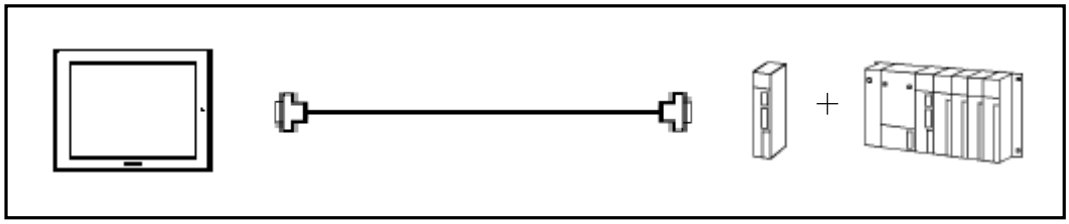
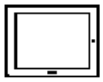
OMRON Corporation PLC
SYSMAC CJ Series Connection

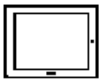
System Structure



GP

Machine 	Model	Remark
GP	GP70 Series GP77/77R Series GP2000 Series	Excepting for handy types.
GLC	GLC2000 Series	

PLC

CPU 	Link Interface 	Communication Method	Connection Cable 	GP 
CJ1G-CPU44 CJ1G-CPU45	Peripheral Port on CPU Unit	RS-232C	**Connection Method [2]**	
	RS-232C Port on CPU Unit	RS-232C	**Connection Method [1]**	
	CJ1W-SCU41	RS-232C (COM Port 2)	**Connection Method [1]**	
		RS-422 (COM Port 1)	**Connection Method [3]**	

Procedure to Connect PLC

Select PLC Type on GP-PRO/PBⅢ C-Package.

Refer to **Selecting PLC Type**

Set the GP and PLC settings as the communication setting sample.

Refer to **Communication Setting Sample**

Set GP communication.
There are 2 ways.

- Setting on GP-PRO/PBⅢ C-Package and transfer the data
- Setting on the Offline of the GP main unit.

Refer to **Communication Settings [GP]**

Set PLC communication.

Refer to **Communication Settings [PLC]**

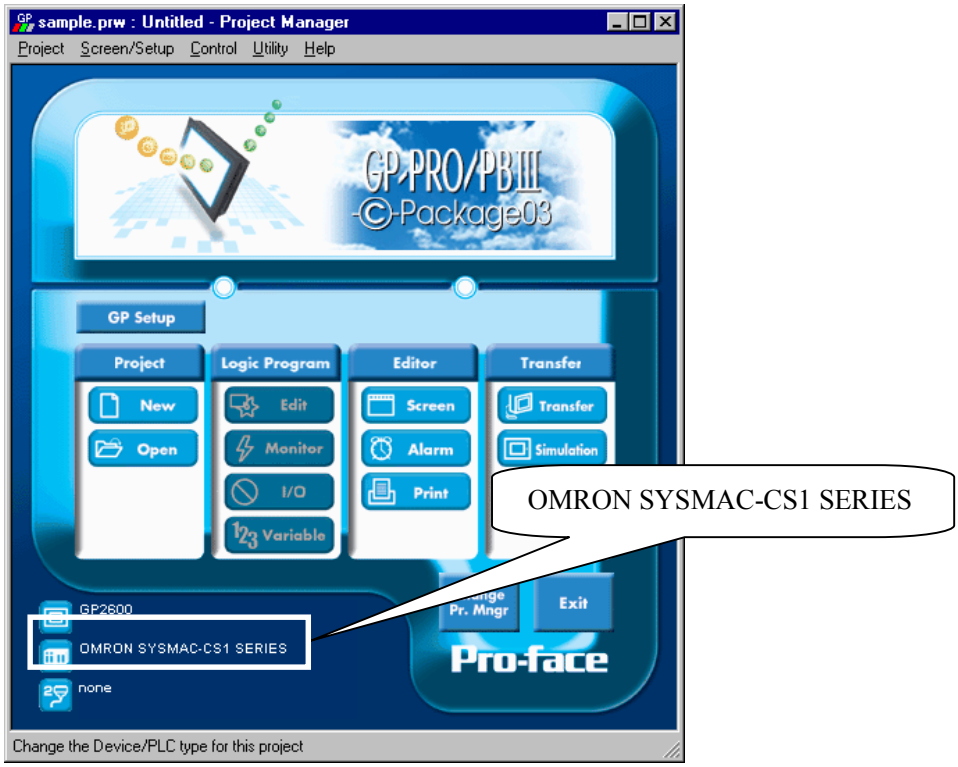
Connect PLC to GP.
Please check the connection method according to the connection type, or distance.

Refer to **Connection Method** & **Recommended Products**

Selecting PLC Type

Start up GP-PRO /PBIII.

Select the following PLC Type when creating the project file.



Communication Setting Sample

■ SYSMAC CS1/CJ/CJ1M Series < RS-232C Port on CPU Unit>

GP Setup		PLC Setup	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	————	————
Communication Format	RS-232C	————	————
Unit No.	0	Station No.	0
————	————	Dip Switch	SW1: OFF SW5: OFF SW7: OFF SW8: OFF
————	————	Mode Setup	Host Link

■ SYSMAC CS1/CJ/CJ1M Series <Communication Board/Unit>

Setup		PLC Setup	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	———	———
Communication Format (Using RS-232C)	RS-232C	———	———
Communication Format (Using RS-422)	4-Wire Type	WIRE (2-Wire/ 4-Wire Type Switch)	4-Wire Type
———	———	TERM (Termination Resistance Switch)	Termination Resistance ON
Unit No.	0	Host Link Station No.	0
———	———	Serial Communication Mode	Host Link
———	———	Communication Delay Time	0
———	———	CTS Control	None

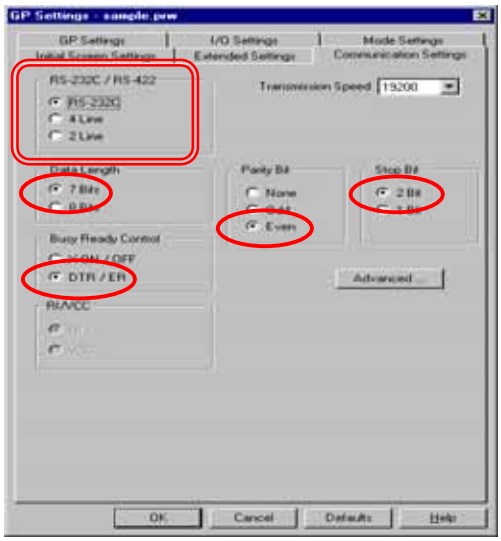
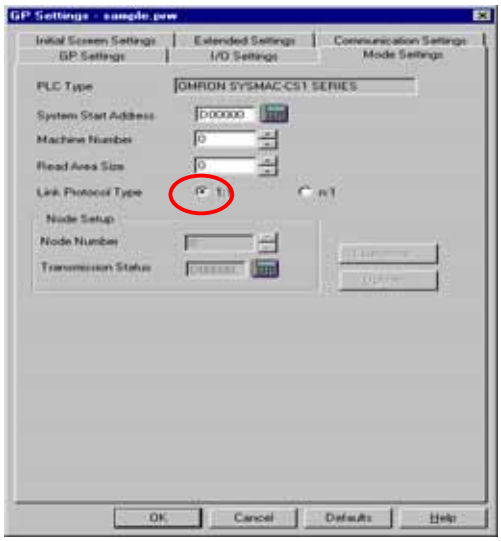
■ SYSMAC CS1/CJ/CJ1M Series <Peripheral Port on CPU Unit>

GP Setup		PLC Setup	
Baud Rate	19200bps	Baud Rate	19200bps
Data Length	7 bits	Data Length	7 bits
Stop Bit	2 bits	Stop Bit	2 bits
Parity Bit	Even	Parity Bit	Even
Data Flow Control	ER Control	———	———
Communication Format	RS-232C	———	———
Unit No.	0	Station No.	0
———	———	Dip Switch	SW1: OFF SW4: ON SW7: OFF SW8: OFF
———	———	Mode Setup	Host Link

Communication Settings [GP]

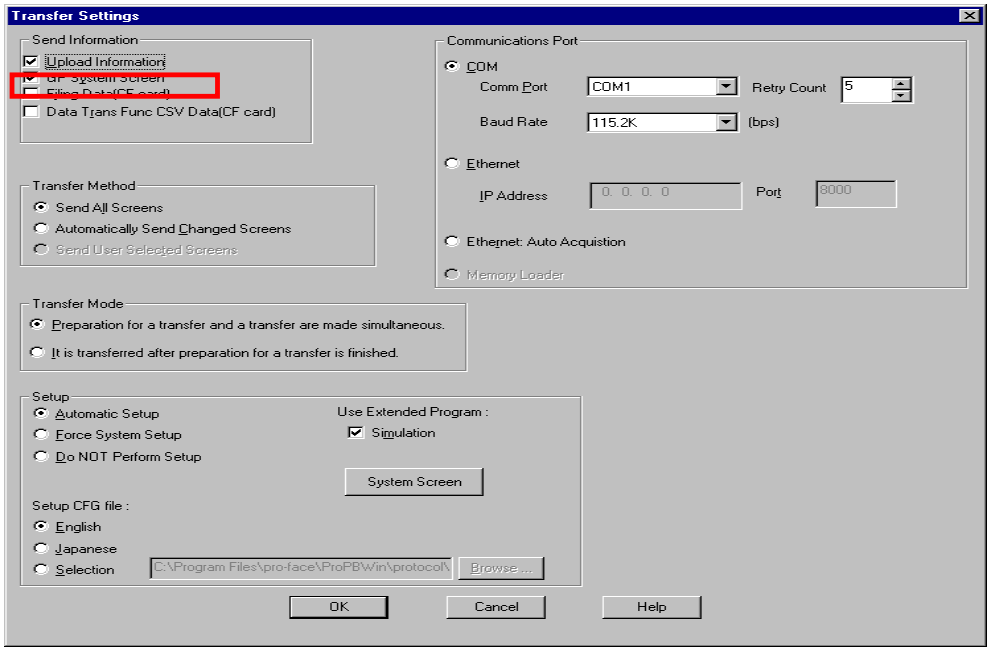
1. [GP-PRO/PBIII C-Package Setting]

Select [GP Setup] on Project Manager.

1) Communication Settings 	1) Communication Settings Transmission Speed: 19200bps Data Length: 7 Bits Stop Bit: 2 Bits Parity Bit: Even Busy Ready Control: DTR / ER RS-232C/ RS-422 RS-232C Connection: RS-232C RS-422 Connection: 4 Line * Select one in ▭.
2) Mode Settings 	2) Mode Settings System Start Address: Arbitrary Address Machine Number: 0 Link Protocol Type: 1:1

Select [Transfer] --> [Setup] --> [Transfer Settings].

3) Transfer Settings



3) Transfer Settings GP System Settings: Checked

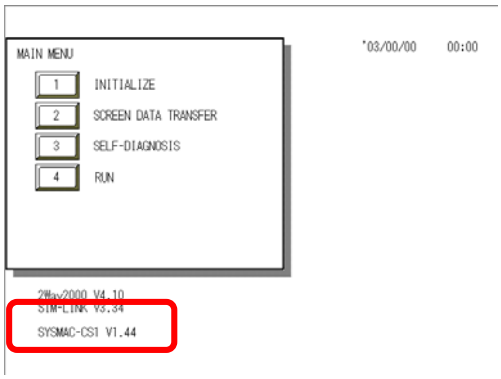
Transfer to GP after settings completed.

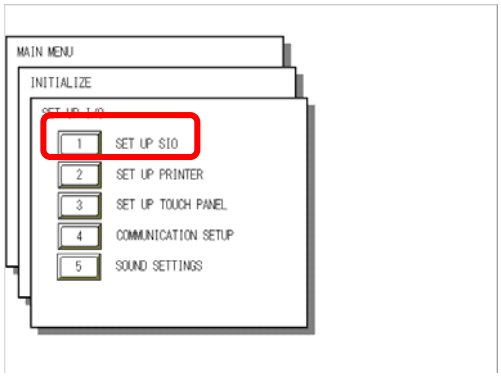
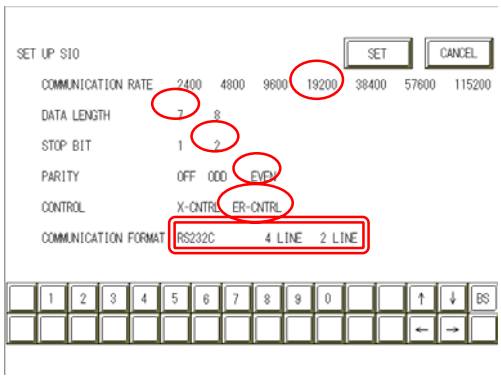
2. [GP Settings]

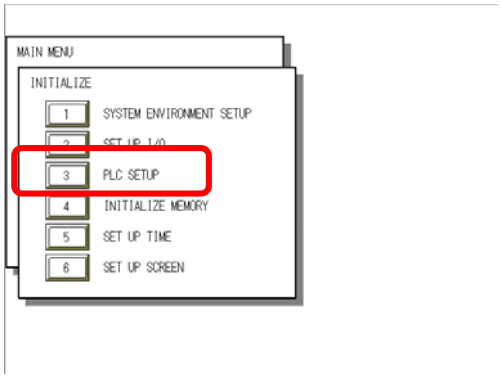
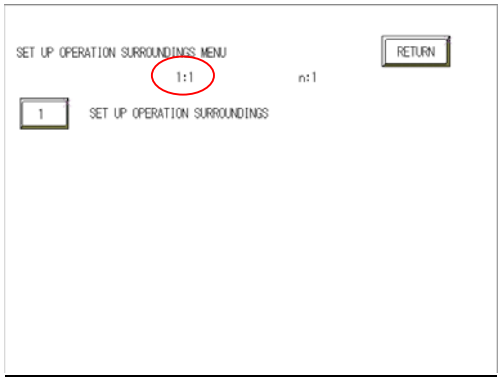
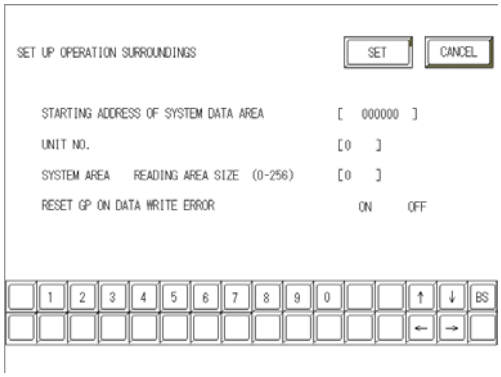
—Displaying Setting Screen—

Touch the top left of the screen within 10 second after powering on.

Or touch the top right and the bottom right of the screen at the same time. Keep 2 points touched and touch the bottom left. The menu bar will display on the bottom of the screen. Then touch [Offline].

1) Checking GP Type	1) Checking GP Type
	If you have selected OMRON SYSMAC - CS1 Series, following will be shown. "SYSMAC-CS1"

2) Communication Settings	2) Communication Settings
	[MAIN MENU] ↓ [INITIALIZE] ↓ [SET UP I/O] ↓ [SET UP SIO]
	Communication Rate: 19200bps Data Length: 7 Bits Stop Bit: 2 Bits Parity: Even Control: ER Cntrl Communication Format RS-232C Connection: RS-232C RS-422 Connection: 4 Line * Select one in [ ].

3) Setting up Operation Surroundings 	3) Setting up Operation Surroundings [MAIN MENU] ↓ [INITIALIZE] ↓ [PLC SETUP] ↓ [PLC SETUP]
	SET UP OPERATION SURROUNDINGS MENU: 1:1
	Starting Address of System Data Area: Arbitrary Address Unit No.: 0

Communication Settings [PLC]

Set the communication settings of each structure by using the OMRON ladder software CX-Programmer.

To communicate the ladder software to the PLC, first of all, set the dipswitches SW4 and SW5 on the front of the CPU unit to the transmission conditions, which are suitable for the environment.

1. [Transmission Condition Settings by Dipswitch]

Switch No.	Setting	Detail
SW1	ON	Disables to write in User Memory (UM)
	OFF	Enables to write in User Memory (UM)
SW2	ON	Executes automatic transfer at startup
	OFF	Not execute automatic transfer at startup
SW3		Unused
SW4	ON	Transmission Condition of Peripheral Port: * Available with CX-Programmer by other connection than tool bus * Available with other programs than CX-Programmer
	OFF	Transmission Condition of Peripheral Port: * Available with CX-Programmer by tool bus
SW5	ON	Transmission Condition of RS-232C Port: * Available with CX-Programmer by tool bus
	OFF	Transmission Condition of RS-232C Port: * Available with CX-Programmer by other connection than tool bus * Available with other programs than CX-Programmer
SW6	ON	Dipswitch for Customizing The state of this dipswitch is reflected on the special auxiliary relay A39512 (Dipswitch 6 State Flag) and it turns ON.
	OFF	Dipswitch for Customizing The state of this dipswitch is reflected on the special auxiliary relay A39512 (Dipswitch 6 State Flag) and it turns OFF.
SW7	OFF	Specifying a Type of Simple Backup Operation
SW8		Always OFF

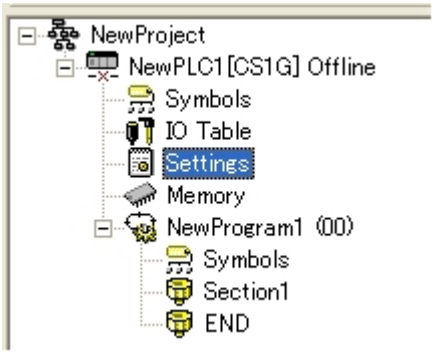
* To communicate with the GP, set SW4 ON and SW5 OFF.
You can also communicate with the GP when other switches are set to default value (OFF) or ON. However, when the memory card is not inserted, set SW2 to OFF. If you set it ON, you cannot communicate with the GP. A host communication error (02:00:80) will occur on the GP.

2. [Transmission Settings by CX-Programmer]

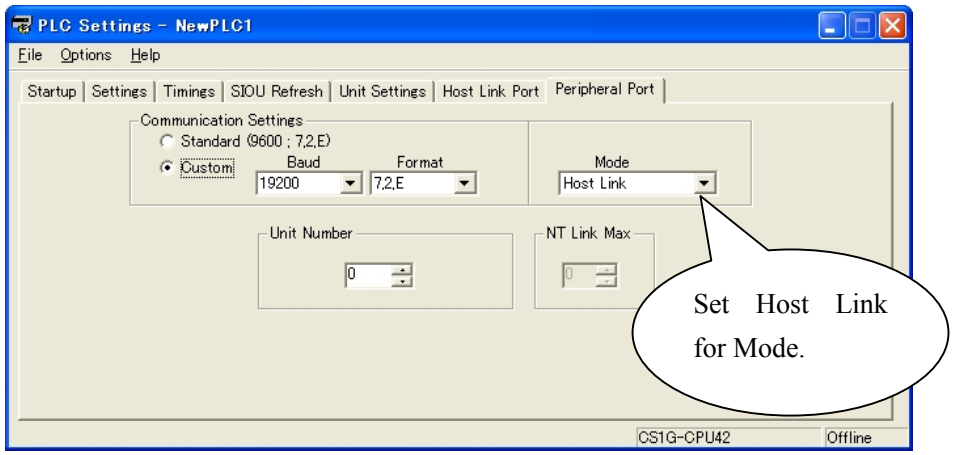
2-1 Settings of Peripheral Port on CPU Unit

To set the transmission settings of the peripheral port on the CPU unit, follow the procedures below.

Start up the ladder tool, CX-Programmer. Double-click [Settings] to execute.



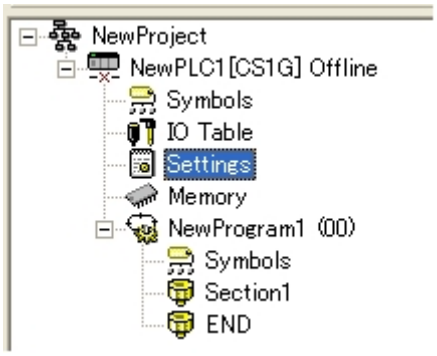
Select the [Peripheral Port] tab on the [PLC Settings] dialog box and set the items as below.



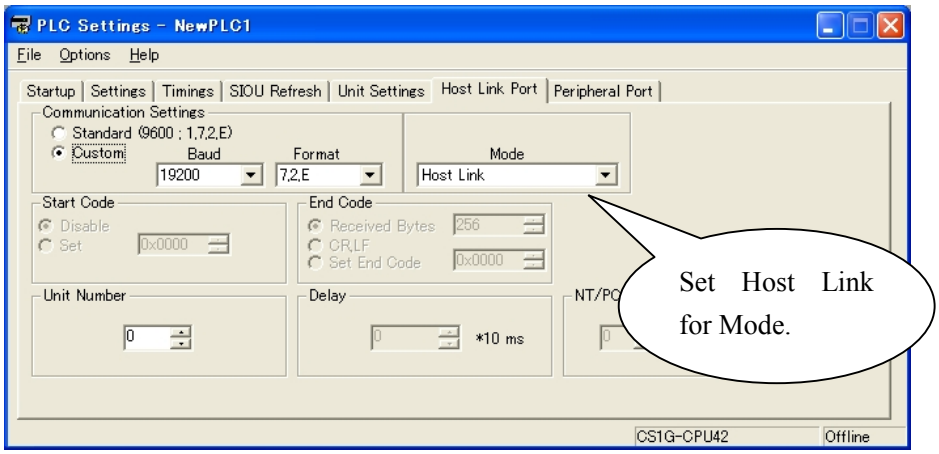
2-2 Settings of RS-232C Port on CPU Unit

To set the transmission settings of the RS-232C port on the CPU unit, follow the procedures below.

Start up the ladder tool, CX-Programmer. Double-click [Settings] to execute.



Select the [Host Link] tab on the [PLC Settings] dialog box and set the items as below.



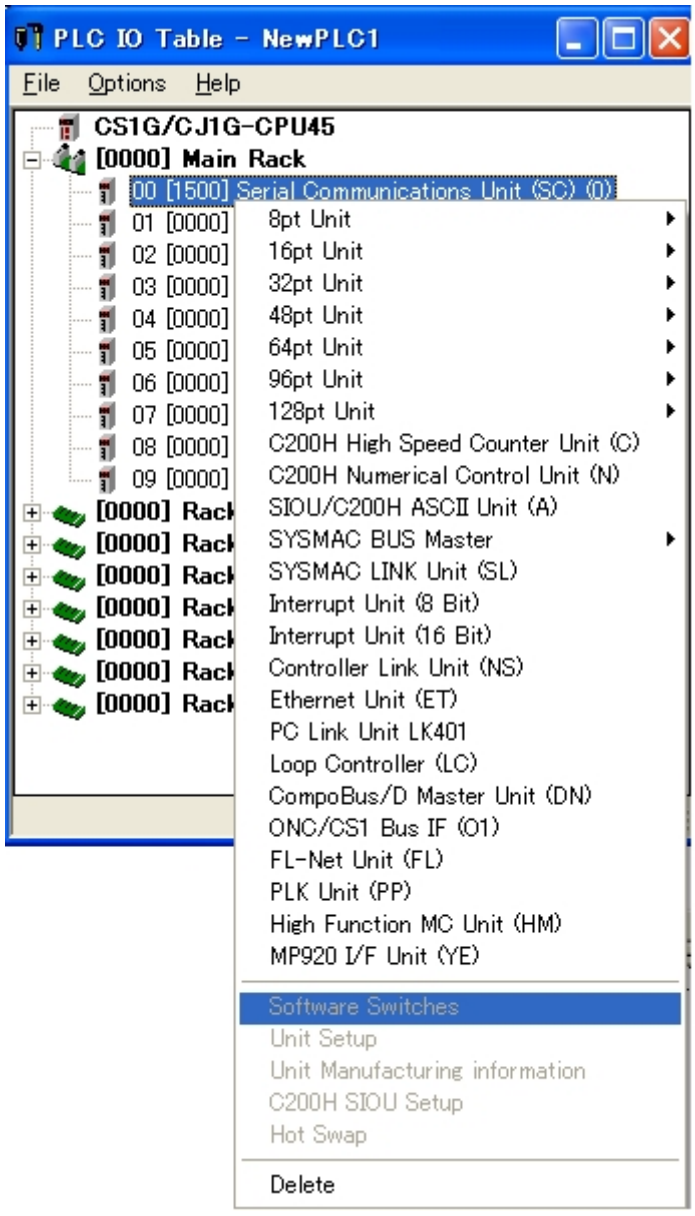
2-3 Settings of COM Port 1 and COM Port 2 on Serial Communication Unit

To set the transmission settings of the serial communication unit, follow the procedures below.

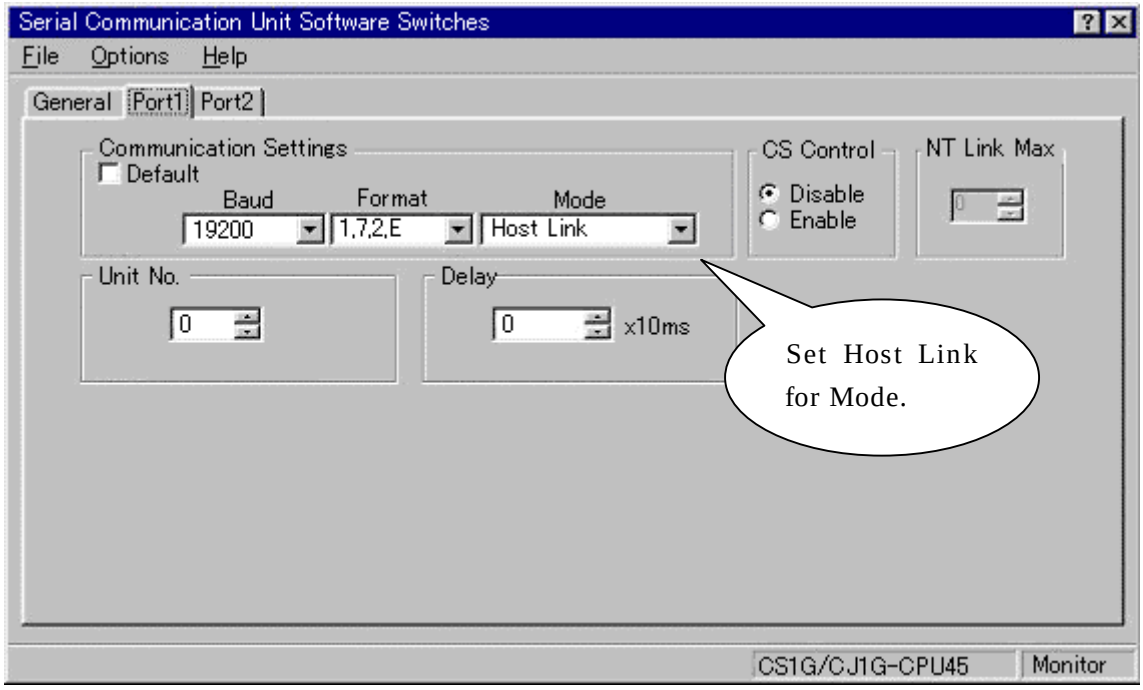
The settings of COM Port 1 are for RS422, and those of COM Port 2 are for RS-232C.

< Settings of RS422 Port on Serial Communication Unit>

Double-click [IO Table] to open the [PLC IO Table] window. Right-click the assigned serial communication unit and select [Software Switches].



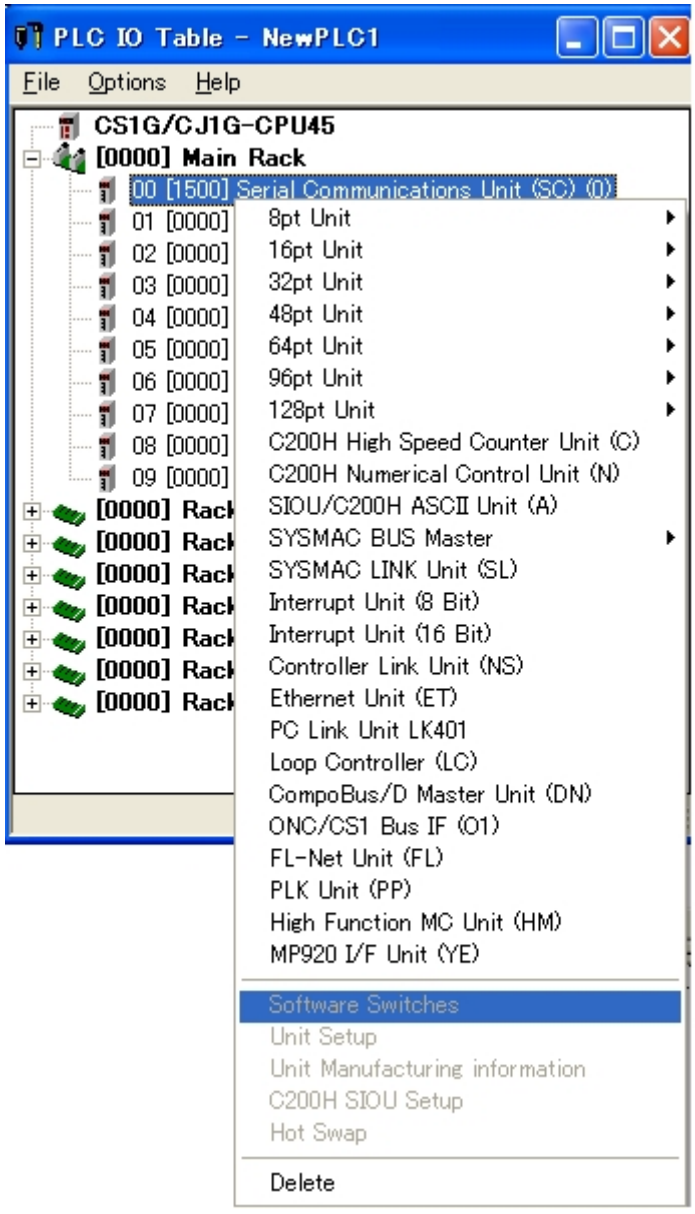
Select the [Port1] tab on the [Serial Communication Unit Software Switch] setting window. Set the items as below.



* For RS-422 communication, set the 2-wire/4-wire type switch on the serial communication unit to 4-wire. The GP does not support the 2-wire type. Also, the termination resistance on the PLC can be added by turning the termination resistance switch ON. Please set it ON.

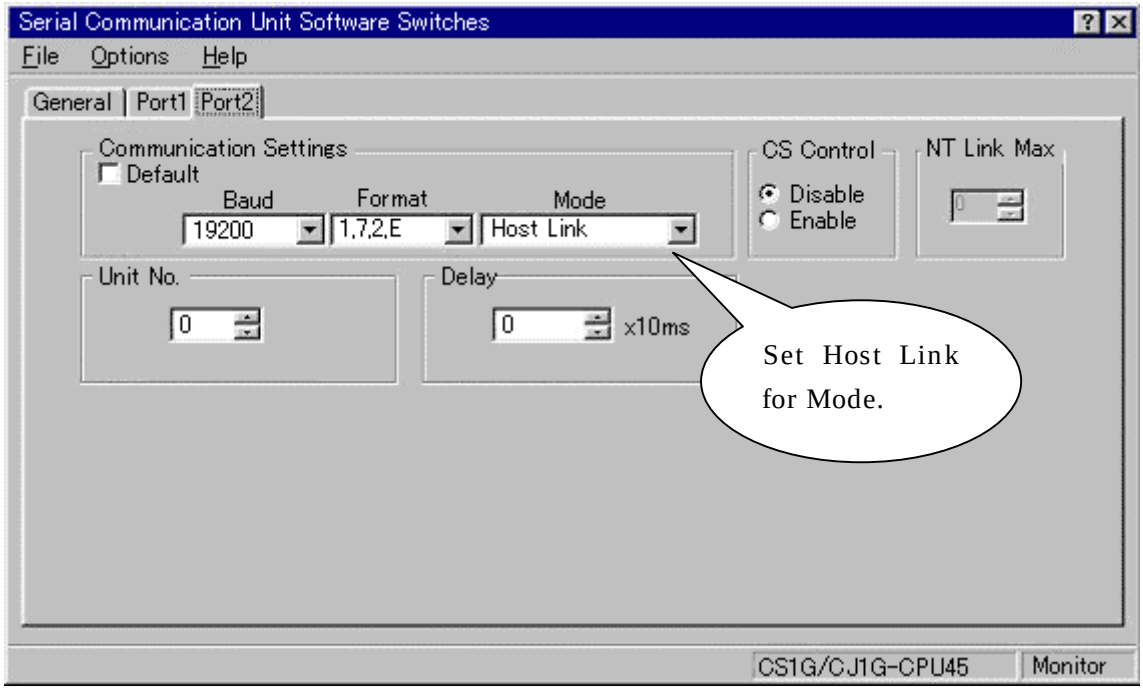
< Settings of RS-232C Port on Serial Communication Unit>

Double-click [IO Table] to open the [PLC IO Table] window. Right-click the assigned serial communication unit and select [Software Switches].



Select the [Port2] tab on the [Serial Communication Unit Software Switches] setting window.

Set the items as below.



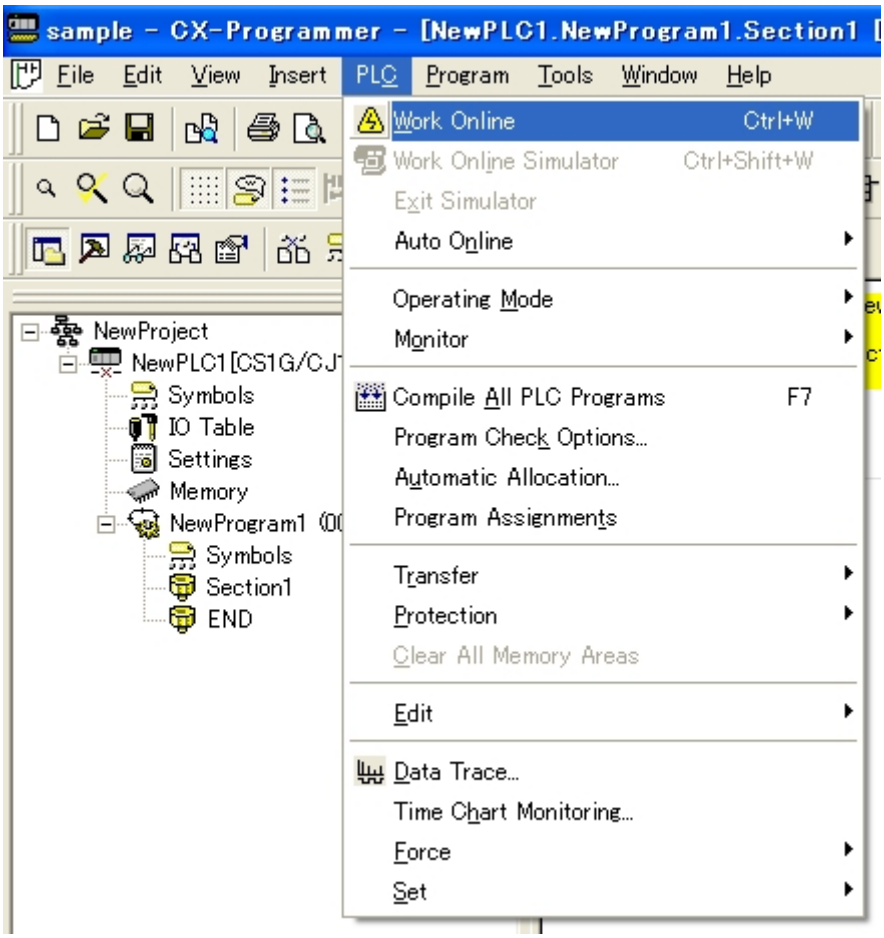
NOTE Details that you have set on CX-Programmer or Programming Console will be reflected in the allocated DM Area. On the other way, when you change the settings of the allocated DM Area, the communication settings on CX-Programmer or Programming Console will be changed.

Important Settings of the software switch of the serial communication unit can be set only when the PLC and the PC are online. Please get the PLC and the PC online to make the settings.

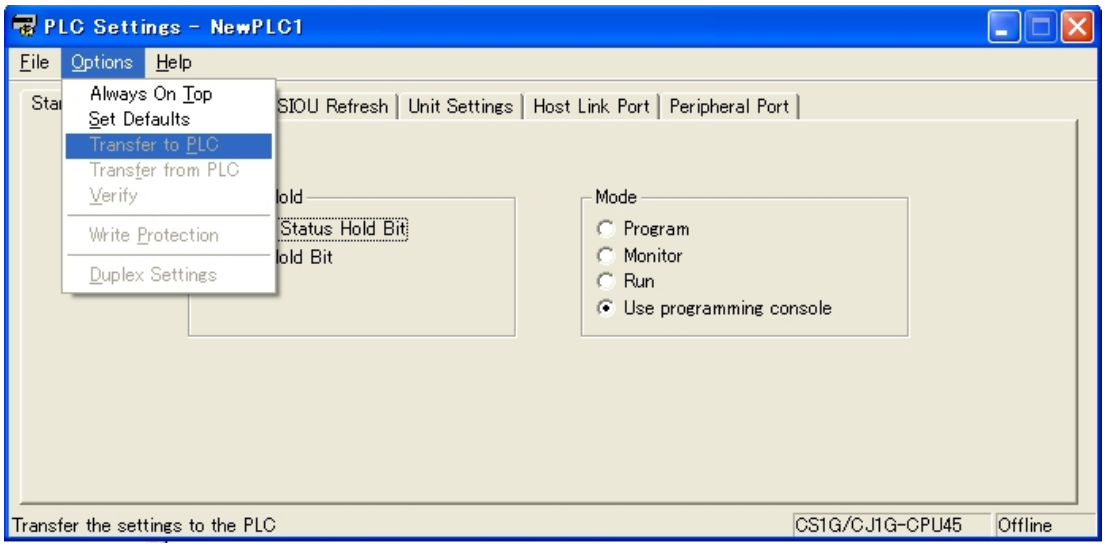
3. [Writing from CX-Programmer to PLC]

To write data from CX-Programmer to the PLC, you need to get the communication between the PC and the PLC online.

Select [PLC] → [Work Online] to get the communication between the PC and the PLC online.



Next, double-click [Settings] to open the window, and select [Options] → [Transfer to PLC].



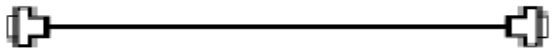
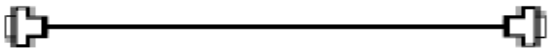
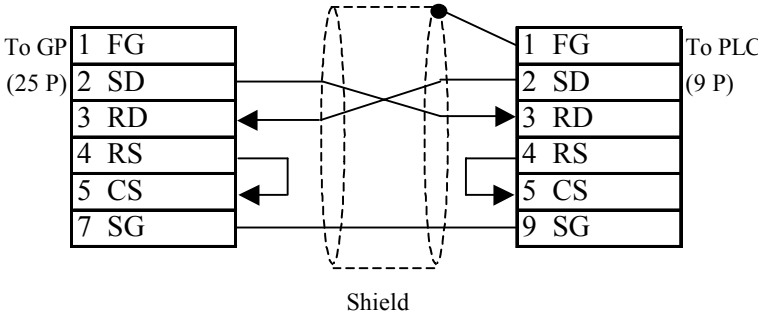
The checking items of the selected contents will be shown, and click [Yes] and write the set parameter information to the PLC.

When writing is completed, turn OFF the PLC and start it up again.

Connection Method

1. RS-232C Connection

[RS-232C Port on CPU Unit / CJ1W-SCU41 (COM Port 2)]

Type	Connection Method	Distance
Using GP000-IS03-MS		3m
Using XW2Z-200S or XW2Z-500S by OMRON Corporation		2m 5m
Creating Cable		Within 15m

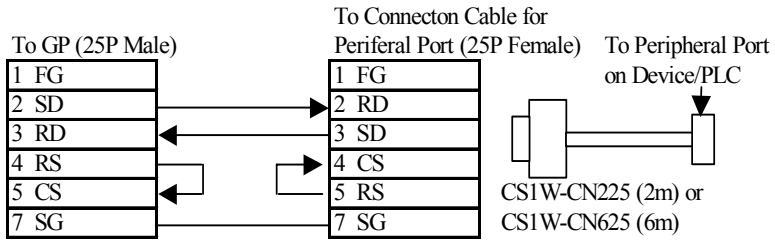
NOTE While the above connection diagram differs slightly from the OMRON XW2Z-200S (2m) and XW2Z-500S (5m) RS-232C cables, the system will operate correctly using this design.

Recommended Products

Connecter/Cover for GP	D-sub 25 pin Plug	XM2A-2501 <OMRON Co.>
	Cover for D-sub 25 pin	XM2S-2511 <OMRON Co.>
	Jack Screw	XM2Z-0071 <OMRON Co.>
Cable	CO-MA-VV-SB5P × 28AWG <Hitachi Cable Ltd.>	
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45	

2. RS-232C Connection

[Peripheral Port on CPU Unit]

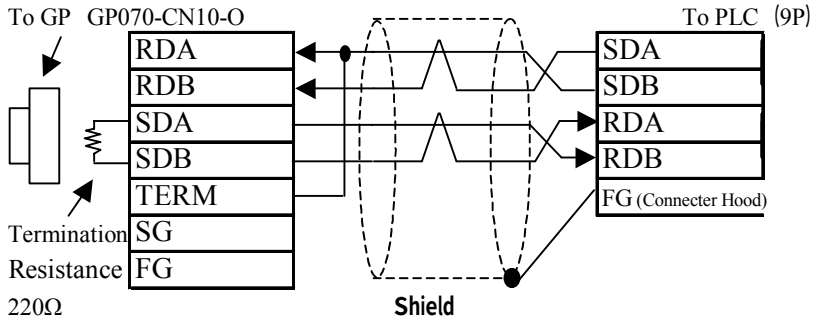
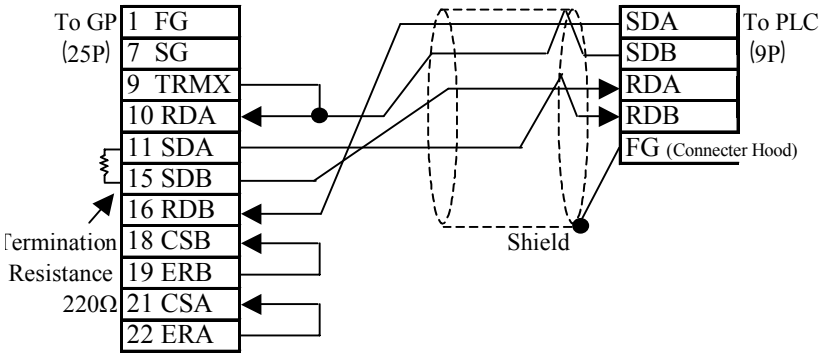
Type	Connection Method	Distance
Using CS1W-CN225 or CS1W-CN625 with Created Cable		Within 15m

Recommended Products

Connecter/Cover for GP	D-sub 25 pin Plug	XM2A-2501 <OMRON Co.>
	Cover for D-sub 25 pin	XM2S-2511 <OMRON Co.>
	Jack Screw	XM2Z-0071 <OMRON Co.>
Cable	CO-MA-VV-SB5P × 28AWG <Hitachi Cable Ltd.>	
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45	

3. RS-422 Connection

[CJ1W-SCU41 (COM Port 1)]

Type	Connection Method	Distance
Using GP070-CN10-O		Within 500m
Creating Cable		Within 500m

*** Turn on the termination resistance switch on the PLC.**

*** Names of Signal A and Signal B are opposite on the GP and the PLC.**

NOTE

* When connecting the #9 and #10 pins on the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Recommended Products

Connecter/Cover for GP	D-sub 25 pin Plug	XM2A-2501 <OMRON Co.>
	Cover for D-sub 25 pin	XM2S-2511 <OMRON Co.>
	Jack Screw	XM2Z-0071 <OMRON Co.>
Cable	CO-HC-ESV-3PX7/0.2 <Hirakawa Hewtech Corp.>	
Setscrew	Metric Coarse Screw Tread : M2.6 × 0.45	