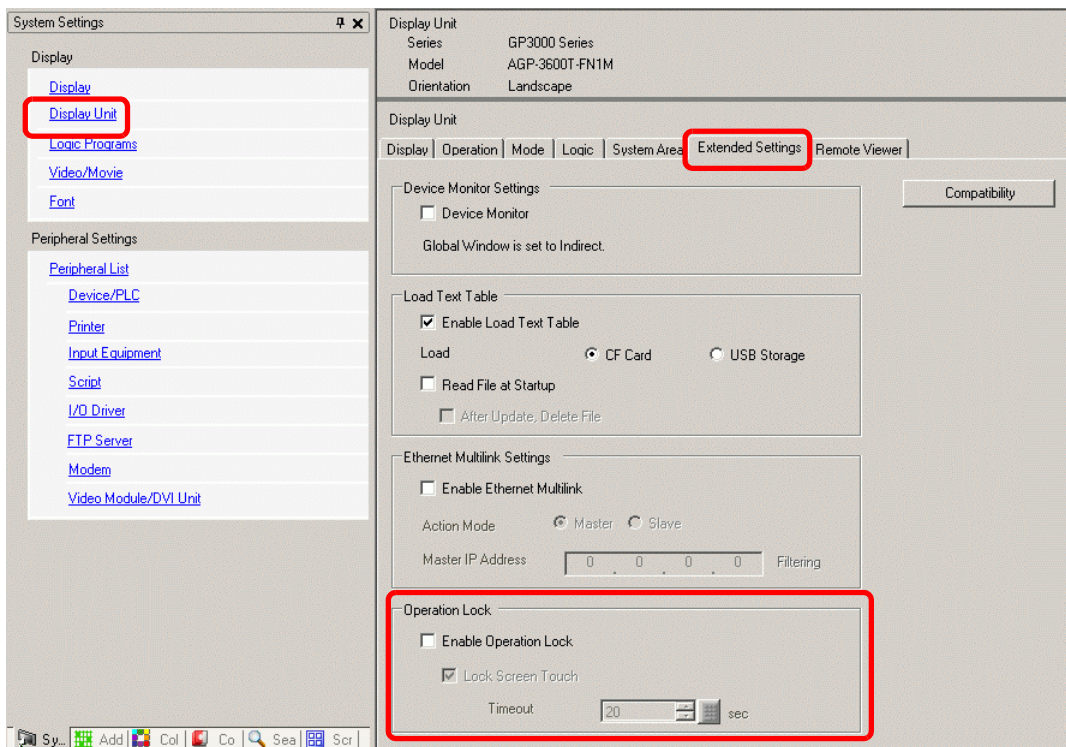


Setting	Description
Enable Ethernet Multilink	Select the check box, and multiple GPs can be connected to one PLC.
Action Mode	Set Master GP or Slave GP for the GP to which the created project is to be transferred. NOTE <ul style="list-style-type: none"> In [Display Unit] - [Remote Access] - [Remote Viewer], if the [Enable] check box is selected, [Slave] cannot be selected.
Master IP Address	Input the IP address of the Master GP. NOTE <ul style="list-style-type: none"> Cannot be set if [Master] is selected in [Action Mode].

Continued

Setting	Description
<p>Filtering</p>	<p>Click to display the [Filtering Settings] screen.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Cannot be set if [Slave] is selected in [Action Mode]. 
<p>Allowing Connection for a Specified Address</p>	<p>When the check box is selected, only slaves with the IP address registered in the list displayed below can be connected.</p>


7.7.4 System Settings [Display Unit] - [Extended Settings] - [Operation Lock] Settings Guide



Setting	Description
Enable Operation Lock	<p>When the check box is selected, touch operation from other GPs is locked during operation with one GP.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Cannot be set if [Slave] is selected in [Ethernet Multilink Settings] - [Action Mode].
Lock with Screen Touch	<p>When the check box is selected, touching the screen of a GP locks the touch operation of other GPs.</p>
Timeout	<p>Set the number of seconds until the lock is automatically unlocked when there is no new touch operation on the lock-from GP after Operation Lock is enabled.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Cannot be set if [Slave] is selected in [Ethernet Multilink Settings] - [Action Mode]. • If a Operation Lock is enabled via an Operation Log Switch with the [Do Not Automatically Unlock] check box selected, the Operation Lock will not be unlocked even if the time set therein has elapsed. <p>☞ "7.6.2 Setup Procedure" (page 7-37)</p>

7.8 Restrictions

7.8.1 Restrictions When Connected to Multiple Devices/PLCs

- After converting a device/PLC, any parts, D-Scripts, Alarms, etc., must have their device addresses set again. Also, please save any screens that use a Special Switch set to [Screen Change].
- If you change the device/PLC by clicking the [Change] button in the [Change Device/PLC] dialog box, the address conversion pattern may not display correctly if there is no device code at the destination. Confirm all device addresses used in the project and correct the relevant addresses.
- When using an Ethernet communication driver with multiple connections, [UDP] or [TCP] cannot be set up in the same driver.
For example, when [Device/PLC1] has been set to MELSEC A Ethernet [UDP] type, [Device/PLC2] cannot be set to MELSEC A Ethernet [TCP] type.
- When deleting the settings for multiple connected PLCs, connected devices whose addresses are already used inside a project cannot be deleted. If you cannot delete PLC settings, click [Project] menu - [Utility] command and open [Cross Reference]. You can then check which addresses are being used. Delete the PLC settings after either replacing the address in use or deleting the unused address.
- You cannot stop the communication scan of a device specified with the System Area Start Address. However, if you are not using the System Data Area, you can stop the communication scan.
 "5.17.6 [System Settings] Setting Guide" (page 5-175)

7.8.2 Restrictions When Connecting Multiple GPs (Ethernet Multilink)

- If the total communications traffic of the connected GP exceeds the upper limit of the maximum constant communications traffic, the slave that has attempted connection will be refused access. In addition, if the upper limit is exceeded by the master GP only, slave GPs cannot be connected.

Create project date considering data traffic.

For the upper limit of data traffic and how to calculate it, refer to the following:

☞ "7.5.3 How to Calculate Communication Traffic" (page 7-33)

- Create screens so that the total station constant communications traffic of all of the screens will not exceed 8090. If the total station constant communications traffic exceeds the upper limit, the slave that has attempted connection will be refused access. In addition, if the upper limit is exceeded by the master GP only, slave GPs cannot be connected.
- Ensure that the total of the number of parts addresses and the number of device addresses is 475 or less. An excessive load will be placed on the Master, which may cause errors and/or access failure.
- The following PLCs are not supported.
 - Fuji Electric FA Components & Systems Co., Ltd: MICREX-SX Series SIO
 - Rockwell Automation, Inc.: EtherNet/IP ControlLogix/CompactLogix Series Native
- The Pass-Through feature, Device Monitor feature, Ladder Monitor feature, and Extended Script cannot be used on Slave GPs. If you would like to share values obtained using Extended Script on a Master with slaves, select Memory Link for a device/PLC and expand the Extended Script used in Master GP with a Memory Link to share it with the slave GPs.
- Network project files are not loaded on slave GPs. Therefore, the distribution/collection feature of Pro-Server EX cannot be used.

Also, device address values of PLCs cannot be read with Device Monitor, Symbol Monitor and API of Pro-Server EX. Device address values of internal devices (USR, LS) can be read.
- Since slave GPs do not communicate directly with PLCs, these GPs cannot get communication error information from system variables or the LS area.
- The above also applies even when slave GPs use memory link to reference the device/PLC connected to the master GP.

As a result, when using memory link, slave GPs cannot control its own memory areas (listed below) or see its own status.

#MEMLINK 0000 - 0019 (System Data Area)

#MEMLINK 2032 - 2095 (Special Relay Area)

#MEMLINK 9000 - 9999 (9000 Area)

