

# Omron

## Sysmac Link (SIO) Driver

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- This manual explains how to connect the target machine with devices from other manufacturers. For information about how to use the Pro-Designer software, please refer to the Pro-Designer Online Help.
- The types of target machines that are compatible with Pro-Designer depends on the Pro-Designer version. For information about target machine compatibility, please refer to the Pro-Designer Online Help.

# 1 System Structure

The following describes the system setup for connecting the target machine to Omron PLCs.

To View a cable diagram for a particular communication format, see Section 2 - *Cable Diagrams*.

Series	CPU	Link I/F	Comm. Format	Diagram
SYSMAC C Series	C200H	C200H-LK201	RS-232C	Cable Diagram 1
SYSMAC CV Series	CVM1	Link I/F on CPU unit (HOSTLINK Port)	RS-232C	Cable Diagram 2
			RS-422 (4-wire type)	Cable Diagram 3

# 2 Cable Diagrams

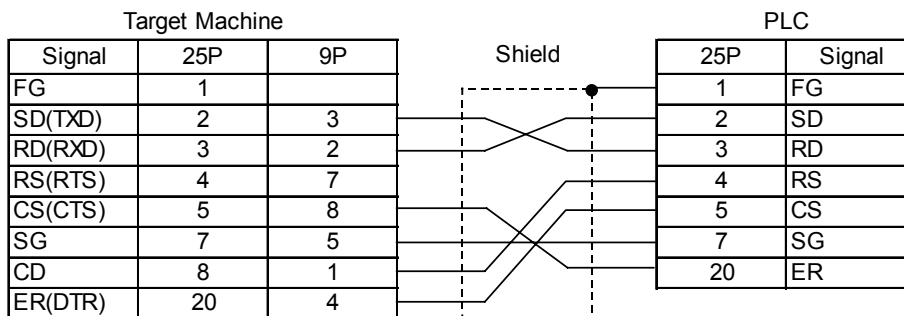
The cable diagrams illustrated below and the cable diagrams recommended by Omron may differ, however, using these cables for your PLC operations will not cause any problems.

- Ground your PLC's FG terminal according to your country's applicable standard. For details, refer to the PLC's manual.
- If a communications cable is used, the SG (signal ground) must be connected.

## Cable Diagram 1 RS-232C

Please choose the appropriate cable and adaptor for your target unit from the table below, or create your own cable to connect the PLC to the target machine.

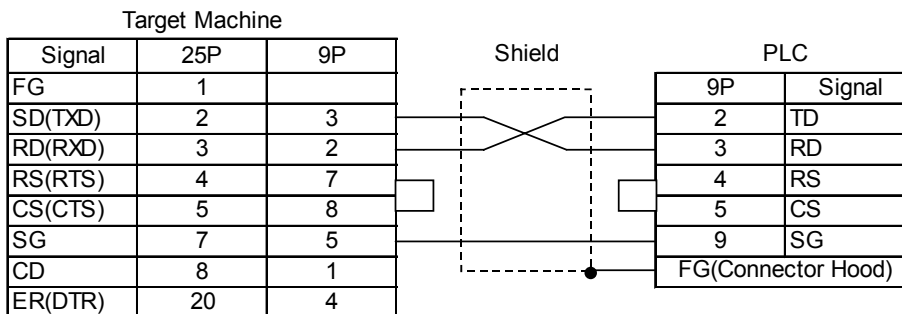
Target Machine	Cable / Adapter	Comments
GP, PS-P, PC/AT(PL), PS-G	RS-232C Cable (Pro-face: GP410-IS00-O 5m)	When connecting to a 9pin port on the target machine, use a 9-25pin conversion adapter.
	User-created Cable	Cable length: 15m max.



## Cable Diagram 2 RS-232C

Please create your own cable to connect the PLC to the target machine.

Target Machine	Cable / Adapter	Comments
GP,PS-P, PC/AT(PL), PS-G	User-created Cable	Cable length: 15m max.

**MEMO**

- Use only the connector (XM2A-0901) and connector hood (XM2S-0911) that come with the PLC.
- When making your own cable connections, we recommend using Hirakawa Densen's H-923A (CO-HC-ESV-3P\*7/0.2) cable.

### Cable Diagram 3 RS-422 (4-wire type)

Please choose the appropriate cable and adaptor for your target unit from the table below, or create your own cable to connect the PLC to the target machine.

Target Machine	Cable / Adapter		Comments
GP*1, PS-P*1	a	RS-422 Connector Terminal Adapter (Pro-face: GP070-CN10-O)	Cable length: 500m max.
	b	User-created Cable	
PC/AT(PL), PS-G	a	RS-232C/RS-422(485) Signal Converter	

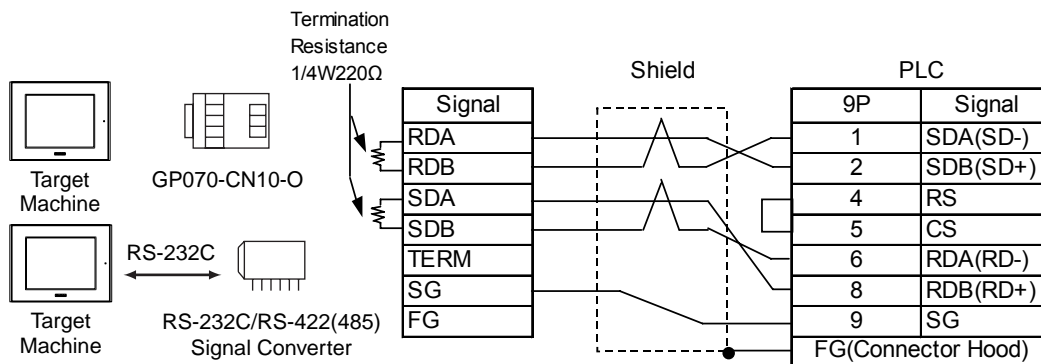
\*1 The available interface is COM1 only.

- Setup the PLC's RS-232C/RS-422 toggle switch to RS-422.

#### MEMO

- Signals A and B are opposite on the GP and PLC.
- Use only the connector (XM2A-0901) and connector hood (XM2S-0911) that come with the PLC.
- When making your own cable connections, we recommend using Hirakawa Densen's H-923A (CO-HC-ESV-3P\*7/0.2) cable.

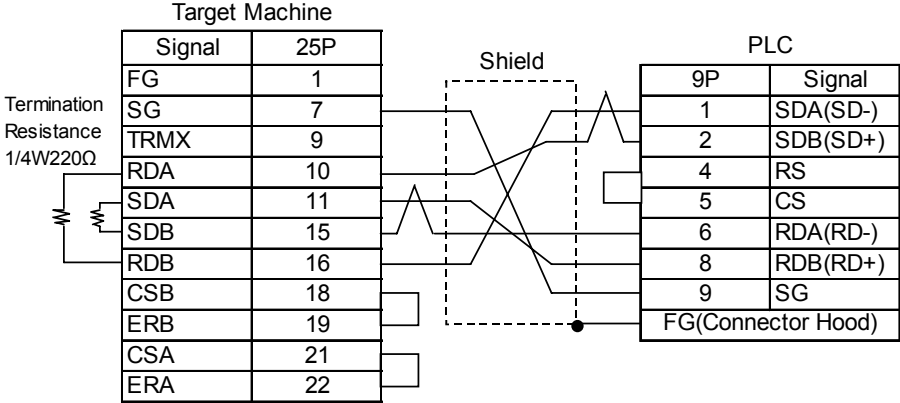
- a. RS-422 Connection Terminal Adapter (Pro-face: GP070-CN10-O)  
OR: RS-232C/RS-422(485) Signal Converter



#### MEMO

- As the RS-422(485) side of the RS-232C/422(485) signal converter is a terminal, use any external line other than the communication line for the power cable.
- Follow the specifications for your RS-232C/RS-422(485) signal converter when connecting termination resistance on the RS-422(485) terminal.
- The RS-232C connection between the RS-232C/RS-422(485) signal converter and target machine depends on the signal converter. Refer to its specifications when connecting the signal converter and target machine.

b. User-created Cable



### 3 Supported Device Addresses

The following tables list the device address ranges you can enter from in Pro-Designer. For actual device address ranges supported by the PLC, refer to the PLC's manual.

#### 3.1 C Series

Device	Bit Address <sup>*1</sup>	Word Address	16 bit	32 bit
I/O Relay <sup>*2</sup>	0000:00-9999:15	0000-9999	<sup>*3</sup> L/H	<sup>*3</sup> L/H
Internal Hold Relay <sup>*2</sup>				
Analog Setup Value <sup>*2</sup> Storage Area	0000:00-9999:15	0000-9999		
Data Link Relay <sup>*2</sup>	LR0000:00-LR9999:15	LR0000-LR9999		
Special Hold Relay <sup>*2</sup>	0000:00-9999:15	0000-9999		
Auxiliary Memory Relay <sup>*2</sup>	AR0000:00-AR9999:15	AR0000-AR9999		
Hold Relay <sup>*2</sup>	HR0000:00-HR9999:15	HR0000-HR9999		
Timer (contact)	TIM0000-TIM9999	--		
Counter (contact)	CNT0000-CNT9999	--		
Timer (current value)	--	TIM0000-TIM9999		
Counter (current value)	--	CNT0000-CNT9999		
Data Memory <sup>*2</sup>	DM0000:00-DM9999:15	DM0000-DM9999		

\*1 You can define a bit address by adding a colon followed by the bit position (0-15) at the end of the word address.

\*2 When the bit write operation is performed, the Target Machine reads the PLC's corresponding word address and turns a bit ON, then sends it back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

\*3 16-bit and 32-bit data, High and Low, refer to data as defined in the following examples.

Byte		16 bit		Word		32 bit			
0	7	...	0	L (Low)	0	15	...	0	L (Low)
1	15	...	8	H (High)	1	31	...	16	H (High)

## 3.2 CV Series

Device	Bit Address <sup>*1</sup>	Word Address	16 bit	32 bit
I/O Relay <sup>*2</sup>	0000:00-9999:15	0000-9999	*4 L/H	*4 L/H
Internal Hold Relay <sup>*2</sup>				
SYSMAC BUS/2 Remote I/O Relay <sup>*2</sup>	0000:00-9999:15	0000-9999		
Data Link Relay <sup>*2</sup>	0000:00-9999:15	0000-9999		
Special Hold Relay <sup>*2</sup>	A000:00-A511:15	A000-A511		
Hold Relay <sup>*2</sup>	00000:00-9999:15	0000-9999		
Internal Auxiliary Relay <sup>*2</sup>	0000:00-9999:15	0000-9999		
SYSBUS Remote I/O Relay <sup>*2</sup>	0000:00-9999:15	0000-9999		
Timer (contact)	T0000-T9999 <sup>*3</sup>	--		
Counter (contact)	C0000-C9999 <sup>*3</sup>	--		
Timer (current value)	--	T0000-T9999		
Counter (current value)	--	C0000-C9999		
Data Memory <sup>*2</sup>	D0000:00-D9999:15	D0000-D9999		

\*1 You can define a bit address by adding a colon followed by the bit position (0-15) at the end of the word address.

\*2 When the bit write operation is performed, the Target Machine reads the PLC's corresponding word address and turns a bit ON, then sends it back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

\*3 Write operations cannot be performed on the bit device's timer and counter.

\*4 16-bit and 32-bit data, High and Low, refer to data as defined in the following examples.

Byte		16 bit		Word		32 bit			
0	7	...	0	L (Low)	0	15	...	0	L (Low)
1	15	...	8	H (High)	1	31	...	16	H (High)

## 4 Consecutive Device Addresses

The following table lists the maximum number of consecutive addresses and the gap span (the maximum gap size between PLC device addresses that are used as consecutive device addresses) that can be read by each PLC. Refer to these tables to utilize *Block Transfer*.

### MEMO

- When the device is setup using the methods below, the Data Communication Speed slows by the number of times the device is read.
  - When consecutive addresses exceed the maximum data number range
  - When an address is designated for division
  - When device types are different

To speed up data communication, use consecutive device addresses on a single target machine.

### 4.1 C Series

Device	Maximum Consecutive Addresses	Gap Span
Timer (contact) (TIM)	110 bits	11 bits
Counter (contact) (CNT)		
Timer (current value) (TIM)	120 words	12 words
Counter (current value) (CNT)		
I/O Relay		
Internal Hold Relay		
Data Link Relay (LR)		
Hold Relay (HR)		
Auxiliary Memory Relay (AR)		
Data Memory (DM)		



## 4.2 CV Series

Device	Maximum Consecutive Addresses	Gap Span
Timer (contact) (T)	110 bits	11bits
Counter (contact) (C)		
Timer (current value) (T)	120 words	12 words
Counter (current value) (C)		
I/O Relay		
Internal Hold Relay		
SYSMAC BUS/2 Remote I/O Relay		
Data Link Relay (LR)		
Hold Relay (HR)		
SYSBUS Remote I/O Relay		
Special Hold Relay (A)		
Data Memory (D)		

## 5 Environment Setup

The following tables list Pro-face's recommended communication settings for the target machine and PLC.

For details, see Section 7 – *Driver Configuration*, and Section 8 – *Protocol Configuration*.

### 5.1 C Series

#### RS-232C

Target Machine Setup		Communication Port Setup		
Driver Configuration	Connection Format	RS-232C	Connection Format	RS-232C
	Flow Control	DTR(ER)/CTS	--	
	Transmission Speed	19200bps	Baud Rate	19200bps
	Retry Count	2	--	
	Parity Bit	Even	Parity Bit	Even
	Stop Bit	2 bits	Stop Bit	2 bits
	Data Length	7 bits	Data Bit	7 bits
	Rcv. Time Out	10sec	--	
	TX Wait Time	0msec	--	
	--	--	Command Level	Level 1,2,3 is valid
	--	--	Relation	1:N
	--	--	DC +5V power supply	No
--	--	CTS Setup	Normally On	
Protocol Configuration	Station No.	0	Station Number	0

## 5.2 CV Series

## RS-232C

Target Machine Setup			Communication Port Setup	
Driver Configuration	Connection Format	RS-232C	Connection Format	RS-232C
	Flow Control	DTR(ER)/CTS	--	
	Transmission Speed	19200bps	Baud Rate	19200bps
	Retry Count	2	--	
	Parity Bit	Even	Parity Bit	Even
	Stop Bit	2 bits	Stop Bit	2 Bits
	Data Length	7 bits	Data Bit	7 bits
	Rcv. Time Out	10sec	--	
	TX Wait Time	0msec	--	
Protocol Configuration	Station No.	0	Station Number	0

## RS-422 (4-wire type)

Target Machine Setup			Communication Port Setup		
		GP, PS-P	PC/AT(PL) PS-G		
Driver Configuration	Connection Format	RS-422 (4-wire type)	RS-232C*1	Connection Format	RS-422
	Flow Control	None		--	
	Transmission Speed	19200bps		Baud Rate	19200bps
	Retry Count	2		--	
	Parity Bit	Even		Parity Bit	Even
	Stop Bit	2 bits		Stop Bit	2 bits
	Data Length	7 bits		Data Length	7 bits
	Rcv. Time Out	10sec		--	
	TX Wait Time	0msec		--	
Protocol Configuration	Station No.	0		Station Number	0

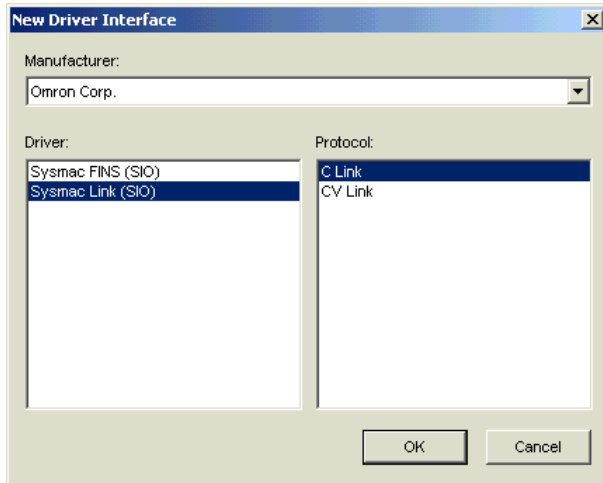
\*1 By using a RS-232C/RS-422(485) signal converter, you can use RS-422 connections with PC/AT(PL Series) and PS Series Type G target machines. In such a configuration, make sure you set the Driver's Serial Interface to RS-232C.

## 6 I/O Manager Configuration

The driver and protocol, which enable communication between the target machine and the PLC, depends on the PLC type.

**MEMO**

For information on how to display the [New Driver Interface] dialog box, see the online help.



## 7 Driver Configuraton

To configure the communication settings of the serial driver in the target machine, use the [Driver Configuration] dialog box. Make sure the settings match those of the PLC.

For an overview of the driver and protocol settings, see Section 5 – *Environment Setup*.

### MEMO

For information on how to display the [Driver Configuration] dialog box, see the online help.

### Manufacturer

Displays the name of the PLC manufacturer. This property is read-only.

### Interface

Displays the type of serial connection used to connect the target machine to the PLC. This property is read-only.

### COM Port

Defines which COM port to use on the target machine, for connecting to the PLC.

### MEMO

Select COM1 for PS Series Type G target machines. Connection is not possible using COM2.

### Serial Interface

Defines the serial connection: RS-232C or RS-422 (4-wire).

For details about the supported connections, see Section 2 – *Cable Diagrams*.

### Flow Control

Defines the signals that control the data flow.

### Transmission Speed

Sets the communication speed in bits per second. This setting must match the PLC baud rate.

### Retry Count

Defines the number of times the driver tries to send or receive data when there is an error.

**Parity Bit**

Sets either a parity bit [Even or Odd] for use in detecting communication errors, or [None] at all.

**Stop Bit**

Defines the length of the stop bit.

**Data Length**

Defines the length of each unit of data.

**Rcv. Timeout**

Defines the length of time the target machine waits for a response before it outputs a timeout error or sends another communication.

**TX Wait Time**

Defines the number of milliseconds that the target machine waits after receiving a communication packet, before sending a response.

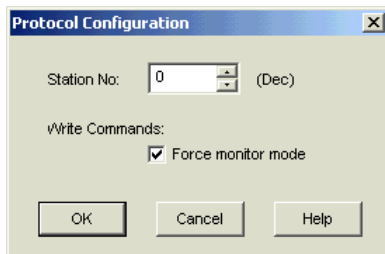
## 8 Protocol Configuraton

To set up details about the communication process between the target machine and the PLC, use the [Protocol Configuration] dialog box.

For an overview of the driver and protocol settings, see Section 5 – *Environment Setup*.

**MEMO**

For information on how to display the [Protocol Configuration] dialog box, see the online help.



### Station No.

Enter the octal number that identifies the PLC. (1-37)

### Write Commands: Force write mode

The PLC prevents write commands by a Pro-Designer Runtime application when Write Mode is OFF.

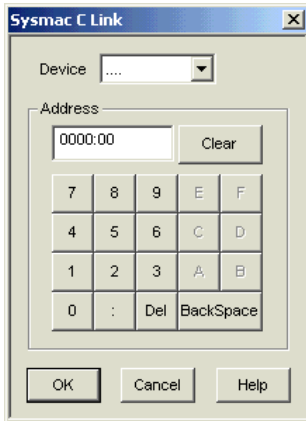
Select Force write mode so the PLC changes to Write Mode when Pro-Designer Runtime attempts a write operation.

## 9 Device Address Configuration

To set up a PLC variable in the Variable List, use the device address keypad from the variable properties. See Section 3 – *Supported Device Addresses*.

**MEMO**

For information on how to display the device address keypad, see the online help.



### Device

Lists the PLC's discrete and word device types.

### Address

Enter the device address for the PLC variable. The keypad ensures that you enter the correct format for bit and word devices.