

# OMRON Corporation PLC

SYSMAC CJ1M Series Connection

## System Structure



GP

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

## PLC

CPU	Link Interface	Communication	Connection Cable	
		Method	4 D	GP
CJ1M-CPU12	Peripheral Port	RS-232C	<b>Connection Method</b>	
CJ1M-CPU13	on CPU Unit	K5-252C	[2]	
CJ1M-CPU22	RS-232C Port	RS-232C	<b>Connection</b> Method	
CJ1M-CPU23	on CPU Unit	K3-232C	[1]	
	CJ1W-SCU41	RS-232C	<b>Connection</b> Method	
		(COM Port 2)	[1]	
		RS-422	<b>Connection</b> Method	
		(COM Port 1)	[3]	







## 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

Setup		PLC Set	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)	RS-232C			
Communication Format (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 <Communication Board/Unit>

#### ■ 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/PB C-Package Setting]

Select [GP Setup] on Project Manager.

1) Communication Settings	1) Communication Settings
GP Settings       I/O Settings       Mode Settings         GP Settings       I/O Settings       Connexectation Settings         R5 2202 / R5 422       Transmission Speed       19200         GP Settings       Parky B#       Stop B#         GP Settings       Parky B#       GP 2 B#         DataLength       Parky B#       GP 2 B#         Bury Ready Corrol       GP 1011 / LB       Advanced         BiAACC       F       Corrol         GP       OK       Cancel       Default	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
India Screen Sattinge     Extended Sattinge     Contenent actinge       India Screen Sattinge     I/O Settinge     Mode Settinge       PLC Type     OMMON SYSMACCEST SEFUELS       System Start Address     I/O Settinge       Machine Number     I/O Settinge       Pred Area Size     I/O Settinge       India Settinge     I/O Settinge       Machine Number     I/O Settinge       Pred Area Size     I/O Settinge       Voide Settinge     I/O Settinge       Node Number     I/O Settinge       Transmission Statue     I/O	System Start Address: Arbitrary Address Machine Number: 0 Link Protocol Type: 1:1
OK Carcel Defaults Help	



ransfer Settings	Communications Port
	© <u>C</u> OM
🔽 GP System Screen	Comm Port COM1 Retry Count 5
Filing Data(CF card) Data Trans Func CSV Data(CF card)	
	Baud Rate 115.2K 💌 (bps)
	© <u>E</u> themet
Transfer Method	IP Address 0. 0. 0 Port 8000
Send All Screens	IP Address U. U. U. U. Port 8000
O Automatically Send Changed Screens	
C Send User Selected Screens	C Ethernet: Auto Acquistion
	C Memory Loader
Transfer Mode	
Preparation for a transfer and a transfer are mad	de simultaneous.
<ul> <li>It is transferred after preparation for a transfer is I</li> </ul>	
C It is transferred after preparation for a transferris	
Setup	
	Ise Extended Program :
C Eorce System Setup	Simulation
C Do NOT Perform Setup	
	System Screen
Setup CFG file :	
• English	
O Japanese	
C Selection C:\Program Files\pro-face\ProF	PBWin\protocol\ Browse
ОК	Cancel Help
UK	Cancel Help
<u>er Settings</u> GP System S	attings: Charled

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

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].

L J	
1) Checking GP Type	1) Checking GP Type
MAIN MENU 1 INITIALIZE 2 SCREEN DATA TRANSFER 3 SELF-DIAGNOSIS 4 RLN 2000-2000 V4.10 510FLINK V5.34 SYSMAC-CSI V1.44	If you have selected Omron SYSMAC-CS1 Series, following will be shown. "SYSMAC-CS1"
2) Communication Settings	2) Communication Settings
MAIN MENU INITIALIZE I SET UP SIO 2 SET UP PRINTER 3 SET UP TOUCH PANEL 4 COMMUNICATION SETUP 5 SOUND SETTINGS	$[MAIN MENU]  \downarrow  [INITIALIZE]  \downarrow  [SET UP I/O]  ↓  [SET UP SIO]$
SET UP SIO COMMUNICATION RATE 2400 4800 9600 19200 38400 57600 115200 DATA LENGTH 8 STOP BIT 1 2 PARITY OFF 000 EUP CONTROL X-ONTRL EP-CATEL COMMUNICATION FORMAT RS232C 4 LINE 2 LINE 1 2 3 4 5 6 7 8 9 0 ↑ ↓ BS	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 1 SYSTEM ENVIRONMENT SETUP 2 SET UP 1/0 3 PLC SETUP 4 INITIALIZE MEMORY 5 SET UP TIME 6 SET UP SCREEN	$[MAIN MENU]  \downarrow  [INITIALIZE]  \downarrow  [PLC SETUP]  ↓  [PLC SETUP]$
SET UP OPERATION SURROUNDINGS MENU 1:1 n:1 T SET UP OPERATION SURROUNDINGS	SET UP OPERATION SURROUNDINGS MENU: 1:1
SET UP OPERATION SURPOUNDINGS STARTING ADDRESS OF SYSTEM DATA AREA [ 000000 ] UNIT ND. [0 ] SYSTEM AREA READING AREA SIZE (0-256) [0 ] RESET GP ON DATA HRITE ERROR ON OFF 1 2 3 4 5 6 7 8 9 0 1 4 4 BS	Starting Address of System Data Area: Arbitrary Address Unit No.: 0



### Communication Settings [PLC]

Set all 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.

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
S	W3	Unused
SW4		Transmission Condition of Peripheral Port:
	ON	* Available with CX-Programmer by other connection than tool bus
		* Available with other programs than CX-Programmer
	OFF	Transmission Condition of Peripheral Port:
	OFF	* Available with CX-Programmer by tool bus
SW5	ON	Transmission Condition of RS-232C Port:
	UN	* Available with CX-Programmer by tool bus
		Transmission Condition of RS-232C Port:
	OFF	* Available with CX-Programmer by other connection than tool bus
		* Available with other programs than CX-Programmer
SW6		Dipswitch for Customizing
	ON	The state of this dipswitch is reflected on the special auxiliary relay
		A39512 (Dipswitch 6 State Flag) and it turns ON.
		Dipswitch for Customizing
	OFF	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

#### 1. [Transmission Condition Settings by Dipswitch]

\* 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.

🐨 PLC Settings - NewPLC1	
<u>F</u> ile <u>O</u> ptions <u>H</u> elp	
Startup       CPU Settings       Timings       SIOU Refresh       Unit Settings       Host Link Port       Peripheral Port	eripheral Service E
Слм-сри	22 Offline



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

🐨 PLC Settings - NewPLC1	
<u>F</u> ile <u>O</u> ptions <u>H</u> elp	
	Set Host Link
	*10 ms
	CJ1M-CPU22 Offline



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].

🗊 PLC IO Table - I	NewPLC1					
<u>F</u> ile <u>O</u> ptions <u>H</u> elp						
GJ1M-GPU22						
🖻 🔩 [0000] Main R						
All Announcements	rial Communications Unit (SC) (0)					
1 01 [0000] E 02 [0000] E		:				
1 02 (0000) E						
04 [0000] E	48pt Unit					
05 [0000] E	64pt Unit	F				
👖 06 [0000] E	96pt Unit	Þ				
📲 07 [0000] E	128pt Unit	Þ				
📲 08 [0000] E	C200H High Speed Counter Unit (C)					
🗐 09 [0000] E	C200H Numerical Control Unit (N)					
🕀 🦦 [0000] Rack	SIOU/C200H ASCII Unit (A)					
🗄 🛶 [0000] Rack	SYSMAC BUS Master	•				
	SYSMAC LINK Unit (SL) Interrupt Unit (8 Bit)					
	Interrupt Unit (16 Bit)					
	Controller Link Unit (NS)					
	Ethernet Unit (ET)					
	PC Link Unit LK401					
	Loop Controller (LC)					
	CompoBus/D Master Unit (DN)					
	ONC/CS1 Bus IF (01)					
	FL-Net Unit (FL)					
	PLK Unit (PP) High Function MC Unit (HM)					
	MP920 I/F Unit (YE)					
_		_				
	Software Switches					
	Unit Setup					
	Unit Manufacturing information C200H SIOU Setup					
	Hot Swap					
-		-				
1	Delete	ł				



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

Serial	Communic	ation Un	it Software Sw	itches			?)
<u>F</u> ile	Options	<u>H</u> elp					
Gene	eral Port1	Port2					
	🗖 Defau	Baud 19200	ettings Format	▼ Host Delay 0	 10ms	CS Control Disable Enable Set Host Link for Mode.	ink Max
						CS1G/CJ1G-CPU45	Monitor

\* For RS-422 communication, set the 2-wire/4-wire type switch on the serial communication unit with 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].

PLC IO Table -	NewPLC1	<				
<u>F</u> ile <u>O</u> ptions <u>H</u> elp						
🚽 🗊 CJ1M-CPU22						
🖻 🔩 [0000] Main R						
1 00 [1500] Se 1 01 [0000] E	rial Communications Unit (SC) (0) 8pt Unit					
1 01 [0000] E 1 02 [0000] E	16pt Unit	1				
1 02 [0000] E	32pt Unit					
04 [0000] E	48pt Unit					
👖 05 [0000] E	64pt Unit					
	96pt Unit	•				
📲 07 [0000] E	128pt Unit	•				
- 👖 08 [0000] E	C200H High Speed Counter Unit (C)					
🚽 👖 09 [0000] E	C200H Numerical Control Unit (N)					
🕀 🦦 [0000] Rack	SIOU/C200H ASCII Unit (A)					
🗄 🐀 [0000] Rack	SYSMAC BUS Master	•				
	SYSMAC LINK Unit (SL)					
	Interrupt Unit (8 Bit) Interrupt Unit (16 Bit)					
	Controller Link Unit (NS)					
	Ethernet Unit (ET)					
	PC Link Unit LK401					
	Loop Controller (LC)					
	CompoBus/D Master Unit (DN)					
	ONC/CS1 Bus IF (O1)					
	FL-Net Unit (FL)					
	PLK Unit (PP)					
	High Function MC Unit (HM)					
	MP920 I/F Unit (YE)					
	Software Switches					
	Unit Setup					
	Unit Manufacturing information					
	C200H SIOU Setup					
	Hot Swap					
	Delete					



Select the [Port2] tab on the [Serial Communication Unit Software Switch] setting window. Set the items as below.

Serial	Communic	cation Un	it Software Swi	itches				? ×
<u>F</u> ile	Options	<u>H</u> elp			 			
Gene	eral   Port1	Port2						
	🗖 Defau	Baud 19200	ettings Format	▼ Host Delay 0	 <10ms	CS Control Disable Enable Set Host I for Mode.	U.ink	
						CS1G/CJ1G-	CPU45	Monitor

## 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 transmission settings on CX-Programmer or Programming Console will be changed.



Settings of the software switch on 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]  $\rightarrow$  [Work Online] to get the communication between the PC and the PLC online.





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

🐨 Pl	.C Settings - NewP	LC1	
<u>F</u> ile	Options <u>H</u> elp		
Star	Always On <u>T</u> op <u>S</u> et Defaults	nes   SIOU Refresh   Unit Settings   Host Link Port   Peripheral Port   Periphera	I Service   E
	Transfer to <u>P</u> LC		
	Trans <u>f</u> er from PLC <u>V</u> erify		
	Write Protection	Status Hold Bit	
	<u>D</u> uplex Settings	- Status Hold Bit C Program	
L.		C Run	
		Use programming console	
	,	on Setting t running program when initialising Unit/Inner board recognition t peripheral service when Inner board is being recognised	
Transf	er the settings to the PL	C GJ1 M-CPU22	Offline

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)]



## 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	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>	
for GP	Cover for D-sub 25 pin	XM2S-2511 <omron co.=""></omron>	
	Jack Screw	XM2Z-0071 <omron co.=""></omron>	
Cable	CO-MA-VV-SB5P × 28AWG <hitachi cable="" ltd.=""></hitachi>		
Setscrew	Metric Coarse Screw Trea	ad : M2.6 × 0.45	



#### 2. RS-422 Connection

[Peripheral Port on CPU Unit]



## **Recommended Products**

Connecter/Cover	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>
for GP	Cover for D-sub 25 pin	XM2S-2511 <omron co.=""></omron>
	Jack Screw	XM2Z-0071 <omron co.=""></omron>
Cable	CO-MA-VV-SB5P × 2	8AWG <hitachi cable="" ltd.=""></hitachi>
Setscrew	Metric Coarse Screw Trea	ad : M2.6 × 0.45



#### 3. RS-422 Connection

[CJ1W-SCU41 (COM Port 1)]





- \* 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  $100\Omega$  is added between RDA and RDB.

## **Recommended Products**

Connecter/Cover	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>
for GP	Cover for D-sub 25 pin	XM2S-2511 <omron co.=""></omron>
	Jack Screw	XM2Z-0071 <omron co.=""></omron>
Cable	CO-HC-ESV-3PX7/0.2	<hirakawa corp.="" hewtech=""></hirakawa>
Setscrew	Metric Coarse Screw Trea	ad : M2.6 × 0.45