

# Mitsubishi Electric

## Melsec-Q CPU (SIO) Driver

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- This manual explains how to connect the target machine with other manufacturer devices. 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 version of Pro-Designer. For information about the compatibility of target machines, please refer to the Pro-Designer Online Help.

# 1 System Structure

The following table describes the basic system setup for connecting the target machine to Mitsubishi Melsec-Q Series PLCs over a serial connection.

To view a cable connection diagram for a particular communication format, see Section 2 – *Cable Diagrams*.

Series	CPU*1	Link I/F	Comm. Format	Diagram
MELSEC Q-Series	QO2CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	CPU Direct	RS-232C	Cable Diagram 1

\*1 Connect to the CPU's RS-232C port.

## 2 Cable Diagrams

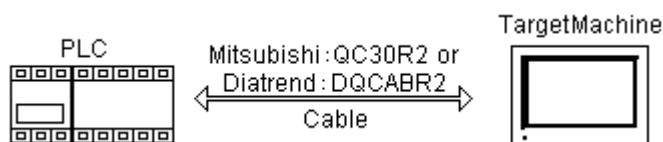
The illustrated cable diagrams and those recommended by Mitsubishi may differ. However, Pro-face recommends using the following diagrammed connections.

Ground the PLC's FG terminal according to your country's applicable standard. For details, refer to the PLC manual.

### Cable Diagram 1 RS-232C

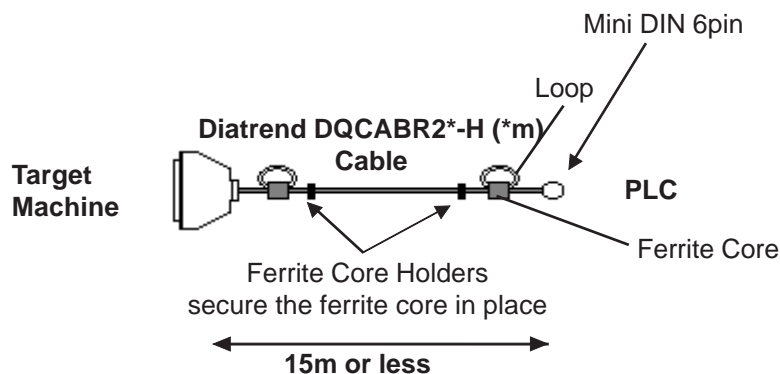
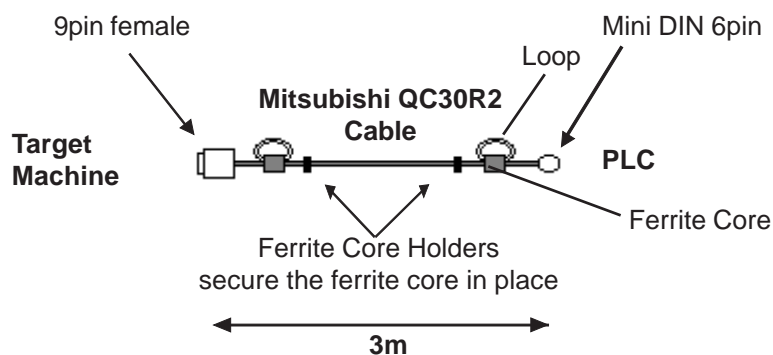
To connect the target machine and the PLC, use a recommended cable or create your own cable using the following specifications.

Target Machine	Cable / Adapter	Comments
GP, PS-P, PC/AT(PL), PS-G	RS-232C Cable (Mitsubishi: QC30R2 (3m) OR Diatrend: DQCABR2*-H (*m))	



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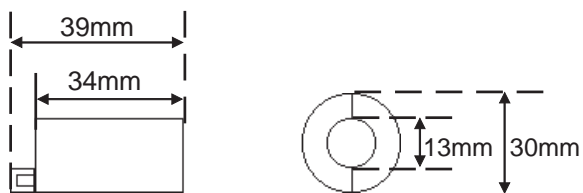
- Attaching a ferrite core will reduce the amount of noise in the cable (see the following diagrams.)
- Attach two ferrite cores to the cable, one at each end. Loop the cable once around each ferrite core.



• **Recommended Ferrite Core**

Maker :Seiwa Electronics Corporation

Model :E04SR301334



You can use ferrite cores from other manufacturers, but make sure they are the same size as defined here.

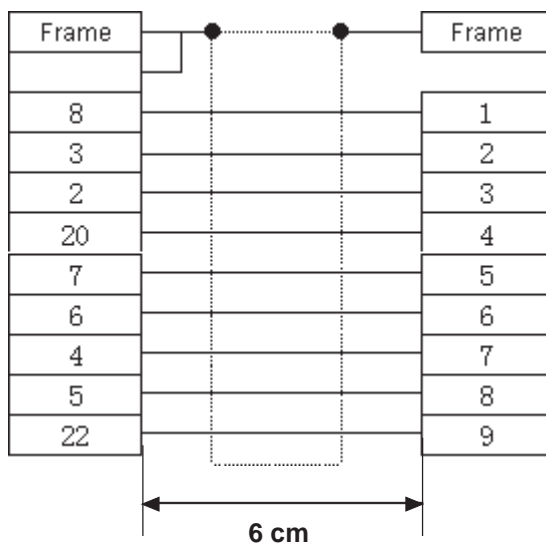
Conversion Adaptor Specifications

- Straight connection type
- Dsub 25pin male Lock-screw (mm)
- Dsub 9pin male Lock nut (inch)

<Adaptor : Roas Co. Model No. ZA-403>

**Dsub 25pin male  
Lock-screw (mm)**

**Dsub 9pin male  
Lock-nut (inch)**



### 3 Supported Device Addresses

The following table lists the device address ranges you can enter from the *Device Address Keypad*.

For actual device address ranges supported by the PLC, refer to the corresponding PLC manual. Supported device addresses differ from protocol to protocol and between PLC models.

Device	Bit Address	Word Address	16 bit	32 bit
Input Relay	X0000-XFFFF	X0000-XFFF0 <sup>*1</sup>	LH <sup>*6</sup>	LH <sup>*6</sup>
Output Relay	Y0000-YFFFF	Y0000-YFFF0 <sup>*1</sup>		
Internal Relay	M0000-M65535	M0000-M65520 <sup>*2</sup>		
Latch Relay	L0000-L65535	L0000-L65520 <sup>*2</sup>		
Special Relay	SM0000-SM9999	SM0000-SM9984 <sup>*2</sup>		
Annunciator	F0000-F65535	F0000-F65520 <sup>*2</sup>		
Edge Relay	V0000-V65535	V0000-V65520 <sup>*2</sup>		
Step Relay	S0000-S9999	S0000-S9984 <sup>*2</sup>		
Link Relay	B0000-BFFFF	B0000-BFFF0 <sup>*3</sup>		
Special Link Relay	SB000-SBFFF	SB000-SBFFF0 <sup>*3</sup>		
Timer (contact)	TS0000-TS65535	--		
Timer (coil)	TC0000-TC65535	--		
Retentive Timer (contact)	SS0000-SS65535	--		
Retentive Timer (coil)	SC0000-SC65535	--		
Counter (contact)	CS0000-CS65535	--		
Counter (coil)	CC0000-CC65535	--		
Timer (current value)	--	TN00000-TN65535		
Retentive Timer (current value)	--	SN00000-SN65535		
Counter (current value)	--	CN00000-CN65535		
Data Register <sup>*3</sup>	D0000:0-D65535:15	D0000-D65535 <sup>*4</sup>		
Special Register <sup>*3</sup>	SD0000:0-SD9999:15	SD0000-SD9999 <sup>*4</sup>		
Link Register <sup>*3</sup>	W0000:0-WFFFF:F	W0000-WFFFF <sup>*5</sup>		
Special Link Register <sup>*3</sup>	SW000:0-SWFFF:F	SW000-SWFFF <sup>*5</sup>		
File Register(Normal) <sup>*3</sup>	R0000:0-R65535:15	R0000-R65535 <sup>*4</sup>		
File Register(0R-31R) <sup>*3</sup>	0R0000:0-0R7FFF:F	0R0000-0R7FFF <sup>*5</sup>		
	1R0000:0-1R7FFF:F	1R0000-1R7FFF <sup>*5</sup>		
	2R0000:0-2R7FFF:F	2R0000-2R7FFF <sup>*5</sup>		
	--	--		
	30R0000:0-30R7FFF:F	30R0000-30R7FFF <sup>*5</sup>		
	31R0000:0-31R7FFF:F	31R0000-31R7FFF <sup>*5</sup>		

\*1 To use as word address, the bit column (last column) must be 0.

\*2 To use as word address, must be multiple of 16.

\*3 When the bit write operation is performed, the Target Machine reads the PLC's corresponding word address and turns a bit ON, then send back to PLC. Do not write to the word address from the ladder program in the middle of this operation.

\*4 You can define a bit address by adding a colon followed by the bit position (0-15) at the end of the word. (e.g. D0100:8)

\*5 You can define a bit address by adding a colon followed by the bit position (0-F) at the end

of the word. (e.g. W0001:A)

\*6 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 that can be read by each PLC. Refer to this table when using block transfers.

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- To speed up data communication, use consecutive device addresses on the same panel screen.
- The following situations increase the number of times that the device is read, and reduces the data communication speed between the target machine and the PLC:
  - when the number of consecutive addresses exceeds the maximum
  - when an address is designated for division
  - when different device types are used

Device	Max. Consecutive Addresses	Gap Span
Input Relay (X)	15360 bits	1535 bits
Output Relay (Y)		
Internal Relay (M)		
Latch Relay (L)		
Link Relay (B)		
Timer [contact] (TS)		
Timer [coil] (TC)		
Counter [contact] (CS)		
Counter [coil] (CC)		
Data Register (D)	960 words	96 words
Link Register (W)		
File Register (R)		
Extended File Register (R)		
Timer [current value] (TN)		
Counter [current value] (CN)		

## 5 Environment Setup

The following table lists the communication settings, recommended by Pro-face, for the target machine and Mitsubishi MELSEC PLCs.

For details, see Section 7 – *Driver Configuration*.

Target Machine		PLC Settings	
Driver	Serial Interface	RS-232C	--
	Flow Control	None	--
	Transmission Speed	19200 bps	--
	Retry Count	2	--
	Parity Bit	Odd	--
	Stop Bit	1 bit	--
	Data Length	8 bits	--
	Rcv. Timeout	10 sec	--
	TX Wait Time	0 msec	--

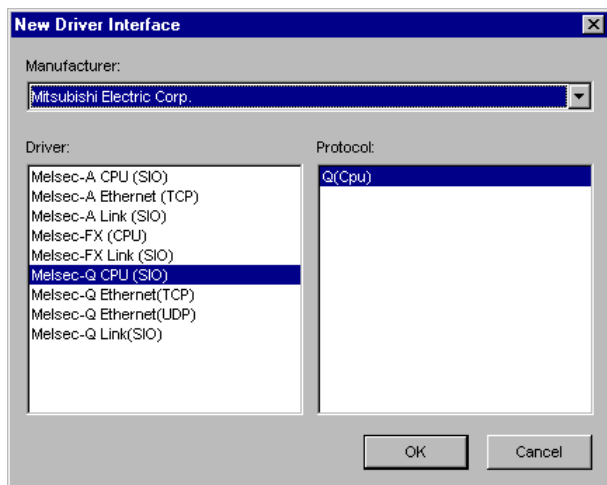


## 6 I/O Manager Configuration

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.



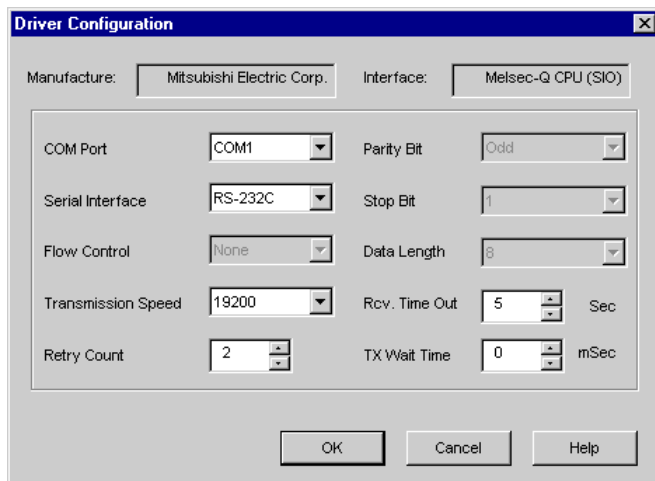
## 7 Driver Configuration

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.

### Interface

Displays the type of serial connection used to connect the target machine to the PLC.

### COM Port

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

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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 the parity bit for detecting communication errors.

### Stop Bit

Defines 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 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.