

# **OMRON Corporation PLC**

SYSMAC CS1 Series Connection

# System Structure



GP

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

# **Pro-face**<sup>®</sup>

# PLC

СРИ	Link Interface	Communication	Connection Cable	
		Method	4 De	GP
CS1H-CPU67	RS-232C Port on			
CS1H-CPU65	er o omt	RS-232C	Connection Method [1]	
CS1H-CPU64				
CS1H-CPU63	Peripheral Port			
CS1G-CPU45	on CPU Unit		Composition Mothed	
CS1G-CPU44		RS-232C	[2]	
CS1G-CPU43			[-]	
CS1G-CPU42				
CS1H-CPU67H	CS1W-SCU21			
CS1H-CPU66H		<b>DS 222C</b>		
CS1H-CPU65H		(COM Port 1, 2)	<b>Connection Method</b>	
CS1H-CPU64H		(COM FOIL 1, 2)	[*]	
CS1H-CPU63H				
CS1G-CPU45H	CS1W-SCB21			
CS1G-CPU44H		DS 222C		
CS1G-CPU43H		KS-232C	Connection Method	
CS1G-CPU42H		(COM Port 1, 2)	[I]	
	CS1W-SCB41	RS-232C	Connection Method	
		(COM Port 1)	[1]	
		RS-422	<b>Connection Method</b>	
		(COM Port 2)	[3]	







# Selecting PLC Type

Start up GP-PRO /PBIII.

Select the following PLC Type when creating the project file.

Sample pro: Untitled - Project Manager	
GPPRO/PBILL C-Package03	
OP Setup Project Legic Program Editor Transfer New Edito Copen Monitor Manner Den VO	
OMRON SYS	MAC-CS1 SERIES
GP2500 GMRON SYSMAC-CS1 SERIES PFO-FGCC Change the Device/PLC type for this project	

# 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 Setu		ıp	
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/ 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 - Langels per       (/O Settings - Mode Settings - Mode Settings - Contended Settings - Contended Settings - Transmission Speed - 15:00 -	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
Initial Scoreen Setting:       Extended Setting:       Contenuercation Setting:         UP Setting:       I/O Setting:       Contenuercation Setting:         PLC Type       DMHON SYSMACCS1 SETUES         System Stat Address       DOCOD         Hachine frambes       DOCOD         Head Area Size       DOCOD         Verk Proceed Type       D         Node Setting:       Contenuercation Setting:         Transmessen Status       DOCOD         Transmessen Status       DOCOD	System Start Address: Arbitrary Address Machine Number: 0 Link Protocol Type: 1:1
OK. Cancel Defaults Help	



sfer Settings	
Transfer Settings	X
Send Information	Communications Port
Upload Information	⊙ <u>с</u> ом
Elina Data(CE card)	Comm Port COM1 Retry Count 5
Data Trans Func CSV Data(CF card)	Baud Rate 115.2K V (bos)
	O <u>E</u> thernet
Transfer Method	IP Address 0. 0. 0. Port 8000
Automatically Send Changed Screens	
C Send User Selected Screens	O Ethernet: Auto Acquistion
	C Memory Loader
Transfer Mode	
Preparation for a transfer and a transfer are made s	simultaneous.
It is transferred after preparation for a transfer is fini-	ished.
_ Setup	
© <u>A</u> utomatic Setup Use	Extended Program :
C D NOT D ( C C	s <u>in</u> ulation
O Do NUT Perform Setup	
L	System Screen
Setup UFG file :	
C:\Program Files\pro-face\ProPB\	Win\protocol\ Browse
UK	
sfer Settings GP System Set	ttings: Checked
	-

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].

1) Checking GP Type	1) Checking GP Type
MAIN MENU         *03/00/00         00:00           1         INITIALIZE         2         SCREEN DATA TRANSFER         3         SELF-DIAGNOSIS           3         SELF-DIAGNOSIS         4         RLN         7/16/2000         V4. 10           2010/2000         V4. 10         51/0/LINK: 15. 34         51/0/LINK: 15. 34         51/0/LINK: 15. 34	If you have selected OMRON SYSMAC-CS1 Series, following will be shown. "SYSMAC-CS1"
SYSMAC-CS1 V1.44	
2) Communication Settings	2) Communication Settings [MAIN MENU] $\downarrow$ [INITIALIZE] $\downarrow$ [SET UP I/O] $\downarrow$ [SET UP SIO]
SET UP SI0       SET       CANCEL         COMMUNICATION RATE       2400       4800       9600       19200       38400       57600       115200         DATA LENGTH       8       8       8       8       115200       38400       57600       115200         DATA LENGTH       8       2       2       2       115200       2       2       2         PARITY       OFF       000       EUP       CONTROL       X-CNTRL       COMMUNICATION FORMAT       ES232C       4       LINE       2       LINE         1       2       3       4       5       6       7       8       0       1       4       ES	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]
MAIN MENU	
1 SYSTEM ENVIRONMENT SETUP	
SET IR 1/0	[PLC SETUP]
3 PLC SETUP	↓ J
4 INITIALIZE MEMORY 5 SET UP TIME	[PLC SETUP]
6 SET UP SOREEN	
SET UP OPERATION SURROUNDINGS MENU	SET UP OPERATION SURROUNDINGS MENU:
1:1 n:1	1:1
1 SET UP OPERATION SURROUNDINGS	
SET UP OPERATION SURROUNDINGS	Starting Address of System Data Area:
	Arbitrary Address
UNIT NO. [0 ]	Unit No.: U
SYSTEM AREA READING AREA SIZE (0-256) [0]	
RESET GP ON DATA WRITE ERROR ON OFF	
	·



## 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.

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
	OFE	Transmission Condition of Peripheral Port:
		* Available with CX-Programmer by tool bus
SW5	ON	Transmission Condition of RS-232C Port:
	ON	* 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
S	W8	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>File Options</u> <u>H</u> elp	
Startup CPU Settings   Timings   SIOU Refresh   Unit Settings   Host Link Port   Peripheral Port   Peripheral Servic Communication Settings Standard (9600 : 72.E) Standard (9600 : 72.E) Unit Number Unit Number Unit Number NT Link Max Set Ho for Mode	el st Link e.
CS1G-H-CPU42	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] tab on the [PLC Settings] dialog box and set the items as below.

PLC Settings - NewPLC1 File Options Help		
Startup OPU Settings   Timings   SIOI Communication Settings C Standard (9600 : 1.72,E) C Standard (96	U Refresh   Unit Settings Host Link Port   Peripheral Format	Port   Peripheral Service
Start Code © Disable © Set Unit Number 0	End Code © Received Bytes 256 © CRLF © Set End Code 0x0000 Delay 0 = *10 ms	Set Host Link for Mode.
		CS1G-H-CPU42 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.

If you use CS1W-SCB41, the settings of COM Port 1 are for RS-232C, and those of COM Port 2 are for RS-422.

If you use CS1W-SCU21/SCB21, refer to the settings of COM Port 1 since both COM Port 1 and COM Port 2 are for RS-232C Communication.

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

Double-click [IO Table] to open the [PLC IO Table] window.

CPU types of the PLC to use will be shown. Select a CPU type and right-click it to select [Inner Board Software Switches].





Select the [Port 1] tab on the [Inner Board Software Switches] setting window. Set the items as below.

Seria	Communic	ation Un	it Software Sw	itches					? ×
<u>F</u> ile	<u>O</u> ptions	<u>H</u> elp							
Gen	eral Port1	Port2							
	Commun Defaul Unit No.	ication S t 19200	ettings Format	Delay 0	Mode Link	<ul> <li>C10ms</li> <li>Set for</li> </ul>	CS Control C Disable Enable Host Link Mode.	NT Link	Max 3
							CS1G-H-CPI	U42	Monitor



< Settings of RS-422 Port on Serial Communication Unit>

Double-click [IO Table] to open the [PLC IO Table] window.

CPU types of the PLC to use will be shown. Select a CPU type and right-click it to select [Inner Board Software Switches].





Select the [Port 2] tab on the [Inner Board Software Switches] setting window. Set the items as below.

Serial	Communic	cation Un	it Software Swi	tches					? ×
<u>F</u> ile	<u>O</u> ptions	<u>H</u> elp							
Gen	eral   Port1	Port2							
	Commur Defau	ication S It Baud 19200	ettings Format	V Host	Mode Link	c10ms	CS Control Disable Enable Set Host for Mode.	Link	Max
							CS1G-H-CPU	42	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.

# 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.



Settings of the inner board software switch 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].

🐨 Pi	LC Settings - NewPLC1	1 -	
Eile	Options Help		
Sta	Always On <u>T</u> op <u>S</u> et Defaults	nings   SIOU Refresh   Unit Settings   Host Link Port   Peripheral Port   Peripheral Service	1
	Transfer to <u>P</u> LC Transfer from PLC Verify	tion Settings land G600 7.2.E) m Baud Format Mode 9600 ▼ 7.2.E ▼ Host Link ▼	
	Write Protection		
	Duplex Settings	Unit Number NT Link Max	
Trans	fer the settings to the PLC	C51G-H-CPU42	_

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 / CS1W-SCU21 / CS1W-SCB21 (COM Port 1, COM Port 2) / CS1W-SCB41 (COM Port 1)]



**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.=""></omron>	
	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 Tread : M2.6 × 0.45		



## 2. RS-232C Connection

[Peripheral Port on CPU Unit]



# **Recommended Products**

Connecter/Cover	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>	
TOP 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 Tread : M2.6 × 0.45		



#### 3. RS-422 Connection

[CS1W-SCB41 (COM Port 2)]





\* Turn on the termination resistance switch on the PLC. \* Names of Signal A and Signal B are opposite on the GP and the PLC.

\* 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 for GP	D-sub 25 pin Plug	XM2A-2501 <omron co.=""></omron>
	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

NOTE