

Modicon

Modicon Modbus (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 system setups, which have been tested, that connect the target machine to Modbus Series PLCs. Use these as the basis for connecting your own system. To view a cable connection diagram for a particular communication format, see Section 2 – [Cable Diagrams](#).

| Series | CPU | Link I/F | Comm. Format | Diagram |
|--------|-------------------------|---------------------------|----------------|--------------------|
| Modbus | Quantum 140 CPU 113 02 | CPU Unit's Modbus Port | RS-232C | Cable Diagram 1 |
| | Quantum 140 CPU 113 03 | | | |
| | Quantum 140 CPU 434 12A | | | |
| | Quantum 140 CPU 534 14A | | | |
| | Momentum 171 CCS 780 00 | CPU Unit's RS-485 port | RS-422(4-wire) | Cable Diagram 2 |
| | Momentum 171 CCS 780 10 | | | |
| | Momentum 171 CCC 980 20 | | | |
| | Momentum 171 CCC 980 30 | | | |

2 Cable Diagrams

The illustrated cable diagrams and those recommended by Modicon 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.
- When making your own communication cable, be sure to connect the SG signal.

Diagram 1 RS-232C

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

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

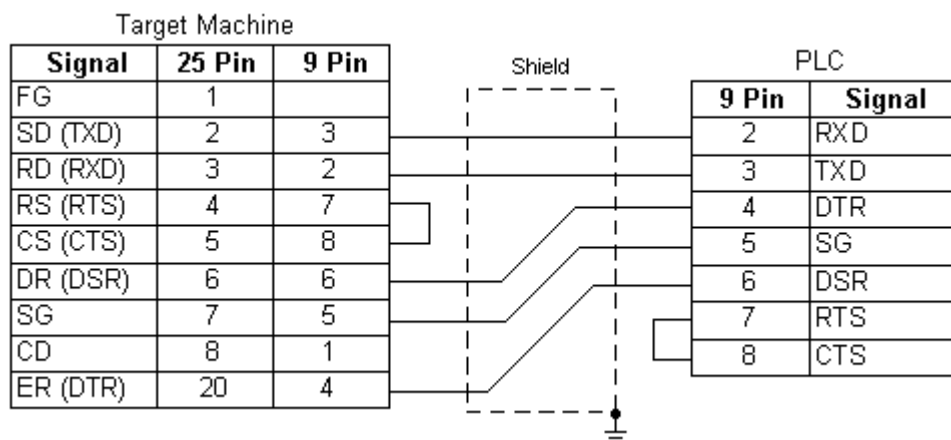


Diagram 2 RS-422 (4-wire)

To connect the target machine and the PLC, use a connection terminal, signal converter, or create your own cable using the following specifications.

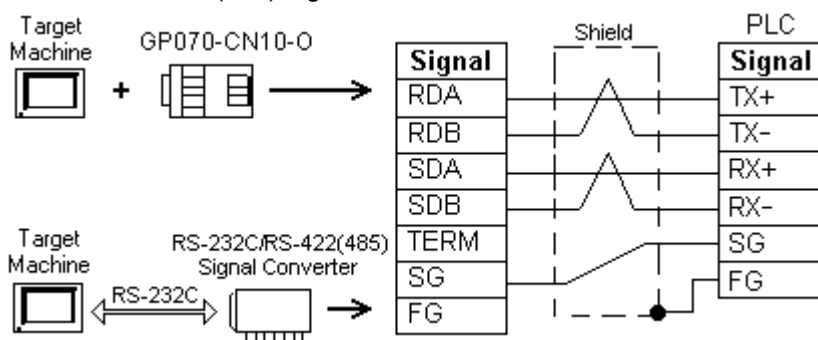
| Target Machine | Cable / Adapter | Comments |
|-----------------|---|-------------------------|
| GP*1, PS-P*1 | a RS-422 Connection Terminal Adapter (Pro-face: GP070-CN10-O) | Cable length: 500m max. |
| | b User-created Cable | |
| PC/AT(PL), PS-G | a RS-232C / RS-422(485) Signal Converter | |

*1 Connect to COM1.

MEMO

Use shielded twisted-pair cables for noise immunity. Connect the cable shields, then connect the cable to a single-point ground.

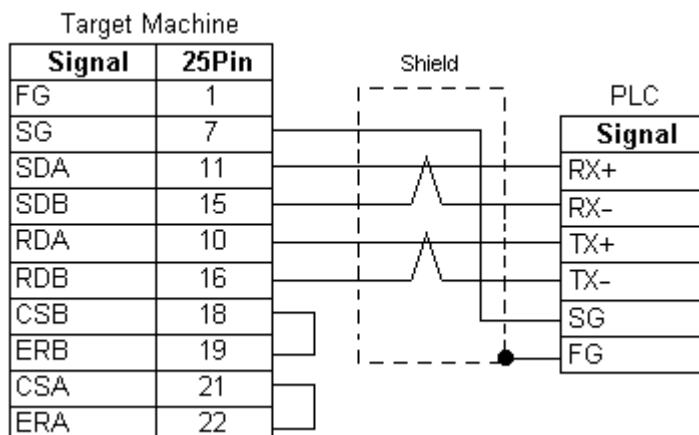
- a. RS-422 Connection Terminal Adapter (Pro-face: GP070-CN10-O) or RS-232C/RS-422(485) Signal Converter



MEMO

- As the RS-422(485) side of the RS-232C/RS-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



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.

MEMO

- 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 |
|------------------------|----------------------------|----------|
| Coils (C) | 512 bits | 127 bits |
| Discrete Inputs (DI) | | |
| Input Registers (IR) | 125 words | 24 words |
| Holding Registers (HR) | | |

5 Environment Setup

The following table lists the communication settings, recommended by Pro-face, for the target machine and Modbus PLC.

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

RS-232C

| Target Machine Settings | | | PLC Settings | |
|-------------------------|--------------------|-------------|-------------------|----------------|
| Driver Interface | Serial Interface | RS-232C | Connection Format | RS-232C |
| | Flow Control | DTR(ER)/CTS | — | |
| | Transmission Speed | 19200 bps | Baud Rate | 19200 bps |
| | Retry Count | 2 | — | |
| | Parity Bit | Even | Parity Bit | Even |
| | Stop Bit | 1 bit | Stop Bit | 1 bit |
| | Data Length | 8 bit | — | |
| | Rcv. Time Out | 10 s | — | |
| | TXWait Time | 0 ms | — | |
| | — | | | Mode/Data Bits |
| Protocol | PLC No. | 1 | Station Address | 1 |

RS-422 (4-wire)

| Target Machine Settings | | | | PLC Settings | |
|-------------------------|--------------------|----------------|----------------|-------------------|-----------|
| | | GP, PS-P | PC/AT(PL),PS-G | | |
| Driver Interface | Serial Interface | RS-422(4-wire) | RS-232C*1 | Connection Format | RS-485 |
| | Flow Control | None | DTR(ER)/CTS | — | |
| | Transmission Speed | 19200 bps | | Baud Rate | 19200 bps |
| | Retry Count | 2 | | — | |
| | Parity Bit | Even | | Parity Bit | Even |
| | Stop Bit | 1 bit | | Stop Bit | 1 bit |
| | Data Length | 8 bit | | — | |
| | Rcv. Time Out | 10 s | | — | |
| | TXWait Time | 0 ms | | — | |
| | — | | | Mode/Data Bits | RTU (8) |
| Protocol | PLC No. | 1 | | Station Address | 1 |

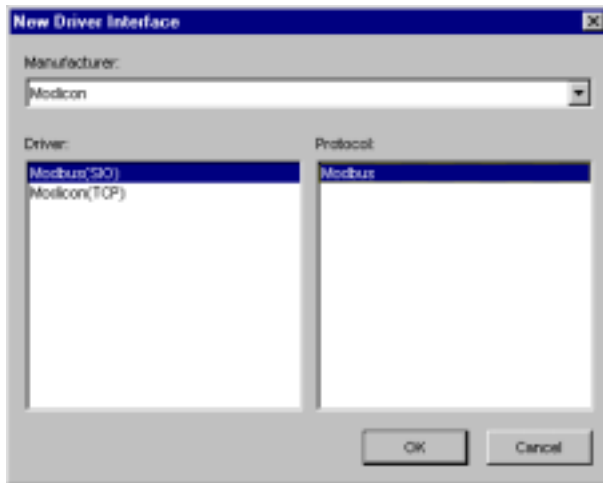
*1 By using a RS-232C/RS-422(485) signal converter, you can use RS-485 connections with PC/AT (PL Series) or PS Series Type G target machines. In such a configuration, make sure you set the Driver's Serial Interface to RS-232C.

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.



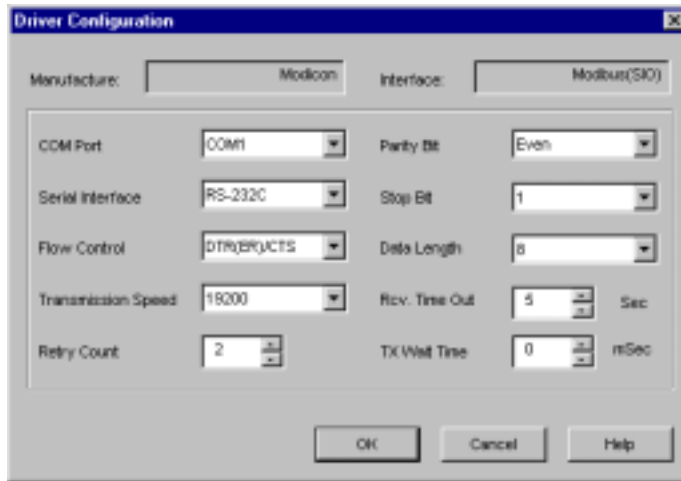
7 Driver Configuration

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 : select RS-232C.

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].

Stop Bit

Defines the stop bit: 1 bit or 2 bits.

Data Length

Defines the length of each unit of data: 7 bit or 8 bit.

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 Configuration

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.



PLC No.

Enter a value (1-247) to identify the PLC. This value must match the Station Address set up on the PLC.

Start Address

PLC manufacturers may use different address ranges for their particular PLCs. Use Start Addresses to configure the addresses supported on your Modbus PLC.

Coils

Defines the start address for Coils as supported on your PLC. Coils begin from this start address and end at the Discrete Inputs start address (or Coils Start Address + 65535).

Discrete Inputs

Defines the start address for Discrete Inputs as supported on your PLC. Discrete Inputs begin from this start address and end at the Input Registers start address (or Discrete Inputs Start Address + 65535).

Input Registers

Defines the start address for Input Registers as supported on your PLC. Input Registers begin from this start address and end at the Holding Registers start address (or Input Registers Start Address + 65535).

Holding Registers

Defines the start address for Holding Registers as supported on your PLC. Holding Registers begin from this start address and end at the start address + 65535.

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 discrete and word device types.

Address

Enter the address for the PLC variable. The keypad ensures you enter the correct address for the selected bit or word device, as configured in the [Protocol Configuration](#) dialog box.

MEMO

Instead of using the device address keypad, you can type the address directly in the Property Inspector. When doing so, you must also type the device (C, DI, IR, or HR). E.g. "HR400001"