Fuji Electric

MONITOUCH

Connection Manual [1]

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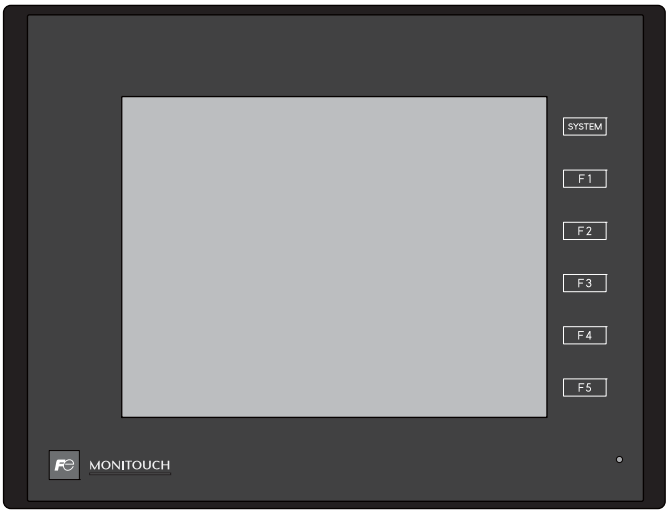

TECHNOSHOT

TS2060

Record of Revisions

Reference numbers are shown at the bottom left corner on the back cover of each manual.

Printing Date	Reference No.	Revised Contents
June, 2016	2204NE0	First edition
June, 2018	2204NE1	Second edition

Preface

Thank you for selecting the MONITOUCH TS2060.
For correct set-up of the TS2060, you are requested to read through this manual to understand more about the product.
For more information about the TS2060, refer to the following related manuals.

Manual Name	Contents	Reference No.
TS2060 Reference Manual [1]	Explains the functions and operation of the TS2060.	1204NE
TS2060 Reference Manual [2]		1205NE
V Series Macro Reference	Provides an overview of macros of V-SFT version 6 and explains macro editor operations and macro command descriptions in detail.	1056NE
V9 Series Operation Manual	Explains the configuration of V-SFT version 6, the editing process of each part and limitations regarding operation in detail.	1072NE
TS2060 Connection Manual [1]	Explains the connection and communication parameters for the TS2060 and controllers in detail.	2204NE
TS2060 Connection Manual [2]		2205NE
TS2060 Connection Manual [3]		2206NE
TS2060 Hardware Specifications	Explains hardware specifications and precautions when handling the TS2060.	2207NE

For details on devices including PLCs, inverters, and temperature controllers, refer to the manual for each device.

Notes:

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2. The information in this manual is subject to change without prior notice.
3. Windows and Excel are registered trademarks of Microsoft Corporation in the United States and other countries.
4. All other company names or product names are trademarks or registered trademarks of their respective holders.
5. This manual is intended to give accurate information about MONITOUCH hardware. If you have any questions, please contact your local distributor.

Types and Model Names of the TS2060

The MONITOUCH TS2060 comprises the following types.

Generic Name	Model	Physical Ports					
		MJ1, MJ2	LAN	USB-A	USB-miniB	SD Card Slot	Option/Communication Unit Connector
TS2060	TS2060i	○	○	○	○	○	○
	TS2060	○*	×	×	○	×	×

* The external power supply of +5 V is not available.

Note that model names are differentiated according to the above descriptions in this manual for operation explanations.

Notes on Safe Usage of MONITOUCH

In this manual, you will find various notes categorized under the following two levels with the signal words "Danger" and "Caution."

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

Note that there is a possibility that an item listed under ⚠ CAUTION may have serious ramifications.

⚠ DANGER

- Never use the output signal of the TS2060 for operations that may threaten human life or damage the system, such as signals used in case of emergency. Please design the system so that it can cope with a touch switch malfunction. A touch switch malfunction may result in machine accidents or damage.
- Turn off the power supply when you set up the unit, connect new cables, or perform maintenance or inspections. Otherwise, electrical shock or damage may occur.
- Never touch any terminals while the power is on. Otherwise, electrical shock may occur.
- You must cover the terminals on the unit before turning the power on and operating the unit. Otherwise, electrical shock may occur.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If leaked liquid crystal makes contact with skin or clothing, wash it away with soap and water.
- Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions will lead to explosion or ignition.
- Never use a lithium battery that is deformed, leaking, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or ignition.
- Switches on the screen are operable even when the screen has become dark due to a faulty backlight or when the backlight has reached the end of its service life. If the screen is dark and hard to see, do not touch the screen. Otherwise, a malfunction may occur resulting in machine accidents or damage.

⚠ CAUTION

- Check the appearance of the unit when it is unpacked. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage, or malfunction.
- For use in a facility or as part of a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, please consult your local distributor.
- Operate (or store) the TS2060 under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage, or deterioration.
- Observe the following environmental restrictions on use and storage of the unit. Otherwise, fire or damage to the unit may result.
  - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids, or cutting oil can come into contact with the unit.
  - Avoid high temperatures, high humidity, and outside weather conditions, such as wind, rain, or direct sunlight.
  - Avoid locations where excessive dust, salt, and metallic particles are present.
  - Avoid installing the unit in a location where vibrations or physical shocks may be transmitted.
- Equipment must be correctly mounted so that the main terminal of the TS2060 will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Tighten the mounting screw on the fixtures of the TS2060 to an equal torque of 4.43 lbf-in (0.5 N·m).
  Excessive tightening may distort the panel surface. Loose mounting screws may cause the unit to fall down, malfunction, or short-circuit.
- Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws or nuts may result in fire or malfunction.
- Tighten the terminal screws on the power supply terminal block of the TS2060 to an equal torque of 5 to 6 lbf-in (0.56 to 0.68 N·m). Improper tightening of screws may result in fire, malfunction, or other serious trouble.
- The TS2060 has a glass screen. Do not drop the unit or impart physical shocks to the unit. Otherwise, the screen may be damaged.
- Correctly connect cables to the terminals of the TS2060 in accordance with the specified voltage and wattage. Overvoltage, overwattage, or incorrect cable connection could cause fire, malfunction, or damage to the unit.
- Always ground the TS2060. The FG terminal must be used exclusively for the TS2060 with the level of grounding resistance less than 100 Ω. Otherwise, electric shock or a fire may occur.
- Prevent any conductive particles from entering the TS2060. Failure to do so may lead to fire, damage, or malfunction.

⚠CAUTION

- After wiring is finished, remove the paper used as a dust cover before starting operation of the TS2060. Operation with the dust cover attached may result in accidents, fire, malfunction, or other trouble.
- Do not attempt to repair the TS2060 yourself. Contact Hakko Electronics or the designated contractor for repairs.
- Do not repair, disassemble, or modify the TS2060. Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, disassembly, or modification of the unit that was performed by an unauthorized person.
- Do not use sharp-pointed tools to press touch switches. Doing so may damage the display unit.
- Only experts are authorized to set up the unit, connect cables, and perform maintenance and inspection.
- Lithium batteries contain combustible material such as lithium and organic solvents. Mishandling may cause heat, explosion, or ignition resulting in fire or injury. Read the related manuals carefully and correctly handle the lithium battery as instructed.
- Take safety precautions during operations such as changing settings when the unit is running, forced output, and starting and stopping the unit. Any misoperations may cause unexpected machine movement, resulting in machine accidents or damage.
- In facilities where the failure of the TS2060 could lead to accidents that threaten human life or other serious damage, be sure that such facilities are equipped with adequate safeguards.
- When disposing of the TS2060, it must be treated as industrial waste.
- Before touching the TS2060, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- Insert an SD card into MONITOUCH in the same orientation as pictured on the unit. Failure to do so may damage the SD card or the slot on the unit.
- Removing the SD card while it is being accessed may destroy any data stored on it. Be sure to press the storage removal switch before removing an SD card.
- Do not press two or more positions on the screen at the same time. If two or more positions are pressed at the same time, the switch located between the pressed positions may be activated.
- Be sure to remove the protective sheet that is attached to the touch panel surface at delivery before use. If used with the protective sheet attached, MONITOUCH may not recognize touch operations or malfunctions may occur.

[General Notes]

- Never bundle control cables or input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep control cables and input/output cables at least 200 mm away from high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using the TS2060 in an environment where a source of high-frequency noise is present, it is recommended that the FG shielded cable (communication cable) be grounded at each end. However, when communication is unstable, select between grounding one or both ends, as permitted by the usage environment.
- Be sure to plug connectors and sockets of the TS2060 in the correct orientation. Failure to do so may lead to damage or malfunction.
- If a LAN cable is inserted into the MJ1 or MJ2 connector, the device on the other end may be damaged. Check the connector names on the unit and insert cables into the correct connectors.
- Do not use thinners for cleaning because it may discolor the TS2060 surface. Use commercially available alcohol.
- Clean the display area using a soft cloth to avoid scratching the surface.
- If a data receive error occurs when the TS2060 unit and a counterpart unit (PLC, temperature controller, etc.) are started at the same time, read the manual of the counterpart unit to correctly resolve the error.
- Avoid discharging static electricity on the mounting panel of the TS2060. Static charge can damage the unit and cause malfunctions.
- Avoid prolonged display of any fixed pattern. Due to the characteristic of liquid crystal displays, an afterimage may occur. If prolonged display of a fixed pattern is expected, use the backlight's auto OFF function.
- The TS2060 is identified as a class-A product in industrial environments. In the case of use in a domestic environment, the unit is likely to cause electromagnetic interference. Preventive measures should thereby be taken appropriately.

[Notes on the LCD]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness, and colors of the TS2060 may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the characteristics of liquid crystal.
- Unevenness in brightness and flickering may occur depending on the screen display pattern due to the characteristics of liquid crystal.
- Each unit varies slightly with respect to brightness and colors.
- Display colors may vary depending on the viewing angle because a converging lens is used in the backlight unit.

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1.1 System Configuration

1.1.1 Overview

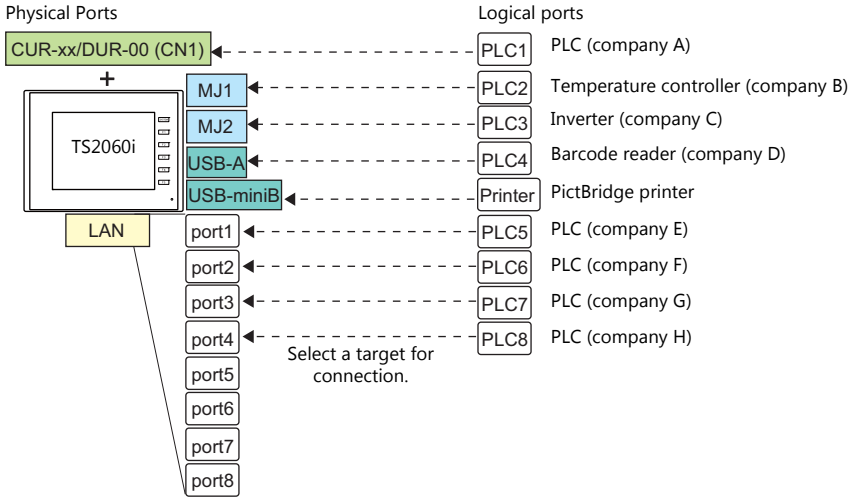
The TS series comprises two models: the TS2060i and TS2060. The number of communication ports each model is equipped with differs.

TS2060i

The TS2060i is equipped with six physical ports consisting of two serial ports [*1], one LAN port, one USB-A port, one USB mini-B port, and one network communication port [*2]. The LAN port can open eight ports simultaneously.
Up to eight different models of devices can be connected to these ports. In addition, a printer and network camera can also be connected.

*1 There are three serial ports when the DUR-00 is attached to the TS2060i.
*2 The communication interface unit "CUR-xx" is required to perform network communication.

Connection example:



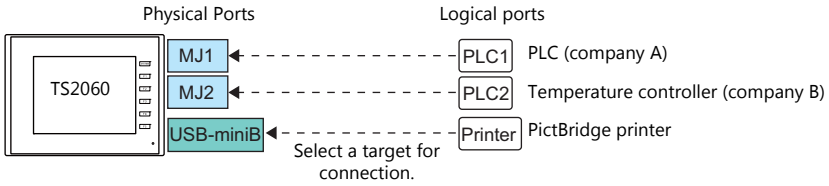
Physical Ports				No. of Ports	Connected Device	
					8-way communication	Other than 8-way
Serial	CN1	RS-232C / RS-422/485	The "DUR-00" is required.	1	PLC, temperature controller, servo, inverter, barcode reader, V-Link, slave communication (Modbus RTU)	-
	MJ1	RS-232C/RS-485 (2-wire system)		1		Computer (screen program transfer, MJ1), serial printer
	MJ2	RS-232C/RS-422 (4-wire system), RS-485 (2-wire system)		1		
Ethernet	LAN			8	PLC, slave communication (Modbus TCP/IP)	Computer, network camera
USB	USB-A			1	Barcode reader	USB flash drive, keyboard, mouse, USB-hub
	USB mini-B			1	-	Printer (PictBridge), computer (screen program transfer)
Network	EXT1	OPCN-1	CUR-00	1	PLC	-
		T-Link	CUR-01			
		CC-LINK	CUR-02			
		Ethernet	CUR-03			
		PROFIBUS-DP	CUR-04			
		SX BUS	CUR-06			
		DeviceNet	CUR-07			
		FL-Net	CUR-08			
		Serial (CN1)	DUR-00		PLC, temperature controller, servo, inverter, barcode reader, V-Link, slave communication (Modbus RTU)	-

- Only the logical port PLC1 can be selected for the following devices and functions. Thus, they cannot be connected at the same time.
  - Devices
    Network connection (CUR-xx), without PLC connection, Mitsubishi Electric A-Link + Net10, AB Control Logix, Allen-Bradley Micro800 controllers, Siemens S7-200PPI, Siemens S7-300/400 MPI connection
  - Functions
    Multi-link2, Multi-link, ladder transfer, ladder monitor, MICREX SX variable name cooperation function

TS2060

The TS2060 is equipped with three physical ports consisting of two serial ports and one USB mini-B port. Up to two different models of devices can be connected to these ports for simultaneous communication. In addition, a PictBridge-compatible printer can be connected as well.

Connection example:



Physical Ports			No. of Ports	Connected Device	
				8-way communication	Other than 8-way
Serial	MJ1	RS-232C/RS-485 (2-wire system)	1	PLC, temperature controller, servo, inverter, barcode reader, V-Link, slave communication (Modbus RTU)	Computer (screen program transfer, MJ1), serial printer
	MJ2	RS-232C/RS-422 (4-wire system), RS-485 (2-wire system)	1		
USB	USB mini-B		1	-	Printer (PictBridge), computer (screen program transfer)

- Only the logical port PLC1 can be selected for the following devices and functions. Thus, they cannot be connected at the same time.
  - Devices
    Without PLC connection, Mitsubishi Electric A-Link + Net10, AB Control Logix, Allen-Bradley Micro800 controllers, Siemens S7-200PPI, Siemens S7-300/400 MPI connection
  - Functions
    Multi-link2, Multi-link, ladder transfer, MICREX SX variable name cooperation function

1.1.2 System Composition

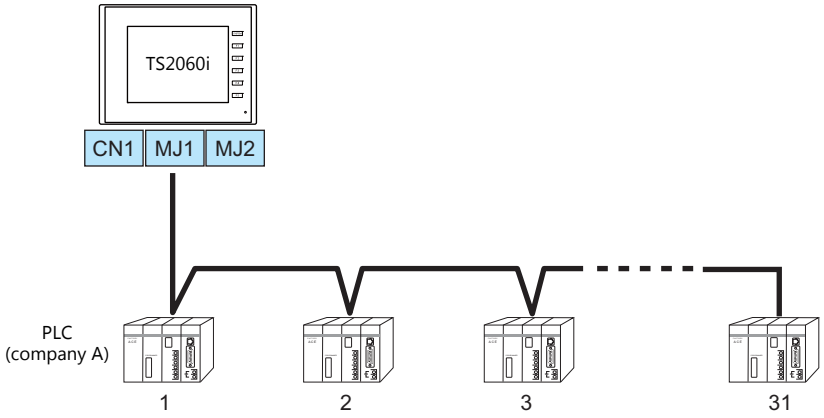
Serial Communication

- 1 : 1 Connection
  A communication port is selectable from CN1 *, MJ1, and MJ2.
  For more information, refer to "1 : 1 Connection" (page 1-11) in "1.3 Connection Methods".

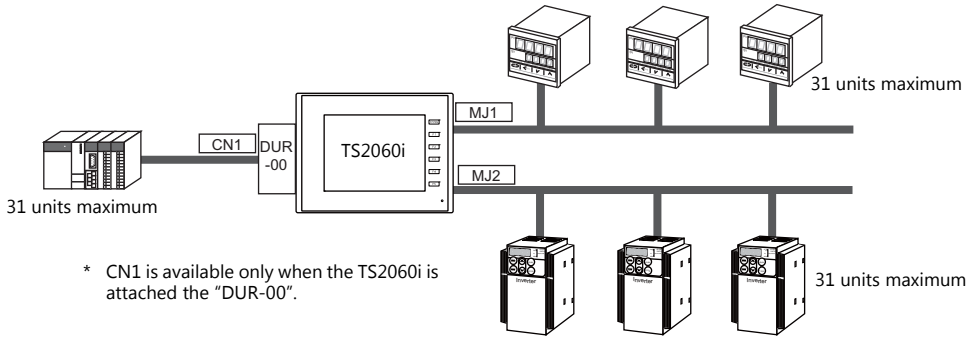
  * CN1 is available only when the TS2060i is attached the "DUR-00".

- 1 : n Connection
  A communication port is selectable from CN1 *, MJ1, and MJ2. A maximum of 31 units of the same model can be connected to each port.
  For more information, refer to "1 : n Connection (Multi-drop)" (page 1-18) in "1.3 Connection Methods".

  * CN1 is available only when the TS2060i is attached the "DUR-00".



- 3-way Connection (TS2060i only; 2-way connection for TS2060)
  The TS2060i is allowed to communicate with three different models of devices at the same time via three serial ports. A maximum of 31 units of the same model can be connected to each port.
  The connection method is the same as those for 1 : 1 and 1 : n.

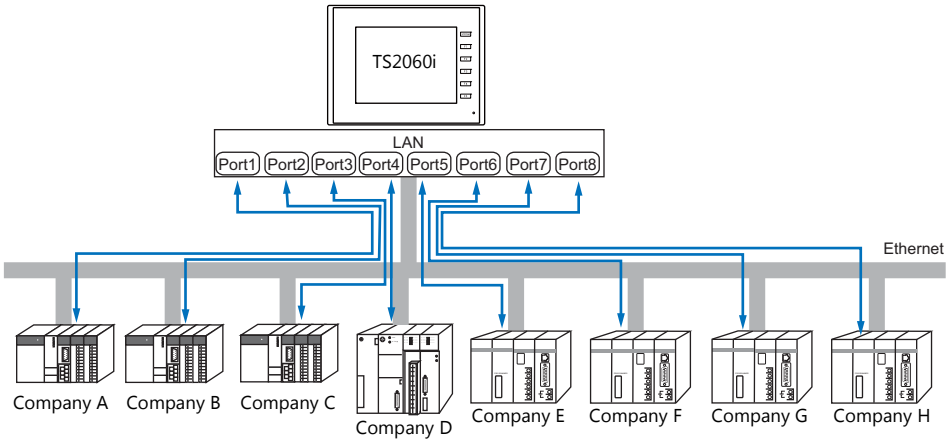


- n : 1 Connection
  Multiple TS2060 units can be connected to one PLC or temperature controller.
  For more information, refer to "n : 1 Connection (Multi-link2)" (page 1-21), "n : 1 Connection (Multi-link2 (Ethernet)) (TS2060i Only)" (page 1-31), "n : 1 Connection (Multi-link)" (page 1-37) in "1.3 Connection Methods".

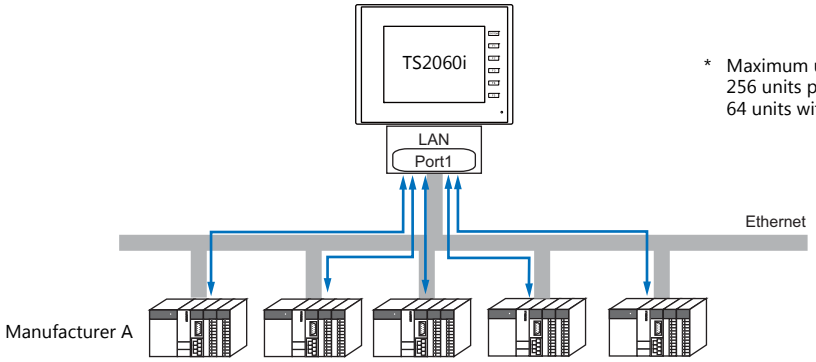
- n : n Connection
  Multiple TS2060 units can be connected to multiple PLCs.
  For more information, refer to "n : n Connection (1 : n Multi-link2 (Ethernet)) (TS2060i Only)" (page 1-34) in "1.3 Connection Methods".

Ethernet Communication (TS2060i Only)

Because eight communication ports can be opened, the TS2060i is allowed to communicate with eight models of PLCs at the same time.



When there are two or more PLCs of the same model, the TS2060i is allowed to carry out 1 : n communication via one port.



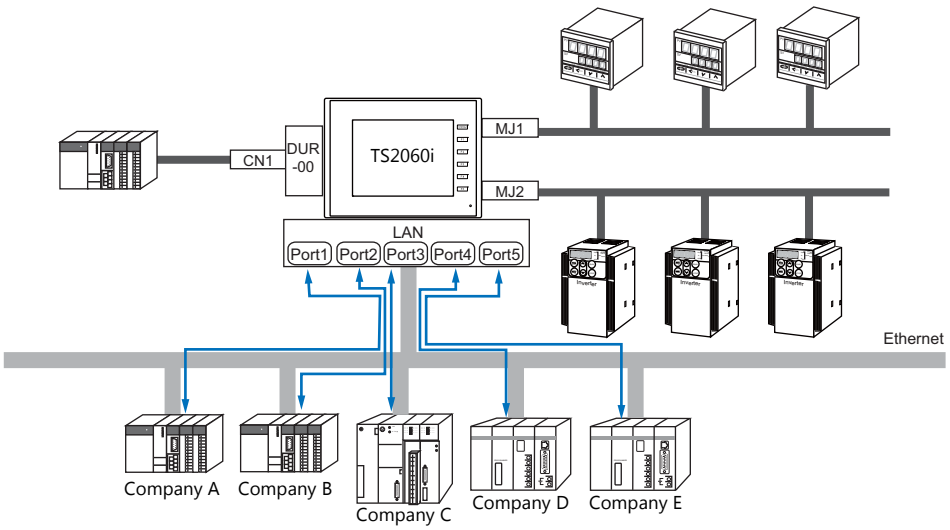
* Maximum units:
256 units per port for UDP/IP
64 units with eight ports for TCP/IP

* For more information, refer to "1.3.2 Ethernet Communication (TS2060i Only)" (page 1-43) in "1.3 Connection Methods".

Mixed Serial-Ethernet Communication (TS2060i only)

In the case of mixed serial-Ethernet communication, the TS2060i is allowed to communicate with eight different models of devices at the same time.

- Connection of 3 models for serial communication and 5 models for Ethernet communication



* For the connection method, refer to "1.3.1 Serial Communication" and "1.3.2 Ethernet Communication (TS2060i Only)".

1.2 Physical Ports

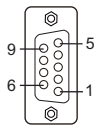
1.2.1 CN1 (TS2060i + DUR-00)

The CN1 port supports communication via RS-232C, RS-422 (4-wire system), and RS-485 (2-wire system).
The signal level can be changed between RS-232C and RS-422/485 under [Communication Setting] of the editor.

⚠CAUTION

- The optional unit "DUR-00" is required. The "DUR-00" cannot be used together with the communication unit "CUR-xx".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i").
- When executing communication via RS-232C, set the terminating resistance DIP switches to OFF.
  Set DIP switches 1 and 2 on the optional "DUR-00" to OFF. For more information on DIP switches, see "1.2.6 DIP Switch (DIPSW) Settings" (page 1-10).

Pin Arrangement

TS2060i + DUR-00 CN1 Dsub 9pin, Female	No.	RS-232C		RS-422/RS-485	
		Name	Contents	Name	Contents
	1	NC	Not used	+RD	Receive data (+)
	2	RD	Receive data	–RD	Receive data (–)
	3	SD	Send data	–SD	Send data (–)
	4	NC	Not used	+SD	Send data (+)
	5	0V	Signal ground	0V	Signal ground
	6	NC	Not used	+RS	RS send data (+)
	7	RS	RS request to send	–RS	RS send data (–)
	8	CS	CS clear to send	NC	Not used
	9	NC	Not used	+5V	Terminating resistance

Recommended Connector for Communication Cable

Recommended Connector	
DDK's 17JE-23090-02(D8C)-CG	D-sub 9-pin, male, inch screw thread, with hood, RoHS compliant

Applicable Devices

Applicable Devices
PLC, temperature controller, inverter, servo, barcode reader

1.2.2 MJ1/MJ2

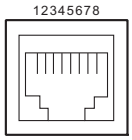
The MJ1 and MJ2 ports support communication via RS-232C, RS-485 (2-wire system), and RS-422 (4-wire system, only with MJ2).
MJ1 is also usable as a screen program transfer port.

CAUTION

- MJ1 and MJ2 use the same type RJ-45 connector as the LAN connector.
  To prevent damage to the device from an external power supply of the MJ, check the indication on the unit and insert a cable in the correct position.
- Only MJ2 supports RS-422 (4-wire system). MJ1 is not usable for connection via RS-422 (4-wire system). Use a commercially available RS-232C-to-RS-422 converter.

Pin Arrangement

MJ1

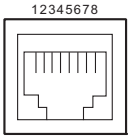
MJ1 RJ-45 8pin	No.	Signal	Contents
	1	+SD/RD	RS-485 + data
	2	–SD/RD	RS-485 – data
	3	+5V	Externally supplied +5 V *1*2
	4		
	5	SG	Signal ground
	6		
	7	RD	RS-232C receive data
	8	SD	RS-232C send data

*1 Only available with TS2060i. The externally supplied +5 V signal is not output with the TS2060 (model name without "i").
*2 For MJ1 and MJ2, the maximum allowable current is 150 mA in total (only when the installation angle of MONITOUCH is within 60° to 120°).

MJ2

CAUTION

Before using MJ2, select whether it is used as an RS-232C/RS-485 (2-wire system) or RS-422 (4-wire system) port using the slide switch.
The switch is factory-set to RS-232C/RS-485 (2-wire system).

MJ2 RJ-45 8-pin	No.	Slide Switch (RS-232C/RS-485)		Slide Switch (RS-422)	
		Signal	Contents	Signal	Contents
	1	+SD/RD	RS-485 + data	+SD	RS-422 + send data
	2	–SD/RD	RS-485 – data	–SD	RS-422 – send data
	3	+5 V	Externally supplied +5 V *1*2 Max. 150 mA	+5V	Externally supplied +5 V *1*2 Max. 150 mA
	4				
	5	SG	Signal ground	SG	Signal ground
	6				
	7	RD	RS-232C receive data	+RD	RS-422 + receive data
	8	SD	RS-232C send data	–RD	RS-422 – receive data

*1 Only available with TS2060i. The externally supplied +5 V signal is not output with the TS2060 (model name without "i").
*2 For MJ1 and MJ2, the maximum allowable current is 150 mA in total (only when the installation angle of MONITOUCH is within 60° to 120°).

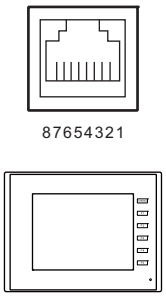
Recommended Cable

Recommended Cable
Hakko Electronics' cable "V6-TMP" 3, 5, 10 m

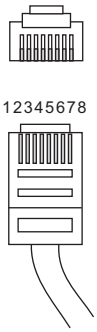
Notes on Configuring a Cable

CAUTION Pins No. 3 and 4 are provided for external power supply. To prevent damage to the device due to wrong connection, check the pin numbers and connect wires correctly.

Pin arrangement on MONITOUCH



Pin arrangement on the cable



Applicable Devices

Port	Applicable Devices
MJ1	Computer (screen program transfer)
	PLC, temperature controller, inverter, servo, barcode reader, V-Link, slave communication (Modbus RTU), serial printer
MJ2	PLC, temperature controller, inverter, servo, barcode reader, V-Link, slave communication (Modbus RTU), serial printer

1.2.3 LAN (TS2060i Only)

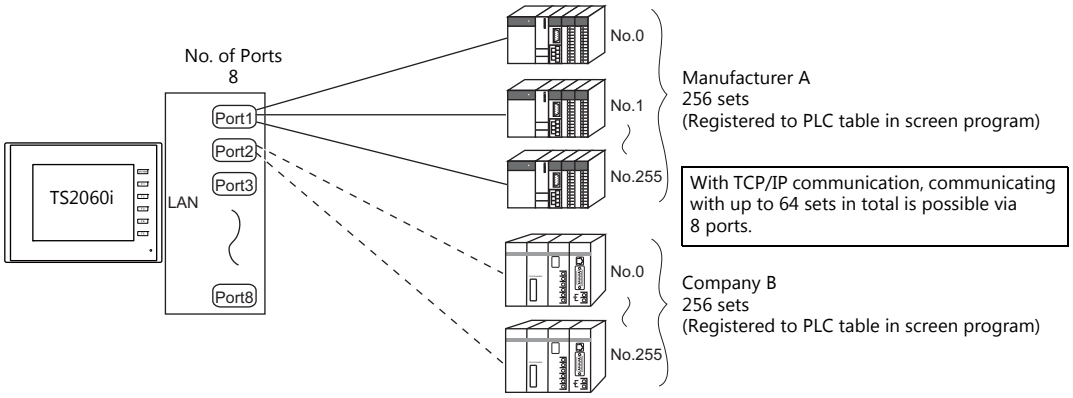
CAUTION

- Only the TS2060i is equipped with a LAN connector. Ethernet communication is not possible with the TS2060 (model name without "i").
- The LAN/LAN2 connector uses the same type RJ-45 connector as MJ1 and MJ2. Check the indication on the unit and insert a cable into the correct position.

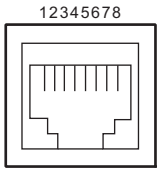
LAN Port Specifications

Item	Specifications	
	100BASE-TX (IEEE802.3u)	10BASE-T (IEEE802.3)
Baud Rate	100 Mbps	10 Mbps
Transmission method	Base band	
Maximum segment length	100 m (between the node and the hub, or between hubs)	
Connecting cable	100 Ω, UTP cable, category 5	
Protocol	UDP/IP, TCP/IP	
Port	Auto-MDIX, Auto-Negotiation functions compatible	
Number of concurrently opened ports	8 ports	
Maximum number of connectable devices	UDP/IP: 256 units via each of ports PLC1 to PLC8 TCP/IP: 64 units in total via ports PLC1 to PLC8	

Maximum number of connectable devices



Pin Arrangement

LAN RJ-45	No.	Name	Contents
	1	TX+	Send signal +
	2	TX–	Send signal –
	3	RX+	Receive signal +
	4	NC	Not used
	5		
	6	RX–	Receive signal –
	7	NC	Not used
	8		

Applicable Devices

Applicable Devices
PLC, slave communication (Modbus TCP/IP), computer (screen program transfer, etc.)

1.2.4 EXT1 (Connection Port for Network Communication Unit/Optional Unit, TS2060i Only)

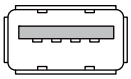
> **CAUTION** This communication port is supported only by the TS2060i. The "CUR-xx" and "DUR-00" cannot be attached to the TS2060 (model name without "i").

This communication port is used by connecting an optional communication interface unit "CUR-xx" or "DUR-00".
For more information on network communication, refer to the specifications for each unit.

Unit Model	Network	Unit Model	Network
CUR-00	OPCN-1	CUR-06	SX BUS
CUR-01	T-Link	CUR-07	DeviceNet
CUR-02	CC-Link Ver. 2.00/1.10/1.00	CUR-08	FL-net
CUR-03	Ethernet (UDP/IP) * TCP/IP communication not possible	DUR-00	Serial (CN1: RS-232C, RS-422/485)
CUR-04	PROFIBUS-DP		

1.2.5 USB

USB Port Specifications

Item		Specifications
USB-A *1 	Applicable standards	USB versions 2.0
USB mini-B	Baud Rate	High-speed 480 Mbps / Full-speed 12 Mbps / Low-speed 1.5 Mbps

*1 Only available with TS2060i. The TS2060 (model name without "i") is not equipped with a USB-A port.

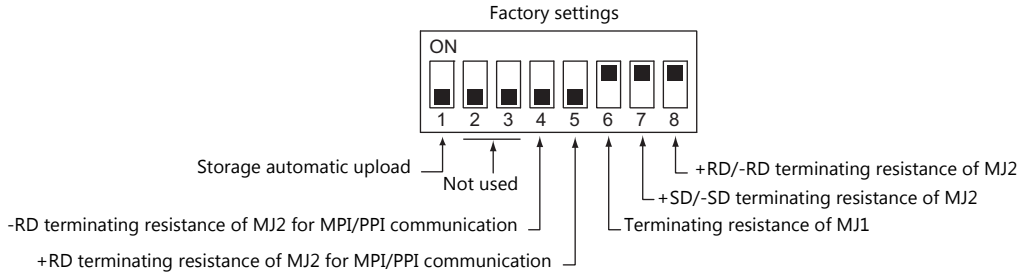
Applicable Devices

Port	Applicable Devices
USB-A *1	Printer (PR201, ESC/P-compatible (parallel connection)), barcode reader, USB flash drive, numeric keypad, keyboard, mouse, USB-hub
USB mini-B	Printer (PictBridge), computer (screen program transfer)

*1 Only available with TS2060i. The TS2060 (model name without "i") is not equipped with a USB-A port.

1.2.6 DIP Switch (DIPSW) Settings

The TS2060 is equipped with DIP switches 1 to 8. When setting the DIP switch, turn the power off.



DIPSW1* (Storage Automatic Upload)

Set the DIPSW1 to ON when automatically uploading screen programs from storage such as an SD card or USB flash drive. For details, refer to the separate TS2060 Hardware Specifications manual.

* Be sure to set the DIPSW1 to OFF when automatic upload is not performed.

DIPSW4, 5 (Terminating Resistance for MPI/PPI Communication with Siemens PLC)

When connecting a Siemens PLC via MPI/PPI communication, set the DIPSW4 and DIPSW5 to ON.

DIPSW6, DIPSW7, and DIPSW8 (Terminating Resistance for Serial Communication)

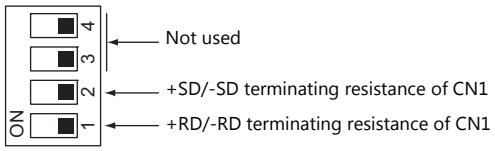
- When connecting a controller at MJ1 via RS-422/485 (2-wire system), set the DIPSW6 to ON.
- When connecting a controller at MJ2 via RS-422/485 (2-wire system), set the DIPSW8 to ON.
- When connecting a controller at MJ2 via RS-422/485 (4-wire system), set the DIPSW7 and DIPSW8 to ON.

TS2060i with DUR-00

- When connecting a controller at CN1 via RS-422/485 (2-wire system), set DIPSW1 on the DUR-00 to the ON position.
- When connecting a controller at CN1 via RS-422/485 (4-wire system), set DIPSW1 and DIPSW2 on the DUR-00 to the ON position.

  - DUR-00 DIP switches

    Settings upon delivery (all OFF)



1.3 Connection Methods

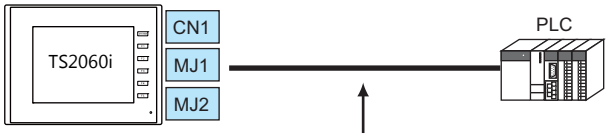
1.3.1 Serial Communication

1 : 1 Connection

Overview

- One set of the TS2060 is connected to one PLC (1 : 1 connection).
- You can make settings for 1 : 1 communication in [Communication Setting] for the logical ports PLC1 - PLC8. A communication port is selectable from CN1 *, MJ1, and MJ2.

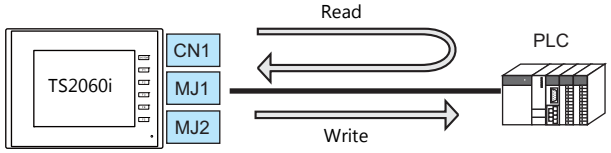
  * CN1 is available only when the TS2060i is attached the "DUR-00".



RS-232C or RS-422 (RS-485) connection
Maximum length of wiring
RS-232C connection: 15 m
RS-422/RS-485 connection: 500 m

* The maximum length of wiring varies depending on the connected device. Check the specifications for each device.

- The TS2060 (master station) communicates with a PLC under the PLC's protocol. Therefore, there is no need to prepare a communication program for the PLC (slave station).
- The TS2060 reads from the PLC device memory for screen display. It is also possible to write switch data or numerical data entered through the keypad directly to the PLC device memory.

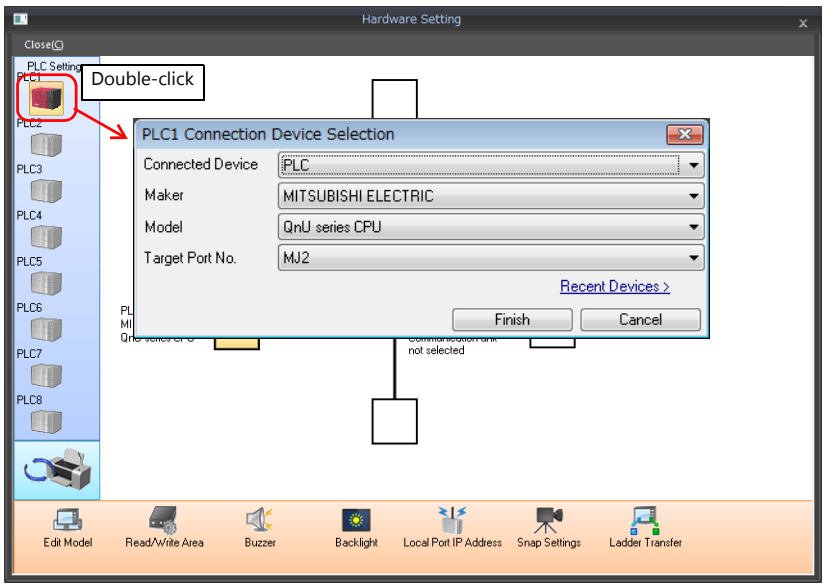


V-SFT Ver. 6 Settings

Hardware Settings

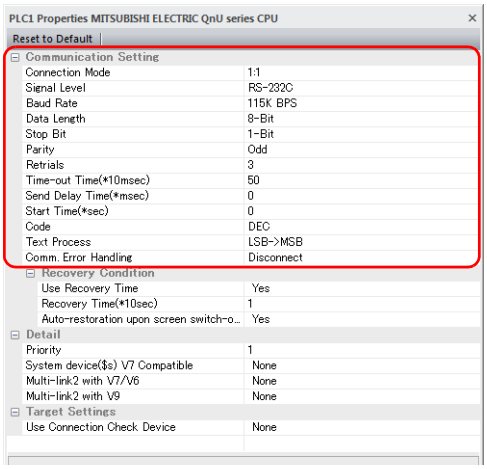
Selecting a device to be connected

Select the device for connection from [System Setting] → [Hardware Setting].



PLC properties

Configure [Communication Setting] on the [PLC Properties] window.



Item	Contents
Connection Mode	1 : 1
Signal Level	Configure according to the connected device.
Baud Rate	
Data Length	
Stop Bit	
Parity	
Target Port No.	
Transmission Mode	

For settings other than the above, see “1.4 Hardware Settings” (page 1-50).

Settings of a Connected Device

Refer to the chapter of the respective manufacturer.
For descriptions of connecting PLCs, refer to the manual for each PLC.

Wiring

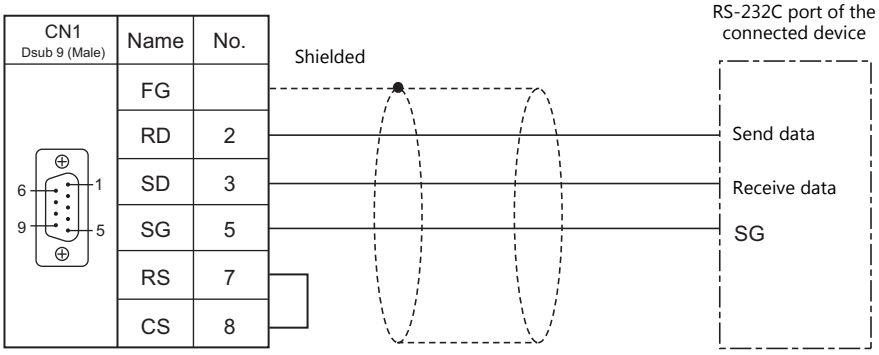
DANGER Be sure to turn off the power before connecting cables. Otherwise, electrical shock or damage may occur.

CN1

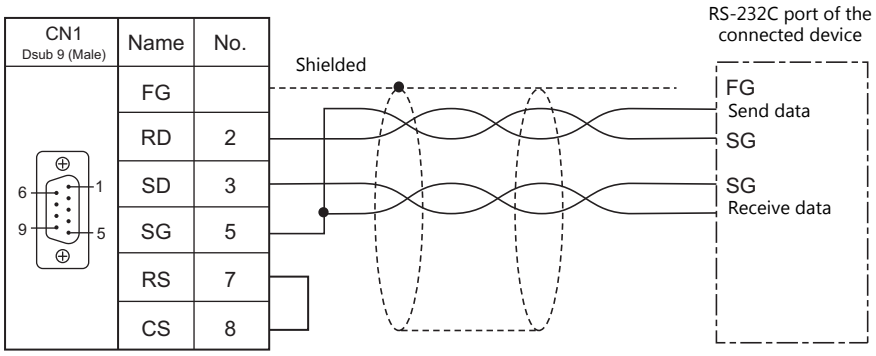
CAUTION
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C connection

- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- The maximum length for wiring is 15 m.
  * The maximum length varies depending on the connected device. Check the specifications for each device.
- Connect a shielded cable to either the TS2060i or the connected device. The connection diagram shows the case where the shielded cable is connected on the TS2060i side. Connect the cable to the FG terminal of the DUR-00.

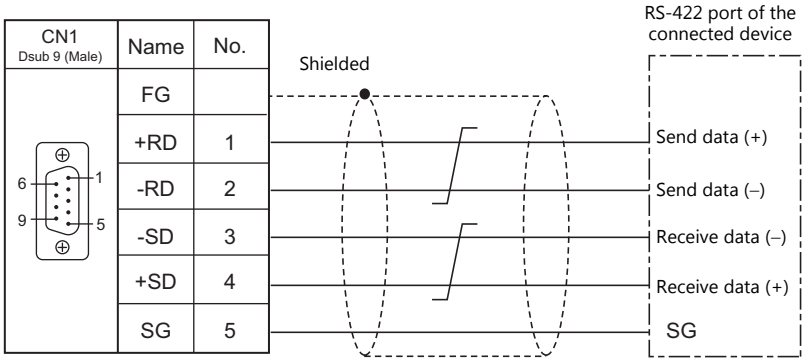


- If noise disturbs communications, establish connections between SD and SG and between RD and SG as pairs respectively, and connect a shielded cable to both the TS2060i and the connected device.

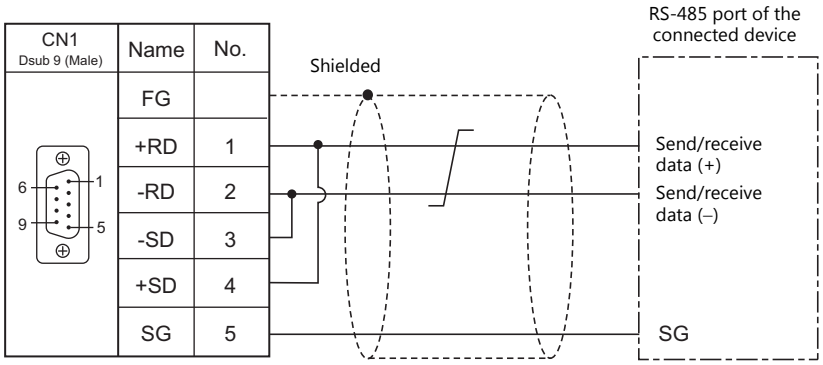


RS-422/RS-485 connection

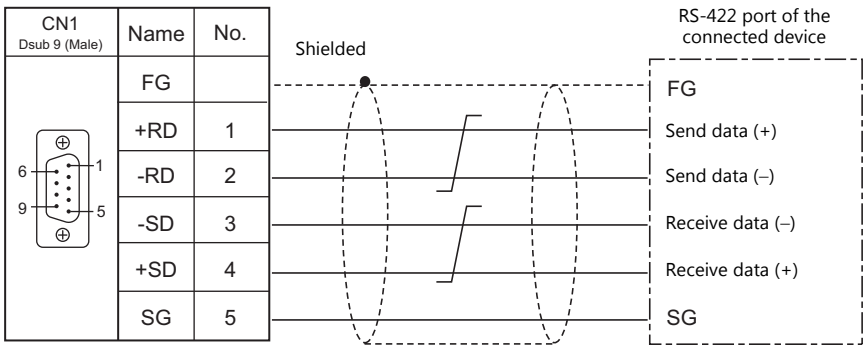
- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- The maximum length of wiring is 500 m.
  * The maximum length varies depending on the connected device. Check the specifications for each device.
- Connect twisted pairs between +SD and –SD, and between +RD and –RD.
- If the PLC has a signal ground (SG) terminal, connect it.
- To use a terminal block for connection, use Hakko Electronics' optionally available "TC-D9".
- The DIP switch on the back of the TS2060i unit is used to set the terminating resistance.
  For more information on DIP switches, refer to "1.2.6 DIP Switch (DIPSW) Settings" (page 1-10).
- Connect a shielded cable to either the TS2060i or the connected device. The connection diagram shows the case where the shielded cable is connected on the TS2060i side. Connect the cable to the FG terminal of the DUR-00.
  - RS-422 (4-wire system)



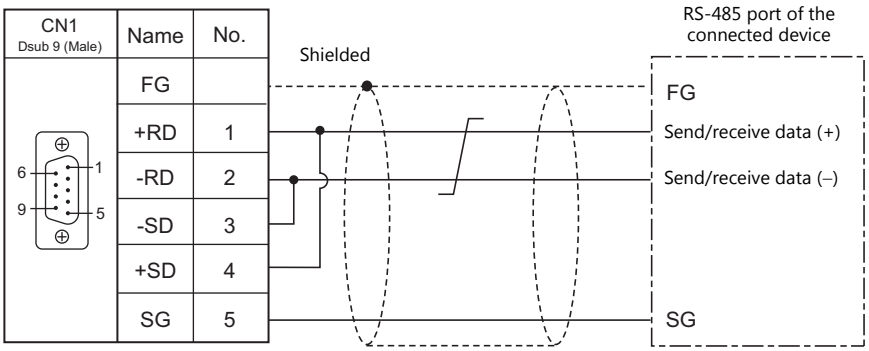
  - RS-485 (2-wire system)



- If noise disturbs communications, connect a shielded cable to both the TS2060i and the connected device.
  - RS-422 (4-wire system)



- RS-485 (2-wire system)

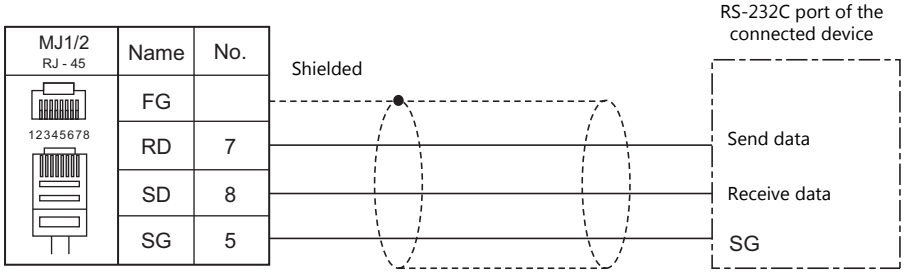


MJ1/MJ2

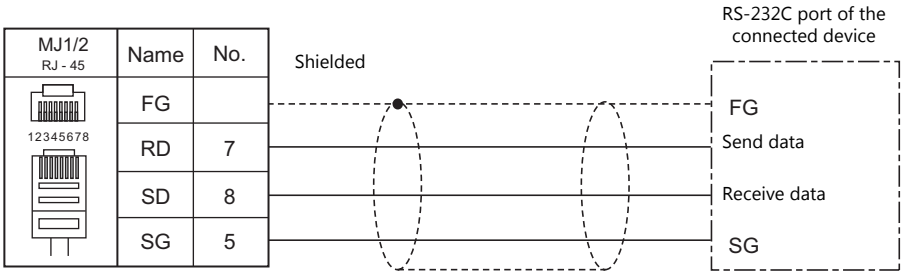
RS-232C connection

> **CAUTION** Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

- Use Hakko Electronics' cable "V6-TMP" (3, 5, 10 m) as a communication cable.
- The maximum length of wiring is 15 m.
  * The maximum length varies depending on the connected device. Check the specifications for each device.
- Connect a shielded cable to either the TS2060 or the connected device. Connect the cable to the FG terminal for communication on the backside of the TS2060.



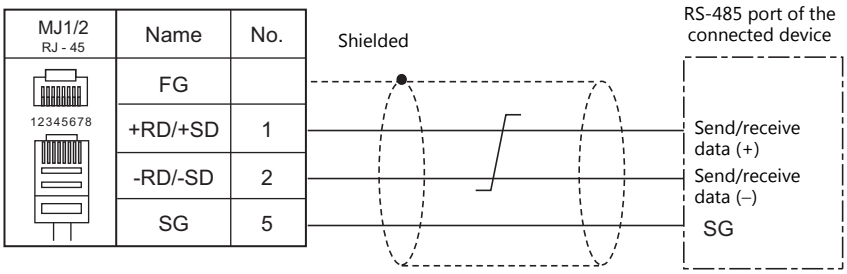
- If noise disturbs communications, connect a shielded cable to both the TS2060 and the connected device.



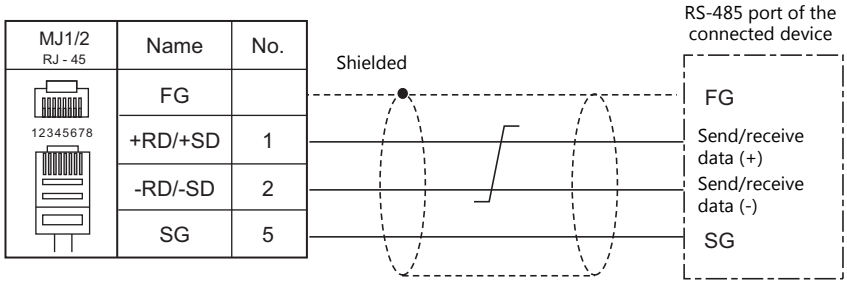
RS-485 (2-wire system) connection

CAUTION	Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

- Use Hakko Electronics' cable "V6-TMP" (3, 5, 10 m) as a communication cable.
- The maximum length of wiring is 500 m.
  * The maximum length varies depending on the connected device. Check the specifications for each device.
- If the PLC has a signal ground (SG) terminal, connect it.
- The DIP switch on the back of the TS2060 unit is used to set the terminating resistance. For more information, see "1.2.6 DIP Switch (DIPSW) Settings" (page 1-10).
- Connect a shielded cable to either the TS2060 or the connected device. Connect the cable to the FG terminal for communication on the backside of the TS2060.



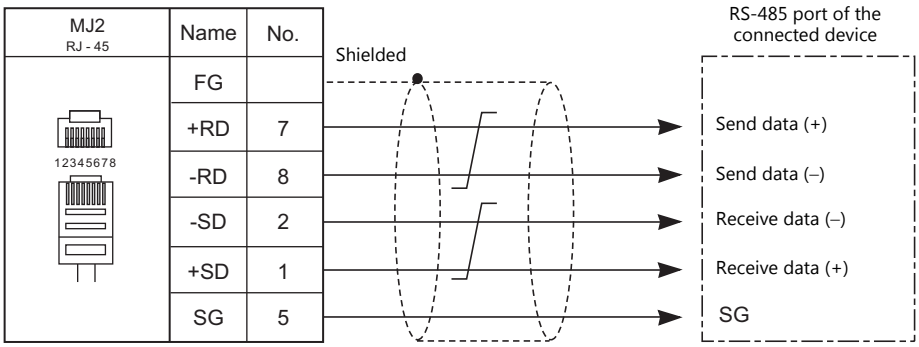
- If noise disturbs communications, connect a shielded cable to both the TS2060 and the connected device.



RS-422 (4-wire system) connection

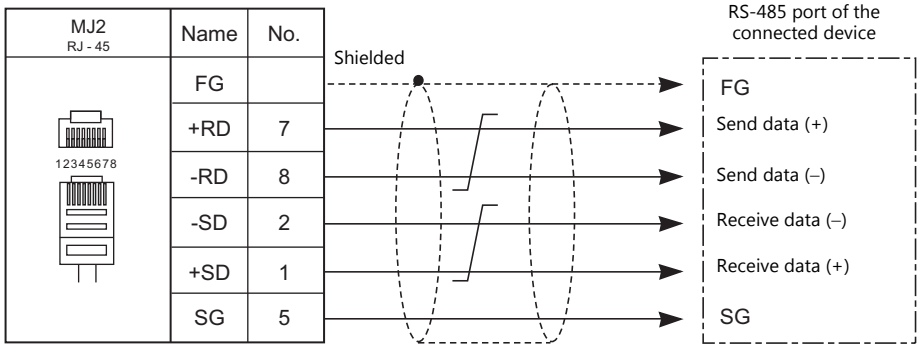
> **CAUTION** RS-422 (4-wire system) is supported by the MJ2 port only. Set the slide switch for signal level selection to RS-422 position (lower). The MJ1/MJ2 ports except these units are not usable for connection via RS-422 (4-wire system).

- Use Hakko Electronics' cable "V6-TMP" (3, 5, 10 m) as a communication cable.
- The maximum length of wiring is 500 m.
  * The maximum length varies depending on the connected device. Check the specifications for each device.
- If the PLC has a signal ground (SG) terminal, connect it.
- The DIP switch on the back of the TS2060 unit is used to set the terminating resistance. For more information, see "1.2.6 DIP Switch (DIPSW) Settings" (page 1-10).
- Connect a shielded cable to either the TS2060 or the connected device. Connect the cable to the FG terminal for communication on the backside of the TS2060.



* Slide switch: RS-422 (lower)

- If noise disturbs communications, connect a shielded cable to both the TS2060 and the connected device.



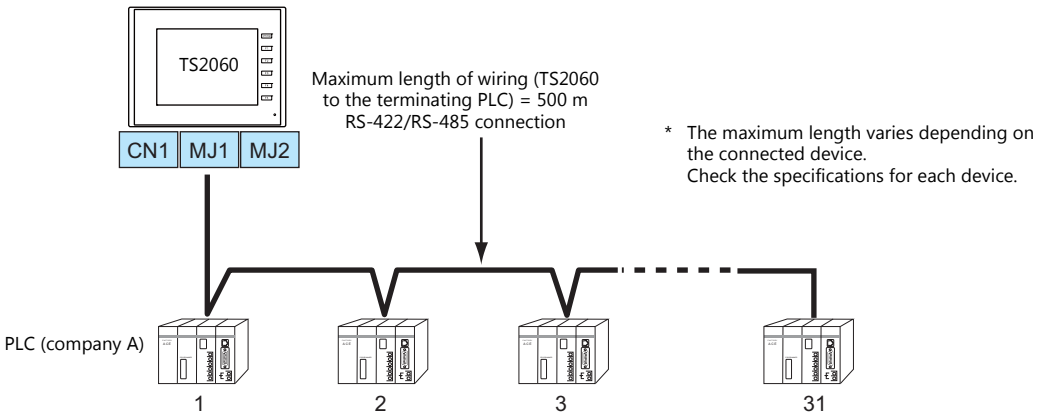
* Slide switch: RS-422 (lower)

1 : n Connection (Multi-drop)

Overview

- Multi-drop connection connects one TS2060 unit to multiple PLCs of the same model as a 1 : n connection. (Maximum connectable units: 31)
- You can make settings for 1 : n communication in [Communication Setting] for the logical ports PLC1 - PLC8. A communication port is selectable from CN1 *, MJ1, and MJ2.

  * CN1 is available only when the TS2060i is attached the "DUR-00".



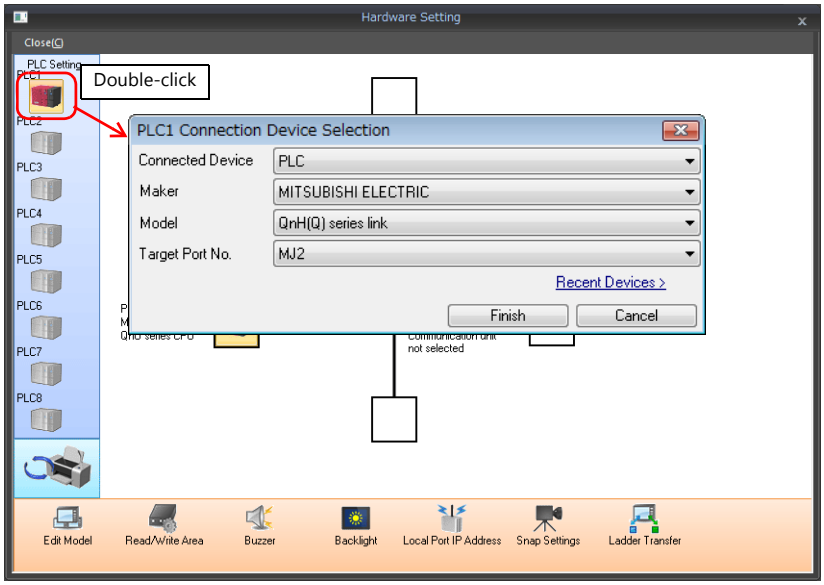
- The ladder transfer function is not available for a 1 : n connection.
- For models that support multi-drop connection, refer to the Connection Compatibility List provided at the end of this manual or the chapters on individual manufacturers.

V-SFT Ver. 6 Settings

Hardware Settings

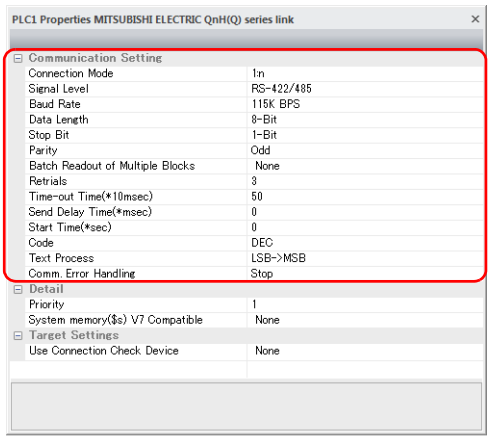
Selecting a device to be connected

Select the device for connection from [System Setting] → [Hardware Setting].



PLC properties

Configure [Communication Setting] on the [PLC Properties] window.



Item	Contents
Connection Mode	1 : n
Signal Level	RS-422/485
Baud Rate	Configure according to the connected device.
Data Length	
Stop Bit	
Parity	
Target Port No.	
Transmission Mode	

For settings other than the above, see "1.4 Hardware Settings" (page 1-50).

Settings of a Connected Device

Refer to the chapter of the respective manufacturer.
For descriptions of connecting PLCs, refer to the manual for each PLC.

Wiring

DANGER Be sure to turn off the power before connecting cables. Otherwise, electrical shock or damage may occur.

CN1

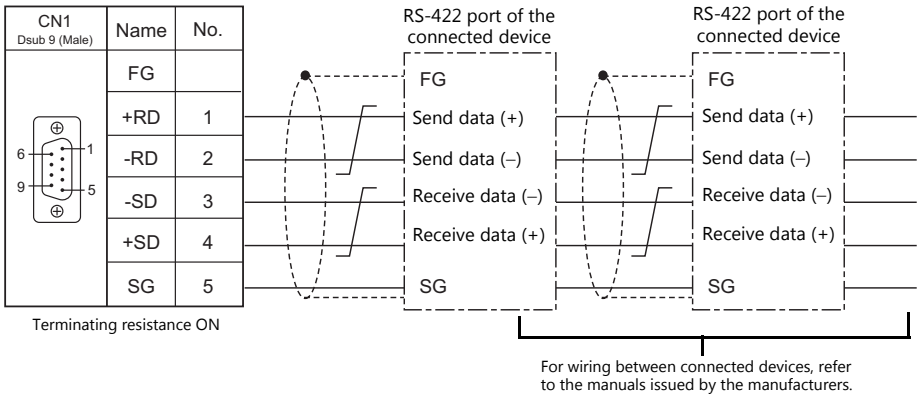
CAUTION

- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

The wiring between a TS2060i and a connected device is the same as that for 1 : 1 communication. For description of wiring between connected devices, refer to the manuals issued by the manufacturers.

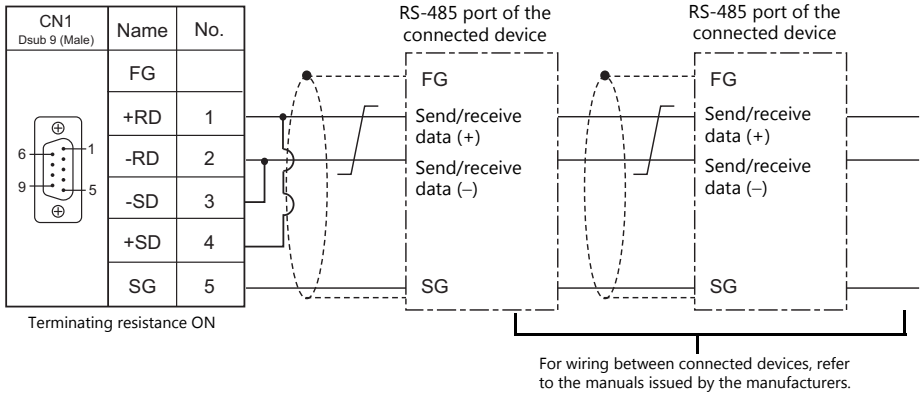
RS-422 (4-wire system) connection

- Connection example



RS-485 (2-wire system) connection

- Connection example

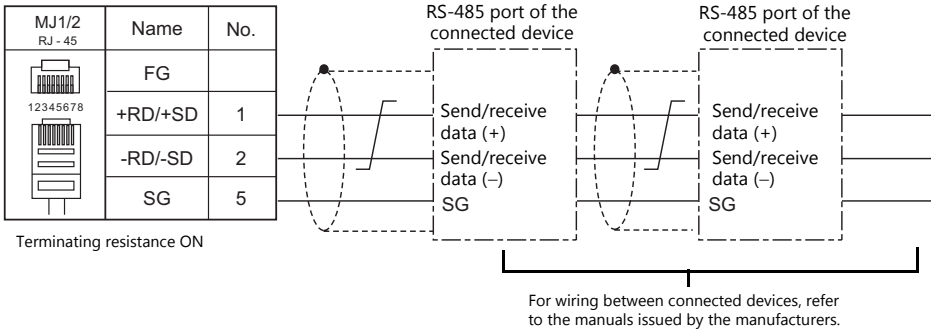


MJ1/MJ2

The wiring between a TS2060 and a connected device is the same as that for 1 : 1 communication. For description of wiring between connected devices, refer to the manuals issued by the manufacturers.

RS-485 (2-wire system) connection

- Connection example

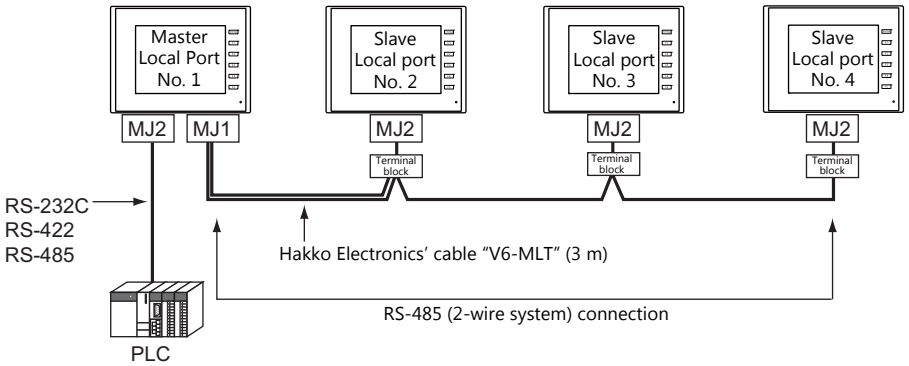


* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

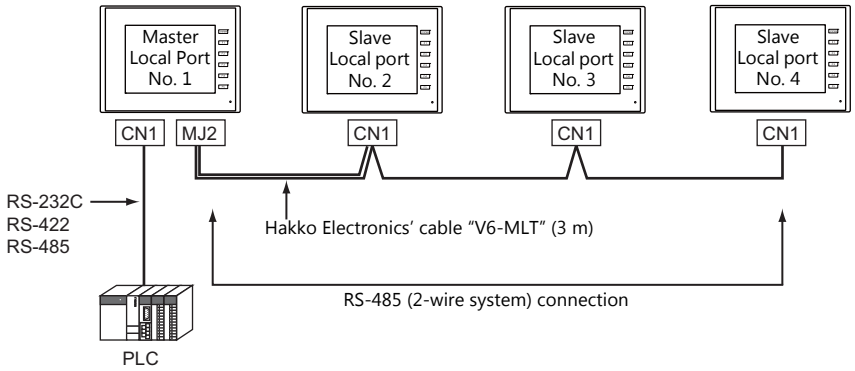
n : 1 Connection (Multi-link2)

Overview

- One PLC is connected to a maximum of four TS2060 units. The V9 and V8 series can be used together.
- Multi-link2 enables you to establish an original network consisting of a master TS2060 of local port No. 1 and slave TS2060 units of local port Nos. 2, 3, and 4. The master TS2060 communicates with the PLC directly, and the slave TS2060 units communicate with the PLC through the master.
  - Connection example 1:



  - Connection example 2:

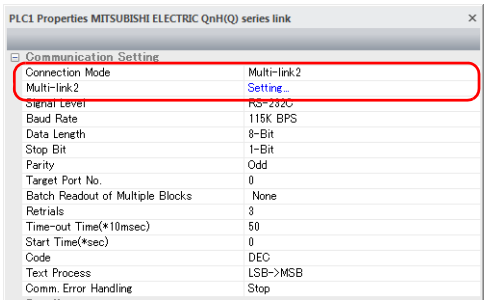


- You can make settings for multi-link2 in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit (under development).
- Multi-link2 enables sharing of data stored in PLC1 device memory among the TS2060 units. However, sharing data in PLC2 - PLC8 is not possible.
- The V7 and V6 series cannot be used together.
  * The V7 and V6 series can also be used together with certain PLC models. For details, see "Multi-link2 with V7/V6" (page 1-23).
- The communication speed between the master and the PLC depends on the setting made on the PLC. The maximum communication speed between TS2060 units is 115 kbps, which is higher than the one available with multi-link connection described in "n : 1 Connection (Multi-link)".
- For PLCs that support multi-link2 connection, see Connection Compatibility List provided at the end of this manual. The connection between the master and the PLC is the same as the one for 1 : 1 connection. RS-485 (2-wire system) connection is adopted to connect a master with slaves. At this time, use Hakko Electronics' cable "V6-MLT" for the multi-link2 master.
- If the master station becomes faulty (communication error), the master and slave stations do not work, and as a result, "Communication Error Time-Out" is displayed. If a slave station becomes faulty, a communication error is occurred only on the faulty station.
- The ladder transfer function is not available for a multi-link2 connection.
- Settings must be made in order to use together with the V9 series.
  Location of setting: [Hardware Setting] → [PLC Properties] → [Detail] → [Multi-link 2 with V9]

V-SFT Ver. 6 Settings

Make settings on [System Setting] → [Hardware Setting] → [PLC Properties]. The differences with respect to a 1 : 1 connection and the points where caution is required are explained here.
For details on other settings, refer to Hardware Settings in "1 : 1 Connection" (page 1-11).

PLC Properties

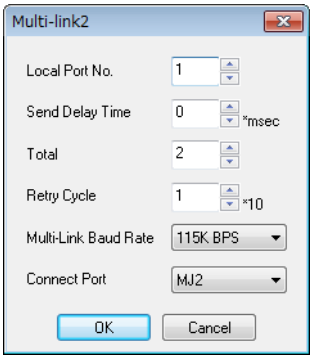


Item		Contents
Communication Setting	Connection Mode	Multi-link2
	Multi-link2	Click [Setting] to display the [Multi-link] dialog, then make the necessary settings in this dialog. For more information on settings, see "Multi-link2" (page 1-22).
Detail	Multi-link2 with V7/V6	Select this when multi-link2 is used for connecting the TS2060 together with V7 or V6 units. For more information, see "Multi-link2 with V7/V6" (page 1-23).
	Multi-link2 with V9	Select this when multi-link2 is used for connecting the TS2060 together with V9 units.

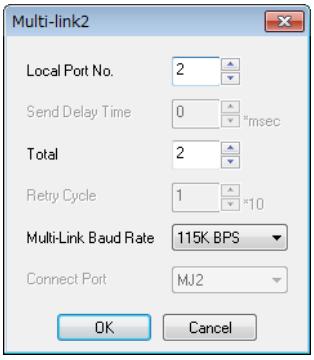
Multi-link2

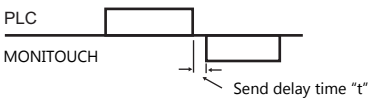
For a master, set all of the items. For a slave, set only those items marked "♦".

- Master



- Slave



Local Port No.♦	1 to 4 Specify a port number of the TS2060. For the master set "1", and for the slaves set "2" to "4". Note that if the port number specified is the same as that already set for another TS2060 unit, the system will not operate correctly.
Send Delay Time	Specify a delay time that elapses before the TS2060 sends the next command after receiving data from the PLC. Normally use the default setting (0). 
Total♦	2 to 4 Set the total number of TS2060 units connected in the multi-link2 connection. The setting must be the same as other TS2060 on the same communication line.
Retry Cycle	Set the number of cycles before the master sends an inquiry for restoration to a slave that has a communication problem (= system down). When a slave has a problem, it is temporarily removed from the communication targets, and the master sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring on the slave; however, if there is any problem, it does affect the communication speed. When the setting value is small: Restoration will not take long. When the setting value is large: Restoration will take a longer time.
Multi-Link Baud Rate♦	4800/9600/19200/38400/57600/115K bps Set the baud rate for between TS2060 units. The setting must be the same as other TS2060 on the same communication line.
Connect Port	CN1/MJ1/MJ2 Set the port to be connected to slaves.

Multi-link2 with V7/V6

- The V9 series cannot be used together if the V7 and V6 series are used together.
- When connecting together with the V6 series, note the following points:
  - When V609E, V606e, V606, or V606i is connected as a master, only V609E, V606e, V606, or V606i can be connected as a slave.
    The TS2060 cannot be used as a slave in this case.
  - Multi-link2 cannot be used for the V6 series with which temperature control network/PLC2Way is used.
  - The V6 series may not support Multi-link2 connection depending on its hardware version. For more information, refer to the V6 Series Hardware Specifications manual.

Supported PLC Models

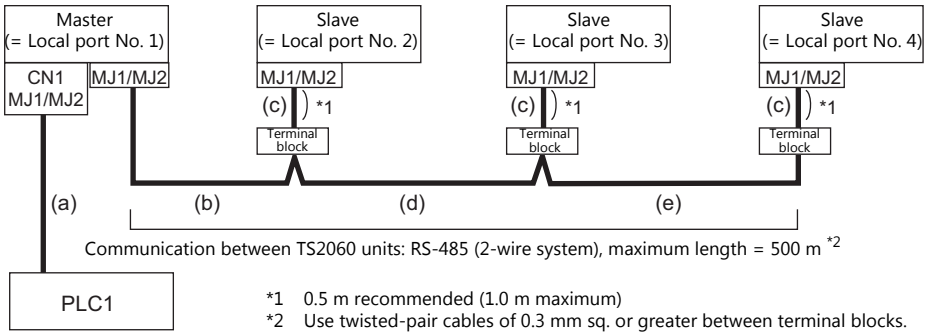
PLC models that support connection together with the V7 and V6 series are listed below.

Manufacturer	PLC Selection on Editor
MITSUBISHI ELECTRIC	A series link A series CPU QnA series link QnA series CPU QnH (Q) series link QnH (Q) series CPU QnU series CPU Q00J/00/01 CPU QnH (Q) series link (multi CPU) QnH (Q) series CPU (multi CPU) FX series CPU FX2N/1N series CPU FX1S series CPU FX series link (A protocol) FX3U/3UC/3G series CPU FX3U/3UC/3G series link (A protocol)
OMRON	SYSMAC C SYSMAC CV SYSMAC CS1/CJ1
GE Fanuc	90 series (SNP-X)
Keyence	KV-700 KV-1000 KV-3000/5000

System Configurations and Wiring Diagrams

Connection Method 1

Connecting the MJ1/MJ2 of the master to the MJ1/MJ2 ports of the slaves



*1 0.5 m recommended (1.0 m maximum)
*2 Use twisted-pair cables of 0.3 mm sq. or greater between terminal blocks.

(a) Connection between master and PLC
Select the port for connection from among CN1, MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

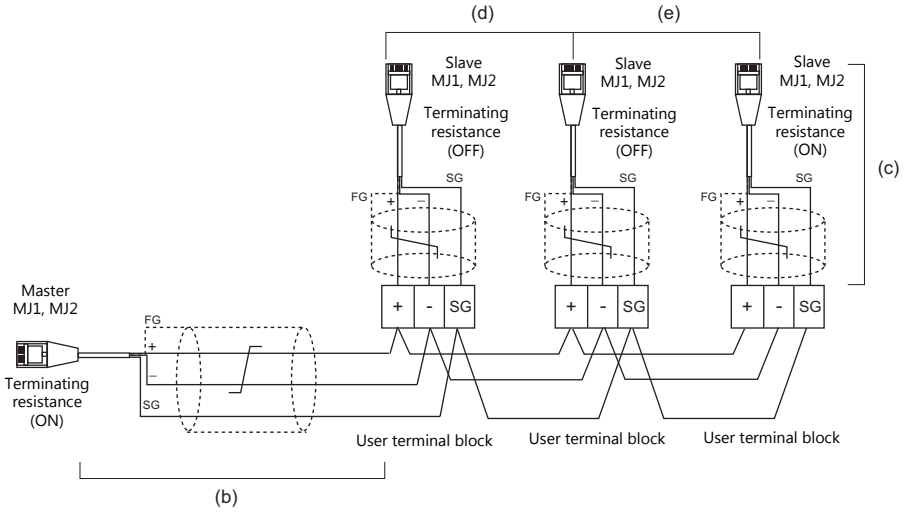
(b) Connection between master and terminal block
Choose the connecting port of the master between MJ1 and MJ2.
For the cable, use "V6-MLT" (3 m). Connect the terminals of this cable to a terminal block prepared by the customer.

(c) Connection between terminal block and slave
Choose the connecting port of the slave between MJ1 and MJ2.
Use the "V6-MLT" cable (3 m).

(d) Connection between terminal blocks
Use the RS-485 (2-wire system) connection. Use twisted-pair cables of 0.3 mm sq or greater.

(b), (c), (d) The maximum length of the wiring between the master and slave is 500 m.

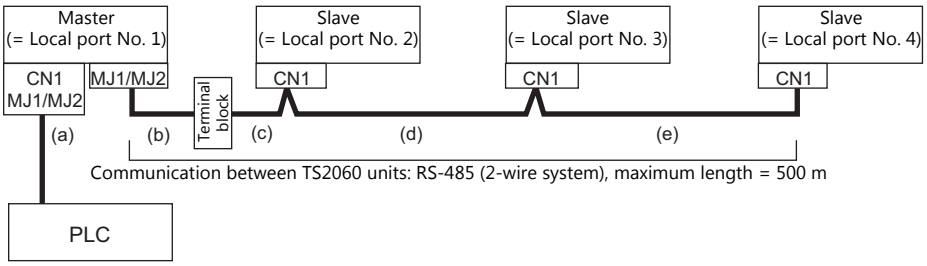
Wiring diagram



* For MJ2, set the slide switch for changing signals to RS-232C/485 (up position).

Connection Method 2

Connecting the MJ1/MJ2 of the master to CN1 connectors of the slaves



(a) Connection between master and PLC
Select the port for connection from among CN1, MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

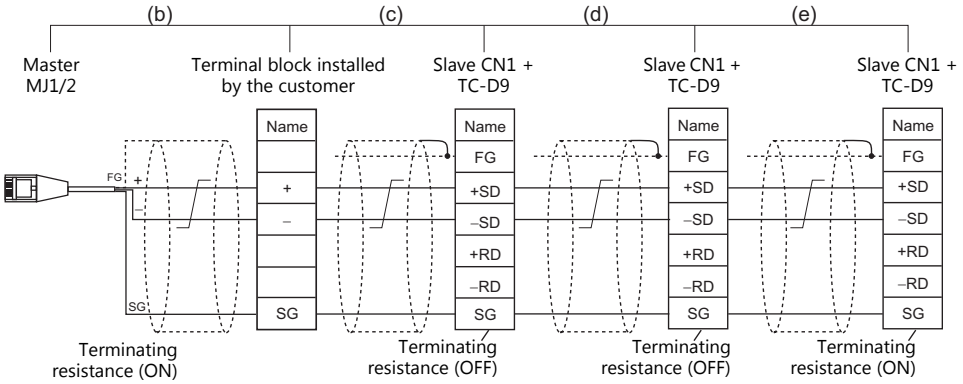
(b), (c) Connection between master and slave
Choose the connecting port of the master between MJ1 and MJ2.
The connecting port of the slave should be CN1. It is convenient to install the optional terminal converter "TC-D9".
Use the "V6-MLT" cable (3 m). If the distance is greater than 3 meters the customer should prepare a terminal block and extension cable (c), and should make the connection through that terminal block.

(d), (e) Connection between slaves
Use the RS-485 (2-wire system) connection. It is convenient to install the optional terminal converter "TC-D9". Use twisted-pair cables of 0.3 mm sq or greater.

(b), (c), (d), (e) The maximum length of the wiring among the master and slave is 500 m.

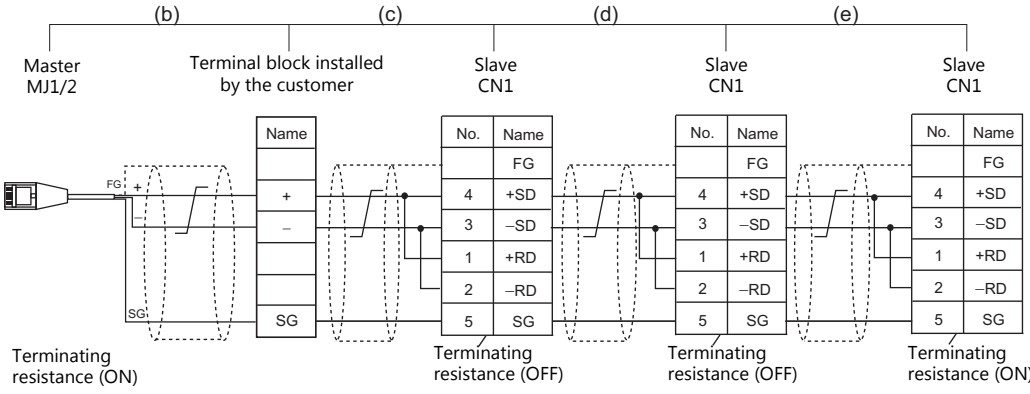
Wiring diagrams

- When a TC-D9 is used:
  Set the slide switch of "TC-D9" to ON (2-wire system).



* As a measure against noise, connect the frame ground terminal of each TS2060 at one side only. The frame ground of V6-MLT must be connected to the TS2060.
* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

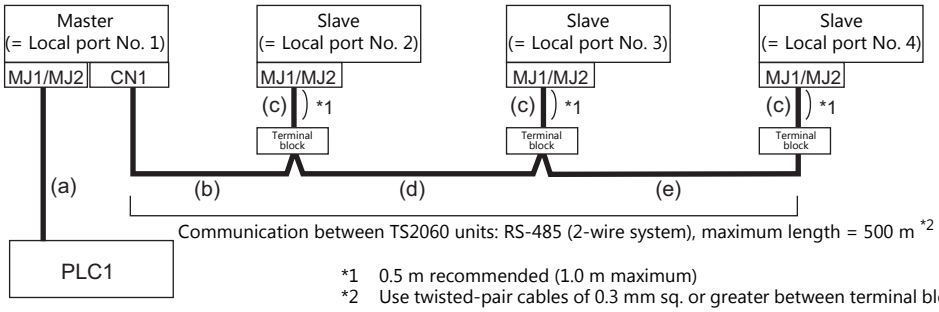
- When no TC-D9 is used:
  Install jumpers between +SD and +RD as well as –SD and –RD.



* As a measure against noise, connect the frame ground terminal of each TS2060 at one side only. The frame ground of V6-MLT must be connected to the TS2060.
* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

Connection Method 3

Connecting the CN1 of the master to the MJ1/MJ2 of the slaves



*1 0.5 m recommended (1.0 m maximum)
*2 Use twisted-pair cables of 0.3 mm sq. or greater between terminal blocks.

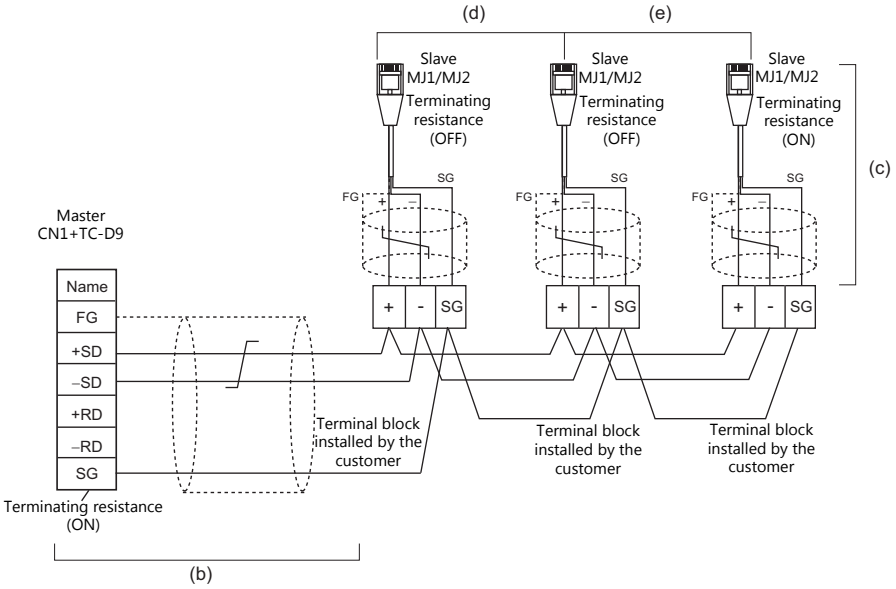
(a) Connection between master and PLC
Choose the connection port between MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

(b), (d), (e) Connection between master and terminal block
For the connecting port of the master, choose CN1. For the slave, choose between MJ1 and MJ2.
Use the RS-485 (2-wire system) connection. Use twisted-pair cables of 0.3 mm sq or greater. The maximum length of the wiring is 500 m.

(c) Connection between terminal block and slave
The connecting port of the slave should be MJ1 or MJ2.
Use the "V6-MLT" cable (3 m).

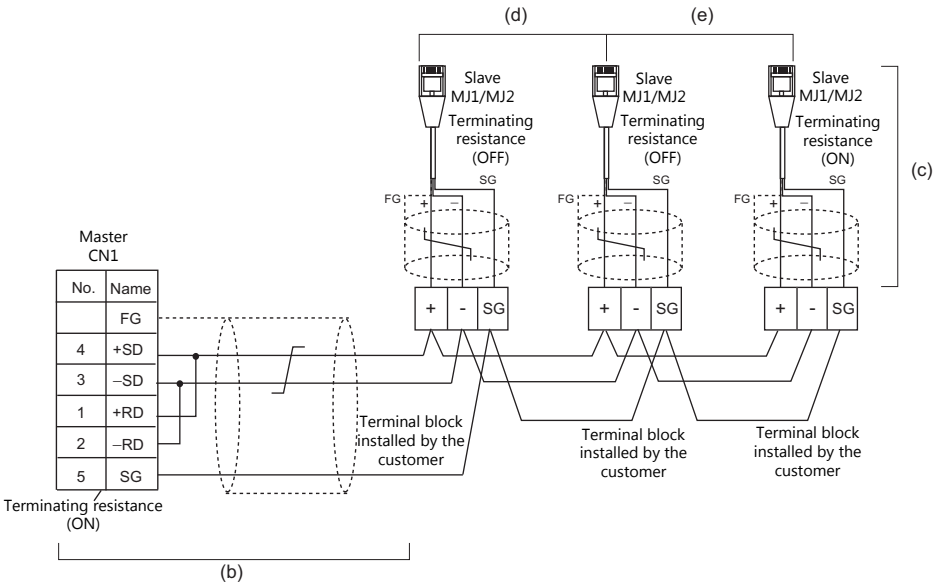
Wiring diagrams

- When a TC-D9 is used:
Set the slide switch of "TC-D9" to ON (2-wire system).



* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

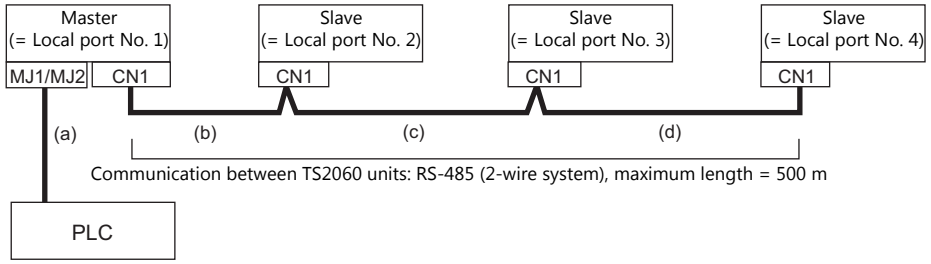
- When no TC-D9 is used:
  Install jumpers between +SD and +RD as well as –SD and –RD.



* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

Connection Method 4

Connecting the CN1 of the master to the CN1s of the slaves

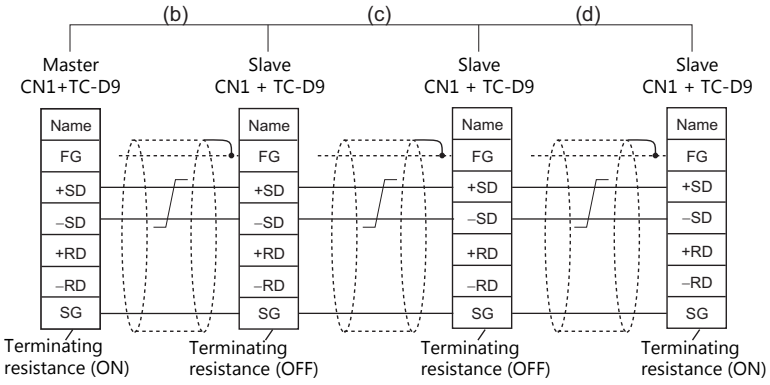


(a) Connection between master and PLC
Choose the connection port between MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

(b), (c), (d) Connection between master and slave
Use the RS-485 (2-wire system) connection. It is convenient to install the optional terminal converter "TC-D9". Use twisted-pair cables of 0.3 mm sq or greater. The maximum length of the wiring is 500 m.

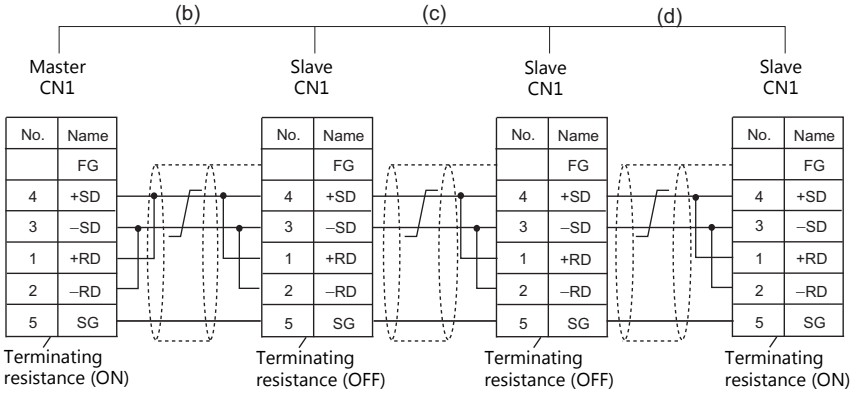
Wiring diagrams

- When a TC-D9 is used:
  Set the slide switch of "TC-D9" to ON (2-wire system).



* As a measure against noise, connect the frame ground terminal of each TS2060i at one side only.

- When no TC-D9 is used:
  Install jumpers between +SD and +RD as well as -SD and -RD.

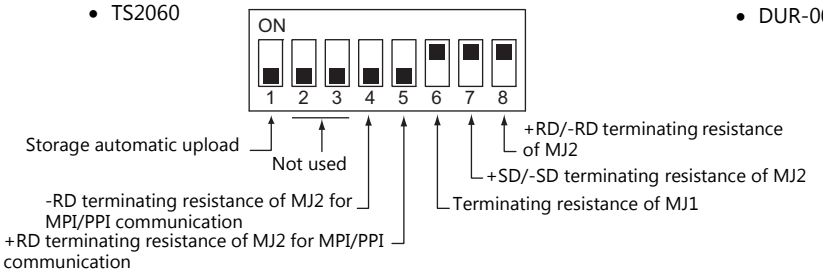


* As a measure against noise, connect the frame ground terminal of each TS2060i at one side only.

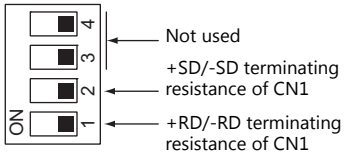
Terminating Resistance Setting

The terminating resistance should be set using the DIP switch.

- TS2060

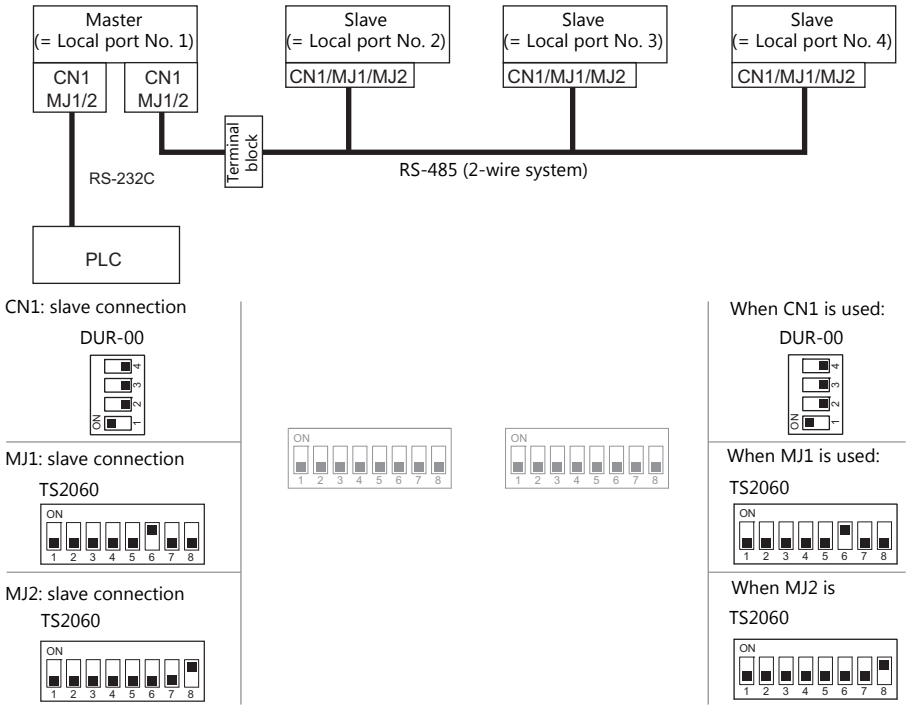


- DUR-00



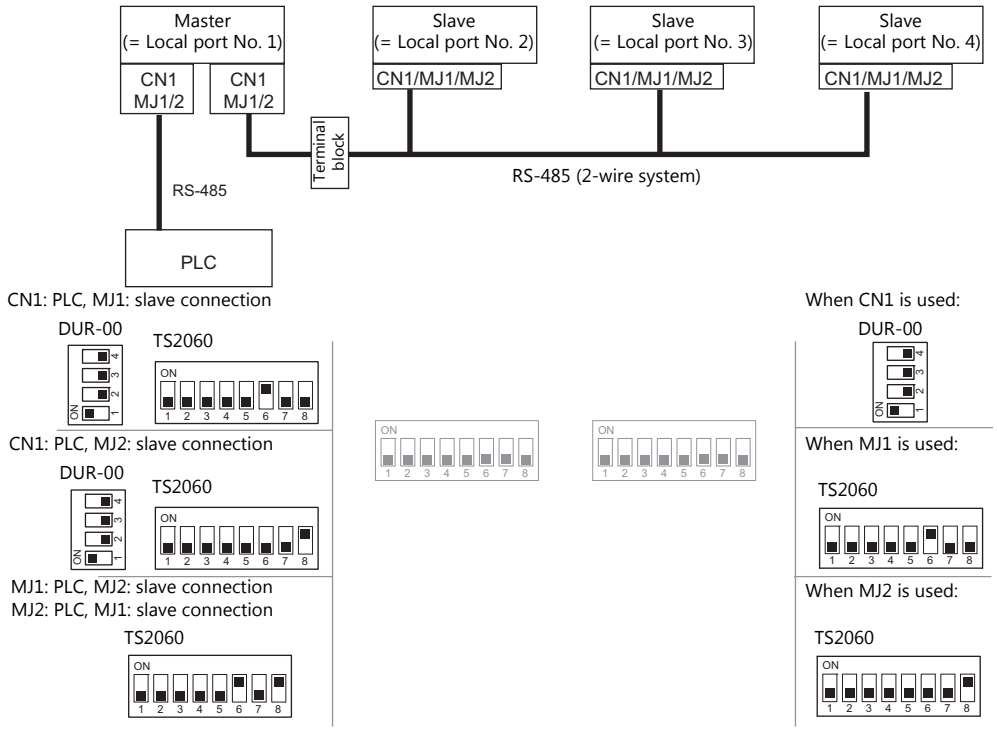
When the PLC is connected to the master via RS-232C:

There is no terminating resistance setting for communications between the master and the PLC. Set terminating resistances for connections between TS2060 units.



When the PLC is connected to the master via RS-485:

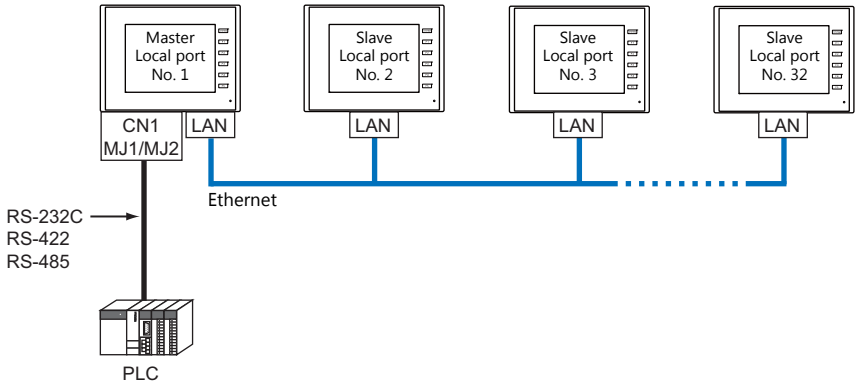
Make terminating resistance settings for communications between the master and PLC, and between TS2060 units.



n : 1 Connection (Multi-link2 (Ethernet)) (TS2060i Only)

Overview

- One PLC is connected to a maximum of 32 TS2060i units. The V9 and V8 series can be used together.
- Multi-link2 (Ethernet) enables you to establish an original network consisting of a master TS2060i of local port No. 1 and slave TS2060i units of local port Nos. 2 to 32. The master TS2060i communicates with the PLC directly, and the slave TS2060i units communicate with the PLC through the master.
  - Connection example

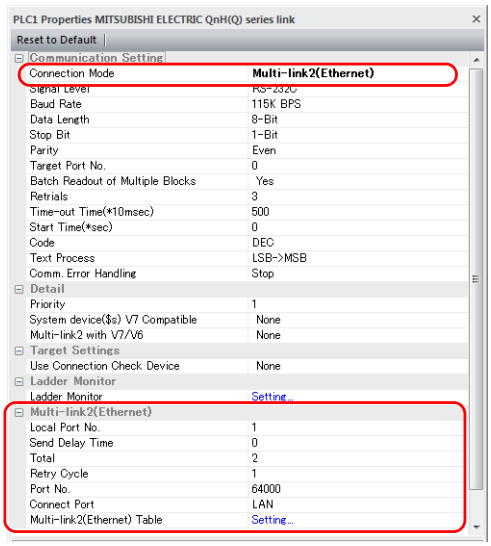


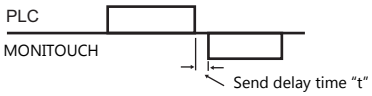
- You can make settings for multi-link2 (Ethernet) in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit.
- Multi-link2 (Ethernet) enables sharing of data stored in PLC1 device memory among the TS2060i units. However, sharing data in PLC2 - PLC8 is not possible.
- The V7 and V6 series cannot be used together.
- The communication speed between the master station and the PLC depends on the setting made on the PLC; however, communication among TS2060i units is performed via Ethernet, thus, high-speed communication is possible among them.
- For PLCs that support multi-link2 (Ethernet) connection, see Connection Compatibility List provided at the end of this manual.
  The connection between the master and the PLC is the same as the one for 1 : 1 connection.
  Ethernet connection is adopted to connect a master with slaves.
- If the master station becomes faulty (communication error), the master and slave stations do not work, and as a result, "Communication Error Time-Out" is displayed. If a slave station becomes faulty, a communication error is occurred only on the faulty station.
- The ladder transfer function is not available for a multi-link2 (Ethernet) connection.

V-SFT Ver. 6 Settings

Make settings on [System Setting] → [Hardware Setting] → [PLC Properties]. The differences with respect to a 1 : 1 connection and the points where caution is required are explained here.
For details on other settings, refer to Hardware Settings in "1 : 1 Connection" (page 1-11).

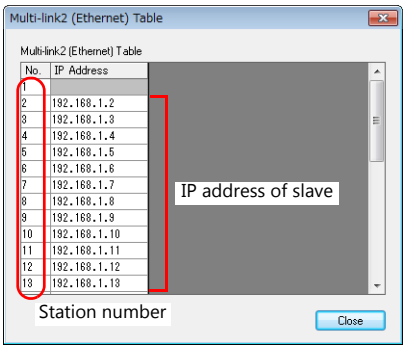
PLC Properties



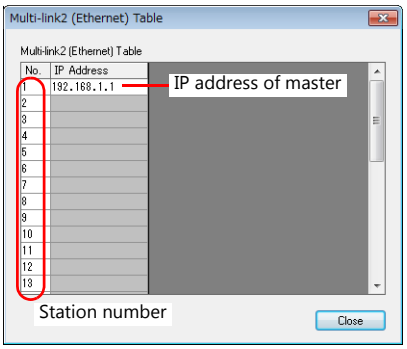
Item		Contents
Communication Setting	Connection Mode	Multi-link2 (Ethernet)
Multi-link2 (Ethernet)	Local Port No.	1: Master 2 to 32: Slave * Note that if the port number specified is the same as that already set for another TS2060 unit, the system will not operate correctly.
	Send Delay Time	Specify a delay time that elapses before the TS2060 sends the next command after receiving data from the PLC. Normally use the default setting (0). 
	Total	2 to 32 Set the total number of TS2060 units connected in the multi-link2 (Ethernet) connection. The setting must be the same as other TS2060 on the same communication line.
	Retry Cycle	Valid only when the local port is "1" (master). Set the number of cycles before the master sends an inquiry for restoration to a slave that has a communication problem (= system down). When a slave has a problem, it is temporarily removed from the communication targets, and the master sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring on the slave; however, if there is any problem, it does affect the communication speed. When the setting value is small: Restoration will not take long. When the setting value is large: Restoration will take a longer time.
	LAN Port No.	Set a value in the range from 1024 to 65535 (excluding 8001 and 8020). Default: 64000 * Set the same port number for all master and slave stations.
	Connection Port	LAN Set a local port number for master or slave connection.
	Multi-link2 (Ethernet) Table	Click [Setting] to display the [Multi-link2 (Ethernet) Table] window. For details on settings, refer to the next section.

Multi-link2 (Ethernet) table

- Master



- Slave



Item	Contents
Multi-link2 (Ethernet) Table	• For local port 1 (master) Set the IP addresses of all TS2060 units used as slave to respective local port numbers. • For local port 2 to 32 (slave) Set the IP address of the master TS2060i for No. 1.

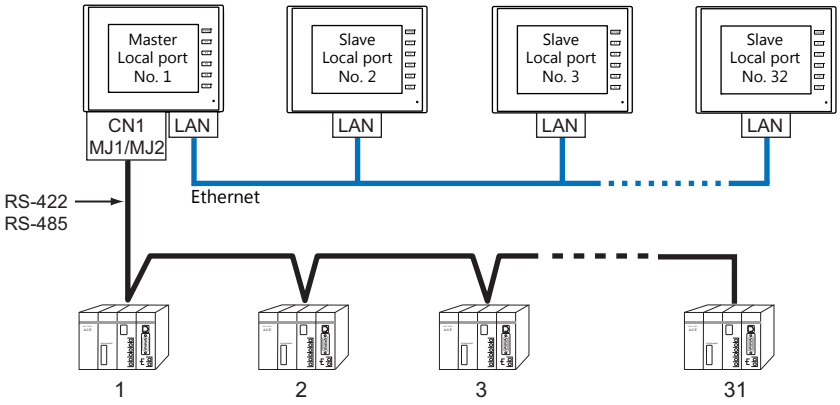
Wiring

The connection between the master and the PLC is the same as the one for 1 : 1 connection. Refer to “Wiring” (page 1-13) in “1 : 1 Connection”.
Use a LAN cable to connect a master with slaves.

n : n Connection (1 : n Multi-link2 (Ethernet)) (TS2060i Only)

Overview

- A maximum of 32 units of TS2060i can be connected to a maximum of 31 units of PLCs. The V9 and V8 series can be used together.
- Multi-link2 (Ethernet) enables you to establish an original network consisting of a master TS2060i of local port No. 1 and slave TS2060i units of local port Nos. 2 to 32. The master TS2060i communicates with the PLC directly, and the slave TS2060i units communicate with the PLC through the master.

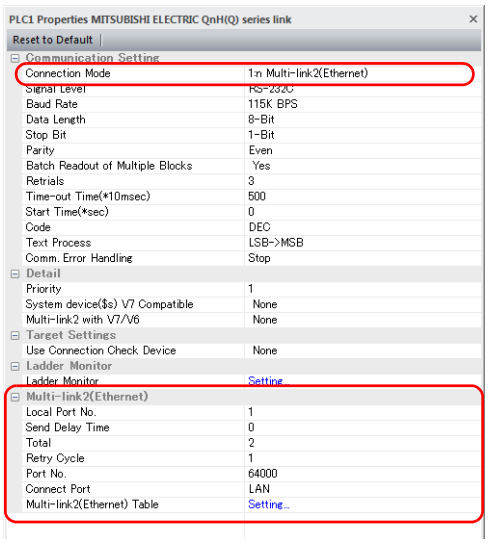


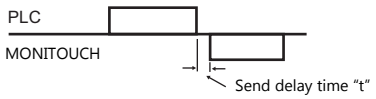
- You can make settings for 1 : n multi-link2 (Ethernet) in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a “CUR-xx” communication interface unit.
- 1 : n multi-link2 (Ethernet) enables sharing of data stored in PLC1 device memory among the TS2060i units. However, sharing data in PLC2 - PLC8 is not possible.
- The V7 and V6 series cannot be used together.
- The communication speed between the master station and the PLC depends on the setting made on the PLC; however, communication among TS2060i units is performed via Ethernet, thus, high-speed communication is possible among them.
- For PLCs that support 1 : n multi-link2 (Ethernet) connection, see Connection Compatibility List provided at the end of this manual.
  The connection between the master and the PLC is the same as the one for 1 : n connection.
  Ethernet connection is adopted to connect a master with slaves.
- If the master station becomes faulty (communication error), the master and slave stations do not work, and as a result, “Communication Error Time-Out” is displayed. If a slave station becomes faulty, a communication error is occurred only on the faulty station.
- The ladder transfer function is not available for a 1 : n multi-link2 (Ethernet) connection.

V-SFT Ver. 6 Settings

Make settings on [System Setting] → [Hardware Setting] → [PLC Properties]. The differences with respect to a 1 : n connection and the points where care is required are explained here.
For details on other settings, refer to “Hardware Settings” (page 1-18) in “1 : n Connection (Multi-drop)”.

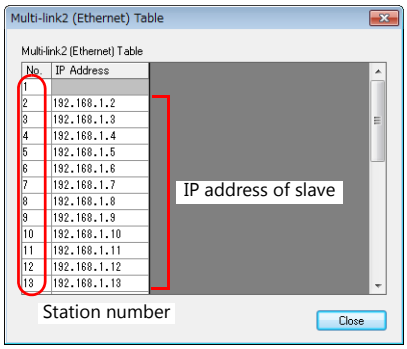
PLC Properties



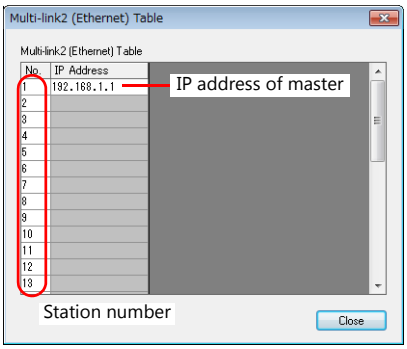
Item		Contents
Communication Setting	Connection Mode	1 : n Multi-link2 (Ethernet)
Multi-link2 (Ethernet)	Local Port No.	1: Master 2 to 32: Slave * Note that if the port number specified is the same as that already set for another TS2060i unit, the system will not operate correctly.
	Send Delay Time	Specify a delay time that elapses before the TS2060i sends the next command after receiving data from the PLC. Normally use the default setting (0). 
	Total	2 to 32 Set the total number of TS2060i units connected in the multi-link2 (Ethernet) connection. The setting must be the same as other TS2060i on the same communication line.
	Retry Cycle	Valid only when the local port is “1” (master). Set the number of cycles before the master sends an inquiry for restoration to a slave that has a communication problem (= system down). When a slave has a problem, it is temporarily removed from the communication targets, and the master sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring on the slave; however, if there is any problem, it does affect the communication speed. When the setting value is small: Restoration will not take long. When the setting value is large: Restoration will take a longer time.
	LAN Port No.	Set a value in the range from 1024 to 65535 (excluding 8001 and 8020). Default: 64000 * Set the same port number for all master and slave stations.
	Connection Port	LAN Set a local port number for master or slave connection.
	Multi-link2 (Ethernet) Table	Click [Setting] to display the [Multi-link2 (Ethernet) Table] window. For details on settings, refer to the next section.

Multi-link2 (Ethernet) table

- Master



- Slave



Item	Contents
Multi-link2 (Ethernet) Table	• For local port 1 (master) Set the IP addresses of all TS2060i units used as slave to respective local port numbers. • For local port 2 to 32 (slave) Set the IP address of the master TS2060i for No. 1.

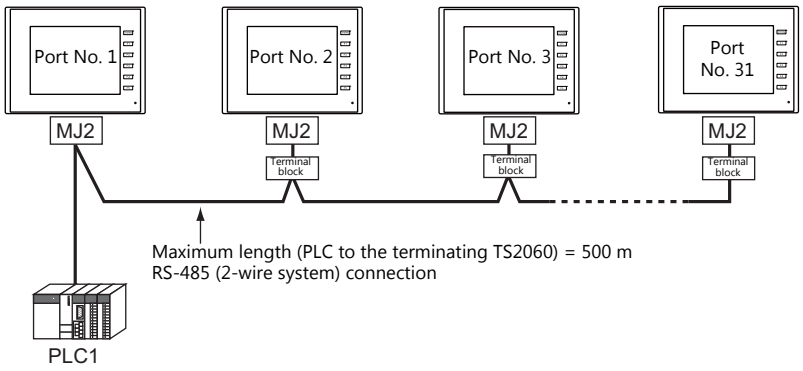
Wiring

The connection between the master and the PLC is the same as the one for 1 : n connection. Refer to “Wiring” (page 1-19) in “1 : n Connection (Multi-drop)”.
Use a LAN cable to connect a master with slaves.

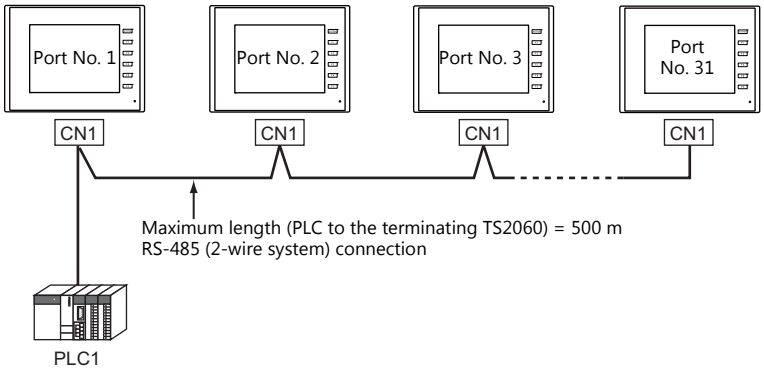
n : 1 Connection (Multi-link)

Overview

- One PLC is connected to a maximum of 31 TS2060 units. Connection together with V8, V7, and V6 units is possible. Connection together with V9 units is not.
  - Connection example 1:



  - Connection example 2:



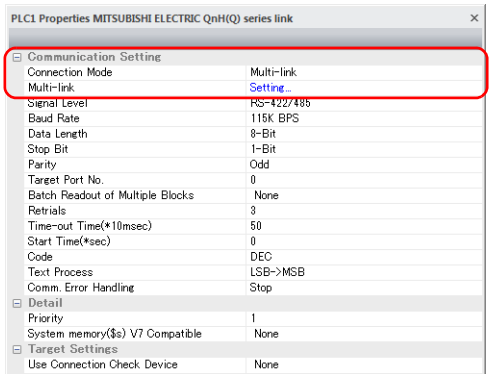
You can make settings for multi-link at the PLC1. Therefore, multi-link connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit. A physical port is selectable from CN1, MJ1, and MJ2.

- Only a PLC [Signal Level: RS422/RS485] and with a port number set. RS-485 (2-wire system) connection is adopted to connect a V-series unit and a PLC. For available models, see Connection Compatibility List provided at the end of this manual.
- Use twisted-pair cables of 0.3 mm sq. or greater between terminal blocks.
- The ladder transfer function is not available for a multi-link connection.

V-SFT Ver. 6 Settings

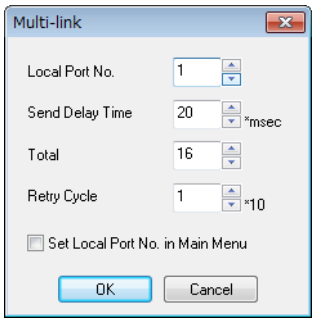
Make settings on [System Setting] → [Hardware Setting] → [PLC Properties]. The differences with respect to a 1 : 1 connection and the points where care is required are explained here.
For details on other settings, refer to Hardware Settings in "1 : 1 Connection" (page 1-11).

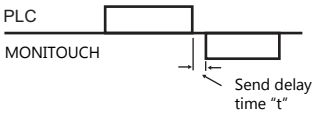
PLC Properties



Item		Contents
Communication Setting	Connection Mode	Multi-link
	Multi-link	Display the [Multi-link] dialog by pressing the [Setting] button, then make the necessary settings in this dialog. For more information on settings, see "Multi-link" (page 1-38).

Multi-link



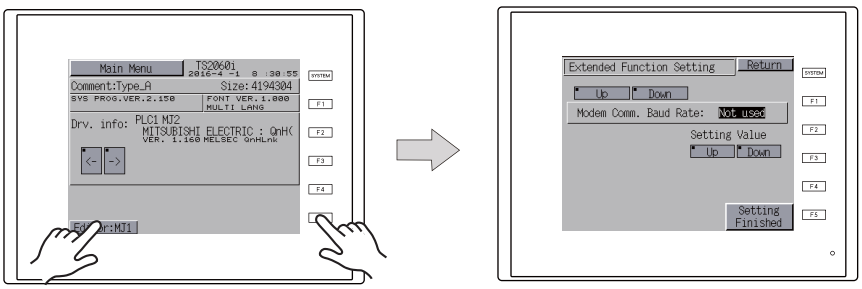
Item	Contents
Local Port No.	1 to 32 Specify a port number of the TS2060. * Note that if the port number specified is the same as that already set for another TS2060 unit, the system will not operate correctly.
Send Delay Time *1	0 to 255 msec (Default setting: 20 msec) Specify a delay time that elapses before the TS2060 sends the next command after receiving data from the PLC. 
Total *1	2 to 32 Set the maximum number of TS2060 units to be connected in multi-link connection. *2
Retry Cycle *1	1 to 100 (× 10) When the TS2060 has a problem, it is temporarily removed from the communication targets, and the master sends an inquiry for restoration every number of cycles specified for [Retry Cycle]. This setting does not affect the communication speed if no problem is occurring; however, if there is any problem, it does affect the communication speed. When the setting value is small: Restoration will not take long. When the setting value is large: Restoration will take a longer time.
Set Local Port No. in Main Menu	Select this checkbox to set the local port number on the Main Menu screen of the TS2060.

*1 For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the TS2060 that are connected in the same communication line.
*2 When connecting three units with the local port numbers 1, 2 and 10, specify "10" for [Total].

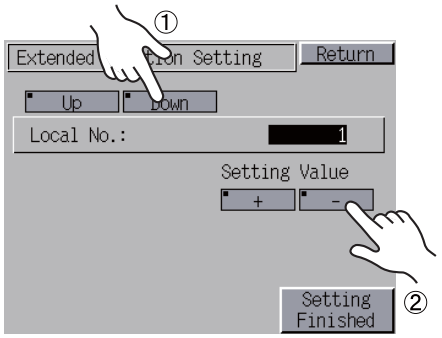
Settings on MONITOUCH

When [Set Local Port No. in Main Menu] is selected in the [Multi-link] window, the local port number must be set on the Main Menu screen of the TS2060.

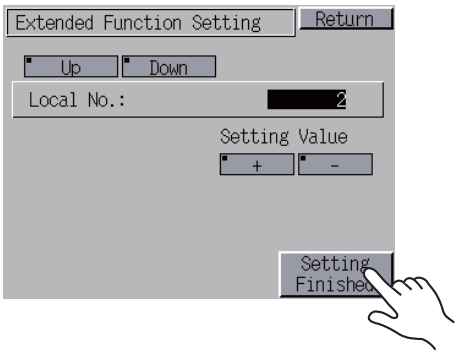
1. Transfer the screen program.
2. Press [SYSTEM] and then the [F1] function switch on MONITOUCH to display the Main Menu screen.
3. Press the [Editor: MJ1] switch and the [F5] function switch at the same time.
   The Extended Function Setting screen is displayed.



4. Select the [Local Port No.] menu using the upper [Up] and [Down] switches (No. 1 in the figure below), and then specify the local port number using the [Up] and [Down] switches on the right (No. 2 in the figure below).



5. Press the [Setting Finished] switch to confirm the setting.



* For more information, refer to the TS2060 Hardware Specifications manual.

The local port number specified here is commonly used for V-Link, Modbus slave and Multi-link communications. Set a number within the range of these communications.

- V-Link: 1 to 254
- Modbus slave: 1 to 31
- Multi-link: 1 to 32

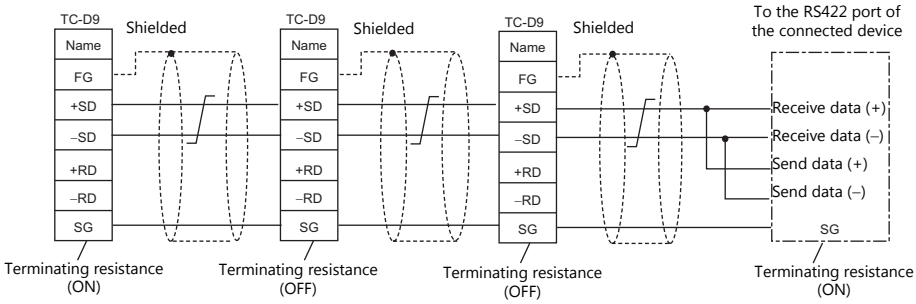
Wiring

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

This shows the situation when a multi-link connection is made at CN1. It is convenient to use the Hakko Electronics' optional terminal converter "TC-D9".

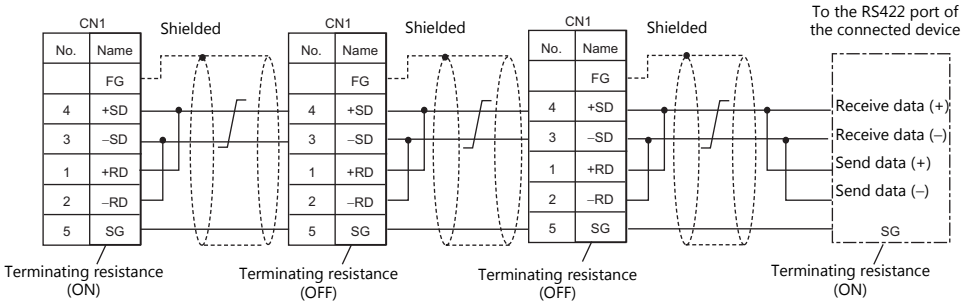
- When a TC-D9 is used:
  Set the slide switch of "TC-D9" to ON (2-wire system).



* Use shielded twist-pair cables.

* Jumpers may not be necessary, depending on the connected device.

- When no TC-D9 is used:
  Install jumpers between +SD and +RD as well as –SD and –RD.



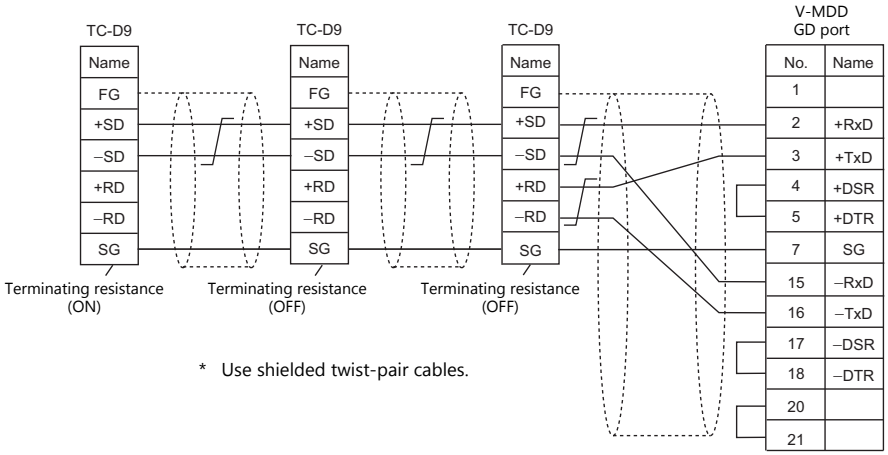
* Use shielded twist-pair cables.

* Jumpers may not be necessary, depending on the connected device.

When connecting to Mitsubishi Electric's QnA CPU:

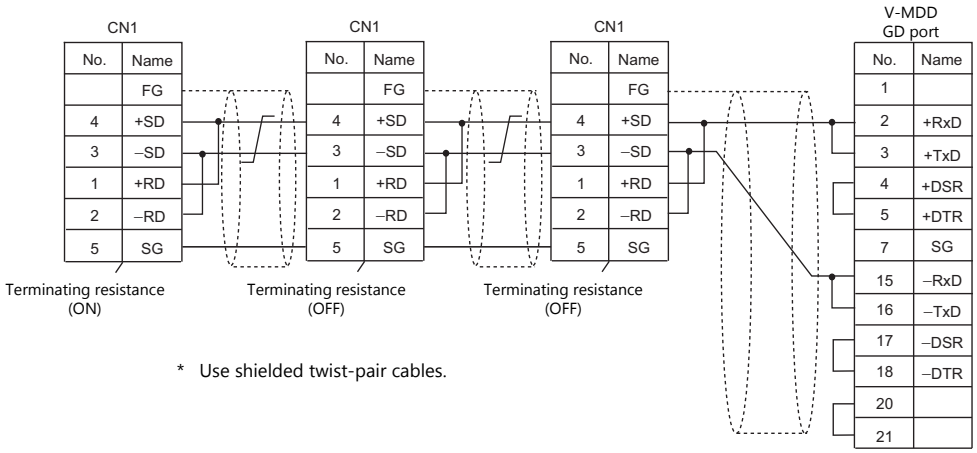
Use the GD port of Hakko Electronics' optional dual port interface V-MDD for the PLC CPU port.

- When a TC-D9 is used:
  Set the slide switch of "TC-D9" to ON (2-wire system).



* Use shielded twist-pair cables.

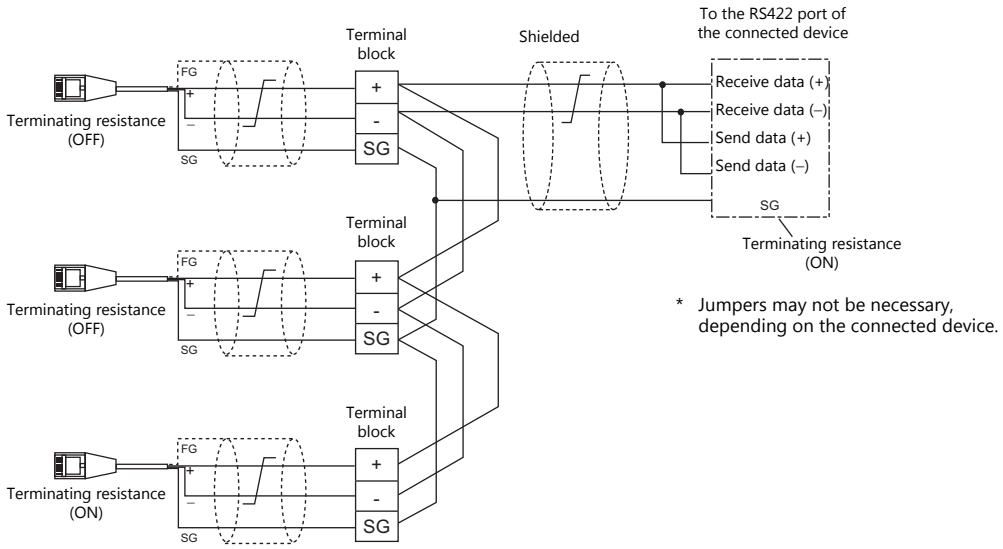
- When no TC-D9 is used:
  Install jumpers between +SD and +RD as well as -SD and -RD.



* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

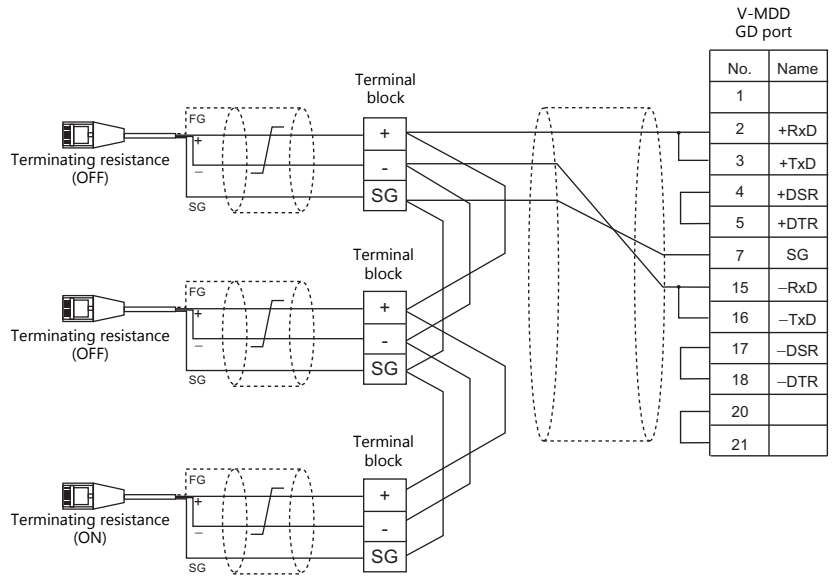
This shows the situation when a multi-link connection is made at MJ1 or MJ2.



* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

When connecting to Mitsubishi Electric's QnA CPU:

Use the GD port of Hakko Electronics' optional dual port interface V-MDD for the PLC CPU port.

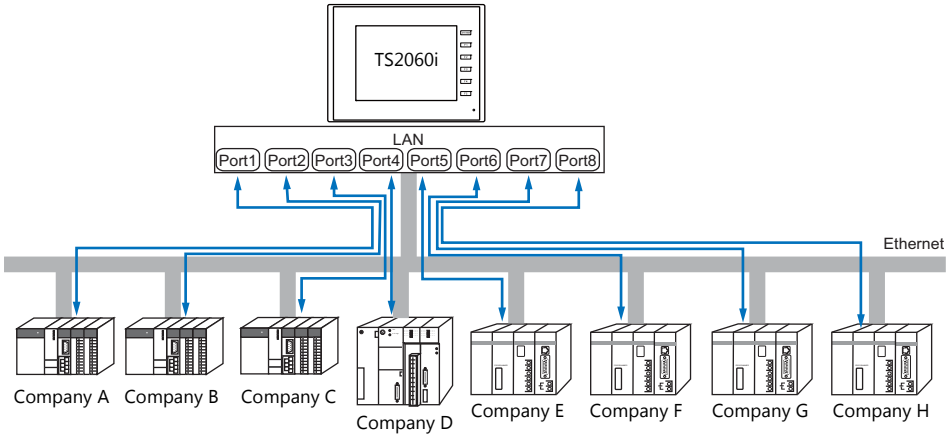


* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

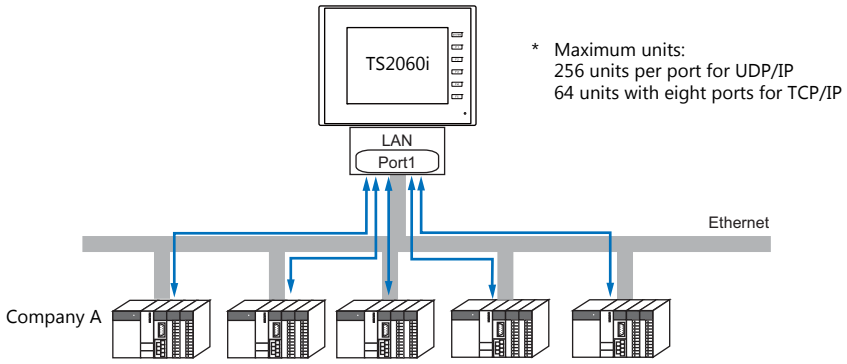
1.3.2 Ethernet Communication (TS2060i Only)

Overview

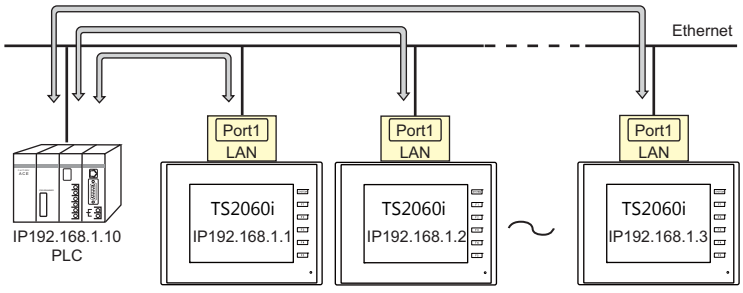
- Because eight communication ports can be opened, the TS2060i is allowed to communicate with eight models of PLCs at the same time.



- When there are two or more PLCs of the same model, the TS2060i is allowed to carry out 1 : n communication via one single port.



- If multiple TS2060i units are connected to one single PLC, the maximum permissible number of these units depends on the PLC specifications. Refer to the PLC manual issued by the manufacturer.



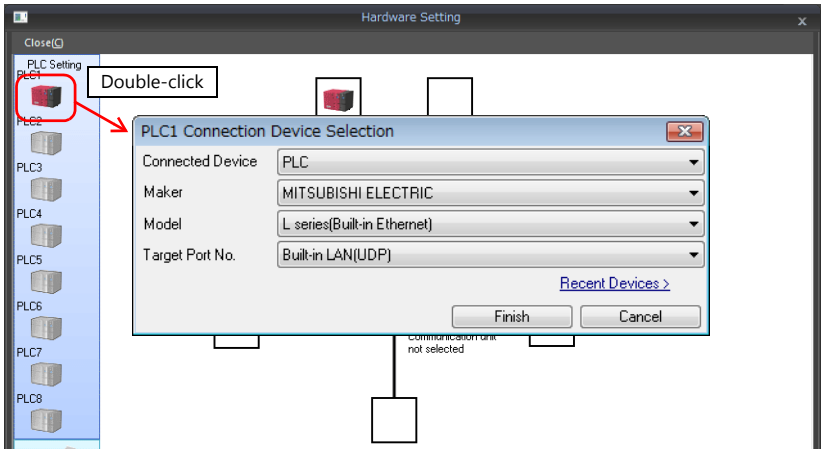
- You can make settings for Ethernet communication in [Communication Setting] for the logical ports PLC1 - PLC8.

V-SFT Ver. 6 Settings

Hardware Settings

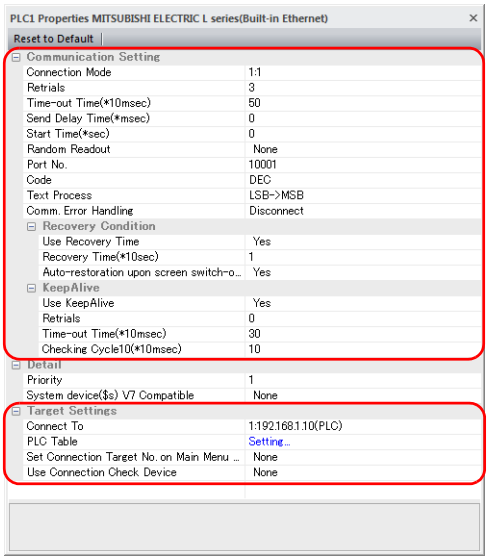
Selecting a device to be connected

Select the device for connection from [System Setting] → [Hardware Setting].

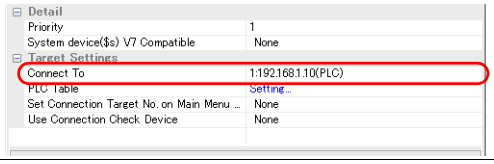
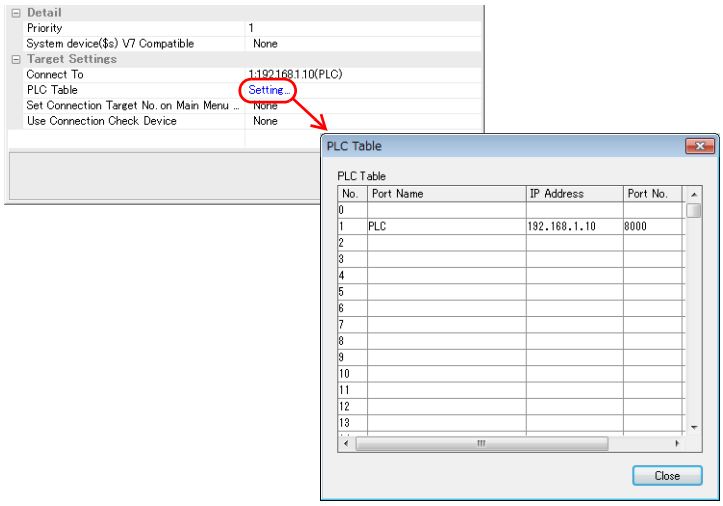


PLC properties

Configure the [PLC Properties].



Item		Contents
Communication Setting	Connection Mode	1:1/1:n Set the number of PLCs that are to be communicated with.
	Port No.	Set the port number of the TS2060i to be used for communications with the PLCs.
	KeepAlive	This setting is used when using the "KeepAlive" function. The "KeepAlive" function is used for periodically checking the connection with devices on the network. This function enables a prompt detection of a communication error, thus, significantly shortens the time to wait until a "disconnect" process takes place after an occurrence of the time-out error. * When using this function, select [Disconnect] for [Comm. Error Handling]. • [Use KeepAlive] Select [Yes] when using the "KeepAlive" function. The following settings will take effect. - [Retrials] Specify the number of retrials. If a timeout persists even after as many retrials as specified, an error handling routine will take place. 0 to 255 Default: 0 - [Time-out Time] Specify a period of time allowed for the TS2060i to monitor a response from its connected device. If no response is given within the specified time, retrial will be made. 1 to 999 (× 10 msec) Default: 30 (× 10 msec) - [Checking Cycle] Set the cycle time of "KeepAlive" communication. 1 to 999 (× 10 msec) Default: 10 (× 10 msec)

Item		Contents
Target Settings	Connect To	These settings are valid when [1 : 1] is selected for [Connection Mode]. Select the IP address of the PLC registered in the PLC table. 1 : 1 communications are executed with the PLC selected here. 
	PLC Table	Click [Setting] to display the [PLC Table] window. Set the IP address, port number and KeepAlive function of the PLC. 

* For settings other than the above, see "1.4 Hardware Settings" (page 1-50).

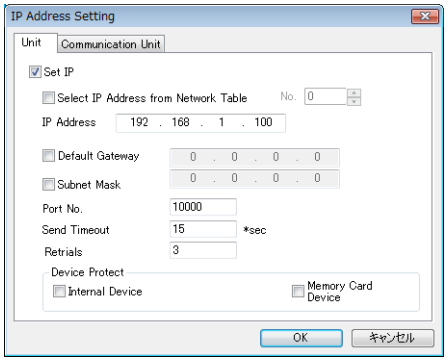
IP Address Setting of the TS2060i

An IP address must be set for the TS2060i to connect to devices via Ethernet. Set the IP address either on the TS2060i unit or for the screen program using the V-SFT editor.

Setting Using the V-SFT Editor

Set the IP address at [System Setting] → [Hardware Setting] → [Local Port IP Address].

Local port IP address setting



Item	Contents
Select IP Address from Network Table	This is valid when the IP address of the TS2060i has been registered in the network table. Select a network table number from 0 to 255 to set the IP address. * For more information on the network table, refer to "Network table" (page 1-64).
IP Address *1	Set the IP address for the TS2060i.
Default Gateway *1	Set the default gateway.
Subnet Mask *1	Set the subnet mask. When this box is not checked, the subnet mask is automatically assigned based on the byte at the extreme left of the IP address. Example: When IP address is "172.16.200.185", "255.255.0.0" is set. When IP address is "192.168.1.185", "255.255.255.0" is set.
Port No. *1	Set a port number from 1024 to 65535. (Excluding 8001 and 8020)
Send Timeout	Specify the timeout time to send the EREAD/EWRITE/SEND/MES command.

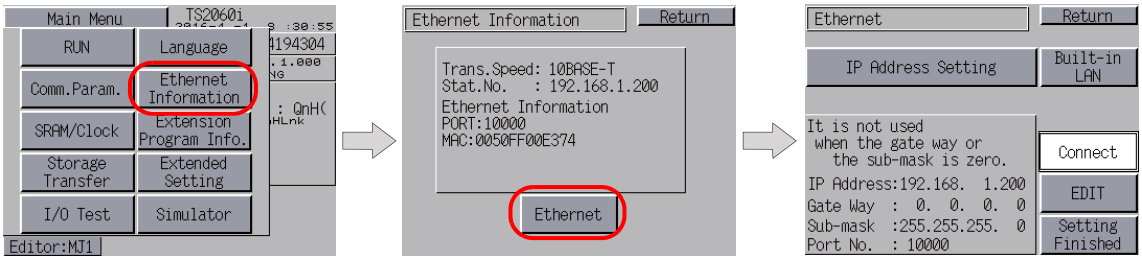
Item	Contents
Retrials	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Device Protect Internal Device Memory Card Device	Check either check box to write-protect the device memory from computers or other stations.

*1 For more information on each setting item, see "Basics of ethernet settings" (page 1-65).

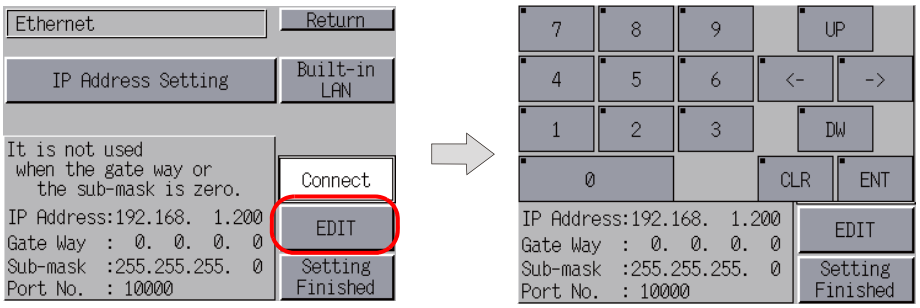
Setting from the Main Menu Screen on MONITOUCH

Set the IP address on the Main Menu screen of MONITOUCH.

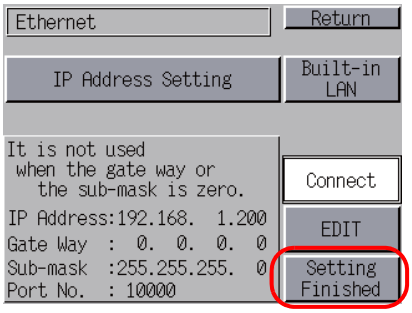
1. Press [SYSTEM] and then the [F1] function switch on MONITOUCH to display the Main Menu screen.
2. Press the [Main Menu] switch to display the drop-down menu. Then press the [Ethernet Information] switch to display the Ethernet Information screen and press the [Ethernet] switch. The Ethernet screen is displayed.



3. Press the [EDIT] switch and make the settings.

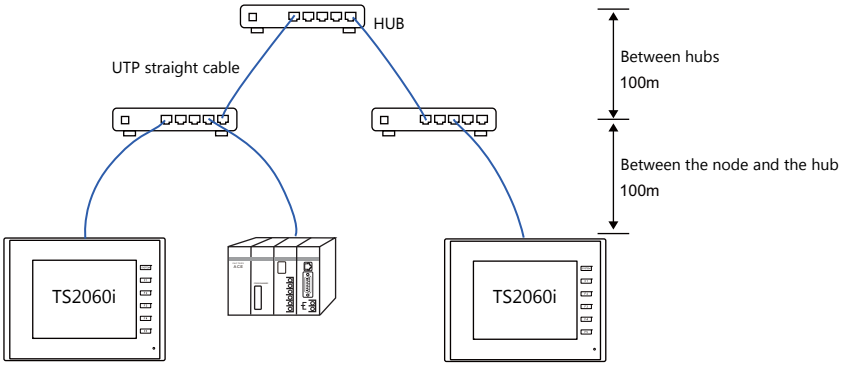


4. Press the [Setting Finished] switch to confirm the setting.

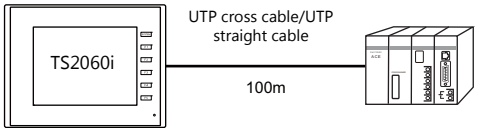


Connection example

With hub



Without hub



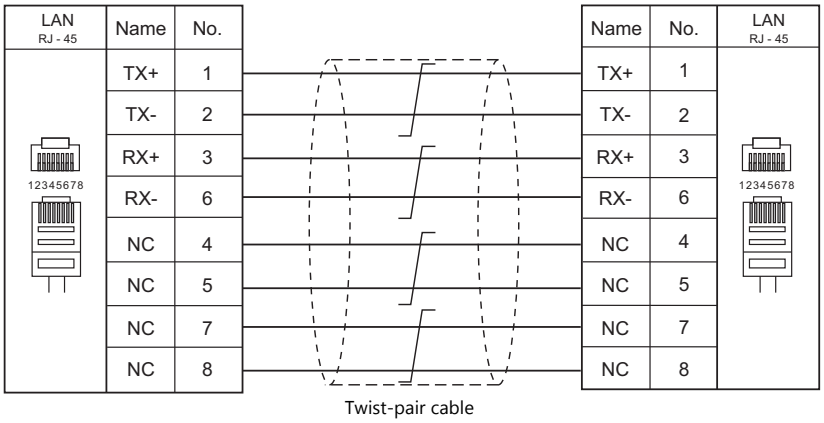
* The Auto-MDIX function is available.
Connection without a hub is possible even when using a straight cable.

Wiring

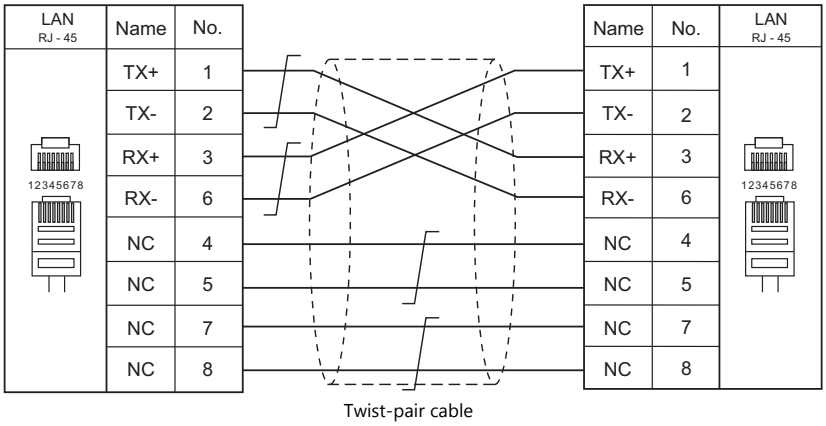
⚠CAUTION

- Use a commercially available cable. Using a self-made cable may cause an error in network connection.
- If the use of a cross cable cannot stabilize communication, use a hub.

- Straight cable



- Cross cable



1.3.3 Network Communication (TS2060i Only)

Overview

- The optional communication interface unit "CUR-xx" is required to enable a network communication listed below.

Communication Interface Unit	Network	Available Models
CUR-00	OPCN-1	Mitsubishi Electric A series (OPCN-1) OMRON SYSMAC C (OPCN-1) Fuji Electric MICREX-SX (OPCN-1)
CUR-01	T-Link	Fuji Electric MICREX-F (T-LINK) Fuji Electric MICREX SX (T-LINK)
CUR-02	CC-LINK Ver. 2.00/1.10/1.00	Mitsubishi Electric A series (CC-LINK) Mitsubishi Electric QnA series (CC-LINK) Mitsubishi Electric QnH (Q) series (CC-LINK)
CUR-03	Ethernet *1	Various PLCs Ethernet UDP/IP communication * TCP/IP communication is not supported.
CUR-04	PROFIBUS-DP	Siemens S7 PROFIBUS-DP Universal PROFIBUS-DP
CUR-06	SX BUS	Fuji Electric MICREX-SX (SX BUS)
CUR-07	DeviceNet	Universal DeviceNet
CUR-08	FL-Net	Universal FL-Net

*1 In addition to UDP/IP communication with a PLC, screen program transfer, the MES interface function, and TELLUS & V-Server connection can be enabled by connecting a PC. Use the built-in LAN port for TCP/IP communication.

- You can make settings for network communication in [Communication Setting] for the logical port PLC1. Thus, devices available with only PLC1, as those used for multi-link or multi-link2, cannot be connected concurrently for network communication.
- The "CUR-xx" cannot be used when the "DUR-00" is already connected.

V-SFT Ver. 6 Settings

For more information, refer to the communication unit specifications provided for each network.

Wiring

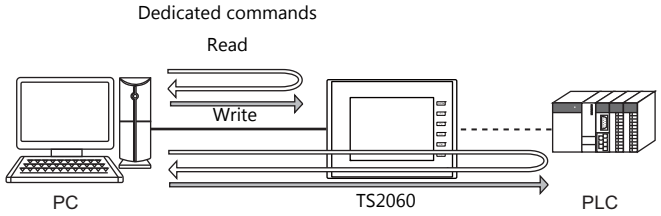
For more information, refer to the communication unit specifications provided for each network.

1.3.4 Slave Communication

Connecting via V-Link, Modbus RTU, or Modbus TCP/IP is applicable to slave communication using the TS2060. V-Link and Modbus RTU are used for serial communication, and Modbus TCP/IP is used for Ethernet (TCP/IP) communication.

V-Link

- "V-Link" is the network where the PC reads from and writes to the internal device memory of the TS2060, memory card device memory, or PLC1 to 8 device memory using a dedicated protocol.



- You can make settings for V-Link communication in [Communication Setting] for the logical ports PLC2 - PLC8. A communication port is selectable from CN1 *, MJ1, and MJ2.

  * CN1 is available only when the TS2060i is attached the "DUR-00".

- For more information, refer to "V-Link" in book 3 of the TS2060 Connection Manual.

MODBUS RTU

- The TS2060 is connected to a Modbus RTU master via serial connection.
- The device memory table for Modbus slave communication is prepared for the TS2060. The master is allowed to gain access to the device memory table and read/write the PLC data.
- For more information, refer to the Modbus Slave Communication Specifications manual separately provided.

MODBUS TCP/IP (TS2060i Only)

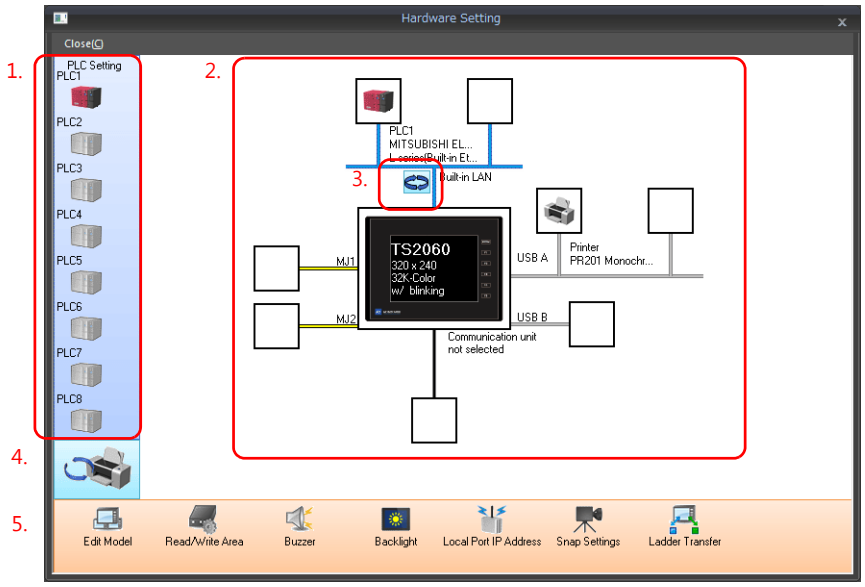
- The TS2060i is connected to a Modbus TCP/IP master via Ethernet communication.
- The device memory table for Modbus slave communication is prepared for the TS2060i. The master is allowed to gain access to the device memory table and read/write the PLC data.
- For more information, refer to the Modbus Slave Communication Specifications manual separately provided.

1.3.5 Other Connections

For connection to a serial printer that is not in 8-way communication, serial ports of MJ1 and MJ2 are used.

1.4 Hardware Settings

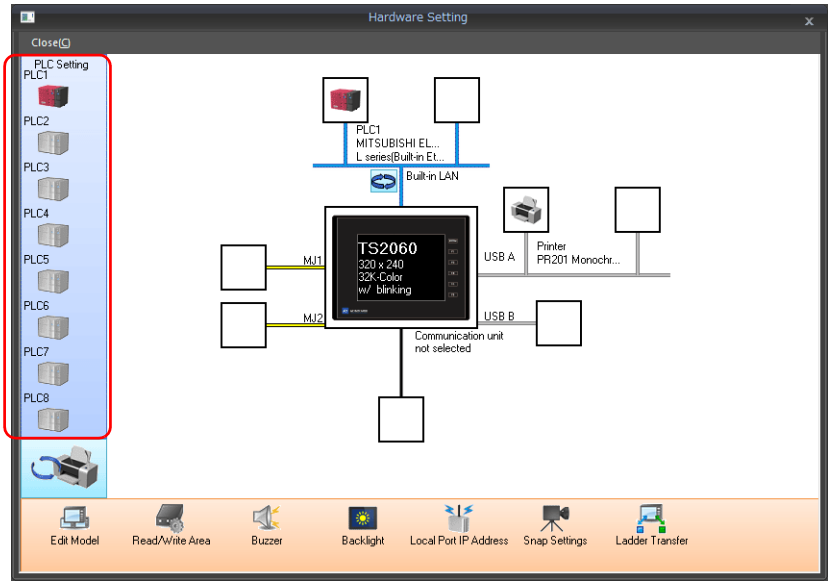
Select and set the devices to connect to the TS2060 on the Hardware Setting screen.



	Item	Contents
1.	PLC Setting	Set the devices (PLC, temperature controller, servo, inverter, barcode reader etc.) to connect to PLC1 to PLC8.
2.	Connection Diagram	The devices which are set for connection are displayed. Devices as well as communication settings can be changed.
3.	Built-in LAN / Ethernet unit switch	Select the Ethernet connection port on the TS2060i from the internal LAN communication unit. The icon changes each time it is clicked.
4.	PLC Setting / Other Setting switch	Switch between PLC settings and other settings. The icon changes each time it is clicked.
5.	MONITOUCH Settings	Make MONITOUCH settings on the TS2060.

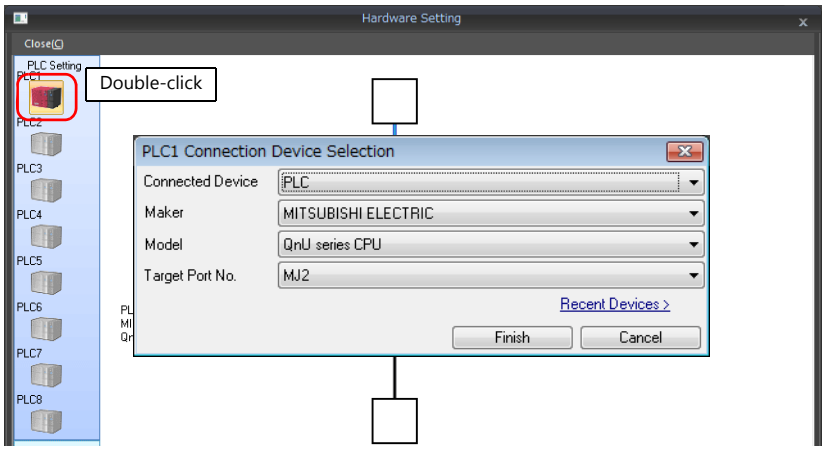
1.4.1 PLC Settings

To enable communication with a PLC, a temperature controller, an inverter, etc., the following settings are required to be set on the editor. You can see the contents of these settings on the TS2060 Main Menu screen.
For information on the Main Menu screen, refer to the TS2060 Hardware Specifications.



Selecting a Device to be Connected

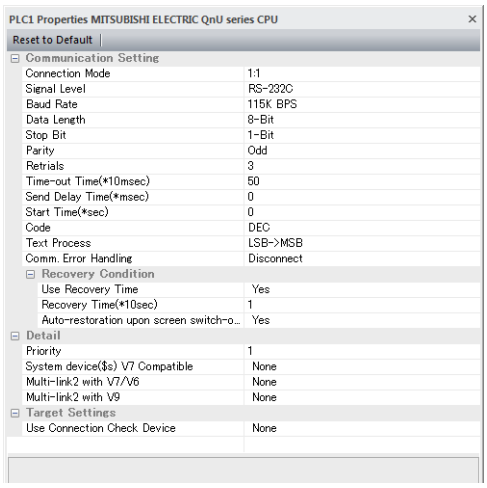
Double-click on a PLC icon in the [Hardware Setting] window to display the window shown below.



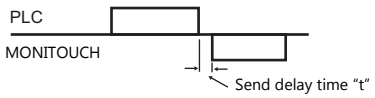
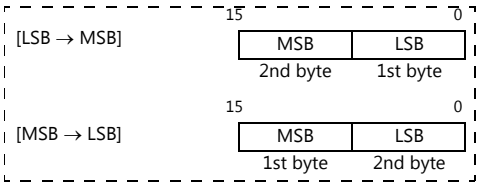
Item	Contents
Connected Device	Select the device to connect.
Maker	Select the maker of the device.
Model	Select the model of the device to connect. Refer to the respective chapter of each maker and select the appropriate model.
Target Port No.	Select the port to which the device connects to on the TS2060.

PLC Properties

Click on the PLC icon in [Hardware Setting] to display the window shown below.



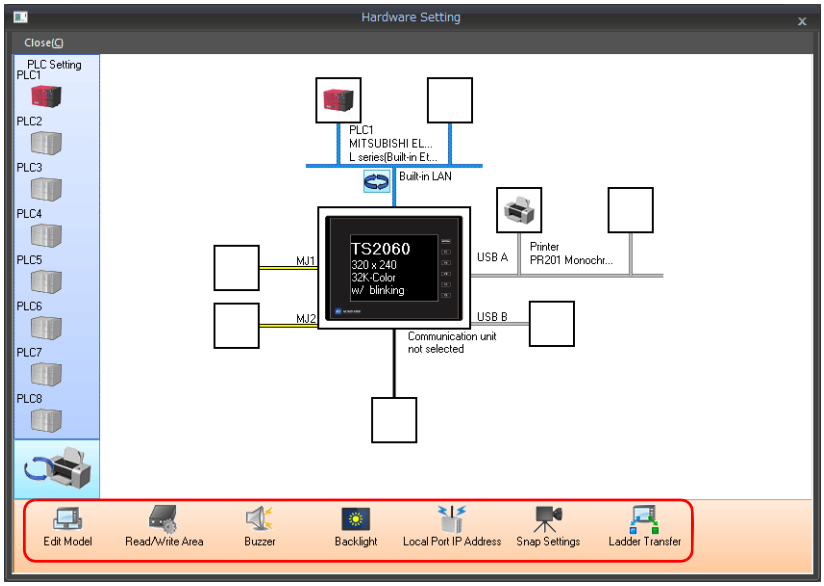
Item		Contents
Communication Setting	Connection Mode	Select a connection mode. 1 : 1 / 1 : n / Multi-link / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) Available options vary, depending on which device is connected. For details, see Connection Compatibility List provided at the end of this manual.
	Signal Level*1	Select a signal level. RS-232C/RS-422/485
	Baud Rate*1	Select a baud rate. 4800/9600/19200/38400/57600/76800/115K/187.5K* bps * Available only when connecting via Siemens S7-200PPI or S7-300/400MPI and CN1.
	Data Length*1	Select a data length. 7 / 8 bits
	Stop Bit*1	Select a stop bit. 1 / 2 bits
	Parity*1	Select an option for parity bit. None / Odd / Even
	Target Port No.*1	Specify a port number of the connected device. 0 to 31 (Modbus RTU: 1 to 255)

Item			Contents
Communication Setting	Transmission Mode[*1]		Select a transmission mode for the connected device. This setting is required if a device of Mitsubishi, Omron, Hitachi Industrial Equipment Systems, Yokogawa, JTEKT, or Yaskawa is in use.
	Retrials		Specify the number of retrials to be allowed in the event of a timeout during communication. If a timeout persists even after as many retrials as specified, an error handing routine will take place. 1 to 255
	Time-out Time		Specify a period of time allowed for the TS2060 to monitor a response from its connected device. If no response is given within the specified time, retrial will be made. 0 to 999 (×10 msec)
	Send Delay Time		Specify a delay time that elapses before the TS2060 sends the next command after receiving a response from its connected device. Normally use the default setting. 0 to 255 (×1 msec) 
	Start Time		Specify a delay time that elapses before the TS2060 starts to send commands upon power-up. If the TS2060 and its connected device are turned on at the same time and the device is slower to start up, set [Start Time]. 0 to 255 (×1 sec)
	Code		Select a code for the connected device. The selected option is reflected through the data displayed on graphs or trending sampling parts. DEC/BCD
	Text Process		Specify a byte order in text data. This setting is valid for macro commands that handle text. LSB → MSB/MSB → LSB 
	Comm. Error Handling		Select an action to be taken in the event of a communication error. • [Stop] Communication will be stopped entirely and the communication error screen will be displayed. The [RETRY] switch is available for attempting reestablishment of communication. • [Continue] The communication error message will be displayed at the center of the screen. The same communication will continue until restoration, and screen operation is not allowed then. When communication has been returned to a normal state, the message disappears and screen operation is allowed. • [Disconnect] No error message will appear and communication will proceed to the next one.* However, communication with the device, in which a timeout was detected, will be disconnected. * Internal device memory must be specified for [Read Area] and [Write Area].
	Recovery Condition	Use Recovery Time	This setting is valid when [Disconnect] is selected for [Comm. Error Handling].
		Recovery Time	Return Time 1 to 255 (×10 sec) When the specified time has elapsed, the TS2060 checks the recovery of the device which discontinued communicating.
		Auto-restoration upon screen switch-over	When the screen is switched, the TS2060 checks the recovery of the device which discontinued communicating.

Item		Contents
Detail	Priority	[1] (higher priority) - [8] (lower priority) Specify the priority taken during 8-way communication. If interrupts from two or more devices occur at the same time, communication with these devices will take place in order of priority.
	System device ($s) V7 Compatible (PLC1)	This is set to [Yes] if the V7-series screen program (including temperature control network/PLC2Way settings) has been converted to data for the TS2060. System information relevant to 8-way communication will be stored in device memory addresses $P1 and $s. * For more information, see "1.5.1 $Pn (For 8-way Communication)" (page 1-70).
	System device ($s) V7 Compatible (PLC2)	This is set to [Yes] if the V7-series screen program (including temperature control network/PLC2Way settings) has been converted to data for the TS2060. • [None] $P2:493/494/495 is used as the transfer table control device memory. • [Yes] $s762/763/764 is used as the transfer table control device memory. * For more information, see "1.5.1 $Pn (For 8-way Communication)" (page 1-70).
	Device Memory Map Control Device	Specify the device memory for controlling device memory maps of PLC1 - PLC8. The device memory specified here is the same as [Control Device] in [Device Memory Map Setting] ([System Setting] → [Device Memory Map] → [Device Memory Map Edit] window → [Device Memory Map Setting]). * For more information, refer to the TS2060 Reference Manual 2.
Target Settings	Connect To	Set this for Ethernet communication. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)" (page 1-43).
	PLC Table	
	Use Connection Check Device	Select [Yes] for connection confirmation using a desired device memory address at the start of communication.
	Connection Check Device	Specify a desired device memory address used for connection confirmation.

*1 Be sure to match the settings to those made on the connected device.

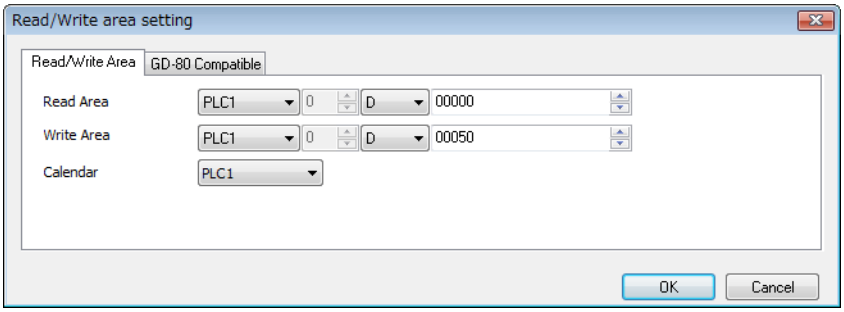
1.4.2 MONITOUCH Settings



Select Edit Model

Set the model of the V series to edit.
For more information, refer to the TS2060 Reference Manual 1.

Read/Write Area

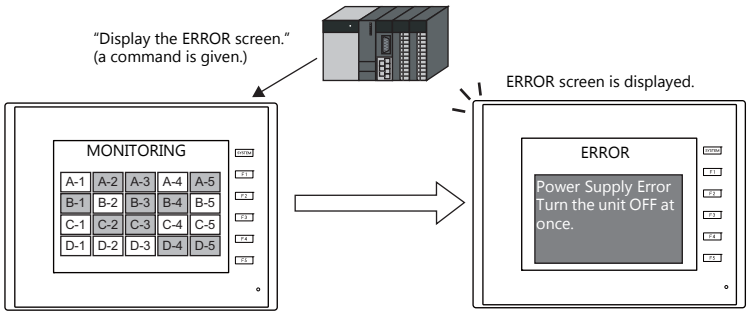


Item	Contents
Read Area	Specify a memory address used to give commands for display or operation from the PLC to MONITOUCH. Three words (at the minimum)*1 of consecutive memory addresses are secured. For more information, see " Read area" (page 1-55).
Write area	This is the area, to which the screen numbers or overlaps displayed on MONITOUCH or a buzzer state will be written. Three words of consecutive memory addresses are secured. For more information, see " Write area" (page 1-59).
Calendar	This setting is valid when the TS2060's internal clock*2 is not used. The setting allows the calendar data to be read from the device via the selected port at PLC1 - PLC8. The calendar data will be updated when: • The power is turned on. • STOP → RUN • The date changes. • Bit 11 in the read area "n" is set (ON) (0 → 1 leading edge)

*1 More words are required if the sampling function is used:
sampling control memory (three words maximum), sampling data memory (variable depending on the setting)
*2 For more information on the internal clock, refer to the TS2060 Reference Manual 1.

Read area

The read area is the area where the PLC gives commands for display or operation to MONITOUCH.
Three words (at the minimum) of consecutive memory addresses are secured.
MONITOUCH always reads data from these three words to display and operate according to the commands.



Memory addresses are allocated as shown below.

Read area =

Address	Contents	Operation
n	Sub command/data	TS2060 ← PLC
n + 1	Screen status command	
n + 2	Screen number command	

* Data in these memory addresses is saved at $s460 to 462 of the TS2060 internal memory. For more information on the internal memory ($s), refer to the TS2060 Reference Manual 1.

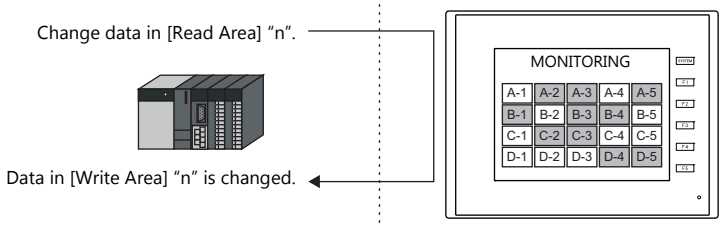
Read area "n" (sub command/data)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0												

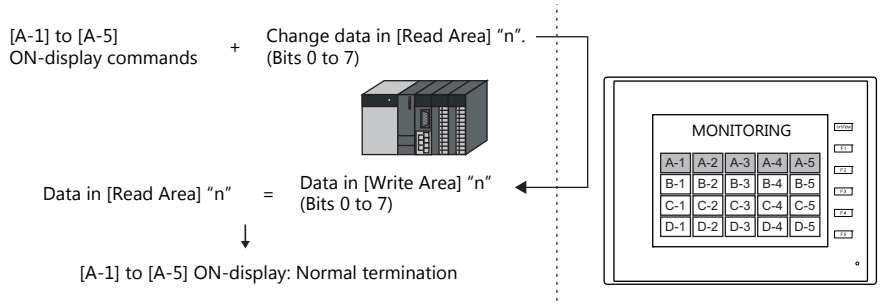
(1) Free
(2) BZ0 [0 → 1] (leading edge)
(3) BZ1 [0 → 1] (leading edge)
(4) BZ2 [1] (level)
(5) Calendar setting ([0 → 1] (leading edge)
(6) System reserved

(1) Free	When data is saved in this area, the same data is written to [Write Area] "n" after the screen has been displayed. Utilizing this operation, these bits can be used for watch dog monitoring *1 or display scanning *2.
(2) BZ0	A beep (peep) sounds at the leading edge [0 → 1].
(3) BZ1	An error buzzer (peep-peep) sounds at the leading edge [0 → 1].
(4) BZ2	A buzzer (ffeee) sounds continuously while the bit remains [1]. When setting this bit, check [Use Continuous Buzzer Sound] ([System Setting] → [Unit Setting] → [General Setting])
(5) Calendar setting *3	This bit is valid when the built-in clock is not used. This bit should be used differently depending on whether the connecting PLC is equipped with the calendar function.
	When MONITOUCH is connected to a PLC with calendar function: When calendar data in the PLC is updated, it can forcibly be read by setting this bit (at the leading edge of [0 → 1]). In addition to calendar data update using this bit, calendar data in the PLC is automatically read and updated when: • The power is turned on. • STOP → RUN • The date changes (AM 00:00:00).
	When MONITOUCH is connected to a PLC without calendar function: A virtual calendar area can be provided by setting [Calendar memory] in the [GD-80 Compatible] tab window ([Read/Write Area] → [GD-80 Compatible]). Then setting this bit (ON) updates the calendar data.
(6) System reserved	This bit is reserved by the system. This bit must be "0".

*1 Watchdog
When the PLC is communicating with TS2060, there is no means for the PLC to know whether or not TS2060 is doing operations correctly. To solve this one-way communication, change data in bits 0 to 7 in [Read Area] "n" and check that the same data is saved in bits 0 to 7 in [Write Area] "n". This proves that the TS2060 is correctly doing operations through communications with the PLC. This verification is called "watchdog".

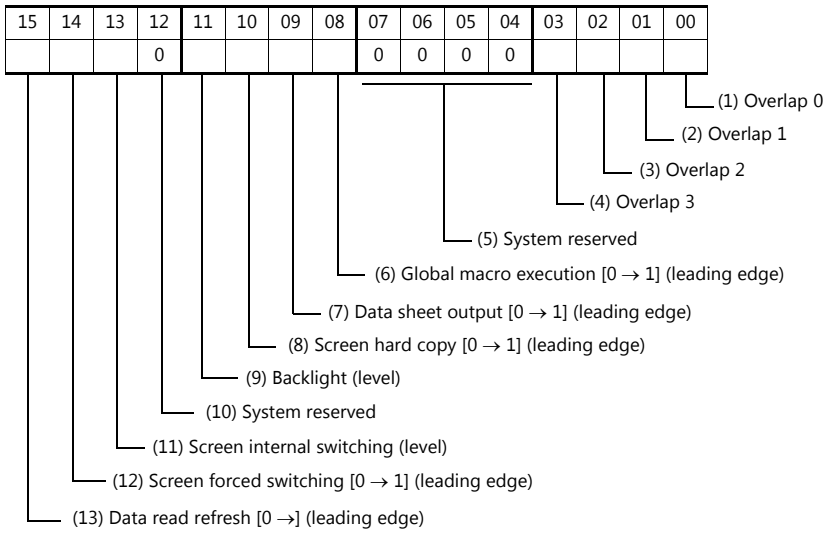


*2 Display scanning
This operation can be utilized for display scanning. Forcibly change data in the [Read Area] "n" when giving a graphic change command and check that the same data is saved in the [Write Area] "n". This can prove that the graphic change command is received and executed correctly.



*3 If this bit is used during constant sampling, data sampling timing may be shifted. If this bit is set during constant sampling, we recommend you to reset the sampling as well.

Read area "n + 1" (screen status command)

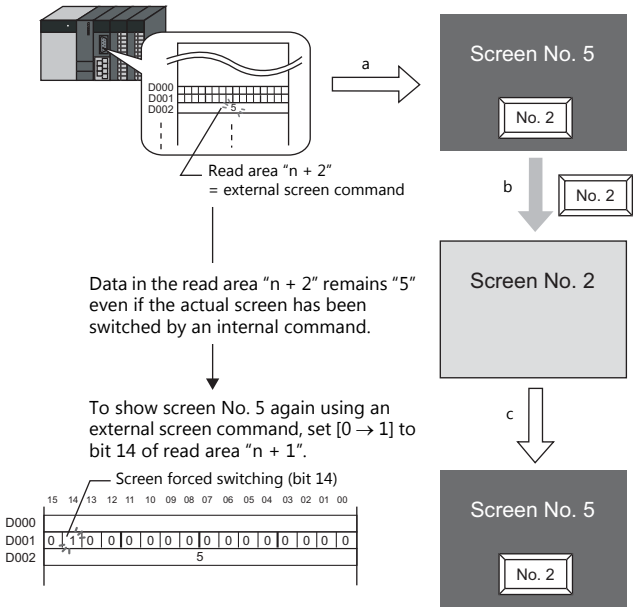


(1) Overlap 0 (2) Overlap 1 (3) Overlap 2	These bits are used for controlling show/hide operations of overlaps. • Normal overlap or call-overlap [0 → 1] (leading edge [*1]): Show [1 → 0] (falling edge [*1]): Hide • Multi-overlap [0] (level [*2]): Hide [1] (level [*2]): Show It is necessary to specify library No. 0 to 1023 for [Overlap Library Number] for [Multi-Overlap] dialog.
(4) Overlap 3	This bit is used for controlling show/hide operations of the global overlap screen. [0 → 1]: Show [1 → 0]: Hide It is necessary to specify library No. 0 to 9999 for [Overlap Library Number] in the [Global Overlap Setting] dialog.
(5) System reserved	This bit is reserved by the system. This bit must be "0".
(6) Global macro execution	The macro set for [Macro Block] is executed once at [0 → 1] (leading edge). The macro block number should be specified for [Global Macro Memory] in the dialog that is displayed by selecting [System Setting] → [Macro Setting]. For more information, refer to the Macro Reference manual provided separately.
(7) Data sheet output	The data sheet is printed out at [0 → 1] (leading edge). This bit becomes valid when the data sheet function is set.
(8) Screen hard copy	The TS2060 screen image is printed out at [0 → 1] (leading edge). This bit becomes valid when a printer is connected. It is also possible to make a screen hard copy using an internal switch [Function: Hard Copy].
(9) Backlight	This bit becomes valid when an option other than [Always ON] is selected in the [Backlight] tab window that is displayed by selecting [System Setting] → [Unit Setting]. [0] (level): OFF when the conditions are satisfied [1] (level): ON
(10) System reserved	This bit is reserved by the system. This bit must be "0".
(11) Screen internal switching	This bit controls screen switching by internal switches. [0]: Screen switching by internal switches is enabled. [1]: Screen switching by internal switches is disabled. * An "internal switch" means a switch you can create for internal processing within MONITOUCH by selecting [Screen] or [Return] for [Function:] of the switch.
(12) Screen forced switching	This bit is used for switching the screen using the read area "n + 2" when the required screen number has already been specified in "n + 2". [*3]
(13) Data read refresh	All the data display items on the screen are refreshed at [0 → 1] (leading edge). This is applied to every data display item regardless of the setting for [Process Cycle].

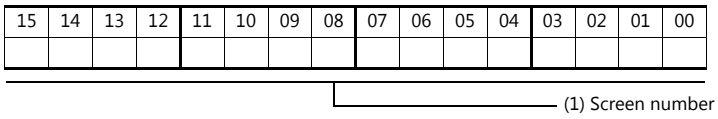
*1 It is possible to make this function work with the bit in the level. For more information, refer to the TS2060 Reference Manual 1 provided separately.

*2 As an exception, a multi-overlap may appear/disappear at the edge. For more information, refer to the TS2060 Reference Manual 1 provided separately.

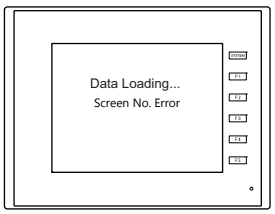
*3 Usage Example
Step a: Screen change according to read area "n + 2"
Step b: Screen change with an internal switch
Step c: Screen change to the same screen number as step 1 according to read area "n + 2"
In this case, however, the same value is stored in read area "n + 2" so the command is not valid. In such a case, it is possible to forcibly switch the screen to the screen number contained in read area "n + 2" at the leading edge [0 → 1] of bit 14.



Reset to this bit after you check that bit 14 of write area "n+1" is set to "1" or the same value is stored in write area "n+2" as the value in read area "n+2".

Read area "n + 2" (screen number command)	
	
(1) Screen number command *1	0 to 9999 These bits are used for switching the screen by an external command. When a screen number is specified in these bits, the screen is displayed. Even if the screen has been switched using an internal switch, it is possible to switch the screen using an external command from the PLC. External commands have priority over internal switches.

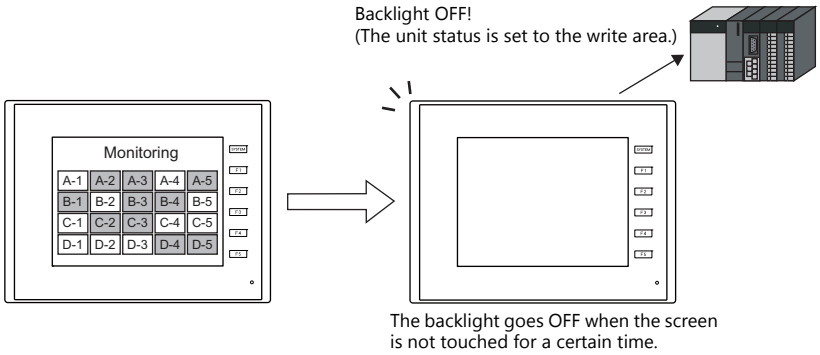
*1 Screen No. Error
When MONITOUCH has started communications with the PLC, the screen of the screen number specified in read area "n + 2" is displayed. If the screen number specified in read area "n + 2" does not exist in the screen data, "Screen No. Error" is displayed on MONITOUCH.



Before starting communications with the PLC, check the data in [Read Area] "n + 2" and confirm that the screen number to be displayed at first is specified.

Write area

This is the area where data is written from [Read Area], such as the displayed screen number, overlap display status, buzzer sounding status, etc. Three words of consecutive memory addresses are secured.
MONITOUCH writes information to these three words during communications with the PLC.
When the TS2060 has completed a display operation, sub command/data in [Read Area] "n" is written.



Memory addresses are allocated as shown below.

Write area =

Address	Contents	Operation
n	Same as data in read area "n"	TS2060 → PLC
n + 1	Screen status	
n + 2	Displayed screen number	

* Data in these memory addresses is saved at $s464 to 466 of the TS2060 internal memory. For more information on the internal memory ($s), refer to the TS2060 Reference Manual 1.

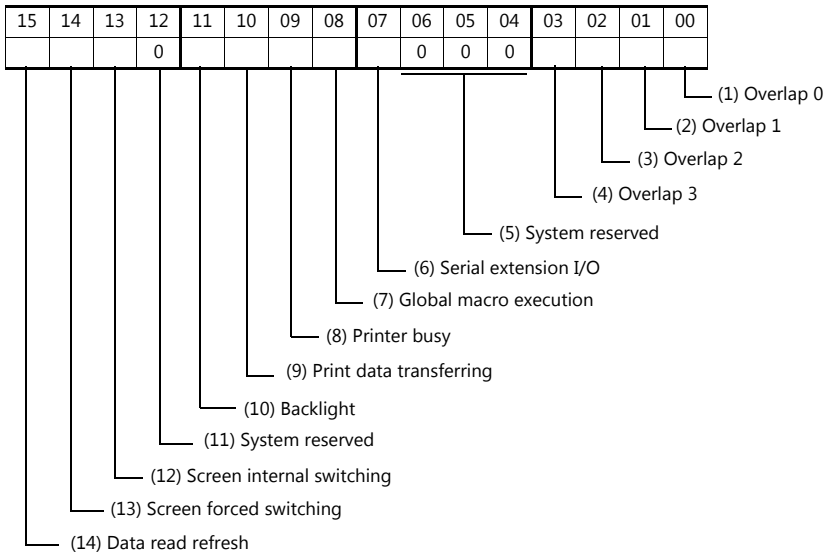
Write Area "n" (output of read area "n")

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0												

(1) Free
(2) BZ0
(3) BZ1
(4) BZ2
(5) Calendar setting
(6) System reserved

(1) Free	These bits reflect the data in read area "n" at the time MONITOUCH has been finished with processing.
(2) BZ0	
(3) BZ1	
(4) BZ2	
(5) Calendar setting	
(6) System reserved	Always "0"

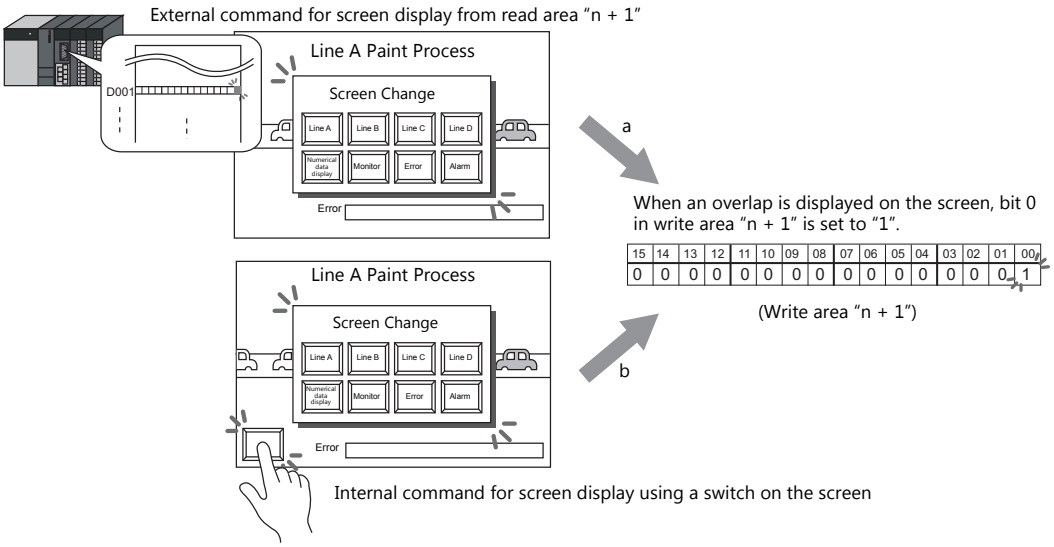
Write area "n + 1" (screen status)



(1) Overlap 0 (2) Overlap 1 (3) Overlap 2 (4) Overlap 3	Overlap status *1 [0]: Hide [1]: Show
(5) System reserved	Always "0"
(6) Serial extension I/O	Serial extension I/O (V-I/O) status [0]: Normal [1]: Error
(7) Global macro execution	This bit reflects the data in bit 8 of read area "n + 1".
(8) Printer busy	Printer status *2 [0]: Not busy [1]: Busy
(9) Print data transferring	Print data transferring status when a print command (hard copy, sample print or data sheet) is executed *2 [0 → 1]: Print data transferring start [1 → 0]: Print data transferring end
(10) Backlight	Backlight ON/OFF status *3 [0]: OFF [1]: ON * Even if bit 11 (backlight) in read area "n + 1" is reset (0: OFF), this bit shows "1" if the backlight is on.
(11) System reserved	Always "0"
(12) Screen internal switching	This bit reflects the data in bit 13 of read area "n + 1".
(13) Screen forced switching	This bit reflects the data in bit 14 of read area "n + 1".
(14) Data read refresh	This bit reflects the data in bit 15 of read area "n + 1".

*1 Example:

a. Display overlap No. 0 from read area (n + 1) using an external command.
b. Display overlap No. 0 internally using the [Function: Overlap = ON] switch.
In either case (a or b), bit 0 of write area "n + 1" is set (ON).
In the case of b, the bit in read area "n + 1" remains "0".



*2 Data of bits 9 and 10 is output to internal memory address $s16. For more information on the internal memory ($s), refer to the TS2060 Reference Manual 1.
*3 Data of bit 11 is output to internal memory address $s17. For more information on the internal memory ($s), refer to the TS2060 Reference Manual 1.

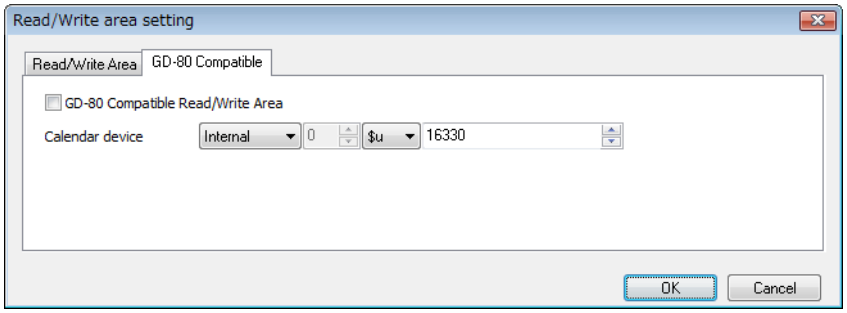
Write area "n + 2" (displayed screen number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

(1) Screen number

(1) Screen number	0 to 9999 Screen number currently displayed

GD-80 Compatible



☐ GD-80 Compatible Read/Write Area	When converting screen data files created on the MONITOUCH GD-80/81S series into those of the TS2060, this option is automatically checked. • Unchecked: The memory addresses allocated to the TS2060 are applied to the read and write areas. (See page 1-54.) • Checked: The memory addresses allocated to the GD-80/81S series are applied to the read and write areas. For more information on [Read Area] and [Write Area] of the GD-80/81S series, refer to the GD-80 User's Manual provided separately.
Calendar	Use this device memory when the connected device is not equipped with the calendar function and the TS2060 built-in clock is not used.

Calendar memory

Follow the steps below to set the calendar memory.

1. Specify the desired memory address for [Calendar]. Six words are occupied consecutively.
2. Save calendar data in the calendar memory addresses specified in step 1 in BCD notation.
   The allocation of calendar memory is shown below.

Memory	Contents
n	Year (BCD 0 to 99)
n + 1	Month (BCD 1 to 12)
n + 2	Day (BCD 1 to 31)
n + 3	Hour (BCD 0 to 23)
n + 4	Minute(s) (BCD 0 to 59)
n + 5	Second(s) (BCD 0 to 59)

   The day of the week is automatically recognized from the above data. It is not necessary to input any data.
3. Set bit 11 (calendar setting) of read area "n". At the leading edge of this bit (0 → 1), data in calendar memory is set for calendar data.

*1 Calendar data is cleared when the power is turned off. When the power is turned on, set calendar data according to the procedure mentioned above.
*2 When using the calendar device memory, neither automatic reading of calendar data at the time of PLC connection nor once-a-day automatic correction is performed. Consequently, errors may result. Perform the procedure described above at regular intervals.

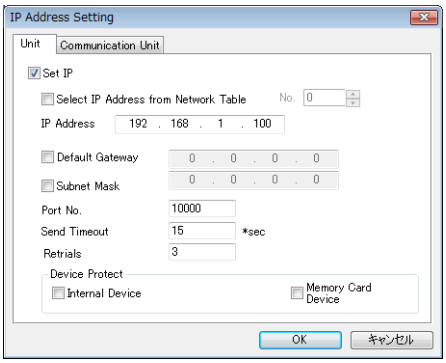
Buzzer

Make settings for the buzzer.
For more information, refer to the TS2060 Reference Manual 1.

Backlight

Make settings for the backlight.
For more information, refer to the TS2060 Reference Manual 1.

Local IP Address (TS2060i Only)



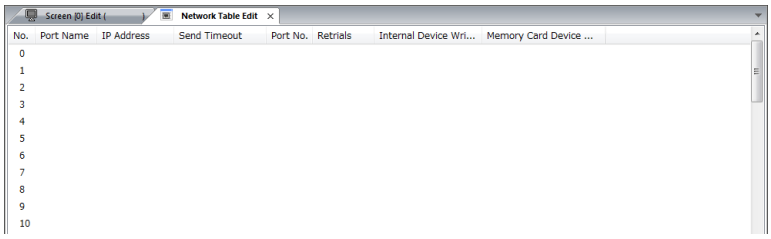
Item	Contents
Select IP Address from Network Table	This is valid when the IP address of the TS2060i has been registered in the network table. Select a network table number from 0 to 255 to set the IP address. * For more information on the network table, refer to "Network table" (page 1-64).
IP Address*1	Set the IP address for the TS2060i.
Default Gateway*1	Set the default gateway.
Subnet Mask*1	Set the subnet mask. When this box is not checked, the subnet mask is automatically assigned based on the byte at the extreme left of the IP address. Example: When IP address is "172.16.200.185", "255.255.0.0" is set. When IP address is "192.168.1.185", "255.255.255.0" is set.
Port No.*1	Set a port number from 1024 to 65535. Other than 8001.
Send Timeout	Specify the timeout time to send the EREAD/EWRITE/SEND/MES command.
Retrials	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Device Protect Internal Device Memory Card Device	Check either check box to write-protect the device memory from computers or other stations.

*1 For more information on each setting item, see "Basics of ethernet settings" (page 1-65).

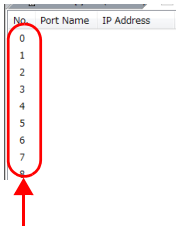
Network table

This is an area for registering IP addresses of the MONITOUCH, PC and other devices.

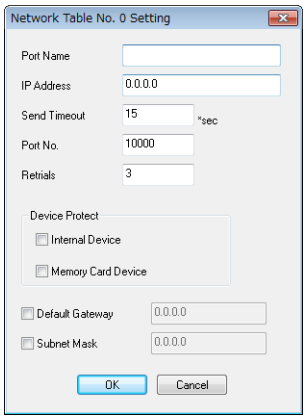
Select [System Setting] → [Ethernet Communication] → [Network Table] and register.



Double-click a number in the No. column to display the [Network Table Setting] dialog. An IP address and other items can be registered.



Network table number



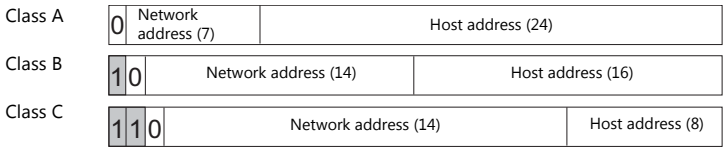
Item	Contents
Port Name	Set the name of the TS2060i or the computer.
IP Address*1	Set the IP address of the TS2060i or the computer.
Send Timeout*2	Specify the timeout time to send the EREAD/EWRITE/SEND/MES command.
Port No.*1	Set the port number of the TS2060i or the computer.
Retrials*2	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Device Protect*2 Internal Device Memory Card Device	Check either check box to write-protect the device memory from computers or other stations.
Default Gateway*1 *2	Set the default gateway.
Subnet Mask*1 *2	Set the subnet mask.

*1 For more information on each setting item, see “Basics of ethernet settings” (page 1-65).
*2 Invalid if TS2060i units or PCs at other ports are registered. Only valid when set as the local port IP of the TS2060i unit.

Basics of ethernet settings

IP address

This is an address that is used for recognizing each node on the Ethernet and should be unique.
The IP address is 32-bit data which consists of the network address and the host address and can be classified into classes A to C depending on the network size.



<Notation>
A string of 32-bit data is divided into four, and each segment delimited with a period is in decimal notation.
Example: The IP address in class C shown below is represented as "192.128.1.50".
11000000 10000000 00000001 00110010

<Unusable IP addresses>
- "0" is specified for one byte at the extreme left. Example: 0.x.x.x
- "127" is specified for one byte at the extreme left (loop back address). Example: 127.x.x.x
- "224" or more is specified for one byte at the extreme left (for multi-cast or experiment). Example: 224.x.x.x
- The host address consists of only "0" or "255" (broadcast address). Example: 128.0.255.255, 192.168.1.0

Port No.

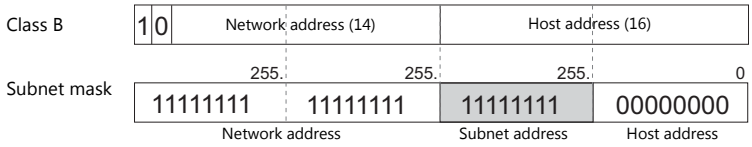
Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit data (from 0 to 65535).
The TS2060i uses the port for screen program transfer (8001), PLC communication (as desired), and the simulator (8020). Set a unique number in the range of 1024 to 65535. For a PLC or a computer, set the port number in the range of 256 to 65535. It is recommended to set a greater number.

Default gateway

A gateway and a router are used for communication between different networks.
The IP address of the gateway (router) should be set to communicate with the node(s) on other networks.

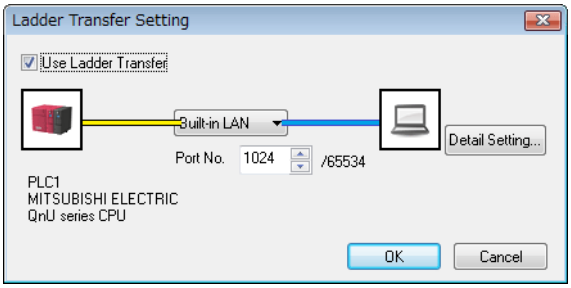
Subnet mask

A subnet mask is used for dividing one network address into multiple networks (subnet).
The subnet is assigned by specifying a part of the host address in the IP address as a subnet address.



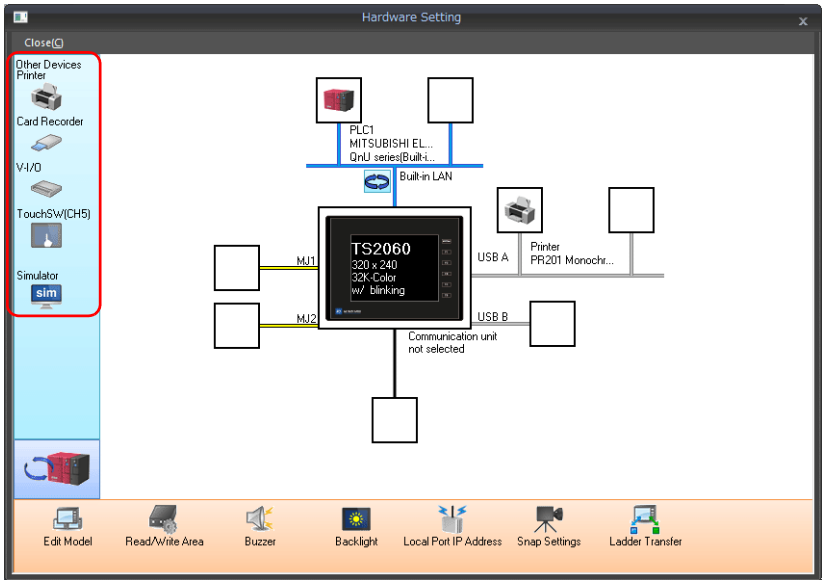
<Unusable subnet masks>
- All bits are set to "0"..... 0.0.0.0
- All bits are set to "1"..... 255.255.255.255

Ladder Transfer



Item	Contents
Use ladder transfer	Select the check box and specify the port to connect with PC when using the ladder transfer function. * For more information, refer to the TS2060 Reference Manual 2.

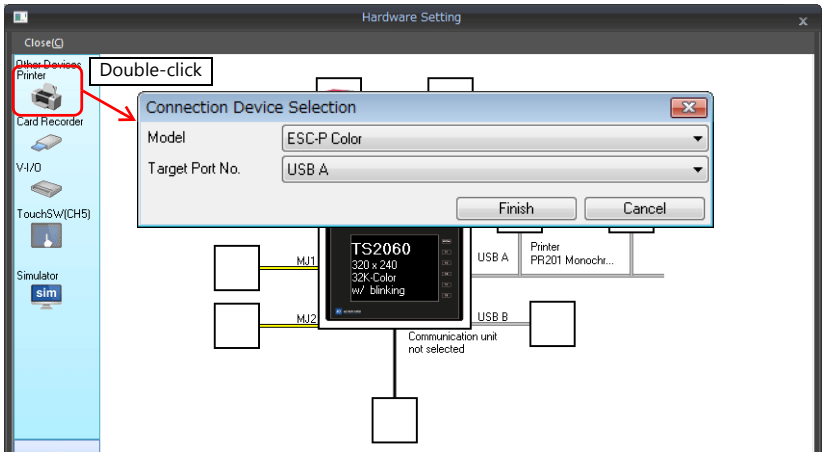
1.4.3 Other Equipment



Printer

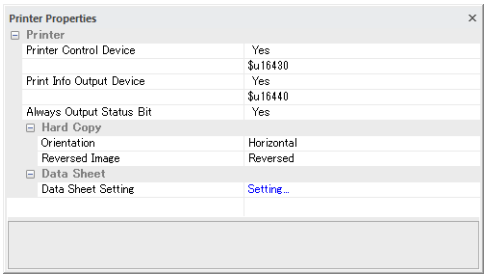
Configure these settings when connecting a printer.

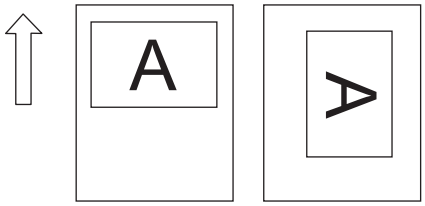
Selecting the printer model



Item	Contents
Model	Select the model of the printer to connect.
Target Port No.	Select the port to connect the printer cable to. USB A: Select when connecting an EPSON, ESC/P-R compatible printer. Also use this setting when connecting a parallel printer using a commercially available parallel-to-USB cable. USB B: Select when connecting a PictBridge-compatible printer. MJ1/MJ2: Select when connecting with the serial interface of a printer. Also select whether to use MJ1 or MJ2 of the TS2060.

Printer properties



Item		Contents
Always Output Status Bit		The TS2060 outputs [0 → 1] when starting to transfer data upon receiving a print command, and outputs [1 → 0] upon finishing transfer. However, these signals may not be output if the print data is small. Select [Yes] to output a signal regardless of the data size. The output area is as follows: • Bit 1 of the device memory for printer information output • Bit 0 of internal device memory $s16 $s16 MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring print data
Hard Copy	Orientation	Specify the printing orientation of the screen on paper. In vertical output, the screen is rotated 90° clockwise with respect to the printing paper and printed out. • Printing examples of hard copies: Horizontal Vertical 
	Reversed Image	Reversed: Screens are printed with black and white inverted. Normal: Screens are printed as they are displayed on MONITOUCH.
Data Sheet	Data Sheet Setting	Make settings for printing data sheets. For more information, refer to the TS2060 Reference Manual 1.
Use PictBridge only on USB-B port.		Make this setting when using a PictBridge-compatible printer. Select [Yes] when starting up the USB-B port as the connection port for a PictBridge printer in the RUN mode. When transferring screen programs via the USB-B port, display the Main Menu screen on MONITOUCH.
Serial Port	Baud Rate	Set the communication baud rate. 4800/9600/19200/38400/57600/76800/115K BPS
	Parity	Select an option for parity bit. None / Odd / Even
	Data Length	Select a data length. 7 bits / 8 bits
	Stop Bit	Select a stop bit. 1 bit / 2 bits

* For details on printing, refer to the TS2060 Reference Manual 1.

Card Recorder

Configure this setting when connecting a "CREC" card recorder.

V-I/O

Configure this setting when connecting a "V-I/O" unit.

Simulator

Configure this setting when saving a simulator communication program to a storage device* (SD card or USB flash drive) in addition to a screen program using the storage manager.

* This function is available only with TS2060i. Storage devices cannot be used with the TS2060 (model name without "i").

1.5 System Device Memory for Communication Confirmation

The TS2060 has addresses $s and $Pn as system device memory.

- $Pn
  This is the system device memory for 8-way communications, and 512 words are allocated for each logical port. For more information, see "1.5.1 $Pn (For 8-way Communication)".

- $s518, 519
  This is the system device memory for confirming the Ethernet status. For more information, see "1.5.2 $s518, 519 (Ethernet Status Confirmation) (TS2060i Only)".

  For the device memory address $s, $s0 to 2047 (2 K words) are assigned and data can be read from written to this area. For more information on addresses other than $s518, 519, refer to the TS2060 Reference Manual 1.

1.5.1 $Pn (For 8-way Communication)

This is the system device memory for 8-way communications, and 512 words are assigned for each logical port. Refer to the next section for more information.

$P1: 0000 : $P1: 0511	PLC1 area
$P2: 0000 : $P2: 0511	PLC2 area
$P3: 0000 : $P3: 0511	PLC3 area
$P4: 0000 : $P4: 0511	PLC4 area
$P5: 0000 : $P5: 0511	PLC5 area
$P6: 0000 : $P6: 0511	PLC6 area
$P7: 0000 : $P7: 0511	PLC7 area
$P8: 0000 : $P8: 0511	PLC8 area

$Pn List

The $Pn list is presented below. Part of the information of logical ports PLC1/PLC2 can also be stored in $s.[*1]

$Pn (n = 1 to 8)	$s[*1]	Contents	Device Type
000	111 (PLC1)	TS2060 local port number Stores the local port number of the TS2060. (Universal serial communication, slave communication, etc.)	← TS2060
:	-	:	
004	130 (PLC1)[*2]	Modbus TCP/IP Sub Station communications Relay station No. designated device memory When a relay station number is set with a MOV macro command, the error information of the sub station number that is connected to that relay station is stored in $Pn010 to 025.	→ TS2060
:	-	:	
010	128 (PLC1)	Link down information (station No. 0 - 15) 0: Normal 1: Down	← TS2060
011	129 (PLC1)	Link down information (station No. 16 - 31) 0: Normal 1: Down	
012	114 (PLC1)	Link down information (station No. 32 - 47) 0: Normal 1: Down	
013	115 (PLC1)	Link down information (station No. 48 - 63) 0: Normal 1: Down	
014	116 (PLC1)	Link down information (station No. 64 - 79) 0: Normal 1: Down	
015	117 (PLC1)	Link down information (station No. 80 - 95) 0: Normal 1: Down	
016	118 (PLC1)	Link down information (station No. 96 - 111) 0: Normal 1: Down	
017	119 (PLC1)	Link down information (station No. 112 - 127) 0: Normal 1: Down	
018	120 (PLC1)	Link down information (station No. 128 - 143) 0: Normal 1: Down	
019	121 (PLC1)	Link down information (station No. 144 - 159) 0: Normal 1: Down	
020	122 (PLC1)	Link down information (station No. 160 - 175) 0: Normal 1: Down	
021	123 (PLC1)	Link down information (station No. 176 - 191) 0: Normal 1: Down	
022	124 (PLC1)	Link down information (station No. 192 - 207) 0: Normal 1: Down	
023	125 (PLC1)	Link down information (station No. 208 - 223) 0: Normal 1: Down	
024	126 (PLC1)	Link down information (station No. 224 - 239) 0: Normal 1: Down	
025	127 (PLC1)	Link down information (station No. 240 - 255) 0: Normal 1: Down	
:	-	:	
099	-	Error information hold (page 1-74) Setting for the update timing of the $Pn: 010 to 025 link down information 0: Always updated with the latest information Other than 0: Only updated when a communication error occurs	→ TS2060
100	730 (PLC2)	Error status Station No. 00 status (page 1-75)	← TS2060
101	731 (PLC2)	Error status Station No. 01 status (page 1-75)	
102	732 (PLC2)	Error status Station No. 02 status (page 1-75)	
103	733 (PLC2)	Error status Station No. 03 status (page 1-75)	
104	734 (PLC2)	Error status Station No. 04 status (page 1-75)	
105	735 (PLC2)	Error status Station No. 05 status (page 1-75)	
106	736 (PLC2)	Error status Station No. 06 status (page 1-75)	
107	737 (PLC2)	Error status Station No. 07 status (page 1-75)	
108	738 (PLC2)	Error status Station No. 08 status (page 1-75)	
109	739 (PLC2)	Error status Station No. 09 status (page 1-75)	

$Pn (n = 1 to 8)	$s*1	Contents	Device Type
110	740 (PLC2)	Error status Station No. 10 status (page 1-75)	
:	:	:	
120	750 (PLC2)	Error status Station No. 20 status (page 1-75)	
:	:	:	
130	760 (PLC2)	Error status Station No. 30 status (page 1-75)	
131	761 (PLC2)	Error status Station No. 31 status (page 1-75)	
132	820 (PLC2)	Error status Station No. 32 status (page 1-75)	
133	821 (PLC2)	Error status Station No. 33 status (page 1-75)	
:	:	:	
140	828 (PLC2)	Error status Station No. 40 status (page 1-75)	
:	:	:	
150	838 (PLC2)	Error status Station No. 50 status (page 1-75)	
:	:	:	← TS2060
160	848 (PLC2)	Error status Station No. 60 status (page 1-75)	
:	:	:	
170	858 (PLC2)	Error status Station No. 70 status (page 1-75)	
:	:	:	
180	868 (PLC2)	Error status Station No. 80 status (page 1-75)	
:	:	:	
190	878 (PLC2)	Error status Station No. 90 status (page 1-75)	
:	:	:	
199	887 (PLC2)	Error status Station No. 99 status (page 1-75)	
200	-	Error status Station No. 100 status (page 1-75)	
:	:	:	
350	-	Error status Station No. 250 status (page 1-75)	
:	:	:	
355	-	Error status Station No. 255 status (page 1-75)	
356	-	Device memory map 0 Status	
357	-	Device memory map 0 Error code 1	
358	-	Device memory map 0 Error code 2	
359-361	-	Device memory map 1 Status, error code	
362-364	-	Device memory map 2 Status, error code	
365-367	-	Device memory map 3 Status, error code	
368-370	-	Device memory map 4 Status, error code	
371-373	-	Device memory map 5 Status, error code	
374-376	-	Device memory map 6 Status, error code	
377-379	-	Device memory map 7 Status, error code	
380-382	-	Device memory map 8 Status, error code	
383-385	-	Device memory map 9 Status, error code	← TS2060
386-388	-	Device memory map 10 Status, error code	
389-391	-	Device memory map 11 Status, error code	
392-394	-	Device memory map 12 Status, error code	
395-397	-	Device memory map 13 Status, error code	
398-400	-	Device memory map 14 Status, error code	
401-403	-	Device memory map 15 Status, error code	
404-406	-	Device memory map 16 Status, error code	
407-409	-	Device memory map 17 Status, error code	
410-412	-	Device memory map 18 Status, error code	
413-415	-	Device memory map 19 Status, error code	
416-418	-	Device memory map 20 Status, error code	

$Pn (n = 1 to 8)	$s*1	Contents	Device Type
419-421	-	Device memory map 21 Status, error code	← TS2060
422-424	-	Device memory map 22 Status, error code	
425-427	-	Device memory map 23 Status, error code	
428-430	-	Device memory map 24 Status, error code	
431-433	-	Device memory map 25 Status, error code	
434-436	-	Device memory map 26 Status, error code	
437-439	-	Device memory map 27 Status, error code	
440-442	-	Device memory map 28 Status, error code	
443-445	-	Device memory map 29 Status, error code	
446-448	-	Device memory map 30 Status, error code	
449	-	Device memory map 31 Status	
450	-	Device memory map 31 Error code 1	
451	-	Device memory map 31 Error code 2	
:	:	:	
493	762 (PLC2)*3	Device memory map reading prohibited flag (refer to the TS2060 Reference Manual 2). 0: Periodical reading/synchronized reading executed Other than 0: Periodical reading/synchronized reading stopped	→ TS2060
494	763 (PLC2)*3	Forced execution of the device memory map TRL_READ/TBL_WRITE macro Setting for macro operation when there is a station with a communication error 0: The macro is not executed in relation to any of the stations. Other than 0: The macro is executed in relation to connected stations.	
495	764 (PLC2)*3	Device memory map writing prohibited flag (refer to the TS2060 Reference Manual 2). 0: Periodical writing/synchronized writing executed Other than 0: Periodical writing/synchronized writing stopped	
:	-	:	
500	800 (PLC3)	Device memory for Modbus slave communications Used for setting the number of the reference device memory map and the device memory for referring free area 31.Used for setting the number of the reference device memory map and the device memory for referring free area 31. $Pn500 to 505 are exclusively used for monitoring: $s800 to 805 are used for writing from the Modbus master. Refer to the Modbus Slave Communication Specifications.	→ TS2060
501	801 (PLC3)		
502	802 (PLC3)		
503	803 (PLC3)		
504	804 (PLC3)		
505	805 (PLC3)		
:	:	:	
508	765 (PLC2)	Error response code (page 1-77) If “800BH” (error code received) is stored for the error status ($Pn100 to 355), it is possible to check the error code.	← TS2060
509	766 (PLC2)		
510	767 (PLC2)		
511	768 (PLC2)		

*1 For PLC1, select [Yes] for [System device ($s) V7 Compatible] under [Detail] on the [PLC Properties] window. The same information is stored in the $P1 and $s.

*2 If designating the relay station number using $s130, select [Yes] for [System device ($s) V7 Compatible] under [Detail] on the [PLC Properties] window for PLC1. $P1: 004 cannot be used in this case.

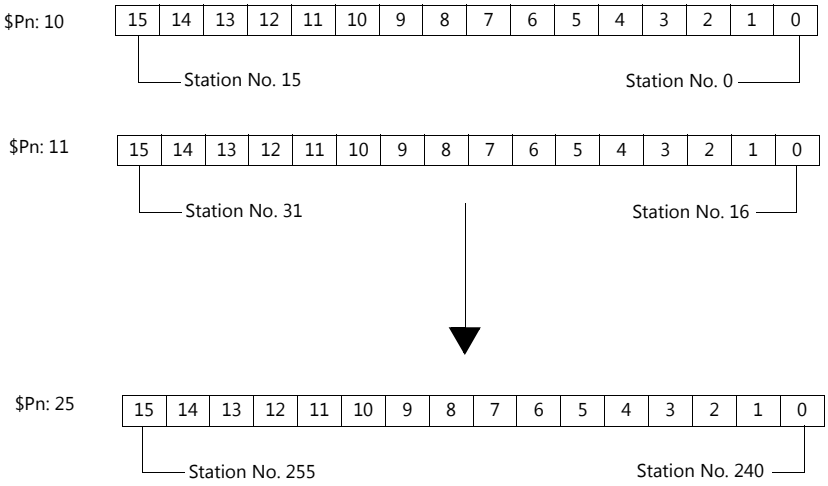
*3 If executing device memory map control using $s762, $s763 and $s764, select yes for [System device ($s) V7 Compatible] under [Detail] on the [PLC Properties] window for PLC2. Note that $P2: 493/494/495 cannot be used in this case.

Details

$Pn: 10 to 25

The bit corresponding to the station where a link down was detected is set (ON).

0: Normal
1: Down

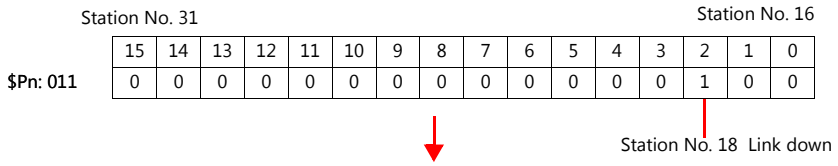


$Pn:99

The update timing for the link down information stored in $Pn: 010 to 025 and the error status stored in $Pn: 100 to 355 are set here.

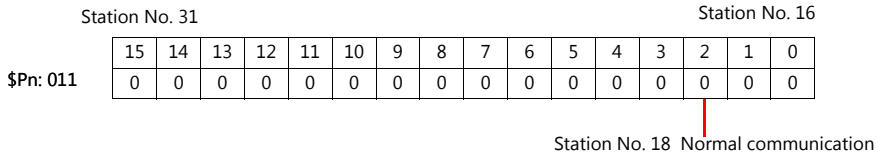
0: Always updated with the latest information
Other than 0: Only updated when a communication error occurs

- Example:
  An error has occurred at station No. 18. 2nd bit of $Pn: 011 is set (ON).

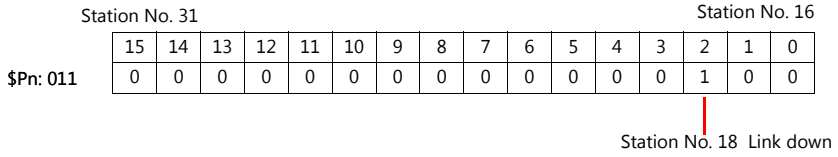


After resetting communications

- If $Pn: 99 = 0, the link down information is updated.



- If $Pn: 99 = other than 0, the link down information is not updated.

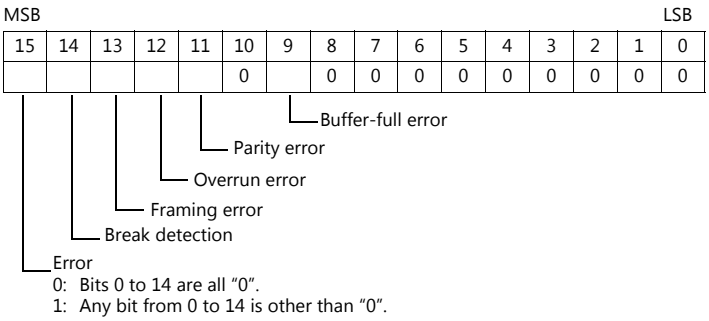


$Pn: 100 to 355

The results of communication with each station are stored here. The status codes are shown below.

Code (HEX)	Contents
0000H	Normal
FFFFH	Time-out
8001H	Check code error
8002H	Data error
800BH	Receives the error code from the connected device

Errors other than the above are stored as shown below.



Error	Details	Solution
Time-out	Although a request to send is given, no answer is returned within the specified time.	Implement solutions 1, 2, and 3.
Check code	The check code of the response is incorrect.	Implement solutions 1 and 3.
Data error	The code of the received data is invalid.	Implement solutions 1, 2, and 3.
Error code received	An error occurred on the connected device.	Refer to the instruction manual for the PLC.
Buffer full	The TS2060 buffer is full.	Contact your local distributor.
Parity	An error occurred in parity check.	Implement solutions 2 and 3.
Overrun	After receiving one character, the next character was received before internal processing was completed.	Implement solutions 1 and 3.
Framing	Although the stop bit must be "1", it was detected as "0".	Implement solutions 1, 2, and 3.
Break detection	The connected device's SD is remaining at the low level.	Examine the connection with the connected device's SD and RD.

- Solution

1) Check if the communication settings of the TS2060 and the connected device are matched.
2) Check the cable connection.
3) Data may be disrupted because of noise. Fix noise.

If you still cannot solve the error even after following the solutions above, contact your local distributor.

$Pn: 356 to 451

This device memory is valid when an Omron ID controller (V600/620/680) is connected with [Guarantee synchronism of the data] checked on the [Device Memory Map Setting] dialog.

- Status ($Pn 356, 359, ...)
  The execution status of the device memory map is stored here.
  The bit is set (ON) when reading or writing of the first data in the device memory map is correctly finished.
  When the control device memory (command bit) is set (ON), the bit is reset.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

System reserve

1: ID tag recognized

- Error code 1 ($Pn 357, 360, ...)
  An error code is stored when an error occurs in the reading or writing of data in the device memory map.
  If multiple errors occur in the device memory map, the last error code is stored.
  When the control device memory (command bit) is set (ON), the bit is reset.

Code (HEX)	Contents
FFFFH	Time-out
8001H	Check code error
8002H	Data error
800BH	Receives the error code from the connected device

Errors other than the above are stored as shown below.

MSB LSB

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
					0		0	0	0	0	0	0	0	0	0

Buffer-full error
Parity error
Overrun error
Framing error
Break detection
Error
0: Bits 0 to 14 are all "0".
1: Any bit from 0 to 14 is other than "0".

- Error code 2 ($Pn 358, 361, ...)
  The exit code is stored here when "800BH" of error code 1 is stored.

Exit Code (HEX)	Contents	
10	Host communication error	Parity error
11		Framing error
12		Overrun error
13		FCS error
14		Format error, execution status error
18		Frame length error
70	Slave communication error	Tag communication error
71		Inconsistency error
72		Tag absence error
76		Copy error
7A		Address error
7C		Antenna disconnection error
7D		Write protect error
75	Tag device memory warning	Data check command Exit code stored when the writing count management command has been successfully processed (without any error)
76		Data check command Exit code stored when the writing count management command has abnormally been processed (comparison error, excessive writing counts)
92	System error	Abnormal mains voltage at antenna
93		Internal device memory error

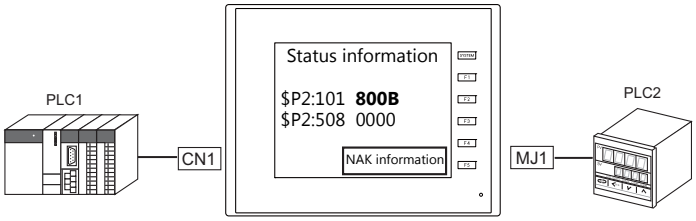
$Pn: 508 to 511

If "800BH" is stored for the error status information ($Pn: 100 to 355), on transferring the data of that station number to any internal device memory address, the reception code will be obtained at $Pn: 508 to 511.

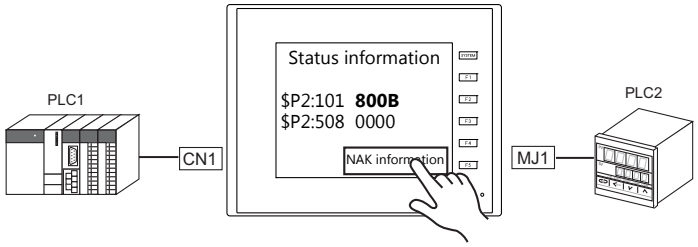
> Notes on use
> - Use $u/$T as the target internal device memory.
> - Use the macro command MOV (W). MOV (D) cannot be used.
> - "0" is stored to device memory addresses that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

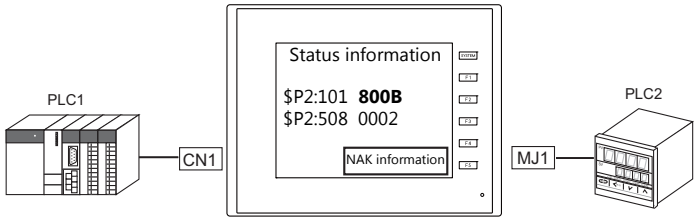
1) On receipt of an error code at station No. 1 of PLC2, "800BH" is stored in $P2:101.



2) The data of $P2: 101 is transferred to $u1000 by a MOV command.
$u1000 = $P2: 101 (W)



3) The reception code is stored in $P2: 508.
$P2:508 = 0002H



4) The PXR manual shows that code 002H means "device memory address range exceeded".
Amend the screen program address designation.

1.5.2 $s518, 519 (Ethernet Status Confirmation) (TS2060i Only)

Stores the current status of the Ethernet.

Address	Contents	Stored Value
$s518	Ethernet status (for built-in LAN port)	• [0]: Normal • [Other than 0]: Error * For details on errors, refer to the next section.
$s519	Ethernet status (for Ethernet unit)	

Error details

No.	Built-in LAN	CUR-03	Contents	Solution
200	×	○	Failed in send request	Check cable connection and network table setting of the target station.
201	○	○	Send error	Check that the setting on the target station is consistent with the network table setting.
202	×	○	Internal port error	The communication unit is in the older version or is faulty.
203	○	×	TCP socket creation error	The TCP socket cannot be created. Turn the power off and back on again, or check the communication line status, e.g., if the port number is duplicated.
204	○	×	TCP connection over	The number of connections reaches the maximum (64), and no more connection is possible. Check the communication lines.
205	○	×	TCP connection error	Connection cannot be established. Check the communication lines, or turn the power off and on.
207	○	×	TCP send error	TCP communication has failed. Check the communication lines.
208	○	×	TCP connection interruption notification from the connected device	Check the connected device and communication lines.
261	○	×	Send processing full error	Sending process is disabled. Check the communication lines.
300	×	○	16 times of collision errors	The line is busy. Consult the network administrator of your company. The communication unit is in the older version or is faulty.
301	×	○	Send buffer full error	
350	○	○	Send buffer full	
351	×	○	IC receive buffer overflow	
352	×	○	Driver receive buffer overflow	
801	○	○	Link down error	Check the HUB or the link confirmation LED on the communication unit. If the LED is not on, check cable connection and the port setting on the network table.
900	○	○	No IP address at local port	Check that the IP address of the local port is set on the network table. Check if the same IP address is set on the network.
901	○	○	Duplicated IP address error	
910	○	×	Local IP address setting error	The local IP address setting is not correct. Check if the IP address and the subnet mask settings are made properly.
911	○	×	Gateway setting error	The default gateway setting is not correct. Check if the default gateway setting is made properly for the specified IP address and subnet mask.
1000	×	○	Ethernet I/F unit not mounted	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, the unit may be faulty. Contact your local distributor.
1001	×	○	Ethernet I/F unit not ready	
1002	×	○	Ethernet I/F unit DPRAM error	
1003	×	○	No response from Ethernet I/F unit	
1004	×	○	Ethernet receive buffer over	
1005	○	○	Ethernet send registration error	
1006	○	○	I/F unit unregistered interrupt	
1007	○	×	ETHER_INIT_FAIL	Turn the power off and back on again. If the problem persists, the unit may be faulty. Contact your local distributor.
1100 to 1115	×	○	Initialization error (communication unit)	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, the unit may be faulty. Contact your local distributor.
1120	×	○	Dual port access error	
1200	×	○	Undefined register	
1201	×	○	Send/receive buffer area over	
1202	○	○	MAC address error	The MAC address is not registered. Repair is necessary.
1203	×	○	Port error	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, the unit may be faulty. Contact your local distributor.
1301	×	○	Watch dog overflow	
1302	×	○	JAVA error LANC error	
1303	×	○	Dual port timeout	
2000	×	○	Boot mode error	
2001	○	○	Undefined error	

2. A&D

2.1 Temperature Controller/Servo/Inverter Connection

2.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Weighing Indicator

PLC Selection on the Editor	Model	Port	Signal Level	Wiring Diagram			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
AD4402 (MODBUS RTU)	AD-4402 AD-4402D	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		AD4402.List
AD4404 (MODBUS RTU)	AD-4404	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		AD4404.List

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to “1.2.2 MJ1/MJ2” (page 1-6).

2.1.1 AD4402 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Parity	None / Odd / Even	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	1 to 99	

AD-4402

Function Number	Item	Setting	Remarks
RSF-02	Data transfer mode	**7: Modbus**	
RSF-03	Baud Rate	4: 4800 bps 5: 9600 bps 6: 19200 bps	
RSF-04	Parity	0: None 1: Odd 2: Even	
RSF-05	Character bit length	7: 7 bits 8: 8 bits	
RSF-06	Stop bit length	1: 1 bit 2: 2 bits	
RSF-08	Address number	1 to 99	

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
0	(output coil)	00H	
1	(input relay)	01H	Read only
4	(holding register)	02H	
3	(input register)	03H	Read only

2.1.2 AD4404 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Parity	None / Odd / Even	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	1 to 99	

AD-4404

Function Number	Item	Setting	Remarks
RSF-02	Data transfer mode	**7: Modbus**	
RSF-03	Baud Rate	4: 4800 bps 5: 9600 bps 6: 19200 bps	
RSF-04	Parity	0: None 1: Odd 2: Even	
RSF-05	Character bit length	7: 7 bits 8: 8 bits	
RSF-06	Stop bit length	1: 1 bit 2: 2 bits	
RSF-08	Address number	1 to 99	

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

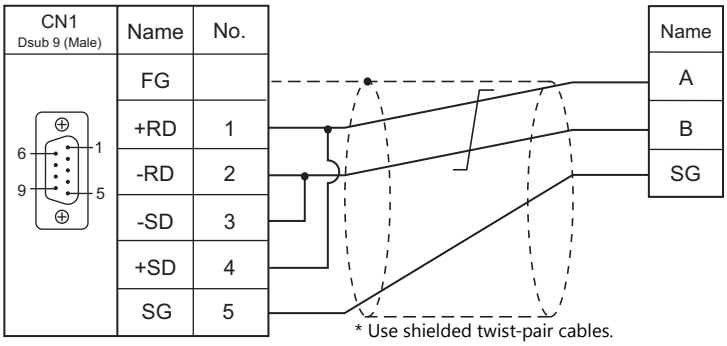
Device Memory		TYPE	Remarks
0	(output coil)	00H	
1	(input relay)	01H	Read only
4	(holding register)	02H	
3	(input register)	03H	Read only

2.1.3 Wiring Diagrams

When Connected at CN1:

RS-422/RS-485

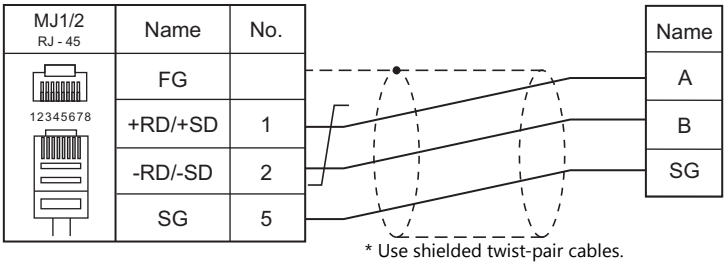
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4



3. Agilent

3.1 Temperature Controller/Servo/Inverter Connection

3.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Wiring Diagram			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
4263 series	4263B 4263A	GPIB-RS232C	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		GPIB-RS485/422	RS-422/485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

3.1.1 4263 Series

Communication Setting

Editor

Communication Setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 /57600 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
CR/LF	CR / LF	

PLC

4263 Series

Set the GPIB address on the front panel.

Item	Setting	Remarks
GBIP Adrs	1 to 30	

GPIB-RS232C / GPIB-RS485/422

Make communication settings using "NI GPIB-Serial Converter Wizard".
For more information, refer to the manual for the GPIB-RS232C / GPIB-RS485/422.

Select mode

Item	Setting	Remarks
Select Mode	**C Mode**	

Serial settings

(Underlined setting: default)

Item	Setting	Remarks
Baud Rate	4800 / 9600 / 19200 / 38400 /57600 115200	
Data Bits	7 / 8	
Parity	None / Odd / Even	
Stop Bits	1 / 2	
Flow Control	**None**	

GBIP settings

Item	Setting	Remarks
Termination Mode	CR / LF	
EOI	**ON**	
GPIB Primary Address	Set the GPIB address of the 4263 series.	

Available Device Memory

There are no device memory.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Resets the trigger system	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 0	
Sets measurement parameters *1	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 1	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: REAL (real part of vector) 1: MLINear (absolute value of vector) 2: CP (equivalent parallel capacitance) 3: CS (equivalent series capacitance) 4: LP (equivalent parallel inductance) 5: LS (equivalent series inductance) 6: IMAGinary (imaginary part of vector) 7: PHASe (impedance phase) 8: D (dissipation factor) 9: Q (quality factor (reciprocal of D)) 10: REAL 11: LP 12: RP (equivalent parallel resistance) 13: INV 1/N (reciprocal of turns ratio (N): inverse)	
Queries measurement parameters	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 2	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Measurement parameter (character string)	
		n + 4		
Defines comparator output to the beeper	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 3	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n+3	0: FAIL 1: PASS	
Queries the definition for comparator output to the beeper	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 4	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n+3	Definition for comparator output to the beeper (character string)	
		n + 4		
Sets whether or not to enable the comparator output to the beeper	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 5	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: OFF (disables output to beeper) 1: ON (enables output to beeper)	
Queries whether or not the comparator output to the beeper is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 6	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Setting of comparator output to beeper	

Contents	F0	F1 (=$u n)		F2
Clears comparator results of measurement parameters	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 7	
		n + 2	1: Primary parameter 2: Secondary parameter	
Queries comparator results of measurement parameters	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 8	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Comparator result	
Sets the lower limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	6/4
		n + 1	Command: 9	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: Numeric value	1: MAXimum 2: MINimum
		n + 4	Numeric value (real number)	-
		n + 5		-
Queries the lower limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 10	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Measurement parameter lower limit (real number)	
		n + 4		
Sets whether or not to enable the lower limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 11	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: OFF (not use) 1: ON (use)	
Queries if the lower limit of a measurement parameter is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 12	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Query response on whether or not lower limit is enabled	
Sets the comparator function ON/OFF	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 13	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: OFF 1: On	
Queries the comparator function	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 14	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Comparator function	

Contents	F0	F1 (=$u n)		F2
Sets the upper limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	6/4
		n + 1	Command: 15	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: Numeric value	1: MAXimum 2: MINimum
		n + 4	Numeric value (real number)	-
		n + 5		-
Queries the upper limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 16	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Measurement parameter upper limit (real number)	
		n + 4		
Sets whether or not to enable the upper limit of a measurement parameter	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 17	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: OFF (not use) 1: ON (use)	
Queries if the upper limit of a measurement parameter is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 18	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Query response on whether or not upper limit is enabled	
Queries the parameter to use for the setting command of deviation measurement mode	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 19	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Parameter (character string)	
		n + 4		
Sets the deviation measurement mode	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 20	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: DEV (deviation) 1: PCNT (percentage of deviation based on reference value)	
Queries the deviation measurement mode	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 21	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Deviation measurement mode (character string)	
		n + 4		

Contents	F0	F1 (=$u n)		F2
Sets the deviation measurement status	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 22	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	0: OFF (no setting) 1: ON (with setting)	
Queries the deviation measurement setting	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 23	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	Sets deviation measurement.	
Returns each CALCulate subsystem command in the order they are to be performed	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 24	
		n + 2	1: Primary parameter 2: Secondary parameter	
		n + 3	CALCulate subsystem command (FORM) (character string)	
		n + 4		
		n + 5	CALCulate subsystem command (MATH) (character string)	
		n + 6		
		n + 7	CALCulate subsystem command (LIM) (character string)	
		n + 8		
Sets the level monitor function ON/OFF	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 25	
		n + 2	3: Current monitor 4: Voltage monitor	
		n + 3	0: ON 1: OFF	
Queries the level monitor function	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 26	
		n + 2	3: Current monitor 4: Voltage monitor	
		n + 3	Level monitor function	
Sets the cable length	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 27	
		n + 2	0: 0 m 1: 1 m 2: 2 m 4: 4 m	
Queries the cable length	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 28	
		n + 2	Cable length	
Stores the reference value for deviation measurement to the data buffer	1 to 8 (PLC1 to 8)	n	Target Port No.	5
		n + 1	Command: 29	
		n + 2	Data buffer 0: REF1 (reference value for primary parameter) 1: REF2 (reference value for secondary parameter)	
		n + 3	Numeric value (real number)	
		n + 4		

Contents	F0	F1 (=$u n)		F2
Queries data in a data buffer	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 30	
		n + 2	Data buffer 0: REF1 (reference value for primary parameter) 1: REF2 (reference value for secondary parameter)	
		n + 3	Data (real number)	
		n + 4		
Queries data in a data buffer (BUF1/BUF2) *2	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 31	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	Internal device memory address *3	
Queries the level monitor value	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 32	
		n + 2	0: IMON (monitored current) 1: VMON (monitored voltage)	
		n + 3	Level monitor value (real number)	
		n + 4		
Sets whether or not to feed measurement data to a data buffer	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 33	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	0: " " (no feeding) 1: "CALCulate1" (primary parameter) 2: "CALCulate2" (secondary parameter)	
Queries whether or not measurement data is to be fed to a data buffer	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 34	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	Output result (7 characters) (character string)	
		n + 4		
		n + 5		
		n + 6		
Sets whether or not to feed data to a data buffer *4	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 35	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	0: NEVer (no feeding) 1: ALWays (feed data each time measurement is performed)	
Queries whether or not data is to be fed to a data buffer	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 36	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	Output result (3 characters) (character string)	
		n + 4		

Contents	F0	F1 (=$u n)		F2
Sets the data buffer size *4	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 37	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	Numeric value (1 to 200)	
Queries the data buffer size	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 38	
		n + 2	Data buffer 0: BUF1 1: BUF2	
		n + 3	Data buffer size	
Sets the display ON or OFF	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 39	
		n + 2	0: OFF (not use) 1: ON (use)	
Queries whether the display is set to ON or OFF	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 40	
		n + 2	Display setting	
Sets the number of display digits	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 41	
		n + 2	Number of digits (3 to 5)	
Queries the number of display digits	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 42	
		n + 2	Number of display digits	
Sets the displayed data	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 43	
		n + 2	Display mode 1: Measurement display 2: Comparator result display	
Queries what data is selected to be displayed	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 44	
		n + 2	Display mode	
Sets the instrument setting display mode on the right side of the display	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 45	
		n + 2	Display mode 1: Displays the frequency and signal level. 2: Displays the DC bias setting and averaging rate. 3: Displays the trigger delay and cable length. 4: Displays the comparator limit value for the primary parameter. 5: Displays the comparator limit value for the secondary parameter. 6: Displays the level monitor value.	
Queries the selected mode for the instrument setting display on the right side of the display	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 46	
		n + 2	Display mode	

Contents	F0	F1 (=$u n)			F2
Places measurement results in the output buffer	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 47		
			When command 48 is "0": ASCii specification	When command 48 is "1": REAL specification	
		n + 2	Measurement status	Measurement status (real number)	
		n + 3	Measurement value of primary parameter (real number)		
		n + 4		Measurement value of primary parameter (real number)	
		n + 5	Measurement value of secondary parameter (real number)		
		n + 6		Measurement value of secondary parameter (real number)	
		n + 7	Comparator result of primary parameter (when command 13 is "ON")		
		n + 8	Comparator result of primary parameter (when command 13 is "ON")	Comparator result of primary parameter (when command 13 is "ON") (real number)	
		n + 9	-		
		n + 10	-	Comparator result of primary parameter (when command 13 is "ON") (real number)	
		n + 11	-		
Sets the data transfer format	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 48		
		n + 2	Display mode 0: ASCii 1: REAL (real number)		
Queries the data transfer format	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 49		
		n + 2	Data transfer format (Max. 7 characters) (character string)		
		n + 3			
		n + 4			
		n + 5			
Initiates the trigger system	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 50		
Sets whether the trigger system is continuously initiated or not	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 51		
		n + 2	0: OFF (no continuous initiation) 1: ON (continuous initiation)		
Queries whether the trigger system is continuously initiated or not	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 52		
		n + 2	Output result		
Sets the averaging rate for measurement results	1 to 8 (PLC1 to 8)	n	Target Port No.		4/3
		n + 1	Command: 53		
		n + 2	0: Numeric value	1: MAXimum 2: MINimum	
		n + 3	Numeric value (1 to 256)	-	
Queries the averaging rate for measurement results	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 54		
		n + 2	Averaging rate		

Contents	F0	F1 (=$u n)		F2
Sets whether or not to enable averaging for measurement results	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 55	
		n + 2	0: OFF (Disables averaging) 1: ON (Enables averaging)	
Queries whether or not averaging is enabled for measurement results	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 56	
		n + 2	Output result	
Sets the reference value for load correction	1 to 8 (PLC1 to 8)	n	Target Port No.	6
		n + 1	Command: 57	
		n + 2	Resistance R (real number)	
		n + 3		
		n + 4	Reactance (real number)	
		n + 5		
Queries the reference value for load correction	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 58	
		n + 2	Primary parameter (real number)	
		n + 3		
		n + 4	Secondary parameter (real number)	
		n + 5		
Measures the standard and saves the result as correction data	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 59	
		n + 2	0: STANdard1 (open correction) 1: STANdard2 (short correction) 2: STANdard3 (load correction)	
Sets the measurement error correction method	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 60	
		n + 2	0: REFL2 (open/short correction) 1: REFL3 (open/short/load correction)	
Queries the measurement error correction method	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 61	
		n + 2	Setting result of measurement error function (5 characters) (character string)	
		n + 3		
		n + 4		
Queries the correction data	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 62	
		n + 2	0: STANdard1 (open correction) 1: STANdard2 (short correction) 2: STANdard3 (load correction)	
		n + 3	Primary parameter (real number)	
		n + 4		
		n + 5	Secondary parameter (real number)	
		n + 6		
Sets whether or not to enable the measurement error correction function	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 63	
		n + 2	0: OFF (Disables the correction function) 1: ON (Enables the correction function)	

Contents	F0	F1 (=$u n)		F2
Queries whether or not the measurement error correction function is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 64	
		n + 2	ON/OFF result of measurement error correction function	
Sets the measurement time mode	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 65	
		n + 2	Numeric value (s) (real number) 0.025/0.065/0.500	
		n + 3		
Queries the measurement time mode	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 66	
		n + 2	Query response of measurement time (real number)	
		n + 3		
Sets whether or not to enable the contact check function	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 67	
		n + 2	0: OFF (not use) 1: ON (use)	
Queries whether or not the contact check function is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 68	
		n + 2	Contact check function status	
Sets whether or not to enable the auto range mode	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 69	
		n + 2	0: OFF (hold mode) 1: ON (auto range mode)	
Queries whether or not the auto range mode is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 70	
		n + 2	Auto range mode status	
Sets the measurement range	1 to 8 (PLC1 to 8)	n	Target Port No.	5/3
		n + 1	Command: 71	
		n + 2	0: Numeric value	1: MAXimum 2: MINimum 3: UP 4: DOWN
		n + 3	Numeric value (Ω) (real number)	-
		n + 4		-
Queries the measurement range	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 72	
		n + 2	Query response of measurement time (real number)	
		n + 3		
Sets whether or not to allow up to two <sensor_function>s at the same time *5	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 73	
		n + 2	0: OFF (Use only one) 1: ON (Use up to two simultaneously)	
Queries whether or not up to two <sensor_function>s can be selected at the same time *5	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 74	
		n + 2	Output result	

Contents	F0	F1 (=$u n)			F2
Queries the number of <sensor_function>s	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 75		
		n + 2	Output result		
Sets the specified measurement function to ON	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 76		
			When command 73 is “OFF”	When command 73 is “ON”	
		n + 2	0: Impedance measurement 1: Admittance measurement	2: DCR measurement (equivalent series circuit) 3: DCR measurement (equivalent parallel circuit) 4: Turns ratio measurement of transformer 5: Mutual inductance measurement of transformer 6: Resistance measurement of transformer	
Queries which measurement function is ON	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 77		
		n + 2	Query response of specified measurement function (Max. 9 characters) (character string)		
		n + 3			
		n + 4			
		n + 5			
		n + 6			
Sets the measurement frequency	1 to 8 (PLC1 to 8)	n	Target Port No.		5/3
		n + 1	Command: 78		
		n + 2	0: Numeric value	1: MAXimum 2: MINimum	
		n+3	Numeric value (Hz) (real number)	-	
		n+4		-	
Queries the measurement frequency	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 79		
		n + 2	Setting result of measurement frequency (real number)		
		n + 3			
Sets the measurement signal level	1 to 8 (PLC1 to 8)	n	Target Port No.		5/3
		n + 1	Command: 80		
		n + 2	0: Numeric value	1: MAXimum 2: MINimum	
		n + 3	Numeric value (0.02 to 1 V) (real number) Specified in steps of 0.004.	-	
		n + 4		-	
Queries the measurement signal level	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 81		
		n + 2	Query response of measurement signal level (real number)		
		n + 3			

Contents	F0	F1 (=$u n)			F2
Sets the DC bias voltage level	1 to 8 (PLC1 to 8)	n	Target Port No.		5/3
		n + 1	Command: 82		
		n + 2	0: Numeric value	1: MAXimum 2: MINimum	
		n + 3	Numeric value (V) (real number) 0/1.5/2.1	-	
		n + 4		-	
Queries the DC bias voltage level	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 83		
		n + 2	Setting result of voltage level (real number)		
		n + 3			
Sets the DC bias voltage source	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 84		
		n + 2	0: INT (Internal voltage source) 1: EXT (External voltage source)		
Queries the DC bias voltage source	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 85		
		n + 2	Query response of voltage source (3 characters) (character string)		
		n + 3			
Sets whether or not to enable DC bias output	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 86		
		n + 2	0: OFF (Disables DC bias output.) 1: ON (Enables DC bias output.)		
Queries whether or not DC bias output is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 87		
		n + 2	Query response of whether or not DC bias output is enabled.		
Queries the contents of the event register for the standard operation status group	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 88		
		n + 2	Output result		
Queries the contents of the condition register of the standard operation status group	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 89		
		n + 2	Output result		
Sets the enable register of the standard operation status group	1 to 8 (PLC1 to 8)	n	Target Port No.		3
		n + 1	Command: 90		
		n + 2	Numeric value		
Queries the contents of the enable register of the standard operation status group	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 91		
		n + 2	Output result		
Clears the operation status and questionable status groups	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 92		
Queries the contents of the event register of the standard questionable status group	1 to 8 (PLC1 to 8)	n	Target Port No.		2
		n + 1	Command: 93		
		n + 2	Response (always “0” for 4263B)		

Contents	F0	F1 (=$u n)		F2
Queries the contents of the condition register of the standard questionable status group	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 94	
		n + 2	Response (always “0” for 4263B)	
Sets the enable register of the standard questionable status group	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 95	
		n + 2	Numeric value (always “0” for 4263B)	
Queries the contents of the enable register of the standard questionable status group	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 96	
		n + 2	Output result	
Produces a beep	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 97	
Sets whether or not to enable the beeper	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 98	
		n + 2	0: OFF (Disables the beeper.) 1: ON (Enables the beeper.)	
Queries whether or not the beeper is enabled	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 99	
		n + 2	Query response of whether or not beeper is enabled	
Queries the number and message of an existing error in the error queue	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 100	
		n + 2	Error number and message (Max. 48 characters) (character string)	
		:		
		n + 25		
Sets whether or not to lock the front-panel keys	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 101	
		n + 2	0: OFF (Does not lock the keys.) 1: ON (Locks the keys.)	
Queries whether or not the front-panel keys are locked	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 102	
		n + 2	Query response of lock status	
Sets the power line frequency	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 103	
		n + 2	Power line frequency (50, 60)	
Queries the power line frequency	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 104	
		n + 2	Power line frequency (50, 60)	
Resets to the default state	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 105	
Queries the value corresponding to the SCPI version	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 106	
		n + 2	YYYY.V (YYYY: Year-version in four digits, V: revision number for that year) (real number)	
		n+3		

Contents	F0	F1 (=$u n)		F2
Sets the trigger delay time	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 107	
		n + 2	Delay time (0 to 9.999) (real number)	
		n + 3		
Queries the trigger delay time	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 108	
		n + 2	Delay time (real number)	
		n + 3		
Causes the trigger to execute a measurement immediately	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 109	
Sets the trigger mode	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 110	
		n + 2	Trigger mode 0: BUS (Triggers single measurements with the GET and *TRG commands.) 1: EXTernal (Inputs a TTL pulse for the external trigger terminal or the handler interface on the rear panel.) 2: INTernal (Executes measurement by internal trigger signals.) 3: MANual (Executes measurements by the trigger key on the front panel.)	
Queries the trigger mode	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 111	
		n + 2	Trigger mode (3 characters) (character string)	
		n + 3		
Clears the status byte register, operation status event register, questionable status register, and standard event status register	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 112	
Sets the bits of the standard event status enable register	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 113	
		n + 2	Numeric value: Sets the bit weight.	
Queries the bits of the standard event status enable register	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 114	
		n + 2	Value in register	
Queries the bits of the standard event status register	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 115	
		n + 2	Value in register	
Queries an identification string	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 116	
		n + 2	Manufacturer (15 characters), model number (5 characters), serial number in Agilent's format (10 characters), firmware version number (5 characters)	
		:		
		n + 15		
Queries the sequence of commands which defines the current state	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 117	
		n + 2	Command (Max. 48 characters) (character string)	
		:		
		n+25		

Contents	F0	F1 (=$u n)		F2
Sets bit "0" in the standard event status register when all pending operations are completed	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 118	
Queries the completion of all pending operations	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 119	
		n + 2	Output result	
Queries option identification numbers	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 120	
		n + 2	Option identification number (3 characters) (character string)	
		n + 3		
Calls the instrument setting stored in the specified register number	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 121	
		n + 2	Register number (0 to 9)	
Returns to the default setting	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 122	
Saves the instrument setting to the specified register number	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 123	
		n + 2	Register number (0 to 9)	
Sets the bits of the service request enable register	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 124	
		n + 2	Sets the bit weight.	
Queries the contents of the service request enable register	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 125	
		n + 2	Content of service request enable register	
Queries the status byte	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 126	
		n + 2	Content of status byte register	
Executes the trigger	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 127	
Queries error codes	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 128	
		n + 2	Sum of error codes Error Code 1: RAM 2: EPROM 4: Calibration data (EEPROM) 8: User's data (EEPROM) 16: A/D converter 32: Backup RAM	
Waits until all commands are completed	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 129	

Return data: Data stored from the panel meter to the TS2060

*1 "Sets the specified measurement function to ON. (command 76)" must be specified.
*2 "Sets the data buffer size. (command 37)" must be specified.
*3 Data is stored from the specified internal device memory ($u).
*4 Specify the data to feed using "Sets whether or not to feed measurement data to a data buffer. (command 33)".
*5 Only when option 001 is available.

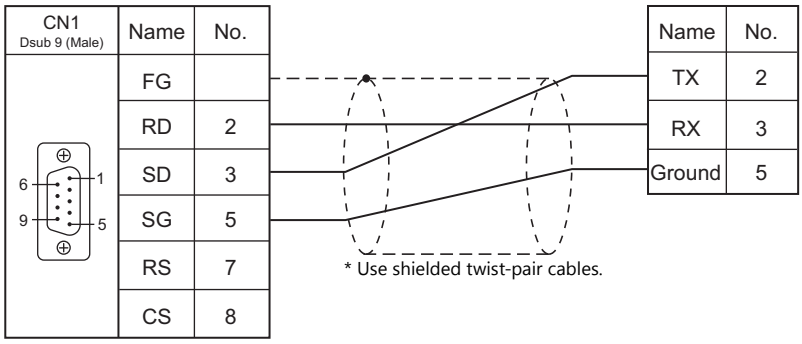
3.1.2 Wiring Diagrams

A GPIB serial converter is necessary to connect the TS2060 series with the 4263 series.
This section shows the wiring diagrams for the TS2060 series and the GPIB serial converter.

When Connected at CN1:

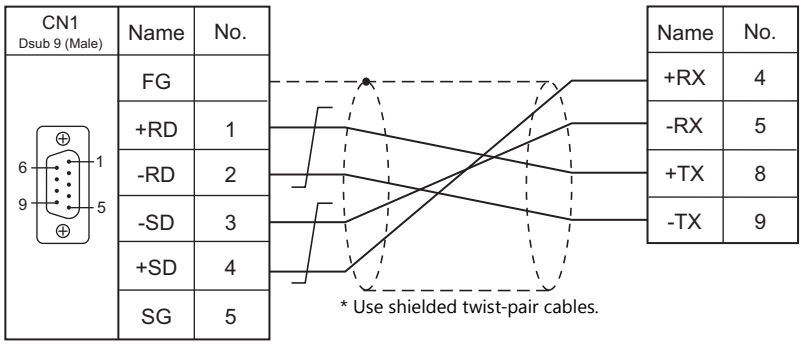
RS-232C

Wiring diagram 1 - C2



RS-422/485

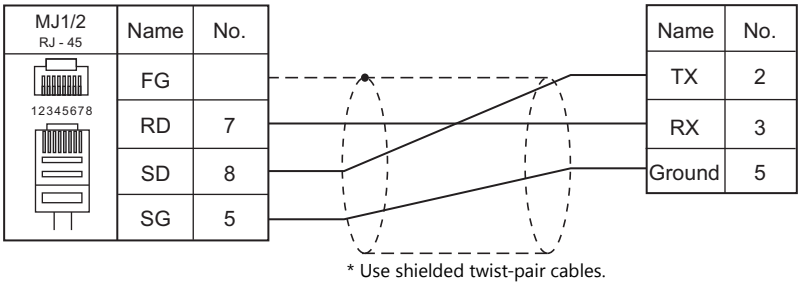
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

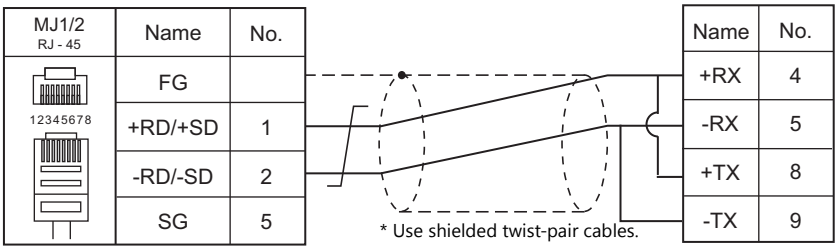
RS-232C

Wiring diagram 1 - M2

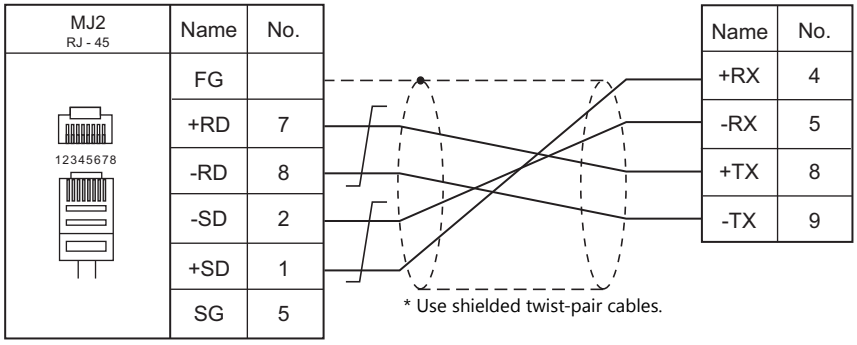


RS-422/485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



4. ALLEN BRADLEY

4.1 PLC Connection

4.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
PLC-5	PLC-5/10, PLC-5/12, PLC-5/15, PLC-5/25	1785-KE	RS-232C	Wiring diagram 3 - C2	Wiring diagram 4 - M2		×
		1770-KF2	RS-232C	Wiring diagram 4 - C2	Wiring diagram 5 - M2		
			RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	PLC-5/11, PLC-5/20, PLC-5/20E, PLC-5/30, PLC-5/40, PLC-5/40L, PLC-5/40E, PLC-5/60, PLC-5/60L, PLC-5/80, PLC-5/80E	Channel 0	RS-232C	Wiring diagram 4 - C2	Wiring diagram 5 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
		1785-KE	RS-232C	Wiring diagram 3 - C2	Wiring diagram 4 - M2		
		1770-KF2	RS-232C	Wiring diagram 4 - C2	Wiring diagram 5 - M2		
			RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
Control Logix / Compact Logix	1756 Control Logix	Logix 5550	RS-232C	Wiring diagram 1 - C2*4	Wiring diagram 1 - M2		×
	1769 Compact Logix	Channel 0					
SLC500	SLC5/03 and later	Channel 0	RS-232C				○
		1747-KE DF1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		×
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
MicroLogix	MicroLogix 1000 MicroLogix 1100 MicroLogix 1500	Channel 0	RS-232C	AB's "1761-CBL-PM02" + Gender changer *5	AB's "1761-CBL-PM02" + Wiring diagram 3 - M2		×
Micro800 Controllers	2080-LC20 2080-LC30 2080-LC50	Serial port	RS-232C	Wiring diagram 5 - C2	Wiring diagram 6 - M2		×

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.
*4 Can be connected using the AB's "1756-CP3" cable + D-sub gender changer (9-pin, female-to-male) commercially available.
*5 Use a D-sub gender changer (9-pin, female-to-male) commercially available.

Manufacturer	Model
Black Box	FA440-R2
Misumi	DGC-9PP

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP *1	UDP/IP	Port No.	Keep Alive *2	Ladder Transfer *3
PLC-5 (Ethernet)	PLC-5/20E PLC-5/40E PLC-5/80E	-	○	×	44818 fixed	×	×
Control Logix (Ethernet)	Logix 5550	1756-ENBT/A	○	×	44818 fixed	×	×
	1769-L32E 1769-L35E 1769-L27ERM-QBFC1B *2	-					
SLC500 (Ethernet TCP/IP)	SLC 5/05	1747-L551 1747-L552 1747-L553					
MicroLogix (Ethernet TCP/IP)	MicroLogix 1100	-					
NET-ENI (SLC500 Ethernet TCP/IP)	SLC 5/03 SLC 5/04 SLC 5/05	1761-NET-ENI 1761-NET-ENI W	○	×	Fixed to 44818 (Max. 6 units)	×	×
NET-ENI (MicroLogix Ethernet TCP/IP)	MicroLogix 1000 MicroLogix 1100 MicroLogix 1200 MicroLogix 1500	1761-NET-ENI 1761-NET-ENI W	○	×	Fixed to 44818 (Max. 6 units)	×	×
Micro800 Controllers (Ethernet TCP/IP)	2080-LC20 2080-LC50	-	○	×	Fixed to 44818	○	×

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS2060i Only)".
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

4.1.1 PLC-5

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	Fixed to 8 bits except for Channel 0
Stop Bit	1 / 2 bits	
Parity	None / Even	
Target Port No.	0 to 31	

PLC

Series A 1785-KE

SW-1 (RS-232C link features)

No.	Item	Setting		Remarks
1, 2, 5	RS-232C Link Features	SW1: OFF SW2: OFF SW5: OFF	Error check: BCC Parity: None Embedded response: No	
		SW1: ON SW2: OFF SW5: OFF	Error check: BCC Parity: Even Embedded response: No	
3	Detect duplicate messages	**ON**	**Detect and ignore duplicate messages**	
4	Hand shaking signals	OFF	Ignore handshaking signals	

SW-2 (for future use)

No	Setting		Remarks
1, 2	**OFF**	**Always OFF (system reserved)**	

SW-3, SW-4 (node number)

SW	Item	Setting	Remarks
SW-3	First digit (OCT)		Setting example: Station number 15 (DEC) = 17 (OCT) SW-3: ON, OFF, OFF SW-4: ON, ON, ON
SW-4	Second digit (OCT)		

No.	0	1	2	3	4	5	6	7
SW1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

No.	0	1	2	3	4	5	6	7
SW1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW3	OFF	OFF	OFF	OFF	ON	ON	ON	ON

SW-5 (network link communication rate)

No.	Item	Setting		Remarks
1	Network Communication Rate	**ON**	**57600 bps**	For DH+ port
2		**ON**		

SW-6 (RS-232C communication rate and diagnostic commands)

<table>
<tr><th>No.</th><th>Item</th><th colspan="2">Setting</th><th>Remarks</th></tr>
<tr><td>1
2
3</td><td>RS-232C Communication Rate</td><td colspan="2"><table><tr><th></th><th>4800 bps</th><th>9600 bps</th><th>19200 bps</th></tr><tr><td>SW1</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW3</td><td>ON</td><td>ON</td><td>ON</td></tr></table></td><td>Set the same value as the one set on TS2060.</td></tr>
<tr><td>4</td><td>Diagnostic Commands</td><td>ON</td><td>Execute diagnostic commands</td><td></td></tr>
</table>

Series B 1785-KE

SW-1 (RS-232C link features)

No.	Item	Setting		Remarks
1-3	RS-232C Link Features	SW1: OFF SW2: OFF SW3: OFF	Error check: BCC Parity: None Embedded response: No	
		SW1: ON SW2: OFF SW3: OFF	Error check: BCC Parity: Even Embedded response: No	
4	Detect duplicate messages	**ON**	**Detect and ignore duplicate messages**	
5	Hand shaking signals	OFF	Ignore handshaking signals	
6	Diagnostic Commands	ON	Execute diagnostic commands	

SW-2 (node number)

<table>
<tr><th>No.</th><th>Item</th><th colspan="2">Setting</th><th>Remarks</th></tr>
<tr><td>1
2</td><td>Octal Digit 0</td><td>0</td><td>SW1: ON
SW2: ON</td><td></td></tr>
<tr><td>3-5</td><td>Octal Digit 1</td><td colspan="2"><table><tr><th>No.</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr><tr><td>SW3</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW4</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW5</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table></td><td rowspan="2">Setting example:
Station number 15 (DEC) = 17 (OCT)

SW3-5: ON, OFF, OFF
SW6-8: ON, ON, ON</td></tr>
<tr><td>6-8</td><td>Octal Digit 2</td><td colspan="2"><table><tr><th>No.</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr><tr><td>SW6</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW7</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW8</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table></td></tr>
</table>

SW-3 (communication rates and local/remote option)

<table>
<tr><th>No.</th><th>Item</th><th colspan="2">Setting</th><th>Remarks</th></tr>
<tr><td>1
2</td><td>Network Communication Rate</td><td>ON
ON</td><td>57600 bps</td><td>For DH+ port</td></tr>
<tr><td>3-5</td><td>RS-232 Link Baud Rate</td><td colspan="2"><table><tr><th></th><th>4800 bps</th><th>9600 bps</th><th>19200 bps</th></tr><tr><td>SW3</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW4</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW5</td><td>ON</td><td>ON</td><td>ON</td></tr></table></td><td>Set the same value as the one set on TS2060.</td></tr>
<tr><td>6</td><td>Local / Remote operation</td><td>ON</td><td>Local mode</td><td></td></tr>
</table>

SW-4 (for future use)

No.	Setting		Remarks
1-4	**OFF**	**Always OFF (system reserved)**	

* Series B 1785-KE switch: ON = 0: DOWN (lower), OFF = 1: UP (upper)

1770-KF2

Setting changes will take effect when the power is turned on. After changing a setting, turn the power off and back on again.

SW-1 (asynchronous link features)

No.	Item	Setting		Remarks
1, 2, 5	Asynchronous Link Features	SW1: OFF SW2: OFF SW5: OFF	Error check: BCC Parity: None Embedded response: No	
		SW1: ON SW2: OFF SW5: OFF	Error check: BCC Parity: Even Embedded response: No	
3	Detect duplicate messages	**ON**	**Detect and ignore duplicate messages**	
4	Hand shaking signals	OFF	Ignore handshaking signals	

SW-2, SW-3, SW-4 (station number)

SW	Item	Setting		Remarks
SW-2	First Digit	**0**	**SW1: ON** **SW2: ON**	
SW-3	Second Digit (OCT)			Setting example: Station number 15 (DEC) = 17 (OCT) SW-3: ON, OFF, OFF SW-4: ON, ON, ON
SW-4	Third Digit (OCT)			

No.	0	1	2	3	4	5	6	7
SW3	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW4	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW5	OFF	OFF	OFF	OFF	ON	ON	ON	ON

No.	0	1	2	3	4	5	6	7
SW6	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW7	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW8	OFF	OFF	OFF	OFF	ON	ON	ON	ON

SW-5 (network link communication rate)

No.	Item	Setting		Remarks
1	Network Communication Rate	**ON**	**57600 bps**	For DH+ port
2		**ON**		

SW-6 (asynchronous link communication rate and diagnostic commands)

No.	Item	Setting		Remarks
1, 2, 3	Asynchronous Communication Rate			Set the same value as the one set on TS2060.
4	Diagnostic Commands	**ON**	**Execute Received Diagnostic Commands**	

	4800 bps	9600 bps
SW1	ON	OFF
SW2	OFF	ON
SW3	ON	ON

SW-7 (selecting the network link)

No.	Item	Setting		Remarks
1	Selecting the Network Link	**ON**	**Peer Communication Link**	
2		**OFF**		

SW-8 (RS-232-C/RS-422-A selection)

No.	Item	Setting	Remarks
1, 2	Selection of RS-232C / RS-422-A		

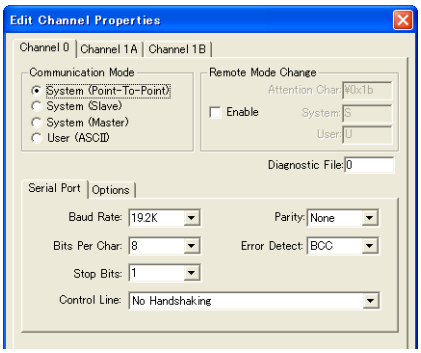
	RS-232C	RS-422
SW1	OFF	ON
SW2	ON	OFF

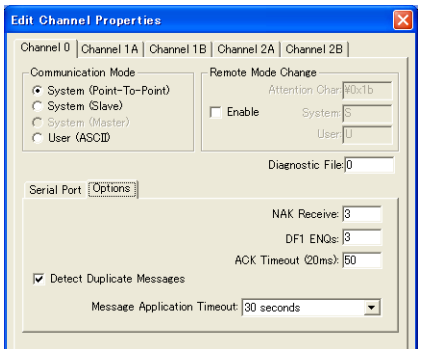
Channel 0

SW-2 (selection of RS-232C/RS-422A)

SW	Setting			Remarks
SW2	No.	RS-232C	RS-422A	ON: Lower position OFF: Upper position
	1	ON	OFF	
	2	ON	OFF	
	3	ON	ON	
	4	OFF	OFF	
	5	OFF	OFF	
	6	ON	OFF	
	7	ON	OFF	
	8	OFF	OFF	
	9	ON	ON	
	10	OFF	OFF	

Channel configuration





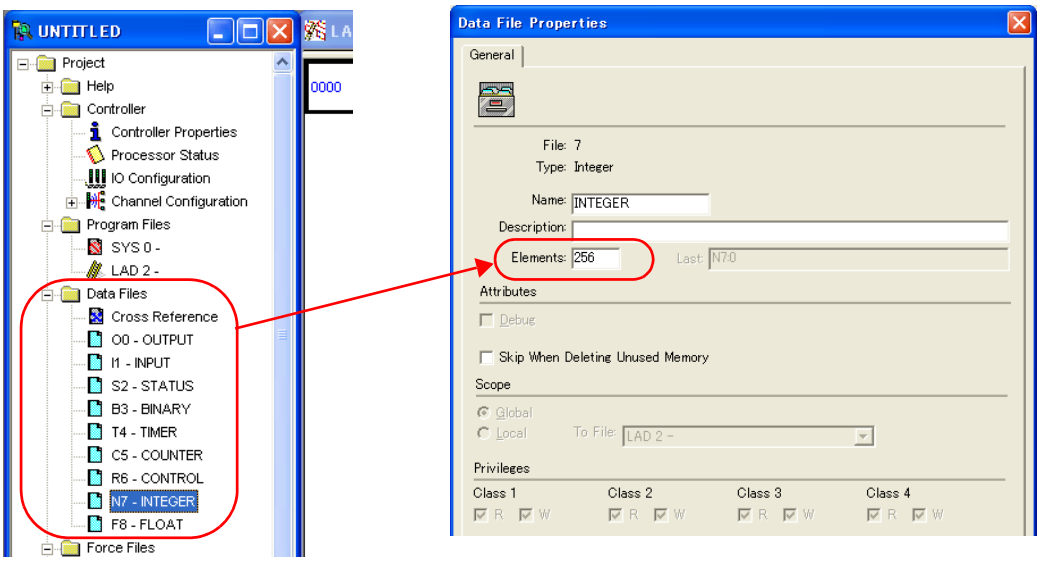
Item		Setting	Remarks
Channel 0	Communication Mode	**System (Point-To-Point)**	
	Remote Mode Change	**Unchecked**	
Serial Port	Baud Rate	4800 / 9600 / 19.2 K	
	Bits Per Char	7 / 8	
	Stop Bits	1 / 2	
	Control Line	No Handshaking	
	Parity	None / Even	
	Error Detect	**BCC**	
Options	Detect Duplicate Messages	**Checked**	
	NAK Receive	3	
	DF1 ENQs	3	
	ACK Timeout (20 msec)	50	
	Message application timeout	30 seconds	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T.ACC	(timer/current value)	02H	
T.PRE	(timer/set value)	03H	
C.ACC	(counter/current value)	04H	
C.PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R.LEN	(control/data length)	0CH	
R.POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	

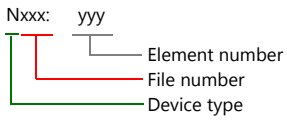
Make settings for "Data Files" using the ladder tool. Otherwise, "Error Code F007", etc. is displayed on MONITOUCH. For more information, refer to the PLC manual issued by the manufacturer.



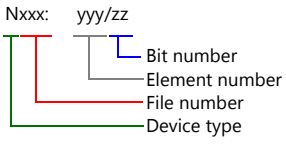
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

Example: For word access



For bit access



The file number will not be displayed for the input, output or status device memory.

Indirect Device Memory Designation

- For the file numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number as well as the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:

  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.2 PLC-5 (Ethernet)

Communication Setting

Editor

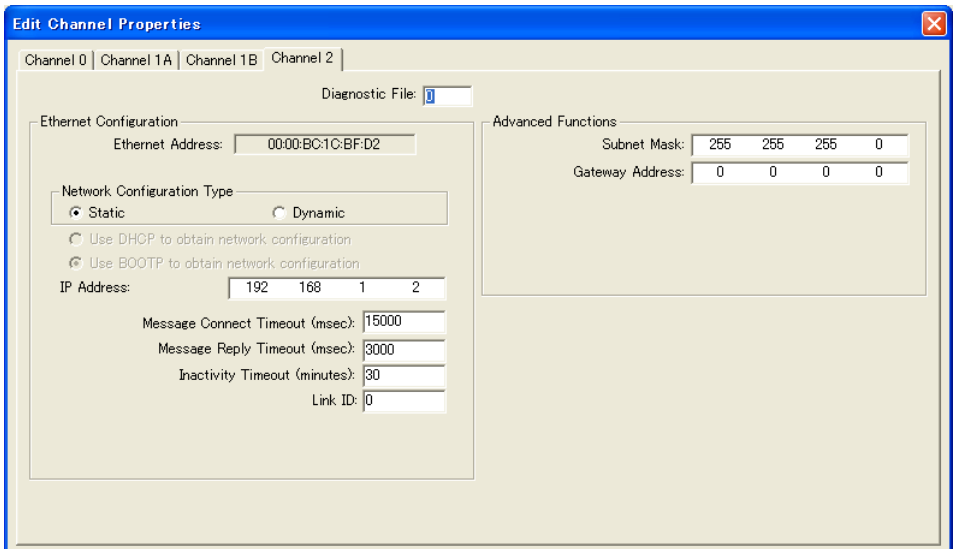
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Channel 2

Channel configuration (channel 2)



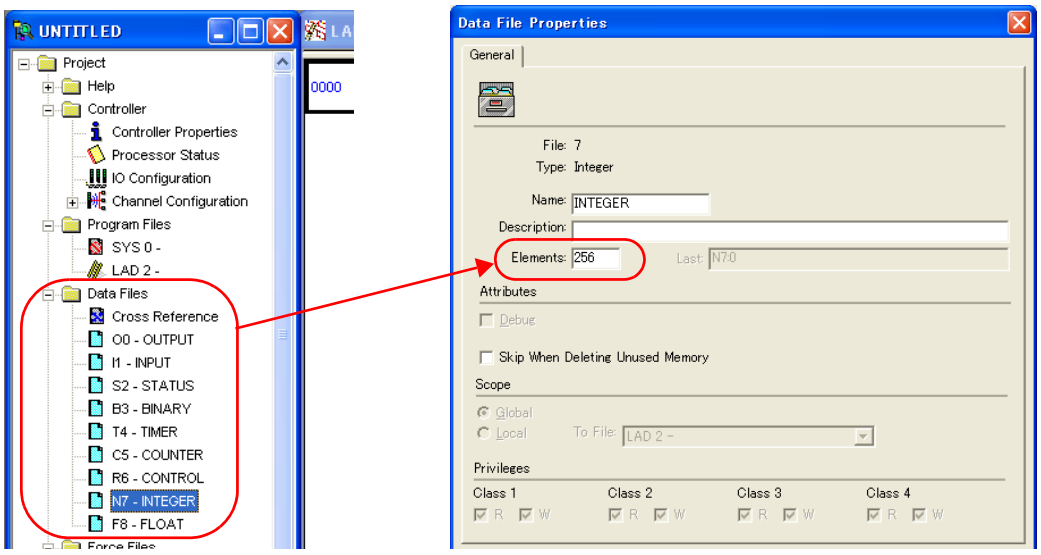
Item	Setting	Remarks
Network Configuration Type	**Static**	
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway Address	Specify according to the environment.	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T.ACC	(timer/current value)	02H	
T.PRE	(timer/set value)	03H	
C.ACC	(counter/current value)	04H	
C.PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R.LEN	(control/data length)	0CH	
R.POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	

Make settings for "Data Files" using the ladder tool. Otherwise, "Error Code F007", etc. is displayed on MONITOUCH. For more information, refer to the PLC manual issued by the manufacturer.



Address denotations

The assigned device memory is expressed as shown below when editing the screen.

Example: For word access

Nxxx: yyy

- Element number
- File number
- Device type

For bit access

Nxxx: yyy/zz

- Bit number
- Element number
- File number
- Device type

The file number will not be displayed for the input, output or status device memory.

Indirect Device Memory Designation

- For the file numbers 0 to 65:

	15 MSB 8	7 LSB 0
n+0	Model	Device type
n+1	Address No.	
n+2	00	Bit designation
n+3	00	Station number

- For the file numbers 66 to 255:

	15 MSB 8	7 LSB 0
n+0	Model	Device type
n+1	Lower address No.	
n+2	Higher address No.	
n+3	00	Bit designation
n+4	00	Station number

- Specify the file number as well as the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the higher address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:

  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.3 Control Logix / Compact Logix

The logical port PLC1 can only be selected because the tag table is used.

Communication Setting

Editor

Communication setting

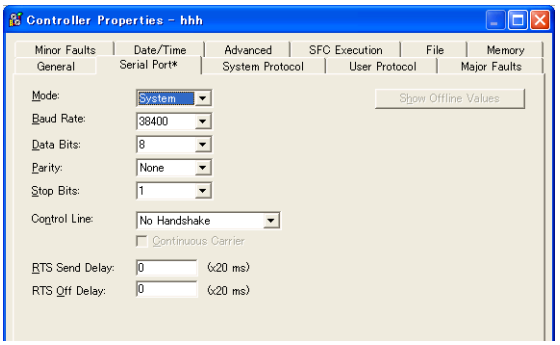
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	For multi-link2, be sure to use the same tag table.
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 115k bps	
Data Length	8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

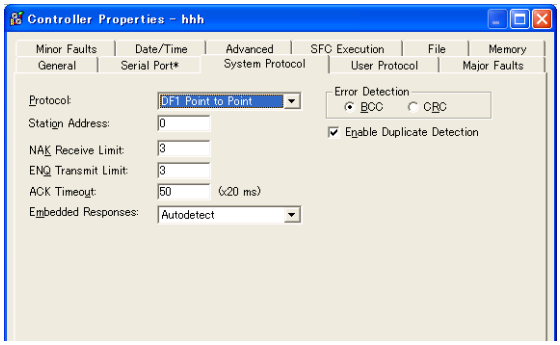
Control Logix

Serial port



Item	Setting	Remarks
Mode	System	
Baud Rate	38400	
Data Bits	8	
Parity	None	
Stop Bits	1	
Control Line	No Handshake	

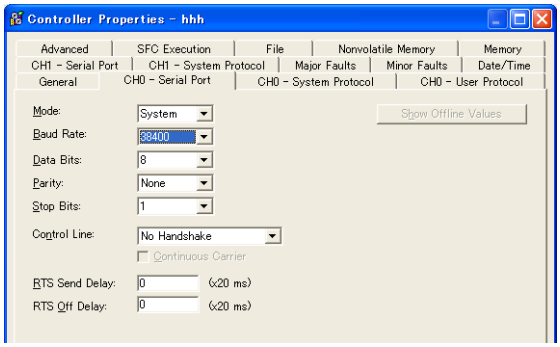
System protocol



Item	Setting	Remarks
Protocol	DF1 Point to Point	
Station Address	0	
NAK Receive Limit	3	
ENQ Transmit Limit	3	
ACK Timeout	50	
Embedded Responses	Autodetect	
Error Detection	BCC	
Enable Duplicate Detection	Checked	

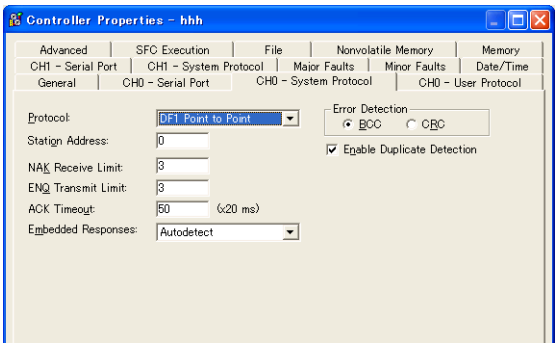
Compact Logix

CH0 - serial port



Item	Setting	Remarks
Mode	System	
Baud Rate	38400	
Data Bits	8	
Parity	None	
Stop Bits	1	
Control Line	No Handshake	

CH0 - system protocol



Item	Setting	Remarks
Protocol	DF1 Point to Point	
Station Address	0	
NAK Receive Limit	3	
ENQ Transmit Limit	3	
ACK Timeout	50	
Embedded Responses	Autodetect	
Error Detection	BCC	
Enable Duplicate Detection	Checked	

Available Device Memory

Create a CSV file by exporting “tag” created by using the ladder tool of the PLC. Then import the CSV file into the editor to set the PLC device memory.
For more information on importing, exporting and creating a tag, refer to “Connection with A•B Control Logix” provided separately.

Indirect Device Memory Designation

Not available

4.1.4 Control Logix (Ethernet)

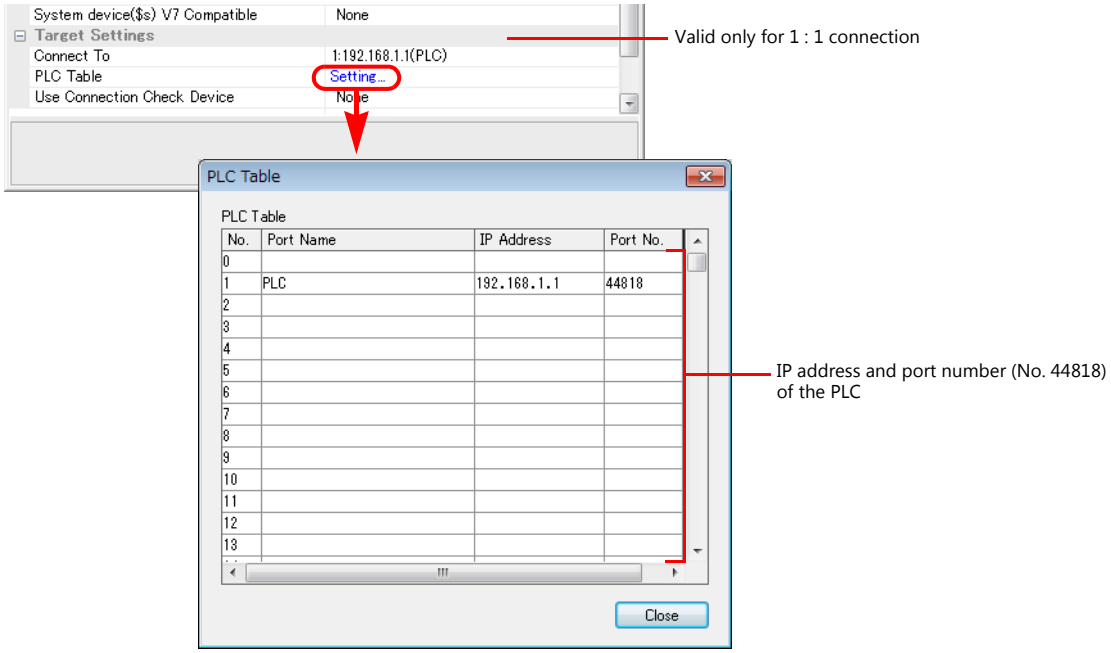
The logical port PLC1 can only be selected because the tag table is used.

Communication Setting

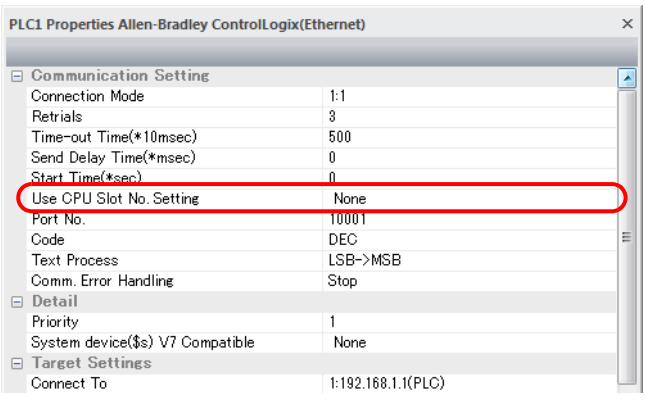
Editor

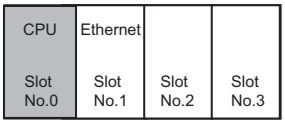
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

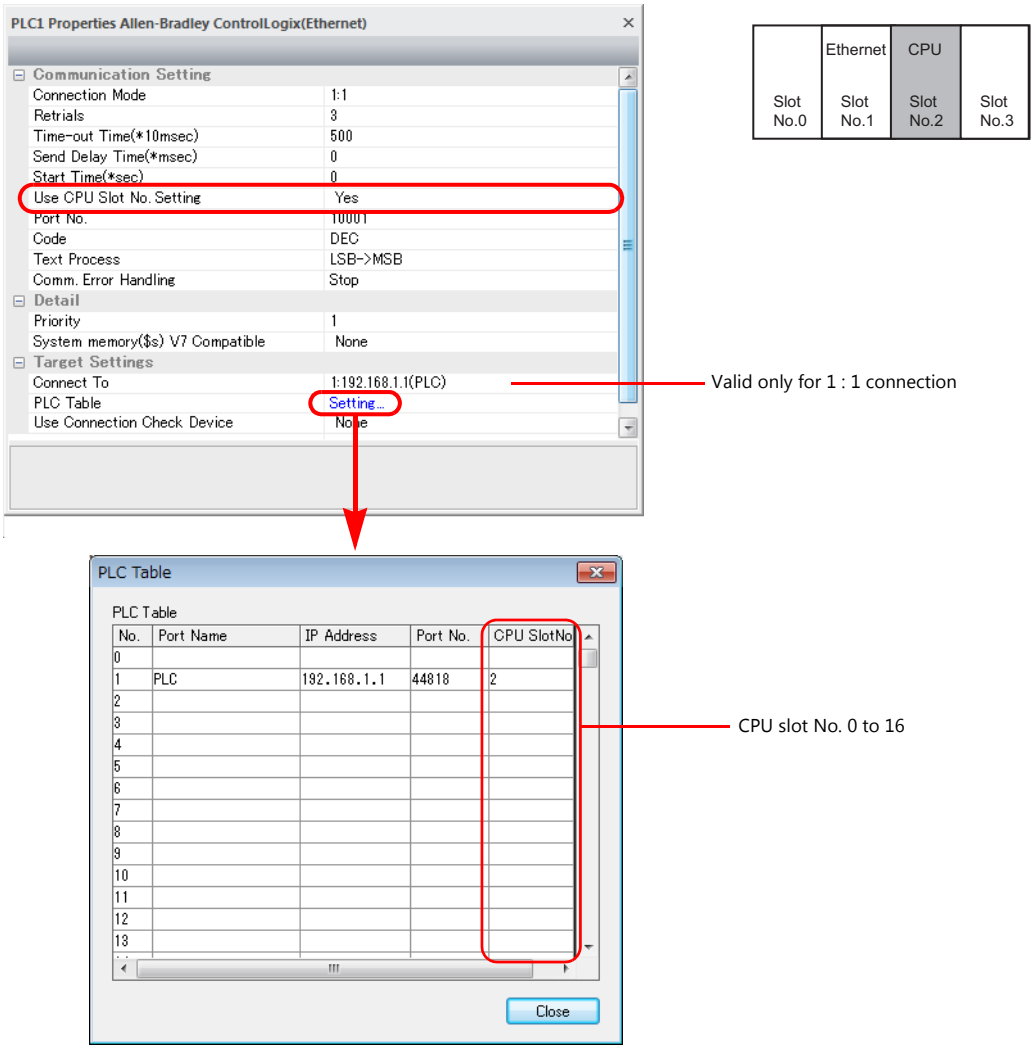


- Others
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting] → [Use CPU Slot No. Setting]
  - [None] (default)
    The CPU slot No. is fixed to "0".





- [Yes]
  Specify the CPU slot number at the [PLC Table] under [Target Settings] on the [PLC Properties] window ([System Setting] → [Hardware Setting]).
  Setting range: 0 to 16



PLC

Use one of the following utilities to set an IP address. For more information, refer to the PLC manual issued by the manufacturer.

- BOOTP utility
- RSLinx software
- RSLogix 5000 software

Available Device Memory

Create a CSV file by exporting "tag" created by using the ladder tool of the PLC. Then import the CSV file into the editor to set the PLC device memory.
For more information on importing, exporting and creating a tag, refer to "Connection with A•B Control Logix" provided separately.

Indirect Device Memory Designation

Not available

4.1.5 SLC500

Communication Setting

Editor

Communication setting

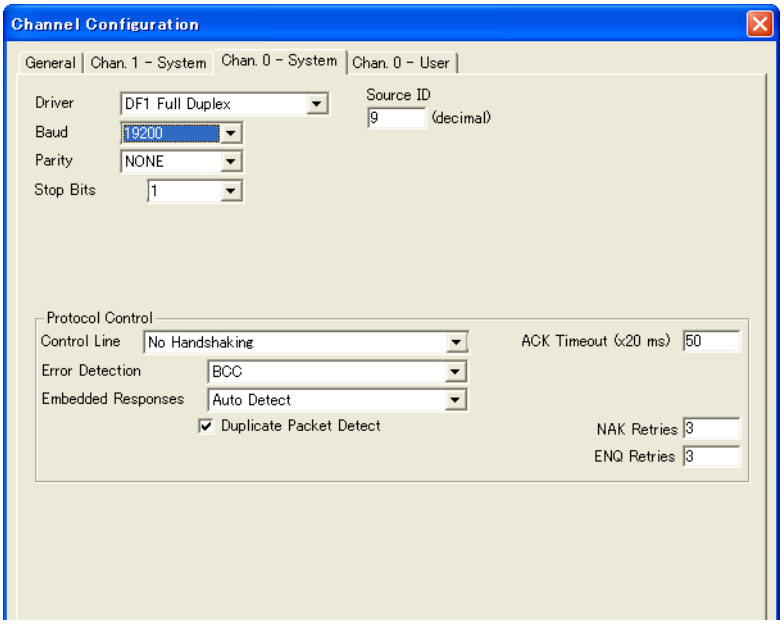
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Even	
Target Port No.	0 to 31	

PLC

Channel 0

Channel configuration (chan. 0 - system)

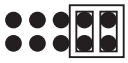


(Underlined setting: default)

Item	Setting	Remarks
Driver	**DF1 Full Duplex**	
Baud	9600 / 19200 / 38400	
Parity	None / Even	
Stop Bits	1 / 2	
Control Line	**No Handshaking**	
Error Detection	**BCC**	
Embedded Responses	**Auto Detect**	
Duplicate Packet Detect	**Checked**	

1747-KE

Jumper JW2

Item	Setting	Remarks
RS-232		
RS-422		

DF1 port setup menu

Item	Setting	Remarks
Baudrate	19200	
Bits Per Character	8	
Parity	Even	
Stop Bits	1	

DF1 full-duplex setup menu

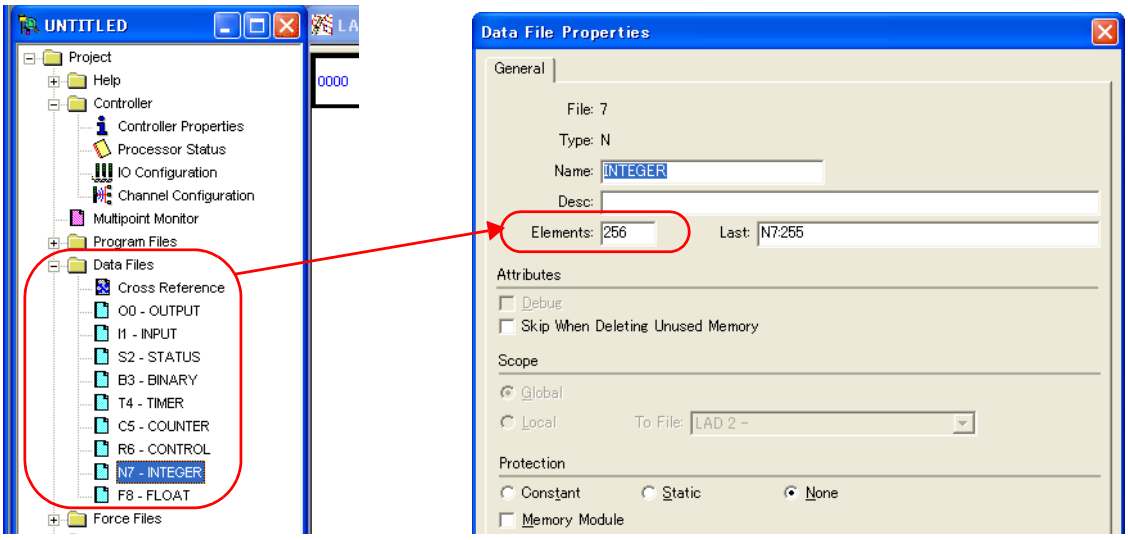
Item	Setting	Remarks
Duplicate Packet Detection	Enabled	
Checksum	BCC	
Constant Carrier Detect	Disabled	
Message Timeout	400	
Hardware Handshaking	Disabled	
Embedded Response Detect	Auto Detect	
ACK Timeout (× 5 ms)	90	
ENQuiry Retries	3	
NAK Received Retries	3	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	

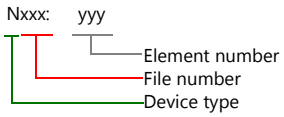
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



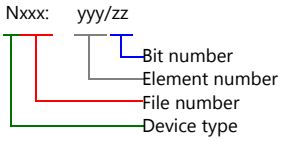
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

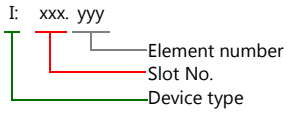


For bit access

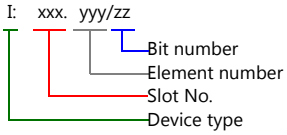


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.6 SLC500 (Ethernet TCP/IP)

Communication Setting

Editor

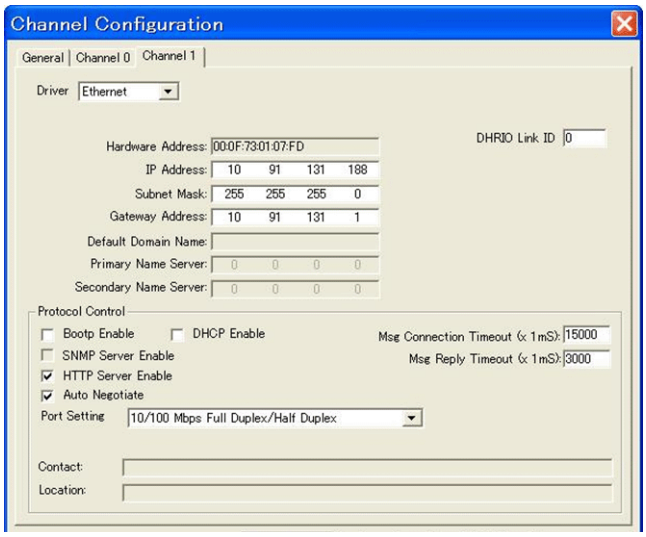
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Channel 1

Channel configuration (channel 1)



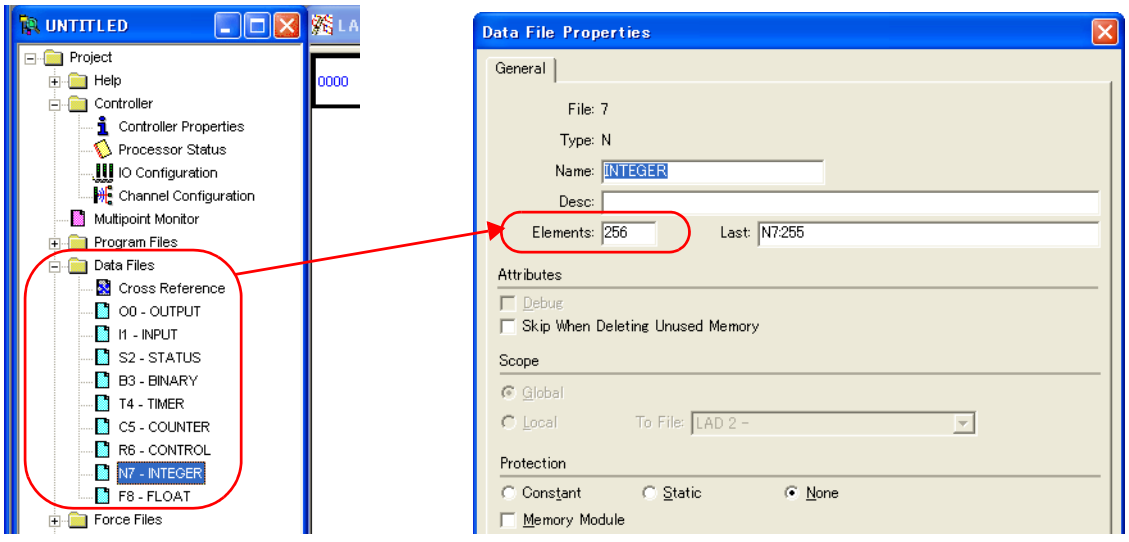
Item	Setting	Remarks
Driver	**Ethernet**	
IP Address	PLC's IP address	
Subnet Mask	PLC's subnet mask	
Gateway Address	Make settings in accordance with the network environment.	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	

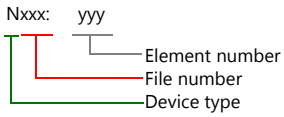
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



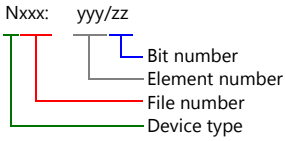
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

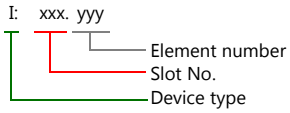


For bit access

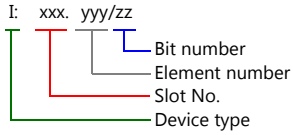


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.7 Micro Logix

Communication Setting

Editor

Communication setting

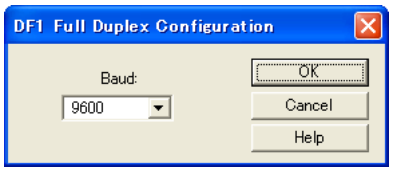
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	**1 bit**	
Parity	None / Even	
Target Port No.	0 to 31	

PLC

Channel Configuration

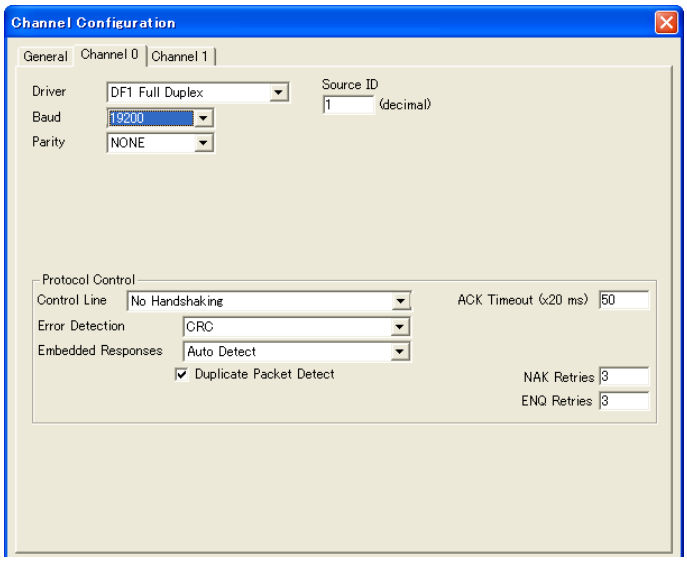
Micro Logix 1000



(Underlined setting: default)

Item	Setting	Remarks
Baud	4800 / 9600 / 19200 / 38.4K	

Micro Logix 1100, 1500



(Underlined setting: default)

Item		Setting	Remarks
Channel 0	Driver	**DF1 Full Duplex**	
	Baud	4800 / 9600 / 19200 / 38.4K	
	Parity	None / Even	
	Control Line	**No Handshaking**	
	Error Detection	**BCC**	
	Embedded Responses	**Auto Detect**	
	Duplicate Packet Detect	**Checked**	

Calendar

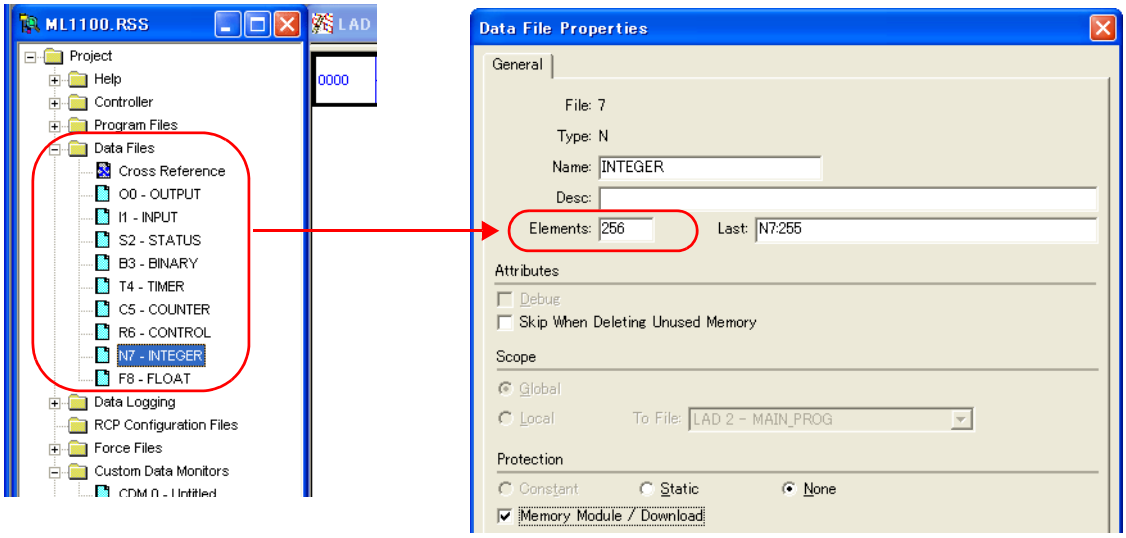
This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	
L	(LONG)	12H	Double-word

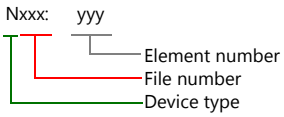
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



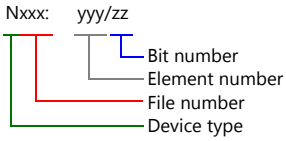
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

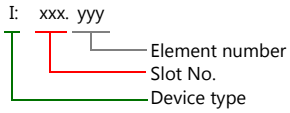


For bit access

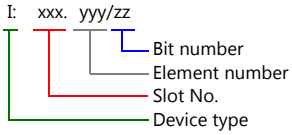


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.8 Micro Logix (Ethernet TCP/IP)

Communication Setting

Editor

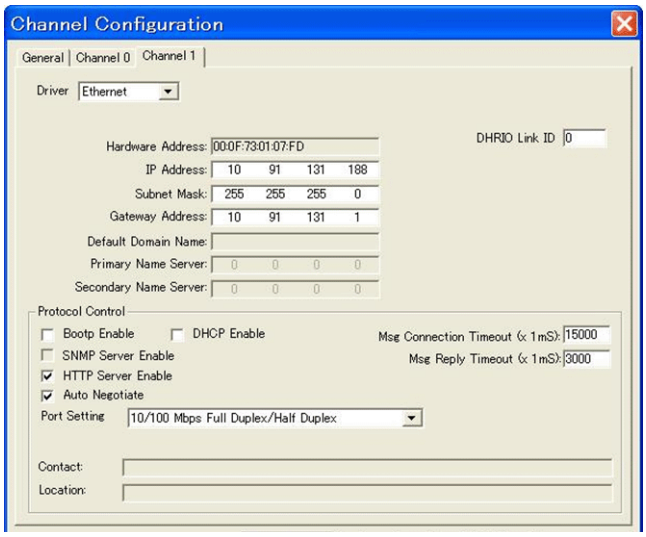
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Channel 1

Channel configuration (channel 1)



Item	Setting	Remarks
Driver	**Ethernet**	
IP Address	PLC's IP address	
Subnet Mask	PLC's subnet mask	
Gateway Address	Make settings in accordance with the network environment.	

Calendar

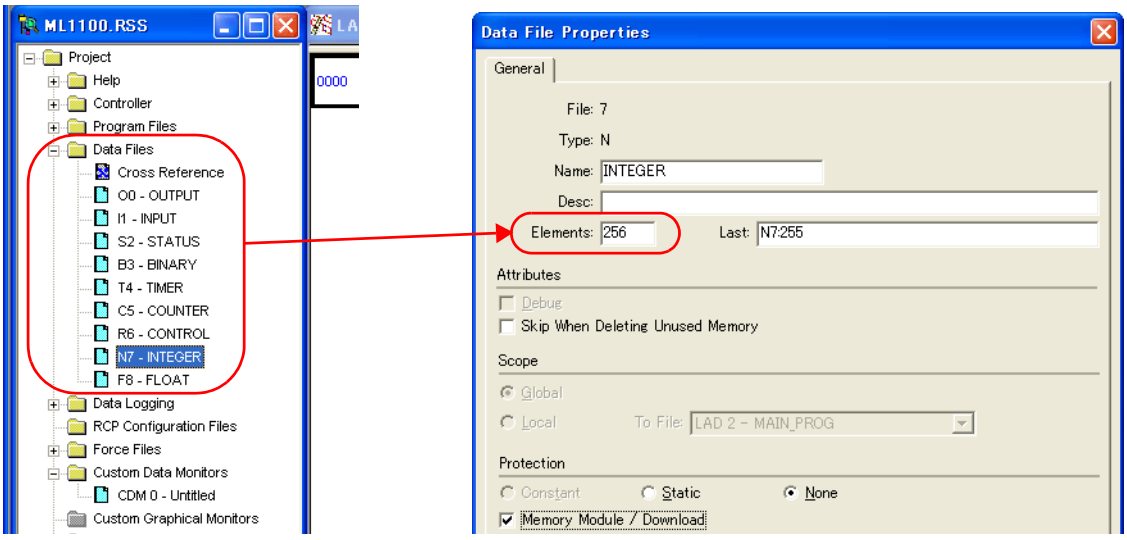
This model is not equipped with the calendar function. Use the built-in clock of the TS2060i.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	
L	(LONG)	12H	Double-word

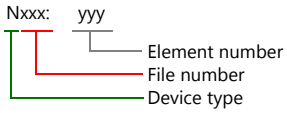
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



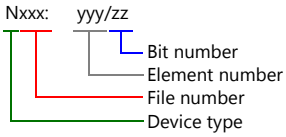
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

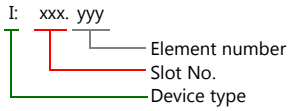


For bit access

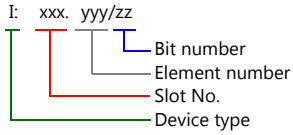


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

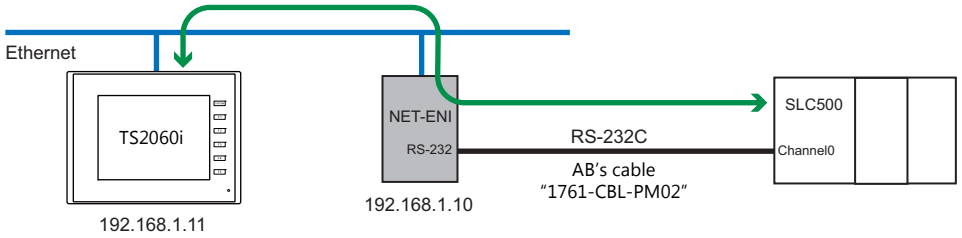
  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.9 NET-ENI (SLC500 Ethernet TCP/IP)

The TS2060 establishes communication with SLC500 via NET-ENI.



Communication Setting

Editor

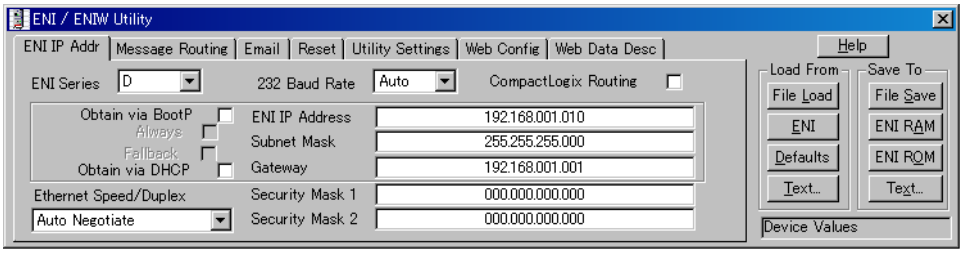
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

NET-ENI / NET-ENIW

ENI / ENIW utility

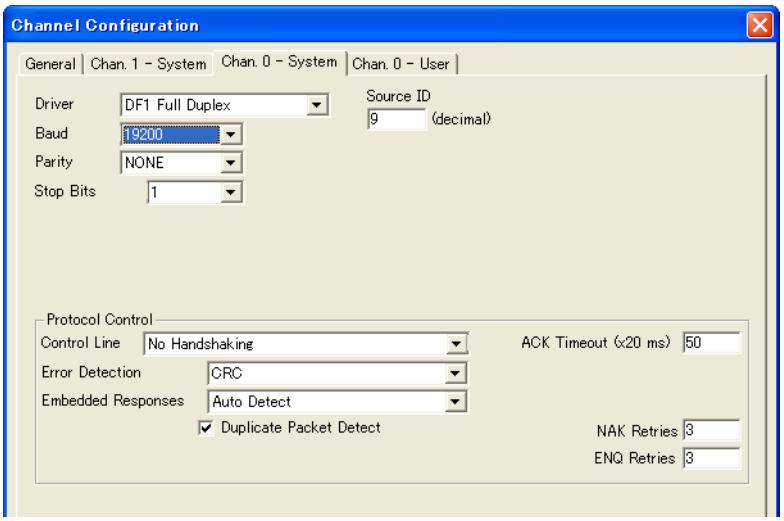


Item		Setting	Remarks
ENI IP Addr	232 Baud Rate	Auto	
	ENI IP Address	Set the IP address of NET-ENI.	
	Subnet Mask	Set the subnet mask of NET-ENI.	
	Gateway	Make settings in accordance with the network environment.	

Press [ENI ROM] to save the settings.

SLC500

Channel configuration



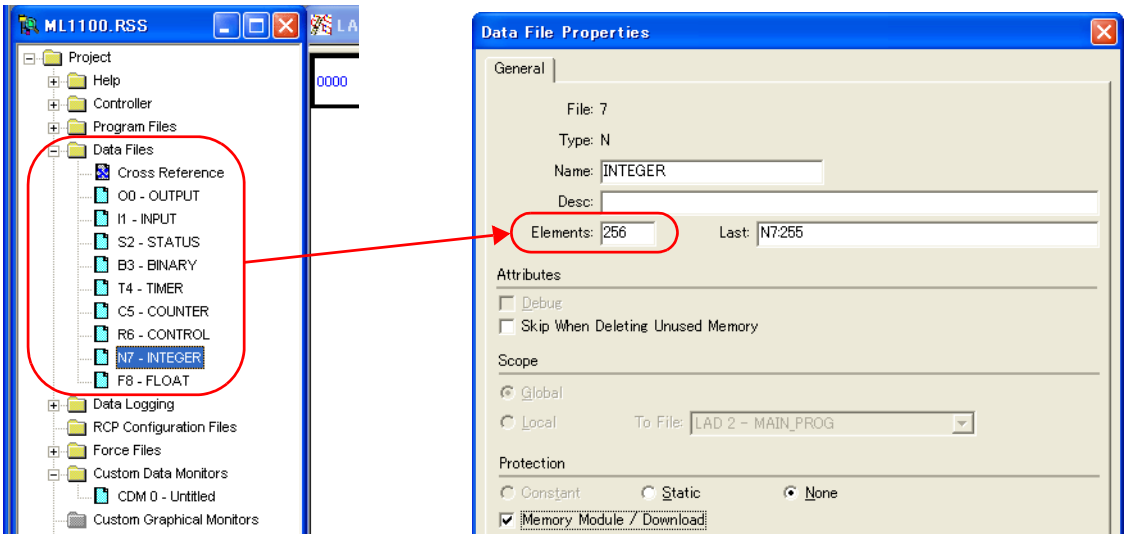
Item		Setting	Remarks
Chan. 0 - System	Driver	**DF1 Full Duplex**	
	Baud	9600 / 19200 / 38400	
	Parity	**NONE**	
	Stop Bits	**1**	
	Control Line	**No Handshaking**	
	Error Detection	**CRC**	
	Embedded Responses	**Auto Detect**	
	Duplicate Packet Detect	**Checked**	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	

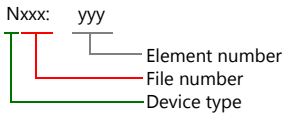
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



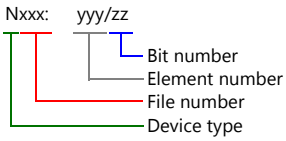
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

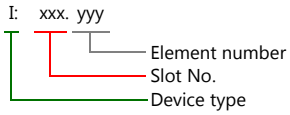


For bit access

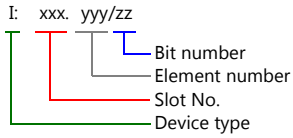


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

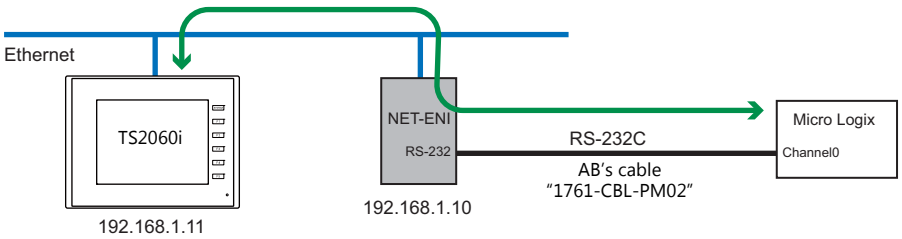
  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.10 NET-ENI (MicroLogix Ethernet TCP/IP)

The TS2060 establishes communication with MicroLogix via NET-ENI.



Communication Setting

Editor

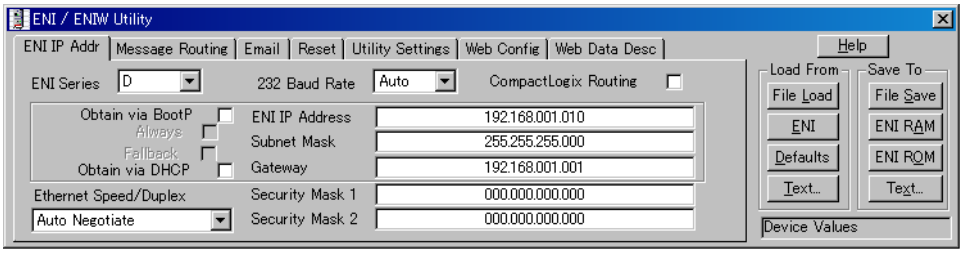
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

NET-ENI / NET-ENIW

ENI / ENIW utility

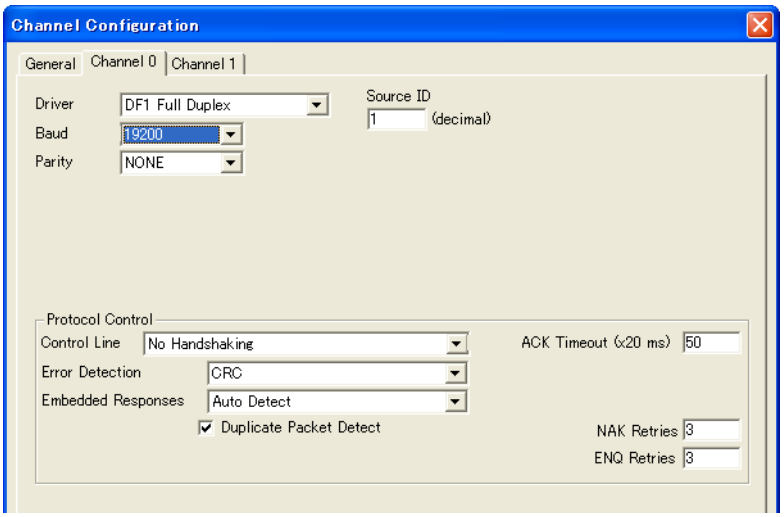


Item		Setting	Remarks
ENI IP Addr	232 Baud Rate	Auto	
	ENI IP Address	Set the IP address of NET-ENI.	
	Subnet Mask	Set the subnet mask of NET-ENI.	
	Gateway	Make settings in accordance with the network environment.	

Press [ENI ROM] to save the settings.

MicroLogix

Channel Configuration



(Underlined setting: default)

Item		Setting	Remarks
Chan. 0	Driver	**DF1 Full Duplex**	
	Baud	4800 / 9600 / 19200 / 38.4K	
	Parity	**NONE**	
	Control Line	**No Handshaking**	
	Error Detection	**CRC**	
	Embedded Responses	**Auto Detect**	
	Duplicate Packet Detect	**Checked**	

Calendar

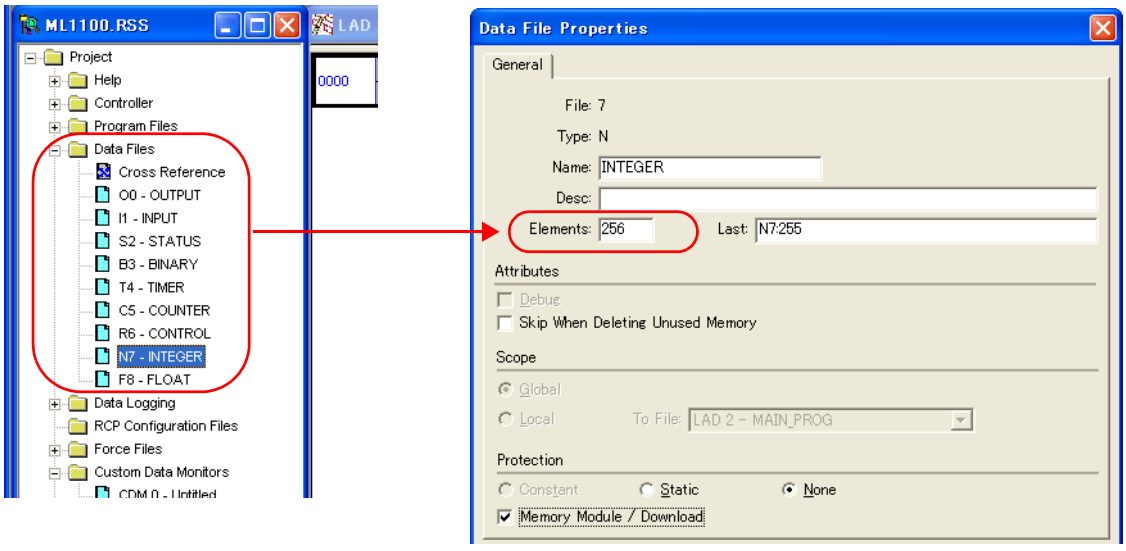
This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	
L	(LONG)	12H	Double-word

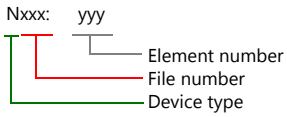
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



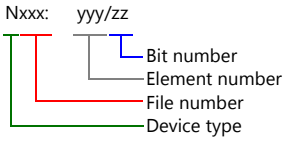
Address denotations

The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output
  - For word access

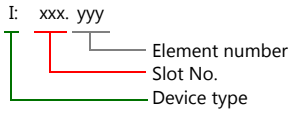


For bit access

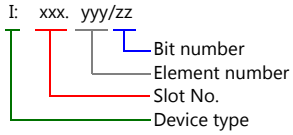


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	00	Bit designation
n + 3	00	Station number

- For the file or slot numbers 66 to 255:

	15 MSB 8	7 LSB 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	00	Bit designation
n + 4	00	Station number

- Specify the file number or slot number and the element number for the address number.

  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

- When specifying an address for the timer (control), counter (control) or control device memory in bit designation, specify the bit number in decimal notation as shown below:
  - T: Timer (control)
    DN = 13, TT = 14, EN = 15
  - C: Counter (control)
    UA = 10, UN = 11, OV = 12, DN = 13, CD = 14, CU = 15
  - R: Control
    FD = 08, IN = 09, UL = 10, ER = 11, EM = 12, DN = 13, EU = 14, EN = 15

4.1.11 Micro800 Controllers

The logical port PLC1 can only be selected because the tag table is used.

Communication Setting

Editor

Communication setting

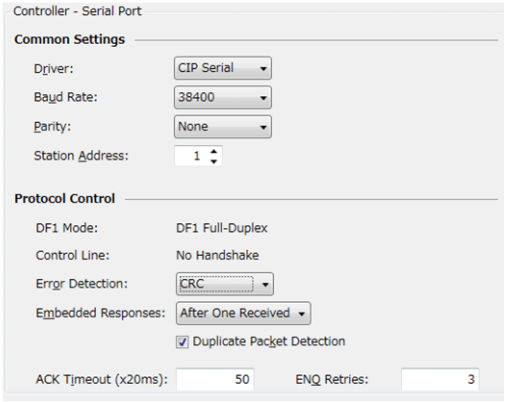
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	For multi-link2, be sure to use the same tag table.
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

Make settings using the ladder tool software “Connected Components Workbench”.

Controller - Serial Port



Item		Setting	Remarks
Common Settings	Driver	**CIP Serial**	
	Baud Rate	4800 / 9600 / 19200 / 38400	
	Parity	None / Odd / Even	
	Station Address	0 to 31	
Protocol Control	Error Detection	**BCC**	
	Embedded Responses	**After One Received**	

Available Device Memory

Export "tags" created using the ladder tool of the PLC programming software to an ISAXML file. Then import the ISAXML file into the editor to set the PLC device memory.
For details on importing, exporting and creating a tag, refer to the Allen-Bradley PLC Connection Manual.

Data Type		Range *2 of Number of Elements for Arrays			Tag Name
		Dim0	Dim1	Dim2	
BOOL	(1-bit integer)	0 to 65535	-	-	Up to 40 characters
SINT	(1-byte integer) *1	0 to 1023 *3	0 to 1023 *3	0 to 1023 *3	
INT	(2-byte integer)	0 to 023	0 to 023	0 to 023	
DINT	(4-byte integer)	0 to 023	0 to 023	0 to 023	
REAL	(4-byte floating-point)	0 to 023	0 to 023	0 to 023	
STRING	(text)	0 to 023	0 to 023	0 to 023	

*1 Specify in units of 2 bytes (word). 1-byte tags cannot be accessed.
*2 The ranges given are based on when a maximum value is specified. Ranges differ according to the created tag.
*3 The address range differs depending on the specified "Dim".

Dim0	Dim1	Dim2
0 to 1022	None	None
0 to 023	0 to 1022	None
0 to 023	0 to 023	0 to 1022

Indirect Device Memory Designation

Not available

4.1.12 Micro800 Controllers(Ethernet TCP/IP)

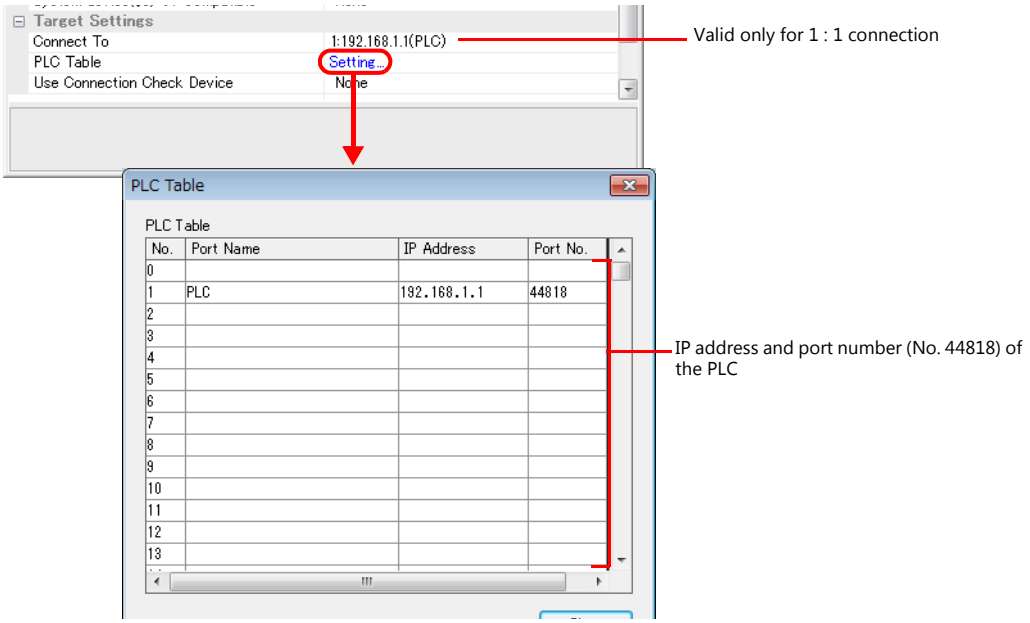
The logical port PLC1 can only be selected because the tag table is used.

Communication Setting

Editor

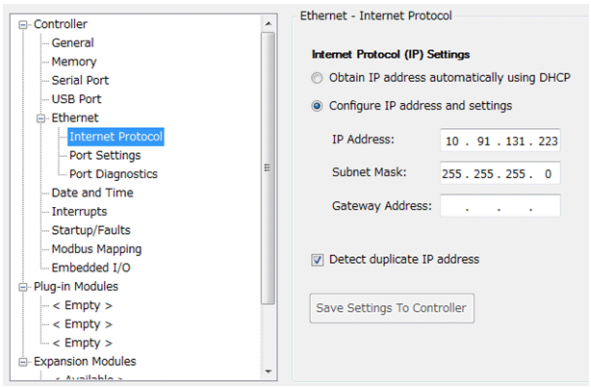
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

Set the IP address using the ladder tool software "Connected Components Workbench". For details, refer to the PLC manual issued by the manufacturer.



Available Device Memory

Export "tags" created using the ladder tool of the PLC programming software to an ISAXML file. Then import the ISAXML file into the editor to set the PLC device memory.
For details on importing, exporting and creating a tag, refer to the Allen-Bradley PLC Connection Manual.

Data Type		Range *2 of Number of Elements for Arrays			Tag Name
		Dim0	Dim1	Dim2	
BOOL	(1-bit integer)	0 to 65535	-	-	Up to 40 characters
SINT	(1-byte integer) *1	0 to 1023 *3	0 to 1023 *3	0 to 1023 *3	
INT	(2-byte integer)	0 to 023	0 to 023	0 to 023	
DINT	(4-byte integer)	0 to 023	0 to 023	0 to 023	
REAL	(4-byte floating-point)	0 to 023	0 to 023	0 to 023	
STRING	(text)	0 to 023	0 to 023	0 to 023	

*1 Specify in units of 2 bytes (word). 1-byte tags cannot be accessed.
*2 The ranges given are based on when a maximum value is specified. Ranges differ according to the created tag.
*3 The address range differs depending on the specified "Dim".

Dim0	Dim1	Dim2
0 to 1022	None	None
0 to 023	0 to 1022	None
0 to 023	0 to 023	0 to 1022

Indirect Device Memory Designation

Not available

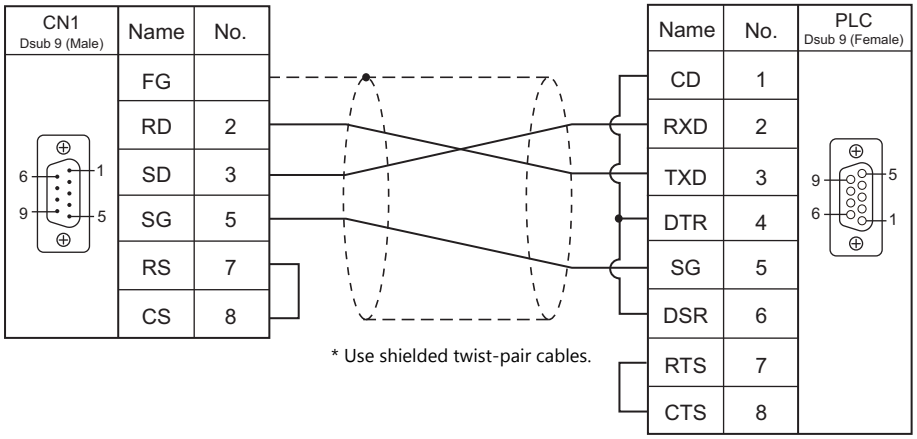
4.1.13 Wiring Diagrams

When Connected at CN1:

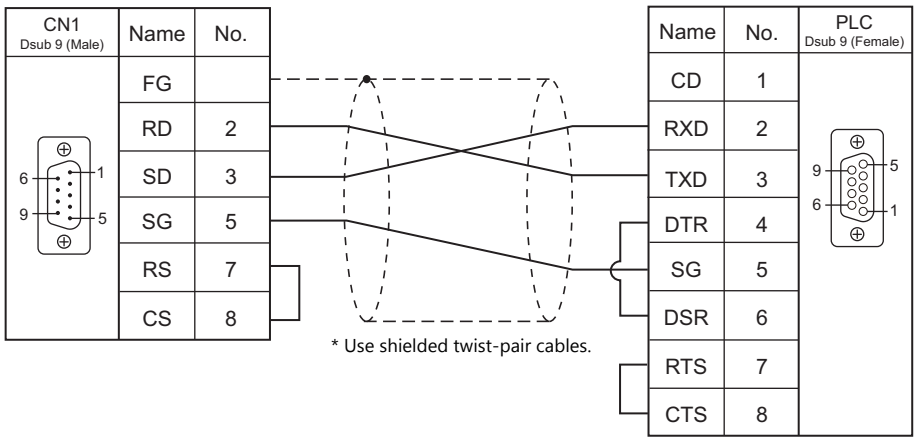
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

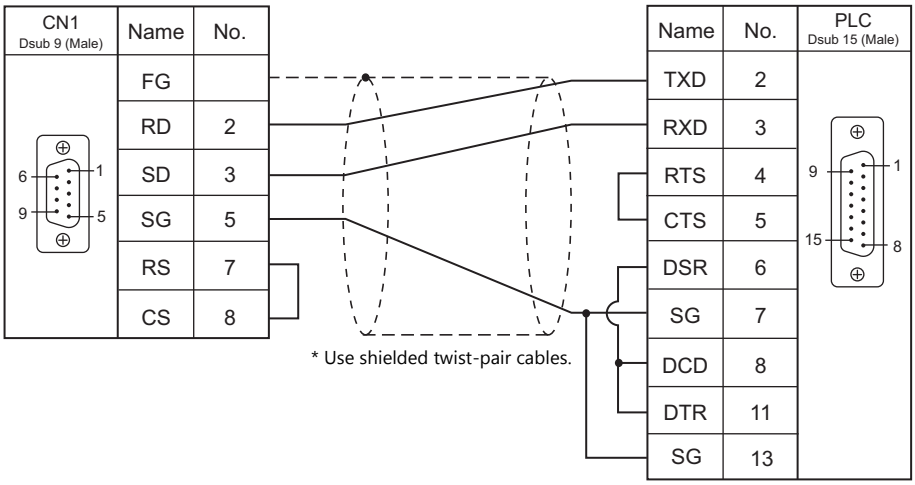
Wiring diagram 1 - C2



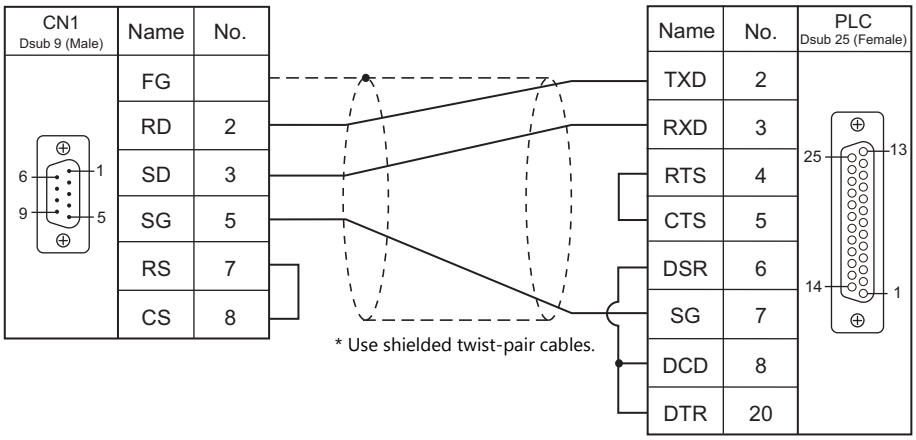
Wiring diagram 2 - C2



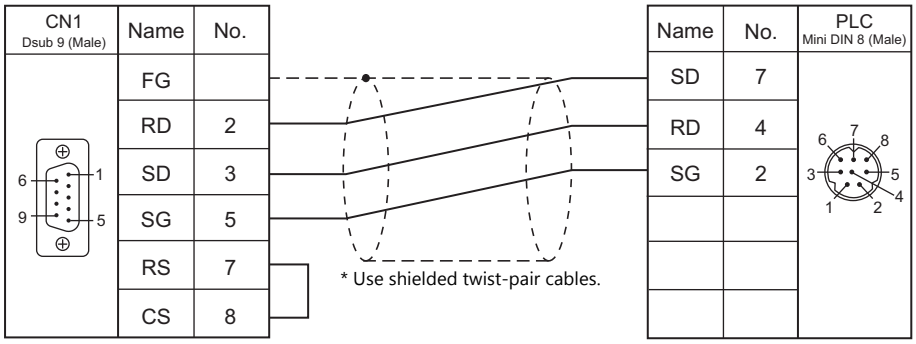
Wiring diagram 3 - C2



Wiring diagram 4 - C2

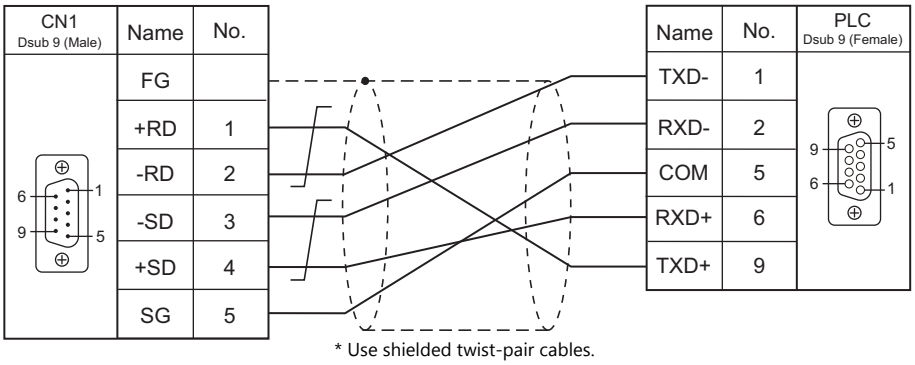


Wiring diagram 5 - C2



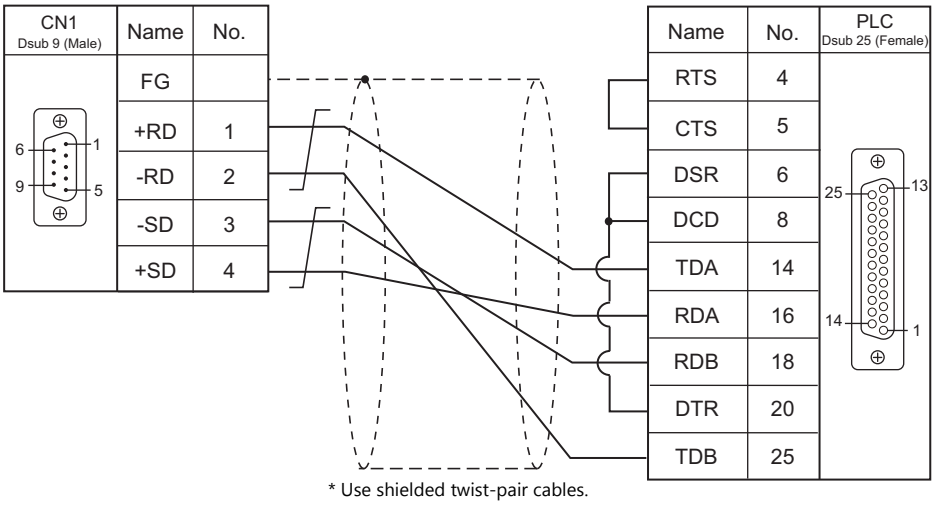
RS-422/RS-485

Wiring diagram 1 - C4



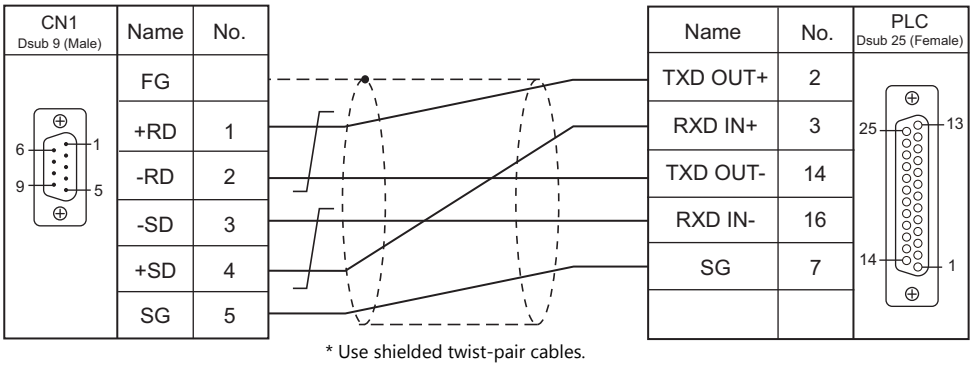
* Use shielded twist-pair cables.

Wiring diagram 2 - C4



* Use shielded twist-pair cables.

Wiring diagram 3 - C4

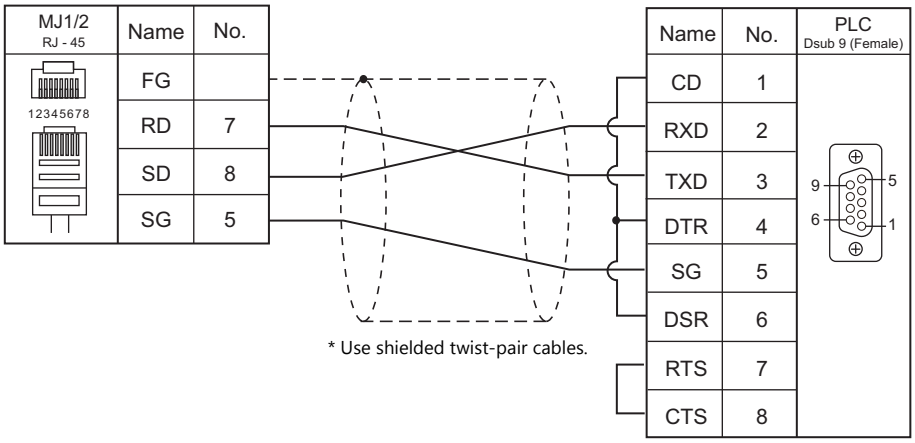


* Use shielded twist-pair cables.

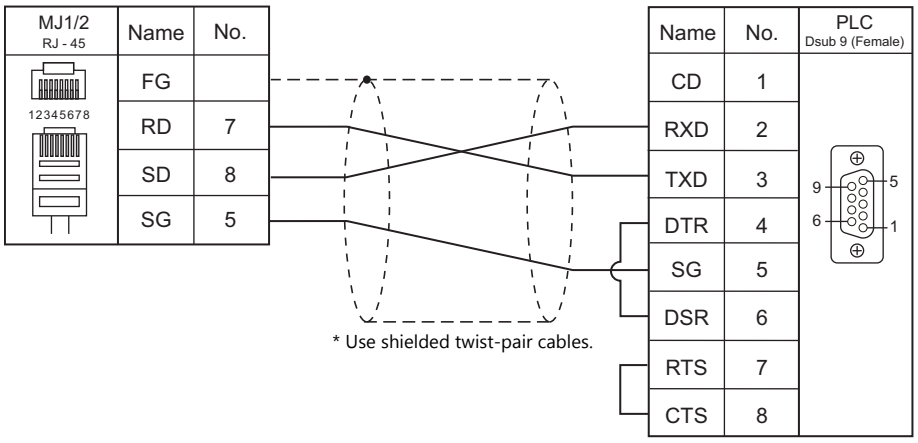
When Connected at MJ1/MJ2:

RS-232C

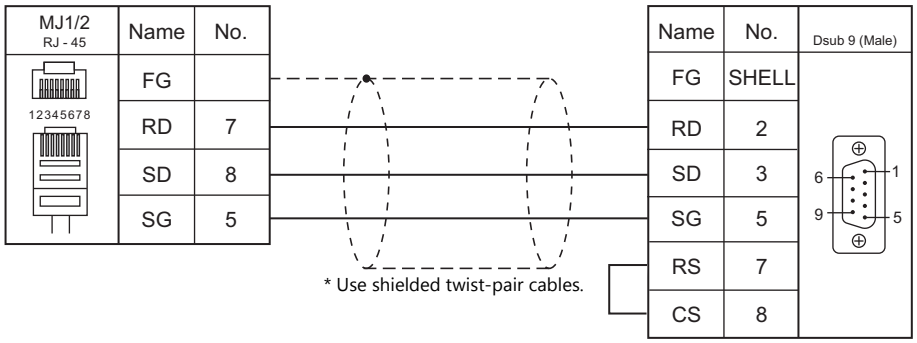
Wiring diagram 1 - M2



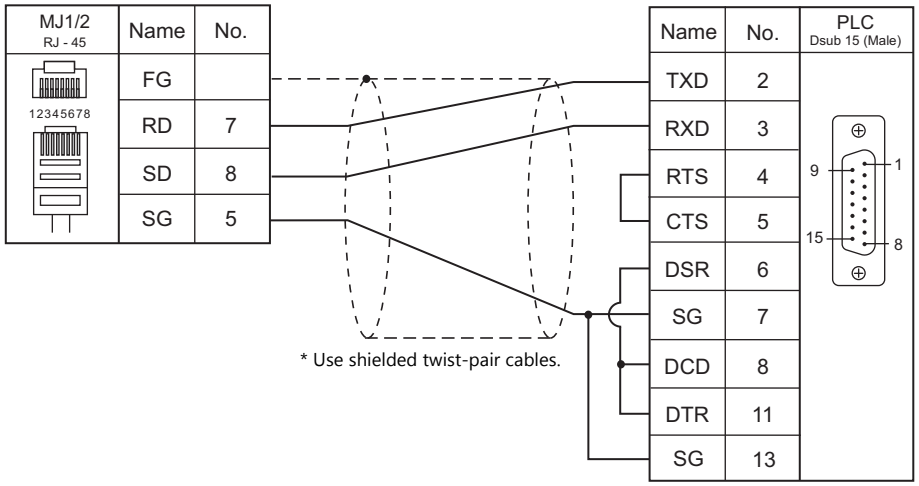
Wiring diagram 2 - M2



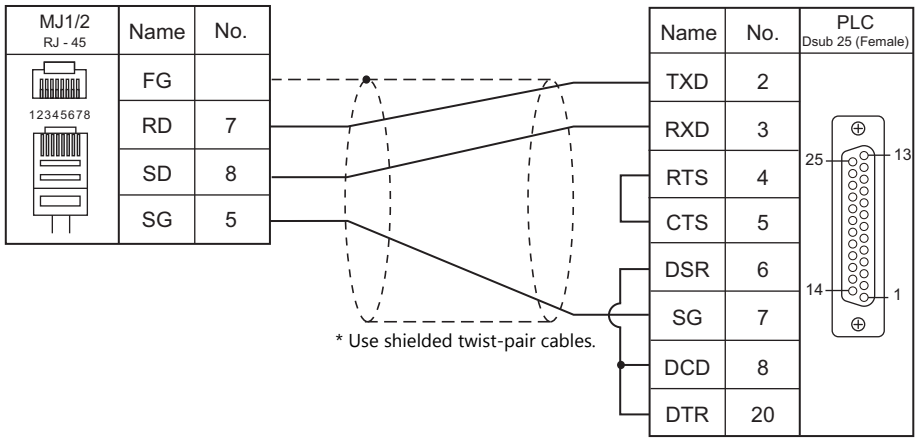
Wiring diagram 3 - M2



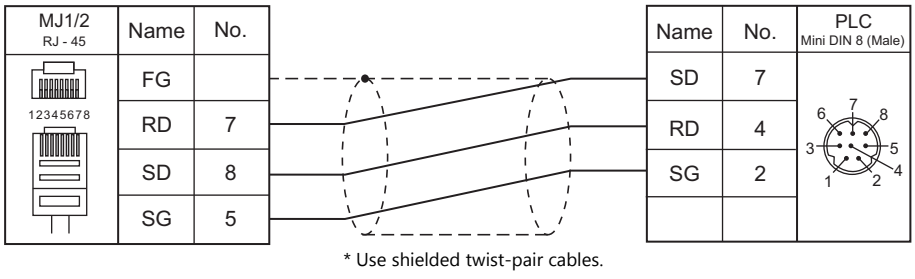
Wiring diagram 4 - M2



Wiring diagram 5 - M2

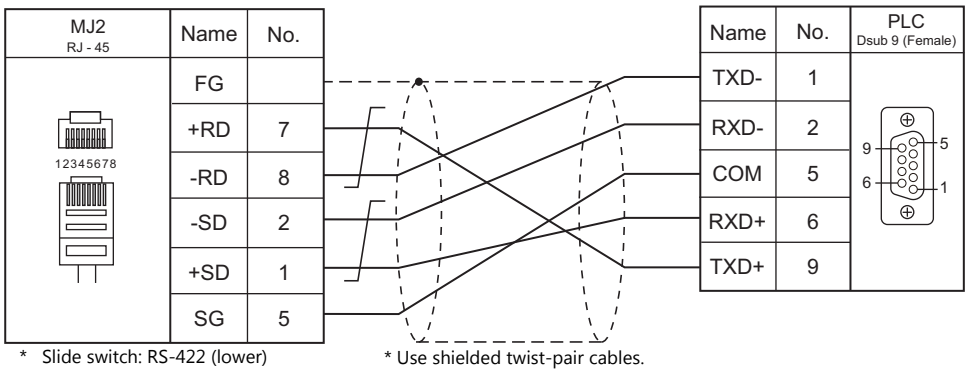


Wiring diagram 6 - M2



RS-422/RS-485

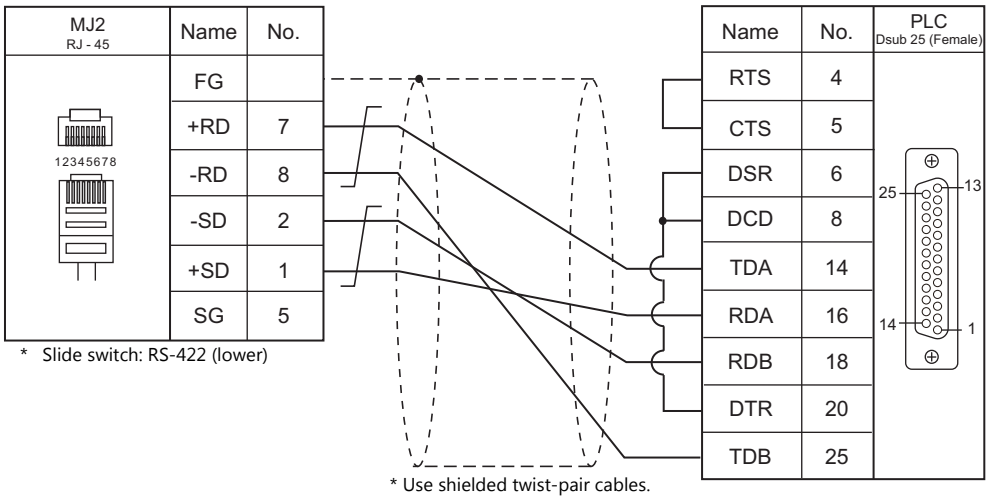
Wiring diagram 1 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

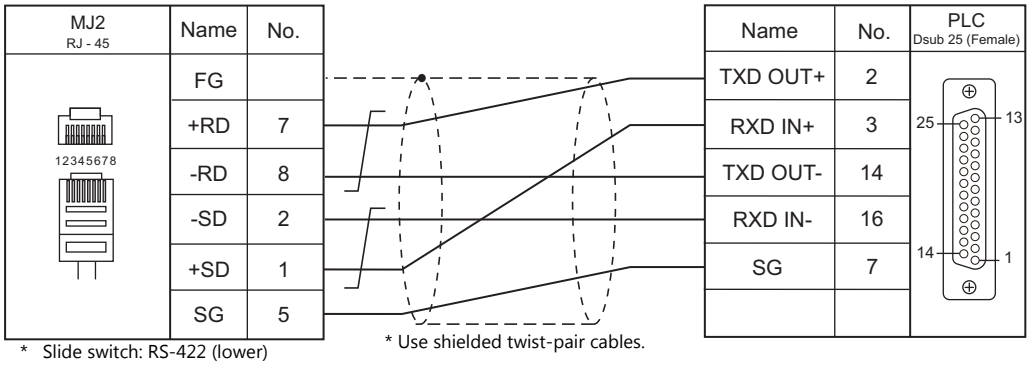
Wiring diagram 2 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 3 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

5. Automationdirect

5.1 PLC Connection

5.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
Direct LOGIC (K-Sequence)	D4-430 D4-440	Port 0	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
		Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	D4-450	Port 0	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		Port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	D2-230	PORT1	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	D2-240 DL05	PORT1					
		PORT2					
	D2-250-1 D2-260 DL06	PORT1					
		PORT2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
Direct LOGIC (MODBUS RTU)	D4-450	Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	D2-250-1 D2-260	PORT2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer *2
Direct LOGIC (Ethernet UDP/IP)	DL05 DL06	H0-ECOM H0-ECOM100	×	○	28784 (fixed)	×
	D2-240 D2-250-1 D2-260	H2-ECOM H2-ECOM100				

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

5.1.1 Direct LOGIC (K-Sequence)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8** bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

D4-450

PORT0

No particular setting is necessary on the PLC. The PLC always performs communication functions using the following parameters. Set the following parameters under [Communication Setting] of the editor.

Item	Setting	
Baud Rate	9600 bps	
Parity	Odd	
Data Length	8	
Stop Bit	1	
Data Type	HEX	

PORT1

Set parameters into the special register "R772, 773", then set "AA5A" (HEX) into the setting complete register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "AAEA" (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R772	0 0 E 0 Communication protocol 80: K-Sequence E0: Automatic recognition (Modbus, CCM, K-Sequence) Communication timeout 0: 800 ms Response delay time 0: 0 ms	00E0H K-Sequence
R773	8 7 0 1 Station number 01 to 1F (HEX) Baud rate 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps Parity stop bit 0: Without parity, stop bit 1 2: Without parity, stop bit 2 8: Odd parity, stop bit 1 A: Odd parity, stop bit 2 C: Even parity, stop bit 1 E: Even parity, stop bit 2	8701H 38400 bps Odd parity Stop bit 1 Station number 01

PORT2

Set parameters into the special register "R774, 775", then set "A5AA" (HEX) into the setting complete register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "AEAA" (HEX), it is regarded as erroneous.

Parameter setting register

Register	Setting	Setting Example
R774	Same as the setting register R772 for PORT1	00E0H
R775	Same as the setting register R773 for PORT1	8701H

PORT3

Set parameters into the special register "R776, 777", then set "5AAA" (HEX) into the setting complete register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "EAAA" (HEX), it is regarded as erroneous.

Parameter setting register

Register	Setting	Setting Example
R776	Same as the setting register R772 for PORT1	00E0H
R777	Same as the setting register R773 for PORT1	8701H

D2-240/D2-250-1

PORT1 / PORT2

No particular setting is necessary on the PLC. The PLC performs communication functions using the following parameters. Set the following parameters under [Communication Setting] of the editor.

Item	Setting	Remarks
Baud Rate	9600 bps	For PORT2: 19200 bps can be set in the special register.
Parity	Odd	
Data Length	8	
Stop Bit	1	
Data Type	HEX	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
V	(data register)	00H	
X	(input)	01H	
Y	(output)	02H	
C	(internal relay)	03H	
S	(stage)	04H	
GX	(transmission relay for all stations)	05H	
GY	(transmission relay for specified station)	06H	
T	(timer/contact)	07H	
CT	(counter/contact)	08H	

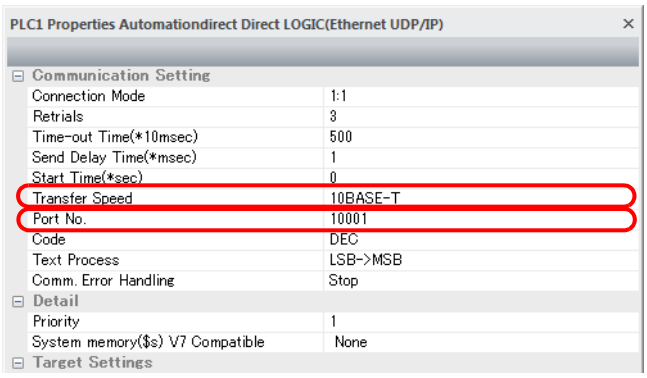
5.1.2 Direct LOGIC (Ethernet UDP/IP)

Communication Setting

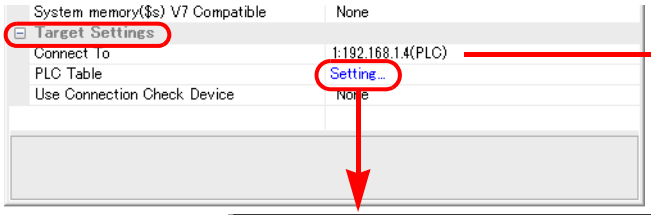
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

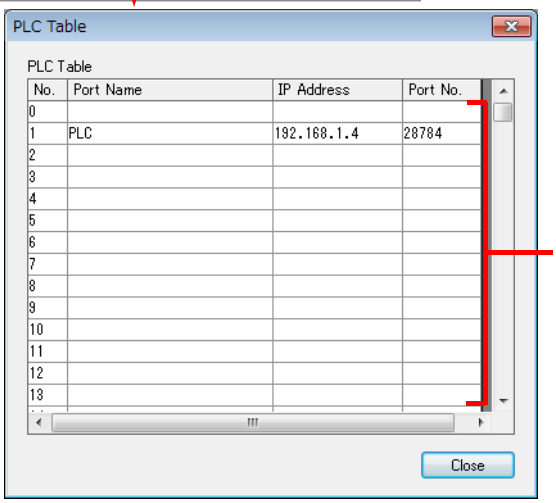
- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
  - For [Transfer Speed], select the same setting as the specification of the connected communication module.*
    For Hx-ECOM: 10BASE-T
    For Hx-ECOM100: 100BASE-TX
    * If the transfer speed is not selected correctly, a check code error occurs.



- IP address and port number (No. 28784) of the PLC
  Register on the [PLC Table] window in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



Valid only for 1 : 1 connection
Select the PLC for connection from those registered on the PLC table.



Set the IP address and port number for the PLC.

DirectLOGIC/SU Series

Make PLC settings by using the software "DirectSOFT". For more information, refer to the PLC manual issued by the manufacturer.

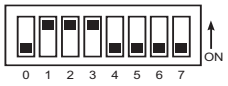
Link wizard

Contents	Setting	Remarks
Transport Protocol	**UDP/IP**	
Module ID	Make settings in accordance with the network environment.	"0" cannot be set. Set all DIP switches on Hx-ECOM to the OFF positions.
IP Address		

* The port number is fixed to "28784".
* The module ID or IP address can also be set by using the Hx-ECOM configuration software "NetEdit3" or HTML of the module (only for Hx-ECOM100). For more information, refer to the PLC manual issued by the manufacturer.

DIP switch

The module ID can be set by the DIP switch.
When any of the DIP switches is set in the ON position upon power-on, the module ID set by the DIP switch will take effect.

DIP Switch	Setting Example	Remarks
	14 (= $2^1 + 2^2 + 2^3$)	Setting range: 1 to 63 Set the value in binary notation by referring to the figures printed on the PCB. Note that the DIP switches 6 and 7 are not used.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
V	(data register)	00H	
X	(input)	01H	
Y	(output)	02H	
C	(internal relay)	03H	
S	(stage)	04H	
GX	(transmission relay for all stations)	05H	
GY	(transmission relay for specified station)	06H	
T	(timer/contact)	07H	
CT	(counter/contact)	08H	

5.1.3 Direct LOGIC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1	

D4-450

PORT1

Set parameters into the special register “R772, 773”, then set “AA5A” (HEX) into the setting complete register “R767”. When the set value at R767 is changed to “AAAA” (HEX), it is regarded as normal; if it is changed to “AAEA” (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R772	0 0 E 0 Communication protocol 20: MODBUS RTU E0: Automatic recognition (Modbus, CCM, K-Sequence) Communication timeout 0: 800 ms Response delay time 0: 0 ms	00E0H
R773	8 6 0 1 Station number 01 to 1F (HEX) Baud rate 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps Parity stop bit 0: Without parity, stop bit 1 2: Without parity, stop bit 2 8: Odd parity, stop bit 1 A: Odd parity, stop bit 2 C: Even parity, stop bit 1 E: Even parity, stop bit 2	8701H 38400 bps Odd parity Stop bit 1 Station number 01

PORT3

Set parameters into the special register "R776, 777", then set "5AAA" (HEX) into the setting complete register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "EAAA" (HEX), it is regarded as erroneous.

Parameter setting register

Register	Setting	Setting Example
R776	Same as the setting register R772 for PORT1	00E0H
R777	Same as the setting register R773 for PORT1	8701H

D2-250-1

PORT2

Set parameters into the special register "R7655, 7656", then set "0500" (HEX) into the setting complete register "R7657". When the set value at R7657 is changed to "0A00" (HEX), it is regarded as normal; if it is changed to "0E00" (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R7655	0 0 2 0 Communication protocol 20: MODBUS RTU Communication timeout 0: Specified time Response delay time 0: 0 ms	0020H
R7656	8 7 0 1 Station number 01 to 7A (HEX) Baud rate 4: 4800 bps 5: 9600 bps <u>6: 19200 bps</u> 7: 38400 bps Parity stop bit 0: Without parity, stop bit 1 2: Without parity, stop bit 2 <u>8: Odd parity, stop bit 1</u> A: Odd parity, stop bit 2 C: Even parity, stop bit 1 E: Even parity, stop bit 2	8701H 38400 bps Odd parity Stop bit 1 Station number 01

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
V	(data register)	00H	
X	(input)	01H	
Y	(output)	02H	
C	(internal relay)	03H	
S	(stage)	04H	
GX	(transmission relay for all stations)	05H	
GY	(transmission relay for specified station)	06H	
T	(timer/contact)	07H	
CT	(counter/contact)	08H	

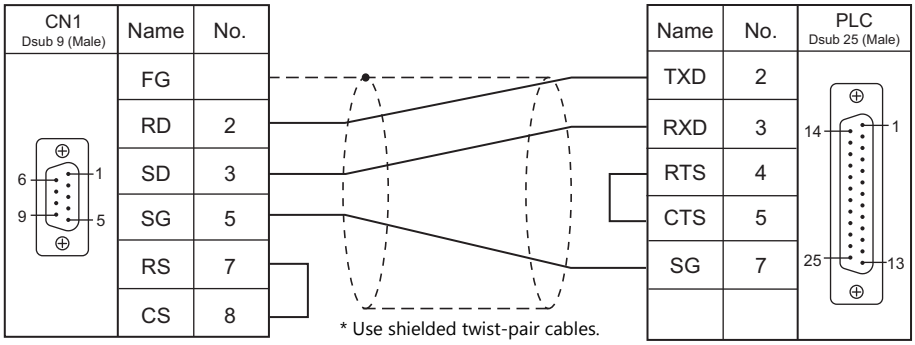
5.1.4 Wiring Diagrams

When Connected at CN1:

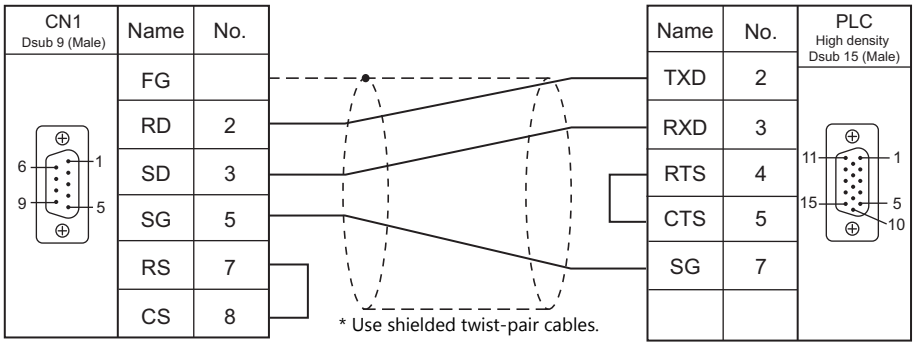
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

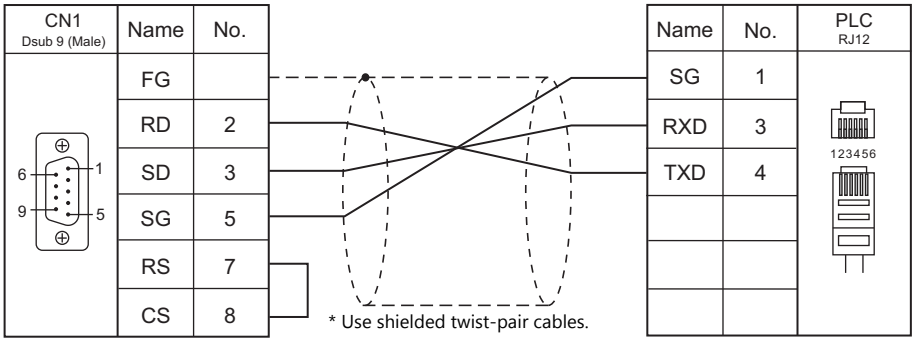
Wiring diagram 1 - C2



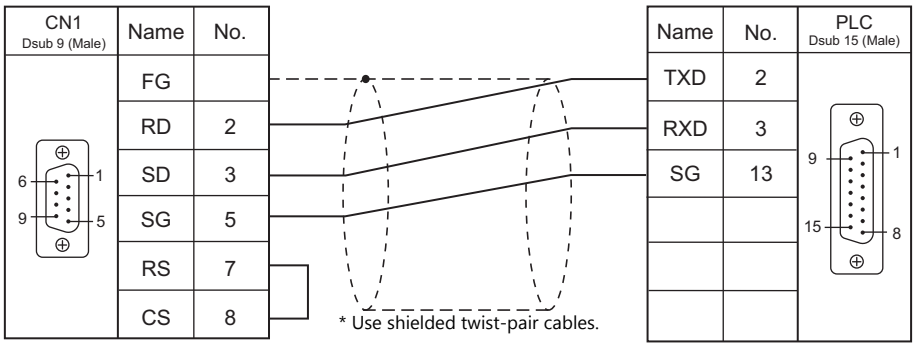
Wiring diagram 2 - C2



Wiring diagram 3 - C2

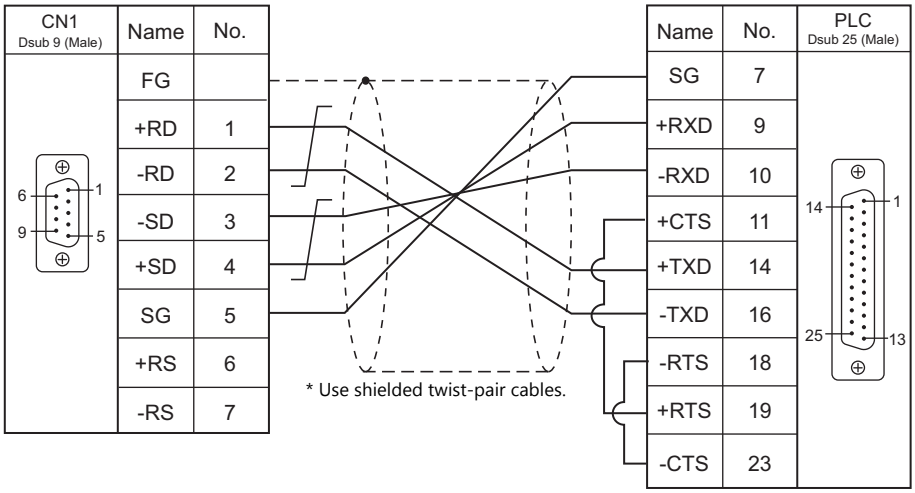


Wiring diagram 4 - C2

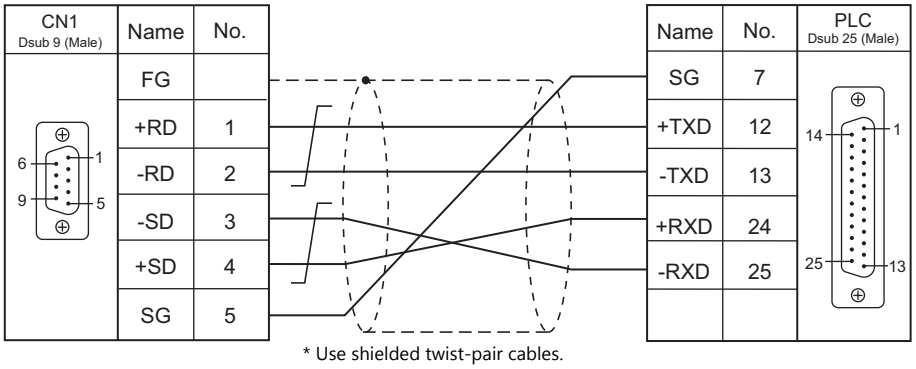


RS-422/RS-485

Wiring diagram 1 - C4

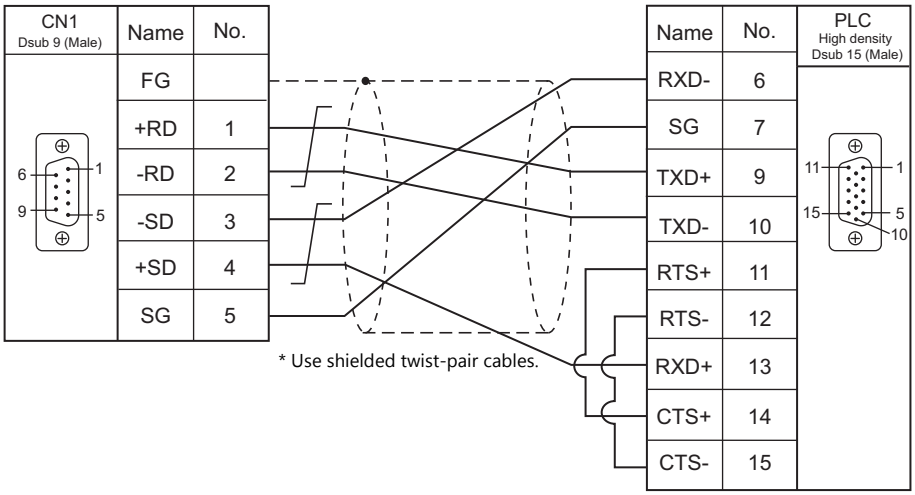


Wiring diagram 2 - C4



* SU-6M: Terminal block connectable

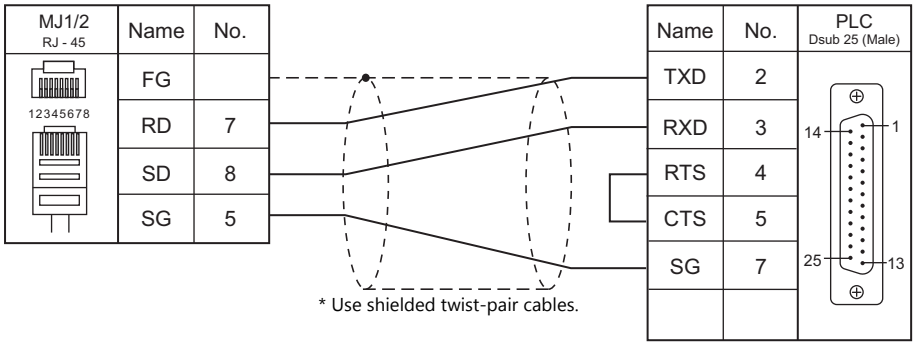
Wiring diagram 3 - C4



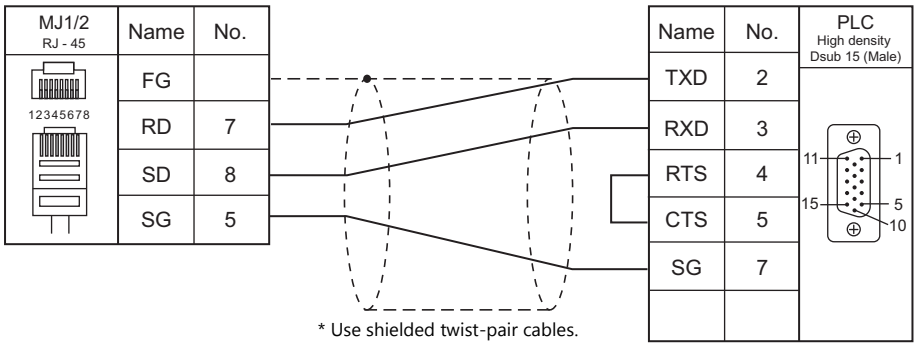
When Connected at MJ1/MJ2:

RS-232C

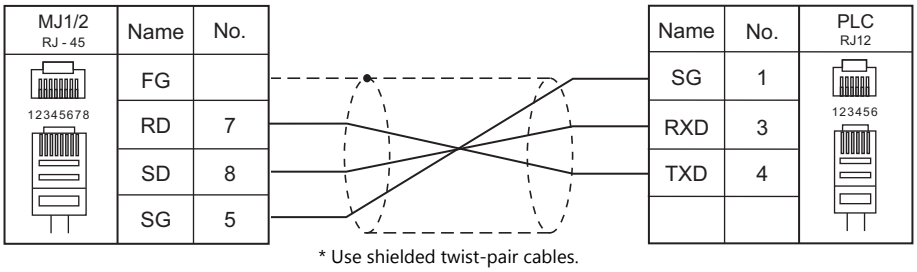
Wiring diagram 1 - M2



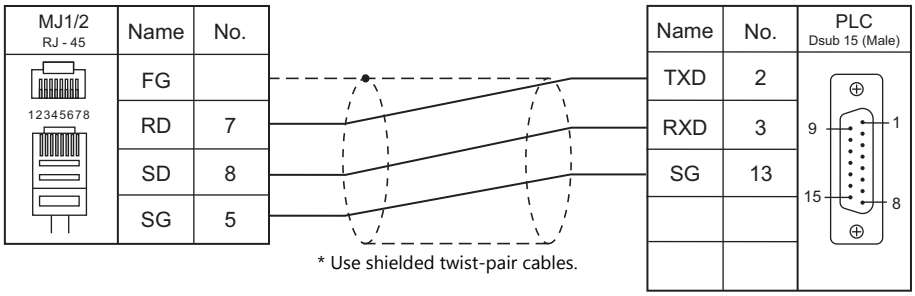
Wiring diagram 2 - M2



Wiring diagram 3 - M2

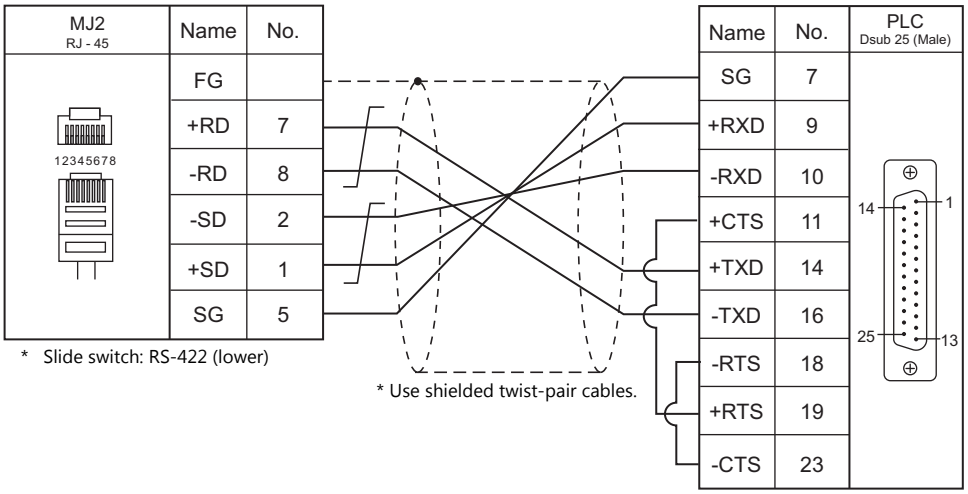


Wiring diagram 4 - M2

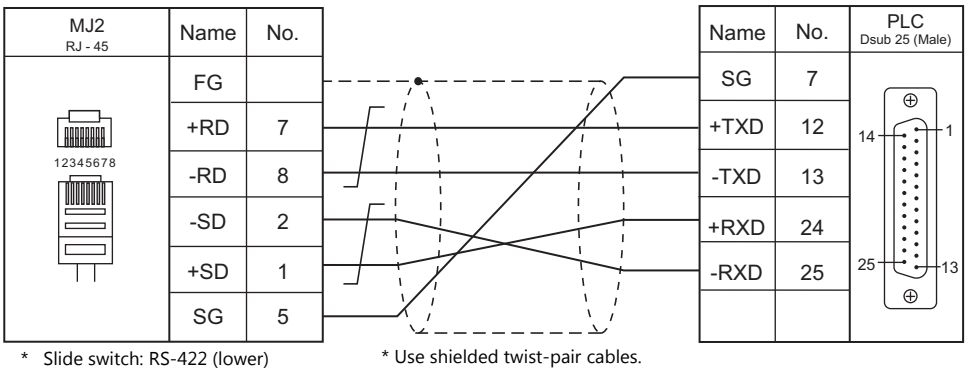


RS-422/RS-485

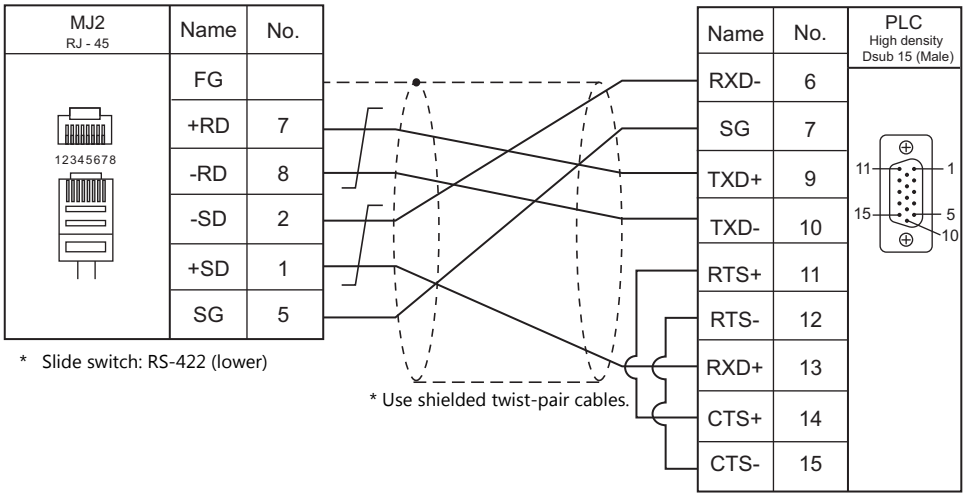
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



6. Azbil

6.1 PLC Connection

6.2 Temperature Controller/Servo/Inverter Connection

6.1 PLC Connection

Serial Connection

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
MX series	MX50	LOAD connector (CN7)	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		ASCII connector (CN8)		Wiring diagram 2 - C2	Wiring diagram 2 - M2		
	MX200	LOAD connector	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		ASCII connector					

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

6.1.1 MX Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even	
Target Port No.	1 to 63, 127	

PLC

MX50

Communication setting

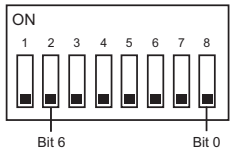
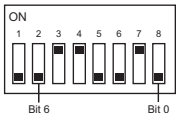
Make the following settings using the application software. For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

Item	Setting	Remarks
Baud rate	4800 / 9600 / 19200 bps	
Data type	Even parity 1 STOP No parity 2 STOP	

Station number

Set a station number using the DIP switches.

DipSW	Setting	Remarks
	1 to 63, 127 (Set a binary number using bits 0 to 6.)	Example: Station No. 50 50(DEC) = 0110010(BIN) 

*** Set SW No. 1 to OFF at all times.**

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS2060. Thus, time correction must be performed on the PLC side.

MX200

Make the following settings on the front panel. For more information, refer to the PLC manual issued by the manufacturer.

LOAD connector

(Underlined setting: default)

Communication Setup Mode		Setting	Remarks
LOAD connector setting	Item 0: Address setting	1 to 63 (DEC): 1 to 63 7F(HEX): 127	Settings can also be made in the PLC application software. For more information, refer to the PLC manual issued by the manufacturer.
	Item 1: Baud rate	48: 4800 bps 96: 9600 bps 192: 19200 bps	
	Item 2: Communication mode	8E1: data length 8 bits, even parity, 1 stop bit 8n2: data length 8 bits, without parity, 2 stop bits	

ASCII connector

(Underlined setting: default)

Communication Setup Mode		Setting	Remarks
ASCII connector setting	Item 0: Baud rate	48: 4800 bps 96: 9600 bps 192: 19200 bps	Settings can also be made in the PLC application software. For more information, refer to the PLC manual issued by the manufacturer.
	Item 1: Data length	7b: 7 bits 8b: 8 bits	
	Item 2: Parity bit	EP: Even oP: Odd nP: None	
	Item 3: Stop bit	1S: 1 bit 2S: 2 bits	
	Item 4: Connector usage	**Ldr: LOAD connector**	
	Item 5: Connecting device selection	**CPL: Azbil communication support device**	
	Item 7: RTS control	**non: No RTS control**	
	Item 8: Signal level selection	**232: RS-232C**	

Station number

Make the following setting on the front panel.

(Underlined setting: default)

MX Address Display/Setting Mode	Setting	Remarks
Addr	1 to 63	

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS2060. Thus, time correction must be performed on the PLC side.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(data register)	00H	R910, 929, 930, 956 to 987, 994 to 997: Read only
M	(auxiliary relay)	01H	M920 to 940, 970 to 990: Read only
L	(latch relay)	02H	
X	(input relay)	03H	
Y	(output relay)	04H	
TP	(timer/current value)	05H	Data format: BCD
TS	(timer/set value)	06H	Data format: BCD
CP	(counter/current value)	07H	Data format: BCD
CS	(counter/set value)	08H	Data format: BCD
T	(timer/contact)	09H	
C	(counter/contact)	0AH	
P	(link register)	0BH	

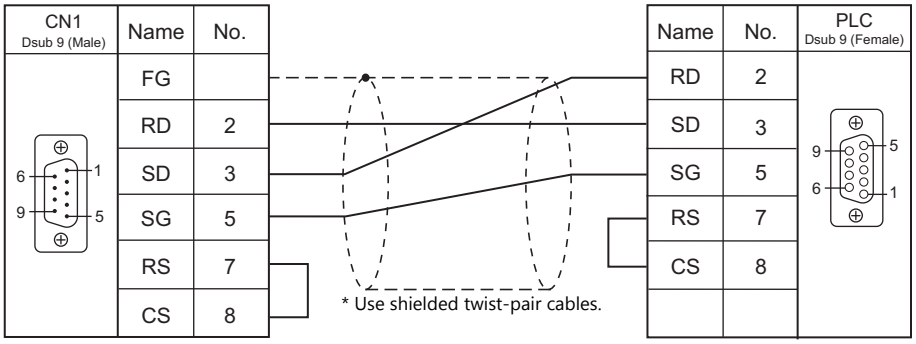
6.1.2 Wiring Diagrams

When Connected at CN1:

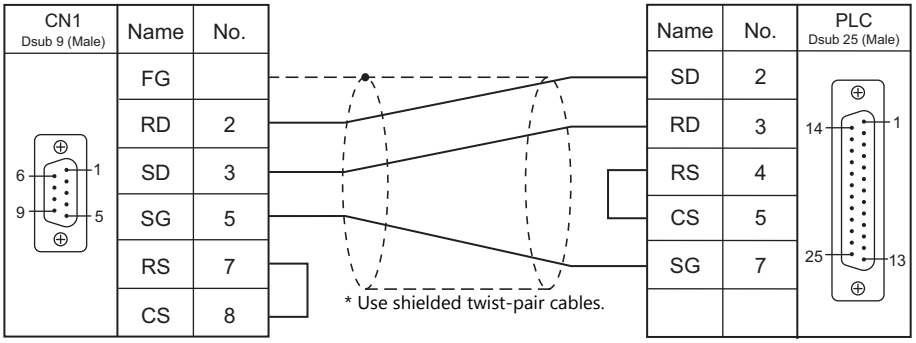
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional “DUR-00”.
> - The “DUR-00” cannot be attached to the TS2060 (model name without “i”). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2



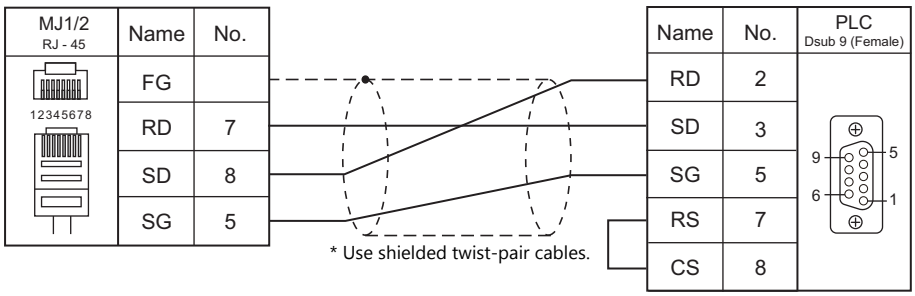
Wiring diagram 2 - C2



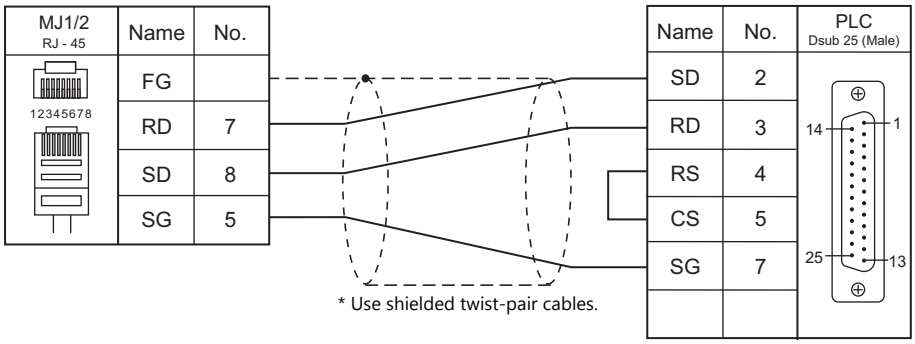
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



Wiring diagram 2 - M2



6.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Digital Indicating Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
SDC10	SDC10xxxxx05xx	Terminal on the back	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		SDC10.Lst
SDC15	SDC15xxxxx03xx SDC15xxxxx06xx	Terminal on the back	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		SDC15.Lst
SDC20	SDC20xxxx02xx SDC20xxxx04xx SDC20xxxx09xx	Terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	SDC20.Lst
	SDC20xxxx03xx SDC20xxxx05xx SDC20xxxx10xx	Terminal on the back	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
SDC21	SDC21xxxx03xx SDC21xxxx06xx SDC21xxxx08xx	Terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	
	SDC21xxxx04xx SDC21xxxx07xx SDC21xxxx09xx	Terminal on the back	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
SDC25/26	SDC25TxxUxx2xx SDC26TxxUxx2xx	Terminal on the back	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		SDC25.Lst
SDC30/31	SDC30xxxx040xx SDC30xxxx041xx	Terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	SDC30.Lst
	SDC31xxxx045xx SDC31xxxx446xx SDC31xxxx546xx						
SDC35/36	SDC35xxxxxx2xx SDC35xxxxxx4xx SDC36xxxxxx2xx SDC36xxxxxx4xx	Terminal on the back	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		SDC36.Lst
SDC45/46	SDC45Axxxxxxx3xx SDC45Axxxxxxx7xx SDC45Vxxxxxxx3xx SDC45Vxxxxxxx7xx SDC46Axxxxxxx3xx SDC46Axxxxxxx7xx SDC46Vxxxxxxx3xx SDC46Vxxxxxxx7xx SDC45A0x1 SDC46A0x1 SDC45RxxxxxR08xx SDC46RxxxxxRx8xx	Terminal on the back	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		SDC45.Lst
SDC40A	SDC40Axxxxxxx2xx	Terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	SDC40A.Lst
	SDC40Axxxxxxx3xx		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
SDC40G	SDC40Gxxxxx095xx	Additional terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	SDC40G.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Module-type Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
DMC10	DMC10S DMC10D	CPL communication terminal	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		DMC10.Lst
DMC50 (COM)	DMC50ME20X DMC50MR20X	RS-485 port 1	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	DMC50.Lst
		Display communication port	RS-485	Wiring diagram 3 - C4	Wiring diagram 3 - M4		
	DMC50CH40X DMC50CH20X DMC50CS40X DMC50CS20X	Display communication port	RS-485				
AHC2001	AHC2001	CPU	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		AHC2001.Lst
		SCU	RS-232C				
			RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4	Wiring diagram 6 - M4	
AHC2001 +DCP31/32	AHC2001	SCU	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4	Wiring diagram 6 - M4	AHC_DCP.Lst
	DCP31Axx0ASxx 2xx DCP32AxxxASxx 2xx	Additional terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	
	IBS	Terminal block					

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Program Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
DCP31/32	DCP31Axx0ASxx 2xx DCP32AxxxASxx 2xx	Additional terminal on the back	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	DCP32.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Instrumentation Network Module

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2*1	MJ2 (4-wire)	
NX (CPL)	NX-D15 NX-D25 NX-D35	Built-in terminal	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		NX_CPL.Lst
NX (MODBUS RTU)		NX-CB1N (terminal) NX-CB1R (terminal)					NX_Mod.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Ethernet Connection (TS2060i Only)

Instrumentation Network Module

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP *1	UDP/IP	Port No.	Lst File
NX (MODBUS TCP/IP)	NX-D15 NX-D25 NX-D35	NX-CB1N NX-CB1R	○	×	502: Default (Max. 2 units)	NX_Mod_Eth.Lst
		NX-CR1	○	×		

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.

6.2.1 SDC10

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Make the following settings.
When the [PARA] key is held down for three seconds or longer in the run mode, the parameter mode is selected. When the [PARA] key is held down for three seconds or longer again, the setup mode is selected.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C22	1 to 31	Communication is disabled when "0" is set.
Communication condition	C23	0: 9600 bps, 8 bits, even parity, 1 stop bit 1: 9600 bps, 8 bits, without parity, 2 stop bit 2: 4800 bps, 8 bits, even parity, 1 stop bit 3: 4800 bps, 8 bits, without parity, 2 stop bit	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without "*": RAM With "*": RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.2 SDC15

Settings are the same as those described in "6.2.7 SDC35/36".

6.2.3 SDC20

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Make the following settings.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C31	1 to 31	Communication is disabled when "0" is set.
Baud rate	C32	0: 9600 bps 1: 4800 bps	
Data type	C33	0: 8 bits, 1 stop bit, even parity 1: 8 bits, 2 stop bit, without parity	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without "*": RAM With "*": RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.4 SDC21

Settings are the same as those described in "6.2.3 SDC20".

6.2.5 SDC25/26

Settings are the same as those described in "6.2.7 SDC35/36".

6.2.6 SDC30/31

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Make the following settings.
When the [PARA] key is held down for three seconds or longer in the run mode, the parameter mode is selected. When the [PARA] key is held down for three seconds or longer again, the setup mode is selected.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C31	1 to 31	Communication is disabled when "0" is set.
Baud rate	C32	0: 9600 bps 1: 4800 bps	
Data type	C33	0: 8 bits, 1 stop bit, even parity 1: 8 bits, 2 stop bit, without parity	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without "*": RAM With "*": RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.7 SDC35/36

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

CPL communication setting

(Underlined setting: default)

Item (Bank)	Indication	Setting	Remarks
Communication type (Setup bank)	C64	**0: CPL**	See "20. MODBUS".
Device address (Setup bank)	C65	1 to 127	Communication is disabled when "0" is set.
Baud rate (Setup bank)	C66	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	
Data type: data length (Setup bank)	C67	0: 7 bits 1: 8 bits	
Data type: parity (Setup bank)	C68	0: Even 1: Odd 2: None	
Data type: stop bit (Setup bank)	C69	0: 1 bit 1: 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without "*": RAM With "*": RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.8 SDC45/46

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 127	

Controller

CPL communication setting

(Underlined setting: default)

Item (Bank)	Indication	Setting	Remarks
Communication type (RS-485 communication bank)	Com.01	**0: CPL**	When establishing a connection in "2: Modbus RTU" format, refer to "28. MODBUS" in book 3 of the TS2060 Connection Manual.
Device address (RS-485 communication bank)	Com.02	1 to 127	Communication is disabled when "0" is set.
Baud Rate (RS-485 communication bank)	Com.03	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	
Data type: data length (RS-485 communication bank)	Com.04	0: 7 bits 1: 8 bits	
Data type: parity (RS-485 communication bank)	Com.05	0: Even 1: Odd 2: None	
Data type: stop bit (RS-485 communication bank)	Com.06	0: 1 bit 1 or 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without asterisk: RAM With asterisk: RAM and EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that frequently reprogrammed parameters be written to RAM, where the number of reprogramming times is not limited. However, when the parameter is written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.9 SDC40A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Make the following settings.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C84	1 to 31	Communication is disabled when "0" is set.
Baud rate	C85	0: 9600 bps, even parity, 1 stop bit 1: 9600 bps, without parity, 2 stop bit 2: 4800 bps, even parity, 1 stop bit 3: 4800 bps, without parity, 2 stop bit	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without "*": RAM With "*": RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.10 SDC40G

Settings are the same as those described in "6.2.9 SDC40A".

6.2.11 DMC10

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Rotary switch for device address

MODULE ADDRESS	Setting	Remarks
	1 to F	Communication is disabled when “0” is set.

CPL communication setting

Make the following settings on the PC loader. (Underlined setting: default)

Setting Items	Setting	Remarks
CPL/MODBUS	**0: CPL**	See “20. MODBUS”.
Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps	
Data type	0: 8 bits / 1 bit / even 1: 8 bits / 2 bits / none	

Available Device Memory

The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	Without “*”: RAM With “*”: RAM + EEPROM

* The number of times EEPROM can be reprogrammed is limited (approx. 100,000 times). Accordingly, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on again, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

6.2.12 DMC50 (COM)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	**8** bits	
Stop Bit	**1** bit	
Parity	**Even**	
Target Port No.	1 to 16	When connecting to the COM module: Station number: COM module Sub-station number: CTRL module When connecting to the CTRL module: Station number: CTRL module Sub-station number: 0
Sub-station No.	0 to 16	

Controller

Rotary address for module address

MODULE ADDRESS	Setting	Remarks
	1 to F	Communication is disabled when “0” is set.

COM module: RS-485 port 1

Make the following settings on the PC loader.

(Underlined setting: default)

Setting Items	Contents	Remarks
Baud rate (port 1)	9600 bps 19200 bps 38400 bps	
Protocol (port 1)	**1: CPL communication**	

CTRL module: Display communication port

Make the following settings on the PC loader.

(Underlined setting: default)

Setting Items	Contents	Remarks
Baud rate for display communication port	9600 bps 19200 bps 38400 bps	

* The display communication port is a dedicated port for 1 : 1 communication.

Available Device Memory

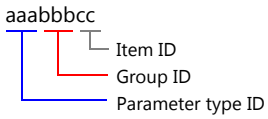
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory (Parameter Type ID)		TYPE	Remarks
000	(NA area)	00H	Double-word
001	(H/W information)	01H	Double-word, read only
002	(calendar time setting)	02H	Double-word
021	(AI setting) high-resolution monitor: for standard input	03H	Double-word
022	(AI setting) special monitor	04H	Double-word
023	(AI setting) high-resolution monitor: for option input	05H	Double-word
041	(AUX-IN setting)	06H	Double-word
045	(AO setting)	07H	Double-word
061	(DO setting)	08H	Double-word
071	(TP setting)	09H	Double-word
074	(zener barrier adjustment value)	0AH	Double-word
0A1	(communication setting: for ME200)	0BH	Double-word, read only
0A2	(communication setting: for MR200)	0CH	Double-word, read only
0A3	(communication setting: front port)	0DH	Double-word, read only
0C1	(system status)	0EH	Double-word, read only
0C3	(calendar time display)	0FH	Double-word, read only
0C4	(log: system alarm)	10H	Double-word
0C5	(log: AI alarm)	11H	Double-word
0C6	(log: AUX-IN alarm)	12H	Double-word
0E1	(AI status)	13H	Double-word, read only
0E2	(AUX-IN setting)	14H	Double-word, read only
0E3	(AO status)	15H	Double-word
0E5	(DI status)	16H	Double-word, read only
0E6	(AO status)	17H	Double-word
0E7	(TP status)	18H	Double-word
0E8	(zener barrier adjustment count)	19H	Double-word, read only
0F1	(communication setting in use: for ME200)	1AH	Double-word, read only
0F2	(communication setting in use: for MR200)	1BH	Double-word, read only
0F3	(communication setting in use: front port)	1CH	Double-word, read only
201	(PID_A setting)	1DH	Double-word
202	(PID_A constant)	1EH	Double-word
203	(PID_A monitor)	1FH	Double-word, read only
211	(PID_CAS setting)	20H	Double-word
212	(PID_CAS constant: master side)	21H	Double-word
213	(PID_CAS constant: slave side)	22H	Double-word
214	(PID_CAS monitor)	23H	Double-word, read only
234	(Ra_PID setting)	24H	Double-word
235	(Ra_PID constant)	25H	Double-word
236	(Ra_PID monitor)	26H	Double-word, read only
241	(UP_PID setting)	27H	Double-word
242	(UP_PID constant)	28H	Double-word
243	(UP_PID monitor)	29H	Double-word, read only
301	(TBL/TBR setting)	2AH	Double-word
801	(user-defined parameter)	2BH	Double-word
802	(user-defined parameter)	2CH	Double-word
803	(user-defined parameter)	2DH	Double-word
804	(user-defined parameter)	2EH	Double-word
805	(user-defined parameter)	2FH	Double-word
806	(user-defined parameter)	30H	Double-word
80D	(user-defined parameter)	31H	Double-word
80E	(user-defined parameter)	32H	Double-word
E01	(user-defined parameter)	33H	Double-word
E02	(user-defined parameter)	34H	Double-word
E04	(user-defined parameter)	35H	Double-word
E05	(user-defined parameter)	36H	Double-word
E06	(user-defined parameter)	37H	Double-word
E07	(user-defined parameter)	38H	Double-word
E08	(user-defined parameter)	39H	Double-word

Device Memory (Parameter Type ID)		TYPE	Remarks
E0A	(user-defined parameter)	3AH	Double-word
E12	(user-defined parameter)	3BH	Double-word
E13	(user-defined parameter)	3CH	Double-word
E14	(user-defined parameter)	3DH	Double-word
E15	(user-defined parameter)	3EH	Double-word
610	(user-defined parameter)	3FH	Double-word
C00	(pattern setup)	40H	Double-word
CF1	(pattern FB monitor)	41H	Double-word, read only
C01	(segment setup)	42H	Double-word
C02	(segment setup)	43H	Double-word
C03	(segment setup)	44H	Double-word
C04	(segment setup)	45H	Double-word
C05	(segment setup)	46H	Double-word
C06	(segment setup)	47H	Double-word
C07	(segment setup)	48H	Double-word
C08	(segment setup)	49H	Double-word
C09	(segment setup)	4AH	Double-word
C0A	(segment setup)	4BH	Double-word
C0B	(segment setup)	4CH	Double-word
C0C	(segment setup)	4DH	Double-word
C0D	(segment setup)	4EH	Double-word
C0E	(segment setup)	4FH	Double-word
C0F	(segment setup)	50H	Double-word
C10	(segment setup)	51H	Double-word
C11	(segment setup)	52H	Double-word
C12	(segment setup)	53H	Double-word
C13	(segment setup)	54H	Double-word
C14	(segment setup)	55H	Double-word
C15	(segment setup)	56H	Double-word
C16	(segment setup)	57H	Double-word
C17	(segment setup)	58H	Double-word
C18	(segment setup)	59H	Double-word
C19	(segment setup)	5AH	Double-word
C1A	(segment setup)	5BH	Double-word
C1B	(segment setup)	5CH	Double-word
C1C	(segment setup)	5DH	Double-word
C1D	(segment setup)	5EH	Double-word
C1E	(segment setup)	5FH	Double-word
C1F	(segment setup)	60H	Double-word

Address denotations

On the signal name reference list, every group ID is designated as “001”. To access any group ID other than “001”, input the desired ID via manual operation.

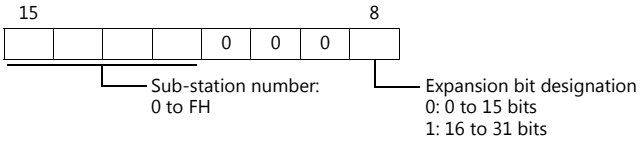


Indirect Device Memory Designation

- When the address (group ID) is 0 to FFH:

	15 8	7 0
n + 0	Model	Device type
n + 1	Group ID	Item ID
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

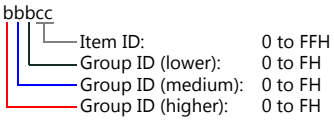
* In the expansion code, specify the sub-station number, and set which word, higher or lower, is to be read when a 2-word address is specified (expansion bit designation).

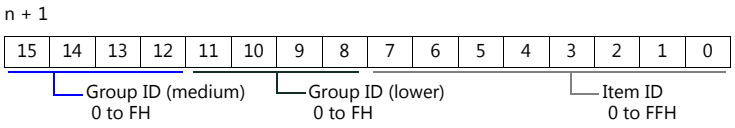


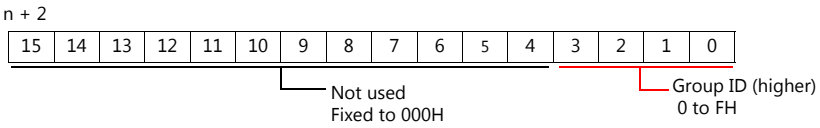
- When the address (group ID) is 100 to FFFH:

	15 8	7 4	3 0
n + 0	Model	Device type	
n + 1	Group ID (medium/lower) *1	Item ID *1	
n + 2	000		Group ID (higher) *1
n + 3	Expansion code *2	Bit designation	
n + 4	00	Station number	

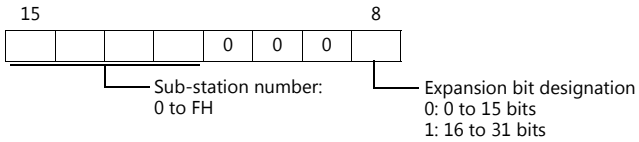
*1 Set the address (group ID + item ID) for "n + 1" and "n + 2".







*2 In the expansion code, specify the sub-station number, and set which word, higher or lower, is to be read when a 2-word address is specified (expansion bit designation).



6.2.13 AHC2001

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 bps	
Data Length	7/ 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

CPU unit RS-232C setting

(Underlined setting: default)

Parameter Type ID	Group ID	Item ID	Setting Items	Contents	Remarks
0D2	001	01	Baud rate (port 1)	9600 bps 19200 bps 38400 bps 57600 bps	
		02	Mode	**1: CPL**	
		03	CPL address	1 to 31	

The following settings are fixed; parity: even, and stop bit: 1 bit.

SCU unit setting

(Underlined setting: default)

Parameter Type ID	Group ID	Item ID	Setting Items	Contents	Remarks
Exx *1	001 002 *2	01	Baud rate	9600 bps 19200 bps 38400 bps	
		02	Data bit length	7: 7 bits 8: 8 bits	
		03	Parity	0: None 1: Even 2: Odd	
		04	Stop bit	1: 1 bit 2: 2 bits	
		05	Half duplex / full duplex	0: Half duplex 1: Full duplex	Half duplex: 2-wire connection Full duplex: 4-wire connection Invalid during RS-232C communication
		07	Protocol selection	2: CPL server	

*1 xx: Unit position 01 to 10H
The unit position varies depending on the mounting position of the SCU unit.

*2 Group ID of port 1 (RS-232C): 001, group ID of port 2 (RS-485): 002

Available Device Memory

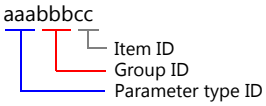
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory (Parameter Type ID)		TYPE	Remarks
000	(NA area)	00H	Double-word
001	(H/W information)	01H	Double-word, read only
002	(calendar time setting)	02H	Double-word
0C3	(calendar time display)	03H	Double-word, read only
0D0	(system information data)	04H	Double-word, read only
0D1	(unit information data)	05H	Double-word, read only
0D2	(CPU unit RS-232C setting)	06H	Double-word, read only
0D3	(system operation setting)	07H	Double-word, read only
0D4	(system configuration setting)	08H	Double-word, read only
0D5	(analog cycle setting)	09H	Double-word, read only
0D6	(memory capacity monitor)	0AH	Double-word, read only
201	(PID_A setting)	0BH	Double-word
202	(PID_A constant)	0CH	Double-word
203	(PID_A monitor)	0DH	Double-word, read only
211	(PID_CAS setting)	0EH	Double-word
212	(PID_CAS constant: master side)	0FH	Double-word
213	(PID_CAS constant: slave side)	10H	Double-word
214	(PID_CAS monitor)	11H	Double-word, read only
234	(Ra_PID setting)	12H	Double-word
235	(Ra_PID constant)	13H	Double-word
236	(Ra_PID monitor)	14H	Double-word, read only
241	(UP_PID setting)	15H	Double-word
242	(UP_PID constant)	16H	Double-word
243	(UP_PID monitor)	17H	Double-word, read only
301	(TBL/TBR setting)	18H	Double-word
600	(PLC link basic setting)	19H	Double-word, read only
801	(user-defined area)	1AH	Double-word
802	(user-defined area)	1BH	Double-word
803	(user-defined area)	1CH	Double-word
804	(user-defined area)	1DH	Double-word
805	(user-defined area)	1EH	Double-word
806	(user-defined area)	1FH	Double-word
807	(user-defined area)	20H	Double-word
808	(user-defined area)	21H	Double-word
809	(user-defined area)	22H	Double-word
80A	(user-defined area)	23H	Double-word
80B	(user-defined area)	24H	Double-word
80C	(user-defined area)	25H	Double-word
80D	(user-defined area)	26H	Double-word
80E	(user-defined area)	27H	Double-word
80F	(user-defined area)	28H	Double-word
810	(user-defined area)	29H	Double-word
811	(user-defined area)	2AH	Double-word
812	(user-defined area)	2BH	Double-word
813	(user-defined area)	2CH	Double-word
814	(user-defined area)	2DH	Double-word
815	(user-defined area)	2EH	Double-word
816	(user-defined area)	2FH	Double-word
817	(user-defined area)	30H	Double-word
820	(user-defined area)	31H	Double-word
E01	(user-defined area)	32H	Double-word
E02	(user-defined area)	33H	Double-word
E03	(user-defined area)	34H	Double-word
E04	(user-defined area)	35H	Double-word
F01	(user-defined area)	36H	Double-word
F02	(user-defined area)	37H	Double-word
F03	(user-defined area)	38H	Double-word
F04	(user-defined area)	39H	Double-word

Device Memory (Parameter Type ID)		TYPE	Remarks
F05	(user-defined area)	3AH	Double-word
F06	(user-defined area)	3BH	Double-word

Address denotations

On the signal name reference list, every group ID is designated as "001". To access any group ID other than "001", manually input the desired ID.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
ISaGRAF application Start/stop	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0: Stop 1: Start	
ISaGRAF application Current status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
		n + 2	0: Stop 1: Run	
Reserve for parameter backup	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 2	

Return data: Data stored from temperature controller to TS2060

6.2.14 AHC2001+DCP31/32

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

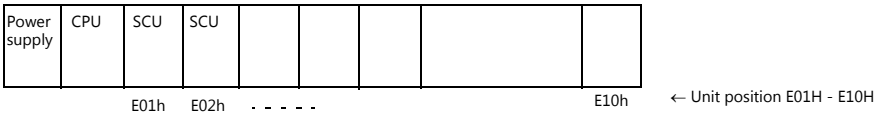
Controller

AHC2001 SCU unit setting

(Underlined setting: default)

Parameter Type ID	Group ID	Item ID	Setting Items	Contents	Remarks
Exx *1	002	01	Baud rate	9600 bps 19200 bps 38400 bps	
		02	Data bit length	7: 7 bits 8: 8 bits	
		03	Parity	0: None 1: Even 2: Odd	
		04	Stop bit	1: 1 bit 2: 2 bits	
		05	Half duplex / full duplex	0: Half duplex 1: Full duplex	Half duplex: 2-wire connection Full duplex: 4-wire connection
		07	Protocol selection	2: CPL server	

*1 xx: Unit position 01 to 10H
The unit position varies depending on the mounting position of the SCU unit.



DCP31/32

Setting group: Make the following setting on the setup data.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C84	1 to 31	Communication is disabled when "0" is set.
Baud rate	C85	0: 9600 bps, even parity, 1 stop bit 1: 9600 bps, without parity, 2 stop bit 2: 4800 bps, even parity, 1 stop bit 3: 4800 bps, without parity, 2 stop bit	
Data type	C93	0: Additional terminal	

IBS (air-fuel ratio controller)

Set the baud rate by the jumper setting (J2) on the CPU board.

(Underlined setting: default)

Item		Setting	Remarks
J2	RS-485 Baud rate setting	9600 bps: short-circuited between 1 and 2, 3 and 4, open between 5 and 6 4800 bps: open between 1 and 2, short-circuited between 3 and 4, open between 5 and 6	

Available Device Memory

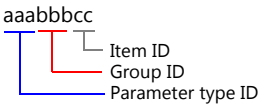
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory (Parameter Type ID)		TYPE	Remarks
000	(NA area)	00H	AHC2001, double-word
001	(H/W information)	01H	AHC2001, double-word, read only
002	(calendar time setting)	02H	AHC2001, double-word
0C3	(calendar time display)	03H	AHC2001, double-word, read only
0D0	(system information data)	04H	AHC2001, double-word, read only
0D1	(unit information data)	05H	AHC2001, double-word, read only
0D2	(CPU unit RS-232C setting)	06H	AHC2001, double-word, read only
0D3	(system operation setting)	07H	AHC2001, double-word, read only
0D4	(system configuration setting)	08H	AHC2001, double-word, read only
0D5	(analog cycle setting)	09H	AHC2001, double-word, read only
0D6	(memory capacity monitor)	0AH	AHC2001, double-word, read only
201	(PID_A setting)	0BH	AHC2001, double-word
202	(PID_A constant)	0CH	AHC2001, double-word
203	(PID_A monitor)	0DH	AHC2001, double-word, read only
211	(PID_CAS setting)	0EH	AHC2001, double-word
212	(PID_CAS constant: master side)	0FH	AHC2001, double-word
213	(PID_CAS constant: slave side)	10H	AHC2001, double-word
214	(PID_CAS monitor)	11H	AHC2001, double-word, read only
234	(Ra_PID setting)	12H	AHC2001, double-word
235	(Ra_PID constant)	13H	AHC2001, double-word
236	(Ra_PID monitor)	14H	AHC2001, double-word, read only
241	(UP_PID setting)	15H	AHC2001, double-word
242	(UP_PID constant)	16H	AHC2001, double-word
243	(UP_PID monitor)	17H	AHC2001, double-word, read only
301	(TBL/TBR setting)	18H	AHC2001, double-word
600	(PLC link basic setting)	19H	AHC2001, double-word, read only
801	(user-defined area)	1AH	AHC2001, double-word
802	(user-defined area)	1BH	AHC2001, double-word
803	(user-defined area)	1CH	AHC2001, double-word
804	(user-defined area)	1DH	AHC2001, double-word
805	(user-defined area)	1EH	AHC2001, double-word
806	(user-defined area)	1FH	AHC2001, double-word
807	(user-defined area)	20H	AHC2001, double-word
808	(user-defined area)	21H	AHC2001, double-word
809	(user-defined area)	22H	AHC2001, double-word
80A	(user-defined area)	23H	AHC2001, double-word
80B	(user-defined area)	24H	AHC2001, double-word
80C	(user-defined area)	25H	AHC2001, double-word
80D	(user-defined area)	26H	AHC2001, double-word
80E	(user-defined area)	27H	AHC2001, double-word
80F	(user-defined area)	28H	AHC2001, double-word
810	(user-defined area)	29H	AHC2001, double-word
811	(user-defined area)	2AH	AHC2001, double-word
812	(user-defined area)	2BH	AHC2001, double-word
813	(user-defined area)	2CH	AHC2001, double-word
814	(user-defined area)	2DH	AHC2001, double-word
815	(user-defined area)	2EH	AHC2001, double-word
816	(user-defined area)	2FH	AHC2001, double-word
817	(user-defined area)	30H	AHC2001, double-word

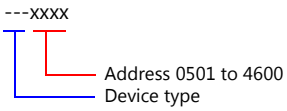
Device Memory (Parameter Type ID)		TYPE	Remarks
820	(user-defined area)	31H	AHC2001, double-word
E01	(user-defined area)	32H	AHC2001, double-word
E02	(user-defined area)	33H	AHC2001, double-word
E03	(user-defined area)	34H	AHC2001, double-word
E04	(user-defined area)	35H	AHC2001, double-word
F01	(user-defined area)	36H	AHC2001, double-word
F02	(user-defined area)	37H	AHC2001, double-word
F03	(user-defined area)	38H	AHC2001, double-word
F04	(user-defined area)	39H	AHC2001, double-word
F05	(user-defined area)	3AH	AHC2001, double-word
F06	(user-defined area)	3BH	AHC2001, double-word
---	(DCP)	3CH	DCP31/32

Address denotations

- AHC2001
  On the signal name reference list, every group ID is designated as “001”. To access any group ID other than “001”, manually input the desired ID.



- DCP31/32
  The address for DCP31/32 is not provided in the signal name reference list. Manually set the address by referring to the instruction manual for DCP31/32.



PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (= $u n)		F2
ISaGRAF application Start/stop	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0: Stop 1: Start	
ISaGRAF application Current status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
		n + 2	0: Stop 1: Run	
Reserve for parameter backup	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 2	

Return data: Data stored from temperature controller to TS2060

6.2.15 DCP31/32

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Controller

Setting group: Make the following setting on the setup data.

(Underlined setting: default)

Item	Indication	Setting	Remarks
Communication address	C84	1 to 31	Communication is disabled when “0” is set.
Baud rate	C85	0: 9600 bps, even parity, 1 stop bit 1: 9600 bps, without parity, 2 stop bit 2: 4800 bps, even parity, 1 stop bit 3: 4800 bps, without parity, 2 stop bit	
Data type	C93	0: Additional terminal	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	

6.2.16 NX (CPL)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 127	

Controller

Make the following settings on [Actual Module Configuration] in the [SLP-NX] software.

(Underlined setting: default)

Item	Setting	Remarks
RS-485 Address	1 to 127	Communication is disabled when "0" is set.
RS-485 Protocol	**CPL**	
RS-485 Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
RS-485 Bit Length	7 / 8 bits	
RS-485 Parity Setting	None / Odd / Even	
RS-485 Stop Bit	1 / 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	

6.2.17 NX (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 127	

Controller

Make the following settings on [Actual Module Configuration] in the [SLP-NX] software.

(Underlined setting: default)

Item	Setting	Remarks
RS-485 Address	1 to 127	Communication is disabled when "0" is set.
RS-485 Protocol	**MODBUS (RTU)**	
RS-485 Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
RS-485 Bit Length	**8 bits**	
RS-485 Parity Setting	None / Odd / Even	
RS-485 Stop Bit	1 / 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	02H	

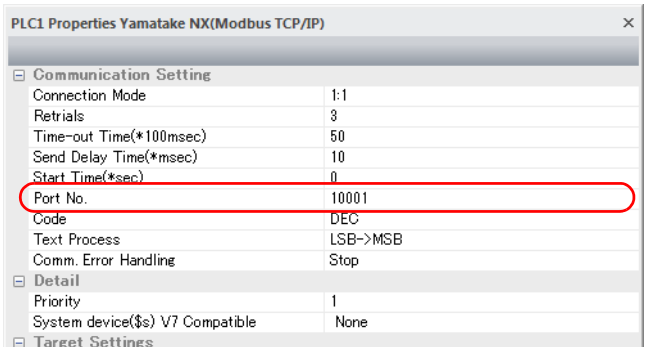
6.2.18 NX (MODBUS TCP/IP)

Communication Setting

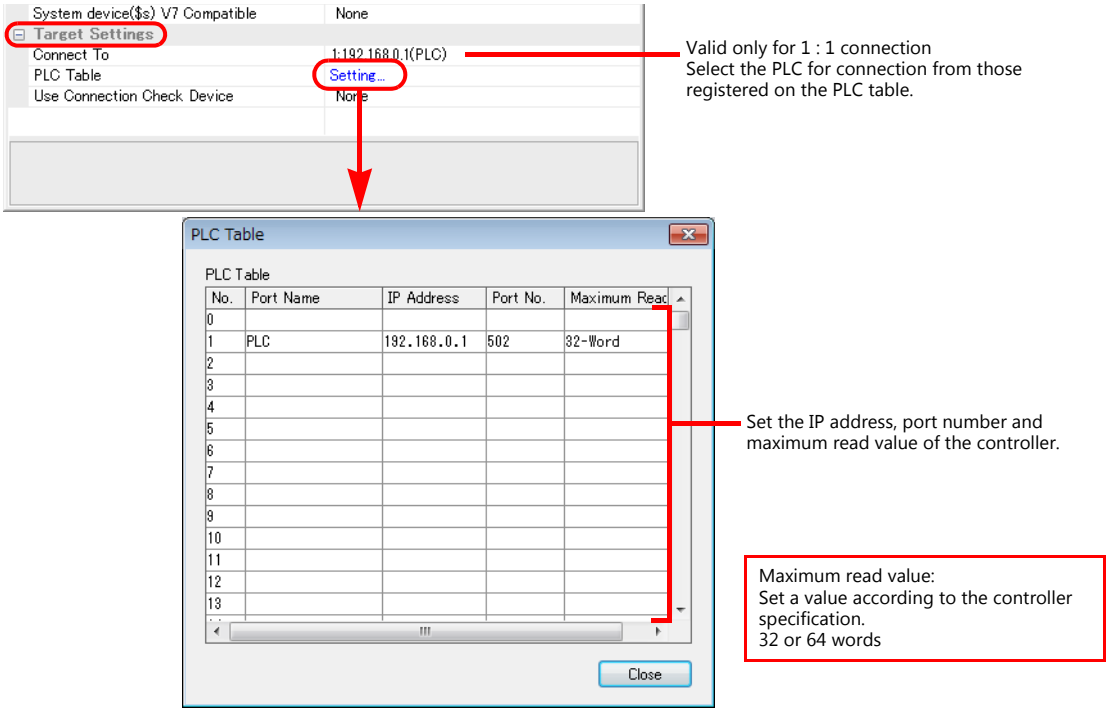
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



- IP address, port number, and maximum read value of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



Controller

Make the following settings on [Actual Module Configuration] in the [SLP-NX] software.

Item		Remarks
IP Address	-	
IP Setting	Net mask	
	Default gateway	
Port Setting	MODBUS communication port number	Default: 502

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	02H	

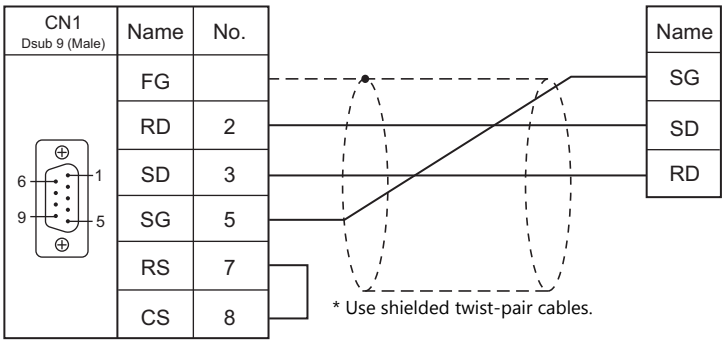
6.2.19 Wiring Diagrams

When Connected at CN1:

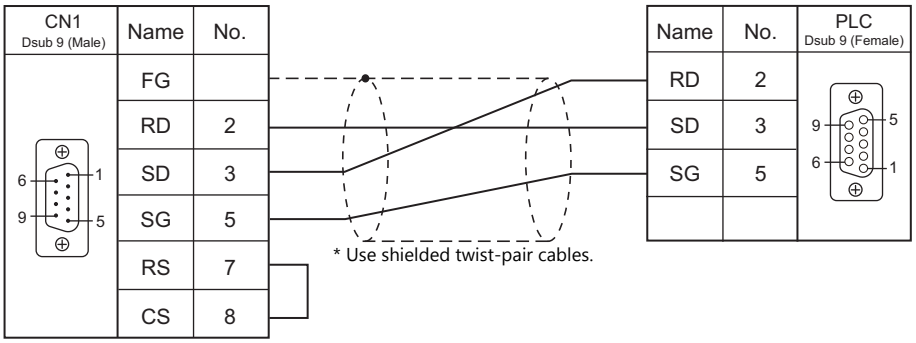
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

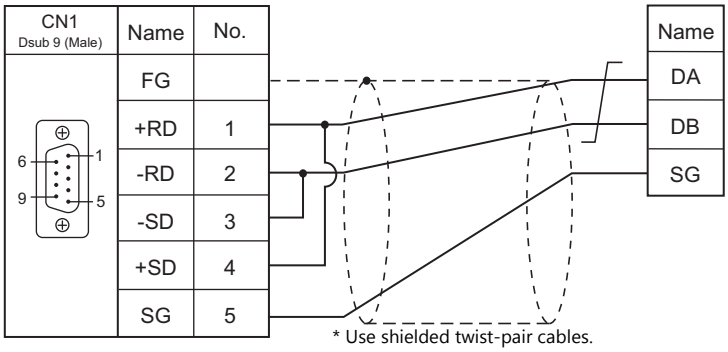


Wiring diagram 2 - C2

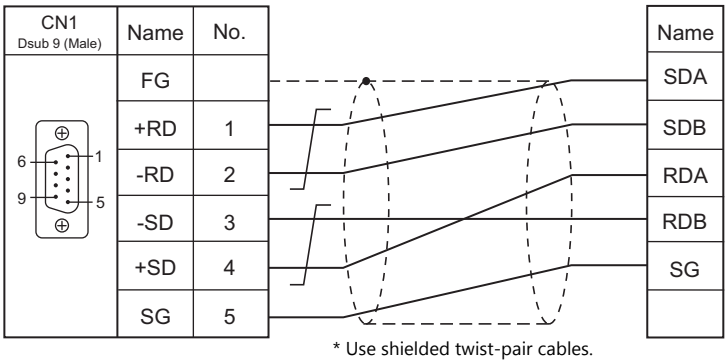


RS-422/RS-485

Wiring diagram 1 - C4

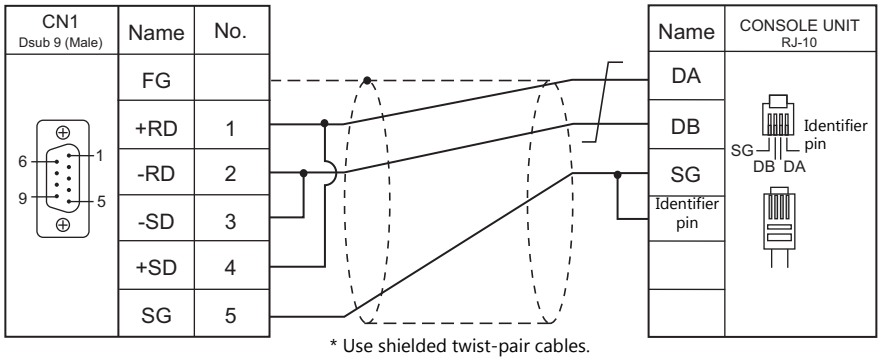


Wiring diagram 2 - C4



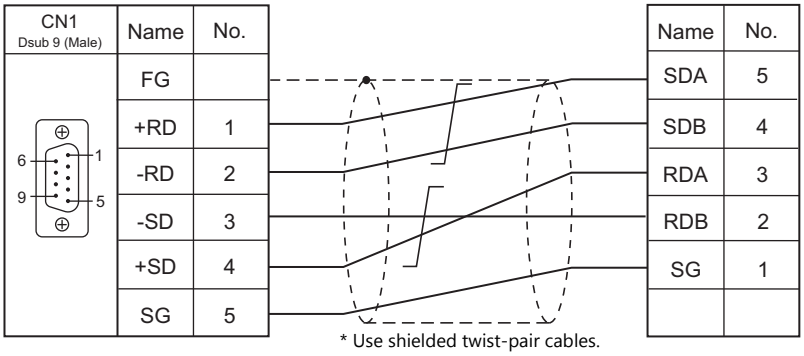
* Use shielded twist-pair cables.

Wiring diagram 3 - C4



* Use shielded twist-pair cables.

Wiring diagram 4 - C4

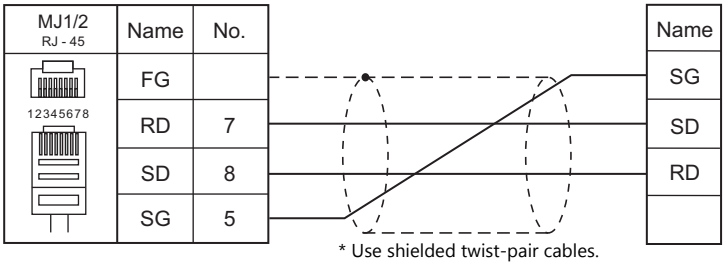


* Use shielded twist-pair cables.

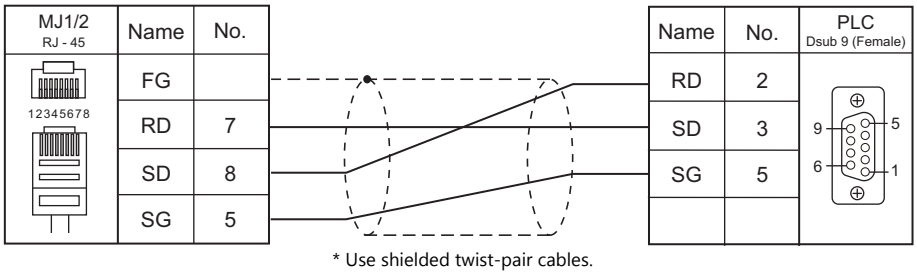
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

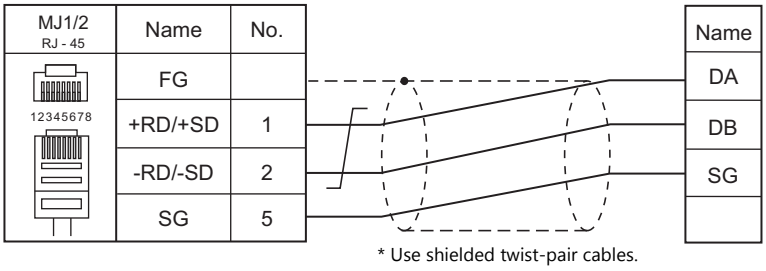


Wiring diagram 2 - M2

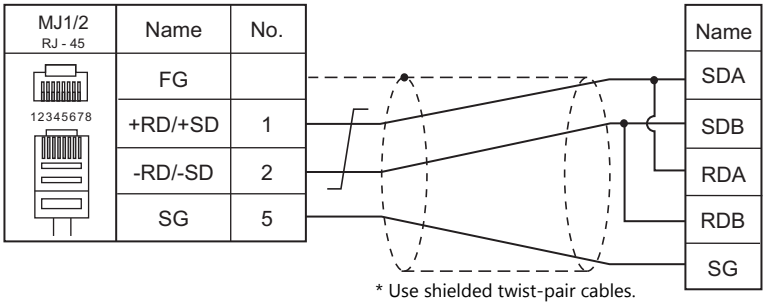


RS-422/RS-485

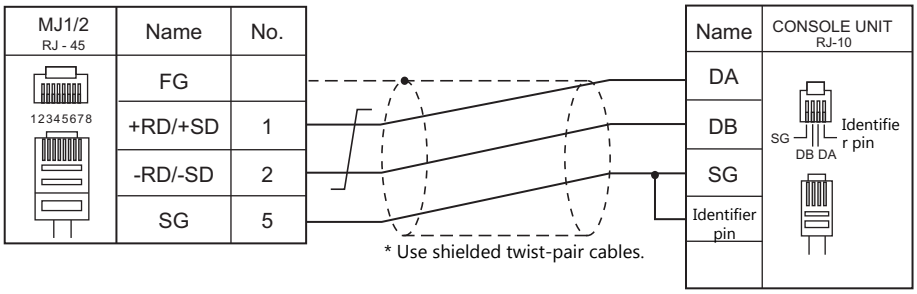
Wiring diagram 1 - M4



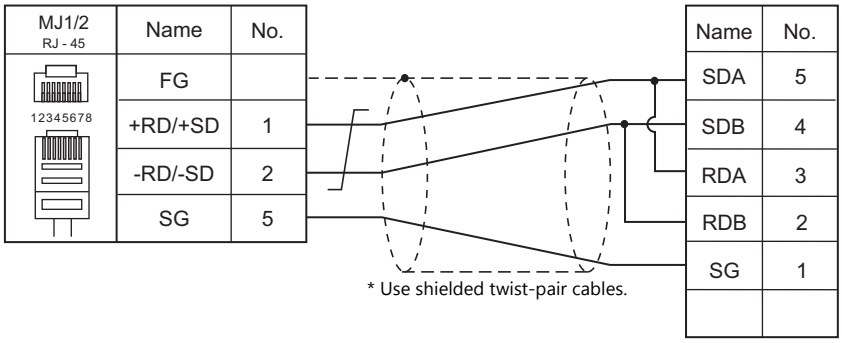
Wiring diagram 2 - M4



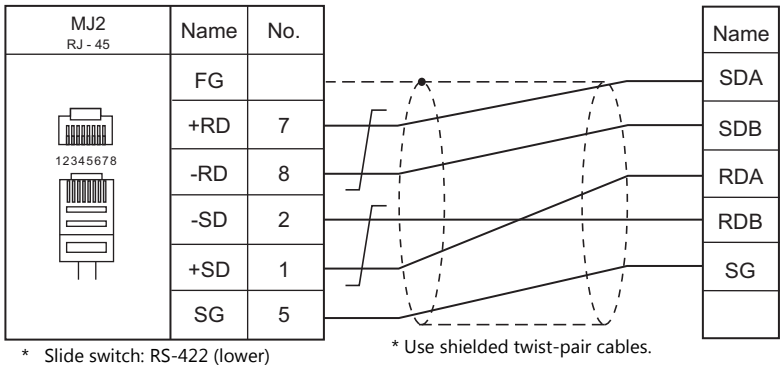
Wiring diagram 3 - M4



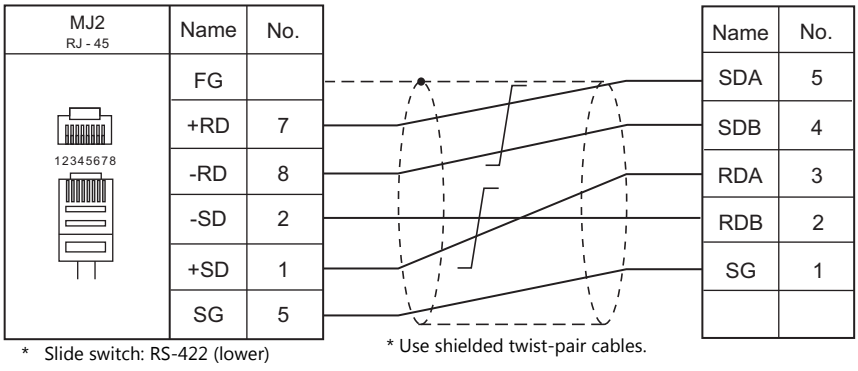
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



MEMO

7. Banner

7.1 Temperature Controller/Servo/Inverter Connection

7.1 Temperature Controller/Servo/Inverter Connection

Ethernet Connection (TS2060i Only)

Vision Sensor

PLC Selection on the Editor	CPU	Port	TCP/IP*1	UDP/IP	Port No.	Keep Alive*2	Lst File
PresencePLUS (Ethernet/IP (TCP/IP))	PresencePLUS P4 PresencePLUS Pro	Ethernet	○	×	44818	×	BPPVS_Eth.Lst

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS2060i Only)".

7.1.1 PresencePLUS (Ethernet/IP (TCP/IP))

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

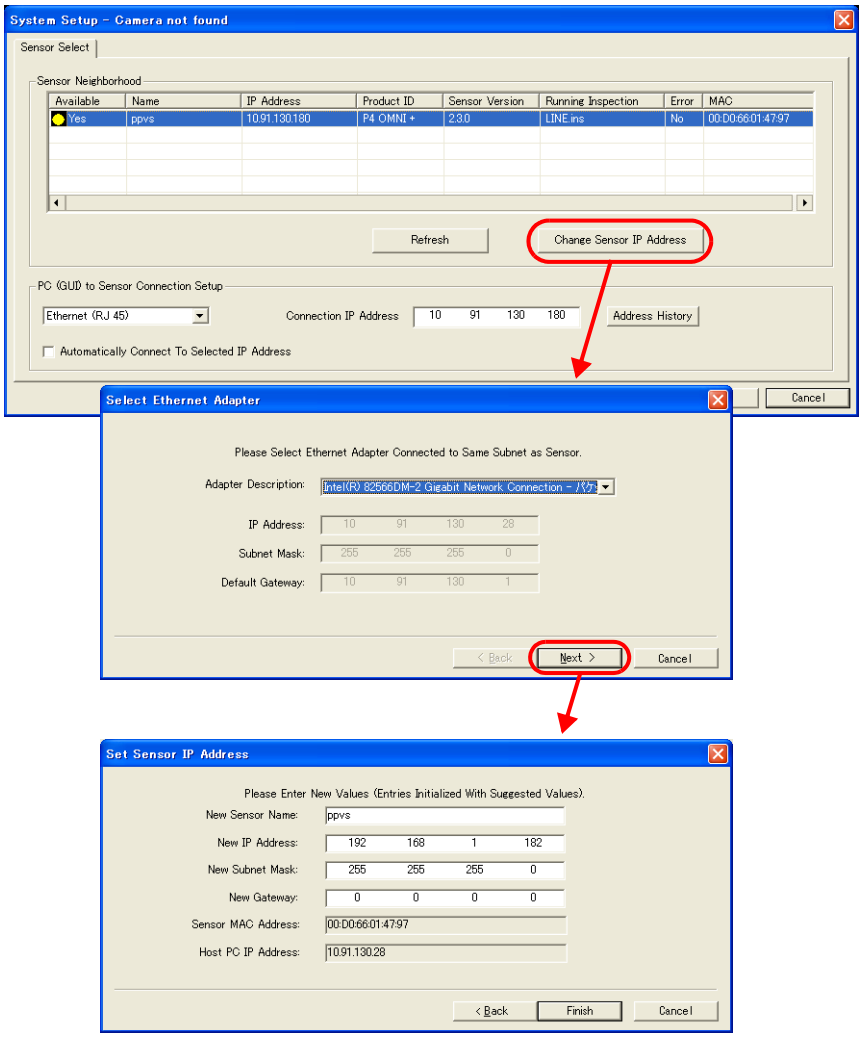
Network camera display settings must be configured to display images from the sensor on the TS2060i series.
For more information, refer to "1.3 Network Camera" in the TS2060i Series Reference Manual 2.

Vision Sensor

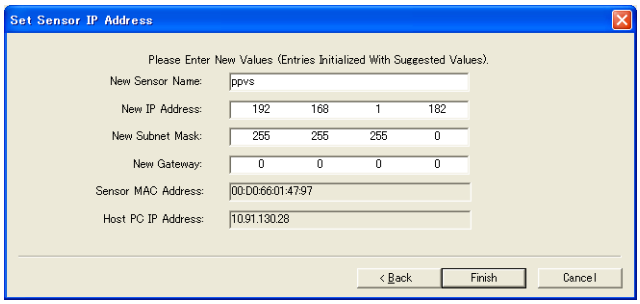
Make settings using Banner's dedicated software "Presence PLUS". For more information, refer to the manual of the vision sensor.

System setup

Click [Change Sensor IP Address] to display the [Set Sensor IP Address] window and configure the IP address and subnet mask settings.



Sensor IP address settings



Item	Setting	Remarks
New Sensor Name	Set a name for the sensor.	
New IP Address	Set the IP address of the sensor.	
New Subnet Mask	Set the subnet mask of the sensor.	
New Gateway	Specify according to the environment.	
Sensor MAC Address	The MAC address of the sensor is displayed.	
Host PC IP Address	The IP address of the computer to which the sensor is connected is displayed.	

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
PI1	(PPVS_INPUT)	00H	
PO1	(PPVS_OUTPUT1)	01H	Read only
PO2	(PPVS_OUTPUT2)	02H	Read only
PO3	(PPVS_OUTPUT3)	03H	Read only
PO4	(PPVS_OUTPUT4)	04H	Read only
PO5	(PPVS_OUTPUT5)	05H	Read only

MEMO

8. Baumuller

8.1 PLC Connection

8.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)*2	
BMx-x-PLC	BMx-x-PLC	RS-232C port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		RS-422 port	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

8.1.1 BMx-x-PLC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	

PLC

No particular setting is necessary on the PLC.

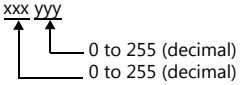
Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
DB (Data Block)	00H	

* The assigned device memory is expressed as shown on the right when editing the screen.

Example: DB xxx yyy



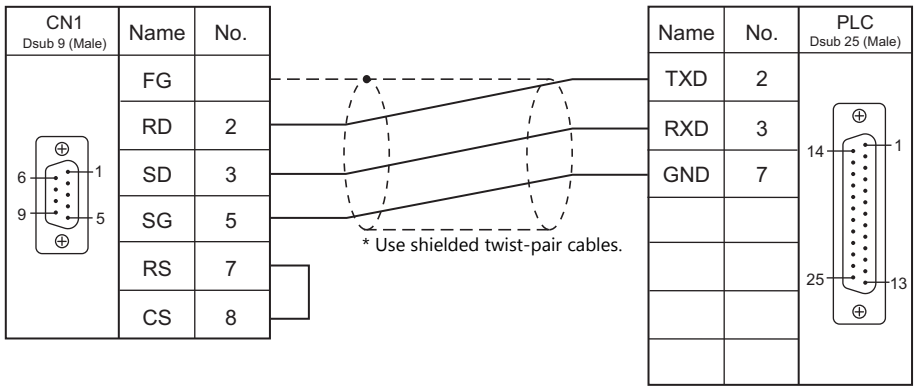
8.1.2 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

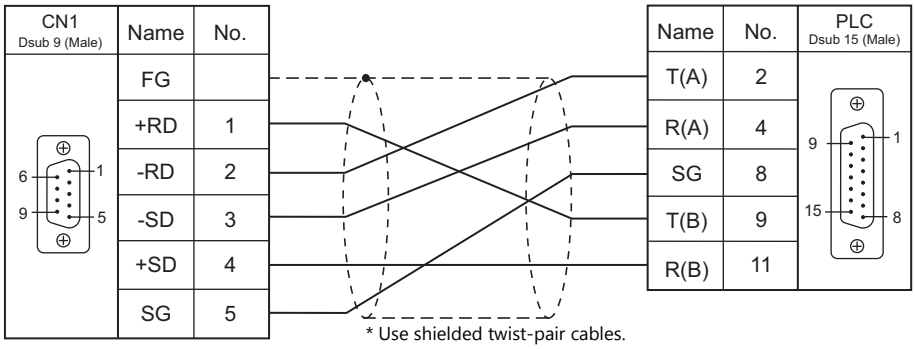
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

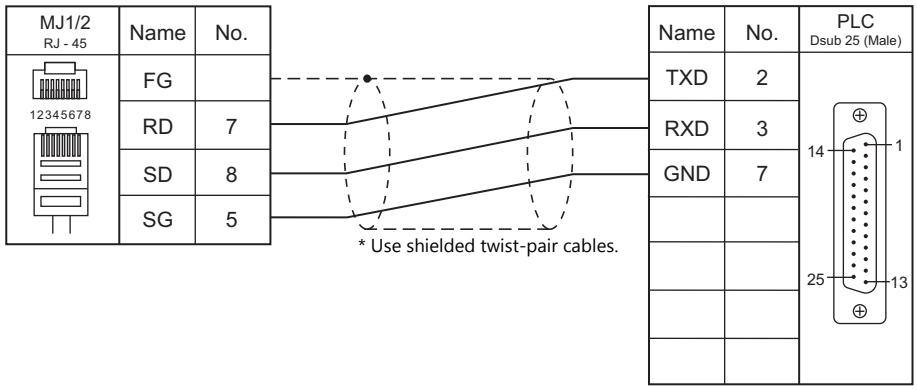
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

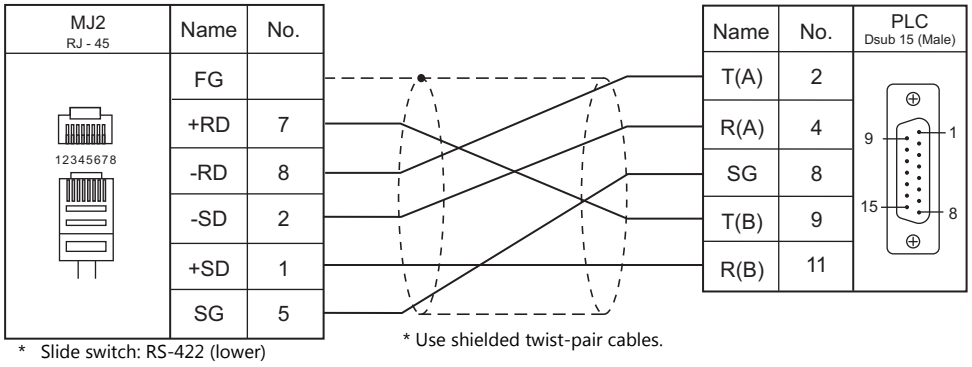
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



9. BECKHOFF

9.1 PLC Connection

9.1 PLC Connection

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	LAN port	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer *2
ADS protocol (Ethernet)	BC9000 BC9100 BX9000	KLxxxx *3	CPU (built-in)	○	×	48898 fixed	×

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.
*3 Use the same voltage (24 V) as for the CPU.

9.1.1 ADS Protocol (Ethernet)

Communication Setting

Editor

Communication settings

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

IP address setting

1. Set the DIP switches 9 and 10 to OFF.
2. Connect the PLC with the computer.
3. Launch "Command Prompt" on the computer.
4. Enter "Arp -a" and execute it.
   The IP address (xxx.xxx.xxx.xxx) and the MAC address (zzz.zzz.zzz.zzz) of the PLC previously set are displayed.
   (Check whether you can ping the IP address of the PLC ("ping xxx.xxx.xxx.xxx") successfully.)
5. Enter "Arp -d xxx.xxx.xxx.xxx" (IP address displayed in step 4.) and execute.
6. Enter "Arp -s yyy.yyy.yyy.yyy zzz.zzz.zzz.zzz" (new IP address and MAC address) and execute.
7. Enter "ping -l 123 yyy.yyy.yyy.yyy" (new IP address) and execute it. The new IP address becomes valid.

Port No.

TCP/IP port No. 48898 (fixed)

Available Device Memory

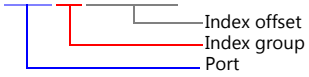
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
P100-0	Port 100 - Index group 0	00H	
P300-I	Port 300 - Inputs	01H	Read only *1
P300-O	Port 300 - Outputs	02H	Write only *1
P800-I	Port 800 - Inputs	03H	*1
P800-O	Port 800 - Outputs	04H	*1
P800-F	Port 800 - Flags	05H	*1
P801-I	Port 801 - Inputs	06H	*1
P801-O	Port 801 - Outputs	07H	*1
P801-F	Port 801 - Flags	08H	*1
P811-I	Port 811 - Inputs	09H	*1
P811-O	Port 811 - Outputs	0AH	*1
P811-F	Port 811 - Flags	0BH	*1
P821-I	Port 821 - Inputs	0CH	*1
P821-O	Port 821 - Outputs	0DH	*1
P821-F	Port 821 - Flags	0EH	*1
P831-I	Port 831 - Inputs	0FH	*1
P831-O	Port 831 - Outputs	10H	*1
P831-F	Port 831 - Flags	11H	*1
P350-I	Port 350 - Inputs	12H	Read only *1
P350-O	Port 350 - Outputs	13H	Write only *1
P851-I	Port 851 - Inputs	14H	*1
P851-O	Port 851 - Outputs	15H	*1
P851-F	Port 851 - Flags	16H	*1
P852-I	Port 852 - Inputs	17H	*1
P852-O	Port 852 - Outputs	18H	*1
P852-F	Port 852 - Flags	19H	*1
P853-I	Port 853 - Inputs	1AH	*1
P853-O	Port 853 - Outputs	1BH	*1
P853-F	Port 853 - Flags	1CH	*1
P854-I	Port 854 - Inputs	1DH	*1
P854-O	Port 854 - Outputs	1EH	*1
P854-F	Port 854 - Flags	1FH	*1

* Access to the device memory area is not allowed if a password is set for the area.
*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

Address denotations

The assigned device memory is expressed as shown below when editing the screen.
Example: P800 - F00000001



Indirect Device Memory Designation

For P300 / P800 / P801 device memory:
Specify a value obtained by dividing the address by 2. (Discard the fraction.)

Example: With indirect device memory designation, "9" is assigned for "P300-I00000013".
13 (HEX) = 19 (DEC)
19 ÷ 2 = 9.5

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Access Inputs	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 0001H	
		n + 2	Port *1	
		n + 3	Index Group *2	
		n + 4		
		n + 5	Index Offset *2	
		n + 6		
		n + 7	Data	
Access Outputs	1 - 8 (PLC1 - 8)	n	Station number	8
		n + 1	Command: 0002H	
		n + 2	Port *1	
		n + 3	Index Group *2	
		n + 4		
		n + 5	Index Offset *2	
		n + 6		
		n + 7	Data	

Return data: Data stored from temperature controller to TS2060i

*1 Port setting values

Port	Name
100	Logger (only NT - Log)
110	Eventlogger
300	IO
301	Additional Task 1
302	Additional Task 2
500	NC
801 / 851	PLC Run-time System 1
811 / 852	PLC Run-time System 2
821 / 853	PLC Run-time System 3
831 / 854	PLC Run-time System 4
900	Camshaft Controller
10000	System Service
14000	Scope

*2 Setting values for "Index Group" and "Index Offset"

Access		Index Group	Index Offset	Description
Input	Output			
○	○	00004020H	0 - 65535	READ_M / WRITE_M
○	×	00004025H	0	PLCADS_IGR_RMSIZE
○	○	0000F003H	0	GET_SYMHANDLE_BYNAME
○	○	0000F005H	0 - 4294967295	READ_SYMVAL_BYHANDLE WRITE_SYMVAL_BYHANDLE
×	○	0000F006H	0	RELEASE_SYMHANDLE
○	○	0000F020H	0 - 4294967295	READ_I / WRITE_I
○	×	0000F025H	0	ADSIGRP_IOIMAGE_RISIZE
○	○	0000F030H	0 - 4294967295	READ_Q / WRITE_Q
○	×	0000F035H	0	ADSIGRP_IOIMAGE_ROSIZE

10. Bosch Rexroth

10.1 Temperature Controller/Servo/Inverter Connection

10.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Servo

PLC Selection on the Editor	Model		Port	Signal Level	Wiring Diagram			Lst File
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
IndraDrive	IndraDrive C	HCS02 HCS03 HCS02.1 HCS03.1	RS-232C Port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		None
	IndraDrive M	HMD01 HMS01 HMS02 HMV01 HMV02						

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

10.1.1 IndraDrive

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	**1: n**	
Signal Level	RS-232C / RS-422 / 485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Parity	None / Odd / Even	
Data Length	**8 bits**	
Stop Bit	**1 bit**	

Servo

Item	Setting	Remarks
Parity	None / Odd / Even	

Baud rate, data length, and stop bit settings are not required.

Available Device Memory

There are no device memory.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
SIS version acquisition	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 1H	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	
		n + 3	mmVnn: SIS version (character string)	
		:		
		n + 7		
FWA number acquisition	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 2H	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	
		n + 3	FWA number (character string) (Max. 20 words)	
		:		
		n + 22		

Contents	F0	F1 (=$u n)		F2
Unit type code acquisition	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 3H	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	
		n + 3	Unit type code (character string) (Max. 20 words)	
		:		
		n+22		
Acquisition of supported baud rate	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 4H	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	
		n + 3	Supported baud rate 0: 9600 bps 1: 19200 bps 2: 38400 bps 4: 57600 bps 8: 115.2 kbps	
Shutdown	1 to 8 (PLC1 to 8)	n	Target Port No.	5
		n + 1	Command: 290H	
		n + 2	Shutdown target 0: Firmware 1: Load routine	
		n + 3	Starting address (lower)	
		n + 4	Starting address (higher)	
		n + 5	Execution result 0H: Normal termination 9002H: Firmware deleted 9003H: Shutdown phase 3 not permitted 9004H: Shutdown phase 4 not permitted	
Reboot	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 291H	
		n + 2	Starting address (lower)	
		n + 3	Starting address (higher)	
		n + 4	Execution result 0H: Normal termination 9102H: Firmware deleted 9103H: Reboot phase 3 not permitted 9104H: Reboot phase 4 not permitted	
Data reading	1 to 8 (PLC1 to 8)	n	Target Port No.	5
		n + 1	Command: 292H	
		n + 2	Starting address (lower)	
		n + 3	Starting address (higher)	
		n + 4	Reading size (Max. 244 bytes)	
		n + 5	Execution result 0H: Normal termination 9200H: Reading range error	
		n + 6	Data to read (Max. 122 words)	
		:		
		n + 127		

Contents	F0	F1 (=$u n)		F2
Header top address acquisition	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 293H	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	
		n + 3	Header top address (lower)	
		n + 4	Header top address (higher)	
Memory initialization	1 to 8 (PLC1 to 8)	n	Target Port No.	6
		n + 1	Command: 294H	
		n + 2	Starting address (lower)	
		n + 3	Starting address (higher)	
		n + 4	Block length (lower)	
		n + 5	Block length (higher)	
		n + 6	Execution result 0H: Normal termination 9400H: Initialization timeout 940A: Initialization of only loader possible	
Data writing	1 to 8 (PLC1 to 8)	n	Target Port No.	7 ~ 126
		n + 1	Command: 296H	
		n + 2	Starting address (lower)	
		n + 3	Starting address (higher)	
		n + 4	Device memory type 2: MEM_RAM 3: MEM_DPR 4: MEM_FLASH	
		n + 5	Writing data length (unit: bytes) m: 1 to 240	
		n + 6	Data to write (m/2 words)	
		:		
		n+(6+m/2) *1	Execution result 0H: Normal termination 96FFH: Range error (other than RAM specified) 96E0H: Programming error of Flash 96E1H: Programming timeout of Flash	
Checksum setting	1 to 8 (PLC1 to 8)	n	Target Port No.	6
		n + 1	Command: 297H	
		n + 2	Starting address (lower)	
		n + 3	Starting address (higher)	
		n + 4	Module size (lower)	
		n + 5	Module size (higher)	
		n + 6	Execution result 0H: Normal termination 9701H: Checksum setting error 9702H: CRC32 checksum error	
Error reset	1 to 8 (PLC1 to 8)	n	Target Port No.	2
		n + 1	Command: 29FH	
		n + 2	Execution result 0: Successful completion Other than 0: Abnormal termination	

Contents	F0	F1 (=$u n)		F2
Timeout setting	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 301H	
		n + 2	Specified timeout time	
		n + 3	Execution result 0: Successful completion Other than 0: Abnormal termination	

Return data: Data stored from servo to TS2060

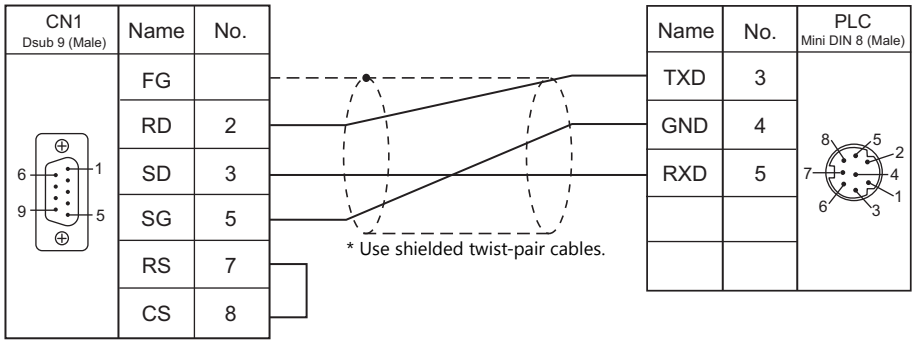
*1 "m/2" is rounded up to the nearest integer.

10.1.2 Wiring Diagrams

When Connected at CN1:

RS-232C

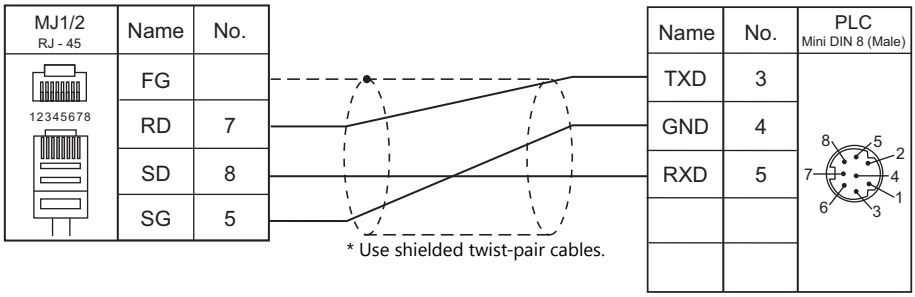
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



11. CHINO

11.1 Temperature Controller/Servo/Inverter Connection

11.1 Temperature Controller/Servo/Inverter Connection

Digital Temperature Controller

PLC Selection on the Editor	Model	Port		Signal Level	Connection			Lst File
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
DP1000	DP1xxxBRxx	Terminal block		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		DP1000.Lst
	DP1xxxBAxx	Terminal block		RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
	DP10xxGRxx-xxx	Terminal block	COM1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
	DP10xxGSxx-xxx	Terminal block	COM1	RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
	DP10xxGAxx-xxx	Terminal block	COM1	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
	DP10xxGBxx-xxx	Terminal block	COM1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			COM2		Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	DP10xxGCxx-xxx	Terminal block	COM1	RS-485	Wiring diagram 3 - C4	Wiring diagram 2 - M4		
			COM2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	DP10xxGDxx-xxx	Terminal block	COM1	RS-422	Wiring diagram 4 - C4	×	Wiring diagram 5 - M4	
			COM2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	DP10xxGExx-xxx	Terminal block	COM1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			COM2	RS-485	Wiring diagram 5 - C4	Wiring diagram 3 - M4		
	DP10xxGFxx-xxx	Terminal block	COM1	RS-485	Wiring diagram 3 - C4	Wiring diagram 2 - M4		
			COM2		Wiring diagram 5 - C4	Wiring diagram 3 - M4		
	DP10xxGGxx-xxx	Terminal block	COM1	RS-422	Wiring diagram 4 - C4	×	Wiring diagram 5 - M4	
			COM2	RS-485	Wiring diagram 5 - C4	Wiring diagram 3 - M4		
DB1000B (MODBUS RTU)	DB1xxxBRxx-xxx	Terminal block		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		DB1000B.Lst
	DB1xxxBAxx-xxx			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
	DB1xxxBSxx-xxx			RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
LT230 (MODBUS RTU)	LT23xxxS00-xx LT23xxx200-xx	Terminal block		RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		LT230.Lst
LT300 (MODBUS RTU)	LT35xxxRx0-xxx LT37xxxRx0-xxx	Terminal block		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		LT300.Lst
	LT35xxxAx0-xxx LT37xxxAx0-xxx			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
	LT35xxxSx0-xxx LT37xxxSx0-xxx			RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
LT400 Series (MODBUS RTU)	LT45xxxRxx-xxx LT47xxxRxx-xxx	Terminal block		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		LT400.Lst
	LT45xxxAxx-xxx LT47xxxAxx-xxx			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
	LT45xxxSxx-xxx			RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
LT830 (MODBUS RTU)	LT830xx000-2xx	Terminal block		RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		LT830.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Graphic Recorder

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
KR2000 (MODBUS RTU)	KR21xxxRxA	Terminal block	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		KR2000 .Lst
			RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
	KR21xxxQxA	Terminal block	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

11.1.1 DP1000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Program Controller

DP1000

The communication parameters can be set using keys attached to the digital program controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode No.	Item	Setting	Remarks
Mode 1 (Operation status selection)	Program start method *	**MASTER COM.: Start by communication**	
	Pattern selection method *	**COM: Selection by communication**	
Mode 8 (Communication setting)	Communication function, type	**COM: Host communication**	
	Device No.	01 to 99	Invalid during RS-232C communication 00: Communication not possible
	Baud rate	4800 / 9600 bps	
	Communication characters (Data length, parity, stop bit)	Data length: 7 / 8 bits Parity: Even / Odd / None Stop bit: 1 / 2 bits	

* To start program operation from the TS2060, select “MASTER COM.” for program start method. To select a pattern number from the TS2060, select “COM” for pattern selection method.

DP1000G

The communication parameters can be set using keys attached to the digital program controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode No.	Item	Setting		Remarks
		COM1	COM2	
Mode 1 (Operation status selection)	Program start method *	**COM: Start by communication**		
	Pattern selection method *	**COM: Selection by communication**		
Mode 8 (Communication setting)	Communication type	Fixed according to communication specification	**PORT2**	
	Protocol	**PRIVATE: CHINO's conventional protocol**		When establishing a connection by using MODBUS RTU format, refer to "30. MODBUS".
	Communication function, type	**COMM: Host communication**		
	Device No.	01 to 99		Invalid during RS-232C communication 00: Communication not possible
	Baud rate	4800 / 9600 / 19200 / 38400 bps		
	Communication characters (Data length, parity, stop bit)	7N1: data length 7 bits, without parity, stop bit 1 7N2: data length 7 bits, without parity, stop bit 2 7E1: data length 7 bits, even parity, stop bit 1 7E2: data length 7 bits, even parity, stop bit 2 7O1: data length 7 bits, odd parity, stop bit 1 7O2: data length 7 bits, odd parity, stop bit 2 8N1: data length 8 bits, without parity, stop bit 1 8N2: data length 8 bits, without parity, stop bit 2 8E1: data length 8 bits, even parity, stop bit 1 8E2: data length 8 bits, even parity, stop bit 2 8O1: data length 8 bits, odd parity, stop bit 1 8O2: data length 8 bits, odd parity, stop bit 2		

* To start program operation from the TS2060, select "COM" for program start method. To select a pattern number from the TS2060, select "COM" for pattern selection method.

Notes on parameter change from the TS2060
Before changing parameters from the TS2060, function keys and the related mode in the setting menu must be locked using keys on the digital program controller.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

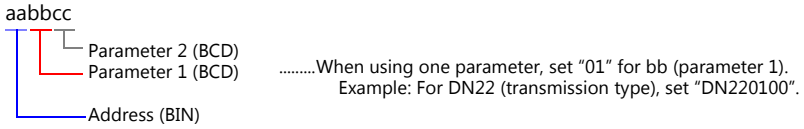
Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data)	00H	Double-word
DN	(individual data)	01H	Double-word
PG	(program)	02H	Double-word

Address denotations

The assigned device memory is expressed as shown below when editing the screen.



Note on device memory setting
Do not access addresses that are not assigned in the device memory map.

D (Data)

Address Denotations			Name	Decimal Place	Command	
Address (BIN)	Parameter 1 (BCD)	Parameter 2 (BCD)			Read	Write
00	0	0	Pattern No.	-	△1, △1	-
01	0	0	Step No.	-	△1, △1	-
02	0	0	PV status	-	△1, △1	-
03	0	0	PV (measurement value)	4	△1, △1	-
04	0	0	SV (setting value)	4	△1, △1	-
05	0	0	Time display method	-	△1, △1	△2, △8
06	0	0	Time unit 1	-	△1, △1	-
07	0	0	Time	2	△1, △1	-
08	0	0	MV1 status	-	△1, △1	-
09	0	0	MV1	2	△1, △1	△2, △3
0a	0	0	MV2 status	-	△1, △1	-
0b	0	0	MV2	2	△1, △1	△2, △3
0e	0	0	Execution target SV	4	△1, △2	-
0f	0	0	Execution P	1	△1, △2	△2, △2
10	0	0	Execution I	-	△1, △2	△2, △2
11	0	0	Execution D	-	△1, △2	△2, △2
12	0	0	Execution AL1	4	△1, △2	△2, △2
13	0	0	Execution AL2	4	△1, △2	△2, △2
14	0	0	Execution AL3	4	△1, △2	△2, △2
15	0	0	Execution AL4	4	△1, △2	△2, △2
16	0	0	Execution OL	1	△1, △2	△2, △2
17	0	0	Execution OH	1	△1, △2	△2, △2
18	0	0	Execution change amount (OSL)	1	△1, △2	△2, △2
19	0	0	Execution sensor offset	4	△1, △2	△2, △2
1a	0	0	SV value offset	4	△1, △2	△2, △2
1b	0	0	2nd P	1	△1, △2	-
1c	0	0	2nd I	-	△1, △2	-
1d	0	0	2nd D	-	△1, △2	-
20	0	0	Controller / setting device	-	△1, △6	-
21	0	0	Setting device / thermoelectric type / resistance type	-	△1, △6	-
22	0	0	1st output	-	△1, △6	-
23	0	0	2nd output	-	△1, △6	-
24	0	0	Transmission	-	△1, △6	-
25	0	0	Time signal	-	△1, △6	-
26	0	0	External drive	-	△1, △6	-
27	0	0	Pattern select	-	△1, △6	-
28	0	0	Time unit 2	-	△1, △6	-
2b	0	0	FNC key (lock / non-lock)	-	△1, △7	△2, △7
2c	0	0	Mode 0 (lock / non-lock)	-	△1, △7	△2, △7
2d	0	0	Lock 1 (lock / non-lock)	-	△1, △7	△2, △7
2e	0	0	Lock 2 (lock / non-lock)	-	△1, △7	△2, △7
2f	0	0	Lock 3 (lock / non-lock)	-	△1, △7	△2, △7
30	0	0	Lock 4 (lock / non-lock)	-	△1, △7	△2, △7
31	0	0	Lock 5 (lock / non-lock)	-	△1, △7	△2, △7
32	0	0	Lock 6 (lock / non-lock)	-	△1, △7	△2, △7
33	0	0	Lock 7 (lock / non-lock)	-	△1, △7	△2, △7
34	0	0	Lock 8 (lock / non-lock)	-	△1, △7	△2, △7
35	0	0	Lock 9 (lock / non-lock)	-	△1, △7	△2, △7
38	0	0	AL1 (ON/OFF)	-	△1, △8	-
39	0	0	AL2 (ON/OFF)	-	△1, △8	-
3a	0	0	AL3 (ON/OFF)	-	△1, △8	-
3b	0	0	AL4 (ON/OFF)	-	△1, △8	-
3c	0	0	Wait time alert	-	△1, △8	-
3d	0	0	Error	-	△1, △8	-

Address Denotations			Name	Decimal Place	Command	
Address (BIN)	Parameter 1 (BCD)	Parameter 2 (BCD)			Read	Write
3e	0	0	TS1 (ON/OFF)	-	△1, △8	-
3f	0	0	TS2 (ON/OFF)	-	△1, △8	-
40	0	0	TS3 (ON/OFF)	-	△1, △8	-
41	0	0	TS4 (ON/OFF)	-	△1, △8	-
42	0	0	TS5 (ON/OFF)	-	△1, △8	-
43	0	0	TS6 (ON/OFF)	-	△1, △8	-
44	0	0	TS7 (ON/OFF)	-	△1, △8	-
45	0	0	TS8 (ON/OFF)	-	△1, △8	-
46	0	0	TS9 (ON/OFF)	-	△1, △8	-
47	0	0	TS10 (ON/OFF)	-	△1, △8	-
4a	Pattern No.	0	RUN	-	△1, △9	△2, △1
4b	0	0	STOP	-	△1, △9	△2, △1
4c	0	0	RESET	-	△1, △9	△2, △1
4d	0	0	END	-	△1, △9	-
4e	0	0	ADV	-	△1, △9	△2, △1
4f	0	0	CONST	-	△1, △9	△2, △4
50	0	0	MAN1	-	△1, △9	△2, △3
51	0	0	MAN2	-	△1, △9	△2, △3
52	0	0	WAIT	-	△1, △9	-
53	0	0	AT	-	△1, △9	△2, △6
54	0	0	FNC key LOCK	-	△1, △9	-
55	0	0	M/S	-	△1, △9	-
56	0	0	FAST	-	△1, △9	-
57	0	0	SV Up	-	△1, △9	-
58	0	0	SV Down	-	△1, △9	-
5b	0	0	Constant SV	4	△1, △1	△2, △4

DN (Individual Data)

Address Denotations			Name	Decimal Place	Command	
Address (BIN)	Parameter 1 (BCD)	Parameter 2 (BCD)			Read	Write
00	Alarm No. (1 to 8)	0	AL1	4	△1, △4	△12
01	Alarm No. (1 to 8)	0	AL2	4	△1, △4	△12
02	Alarm No. (1 to 8)	0	AL3	4	△1, △4	△12
03	Alarm No. (1 to 8)	0	AL4	4	△1, △4	△12
06	PID No. (1 to 8, 91 to 98)	0	P	1	△1, △4	△13
07	PID No. (1 to 8, 91 to 98)	0	I	-	△1, △4	△13
08	PID No. (1 to 8, 91 to 98)	0	D	-	△1, △4	△13
0b	Parameter No. (1 to 8)	0	Output change amount limit	1	△1, △4	△14
0e	Parameter No. (1 to 8)	0	Output lower limit	1	△1, △4	△15
0f	Parameter No. (1 to 8)	0	Output upper limit	1	△1, △4	△15
12	Parameter No. (1 to 8)	0	Sensor offset	4	△1, △4	△16
15	Parameter No. (1 to 8)	0	Actual temperature compensation	4	△1, △4	△17
18	Parameter No. (1 to 8)	0	Wait time alert	2	△1, △4	△18
1b	Parameter No. (1 to 8)	0	Time signal ON time	2	△1, △4	△19
1c	Parameter No. (1 to 8)	0	Time signal OFF time	2	△1, △4	△19
1f	1	0	Digital filter	1	△1, △4	△20

Address Denotations			Name	Decimal Place	Command	
Address (BIN)	Parameter 1 (BCD)	Parameter 2 (BCD)			Read	Write
22	1	0	Transmission type	-	△1, △4	△21
23	1	0	Scale (min.)	4	△1, △4	△21
24	1	0	Scale (max.)	4	△1, △4	△21
27	1	0	2nd output gap	1	△1, △4	△22
2a	1	0	2nd output P	1	△1, △4	△23
2b	1	0	2nd output I	-	△1, △4	△23
2c	1	0	2nd output D	-	△1, △4	△23
2f	1	0	2nd output change amount limit	1	△1, △4	△24
32	1	0	2nd OL	1	△1, △4	△25
33	1	0	2nd OH	1	△1, △4	△25
36	1	0	2nd deadband	1	△1, △4	△26
39	1	0	2nd PV output error	1	△1, △4	△27
3c	1	0	2nd output normal/reverse	-	△1, △4	△28
3f	1	0	2nd pulse cycle	-	△1, △4	△29
42	1	0	Measurement input unit (input type No.)	-	△1, △4	△30
43	1	0	Measurement input unit (unit)	-	△1, △4	△30
46	1	0	CJ INT/EXT	-	△1, △4	△31
49	1	0	SV decimal place	-	△1, △4	△32
4c	1	0	PV decimal place	-	△1, △4	△33
4f	1	0	Alarm filter	-	△1, △4	△34
52	Alarm No. (1 to 4)	0	Alarm mode	-	△1, △4	△35
53	1	0	Alarm deadband	4	△1, △4	△35
56	1	0	Deadband	1	△1, △4	△36
59	1	0	Pulse cycle	-	△1, △4	△37
5c	1	0	Zero	1	△1, △4	△38
5d	1	0	Span	1	△1, △4	△38
5e	1	0	Deadband	1	△1, △4	△38
61	1	0	Output preset	1	△1, △4	△39
64	1	0	Output in PV error	1	△1, △4	△40
67	1	0	Output normal/reverse	-	△1, △4	△41
6a	1	0	Linear range (zero)	4	△1, △4	△42
6b	1	0	Linear range (span)	4	△1, △4	△42
6e	1	0	Linear scale (min.)	4	△1, △4	△43
6f	1	0	Linear scale (max.)	4	△1, △4	△43
72	1	0	ARW (lower limit)	1	△1, △4	△44
73	1	0	ARW (upper limit)	1	△1, △4	△44
76	Parameter No. (1 to 8)	0	AT2SV (ON/OFF)	-	△1, △4	△45
77	Parameter No. (1 to 8)	0	AT2SV	4	△1, △4	△45
7a	Parameter No. (1 to 7)	0	Break SV	4	△1, △4	△46
7d	Parameter No. (1 to 8)	0	AT3SV (ON/OFF)	-	△1, △4	△47
7e	Parameter No. (1 to 8)	0	AT3SV	4	△1, △4	△47
81	1	0	AT start direction	-	△1, △4	△48
84	1	0	SV at reset	4	△1, △4	△49
87	1	0	SV display scale (min.)	4	△1, △4	△50
88	1	0	SV display scale (max.)	4	△1, △4	△50
8b	1	0	Thermocouple type (thermocouple No.)	-	△1, △4	△51
8c	1	0	Thermocouple type (unit)	-	△1, △4	△51
8f	1	0	SV scale (min.)	4	△1, △4	△52
90	1	0	SV scale (max.)	4	△1, △4	△52

PG (Program)

Address Denotations			Name	Decimal Place	Command	
Address (BIN)	Parameter 1 (BCD)	Parameter 2 (BCD)			Read	Write
00	Pattern No.	0	Start SV	4	△1, △3	△3, △1
01	Pattern No.	0	SV/PV start	-	△1, △3	△3, △1
04	Pattern No.	Step No.	Program setting SV	4	△1, △3	△3, △2
05	Pattern No.	Step No.	Program setting time	2	△1, △3	△3, △2
06	Pattern No.	Step No.	Step repeat times	-	△1, △3	-
07	Pattern No.	Step No.	PID No.	-	△1, △3	△3, △4
08	Pattern No.	Step No.	ALM No.	-	△1, △3	△3, △4
09	Pattern No.	Step No.	OPL No.	-	△1, △3	△3, △4
0a	Pattern No.	Step No.	OSL No.	-	△1, △3	△3, △4
0b	Pattern No.	Step No.	Sensor offset No.	-	△1, △3	△3, △4
0c	Pattern No.	Step No.	Actual temperature compensation No.	-	△1, △3	△3, △4
0d	Pattern No.	Step No.	Wait time No.	-	△1, △3	△3, △4
0e	Pattern No.	Step No.	TS1	-	△1, △3	△3, △4
0f	Pattern No.	Step No.	TS2	-	△1, △3	△3, △4
10	Pattern No.	Step No.	TS3	-	△1, △3	△3, △4
11	Pattern No.	Step No.	TS4	-	△1, △3	△3, △4
12	Pattern No.	Step No.	TS5	-	△1, △3	△3, △4
13	Pattern No.	Step No.	TS6	-	△1, △3	△3, △4
14	Pattern No.	Step No.	TS7	-	△1, △3	△3, △4
15	Pattern No.	Step No.	TS8	-	△1, △3	△3, △4
16	Pattern No.	Step No.	TS9	-	△1, △3	△3, △4
17	Pattern No.	Step No.	TS10	-	△1, △3	△3, △4
1a	Pattern No.	Step No.	Link target pattern No.	-	△1, △3	△3, △3
1b	Pattern No.	Step No.	Output at 1st end	-	△1, △3	△3, △3
1c	Pattern No.	Step No.	Output at 2nd end	-	△1, △3	△3, △3
1f	0	0	Pattern repeat times	-	△1, △3	△3, △6
22	Pattern No.	0	Set number of steps	-	△1, △5	-
23	Pattern No.	0	Remaining number of steps	-	△1, △5	-

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Alarm reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0000H	
Pattern select	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0001H	
		n + 2	Pattern No.	
Step repeat	1 - 8 (PLC1 - 8)	n	Station number	6
		n + 1	Command: 0002H	
		n + 2	Pattern No.	
		n + 3	Start step	
		n + 4	End step	
		n + 5	Repeat times Reset: 0000H Times: 0001H to 0099H	
Pattern copy	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0003H	
		n + 2	Copy source pattern No.	
		n + 3	Copy target pattern No.	
Pattern clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0004H	
		n + 2	Pattern No. Clear all patterns: 0000H Clear individual pattern: 0001H to 0030H	

11.1.2 DB1000B (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Indicating Controller

The communication parameters can be set using keys attached to the digital indicating controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode No.	Item	Setting	Remarks
Mode 7 (Communication setting)	Baud rate	4800 / 9600 / 19200 / 38400 bps	
	Device No.	01 to 99	
	Communication function	**COM: Host communication**	
	Communication protocol	**MODBUS (RTU)**	
	Communication characters (Data length, parity, stop bit)	8 bits / without parity / 1 bit 8 bits / without parity / 2 bits 8 bits / even parity / 1 bit 8 bits / even parity / 2 bits 8 bits / odd parity / 1 bit 8 bits / odd parity / 2 bits	

Notes on parameter change from the TS2060
Before changing parameters from the TS2060, all modes on the setting screen must be locked using keys on the digital indicating controller. For more information, refer to the instruction manual for the controller issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

11.1.3 LT230 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Indicating Controller

The communication parameters can be set using keys attached to the digital indicating controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode	Indication	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 com (communication setting)	PtCL	Communication protocol	**rtU: MODBUS (RTU)**
	FUnC	Communication function	**Com: Host communication**
	AdrS	Device No.	1 to 99
	rAtE	Baud rate	9600 / 19200 bps
	CHAr	Character (Data length, parity, stop bit)	5: 8 bits / without parity / 1 bit 6: 8 bits / without parity / 2 bits 7: 8 bits / even parity / 1 bit 8: 8 bits / even parity / 2 bits 9: 8 bits / odd parity / 1 bit 10: 8 bits / odd parity / 2 bits

* When changing parameters from the TS2060, set "LoCK (key lock): 4".

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.4 LT300 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Indicating Controller

The communication parameters can be set using keys attached to the digital indicating controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode	Indication	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 com (communication setting)	PtCL	Communication protocol	**rtU: MODBUS (RTU)**
	FUnC	Communication function	**Com: Host communication**
	AdrS	Device No.	01 to 99
	rAtE	Baud rate	9600 / 19200 bps
	CHAr	Character (Data length, parity, stop bit)	5: 8 bits / without parity / 1 bit 6: 8 bits / without parity / 2 bits 7: 8 bits / even parity / 1 bit 8: 8 bits / even parity / 2 bits 9: 8 bits / odd parity / 1 bit 10: 8 bits / odd parity / 2 bits

* When changing parameters from the TS2060, set "LoCK (key lock): 4".

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.5 LT400 Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Indicating Controller

The communication parameters can be set using keys attached to the digital indicating controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode	Display	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 commu (communication setting)	PrtCL	Communication protocol	**rtU: MODBUS (RTU)**
	FUnC	Communication function	**Com: Host communication**
	AdrS	Device No.	01 to 99
	rAtE	Baud rate	9600 / 19200 bps
	CHArA	Character (Data length, parity, stop bit)	8N1: 8 bits / without parity / 1 bit 8N2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8O1: 8 bits / odd parity / 1 bit 8O2: 8 bits / odd parity / 2 bits

* When changing parameters from the TS2060, set "LoCK (key lock): 4".

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.6 LT830 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	

Digital Indicating Controller

The communication parameters can be set using keys attached to the digital indicating controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Mode	Indication	Item	Setting	Remarks
Mode 5 tyPE (type)	LoCK	Lock function	3: All items prohibited *	
Mode 6 com (communication setting)	PtCL	Communication protocol	**rtU: MODBUS (RTU)**	
	FUnC	Communication function	**Com: Host communication**	
	AdrS	Device No.	1 to 99	
	rAtE	Baud rate	9600 / 19200 bps	
	CHAr	Character (Data length, parity, stop bit)	8n1: 8 bits / without parity / 1 bit 8n2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	

* When changing parameters from the TS2060, set "LoCK (lock function): 3".

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.7 KR2000 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Graphic Recorder

Selector switch

When establishing a communication with a graphic recorder, set the selector switch at the top of the unit.

(Underlined setting: default)

Selector switch	Setting	Remarks
485 232C	232C: RS-232C connection 485: RS-485 connection	Switch the signal with the power to the recorder OFF.

Communication setting

The communication parameters can be set using MENU keys attached to the graphic recorder.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Menu	Menu	Item	Setting	Remarks
System setting	Host communication	Communication mode	**RTU: MODBUS (RTU)**	
		Device address	01 to 31	
		Bit rate	9600 / 19200 bps	
		Communication characters (Data length, parity, stop bit)	8N1: 8 bits / without parity / 1 bit 8N2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8O1: 8 bits / odd parity / 1 bit 8O2: 8 bits / odd parity / 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

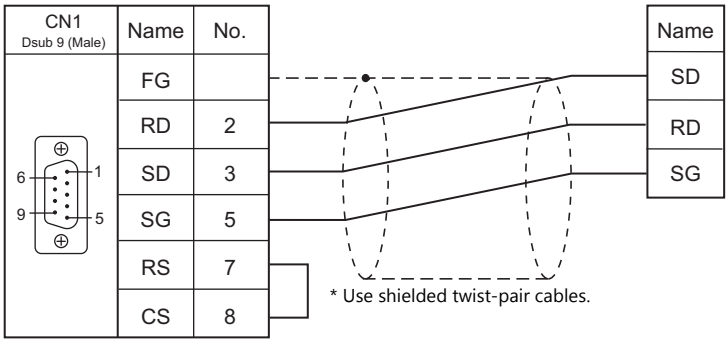
11.1.8 Wiring Diagrams

When Connected at CN1:

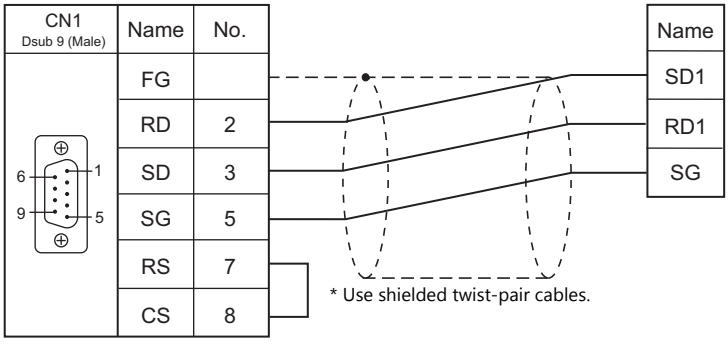
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

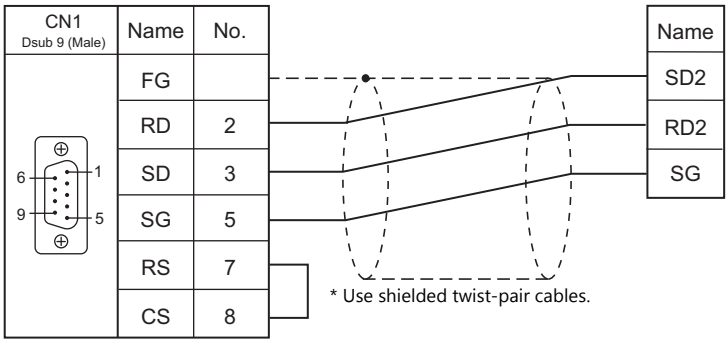
Wiring diagram 1 - C2



Wiring diagram 2 - C2

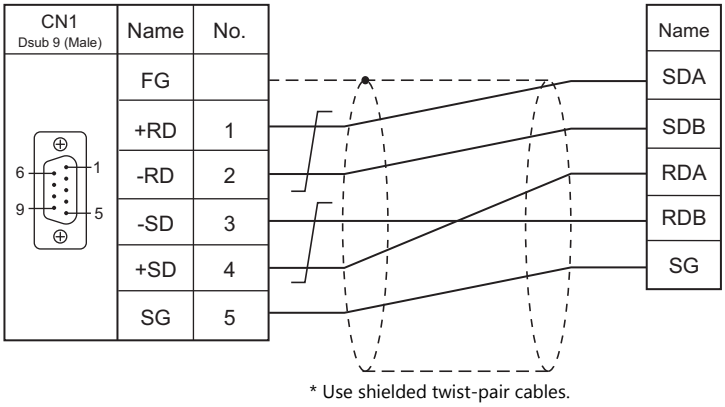


Wiring diagram 3 - C2



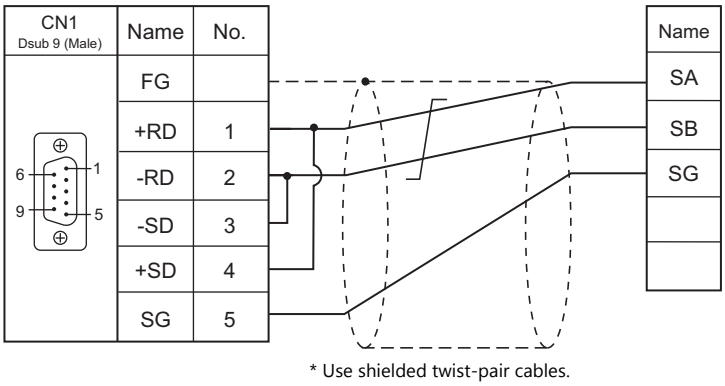
RS-422/RS-485

Wiring diagram 1 - C4



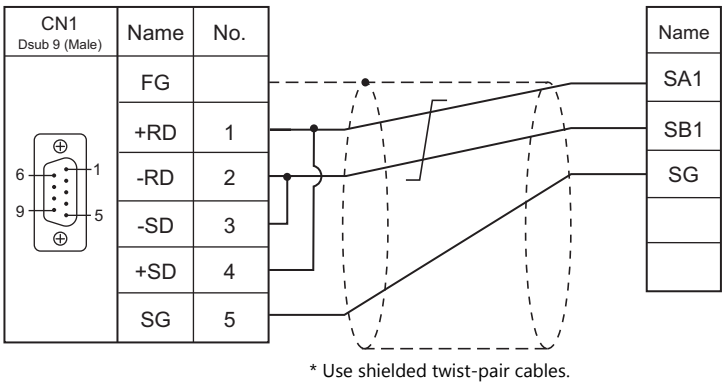
* Use shielded twist-pair cables.

Wiring diagram 2 - C4



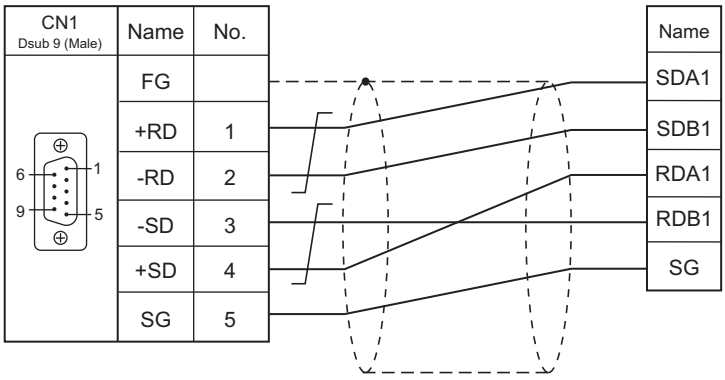
* Use shielded twist-pair cables.

Wiring diagram 3 - C4



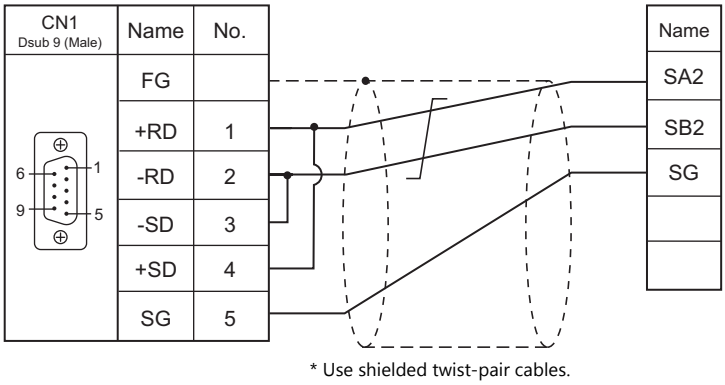
* Use shielded twist-pair cables.

Wiring diagram 4 - C4



* Use shielded twist-pair cables.

Wiring diagram 5 - C4

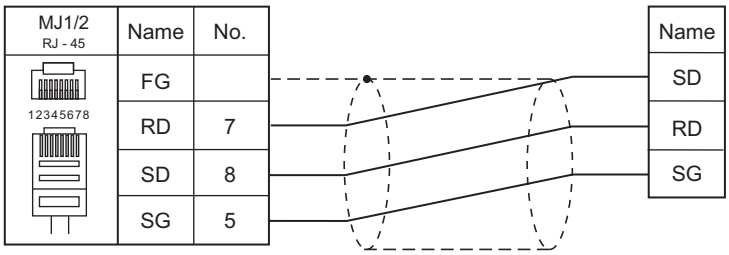


* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

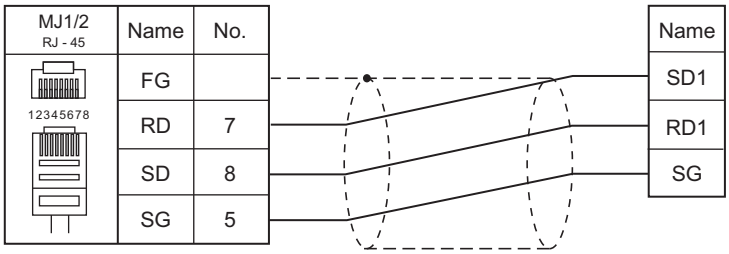
RS-232C

Wiring diagram 1 - M2



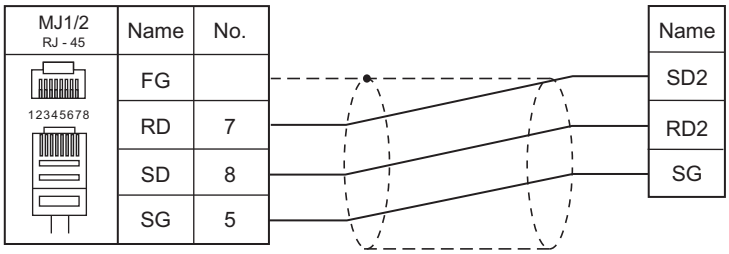
* Use shielded twist-pair cables.

Wiring diagram 2 - M2



* Use shielded twist-pair cables.

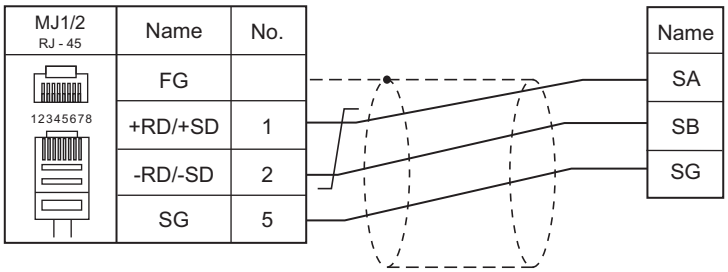
Wiring diagram 3 - M2



* Use shielded twist-pair cables.

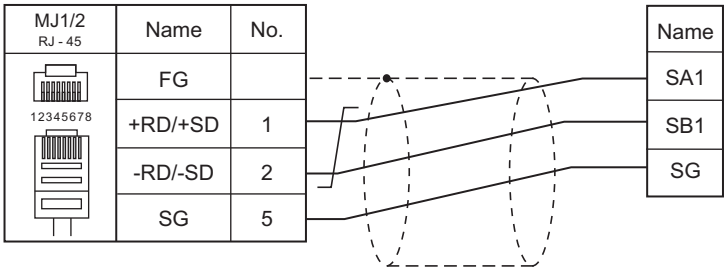
RS-422/RS-485

Wiring diagram 1 - M4



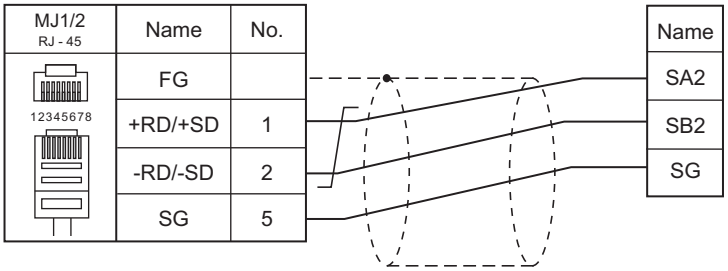
* Use shielded twist-pair cables.

Wiring diagram 2 - M4



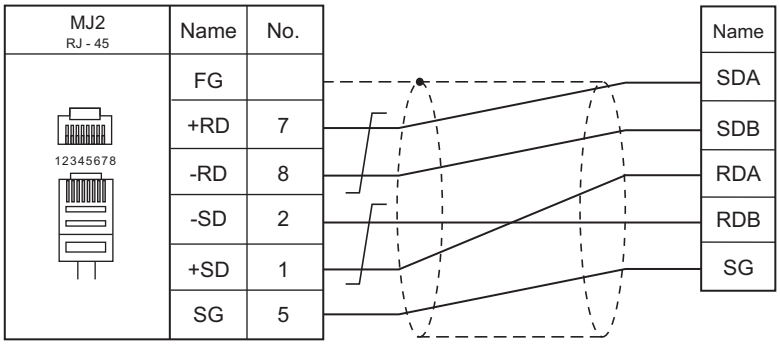
* Use shielded twist-pair cables.

Wiring diagram 3 - M4



* Use shielded twist-pair cables.

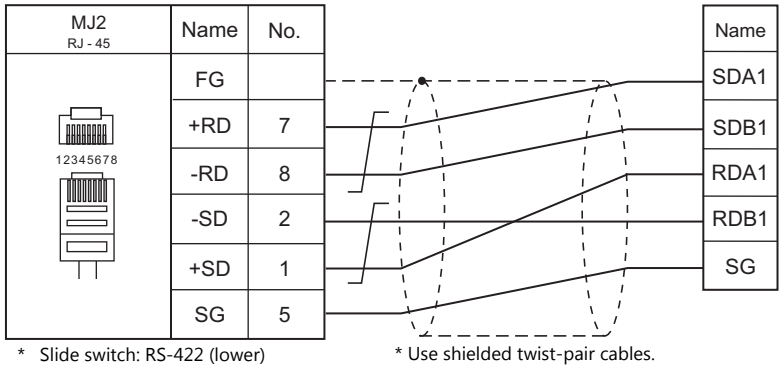
Wiring diagram 4 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 5 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

MEMO

12. CIMON

12.1 PLC Connection

12.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection			Ladder Transfer *3
					CN1 TS2060i+ DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
BP series	CM2-BPxxMDxx-R CM2-BPxxMDxx-T CM2-BPxxMDxx-S CM2-BPxxMDxx-U	LOADER port		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		○
	CM2-BPxxMDxx-R	Comm port		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	CM2-BPxxMDxx-T	CH1		RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		CH2		RS-422/485	Wiring diagram 3 - C4	Wiring diagram 1 - M4	Wiring diagram 7 - M4	
	CM2-BPxxMDxx-S	Comm port		RS-422/485	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 5 - M4	
	CM2-BPxxMDxx-U	CH1		RS-422	Wiring diagram 2 - C4	×	Wiring diagram 6 - M4	
		CH2		RS-422/485	Wiring diagram 3 - C4	Wiring diagram 1 - M4	Wiring diagram 7 - M4	
CP series	CM1-CPxx	LOADER port		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
	CM1-CP4C	Comm port		RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
	CM1-CP4D	Comm port		RS-422/485	Wiring diagram 4 - C4	Wiring diagram 3 - M4	Wiring diagram 8 - M4	×
	CM1-CPxx	CM1-SC01A	CH1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		CM1-SC01B	CH1	RS-422	Wiring diagram 5 - C4	×	Wiring diagram 9 - M4	
			CH2	RS-422/485	Wiring diagram 5 - C4	Wiring diagram 4 - M4	Wiring diagram 9 - M4	
		CM1-SC02A	CH1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			CH2	RS-422/485	Wiring diagram 5 - C4	Wiring diagram 4 - M4	Wiring diagram 9 - M4	
S series	CM3-SP32MDT CM3-SP32MDT-SD CM3-SP32MDTV CM3-SP32MDTV-SD CM3-SP32MDTE CM3-SP32MDTE-SD CM3-SP32MDTF CM3-SP32MDTF-SD CM3-SP16MDR CM3-SP16MDRV CM3-SP16MDRE CM3-SP16MDRF	Channel1		RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
		Channel2		RS-422/485	Wiring diagram 6 - C4	Wiring diagram 10 - M4		
		CM3-SP02ERS CM3-SP02ERR	CH1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			CH2	RS-422/485	Wiring diagram 7 - C4	Wiring diagram 11 - M4	Wiring diagram 12 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP*1	UDP/IP	Port No.	Keep Alive *2	Ladder Transfer *3
S series (Ethernet)	CM3-SP32MDTE CM3-SP32MDTE-SD CM3-SP32MDTF CM3-SP32MDTF-SD CM3-SP16MDRE CM3-SP16MDRF	LAN built into CPU	○	○	TCP/IP: 10260 (fixed)	○	×
		CM3-SP01EET	○	○	UDP/IP: 10262 (fixed)		

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS2060i Only)".
*3 For the ladder transfer function, see the TS2060i Reference Manual 2.

12.1.1 BP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

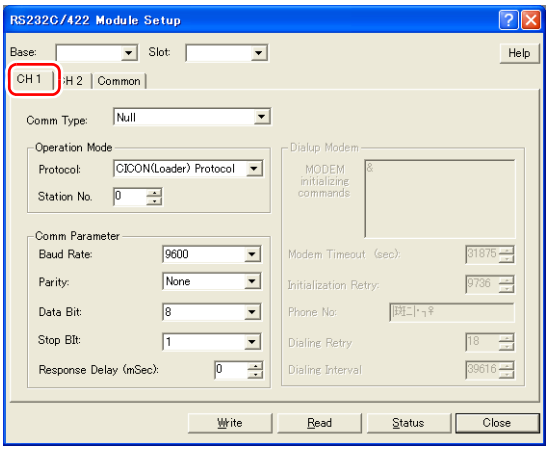
PLC

CM2-BPxxMDxx-R, T, S, U (LOADER Port)

No particular setting is necessary on the PLC.
The communication parameters are fixed; signal level: RS-232C, baud rate: 38400 bps, data length: 8 bits, stop bit: 1 bit, parity: none.

CM2-BPxxMDxx-T, U (CH1)

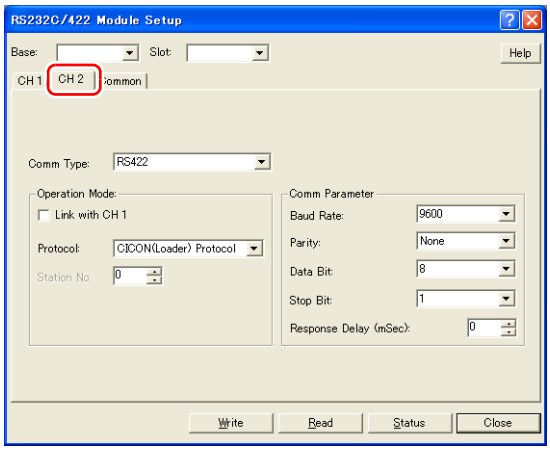
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM2-BPxxMDxx-T, U (CH2)

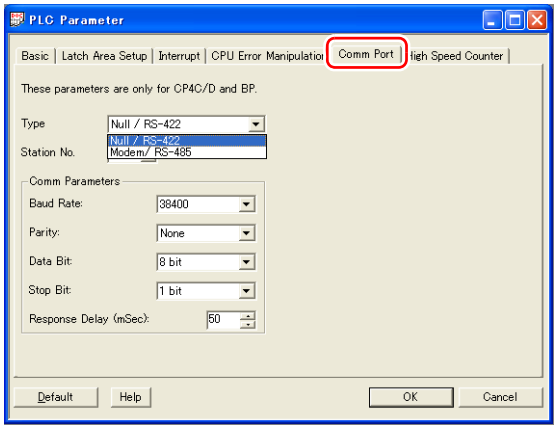
Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire RS-485: 2-wire
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM2-BPxxMDxx-R, S

Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Type	Null / RS-422, Modem / RS-485	RS-232C connection: Null / RS-422 RS-422 (4-wire) connection: Null / RS-422 RS-485 (2-wire) connection: Modem / RS-485
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer SV)	08H	
TC	(Timer PV)	09H	
C	(Counter Output)	0AH	
CS	(Counter SV)	0BH	
CC	(Counter PV)	0CH	
S	(Step Control Relay)	0DH	*1

*1 The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.

12.1.2 CP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

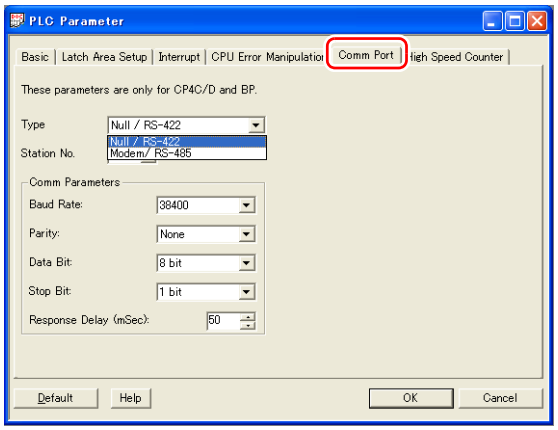
PLC

LOADER Port

No particular setting is necessary on the PLC.
The communication parameters are fixed; signal level: RS-232C, baud rate: 38400 bps, data length: 8 bits, stop bit: 1 bit, parity: none.

CM1-CP4C/CM1-CP4D

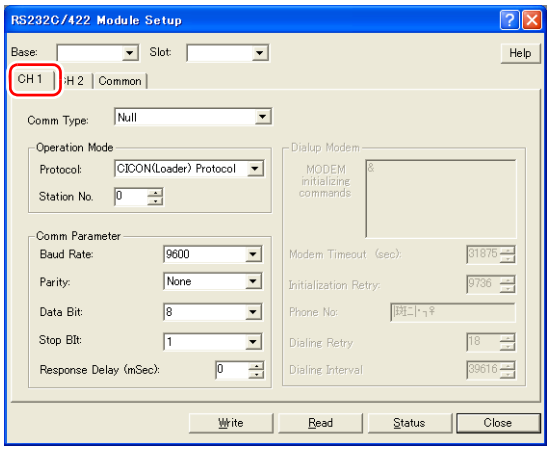
Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Type	Null / RS-422, Modem / RS-485	RS-232C connection: Null / RS-422 RS-422 (4-wire) connection: Null / RS-422 RS-485 (2-wire) connection: Modem / RS-485
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01A, CM1-SC01B, CM1-SC02A (CH1)

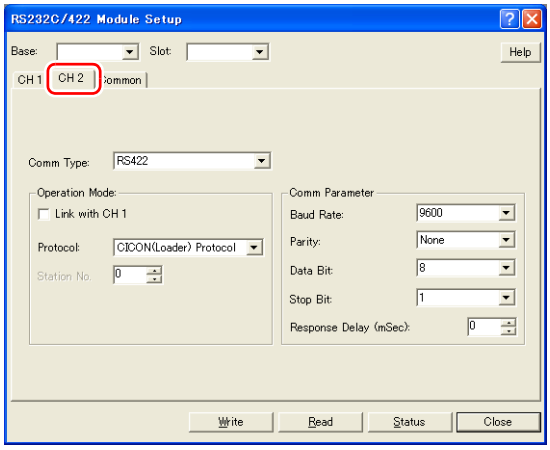
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01B, CM1-SC02A (CH2)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire RS-485: 2-wire
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer SV)	08H	
TC	(Timer PV)	09H	
C	(Counter Output)	0AH	
CS	(Counter SV)	0BH	
CC	(Counter PV)	0CH	
S	(Step Control Relay)	0DH	*1

*1 The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.

12.1.3 S Series

Communication Setting

Editor

Communication setting

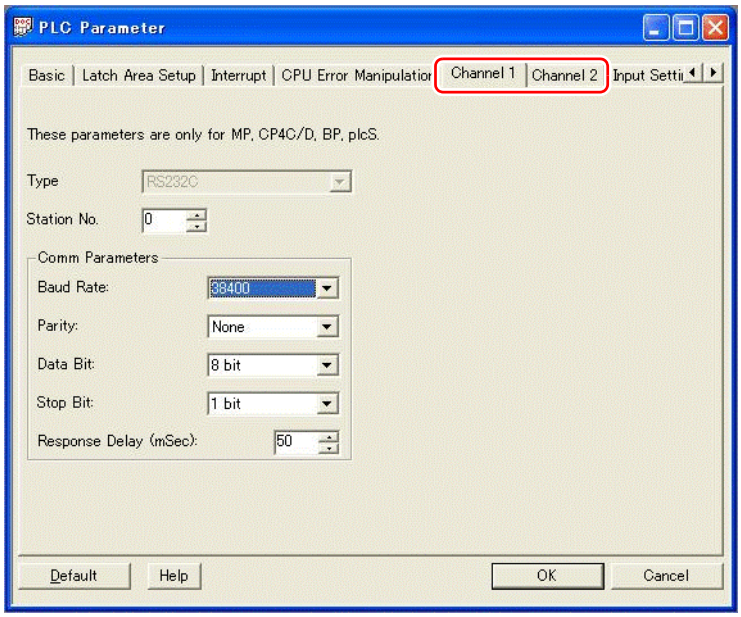
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 255	

PLC

CPU Port: Channel1 (RS-232C) / Channel2 (RS-422/485)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

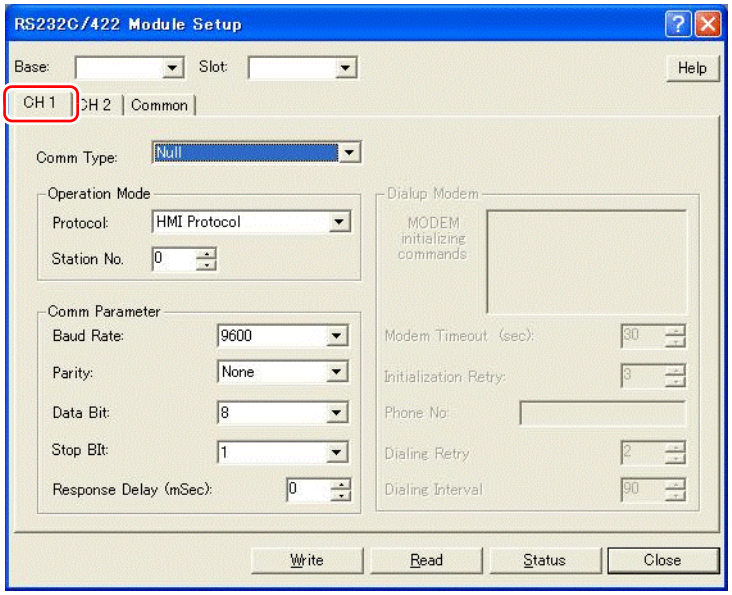
Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

CM3-SP02ERS/CM3-SP02ERR

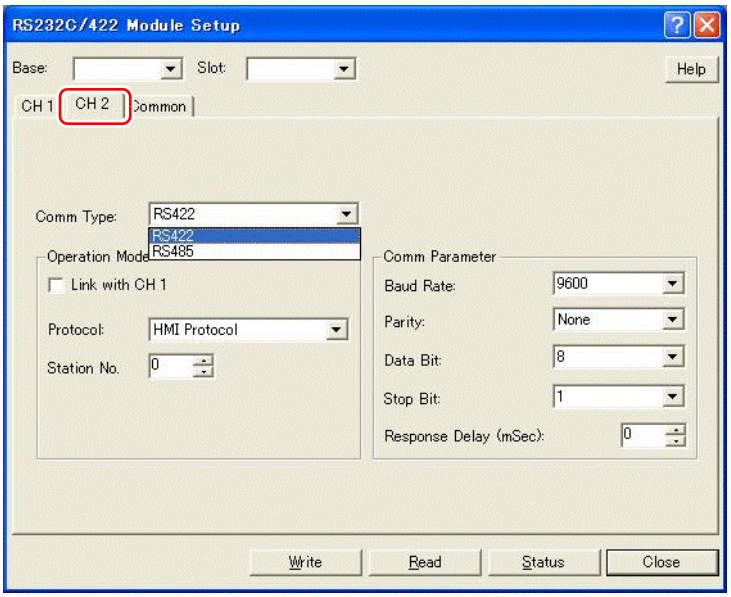
Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.

CH1



Item	Setting	Remarks
Protocol	**HMI Protocol**	
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CH2



Item	Setting	Remarks
Comm Type	RS-422, RS-485	
Protocol	**HMI Protocol**	
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1
Z		0EH	

*1 The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.

Indirect Device Memory Designation

	15 8	7 0
n+0	Model	Device type
n+1	Address No. *1	
n+2	Expansion code	Bit designation *2
n+3	00	Station number

*1 For designation of byte device memory S:
Specify an address number divided by “2” as the address number.

*2 For bit designation of byte device memory S:

- An even address number
  Specify a byte address number divided by “2” as the address number.
- An odd address number
  Specify a byte address number minus “1”, divided by “2”, as the address number. Specify a bit number plus “8” for the bit designation.

  Example: Indirect device memory designation of S11-07
  n + 1 = (11 - 1) / 2 = 5 (DEC)
  n + 2 = 7 + 8 = 15 (DEC)

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (=$u n)		F2
Mode change	1 to 8 (PLC1 to 8)	n	Station number	3
		n+1	Command: 0000H	
		n+2	Mode 0: Run 1: Program 2: Pause/Remote	

12.1.4 S Series (Ethernet)

Communication Setting

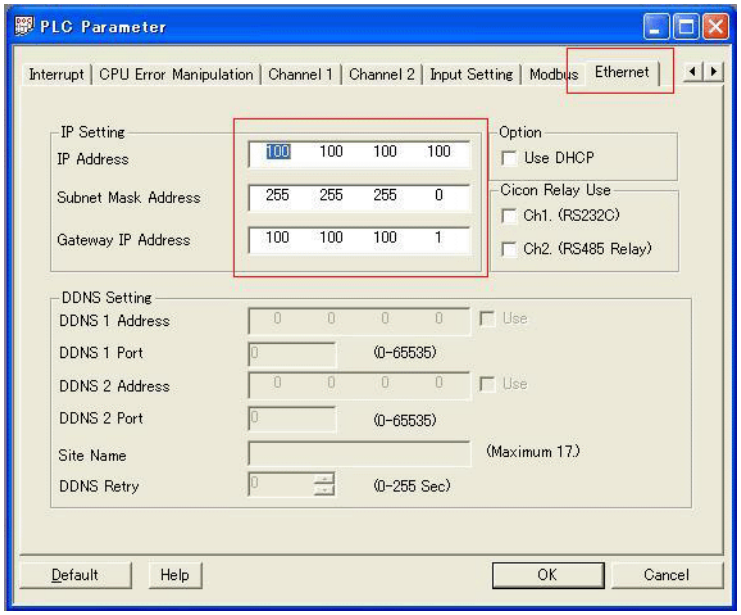
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 10260 for TCP/IP or No. 10262 for UDP/IP) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

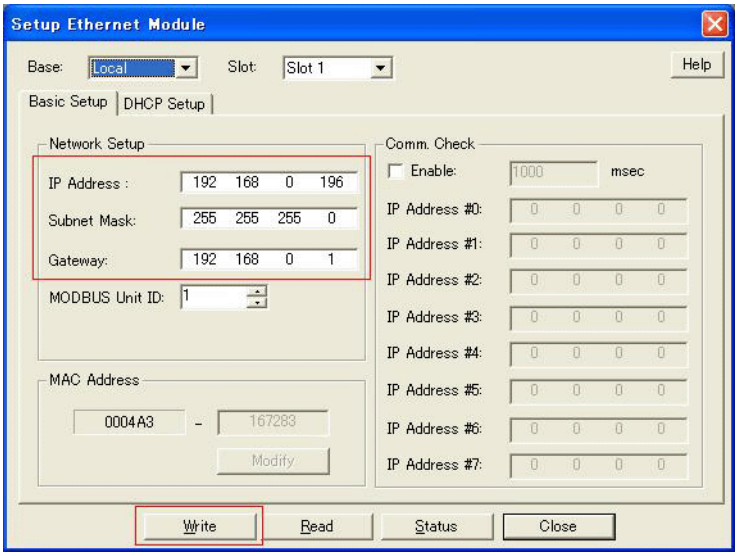
LAN port built into CPU



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	For more information, refer to the manual of the PLC.
Subnet Mask Address	Set the subnet mask of the PLC.	
Gateway IP Address	Specify according to the environment.	

* The port numbers are 10260 for TCP/IP and 10262 for UDP/IP (both fixed). For details, refer to the PLC manual issued by the manufacturer.

CM3-SP01EET



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	For more information, refer to the manual of the PLC.
Subnet Mask	Set the subnet mask of the PLC.	
Gateway	Specify according to the environment.	

* The port numbers are 10260 for TCP/IP and 10262 for UDP/IP (both fixed). For details, refer to the PLC manual issued by the manufacturer.

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060i.

Available Device Memory

Settings are the same as those described in “12.1.3 S Series”.

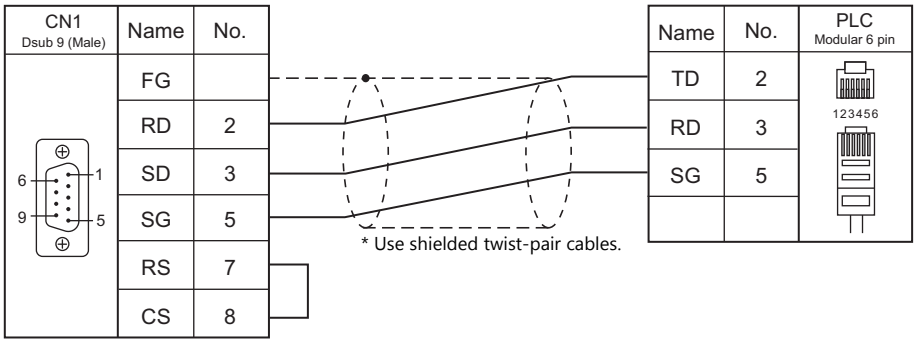
12.1.5 Wiring Diagrams

When Connected at CN1:

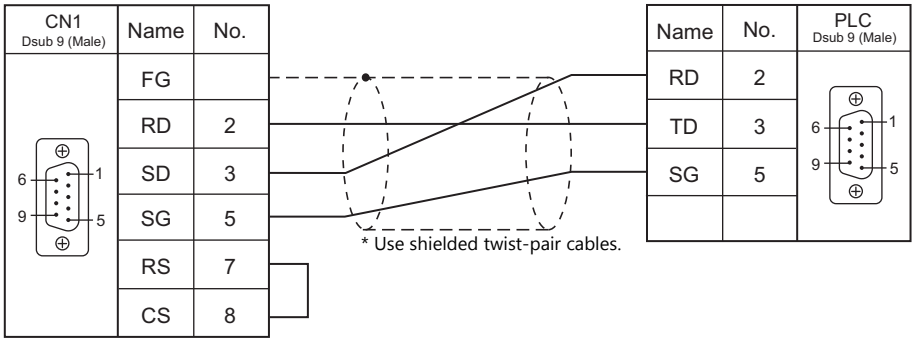
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

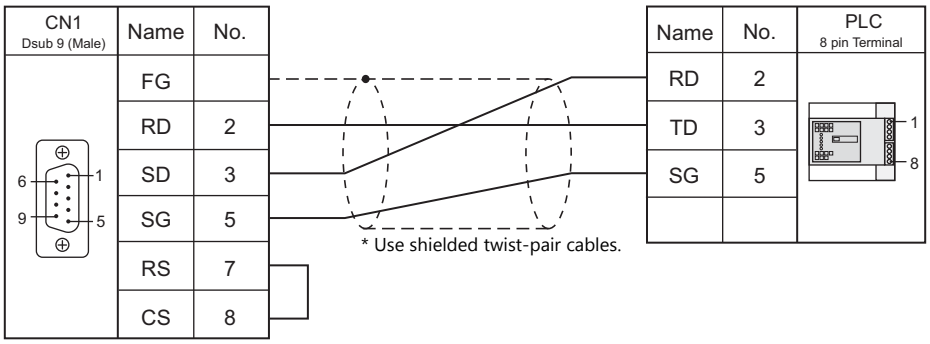
Wiring diagram 1 - C2



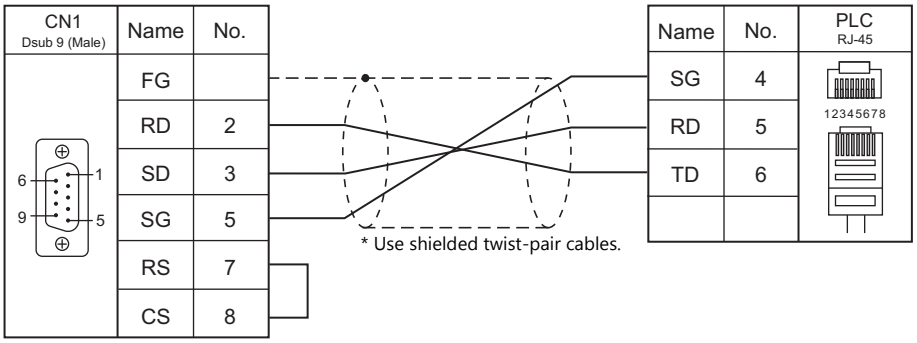
Wiring diagram 2 - C2



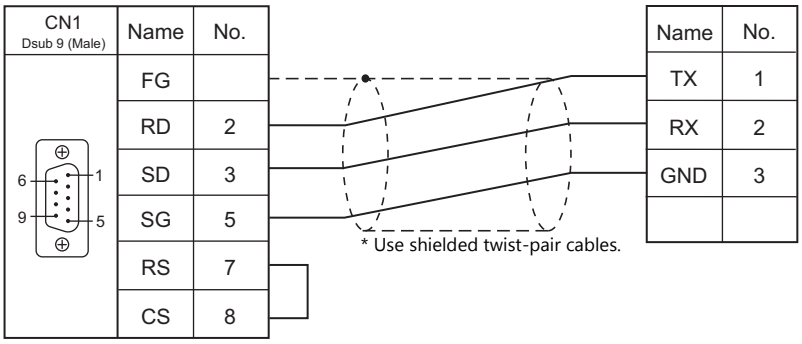
Wiring diagram 3 - C2



Wiring diagram 4 - C2

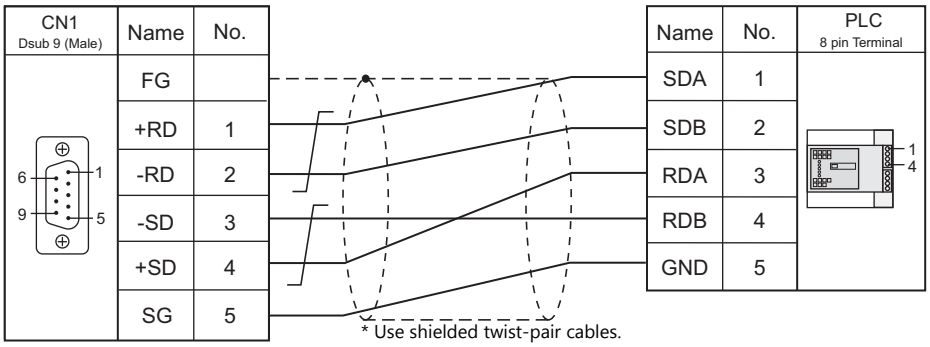


Wiring diagram 5 - C2

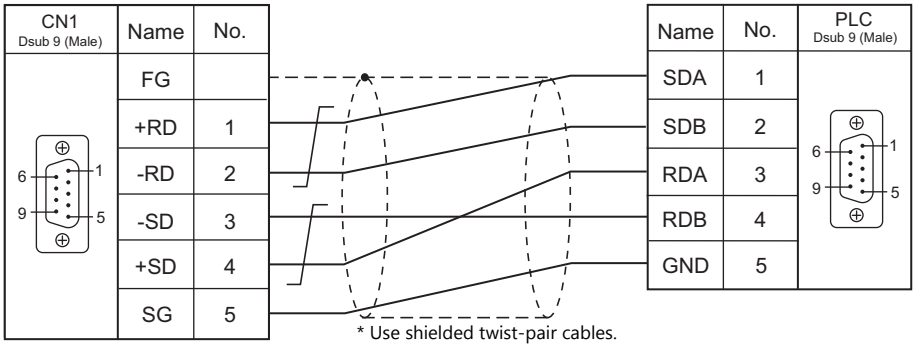


RS-422/RS-485

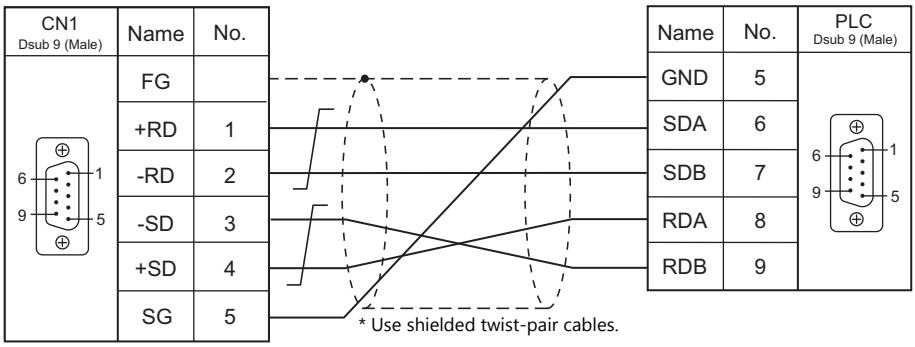
Wiring diagram 1 - C4



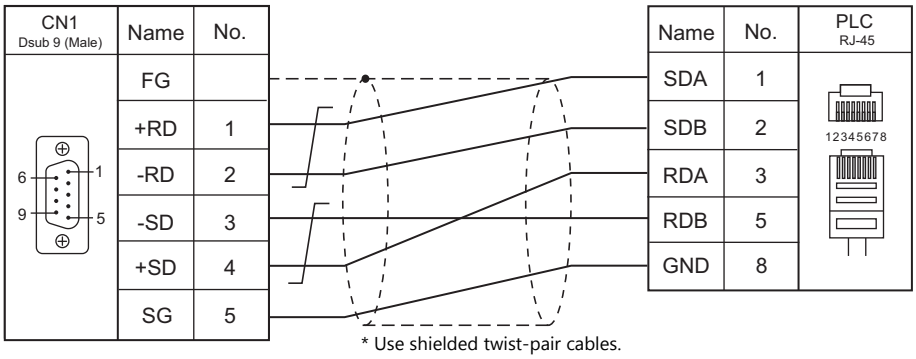
Wiring diagram 2 - C4



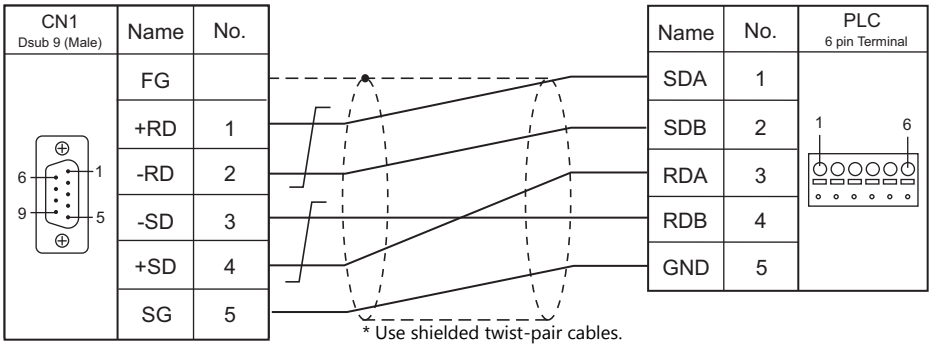
Wiring diagram 3 - C4



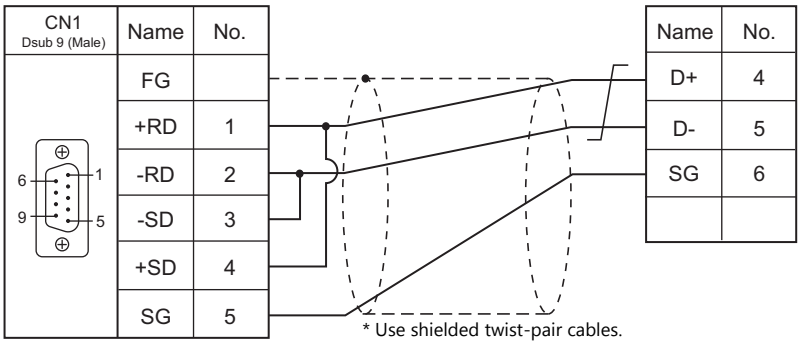
Wiring diagram 4 - C4



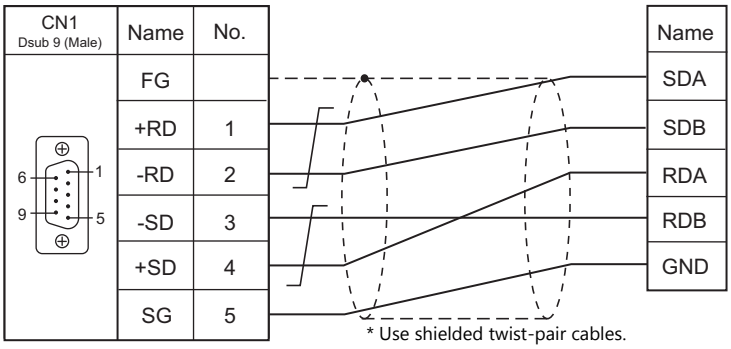
Wiring diagram 5 - C4



Wiring diagram 6 - C4



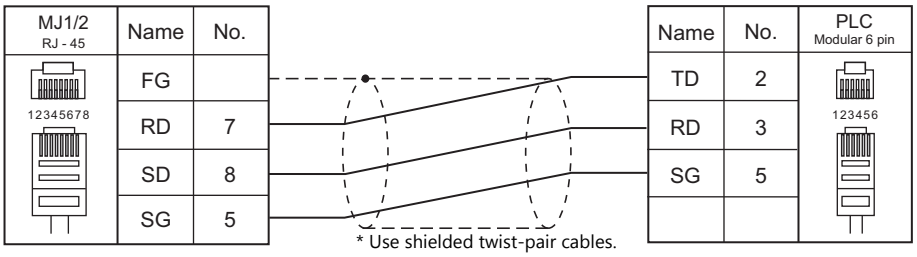
Wiring diagram 7 - C4



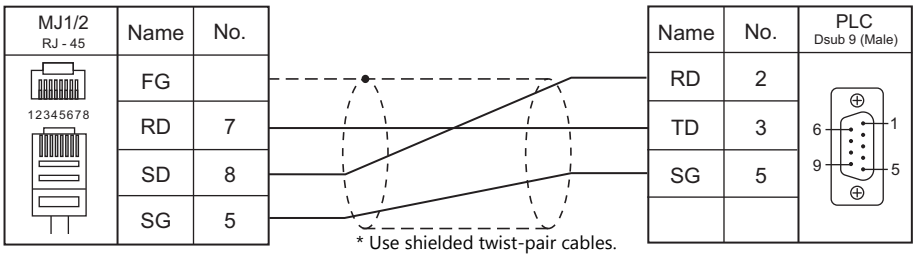
When Connected at MJ1/MJ2:

RS-232C

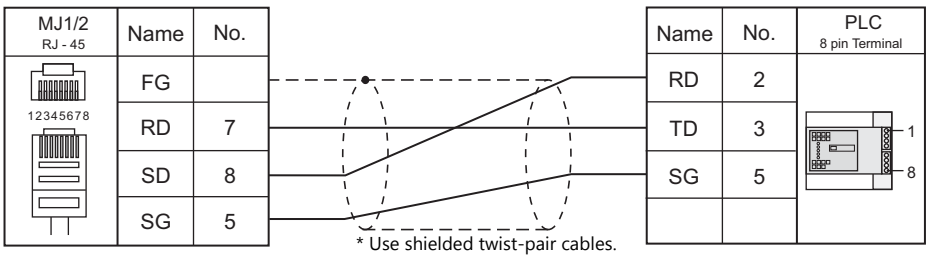
Wiring diagram 1 - M2



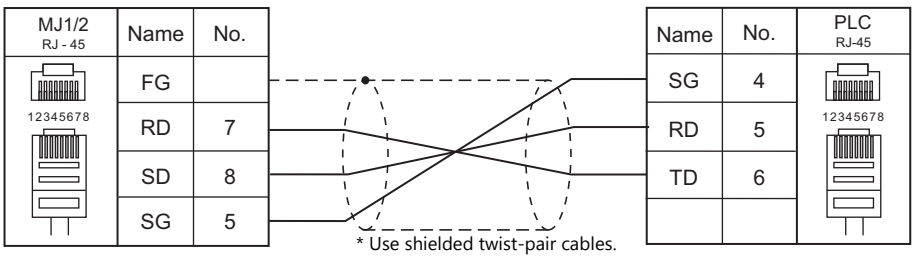
Wiring diagram 2 - M2



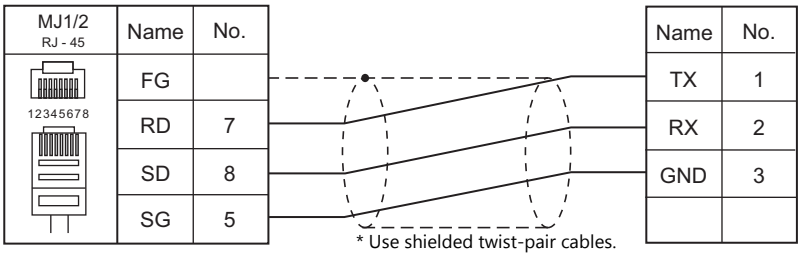
Wiring diagram 3 - M2



Wiring diagram 4 - M2

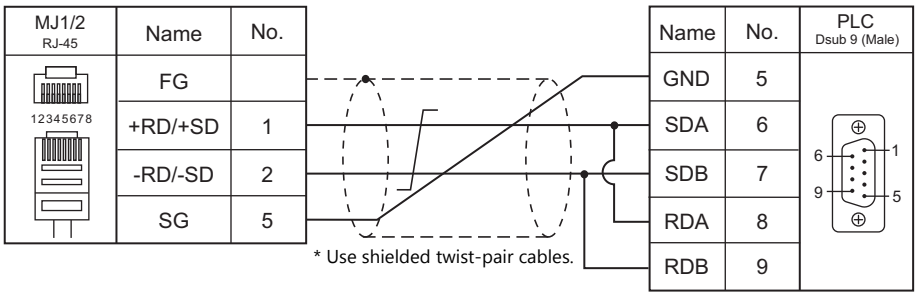


Wiring diagram 5 - M2

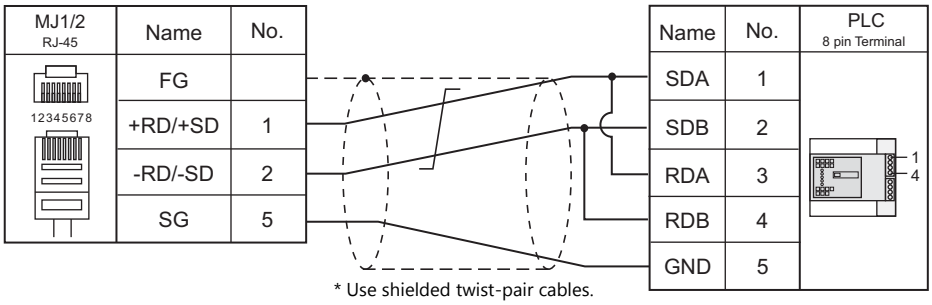


RS-422/RS-485

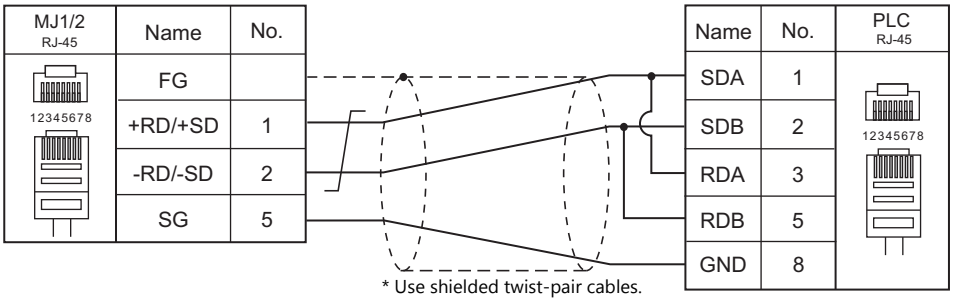
Wiring diagram 1 - M4



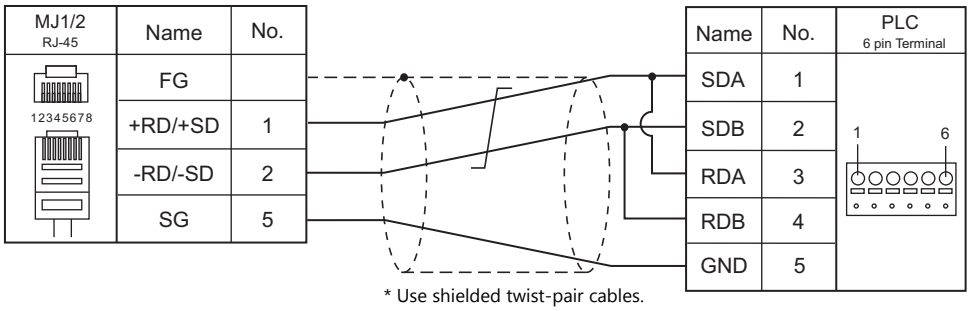
Wiring diagram 2 - M4



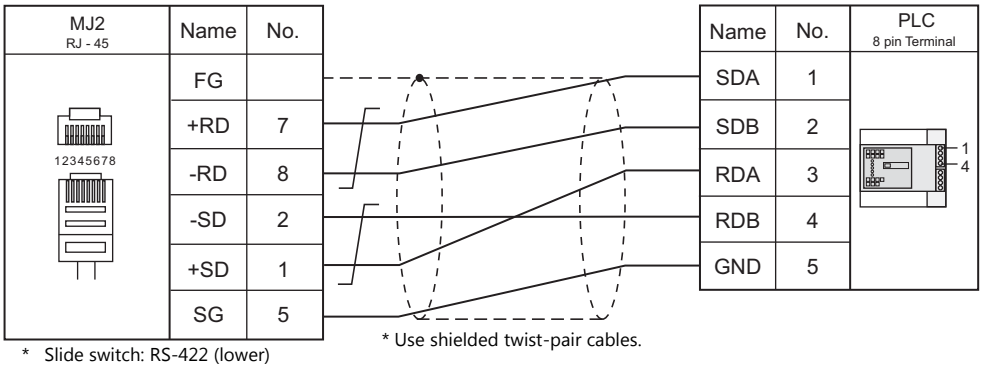
Wiring diagram 3 - M4



Wiring diagram 4 - M4



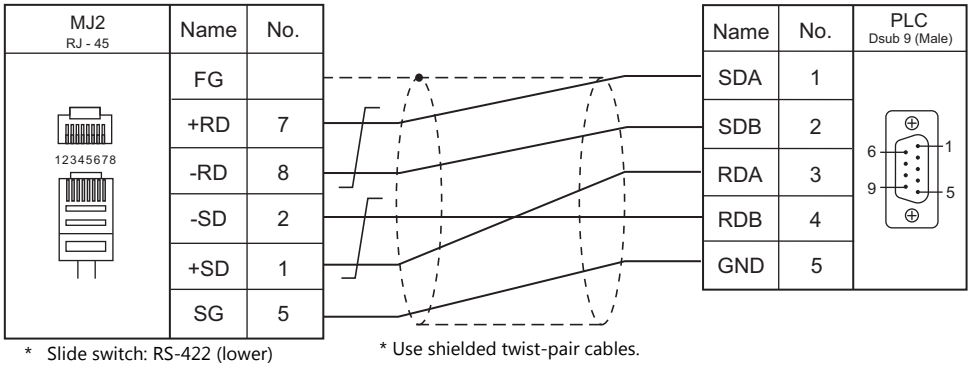
Wiring diagram 5 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

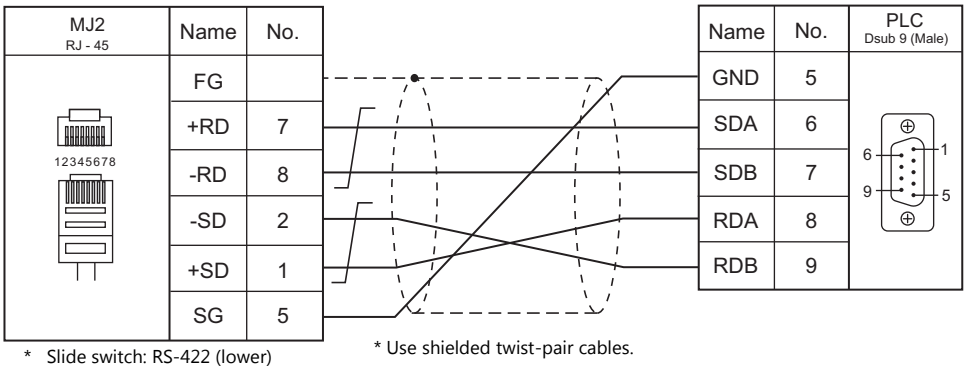
Wiring diagram 6 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

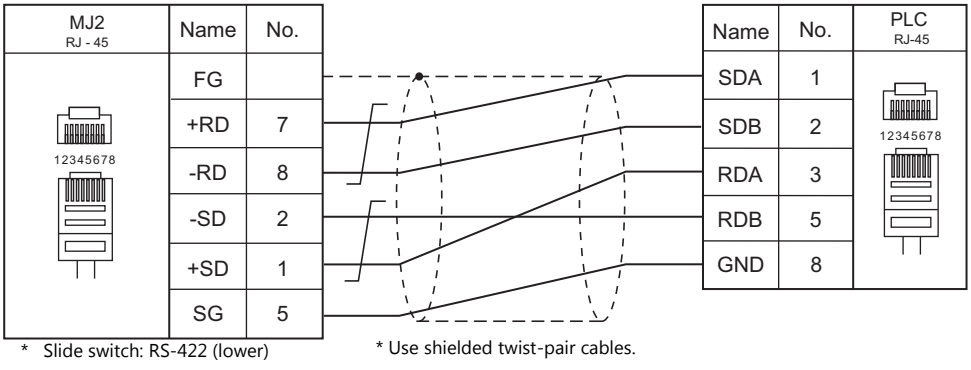
Wiring diagram 7 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

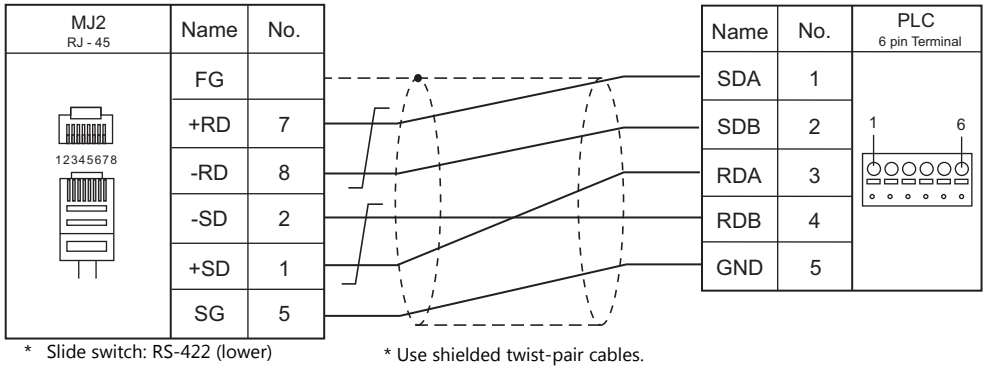
Wiring diagram 8 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

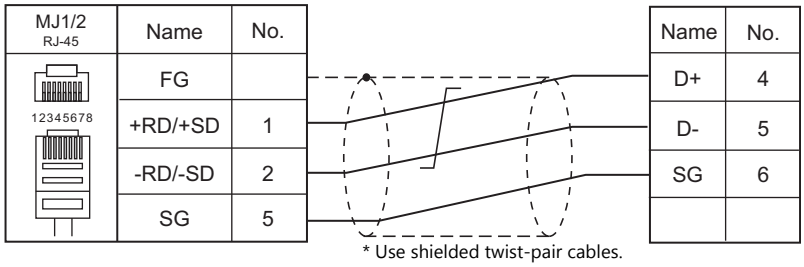
Wiring diagram 9 - M4



* Slide switch: RS-422 (lower)

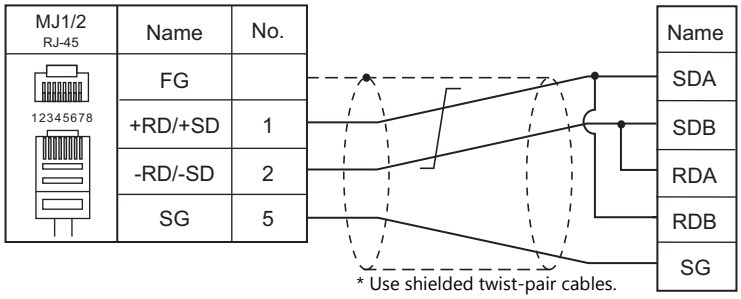
* Use shielded twist-pair cables.

Wiring diagram 10 - M4



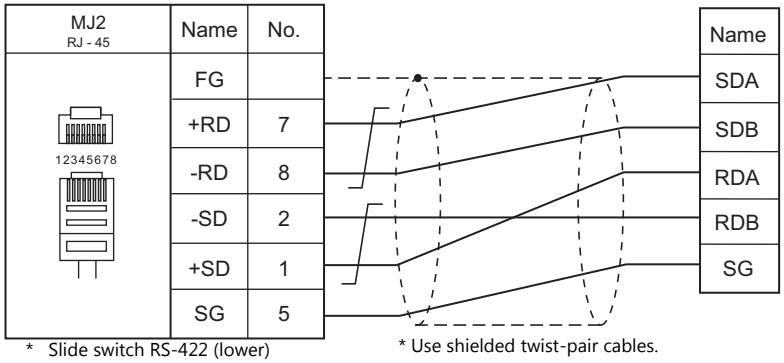
* Use shielded twist-pair cables.

Wiring diagram 11 - M4



* Use shielded twist-pair cables.

Wiring diagram 12 - M4



* Slide switch RS-422 (lower)

* Use shielded twist-pair cables.

MEMO

13. DELTA

13.1 PLC Connection

13.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
DVP series	DVP-EH2 DVP-ES DVP-EX DVP-SS DVP-SA DVP-SX DVP-SC DVP-SV DVP-PM	RS-232C communication port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		RS-485 communication port	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
DVP-SE (MODBUS ASCII)	DVP-SE	RS-485 communication port	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		×

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP*1	UDP/IP*1	Port No.	Keep Alive*2	Ladder Transfer *3
DVP-SE (MODBUS TCP/IP)	DVP-SE	Built-in Ethernet port	○	×	502 (fixed)	○	×

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For KeepAlive functions, see "1.3.2 Ethernet Communication".
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

13.1.1 DVP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

PLC

(Underlined setting: default)

Item	Setting	Remarks
Baud rate	9600	For more information, refer to the PLC manual issued by the manufacturer.
Station number	1	
Data length	7	
Stop bit	1	
Parity	Even	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

13.1.2 DVP-SE (MODBUS ASCII)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	0: Broadcast

PLC

Item	Setting	Remarks
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200	For more information, refer to the PLC manual issued by the manufacturer.
Target Port No.	1 to 31	
Data Length	7 / 8	
Stop Bit	1 / 2	
Parity	None / Odd / Even	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

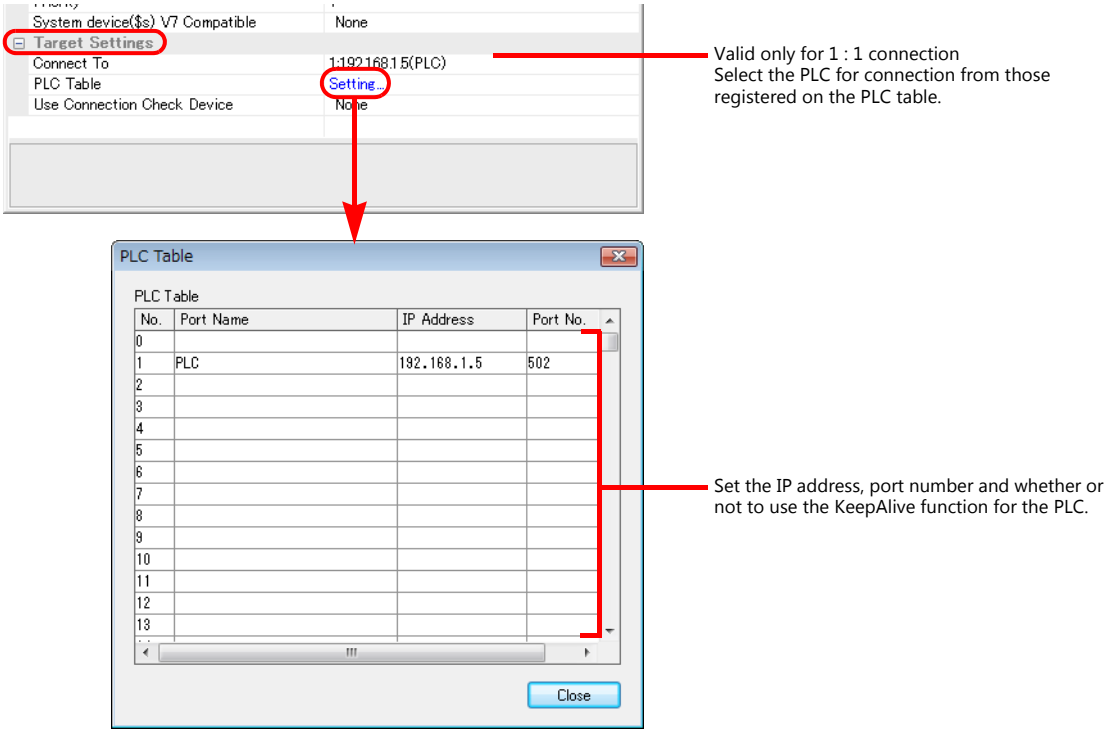
13.1.3 DVP-SE (MODBUS TCP/IP)

Communication Setting

Editor

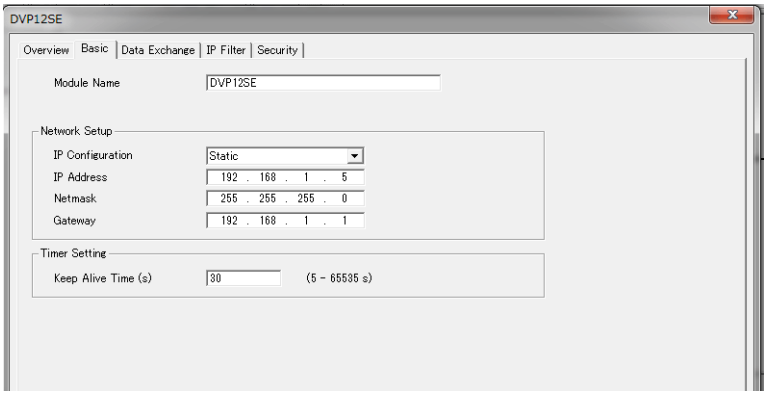
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 502) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

Make settings using the application software "DCISoft". For more information, refer to the PLC manual issued by the manufacturer.



Item	Setting	Remarks
IP Configration	**Static**	For more information, refer to the PLC manual issued by the manufacturer.
IP Address	Set the IP address of the PLC.	
Netmask	Set the subnet mask of the PLC.	
Gateway	Specify according to the environment.	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060i.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

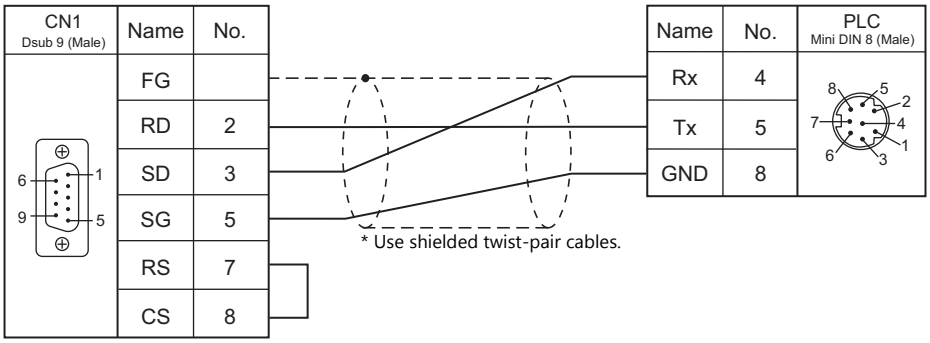
13.1.4 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

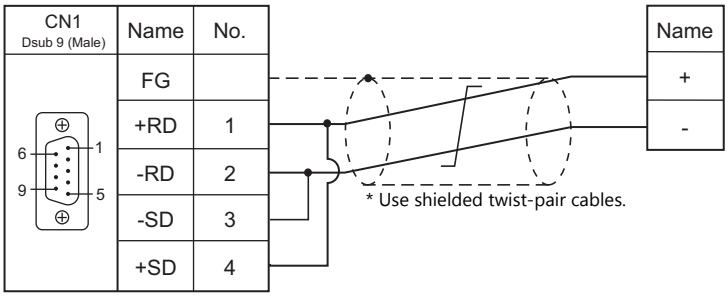
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

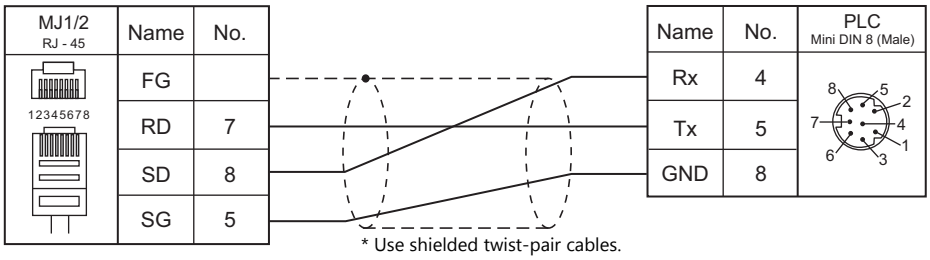
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

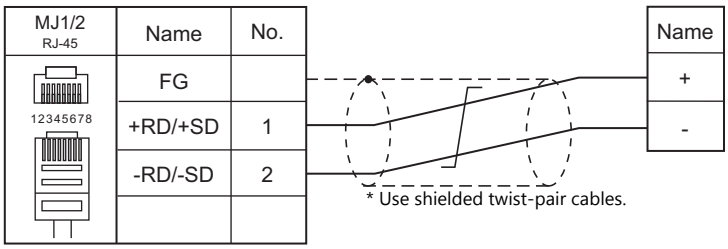
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



MEMO

14. DELTA TAU DATA SYSTEMS

14.1 Temperature Controller/Servo/Inverter Connection

14.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Motion Controller

PLC Selection on the Editor	Model	Port		Signal Level	Connection			Lst File
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
PMAC	PMAC PCI	Serial port	J4	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		PMAC.Lst
	Turbo PMAC PCI	Option-9T	J8		Wiring diagram 2 - C2	Wiring diagram 2 - M2		
	PMAC2 PCI	Serial port	J5					
	Turbo PMAC2 PCI	Option-9T	J8					
	UMAC Turbo CPU	Serial port	J7					
		Sub-serial port	J8					
	3U Turbo PMAC2	Serial port	J7		Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		Option-9T	J8		Wiring diagram 2 - C2	Wiring diagram 2 - M2		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Ethernet Connection (TS2060i Only)

Motion Controller

PLC Selection on the Editor	Model	Unit	TCP/IP *1	UDP/IP	Port No.	Lst File
PMAC (Ethernet TCP/IP)	UMAC Turbo CPU	CPU with built-in Ethernet	○	×	1025 (max. 4 units)	PMAC_Eth.Lst

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.

14.1.1 PMAC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 31	

PMAC

Make PMAC settings by using the software "PEWIN32PRO2". For more information, refer to the PMAC instruction manual issued by the manufacturer.
Values after change are saved in FROM and determined when the power is turned off and back on again.

I-Variables by number

Address	Contents	Setting
I0	Serial card number	0: 1:1 connection
I1	Serial port mode	0: CTS signal used
I3	Handshake I/O control	2
I4	Communication sum check mode	0: Without sum check
I6	Error notification mode	1
I43	Protocol selection *1	0: Standard protocol
I53	Sub port *2	Baud rate 6: 4800, 8: 9600, 10: 19200, 12: 38400, 13: 57600, 14: 78600, 15: 115K *3 bps
I54	Main port	Baud rate 6: 4800, 8: 9600, 10: 19200, 12: 38400, 13: 57600, 14: 78600, 15: 115K *3 bps
I63	Echo back selection	1: Valid

*1 Set when Turbo PMAC PCI, Turbo PMAC2 CPCI, UMAC Turbo CPU or 3U Turbo PMAC2 is used.
*2 Valid when "Option-9T" is used with Turbo PMAC PCI, Turbo PMAC2 CPCI / 3U Turbo PMAC2 or the sub port of UMAC Turbo CPU is used.
*3 When "115K bps" is set, set the multiples of 30 MHz for "I52" (CPU frequency).

PMAC PCI

MAIN BOARD E-POINT

E-POINT		Contents	Setting
	E49	Parity control for serial communication	No parity: Install a jumper between pins 1 and 2.
	E110	Serial port setting	RS-232C: Install a jumper between pins 1 and 2.

PMAC2 PCI

BASE BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port type selection	RS-232C: Install a jumper between pins 1 and 2.

Turbo PMAC PCI

MAIN BOARD E-POINT

E-POINT		Contents	Setting
	E49	Parity control for serial communication	No parity: Install a jumper between pins 1 and 2.
	E110	Serial port setting	RS-232C: Install a jumper between pins 1 and 2.

Turbo PMAC2 PCI

BASE BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port type selection	RS-232C: Install a jumper between pins 1 and 2.

UMAC Turbo CPU

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E17A	PHASE+ valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E17B	PHASE- valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E18A	SERVO+ valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E18B	SERVO- valid/invalid	Invalid: Install a jumper between pins 1 and 2.

3U Turbo MPMAC2

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port selection	RS-232C: Install a jumper between pins 1 and 2.

Available Device Memory

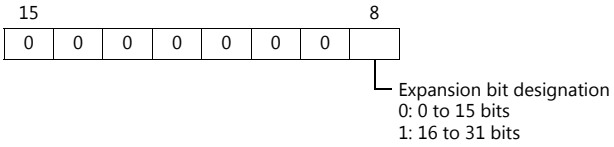
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
P	(variable P)	00H	Real number
Q	(variable Q)	01H	Real number
M	(variable M)	02H	Real number
I	(variable I)	03H	Real number
M_INT	(variable M (integer))	04H	Double-word
I_INT	(variable I (integer))	05H	Double-word
P_INT	(variable P (integer))	06H	Double-word

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Write of data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0000H	
		n + 2	Timeout time: 1 to 300 sec. (0: Time set on the editor*)	
Control-X	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0001H	

* Depends on the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).

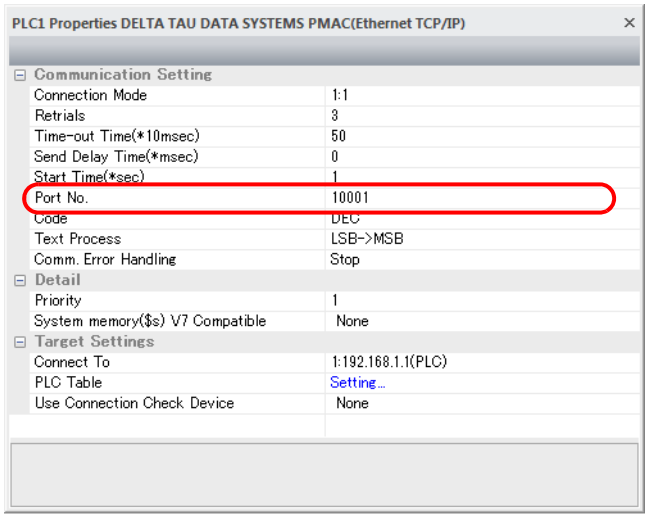
14.1.2 PMAC (Ethernet TCP/IP)

Communication Setting

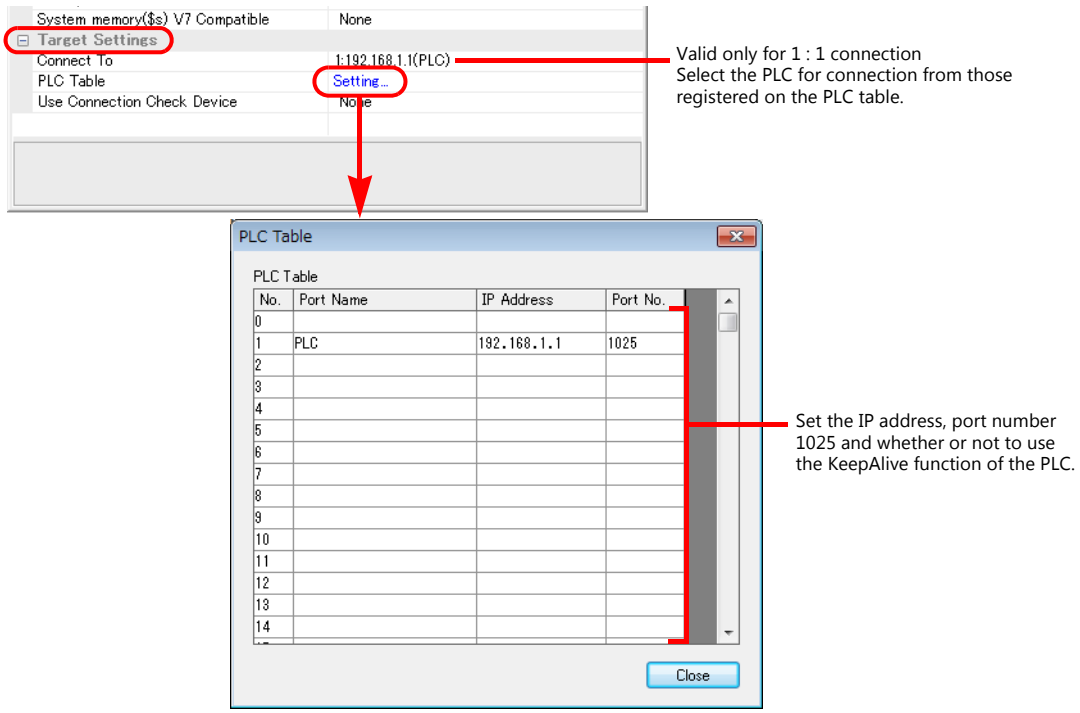
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

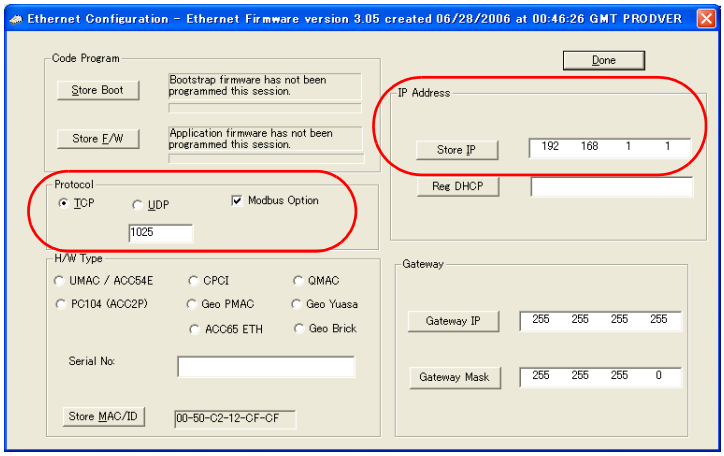


UMAC

Make UMAC settings by using the software "PEWIN32PRO2 *". For more information, refer to the UMAC manual issued by the manufacturer.

* For Ethernet communication, PEWIN32PRO service pack 2.0 and later is necessary.

Ethernet configuration

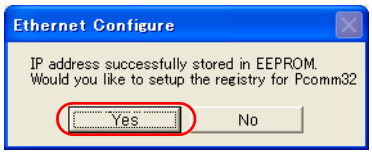


Item		Setting	Remarks
Protocol		**TCP**	For more information, refer to the UMAC instruction manual.
	Port No.	**1025 (fixed)**	
IP Address		IP address of UMAC	

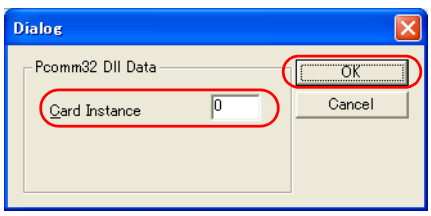
Procedure for changing the IP address

1. Change the IP address on the [Ethernet Configuration] dialog.
2. Click [Store IP] on the [Ethernet Configuration] dialog.

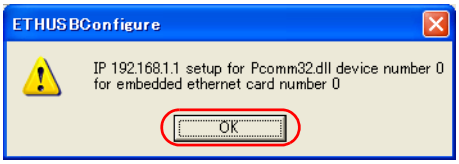
3. The [Ethernet Configure] dialog is displayed.
   Click [Yes].



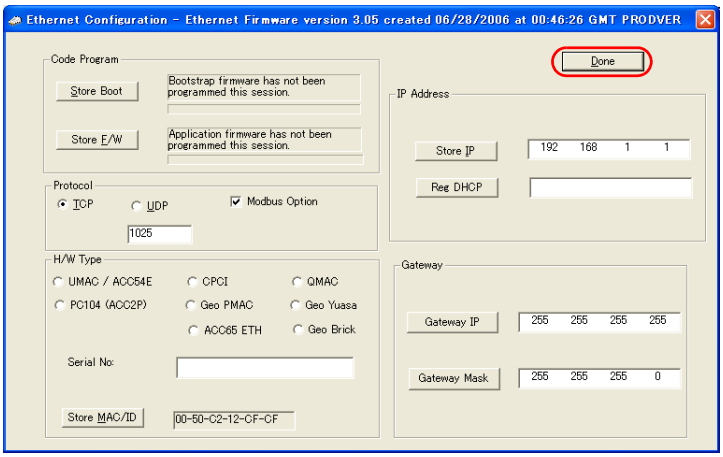
4. The [Dialog] dialog is displayed.
   Set "0" for [Card Instance] and click [OK].



5. The [ETHUSBConfigure] dialog is displayed.
   Click [OK].



6. The [Ethernet Configuration] dialog is displayed again.
   Click [Done] in the dialog.



7. Turn the power off and back on again.

* UMAC settings must be made via USB communication.
Before performing Ethernet communication with MONITOUCH, turn the power to UMAC off and remove the USB cable. Then, insert the Ethernet cable and turn the power on again.

I-Variables by number

Address	Contents	Setting
I3	Handshake I/O control	2
I6	Error notification mode	1
I63	<Control-X> Echo valid/invalid	1: Valid

* Values after change are saved in FROM and determined when the power is turned off and back on again.

UMAC Turbo CPU

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E6	Reloading the micro controller firmware	Normal operation: Install a jumper between pins 1 and 2.

Available Device Memory

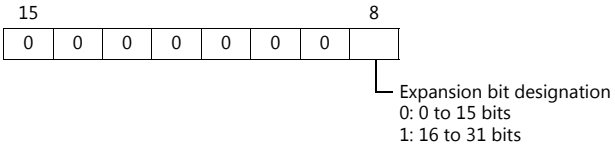
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
P	(variable P)	00H	Real number
Q	(variable Q)	01H	Real number
M	(variable M)	02H	Real number
I	(variable I)	03H	Real number
M_INT	(variable M (integer))	04H	Double-word
I_INT	(variable I (integer))	05H	Double-word
P_INT	(variable P (integer))	06H	Double-word

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Write of data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0000H	
		n + 2	Timeout time: 1 to 300 sec. (0: Time set on the editor*)	
Control-X	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0001H	

* Depends on the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).

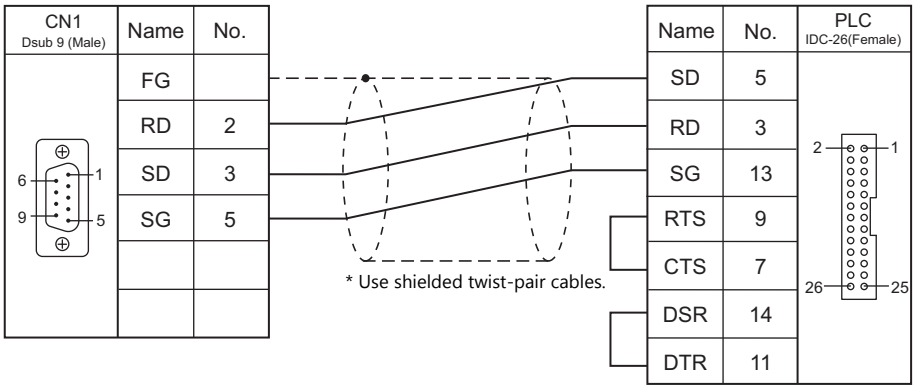
14.1.3 Wiring Diagrams

When Connected at CN1:

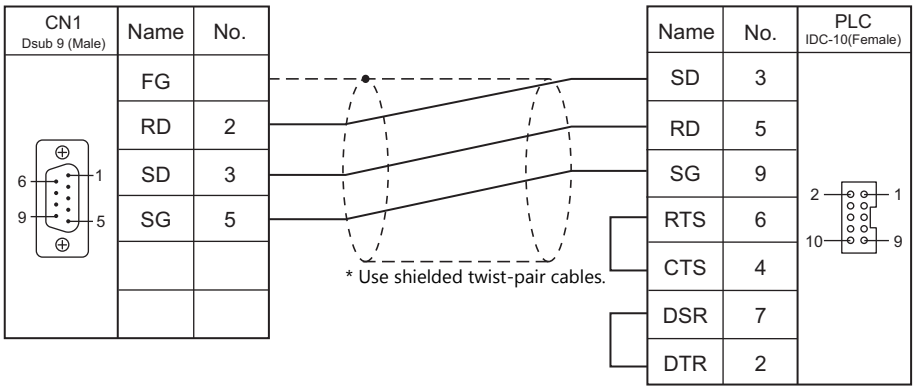
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2



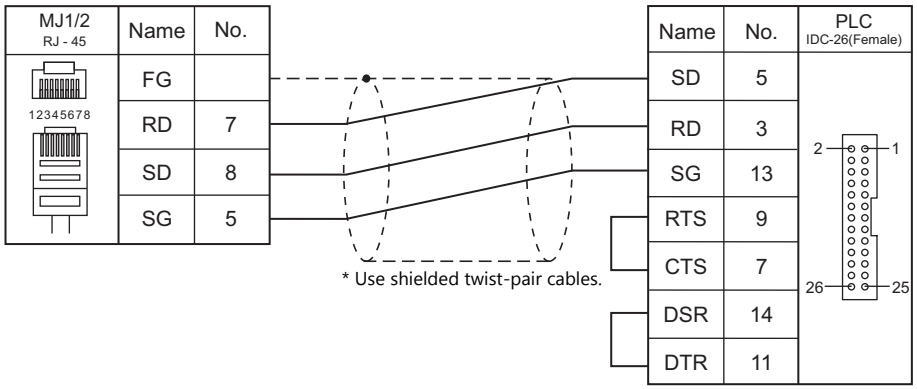
Wiring diagram 2 - C2



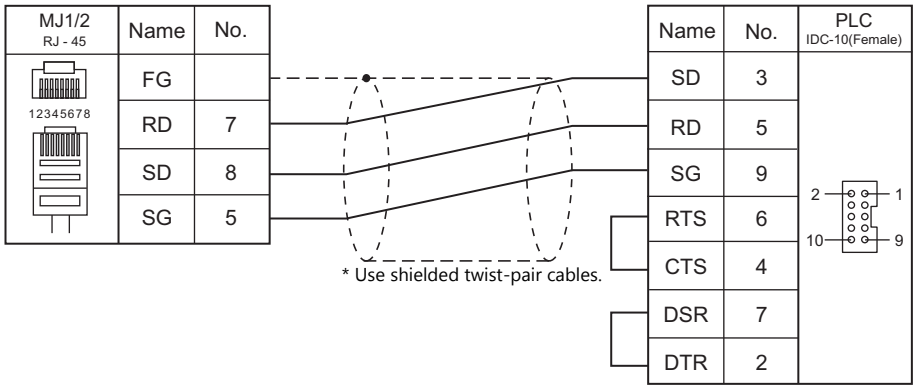
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



Wiring diagram 2 - M2



15. EATON Cutler-Hammer

15.1 PLC Connection

15.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
ELC	ELC-PA10 ELC-PC12 ELC-PH12 ELC-PB14	Programming port on the CPU unit (COM1)	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		Communication port on the CPU unit (COM2)	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

15.1.1 ELC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

PLC

Make the PLC setting using device memory “D” (data register). For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	
X	(input)	01H	Read only
Y	(output)	02H	
M	(auxiliary relay)	03H	
S	(step point)	04H	
T	(timer)	05H	
C	(counter)	06H	
32C	(high-speed counter)	07H	Double-word

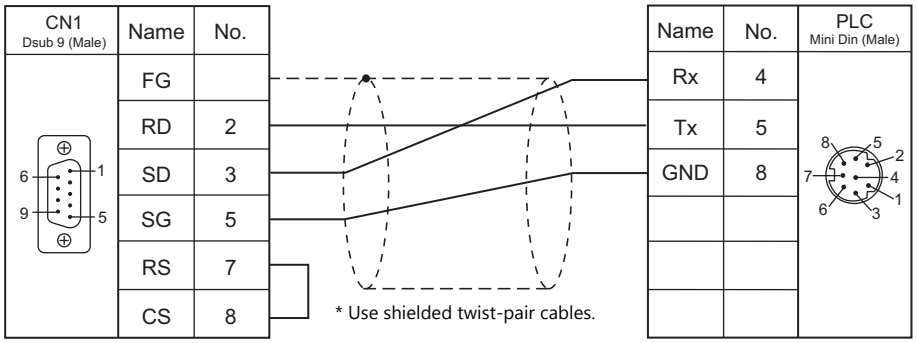
15.1.2 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

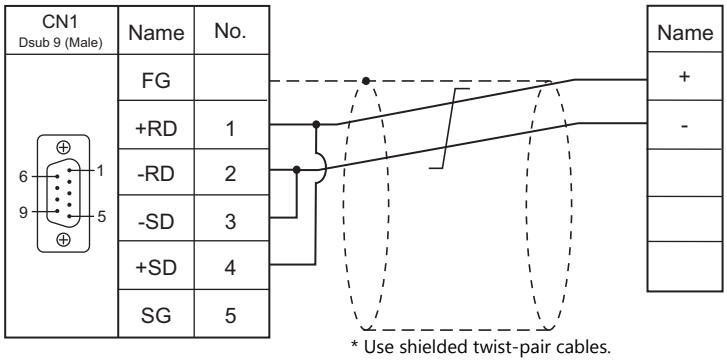
RS-232C

Wiring diagram 1 - C2



RS-422

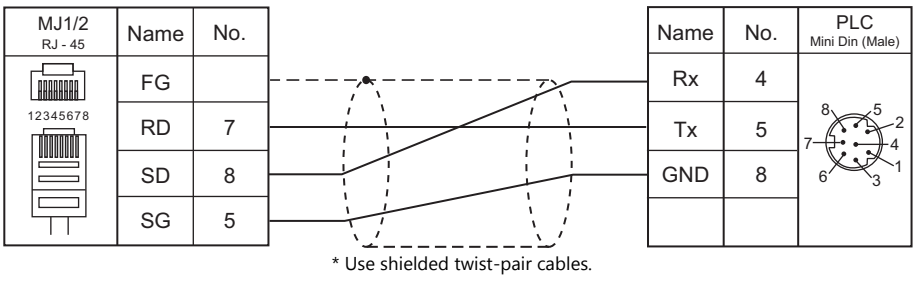
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

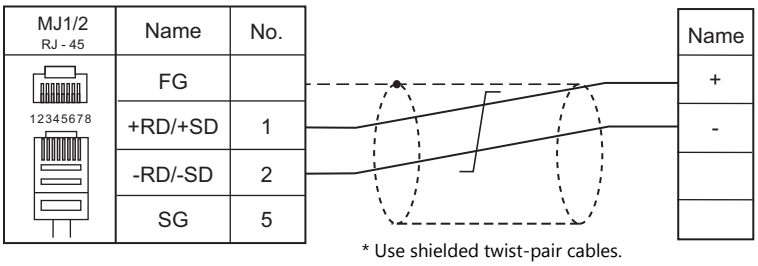
RS-232C

Wiring diagram 1 - M2



RS-422

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

16. EMERSON

16.1 PLC Connection

16.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
EC10/EC20/EC20H (MODBUS RTU)	EC10	Port1 *3	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
	EC20	COM2 *3	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.
*3 The concurrent use of RS-232C and RS-485 terminals is not allowed for connection.

16.1.1 EC10/EC20/EC20H (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	Odd /Even / None	
Target Port No.	1 to 247	

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS2060. Thus, time correction must be performed on the controller side.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data register)	00H	
SD	(Special data register)	01H	
Y	(Output I/O)	02H	
X	(Input I/O)	03H	
M	(Auxiliary relay)	04H	
SM	(Special auxiliary relay)	05H	
S	(State relay)	06H	
T	(Timer)	07H	
C	(Counter)	08H	
Z	(Offset addressing register)	09H	
TW	(Timer)	0AH	
CW	(Counter)	0BH	
CDW	(Counter)	0CH	Double-word
R	(R)	0DH	

Indirect Device Memory Designation

	15 8	7 0
n+0	Model	Device type
n+1	Address No.	
n+2	Expansion code *	Bit designation
n+3	00	Station number

* For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

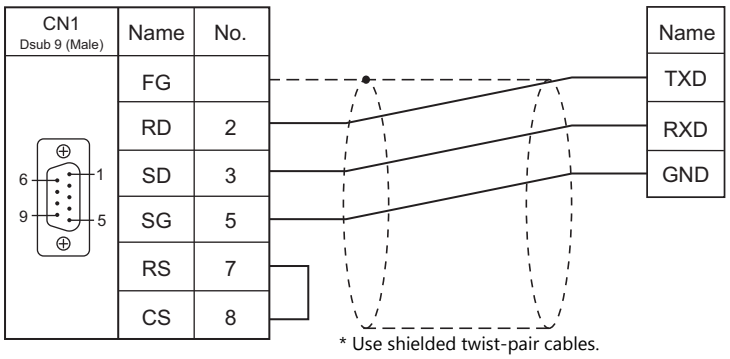
16.1.2 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

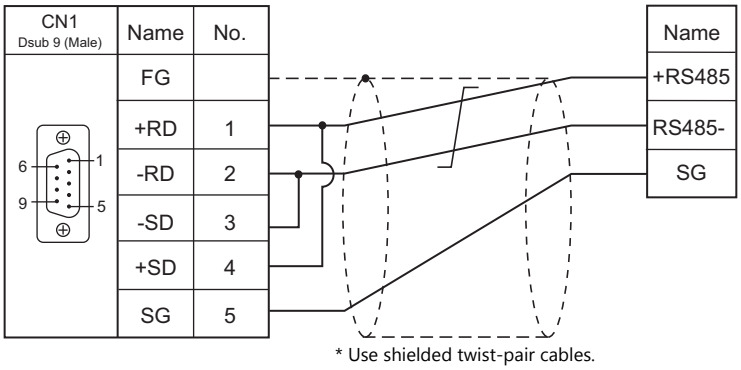
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

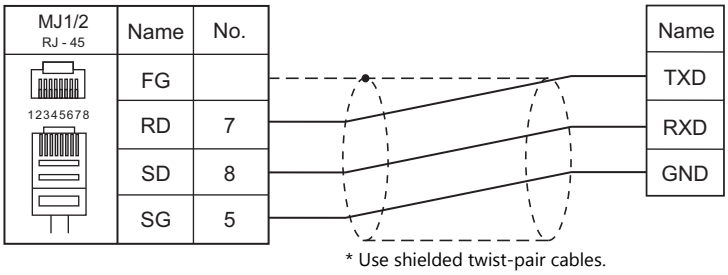
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-232C

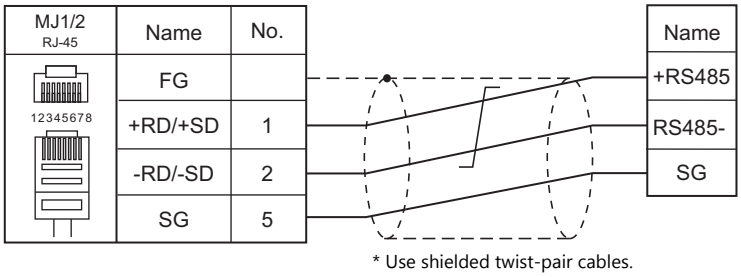
Wiring diagram 1 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

17. FANUC

17.1 PLC Connection

17.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
Power Mate	Power Mate Model H/D	JD14	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	×
	Power Mate i Model H/D	JD40	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
		JD42	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
	16-Model C	JD5B	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
	16i-Model A 16i-Model B 18i-Model A 18i-Model B 18-Model C 21i-Model A 21i-Model B	JD36B	RS-232C				
	30i-Model A 31i-Model A 32i-Model A	JD36A					
		JD54		Wiring diagram 3 - C2	Wiring diagram 3 - M2		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

17.1.1 Power Mate

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	19200 bps (fixed)	
Data Length	8 bits (fixed)	
Stop Bit	1 bit (fixed)	
Parity	Even (fixed)	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data table)	00H	
X	(input relay)	01H	WX as word device
Y	(output relay)	02H	WY as word device
R	(internal relay)	03H	WR as word device
K	(keep relay)	04H	WK as word device
T	(timer)	05H	
C	(counter)	06H	
E	(extensional relay)	07H	WE as word device, available only with 30i/31i/32i-ModelA

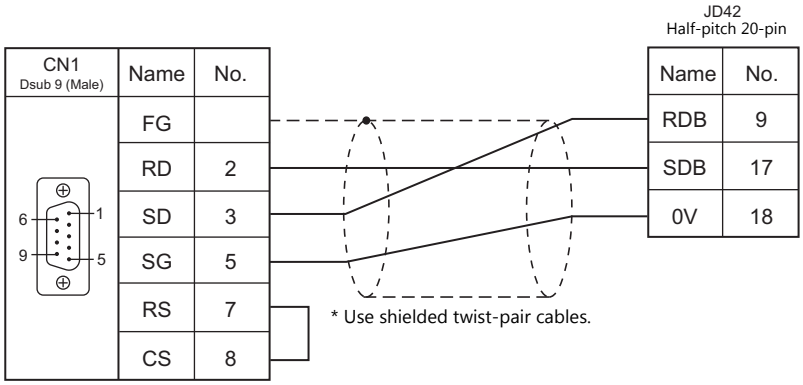
17.1.2 Wiring Diagrams

When Connected at CN1:

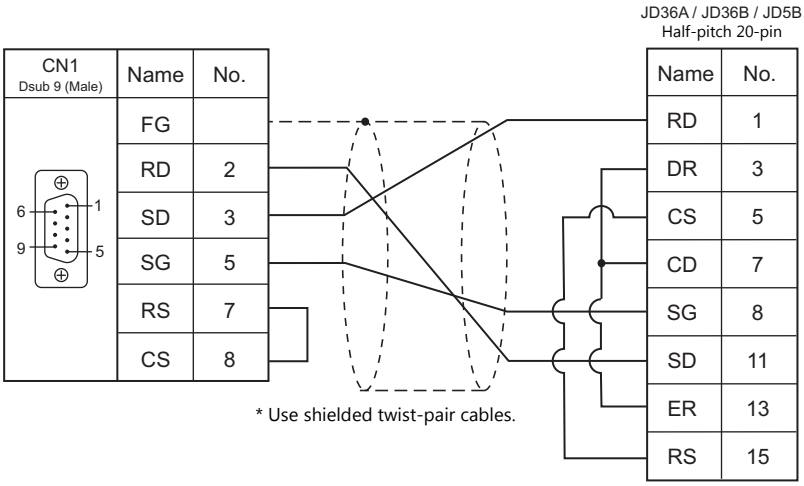
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

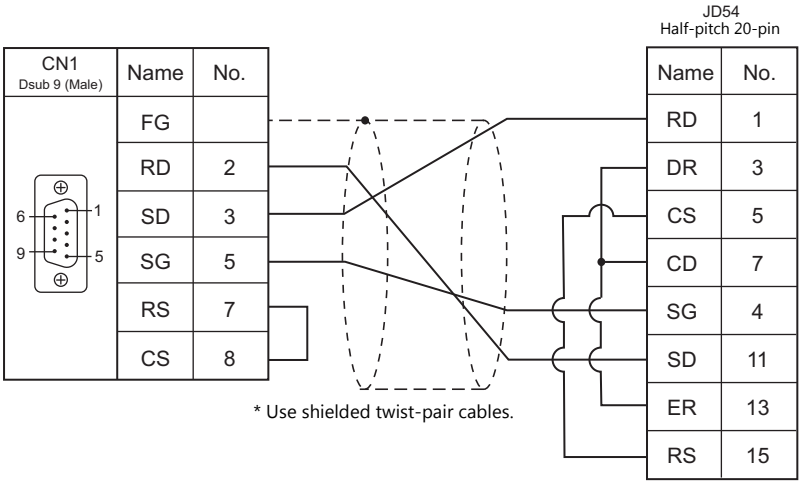
Wiring diagram 1 - C2



Wiring diagram 2 - C2

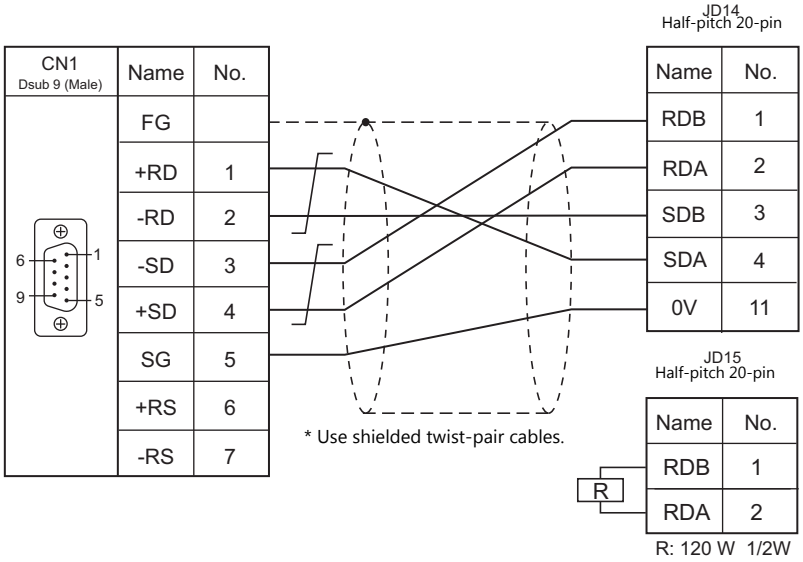


Wiring diagram 3 - C2

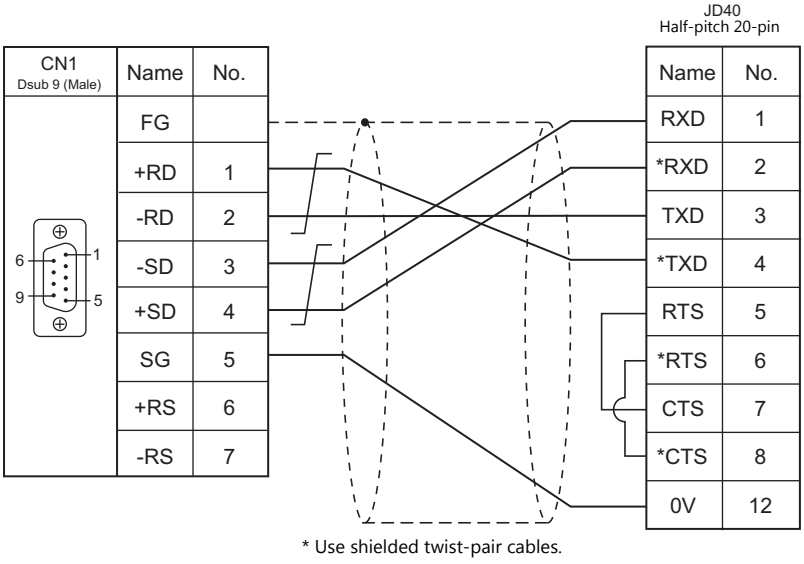


RS-422

Wiring diagram 1 - C4



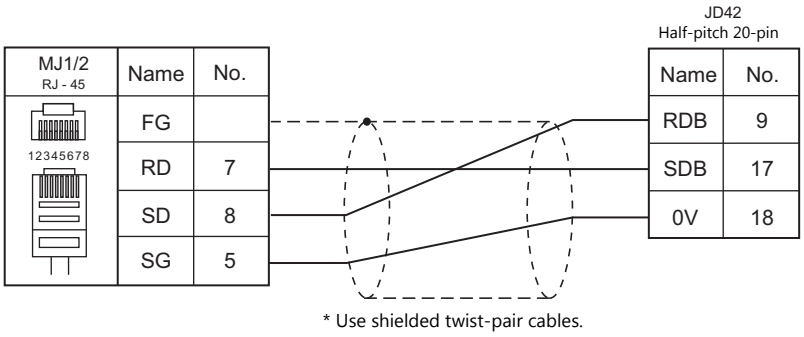
Wiring diagram 2 - C4



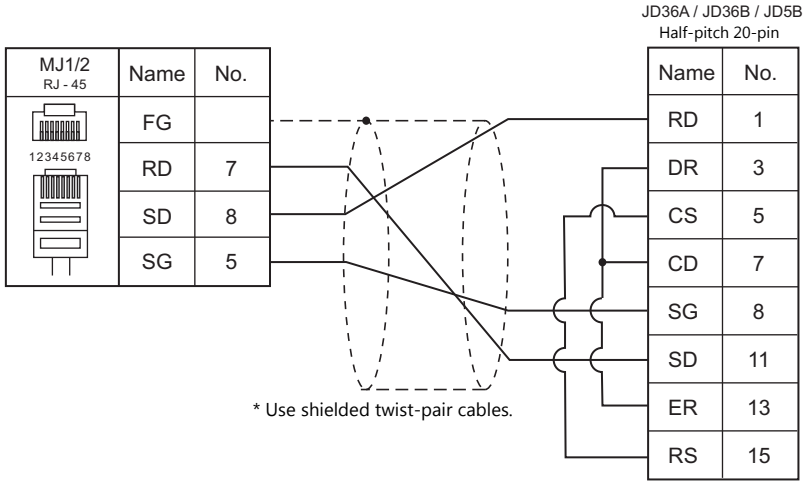
When Connected at MJ1/MJ2:

RS-232C

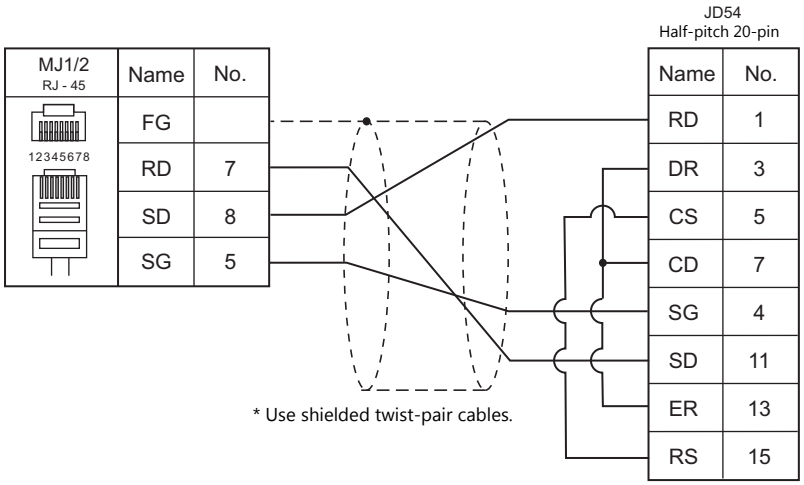
Wiring diagram 1 - M2



Wiring diagram 2 - M2

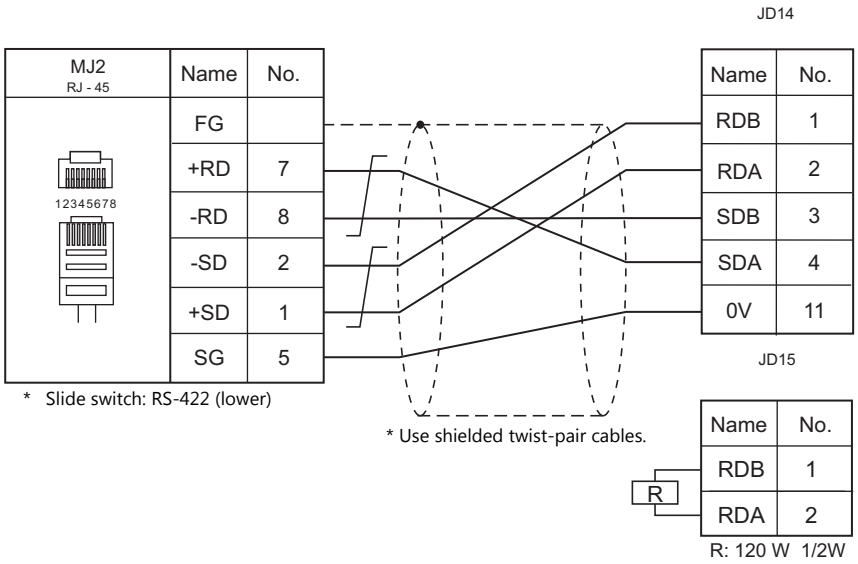


Wiring diagram 3 - M2

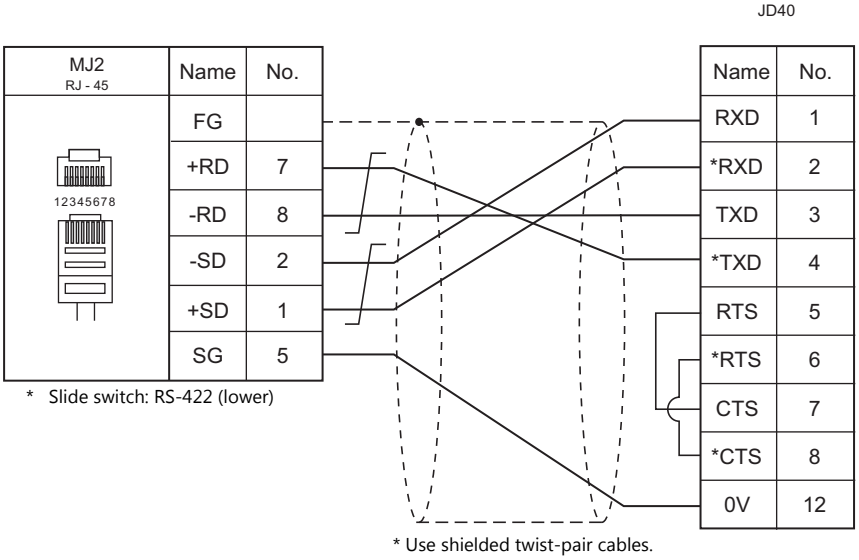


RS-422/485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



18. Fatek Automation

18.1 PLC Connection

18.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection			Ladder Transfer *2
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
FACON FB series	FBE-20MC FBE-28MC FBE-40MC	CPU unit Programming port	Port1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			Port2	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
		FB-DTBR	Port1 (D-sub 15)	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			Port1 (D-sub 9)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			Port2 (terminal block)	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

18.1.1 FACON FB Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

PLC

Make the PLC setting using the configuration tool "PRO_LADDER". For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
HR	(data register)	00H	
DR	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
RT	(timer/current value)	08H	
RC	(counter/current value)	09H	
DRC	(32-bit counter/current value)	0AH	*1

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

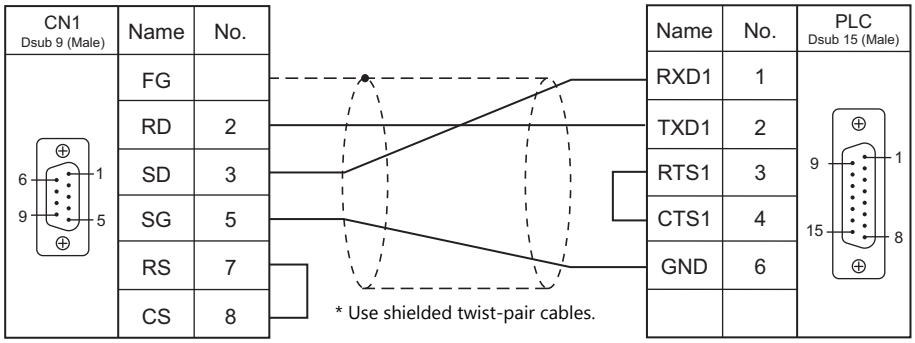
18.1.2 Wiring Diagrams

When Connected at CN1:

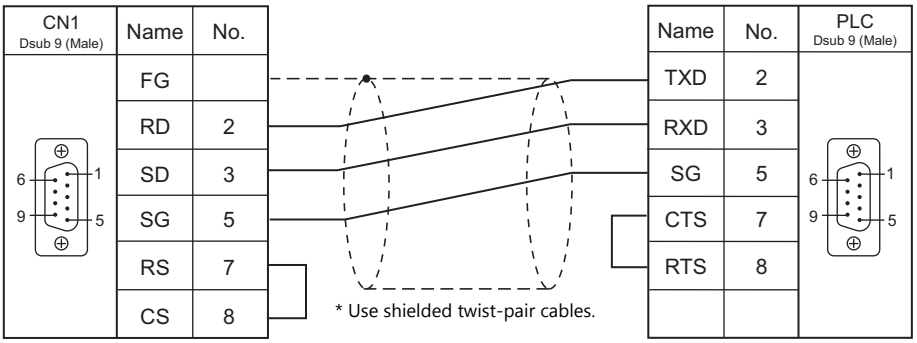
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

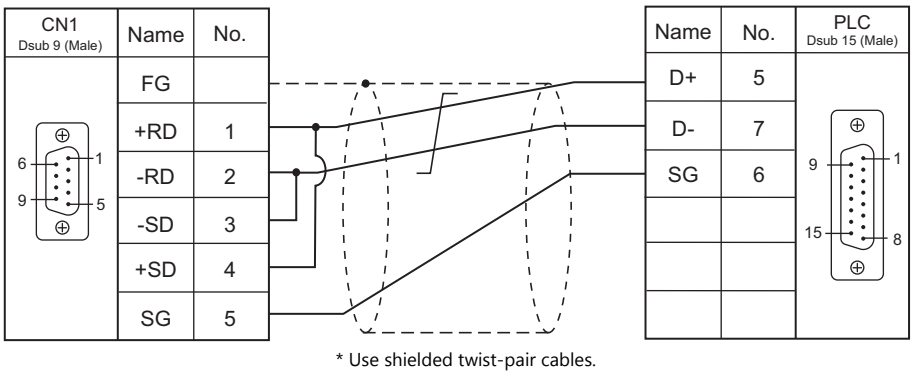


Wiring diagram 2 - C2

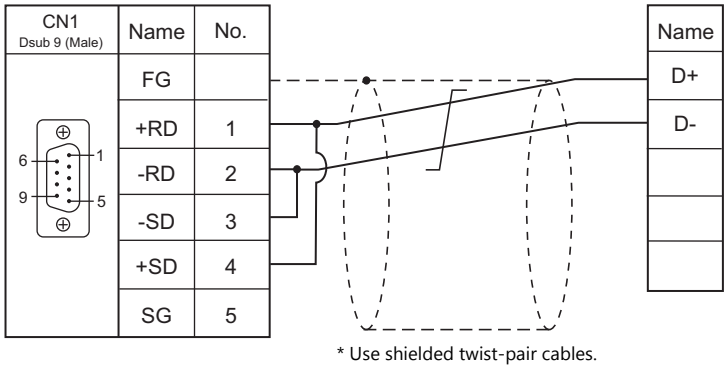


RS-422

Wiring diagram 1 - C4



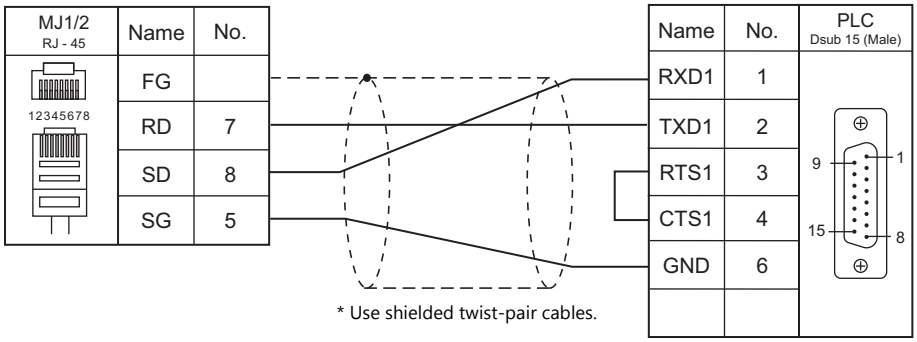
Wiring diagram 2 - C4



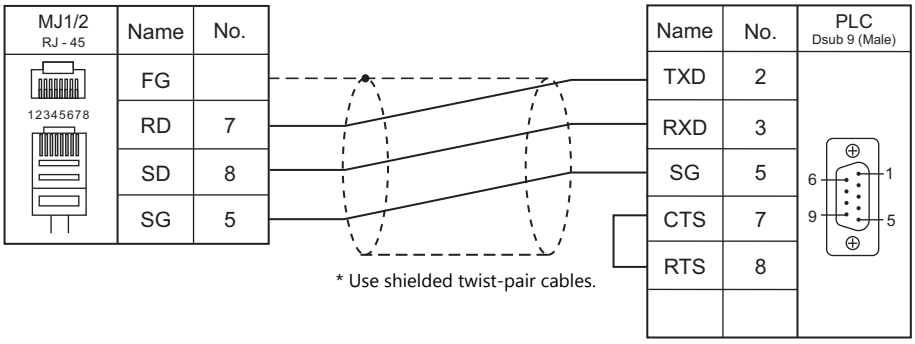
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

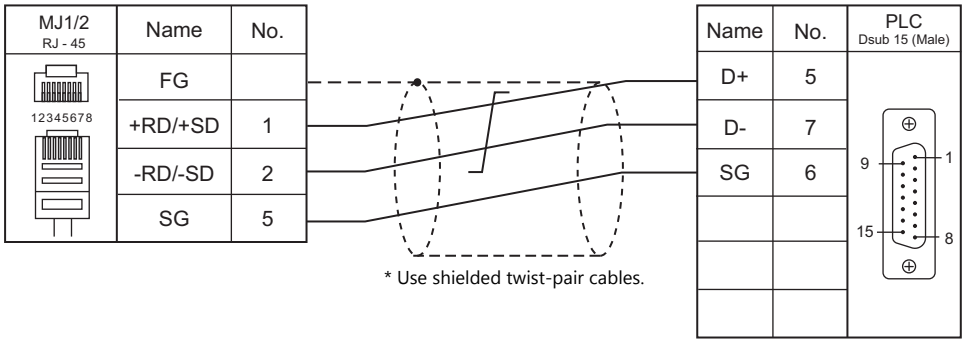


Wiring diagram 2 - M2

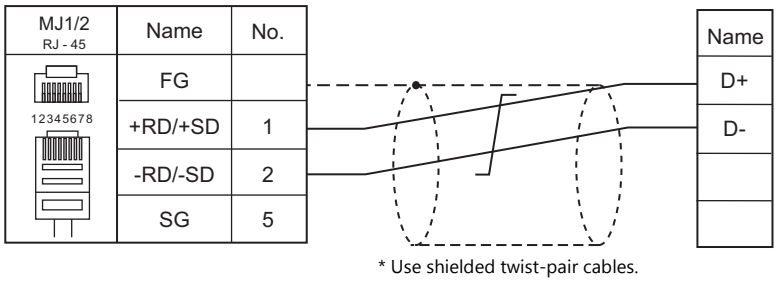


RS-422

Wiring diagram 1 - M4



Wiring diagram 2 - M4



MEMO

19. FESTO

19.1 PLC Connection

19.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Port	Signal Level	Wiring Diagram			Ladder Transfer *2
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
FEC	FEC Compact	FC20-FST FC21-FST FC22-FST FC23-FST FC30-FST FC34-FST	EXT	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

19.1.1 FEC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	**None**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	

PLC

No particular setting is necessary on the PLC.

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

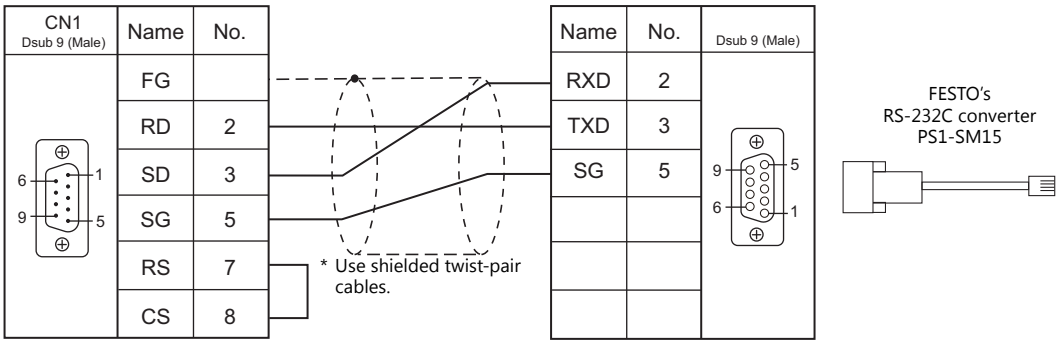
Device Memory		TYPE	Remarks
FW	(flag word)	00H	
IW	(input)	01H	
OW	(output)	02H	
R	(register)	03H	
T	(pulse timer)	04H	
TP	(timer [preset value])	05H	
TW	(timer [current value])	06H	
C	(counter)	07H	
CP	(counter [preset value])	08H	
CW	(counter [current value])	09H	

19.1.2 Wiring Diagrams

When Connected at CN1:

RS-232C

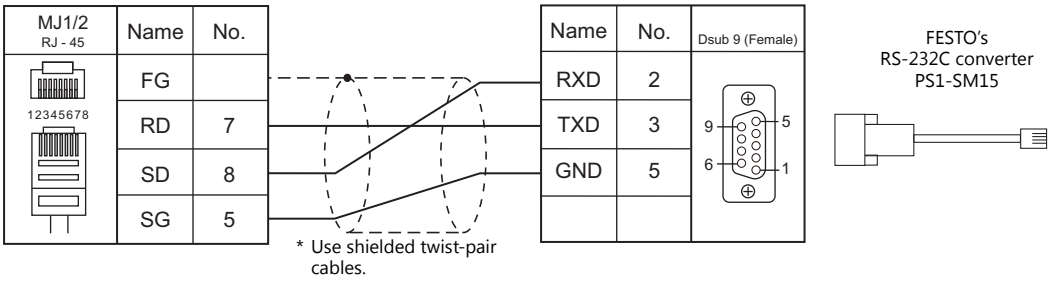
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



MEMO

20. FUFENG

20.1 PLC Connection

20.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
APC Series Controller	APB-50	COM1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			RS-422/485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
		COM2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

20.1.1 APC Series Controller

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 98	

PLC

COM1

Communication setting

Make PLC settings using the application software “APC Pro”. For more information, refer to the PLC manual issued by the manufacturer.

Item		Setting	Remarks
APC system	APC number setup	0 to 98	
	APC baud rate setup	115200 / 38400 / 19200 / 9600 / 4800	

Parity: none, data length: 8 bits, stop bit: 1 bit (fixed)

Signal level selection

Item			Setting	Remarks
Jumper	J1-1 J1-2 J1-3	RS-232C	J1-1: Jumper across pins 2 and 3 J1-2: Jumper across pins 2 and 3 J1-3: Jumper across pins 2 and 3	
		RS-485	J1-1: Jumper across pins 1 and 2 J1-2: Jumper across pins 1 and 2 J1-3: Jumper across pins 1 and 2	

COM2

Station number: 0, parity: none, data length: 8 bits, stop bit: 1 bit, baud rate: 115200 bps (fixed)

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data area)	00H	
T	(Timer relay area)	01H	Read only
C	(Counter relay area)	02H	Read only
R	(Accessory relay area)	03H	Common to D0 to D15 *1
X	(Input channel)	04H	Common to D16 to D30 *1
Y	(Output channel)	05H	Common to D31 to D40 *1
S	(System relay area)	06H	Common to D41 to D55 *1
K	(Thermal control relay area)	07H	Common to D56 to D63 *1
TSW	(Timer setting area)	08H	Common to D208 to D335
TP	(Present timer setting area)	09H	Read only, common to D336 to D463
CSW	(Counter setting area)	0AH	Common to D464 to D591
CP	(Present counter setting area)	0BH	Read only, common to D592 to D719
KJS	(Thermal control temperature setting)	0CH	Common to D80 to D95
KP	(Present thermal control temperature setting)	0DH	Read only, common to D96 to D111
KJL	(Thermal control low-temperature alarm setting)	0EH	Common to D112 to D127
KJH	(Thermal control high-temperature alarm setting)	0FH	Common to D128 to D143
KI	(Present thermal control current setting)	10H	Read only, common to D144 to D159
KJC	(Insufficient thermal control)	11H	Common to D160 to D175
KJR	(Thermal control cycle setting)	12H	Common to D192 to D207

*1 When using consecutive bit devices, select device memory “D” for improved performance.

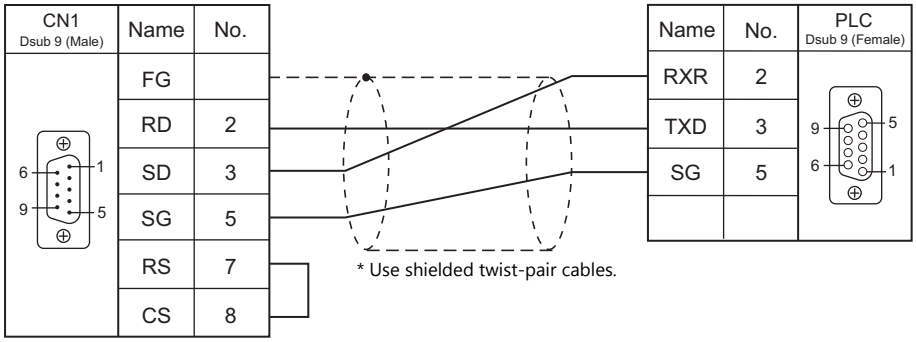
20.1.2 Wiring Diagrams

When Connected at CN1:

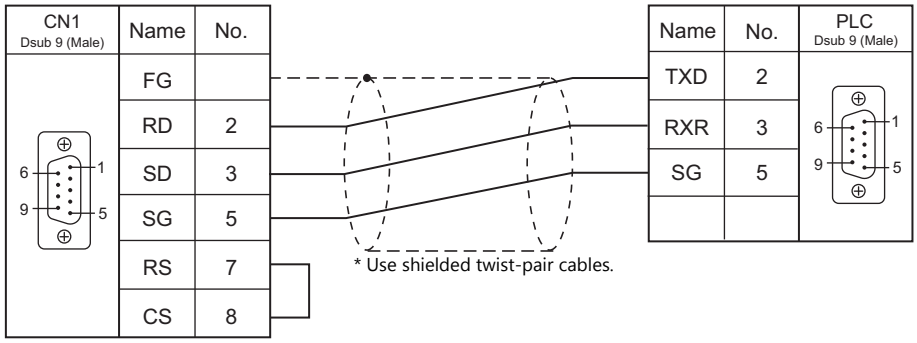
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

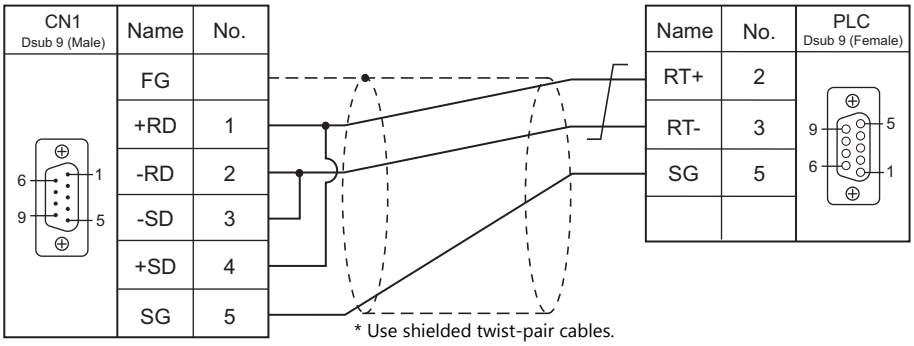


Wiring diagram 2 - C2



RS-422/RS-485

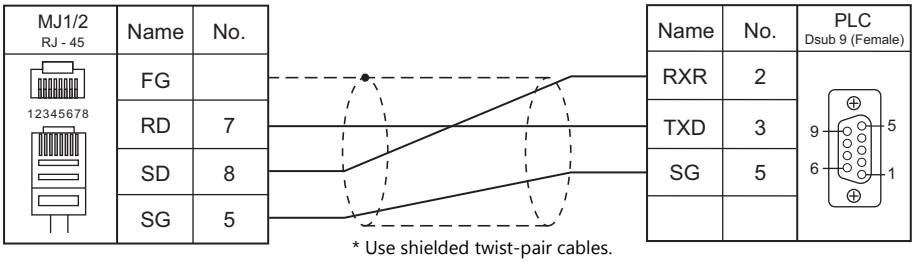
Wiring diagram 1 - C4



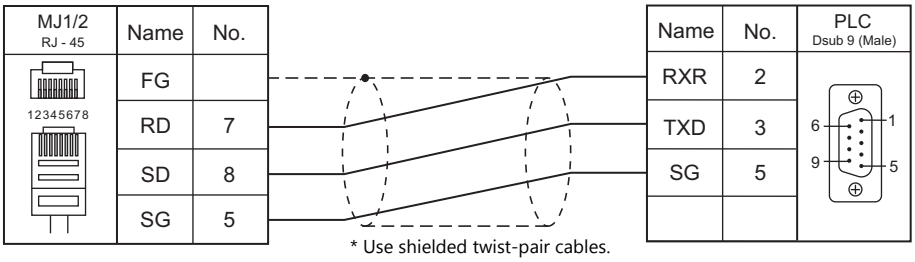
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

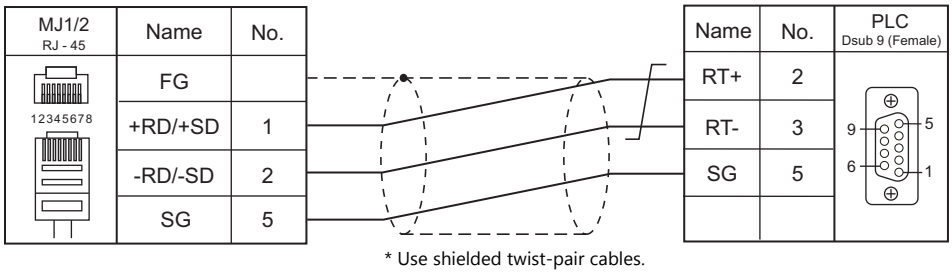


Wiring diagram 2 - M2



RS-422/RS-485

Wiring diagram 1 - M4



MEMO

21. Fuji Electric

21.1 PLC Connection

21.2 Temperature Controller/Servo/Inverter Connection

21.1 PLC Connection

Serial Connection

MICREX-F Series

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
MICREX-F series	NV1P-x (F55)	NV1L-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
	NC1P-E (F70) NC1P-S (F70S)	NC1L-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		NC1L-RS4	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
	FPU080H (F80H) FPU120H (F120H) FPU120S (F120S) FPU140S (F140S) FPU15xS (F15xS)	FFU120B	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		FFK120A	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

SPB (N Mode), FLEX-PC

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
SPB (N mode) & FLEX-PC series	NS-CPU-xx	NS-RS1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NJ-CPU-xx	NJ-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		NJ-RS4	RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NBxx	NB-RS1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		NW0LA-RS4	RS-485 (4-wire)	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
			RS-485 (2-wire)	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
SPB (N Mode) & FLEX-PC CPU	NS-CPU-xx NJ-CPU-xx NBxx NW0Pxx (SPB)	CPU port	RS-485	Hakko Electronics' cable "D9-FU-SPBCPU" *4	×	Hakko Electronics' cable "MJ2-FU-SPBCPU" *4	○
	NJ-CPU-B16	RS-232C port	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.
*4 Cable length: XXX-FU-SPBCPU-☐M (☐ = 2, 3, 5 m)

MICREX-SX, SPB (IEC Mode)

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
MICREX-SX SPH/SPB/ SPM/SPE/ SPF series	NP1Px-xx (SPH)	NP1L-RS1	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
			RS-485	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
		NP1L-RS2 NP1L-RS3	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		NP1L-RS4	RS-485	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
		NP1L-RS5	RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		NW0LA-RS4	RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NA0PAxxx-xxx (SPF)	NA3LA-RS1	RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
			RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		
		NA0LA-RS3	RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
		NA0LA-RS5	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		
MICREX-SX SPH/SPB/ SPM/SPE/ SPF CPU	NP1Px-xx (SPH)	CPU port	RS-485	Hakko Electronics' cable *4 *5	×	Hakko Electronics' cable *4 *5	○
	NW0Pxx (SPB)	CPU port	RS-485	Hakko Electronics' cable "D9-FU-SPBCPU" *5	×	Hakko Electronics' cable "MJ2-FU-SPBCPU" *5	
	NA0PAxxx-xxx (SPF)	CPU port	RS-232C	Hakko Electronics' cable "D9-FU-SPFCPU" *5	Hakko Electronics' cable "MJ-FU-SPFCPU" *5		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.
*4 The cable for connection varies depending on the model and hardware version of the CPU.

CPU Model: Hardware Version		Connector Shape	CN1	MJ2 (4-wire)
NP1PH-08/16:	Before V22	Small-type connector	Hakko Electronics' cable "D9-FU-SPHCPU" *5	Hakko Electronics' cable "MJ2-FU-SPHCPU" *5
NP1PS-32:	Before V26			
NP1PS-32R/74R/117R:	Before V26			
NP1PS-245R:	Before V23			
NP1PM-48R/48E/256E/256H:	Before V25			
NP1PU-048E/128E/256E:	Before V22			
NP1PH-08/16:	V22 or later	RJ-45	Hakko Electronics' cable "D9-FU-SPBCPU" *5	Hakko Electronics' cable "MJ2-FU-SPBCPU" *5
NP1PS-32:	V26 or later			
NP1PS-32R/74R/117R:	V26 or later			
NP1PS-245R:	V23 or later			
NP1PM-48R/48E/256E/256H:	V25 or later			
NP1PU-048E/128E/256E:	V22 or later			

*5 Cable length: xxx-FU-SPHCPU-☐M, xxx-FU-SPBCPU-☐M, xx-FU-SPFCPU-☐M (☐=2, 3, 5 m)

Ethernet Connection (TS2060i Only)

MICREX-SX Series

PLC Selection on the Editor	CPU	Unit	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer *2
MICREX-SX (Ethernet)	NP1PH-xx (SPH200) NP1PS-xx (SPH300) NP1PM-xx (SPH2000) NP1PU-xx (SPH3000) NP1PU2-xx (SPH3000MM)	NP1L-ET1	○	×	Self port standard No. + 251	×
	NP1PM-xx (SPH2000) NP1PU-xx (SPH3000) NP1PU2-xx (SPH3000MM)	CPU with built-in Ethernet				
	NA0PAxxx-xxx (SPF)	NA3LA-ET1 NA0LA-ET1	○	×		

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

Network Connection (TS2060i Only)

T-Link

PLC Selection on the Editor	CPU	Unit on PLC	Unit on TS2060i	Ladder Transfer
MICREX-F (T-Link)	NV1P-x (F55)	NV1L-TL1	CUR-01	×
	NC1P-E (F70)	Standard T-Link		
	NC1P-S (F70S)	Standard T-Link NC1H-TL1		
	FPU080H (F80H) FPU120H (F120H) FPU120S (F120S) FPU140S (F140S) FPU15xS (F15xS)	Standard T-Link FPC120T		
MICREX-SX (T-Link)	NP1Px-xx (SPH)	NP1L-TL1		

For more information on T-Link connection, refer to the Specifications for Communication Unit T-LINK manual.

OPCN-1

PLC Selection on the Editor	CPU	Unit on PLC	Unit on TS2060i	Ladder Transfer
MICREX-SX (OPCN-1)	NP1Px-xx (SPH)	NP1L-JP1	CUR-00	×

For more information on OPCN-1 connection, refer to the Specifications for Communication Unit OPCN-1 manual.

SX BUS

PLC Selection on the Editor	CPU	Unit on PLC	Unit on TS2060i	Ladder Transfer
MICREX-SX (SX BUS)	NP1Px-xx (SPH)	–	CUR-06	×

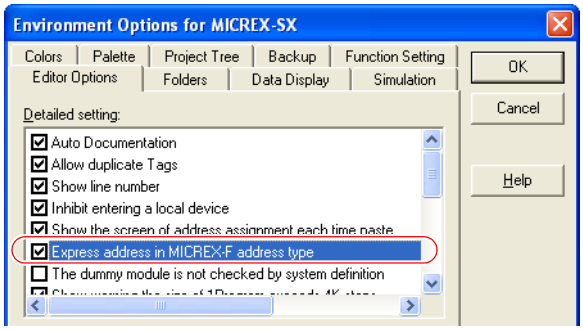
MICREX-SX Model Selection

When the MICREX-SX SPH or SPB series is connected, a mode selection may be required on the TS2060 editor depending on the programming tool used on the PLC or the setting on the programming tool.

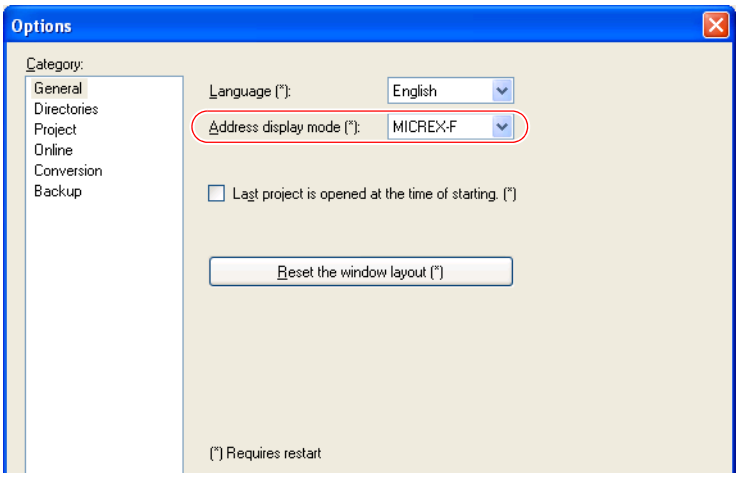
PLC	PLC Programming Tool			Setting on the TS2060 Editor	
		Address Expression		PLC Selection	Mode Selection *2
SPH series	SX-Programmer Expert (D300win)			MICREX-SX SPH/SPB/SPM/SPE/SPF series MICREX-SX SPH/SPB/SPM/SPE/SPF CPU MICREX-SX (Ethernet) MICREX-SX (T-Link) MICREX-SX (OPCN-1) MICREX-SX (SX BUS)	IEC Mode
	SX-Programmer Standard (Ver. 1 / 2)		Unchecked *1		N Mode
			Checked *1		F Mode
	SX-Programmer Standard (Ver. 3)		FLEX-PC *1		N Mode
			MICREX-F *1		F Mode
SPF series	SX-Programmer Expert (D300win)			MICREX-SX SPH/SPB/SPM/SPE/SPF series MICREX-SX SPH/SPB/SPM/SPE/SPF CPU	IEC Mode
	SX-Programmer Standard (Ver. 1 / 2)	SX-MODE	Unchecked *1		N Mode
			Checked *1		F Mode
	SX-Programmer Standard (Ver. 3)		FLEX-PC *1		N Mode
			MICREX-F *1		F Mode
	SX-Programmer Standard (Ver. 1 / 2)	N-MODE	-	SPB (N mode) & FLEX-PC series SPB (N mode) & FLEX-PC CPU	-
	FLEX-PC Programmer		-		-

*1 The setting procedure differs depending on the version of the SX-Programmer Standard tool.

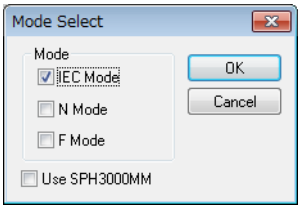
- Ver. 1 or 2:
  Check or uncheck the box for [Express address in MICREX-F address type] on the [Editor Options] tab window in the [Environment Options for MICREX-SX] dialog ([Options] → [MICREX-SX Environment]).



- Ver. 3:
  Select "MICREX-F" from [Address display mode] ([Tool] →[Options] → [Category: General]).



*2 [Mode Select] dialog on the TS2060 editor



- [IEC Mode]: Variable name cooperation function
- [N Mode]: Address denotation "hexadecimal" *
- [F Mode]: Address denotation "decimal" *

* Except bit addresses

21.1.1 MICREX-F Series

Communication Setting

Editor

Communication setting

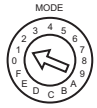
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

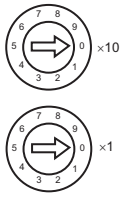
Be sure to match the settings to those made under [Communication Setting] of the editor.

Mode setting

MODE	Setting	Contents	
	1	RS-232C	Command-defined asynchronous communication (non-procedure)
	3	RS-485	Command-defined asynchronous communication (non-procedure)

* The mode setting switch is common to NV1L-RS2, NC1L-RS2, NC1L-RS4, FFU120B and FFK120A.

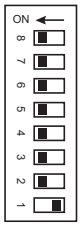
Station number setting

ADDRESS	Setting	Contents
	0 to 31	Station number ×10: the tens place ×1: the ones place

* The station number setting switch is common to NC1L-RS4, FFU120B and FFK120A.
It is not provided on NV1L-RS2 nor NC1L-RS2.

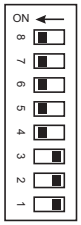
Transmission setting

NV1L-RS2, NC1L-RS2, NC1L-RS4, FFU120B

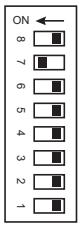
Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	1 bit	2 bits	
	Baud rate	19200	9600	
3		ON	ON	
2		ON	OFF	
1		OFF	ON	

FFK120A

- Character switches

Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	2 bits	1 bit	
3	Not used	-	OFF	
2		-	OFF	
1		-	OFF	

- Baud rate setting switches
  Set a switch to the ON position.

Switch	Contents	Example: 19,200 bps
8	Not used	
7	19,200 bps	
6	9,600 bps	
5	4,800 bps	
4	2,400 bps	
3	1,200 bps	
2	600 bps	
1	300 bps	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
M	(auxiliary relay)	00H	WM as word device
K	(keep relay)	01H	WK as word device
B	(input/output relay)	02H	WB as word device
L	(link relay)	09H	WL as word device
F	(special relay)	0AH	WF as word device
TS	(timer/set value)	0BH	*1
TR	(timer/current value)	0CH	*1
W9	(0.1-sec timer/current value)	0DH	*1
CS	(counter/set value)	0EH	*1
CR	(counter/current value)	0FH	*1
BD	(data memory)	10H	*1
WS	(step relay)	11H	*2
Wn	(file memory)	12H	*3, *4

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

*2 WS (step relay) is a byte device processed as described below.
For input: Upper 8 bits are "0".
For output: Lower 8 bits are written.

*3 To set up the file memory on the editor, enter "file number" + ": (colon)" + "address" in order.

Example: W30 : 00002
Address
Colon
File number

*4 Define the file area as "**SI**".

21.1.2 SPB (N Mode) & FLEX-PC Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

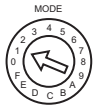
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

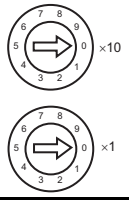
Be sure to match the settings to those made under [Communication Setting] of the editor.

NS-RS1, NJ-RS2, NJ-RS4, NB-RS1

Mode setting

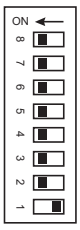
MODE	Setting	Contents	
	1	RS-232C	Command-defined asynchronous communication (non-procedure)
	3	RS-485	Command-defined asynchronous communication (non-procedure)

Station number setting

ADDRESS	Setting	Contents
	0 to 31	Station number ×10: the tens place ×1: the ones place

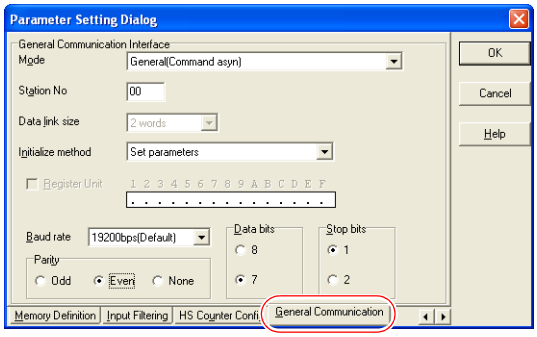
* The station number setting switch is not provided on NJ-RS2.

Transmission setting

Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	1 bit	2 bits	
	Baud rate	19200	9600	
3		ON	ON	
2		ON	OFF	
1		OFF	ON	

NW0LA-RS2, NW0LA-RS4 (parameter setting)

On the PLC loader, set parameters for general communications.
Be sure to match the settings to those made under [Communication Setting] of the editor.



Item	Setting	Remarks
Mode	General (Command asyn)	These settings can also be specified for the parameter area. For more information, refer to the MICREX-SX SPB Series User's Manual <Communication Adapter> (FEH405).
Station No.	RS-232C: 0, RS-485: 0 to 31	
Initialize method	Set parameters	
Baud rate	4800 / 9600 / 19200 / 38400	
Parity	Odd / Even / None	
Data bits	8 / 7	
Stop bits	1 / 2	

Notes on use of 2-wire connection with NW0LA-RS4
The settings show above are not enough to establish a 2-wire connection with NW0LA-RS4.
To establish a connection, select [Initial file transfer] for [Initial Setting Mode] on the PLC loader, and select 2-wire connection for [485 mode] in the initial setting file.
For more information, refer to the MICREX-SX SPB Series User's Manual <Communication Adapter> (FEH405).

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Standard Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
M	(internal relay)	02H	WM as word device
L	(latch relay)	03H	WL as word device
X	(input relay)	04H	WX as word device
Y	(output relay)	05H	WY as word device
R	(file register)	06H	
TN	(timer/current value)	07H	
CN	(counter/current value)	08H	
T	(timer/contact)	09H	
C	(counter/contact)	0AH	
WS	(step relay)	0BH	

21.1.3 SPB (N Mode) & FLEX-PC CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	When connecting MONITOUCH to the RS-232C port on NJ-CPU-B16, select [RS-232C]. In other cases, select [RS-422/485].
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	
Target Port No.	0	

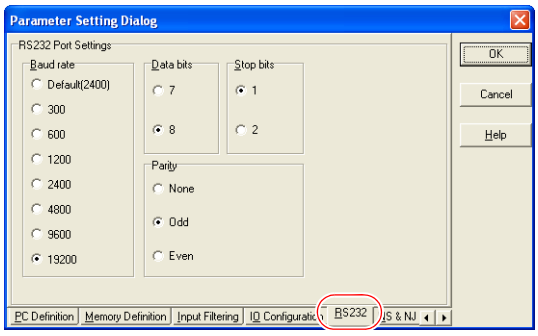
PLC

SPB, FLEX-PC CPU port

No particular setting is necessary on the PLC.

Built-in RS-232C port on NJ-CPU-B16

On the PLC loader, set parameters for the built-in RS-232C port.
Be sure to match the settings to those made under [Communication Setting] of the editor.



Available Device Memory

The available device memory is the same as the one described in “21.1.2 SPB (N Mode) & FLEX-PC Series”.

21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)

Communication Setting

Editor

Communication setting

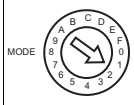
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	**38400 bps**	For the SPH series: Do not change the default setting.
Data Length	**8 bits**	
Stop Bit	**1 bits**	
Parity	**Even**	
Target Port No.	0 to 31	

PLC

NP1L-RS1, NP1L-RS2, NP1L-RS3, NP1L-RS4, NP1L-RS5

Mode setting

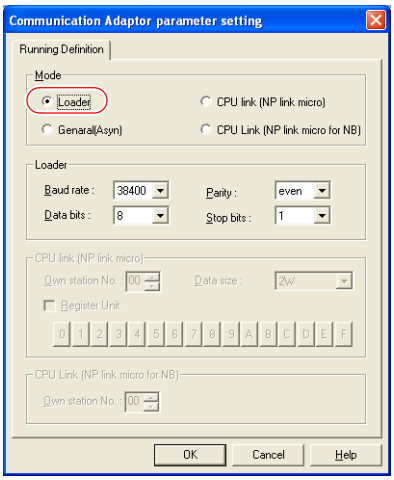
MODE	Setting	RS1, 2, 4 RS3, 5	RS-232C Port CH1	RS-485 Port CH2	Remarks
	0		General equipment	General equipment	
	1		Loader	General equipment	
	2		General equipment	Loader	
	3		Loader	Loader	
	4		General equipment	General equipment	RS3 and 5 are not used.
	5		Not used		
	6		Modem loader 19200 bps	General equipment	
	7		Self-diagnosis mode 1		
	8		Self-diagnosis mode 2		
	9		Modem loader 19200 bps	Loader	
	A		Modem loader 9600 bps	General equipment	
	B		Modem loader 9600 bps	Loader	
	C		Modem loader 38400 bps	General equipment	
	D		Modem loader 38400 bps	Loader	
	E		Modem loader 76800 bps	General equipment	
	F		Modem loader 115200 bps	Modem loader 115200 bps	

* Set the port (or CH No.) where the TS2060 is connected to “loader”.
Communication parameters are fixed to 38400 bps (baud rate), 8 bits (data length), 1 bit (stop bit), and even (parity).

* When the PLC is connected with the TS2060, the station number setting switch for RS-485 is not used.

NW0LA-RS2, NW0LA-RS4 (parameter setting)

On the PLC loader, set parameters for general communications.
Be sure to match the settings to those made under [Communication Setting] of the editor.



Item	Setting	Remarks
Mode	Loader	
Baud rate	4800 / 9600 / 19200 / 38400	
Parity	Odd / Even / None	
Data bits	8	
Stop bits	1 / 2	

Available Device Memory

Variable name cooperation function
The variable name cooperation function can be used only for PLC1. For device memory assignment, basically use the variable name cooperation function. **It is recommended that you specify a device memory address in the [AT] field to define the area (variable) that is used for communications with the TS2060.**

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
%IX	(input memory) *1	-	%IW as word device, %ID as double-word device *3
%QX	(output memory) *1	-	%QW as word device, %QD as double-word device *3
%MX1.	(standard memory)	02H	%MW1. as word device, %MD1. as double-word device *2 *3
%MX3.	(retain memory)	04H	%MW3. as word device, %%MD3. as double-word device *2 *3
%MX10.	(system memory)	08H	%MW10. as word device, %MD10. as double-word device *2 *3

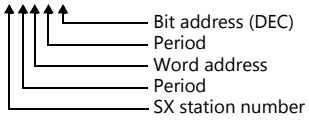
*1 For the input/output memory, the variable name cooperation function of the PLC1 must be used. Indirect designation is not available with the input/output memory.

*2 Double-word addresses (%MD1., %MD3., %MD10.) can be specified only for PLC1.
In the case with PLC2 to PLC8, access to the above addresses is possible when the data length is set to 2 words in the word address (%MW1., %MW3., %MW10.).
Example: When accessing the address in %MD1.100:
Set the data length to 2 words for %MW1.100.

*3 The assigned device memory is expressed as shown below when editing the screen.

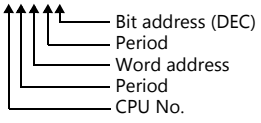
- For %IX or %QX:

Example: %IX1.1.0



- For %MX1., %MX3., or %MX10:

Example: %MX1.1.1.0



Indirect Device Memory Designation

Specify the CPU number in the expansion code.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
All start	1 - 8 (PLC1 - 8)	n	Station number: 0000H	2
		n + 1	Command: 0400H	
All stop	1 - 8 (PLC1 - 8)	n	Station number: 0000H	2
		n + 1	Command: 0402H	
Operation / standby switching *	1 - 8 (PLC1 - 8)	n	Station number: 0000H	3
		n + 1	Command: 040BH	
		n + 2	CPU No. operated by default: m (0, 2, 4, 6)	

* Valid only for the redundant system.

21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

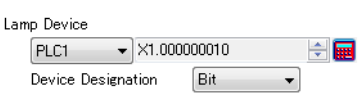
Device Memory		TYPE	Remarks
X	(input memory) *1	-	WX as word device, DX as double-word device *3
Y	(output memory) *1	-	WY as word device, DY as double-word device *3
M	(standard memory)	02H	WM as word device, DM as double-word device *2 *3
L	(retain memory)	04H	WL as word device, DL as double-word device *2 *3
SM	(system memory)	08H	WSM as word device, DSM as double-word device *2 *3
WFL	(user file)	0FH	DFL as double-word device *4

1 Input/output memory does not operate normally unless you import the ".ini" file created using [Export Device Information] in the PLC programming tool.
Can be used only for PLC1. Indirect designation is not available.

*2 Double-word addresses (DM, DL, DSM) can be specified only for PLC1.
In the case with PLC2 to PLC8, access to the above addresses is possible when the data length is set to 2 words in the word address (WM, WL, WSM).
Example: When accessing the address in DM100:
Set the data length to 2 words for WM100.

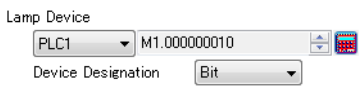
*3 The assigned device memory is expressed as shown below when editing the screen.

- For X or Y:



Example: X 1 . 00000001 0
Bit address (HEX)
Word address
(F mode: DEC, N mode: HEX)
Period
SX station number

- For M, L or SM



Example: M 1 . 00000001 0
Bit address (HEX)
Word address
(F mode: DEC, N mode: HEX)
Period
CPU No.

*4 Can be used only in F mode. Bit designation is not available.

Indirect Device Memory Designation

Specify the CPU number in the expansion code.

PLC_CTL

The macro command is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

21.1.6 MICREX-SX SPH/SPB/SPM/SPE/SPF CPU (IEC Mode)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	**38400 bps**	Do not change the setting from default.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	0 to 31	

PLC

No particular setting is necessary on the PLC.
Communication parameters are fixed to 38400 bps (baud rate), RS-422 (signal level), 8 bits (data length), 1 bit (stop bit), and even (parity).

Available Device Memory

The available device memory is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

PLC_CTL

The macro command is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

21.1.7 MICREX-SX SPH/SPB/SPM/SPF CPU (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in "21.1.6 MICREX-SX SPH/SPB/SPM/SPE/SPF CPU (IEC Mode)".

Available Device Memory

The available device memory is the same as the one described in "21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)".

PLC_CTL

The macro command is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

21.1.8 MICREX-SX (Ethernet) (IEC Mode)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
  The PLC port number is "Self port standard No." plus 251 set on the PLC.

PLC (Ethernet Parameter Setting)

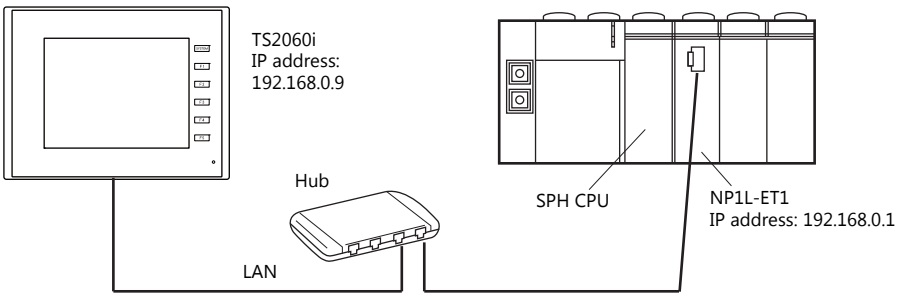
The table below shows settings required for communication with the TS2060i. (Underlined setting: default)

Item	Setting	Remarks
IP Address	192.168.0.1	
Subnet Mask	255.255.255.0	
Self-port Standard No.	256	

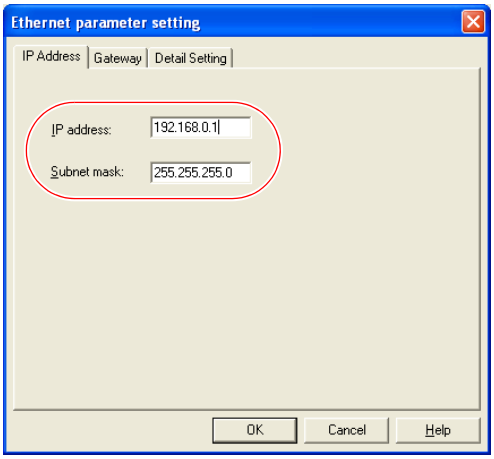
For more information on other setting items, refer to the PLC manual issued by the manufacturer.

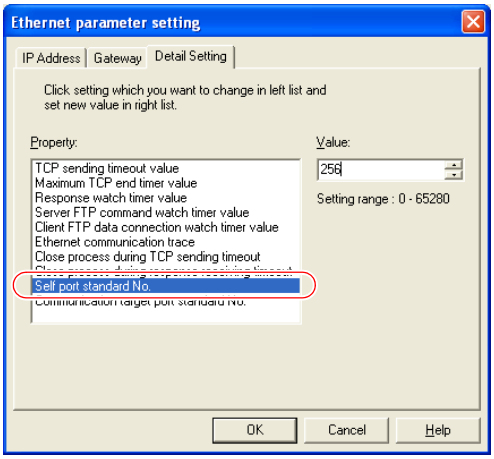
Setting Example

The following example shows the setting for communication between MICREX-SX ET1 module and the TS2060i unit via Ethernet.



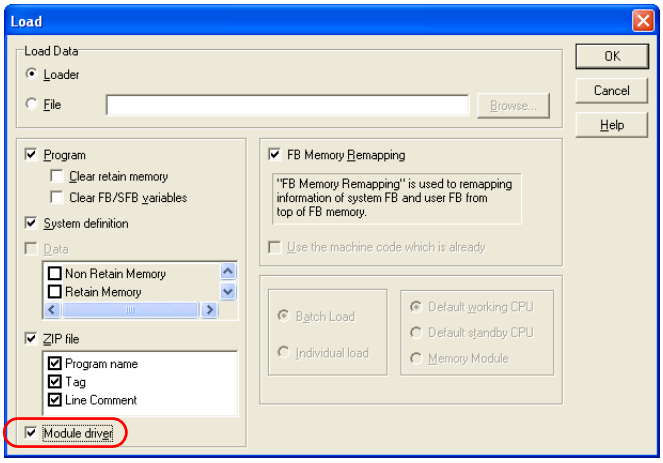
Setting on the PLC loader



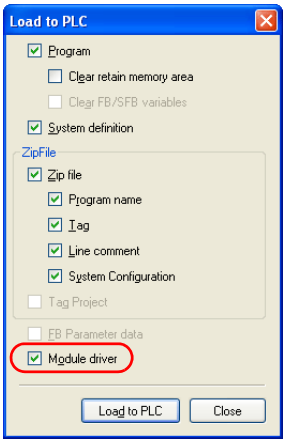


When the Ethernet module is used, the module driver must be transferred to the PLC.
To transfer it to the PLC, check [Module driver] on the relevant PLC transfer setting dialog.

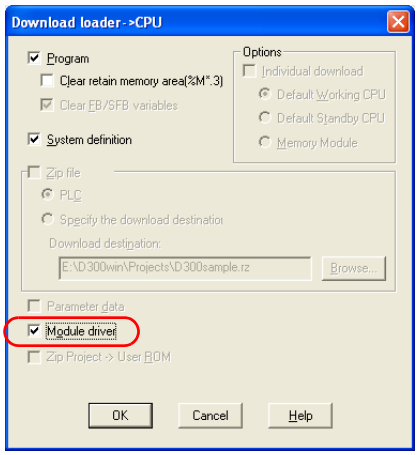
- SX Programmer Standard Ver. 2



- SX Programmer Standard Ver. 3

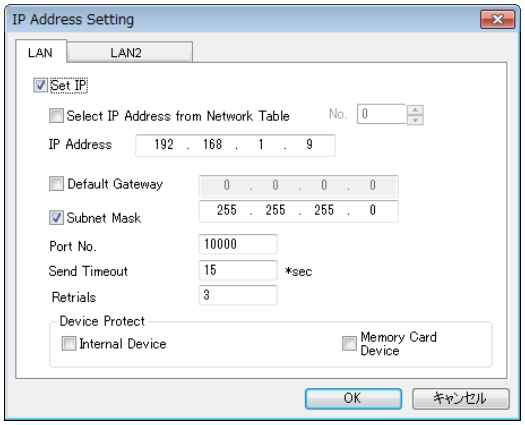


- D300win

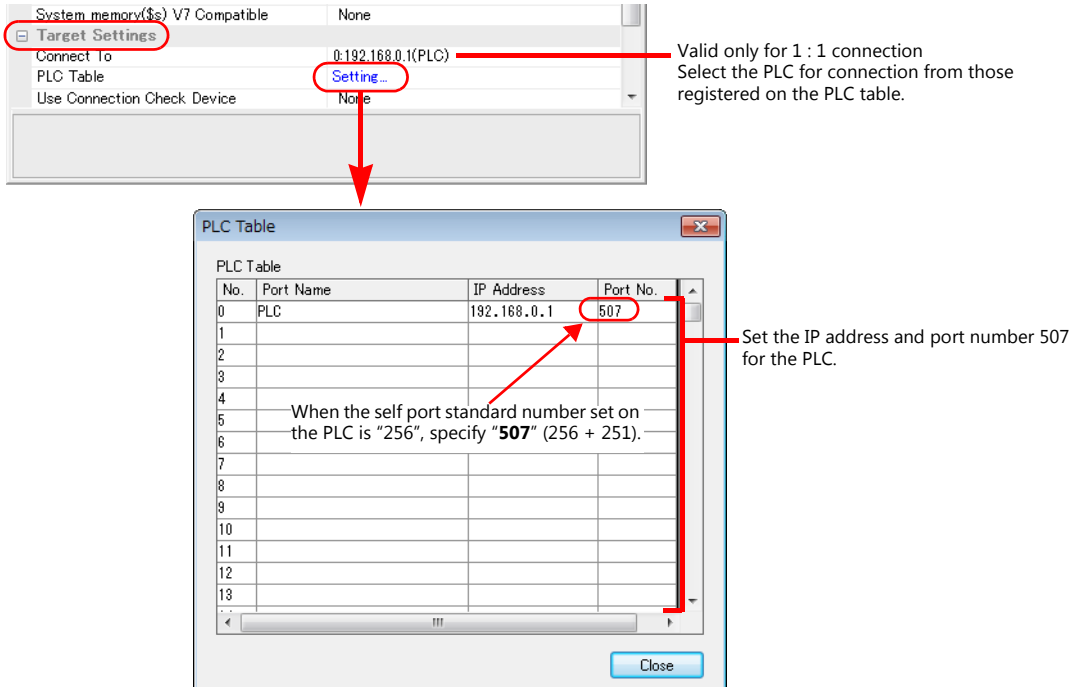


Settings on the editor

- IP address setting for the TS2060i unit (on the editor)
  [System Setting] → [Hardware Setting] → [Local Port IP Address]



- PLC Table
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings] → [PLC Table]



Available Device Memory

The available device memory is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
All start	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	2
		n + 1	Command: 0400H	
All stop	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	2
		n + 1	Command: 0402H	
Operation / standby switching *2	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	3
		n + 1	Command: 040BH	
		n + 2	CPU No. operated by default: m (0, 2, 4, 6)	

*1 Valid only when "1 : n" connection mode is selected under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).
For the station number, set the PLC table number under [Target Settings] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).
*2 Valid only for a redundant system.

21.1.9 MICREX-SX (Ethernet) (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in "21.1.8 MICREX-SX (Ethernet) (IEC Mode)".

Available Device Memory

The available device memory is the same as the one described in "21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)".

PLC_CTL

The macro command is the same as the one described in "21.1.8 MICREX-SX (Ethernet) (IEC Mode)".

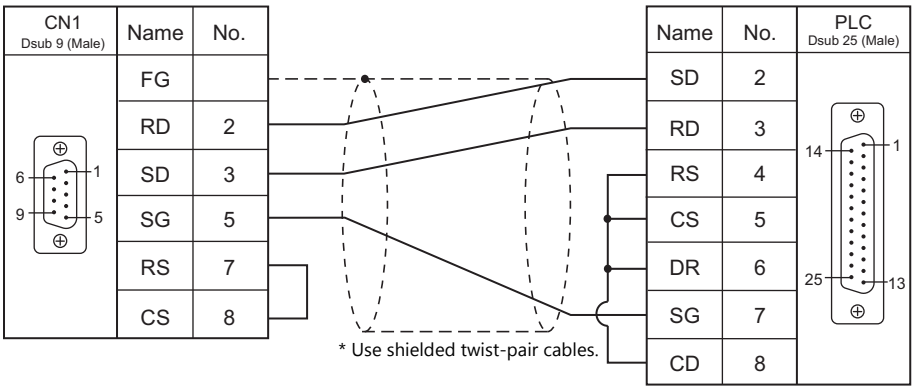
21.1.10 Wiring Diagrams

When Connected at CN1:

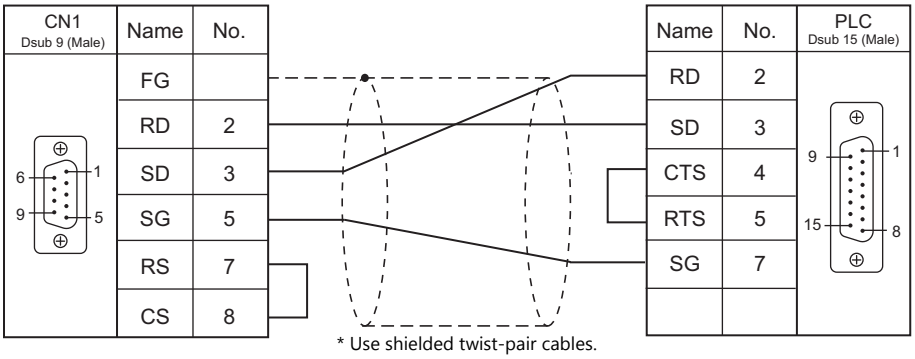
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

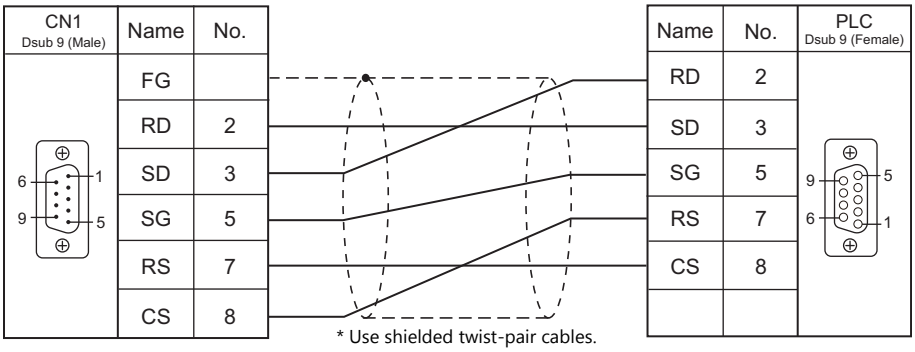
Wiring diagram 1 - C2



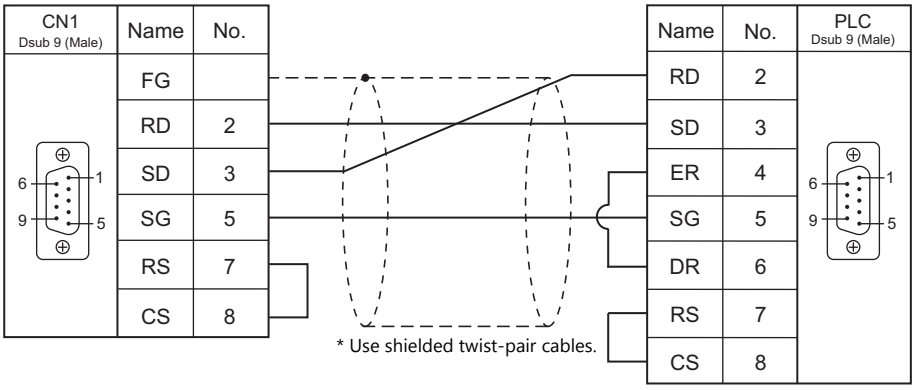
Wiring diagram 2 - C2



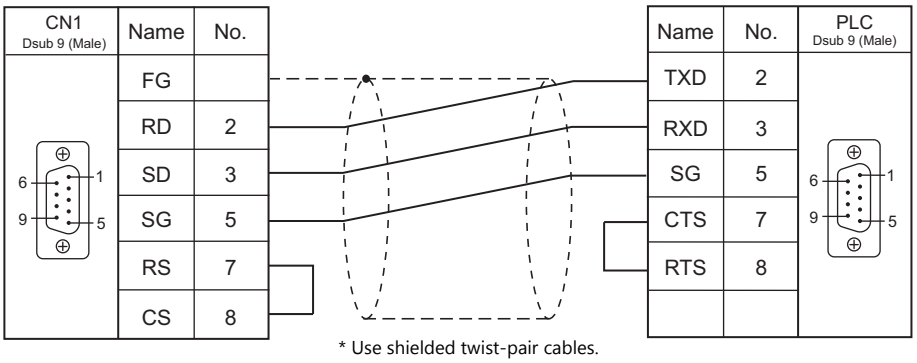
Wiring diagram 3 - C2



Wiring diagram 4 - C2

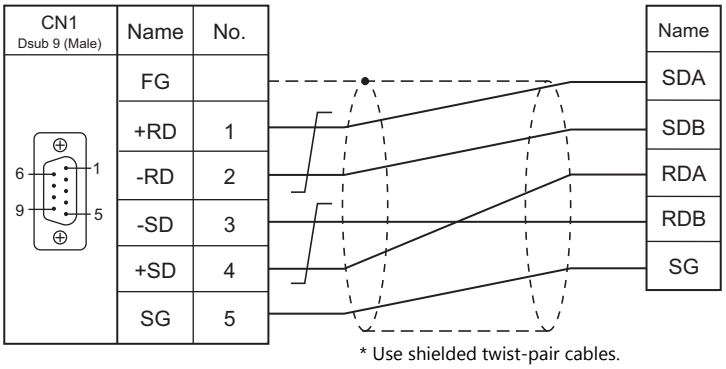


Wiring diagram 5 - C2

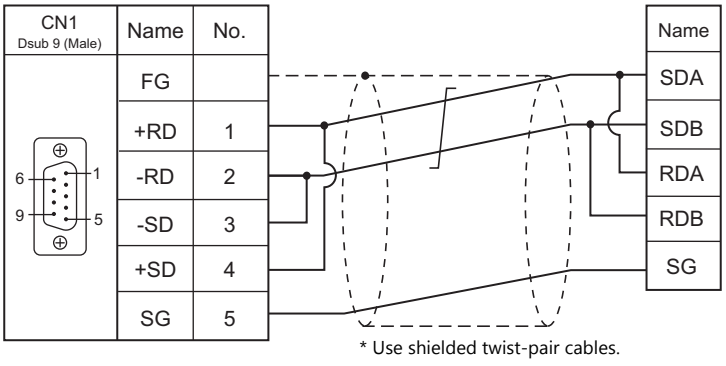


RS-422/RS-485

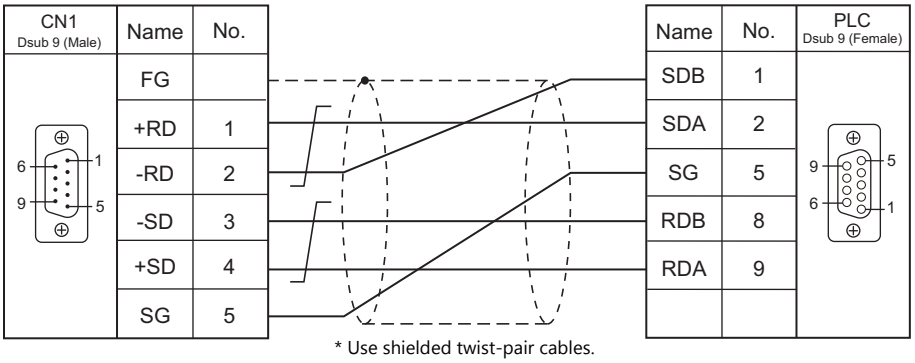
Wiring diagram 1 - C4



Wiring diagram 2 - C4

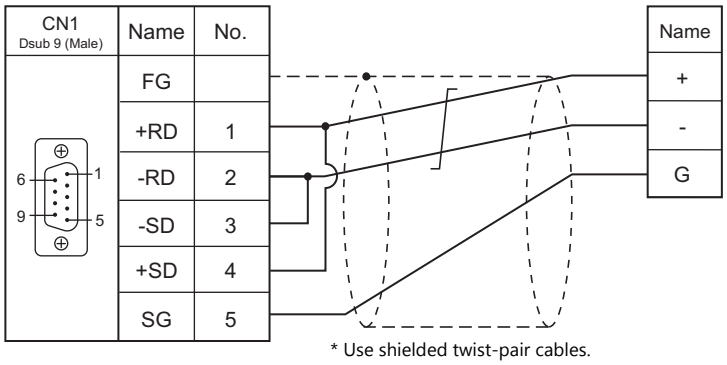


Wiring diagram 3 - C4



* Use shielded twist-pair cables.

Wiring diagram 4 - C4

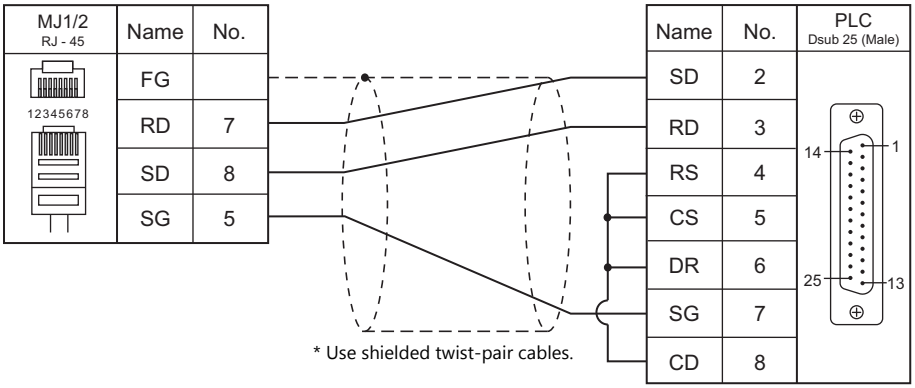


* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

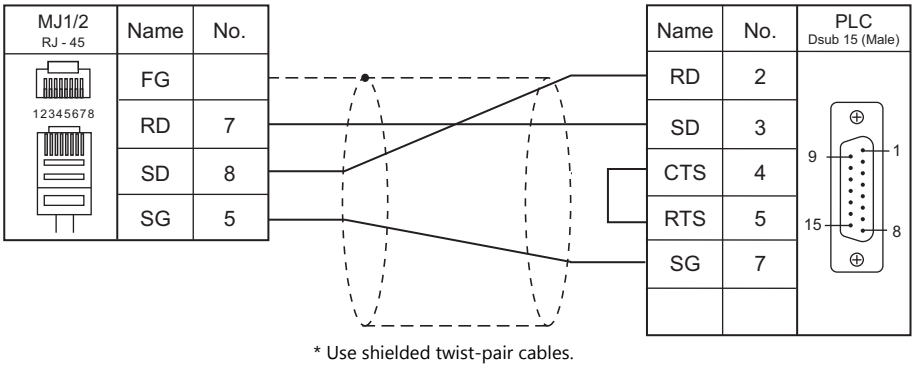
RS-232C

Wiring diagram 1 - M2



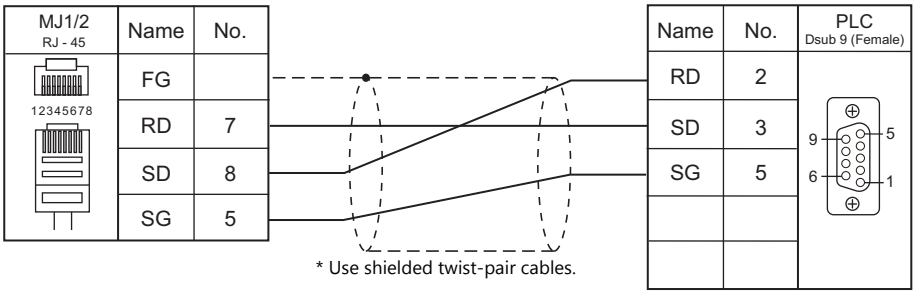
* Use shielded twist-pair cables.

Wiring diagram 2 - M2



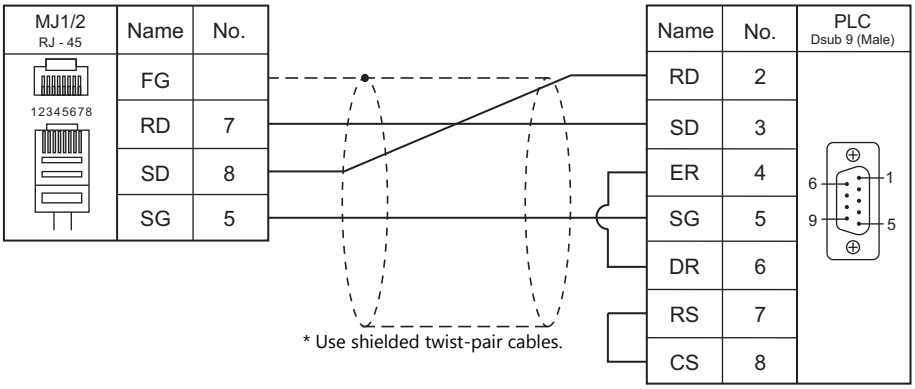
* Use shielded twist-pair cables.

Wiring diagram 3 - M2



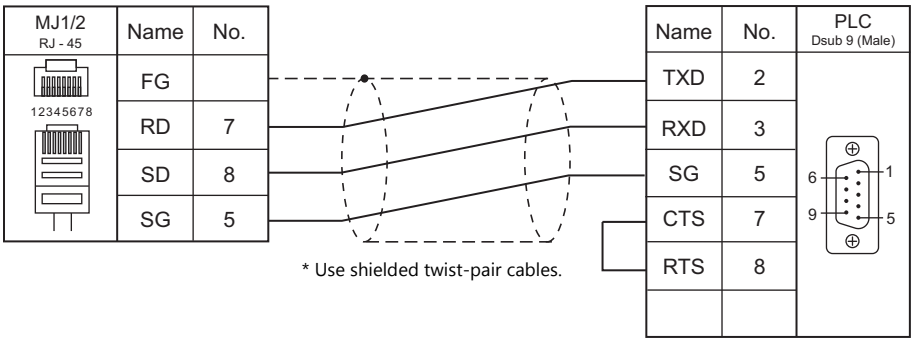
* Use shielded twist-pair cables.

Wiring diagram 4 - M2



* Use shielded twist-pair cables.

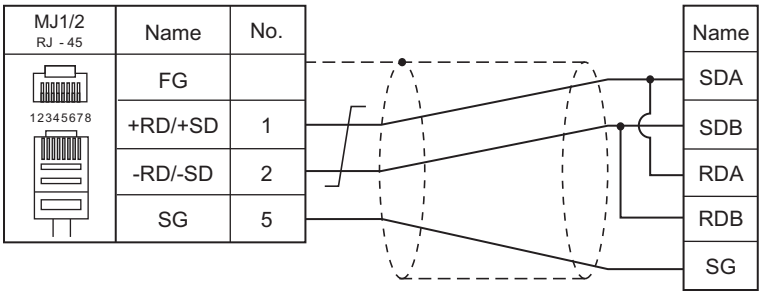
Wiring diagram 5 - M2



* Use shielded twist-pair cables.

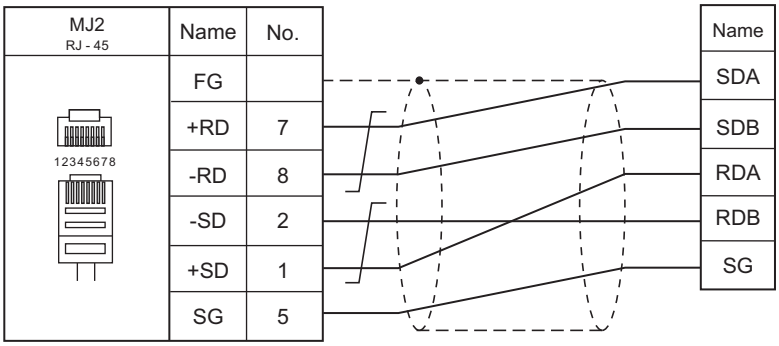
RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

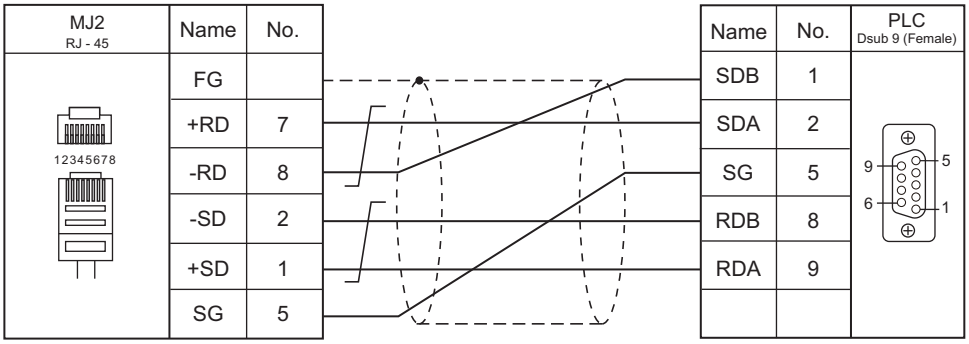
Wiring diagram 2 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

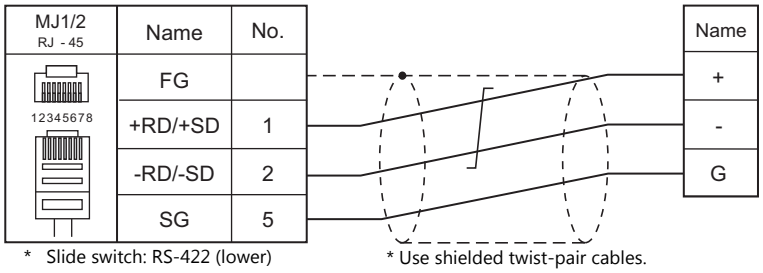
Wiring diagram 3 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 4 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

21.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
PYX (MODBUS RTU)	PYX4xx PYX5xx *2 PYX9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		PYX.Lst
PXR (MODBUS RTU)	PXR3xx PXR4xx PXR5xx *2 PXR7xx PXR9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		PXR.Lst
PXF (MODBUS RTU)	PXF4xx PXF5xx *2 PXF9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		PXF.Lst
PXG (MODBUS RTU)	PXG4xx PXG5xx *2 PXG9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		F_PXG.Lst
PXH (MODBUS RTU)	PXH9xx *2	Terminal block	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PXH.Lst
PUM (MODBUS RTU)	PUMxx	Terminal block (base)	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PUMA_B.Lst F_PUME.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Select a model on which Modbus communication is available.

Power Monitor Unit

PLC Selection on the Editor	Series Name	Model	Port	Signal Level	Connection			Lst File
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
F-MPC04P (loader)	F-MPC04P	UM02-AR2 UM02-AR3 UM02-AR4	RS-485 connector	RS-485	Wiring diagram 3 - C4	Wiring diagram 3 - M4		F-MPC04P.Lst
F-MPC series / FePSU	F-MPC04	UM01-ARxx	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM01_ARA4.Lst
	F-MPC04P	UM02-AR2	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM02_AR2.Lst
		UM02-AR3						UM02_AR3.Lst
		UM02-AR4						UM02_AR4.Lst
	F-MPC04S	UM03-AR3x	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM03_ARA3G.Lst
	F-MPC30	UM5ACxx *2	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM5A.Lst
		UM45xx *2						
	F-MPC50	UM50xx *2	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM50.Lst
	F-MPC55	UM55V	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM55V.Lst
	F-MPC60B	UM4Bxx *2	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM4_UM42_UM43.Lst
		UM42Cxx *2						
		UM42Fxx *2						
		UM43FDxx *2						
		UM43FGxx *2						
		UM44Bxx *2						UM44.Lst
		UM44CDxx *2						
		UM44FGxx *2						
	FePSU	EAxx EGxx SAXX SGxx	Terminal block	RS-485	Wiring diagram 5 - C4	Wiring diagram 5 - M4		FePSU.Lst
		BWxxxxxx EWxxxxxx	Terminal block	RS-485	Wiring diagram 5 - C4	Wiring diagram 5 - M4		FePSUBk.Lst
	F*JF-R	F1JF-R F2JF-R F3JF-R	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		FJF-R.Lst
	F-MPC04E	UM05-AR3	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM05_AR3.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Select a model on which RS-485 communication is available.

Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+ DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
FVR-E11S	FVRxxE11S-x	Touch panel connector	RS-485	Wiring diagram 6 - C4	Wiring diagram 6 - M4		FVR-E11S.Lst
FVR-E11S (MODBUS RTU)							FVR-E11S (Modbus).Lst
FVR-C11S (MODBUS RTU)	FVRxxC11S-x	OPC-C11S-RSx	RS-485	Wiring diagram 7 - C4	Wiring diagram 7 - M4		FVR-C11S (Modbus).Lst
FRENIC5000G11S / P11S	FRNxxG11S-x FRNxxP11S-x	Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		F-G11S.Lst
FRENIC5000G11S / P11S (MODBUS RTU)							FRENIC5000G11S_P11S (Modbus).Lst
FRENIC5000VG7 (MODBUS RTU)	FRNxxVG7S-x	RS-485 connector	RS-485	Wiring diagram 9 - C4	Wiring diagram 9 - M4	Wiring diagram 19 - M4	FRENIC5000VG7S (Modbus).Lst
		OPC-VG7-RS (communication board)		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-Mini (MODBUS RTU)	FRNxxC1S-x	OPC-C1-RS (communication board)	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Mini.Lst
	FRNxxC2x-xx	RS-485 communication port					
FRENIC-Eco (MODBUS RTU)	FRNxxF1S-x	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Eco (Modbus).Lst
		OPC-F1-RS (communication board)		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-Multi (MODBUS RTU)	FRNxxE1S-x	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Multi.Lst
		OPC-E1-RS (communication board)		Wiring diagram 10 - C4	Wiring diagram 10 - M4		
FRENIC-MEGA (MODBUS RTU)	FRNxxxG1x-xx	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		FRENIC-MEGA (Modbus).Lst
		Terminal block on control circuit		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-MEGA SERVO (MODBUS RTU)	FRNxxxG1x-xxxQ	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		FRENIC-MEGA SERVO (Modbus).Lst
		Control circuit terminal block		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-HVAC/AQUA (MODBUS RTU)	FRNxxxAR1x-4x FRNxxxAQ1x-4x	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		FRENIC-HVAC (Modbus).Lst FRENIC-AQUA (Modbus).Lst
		Control circuit terminal block		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-VG1 (MODBUS RTU)	FRNxxVG1S-xx	Control circuit terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		FRENIC-VG1 (MODBUS RTU).Lst
FRENIC-Ace (MODBUS RTU)	FRNxE2x-xJ	RS-485 communication port 1	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		FRENIC-Ace (MODBUS RTU).Lst
		RS-485 communication port 2	RS-485	Wiring diagram 20 - C4	Wiring diagram 24 - M4		

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+ DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
FRENIC series (loader)	FRENIC5000VG7S	RS-485 connector	RS-485	Wiring diagram 9 - C4	Wiring diagram 9 - M4	Wiring diagram 19 - M4	-
		OPC-VG7-RS (communication board)	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		
	FRENIC-Mini	OPC-C1-RS (communication board)	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		
		RS-485 communication port					
	FRENIC-Eco FRENIC-Multi FRENIC-MEGA FRENIC-MEGA SERVO FRENIC-HF FRENIC-Lift	Touch panel connector					
	FRENIC-HVAC/ AQUA	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		
		Control circuit Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		
	FRENIC-VG1	Control circuit Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		
	FRENIC-Ace	RS-485 communication port 1	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		
		RS-485 communication port 2	RS-485	Wiring diagram 20 - C4	Wiring diagram 24 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

IH Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
HFR-C9K	HFR030C9Kxx HFR050C9Kxx	HFR-OPC01 (communication board)	RS-485	Wiring diagram 13 - C4	Wiring diagram 13 - M4		F_HFR.Lst
HFR-C11K	HFR3.0C11Kxx HFR5.0C11Kxx HFR7.0C11Kxx	Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		HFR-C11K.Lst
HFR-K1K	HFR2.5K1K-2 HFR3.0K1K-2 HFR5.0K1K-2 HFR6.0K1K-2	CN3	RS-485	Wiring diagram 19 - C4	Wiring diagram 23 - M4		HFR-K1K.Lst
		I/O PCB (option) *2	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 This port is available only with models equipped with the option.

AC Power Monitor

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
PPMC (MODBUS RTU)	PPMCxx *2	Terminal block	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		F-PPMC.Lst
			RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Select a model on which RS-485 or RS-232C communication is available.

Servo Amplifier

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
FALDIC-α series	RYSxx *3	CN3	RS-485	Wiring diagram 12 - C4	Wiring diagram 12 - M4	Wiring diagram 20 - M4	F_FAL-A.Lst
FALDIC-W series	RYCxxx x3-VVT2	CN3A (UP port)	RS-485	Wiring diagram 17 - C4	Wiring diagram 17 - M4	Wiring diagram 22 - M4	F_Fal-W.Lst
ALPHA5 (MODBUS RTU)	RYTxxxx5-VVx	CN3A	RS-485	Wiring diagram 14 - C4	Wiring diagram 14 - M4		ALPHA5.Lst
ALPHA5 Smart (MODBUS RTU)	RYHxxxF5-VV2	CN3A	RS-485	Wiring diagram 14 - C4	Wiring diagram 14 - M4		ALPHA5 Smart.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 Select a model on which host interface: universal communication (RS-485) is available.

Controller

PLC Selection on the Editor	Model	Port		Signal Level	Connection			Lst File
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
WSZ series	WSZ-24MCT2-AC WSZ-32MCT2-AC WSZ-40MCT2-AC WSZ-60MCT2-AC	PORT0		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		WSZ.Lst
		WSZ-CB25	PORT1	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
			PORT2	RS-485	Wiring diagram 18 - C4	Wiring diagram 18 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Recorder

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
PH series	PHAxxxx4-xxxRY PHCxxxx3-xxxRY	Terminal block	RS-485	Wiring diagram 16 - C4	Wiring diagram 16 - M4		F_PHC.Lst
PHR (MODBUS RTU)	PHRxx	Terminal block	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PHR.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Digital Panel Meter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
WA5000	WA5xx3-yy WA5xx4-yy WA5xx6-yy WA5xx7-yy *2	Modular Jack	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		WA5000.Lst
			RS-485	Wiring diagram 11 - C4	Wiring diagram 11 - M4		

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Specify an input unit (-yy: 01 to 12, or 18) when selecting the model.

AC Power Regulator

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
APR-N (MODBUS RTU)	RPNExxxx-xx-ZAM-xx/xx	RPN003-AM (communication board)	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4	Wiring diagram 21 - M4	F_APR-N.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

Electronic Multimeter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
WE1MA (Ver. A) (MODBUS RTU)	WE1MA-AFxxx-Mxx WE1MA-AGxxx-Mxx	Terminal block	RS-485	Wiring diagram 15 - C4	Wiring diagram 15 - M4		F_WE1MA.Lst
	WE1MA-A1xxx-Mxx WE1MA-A5xxx-Mxx						F_WE1MA_1P.Lst *2
	WE1MA-A2xxx-Mxx WE1MA-A6xxx-Mxx						F_WE1MA_1P3L.Lst *2
	WE1MA-A3xxx-Mxx WE1MA-A7xxx-Mxx						F_WE1MA_3P3L.Lst *2
	WE1MA-A4xxx-Mxx						F_WE1MA_3P4L.Lst *2
WE1MA (Ver. B) (MODBUS RTU)	WE1MA-AFxxx-Mxx WE1MA-AGxxx-Mxx	Terminal block	RS-485	Wiring diagram 15 - C4	Wiring diagram 15 - M4		F_WE1MA (Ver. B).Lst
	WE1MA-A1xxx-Mxx WE1MA-A5xxx-Mxx						F_WE1MA_1P (Ver. B).Lst *2
	WE1MA-A2xxx-Mxx WE1MA-A6xxx-Mxx						F_WE1MA_1P 3L (Ver. B).Lst *2
	WE1MA-A3xxx-Mxx WE1MA-A7xxx-Mxx						F_WE1MA_3P 3L (Ver. B).Lst *2
	WE1MA-A4xxx-Mxx						F_WE1MA_3P 4L (Ver. B).Lst *2

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 List files "F_WE1MA.Lst" and "F_WE1MA(Ver. B).Lst" can be browsed as default through the [Refer] button. These files can be used for device memory settings.

Ethernet Connection (TS2060i Only)

Controller

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP *1	UDP/IP	Port No.	Keep Alive *2	Lst File
WSZ series (Ethernet)	WSZ-xxMAR2-D24 WSZ-xxMCT2-D24 WSZ-xxMCT2-AC	WSZ-CBE	○	○	500: Default (Max. 8 units for TCP/IP)	○	WSZ_Eth.Lst
	FBs-xxMNxxx-x FBs-xxMCxxx-x-XY FBs-xxMAxxx-x	FBs-CBE	○	○			

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For KeepAlive functions, see 1.3.2 Ethernet Communication (TS2060i Only).

21.2.1 PYX (MODBUS RTU)

Communication Setting

Editor

Communication setting

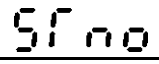
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings because these settings on the temperature controller cannot be changed.
Baud Rate	**9600 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Odd**	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter	Item	Setting	Example
	Digital transmission function (station number)	1 to 31	1

* The communication function of the temperature controller can be selected from Fuji protocol or Modbus protocol at the time of purchase. For communication with a TS2060, select a model on which the Modbus protocol is available.
* The following communication parameters are fixed; baud rate: 9600 bps, data length: 8 bits, stop bit: 1 bit, and parity: odd.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
0	00H	
1	01H	Read only
4	02H	
3	03H	Read only

21.2.2 PXR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings because these settings on the temperature controller cannot be changed.
Baud Rate	**9600 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter	Display		Item	Setting	Example
Third block parameter	SFno	STno	Station number	1 - 31	1
	CoN	CoM	Parity	0: Odd 1: Even 2: None	0
	PCoL	PCoL	Communication protocol	**1: Modbus**[*1] 2: Z-ASCII	1

*1 The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
*2 The following communication parameters are fixed; baud rate: 9600 bps, data length: 8 bits, and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
0	00H	
1	01H	Read only
4	02H	
3	03H	Read only

21.2.3 PXF (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 / 115200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Odd / Even	
Target Port No.	1 to 255	

Temperature Controller

The communication parameters can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter Channel	Display	Parameter Name	Setting	Example
Ch9 COM	CtyP	Communication type selection	**0: Modbus RTU**	0
	STno	ST No. setting	1 to 255	1
	SPEd	RS-485 baud rate	96: 9600 bps 192: 19200 bps 384: 38400 bps 115K:115K bps	96
	PrTy	RS-485 Parity	NoNe odd EVEN	odd

*1 The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available as an option.
*2 The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	
3	03H	Read only

21.2.4 PXG (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Channel	Parameter Display		Item	Setting	Example
"CoM Ch9" Communication (Ch9)	"STno"	STno	Station number	1 to 31	1
	"CoM"	CoM	Parity	96od (9600 bps / odd parity) 96Ev (9600 bps / even parity) 96no (9600 bps / without parity) 19od (19200 bps / odd parity) 19Ev (19200 bps / even parity) 196no (19200 bps / without parity)	96od
	"SCC"	SCC	Communication authority	r (Read only) rW (Read/write allowed)	rW

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
1	(input relay)	01H	
4	(holding register)	02H	
3	(input register)	03H	

21.2.5 PXH (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Channel	Parameter Display		Item	Setting	Example
CoM Communication (Ch B)	SLn4	STn4	RS-485 station No.	1 to 31	1
	SPd4	SPd4	RS-485 baud rate	96: 9600 bps 192: 19200 bps 384: 38400 bps	384
	biT4	biT4	RS-485 bit format	8n: Data length 8 bits, without parity 8o: Data length 8 bits, odd parity 8E: Data length 8 bits, even parity	8o

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

21.2.6 PUM (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

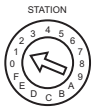
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 / 115200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 15 [DEC]	

Temperature Controller

Be sure to match the settings to those made under [Communication Setting] of the editor.

Station number setting

(Underlined setting: default)

STATION	Setting	Example
	0 to F [HEX]	0: Station number 1 F: Station number 16

Communication setting

On the temperature controller loader, set communication parameters.

(Underlined setting: default)

Item	Setting	Example	Remarks
RS-485 parity setting	0: None 1: Odd 2: Even	0	
RS-485 baud rate setting	0: 9600 1: 19200 2: 38400 4: 115200 kbps	1	
RS-485 communication authority setting	0: Read only 1: Read/write allowed	1	
RS-485 response interval setting	0 to 25 (default: 1)	1	Response interval = setting value × 20 ms
Extensional communication module (PUMC) connection	**0: Without PUMC (RS-485 valid)** 1: With PUMC (RS-485 invalid)	0	When using RS-485 communication, set "0".

* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

Note on Setting the Device Memory

In accordance with the connected PUM model, set the "List" file name to be browsed by pressing the [Refer] button.

Model		List File Name
PUMAxx	Control module (4 ch)	F_PUMA_B.Lst
PUMBxx	Control module (2 ch)	
PUMExx	Event input/output module	F_PUME.Lst

"F_PUMA_B.Lst" is set as default.

21.2.7 F-MPC04P (Loader)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

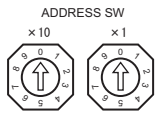
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	**1 bit**	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / Odd / Even	
Target Port No.	1 to 99*1	

*1 To use port No. 32 to 99, use the station number table.

Power Monitor Unit

Be sure to match the settings to those made under [Communication Setting] of the editor.

Station number setting

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 0)	1	

Communication setting

The communication parameter can be set using keys attached to the front of the power monitor unit.

(Underlined setting: default)

Circuit No.	Setting Code	Item	Setting	Example
C	L1-☐☐	Baud rate	00: 4800 bps 01: 9600 bps 02: 19200 bps	02
	L2-☐☐	Parity	00: None 01: Even 02: Odd	02
	L3-☐☐	Data length	00: 7 bits 01: 8 bits	00

* The communication parameter (stop bit) is fixed to 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

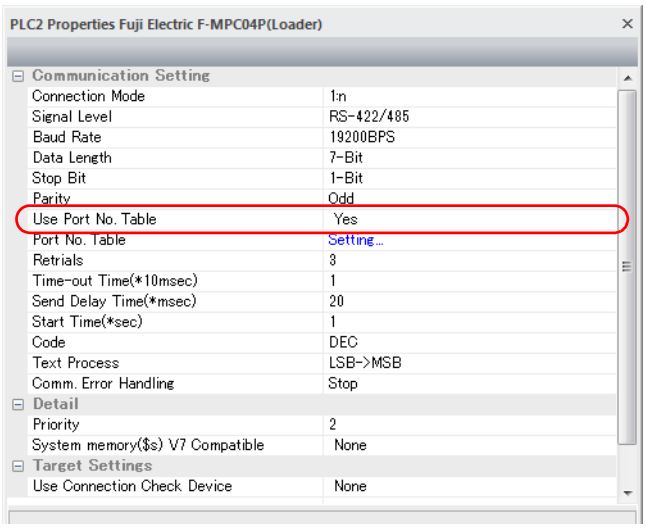
Device Memory	TYPE	Remarks
---	00H	Double-word

Station Number Table

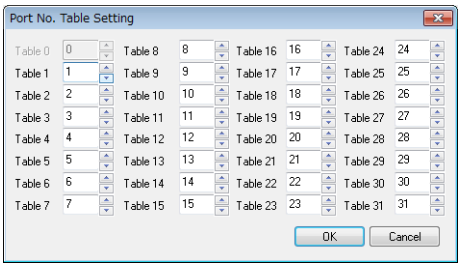
- A maximum of 31 units can be connected via serial communication. Port numbers from 0 to 31 can be set on the [Device Setting] dialog of the editor; however, depending on the controller, port numbers exceeding 32 may be available. In such a case, use the station number table to enable communications with devices of port No. 32 or greater.
- It is easier to specify port numbers for each network in the field by making the screen for setting the port number when creating the screen program. In this case, it is not necessary to transfer the screen program again.

Setting the Station Number Table

1. Select [Yes] for [Use Port No. Table] under [Communication Setting] on the [PLC Properties] window ([System Setting] → [Hardware Setting]).



2. Click “Setting...” next to [Port No. Table]. The [Port No. Table Setting] dialog is displayed.
3. Specify port numbers of the temperature controllers for “Table 0” to “31”.



Macro

To rewrite the station number table on the TS2060 screen, use macro commands [FROM_WR] and [RESTART].

FROM_WR

FROM_WR F0 F1

- Function: Writing to FROM
  As many words as specified for F1 from the device memory address set for F0 is written in the FP-ROM.
- Available device memory

	Internal Device Memory	PLC n Device Memory	Memory Card	Constant
F0	◎	◎	◎	
F1				○

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Data range

	Setting	Remarks
F0	Top device memory address of the source	32 words from the top address of the specified device memory are used. Set port numbers from 0 to 31 for each address. For the station number table not used, set [–1].
F1	Number of transmission words: 32	If any other value than "32" is set, the write error ($s728 = 1) occurs.

- Notes
  - The maximum possible number of write operations to the FP-ROM is 100,000 times. This is not related to the number of words that are written.
  - Do not include the FROM_WR command in a cycle macro or an event timer macro.
  - Writing to FP-ROM takes a longer time.
  - When the station number table has been rewritten using the [FROM_WR] command, be sure to execute the [RESTART] command.
  - When the station number table is used, it is not possible to set [☐ Use Internal Flash ROM as Back-up Area] on the [General Settings] tab window that is displayed by selecting [System Setting] → [Unit Setting] → [General Settings]. Be sure to leave this box unchecked.

RESTART

When the station number table has been rewritten using the [FROM_WR] command, be sure to execute this command.

SYS (RESTART) F0

- Function: Reconnection
  This macro command reconnects the controller when the time specified for F1 has elapsed.
- Available device memory

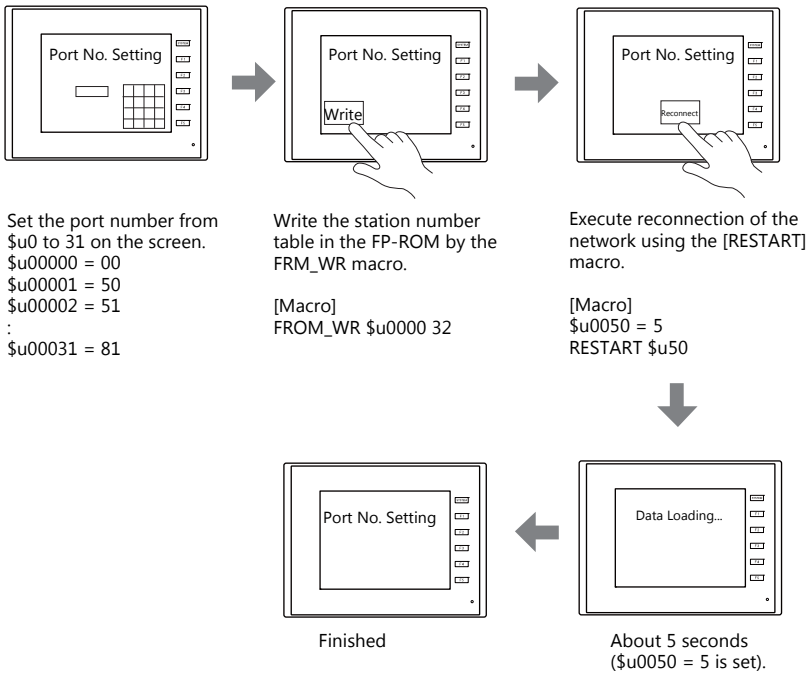
	Internal Device Memory	PLC n Device Memory	Memory Card	Constant
F1	◎			

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Data range

	Setting
F0	RESTART
F1	Time: 0 to 60 s

Example of Procedure for Rewriting the Station Number Table



Set the port number from $u0 to 31 on the screen.
$u00000 = 00
$u00001 = 50
$u00002 = 51
:
$u00031 = 81

Write the station number table in the FP-ROM by the FRM_WR macro.

[Macro]
FROM_WR $u0000 32

Execute reconnection of the network using the [RESTART] macro.

[Macro]
$u0050 = 5
RESTART $u50

About 5 seconds ($u0050 = 5 is set).

Finished

System Device Memory

The result of [FROM_WR] macro execution is stored in $s728.
[0]: Normal
[1]: Error

21.2.8 F-MPC Series / FePSU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	38400 bps is available for F-MPC04E only.
Data Length	7 / 8 bits	
Stop Bit	**1 bit**	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / Odd / Even	
Target Port No.	1 to 99*1	

*1 To use port numbers 32 to 99, use the station number table. For the station number table, see "Station Number Table" (page 21-37).

F-MPC04

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

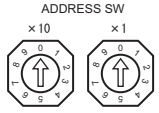
(Underlined setting: default)

Circuit No.	Setting Code	Item	Setting	Example
C	4-0	RS-485 address	Loc: Communication not used 01 to 99	01
	4-1	RS-485 baud rate setting	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
	4-2	RS-485 data length	7: 7 bits 8: 8 bits	7
	4-3	RS-485 parity	00: None 01: Even 02: Odd	02

F-MPC04P

Be sure to match the settings to those made under [Communication Setting] of the editor.

Station number setting

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 0)	1	

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.

(Underlined setting: default)

Circuit No.	Setting Code	Item	Setting	Example
C	L1-☐☐	Baud rate	00: 4800 bps 01: 9600 bps 02: 19200 bps	02
	L2-☐☐	Parity	00: None 01: Even 02: Odd	02
	L3-☐☐	Data length	00: 7 bits 01: 8 bits	00

* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC04S

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Code	Item	Setting	Example
L-□□	Baud rate	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
L2-□□	Data length and parity	8n: Data length 8 bits, without parity 8E: Data length 8 bits, even parity 8o: Data length 8 bits, odd parity 7n: Data length 7 bits, without parity 7E: Data length 7 bits, even parity 7o: Data length 7 bits, odd parity	7o
LA-□□	Address (Transmission station number)	Loc: Station number not set 01 to 99	01
Lt-□□	Communication model mode	**04: F-MPC04 mode** *1 PP: PPM (B) mode	04

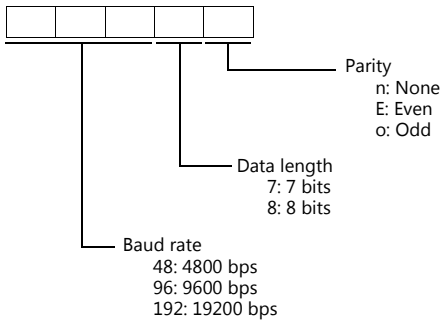
*1 The communication function of F-MPC04 can be selected at the time of purchase. Select a model on which "F-MPC04 mode" is available.
*2 The communication parameter (stop bit) is fixed to 1 bit.

F-MPC30

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: Communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED  * "b192E" is set as default.	1927o

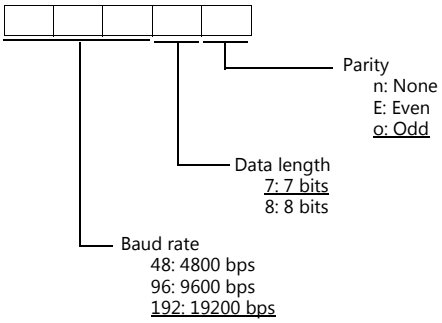
* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC50/F-MPC55/F-MPC60B (UM4Bx, UM42xx, UM43xx)

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED  	1927o

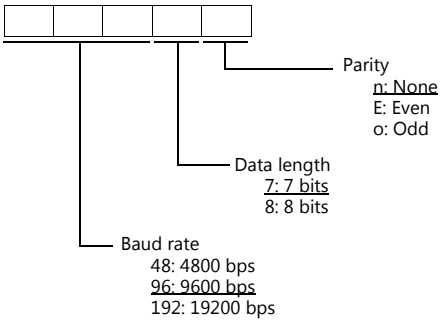
* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC60B (UM44xx)

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED  	1927o

* The communication parameter (stop bit) is fixed to 1 bit.

FePSU

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Type	Parameter Display	Item	Setting	Example
SEL-c	Adr.☐☐	Communicating station number	Loc: Communication not used 01 to 99	01
	bud☐☐	Baud rate	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
	cbit.☐☐	Data length, parity	8n: Data length 8 bits, without parity 8E: Data length 8 bits, even parity 8o: Data length 8 bits, odd parity 7n: Data length 7 bits, without parity 7E: Data length 7 bits, even parity 7o: Data length 7 bits, odd parity	7o
	LtY.☐☐	Communication Mode	**Psu: FePSU mode** *1 _PP: PPM(B) mode	Psu

*1 The communication function of FePSU can be selected at the time of purchase. Select a model on which "FePSU mode" is available.
*2 The communication parameter (stop bit) is fixed to 1 bit.

F*JF-R

Communication setting

The communication parameters can be set using keys attached to the front of the digital regular electricity meter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

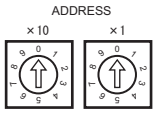
Type	Item	Setting	Example
Communication setting	Address	01 - 99	01
	Baud Rate	4800 bps / 9600 bps / 19.2k bps	19.2k bps
	Data Length	7 / 8 bits	7 bits
	Parity Bit	None / Even / Odd	Odd

* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC04E

Be sure to match the settings to those made under [Communication Setting] of the editor.

Station number

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 00)	1	Communication is not possible with “00”.

Communication setting

The communication parameters can be set using keys attached to the front of the digital regular electricity meter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Type	Item	Setting	Example
Communication setting	Baud rate	4800 bps / 9600 bps / 19200 bps / 38400 bps	19200 bps
	Data length, parity	8E / 8o / 8n / 7E / 7o / 7n	7o

* The communication parameter (stop bit) is fixed to 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
00	(data request of circuit No. 1 to 4) *1	00H	Double-word, read only
01	(data request of circuit No. 5 to 8) *1	01H	Double-word, read only
02	(data request of circuit No. 9, 10 or E) *1	02H	Double-word, read only
03	(Data request of the minimum/maximum voltage, power factor of circuit 1 to 10, and invalid power)*1 *2	03H	Double-word, read only
09	(model code)	09H	Read only
10	(operation status)	0AH	Read only
11	(pre-alarm value) *1	0BH	Double-word, read only
12	(current value measurement data)*1 *2	0CH	Double-word, read only
13	(integrated value data)*1 *2	0DH	Double-word, read only
14	(demand measurement data)*1 *2	0EH	Double-word, read only
15	(data of a maximum value of demand measurement)*1 *2	0FH	Double-word, read only
16	(historical data 1)*1 *2	10H	Double-word, read only
17	(historical data 2)	11H	Double-word, read only
18	(setting data)*3	12H	Double-word
50	(9-digit power request)	32H	Read only, double-word

*1 When a device memory other than status is used, set the decimal point of the numerical display part to “3”.
*2 “0” is stored in the address for which “(Blank)” is indicated in the table below.
*3 For setting data, see “18 (Setting Data)” described below.

18 (Setting Data)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
00zz	Wiring method (voltage measured)	(Blank)	CT primary rated current	(Blank)
01zz	Ratio of VT 1 (primary voltage) *1	(Blank)	Ratio of VT (primary voltage)	Ratio of VT *3
02zz	Ratio of VT 1 (secondary voltage) *1	(Blank)	Ratio of VT (secondary voltage)	(Blank)
03zz	Demand average time	Demand average time	Rated frequency	(Blank)
04zz	Frequency	(Blank)	Protective INST (current setting)*2	(Blank)
05zz	Number of applicable circuits	(Blank)	Protective INST (output setting)	(Blank)
06zz	Pulse multiplying factor	(Blank)	Protective DT (current setting)*2	Pulse multiplying factor
07zz	Ratio of VT 2 (primary voltage) *1	(Blank)	Protective DT (operation time)*2	(Blank)
08zz	Ratio of VT 2 (secondary voltage) *1	(Blank)	Protective DT (output setting)*2	(Blank)
09zz	Number of turns for CT2 secondary line	(Blank)	Protective OC (current setting)	(Blank)
10zz	CT primary current *1	(Blank)	Protective OC (characteristic)	CT primary current
11zz	OCG sensitivity current	(Blank)	Protective OC (time magnification)*2	(Blank)
12zz	OCG operation time *2	(Blank)	Protective OC (output setting)	(Blank)
13zz	Load pre-alarm sensitivity current	(Blank)	Protective OCA overcurrent pre-alarm (current setting)	(Blank)
14zz	Load pre-alarm operation time	(Blank)	Protective OCA overcurrent pre-alarm (operation time)	(Blank)
15zz	Automatic display circuit register	(Blank)	Protective OCA overcurrent pre-alarm (output setting)	(Blank)
16zz	ZCT select	(Blank)	Protective OCG (51G) (current setting) *3	(Blank)
17zz	VT select	(Blank)	Protective OCG (51G) (characteristic)	(Blank)
18zz	(Blank)	(Blank)	Protective OCG (51G) (time magnification) *2	(Blank)
19zz	(Blank)	(Blank)	Protective OCG (51G) (output setting)	(Blank)
20zz	Phase selection	(Blank)	Protective OCG (50G) (current setting) *2	(Blank)
21zz	Power alarm upper limit	Power alarm upper limit	Protective OCG (50G) (operation time) *2	(Blank)
22zz	Integral power pulse multiplying factor *4	Pulse multiplying factor *4	Protective OCG (50G) (output setting)	(Blank)
23zz	Load pre-alarm operation value	Load pre-alarm operation value	Protective DG (DG/OCG) (current setting) *3	(Blank)
24zz	Load pre-alarm operation time	(Blank)	Protective DG (DG/OCG) (operation time) *3	(Blank)
25zz	Leak pre-alarm sensitivity current	Leak pre-alarm sensitivity current	Protect DG (DG/OCG) (output setting)	(Blank)
26zz	Leak pre-alarm operation time *2	Leak pre-alarm operation time *2	Protective DG (DG/OCG) (maximum sensitivity phase angle)	(Blank)
27zz	OCG sensitivity current	Leak alarm sensitivity current	Protective DG (DG/OCG) (voltage setting) *2	(Blank)
28zz	OCG operation time *2	Leak alarm operation time *2	Protective DG (DG/OCG) (selected from DG or OCG)	(Blank)
29zz	Operation type for power	Operation type for power	Protective 0 V (voltage setting)	(Blank)
30zz	(Blank)	Phase R input position	Protective 0 V (operation time)*2	(Blank)

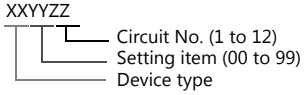
Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
31zz	(Blank)	History of turning breaker ON	Protective 0 V (output setting)	(Blank)
32zz	(Blank)	Show/hide cause of trouble	Protective UV (voltage setting)	(Blank)
33zz	(Blank)	Phase interruption alarm of neutral line	Protective UV (operation time)*2	(Blank)
34zz	(Blank)	Alarm output 1	Protective UV (output setting)	(Blank)
35zz	(Blank)	Alarm output 2	Protective UV2 (voltage setting)	(Blank)
36zz	(Blank)	Contact input 1	Protective UV2 (operation time)*2	(Blank)
37zz	(Blank)	Contact input 2	Protective UV2 (output setting)	(Blank)
38zz	(Blank)	(Blank)	Protective UV operation setting	(Blank)
39zz	(Blank)	Rated current (IN)	Voltage establishment VR (voltage setting)	(Blank)
40zz	(Blank)	Current demand time	Voltage establishment VR (operation time) *2	(Blank)
41zz	(Blank)	Voltage demand time	Voltage establishment VR (output setting)	(Blank)
42zz	(Blank)	Power demand time	Protective OVG (voltage setting)*2	(Blank)
43zz	(Blank)	Leak demand time	Protective OVG (operation time)	(Blank)
44zz	(Blank)	(Blank)	Protective OVG (output setting)	(Blank)
45zz	(Blank)	(Blank)	ZPD/EVT selection	(Blank)
46zz	(Blank)	(Blank)	Phase interruption relay	(Blank)
47zz	(Blank)	(Blank)	Reverse phase relay	(Blank)
48zz	(Blank)	(Blank)	Demand average time	(Blank)
49zz	(Blank)	Year setting	CB opening jam monitoring time *3	(Blank)
50zz	(Blank)	Month setting	CB closing jam monitoring time *3	(Blank)
51zz	(Blank)	Date setting	Monitoring trip coil TC disconnection, OFF expedited, function application setting	(Blank)
52zz	(Blank)	Hour setting	kWh pulse constant *5	(Blank)
53zz	(Blank)	Minute setting	kvarh pulse constant *5	(Blank)
54zz	(Blank)	(Blank)	Selective input 1 function setting	(Blank)
55zz	(Blank)	(Blank)	Selective input 2 function setting	(Blank)
56zz	(Blank)	(Blank)	Selective input 3 function setting	(Blank)
57zz	(Blank)	(Blank)	Selective input 4 function setting	(Blank)
58zz	(Blank)	(Blank)	Selective input 5 function setting	(Blank)
59zz	(Blank)	(Blank)	Selective input 6 function setting	(Blank)
60zz	(Blank)	(Blank)	Selective input 7 function setting	(Blank)
61zz	(Blank)	(Blank)	Selective input 8 function setting	(Blank)
62zz	(Blank)	(Blank)	Device fault detection function setting	(Blank)
63zz	(Blank)	(Blank)	Fault pick-up output setting	(Blank)
64zz	(Blank)	(Blank)	Transmission component 1 output setting	(Blank)
65zz	(Blank)	(Blank)	Transmission component 2 output setting	(Blank)
66zz	(Blank)	(Blank)	Distant/direct state output setting	(Blank)
67zz	(Blank)	(Blank)	Transducer output current phase setting	(Blank)
68zz	(Blank)	(Blank)	Transducer output voltage phase setting	(Blank)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
69zz	(Blank)	(Blank)	Residue/CT 3rd selection (zero-phase current)	(Blank)
70zz	(Blank)	(Blank)	Protective INST (phase N) (current setting)*2	(Blank)
71zz	(Blank)	(Blank)	Protective INST (phase N) (output setting)	(Blank)
72zz	(Blank)	(Blank)	Protective OC (phase N) (current setting)	(Blank)
73zz	(Blank)	(Blank)	Protective OC (phase N) (characteristic)	(Blank)
74zz	(Blank)	(Blank)	Protective OC (phase-N) (time magnification)*2	(Blank)
75zz	(Blank)	(Blank)	Protective OC (phase N) (output setting)	(Blank)
76zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (current setting)	(Blank)
77zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (operation time)	(Blank)
78zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (output setting)	(Blank)
79zz	(Blank)	(Blank)	Protective OCGA pre-alarm (current setting)	(Blank)
80zz	(Blank)	(Blank)	Protective OCGA pre-alarm (operation time)	(Blank)
81zz	(Blank)	(Blank)	Protective OCGA pre-alarm (output setting)	(Blank)
82zz	(Blank)	(Blank)	Protective DT2 (current setting)	(Blank)
83zz	(Blank)	(Blank)	Protective DT2 (operation time) *2	(Blank)
84zz	(Blank)	(Blank)	Protective DT2 (output setting)	(Blank)
85zz	(Blank)	(Blank)	Transducer output CH1 setting	(Blank)
86zz	(Blank)	(Blank)	Transducer output CH2 setting	(Blank)
87zz	(Blank)	(Blank)	Transducer output CH3 setting	(Blank)
88zz	(Blank)	(Blank)	Transducer output CH4 setting	(Blank)
89zz	(Blank)	(Blank)	Transducer output CH5 setting	(Blank)
90zz	(Blank)	(Blank)	Transducer output CH6 setting	(Blank)
91zz	(Blank)	(Blank)	External change-over function setting of transducer output	(Blank)
92zz	(Blank)	(Blank)	Display mode selection	(Blank)

*1 When using a direct value, set [DEC (with sign)] for [Display Format] on the [Num. Display] window.
*2 Specify "1" for [Decimal Point] on the [Num. Display] window.
*3 Specify "2" for [Decimal Point] on the [Num. Display] window.
*4 Specify the multiplying factor in the range of –3 to 2.
*5 Specify the pulse constant in the range of –2 to 4 or F.

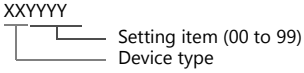
Address denotations:

- For the device memory for which the circuit number is set (00 to 02, 12 to 18, 50):



* For circuit No. E, specify "11" for the circuit number.

- For the device memory for which the circuit number is not set (03, 09 to 11):



Note on Setting the Device Memory
Only the "List" file of "F-MPC04S" can be browsed by pressing the [Refer] button by default.
If any power monitor unit other than above is used, refer to each "List" file by pressing the [Refer] button and set the device memory.

PLC_CTL

Content	F0	F1 (=$u n)		F2
kWh integrated value reset *1	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
Max. kW (amount of power) reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
Operation control *2	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	0: Turning ON the input/output 1: Turning ON the output of Power OFF 2: Turning OFF the output of power ON/OFF	
Reset all of the demand maximum values *3	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 3	
Alarm reset *3	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Time setting *3	1 - 8 (PLC1 - 8)	n	Station number *4	8 (9 when broadcast is specified)
		n + 1	Command: 5	
		n + 2	0: Specific station number 1: Broadcast	
		n + 3	Year	
		n + 4	Month	
		n + 5	Day	
		n + 6	Hour	
		n + 7	Minute	
		n + 8	Second *5	
Reset the maximum and minimum voltage values *6	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6	
Entering test mode *6	1 - 8 (PLC1 - 8)	n	Station number *4	3
		n + 1	Command: 7	
		n + 2	0: Specific station number 1: Broadcast	
Exiting test mode *6	1 - 8 (PLC1 - 8)	n	Station number *4	3
		n + 1	Command: 8	
		n + 2	0: Specific station number 1: Broadcast	

*1 Not available with F*JF-R.
*2 Available only with F-MPC60B.
*3 Available only with FePSU.
*4 Select station No. 0 for broadcast commands.
*5 Can be set only for a broadcast command.
*6 Available only with F*JF-R.

21.2.9 FVR-E11S

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters. Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1	<table><tr><th></th><th>Monitor</th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>○</td><td>X</td><td>X</td></tr><tr><td>1</td><td>○</td><td>○</td><td>X</td></tr><tr><td>2</td><td>○</td><td>X</td><td>○</td></tr><tr><td>3</td><td>○</td><td>○</td><td>○</td></tr></table>	3
H31	Station address	1 to 31	1
H34	Baud rate	0: 19200 bps 1: 9600 bps 2: 4800 bps	1
H35	Data length	0: 8 bits 1: 7 bits	0
H36	Parity bit	0: None 1: Even 2: Odd	0
H37	Stop bit	0: 1 bits 1: 2 bits	0
-	Communication protocol *2	"FGI-bus" is set as default.	-

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "18 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X5 can also be used. Set the function code corresponding to the digital input terminal to use.

*2 When "FVR-E11S" is selected for model selection on the editor, use "FGI-bus" for the communication protocol on the inverter.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	Double-word
F	(basic function)	02H	
E	(terminal function)	03H	
C	(control function)	04H	
P	(motor 1)	05H	
H	(high level function)	06H	
A	(motor 2)	07H	
o	(optional function)	08H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Reset command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	

21.2.10 FVR-E11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.11 FVR-C11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.12 FRENIC5000 G11S / P11S

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1	<table><tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>O</td><td>X</td><td>X</td></tr><tr><td>1</td><td>O</td><td>O</td><td>X</td></tr><tr><td>2</td><td>O</td><td>X</td><td>O</td></tr><tr><td>3</td><td>O</td><td>O</td><td>O</td></tr></table>	3
H31	Station address	1 to 31	1
H34	Baud rate	0: 19200 bps 1: 9600 bps 2: 4800 bps	1
H35	Data length	0: 8 bits 1: 7 bits	0
H36	Parity bit	0: None 1: Even 2: Odd	0
H37	Stop bit	0: 2 bits 1: 1 bit	0
U49	Communication protocol*2	**0: FGI-bus** 1: Modbus RTU	1

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "24 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.

*2 When "FRENIC5000G11S/P11S" is selected for model selection on the editor, select "FGI-bus" for the communication protocol on the inverter.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	Double-word, read only
F	(basic function)	02H	
E	(terminal function)	03H	
C	(control function)	04H	
P	(motor 1)	05H	
H	(high level function)	06H	
A	(motor 2)	07H	
o	(optional function)	08H	
U	(user function)	0AH	

Indirect Device Memory Designation

- When “S” (command data) or “M” (monitor data) is used:
  For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (= $u n)		F2
Reset command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	

21.2.13 FRENIC5000 G11S / P11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

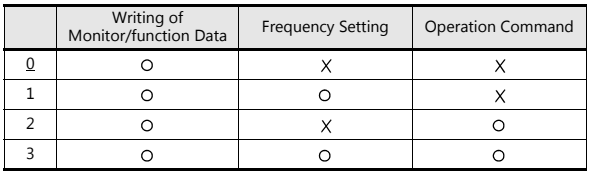
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1		3
H31	Station address	1 to 31	1
H34	Baud rate	0: 19200 bps 1: 9600 bps 2: 4800 bps	1
H35	Data length	0: 8 bits 1: 7 bits	0
H36	Parity bit	0: None 1: Even 2: Odd	0
H37	Stop bit	0: 2 bits 1: 1 bit	0
U49	Communication protocol*2	0: FGI-bus **1: Modbus RTU**	1

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "24 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.

*2 When "FRENIC5000G11S/P11S (MODBUS RTU)" is selected for model selection on the editor, select "Modbus RTU" for the communication protocol on the inverter.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.14 FRENIC5000 VG7S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits*1	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

*1 When no parity setting is made, set "2 bits" for stop bit.
When a parity setting (even or odd) is made, set "1 bit" for stop bit.

When Connecting to the Built-in RS-485 Port on the Inverter:

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1	<table><tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>O</td><td>X</td><td>X</td></tr><tr><td>1</td><td>O</td><td>O</td><td>X</td></tr><tr><td>2</td><td>O</td><td>X</td><td>O</td></tr><tr><td>3</td><td>O</td><td>O</td><td>O</td></tr></table>	3
H31	Station address	1 to 31	1
H34	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps	0
H36	Parity bit	0: None 1: Even 2: Odd	1
H37	Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When no parity setting is made, "2 bits" is set for stop bit. When a parity setting (even or odd) is made, "1 bit" is set for stop bit.	1
H40	Communication protocol*2	0: FGI-bus 1: SX (loader) protocol **2: Modbus RTU**	2

* The communication parameter (data length) is fixed to 8 bits.

When Connecting to the Terminal Block on "OPC-VG7-RS" (Optional Communication Board):

Communication setting

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td>
<table>
<tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td>0</td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>O</td><td>O</td><td>X</td></tr>
<tr><td>2</td><td>O</td><td>X</td><td>O</td></tr>
<tr><td>3</td><td>O</td><td>O</td><td>O</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>o37</td><td>Communication definition setting</td><td>Baud rate
0: 38400 bps
1: 19200 bps
2: 9600 bps
3: 4800 bps
Parity
0: None (stop bit: 2 bits)
1: Even (stop bit: 1 bit)
2: Even (stop bit: 1 bit)</td><td>10</td></tr>
<tr><td>H40</td><td>Communication protocol*2</td><td>0: FGI-bus
1: SX (loader) protocol
2: Modbus RTU</td><td>2</td></tr>
</table>

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "24 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.

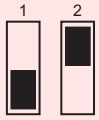
*2 When "FRENIC5000G11S/P11S (MODBUS RTU)" is selected for model selection on the editor, select "Modbus RTU" for the communication protocol on the inverter.

*3 The communication parameter (data length) is fixed to 8 bits.

Notes on Using "OPC-VG7-RS" (Optional Communication Board)

Set the DIPSW2 on the optional communication board "OPC-VG7-RS" as shown below when connecting the TS2060 and the terminal block of the board.

The underlined settings are set as default.

<table>
<tr><th>SW2</th><th>SW2-1 Setting</th><th>SW2-2 Setting</th><th>Function</th><th>Remarks</th></tr>
<tr><td rowspan="4"> 
</td><td>OFF</td><td>OFF</td><td rowspan="2">-</td><td>-</td></tr>
<tr><td>ON</td><td>OFF</td><td>-</td></tr>
<tr><td>OFF</td><td>ON</td><td>Optional communication board enabled</td><td>Do not change the default setting when connecting with the TS2060.</td></tr>
<tr><td>ON</td><td>ON</td><td>-</td><td>-</td></tr>
</table>

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.15 FRENIC-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the inverter cannot be changed.
Stop bit	1 / 2 bits*1	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

*1 When no parity setting is made, "2 bits" is set for stop bit.
When a parity setting (even or odd) is made, "1 bit" is set for stop bit.

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
y01	Station address	1 to 31	1
y04	Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps	3
y06	Parity bit	0: None 1: Even 2: Odd	0
y07	Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When no parity setting is made, "2 bits" is set for stop bit. When a parity setting (even or odd) is made, "1 bit" is set for stop bit.	-
y10	Communication protocol*1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y99	Support link function	<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from RS-485</td></tr><tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr></table>	0
H30	Link function *2	<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Inverter</td><td>Inverter</td></tr><tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr><tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr><tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr></table>	3

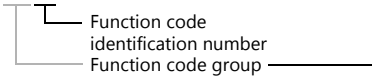
*1 Select "Modbus RTU" for the communication protocol on the inverter when connecting with the TS2060.
*2 When "0" is specified for y99 (support link function), command from function code H30 is valid for the frequency setting and operation command.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	02H	

Address denotations XXYY



Group	Code	Name
F	00H	Basic function
E	01H	Terminal function
C	02H	Control function
P	03H	Motor parameter
H	04H	High level function
S	07H	Command/function data
M	08H	Monitor data
J	0DH	Application function
y	0EH	Link function
W	0FH	Monitor 2
X	10H	Alarm 1
Z	11H	Alarm 2

21.2.16 FRENIC-Eco (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits	When no parity setting is made, "2 bits" is set for stop bit. When a parity setting is made, "1 bit" is set for stop bit.
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting (touch panel)	Station address	1 to 31	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When no parity setting is made, "2 bits" is set for stop bit. When a parity setting (even or odd) is made, "1 bit" is set for stop bit.	-
y10		Communication protocol*1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y11	RS-485 setting 2 (optional board)	Station address	1 to 31	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When no parity setting is made, "2 bits" is set for stop bit. When a parity setting (even or odd) is made, "1 bit" is set for stop bit.	-
y20		Communication protocol*1	**0: Modbus RTU** 2: FGI-bus	0
y98	Bus function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table>	0
y99	Support link function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr><tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30, y98</td></tr><tr><td>2</td><td>Function code H30, y98</td><td>Commanded from RS-485</td></tr><tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr></table>	0

Function Code	Item	Setting	Example
H30	Link function *2	0: Frequency: Inverter; Operation Command: Inverter 1: Frequency: RS-485 communication; Operation Command: Inverter 2: Frequency: Inverter; Operation Command: RS-485 communication 3: Frequency: RS-485 communication; Operation Command: RS-485 communication 4: Frequency: RS-485 communication (optional); Operation Command: Inverter 5: Frequency: RS-485 communication (optional); Operation Command: RS-485 communication 6: Frequency: Inverter; Operation Command: RS-485 communication (optional) 7: Frequency: RS-485 communication; Operation Command: RS-485 communication (optional) 8: Frequency: RS-485 communication (optional); Operation Command: RS-485 communication (optional)	3

*1 Select "Modbus RTU" for the communication protocol on the inverter when connecting with the TS2060.
*2 When "0" is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making the frequency and operation command settings on the TS2060 connected to the connector for the touch panel, specify "3" for function code H30. When making those settings on the TS2060 connected to the optional communication board, specify "8" for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.17 FRENIC-Multi (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits	On the inverter: 2 bits when "0" is specified for y06 or y16 1 bit when "1", "2" or "3" is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting (touch panel)	Station address	1 to 31	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y06, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y06, "1 bit" is set for stop bit.	-
y10		Communication protocol*1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y11	RS-485 setting 2 (optional board)	Station address	1 to 31	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y16, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y16, "1 bit" is set for stop bit.	-
y20		Communication protocol*1	**0: Modbus RTU** 2: FGI-bus	0
y98	Bus function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table>	0

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Commanded from RS-485</td></tr>
<tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (optional)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (optional)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (optional)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (optional)</td></tr>
<tr><td>8</td><td>RS-485 communication (optional)</td><td>RS-485 communication (optional)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the TS2060.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making the frequency and operation command settings on the TS2060 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the TS2060 connected to the optional communication board, specify “8” for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.18 FRENIC-MEGA (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits	On the inverter: 2 bits when "0" is specified for y06 or y16 1 bit when "1", "2" or "3" is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting (touch panel)	Station address	1 to 31	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y06, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y06, "1 bit" is set for stop bit.	-
y10		Communication protocol*1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y11	RS-485 setting 2 (control circuit)	Station address	1 to 31	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y16, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y16, "1 bit" is set for stop bit.	-
y20		Communication protocol*1	**0: Modbus RTU** 2: FGI-bus	0
y98	Bus function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table>	0

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from the loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Commanded from the loader</td></tr>
<tr><td>3</td><td>Commanded from the loader</td><td>Commanded from the loader</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (control circuit)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (control circuit)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (control circuit)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (control circuit)</td></tr>
<tr><td>8</td><td>RS-485 communication (control circuit)</td><td>RS-485 communication (control circuit)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the TS2060.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making the frequency and operation command settings on the TS2060 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the TS2060 connected to the terminal block on control circuit, specify “8” for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.19 FRENIC-MEGA SERVO (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	On the inverter: 2 bits when "0" is specified for y06 or y16 1 bit when "1", "2" or "3" is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting 1 (Touch panel)	Station address	1 to 247	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y06, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y06, "1 bit" is set for stop bit.	-
y10		Communication protocol *1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y11	RS-485 setting 2 (Control circuit)	Station address	1 to 247	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y16, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y16, "1 bit" is set for stop bit.	-
y20		Communication protocol *1	**0: Modbus RTU** 2: FGI-bus	0
y98	Bus function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table>	0

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from FRENIC loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Commanded from FRENIC loader</td></tr>
<tr><td>3</td><td>Commanded from FRENIC loader</td><td>Commanded from FRENIC loader</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (Control circuit)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (Control circuit)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (Control circuit)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (Control circuit)</td></tr>
<tr><td>8</td><td>RS-485 communication (Control circuit)</td><td>RS-485 communication (Control circuit)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the TS2060.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making frequency and operation command settings on the TS2060 connected to the connector for the touch panel, specify “3” for function code H30. When making the settings on the TS2060 connected to the control circuit terminal block, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.20 FRENIC-HVAC/AQUA (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	On the inverter: 2 bits when "0" is specified for y06 or y16 1 bit when "1", "2" or "3" is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting 1 (Touch panel)	Station address	1 to 247	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y06, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y06, "1 bit" is set for stop bit.	-
y10		Communication protocol *1	**0: Modbus RTU**	0
y11	RS-485 setting 2 (terminal block)	Station address	1 to 247	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y16, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y16, "1 bit" is set for stop bit.	-
y20		Communication protocol *1	**0: Modbus RTU**	0
y98	Bus function		<table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table>	0

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from FRENIC loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Command from FRENIC loader</td></tr>
<tr><td>3</td><td>Command from FRENIC loader</td><td>Command from FRENIC loader</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (Control circuit)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (Control circuit)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (Control circuit)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (Control circuit)</td></tr>
<tr><td>8</td><td>RS-485 communication (Control circuit)</td><td>RS-485 communication (Control circuit)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the TS2060.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making frequency and operation command settings on the TS2060 connected to the connector for the touch panel, specify “3” for function code H30. When making the settings on the TS2060 connected to the control circuit terminal block, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.21 FRENIC-VG1 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
H31	Station address	1 to 247	1
H34	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps	0
H35	Data length	**0: 8 bits**	0
H36	Parity bit	0: None 1: Even parity 2: Odd parity	1
H37	Stop bit	0: 2 bits 1: 1 bit	1
H40	Protocol selection	**2: Modbus-RTU protocol**	2

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.22 FRENIC-Ace (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting (communication port 1)	Station address	1 to 247	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y05		Data length	0: 8 bits 1: 7 bits	0
y06		Parity bit	0: None 1: Even parity 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y06, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y06 "1 bit" is set for stop bit.	-
y10		Communication protocol *1	**0: Modbus RTU**	0
y11	RS-485 setting 2 (communication port 2)	Station address	1 to 247	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y15		Data length	0: 8 bits 1: 7 bits	0
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When "0" is specified for y16, "2 bits" is set for stop bit. When "1", "2", or "3" is specified for y16, "1 bit" is set for stop bit.	-
y20		Communication protocol *1	**0: Modbus RTU**	0

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y98</td><td>Bus function</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table></td><td>0</td></tr>
<tr><td>y99</td><td>Support link function</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr><tr><td>1</td><td>Command from FRENIC loader</td><td>Function code H30, y98</td></tr><tr><td>2</td><td>Function code H30, y98</td><td>Command from FRENIC loader</td></tr><tr><td>3</td><td>Command from FRENIC loader</td><td>Command from FRENIC loader</td></tr></table></td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Inverter</td><td>Inverter</td></tr><tr><td>1</td><td>RS-485 communication (port 1)</td><td>Inverter</td></tr><tr><td>2</td><td>Inverter</td><td>RS-485 communication (port 1)</td></tr><tr><td>3</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 1)</td></tr><tr><td>4</td><td>RS-485 communication (port 2)</td><td>Inverter</td></tr><tr><td>5</td><td>RS-485 communication (port 2)</td><td>RS-485 communication (port 1)</td></tr><tr><td>6</td><td>Inverter</td><td>RS-485 communication (port 2)</td></tr><tr><td>7</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 2)</td></tr><tr><td>8</td><td>RS-485 communication (port 2)</td><td>RS-485 communication (port 2)</td></tr></table></td><td>3</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the TS2060.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the TS2060.
When making frequency and operation command settings on the TS2060 connected to communication port 1, specify “3” for function code H30. When making the settings on the TS2060 connected to communication port 2, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4	02H	

21.2.23 FRENIC Series (Loader)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	1 to 255	

Inverter

Set communication parameters. Be sure to match the settings to those made under [Communication Setting] of the editor.

FRENIC5000VG7S

Built-in RS-485 port

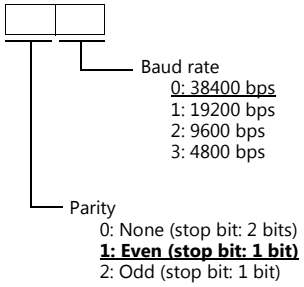
(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1	<table><tr><th></th><th>Writing of Monitor/Function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>○</td><td>×</td><td>×</td></tr><tr><td>1</td><td>○</td><td>○</td><td>×</td></tr><tr><td>2</td><td>○</td><td>×</td><td>○</td></tr><tr><td>3</td><td>○</td><td>○</td><td>○</td></tr></table>	3
H31	Station address	1 to 255	1
H34	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps	1
H40	Communication protocol	0: FGI-bus **1: SX (loader) protocol** 2: Modbus RTU	1

Connecting to terminal block of “OPC-VG7-RS” optional communication board

(Underlined setting: default)

Function Code	Item	Setting	Example
H30	Link function *1	<table><tr><th></th><th>Writing of Monitor/Function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>○</td><td>×</td><td>×</td></tr><tr><td>1</td><td>○</td><td>○</td><td>×</td></tr><tr><td>2</td><td>○</td><td>×</td><td>○</td></tr><tr><td>3</td><td>○</td><td>○</td><td>○</td></tr></table>	3
H31	Station address	1 to 255	1

Function Code	Item	Setting	Example
o37	Communication definition setting		11
H40	Communication protocol	0: FGI-bus **1: SX (loader) protocol** 2: Modbus RTU	1

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON:
Set "24 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.

Notes on Using the "OPC-VG7-RS" (Optional Communication Board)

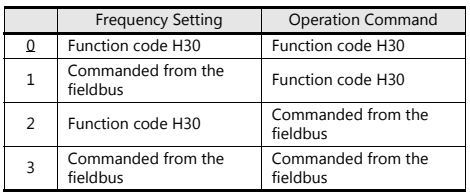
Set the DIPSW2 on the optional communication board "OPC-VG7-RS" as shown below when connecting the TS2060 and the terminal block of the board.

The underlined settings are set as default.

SW2	SW2-1 Setting	SW2-2 Setting	Function	Remarks
	OFF	OFF	-	-
	ON	OFF		-
	OFF	ON	Optional communication board enabled	Do not change the default setting when connecting with the TS2060.
	ON	ON	-	-

FRENIC-Mini/Eco/Multi/MEGA/MEGA SERVO/HVAC/AQUA/Ace/HF/Lift

(Underlined setting: default)

Function Code	Name		Setting	Example	Remarks
y01	RS-485 setting 1 (touch panel / communication port 1)	Station address	1 to 255	1	
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3	
y10		Communication protocol *1	0: Modbus RTU **1: SX (loader) protocol** 2: FGI-bus	1	
y11	RS-485 setting 2 (control circuit terminal block / communication port 2)	Station address	1 to 255	1	The control circuit terminal block / communication port 2 is available only with FRENIC-HVAC/ AQUA/Ace.
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3	
y20		Communication protocol	0: Modbus RTU **1: SX (loader) protocol** 2: FGI-bus	1	
y98	Bus function			0	

	Frequency Setting	Operation Command
0	Function code H30	Function code H30
1	Commanded from the fieldbus	Function code H30
2	Function code H30	Commanded from the fieldbus
3	Commanded from the fieldbus	Commanded from the fieldbus

<table>
<tr><th>Function Code</th><th>Name</th><th>Setting</th><th>Example</th><th>Remarks</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Command from FRENIC loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Command from FRENIC loader</td></tr>
<tr><td>3</td><td>Command from FRENIC loader</td><td>Command from FRENIC loader</td></tr>
</table>
</td><td>0</td><td></td></tr>
<tr><td>H30</td><td>Link function *1</td><td>
• FRENIC-Mini/Eco/Multi/MEGA/MEGA SERVO/ HVAC/AQUA/Ace/HF
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication (port 1)</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>3</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>4</td><td>RS-485 communication (port 2) *</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (port 2) *</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (port 2) *</td></tr>
<tr><td>7</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 2) *</td></tr>
<tr><td>8</td><td>RS-485 communication (port 2) *</td><td>RS-485 communication (port 2) *</td></tr>
</table>
• FRENIC-Lift
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th><th>Torque Bias Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td><td>L54</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td><td>L54</td></tr>
<tr><td>4</td><td>CAN</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>5</td><td>Inverter</td><td>CAN</td><td>L54</td></tr>
<tr><td>6</td><td>CAN</td><td>CAN</td><td>L54</td></tr>
<tr><td>7</td><td>Inverter</td><td>Terminal block</td><td>RS-485 communication</td></tr>
<tr><td>8</td><td>RS-485 communication</td><td>Terminal block</td><td>RS-485 communication</td></tr>
<tr><td>9</td><td>Inverter</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>10</td><td>RS-485 communication</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>11</td><td>Inverter</td><td>Terminal block</td><td>CAN</td></tr>
<tr><td>12</td><td>CAN</td><td>Terminal block</td><td>CAN</td></tr>
<tr><td>13</td><td>Inverter</td><td>CAN</td><td>CAN</td></tr>
<tr><td>14</td><td>CAN</td><td>CAN</td><td>CAN</td></tr>
</table>
</td><td>3</td><td>* The communication port 2 is available only with FRENIC-HVAC/AQUA/ Ace.</td></tr>
</table>

*1 When "0" is specified for y98 (bus function) and "3" is specified for y99 (support link function), the frequency and operation command can be set on the TS2060.
When making frequency and operation command settings on the TS2060 connected to communication port 1, specify "3" for function code H30. When making the settings on the TS2060 connected to communication port 2, specify "8" for H30.

FRENIC-VG1

(Underlined setting: default)

Function Code	Name	Setting	Example
H31	Station address	1 to 255	1
H34	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps	1
H40	Protocol selection	0: FGI-bus **1: SX (loader) protocol** 2: Modbus RTU	1

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
F	(basic function)	00H	
E	(terminal function)	01H	
C	(control function)	02H	
P	(motor parameter function M1)	03H	
H	(high performance function)	04H	
A	(motor parameter function M2, 3)	05H	
o	(optional function)	06H	
S	(communication command function)	07H	
M	(monitor data function)	08H	
L	(lift function)	09H	
r	(VG7, UPAC RAS function)	0AH	
U	(user function)	0BH	
J	(application function)	0DH	
y	(communication function)	0EH	
W	(extensional monitor)	0FH	
X	(alarm information 1)	10H	
Z	(alarm information 2)	11H	
b	(ASR/torque)	12H	
d	(soft relay)	13H	
E1	(terminal function 1)	14H	
H1	(high level function 1)	15H	
H2	(high level function 2)	16H	
H3	(high level function 3)	17H	
H4	(high level function 4)	18H	
H5	(high level function 5)	19H	
A1	(motor 3 function)	1AH	
o1	(optional function 1)	1BH	
o2	(optional function 2)	1CH	
U1	(user function 1)	1DH	
M1	(monitor data function 1)	1EH	
M2	(monitor data function 2)	1FH	
q	(for validation by manufacturer)	21H	
i	(model-specific adjustment value)	22H	
u	(back 1 function code)	23H	
n	(back 2 function code)	24H	
K	(touch panel / loader communication (K))	26H	

21.2.24 HFR-C9K

Communication Setting

Editor

Communication setting

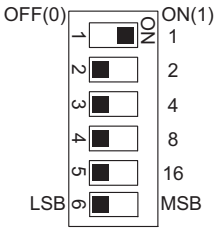
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

IH Inverter

Be sure to match the settings to those made under [Communication Setting] of the editor.

SW1 setting (station address / optional selection)

<table>
<tr><th>Switch</th><th colspan="2">Contents</th><th>Example:
Station Address: 1
Optional Selection: Selection for Communication Operation
(Start from LSB)</th></tr>
<tr><td>1
2
3
4
5</td><td>Station Address*1</td><td>
<table>
<tr><th>Switch / Address</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>3</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr>
<tr><td>28</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>29</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>30</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>31</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
</td><td rowspan="2"> 
</td></tr>
<tr><td>6</td><td>Optional Selection</td><td>
<table>
<tr><th>Contents</th><th>LSB</th><th>MSB</th></tr>
<tr><td>Selection for Communication Operation (Start from LSB)</td><td>ON</td><td>OFF</td></tr>
<tr><td>Selection for Communication Operation (Start from MSB)</td><td>OFF</td><td>ON</td></tr>
</table>
</td></tr>
</table>

*1 For connection to a TS2060, be sure to set the station address other than 0.

Communication setting

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
F16	Baud rate	4: 4800 bps 5: 9600 bps 6: 19200 bps	5
F17	Data length	0: 7 bit 1: 8 bits	1
F18	Parity bit	0: None 1: Even 2: Odd	1
F19	Stop bit	0: 1 bit 1: 2 bits	1

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	

21.2.25 HFR-C11K

Communication Setting

Editor

Communication setting

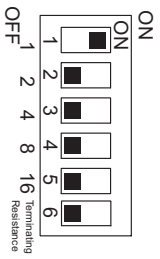
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

IH Inverter

Be sure to match the settings to those made under [Communication Setting] of the editor. (Underlined setting: default)

SW3 setting (station address / terminating resistance)

<table>
<tr><th>Switch</th><th colspan="2">Contents</th><th>Example:
Station Address: 1
Terminating Resistance: None</th></tr>
<tr><td>1
2
3
4
5</td><td>Station Address*1</td><td>
<table>
<tr><th>Switch / Address</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>3</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr>
<tr><td>28</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>29</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>30</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>31</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
</td><td rowspan="2"> 
</td></tr>
<tr><td>6</td><td>Terminating Resistance</td><td>
<table>
<tr><th>Contents</th><th>OFF</th><th>ON</th></tr>
<tr><td>Terminating resistance</td><td>None</td><td>Provided</td></tr>
</table>
</td></tr>
</table>

*1 For connection to a TS2060, be sure to set the station address other than 0.

Communication setting

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
r 04	Baud rate	2: 4800 bps 3: 9600 bps 4: 19200 bps	3
r 05	Data length	0: 8 bit 1: 7 bits	1
r 06	Parity bit	0: None 1: Even 2: Odd	1
r 07	Stop bit	0: 2 bit 1: 1 bits	1
r 10	Communication protocol*	**0: FGI-bus** 1: C9K mode	0

* RS-485 communication is available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "11 (RS485 communication selection (RS))" for function code i01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X5 can also be used. Set the function code corresponding to the digital input terminal to use.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	
F	(basic function)	02H	
E	(error display function)	03H	
C	(control function)	04H	
P	(optional function)	05H	
H	(high level function)	06H	
o	(output terminal function)	08H	
i	(input terminal function)	0BH	
t	(control function in the event of trip (alarm) occurrence)	0CH	
r	(RS communication function)	0DH	
Pn	(touch panel function)	0EH	

PLC_CTL

Content	F0	F1 (=$u n)		F2
Reset command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	

21.2.26 HFR-K1K

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

IH Inverter

Be sure to match the settings to those made under [Communication Setting] of the editor.

Control PCB internal switch

Internal Switch		Description
SW3	SW4	
RS	RS	For RS-485 communication

Communication setting

Set communication parameters.

(Underlined setting: default)

Function Code	Item		Setting	Example
R00	Communication host setting		0: Touch panel connection terminal 1: I/O PCB (option)	0
R01	RS-485 setting (touch panel connection terminal)	Station address	1 to 31	1
R04		Baud Rate	3: 9600 bps 4: 19200 bps 5: 38400 bps	5
R05		Data length	0: 8 bits 1: 7 bits	1
R06		Parity bit	0: None 1: Even parity 2: Odd parity 3: None	1
R07		Stop bit	0: 2 bits 1: 1 bit	1
R10		Protocol selection	**0: FGI-bus**	0
R12	RS-485 setting (I/O PCB (option))	Station address	1 to 31	1
R15		Baud Rate	3: 9600 bps 4: 19200 bps 5: 38400 bps	5
R16		Data length	0: 8 bits 1: 7 bits	1
R17		Parity bit	0: None 1: Even parity 2: Odd parity 3: None	1
R18		Stop bit	0: 2 bits 1: 1 bit	1
R21		Protocol selection	**0: FGI-bus**	0

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
S	(command data)	00H	
d	(monitor data)	01H	
F	(basic function)	02H	
E	(error display function)	03H	
C	(control function)	04H	
P	(optional function)	05H	
H	(advanced function)	06H	
o	(output terminal function)	08H	
I	(input terminal function)	0BH	
t	(trip (alarm) control function)	0CH	
r	(RS communication function)	0DH	
Pn	(touch panel function)	0EH	

PLC_CTL

Description	F0	F1 (=$u n)		F2
Reset command	1 to 8 (PLC1 to 8)	n	Station number	2
		n+1	Command: 0	

21.2.27 PPMC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the AC power monitor cannot be changed.
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

AC Power Monitor

The communication parameters can be set using keys attached to the front of the AC power monitor.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter		Item	Setting	Example
Setting condition 2	Item number 2	ID number	1 to 31 (default: unit number*1)	1
	Item number 3	Communication protocol selection	nor: Dedicated protocol **rtu: Modbus RTU protocol** *2	rtu
	Item number 7	Baud rate	9.6: 9600 bps 19.2: 19200 bps 4.8: 4800 bps	9.6
	Item number 8	Data length, parity	8n: Data length 8 bits, without parity 8o: Data length 8 bits, odd parity 8E: Data length 8 bits, even parity	8n

*1 The unit number is set for the ID number upon delivery. The unit number is indicated on the instruction plate attached to the side of the case.
*2 Select "rtu (Modbus RTU)" for the communication protocol when communicating with the TS2060.
*3 The communication parameter (stop bit) is fixed to 1 bit.
*4 The communication function of the AC power monitor can be selected at the time of purchase. Select a model on which RS-485/RS-232C communication is available.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	Read only

* Remarks on data format for the following device memory:
40022 (fixed voltage), 40028 (Ip fixed power factor): 6-byte character string
40046 (calendar): 14-byte character string
Measurement data: real type (Float)
40060 (alarm clear), 40062 (amount of power clear), 40064 (cumulative value of invalid power clear): write only

21.2.28 FALDIC-α Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default setting other than baud rate because the setting on the servo amplifier cannot be changed.
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	1 to 31	

Servo Amplifier

Set the communication parameters using the touch panel mounted on the servo amplifier.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter			Item	Setting	Example
PnOO2 System parameter	PP096	(No. 96)	Station number	1 to 31	1
	PP097	(No. 97)	Baud rate	0: 9600 bps 1: 19200 bps 2: 38400 bps	0

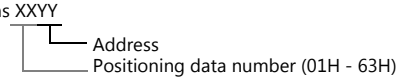
*1 The communication function of the servo amplifier can be selected at the time of purchase. Select a model on which host interface: universal communication (RS-485) is available.
*2 The following communication parameters are fixed; data length: 8 bits, stop bit: 1 bit, and parity: even.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
00	(monitor data)	00H	Double-word, read only
01	(data on positioning being executed)	01H	Double-word, read only
10	(sequence mode)	02H	Read only
11	(control input/output signal)	03H	Read only
12	(alarm detection log)	04H	Read only
13	(detected alarm contents)	05H	Read only
20	(standard parameter)	06H	Double-word*1
21	(system parameter)	07H	Double-word*1
30	(positioning data)	08H	Double-word*2
40	(control command)	09H	Double-word, write only

*1 Input a parameter number by manual operation.
*2 Address denotations XXYY



PLC_CTL

Contents	F0	F1 (= $u n)		F2
Positioning data (immediate) setting	1 - 8 (PLC1 - 8)	n	Station number	6
		n + 1	Command: 9	
		n + 2	ABS/INC	
		n + 3	Speed selection	
		n + 4 to n + 5	Position data	
Automatic start (immediate)	1 - 8 (PLC1 - 8)	n	Station number	6
		n + 1	Command: 11	
		n + 2	ABS/INC	
		n + 3	Speed selection	
		n + 4 to n + 5	Position data	
Automatic start (positioning data number)	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 12	
		n + 2	Start number	
Override setting	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 33	
		n + 2	Data type	
		n + 3	Setting	

21.2.29 FALDIC-W Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u> / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	Do not change the default setting other than baud rate because the setting on the servo amplifier cannot be changed.
Baud Rate	9600 / 19200 / <u>38400</u> bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	1 to 31	

* When changing the time-out time, note the following points. (Default: 500 (msec))

- When the baud rate is 19200 bps or 38400 bps, set 200 (msec) or greater.
- When the baud rate is 9600 bps, set 500 (msec) or greater.

Servo Amplifier

Set the communication parameters using the touch panel mounted on the servo amplifier.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter			Item	Setting	Example	Remarks
PnO 1 Parameter editing mode	no.82	(No. 82)	Station number	<u>1</u> to 31	1	The setting takes effect when the power is turned off and back on again.
	no.83	(No. 83)	Baud rate	<u>0: 38400 bps</u> 1: 19200 bps 2: 9600 bps	0	

* The following communication parameters are fixed; data length: 8 bits, stop bit: 1 bit, and parity: even.

Available Device Memory

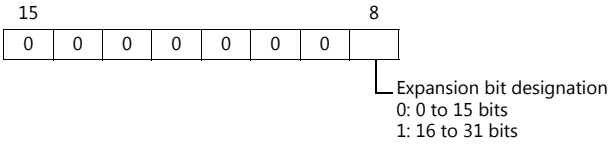
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
01	(monitor data)	00H	Double-word, read only
02	(sequence mode)	01H	Read only
03	(sequence I/O signal)	02H	Read only
04	(alarm history)	03H	Read only
06	(current alarm readout)	04H	Read only
07	(parameter)	05H	Double-word
09	(alarm reset)	06H	Write only

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model		Device Memory type
n + 1	Address No.		
n + 2	Expansion code *		Bit designation
n + 3	00		Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).



PLC_CTL

Contents	F0	F1 (= $u n)		F2
System status readout	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
		n + 2	System 1	
		n + 3	System 2	
		n + 4	Model	
		n + 5	Occupied by maker, Zno	
		n + 6 - n + 10	Occupied by maker (max. 10 bytes)	

Return data: Data stored from the servo amplifier to the TS2060

21.2.30 PH Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	Do not change the default setting because the setting on the recorder cannot be changed.
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Recorder

The communication parameters can be set using keys attached to the front of the recorder.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter	Setting	Example	Remarks
Station No.	1 to 31	1	
Baud rate	4800 / 9600 / 19200 bps	19200 bps	
Stop bit	1 / 2 bits	1	
Parity	None / Even / Odd	Odd	

* The communication function of the recorder can be selected at the time of purchase. Select a model on which RS-485 transmission mode is available.
* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
F00	(setting value file)	00H	
F01	(range file CH1)	01H	
F02	(range file CH2)	02H	
F03	(range file CH3)	03H	
F04	(range file CH4)	04H	
F05	(range file CH5)	05H	
F06	(range file CH6)	06H	
F07	(range file CH7)	07H	
F08	(range file CH8)	08H	
F09	(range file CH9)	09H	
F10	(range file CH10)	0AH	
F11	(range file CH11)	0BH	
F12	(range file CH12)	0CH	
F13	(warning setting file)	0DH	
F14	(system file)	0EH	
F15	(command file)	0FH	
F16	(abnormal input information file)	10H	Read only
F17	(input data file)	11H	Read only
F19	(alarm output file)	13H	Read only
F21	(transmission input data file)	15H	Write only
F22	(message file)	16H	
F33	(daily report file 1)	21H	Read only
F34	(daily report file 2)	22H	Read only
F35	(daily report file 3)	23H	Read only
F37	(integral file 1)	25H	Read only
F38	(integral file 2)	26H	Read only
F51	(status information control file)	33H	

21.2.31 PHR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the recorder cannot be changed.
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Recorder

The communication parameters can be set using keys attached to the front of the recorder.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter	Setting	Example	Remarks
Modbus station No.	1 to 31	1	
Modbus baud rate	9600 / 19200 bps	19200 bps	
Modbus parity	None / Even / Odd	Odd	
Front communication function	**ON** / OFF	ON	Be sure to set to “ON”.

*1 The communication function of the recorder can be selected at the time of purchase. Select a model on which RS-485 communication is available.
*2 The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

21.2.32 WA5000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
CR / LF	CR / CR/LF	
Target Port No.	1 to 31	
Send Delay Time	0 to 255 msec	*1

*1 If the send delay time is too short, "Communication Error "Format"" may occur. If this error occurs, set the send delay time to 5 msec or longer.

Digital Panel Meter

The communication parameters can be set using keys attached to the front of the digital panel meter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter		Item	Setting	Example	Remarks
bAUd	BAUD	Baud rate setting	4800: 4800 9600: 9600 192: 19200 384: 38400	9600	
dAtA	DATA	Data length setting	7: 7 bits 8: 8 bits	7 bits	
P.bIt	P.BIT	Parity bit setting	E: Even o: Odd n: None	E: Even	
S.bIt	S.BIT	Stop bit setting	2: 2 bits 1: 1 bit	2: 2 bits	
t-	T-	Delimiter setting	cr.LF: CR/LF cr: CR	cr.LF: CR/LF	
Adr	ADR	Unit ID setting	01 to 31 (default: 00)	01	Specify a value when using RS-485 connection.

* The communication function of the temperature controller can be selected with the output unit specified at the time of purchase. Select a model on which RS-485/RS-232C communication is available.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
DSP	(display)	00H	
CMP	(comparator)	01H	
SCL	(scaling)	02H	
CAL1	(calibration 1)*1	03H	
CAL2	(calibration 2)	04H	

*1 To perform zero calibration (0000), specify a value other than 0.

PLC_CTL

Contents	F0	F1 (=$u n)		F2
Hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
		n + 2	Hold status 0: OFF, 1: ON	
Hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
		n + 2	Hold status 0: OFF, 1: ON	
Hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	Hold status 0: OFF, 1: ON	
Trigger input	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 3	
		n + 2	Display type 0: Normal display 1: Over display 2: Peak hold display 3: Valley hold display 4: Peak valley hold display	
		n + 3	Measurement value	
		n + 4	Comparison result 0: OFF 1: HI 2: GO 3: LO	
Hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Peak hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 5	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
		n + 3	Peak hold status 0: OFF, 1: ON	
Peak hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6	
		n + 2	Peak hold status 0: OFF, 1: ON	
Peak hold type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 7	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peak hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 8	
		n + 2	Peak hold remote 0: OFF, 1: ON	
Peak hold value response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	Peak hold value	
		n + 3	Valley hold value	
		n + 4	Peak valley hold value	
Peak hold value clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 10	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peal hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	
Digital zero remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 12	
		n + 2	Digital zero 0: OFF, 1: ON	
		n + 3	Displayed value	

Contents	F0	F1 (=$u n)		F2
Digital zero terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 13	
		n + 2	Digital zero 0: OFF, 1: ON	
Digital zero remote control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 14	
		n + 2	Digital zero 0: OFF, 1: ON, 2: ON when the value reaches the set value	
		n + 3	Setting value	
Digital zero remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 15	
Comparison output remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 16	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 17	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 18	
Remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 19	
		n + 2	Remote control status Bit - 3 2 1 0 Hold function Peak hold Digital zero Comparison output * No remote control is performed when all bits are reset (OFF).	
Maximum / minimum / (maximum - minimum) response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 20	
		n + 2	Maximum	
		n + 3	Minimum	
		n + 4	(Maximum - minimum)	
Maximum / minimum / (maximum - minimum) clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 21	
		n + 2	Maximum /minimum /(maximum - minimum) clear 0: Maximum 1: Minimum 2: Maximum - minimum	
Range response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 22	
		n + 2	Range 0: No designation 1: Range 11 2: Range 12 3: Range 13 4: Range 14 5: Range 15 6: Range 23 7: Range 24 8: Range 25 9: Range 26 10: KA 11: KB 12: J 13: T 14: R 15: S 16: B 17: PA 18: Pb 19: JPA 20: JPb 21: 1V 22: 2A	

Contents	F0	F1 (=$u n)		F2
Range setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 23	
		n + 2	Range 1: Range 11 12: J 2: Range 12 13: T 3: Range 13 14: R 4: Range 14 15: S 5: Range 15 16: B 6: Range 23 17: PA 7: Range 24 18: Pb 8: Range 25 19: JPA 9: Range 26 20: JPb 10: KA 21: 1V 11: KB 22: 2A	
Average number of responses	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 24	
		n + 2	Average number of times 1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)	
Setting for average number of times	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 25	
		n + 2	Average number of times 1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)	
Average number of movement times	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 26	
		n + 2	Average number of movement times 0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)	
Setting for average number of movement times	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 27	
		n + 2	Average number of movement times 0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)	
Step-wide response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 28	
		n + 2	Step wide 1:1, 2:2, 5:5, 0:10 (digit)	
Step-wide setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 29	
		n + 2	Step wide 1:1, 2:2, 5:5, 0:10 (digit)	
Communication function parameter response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 30	
		n + 2	Baud rate 0: 2400, 1: 4800, 2: 9600, 3: 19200, 4: 38400	
		n + 3	Data length 0: 7 bits, 1: 8 bits	
		n + 4	Parity 0: none, 1: odd, 2: even	
		n + 5	Stop bit 0: 1 bit, 1: 2 bits	
		n + 6	Delimiter 0: CR/LF, 1: CR	
Communication function parameter setting	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 31	
		n + 2	Baud rate 0: 2400, 1: 4800, 2: 9600, 3: 19200, 4: 38400	
		n + 3	Data length 0: 7 bits, 1: 8 bits	
		n + 4	Parity 0: none, 1: odd, 2: even	
		n + 5	Stop bit 0: 1 bit, 1: 2 bits	
		n + 6	Delimiter 0: CR/LF, 1: CR	
Unit ID response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 32	
		n + 2	Unit ID 1 to 99	
Unit ID setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 33	
		n + 2	Unit ID 1 to 99	

Contents	F0	F1 (=$u n)		F2
Analog output type response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 34	
		n + 2	Analog output type 0: Not provided 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Analog output type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 35	
		n + 2	Analog output type 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Digital zero backup status response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 36	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero backup control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 37	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero data save command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 38	
Input change response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 39	
		n + 2	Input change 0: Not provided 1: Open collector 2: Logic 3: Magnetic	
Input change setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 40	
		n + 2	Input change 1: Open collector 2: Logic 3: Magnetic	
Tracking zero response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 41	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
		n + 3	Tracking zero width 0 (OFF) / 1 to 99	
Tracking zero time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 42	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
Tracking zero width setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 43	
		n + 2	Tracking zero width 0 (OFF) /1 to 99	
Sensor power response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 44	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Sensor power setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 45	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Power-on delay time response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 46	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	

Contents	F0	F1 (=$u n)		F2
Power-on delay time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 47	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	
Protection response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 48	
		n + 2	Protect 0: OFF 1: ON	
Protection setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 49	
		n + 2	Protect 0: OFF 1: ON	
Unit No. response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 50	
		n + 2	Input unit number 1 to 18	
		n + 3	Output unit number 0 to 7	
Response to prohibition of key operations	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 51	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Prohibition of key operations setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 52	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Response to linearizing function status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 53	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	
Linearizing function status setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 54	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	
Response to the number of linearization correction data	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 55	
		n + 2	Linearization correction data 0 (clear) to 16	
The number of linearization correction data setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 56	
		n + 2	Linearization correction data 1 to 16	

Contents	F0	F1 (=$u n)		F2
Response to linearization data	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 57	
		n + 2	Read start number 1 to 16	
		n + 3	The number of read data 1 to 16	
		n + 4	Linearization data input value (start number + 0)	
		n + 5	Linearization data output value (start number + 0)	
		n + 6	Linearization data input value (start number + 1)	
		n + 7	Linearization data output value (start number + 1)	
		n + 8	Linearization data input value (start number + 2)	
		n + 9	Linearization data output value (start number + 2)	
		n + 10	Linearization data input value (start number + 3)	
		n + 11	Linearization data output value (start number + 3)	
		n + 12	Linearization data input value (start number + 4)	
		n + 13	Linearization data output value (start number + 4)	
		n + 14	Linearization data input value (start number + 5)	
		n + 15	Linearization data output value (start number + 5)	
		n + 16	Linearization data input value (start number + 6)	
		n + 17	Linearization data output value (start number + 6)	
		n + 18	Linearization data input value (start number + 7)	
		n + 19	Linearization data output value (start number + 7)	
		n + 20	Linearization data input value (start number + 8)	
		n + 21	Linearization data output value (start number + 8)	
		n + 22	Linearization data input value (start number + 9)	
		n + 23	Linearization data output value (start number + 9)	
		n + 24	Linearization data input value (start number + 10)	
		n + 25	Linearization data output value (start number + 10)	
		n + 26	Linearization data input value (start number + 11)	
		n + 27	Linearization data output value (start number + 11)	
		n + 28	Linearization data input value (start number + 12)	
		n + 29	Linearization data output value (start number + 12)	
		n + 30	Linearization data input value (start number + 13)	
		n + 31	Linearization data output value (start number + 13)	
		n + 32	Linearization data input value (start number + 14)	
		n + 33	Linearization data output value (start number + 14)	4
		n + 34	Linearization data input value (start number + 15)	
		n + 35	Linearization data output value (start number + 15)	

Contents	F0	F1 (=$u n)		F2
Linearization data setting	1 - 8 (PLC1 - 8)	n	Station number	6 ' 36
		n + 1	Command: 58	
		n + 2	Read start number 1 to 16	
		n + 3	The number of read data 1 to 16	
		n + 4	Linearization data input value (start number + 0)	
		n + 5	Linearization data output value (start number + 0)	
		n + 6	Linearization data input value (start number + 1)	
		n + 7	Linearization data output value (start number + 1)	
		n + 8	Linearization data input value (start number + 2)	
		n + 9	Linearization data output value (start number + 2)	
		n + 10	Linearization data input value (start number + 3)	
		n + 11	Linearization data output value (start number + 3)	
		n + 12	Linearization data input value (start number + 4)	
		n + 13	Linearization data output value (start number + 4)	
		n + 14	Linearization data input value (start number + 5)	
		n + 15	Linearization data output value (start number + 5)	
		n + 16	Linearization data input value (start number + 6)	
		n + 17	Linearization data output value (start number + 6)	
		n + 18	Linearization data input value (start number + 7)	
		n + 19	Linearization data output value (start number + 7)	
		n + 20	Linearization data input value (start number + 8)	
		n + 21	Linearization data output value (start number + 8)	
		n + 22	Linearization data input value (start number + 9)	
		n + 23	Linearization data output value (start number + 9)	
		n + 24	Linearization data input value (start number + 10)	
		n + 25	Linearization data output value (start number + 10)	
		n + 26	Linearization data input value (start number + 11)	
		n + 27	Linearization data output value (start number + 11)	
		n + 28	Linearization data input value (start number + 12)	
		n + 29	Linearization data output value (start number + 12)	
		n + 30	Linearization data input value (start number + 13)	
		n + 31	Linearization data output value (start number + 13)	
		n + 32	Linearization data input value (start number + 14)	
		n + 33	Linearization data output value (start number + 14)	
		n + 34	Linearization data input value (start number + 15)	
		n + 35	Linearization data output value (start number + 15)	

Return data: Data stored from the panel meter to the TS2060

21.2.33 APR-N (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

AC Power Regulator

The communication parameter can be set using keys attached to the front of the AC power regulator.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code	Item	Setting	Example
6.o02	Setting device selection*	APd: Setting indicator nEt: Network device APr: APR main unit	nEt
7.n01	Communication protocol selection*	m-S: Master / slave parallel operation **nEt: MODBUS RTU**	nEt
7.n02	Station address	A000: 0 ' A031: 31 (default: A001: 1)	A001
7.n04	Baud rate selection	4800: 4800 bps 9600: 9600 bps 1.920: 19200 bps 3.840: 38400 bps	9600
7.n05	Parity bit + Stop bit selection	P0: Without parity, Stop bit 2 bits P1: Even parity, Stop bit 1 bits P2: Odd parity, Stop bit 1 bits P3: Without parity, Stop bit 1 bits	P2

*1 For communication with TS2060, select "Network device" for the setting device selection and "MODBUS RTU" for the communication protocol selection on this regulator.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	02H	Byte address

Indirect Device Memory Designation

- For word designation, specify the device memory No. (address) in even address.
  Example: To make the setting of "output setting" for the function code 1.b01;
  Specify "2" in the device memory No. (address).
- For bit designation, it is possible to specify the device memory No. (address) in both even and odd address.
  Specify "00H" for the extensional code because the setting range for the bit address is 0 to 7.
  Example: To make the setting of "gradient setting selection" for the function code 1.b09;
  Specify "1" in the device memory No. (address), "00H" for the extensional code, and "00" or "01" in the bit No..

21.2.34 ALPHA5 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 /115200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Servo Amplifier

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extensional Function Setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 115200 bps	0
	PA2_93	(No. 93)	Parity bit / Stop bit selection	0: Even parity, Stop bit 1 bits 1: Odd parity, Stop bit 1 bits 2: Without parity, Stop bit 1 bits 3: Even parity, Stop bit 2 bits 4: Odd parity, Stop bit 2 bits 5: Without parity, Stop bit 2 bits	0
	PA2_97	(No. 97)	Communication protocol selection*	0: PC Loader protocol **1: MODBUS RTU**	1

*1 For communication with TS2060, select "MODBUS RTU" for the communication protocol selection on the servo amplifier.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

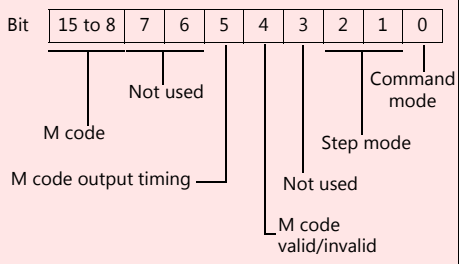
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

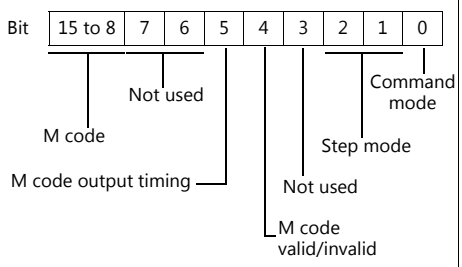
Device Memory		TYPE	Remarks
00	(communication CONT / OUT signals)	00H	Double-word*
01	(monitor)	01H	Double-word, read only
02	(sequence monitor)	02H	Double-word, read only
03	(various commands)	03H	Double-word
04	(parameter)	04H	Double-word
05	(immediate value data)	05H	Double-word

* Communication OUT signal is read only.

PLC_CTL

<table>
<tr><th>Contents</th><th>F0</th><th colspan="3">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="14">Positioning data reading</td><td rowspan="14">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="14">4</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 03 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Reading device memory address</td></tr>
<tr><td>n+3</td><td colspan="2">Reading positioning data count: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="7">Positioning data

m = 1</td><td>Positioning status and M code
 
</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
<tr><td rowspan="14">Positioning data writing</td><td rowspan="14">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number *1</td><td rowspan="14">4+10m</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 10 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Writing device memory address</td></tr>
<tr><td>n+3</td><td colspan="2">Writing positioning data count: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="7">Positioning data

m = 1</td><td>Positioning status and M code
 
</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
</table>

Return data: Data stored from the servo amplifier to the TS2060

*1 Select station No. 0 for broadcast commands.

21.2.35 ALPHA5 Smart (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Servo Amplifier

Set communication parameters.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extended function setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 115200 bps	0
	PA2_93	(No. 93)	Parity bit and stop bit selection	0: Even parity, stop bit 1 1: Odd parity, stop bit 1 2: Without parity, stop bit 1 3: Even parity, stop bit 2 4: Odd parity, stop bit 2 5: Without parity, stop bit 2	0
	PA2_97	(No. 97)	Communication protocol selection*1	0: PC loader protocol **1: MODBUS RTU**	1

*1 For communication with a TS2060, select "MODBUS RTU" for the communication protocol.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

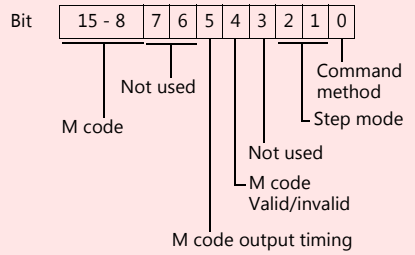
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

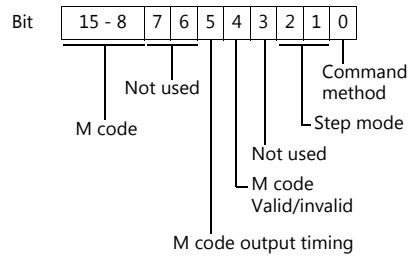
Device Memory		TYPE	Remarks
00	(communication CONT/OUT signal)	00H	Double-word *1
01	(monitor)	01H	Double-word, read only
02	(sequence monitor)	02H	Double-word, read only
03	(various commands)	03H	Double-word
04	(parameter)	04H	Double-word
05	(immediate data)	05H	Double-word

*1 Communication OUT signal: Read only

PLC_CTL

<table>
<tr><th>Contents</th><th>F0</th><th colspan="3">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="14">Reading of positioning data</td><td rowspan="14">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="14">4</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 03 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Reading address</td></tr>
<tr><td>n+3</td><td colspan="2">Number of positioning data to read: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="7">Positioning data

m = 1</td><td>Positioning status & M code
 
</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
<tr><td rowspan="14">Writing of positioning data</td><td rowspan="14">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number *1</td><td rowspan="14">4+10m</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 10 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Writing address</td></tr>
<tr><td>n+3</td><td colspan="2">Number of positioning data to write: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="7">Positioning data

m = 1</td><td>Positioning status & M code
 
</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
</table>

Return data: Data stored from servo amplifier to TS2060

*1 Select station No. 0 for broadcast commands.

21.2.36 WE1MA (Ver. A) (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1/1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	0 to 247	0: Broadcast

Electronic Multimeter

The communication parameter can be set using keys attached to the front of the electronic multimeter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Component	Setting No.	Item	Setting	Example
Adr	231C	Station address	1 to 247	1
bPS	232C	Baud rate	4800 / 9600 / 19200 / 38400 bps	9600
PAr	233C	Parity bit	E: Even o: Odd -: None	E
StoP	234C	Stop bit	1 / 2 bits	1
WEr	235C	Protocol version	**A: Version A**	A

* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
1	(input relay)	01H	Read only
4	(holding register)	02H	
3	(input register)	03H	Read only

21.2.37 WE1MA (Ver. B) (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	0 to 247	0: Broadcast

Electronic Multimeter

Communication parameters can be set by operating the front-mounted keys of the electronic multimeter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Component	Setting No.	Item	Setting	Example
Adr	231C	Address	1 to 247	1
bPS	232C	Baud rate	4800 / 9600 / 19200 / 38400 bps	9600
PAr	233C	Parity	E: Even o: Odd -: None	E
StoP	234C	Stop bit	1 / 2 bits	1
WEr	235C	Protocol version	**B: Version B**	B

* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	Read only

21.2.38 WSZ Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115k bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	1 to 254	

WSZ Series

Make settings for the controller by using the software “WinProladder”. For more information, refer to the instruction manual of the controller issued by the manufacturer.

Station number

(Underlined setting: default)

Setting Items	Setting	Remarks
Station Number	1 to 254	

PORT 0

Comm. parameters setting - Port 0

(Underlined setting: default)

Setting Items	Setting	Remarks
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200	The baud rate can also be set by specifying a value for the designated address. For more information, refer to the instruction manual of the controller issued by the manufacturer.

* The following settings are fixed; data length: 7, stop bit: 1, parity: even, and protocol: Fatek Communication protocol.

WSZ-CB25 (PORT 1 / PORT 2)

Comm. parameters setting - Port 1 / Port 2

(Underlined setting: default)

Setting Items	Setting	Remarks
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115200	The baud rate can also be set by specifying a value for the designated address. For more information, refer to the instruction manual of the controller issued by the manufacturer.
Parity	None / Even / Odd	
Data Bit	7 / 8	
Stop Bit	1 / 2	
Protocol	**Fatek Communication protocol**	

DIPSW

Setting Items	Setting	Remarks
Terminating resistance	ON: With terminating resistance OFF: Without terminating resistance	This setting must be the same for both switches.

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS2060. Thus, time correction must be performed on the controller side.

Available Device Memory

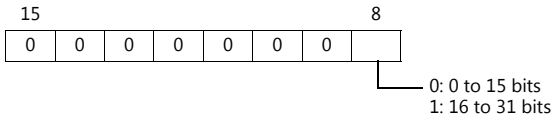
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(data register)	00H	
D	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
TR	(timer/current value)	08H	
CR	(counter/current value)	09H	
32CR	(32-bit counter/current value)	0AH	Double-word

Indirect Device Memory Designation

	15 – 8	7 – 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



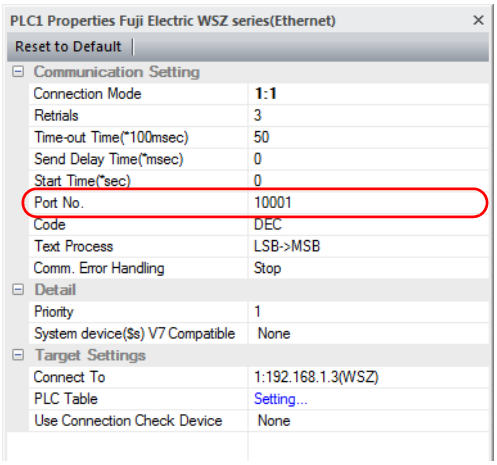
21.2.39 WSZ Series (Ethernet)

Communication Setting

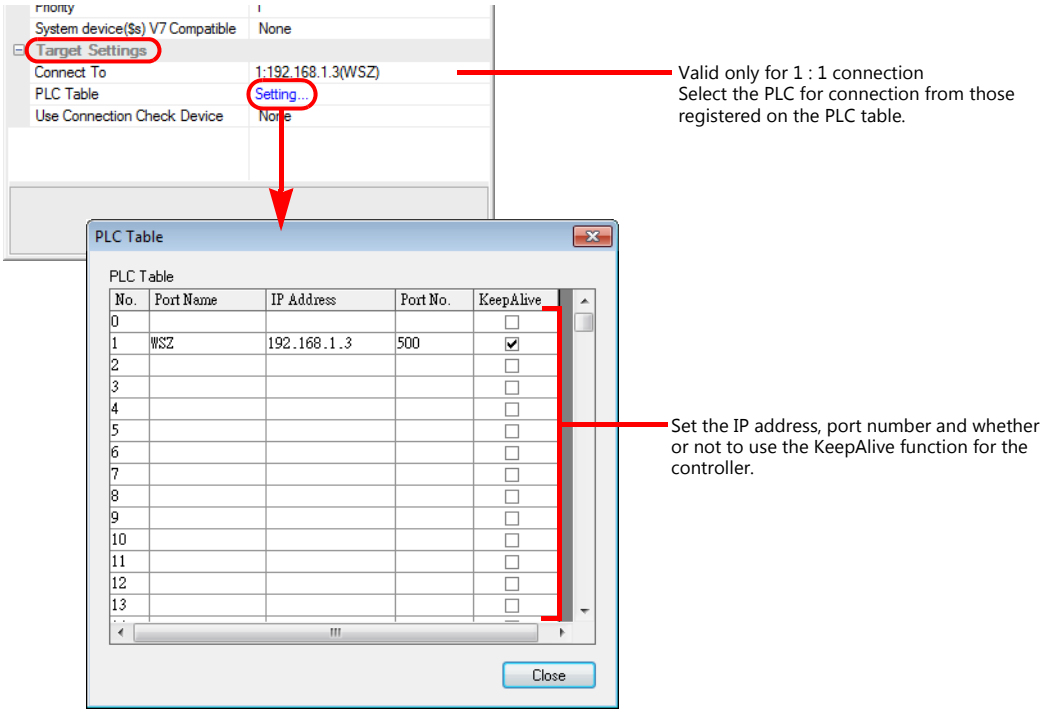
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

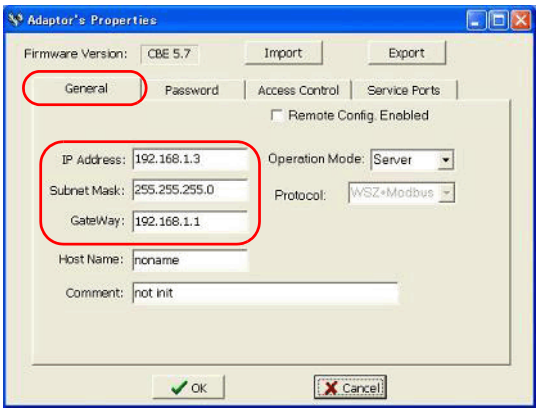


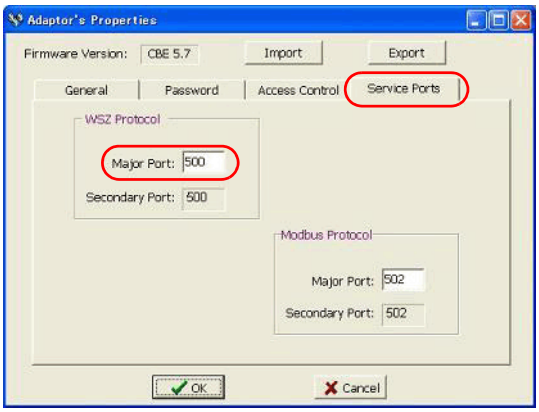
- IP address, port number, and maximum read value of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



WSZ Series

Make settings for the controller using the software “Ethernet Module Configuration Tool Version. 3. 3” For more information, refer to the instruction manual of the controller issued by the manufacturer.





Item			Remarks
General	IP Address		
	Subnet Mask		
	GateWay		
Service Ports	WSZ Protocol	Major Port	Default: 500

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS2060i. Thus, time correction must be performed on the controller side.

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(data register)	00H	
D	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
TR	(timer/current value)	08H	
CR	(counter/current value)	09H	
32CR	(32-bit counter/current value)	0AH	Double-word
F	(file register)	0BH	

Indirect Device Memory Designation

	15 ... 8	7 ... 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits
1: 16 to 31 bits

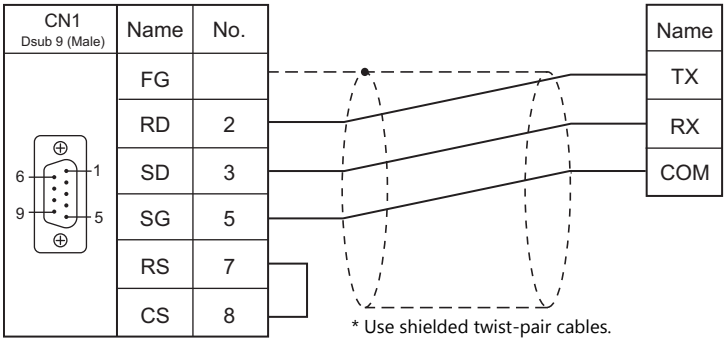
21.2.40 Wiring Diagrams

When Connected at CN1:

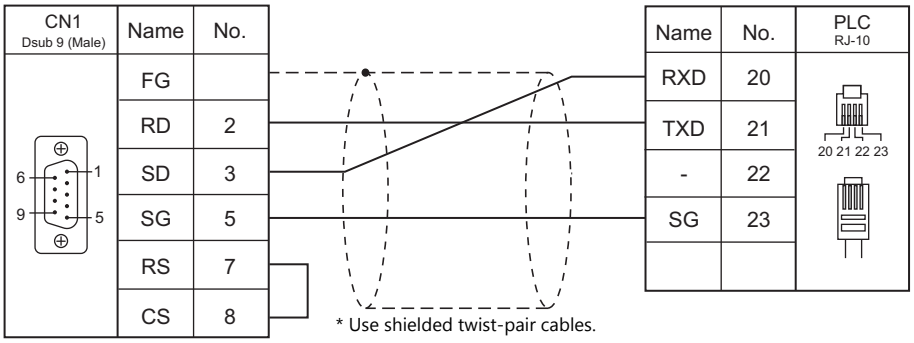
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

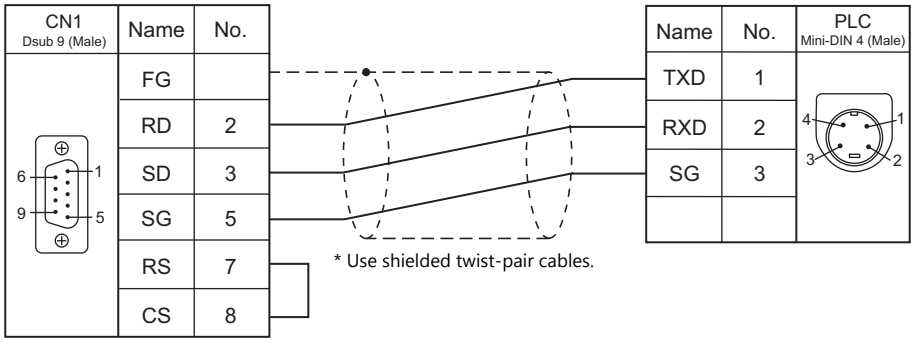
Wiring diagram 1 - C2



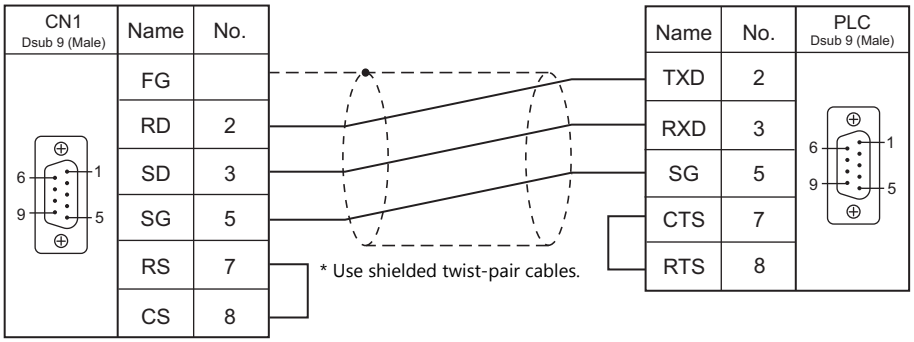
Wiring diagram 2 - C2



Wiring diagram 3 - C2

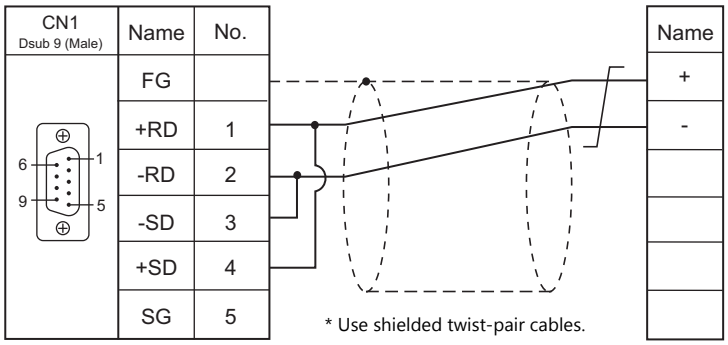


Wiring diagram 4 - C2

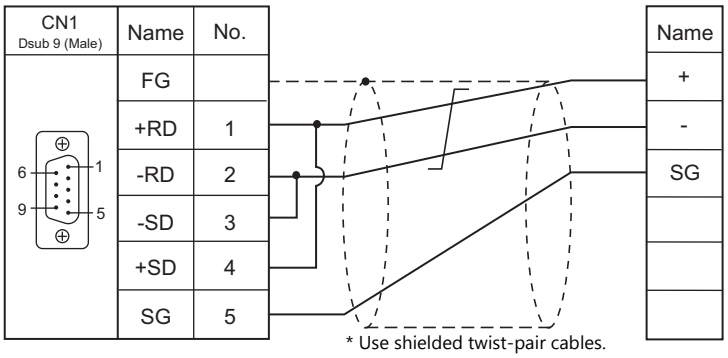


RS-422/RS-485

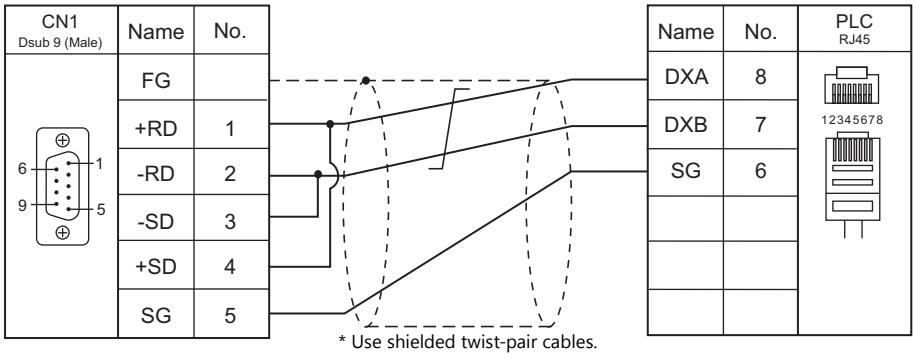
Wiring diagram 1 - C4



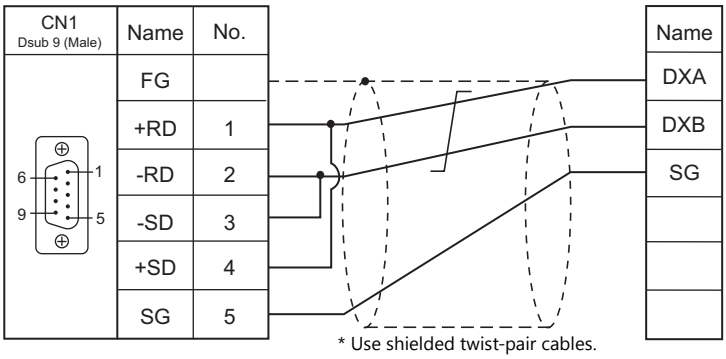
Wiring diagram 2 - C4



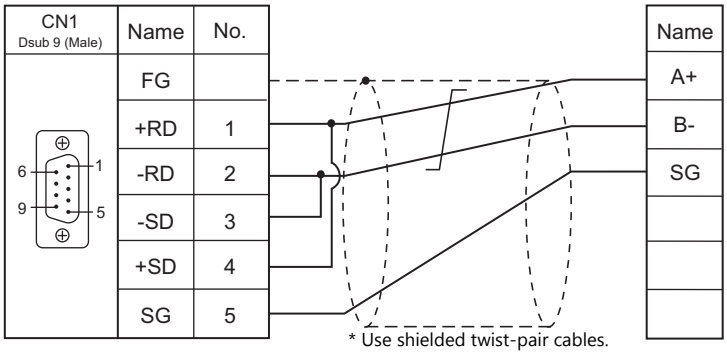
Wiring diagram 3 - C4



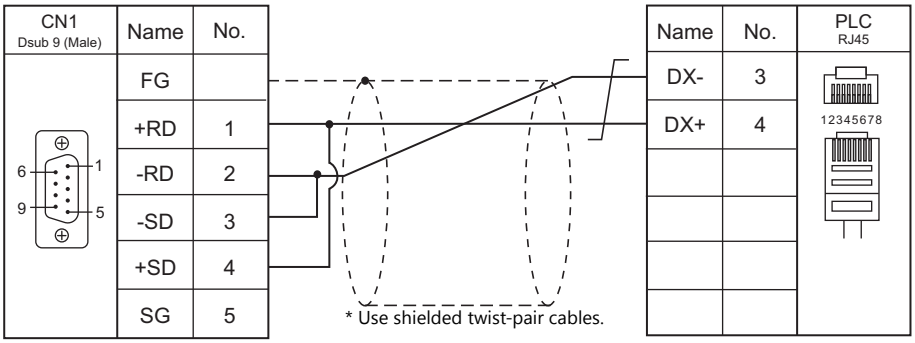
Wiring diagram 4 - C4



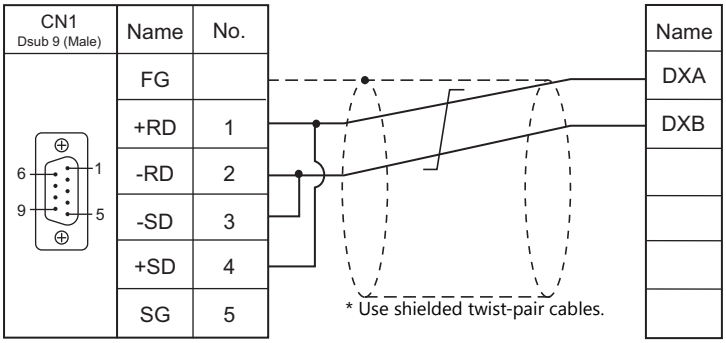
Wiring diagram 5 - C4



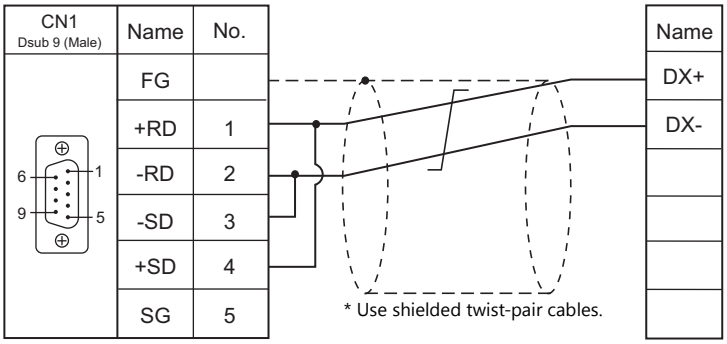
Wiring diagram 6 - C4



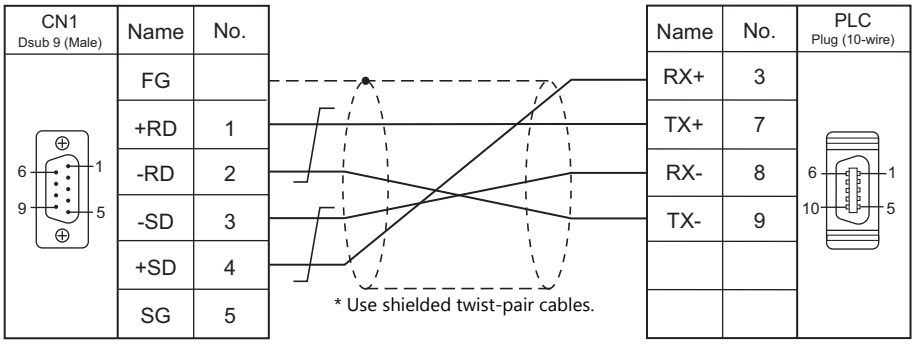
Wiring diagram 7 - C4



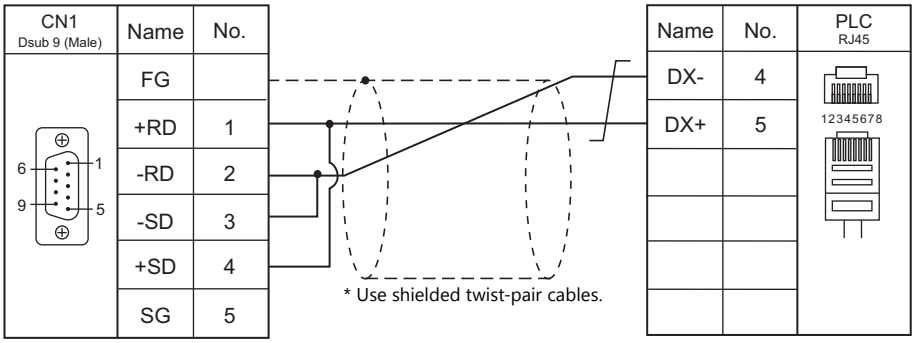
Wiring diagram 8 - C4



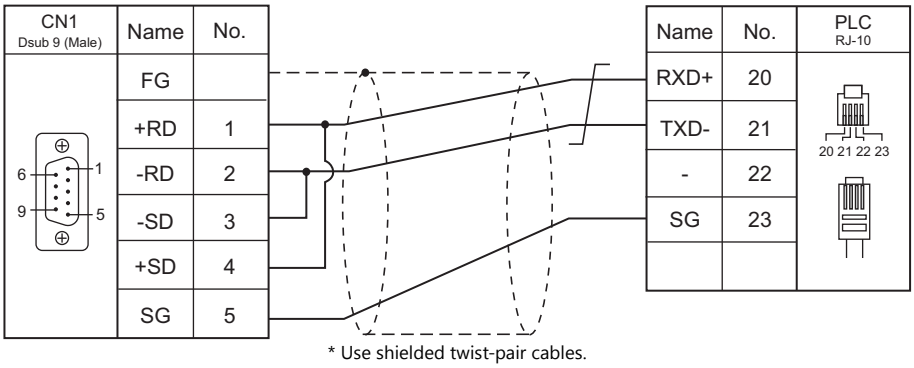
Wiring diagram 9 - C4



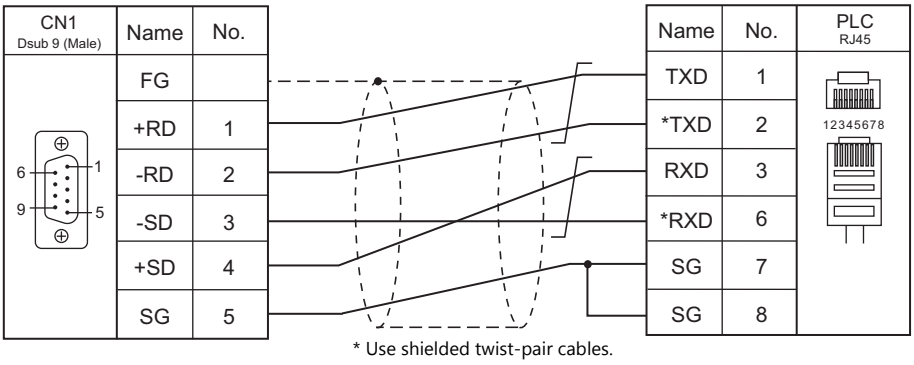
Wiring diagram 10 - C4



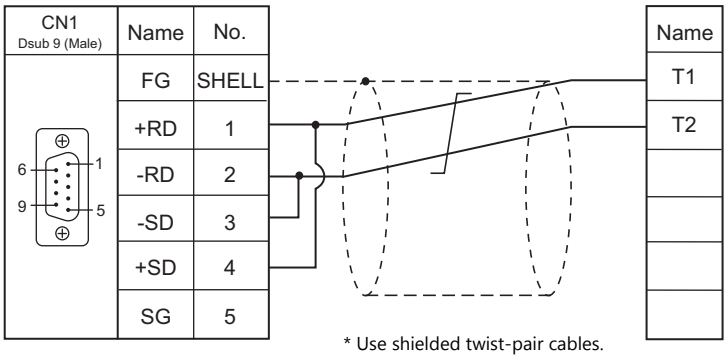
Wiring diagram 11 - C4



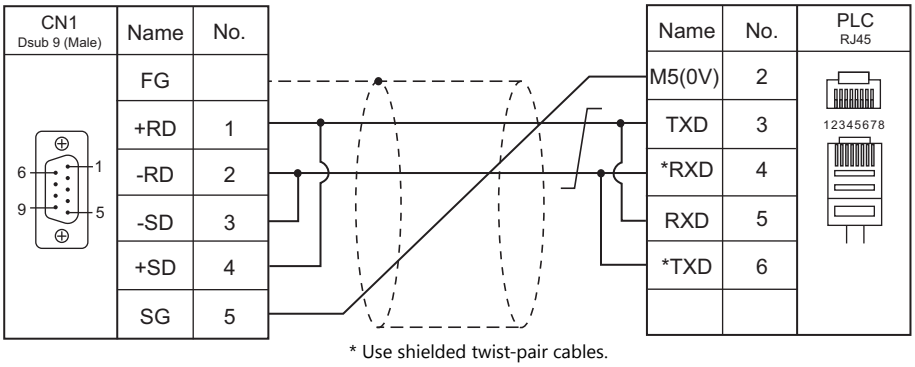
Wiring diagram 12 - C4



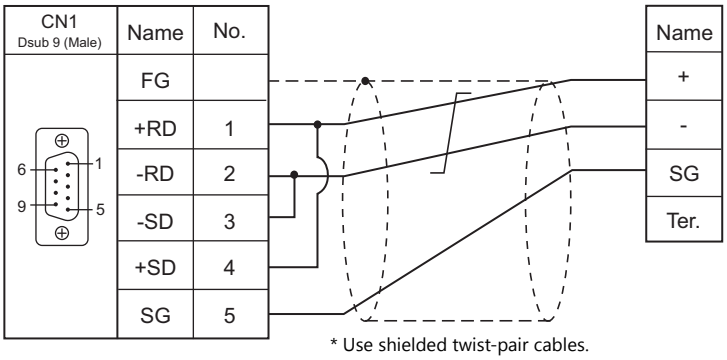
Wiring diagram 13 - C4



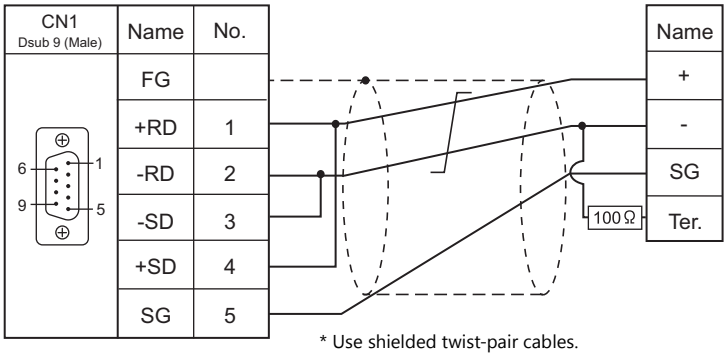
Wiring diagram 14 - C4



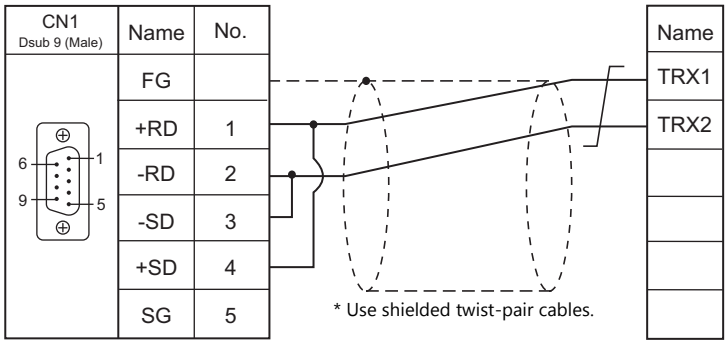
Wiring diagram 15 - C4



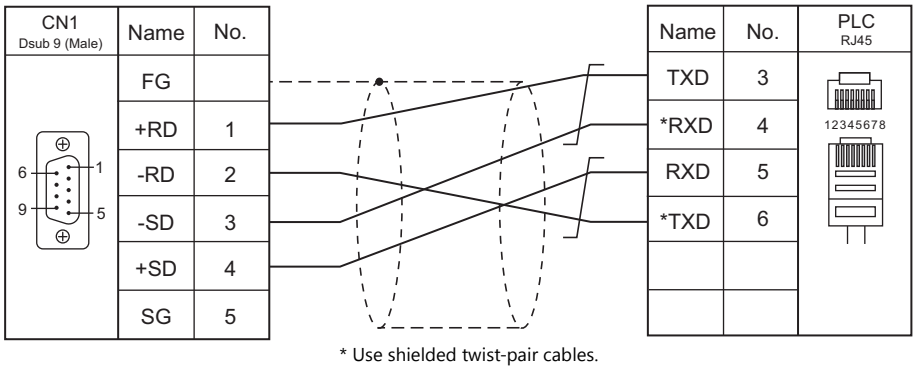
With an electronic multimeter connected at the terminal



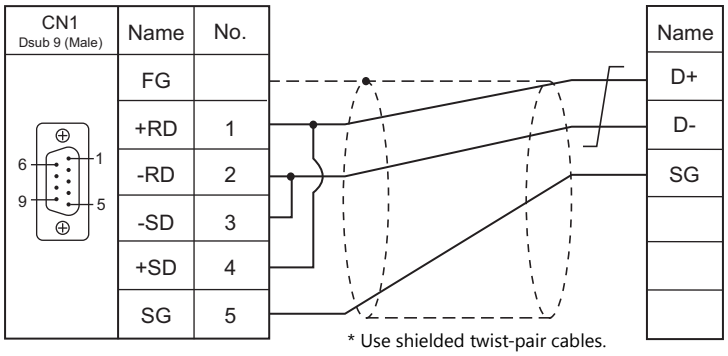
Wiring diagram 16 - C4



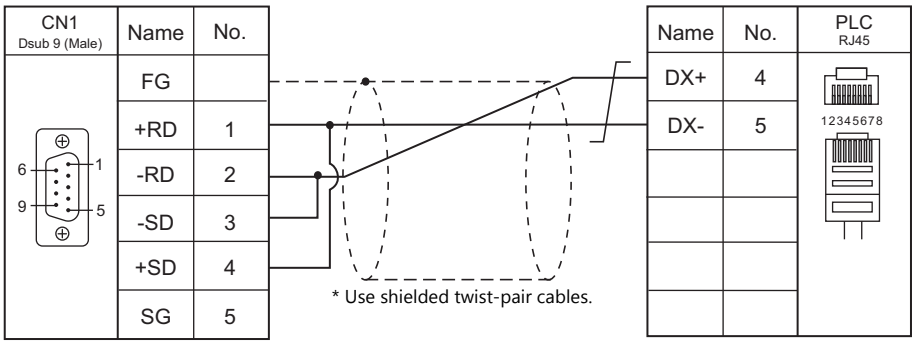
Wiring diagram 17 - C4



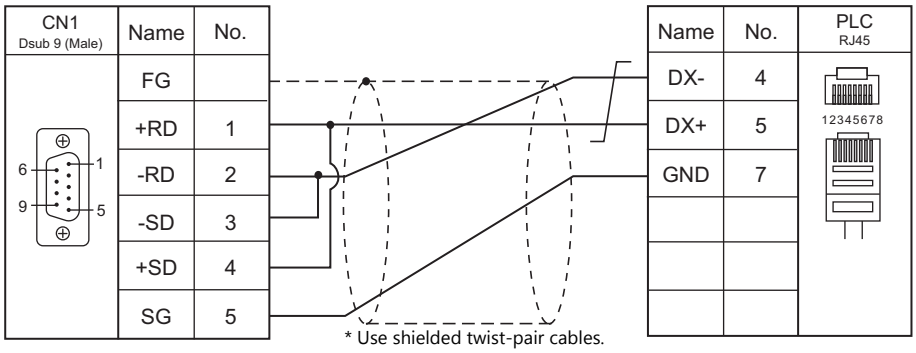
Wiring diagram 18 - C4



Wiring diagram 19 - C4



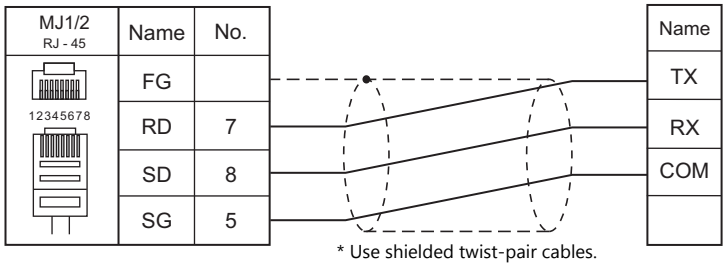
Wiring diagram 20 - C4



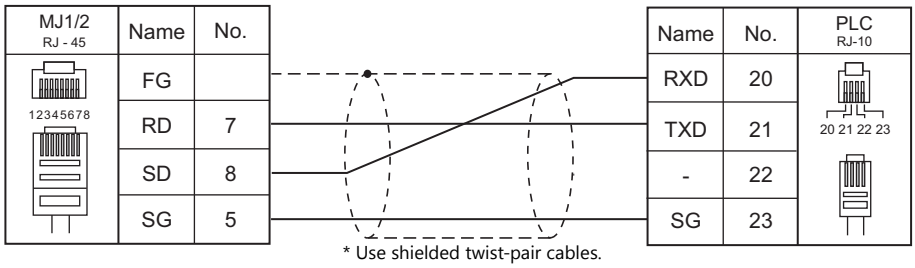
When Connected at MJ1/MJ2:

RS-232C

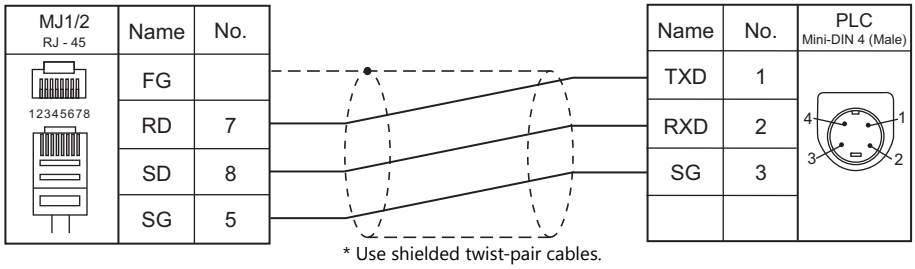
Wiring diagram 1 - M2



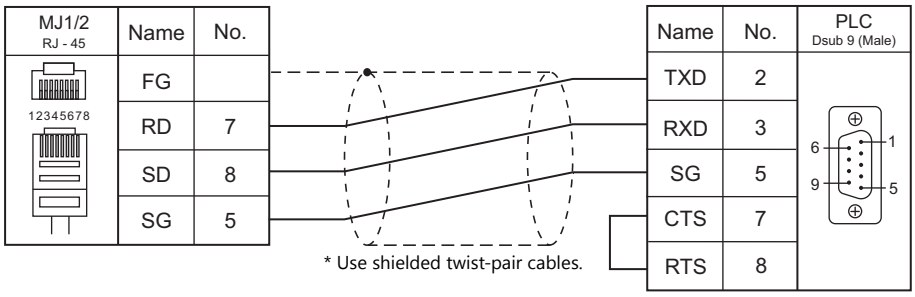
Wiring diagram 2 - M2



Wiring diagram 3 - M2

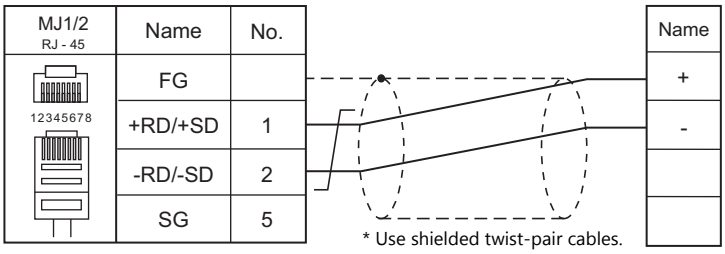


Wiring diagram 4 - M2

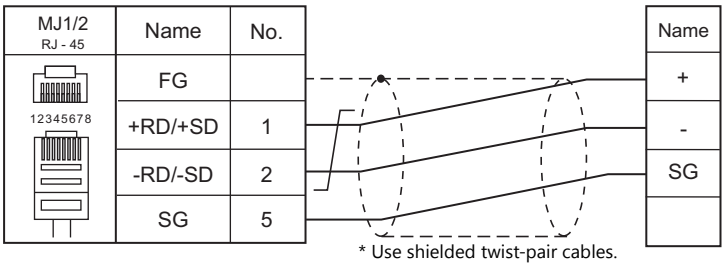


RS-422/RS-485

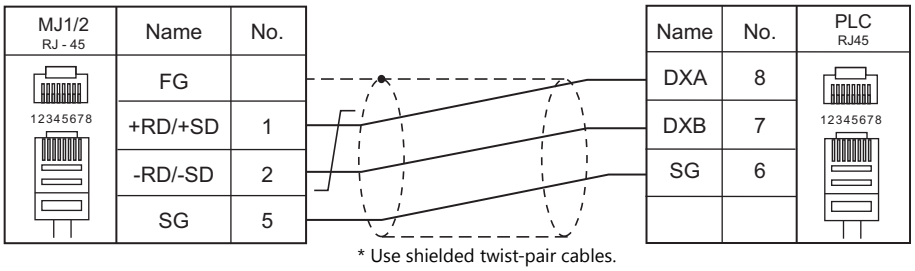
Wiring diagram 1 - M4



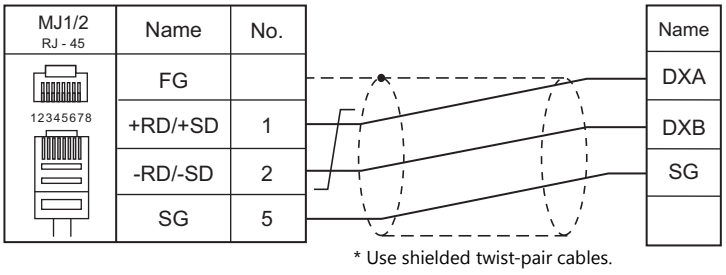
Wiring diagram 2 - M4



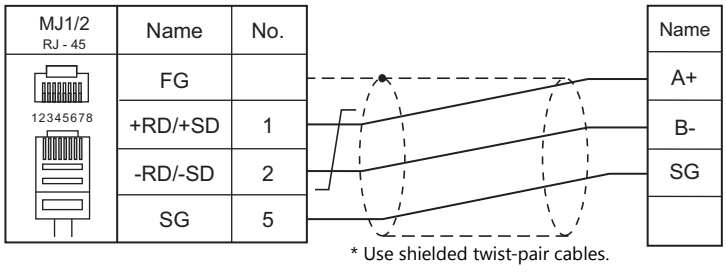
Wiring diagram 3 - M4



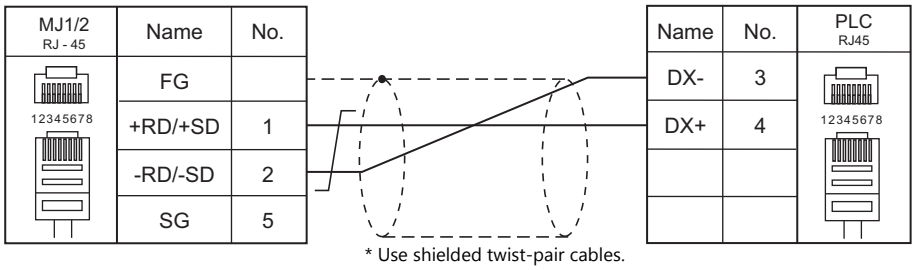
Wiring diagram 4 - M4



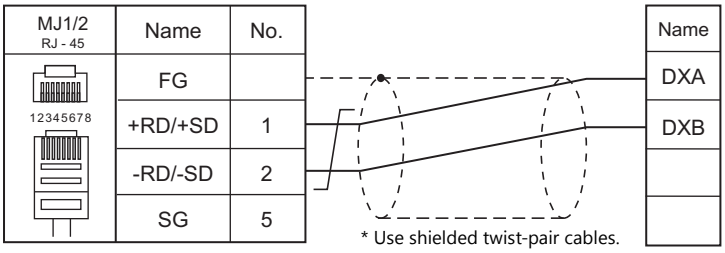
Wiring diagram 5 - M4



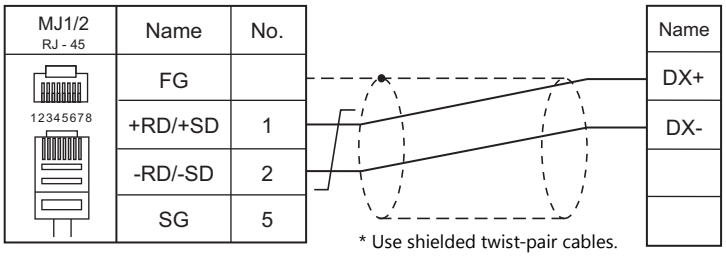
Wiring diagram 6 - M4



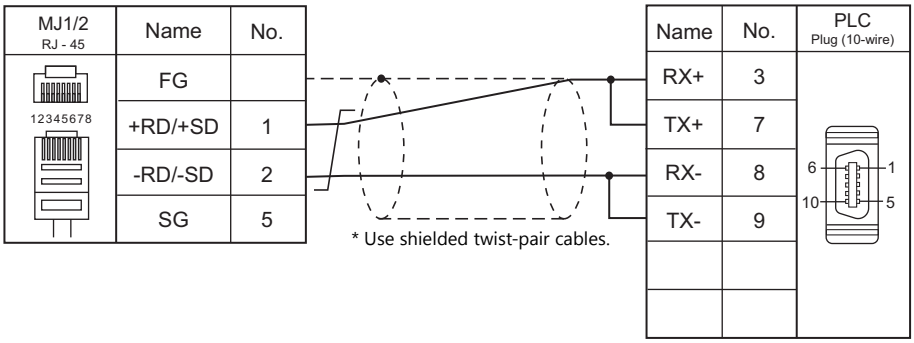
Wiring diagram 7 - M4



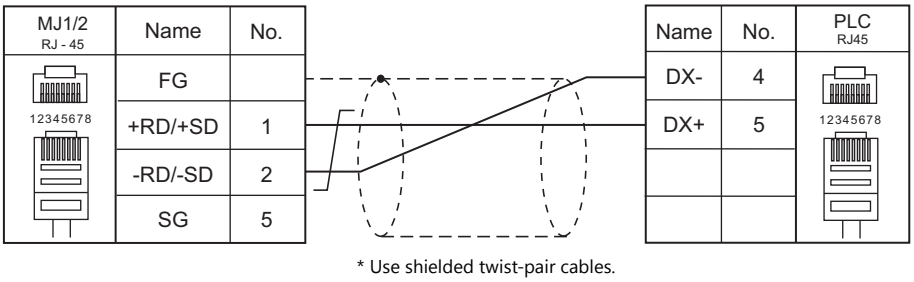
Wiring diagram 8 - M4



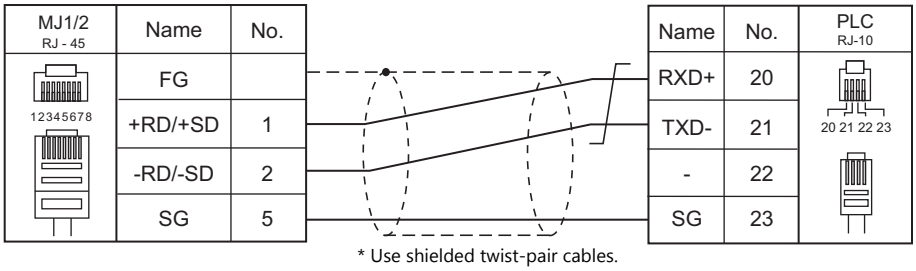
Wiring diagram 9 - M4



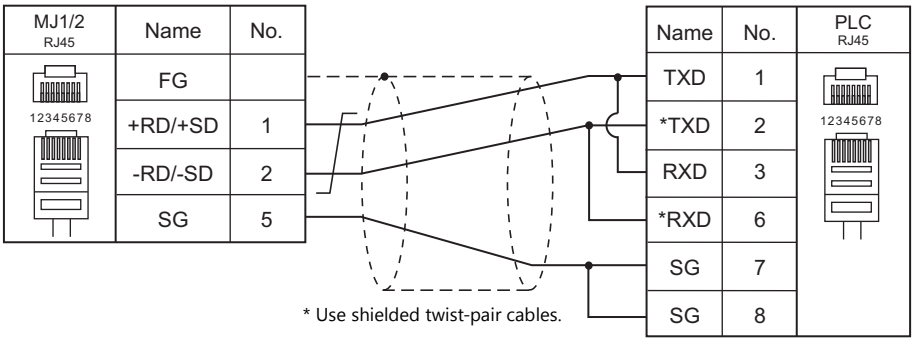
Wiring diagram 10 - M4



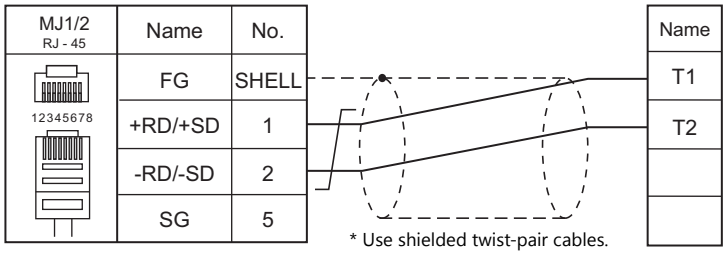
Wiring diagram 11 - M4



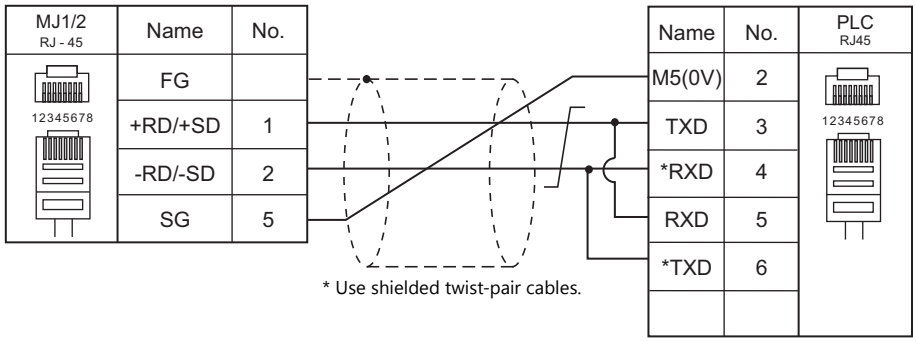
Wiring diagram 12 - M4



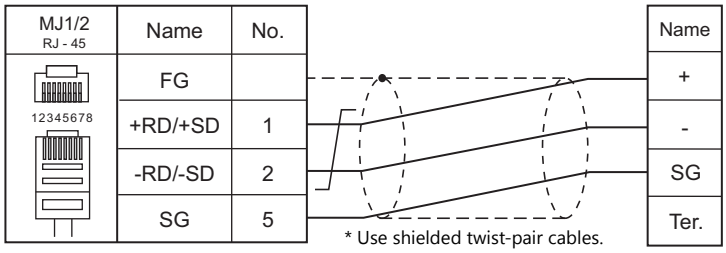
Wiring diagram 13 - M4



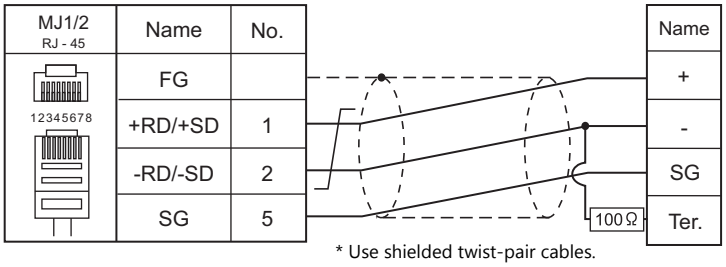
Wiring diagram 14 - M4



Wiring diagram 15 - M4

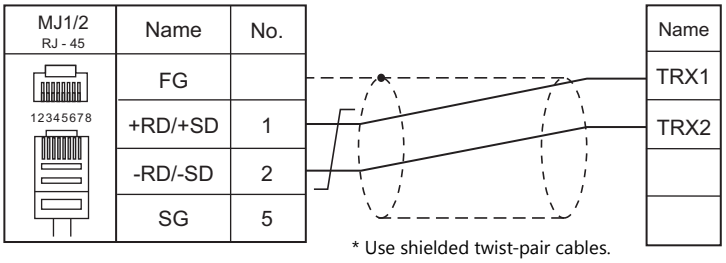


With an electronic multimeter connected at the end



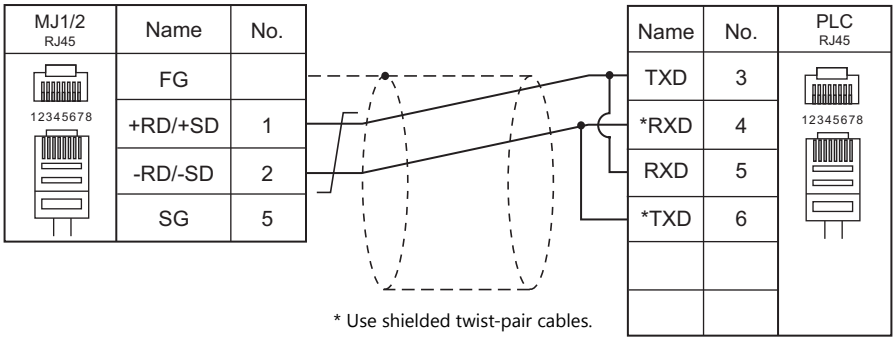
* Use shielded twist-pair cables.

Wiring diagram 16 - M4



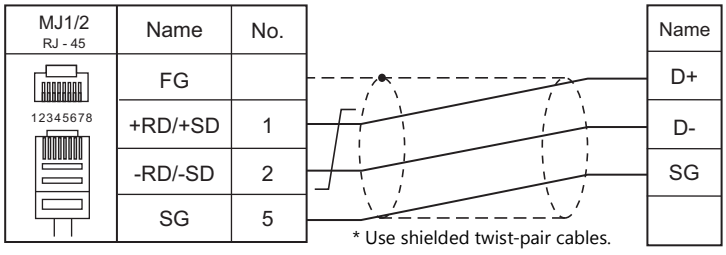
* Use shielded twist-pair cables.

Wiring diagram 17 - M4



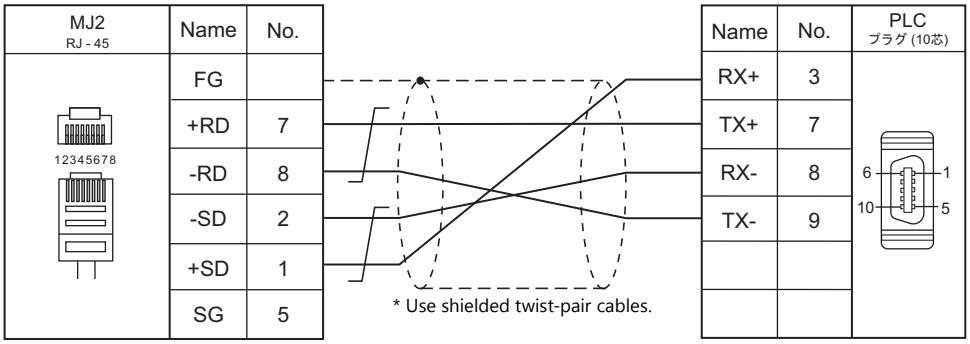
* Use shielded twist-pair cables.

Wiring diagram 18 - M4



* Use shielded twist-pair cables.

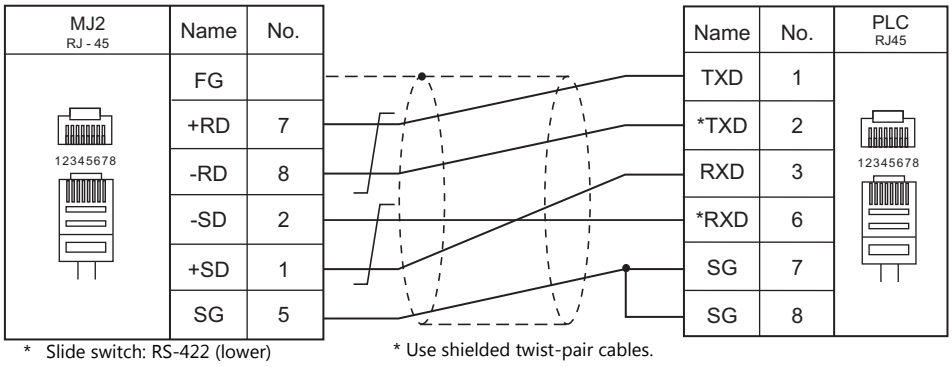
Wiring diagram 19 - M4



* Use shielded twist-pair cables.

* Slide switch: RS-422 (lower)

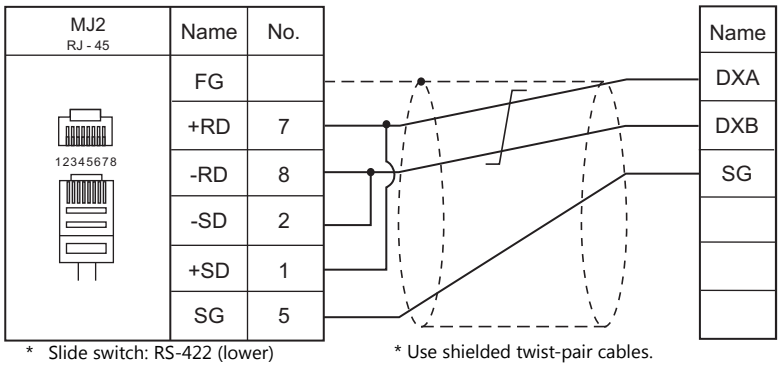
Wiring diagram 20 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

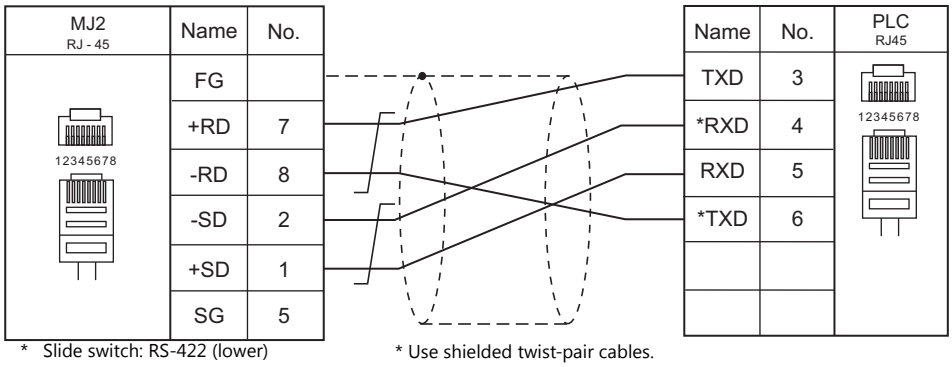
Wiring diagram 21 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

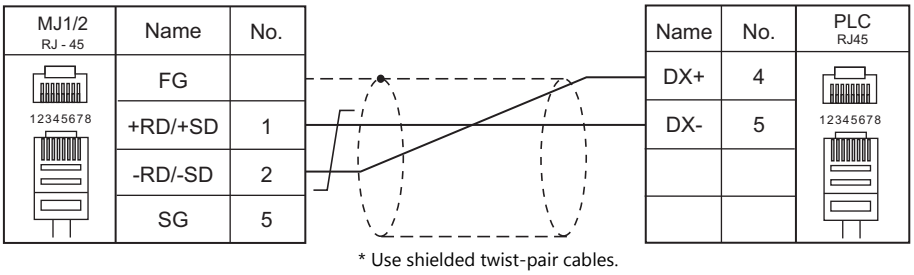
Wiring diagram 22 - M4



* Slide switch: RS-422 (lower)

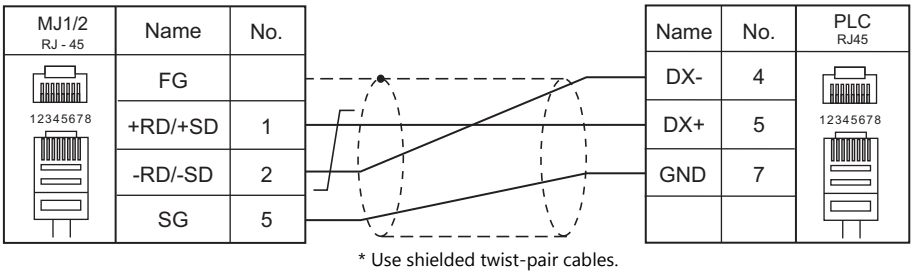
* Use shielded twist-pair cables.

Wiring diagram 23 - M4



* Use shielded twist-pair cables.

Wiring diagram 24 - M4



* Use shielded twist-pair cables.

22. Gammaflux

22.1 Temperature Controller / Servo / Inverter

22.1 Temperature Controller / Servo / Inverter

Serial Connection

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
TTC2100	TTC2100-1 TTC2100-2 TTC2200-1	COM2	RS-485	Wiring diagram1 - C4	Wiring diagram 1 - M4		TTC2100.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

22.1.1 TTC2100

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	**57600 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Not provided**	
Target Port No.	**0 to 31**	

Temperature Controller

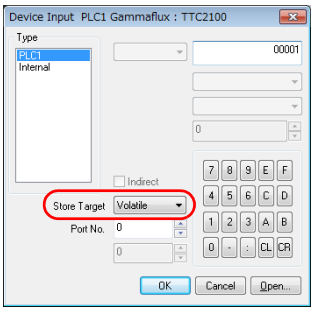
Be sure to match the settings to those made under [Communication Setting] of the editor.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
TD	(temperature data)	00H	Read only
ZC	(zone commands)	01H	Partially read only
ZD	(zone commands2)	02H	Partially read only

Specify the storage device memory.



Address denotations are as follows.

- For the TD:
  Example: 0 : #0 : TD0000A
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number

- For ZC, ZD:
  Example: 0 : #1 : ZC000A0
  - Data No. (HEX)
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Station number

- Specify the ZONE number, command number, and the data number for the address number.

  Example: When specifying TD1000A
  Store "1000A" as the address number.
  Lower address No. = 000A (HEX)
  Higher address No. = 0001 (HEX)

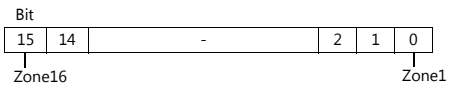
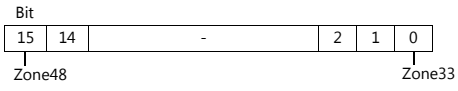
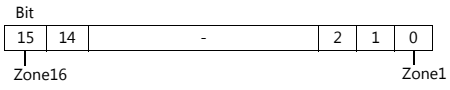
  Example: When specifying ZC100A0
  Store "100A0" as the address number.
  Lower address No. = 00A0 (HEX)
  Higher address No. = 0001 (HEX)

- Specify the storage device memory address with the expansion code.
  00H: Volatile
  01H: Nonvolatile

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
External Standby Group	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 008CH (Storage device memory: Volatile) 808CH (Storage device memory: Nonvolatile)	
		n + 3	Bit 15 14 - 2 1 0 Zone16 … Zone1	
		n + 4	Bit 15 14 - 2 1 0 Zone32 … Zone17	
		n + 5	Bit 15 14 - 2 1 0 Zone48 … Zone33	
		n + 6	Bit 15 14 - 2 1 0 Zone64 … Zone49	
Data Concentrator Resettable Alarm Relays	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND: 91H	
		n + 3	Bit - 12 11 10 9 8 - 3 2 1 0 Not used Clear Overtemp Occurred Clear Output4 (Alarm Bar) Clear Output3 Clear2, Non-resettable Alarm Clear1, Resettable Alarm Set Output4 (Alarm Bar) Set Output3 Set Output2, Non-resettable Alarm Set Output1, Resettable Alarm	

Contents	F0	F1 (=$u n)		F2
Turn All Zones On/Off	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 0099H (Storage device memory: Volatile) 8099H (Storage device memory: Nonvolatile)	
		n + 3		
		n + 4		
		n + 5		
		n + 6		
Zones Temporarily in Group	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 009AH (Storage device memory: Volatile) 809AH (Storage device memory: Nonvolatile)	
		n + 3		
		n + 4		
		n + 5		
		n + 6		

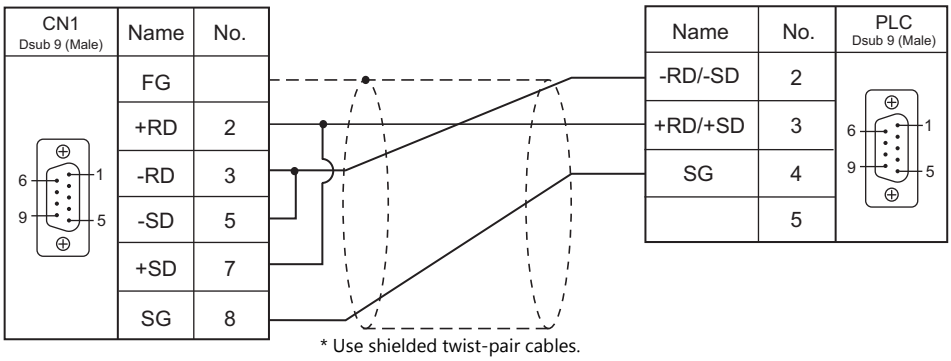
22.1.2 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-422/RS-485

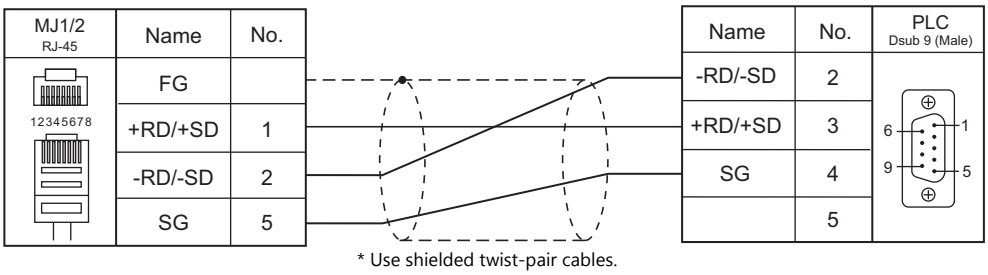
Wiring diagram1 - C4



When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4



MEMO

23. GE Fanuc

23.1 PLC Connection

23.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port		Signal Level	Connection			Ladder Transfer *3
						CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
90 series	IC693CPU331 IC693CPU340 IC693CPU341 IC693CPU350 IC693CPU351 IC693CPU352 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU370 IC693CPU372 IC693CPU374		IC693CMM311	Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
				Port 2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	
90 series (SNP-X)	IC698CPE010 IC698CPE020 IC698CRE020 IC697CPU731 IC697CPX772 IC697CPX782 IC697CPX928 IC697CPX935 IC697CPU780 IC697CGR772 IC697CGR935 IC697CPU789 IC697CPM790		IC697CMM711		RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	×
	IC693CPU350 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU374		COM port of the CPU		RS-422	Wiring diagram 1 - C4	×	Wiring diagram 4 - M4	
90 series (SNP)	90-30 series	IC693CPU311 IC693CPU313 IC693CPU323 IC693CPU331 IC693CPU340 IC693CPU341 IC693CPU350 IC693CPU360 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU370 IC693CPU372 IC693CPU374 PLUS	Serial port (power supply)		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	×
			IC693CMM311	Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
				Port 2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	
		IC693CPU351 IC693CPU352 IC693CPU363	Serial port (power supply)		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
			PORT1		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
			PORT2		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
			IC693CMM311	Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
				Port 2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	

PLC Selection on the Editor	CPU		Unit/Port		Signal Level	Connection			Ladder Transfer *3
						CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
90 series (SNP)	90-70 series	IC697CPU731 IC697CPU780 IC697CPU789 IC697CPM790	Serial Port		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	×
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	
		IC697CPX772 IC697CPX782 IC697CPX928 IC697CPX935 IC697CGR772 IC697CGR935	Serial Port1		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
			Serial Port2 Serial Port3		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	
	PACSystems RX3i	IC695CPU310 IC695CPU315 IC695CPU320 IC695CMU310 IC695CRU320 IC695CPE310	COM1		RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
			COM2		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
		IC695CPE305	COM1		RS-232C	Wiring diagram 4 - C2 + GE Fanuc IC693CBL316	Wiring diagram 4 - M2 + GE Fanuc IC693CBL316		
	PACSystems RX7i	IC698CPE010 IC698CPE020 IC698CPE030 IC698CPE040 IC698CRE020 IC698CRE030 IC698CRE040	COM1		RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
			COM2		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
					RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4	Wiring diagram 5 - M4	
	VersaMax	IC200CPU001 IC200CPU002 IC200CPU005 IC200CPUE05	PORT1		RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
			PORT2		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
	VersaMax Micro & Nano	Nano 10 PLCs Micro 14 PLCs	Serial Port		RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
		Micro 23 PLCs Micro 28 PLCs	Serial Port 1		RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
			Serial Port 2		RS-422	Wiring diagram 1 - C4	Wiring diagram 2 - M4	Wiring diagram 4 - M4	
		Micro 20 PLCs Micro 40 PLCs Micro 64 PLCs	Serial Port		RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
			IC200USB001		RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
			IC200USB002		RS-422	Wiring diagram 3 - C4	Wiring diagram 3 - M4	Wiring diagram 6 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU		Unit	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer *2
90 series (Ethernet TCP/IP)	Series 90-70		IC697CMM742 (Type 2)	○	×	18245 fixed	×
	Series 90-30		IC693CMM321	○	×		
			CPU with built-in port				
RX3i (Ethernet TCP/IP)	PACSystems RX3i	IC695CPU310	ETM001	○	×	18245 fixed	×

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

23.1.1 90 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Odd	
Target Port No.	1 to 31	

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

PCM

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		CCM ONLY, BAS/CCM, PROG/CCM, CCM/PROG	
Port 1	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	**RS-232**	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CPU ID	1 to 31	
Port 2	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	RS-232 / RS-485	Only RS-485 is available with IC693PCM300.
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CPU ID	1 to 31	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

IC693CMM311

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		CCM ONLY, CCM/RTU, RTU/CCM, SNP/CCM, CCM/SNP	
Port 1	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	**RS-232**	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CCM CPU ID	1 to 31	
Port 2	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	RS-232 / RS-485	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CCM CPU ID	1 to 31	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.2 90 Series (SNP-X)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

90 series (SNP-X)

Item		Setting	Remarks
Baud Rate		19200 bps	
Parity		Odd	
Transmission code	Data Length	8 bits	
	Stop Bit	1 bit	
Function		SNP-X	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.3 90 Series (SNP)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

IC693CMM311 / IC697CMM711

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		SNP ONLY, SNP/CCM, CCM/SNP, SNP/RTU, RTU/SNP	
Port 1	SNP Enable	**YES**	
	SNP Mode	**SLAVE**	
	Interface	RS485 / RS232	Only RS232C supported by IC693CMM311
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	ODD / EVEN / NONE	
	Stop Bits	1 / 2	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Modem Turnaround Delay	NONE/ 10 ms / 100 ms / 500 ms	
Port 2	SNP Enable	**YES**	
	SNP Mode	**SLAVE**	
	Interface	RS485 / RS232	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	ODD / EVEN / NONE	
	Stop Bits	1 / 2	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Modem Turnaround Delay	NONE/ 10 ms / 100 ms / 500 ms	

90-30 Series / 90-70 Series

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP Slave**	
Data Rate	4800 / 9600 / 19200 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	1 / 2	
Physical Interface	2-wire / 4-wire	Both valid for RS232

PAC Systems

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP Slave**	
Data Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	**1**	
Physical Interface	2-wire / 4-wire	Both valid for RS232

VersaMax / VersaMax Micro & Nano / IC200USB001 / IC200USB002

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP**	
Port Type	**Slave**	
Data Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	1 / 2	
Physical Interface	2-wire / 4-wire	Both valid for RS232

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	
P	(local subblock data)	0CH	90-70 series only
L	(program block data)	0DH	90-70 series only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.4 90 Series (Ethernet TCP/IP)

Communication Setting

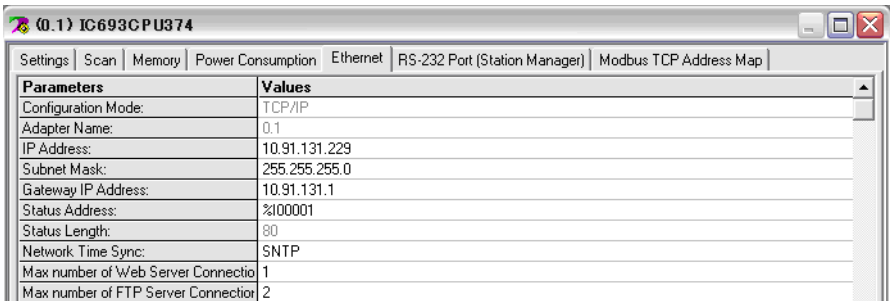
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 18245) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Parameters



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway IP Address	Make settings in accordance with the network environment.	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060i.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

23.1.5 RX3i (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 18245) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Parameters

Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway IP Address	Specify according to the environment.	

Calendar

This model is not equipped with the calendar function. Use the built-in clock of the TS2060i.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

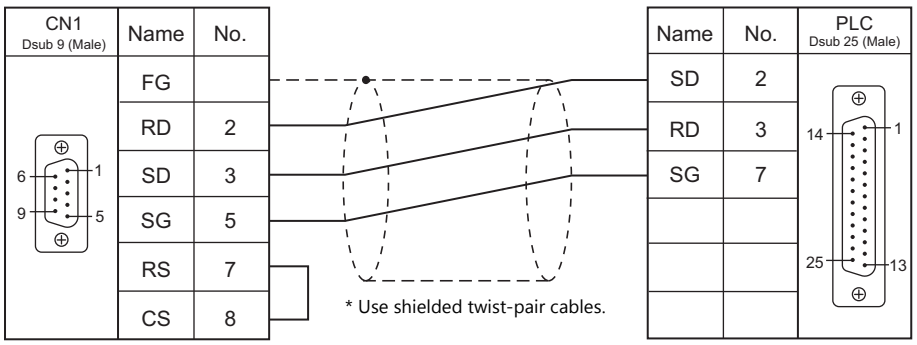
23.1.6 Wiring Diagrams

When Connected at CN1:

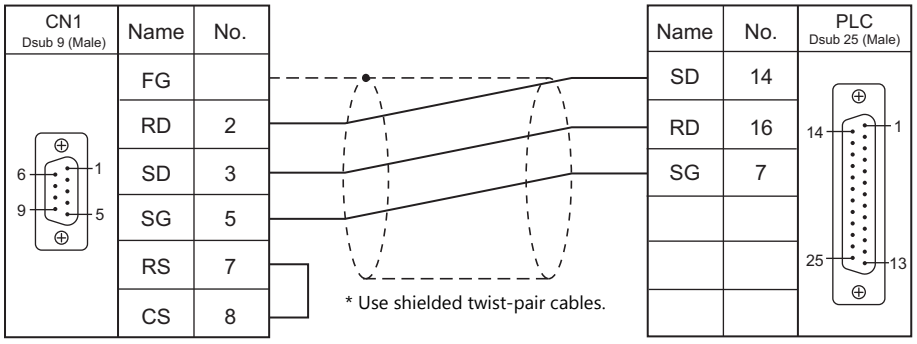
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

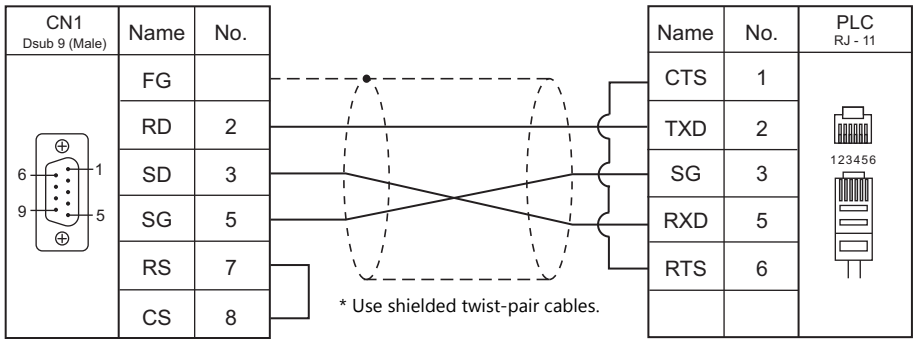
Wiring diagram 1 - C2



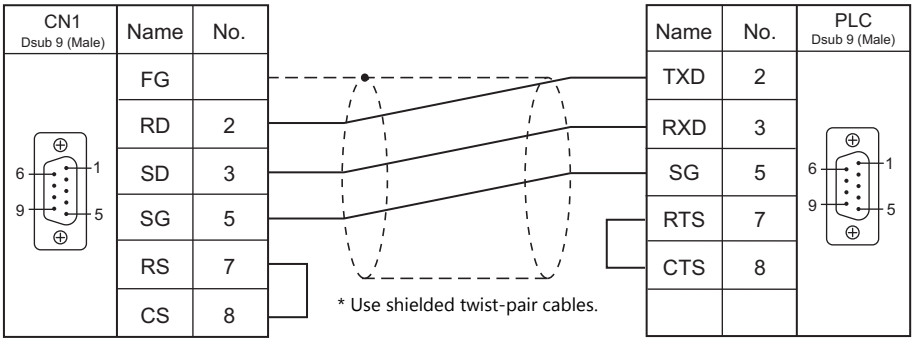
Wiring diagram 2 - C2



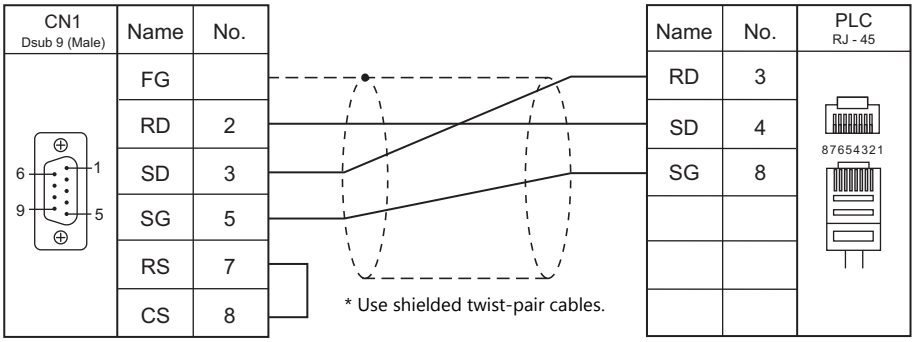
Wiring diagram 3 - C2



Wiring diagram 4 - C2

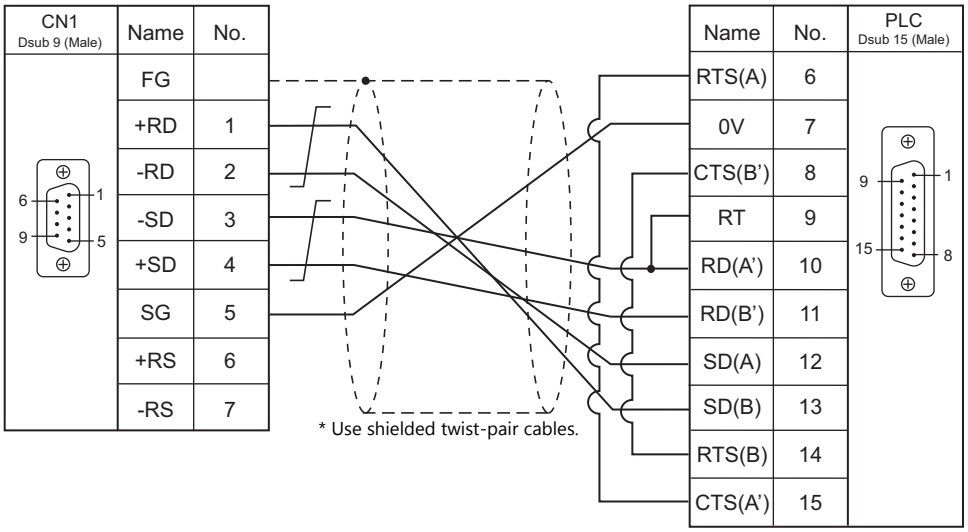


Wiring diagram 5 - C2

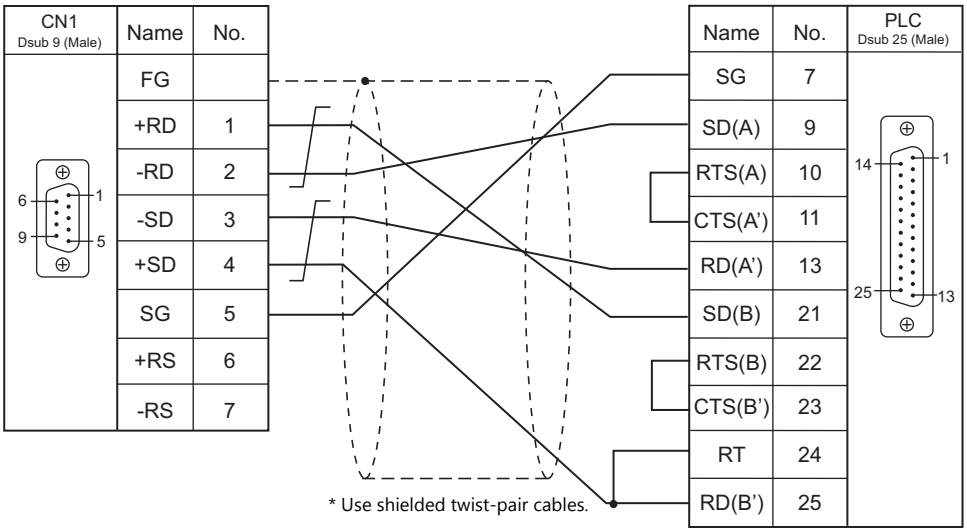


RS-422/RS-485

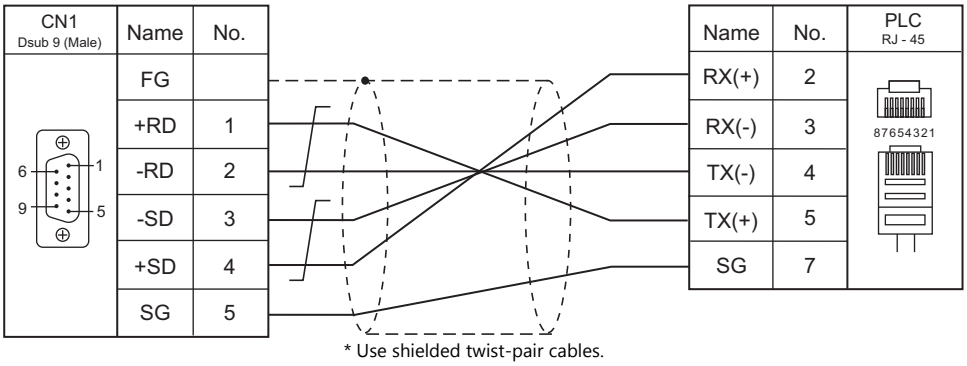
Wiring diagram 1 - C4



Wiring diagram 2 - C4



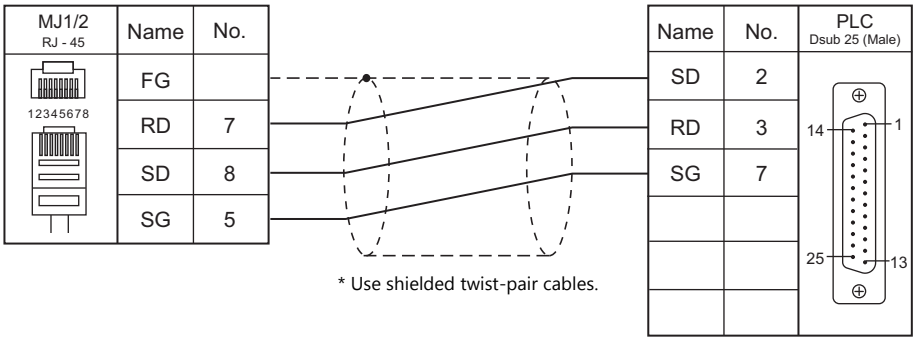
Wiring diagram 3 - C4



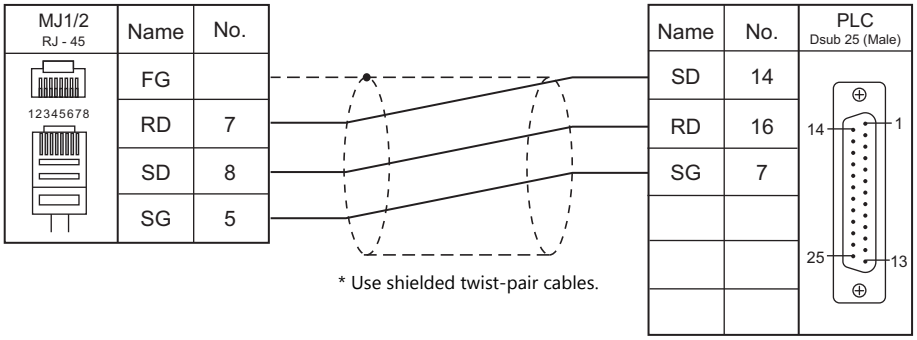
When Connected at MJ1/MJ2:

RS-232C

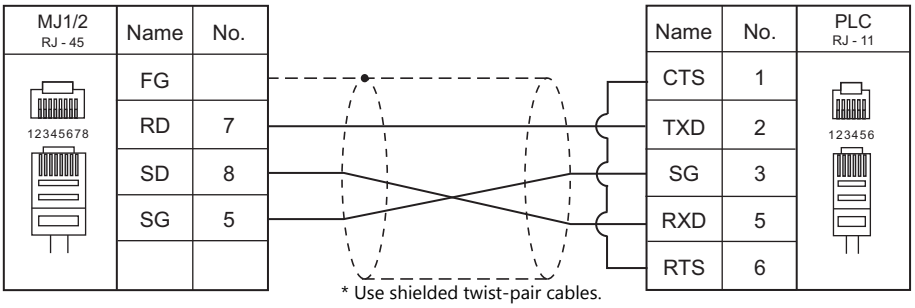
Wiring diagram 1 - M2



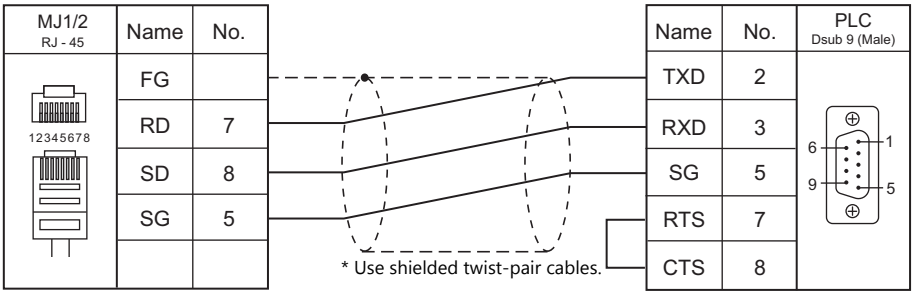
Wiring diagram 2 - M2



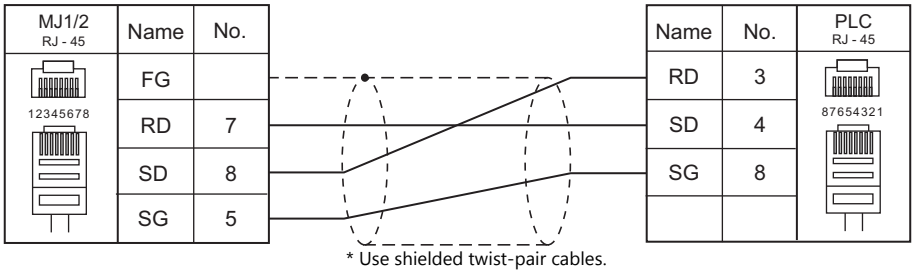
Wiring diagram 3 - M2



Wiring diagram 4 - M2

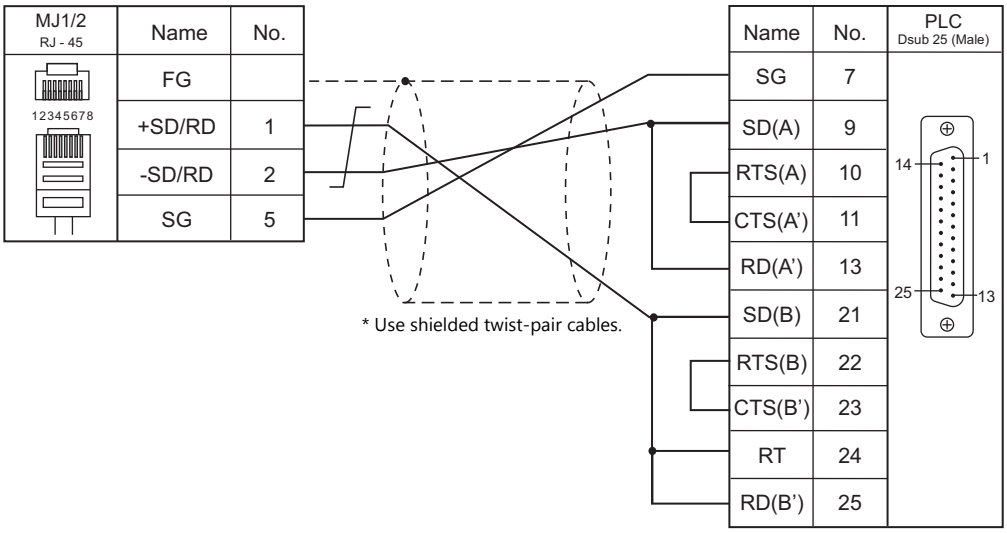


Wiring diagram 5 - M2

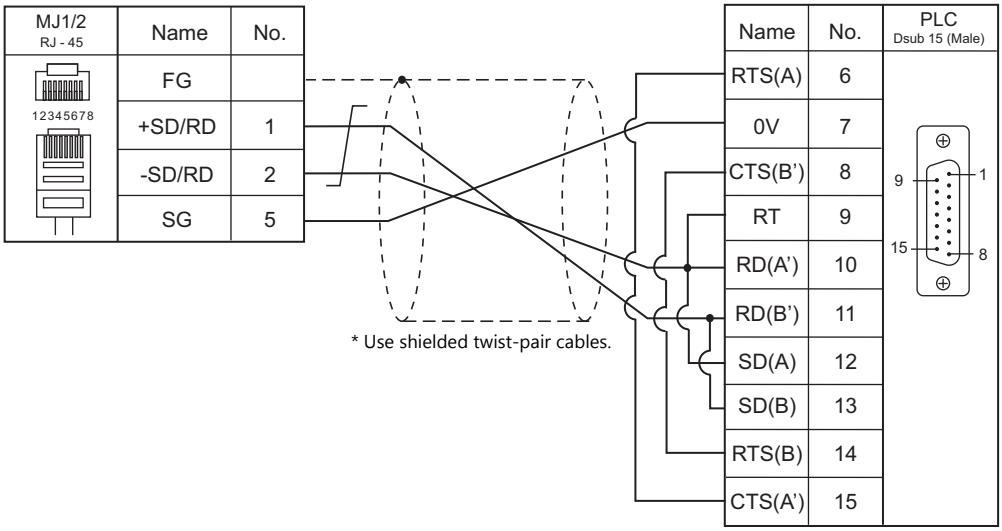


RS-422/RS-485

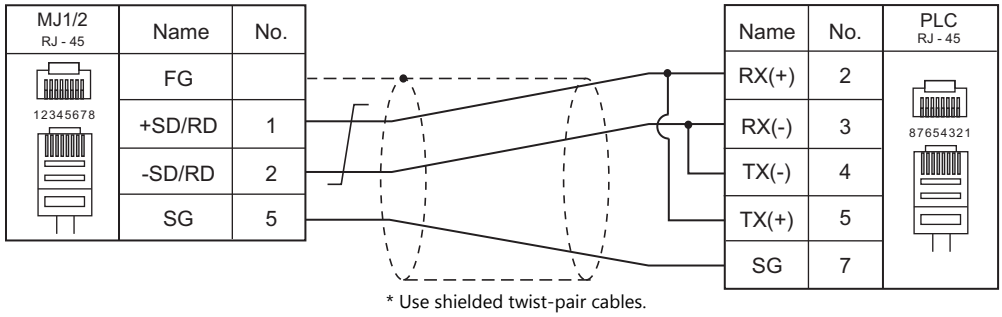
Wiring diagram 1 - M4



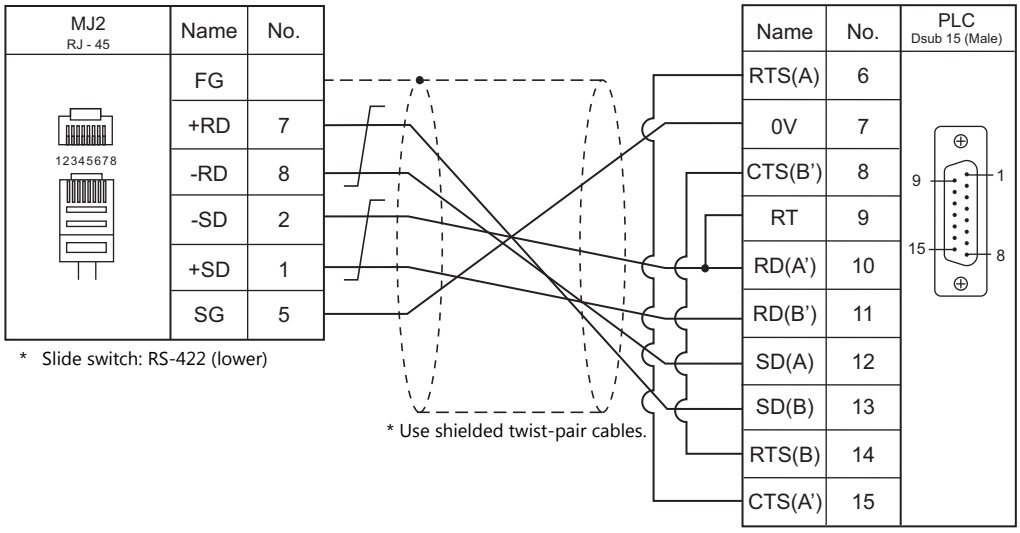
Wiring diagram 2 - M4



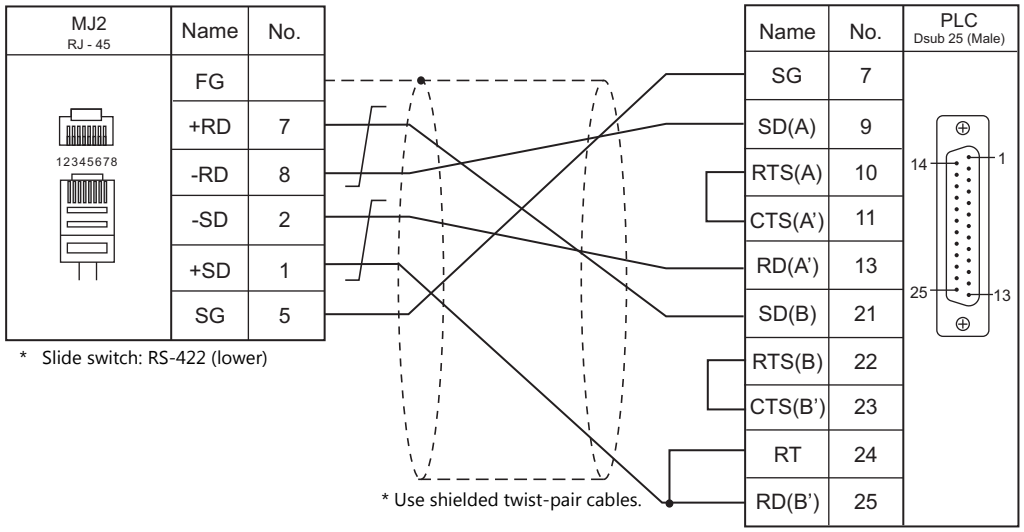
Wiring diagram 3 - M4



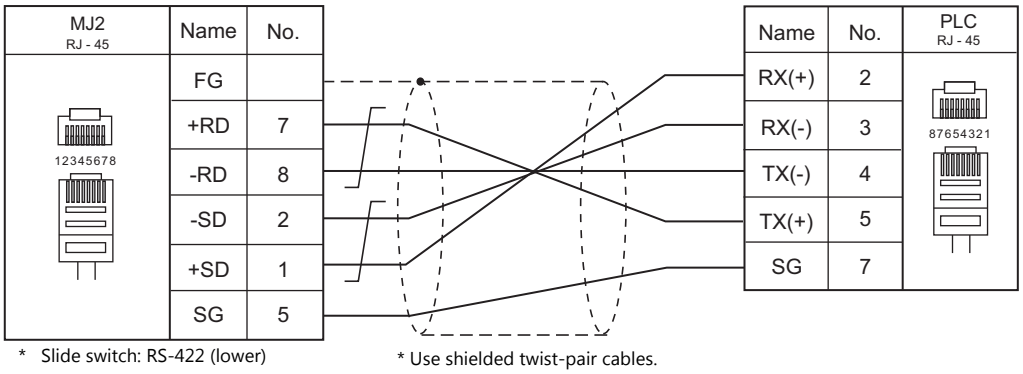
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



MEMO

24. Hitachi

24.1 PLC Connection

24.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *3
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
HIDIC-S10/2α, S10mini	S10 2α	Interface on the CPU unit	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	×
	LQP000 LQP010 LQP011 LQP120	RS-232C connector on the CPU unit	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		LQE060 (CN1, CN2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		LQE160 (CN1, CN2)					
		LQE560 (CN1, CN2)					
		LQE165 (CN1, CN2)	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
		LQE565 (CN1, CN2)					
HIDIC-S10/4α	S10 4α	LWE805	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
HIDIC-S10V	LQP510	UP LINK	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
		LQE560 (CN1, CN2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		LQE565 (CN1, CN2)	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer*2
HIDIC-S10/2α, S10mini (Ethernet)	S10mini	LQE020	○	×	4301 (max. 4 units)	×
		LQE520				
HIDIC-S10V (Ethernet)	LQP510	LQE520			4302 (max. 4 units)	
		LQP520			4302 to 4305 (1 each)	

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

Network Connection (TS2060i Only)

OPCN-1

The optional communication interface unit "CUR-00" is required. For more information, refer to the Specifications for Communication Unit OPCN-1 manual.

PLC Selection on the Editor	CPU	Unit	Unit on TS2060	Ladder Transfer *1
HIDIC-S10 (OPCN-1)	S10V (LQP510)	LQE540 LQE545	CUR-00	×
	S10-mini	LQE040 LQE540 LQE045 LQE545		
	S10α	LWE580		

*1 For the ladder transfer function, see the TS2060 Reference Manual 2.

24.1.1 HIDIC-S10/2α, S10mini

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd
However, when the optional RS-232C/RS-422 module is used, the channel and the protocol must be set using the channel No./protocol setting switch.

Channel No./Protocol Setting Switch

A maximum of two RS-232C/RS-422 modules (four channels) can be attached to one CPU. When using multiple channels, set a unique channel number (#1 to #4) for each.

LQE060

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1

LQE160 / LQE165 / LQE560 / LQE565

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1
A		#2
E		#3

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device

24.1.2 HIDIC-S10/2α, S10mini (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

LQE020

Module No. setting switch

MODU NO	Contents	
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

ET. NET system

Specify the IP address and the subnet mask.

LQE520

Module No. setting switch

MODU NO	Contents	
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

S10V ET.NET system

Specify the IP address and the subnet mask.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device

24.1.3 HIDIC-S10/4α

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd

Only RS-422 (4-wire) connection can be used. For RS-232C or RS-485 (2-wire) connection, a commercially available converter must be used.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device

24.1.4 HIDIC-S10V

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd
However, when the optional RS-232C/RS-422 module is used, the channel and the protocol must be set using the channel No./protocol setting switch.

Channel No./Protocol Setting Switch

A maximum of two RS-232C/RS-422 modules (four channels) can be attached to one CPU. When using multiple channels, set a unique channel number (#1 to #4) for each.

LQE560 / LQE565

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1
A		#2
E		#3

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device
LB	(work register)	15H	LBW as word device
LR	(work register 1 for ladder converter)	16H	LRW as word device
LV	(work register 2 for ladder converter)	17H	LVW as word device
LLL	(long-word work register)	18H	Double-word
LFF	(floating-point work register)	19H	
LWW	(word work register)	1AH	
LML	(long-word work register) backup area	1BH	Double-word
LGF	(floating-point work register) backup area	1CH	
LXW	(word work register) backup area	1DH	

24.1.5 HIDIC-S10V (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

LQE520

Module No. setting switch

MODU NO	Contents	Remarks
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

S10V ET.NET

Specify the IP address and the subnet mask.

LQP520

Station No. setting switch

S/T NO	Setting	Contents
U L	0 0	Set IP address is valid.
	F F	192.192.192.1 is valid.

Standard system tool

Specify the IP address and the subnet mask.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device
LB	(work register)	15H	LBW as word device
LR	(work register 1 for ladder converter)	16H	LRW as word device
LV	(work register 2 for ladder converter)	17H	LVW as word device
LLL	(long-word work register)	18H	Double-word
LFF	(floating-point work register)	19H	
LWW	(word work register)	1AH	
LML	(long-word work register) backup area	1BH	Double-word
LGF	(floating-point work register) backup area	1CH	
LXW	(word work register) backup area	1DH	
A	(extensional internal register)	1EH	AW as word device
N	(nesting coil)	1FH	NW as word device
P	(process coil)	20H	PW as word device
V	(edge contact)	21H	VW as word device
Z	(Z register)	22H	ZW as word device
IW	(extensional input)	23H	
OW	(extensional output)	24H	
BD	(special internal register)	25H	

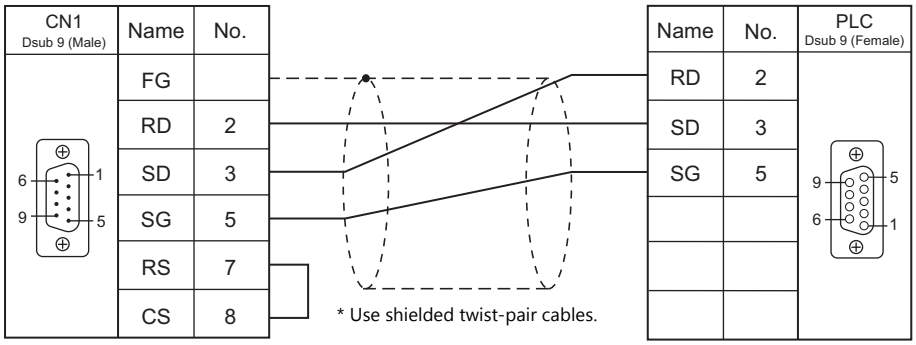
24.1.6 Wiring Diagrams

When Connected at CN1:

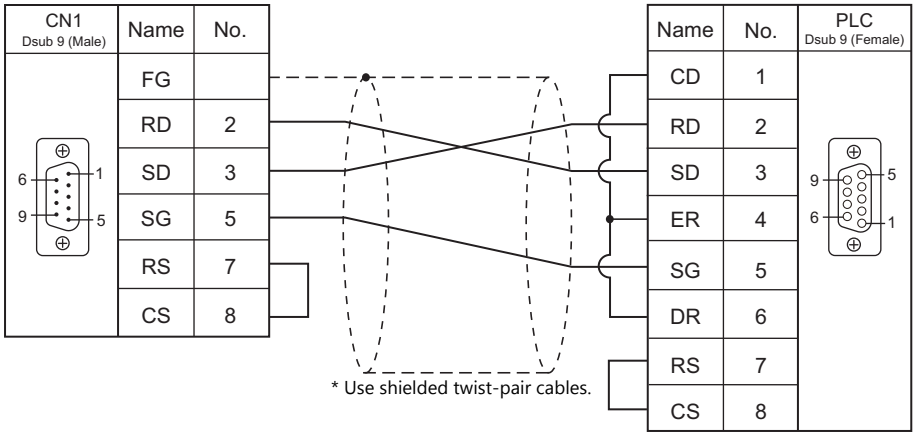
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2



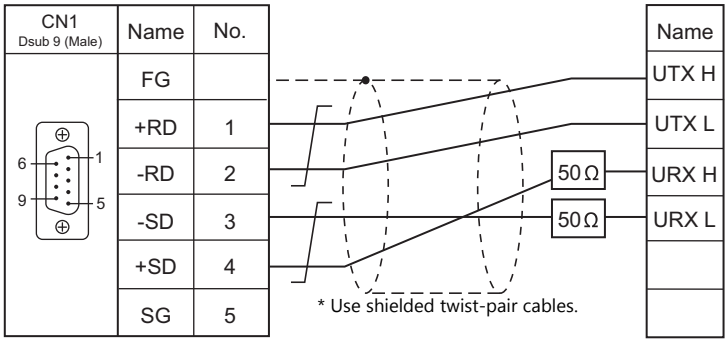
Wiring diagram 2 - C2



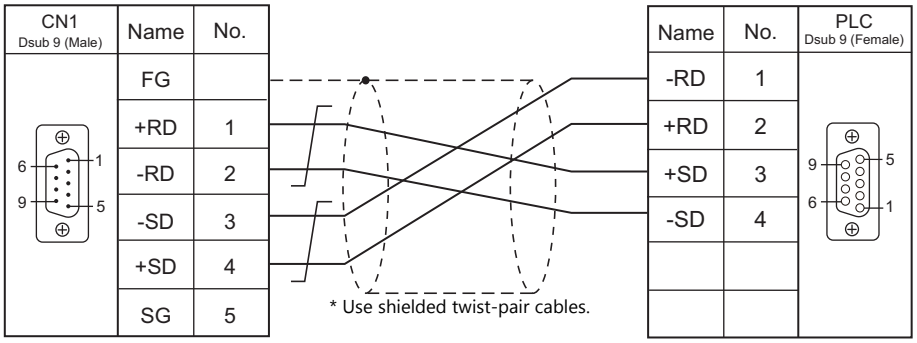
RS-422/RS-485

Wiring diagram 1 - C4

When connecting to the S10xα series, place a resistor of 50Ω (1/2 W) as shown below.



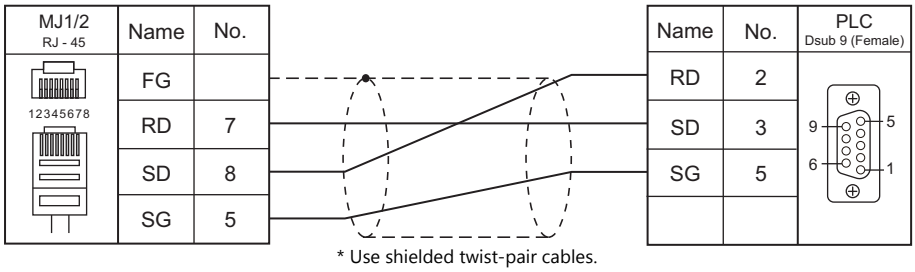
Wiring diagram 2 - C4



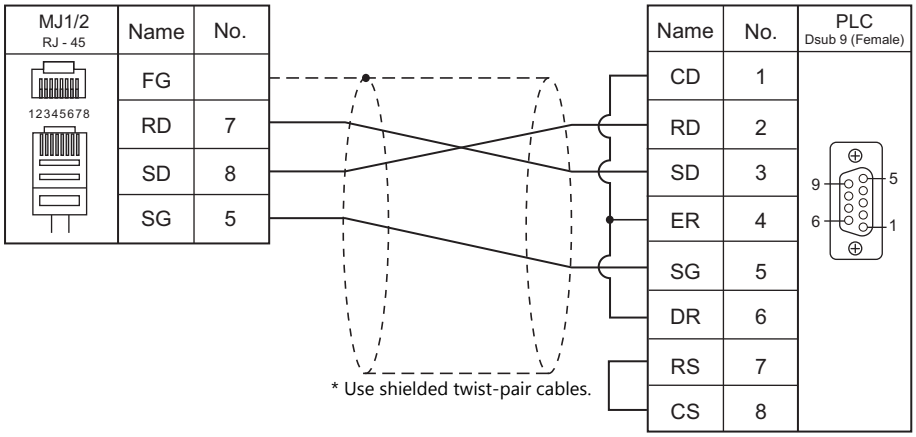
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

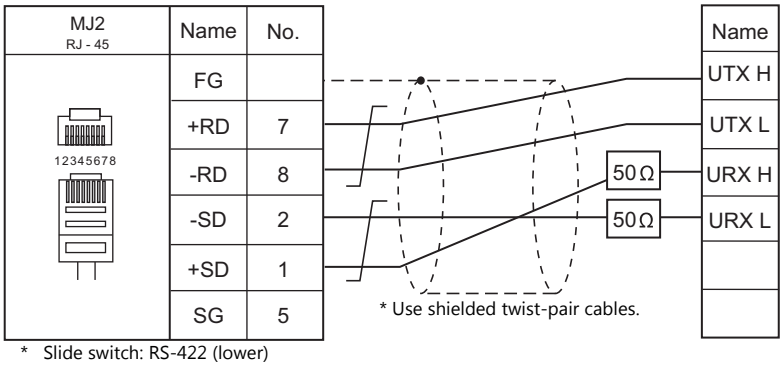


Wiring diagram 2 - M2



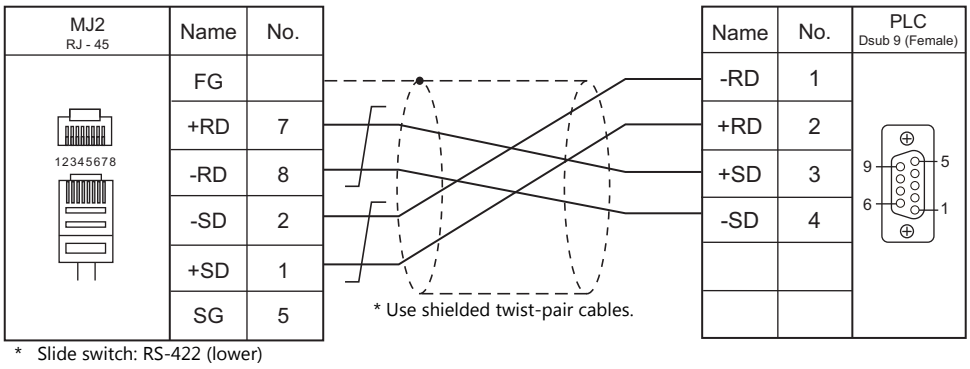
RS-422/RS-485

Wiring diagram 1 - M4



* Slide switch: RS-422 (lower)

Wiring diagram 2 - M4



* Slide switch: RS-422 (lower)

MEMO

25. Hitachi Industrial Equipment Systems

25.1 PLC Connection

25.2 Temperature Controller/Servo/Inverter Connection

25.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection			Ladder Transfer*3
					CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire) *2	
HIDIC-H	H series	COMM-2H		RS-232C	Hakko Electronics' cable "D9-HI2-H-5M" or Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
				RS-422	Wiring diagram 1 - C4	×	Wiring diagram 6 - M4	
		PERIPHERAL on CPU		RS-232C	Hakko Electronics' cable "D9-HI2-H-5M" or Wiring diagram 1 - C2	×		
		H252C CPU	PERIPHERAL1	RS-232C	Hakko Electronics' cable "D9-HI2-H-5M" or Wiring diagram 1 - C2	×		
			PERIPHERAL2	RS-232C	Hakko Electronics' cable "D9-HI2-H-5M" + Hitachi's "CNCOM-05" or Wiring diagram 1 - C2 + Hitachi's "CNCOM-05"	×		
	EH-150	On CPU	PORT1	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4*6	Wiring diagram 7 - M4	
			PORT2	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2*6		
		EH-SIO*4	PORT1	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
			PORT2	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 3 - C4	Wiring diagram 2 - M4*6	Wiring diagram 8 - M4	
	MICRO-EH	On CPU	PORT1	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
			PORT2	RS-422	Wiring diagram 4 - C4	Wiring diagram 3 - M4*6	Wiring diagram 9 - M4	
		EH-OB232		RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
		EH-OB485		RS-422	Wiring diagram 5 - C4	Wiring diagram 4 - M4*6	Wiring diagram 10 - M4	
	Web controller	EH-WD10DR	SERIAL	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		EH-WA23DR		RS-422	Wiring diagram 6 - C4	Wiring diagram 5 - M4*6	Wiring diagram 11 - M4	
HIDIC-EHV	EH-150 EHV	EHV-CPU128	SERIAL	RS-232C	Wiring diagram 2 - C2*5	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 5 - C4	Wiring diagram 4 - M4*6	Wiring diagram 10 - M4	
		EH-SIO*4	PORT1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			PORT2	RS-422	Wiring diagram 3 - C4	Wiring diagram 2 - M4*6	Wiring diagram 8 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*2 Set the slide switch for signal level selection to RS-422 position (lower). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).
*3 For the ladder transfer function, see the TS2060 Reference Manual 2.
*4 For the EH-SIO unit, EH-CPU548 (version E402 or later) and EH-CPU516 (version E202 or later) can only be used.
*5 Communication is also available using the Hitachi's "EH-RS05" cable with the cable used for the wiring diagram 1-C2.
*6 Communication cannot be established when "transmission control protocol 1, without port" is set. Set "transmission control protocol 2, without port". Note that some CPUs do not support "transmission control protocol 2, without port". For more information, refer to the PLC manual issued by the manufacturer.

Ethernet Connection (TS2060i Only)

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP *1	UDP/IP	Port No.	Ladder Transfer *2
HIDIC-H (Ethernet)	H series	LAN-ETH2	×	○	3004 to 3005 (1 each)	×
	EH-150	EH-ETH			3004 to 3007 (1 each)	
	Web controller	ETHERNET				
HIDIC-EHV (Ethernet)	EHV-CPU128	ETHERNET				

*1 Only the built-in LAN port of the TS2060i can be used. The "CUR-03" communication unit cannot be used.
*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

25.1.1 HIDIC-H

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Parity	None / Odd / Even	
Signal Level	RS-232C / RS-422/485	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	0 to 31	
Transmission Mode	Protocol 2 with port Protocol 1 without port Protocol 2 without port Protocol 1 with port	Protocol 2 achieves higher communication speed, compared to protocol 1.

COMM-2H

ST No. switch

ST No.	Setting	Remarks
10^1, 10^0	0 to 31	If a value greater than 31 is set, the unit works as the station No. 31.

MODE switch

MODE	RS-232C	RS-422
0	Transmission control protocol 1 with port	-
2	Transmission control protocol 1 without port	Transmission control protocol 1 with port
7	Transmission control protocol 2 with port	-
9	Transmission control protocol 2 without port	Transmission control protocol 2 with port

* When connecting to both RS-232C and RS-422, set MODE switch to 9.

DIP switch

Switch	Setting	Contents
1	OFF	Bit length 7
2	OFF	19200 bps
3	ON	
4	ON	
5	ON	With parity
6	ON	Even
7	OFF	Stop bit 1
8	ON	With sum check

PERIPHERAL Port

No particular setting is necessary on the PLC. The PLC always operates using the parameter shown below. Set the following parameter on TS2060.

Item	Setting	Remarks
Signal Level	RS-232C	
Baud Rate	19200 bps	
Data Length	7 bits	ASCII
Stop Bit	1 bit	
Parity	Even	
Transmission Mode	Protocol 1 without port	
Sum Check	Provided	
Port Operation	Dedicated port	

EH-150 CPU

PORT1

Set the signal level and the communication protocol as shown below for PORT1 (dedicated port). Other parameters (7 bits, 1 bit, even) are fixed.

Signal Level	Communication Protocol	CPU Model
RS-232C	Transmission control protocol 1	EH-CPU104/104A/208/208A/308/308A/316/316A/448/448A/516/548
	Transmission control protocol 2	EH-CPU104A/208A/308A/316A/448/448A/516/548
RS-422	Transmission control protocol 1	EH-CPU308A/316A/448/448A/516/548
	Transmission control protocol 2	
	Transmission control protocol 1 with port	
	Transmission control protocol 2 with port	
RS-485	Transmission control protocol 1 with port	
	Transmission control protocol 2 with port	

Procedure

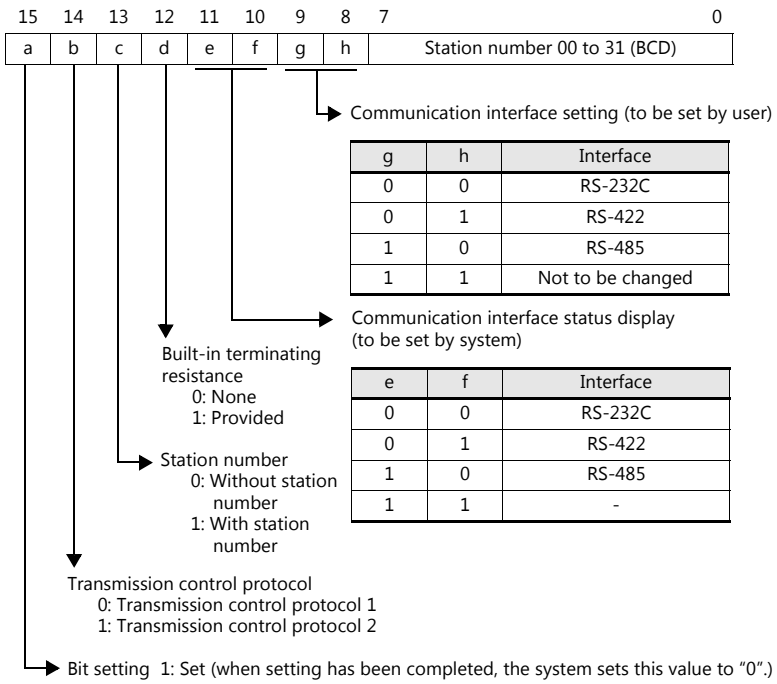
1. Turn the PLC off and set the “Mode setting switch” (page 25-3).
2. Turn the power on and check the value for “Special internal output: WRF037” (page 25-4).
3. When the signal level and the communication control protocol have correctly been selected, setting is completed. If they are wrong, set a correct value and turn the power off and back on again.
4. Check the value set for WRF037.

Mode setting switch

SW3	SW4	SW5	Contents
ON	ON	ON	Dedicated port, 4,800 bps
OFF	ON		Dedicated port, 9,600 bps
ON	OFF		Dedicated port, 19,200 bps
OFF	OFF		Dedicated port, 38,400 bps

Special internal output: WRF037

WRF037



g	h	Interface
0	0	RS-232C
0	1	RS-422
1	0	RS-485
1	1	Not to be changed

e	f	Interface
0	0	RS-232C
0	1	RS-422
1	0	RS-485
1	1	-

Setting example

User Setting	After Turning the Power Back ON	Signal Level	Communication Control Protocol
H8000	H0000	RS-232C	Transmission control protocol 1
HC000	H4000		Transmission control protocol 2
H8100 (H9100)	H0500 (H1500)	RS-422	Transmission control protocol 1
HC100 (HD100)	H4500 (H5500)		Transmission control protocol 2
HA1** (HB1**)	H25** (H35**)		Transmission control protocol 1 with port
HE1** (HF1**)	H65** (H75**)		Transmission control protocol 2 with port
HA2** (HB2**)	H2A** (H3A**)	RS-485	Transmission control protocol 1 with port
HE2** (HF2**)	H6A** (H7A**)		Transmission control protocol 2 with port

Inside the parentheses ( ) shows cases where the terminating resistance is provided.

* If the setting is undefined upon power-up, the default setting (transmission control protocol 1, without port, RS-232C) is applied.

PORT2

PORT2 settings are defined as "dedicated port, RS-232C, transmission control protocol 1, 7 bits, 1 bit, even", regardless of the CPU model.

Mode setting switch, PHL switch

SW6	PHL Switch	Baud Rate	Remarks
OFF	OFF (Low)	4800 bps	PHL signal (pin 4 at PORT2) Low
ON	OFF (Low)	9600 bps	
OFF	ON (High)	19200 bps	PHL signal (pin 4 at PORT2) High
ON	ON (High)	38400 bps	

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

MICRO EH

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

CPU Model	Port	Signal Level	Communication Protocol
EH-D10 EH-D14 / EH-A14 EH-D20 / EH-A20 EH-D23 / EH-A23 EH-D28 / EH-A28 EH-D40 / EH-A40 EH-D64 / EH-A64	PORT1	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-D23 / EH-A23 EH-D28 / EH-A28	PORT2	RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
EH-x64xxx + EH-OB232	PORT2	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-x64xxx + EH-OB485		RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

PORT1

Procedure

1. Turn the PLC off and set the baud rate using the DIPSW.
2. Turn the power on and check the value set for "Special internal output: WRF01A".
3. When the transmission control protocol has correctly been selected, setting is completed. If it is wrong, set a correct value.
4. Set the bit "R7F6" (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory. Note that the ladder tool cannot be connected when the setting has been saved using the transmission control protocol 2.

DIPSW

SW1	SW2	SW3	SW4	Baud Rate
ON	OFF	ON	OFF	38.4 kbps
ON	OFF	OFF	OFF	19.2 kbps
OFF	OFF	ON	OFF	9600 bps
OFF	OFF	OFF	OFF	4800 bps

Special internal output: WRF01A

Device Memory	Setting	Contents
WRF01A	H0000	Transmission control protocol 1
	H8000	Transmission control protocol 2

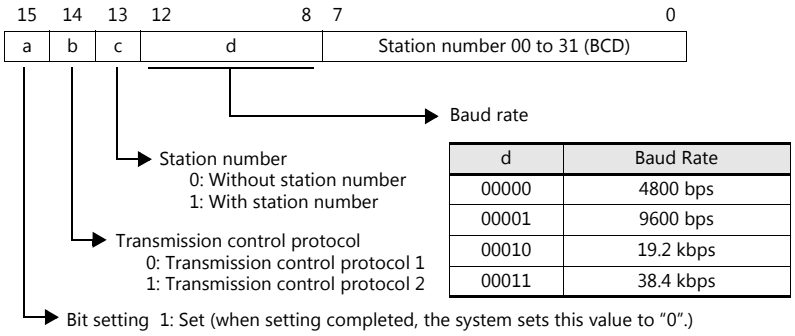
PORT2

Procedure

1. Check the value set for special internal output "WRF03D".
2. When the setting, such as transmission control protocol or baud rate, has correctly been defined, the setting is completed. If it is wrong, set a correct value. See "User Setting" described in "Special internal output: WRF03D".
3. Check that the value set for WRF03D has been changed to the one shown in the "System Setting" column.
4. Set the bit "R7F6" (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory.

Special internal output: WRF03D

<table>
<tr><th>Device Memory</th><th>Setting</th></tr>
<tr><td>WRF03D</td><td>


<table>
<tr><th>d</th><th>Baud Rate</th></tr>
<tr><td>00000</td><td>4800 bps</td></tr>
<tr><td>00001</td><td>9600 bps</td></tr>
<tr><td>00010</td><td>19.2 kbps</td></tr>
<tr><td>00011</td><td>38.4 kbps</td></tr>
</table>
Setting example
<table>
<tr><th>User Setting</th><th>System Setting</th><th>Interface</th><th>Baud Rate</th></tr>
<tr><td>H8300</td><td>H0300</td><td>Transmission control protocol 1</td><td rowspan="4">38.4 kbps</td></tr>
<tr><td>HC300</td><td>H4300</td><td>Transmission control protocol 2</td></tr>
<tr><td>HA300</td><td>H2300</td><td>Transmission control protocol 1 with port</td></tr>
<tr><td>HE300</td><td>H6300</td><td>Transmission control protocol 2 with port</td></tr>
</table>
</td></tr>
</table>

Web Controller

The following table shows the signal level and the communication protocol for each PLC. Other parameters (7 bits, 1 bit, even) are fixed.

PLC	Port	Signal Level	Communication Protocol
EH-WD10DR	SERIAL	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-WA23DR	PORT1	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
		RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
		RS-485	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

Procedure

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (RS-232C protocol/serial protocol → passive HI protocol)

Make settings for “Interface Type”, “Transmission Control Procedure”, “Transmission Speed”.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

25.1.2 HIDIC-H (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

LAN-ETH2 (H Series)

The IP address setting tool can be downloaded from the Hitachi Industrial Equipment Systems website.
Connect the computer (PC) to the RS-232C port of PORT1 and specify the IP address and the task port. For more information, refer to the PLC manual issued by the manufacturer.

EH-ETH (EH-150)

Make settings using the web server function incorporated in EH-ETH. For more information, refer to the PLC manual issued by the manufacturer.

IP address information setup

Set the IP address and the subnet mask.

Task code information setup

Select [UDP/IP] for [Protocol] and specify the port number.

Web Controller

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (IP address)

Specify the IP address and the subnet mask.

System configuration (ethernet protocol → passive HI protocol)

Select [UDP/IP] for [Task code port] and specify the port number.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

25.1.3 HIDIC-EHV

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 bps	
Data Length	7 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	
Transmission Mode	Protocol 2 with port Protocol 1 without port Protocol 2 without port Protocol 1 with port	Protocol 2 achieves higher communication speed, compared to protocol 1.

EHV-CPU

CPU communication setting on control editor

Item	Setting
Serial communication setting	Dedicated
Port type	RS-232C/RS-422/RS-485 The following table shows the combination of port type and communication protocols available.

Port Type	Communication Protocol
RS-232C	Transmission control protocol 1 (1 : 1)
	Transmission control protocol 2 (1 : 1)
RS-422	Transmission control protocol 1 (1 : 1)
	Transmission control protocol 2 (1 : 1)
	Transmission control protocol 1 (1 : n)
	Transmission control protocol 2 (1 : n)
RS-485	Transmission control protocol 2 (1 : 1)
	Transmission control protocol 1 (1 : n)
	Transmission control protocol 2 (1 : n)

Baud rate	4800 / 9600 / 19200 / 38400 / 57600 bps
Communication protocol	See “Port Type” shown above.
Station number	0 to 31 (to be specified when “with port” is selected)

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

25.1.4 HIDIC-EHV (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- IP address for the TS2060i unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TS2060i unit:
    Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Control Editor

IP address setting

Item	Contents	
IP address	Specify the IP address for the PLC.	
Subnet mask	Specify the subnet mask for the PLC.	
Default gateway	Specify according to the environment.	

Ethernet communication (task code) setting

Item	Contents	
Valid	Select a port to which the TS2060i unit is connected and make the port enabled.	
Port No.	Set the port number of the PLC.	
Protocol	UDP/IP	

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

25.1.5 Wiring Diagrams

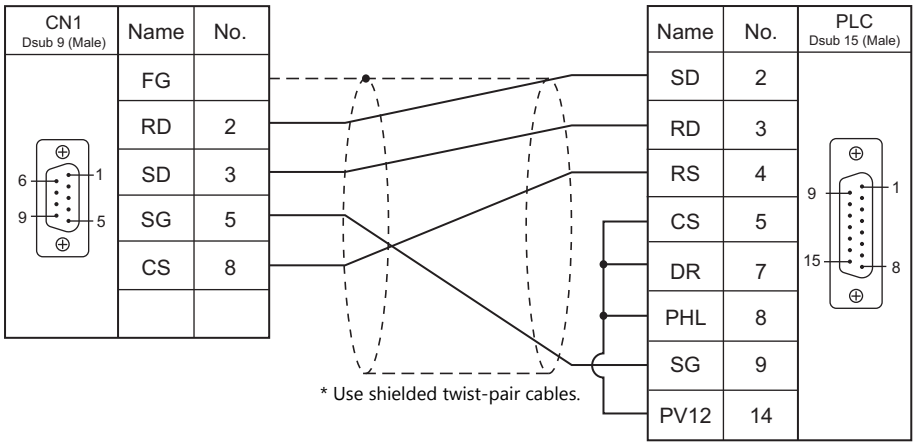
When Connected at CN1:

CAUTION

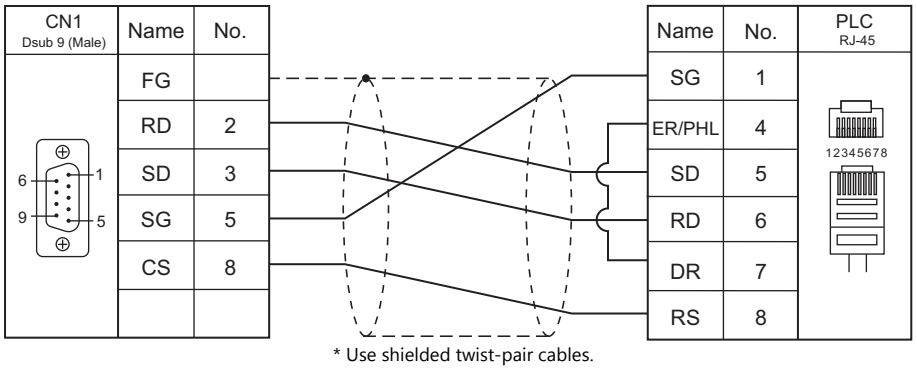
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

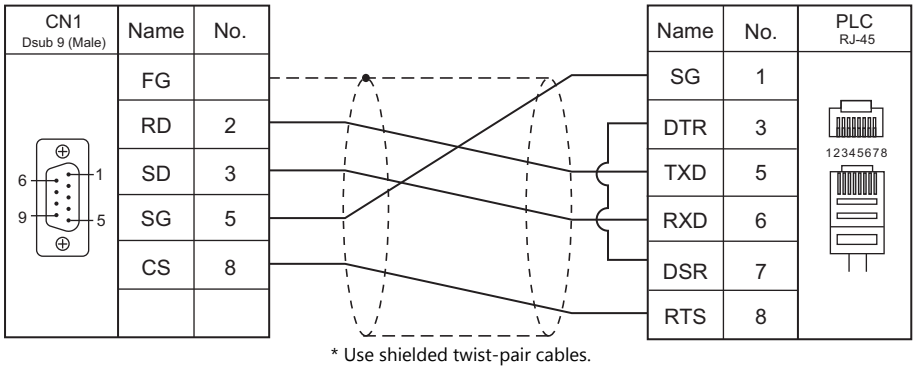
Wiring diagram 1 - C2



Wiring diagram 2 - C2

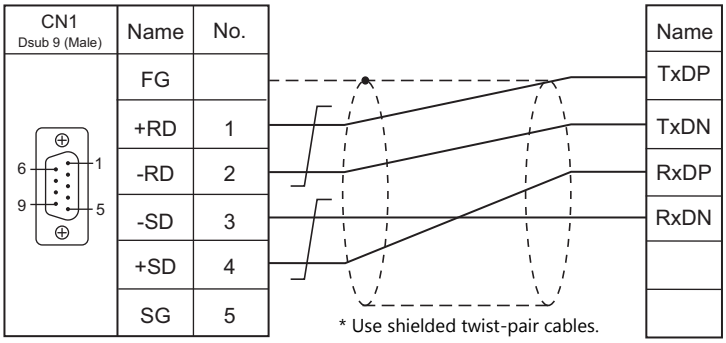


Wiring diagram 3 - C2

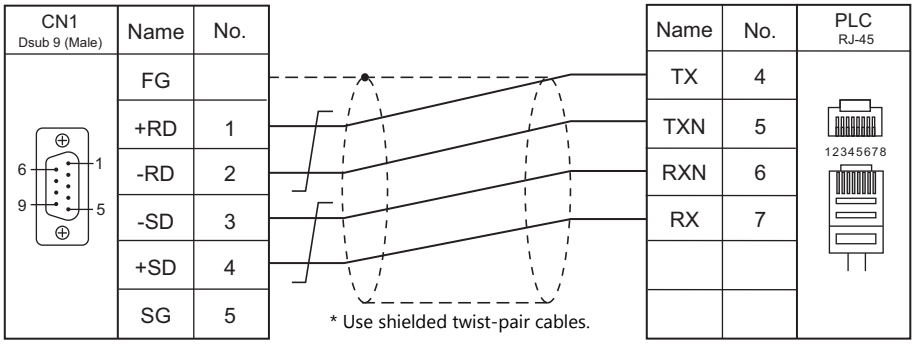


RS-422/RS-485

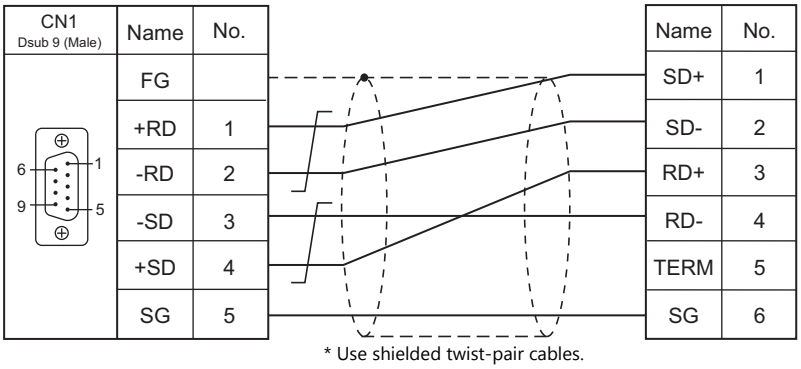
Wiring diagram 1 - C4



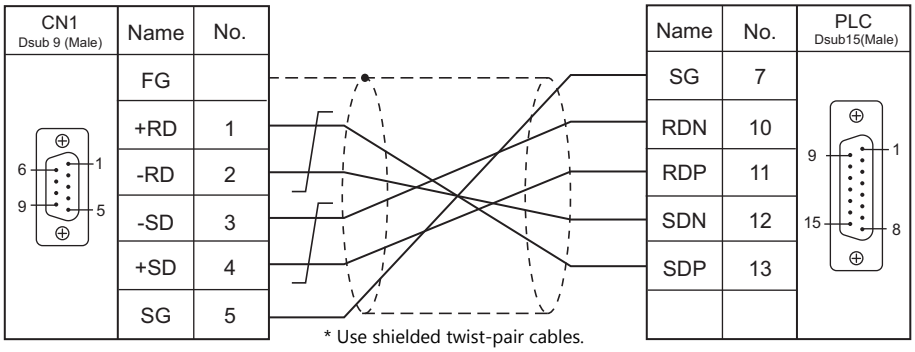
Wiring diagram 2 - C4



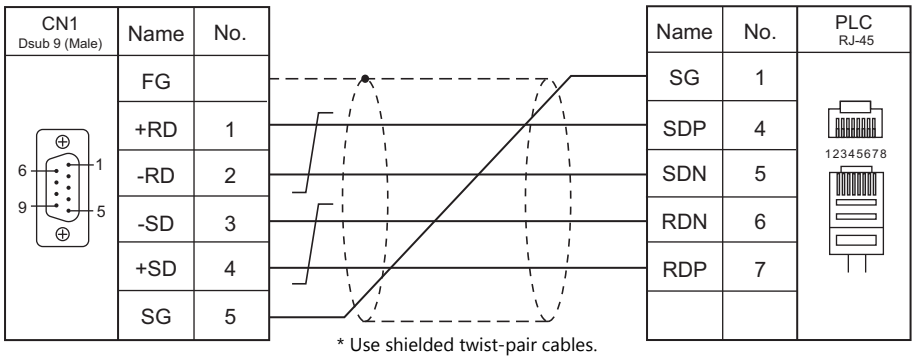
Wiring diagram 3 - C4



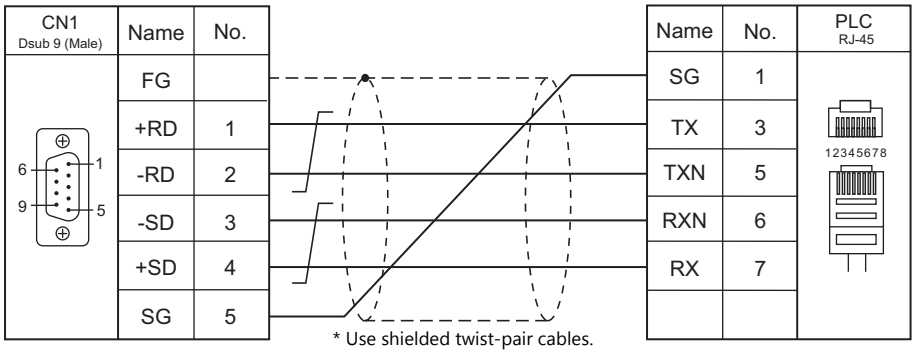
Wiring diagram 4 - C4



Wiring diagram 5 - C4



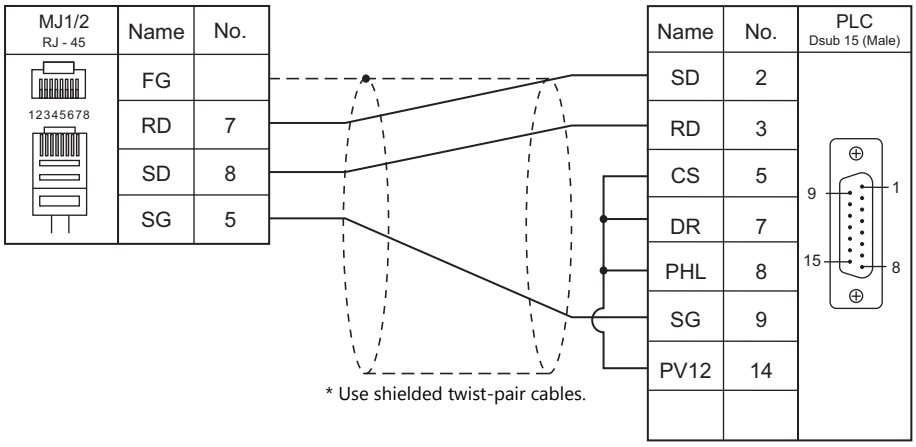
Wiring diagram 6 - C4



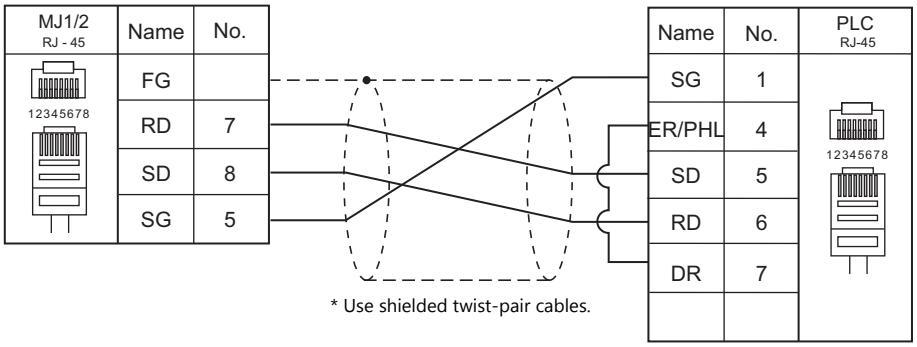
When Connected at MJ1/MJ2:

RS-232C

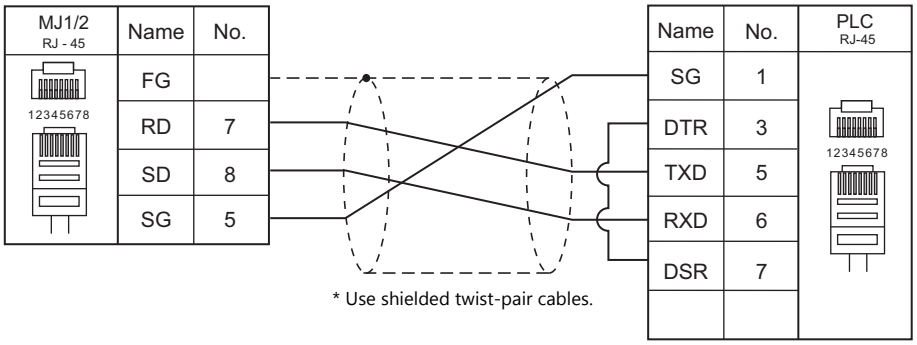
Wiring diagram 1 - M2



Wiring diagram 2 - M2

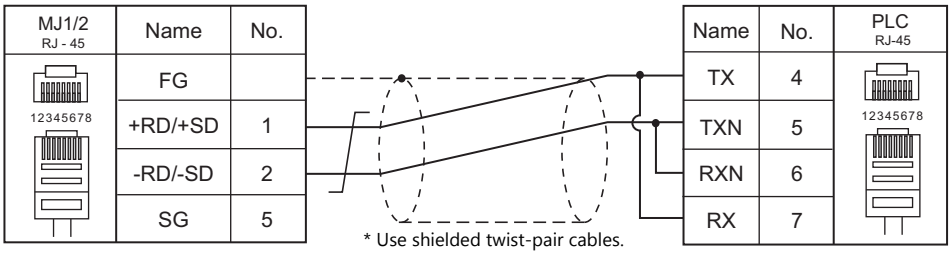


Wiring diagram 3 - M2

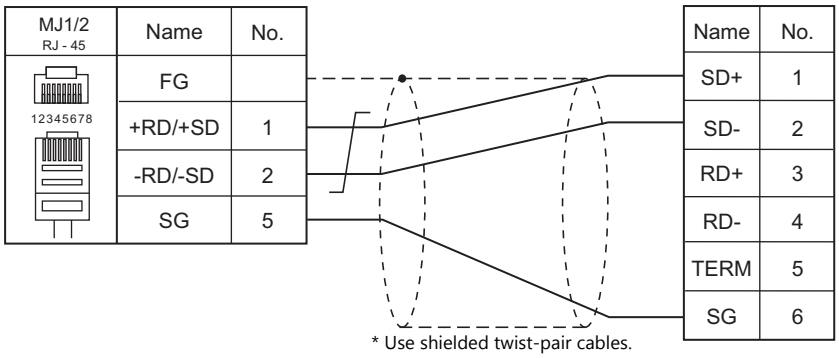


RS-422/RS-485

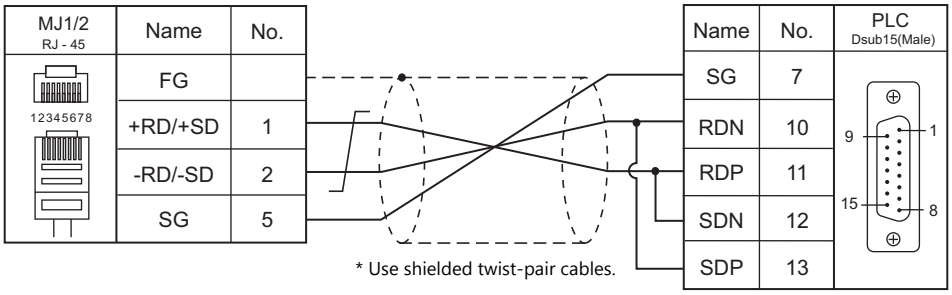
Wiring diagram 1 - M4



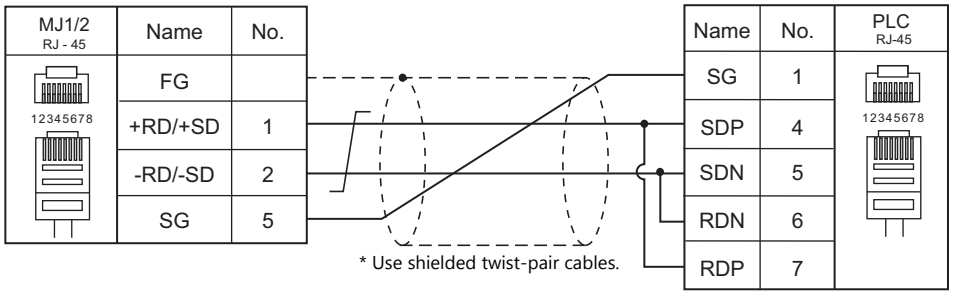
Wiring diagram 2 - M4



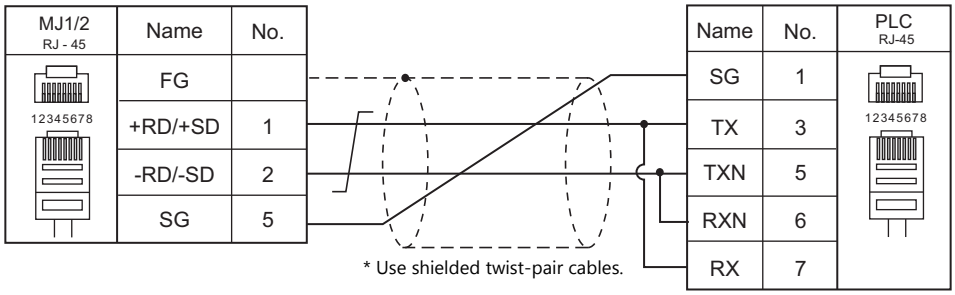
Wiring diagram 3 - M4



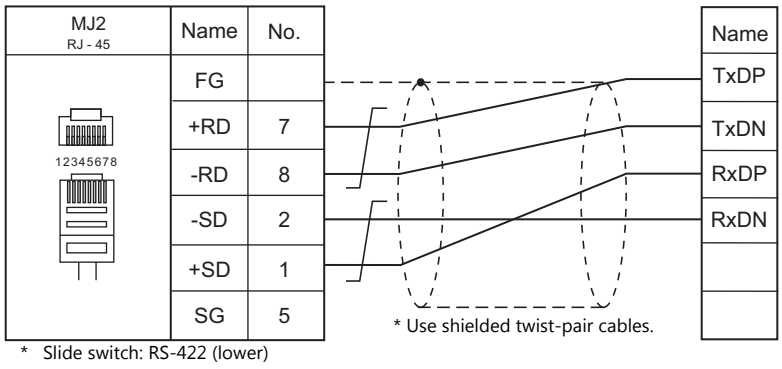
Wiring diagram 4 - M4



Wiring diagram 5 - M4

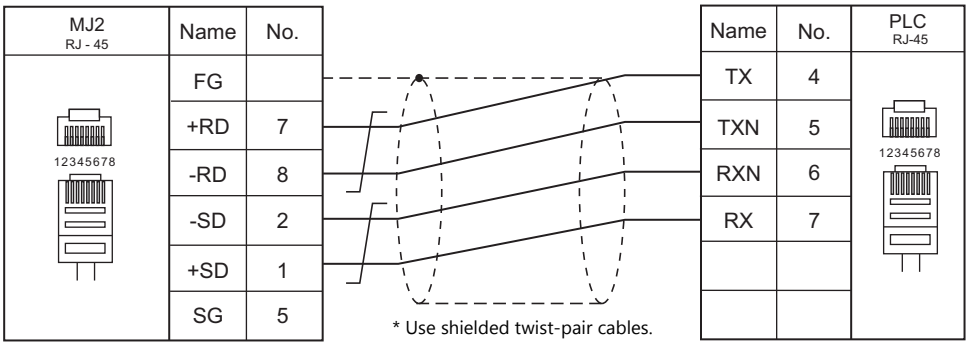


Wiring diagram 6 - M4



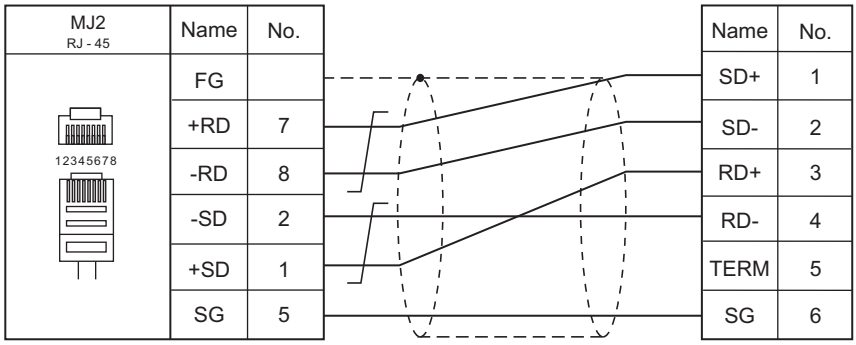
* Slide switch: RS-422 (lower)

Wiring diagram 7 - M4



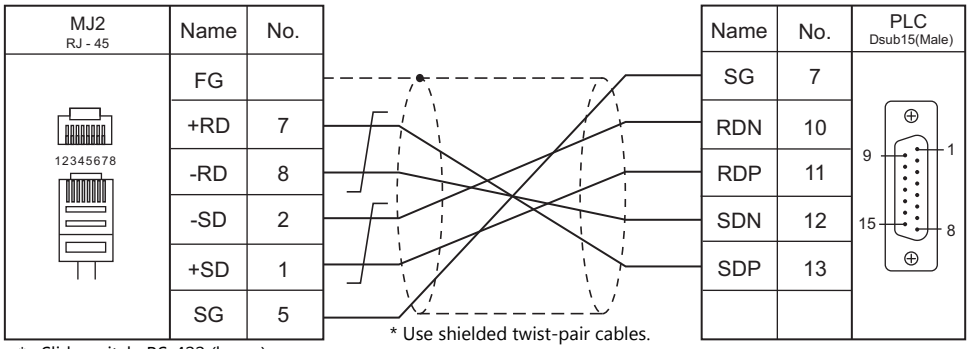
* Slide switch: RS-422 (lower)

Wiring diagram 8 - M4



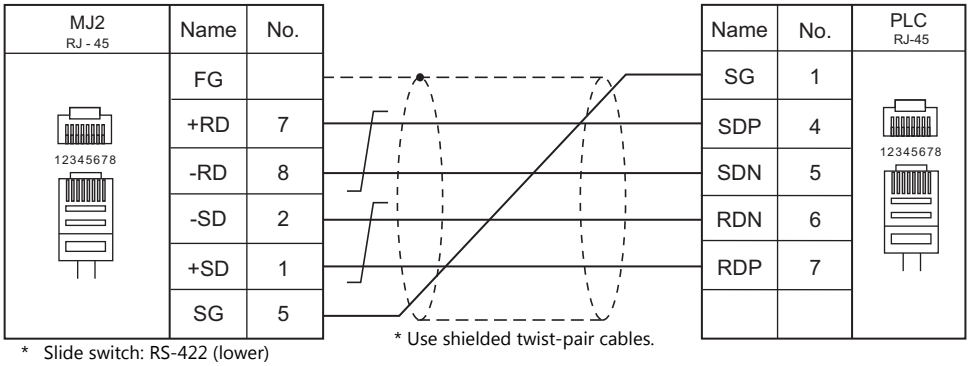
* Slide switch: RS-422 (lower)

Wiring diagram 9 - M4



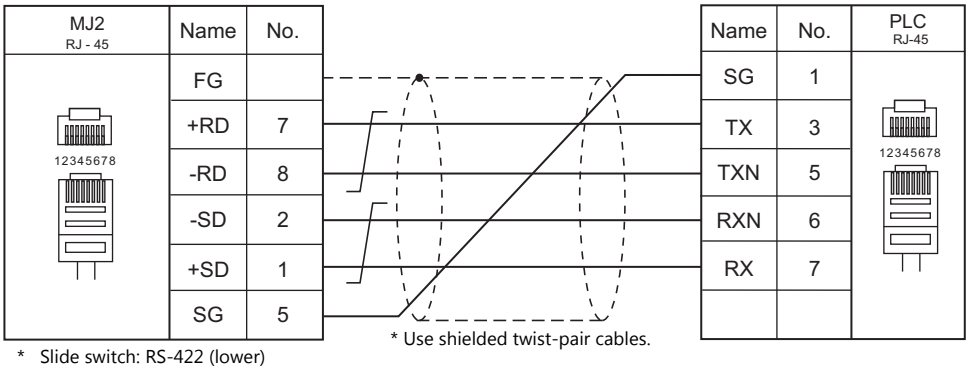
* Slide switch: RS-422 (lower)

Wiring diagram 10 - M4



* Slide switch: RS-422 (lower)

Wiring diagram 11 - M4



* Slide switch: RS-422 (lower)

25.2 Temperature Controller/Servo/Inverter Connection

Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1 TS2060i+DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
SJ300 series	SJ300 SJH300	TM2	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		H_SJ300.Lst
SJ700 series	SJ700 SJ700-2	TM2	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		H_SJ700.Lst

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

25.2.1 SJ300 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 32	

Inverter

Parameter

The communication parameters can be set using keys attached to the inverter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code		Function Name	Setting	Remarks
Basic setting	A001	Frequency command selection	**03: RS-485**	To give the frequency command from TS2060, always select "03".
	A002	Operation command selection	**03: RS-485**	To give the operation command from TS2060, always select "03".
Communication function adjustment	C070	Data command selection	**03: RS-485**	
	C071	Baud rate selection	04: 4800 bps 05: 9600 bps 06: 19200 bps	
	C072	Communication station number selection	1. to 32.	
	C073	Communication bit length selection	7: 7 bits 8: 8 bits	
	C074	Communication parity selection	00: No parity 01: Even parity 02: Odd parity	
	C075	Communication stop bit selection	1: 1 bit 2: 2 bits	
	C078	Communication latency	0. to 1000. (msec)	

Terminating resistance

Short-circuit RP-SN (control terminal block) on the terminal inverter.

Available Device Memory

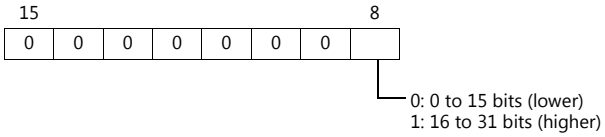
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
d	00H	Double-word, read only
F	01H	Double-word
A	02H	Double-word
b	03H	Double-word
C	04H	Double-word
H	05H	Double-word
P	06H	Double-word
T (trip history)	07H	Double-word, read only

Indirect Device Memory Designation

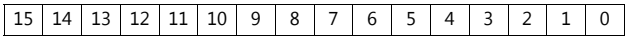
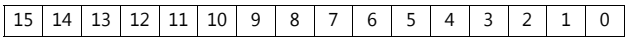
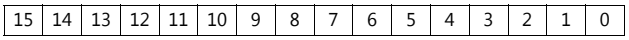
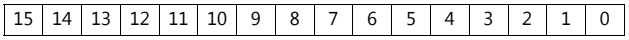
	15 8	7 0
n + 0	Models (11 to 18)	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Normal turn, reverse turn or stop command</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 0</td></tr>
<tr><td>n + 2</td><td>0: Stop command
1: Normal turn command
2: Reverse turn command</td></tr>
<tr><td rowspan="3">Frequency command setting</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 1</td></tr>
<tr><td>n + 2</td><td>Frequency (0 to 400 Hz)</td></tr>
<tr><td rowspan="6">Intelligent terminal status setting</td><td rowspan="6">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="6">6</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
<tr><td>n + 2</td><td>Data (HH)
 
Bit 0: "STAT" Pulse train input enabled</td></tr>
<tr><td>n + 3</td><td>Data (HL)
 
Bit 0: "SF1" Multistep speed (bit operation)
Bit 1: "SF2" Multistep speed (bit operation)
Bit 2: "SF3" Multistep speed (bit operation)
Bit 3: "SF4" Multistep speed (bit operation)
Bit 4: "SF5" Multistep speed (bit operation)
Bit 5: "SF6" Multistep speed (bit operation)
Bit 6: "SF7" Multistep speed (bit operation)
Bit 7: "OLR" Overload limitation selection
Bit 8: "TL" Torque limitation valid/invalid
Bit 9: "TRQ1" Torque limit selection 1
Bit 10: "TRQ2" Torque limit selection 2
Bit 11 "PPI" P/PI selection
Bit 12: "BOK" Brake check
Bit 13: "ORT" Orientation
Bit 14: "LAC" LAD cancel
Bit 15: "PCLR" Positioning deviation clear</td></tr>
<tr><td>n + 4</td><td>Data (LH)
 
Bit 0: "AT" Analog input selection
Bit 1: "SET3" 3rd control
Bit 2: "RS" Reset
Bit 3: --
Bit 4: "STA" 3-wire start
Bit 5: "STP" 3-wire retain
Bit 6: "F/R" 3-wire normal/reverse turn
Bit 7: "PID" PID selection (valid/invalid)
Bit 8: "PIDC" PID integral reset
Bit 9: --
Bit 10: "CAS" Control gain selection
Bit 11: "UP" Remote control acceleration
Bit 12: "DWN" Remote control deceleration
Bit 13: "UDC" Remote control data clear
Bit 14: --
Bit 15: "OPE" Forced operation</td></tr>
<tr><td>n + 5</td><td>Data (LL)
 
Bit 0: "FW" Normal turn command
Bit 1: "RV" Reverse turn command
Bit 2: "CF1" Multistep speed 1 (binary operation)
Bit 3: "CF2" Multistep speed 2 (binary operation)
Bit 4: "CF3" Multistep speed 3 (binary operation)
Bit 5: "CF4" Multistep speed 4 (binary operation)
Bit 6: "JG" Jogging (inching operation)
Bit 7: "DB" External DC braking
Bit 8: "SET" 2nd control
Bit 9: "2CH" 2-step acceleration/deceleration
Bit 10: --
Bit 11: "FRS" Free-run stop
Bit 12: "EXP" External trip
Bit 13: "USP" Unattended start protection function
Bit 14: "CS" Commercial switching
Bit 15: "SFT" Soft lock (control terminal block)</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Inverter status readout	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
		n + 2	Status A (BCD) 00: Initial status 01: Waiting for Vdc establishment 02: Stopping 03: Running 04: FRS in progress 05: JG in progress 06: DB in progress 07: F acquisition in progress 08: Retry in progress 09: UV in progress 10: Tripping 11: Waiting for reset	
		n + 3	Status B (BCD) 00: Stopping 01: Running 02: Tripping	
		n + 4	Status C (BCD) 00: -- 01: Stop 02: Deceleration 03: Constant speed 04: Acceleration 05: Normal turn 06: Reverse turn 07: Normal to reverse turn 08: Reverse to normal turn 09: Normal turn start 10: Reverse turn start	
Resetting of setting value to default *	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 8	
Check for EEPROM availability	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	01: Allowed	
Storing of setting values in EEPROM	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 10	
Re-calculation of internal constant	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	

Return data: Data stored from inverter to TS2060

* When the initialize parameter of “b084” is set to “00”, only trip history is cleared.

25.2.2 SJ700 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 32	

Inverter

Parameter

The communication parameters can be set using keys attached to the inverter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code		Function Name	Setting	Remarks
Basic setting	A001	Frequency command selection	**03: RS-485**	To give the frequency command from TS2060, always select "03".
	A002	Operation command selection	**03: RS-485**	To give the operation command from TS2060, always select "03".
Communication function adjustment	C071	Baud rate selection	04: 4800 bps 05: 9600 bps 06: 19200 bps	
	C072	Communication station number selection	1. to 32.	
	C073	Communication bit length selection	7: 7 bits 8: 8 bits	
	C074	Communication parity selection	00: No parity 01: Even parity 02: Odd parity	
	C075	Communication stop bit selection	1: 1 bit 2: 2 bits	
	C076	Communication error selection	**02: Ignored**	
	C077	Communication trip time	0.00 - 99.99 (s)	
	C078	Communication latency	0. - 1000. (ms)	
	C079	Communication mode selection	**00: ASCII**	

Terminating resistance

Short-circuit RP-SN (control terminal block) on the terminal inverter.

Available Device Memory

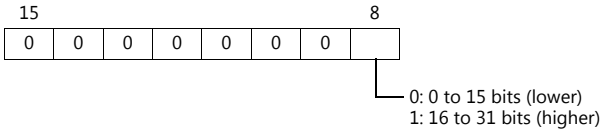
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
d	00H	Double-word, read only
F	01H	Double-word
A	02H	Double-word
b	03H	Double-word
C	04H	Double-word
H	05H	Double-word
P	06H	Double-word
T (trip history)	07H	Double-word, read only

Indirect Device Memory Designation

	15 8	7 0
n + 0	Models (11 to 18)	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Normal turn, reverse turn or stop command	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0: Stop command 1: Normal turn command 2: Reverse turn command	
Frequency command setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 1	
		n + 2	Frequency (0 to 400 Hz)	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="6">Intelligent terminal status setting</td><td rowspan="6">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="6">6</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
<tr><td>n + 2</td><td>Data (HH)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “STAT” Pulse train position command enabled
Bit 1: --
Bit 2: “ADD” Set frequency addition
Bit 3: “F-TM”: Forced terminal
Bit 4: “ATR” Torque command input enabled
Bit 5: “KHC” Integral power clear
Bit 6: “SON” Servo ON
Bit 7: “FOC” Pre-excitation
Bit 8: “MI1” General-purpose input 1
Bit 9: “MI2” General-purpose input 2
Bit 10: “MI3” General-purpose input 3
Bit 11: “MI4” General-purpose input 4
Bit 12: “MI5” General-purpose input 5
Bit 13: “MI6” General-purpose input 6
Bit 14: “MI7” General-purpose input 7
Bit 15: “MI8” General-purpose input 8</td></tr>
<tr><td>n + 3</td><td>Data (HL)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “SF1” Multistep speed (bit operation)
Bit 1: “SF2” Multistep speed (bit operation)
Bit 2: “SF3” Multistep speed (bit operation)
Bit 3: “SF4” Multistep speed (bit operation)
Bit 4: “SF5” Multistep speed (bit operation)
Bit 5: “SF6” Multistep speed (bit operation)
Bit 6: “SF7” Multistep speed (bit operation)
Bit 7: “OLR” Overload limitation selection
Bit 8: “TL” Torque limitation valid/invalid
Bit 9: “TRQ1” Torque limit selection 1
Bit 10: “TRQ2” Torque limit selection 2
Bit 11 “PPI” P/PI selection
Bit 12: “BOK” Brake check
Bit 13: “ORT” Orientation
Bit 14: “LAC” LAD cancel
Bit 15: “PCLR” Positioning deviation clear</td></tr>
<tr><td>n + 4</td><td>Data (LH)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “AT” Analog input selection
Bit 1: --
Bit 2: “RS” Reset
Bit 3: --
Bit 4: “STA” 3-wire start
Bit 5: “STP” 3-wire retain
Bit 6: “F/R” 3-wire normal/reverse turn
Bit 7: “PID” PID selection (valid/invalid)
Bit 8: “PIDC” PID integral reset
Bit 9: --
Bit 10: --
Bit 11: “UP” Remote control acceleration
Bit 12: “DWN” Remote control deceleration
Bit 13: “UDC” Remote control data clear
Bit 14: --
Bit 15: “OPE” Forced operation</td></tr>
<tr><td>n + 5</td><td>Data (LL)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “FW” Normal turn command
Bit 1: “RV” Reverse turn command
Bit 2: “CF1” Multistep speed 1 (binary operation)
Bit 3: “CF2” Multistep speed 2 (binary operation)
Bit 4: “CF3” Multistep speed 3 (binary operation)
Bit 5: “CF4” Multistep speed 4 (binary operation)
Bit 6: “JG” Jogging (inching operation)
Bit 7: “DB” External DC braking
Bit 8: “SET” 2nd control
Bit 9: “2CH” 2-step acceleration/deceleration
Bit 10: --
Bit 11: “FRS” Free-run stop
Bit 12: “EXP” External trip
Bit 13: “USP” Unattended start protection function
Bit 14: “CS” Commercial switching
Bit 15: “SFT” Soft lock (control terminal block)</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Inverter status readout	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
		n + 2	Status A (BCD) 00: Initial status 01: Waiting for Vdc establishment 02: Stopping 03: Running 04: FRS in progress 05: JG in progress 06: DB in progress 07: F acquisition in progress 08: Retry in progress 09: UV in progress 10: Tripping 11: Waiting for reset	
		n + 3	Status B (BCD) 00: Stopping 01: Running 02: Tripping	
		n + 4	Status C (BCD) 00: -- 01: Stop 02: Deceleration 03: Constant speed 04: Acceleration 05: Normal turn 06: Reverse turn 07: Normal to reverse turn 08: Reverse to normal turn 09: Normal turn start 10: Reverse turn start	
Resetting of setting value to default *	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 8	
Check for EEPROM availability	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	01: Allowed	
Storing of setting values in EEPROM	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 10	
Re-calculation of internal constant	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	

Return data: Data stored from inverter to TS2060

* When the initialize parameter of “b084” is set to “00”, only trip history is cleared.

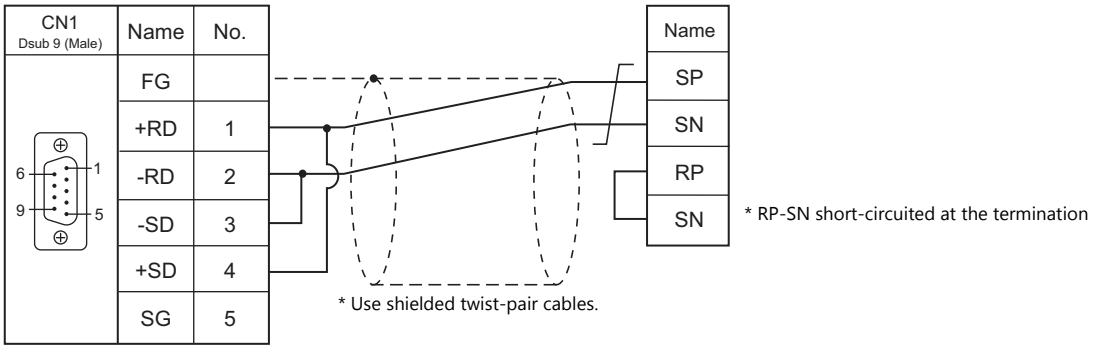
25.2.3 Wiring Diagrams

When Connected at CN1:

> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-485

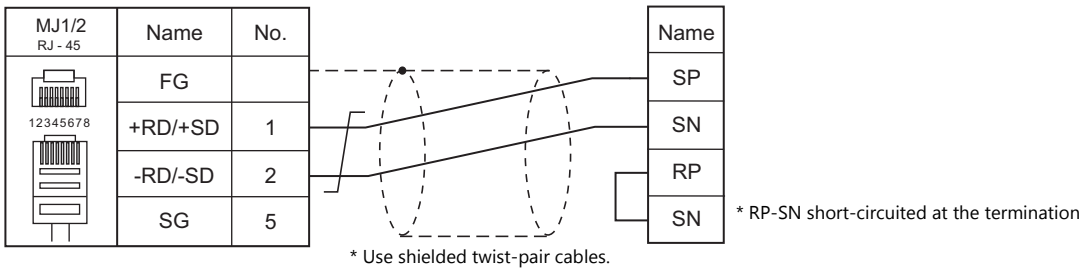
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-485

Wiring diagram 1 - M4



MEMO

26. HYUNDAI

26.1 PLC Connection

26.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1 TS2060i+ DUR-00	MJ1/MJ2 *1	MJ2 (4-wire)	
Hi4 Robot (MODBUS RTU)	Hi4-0010 Hi4-A010 Hi4-0018 Hi4-A018 Hi4-0002 Hi4-0000-CP	Serial port #1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		Serial port #2		Wiring diagram 2 - C2	Wiring diagram 2 - M2		
Hi5 Robot (MODBUS RTU)	Hi5	Serial port #1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		Serial port #2		Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		Serial port #1	RS-422/485	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Serial port #2		Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	

*1 Set the slide switch for signal selection of the MJ2 port to the RS-232C/485 position (upper).
For details, refer to “1.2.2 MJ1/MJ2” (page 1-6).

*2 For the ladder transfer function, see the TS2060 Reference Manual 2.

26.1.1 Hi4 Robot (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	0: Broadcast

PLC

Serial Port #1 / Serial Port #2

DIP switches of built-in PLC

DIPSW	Setting
SW1	OFF
SW2	OFF
SW3	OFF
SW4	OFF
SW5	ON
SW6	OFF
SW7	OFF
SW8	OFF

Communication setting

Set parameters using the dedicated controller.
Turn the key on the upper right of the controller clockwise to switch to manual mode. Press the “F2 System” button to display the system menu. Then select “2: Control parameter” with the cursor keys.
For more information, refer to the manual issued by HYUNDAI.

Item	Setting	Remarks
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Character length	**8 bits**	
Stop bit	1 / 2 bits	
Parity bit	Disable / Odd / Even	
Port usage	**MODBUS**	
Slave address	1 to 247	

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS2060.

Available Device Memory

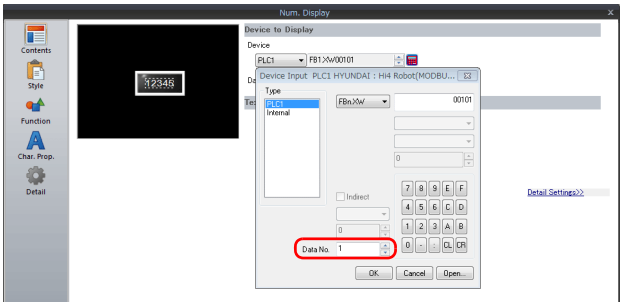
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
X	(External Input)	00H	XW as word device, read only
D0	(PLC Input)	01H	D0W as word device, read only
FBn.X	(Fieldbus Input)	02H	FBn.XW as word device, read only *1
T	(Timer (Contact))	04H	Read only
C	(Counter (Contact))	05H	Read only
AI	(Analog Input)	06H	Read only
Y	(External Output)	07H	YW as word device
DI	(PLC Output)	08H	DIW as word device
FBn.Y	(Fieldbus Output)	09H	FBn.YW as word device, read only *1
SP	(Special)	0BH	SPW as word device
R	(Auxiliary)	0CH	RW as word device
K	(Keep)	0DH	KW as word device
TW	(Timer (Current Value))	0EH	
CW	(Counter (Current Value))	0FH	
A0	(Analog Output)	10H	
SW	(System Memory)	11H	
MW	(Data Memory)	12H	
V%	(V% variable)	13H	
RN	(RN Register)	14H	
V$	(V$ Variable)	15H	*2
V!	(V! Variable)	16H	Real number

*1 Specify the array number for the data number.

Example: FBn.XW

Data No. of FBn device memory: 1 to 5



*2 The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is V$1.0 to V$65536.17.

Example: V$1.17

0 to 17
1 to 65536

Indirect Device Memory Designation

	15 8	7 0
n+0	Model	Device type
n+1	Address No. *1	
n+2	Expansion code *2	Bit designation
n+3	00	Station number

*1 Address numbers

- Other than V$ device memory:
  Specify the value obtained by subtracting "1" from the actual address.
- V$ device memory:
  V$20.17
  [B]: 0 to 17
  [A]: 1 to 65536

  Designate the address number as follows: ([A] - 1) * 18 + [B] = (20 - 1) * 18 + 17 = 359 (DEC)

*2 FBn.XW, FBn.YW device memory

15							8
0	0	0	0				0

Data No.: 1 to 5

26.1.2 Hi5 Robot (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	0: Broadcast

PLC

Serial Port #1 / Serial Port #2

DIP switches of built-in PLC

DIPSW	Setting
SW1	OFF
SW2	OFF
SW3	OFF
SW4	OFF
SW5	ON
SW6	OFF
SW7	OFF
SW8	OFF

Communication setting

Set parameters using the dedicated controller.
Turn the key on the upper right of the controller clockwise to switch to manual mode. Press the “F2 System” button to display the system menu. Then select “2: Control parameter” with the cursor keys.
For more information, refer to the manual issued by HYUNDAI.

Item	Setting	Remarks
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Character length	**8 bits**	
Stop bit	1 / 2 bits	
Parity bit	Disable / Odd / Even	
Port usage	**MODBUS**	
Communication	RS-232C / RS-422 / RS-485	
Slave address	1 to 247	

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS2060.

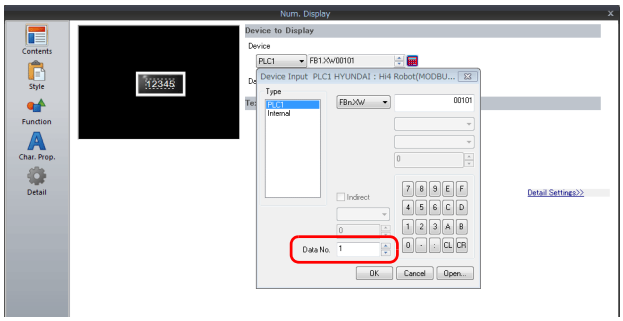
Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
X	(External Input)	00H	XW as word device, read only
D0	(PLC Input)	01H	D0W as word device, read only
FBn.X	(Fieldbus Input)	02H	FBn.XW as word device, read only *1
FNn.X	(Fieldbus Node Input)	03H	FNn.XW as word device, read only *1
T	(Timer (Contact))	04H	Read only
C	(Counter (Contact))	05H	Read only
AI	(Analog Input)	06H	Read only
Y	(External Output)	07H	YW as word device
DI	(PLC Output)	08H	DIW as word device
FBn.Y	(Fieldbus Output)	09H	FBn.YW as word device, read only *1
FNn.Y	(Fieldbus Node Output)	0AH	FNn.YW as word device, read only *1
SP	(Special)	0BH	SPW as word device
R	(Auxiliary)	0CH	RW as word device
K	(Keep)	0DH	KW as word device
TW	(Timer (Current Value))	0EH	
CW	(Counter (Current Value))	0FH	
A0	(Analog Output)	10H	
SW	(System Memory)	11H	
MW	(Data Memory)	12H	
V%	(V% Variable)	13H	
RN	(RN Register)	14H	
V$	(V$ Variable)	15H	*2
V!	(V! Variable)	16H	Real number
XL	(External Input (Dword))	17H	Read only, double-word
D0L	(PLC Input (Dword))	18H	Read only, double-word
FBn.XL	(Fieldbus Input (Dword))	19H	Read only, double-word *1
FNn.XL	(Fieldbus Node Input (Dword))	1AH	Read only, double-word *1
YL	(External Output (Dword))	1BH	Double-word
DIL	(PLC Output (Dword))	1CH	Double-word
FBn.YL	(Fieldbus Output (Dword))	1DH	Double-word *1
FNn.YL	(Fieldbus Node Output (Dword))	1EH	Double-word *1
SPL	(Special (Dword))	1FH	Double-word
RL	(Auxiliary (Dword))	20H	Double-word
KL	(Keep (Dword))	21H	Double-word
TL	(Timer (Current Value) (Dword))	22H	Double-word
CL	(Counter (Current Value) (Dword))	23H	Double-word
SL	(System Memory (Dword))	24H	Double-word
ML	(Data Memory (Dword))	25H	Double-word

*1 Specify the array number for the data number.

Data No. of FBn: 1 to 5
Data No. of FNn: 1 to 64



*2 The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is V$1.0 to V$65536.17.

Example: V$1.17
0 to 17
1 to 65536

Indirect Device Memory Designation

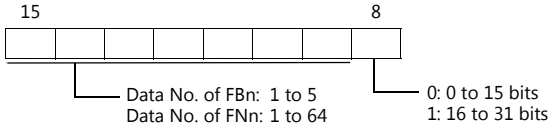
	15	8 7	0
n+0	Model		Device type
n+1	Address No. *1		
n+2	Expansion code *2		Bit designation
n+3	00		Station number

*1 Address numbers

- Other than V$ device memory:
  Specify the value obtained by subtracting "1" from the actual address.
- V$ device memory:
  V$20.17
  [B]: 0 to 17
  [A]: 1 to 65536

  Designate the address number as follows: ([A] - 1) * 18 + [B] = (20 - 1) * 18 + 17 = 359 (DEC)

*2 FBn.XW, FNn.XW, FBn.YW, FNn.YW, FBn.X, FNn.XL, FBn.YL, FNn.YL device memory



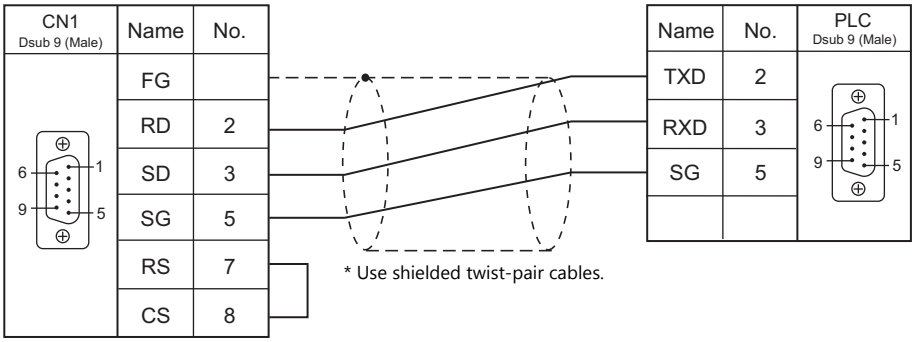
26.1.3 Wiring Diagrams

When Connected at CN1:

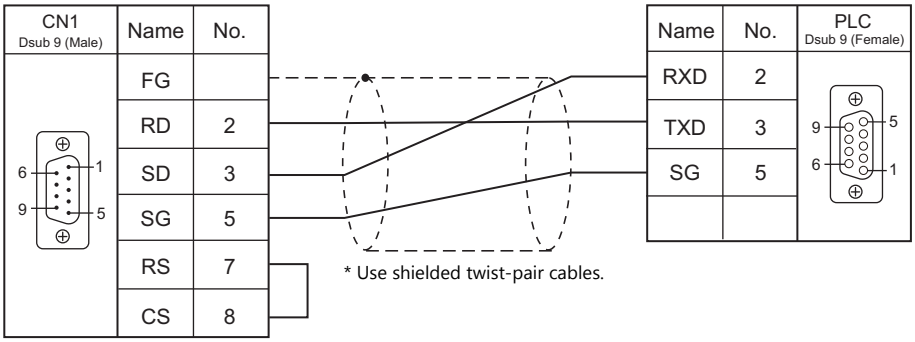
> **CAUTION**
> - The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
> - The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

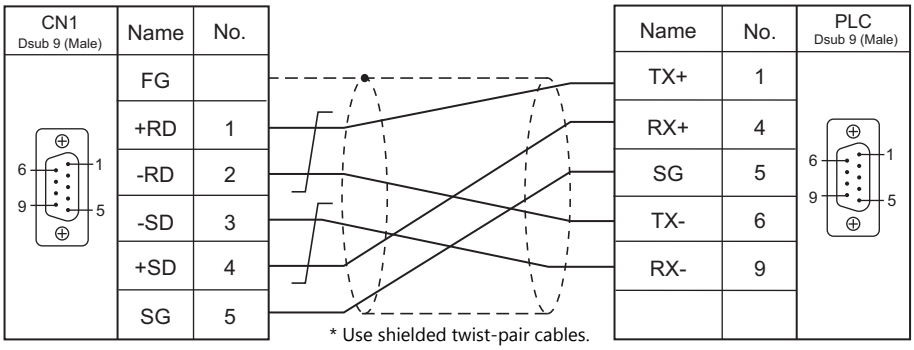


Wiring diagram 2 - C2

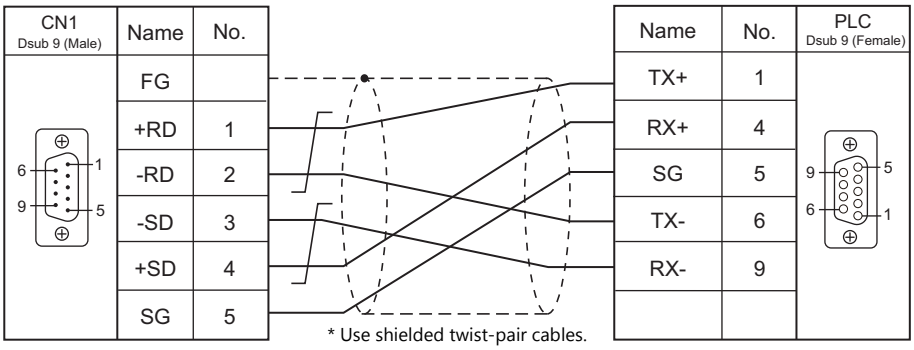


RS-422/RS-485

Wiring diagram 1 - C4



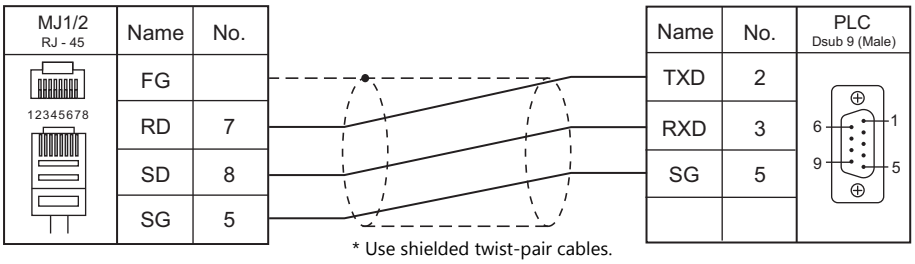
Wiring diagram 2 - C4



When Connected at MJ1/MJ2:

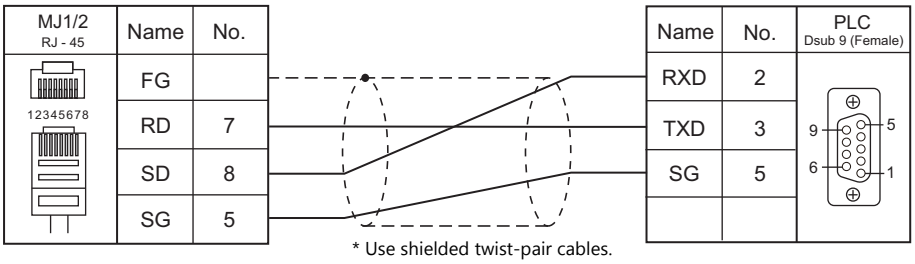
RS-232C

Wiring diagram 1 - M2



* Use shielded twist-pair cables.

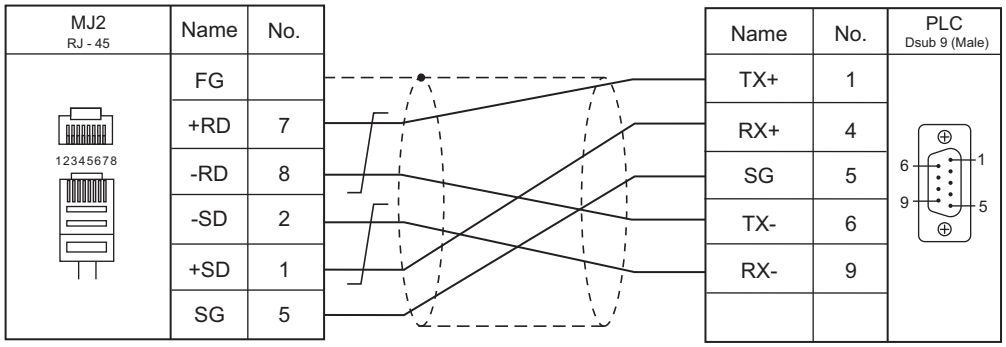
Wiring diagram 2 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

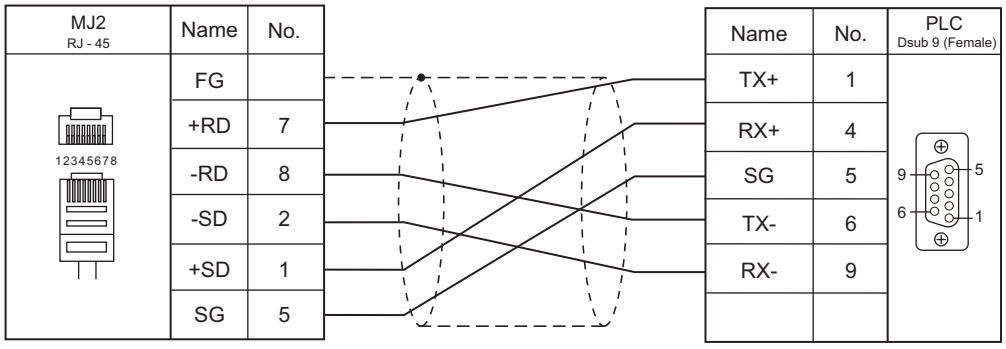
Wiring diagram 1 - M4



* Slide switch RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 2 - M4



* Slide switch RS-422 (lower)

* Use shielded twist-pair cables.

MEMO

Connection Compatibility List

December, 2017

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
A&D	AD4402 (MODBUS RTU)	○	○	○				
	AD4404 (MODBUS RTU)	○	○	○				
Agilent	4263 series	○		○	○			
Allen-Bradley	PLC-5	○	○	○	○	○	○	
	PLC-5 (Ethernet)	○	○					
	Control Logix / Compact Logix	○		○				
	Control Logix (Ethernet)	○	○					
	SLC500	○	○	○				
	SLC500 (Ethernet TCP/IP)	○	○					
	NET-ENI (SLC500 Ethernet TCP/IP)	○	○					
	NET-ENI (MicroLogix Ethernet TCP/IP)	○	○					
	Micro Logix	○	○	○				
	Micro Logix (Ethernet TCP/IP)	○	○					
	Micro800 Controllers	○		○				
	Micro800 Controllers (Ethernet TCP/IP)	○	○					
Automationdirect	Direct LOGIC (K-Sequence)	○		○				
	Direct LOGIC (Ethernet UDP/IP)	○	○					
	Direct LOGIC (MODBUS RTU)	○	○	○				
Azbil	MX series	○	○	○	○	○		
	SDC10	○	○	○	○			
	SDC15	○	○	○	○	○		
	SDC20	○	○	○	○			
	SDC21	○	○	○	○			
	SDC25/26	○	○	○	○	○		
	SDC30/31	○	○	○	○			
	SDC35/36	○	○	○				
	SDC45/46	○	○	○	○	○		
	SDC40A	○	○	○	○			
	SDC40G	○	○	○	○			
	DMC10	○	○	○				
	DMC50(COM)	○	○	○				
	AHC2001	○	○	○				
	AHC2001+DCP31/32	○	○	○				
	DCP31/32	○	○	○	○			
	NX(CPL)	○	○	○	○	○		
	NX(MODBUS RTU)	○	○	○	○	○		
	NX(MODBUS TCP/IP)	○	○					
Banner	PresencePLUS (Ethernet/IP (TCP/IP))	○	○					
Baumuller	BMx-x-PLC	○		○				
BECKHOFF	ADS protocol (Ethernet)	○	○					
Bosch Rexroth	Indra Drive		○					
CHINO	LT400 Series (MODBUS RTU)	○	○	○	○	○		
	DP1000	○	○	○	○			
	DB100B (MODBUS RTU)	○	○	○	○			
	KR2000 (MODBUS RTU)	○	○	○	○			
	LT230 (MODBUS RTU)	○	○	○	○			
	LT300 (MODBUS RTU)	○	○	○	○			
	LT830 (MODBUS RTU)	○	○	○	○			
CIMON	BP series	○		○	○			
	CP series	○		○	○			
	S series	○	○	○	○	○		
	S series (Ethernet)	○	○					
DELTA	DVP series	○	○	○				
	DVP-SE (MODBUS ASCII)	○	○	○	○	○		
	DVP-SE (MODBUS TCP/IP)	○	○					
DELTA TAU DATA SYSTEMS	PMAC	○		○	○			
	PMAC(Ethernet TCP/IP)	○	○					
EATON Cutler-Hammer	ELC	○	○	○				
EMERSON	EC10/20/20H (MODBUS RTU)	○	○	○	○			
FANUC	Power Mate	○		○				
Fatek Automation	FACON FB Series	○	○	○				

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
FESTO	FEC	○		○	○			
FUFENG	APC Series Controller	○	○	○	○	○		
Fuji Electric	MICREX-F series	○	○	○			○	
	MICREX-F series V4-compatible	○	○	○				
	MICREX-F T-Link							○
	MICREX-F T-Link V4-compatible							○
	SPB (N mode) & FLEX-PC series	○	○	○				
	SPB (N mode) & FLEX-PC CPU	○		○				
Fuji Electric	MICREX-SX (T-Link)							○
	MICREX-SX (OPCN1)							○
	MICREX-SX (SX BUS)							○
	MICREX-SX SPH/SPB/SPM/SPE/SPF series	○		○				
	MICREX-SX SPH/SPB/SPM/SPE/SPF CPU	○		○				
	MICREX-SX (Ethernet)	○	○					
	PYX (MODBUS RTU)	○	○	○				
	PXR (MODBUS RTU)	○	○	○				
	PXF (MODBUS RTU)	○	○	○	○	○		
	PXG (MODBUS RTU)	○	○	○				
	PXH (MODBUS RTU)	○	○	○				
	PUM (MODBUS RTU)	○	○	○				
	F-MPC04P (loader)	○	○	○				
	F-MPC series / FePSU	○	○	○				
	FVR-E11S	○	○	○	○	○		
	FVR-E11S (MODBUS RTU)	○	○	○				
	FVR-C11S (MODBUS RTU)	○	○	○				
	FRENIC5000 G11S/P11S	○	○	○	○	○		
	FRENIC5000 G11S/P11S (MODBUS RTU)	○	○	○				
	FRENIC5000 VG7S (MODBUS RTU)	○	○	○				
	FRENIC-Ace (MODBUS RTU)	○	○	○	○	○		
	FRENIC-HVAC/AQUA (MODBUS RTU)	○	○	○	○	○		
	FRENIC-Mini (MODBUS RTU)	○	○	○				
	FRENIC-Eco (MODBUS RTU)	○	○	○				
	FRENIC-Multi (MODBUS RTU)	○	○	○				
	FRENIC-MEGA (MODBUS RTU)	○	○	○				
	FRENIC-MEGA SERVO(MODBUS RTU)	○	○	○	○	○		
	FRENIC-VG1(MODBUS RTU)	○	○	○	○	○		
	FRENIC series (loader)	○	○	○	○	○		
	HFR-C9K	○	○	○				
	HFR-C11K	○	○	○				
	HFR-K1K	○	○	○				
	PPMC (MODBUS RTU)	○	○	○				
	FALDIC-α series	○	○	○				
	FALDIC-W series	○	○	○	○	○		
	PH series	○	○	○	○	○		
	PHR (MODBUS RTU)	○	○	○				
	WA5000	○	○	○				
	APR-N (MODBUS RTU)	○	○	○				
	ALPHA5 (MODBUS RTU)	○	○	○				
	ALPHA5 Smart (MODBUS RTU)	○	○	○	○	○		
	WE1MA (Ver. A)(MODBUS RTU)	○	○	○	○	○		
	WE1MA (Ver. B)(MODBUS RTU)	○	○	○	○	○		
	WSZ series	○	○	○	○	○		
	WSZ series (Ethernet)	○	○					
Gammaflux	TTC2100	○	○	○				
GE Fanuc	90 series	○	○	○	○			
	90 series (SNP-X)	○		○				
	90 series (SNP)	○	○	○	○	○		
	90 series (Ethernet TCP/IP)	○	○					
	RX3i (Ethernet TCP/IP)	○	○					
Hitachi	HIDIC-S10/2α, S10mini	○		○				
	HIDIC-S10/2α, S10mini (Ethernet)	○	○					
	HIDIC-S10/4α	○		○	○			
	HIDIC-S10 (OPCN-1)							○
	HIDIC-S10V	○		○				
	HIDIC-S10V (Ethernet)	○	○					

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
Hitachi Industrial Equipment Systems	HIDIC-H	○	○	○			○	
	HIDIC-H (Ethernet)	○	○					
	HIDIC-EHV	○	○	○			○	
	HIDIC-EHV (Ethernet)	○	○					
	SJ300 series	○	○	○	○			
	SJ700 series	○	○	○	○			
HYUNDAI	Hi5 Robot (MODBUS RTU)	○	○	○	○	○		
	Hi4 Robot (MODBUS RTU)	○	○	○	○	○		
IAI	X-SEL controller	○	○	○				
	ROBO CYLINDER (RCP2/ERC)	○	○	○	○	○		
	ROBO CYLINDER (RCS/E-CON)	○	○	○	○	○		
	PCON/ACON/SCON (MODBUS RTU)	○	○	○				
IDEC	MICRO 3	○	○	○				
	MICRO Smart	○	○	○				
	MICRO Smart pentra	○	○	○	○			
Jetter	JetControl Series2/3 (Ethernet UDP/IP)	○	○					
JTEKT	TOYOPUC	○	○	○			○	
	TOYOPUC (Ethernet)	○	○					
	TOYOPUC (Ethernet PC10 mode)	○	○					
	TOYOPUC-Plus	○	○	○	○	○		
	TOYOPUC-Plus (Ethernet)	○	○					
	TOYOPUC-Nano (Ethernet)	○	○					
KEYENCE	KZ Series Link	○	○	○	○	○	○	
	KZ-A500 CPU	○		○				
	KZ/KV series CPU	○		○	○			
	KZ24/300 CPU	○		○	○			
	KV10/24 CPU	○		○				
	KV-700	○		○				
	KV-700 (Ethernet TCP/IP)	○	○					
	KV-1000	○		○				
	KV-1000 (Ethernet TCP/IP)	○	○					
	KV-3000/5000	○		○				
	KV-3000/5000 (Ethernet TCP/IP)	○	○					
	KV-7000 (Ethernet TCP/IP)	○	○					
Koatsu Gas Kogyo	R-BLT	○						
KOGANEI	IBFL-TC	○	○	○	○	○		
KOYO ELECTRONICS	SU/SG	○	○	○	○			
	SR-T (K protocol)	○		○	○			
	SU/SG (K-Sequence)	○		○				
	SU/SG (Modbus RTU)	○	○	○				
Lenze	ServoDrive9400 (Ethernet TCP/IP)	○	○					
LS	MASTER-KxxxS	○		○				
	MASTER-KxxxS CNET	○	○	○				
	MASTER-K series (Ethernet)	○	○					
	GLOFA CNET	○	○	○	○		○	
	GLOFA GM7 CNET	○	○	○	○	○		
	GLOFA GM series CPU	○		○	○			
	GLOFA GM series (Ethernet UDP/IP)	○	○					
	XGT/XGK series CNET	○	○	○				
	XGT/XGK series CPU	○		○				
	XGT/XGK series (Ethernet)	○	○					
	XGT/XGI series CNET	○	○	○	○	○		
	XGT/XGI series CPU	○		○	○			
	XGT/XGI series (Ethernet)	○	○					

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
MITSUBISHI ELECTRIC	A series link	○	○	○			○	
	A series CPU	○		○				
	A series (OPCN1)							○
	QnA series link	○	○	○	○	○		
	QnA series CPU	○		○	○			
	QnA series (Ethernet)	○	○					
	QnH (Q) series link	○	○	○	○	○		
	QnH (Q) series CPU	○		○	○			
	QnU series CPU	○		○	○			
	Q00J/00/01CPU	○		○	○			
	QnH (Q) series (Ethernet)	○	○					
	QnH (Q) series link (multi CPU)	○	○	○	○	○		
	QnH (Q) series (multi CPU) (Ethernet)	○	○					
	QnH (Q) series CPU (multi CPU)	○		○	○			
MITSUBISHI ELECTRIC	QnH (Q) series (Ethernet ASCII)	○	○					
	QnH (Q) series (multi CPU) (Ethernet ASCII)	○	○					
	QnU series (built-in Ethernet)	○	○					
	L series link	○	○	○	○			
	L series (built-in Ethernet)	○	○					
	L series CPU	○		○	○			
	A series (CC-Link)							○
	QnA series (CC-Link)							○
	QnH (Q) series (CC-LINK)							○
	FX series CPU	○		○				
	FX2N/1N series CPU	○		○				
	FX1S series CPU	○		○				
	FX series link (A protocol)	○	○	○			○	
	FX-3U/3UC/3G series CPU	○		○				
	FX-3U/3GE series (Ethernet)	○	○					
	FX3U/3UC/3UG series link(A protocol)	○	○	○			○	
	FX-5U/5UC series	○	○	○				
	FX-5U/5UC series (Ethernet)	○	○					
	A-Link + Net10		○					
	Q170MCPU (multi CPU)	○		○	○			
	Q170 series (multi CPU) (Ethernet)	○	○					
	iQ-R series (Built-in Ethernet)	○	○					
	iQ-R series link	○	○	○	○	○		
	iQ-R series (Ethernet)	○	○					
	FR-*500	○	○	○				
	FR-V500	○	○	○				
	MR-J2S-*A	○	○	○	○			
	MR-J3-*A	○	○	○	○			
	MR-J3-*T	○	○	○	○			
	MR-J4-*A	○	○	○	○			
	FR-E700	○	○	○	○			
MODICON	Modbus RTU	○		○	○			
MOELLER	PS4	○		○	○			
MOOG	J124-04x	○	○	○	○			
M-SYSTEM	R1M series (MODBUS RTU)	○	○	○	○	○		

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
OMRON	SYSMAC C	○	○	○			○	
	SYSMAC C (OPCN-1)							○
	SYSMAC CV	○	○	○			○	
	SYSMAC CS1/CJ1	○	○	○				
	SYSMAC CS1/CJ1 DNA	○	○					
	SYSMAC CS1/CJ1 (Ethernet)	○	○					
	SYSMAC CS1/CJ1 (Ethernet Auto)	○	○					
	SYSMAC CS1/CJ1 DNA (Ethernet)	○	○					
	NJ Series (EtherNet/IP)	○	○					
	E5AK	○	○	○	○			
	E5AK-T	○	○	○	○	○		
	E5AN/E5EN/E5CN/E5GN	○	○	○				
	E5AR/E5ER	○	○	○				
	E5CK	○	○	○	○			
	E5CK-T	○	○	○	○	○		
	E5CN-HT	○	○	○	○	○		
	E5EK	○	○	○	○			
	E5ZD	○	○	○	○			
	E5ZE	○	○	○	○			
	E5ZN	○	○	○	○			
	V600/620/680	○	○	○				
	KM20	○	○	○	○			
	KM100	○	○	○	○			
	V680S (Ethernet TCP/IP)	○	○					
Oriental Motor	High-efficiency AR series (MODBUS RTU)	○	○	○	○	○		
	CRK series (MODBUS RTU)	○	○	○	○	○		
Panasonic	FP Series (RS232C/422)	○	○	○			○	
	FP Series (TCP/IP)	○	○					
	FP Series (UDP/IP)	○	○					
	FP-X (TCP/IP)	○	○					
	FP7 Series (RS232C/422)	○	○	○	○	○		
	FP7 Series (Ethernet)	○	○					
	LP-400	○		○				
	KW Series	○	○	○	○	○		
	MINAS A4 series	○	○	○	○	○		
RKC	SR-Mini (MODBUS RTU)	○	○	○				
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)	○	○	○				
	SR-Mini (Standard Protocol)	○	○	○				
	REX-F400/F700/F900(Standard Protocol)	○	○	○	○			
	REX-F9000 (Standard Protocol)	○	○	○	○	○		
	SRV (MODBUS RTU)	○	○	○				
	MA900/MA901 (MODBUS RTU)	○	○	○				
	SRZ (MODBUS RTU)	○	○	○				
	FB100/FB400/FB900 (MODBUS RTU)	○	○	○	○	○		
RS Automation	NX7/NX Plus Series (70P/700P/CCU+)	○	○	○	○	○	○	
	N7/NX Series (70/700/750/CCU)	○	○	○			○	
	NX700 Series (Ethernet)	○	○					
	X8 Series	○	○	○	○	○	○	
	X8 Series (Ethernet)	○	○					
	CSD5 (MODBUS RTU)	○	○	○	○	○		
	Moscon-F50 (MODBUS RTU)	○	○	○	○	○		
SAIA	PCD	○	○	○				
	PCD S-BUS (Ethernet)	○	○					
SAMSUNG	SPC series	○	○	○	○	○	○	
	N_plus	○	○	○	○	○	○	
	SECNET	○	○	○			○	
SANMEI	Cuty Axis	○	○	○	○	○		
SanRex	DC AUTO (HKD type)	○	○	○				

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
SHARP	JW series	○	○	○			○	
	JW100/70H COM port	○	○	○			○	
	JW20 COM port	○	○	○			○	
	JW series (Ethernet)	○	○					
	JW300 series	○	○	○	○		○	
	JW311/312/321/322 series (Ethernet)	○	○					
	JW331/332/341/342/352/362 series (Ethernet)	○	○					
	DS-30D	○	○	○	○	○		
	DS-32D	○	○	○	○	○		
SHIMADEN	SHIMADEN standard protocol	○	○	○	○			
SHINKO TECHNOS	C Series	○	○	○	○	○		
	FC Series	○	○	○	○	○		
	GC Series	○	○	○	○	○		
	DCL-33A	○	○	○				
	JCx-300 Series	○	○	○	○	○		
	PC-900	○	○	○	○	○		
	PCD-33A	○	○	○	○	○		
	ACS-13A	○	○	○	○	○		
	ACD/ACR Series	○	○	○	○	○		
	WCL-13A	○	○	○	○	○		
Siemens	S5 PG port	○	○	○	○	○		
	S7	○		○				
	S7-200 PPI	○	○				○	
	S7-200 (Ethernet ISOTCP)	○	○					
	S7-300/400 MPI	○	○					
	S7-300/400 (Ethernet ISOTCP)	○	○					
	S7-300/400 (Ethernet TCP/IP PG protocol)	○	○					
	S7-1200/1500 (Ethernet ISOTCP)	○	○					
	S7 PROFIBUS-DP							○
	TI500/505	○	○	○	○	○		
	TI500/505 V4-compatible	○	○	○	○	○		
	S120 (Ethernet ISOTCP)	○	○					
SINFONIA TECHNOLOGY	SELMART	○	○	○			○	
SUS	XA-A*	○		○	○			
TECO	TP-03 (MODBUS RTU)	○	○	○				
Telemecanique	TSX Micro						○	
TOHO	TTM-000	○	○	○	○	○		
	TTM-00BT	○	○	○				
	TTM-200 (MODBUS RTU)	○	○	○				
Tokyo Chokoku Marking Products	MB3315/1010	○						
TOSHIBA	T series / V series (T compatible)	○	○	○	○		○	
	T series / V series (T compatible) (Ethernet UDP/IP)	○	○					
	EX series	○	○	○	○			
	nv series (Ethernet UDP/IP)	○	○					
	VF-S7	○	○	○	○			
	VF-S9	○	○	○	○			
	VF-S11	○	○	○	○			
	VF-S15	○	○	○	○	○		
	VF-A7	○	○	○				
	VF-AS1	○	○	○	○			
	VF-P7	○	○	○	○			
	VF-PS1	○	○	○	○			
	VF-FS1	○	○	○	○			
	VF-MB1	○	○	○	○	○		
	VF-nC1	○	○	○	○			
	VF-nC3	○	○	○	○	○		
TOSHIBA MACHINE	TC200	○	○	○				
	VELCONIC series		○					
TOYO DENKI	µGPCsx (OPCN-1)							○
	µGPCsx (SX BUS)							○
	µGPCsx series	○		○	○			
	µGPCsx CPU	○		○	○			
	µGPCsx series (Ethernet)	○	○					
TURCK	BL Series Distributed I/O (MODBUS TCP/IP)	○	○					
Ultra Instruments	UICCPU (MODBUS RTU)	○		○	○			

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link	Network
ULVAC	G-TRAN series	○	○	○	○	○		
UNIPULSE	F340A	○	○	○	○			
	F371	○	○	○	○			
	F800	○	○	○	○			
	F805A	○	○	○	○	○		
	F720A	○	○	○	○			
UNITRONICS	M90/M91/Vision Series (ASCII)	○	○	○				
	Vision Series (ASCII Ethernet TCP/IP)	○	○					
VIGOR	M series	○	○	○	○	○		
WAGO	750 series (MODBUS RTU)	○	○	○	○	○		
	750 series (MODBUS ETHERNET)	○	○					
XINJE	XC Series (MODBUS RTU)	○	○	○	○	○		
YAMAHA	RCX142	○		○				
Yaskawa Electric	Memobus	○	○	○				
	CP9200SH/MP900	○	○	○				
	MP2000 series	○	○	○	○	○		
	MP2300 (MODBUS TCP/IP)	○	○					
	CP MP expansion memobus (UDP/IP)	○	○					
	MP2000 series (UDP/IP)	○	○					
	MP3000 Series	○	○	○	○	○		
	MP3000 series (Ethernet UDP/IP)	○	○					
	MP3000 series expansion memobus (Ethernet)	○	○					
	DX200 (high-speed Ethernet)	○	○					
Yokogawa Electric	FA-M3	○	○	○			○	
	FA-M3R	○	○	○			○	
	FA-M3/FA-M3R (Ethernet UDP/IP)	○	○					
	FA-M3/FA-M3R (Ethernet UDP/IP ASCII)	○	○					
	FA-M3/FA-M3R (Ethernet TCP/IP)	○	○					
	FA-M3/FA-M3R (Ethernet TCP/IP ASCII)	○	○					
	FA-M3V	○	○	○	○	○	○	
	FA-M3V (Ethernet)	○	○					
	FA-M3V(Ethernet ASCII)	○	○					
	UT100	○	○	○				
	UT750	○	○	○				
	UT550	○	○	○				
Yokogawa Electric	UT520	○	○	○				
	UT350	○	○	○				
	UT320	○	○	○				
	UT2400/2800	○	○	○				
	UT450	○	○	○				
	UT32A/35A (MODBUS RTU)	○	○	○	○	○		
	UT52A/55A (MODBUS RTU)	○	○	○	○	○		
	UT75A (MODBUS RTU)	○	○	○	○	○		
	µR10000/20000 (Ethernet TCP/IP)	○	○					
None	Universal serial	○	○					
	Universal FL-Net							○
	General-purpose PROFIBUS-DP							○
	Universal DeviceNet							○
	Without PLC Connection							
	MODBUS RTU	○	○	○	○	○		
	MODBUS RTU EXT Format	○	○	○	○	○		
	MODBUS TCP/IP (Ethernet)	○	○					
	MODBUS TCP/IP (Ethernet) Sub Station	○	○					
	MODBUS TCP/IP (Ethernet) EXT Format	○	○					
	MODBUS ASCII	○	○	○	○	○		

Slave Communication

Manufacturer	Models	Setting	Remarks
None	Universal serial	○	
	V-Link	○	
	Modbus slave (RTU)	○	
	Modbus slave (TCP/IP)	○	
	Modbus slave (ASCII)	○	

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