

MONITOUCH

Connection Manual [3]

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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.

[illegible]

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.
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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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Connection Compatibility List

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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.

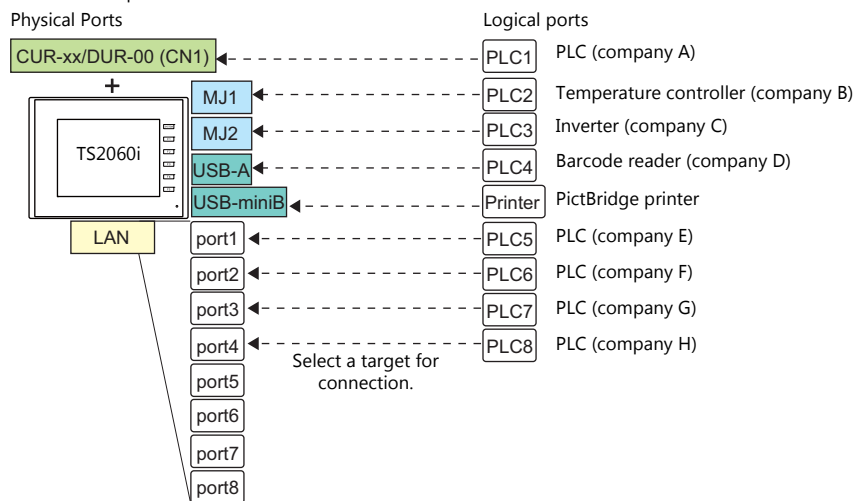
TS2060i

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:



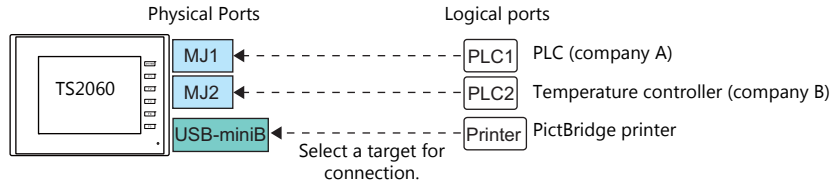
| Physical Ports | | | | No. of Ports | Connected Device | |
|----------------|------------|--|---------------------------|--------------|--|--|
| | | | | | 8-way communication | Other than 8-way |
| Serial | CN1 | RS-232C / RS-422/485 | The "DUR-00" is required. | 1 | PLC, temperature controller, servo, 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".

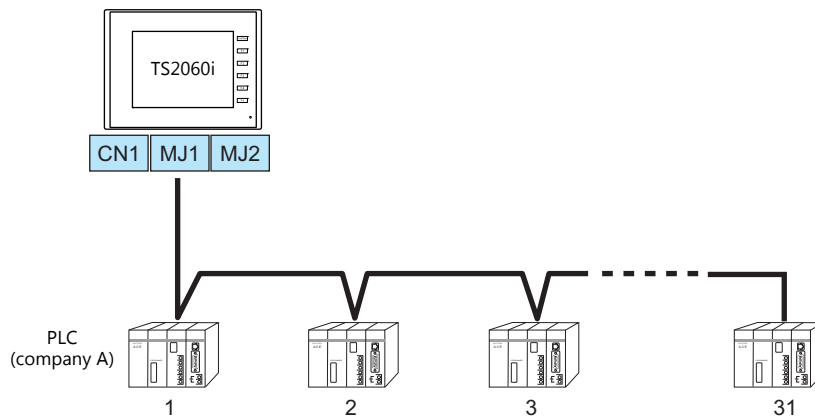


- 1 : n Connection

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".

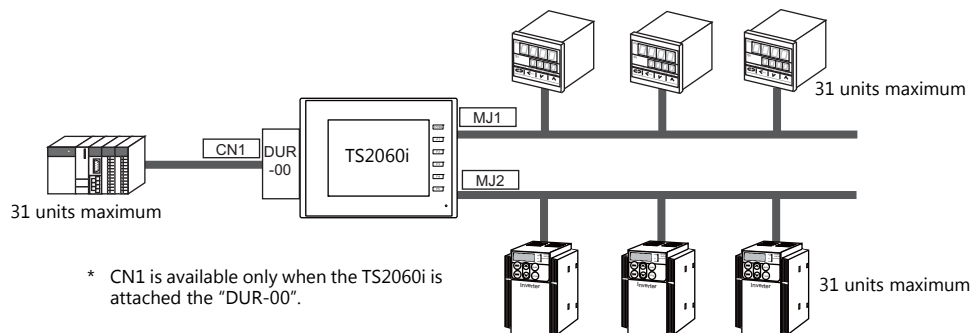
* CN1 is available only when the TS2060i is attached the "DUR-00".



- 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.



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

- 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".

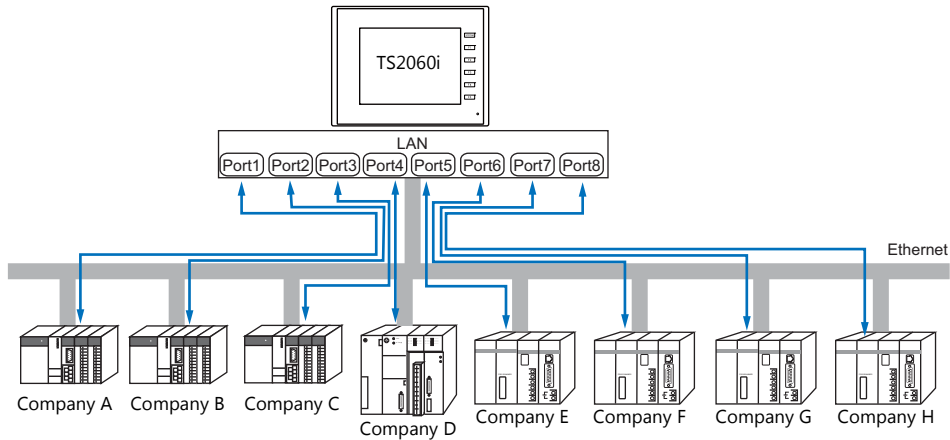
- n : n Connection

Multiple TS2060 units can be connected to multiple PLCs.

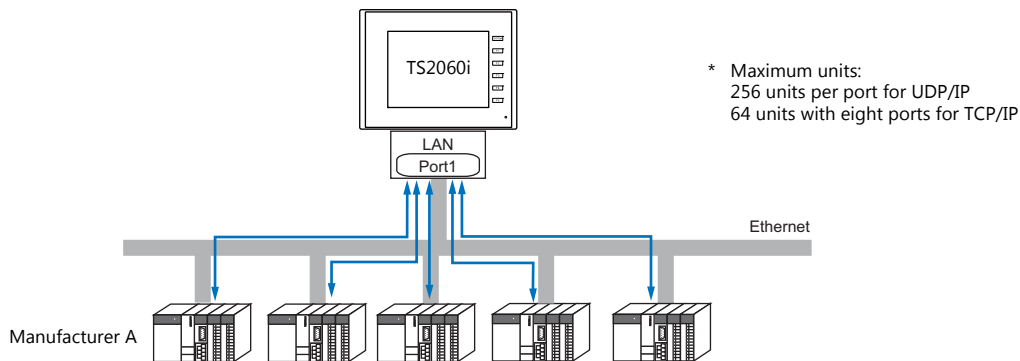
For more information, refer to "n : n Connection (1 : n Multi-link2 (Ethernet)) (TS2060i Only)" (page 1-34) in "1.3 Connection Methods".

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.



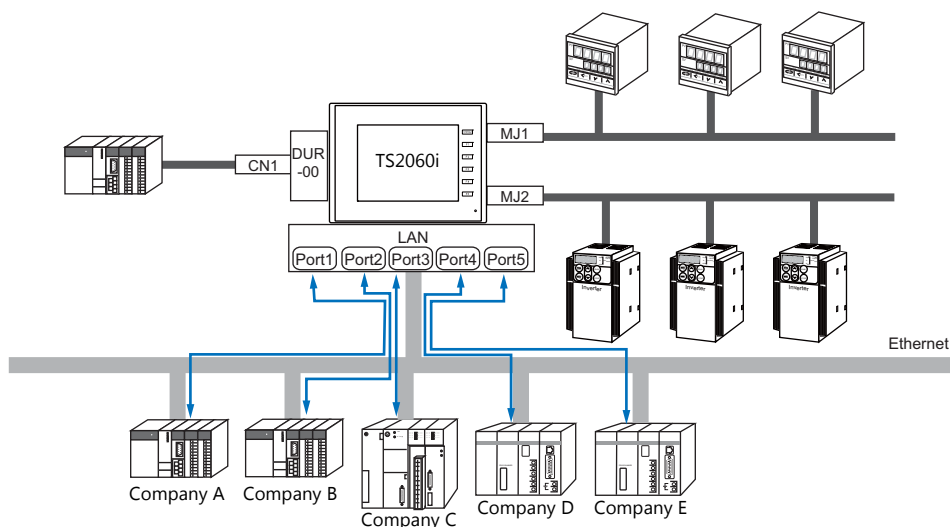
* Maximum units:
256 units per port for UDP/IP
64 units with eight ports for TCP/IP

* 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.



- 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).

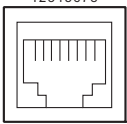
MJ1 is also usable as a screen program transfer port.

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 |

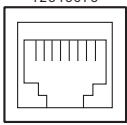
*1 Only available with TS2060i. The externally supplied +5 V signal is not output with the TS2060 (model name without "i").

*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

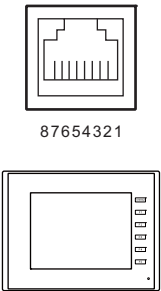
| Recommended Cable |
|--|
| Hakko Electronics' cable "V6-TMP" 3, 5, 10 m |

Notes on Configuring a Cable

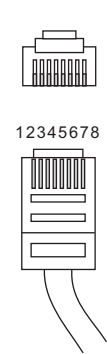
**CAUTION**

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)

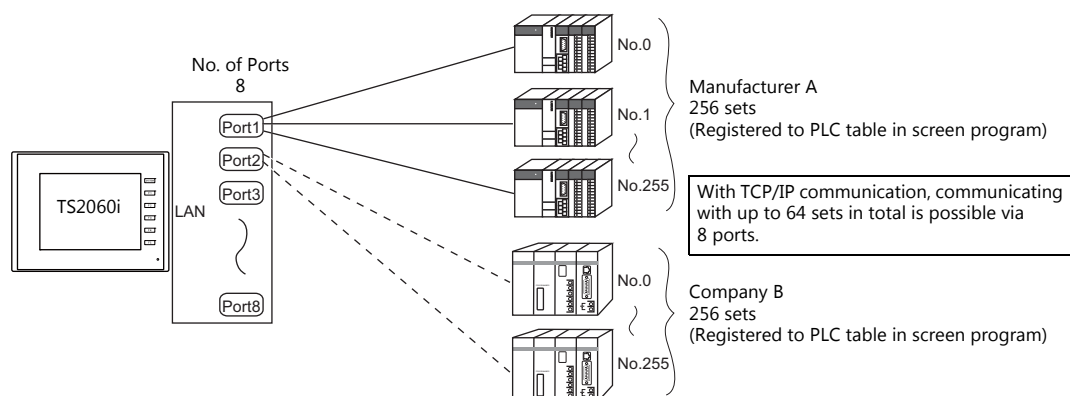
CAUTION

- 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

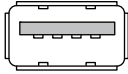

This communication port is supported only by the TS2060i. The "CUR-xx" and "DUR-00" cannot be attached to the TS2060 (model name without "i").

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.

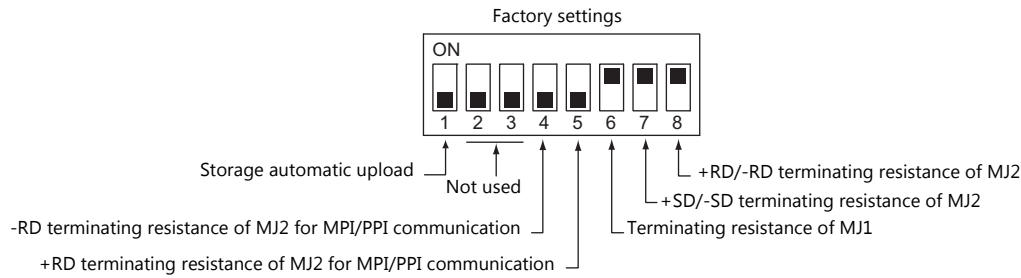
Applicable Devices

| 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.

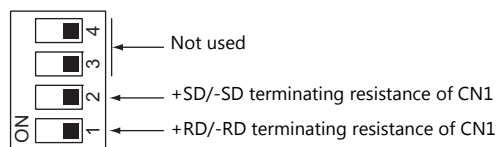
DIPSW6, DIPSW7, and DIPSW8 (Terminating Resistance for Serial Communication)

- 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

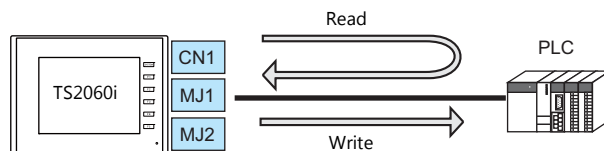
Maximum length of wiring

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.

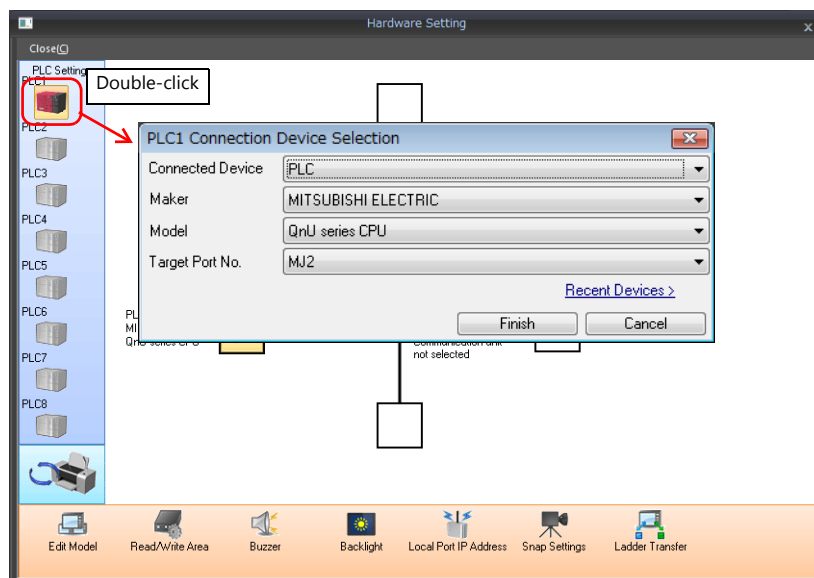


V-SFT Ver. 6 Settings

Hardware Settings

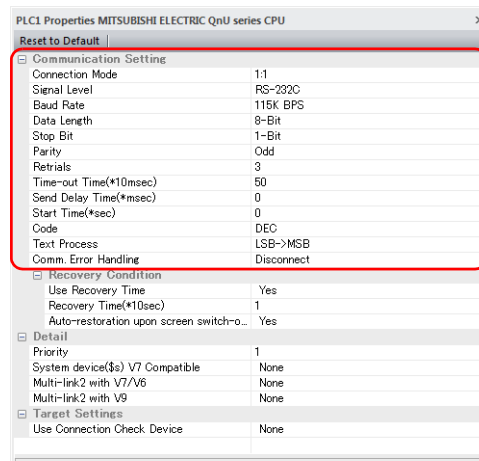
Selecting a device to be connected

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



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

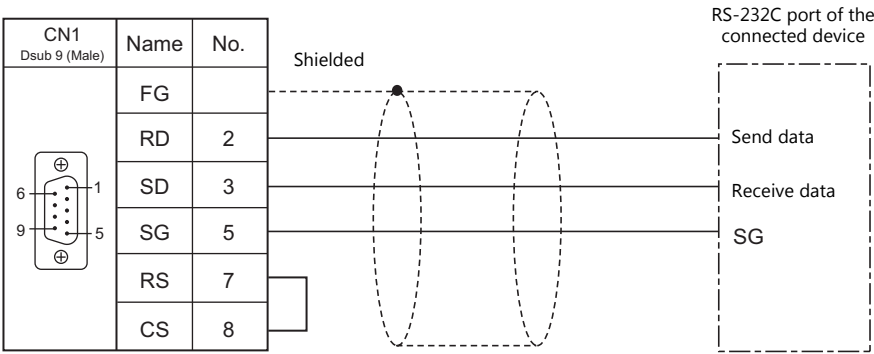
CN1



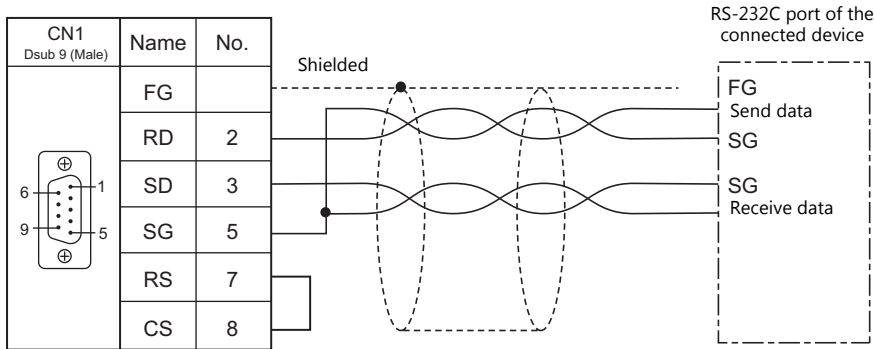
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

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.

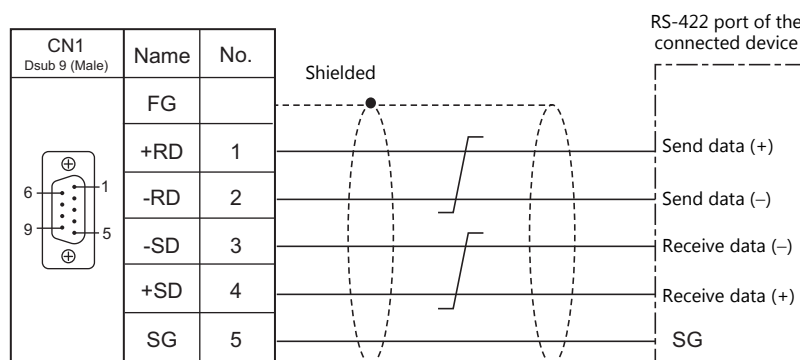


- If noise disturbs communications, establish connections between SD and SG and between RD and SG as pairs respectively, and connect a shielded cable to both the TS2060i and the connected device.

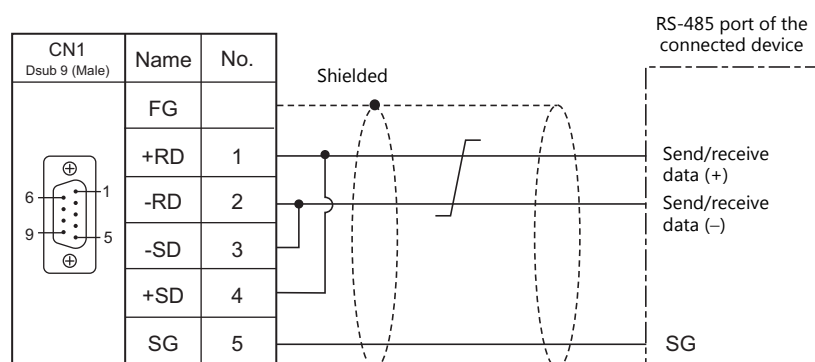


RS-422/RS-485 connection

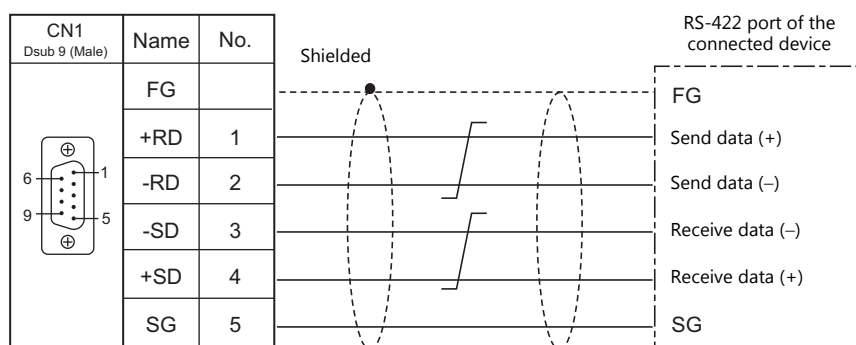
- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- The maximum length of wiring is 500 m.
 - * The maximum length varies depending on the connected device. Check the specifications for each device.
- Connect twisted pairs between +SD and –SD, and between +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)



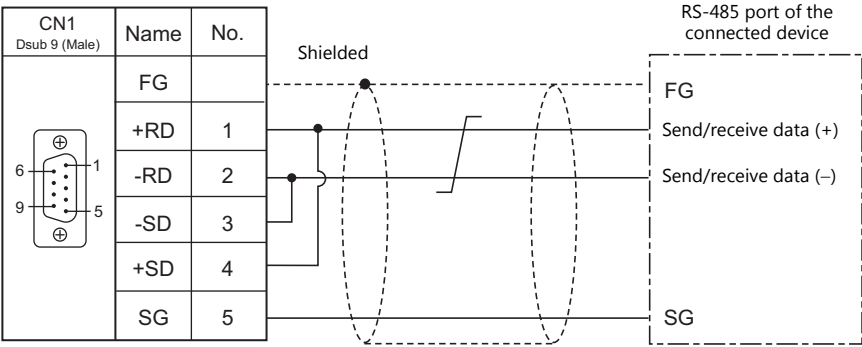
- RS-485 (2-wire system)



- 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

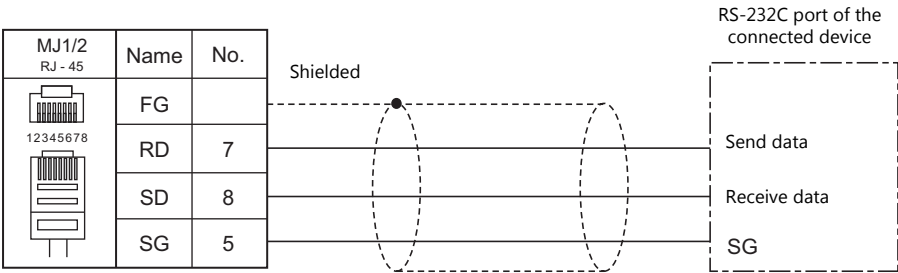
RS-232C connection



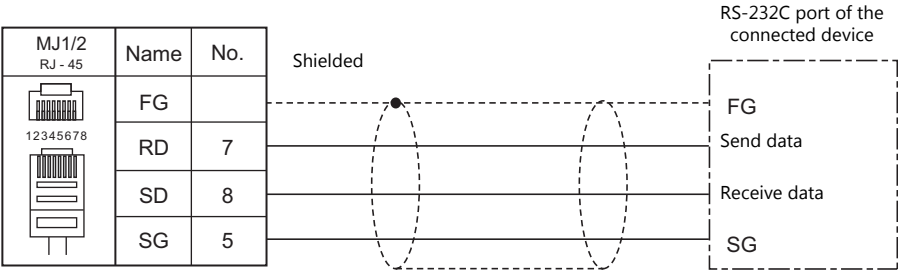
CAUTION

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.



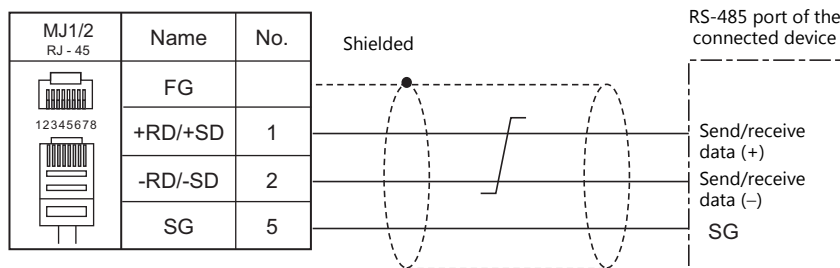
- If noise disturbs communications, connect a shielded cable to both the TS2060 and the connected device.



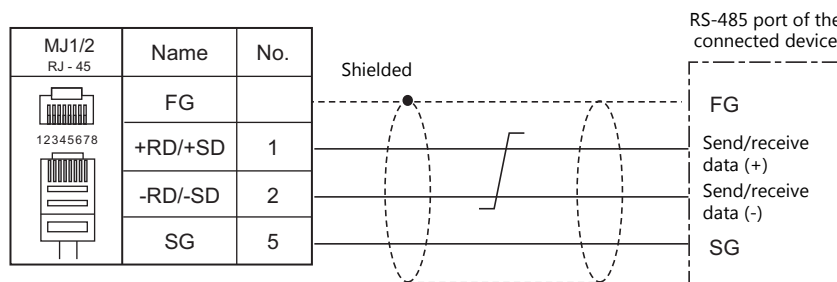
RS-485 (2-wire system) connection**CAUTION**

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.



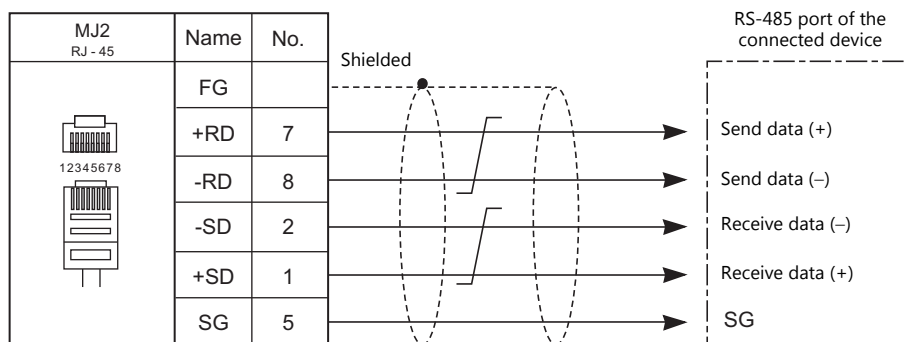
- If noise disturbs communications, connect a shielded cable to both the TS2060 and the connected device.



RS-422 (4-wire system) connection

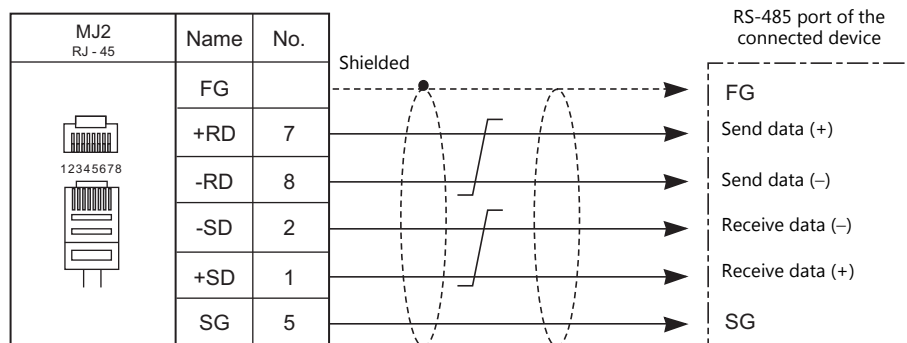
RS-422 (4-wire system) is supported by the MJ2 port only. Set the slide switch for signal level selection to RS-422 position (lower). The MJ1/MJ2 ports except these units are not usable for connection via RS-422 (4-wire system).

- 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.

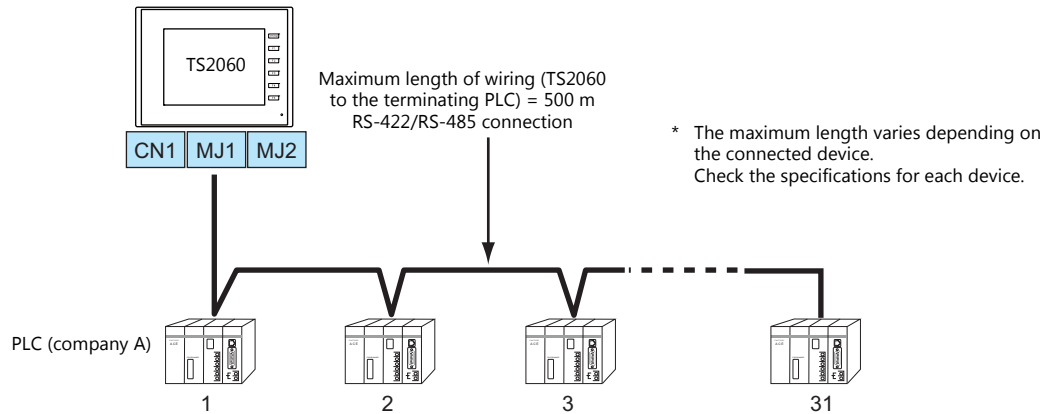


* Slide switch: RS-422 (lower)

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".



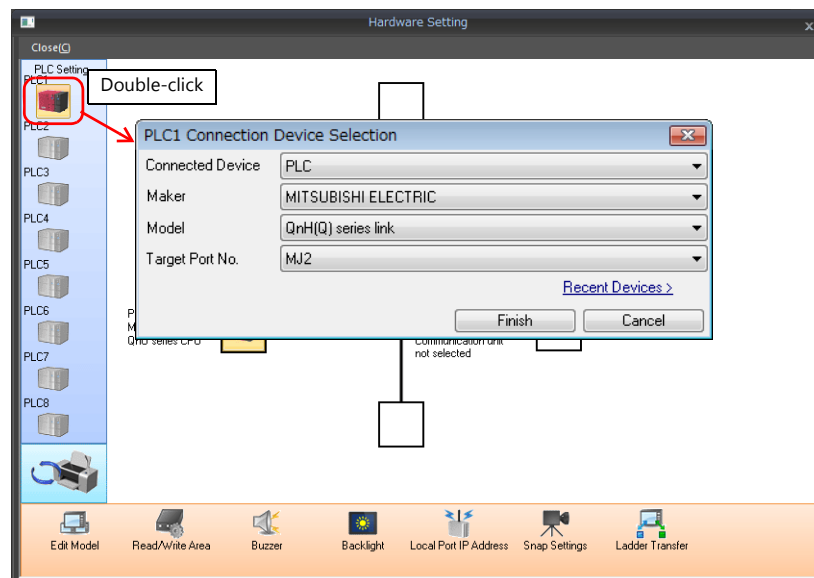
- The ladder transfer function is not available for a 1 : n connection.
- For models that support multi-drop connection, refer to the Connection Compatibility List provided at the end of this manual or the chapters on individual manufacturers.

V-SFT Ver. 6 Settings

Hardware Settings

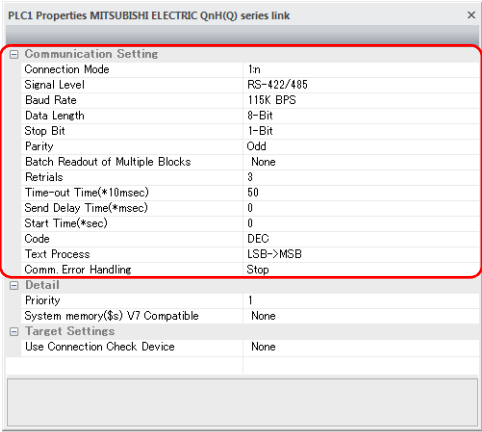
Selecting a device to be connected

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

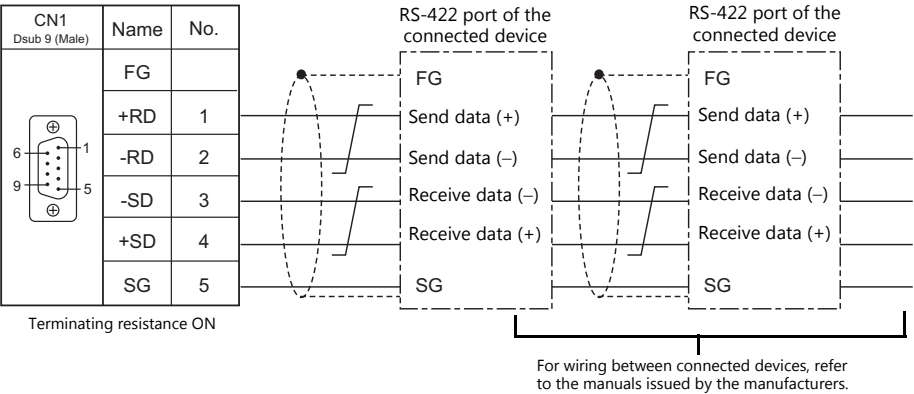
**CAUTION**

- 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.

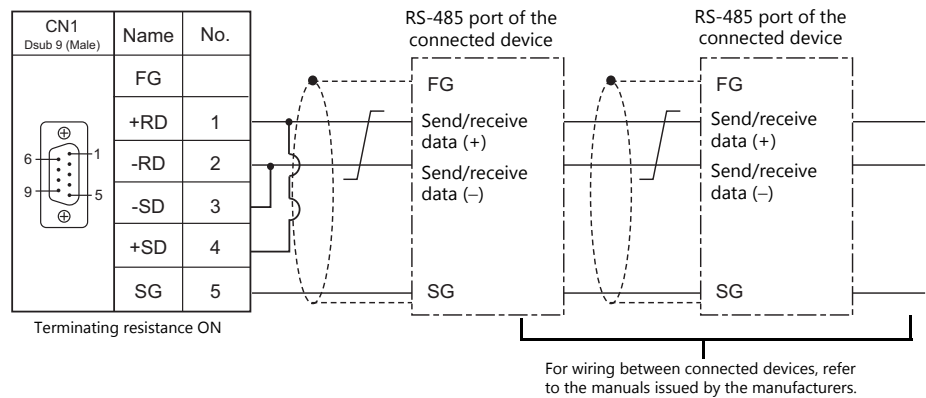
RS-422 (4-wire system) connection

- Connection example



RS-485 (2-wire system) connection

- Connection example

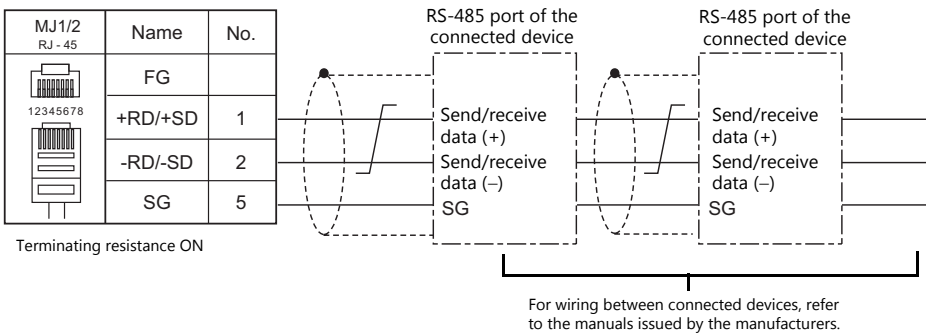


MJ1/MJ2

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



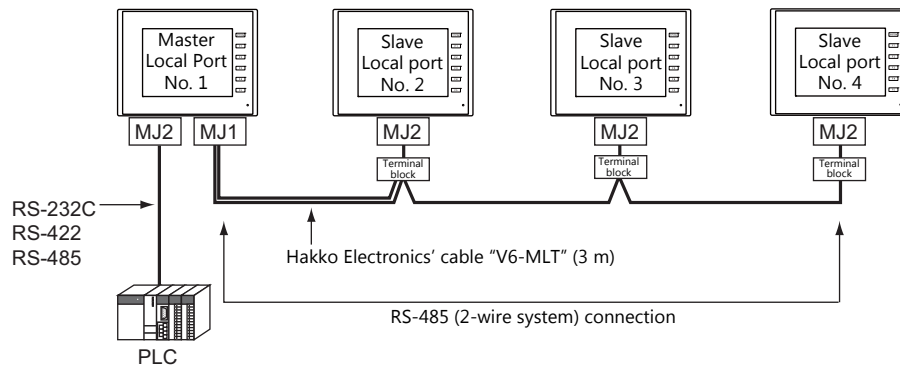
* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

n : 1 Connection (Multi-link2)

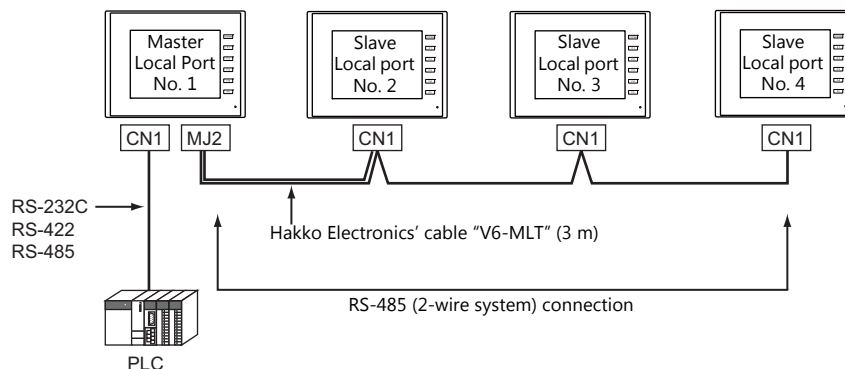
Overview

- 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:



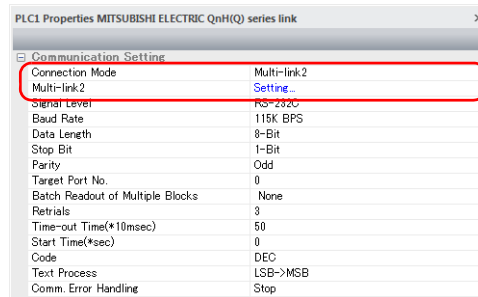
- You can make settings for multi-link2 in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit (under development).
- Multi-link2 enables sharing of data stored in PLC1 device memory 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



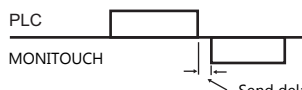
| Item | | Contents |
|-----------------------|------------------------|--|
| Communication Setting | Connection Mode | Multi-link2 |
| | Multi-link2 | Click [Setting] to display the [Multi-link] dialog, then make the necessary settings in this dialog. For more information on settings, see “Multi-link2” (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

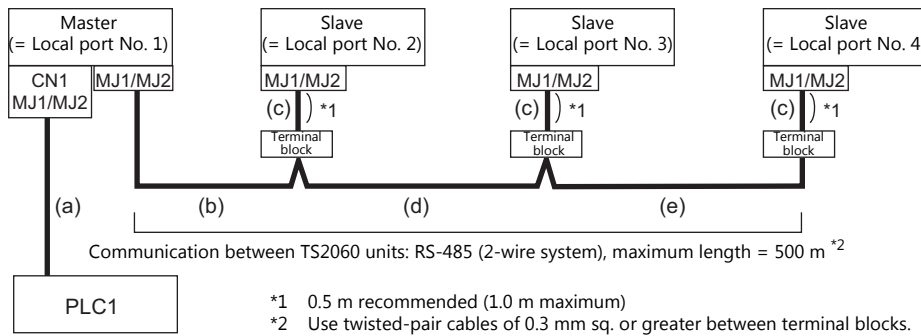
PLC models that support connection together with the V7 and V6 series are listed below.

| 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

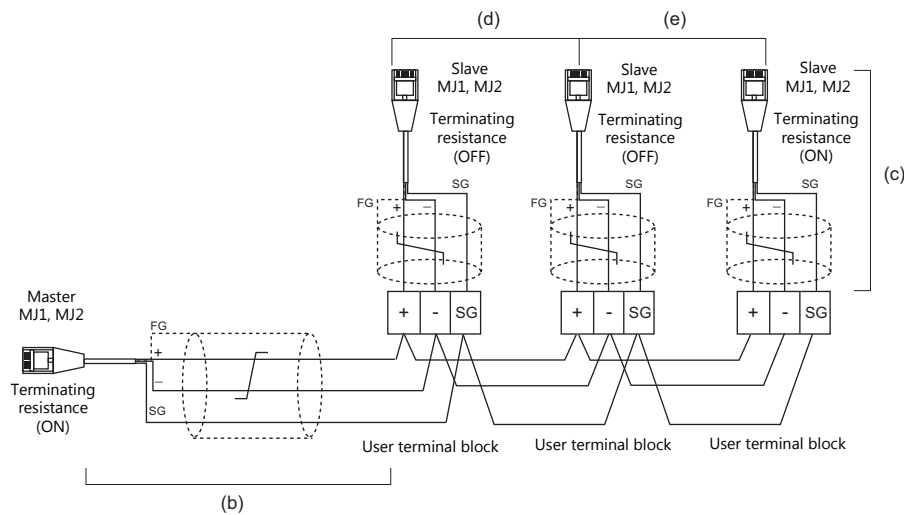
Connection Method 1

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



- (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.

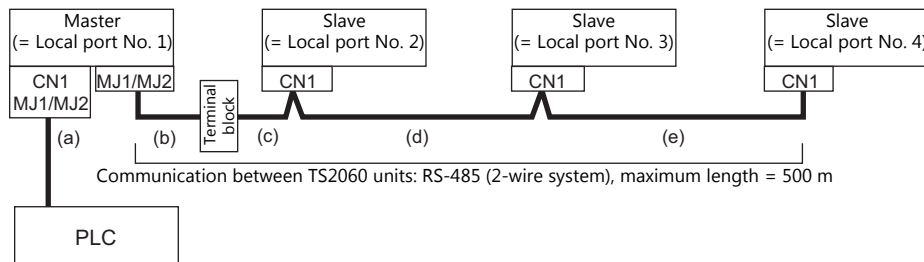
Wiring diagram



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

Connection Method 2

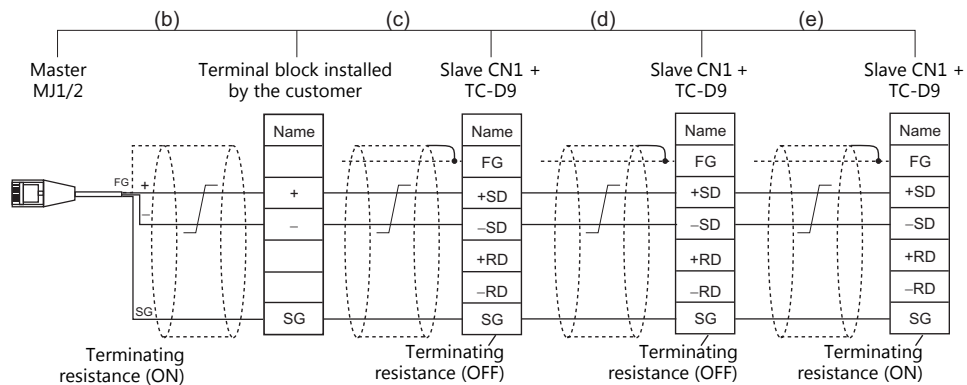
Connecting the MJ1/MJ2 of the master to CN1 connectors of the slaves



- (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.

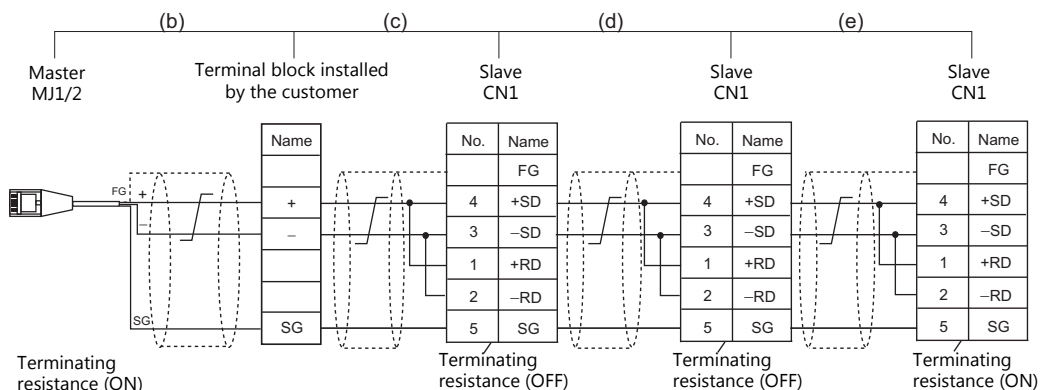
Wiring diagrams

- 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.

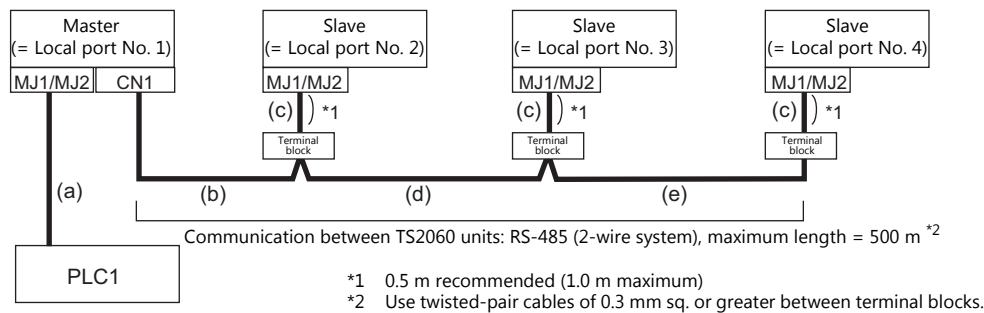
- When no TC-D9 is used:
Install jumpers between +SD and +RD as well as -SD and -RD.



- * 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

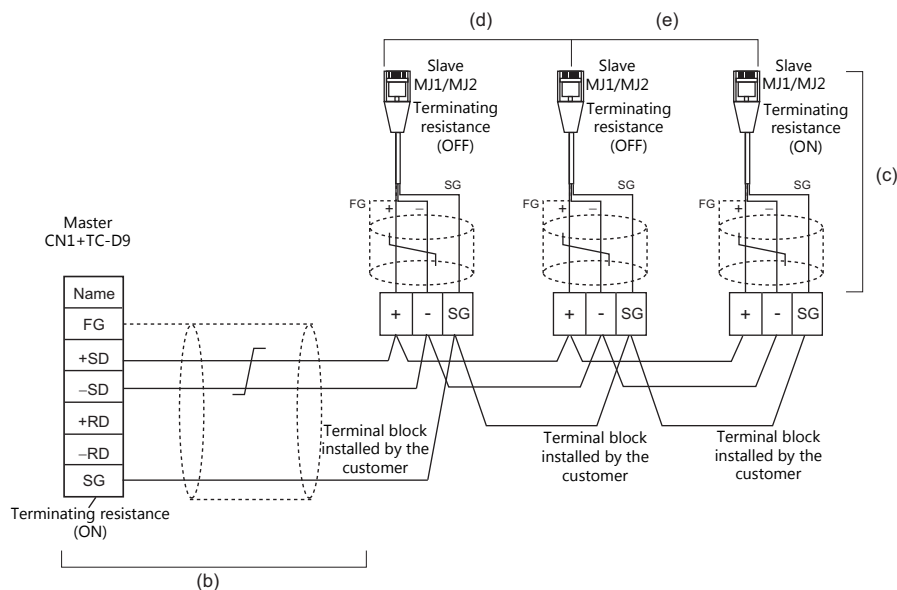
Connecting the CN1 of the master to the MJ1/MJ2 of the slaves



- (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).

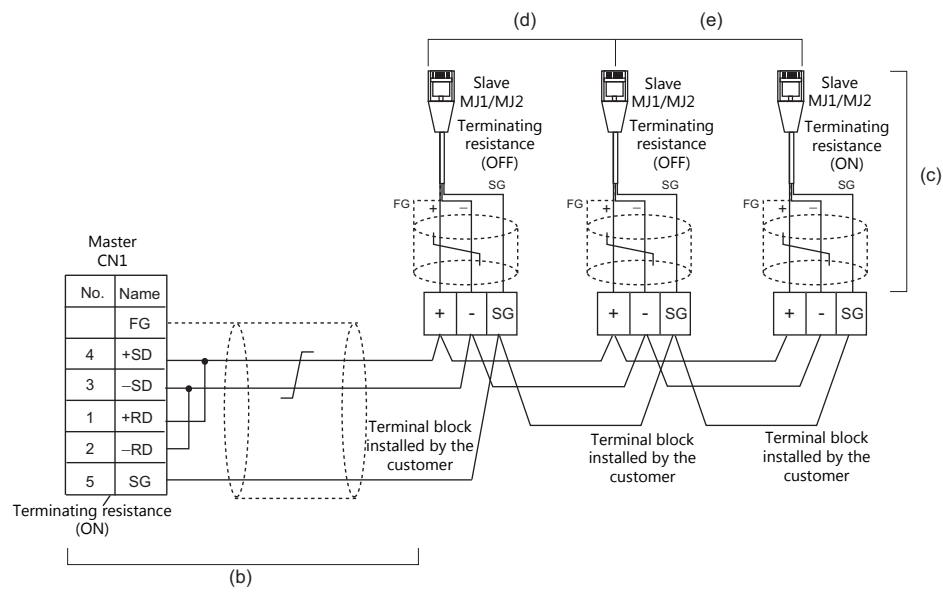
Wiring diagrams

- 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.

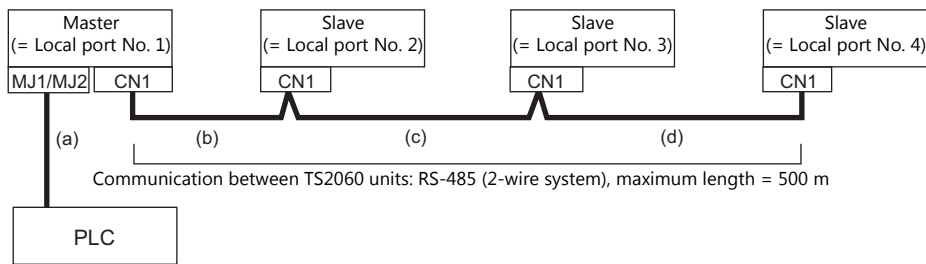
- When no TC-D9 is used:
Install jumpers between +SD and +RD as well as –SD and –RD.



* 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.

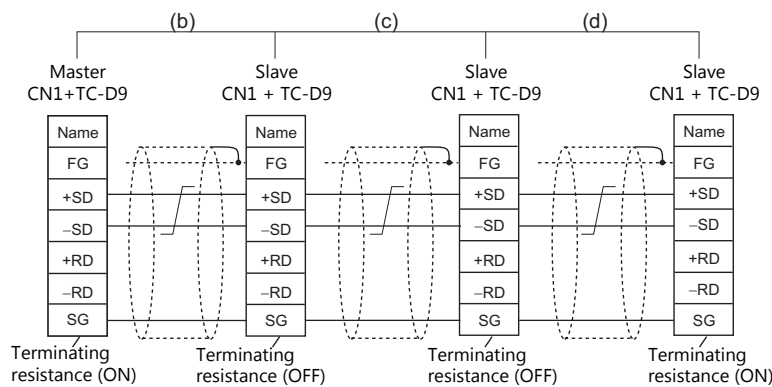
The communication settings and connection method are the same as those for 1 : 1 connection.

(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.

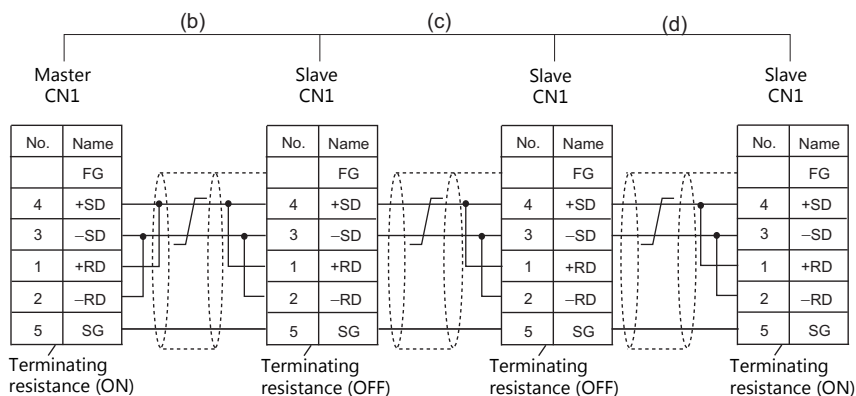
Wiring diagrams

- 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.

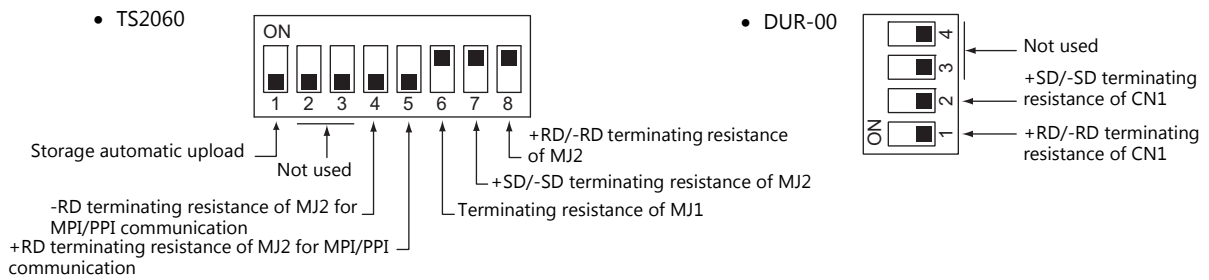
- When no TC-D9 is used:
Install jumpers between +SD and +RD as well as -SD and -RD.



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

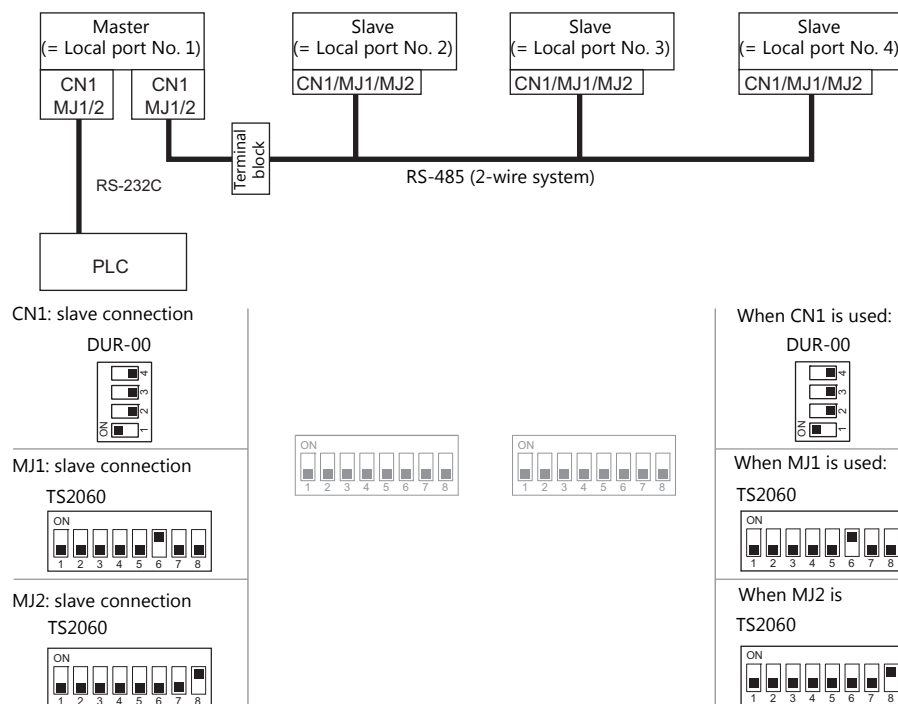
Terminating Resistance Setting

The terminating resistance should be set using the DIP switch.



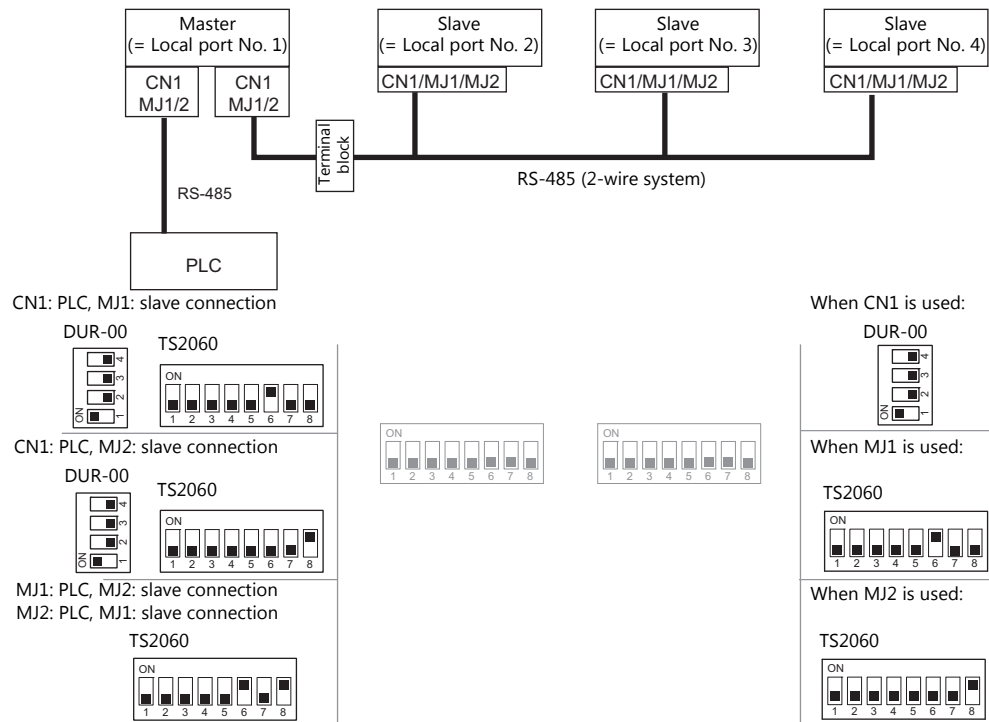
When the PLC is connected to the master via RS-232C:

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.

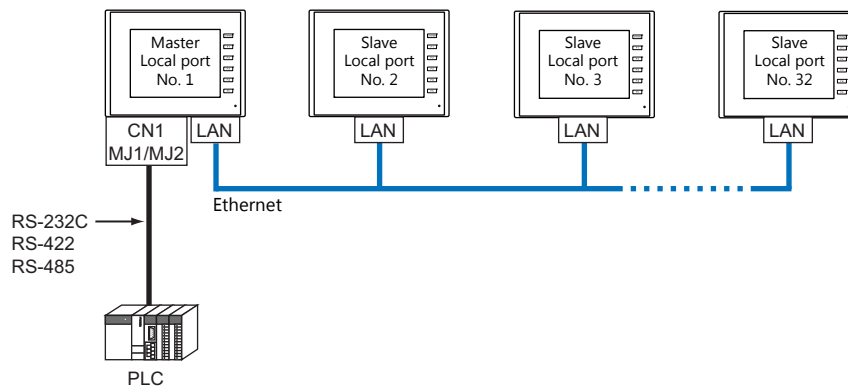


n : 1 Connection (Multi-link2 (Ethernet)) (TS2060i Only)

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



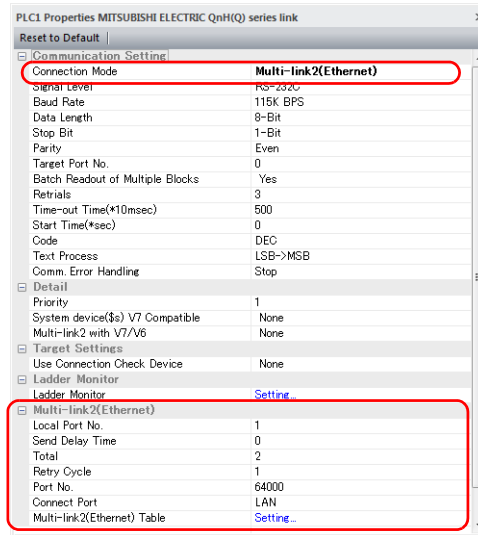
- You can make settings for multi-link2 (Ethernet) in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit.
- Multi-link2 (Ethernet) enables sharing of data stored in PLC1 device memory 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.

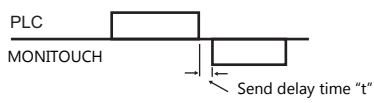
V-SFT Ver. 6 Settings

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) |
| | 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) | 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

| No. | IP Address |
|-----|--------------|
| 1 | 192.168.1.2 |
| 2 | 192.168.1.3 |
| 3 | 192.168.1.4 |
| 4 | 192.168.1.5 |
| 5 | 192.168.1.6 |
| 6 | 192.168.1.7 |
| 7 | 192.168.1.8 |
| 8 | 192.168.1.9 |
| 9 | 192.168.1.10 |
| 10 | 192.168.1.11 |
| 11 | 192.168.1.12 |
| 12 | 192.168.1.13 |
| 13 | |

Station number

Close

• Slave

| No. | IP Address |
|-----|-------------|
| 1 | 192.168.1.1 |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |

Station number

Close

| Item | Contents |
|------------------------------|---|
| Multi-link2 (Ethernet) Table | <ul style="list-style-type: none">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. |

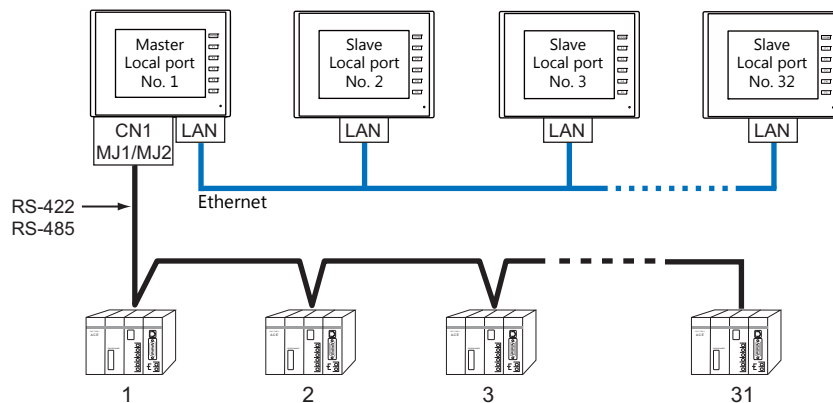
Wiring

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.

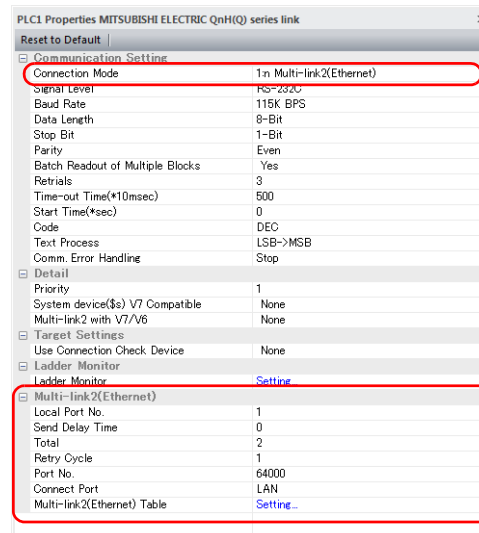


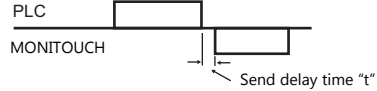
- You can make settings for 1 : n multi-link2 (Ethernet) in [Communication Setting] for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CUR-xx" communication interface unit.
- 1 : n multi-link2 (Ethernet) enables sharing of data stored in PLC1 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)”.

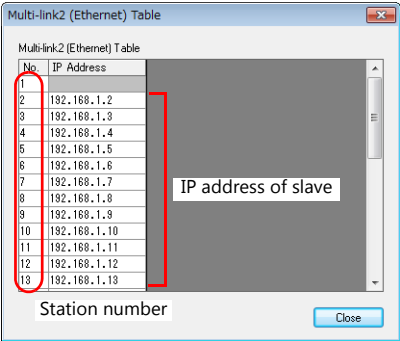
PLC Properties



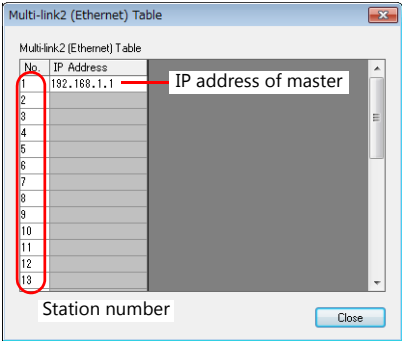
| Item | | Contents |
|------------------------|------------------------------|---|
| Communication Setting | Connection Mode | 1 : n Multi-link2 (Ethernet) |
| Multi-link2 (Ethernet) | Local Port No. | 1: Master 2 to 32: Slave * Note that if the port number specified is the same as that already set 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 | <ul style="list-style-type: none">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)”.

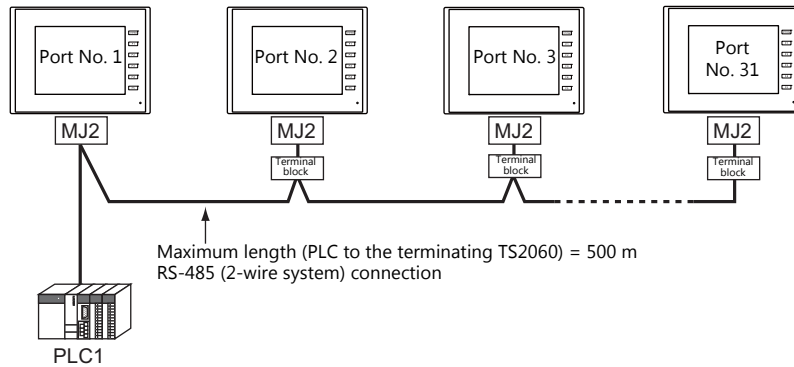
Use a LAN cable to connect a master with slaves.

n : 1 Connection (Multi-link)

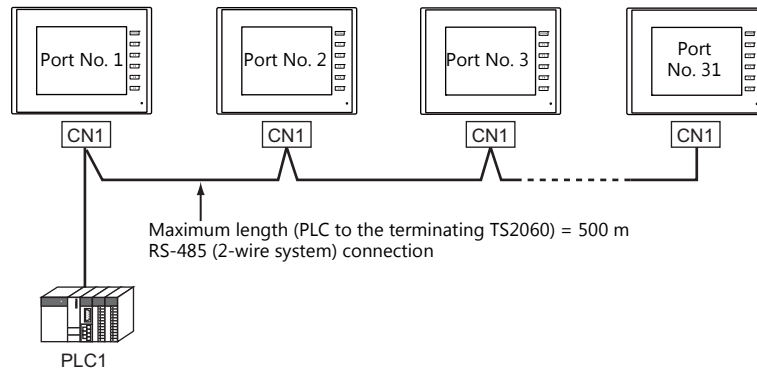
Overview

- 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.

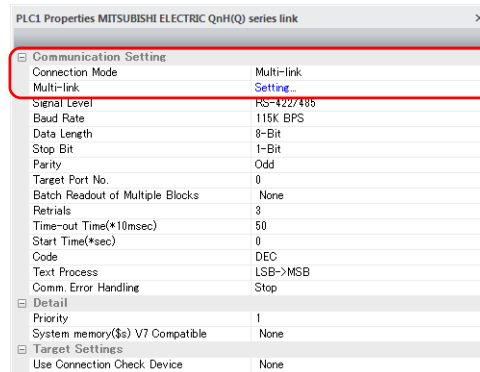
- Only a PLC [Signal Level: RS422/RS485] and with a port number set. RS-485 (2-wire system) connection is adopted to connect a V-series unit and a PLC. For available models, see Connection Compatibility List provided at the end of this manual.
- Use twisted-pair cables of 0.3 mm sq. or greater between 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.

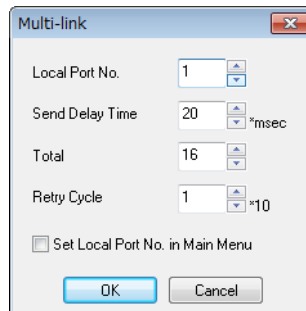
For details on other settings, refer to Hardware Settings in “1 : 1 Connection” (page 1-11).

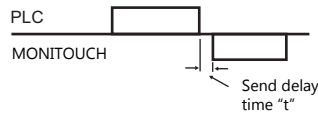
PLC Properties



| 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. |

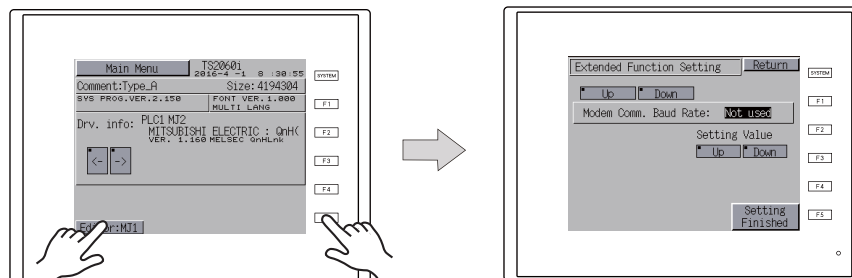
^{*1} For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the TS2060 that are connected in the same communication line.

^{*2} When connecting three units with the local port numbers 1, 2 and 10, specify “10” for [Total].

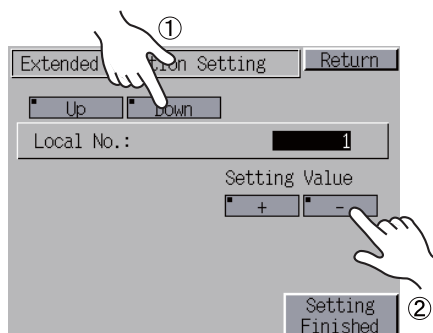
Settings on MONITOUCH

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.

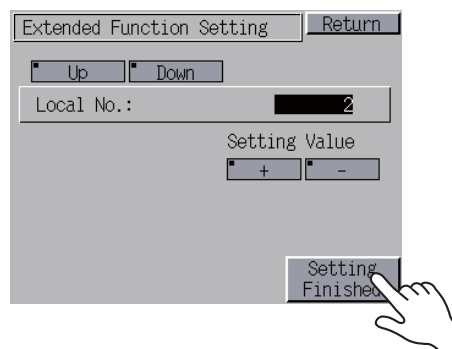
1. Transfer the screen program.
2. Press [SYSTEM] and then the [F1] function switch on MONITOUCH to display the Main Menu screen.
3. Press the [Editor: MJ1] switch and the [F5] function switch at the same time.
The Extended Function Setting screen is displayed.



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

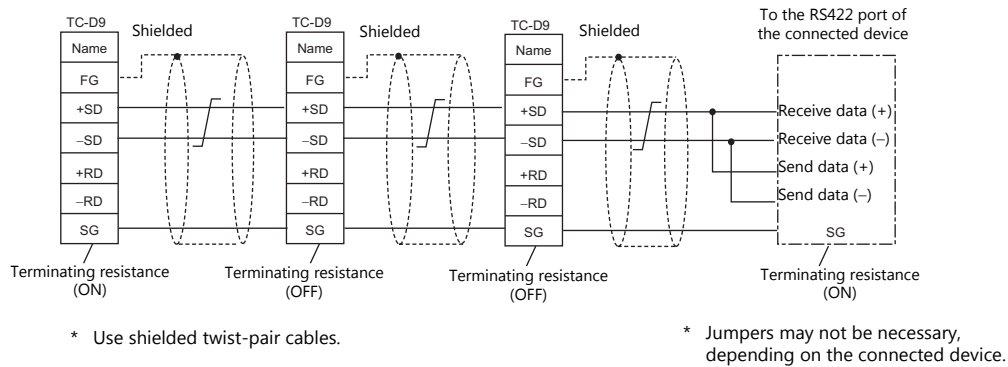
When Connected at CN1:



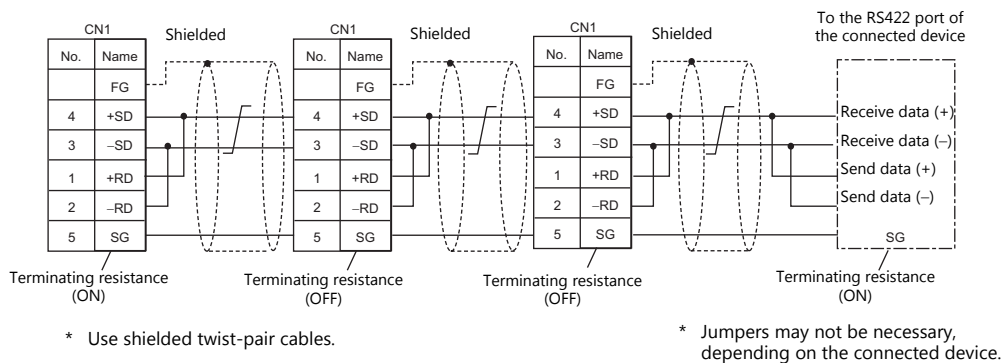
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

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).



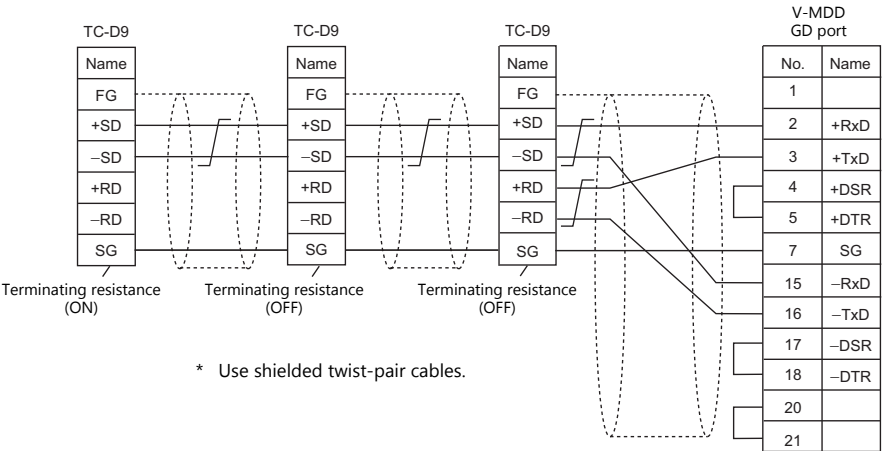
- When no TC-D9 is used:
Install jumpers between +SD and +RD as well as -SD and -RD.



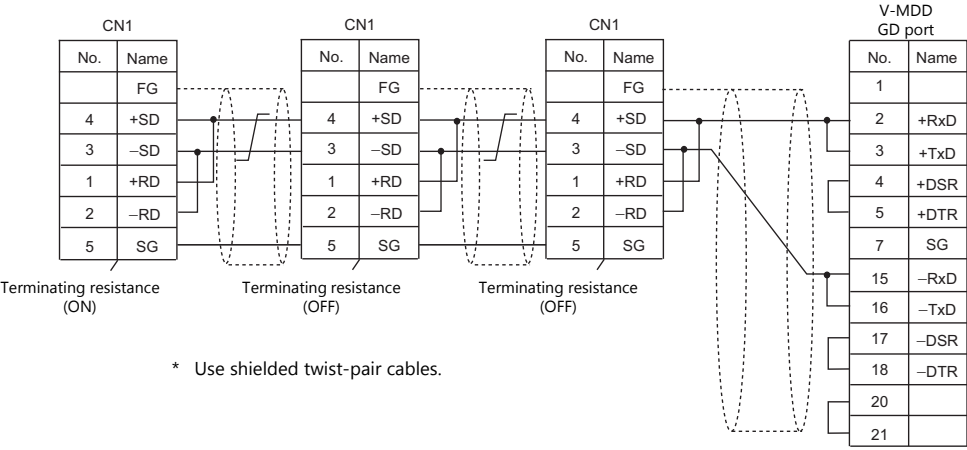
When connecting to Mitsubishi Electric's QnA CPU:

Use the GD port of Hakkō 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).

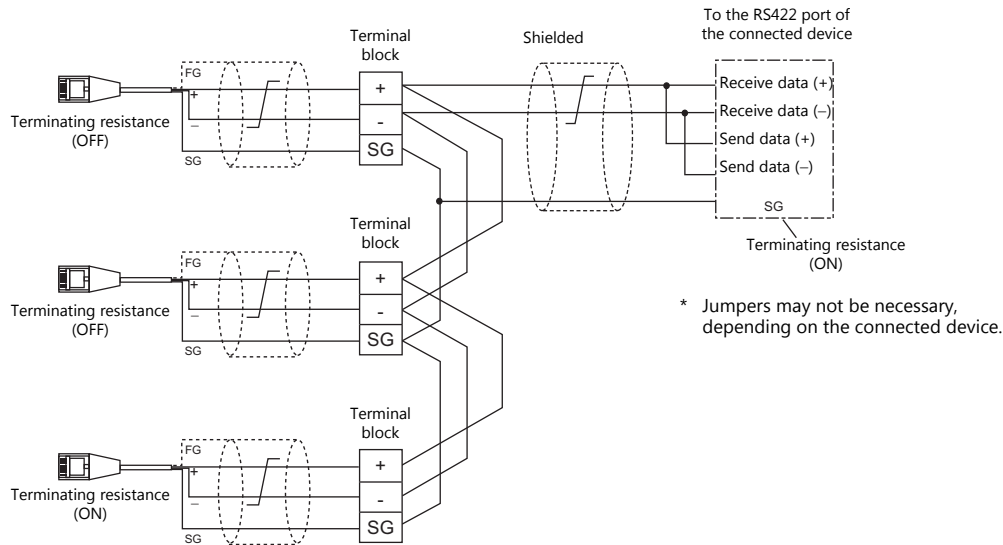


- When no TC-D9 is used:
Install jumpers between +SD and +RD as well as -SD and -RD.



When Connected at MJ1/MJ2:

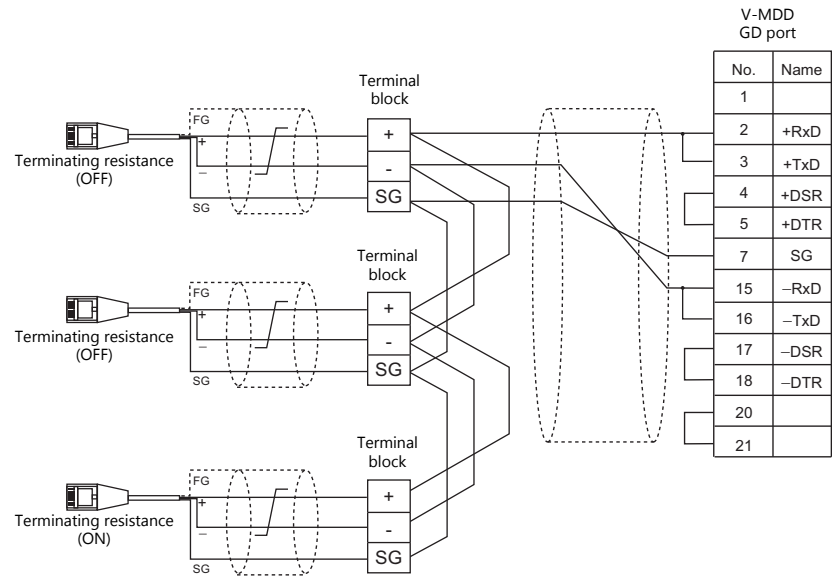
This shows the situation when a multi-link connection is made at MJ1 or MJ2.



* 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.

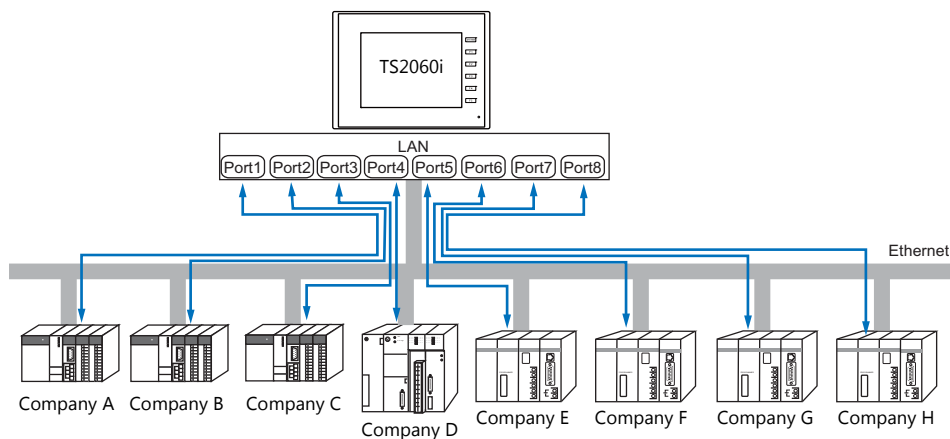


* Set the slide switch for signal level selection to RS-232C/485 position (upper) when using the MJ2 port.

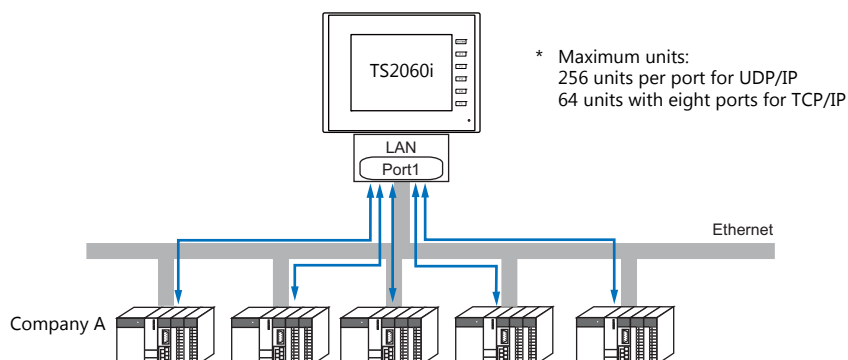
1.3.2 Ethernet Communication (TS2060i Only)

Overview

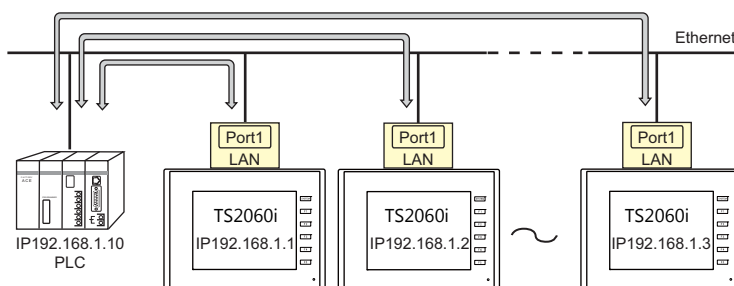
- Because eight communication ports can be opened, the TS2060i is allowed to communicate with eight models of PLCs at the same time.



- 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.



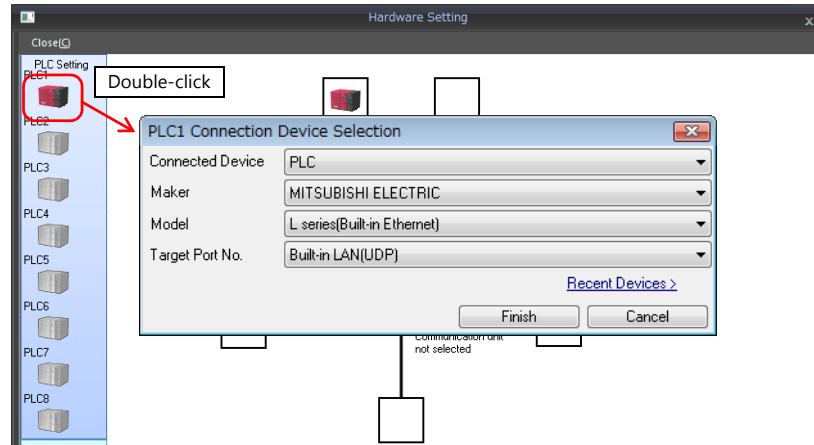
- You can make settings for Ethernet communication in [Communication Setting] for the logical ports PLC1 - PLC8.

V-SFT Ver. 6 Settings

Hardware Settings

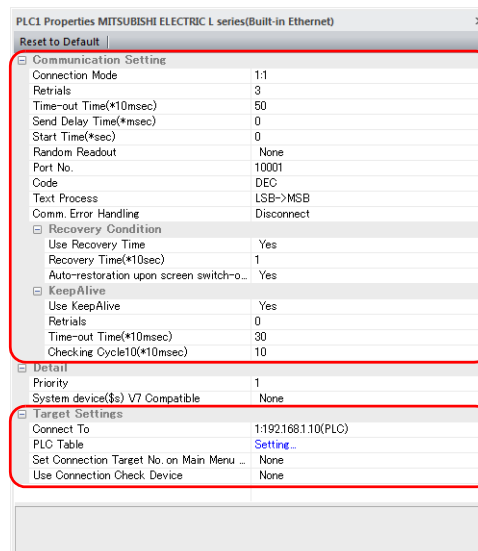
Selecting a device to be connected

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

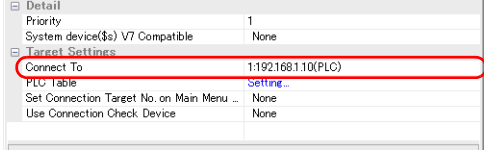
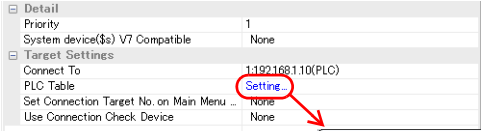
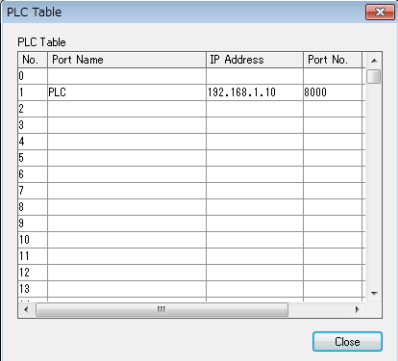


PLC properties

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 | <p>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.</p> <p>* When using this function, select [Disconnect] for [Comm. Error Handling].</p> <ul style="list-style-type: none"> [Use KeepAlive] Select [Yes] when using the "KeepAlive" function. The following settings will take effect. <ul style="list-style-type: none"> [Retrials] Specify the number of retries. If a timeout persists even after as many retries 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, retrieval 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 |
|-----------------|--|
| Connect To | <p>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.</p>  |
| Target Settings | <p>Click [Setting] to display the [PLC Table] window. Set the IP address, port number and KeepAlive function of the PLC.</p>  |
| PLC Table |  |

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

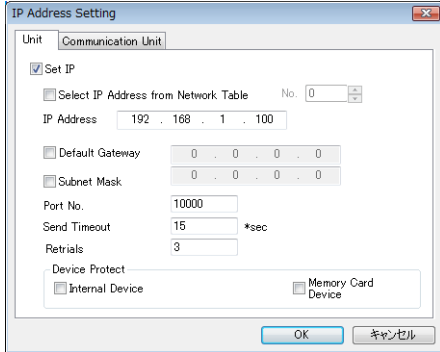
IP Address Setting of the TS2060i

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 | <p>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.</p> <p>* For more information on the network table, refer to "Network table" (page 1-64).</p> |
| IP Address * ¹ | Set the IP address for the TS2060i. |
| Default Gateway * ¹ | Set the default gateway. |
| Subnet Mask * ¹ | <p>Set the subnet mask.</p> <p>When this box is not checked, the subnet mask is automatically assigned based on the byte at the extreme left of the IP address.</p> <p>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.</p> |
| 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. |

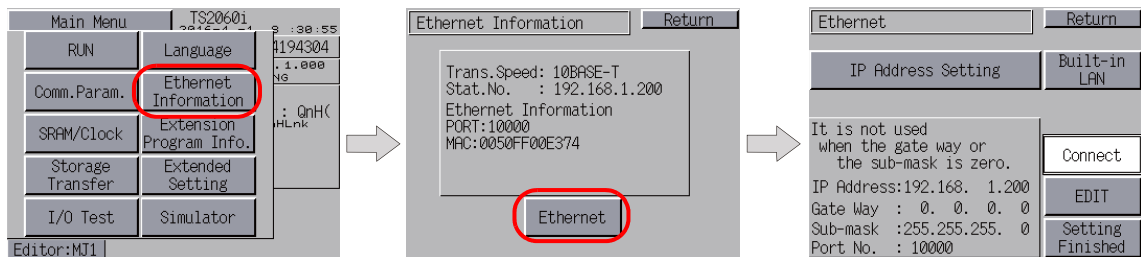
| Item | Contents |
|---|---|
| Retrials | 0 to 255 Set the number of retrials to be performed when a time-out occurs. |
| Device Protect Internal Device Memory Card Device | Check either check box to write-protect the device memory from computers or other stations. |

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

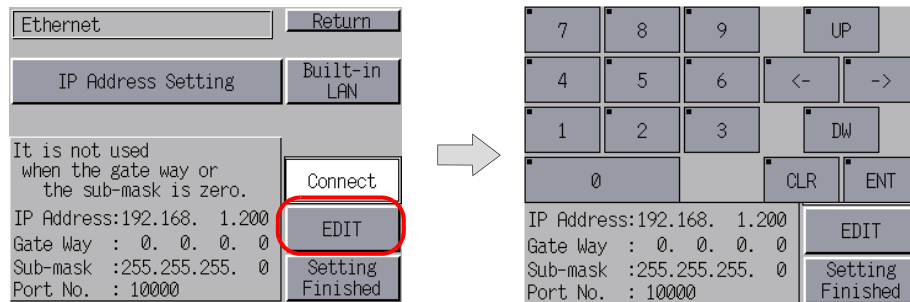
Setting from the Main Menu Screen on MONITOUCH

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

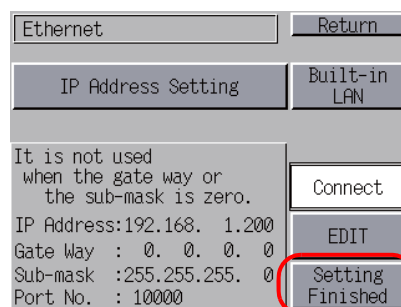
- Press [SYSTEM] and then the [F1] function switch on MONITOUCH to display the Main Menu screen.
- Press the [Main Menu] switch to display the drop-down menu. Then press the [Ethernet Information] switch to display the Ethernet Information screen and press the [Ethernet] switch. The Ethernet screen is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



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

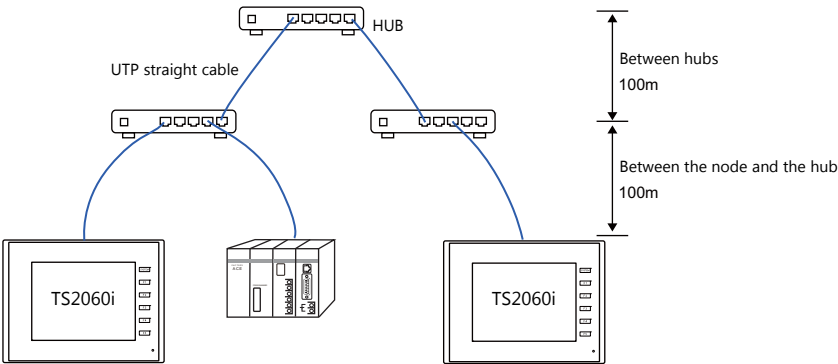


- Press the [Setting Finished] switch to confirm the setting.

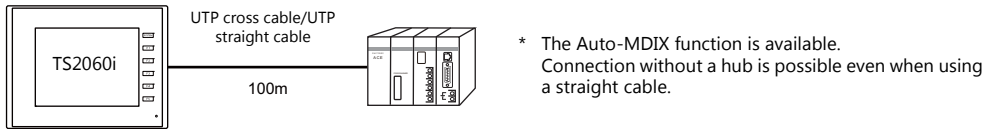


Connection example

With hub



Without hub

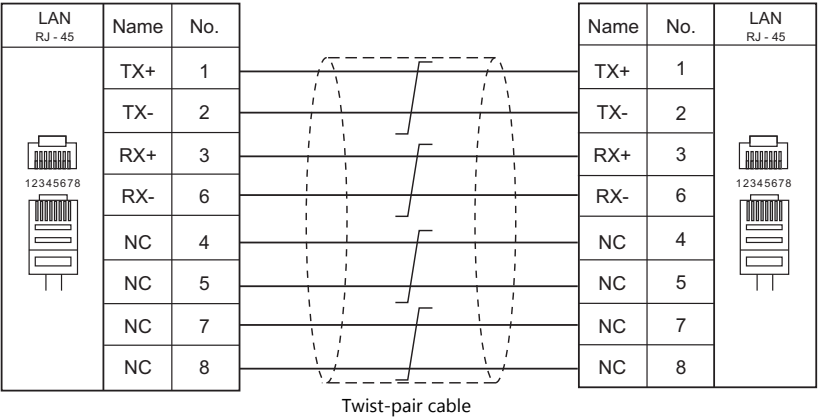


Wiring

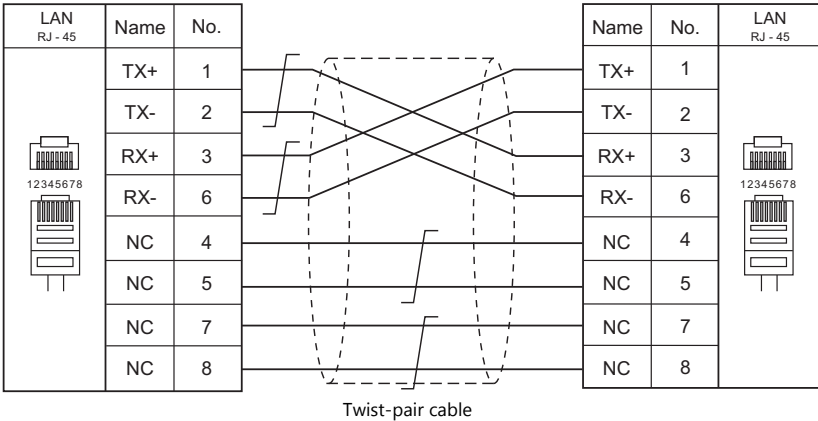


- Use a commercially available cable. Using a self-made cable may cause an error in network connection.
- If the use of a cross cable cannot stabilize communication, use a hub.

• 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 OMRON Fuji Electric | A series (OPCN-1) SYSMAC C (OPCN-1) MICREX-SX (OPCN-1) |
| CUR-01 | T-Link | Fuji Electric Fuji Electric | MICREX-F (T-LINK) MICREX SX (T-LINK) |
| CUR-02 | CC-LINK Ver. 2.00/1.10/1.00 | Mitsubishi Electric Mitsubishi Electric Mitsubishi Electric | A series (CC-LINK) QnA series (CC-LINK) 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 Universal PROFIBUS-DP | S7 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

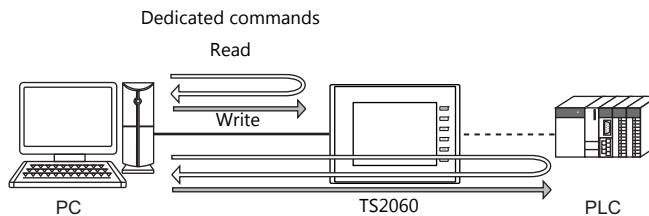
For more information, refer to the communication unit specifications provided for each network.

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)

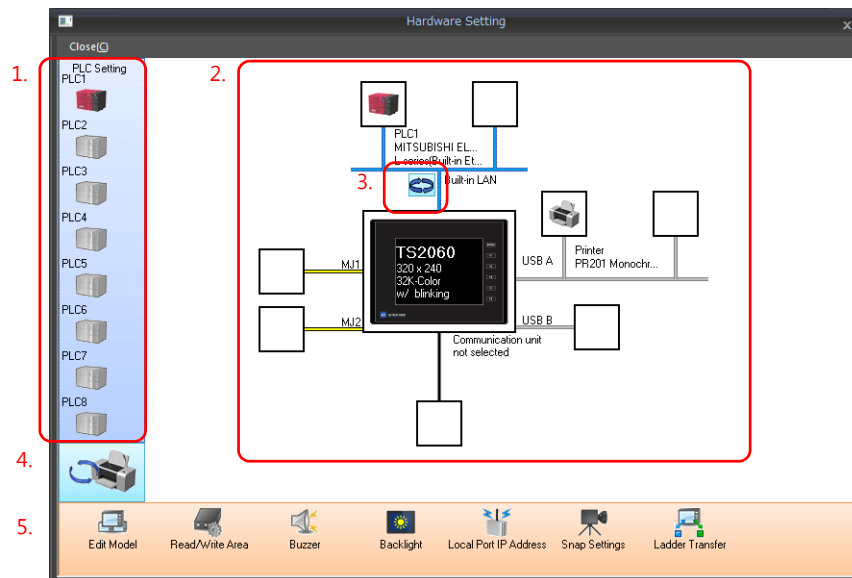
- The TS2060i is connected to a Modbus TCP/IP master via Ethernet communication.
- The device memory table for Modbus slave communication is prepared for the TS2060i. The master is allowed to gain access to the device memory table and read/write the PLC data.
- For more information, refer to the Modbus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

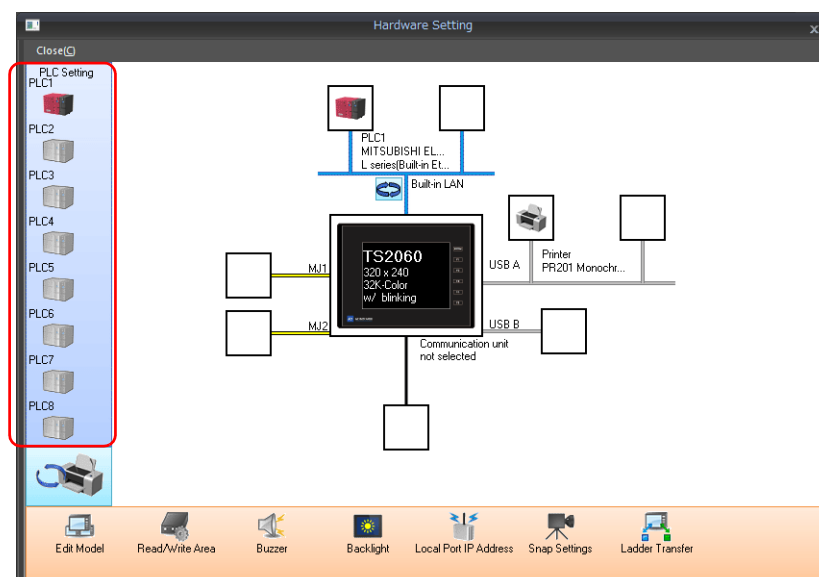
Select and set the devices to connect to the TS2060 on the Hardware Setting screen.



| | 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. |

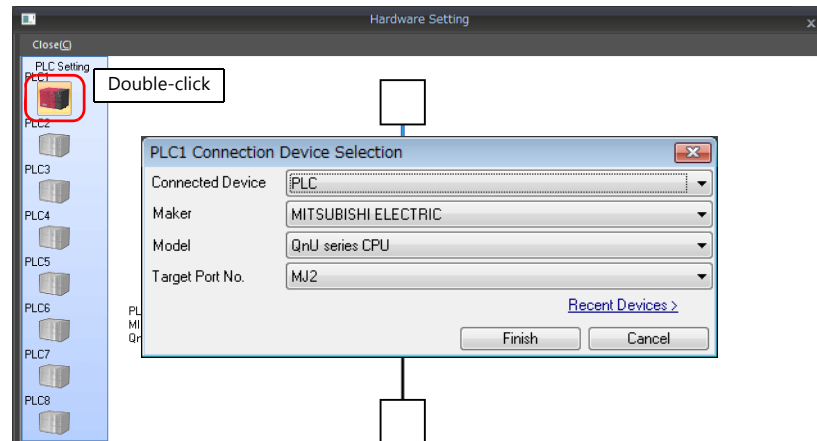
1.4.1 PLC Settings

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

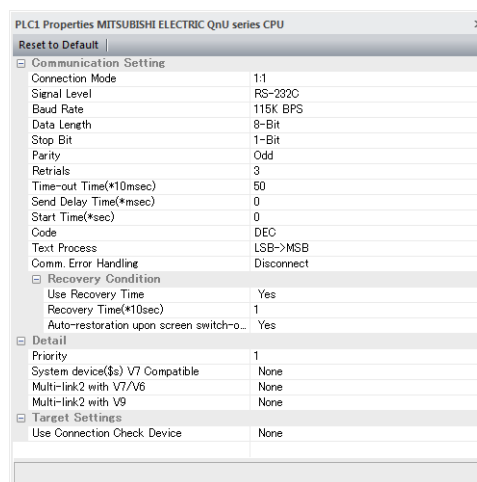
Double-click on a PLC icon in the [Hardware Setting] window to display the window shown below.



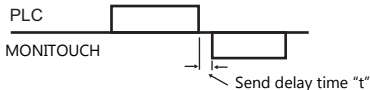
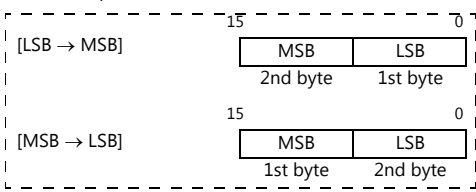
| Item | Contents |
|------------------|--|
| Connected Device | Select the device to connect. |
| Maker | Select the maker of the device. |
| Model | Select the model of the device to connect. Refer to the respective chapter of each maker and select the appropriate model. |
| Target Port No. | Select 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.



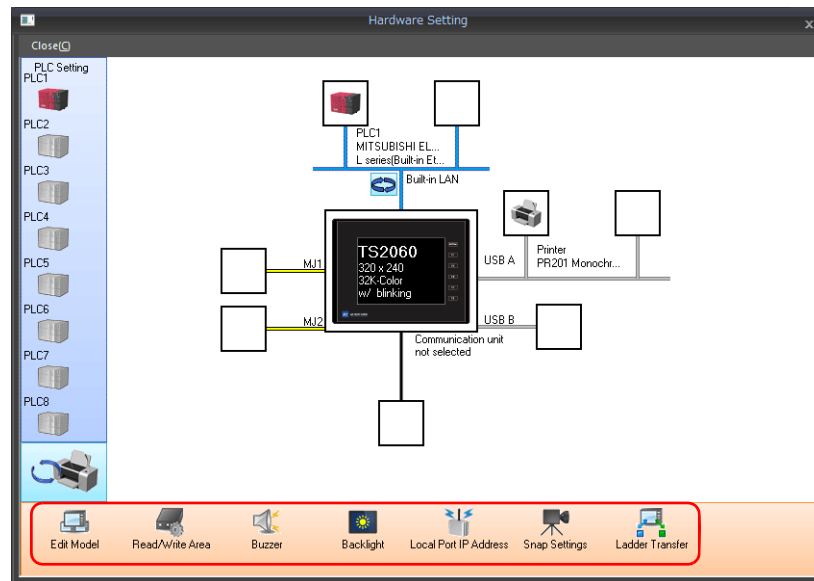
| Item | Contents |
|-------------------------------|--|
| Communication Setting | Connection Mode Select a connection mode. 1 : 1 / 1 : n / Multi-link / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) Available options vary, depending on which device is connected. For details, see Connection Compatibility 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 handling 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. <ul style="list-style-type: none"> • [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. <p>* Internal device memory must be specified for [Read Area] and [Write Area].</p> |
| | Recovery Condition | Use Recovery Time |
| | | Recovery Time |
| | | Auto-restoration upon screen switch-over |

| 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. <ul style="list-style-type: none"> • [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: <ul style="list-style-type: none"> • 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)

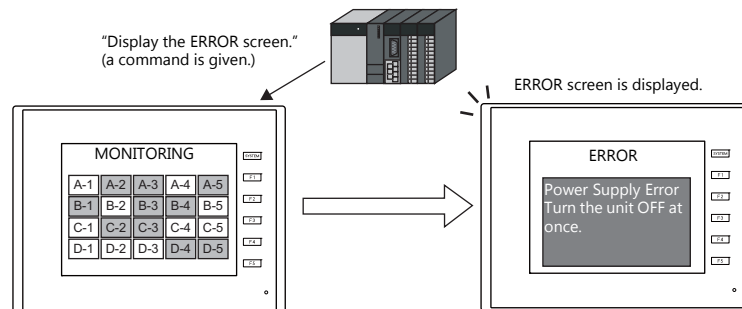
*2 For more information on the internal clock, refer to the TS2060 Reference Manual 1.

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.

| | Address | Contents | Operation |
|-------------|---------|-----------------------|--------------|
| Read area = | 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.

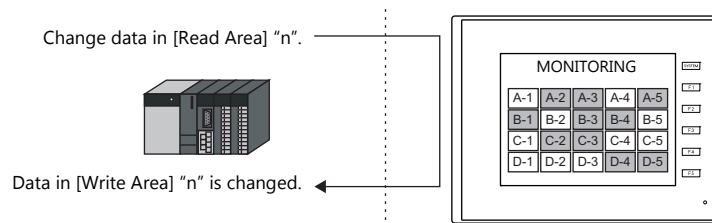
| Read area "n" (sub command/data) | | | | | | | | | | | | | | | |
|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | 0 | 0 | 0 | | | | | | | | | | | | |

(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

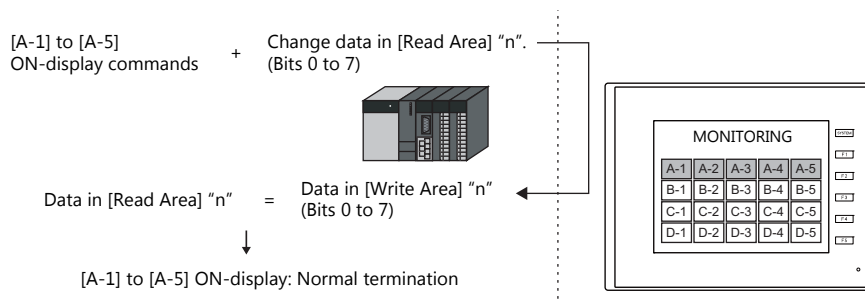
| | |
|------------------------------------|--|
| (1) Free | When data is saved in this area, the same data is written to [Write Area] "n" after the screen has been displayed. Utilizing this operation, these bits can be used for watch dog monitoring ^{*1} or display scanning ^{*2} . |
| (2) BZ0 | A beep (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 (ffee) 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} | <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • The power is turned on. • STOP → RUN • The date changes (AM 00:00:00). <p>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.</p> |
| (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) | | | | | | | | | | | | | | | |
|---|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| | | | 0 | | | | | 0 | 0 | 0 | 0 | | | | |
| | | | | | | | | | | | | | | | |
| (1) Overlap 0 (2) Overlap 1 (3) Overlap 2 | | <p>These bits are used for controlling show/hide operations of overlaps.</p> <ul style="list-style-type: none"> 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 <p>It is necessary to specify library No. 0 to 1023 for [Overlap Library Number] for [Multi-Overlap] dialog.</p> | | | | | | | | | | | | | |
| (4) Overlap 3 | | <p>This bit is used for controlling show/hide operations of the global overlap screen.</p> <p>[0 → 1]: Show [1 → 0]: Hide</p> <p>It is necessary to specify library No. 0 to 9999 for [Overlap Library Number] in the [Global Overlap Setting] dialog.</p> | | | | | | | | | | | | | |
| (5) System reserved | | This bit is reserved by the system. This bit must be "0". | | | | | | | | | | | | | |
| (6) Global macro execution | | <p>The macro set for [Macro Block] is executed once at [0 → 1] (leading edge).</p> <p>The macro block number should be specified for [Global Macro Memory] in the dialog that is displayed by selecting [System Setting] → [Macro Setting].</p> <p>For more information, refer to the Macro Reference manual provided separately.</p> | | | | | | | | | | | | | |
| (7) Data sheet output | | <p>The data sheet is printed out at [0 → 1] (leading edge).</p> <p>This bit becomes valid when the data sheet function is set.</p> | | | | | | | | | | | | | |
| (8) Screen hard copy | | <p>The TS2060 screen image is printed out at [0 → 1] (leading edge). This bit becomes valid when a printer is connected.</p> <p>It is also possible to make a screen hard copy using an internal switch [Function: Hard Copy].</p> | | | | | | | | | | | | | |
| (9) Backlight | | <p>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].</p> <p>[0] (level): OFF when the conditions are satisfied [1] (level): ON</p> | | | | | | | | | | | | | |
| (10) System reserved | | This bit is reserved by the system. This bit must be "0". | | | | | | | | | | | | | |
| (11) Screen internal switching | | <p>This bit controls screen switching by internal switches.</p> <p>[0]: Screen switching by internal switches is enabled. [1]: Screen switching by internal switches is disabled.</p> <p>* An "internal switch" means a switch you can create for internal processing within MONITOUCH by selecting [Screen] or [Return] for [Function:] of the switch.</p> | | | | | | | | | | | | | |
| (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} This function is not available in the TS2060 Reference Manual 1.

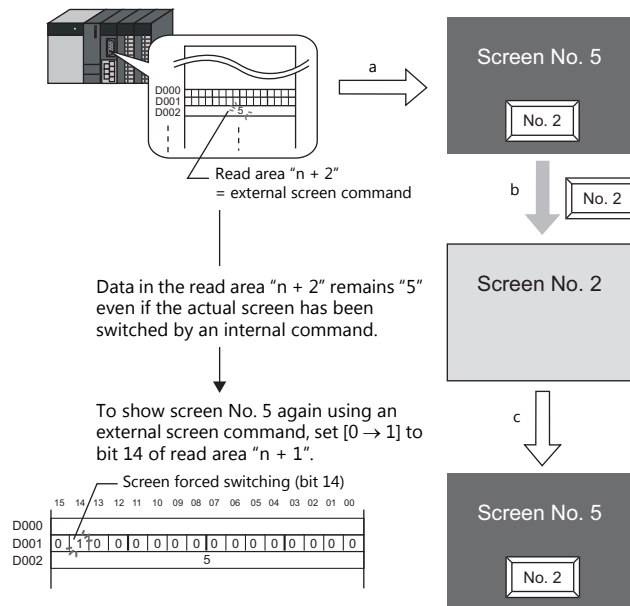
*3 Usage Example

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.

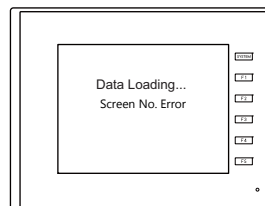


Reset to this bit after you check that bit 14 of write area "n+1" is set to "1" or the same value is stored in write area "n+2" as the value in read area "n+2".

| Read area "n + 2" (screen number command) | | | | | | | | | | | | | | | | |
|---|----|--|----|----|----|----|----|----|----|----|----|----|----|----|----|-------------------|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | (1) Screen number |
| (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.

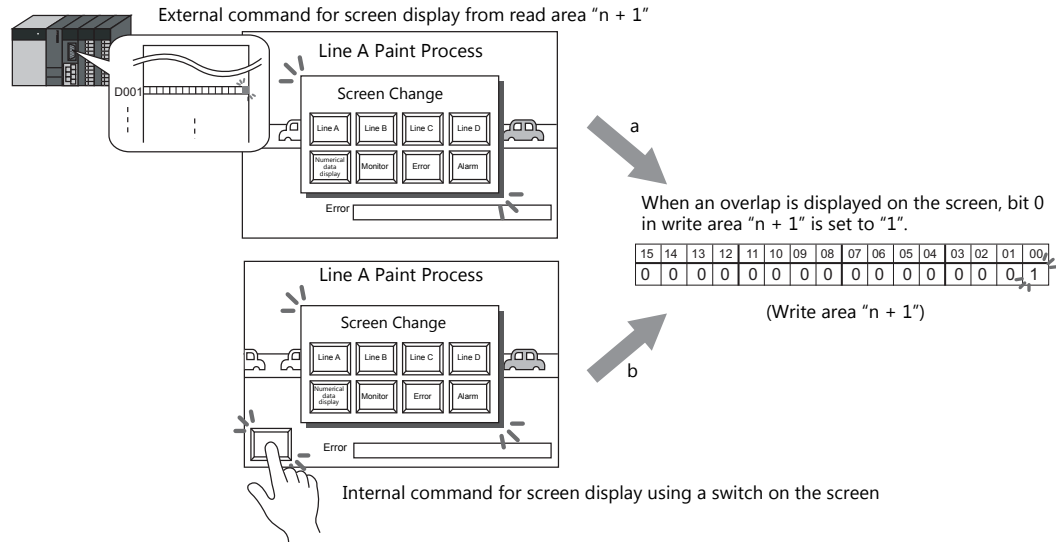
Write area "n + 1" (screen status)

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

| | |
|--|---|
| (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".



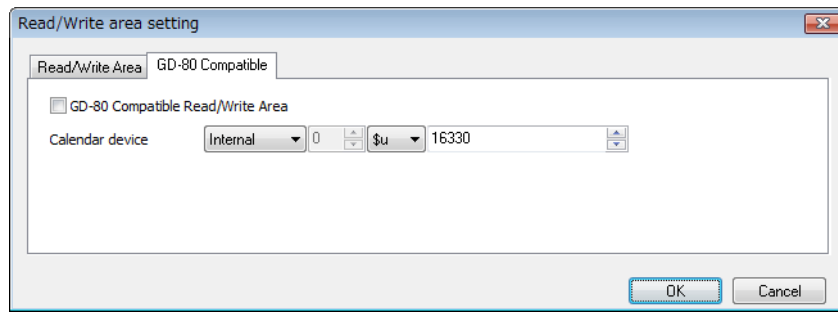
- *2 Data of bits 9 and 10 is output to internal memory address \$s16. For more information on the internal memory (\$s), refer to the TS2060 Reference Manual 1.
- *3 Data of bit 11 is output to internal memory address \$s17. For more information on the internal memory (\$s), refer to the TS2060 Reference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

GD-80 Compatible



| | |
|---|--|
| <input type="checkbox"/> GD-80 Compatible Read/Write Area | <p>When converting screen data files created on the MONITOUCH GD-80/81S series into those of the TS2060, this option is automatically checked.</p> <ul style="list-style-type: none"> • 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.

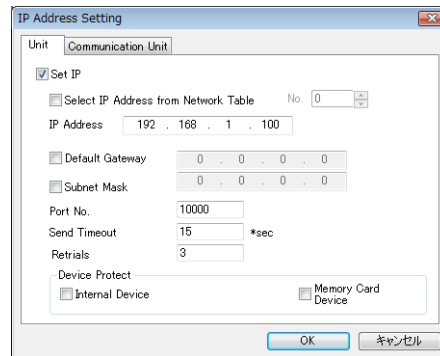
Buzzer

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)



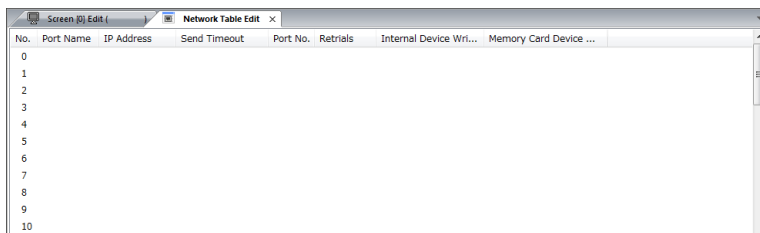
| Item | Contents |
|---|---|
| Select IP Address from Network Table | This is valid when the IP address of the TS2060i has been registered in the network table. Select a network table number from 0 to 255 to set the IP address. * For more information on the network table, refer to "Network table" (page 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).

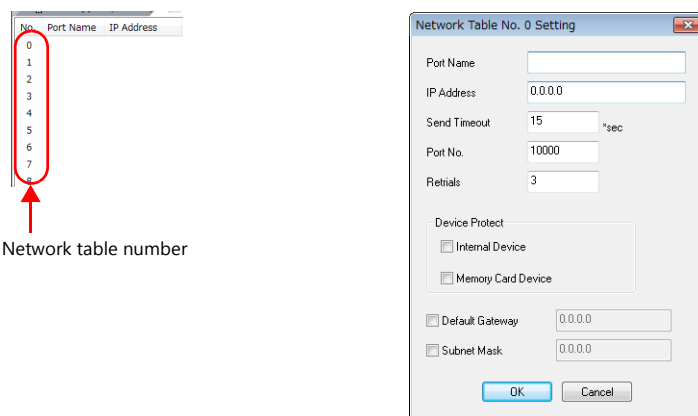
Network table

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.



| 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.

| | | | |
|---------|-----|----------------------|-------------------|
| Class A | 0 | Network address (7) | Host address (24) |
| Class B | 10 | Network address (14) | Host address (16) |
| Class C | 110 | Network address (14) | Host address (8) |

<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.
- "127" is specified for one byte at the extreme left (loop back address).
- "224" or more is specified for one byte at the extreme left (for multi-cast or experiment).
- The host address consists of only "0" or "255" (broadcast address).

Example: 0.x.x.x

Example: 127.x.x.x

Example: 224.x.x.x

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).

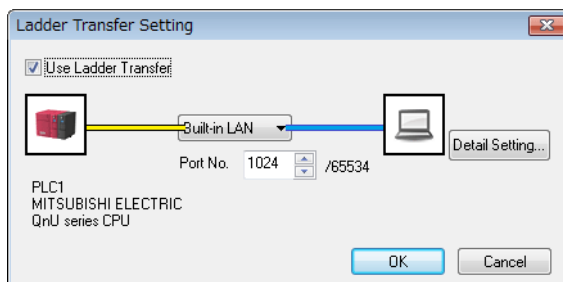
The subnet is assigned by specifying a part of the host address in the IP address as a subnet address.

| | | | |
|-------------|-----------------|----------------------|-------------------|
| Class B | 10 | Network address (14) | Host address (16) |
| Subnet mask | 255. | 255. | 255. 0 |
| | 11111111 | 11111111 | 11111111 00000000 |
| | Network address | Subnet address | Host address |

<Unusable subnet masks>

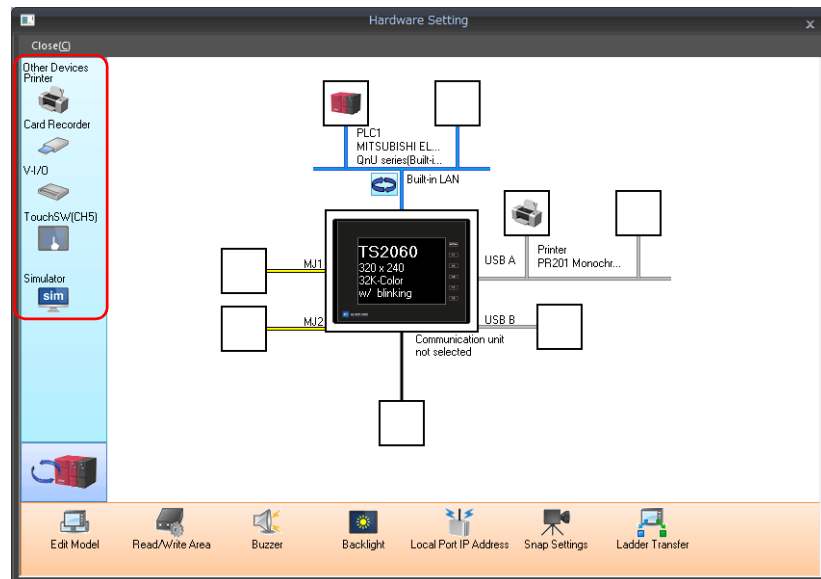
- All bits are set to "0"..... 0.0.0.0
- All bits are set to "1"..... 255.255.255.255

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. |

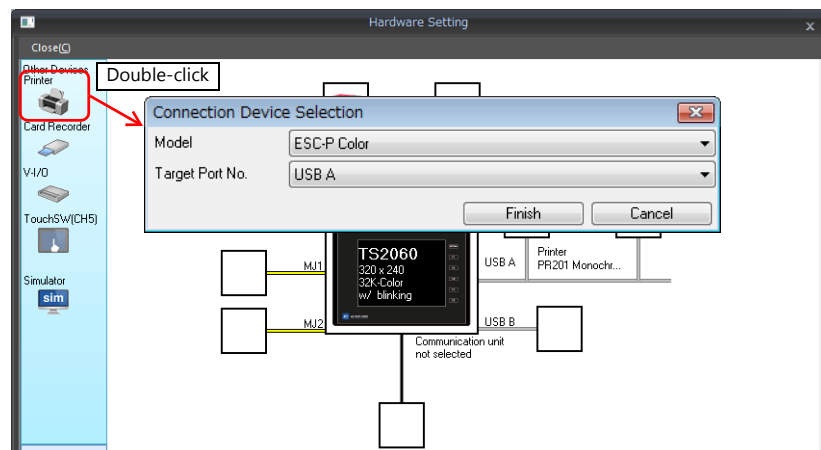
1.4.3 Other Equipment



Printer

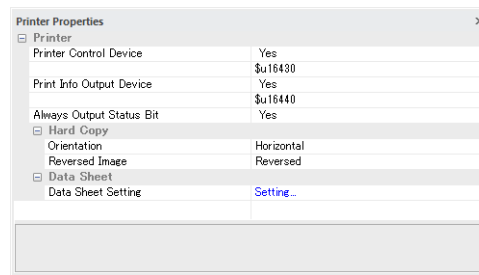
Configure these settings when connecting a printer.


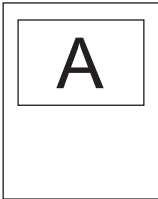
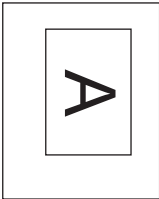

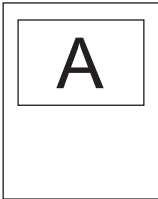
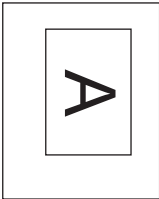

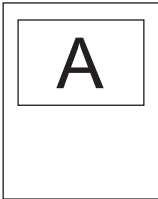
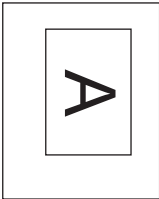
Selecting the printer model



| Item | Contents |
|-----------------|---|
| Model | Select the model of the printer to connect. |
| Target Port No. | <p>Select the port to connect the printer cable to.</p> <p>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.</p> <p>USB B: Select when connecting a PictBridge-compatible printer.</p> <p>MJ1/MJ2: Select when connecting with the serial interface of a printer. Also select whether to use MJ1 or MJ2 of the TS2060.</p> |

Printer properties



| Item | | Contents | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|----------|------------|----------|---|---|--|----|----|----|----|----|----|-----|--|--|-----|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Always Output Status Bit | | <p>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.</p> <p>The output area is as follows:</p> <ul style="list-style-type: none">• Bit 1 of the device memory for printer information output• Bit 0 of internal device memory \$s16 <p>\$s16</p> <table><tr><td colspan="15">MSB</td><td colspan="2">LSB</td></tr><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>09</td><td>08</td><td>07</td><td>06</td><td>05</td><td>04</td><td>03</td><td>02</td><td>01</td><td>00</td></tr><tr><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td></tr></table> <p>0: End (standby) 1: Transferring print data</p> | 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 | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hard Copy | Orientation | <p>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.</p> <ul style="list-style-type: none">• Printing examples of hard copies: <table><tr><td></td><td>Horizontal</td><td>Vertical</td></tr><tr><td></td><td></td><td></td></tr></table> | | Horizontal | Vertical |  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Horizontal | Vertical | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reversed Image | <p>Reversed: Screens are printed with black and white inverted. Normal: Screens are printed as they are displayed on MONITOUCH.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 \$.^{*1}

| \$Pn (n = 1 to 8) | \$. ^{*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) | ← TS2060 |
| : | : | : | |
| 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) | |
| : | : | : | |
| 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) | ← TS2060 |
| 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 | |
| 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.

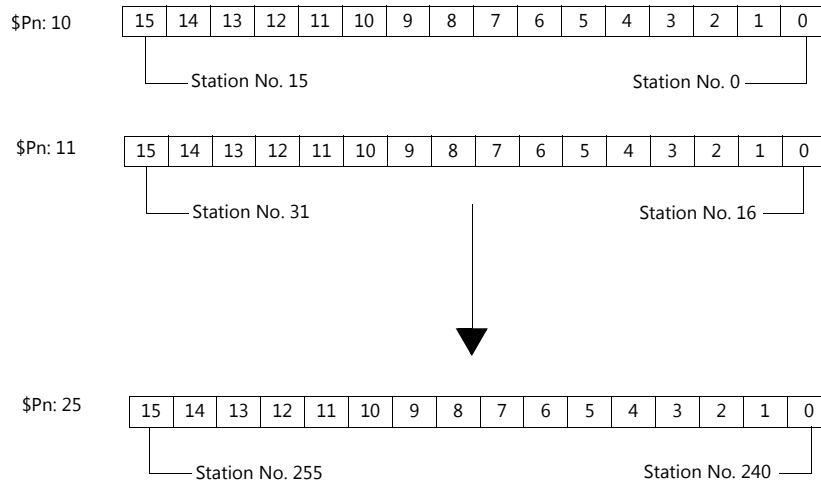
Details

\$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

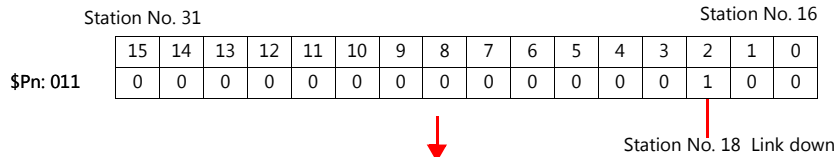
The update timing for the link down information stored in \$Pn: 010 to 025 and the error status stored in \$Pn: 100 to 355 are set here.

0: Always updated with the latest information

Other than 0: Only updated when a communication error occurs

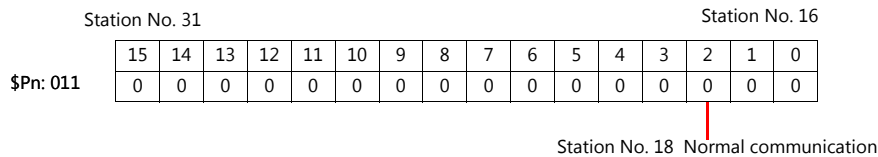
- Example:

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

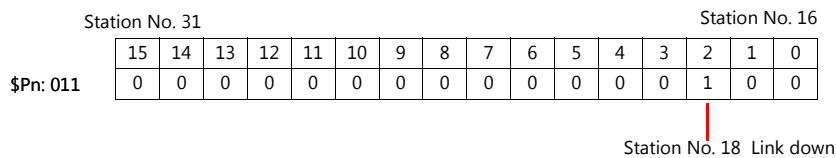


After resetting communications

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



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

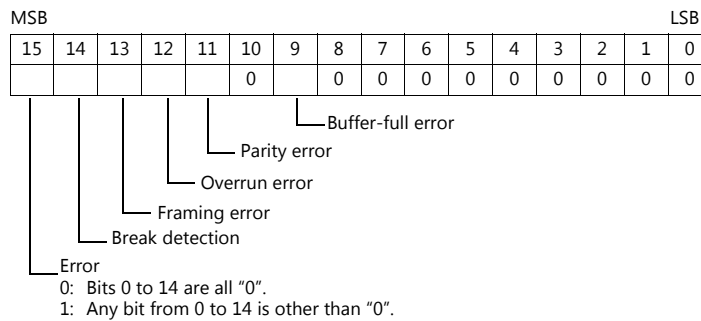


\$Pn: 100 to 355

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 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | LSB | 0 |
| | | | | | | 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 | Parity error |
| 11 | Framing error |
| 12 | Overrun error |
| 13 | FCS error |
| 14 | Format error, execution status error |
| 18 | Frame length error |
| 70 | 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 | Tag device memory warning 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 | System error Internal device memory error |

\$Pn: 508 to 511

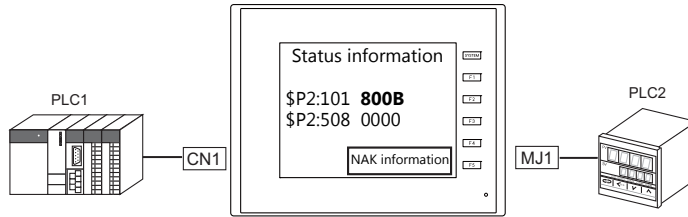
If "800BH" is stored for the error status information (\$Pn: 100 to 355), on transferring the data of that station number to any internal device memory address, the reception code will be obtained at \$Pn: 508 to 511.

Notes on use

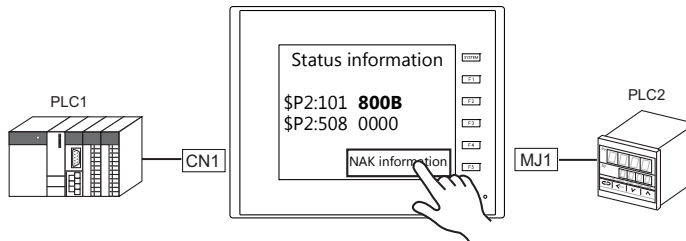
- Use \$u/\$T as the target internal device memory.
- Use the macro command MOV (W). MOV (D) cannot be used.
- "0" is stored to device memory addresses that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

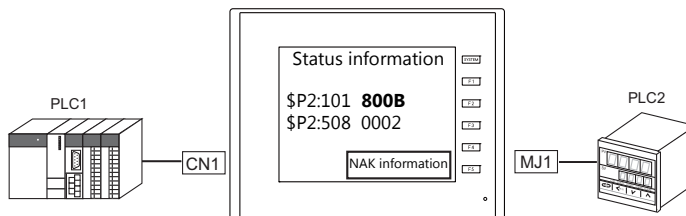
- 1) On receipt of an error code at station No. 1 of PLC2, "800BH" is stored in \$P2:101.



- 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) | <ul style="list-style-type: none"> • [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. The line is busy. Consult the network administrator of your company. The communication unit is in the older version or is faulty. |
| 300 | × | ○ | 16 times of collision errors | |
| 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. SAIA

2.1 PLC Connection

2.1 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) | |
| PCD | PCD1.M120 PCD1.M130 | PGU port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | PCD2.M120 PCD2.M130 | PCD7.F120 | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | PCD2.M170 PCD2.M480 | PCD7.F110 | 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} For the ladder transfer function, see the TS2060 Reference Manual 2.

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit | TCP/IP | UDP/IP | Port No. | Ladder Transfer ^{*2} |
|-----------------------------|--|----------------------------|--------|--------|------------|-------------------------------|
| PCD S-BUS (Ethernet) | PCD.M3120 PCD.M3330 PCD.M5340 PCD.M5540 PCD.M6340 PCD.M6540 | CPU with built-in Ethernet | × | ○ | 5050 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.

2.1.1 PCD

Communication Setting

Editor

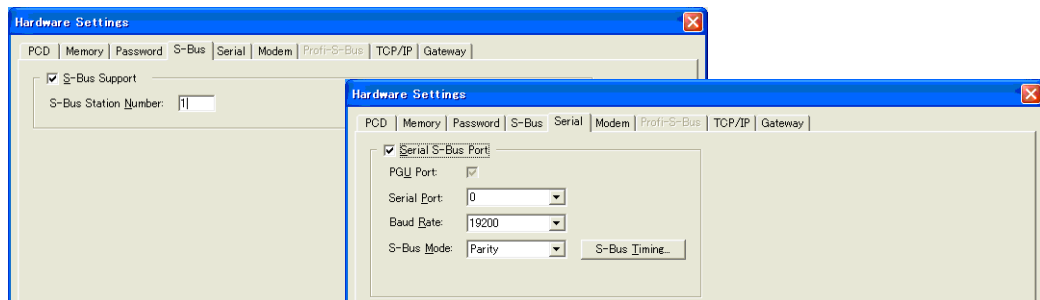
Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / 1:n / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 9600 / <u>19200</u> / 38400 / 57600 / 115K bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bits | |
| Target Port No. | 1 | |

PLC

PCD



| Item | Setting | Remarks |
|----------------------|------------------------------------|---------|
| S-Bus Station Number | 1 | |
| Serial Port | 0: PGU Port 1: PCD7.F120 / F110 | |
| Baud Rate | 19200 bps | |
| S-Bus Mode | Parity | |

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 | Double-word |
| Rfp (register/floating point) | 01H | Double-word |
| T (timer) | 02H | Double-word |
| C (counter) | 03H | Double-word |
| I (input) | 04H | Read only |
| O (output) | 05H | |
| F (flag) | 06H | |

2.1.2 PCD S-BUS (Ethernet)

Communication Setting

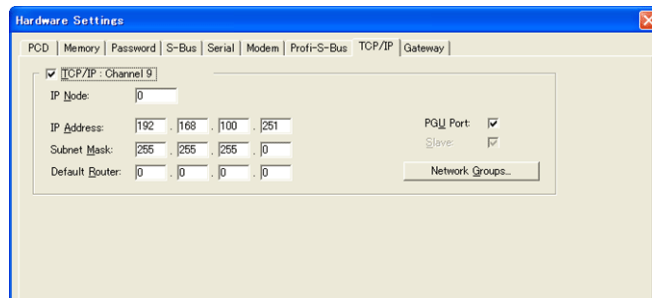
Editor

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

PCD S-BUS (Ethernet)



| Item | Setting | Remarks |
|----------------|---|---|
| IP Node | Make settings in accordance with the network environment. | For more information, refer to the manual of the PLC. |
| IP Address | PLC's IP address | |
| Subnet Mask | PLC's subnet mask | |
| Default Router | 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 |
|-------------------------------|------|-------------|
| R (register) | 00H | Double-word |
| Rfp (register/floating point) | 01H | Double-word |
| T (timer) | 02H | Double-word |
| C (counter) | 03H | Double-word |
| I (input) | 04H | Read only |
| O (output) | 05H | |
| F (flag) | 06H | |

2.1.3 Wiring Diagrams

When Connected at CN1:

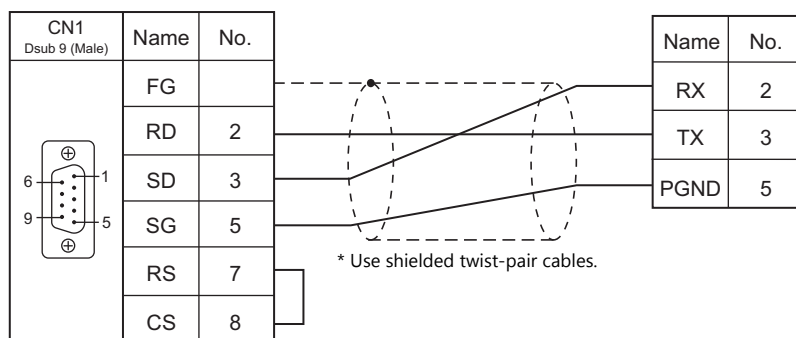


CAUTION

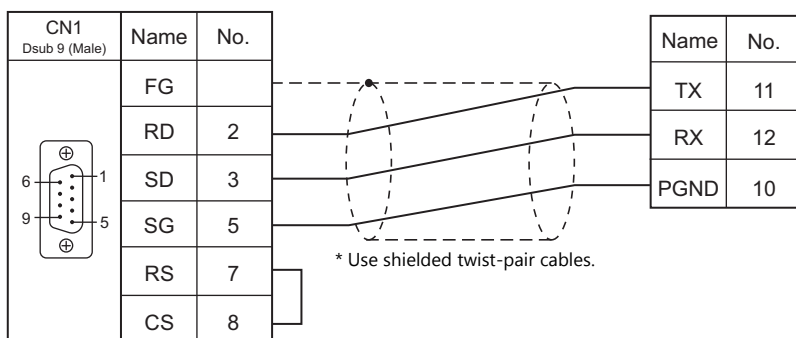
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

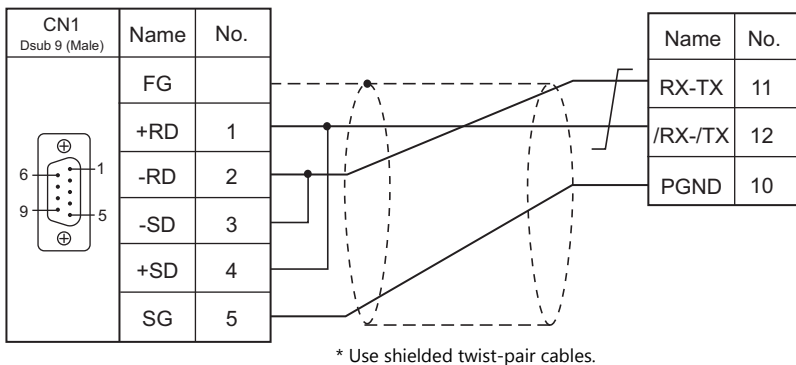


Wiring diagram 2 - C2



RS-422/RS-485

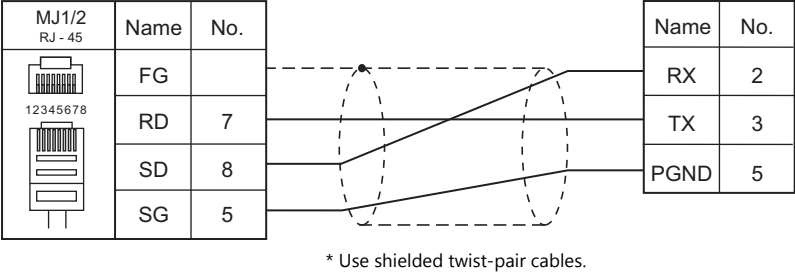
Wiring diagram 1 - C4



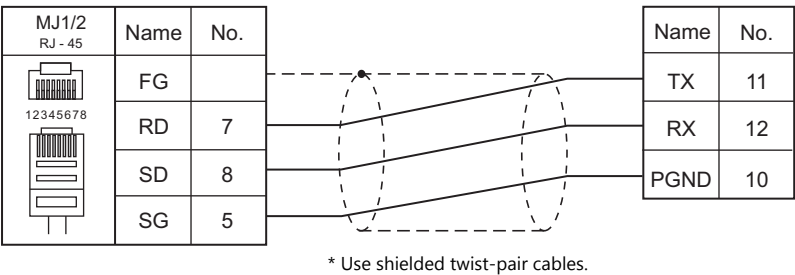
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

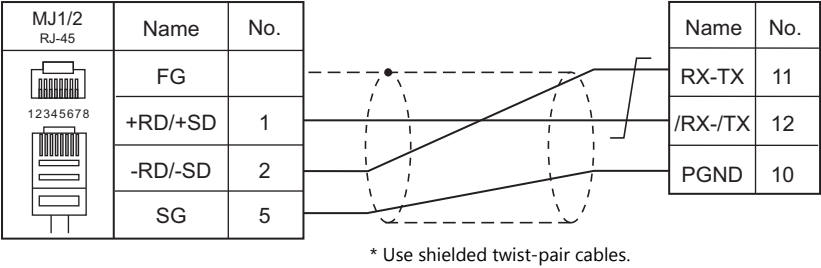


Wiring diagram 2 - M2



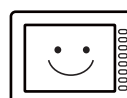
RS-422/RS-485

Wiring diagram 1 - M4



MEMO

MONITOUCH



3. SAMSUNG

3.1 PLC Connection

3.1 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} | |
| SPC series | SPC-10 | SPC-10ADT | RS-232C communication port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | SPC-100 | CPU-10AR | | | | | | |
| | SPC-300 | CPU-300 CPU-300A CPU-300B CPU-300C | RS-485 communication port | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | |
| N_plus | N70 plus | CPL9215A CPL9216A | COM1/ COM2 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | N700 plus | CPL7215A | | | | | | |
| | NX70 plus | NX70-CPU 70p1 | COM port | | | | | |
| | | | | | | | | |
| | | NX70-CPU 70p2 | COM1/ COM2 | | | | | |
| | | | NX70-CCU+ (CCU) | | | | | |
| | NX700 plus | NX-CPU 700p | COM1/ COM2 | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | | | NX-CCU+ (CCU) | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| 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} | |
| SECNET | N70 | CPL9211A | COM port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | × |
| | | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | ○ |
| | | CPL9462 (CCU) | | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | N70α | CPL9210A | COM port | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | ○ |
| | | | | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | N700 | CPL7210A CPL7211A | COM port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | × |
| | | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | ○ |
| | | | CPL7462 (CCU) | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | N700α | CPL6210A CPL6210B | TOOL port | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | ○ |
| | | | COM port | RS-232C | Wiring diagram 5 - C2 | Wiring diagram 5 - M2 | | × |
| | | | | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | N7000 | CPL5221B CPL5231 | COM port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | × |
| | | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | ○ |
| | | | CPL5462 (CCU) | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | N7000α | CPL4210 CPL4211 | COM1 | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | ○ |
| | | | COM2 | RS-232C | Wiring diagram 5 - C2 | Wiring diagram 5 - M2 | | × |
| | | | | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | NX70 | NX70-CPU70 | TOOL port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | ○ |
| | | | NX70-CCU (CCU) | RS-232C | Wiring diagram 6 - C2 | Wiring diagram 6 - M2 | | × |
| | | NX70-CPU 750 | TOOL port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | ○ |
| | | | COM port | RS-232C | Wiring diagram 6 - C2 | Wiring diagram 6 - M2 | | × |
| | | | | RS-232C | Wiring diagram 6 - C2 | Wiring diagram 6 - M2 | | |
| | NX700 | NX-CPU750A NX-CPU750B NX-CPU750C NX-CPU750D | TOOL port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | ○ |
| | | | COM port | RS-232C | Wiring diagram 6 - C2 | Wiring diagram 6 - M2 | | × |
| | | | | RS-232C | Wiring diagram 6 - C2 | Wiring diagram 6 - M2 | | |
| | | NX-CPU700 | TOOL port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | ○ |
| | | | NX-CCU (CCU) | RS-232C | Wiring diagram 6 - 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.

3.1.1 SPC Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 9600 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |
| Target Port No. | <u>0</u> to 255 | |

PLC

Communication setting

Baud rate: 9600 bps, data length: 8 bits, stop bit: 1 bit, without parity (fixed)

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 (input/output) | 00H | |
| L (link relay) | 01H | |
| M (internal relay) | 02H | |
| K (keep relay) | 03H | |
| F (special relay) | 04H | |
| W (word register) | 05H | |

3.1.2 N_plus

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | For RS-485 connection, set the transmission delay time to 3 msec or longer. |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |
| Target Port No. | <u>0</u> to 31 | |

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

System information

Set a station number for the PLC using the PLC software "WINGPC". For more information, refer to the PLC manual issued by the manufacturer.

| Setting Item | Setting | Remarks |
|--------------|---------------|---------|
| CPU ID | 0 to 223, 255 | |

CPL9215A

DIP switches 1

| DIPSW1 | | Contents | Setting | | | | | | | | | | | | | | | |
|---|-----|----------------------------|--|-----------|-----|-----------|-----|-----|---------|----|-----|----------|-----|----|----------|----|----|---------|
| <div>ON OFF</div> <div><div><div></div><div></div></div>1</div> <div><div><div></div><div></div></div>2</div> <div><div><div></div><div></div></div>3</div> <div><div><div></div><div></div></div>4</div> | SW1 | Program write target | ON: EEPROM OFF: RAM | | | | | | | | | | | | | | | |
| | SW2 | RS-232C / RS-485 selection | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | |
| | SW3 | Baud rate selection | <table><tr><th>SW3</th><th>SW4</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>38400bps</td></tr><tr><td>OFF</td><td>ON</td><td>19200bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW3 | SW4 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 38400bps | OFF | ON | 19200bps | ON | ON | 4800bps |
| | SW3 | | SW4 | Baud Rate | | | | | | | | | | | | | | |
| OFF | OFF | 9600bps | | | | | | | | | | | | | | | | |
| ON | OFF | 38400bps | | | | | | | | | | | | | | | | |
| OFF | ON | 19200bps | | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | |
| SW4 | | | | | | | | | | | | | | | | | | |

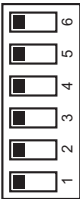
CPL9216A**DIP switches 1**

| DIPSW1 | | Contents | Setting | | | | | | | | | | | | | | | |
|---|-----------------------------------|----------------------------|--|-----------|-----|-----------|-----|-----|---------|----|-----|----------|-----|----|----------|----|----|---------|
| <div>ON OFF</div> <div><div><div></div><div></div></div>1</div> <div><div></div><div></div></div> 2 <div><div></div><div></div></div> 3 <div><div></div><div></div></div> 4 <div><div></div><div></div></div> 5 <div><div></div><div></div></div> 6 <div><div></div><div></div></div> 7 <div><div></div><div></div></div> 8 | SW1 | Baud rate selection (COM1) | <table><tr><th>SW1</th><th>SW2</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>19200bps</td></tr><tr><td>OFF</td><td>ON</td><td>38400bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW1 | SW2 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 19200bps | OFF | ON | 38400bps | ON | ON | 4800bps |
| | SW1 | | SW2 | Baud Rate | | | | | | | | | | | | | | |
| | OFF | | OFF | 9600bps | | | | | | | | | | | | | | |
| | ON | | OFF | 19200bps | | | | | | | | | | | | | | |
| | OFF | | ON | 38400bps | | | | | | | | | | | | | | |
| | ON | ON | 4800bps | | | | | | | | | | | | | | | |
| | SW2 | | | | | | | | | | | | | | | | | |
| | SW3 | Baud rate selection (COM2) | <table><tr><th>SW3</th><th>SW4</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>19200bps</td></tr><tr><td>OFF</td><td>ON</td><td>38400bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW3 | SW4 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 19200bps | OFF | ON | 38400bps | ON | ON | 4800bps |
| | SW3 | | SW4 | Baud Rate | | | | | | | | | | | | | | |
| | OFF | | OFF | 9600bps | | | | | | | | | | | | | | |
| ON | OFF | 19200bps | | | | | | | | | | | | | | | | |
| OFF | ON | 38400bps | | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | |
| SW4 | | | | | | | | | | | | | | | | | | |
| SW5 | RS-232C / RS-485 selection (COM1) | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | | |
| SW6 | RS-232C / RS-485 selection (COM2) | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | | |
| SW7 | Not used | OFF | | | | | | | | | | | | | | | | |
| SW8 | Program write target | ON: EEPROM OFF: RAM | | | | | | | | | | | | | | | | |


DIP switches 2

| DIPSW2 | | Contents | Setting | | |
|---|-----|--|---------|-----|------------------------|
| <div>ON OFF</div> <div><div><div></div><div></div></div>1</div> <div><div></div><div></div></div> 2 <div><div></div><div></div></div> 3 <div><div></div><div></div></div> 4 | SW1 | COM1 terminating resistance (for RS-485 connection) | SW1 | SW2 | Terminating Resistance |
| | SW2 | | OFF | OFF | Invalid |
| | | | ON | ON | Valid |
| | SW3 | COM2 terminating resistance (for RS-485 connection) | SW3 | SW4 | Terminating Resistance |
| | SW4 | | OFF | OFF | Invalid |
| | | | ON | ON | Valid |

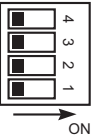
CPL7215A**DIP switches 1**

| DIPSW1 | | Contents | Setting | | | | | | | | | | | | | | | |
|---|--|---|--|-----------|------------------------|-----------|-----|---------|---------|----|-------|----------|-----|----|----------|----|----|---------|
|  → ON | SW1 | Baud rate selection (COM1) | ON: 19200bps OFF: 9600bps | | | | | | | | | | | | | | | |
| | SW2 | Baud rate selection (COM2) | <table><tr><th>SW2</th><th>SW3</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>19200bps</td></tr><tr><td>OFF</td><td>ON</td><td>38400bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW2 | SW3 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 19200bps | OFF | ON | 38400bps | ON | ON | 4800bps |
| | SW2 | | SW3 | Baud Rate | | | | | | | | | | | | | | |
| | OFF | | OFF | 9600bps | | | | | | | | | | | | | | |
| | ON | OFF | 19200bps | | | | | | | | | | | | | | | |
| | OFF | ON | 38400bps | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | |
| SW3 | | | | | | | | | | | | | | | | | | |
| SW4 | Program write target | ON: EEPROM OFF: RAM | | | | | | | | | | | | | | | | |
| SW5 | COM2 terminating resistance (for RS-485 connection) | <table><tr><th>SW5</th><th>SW6</th><th>Terminating Resistance</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid</td></tr><tr><td>ON</td><td>ON</td><td>Valid</td></tr></table> | SW5 | SW6 | Terminating Resistance | OFF | OFF | Invalid | ON | ON | Valid | | | | | | | |
| SW5 | | SW6 | Terminating Resistance | | | | | | | | | | | | | | | |
| OFF | OFF | Invalid | | | | | | | | | | | | | | | | |
| ON | ON | Valid | | | | | | | | | | | | | | | | |
| SW6 | | | | | | | | | | | | | | | | | | |


NX70-CPU70p1 (COM Port)**DIP switches**

| DIPSW | | Contents | Setting | | | | | | | | | | | | | | | | |
|---|----------------------------|--|---|------------------------|-----|-----|-----------|------------------------|-----|---------|---------|-----|----------|-------|----|----------|----|----|---------|
|  ON | SW1 | Terminating resistance (for RS-485 connection) | <table><tr><th>SW1</th><th>SW2</th><th>Terminating Resistance</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid</td></tr><tr><td>ON</td><td>ON</td><td>Valid</td></tr></table> | | | SW1 | SW2 | Terminating Resistance | OFF | OFF | Invalid | ON | ON | Valid | | | | | |
| | SW1 | | SW2 | Terminating Resistance | | | | | | | | | | | | | | | |
| | OFF | OFF | Invalid | | | | | | | | | | | | | | | | |
| | ON | ON | Valid | | | | | | | | | | | | | | | | |
| | SW2 | | | | | | | | | | | | | | | | | | |
| | SW3 | Program write target | ON: EEPROM OFF: RAM | | | | | | | | | | | | | | | | |
| SW4 | RS-232C / RS-485 selection | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | | | |
| SW5 | Baud rate selection | <table><tr><th>SW5</th><th>SW6</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>38400bps</td></tr><tr><td>OFF</td><td>ON</td><td>19200bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | | | SW5 | SW6 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 38400bps | OFF | ON | 19200bps | ON | ON | 4800bps |
| SW5 | | SW6 | Baud Rate | | | | | | | | | | | | | | | | |
| OFF | OFF | 9600bps | | | | | | | | | | | | | | | | | |
| ON | OFF | 38400bps | | | | | | | | | | | | | | | | | |
| OFF | ON | 19200bps | | | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | | |
| SW6 | | | | | | | | | | | | | | | | | | | |

NX70-CPU70p2 (COM Port) / NX-CPU700p (COM Port)**DIP switches 1**

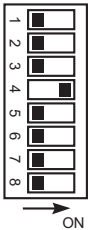
| DIPSW1 | | Contents | Setting | | | | | | | | | | | |
|---|-----|--|---|------------------------|--|-----|-----|------------------------|-----|-----|---------|----|----|-------|
|  | SW1 | COM1 terminating resistance (for RS-485 connection) | <table><tr><th>SW1</th><th>SW2</th><th>Terminating Resistance</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid</td></tr><tr><td>ON</td><td>ON</td><td>Valid</td></tr></table> | | | SW1 | SW2 | Terminating Resistance | OFF | OFF | Invalid | ON | ON | Valid |
| | SW1 | | SW2 | Terminating Resistance | | | | | | | | | | |
| | OFF | OFF | Invalid | | | | | | | | | | | |
| | ON | ON | Valid | | | | | | | | | | | |
| SW2 | | | | | | | | | | | | | | |
| | SW3 | COM2 terminating resistance (for RS-485 connection) | <table><tr><th>SW3</th><th>SW4</th><th>Terminating Resistance</th></tr><tr><td>OFF</td><td>OFF</td><td>Invalid</td></tr><tr><td>ON</td><td>ON</td><td>Valid</td></tr></table> | | | SW3 | SW4 | Terminating Resistance | OFF | OFF | Invalid | ON | ON | Valid |
| SW3 | SW4 | | Terminating Resistance | | | | | | | | | | | |
| OFF | OFF | Invalid | | | | | | | | | | | | |
| ON | ON | Valid | | | | | | | | | | | | |
| | SW4 | | | | | | | | | | | | | |

DIP switches 2

| DIPSW2 | | Contents | Setting | | | | | | | | | | | | | | | |
|---|----------------------------|--|--|-----------|-----------|-----------|-----|---------|---------|-----|----------|----------|-----|----------|----------|----|---------|---------|
|  | SW1 | Program write target | ON: EEPROM OFF: RAM | | | | | | | | | | | | | | | |
| | SW2 | Not used | OFF | | | | | | | | | | | | | | | |
| | SW3 | RS-232C / RS-485 selection (COM2) | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | |
| | SW4 | RS-232C / RS-485 selection (COM1) | ON: RS-485 OFF: RS-232C | | | | | | | | | | | | | | | |
| | SW5 | Baud rate selection (COM1) | <table><tr><th>SW5</th><th>SW6</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>38400bps</td></tr><tr><td>OFF</td><td>ON</td><td>19200bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW5 | SW6 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 38400bps | OFF | ON | 19200bps | ON | ON | 4800bps |
| | SW5 | | SW6 | Baud Rate | | | | | | | | | | | | | | |
| | OFF | OFF | 9600bps | | | | | | | | | | | | | | | |
| | ON | OFF | 38400bps | | | | | | | | | | | | | | | |
| OFF | ON | 19200bps | | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | |
| SW6 | | | | | | | | | | | | | | | | | | |
| SW7 | Baud rate selection (COM2) | <table><tr><th>SW7</th><th>SW8</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>9600bps</td></tr><tr><td>ON</td><td>OFF</td><td>38400bps</td></tr><tr><td>OFF</td><td>ON</td><td>19200bps</td></tr><tr><td>ON</td><td>ON</td><td>4800bps</td></tr></table> | SW7 | SW8 | Baud Rate | OFF | OFF | 9600bps | ON | OFF | 38400bps | OFF | ON | 19200bps | ON | ON | 4800bps | |
| SW7 | | SW8 | Baud Rate | | | | | | | | | | | | | | | |
| OFF | OFF | 9600bps | | | | | | | | | | | | | | | | |
| ON | OFF | 38400bps | | | | | | | | | | | | | | | | |
| OFF | ON | 19200bps | | | | | | | | | | | | | | | | |
| ON | ON | 4800bps | | | | | | | | | | | | | | | | |
| SW8 | | | | | | | | | | | | | | | | | | |

NX-CCU+(CCU) / NX70-CCU+(CCU)

DIP switches

| DIPSW | Contents | | Setting | | | |
|---|----------|---------------------|------------|-----|-----|-----------|
|  | SW1 | Baud rate selection | SW1 | SW2 | SW3 | Baud Rate |
| | SW2 | | OFF | OFF | OFF | 38400bps |
| | SW3 | | ON | OFF | OFF | 19200bps |
| | SW4 | Data length | OFF | ON | OFF | 9600bps |
| | | | ON | ON | OFF | 4800bps |
| | SW5 | Parity check | ON: 8 bits | | | |
| | SW6 | | OFF: None | | | |
| | SW7 | Stop bit | OFF: 1 bit | | | |
| | SW8 | Reserved | OFF | | | |

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 | (input/output) | 00H | |
| L | (link relay) | 01H | |
| M | (internal relay) | 02H | |
| K | (keep relay) | 03H | |
| F | (special relay) | 04H | |
| W | (word register) | 05H | |

3.1.3 SECRET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------|---|--|
| Connection Mode | <u>1</u> : <u>1</u> / 1 : n / Multi-link / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 / 76800 / 115K bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 31 | Only port No. 31 is valid, depending on the CPU model. For connection with a CCU module, select port No. 1. |
| Header | % (<u>Header</u>) / < (Extension Header) | Models on which "< (Expansion Header)" is available: NX-CPU750A / NX-CPU750B / NX-CPU750C / NX-CPU750D / NX70-CPU750 |
| Monitor Registration | Unchecked / <u>Checked</u> | One TS2060 unit can be registered as a monitor for one PLC. When multi-link connection (n : 1) is selected, do not check this box for multiple TS2060 units. |

PLC

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 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 |
|----------------------------------|------|------------------------------|
| DT (data register) | 00H | |
| X (external input) | 01H | WX as word device, read only |
| Y (external output) | 02H | WY as word device |
| R (internal relay) | 03H | WR as word device |
| L (link relay) | 04H | WL as word device |
| LD (link register) | 05H | |
| FL (file register) | 06H | |
| SV (timer, counter/set value) | 07H | |
| EV (timer, counter/elapsed time) | 08H | |
| T (timer/contact) | 09H | Read only |
| C (counter/contact) | 0AH | Read only |

3.1.4 Wiring Diagrams



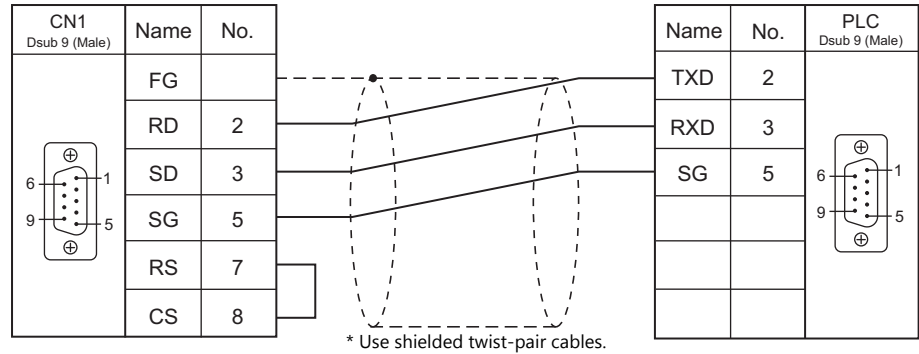
CAUTION

- 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.

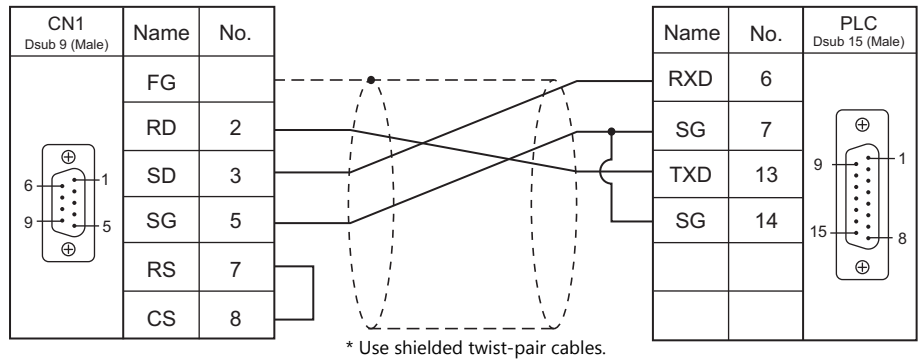
When Connected at CN1:

RS-232C

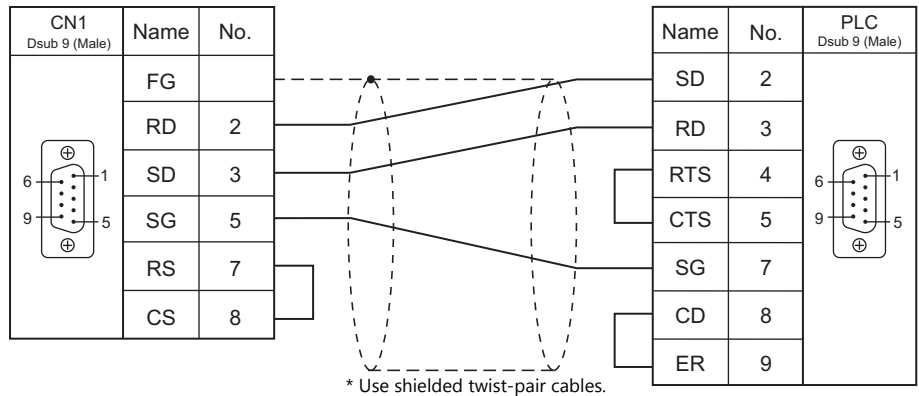
Wiring diagram 1 - C2

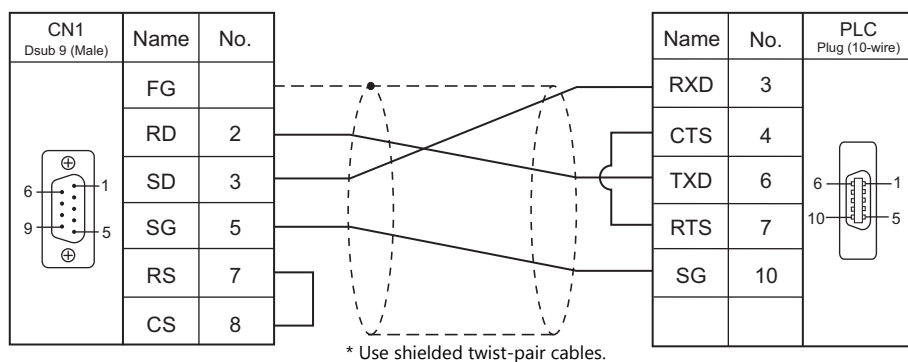
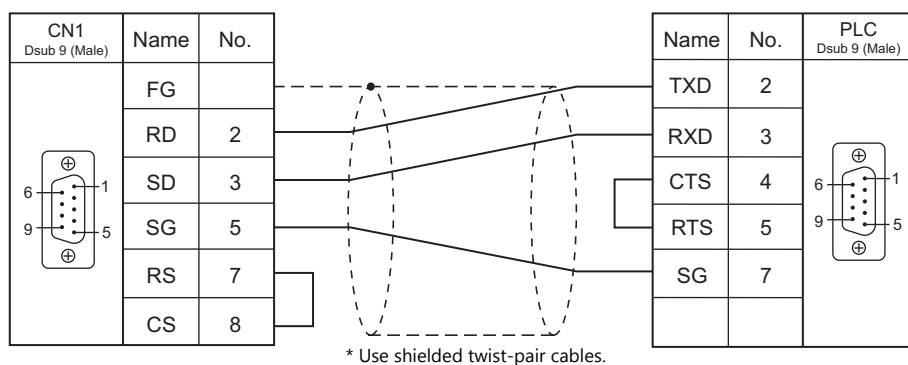
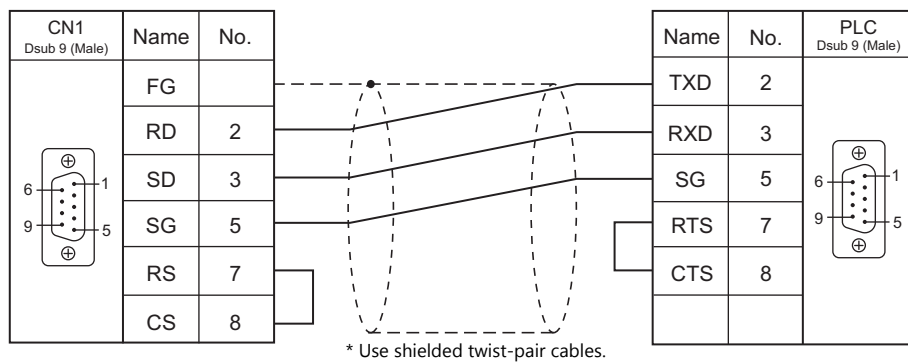


Wiring diagram 2 - C2



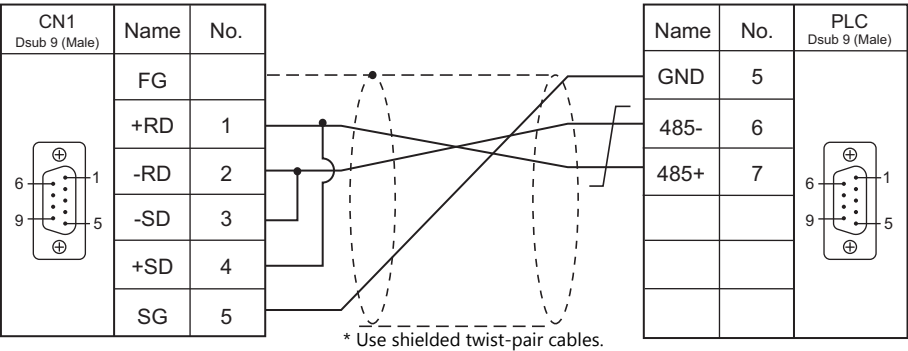
Wiring diagram 3 - C2



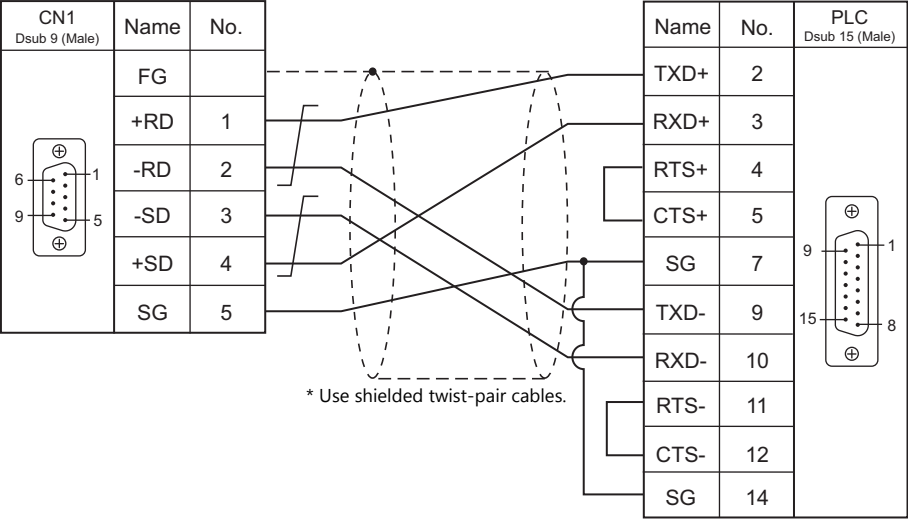
Wiring diagram 4 - C2**Wiring diagram 5 - C2****Wiring diagram 6 - C2**

RS-422/RS-485

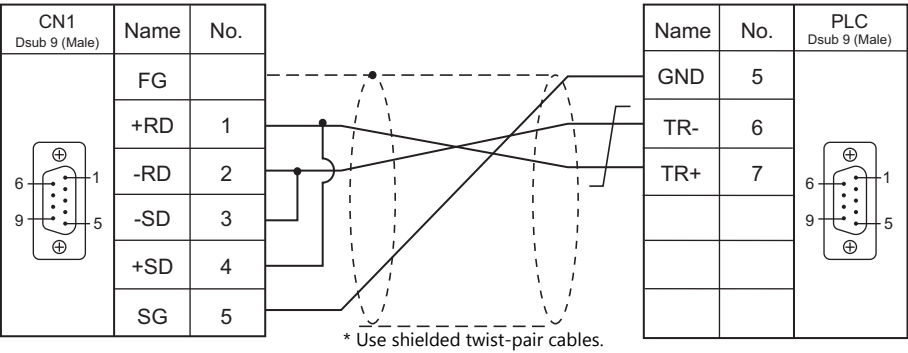
Wiring diagram 1 - C4



Wiring diagram 2 - C4



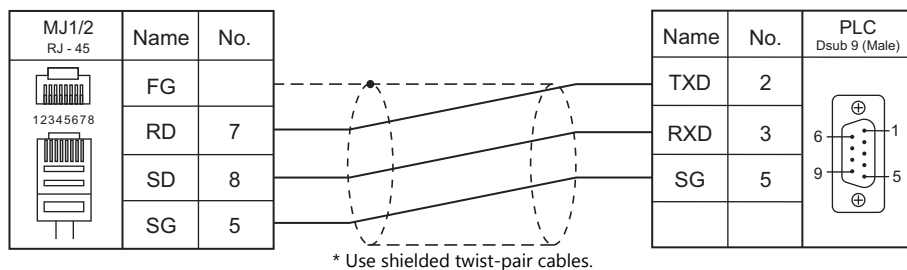
Wiring diagram 3 - C4



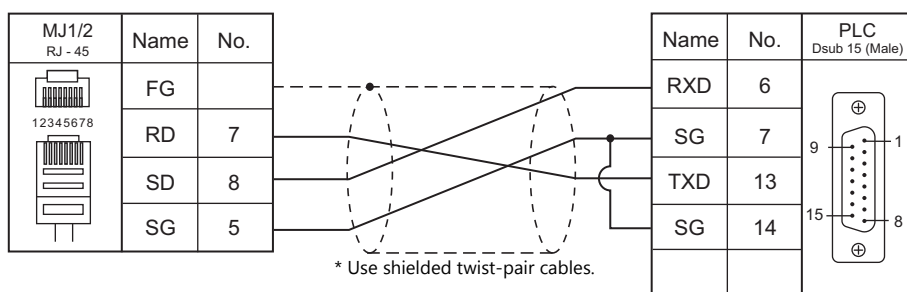
When Connected at MJ1/MJ2:

RS-232C

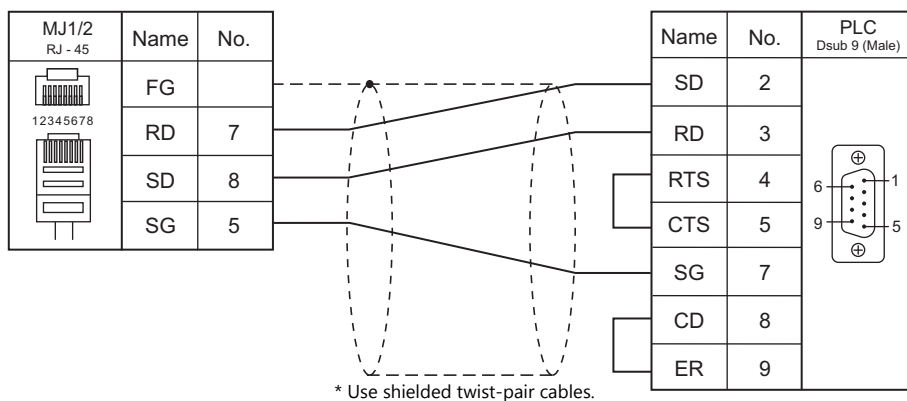
Wiring diagram 1 - M2



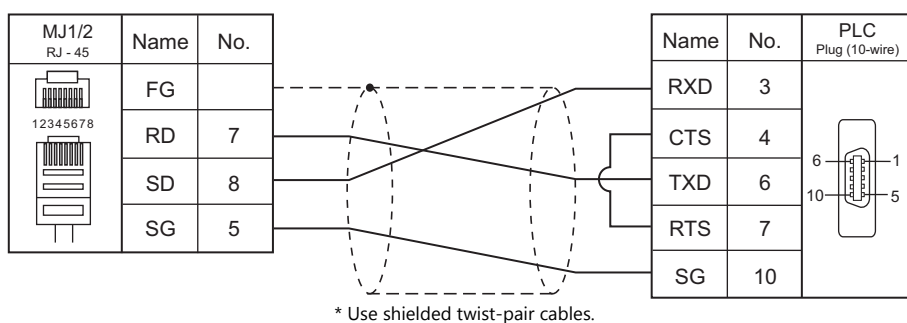
Wiring diagram 2 - M2



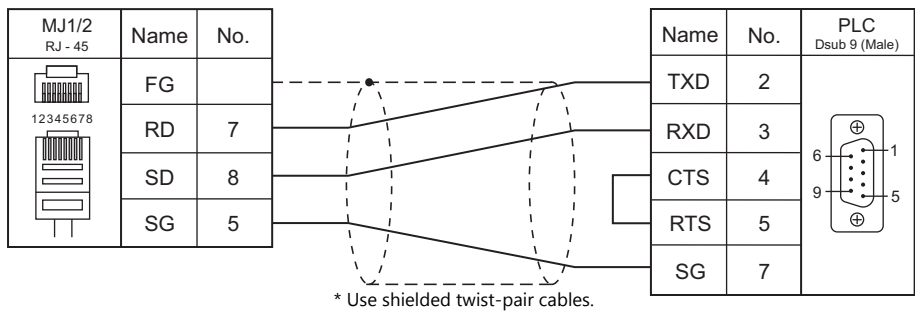
Wiring diagram 3 - M2



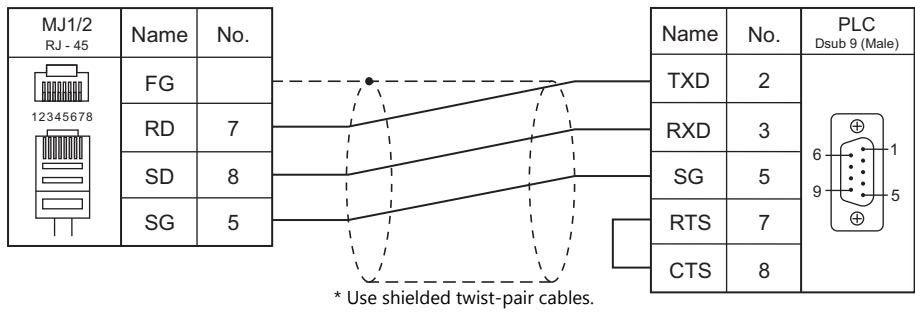
Wiring diagram 4 - M2



Wiring diagram 5 - M2

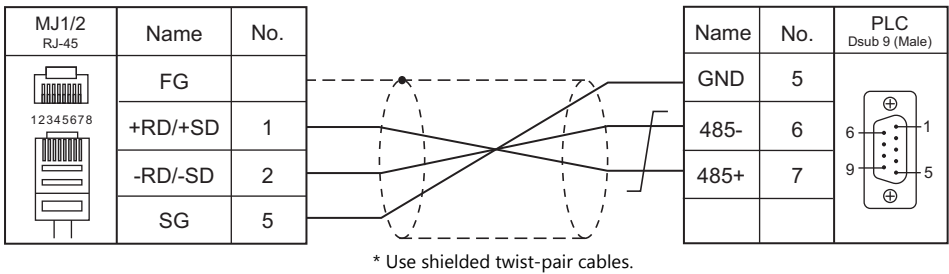


Wiring diagram 6 - M2

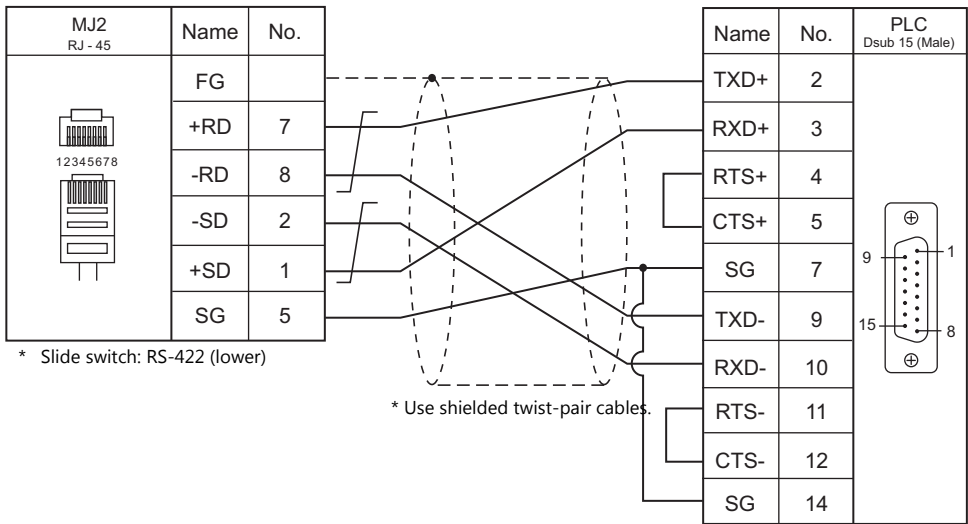


RS-422/RS-485

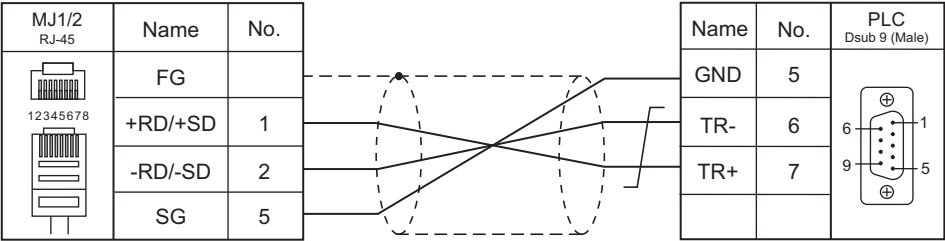
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



4. SanRex

4.1 Temperature Controller / Servo / Inverter Connection

4.1 Temperature Controller / Servo / Inverter Connection

Serial Connection

DC Power Supply Unit

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|------------|----------------|--------------|-----------------------|------------|-----------------------|----------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) *2 | |
| DC AUTO (HKD type) | Type HKD B | Terminal block | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | HKD.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).

4.1.1 DC AUTO (HKD type)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|------------------------------------|---------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 | |
| Signal Level | RS-422/485 | |
| Baud Rate | 9600 bps | |
| Parity | Even | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Target Port No. | <u>1</u> to 31 | |

DC AUTO (Type HKD B)

| Item | Setting | Remarks |
|-----------------------|-----------------|-----------------------------------|
| Communication address | 1 to 31 | |
| Baud rate | 9600 BPS | |
| Transmission mode | 8E1 | |
| REMOTE/PANEL key | REMOTE | Remote control mode ^{*1} |

^{*1} This setting is not provided, depending on the model.

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 |
|-----------------------------|------|------------------------|
| M (monitor data) | 00H | Read only |
| MD (monitor data (4 bytes)) | 01H | Double-word, read only |
| S (setting data) | 02H | ^{*1} |
| SD (setting data (4 bytes)) | 03H | Double-word |

^{*1} When changing the data setting, press the REMOTE/PANEL key to select the remote mode.

4.1.2 Wiring Diagrams

When Connected at CN1:

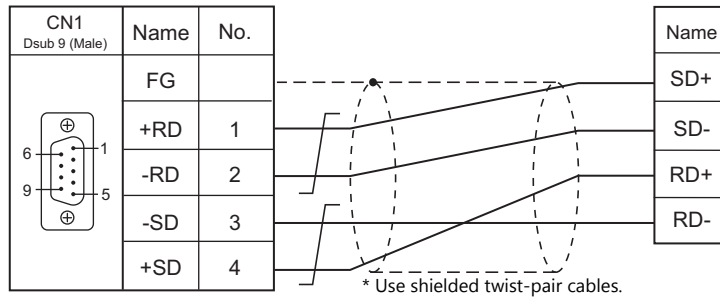


CAUTION

- 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

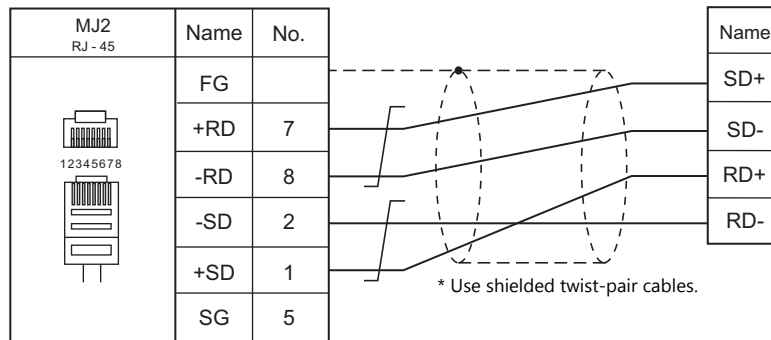
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-422/RS-485

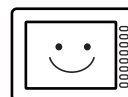
Wiring diagram 1 - M4



* Slide switch: RS-422 (lower)

MEMO

MONITOUCH



5. SANMEI

5.1 Temperature Controller/Servo/Inverter Connection

5.1 Temperature Controller/Servo/Inverter Connection

AC Servo Driver

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|--------------------------------|----------|------|-----------------|-----------------------|-----------------------|----------------------------|-----------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) ^{*2} | |
| Cuty Axis | QT-0xxAX | CN4 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | SanQT.Lst |
| | | | 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).

5.1.1 Cuty Axis

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 | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 9600 bps (fixed) | |
| Data Length | 8 bits (fixed) | |
| Stop Bit | 1 bit (fixed) | |
| Parity | Even (fixed) | |
| Target Port No. | <u>0</u> to 9 | Set the same number as the axis number of the AC servo driver. |

AC Servo Driver

The communication parameters can be set using the MODE key on the built-in digital operator attached to the front of the AC servo driver.

They can also be set by using the software "Cuty Wave" or the ladder program.

For settings using the software or ladder program, refer to the AC servo driver manual issued by the manufacturer.

(Underlined setting: default)

| Mode | Parameter No. | Item | Setting | Remarks |
|---------------------|---------------|-------------|---------------|--------------------------------------|
| Parameter mode (P-) | 27 | Axis number | <u>0</u> to 9 | Invalid during RS-232C communication |

The following settings are fixed; baud rate: 9600 bps, 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 |
|------------------------|------|------------------------|
| PRM (parameter) *1 | 00H | Double-word |
| TBL (point table) *2 | 01H | Double-word |
| OPE (basic operation) | 02H | Double-word |
| MON (value monitor) *1 | 03H | Double-word, read only |
| IO (I/O monitor) *1 | 04H | Double-word, read only |
| ALM (alarm status) *1 | 05H | Double-word, read only |
| S (servo status) | 06H | Double-word, read only |
| VV (internal monitor) | 07H | Double-word, read only |

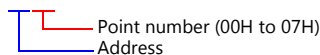
*1 When using the parameter, value monitor, I/O monitor or alarm status device memory, set the address with the number of digits shown below. For other types of device memory, see "Device Memory Types" described later.

- Parameter, value monitor, I/O monitor: 8 digits
- Alarm status: 4 digits

*2 Address denotations

On the signal name reference list, every point number is designated as "00". To access any point number other than "00", manually input the desired number.

aabb



Device Memory Types

| Type | Address | Name | Digits |
|--------------------------|---------|---|--------|
| TBL (Point table) | 0 | Absolute/relative value | 2 |
| | 1 | Distance of movement | 8 |
| | 2 | Speed | 4 |
| | 3 | Acceleration/deceleration time constant | 4 |
| | 4 | Wait time | 4 |
| | 5 | Continuous motion | 2 |
| | 6 | Branch target point number | 2 |
| | 7 | Acceleration/deceleration ON/OFF at S | 2 |
| | 8 | Expansion (1) | 2 |
| OPE (Basic operation) | 9 | Expansion (2) | 4 |
| | 0 | Write into EEPROM | 1 |
| | 1 | Servo ON | 1 |
| | 2 | Servo OFF | 1 |
| | 3 | Emergency stop ON | 1 |
| | 4 | Emergency stop OFF | 1 |
| | 5 | Alarm reset | 1 |
| | 6 | Start ON | 1 |
| | 7 | Start OFF | 1 |
| | 8 | Zero start ON | 1 |
| | 9 | Zero start OFF | 1 |
| | A | Zero deceleration ON | 1 |
| | B | Zero deceleration OFF | 1 |
| | C | Pause ON | 1 |
| | D | Pause OFF | 1 |
| | E | Single block ON | 1 |
| | F | Single block OFF | 1 |
| | 10 | Point No. designation | 2 |
| | 11 | Log clear | 1 |
| | 12 | Torque peak reset | 1 |
| | 13 | Machine zero point change | 8 |
| | 14 | Reset | 1 |
| | 15 | Normal JOG | 1 |
| | 16 | Reverse JOG | 1 |
| | 17 | JOG stop | 1 |
| | 18 | General-purpose output setting | 2 |
| | 19 | General-purpose output | 2 |
| | 1A | Smoothing setting | 8 |

| Type | Address | Name | Digits |
|--------------------------|---------|----------------------------|--------|
| S (Servo status) | 0 | Servo status | 8 |
| | 1 | Command point | 2 |
| | 2 | Motor type | 2 |
| | 3 | ROM version | 4 |
| | 4 | System data 1 | 4 |
| | 5 | System data 2 | 4 |
| | 6 | System data 3 | 2 |
| | 7 | System data 4 | 2 |
| Internal monitor (VV) | 0 | System data 1 | 2 |
| | 1 | System data 2 | 2 |
| | 2 | System data 3 | 2 |
| | 3 | System data 4 | 2 |
| | 4 | System data 5 | 2 |
| | 5 | System data 6 | 2 |
| | 6 | System data 7 | 2 |
| | 7 | System data 8 | 2 |
| | 8 | Speed [rpm] | 8 |
| | 9 | Torque [%] | 8 |
| | A | Torque (+/-) peak [%] | 8 |
| | B | Current position [pulse] | 8 |
| | C | Position command [pulse] | 8 |
| | D | Position deviation [pulse] | 8 |
| | E | Servo status | 8 |
| | F | I/O status | 8 |
| | 10 | System data 9 | 4 |
| | 11 | System data 10 | 4 |
| | 12 | System data 11 | 4 |
| | 13 | Point being executed | 2 |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|------------------|---|------------------|
| Data write of all axes (PRM, OPE) | 1 - 8 (PLC1 - 8) | n | Command: 7FH * ¹ | 5 |
| | | n + 1 | Device number 00H: Parameter (PRM) 02H: Basic operation (OPE) | |
| | | n + 2 | Address | |
| | | n + 3 | Data (lower) | |
| | | n + 4 | Data (higher) | |
| Data write of all axes * ² (TBL) | 1 - 8 (PLC1 - 8) | n | Command: 7FH * ¹ | 23* ³ |
| | | n + 1 | Device number 01H: Point table (TBL) | |
| | | n + 2 | Point number: 0000H to 0007H | |
| | | n + 3 to n + 4 | Absolute/relative value: 0 to 1 | |
| | | n + 5 to n + 6 | Distance of movement: -9999999 to 9999999 | |
| | | n + 7 to n + 8 | Speed: 1 to 5000 | |
| | | n + 9 to n + 10 | Acceleration/deceleration time constant: 1 to 9999 | |
| | | n + 11 to n + 12 | Wait time: 0 to 9999 | |
| | | n + 13 to n + 14 | Continuous motion: 0 to 1 | |
| | | n + 15 to n + 16 | Branch target point number: 0 to 107 | |
| | | n + 17 to n + 18 | S-shaped motion ON/OFF: 0 to 1 | |
| | | n + 19 to n + 20 | Expansion 1 * ³ | |
| | | n + 21 to n + 22 | Expansion 2 * ³ | |
| Data write of each axis (PRM, OPE) | 1 - 8 (PLC1 - 8) | n | Station number: 0100H to 0109H | 5 |
| | | n + 1 | Device number 00H: Parameter (PRM) 02H: Basic operation (OPE) | |
| | | n + 2 | Address | |
| | | n + 3 | Data (lower) | |
| | | n + 4 | Data (higher) | |
| Data write of each axis (TBL) | 1 - 8 (PLC1 - 8) | n | Station number: 0100H to 0109H | 23* ³ |
| | | n + 1 | Device number 01H: Point table (TBL) | |
| | | n + 2 | Point number: 0000H to 0007H | |
| | | n + 3 to n + 4 | Absolute/relative value: 0 to 1 | |
| | | n + 5 to n + 6 | Distance of movement: -9999999 to 9999999 | |
| | | n + 7 to n + 8 | Speed: 1 to 5000 | |
| | | n + 9 to n + 10 | Acceleration/deceleration time constant: 1 to 9999 | |
| | | n + 11 to n + 12 | Wait time: 0 to 9999 | |
| | | n + 13 to n + 14 | Continuous motion: 0 to 1 | |
| | | n + 15 to n + 16 | Branch target point number: 0 to 107 | |
| | | n + 17 to n + 18 | S-shaped motion ON/OFF: 0 to 1 | |
| | | n + 19 to n + 20 | Expansion 1 * ³ | |
| | | n + 21 to n + 22 | Expansion 2 * ³ | |
| Teaching | 1 - 8 (PLC1 - 8) | n | Station number: 00H to 09H | 2 |
| | | n + 1 | Command: 0000H | |
| | | n + 2 | Data (lower) | |
| | | n + 3 | Data (higher) | |

| Contents | F0 | F1 (= \$u n) | | | | | | | F2 | |
|-----------------------------|---------------------|--------------------------|--|---|----------------------------|--|--|--|----|---|
| T waveform monitor sampling | 1 - 8 (PLC1 - 8) | n | Station number: 00H to 09H | | | | | | | 5 |
| | | n + 1 | Command: 0001H | | | | | | | |
| | | n + 2 | <div>Control code</div> <div><div>Bit</div><div><div>-</div><div>7</div><div>6</div><div>5</div><div>4</div><div>3</div><div>2</div><div>1</div><div>0</div></div><div><div>Trigger target</div><div>0: Speed</div><div>1: Torque</div><div>2: Servo status</div><div>3: Manual</div></div><div><div>Trigger edge</div><div>0: Leading edge in normal turn</div><div>1: Trailing edge in normal turn</div><div>2: Leading edge in reverse turn</div><div>3: Trailing edge in reverse turn</div></div><div><div>Sampling interval</div><div>0: 2 ms (50 ms/div)</div><div>1: 4 ms (100 ms/div)</div><div>2: 8 ms (200 ms/div)</div><div>3: 20 ms (500 ms/div)</div></div><div><div>Operation command</div><div>0: Stop</div><div>1: Run</div></div></div> | | | | | | | |
| | | n + 3 | Trigger position 00H to 1EH (0FH: Center) | | | | | | | |
| | | n + 4 | <div>Servo status bit</div> <div><div>Bit</div><div><div>-</div><div>7</div><div>6</div><div>5</div><div>4</div><div>3</div><div>2</div><div>1</div><div>0</div></div><div><div>Positioning</div></div></div> | | | | | | | |
| | | n + 5 | Servo status | | | | | | | |
| | | n + 6 | Torque | | | | | | | |
| | | n + 7 | Speed | | | | | | | |
| | | n + 8 | Servo status | | | | | | | |
| | | : | : | | | | | | | |
| | | n + 51 | Torque | | | | | | | |
| | | n + 52 | Speed | | | | | | | |
| | | Servo status acquisition | 1 - 8 (PLC1 - 8) | n | Station number: 00H to 09H | | | | | |
| n + 1 | Command: 0002H | | | | | | | | | |
| n + 2 to n + 3 | Servo status | | | | | | | | | |
| n + 4 to n + 5 | Command point | | | | | | | | | |
| n + 6 to n + 7 | Motor type | | | | | | | | | |
| n + 8 to n + 9 | ROM version | | | | | | | | | |
| n + 10 to n + 11 | System data | | | | | | | | | |
| n + 12 to n + 13 | System data | | | | | | | | | |
| n + 14 to n + 15 | System data | | | | | | | | | |
| n + 16 to n + 17 | System data | | | | | | | | | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|------------------|---------------------|------------------|----------------------------|----|
| Internal monitor | 1 - 8 (PLC1 - 8) | n | Station number: 00H to 09H | 2 |
| | | n + 1 | Command: 0003H | |
| | | n + 2 to n + 3 | System data | |
| | | n + 4 to n + 5 | System data | |
| | | n + 6 to n + 7 | System data | |
| | | n + 8 to n + 9 | System data | |
| | | n + 10 to n + 11 | System data | |
| | | n + 12 to n + 13 | System data | |
| | | n + 14 to n + 15 | System data | |
| | | n + 16 to n + 17 | System data | |
| | | n + 18 to n + 19 | Speed [rpm] | |
| | | n + 20 to n + 21 | Torque [%] | |
| | | n + 22 to n + 23 | Torque (+) peak [%] | |
| | | n + 24 to n + 25 | Current position [pulse] | |
| | | n + 26 to n + 27 | Position command [pulse] | |
| | | n + 28 to n + 29 | Position deviation [pulse] | |
| | | n + 30 to n + 31 | Servo status | |
| | | n + 32 to n + 33 | I/O status | |
| | | n + 34 to n + 35 | System data | |
| | | n + 36 to n + 37 | System data | |
| | | n + 38 to n + 39 | System data | |
| | | n + 40 to n + 41 | Point being executed | |

Return data: Data stored from AC servo to TS2060

- *1 "FFH" can be set for the command (n) when Cuty Axis of version 2.50 and later is used.
- *2 When "01H: point table" is set for the device number (n + 1) of the "data write of all axes" command, the version of all connected Cuty Axis units must be unified into earlier than 2.50 or 2.50 and later.
- *3 "Expansion 1" and "expansion 2" settings are valid when Cuty Axis of version 2.50 and later is used.

| Function | Expansion 1 | Expansion 2 |
|----------------------------------|---------------------------|---|
| None | 00 | 0000 |
| Jump setting for input condition | 01 | Jump destination Point number: 0000 to 0007 Operation end: 0063 |
| Loop setting | Number of loops: 02 to 64 | Point number (single block function): 0064 to 0071 |
| Torque setting | FF | Torque setting value [%]: 0001 to 0120 |
| Loop counter clear | 7F | Counter number to be cleared: 0000 to 0007 |

5.1.2 Wiring Diagrams

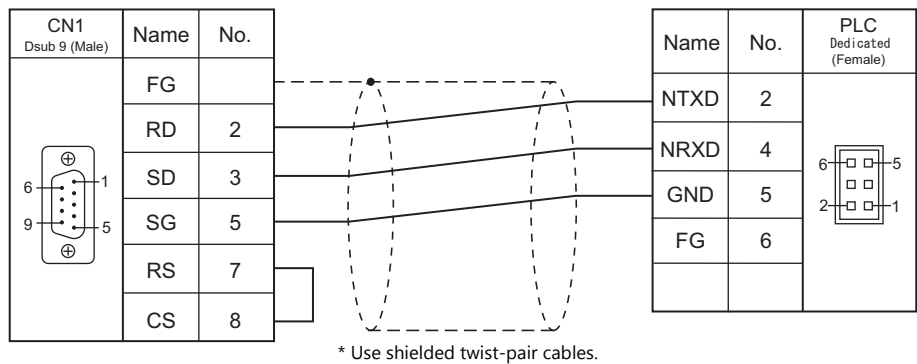
When Connected at CN1:



- 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.

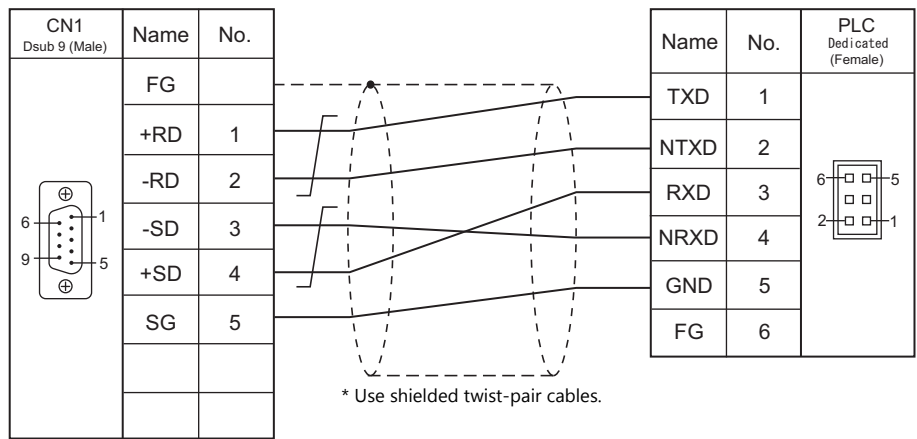
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

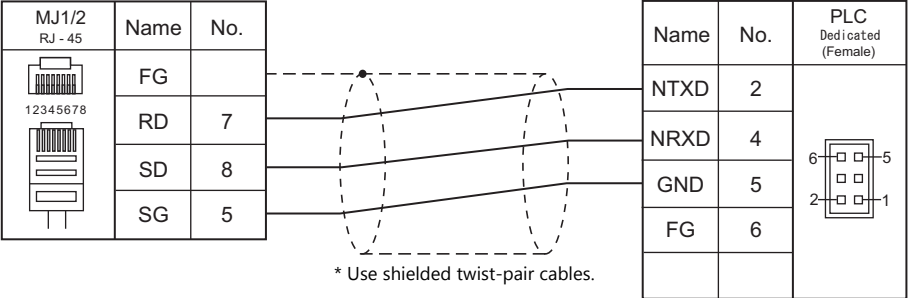
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

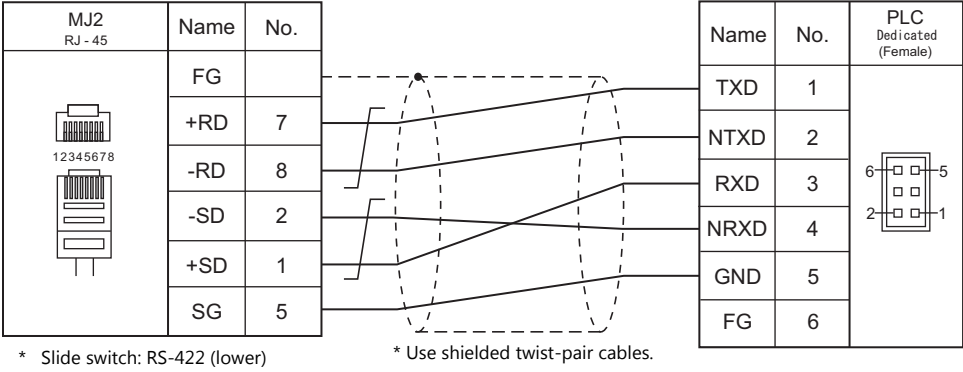
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



6. SHARP

6.1 PLC Connection

6.2 Temperature Controller/Servo/Inverter Connection

6.1 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 | | |
| JW series | W70H, W100H JW50, JW70, JW100 JW50H, JW70H, JW100H JW-50CU | | JW-10CM ZW-10CM | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | × | |
| | JW20, JW20H, JW30H | | JW-21CM | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | | |
| | JW10 | JW-1324K JW-1342K JW-1424K JW-1442K JW-1624K JW-1642K | MMI port | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 3 - M4 | | |
| | | Communication port | RS-422 | Wiring diagram 3 - C4 | Wiring diagram 1 - M4 | | | | |
| | JW30H | | JW-32CUH JW-32CUH1 JW-32CUM1 JW-33CUH JW-33CUH1 JW-33CUH2 JW-33CUH3 | PG/COMM1 port | RS-422 | Wiring diagram 4 - C4 | × | | Wiring diagram 4 - M4 |
| | | PG/COMM2 port | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | | |
| | | | RS-422 | Wiring diagram 4 - C4 | × | Wiring diagram 4 - M4 | | | |
| | J-board | Z-331J Z-332J | Host communication port T1 | RS-422 | Wiring diagram 3 - C4 | Wiring diagram 1 - M4 | | | |
| | JW100/70H COM port | JW70 | JW-70CU | Communication port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | JW100 | JW-100CU | | RS-422 | Wiring diagram 5 - C4 | × | | Wiring diagram 5 - M4 |
| | | JW70H | JW-70CUH | Communication port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | JW100 H | JW-100CUH | | RS-422 | Wiring diagram 6 - C4 | × | | Wiring diagram 6 - M4 |
| JW20 COM port | JW20H | JW-22CU | Communication port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | | |
| | J-board | Z-311J Z-312J | Host communication port CN3 | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | | |
| | | | Host communication port TC1 | RS-422 | Wiring diagram 7 - C4 | × | Wiring diagram 7 - M4 | | |
| | | Z-511J | PG/COMM1 port PG/COMM2 port | RS-422 | Wiring diagram 4 - C4 | × | Wiring diagram 4 - M4 | | |
| | | | PG/COMM1 port PG/COMM2 port | | | | | | |
| | | Z-512J | PG/COMM1 port PG/COMM2 port | | | | | | |
| | | | | | | | | | |
| | JW300 series | JW300 | JW-311CU JW-312CU | PG/COMM1 port | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | |
| JW-21CM *4 | | | | RS-422 | Wiring diagram 4 - C4 | × | Wiring diagram 4 - M4 | | |
| | | | | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | | |
| JW-321CU JW-322CU JW-331CU JW-332CU JW-341CU JW-342CU JW-352CU JW-362CU | | | PG/COMM1 port | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | | |
| | | | PG/COMM2 port | RS-422 | Wiring diagram 4 - C4 | × | Wiring diagram 4 - M4 | | |
| | | | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | | |
| JW-21CM *4 | | | RS-422 | Wiring diagram 4 - C4 | × | Wiring diagram 4 - M4 | | | |
| | | | RS-422 | 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.

*4 When using this unit with JW300, be sure to use one of the JW300-compatible type. The JW300-compatible unit has a 300 mark on its front.

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | | Unit | TCP/IP | UDP/IP ^{*1} | Port No. | Ladder Transfer ^{*2} |
|---|--------------------------|--|------------------------|--------|----------------------|---------------|-------------------------------|
| JW series (Ethernet) | JW20H JW30H | | JW-255CM | × | ○ | 1001 to 65534 | × |
| | | | JW-25TCM | | | | |
| | JW50H JW70H JW100H | | JW-50CM JW-51CM | | | | |
| | J-board | | Z-339J | | | | |
| JW311/312/321/322 series (Ethernet) | JW300 | JW-311CU JW-312CU JW-321CU JW-322CU | JW-255CM ^{*3} | | | | |
| | | | JW-25TCM ^{*3} | | | | |
| JW331/332/341/342/352/362 series (Ethernet) | JW300 | JW-331CU JW-332CU JW-341CU JW-342CU JW-352CU JW-362CU | JW-255CM ^{*3} | | | | |
| | | | JW-25TCM ^{*3} | | | | |

^{*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.

^{*3} When using with JW300, be sure to use a JW300-compatible type. A JW300-compatible unit has a 300 mark on its front.

6.1.1 JW Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link2 | |
| Signal Level | RS-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115K bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | 0 to 31 | |

* For JW10 series with MMI port or communication port, turn off the terminating resistances of the TS2060.

The following switches must be turned off.

CN1: DIP switches 1 and 2 of DUR-00

MJ1: DIP switch 6

MJ2: DIP switches 7 and 8

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

JW-10CM, ZW-10CM, JW-21CM Unit

Switch setting

| Switch | Contents | Setting |
|--------|--|------------|
| SW0 | Computer link (command mode) | 4 |
| SW1 | Station address Set the number from 01 to 37 in octal notation. | 1 |
| SW2 | SW1 denotes the lower-order digit, and SW2 denotes the higher-order digit.* * Do not set 00, 08, 09, 18, 19, 28, 29 and 40 or greater. When any of these numbers is set, an error will occur. | 0 |
| SW3 | 1 Not used | OFF |
| | 2 Communication system (ON: 4-wire system, OFF: 2-wire system) | ON |
| | 3 Not used | OFF |
| | 4 Parity (ON: even, OFF: odd) | ON |
| SW4 | Baud rate 0:19200, 1: 9600, 2: 4800 | 0 |
| SW7 | Terminating resistance (ON: provided, OFF: not provided) | ON |

* The following settings are fixed; data length: 7 bits, and stop bit: 2 bits.

Z-331J, Z-332J

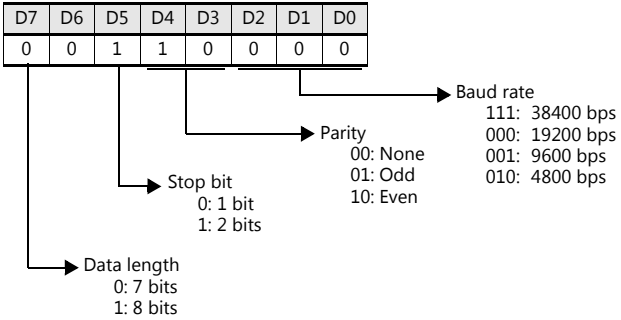
| Switch | Contents | Setting |
|--------|--|------------|
| SW0 | Command mode | 4 |
| SW1 | Station address Set the number from 01 to 37 in octal notation. | 1 |
| SW2 | SW1 denotes the lower-order digit, and SW2 denotes the higher-order digit.* * Do not set 00, 08, 09, 18, 19, 28, 29 and 40 or greater. When any of these numbers is set, an error will occur. | 0 |
| SW3 | 1 Not used | OFF |
| | 2 Communication system (ON: 4-wire system, OFF: 2-wire system) | OFF |
| | 3 Not used | OFF |
| | 4 Parity (ON: even, OFF: odd) | ON |
| SW4 | Baud rate 0: 19200, 1: 9600, 2: 4800 | 0 |
| SW7 | Terminating resistance (ON: provided, OFF: not provided) | ON |

* The following settings are fixed; data length: 7 bits, and stop bit: 2 bits.

JW-10

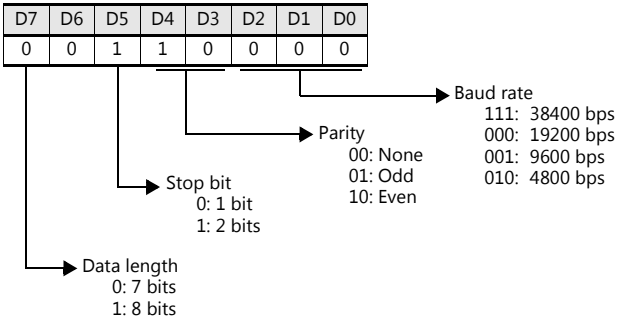
The settings for communications with the TS2060 should be made at the system memory as shown below.

MMI port

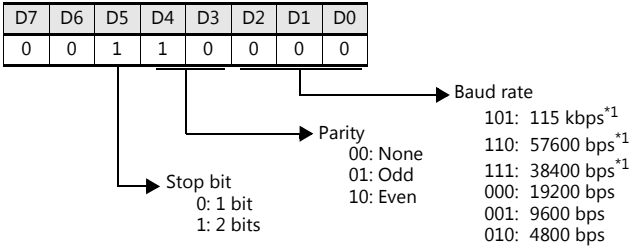
| System Memory | Contents | Setting Example |
|---------------|--|--|
| #226 | Transmission specification  | 30H Data length: 7 bits Stop bit: 2 bits Parity: even Baud rate: 19200 bps |
| #227 | Port number: 001 to 037 (OCT) | 01H |

* With the MMI port, only 1 : 1 or multi-link2 communication is available.

Communication port

| System Memory | Contents | Setting Example |
|---------------|--|--|
| #234 | Communication mode: computer link mode | 00H |
| #236 | Transmission specification  | 30H Data length: 7 bits Stop bit: 2 bits Parity: even Baud rate: 19200 bps |
| #237 | Port number: 001 to 037 (OCT) | 01H |

JW-30H**PG/COMM1 port**

| System Memory | Contents | Setting Example |
|---------------|--|--|
| #234 | Transmission specification  | 30H Data length: 7 bits (fixed) Stop bit: 2 bits Parity: even Baud rate: 19200 bps |
| #235 | Port number: 001 to 037 (OCT) | 01H |

*1 Not available for JW-32CUH and JW-33CUH

PG/COMM2 port

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | | |
|---------------|---|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|--|
| #236 | <div>Transmission specification</div> <div><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></div> <div><div>Stop bit 0: 1 bit 1: 2 bits</div><div>Parity 00: None 01: Odd 10: Even</div><div>Baud rate 101: 115 kbps^{*1} 110: 57600 bps^{*1} 111: 38400 bps^{*1} 000: 19200 bps 001: 9600 bps 010: 4800 bps</div></div> | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | <div>30H</div> <div>Data length: 7 bits (fixed) Stop bit: 2 bits Parity: even Baud rate: 19200 bps</div> |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | | |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| #237 | Port number: 001 to 037 (OCT) | 01H | | | | | | | | | | | | | | | | |

*1 Not available for JW-32CUH and JW-33CUH

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 | *1, *2 |
| Relay (relay) | 01H | \square for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| Fn (file register) | 07H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: x9yyy
 ↑ ↑
 0 to 777 (octal)
 0 to 9 (decimal)

*3 The file number is required in addition to the device type and address.
 The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1:00002
 ↑ ↑ ↑
 Address number
 Colon
 File number

Indirect Device Memory Designation

- For R device memory "x9yyy":
 Specify the value "x" (0 to 9: decimal) for higher bytes (bit 15 to 8).
 Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" (H) is assigned for "R89332".
 89 (ignoring the lower digit of "9") → 8 (DEC) → 08 (HEX)
 332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory :
 Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
 Example: With indirect device memory designation, "01BF" (H) is assigned for " \square 1576".
 1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.2 JW100/70H COM Port

Communication Setting

Editor

Communication setting

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

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.


JW-70CU/JW-100CU, JW-70CUH/JW-100CUH

The settings for communications with the TS2060 should be made at the system memory as shown below.

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | | |
|---------------|--|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|--|
| #236 | <div>Transmission specification</div> <div><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></div> <div><div>Stop bit 0: 1 bit 1: 2 bits</div><div>Parity 00: None 01: Odd 10: Even</div><div>Baud rate 000: 19200 bps 001: 9600 bps 010: 4800 bps</div></div> | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 30H Data length: 7 bits (fixed) Stop bit: 2 bits Parity: even Baud rate: 19200 bps |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | | |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| #237 | Port number: 001 to 037 (OCT) | 01H | | | | | | | | | | | | | | | | |

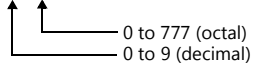
Available Device Memory

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.

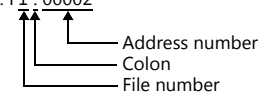
| Device Memory | TYPE | Remarks |
|----------------------------------|------|--|
| R (register) | 00H | *1, *2 |
| Relay (relay) | 01H |  for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| Fn (file register) | 07H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: x9yyy



*3 The file number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1 : 00002


Indirect Device Memory Designation

- For R device memory "x9yyy":
Specify the value "x" (0 to 9: decimal) for higher bytes (bit 15 to 8).
Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" is assigned for "R89332".
 89 (ignoring the lower digit of "9") → 8 (DEC) → 08 (HEX)
 332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory :
Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
Example: With indirect device memory designation, "01BF" is assigned for " 1576".
 1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.3 JW20 COM Port

Communication Setting

Editor

Communication setting

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

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

JW-22CU, Z-311J, Z-312J

The settings for communications with the TS2060 should be made at the system memory as shown below.

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | | |
|---------------|---|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|--|
| #236 | <div>Transmission specification</div> <table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> <div><div>Stop bit 0: 1 bit 1: 2 bits</div><div>Parity 00: None 01: Odd 10: Even</div><div>Baud rate 000: 19200 bps 001: 9600 bps 010: 4800 bps</div></div> | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | <div>30H</div> <div>Data length: 7 bits (fixed) Stop bit: 2 bits Parity: even Baud rate: 19200 bps</div> |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | | |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| #237 | Port number: 001 to 037 (OCT) | 01H | | | | | | | | | | | | | | | | |

* The terminating resistance switch (SW1) is provided at the back of the JW-22CU board. Turn this switch off for RS-232C connection.

Z-511J, Z-512J

PG/COMM1 port

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | | |
|---------------|--|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|
| #234 | <div>Transmission specification</div> <div><table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></div> <div><div>Stop bit</div><div>0: 1 bit</div><div>1: 2 bits</div></div> <div><div>Parity</div><div>00: None</div><div>01: Odd</div><div>10: Even</div></div> <div><div>Baud rate</div><div>000: 19200 bps</div><div>001: 9600 bps</div><div>010: 4800 bps</div></div> | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | <div>30H</div> <div>Data length: 7 bits (fixed)</div> <div>Stop bit: 2 bits</div> <div>Parity: even</div> <div>Baud rate: 19200 bps</div> |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | | |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| #235 | Port number: 001 to 037 (OCT) | 01H | | | | | | | | | | | | | | | | |

PG/COMM2 port

| System Memory | Contents | Setting Example |
|---------------|---|--|
| #236 | Transmission specification <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div> Stop bit 0: 1 bit 1: 2 bits </div> <div> Parity 00: None 01: Odd 10: Even </div> <div> Baud rate 000: 19200 bps 001: 9600 bps 010: 4800 bps </div> </div> | 30H Data length: 7 bits (fixed) Stop bit: 2 bits Parity: even Baud rate: 19200 bps |
| #237 | Port number: 001 to 037 (OCT) | 01H |

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 | *1, *2 |
| Relay (relay) | 01H | for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| Fn (file register) | 07H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: x9yyy

*3 The file number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1 : 00002

Indirect Device Memory Designation

- For R device memory "x9yyy":
 Specify the value "x" (0 to 9: decimal) for higher bytes (bit 15 to 8).
 Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" is assigned for "R89332".
 89 (ignoring the lower digit of "9") → 8 (DEC) → 08 (HEX)
 332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory:
 Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
 Example: With indirect device memory designation, "01BF" is assigned for " 1576".
 1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.4 JW300 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) | |
| Signal Level | RS-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / 9600 / 19200 / 38400 / <u>115K</u> bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | 1 / <u>2</u> bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 31 | |
| Transmission Mode | <u>2-wire</u> / 4-wire | Multi-link connection is not available in the 4-wire mode. |

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.

PG/COMM 1 Port, PG/COMM 2 Port

Make PLC communication settings by using the application software "JW300SP" or writing the setting values directly into the system memory. For more information, refer to the PLC manual issued by the manufacturer.

JW300SP

| | Item | Setting | Remarks |
|------------------|----------------|--------------------------------------|---------|
| Port 1 Port 2 | Baud Rate | 115200 / 38400 / 19200 / 9600 / 4800 | |
| | Parity | None / Odd / Even | |
| | Stop Bit | 1 / 2 | |
| | Station number | 0 to 37 (OCT) | |
| | Data Length | 7 bits / 8 bits | |

System memory

PG/COMM 1 port

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | |
|---------------|---|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| #234 | <div>Transmission specification</div> <table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table> <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></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| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | | | | | | | | | |

PG/COMM 2 port

| System Memory | Contents | Setting Example | | | | | | | | | | | | | | | |
|---------------|--|-----------------|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| #236 | <div>Transmission specification</div> <table><tr><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr></table> 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| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | | | | | | | | | | |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | | | | | | | | | | |

JW-21CM Unit**Switch setting**

| Switch | Contents | Setting |
|--------|---|------------|
| SW0 | Computer link (command mode) | 4 |
| SW1 | Station address Set the number from 01 to 37 in octal notation. SW1 denotes the lower-order digit, and SW2 denotes the higher-order digit. | 1 |
| SW2 | Do not set 00, 08, 09, 18, 19, 28, 29 and 40 or greater. When any of these number is set, an error occurs. | 0 |
| SW3 | 1 Not used | OFF |
| | 2 Communication system (ON: 4-wire / OFF: 2-wire) | ON |
| | 3 Not used | OFF |
| | 4 Parity (ON: Even / OFF: Odd) | ON |
| SW4 | Baud rate 0: 19200, 1: 9600, 2: 4800 | 0 |
| SW7 | Terminating resistance (ON: Provided / OFF: Not provided) | ON |

* The following settings are fixed; data length: 7 bits, and stop bit: 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 |
|----------------------------------|------|----------------------|
| R (register) | 00H | *1, *2 |
| Relay (relay) | 01H | □ for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| F1 (file register) | 04H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: xx9yyy

*3 The file number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1 : 00002

Indirect Device Memory Designation

- For R device memory "xx9yyy":
Specify the value "xx" (00 to 38: decimal) for higher bytes (bit 15 to 8).
Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" is assigned for "R89332".
089 (ignoring the lower digit of "9") → 08 (DEC) → 08 (HEX)
332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory:
Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
Example: With indirect device memory designation, "01BF" is assigned for "□ 1576".
1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.5 JW 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 of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

JW-255CM, JW-25TCM

Make PLC communication settings by using the application software or entering the setting values directly into the network parameter.

For more information, refer to the PLC manual issued by the manufacturer.

JW300SP (JW25TCM/255CM parameter settings)

| Item | Setting | Remarks |
|--------------------|----------------|---------------------------------|
| IP Address Setting | IP Address | Set the IP address of the PLC. |
| | Subnet Mask | Set the subnet mask of the PLC. |
| Connection Setting | Open Method | UDP |
| | Local Port No. | Set the port number of the PLC. |

Network parameter

| Parameter Address | Contents | Setting Example |
|-------------------|--|--|
| 0000 to 0003 | IP address at local port (DEC) | IP address: 192.168.1.1 0000: 192 0001: 168 0002: 1 0003: 1 |
| 0004 to 0007 | Subnet mask (DEC) | Subnet mask: 255.255.255.0 0004: 255 0005: 255 0006: 255 0007: 0 |
| 0100 to 0103 | Connection 0 setting 0100: Open method 01: UDP 0101: Fixed to 0 0102: Local port number (lower byte (HEX)) 0103: Local port number (higher byte (HEX)) | UDP connection, port number 3000 (= BB8H) 0100: 01H 0101: 00H 0102: B8H 0103: 0BH |
| 0104 to 0107 | Connection 1 setting (same as connection 0) | |
| 0110 to 0113 | Connection 2 setting (same as connection 0) | |
| 0114 to 0117 | Connection 3 setting (same as connection 0) | |
| 0120 to 0123 | Connection 4 setting (same as connection 0) | |
| 0124 to 0127 | Connection 5 setting (same as connection 0) | |
| 0130 to 0133 | Connection 6 setting (same as connection 0) | |
| 0134 to 0137 | Connection 7 setting (same as connection 0) | |
| 3777 * | Communication start switch 00H: Communication stop 01H: Parameter check, BCC check, communication start 81H: Parameter check, BCC creation, writing into EEPROM, communication start (changed to 01H after the start of communication) | |

* Communication must be stopped before entering values into the network parameter to make the communication setting. Specify 00H at parameter address 3777 at first, and set the IP address, etc.
After settings are made, specify 81H at parameter address 3777. Then settings will be written into EEPROM and communication will start.

JW-50CM, JW-51CM

Make PLC communication settings by using the application software or entering the setting values directly into the network parameter.

For more information, refer to the PLC manual issued by the manufacturer.

JW300SP (parameter settings)

| Item | Setting | Remarks |
|--------------------|----------------|---------------------------------|
| IP Address Setting | IP Address | Set the IP address of the PLC. |
| | Subnet Mask | Set the subnet mask of the PLC. |
| Connection Setting | Open Method | UDP |
| | Local Port No. | Set the port number of the PLC. |

Network parameter

| Parameter Address | Contents | Setting Example |
|-------------------|--|--|
| 0000 to 0003 | IP address at local port (DEC) | IP address: 192.168.1.1 0000: 192 0001: 168 0002: 1 0003: 1 |
| 0004 to 0007 | Subnet mask (DEC) | Subnet mask: 255.255.255.0 0004: 255 0005: 255 0006: 255 0007: 0 |
| 0100 to 0103 | Connection 0 setting 0100: Open method 01: UDP 0101: Fixed to 0 0102: Local port number (lower byte (HEX)) 0103: Local port number (higher byte (HEX)) | UDP connection, port number 3000 (= BB8H) 0100: 01H 0101: 00H 0102: B8H 0103: 0BH |
| 0104 to 0107 | Connection 1 setting (same as connection 0) | |
| 0110 to 0113 | Connection 2 setting (same as connection 0) | |
| 0114 to 0117 | Connection 3 setting (same as connection 0) | |
| 0120 to 0123 | Connection 4 setting (same as connection 0) | |
| 0124 to 0127 | Connection 5 setting (same as connection 0) | |
| 0130 to 0133 | Connection 6 setting (same as connection 0) | |
| 0134 to 0137 | Connection 7 setting (same as connection 0) | |
| 3777 * | Communication start switch 00H: Communication stop 01H: Parameter check, BCC check, communication start 81H: Parameter check, BCC creation, writing into EEPROM, communication start (changed to 01H after the start of communication) | |

* Communication must be stopped before entering values into the network parameter to make the communication setting. Specify 00H at parameter address 3777 at first, and set the IP address, etc.
After settings are made, specify 81H at parameter address 3777. Then settings will be written into EEPROM and communication will start.

Z-339J**12-VDC Power Input**

10BASE5 or 10BASE-T is selected according to the input status of the 12-VDC power supply.

| Item | Contents |
|--------------------|--------------|
| 12-VDC power input | Provided |
| | Not provided |

Network parameter

| Parameter Address | Contents | Setting Example |
|-------------------|--|--|
| 0000 to 0003 | IP address at local port (DEC) | IP address: 192.168.1.1 0000: 192 0001: 168 0002: 1 0003: 1 |
| 0004 to 0007 | Subnet mask (DEC) | Subnet mask: 255.255.255.0 0004: 255 0005: 255 0006: 255 0007: 0 |
| 0100 to 0103 | Connection 0 setting 0100: Open method 01: UDP 0101: Fixed to 0 0102: Local port number (lower byte (HEX)) 0103: Local port number (higher byte (HEX)) | UDP connection, port number 3000 (= BB8H) 0100: 01H 0101: 00H 0102: B8H 0103: 0BH |
| 0104 to 0107 | Connection 1 setting (same as connection 0) | |
| 0110 to 0113 | Connection 2 setting (same as connection 0) | |
| 0114 to 0117 | Connection 3 setting (same as connection 0) | |
| 0120 to 0123 | Connection 4 setting (same as connection 0) | |
| 0124 to 0127 | Connection 5 setting (same as connection 0) | |
| 0130 to 0133 | Connection 6 setting (same as connection 0) | |
| 0134 to 0137 | Connection 7 setting (same as connection 0) | |
| 3777 * | Communication start switch 00H: Communication stop 01H: Parameter check, BCC check, communication start 81H: Parameter check, BCC creation, writing into EEPROM, communication start (changed to 01H after the start of communication) | |

- * Communication must be stopped before entering values into the network parameter to make the communication setting. Specify 00H at parameter address 3777 at first, and set the IP address, etc.
After settings are made, specify 81H at parameter address 3777. Then settings will be written into EEPROM and communication will start.

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 | *1, *2 |
| Relay (relay) | 01H | <input type="checkbox"/> for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| Fn (file register) | 07H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: x9yyy

*3 The file number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1 : 00002

Indirect Device Memory Designation

- For R device memory "x9yyy":
Specify the value "x" (0 to 9: decimal) for higher bytes (bit 15 to 8).
Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" is assigned for "R89332".
89 (ignoring the lower digit of "9") → 8 (DEC) → 08 (HEX)
332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory:
Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
Example: With indirect device memory designation, "01BF" is assigned for "□ 1576".
1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.6 JW311/312/321/322 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 of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

JW-255CM, JW-25TCM

Make PLC communication settings by using the application software or entering the setting values directly into the network parameter.

For more information, refer to the PLC manual issued by the manufacturer.

JW300SP (JW25TCM/255CM parameter settings)

| Item | Setting | Remarks |
|--------------------|----------------|---------------------------------|
| IP Address Setting | IP Address | Set the IP address of the PLC. |
| | Subnet Mask | Set the subnet mask of the PLC. |
| Connection Setting | Open Method | UDP |
| | Local Port No. | Set the port number of the PLC. |

Network parameter

| Parameter Address | Contents | Setting Example |
|-------------------|--|--|
| 0000 to 0003 | IP address at local port (DEC) | IP address: 192.168.1.1 0000: 192 0001: 168 0002: 1 0003: 1 |
| 0004 to 0007 | Subnet mask (DEC) | Subnet mask: 255.255.255.0 0004: 255 0005: 255 0006: 255 0007: 0 |
| 0100 to 0103 | Connection 0 setting 0100: Open method 01: UDP 0101: Fixed to 0 0102: Local port number (lower byte (HEX)) 0103: Local port number (higher byte (HEX)) | UDP connection, port number 3000 (= BB8H) 0100: 01H 0101: 00H 0102: B8H 0103: 0BH |
| 0104 to 0107 | Connection 1 setting (same as connection 0) | |
| 0110 to 0113 | Connection 2 setting (same as connection 0) | |
| 0114 to 0117 | Connection 3 setting (same as connection 0) | |
| 0120 to 0123 | Connection 4 setting (same as connection 0) | |
| 0124 to 0127 | Connection 5 setting (same as connection 0) | |
| 0130 to 0133 | Connection 6 setting (same as connection 0) | |
| 0134 to 0137 | Connection 7 setting (same as connection 0) | |
| 3777 * | Communication start switch 00H: Communication stop 01H: Parameter check, BCC check, communication start 81H: Parameter check, BCC creation, writing into EEPROM, communication start (changed to 01H after the start of communication) | |

* Communication must be stopped before entering values into the network parameter to make the communication setting. Specify 00H at parameter address 3777 at first, and set the IP address, etc.
After settings are made, specify 81H at parameter address 3777. Then settings will be written into EEPROM and communication will start.

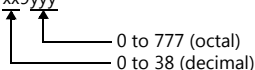
Available Device Memory

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.

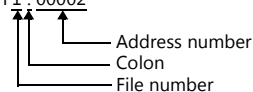
| Device Memory | TYPE | Remarks |
|----------------------------------|------|------------------------------|
| R (register) | 00H | *1, *2 |
| Relay (relay) | 01H | \square for word device *1 |
| E (self diagnosis) | 02H | *1 |
| b (timer, counter/current value) | 03H | *1 |
| F1 (file register) | 04H | *1, *3 |

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

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

Example: xx9yyy


*3 The file number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: F1 : 00002


Indirect Device Memory Designation

- For R device memory "xx9yyy":
Specify the value "xx" (0 to 38: decimal) for higher bytes (bit 15 to 8).
Specify a value obtained by dividing "yyy" (000 to 777: octal) by 2 for lower bytes (bit 7 to 0).

Example: With indirect device memory designation, "086D" is assigned for "R89332".
 089 (ignoring the lower digit of "9") → 08 (DEC) → 08 (HEX)
 332 (OCT) → 218 (DEC) / 2 = 109 (DEC) → 6D (HEX)

- For Fn device memory:
Specify the file number in the expansion code.
- For a device memory other than "R" or "Fn":
Example: With indirect device memory designation, "01BF" is assigned for " \square 1576".
 1576 (OCT) → 894 (DEC) / 2 = 447 (DEC) → 01BF (HEX)

6.1.7 JW331/332/341/342/352/362 Series (Ethernet)

Settings are the same as those described in "6.1.6 JW311/312/321/322 Series (Ethernet)".

6.1.8 Wiring Diagrams

When Connected at CN1:

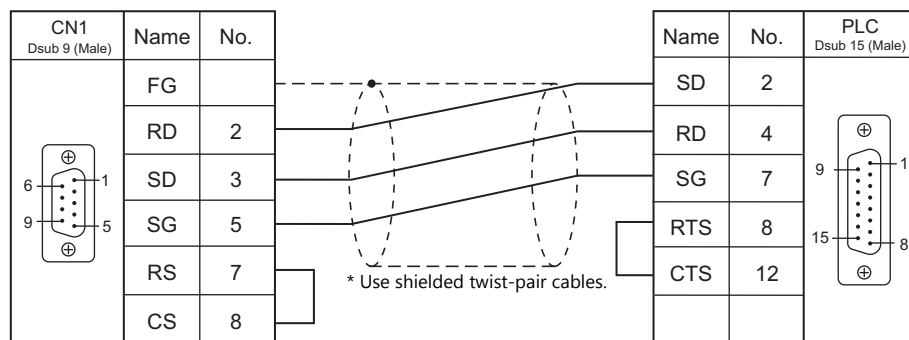


CAUTION

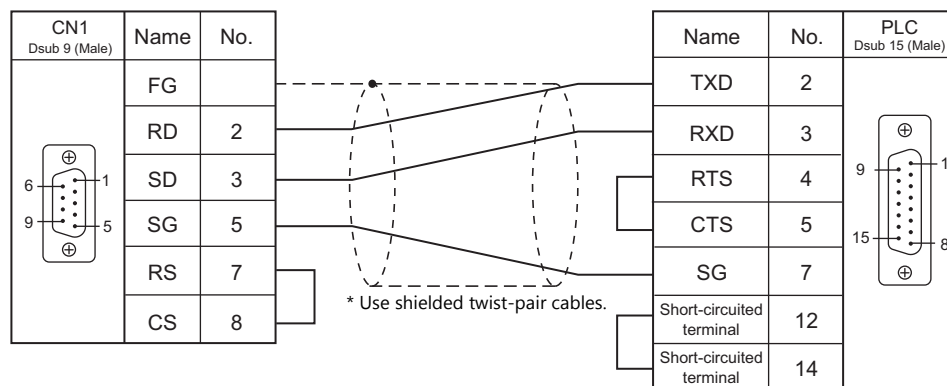
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

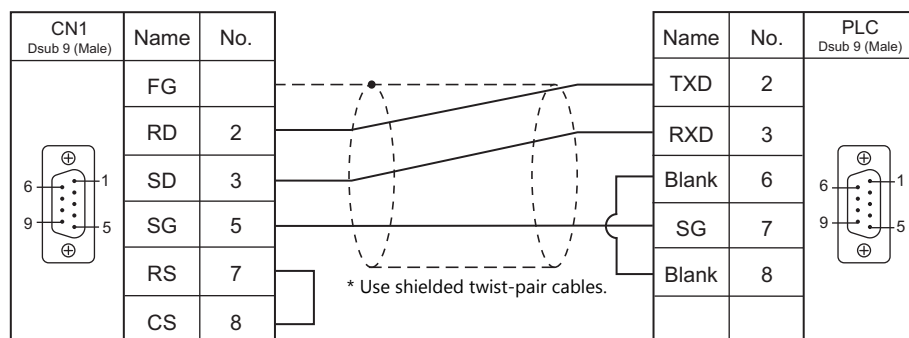
Wiring diagram 1 - C2

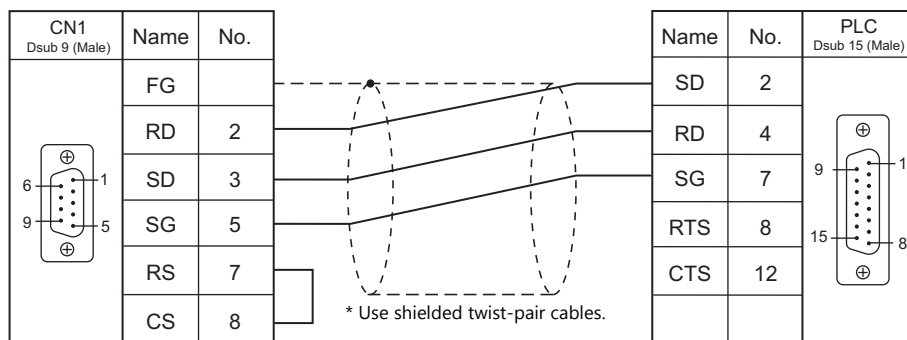
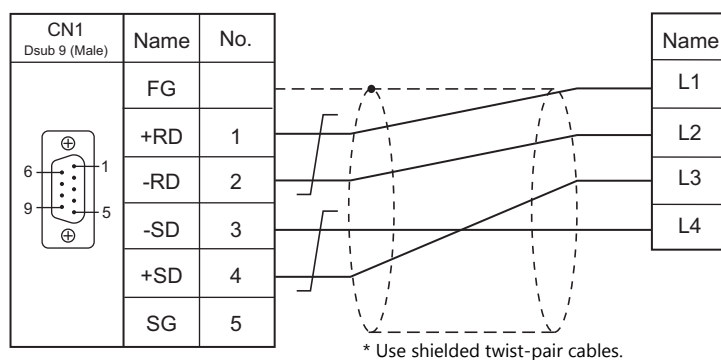
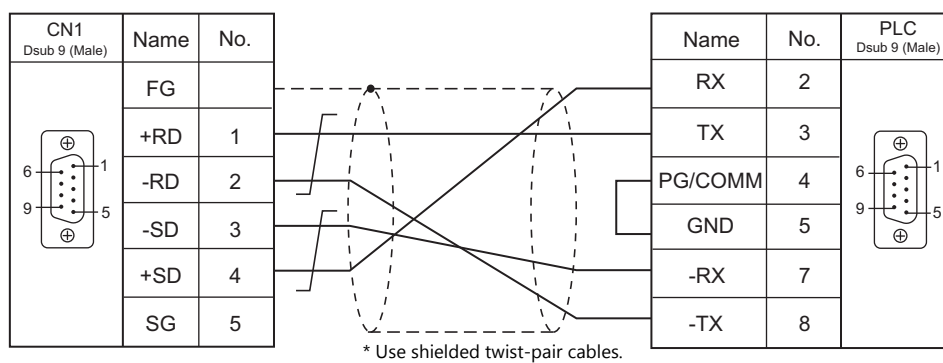
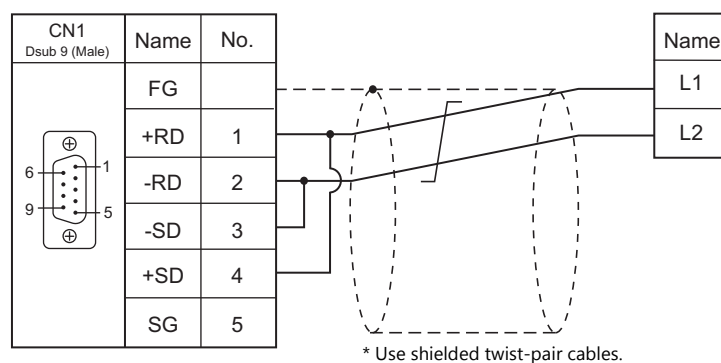


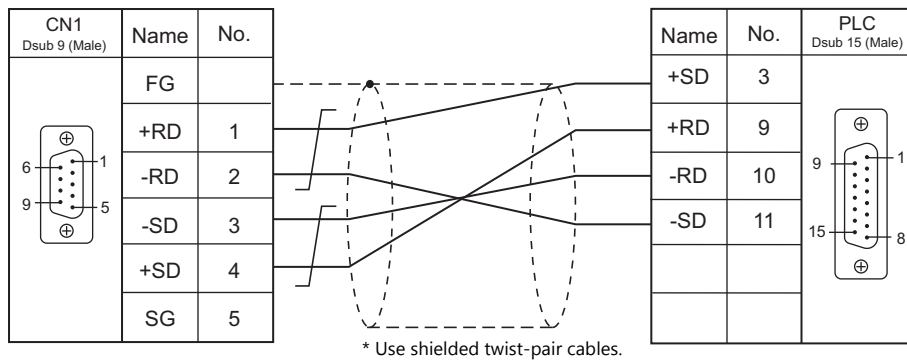
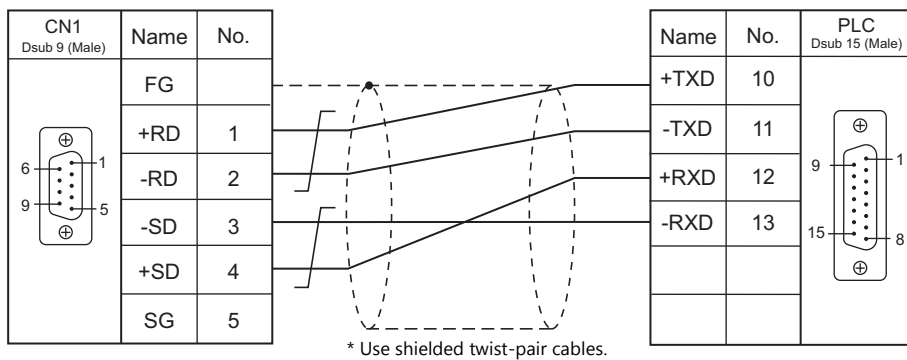
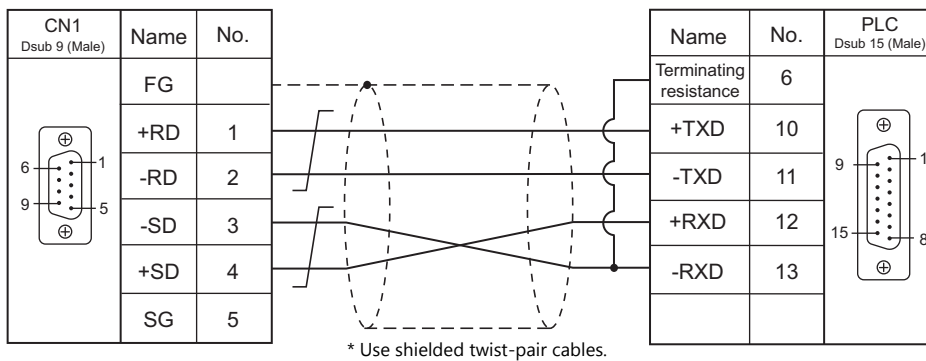
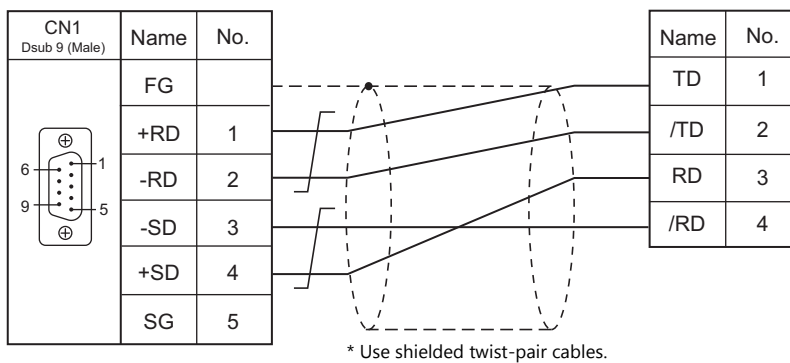
Wiring diagram 2 - C2



Wiring diagram 3 - C2



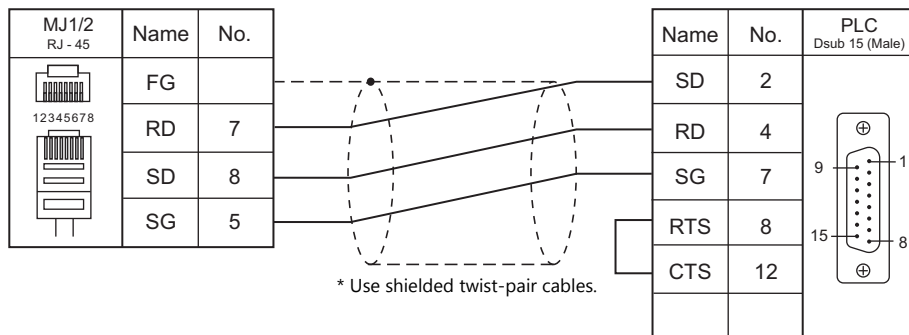
Wiring diagram 4 - C2**RS-422/RS-485****Wiring diagram 1 - C4****Wiring diagram 2 - C4****Wiring diagram 3 - C4**

Wiring diagram 4 - C4**Wiring diagram 5 - C4****Wiring diagram 6 - C4****Wiring diagram 7 - C4**

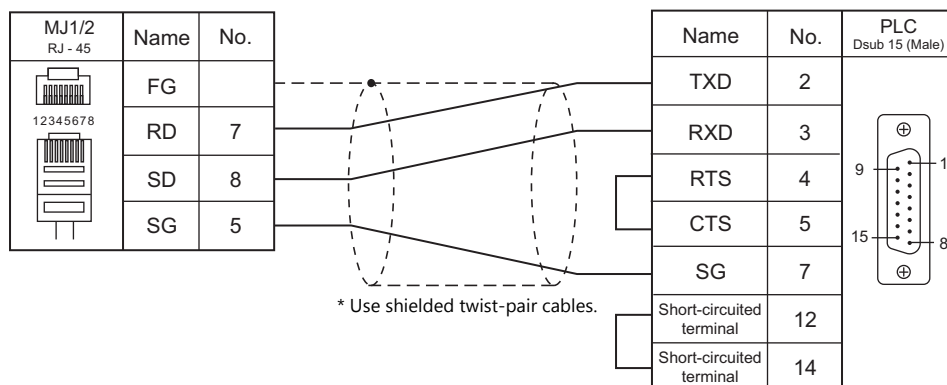
When Connected at MJ1/MJ2:

RS-232C

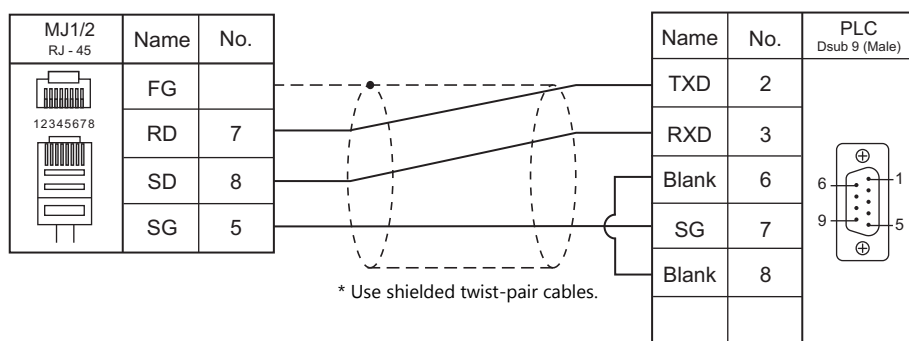
Wiring diagram 1 - M2

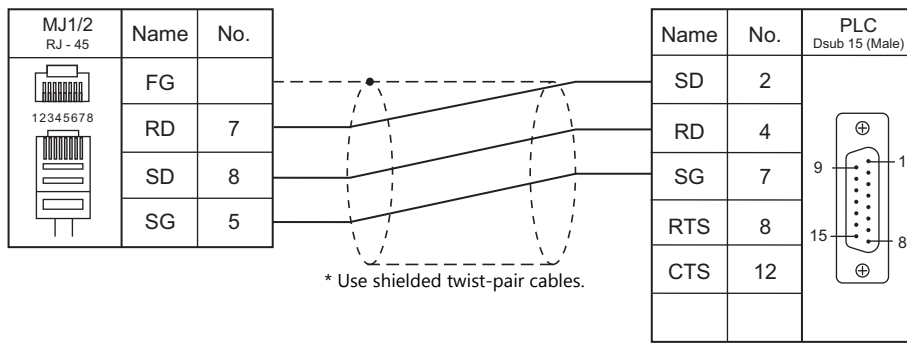
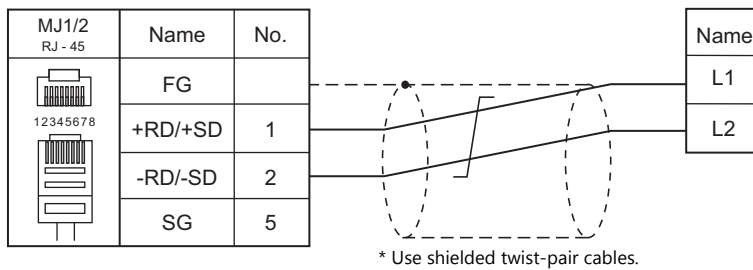
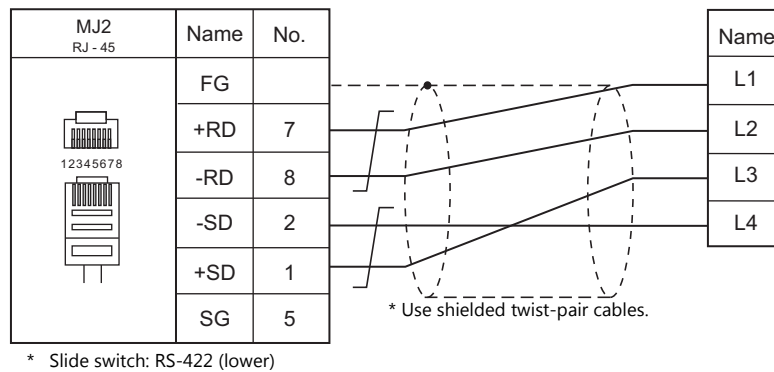
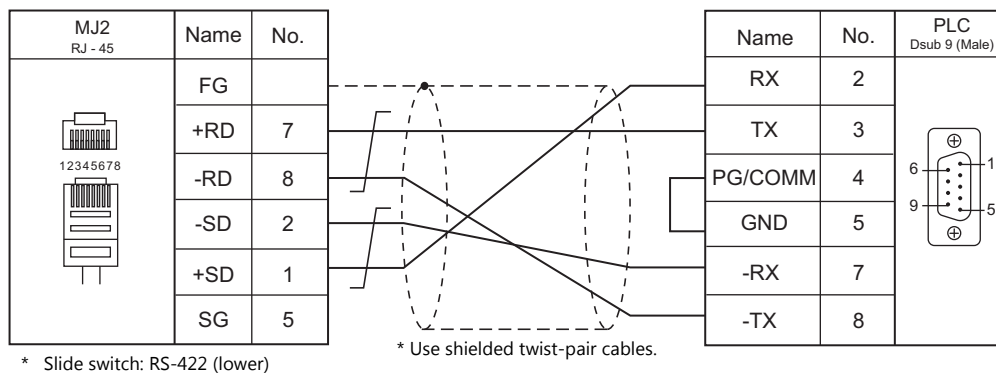


Wiring diagram 2 - M2

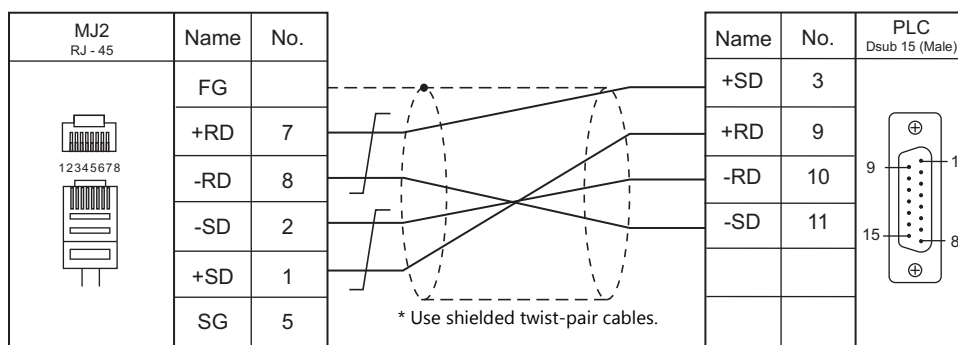


Wiring diagram 3 - M2



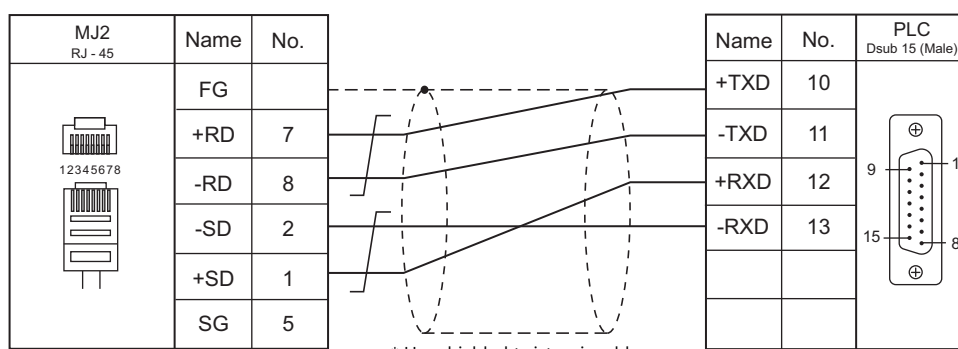
Wiring diagram 4 - M2**RS-422/RS-485****Wiring diagram 1 - M4****Wiring diagram 2 - M4****Wiring diagram 3 - M4**

Wiring diagram 4 - M4



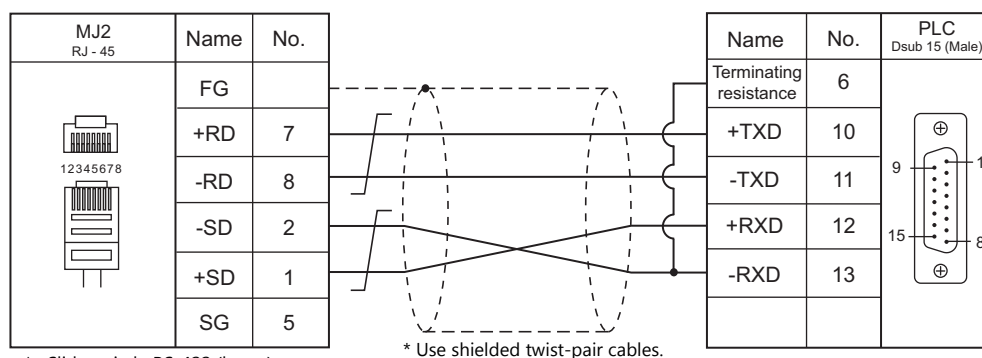
* Slide switch: RS-422 (lower)

Wiring diagram 5 - M4



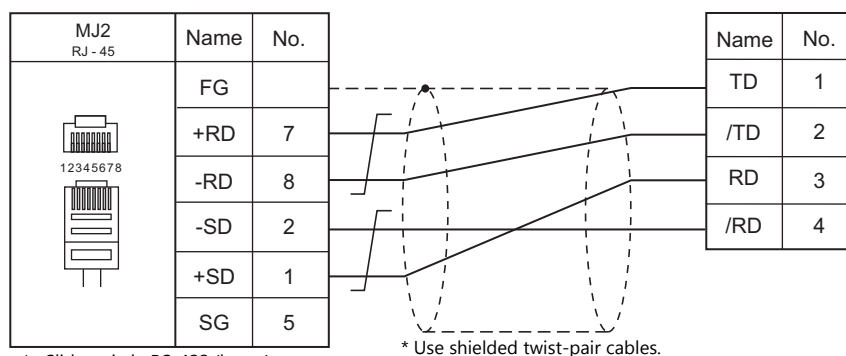
* Slide switch: RS-422 (lower)

Wiring diagram 6 - M4



* Slide switch: RS-422 (lower)

Wiring diagram 7 - M4



* Slide switch: RS-422 (lower)

6.2 Temperature Controller/Servo/Inverter Connection

ID Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|--------|---|--------------|-----------------------|-----------------------|----------------------------|------------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) ^{*2} | |
| DS-30D | DS-30D | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | SH-DS30D. Lst |
| | | | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | |
| | | Connector for host/peripheral equipment | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 3 - M4 | |
| DS-32D | DS-32D | Host communication port 1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | SH-DS32D. Lst |
| | | Host communication port 2 | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | |
| | | MMI 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).

6.2.1 DS-30D

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 | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | <u>0</u> to 15 | |

RFID System


Switch Setting

(Underlined setting: default)


Communication setting

| SW1 | Function | OFF | ON | Setting Example | | | | | | | | | |
|------------|------------------------------------|--|--|--|---------|------------------------|------------------------|------------|----|-----|------------|-----|----|
| 1 | Data length | <u>7</u> | 8 | <div><div><div>OFF</div><div>ON</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div></div></div> <div>OFF ↔ ON</div> | | | | | | | | | |
| 2 | Parity | <u>None</u> | Provided | | | | | | | | | | |
| 3 | | <u>Even</u> | Odd | | | | | | | | | | |
| 4 | Stop bit | <u>1</u> | 2 | | | | | | | | | | |
| 5 | Connector type | <u>Using the host only</u> | Using the host and hand-held programmer (e.g. JW-12PG) at one time | | | | | | | | | | |
| 6 | Communication system (wiring type) | <table><tr><th>RS-232C</th><th>RS-422 (4-wire system)</th><th>RS-485 (2-wire system)</th></tr><tr><td><u>OFF</u></td><td>ON</td><td>OFF</td></tr><tr><td><u>OFF</u></td><td>OFF</td><td>ON</td></tr></table> | | | RS-232C | RS-422 (4-wire system) | RS-485 (2-wire system) | <u>OFF</u> | ON | OFF | <u>OFF</u> | OFF | ON |
| RS-232C | | RS-422 (4-wire system) | RS-485 (2-wire system) | | | | | | | | | | |
| <u>OFF</u> | | ON | OFF | | | | | | | | | | |
| <u>OFF</u> | OFF | ON | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | Mode | <u>High speed</u> | Standard | | | | | | | | | | |


Station number setting

| SW2 | Contents | Setting Example |
|---|-----------------------------|-----------------|
|  | <u>0</u> to F (H) (0 to 15) | 0 |

Baud rate

| SW3 | Setting | Baud Rate | Setting Example |
|---|----------|-----------------|-----------------|
|  | 4 | 4800 bps | 5 |
| | <u>5</u> | <u>9600 bps</u> | |
| | 6 | 19200 bps | |

Terminating resistance

| SW4 | Contents | Setting Example | | | | | | | | | |
|---|--|------------------------|------------------------|------------------------|------------|----|-----|------------|-----|----|------------------|
|  | <table border="1"> <thead> <tr> <th>RS-232C</th><th>RS-422 (4-wire system)</th><th>RS-485 (2-wire system)</th></tr> </thead> <tbody> <tr> <td><u>OFF</u></td><td>ON</td><td>OFF</td></tr> <tr> <td><u>OFF</u></td><td>OFF</td><td>ON</td></tr> </tbody> </table> | RS-232C | RS-422 (4-wire system) | RS-485 (2-wire system) | <u>OFF</u> | ON | OFF | <u>OFF</u> | OFF | ON | 1: OFF 2: OFF |
| RS-232C | RS-422 (4-wire system) | RS-485 (2-wire system) | | | | | | | | | |
| <u>OFF</u> | ON | OFF | | | | | | | | | |
| <u>OFF</u> | OFF | ON | | | | | | | | | |

Communication Mode Setting

Set a communication mode at the system memory. The selected mode becomes effective when the power is turned off and on again.

| Address | Contents | Setting |
|---------|------------------------------|-------------------------|
| A008 | Communication start method | 0: At any time required |
| A00A | Response transmission method | 0: Automatic |

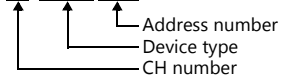
Available Device Memory

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 |
|--------------------------------------|------|-------------|
| CMUC (controller memory 1-byte data) | 00H | |
| CMS (controller memory 2-byte data) | 01H | |
| CMUT (controller memory 3-byte data) | 02H | |
| CML (controller memory 4-byte data) | 03H | |
| IMUC (ID memory 1-byte data) | 04H | |
| IMS (ID memory 2-byte data) | 05H | |
| IMUT (ID memory 3-byte data) | 06H | |
| IML (ID memory 4-byte data) | 07H | |
| ID (ID code) | 08H | Double-word |
| TM (time) | 09H | |

*1 The CH number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: #0: CMUC9000



Indirect Device Memory Designation

Specify the CH number in the expansion code.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|---|---------------------|--------------|---|-----|
| Plate clear | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Clear data | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| Plate initialize | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | - | |
| DS-30D clear | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 2 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| | | n + 5 | Clear data | |
| DS-30D initialize | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | CH No. | |
| Log clear (communication time, number of retrials, error log) | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Area 0: Communication time log 1: Retry count log 2: Error log | |
| Plate self diagnosis | 1 - 8 (PLC1 - 8) | n | Station number | 6/8 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Battery use rate | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| ROM check | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 6 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| RAM check | 1 - 8 (PLC1 - 8) | n | Station number | 6/8 |
| | | n + 1 | Command: 7 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | - | |
| | | n + 7 | - | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|----------------------------------|---------------------|--------------|---|-----|
| Plate battery service life check | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 8 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Battery use rate | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| DS-30D self diagnosis | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 9 | |
| Block check | 1 - 8 (PLC1 - 8) | n | Station number | 6/8 |
| | | n + 1 | Command: 10 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | - | |
| Reset | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | CH No. 0: CH No. 0 1: CH No. 1 2: Both | |
| Output command | 1 - 8 (PLC1 - 8) | n | Station number | 7 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Output 0 | |
| | | n + 4 | Output 1 | |
| | | n + 5 | Output 2 | |
| Status read out | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | CH No. | |
| DS-30D read out | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 14 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| DS-30D write | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 15 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| ID memory read out | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 16 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Internal device memory address ^{*1} | |
| | | n + 7 | - | |
| | | n + 8 | - | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|------------------|---------------------|--------------|-----------------------------------|-----|
| ID memory write | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 17 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Internal device memory address *2 | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| ID code read out | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 18 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | ID code | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| ID code write | 1 - 8 (PLC1 - 8) | n | Station number | 6/8 |
| | | n + 1 | Command: 19 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, A, D) | |
| | | n + 4 | ID code | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| Time read out | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 20 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Year | |
| | | n + 4 | Month | |
| | | n + 5 | Day | |
| | | n + 6 | Hour | |
| | | n + 7 | Minute | |
| | | n + 8 | Second | |
| Time correction | 1 - 8 (PLC1 - 8) | n | Station number | 10 |
| | | n + 1 | Command: 21 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Year | |
| | | n + 4 | Month | |
| | | n + 5 | Day | |
| | | n + 6 | Hour | |
| | | n + 7 | Minute | |
| | | n + 8 | Second | |
| | | n + 9 | A day of the week | |

Return data: Data stored from servo to TS2060

*1 Specify the top address of the internal device memory (\$u) at which the read data is to be stored.

*2 Specify the top address of the internal device memory (\$u) at which data to be written is stored.

6.2.2 DS-32D

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 | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / <u>115K</u> bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 15 | |


*1 When RS-422 connection is used via the MMI port, the following settings are fixed; baud rate: 115 kbps, data length: 8 bits, stop bit: 1 bit, and parity: even.

RFID System


Switch Setting

(Underlined setting: default)


Station number setting

| SW1 | Contents | Setting Example |
|---|-----------------------------|-----------------|
|  | <u>0</u> to F (H) (0 to 15) | 0 |

Baud rate

| SW2 | Setting | Baud Rate | Setting Example |
|---|----------|-----------------|-----------------|
|  | 4 | 4800 bps | 9 |
| | 5 | 9600 bps | |
| | 6 | 19200 bps | |
| | 7 | 38400 bps | |
| | 8 | 57600 bps | |
| | <u>9</u> | <u>115 kbps</u> | |

Terminating resistance

| SW3 | Contents | | | Setting Example |
|---|------------|---------------------------|---------------------------|------------------|
|  OFF ↔ ON | RS-232C | RS-422 (4-wire system) | RS-485 (2-wire system) | 1: OFF 2: OFF |
| | <u>OFF</u> | ON | OFF | |
| | <u>OFF</u> | ON | ON | |

Communication setting

| SW4 | Function | OFF | ON | Setting Example | | | | | | | | | |
|------------|------------------------------------|--|------------------------|---|---------|------------------------|------------------------|------------|----|-----|------------|-----|----|
| 1 | Data length | 7 | 8 | <div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div></div><div>NO</div></div> <div>OFF ↔ ON</div> | | | | | | | | | |
| 2 | Parity | None | <u>Provided</u> | | | | | | | | | | |
| 3 | | <u>Even</u> | Odd | | | | | | | | | | |
| 4 | Stop bit | 1 | 2 | | | | | | | | | | |
| 5 | Fixed to OFF | | | | | | | | | | | | |
| 6 | Communication system (wiring type) | <table><tr><th>RS-232C</th><th>RS-422 (4-wire system)</th><th>RS-485 (2-wire system)</th></tr><tr><td><u>OFF</u></td><td>ON</td><td>OFF</td></tr><tr><td><u>OFF</u></td><td>OFF</td><td>ON</td></tr></table> | | | RS-232C | RS-422 (4-wire system) | RS-485 (2-wire system) | <u>OFF</u> | ON | OFF | <u>OFF</u> | OFF | ON |
| RS-232C | | RS-422 (4-wire system) | RS-485 (2-wire system) | | | | | | | | | | |
| <u>OFF</u> | | ON | OFF | | | | | | | | | | |
| <u>OFF</u> | | OFF | ON | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | Fixed to OFF | | | | | | | | | | | | |
| 9 | Fixed to OFF | | | | | | | | | | | | |

Communication Mode Setting

Set a communication mode at the system memory. The selected mode becomes effective when the power is turned off and on again.

| Address | Contents | Setting |
|---------|------------------------------|-------------------------|
| A008 | Communication start method | 0: At any time required |
| A00A | Response transmission method | 0: Automatic |
| A00F | Trigger setting | 0: Triggering invalid |

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 |
|---|------|-------------|
| CMUC (controller memory 1-byte data) | 00H | |
| CMS (controller memory 2-byte data) | 01H | |
| CMUT (controller memory 3-byte data) | 02H | |
| CML (controller memory 4-byte data) | 03H | |
| IMUC (ID memory 1-byte data) | 04H | |
| IMS (ID memory 2-byte data) | 05H | |
| IMUT (ID memory 3-byte data) | 06H | |
| IML (ID memory 4-byte data) | 07H | |
| ID (ID code) | 08H | Double-word |
| TM (time) | 09H | |
| RWUC (reader/writer memory 1-byte data) | 0AH | |
| RWS (reader/writer memory 2-byte data) | 0BH | |
| RWUT (reader/writer memory 3-byte data) | 0CH | |
| RWL (reader/writer memory 4-byte data) | 0DH | |

*1 The CH number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: #0 : CMUC9000

Address number
Device type
CH number

Indirect Device Memory Designation

Specify the CH number in the expansion code.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|--------------|--------------------------------------|------|
| Tag memory clear | 1 - 8 (PLC1 - 8) | n | Station number | 7/11 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Clear data | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| | | n + 9 | - | |
| | | n + 10 | - | |
| Controller clear | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| Controller initialize | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 2 | |
| | | n + 2 | CH No. | |
| Error log clear (communication time, number of retrials) | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | CH No. | |
| Reader/writer memory clear | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Clear data | |
| | | n + 7 | - | |
| Controller self diagnosis | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | CH No. | |
| Reader/writer self diagnosis | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 6 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | |
| | | n + 4 | - | |
| Error reset | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 7 | |
| | | n + 2 | CH No. 0: CH No. 0 1: CH No. 1 | |
| Output command | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 8 | |
| | | n + 2 | CH No. | |
| | | n + 3 | OUT0 0: OFF 1: ON | |
| | | n + 4 | OUT1 0: OFF 1: ON | |
| Status read out | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 9 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Status | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|-------------------------------|---------------------|--------------|--|------|
| Reader/writer reset | 1 - 8 (PLC1 - 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 10 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| Reader/writer radio wave stop | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Command to reader/writer 0: Radio wave stop 1: Radio wave emit | |
| Input check | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | CH No. | |
| | | n + 3 | IN0 | |
| | | n + 4 | IN1 | |
| Controller read out | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| | | n + 5 | Internal device memory address ^{*1} | |
| Controller write | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 14 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Address | |
| | | n + 4 | Bytes | |
| | | n + 5 | Internal device memory address ^{*2} | |
| Tag read out | 1 - 8 (PLC1 - 8) | n | Station number | 7/11 |
| | | n + 1 | Command: 15 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, 4, 8, B, C) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Internal device memory address ^{*1} | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| | | n + 9 | - | |
| Tag write | 1 - 8 (PLC1 - 8) | n | Station number | 7/11 |
| | | n + 1 | Command: 16 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, 4, 8, B, C) | |
| | | n + 4 | Address | |
| | | n + 5 | Bytes | |
| | | n + 6 | Internal device memory address ^{*2} | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| | | n + 9 | - | |
| | | n + 10 | - | |
| Tag UID code read out | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 17 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 3, 4, 8, B, C) | |
| | | n + 4 | Internal device memory address ^{*1} | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|------------------------|---------------------|--------------|--|--|
| Time read out | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 18 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Year | |
| | | n + 4 | Month | |
| | | n + 5 | Day | |
| | | n + 6 | Hour | |
| | | n + 7 | Minute | |
| | | n + 8 | Second | |
| | | n + 9 | A day of the week | |
| Time setting | 1 - 8 (PLC1 - 8) | n | Station number | 10 |
| | | n + 1 | Command: 19 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Year | |
| | | n + 4 | Month | |
| | | n + 5 | Day | |
| | | n + 6 | Hour | |
| | | n + 7 | Minute | |
| | | n + 8 | Second | |
| | | n + 9 | A day of the week | |
| Reader/writer read out | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 20 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | Attribute (1, 9) |
| | | n + 4 | Address | Address |
| | | n + 5 | Bytes | Bytes |
| | | n + 6 | Internal device memory address ^{*1} | Identification sign |
| | | n + 7 | - | |
| | | n + 8 | - | Internal device memory address ^{*1} |
| Reader/writer write | 1 - 8 (PLC1 - 8) | n | Station number | 7/9 |
| | | n + 1 | Command: 21 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Attribute (0, 8) | Attribute (1, 9) |
| | | n + 4 | Address | Address |
| | | n + 5 | Bytes | Bytes |
| | | n + 6 | Internal device memory address ^{*2} | Identification sign |
| | | n + 7 | - | |
| | | n + 8 | - | Internal device memory address ^{*2} |

Return data: Data stored from servo to TS2060

*1 Specify the top address of the internal device memory (\$u) at which the read data is to be stored.

*2 Specify the top address of the internal device memory (\$u) at which data to be written is stored.

6.2.3 Wiring Diagrams

When Connected at CN1:

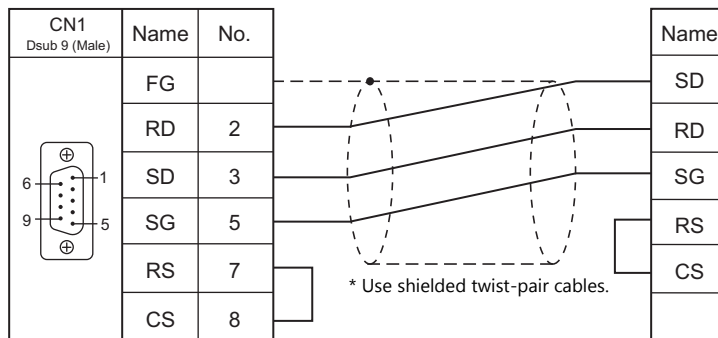


CAUTION

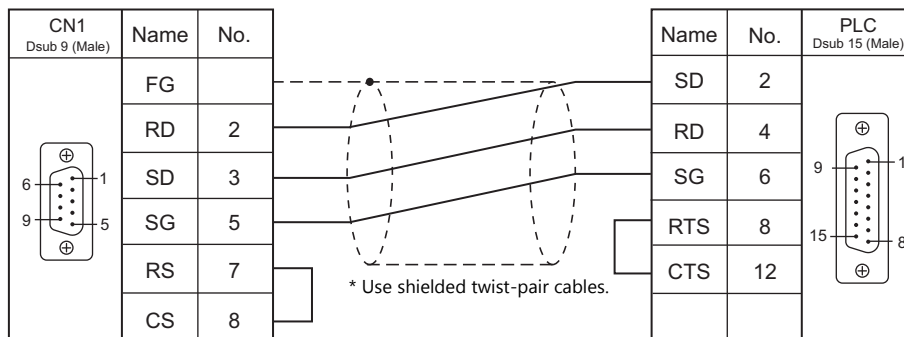
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

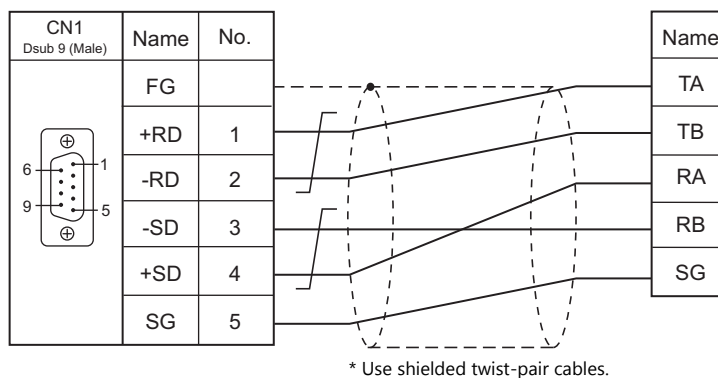


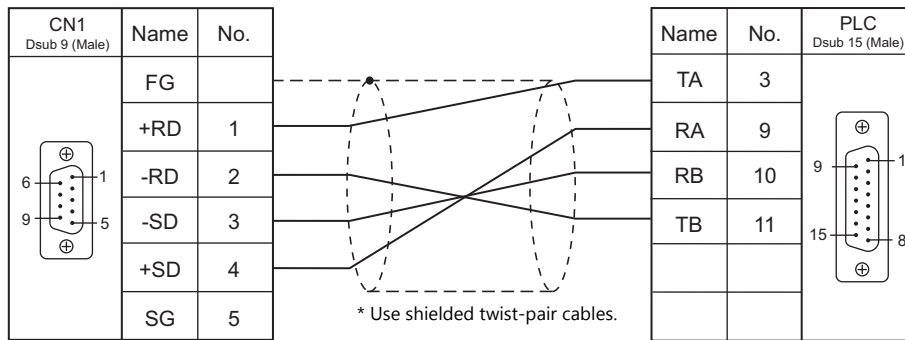
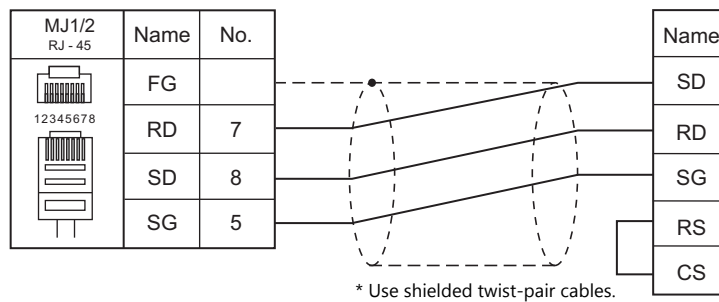
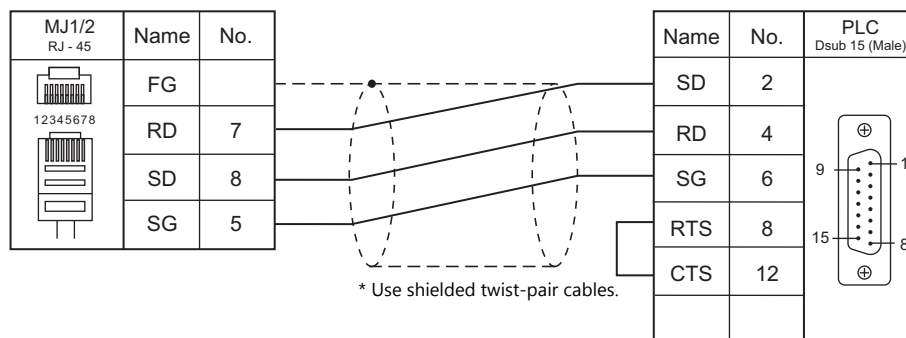
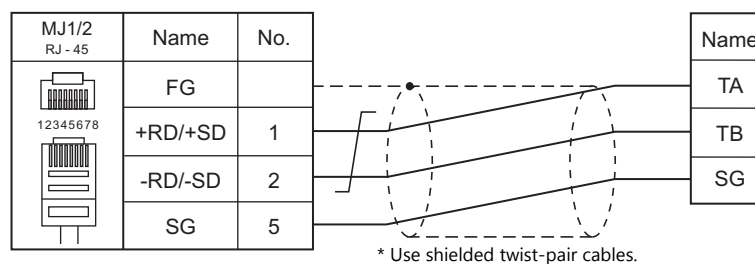
Wiring diagram 2 - C2



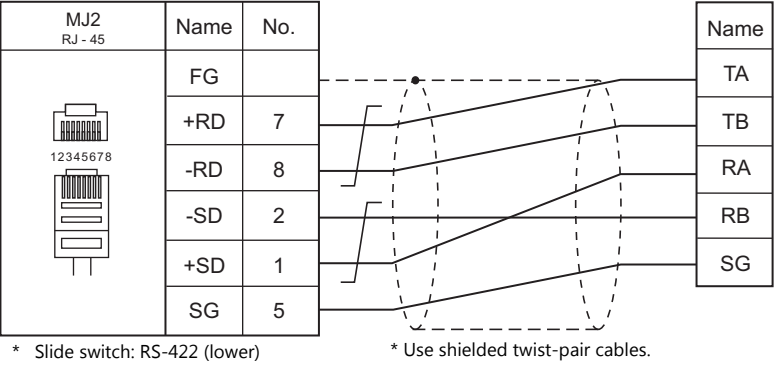
RS-422/RS-485

Wiring diagram 1 - C4

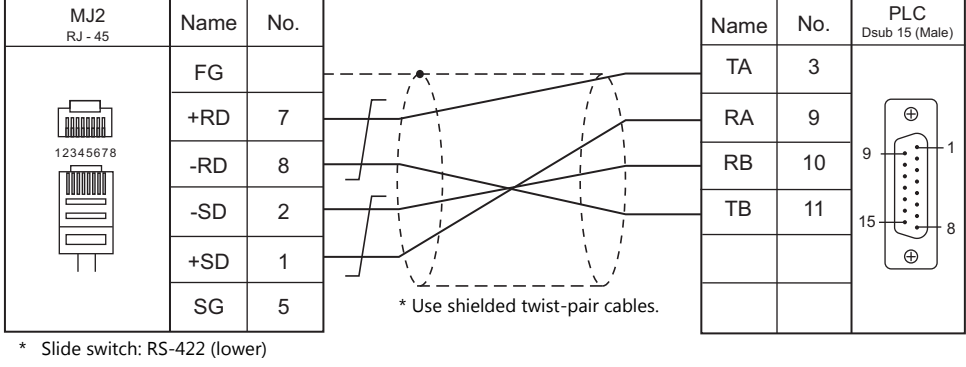


Wiring diagram 2 - C4**When Connected at MJ1/MJ2:****RS-232C****Wiring diagram 1 - M2****Wiring diagram 2 - M2****RS-422/RS-485****Wiring diagram 1 - M4**

Wiring diagram 2 - M4



Wiring diagram 3 - M4



7. SHIMADEN

7.1 Temperature Controller / Servo / Inverter Connection

7.1 Temperature Controller / Servo / Inverter Connection

Controller / Indicator / Servo Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|---|--------------------|--------------|-----------------------|-----------------------|----------------------------|--------------------|
| | | | | CN1 TS2060i+ DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) ^{*2} | |
| SHIMADEN standard protocol | SR82-xx-N-xx-xxxx5xx SR83-xx-x-xx-xxxx5xx SR84-xx-x-xx-xxxx5xx SR91-xx-xx-x5x SR92-xx-x-xx-xx5x SR93-xx-x-xx-x05x SR94-xx-x-xx-x05x SR23-xxxx-xxxxx5x FP93-xx-xx-xx5x MR13-xx1-xxxx15x SD16-xxx-xx5x EM70-xx-xxx5x | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | Shimaden. List |
| | SR82-xx-N-xx-xxxx7xx SR83-xx-x-xx-xxxx7xx SR84-xx-x-xx-xxxx7xx SR92-xx-x-xx-xx7x SR93-xx-x-xx-x07x SR94-xx-x-xx-x07x SR23-xxxx-xxxxx7x FP93-xx-xx-xx7x MR13-xx1-xxxx17x SD16-xxx-xx7x EM70-xx-xxx7x | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | SR253-xx-x-xxxxxx5x | Communication port | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| | SR253-xx-x-xxxxxx6x | Communication port | RS-422 | Wiring diagram 3 - C4 | × | Wiring diagram 3 - M4 | |
| | SR253-xx-x-xxxxxx7x | Communication port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | FP23-xxxx-xxxxx5x | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | FP23-xxxx-xxxxx7x | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | Shimaden FP23.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 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).

7.1.1 SHIMADEN Standard Protocol

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|--------------------------|--|--|
| Connection Mode | 1 : 1 / <u>1:n</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |
| Sum Check | <u>Add</u> / Complement for Adding 2 / Exclusive OR / None | |
| CR/LF | <u>CR</u> / CR/LF | Only CR supported by the SR90/FP93/SD16 series |
| Write Data Count Setting | <u>1</u> to 10 | |

Controller / Indicator / Servo Controller

Communication parameters can be set by operating the keys on the front of the controller.
Be sure to match the settings to those made under [Communication Setting] of the editor.

SR80 Series / EM70 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|----------------------------|--|---------|
| Comm | Communication mode *1 | <u>LOC</u> : Read only COM: Read/write | COM |
| AdrS | Communication address | <u>1</u> to 99 | 1 |
| bPS | Baud rate | 4800 / 9600 / 19200 bps | 19200 |
| dAtA | Communication data format | <u>7E1</u> : 7 bits / even parity / 1 bit 7E2: 7 bits / even parity / 2 bits 7N1: 7 bits / none / 1 bit 7N2: 7 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8N1: 8 bits / none / 1 bit <u>8N2</u> : 8 bits / none / 2 bits | 7E1 |
| Ctrl | Communication control code | 1: STX_ETX_CR 2: STX_ETX_CRLF | 1 |
| bcc | Communication BCC check | <u>1: ADD (addition)</u> 2: ADD_two's cmp (addition + 2's complement number) 3: XOR (exclusive OR) 4: None | 1 |

*1 The front-mounted key works for switching COM → LOC only.
When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

SR90 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|---------------------------|---|---------|
| Comm | Communication mode *1 | <u>LOC</u> : Read only COM: Read/write | COM |
| Prot | Communication protocol | <u>Shim: SHIMADEN protocol</u> | Shim |
| bcc | BCC calculation | 1: ADD (addition) 2: ADD_two's cmp (addition + 2's complement number) 3: XOR (exclusive OR) 4: None | 1 |
| bPS | Baud rate | 4800 / 9600 / 19200 bps | 19200 |
| Addr | Communication address | <u>1</u> to 255 | 1 |
| dAtA | Communication data format | <u>7E1: 7 bits / even parity / 1 bit</u> 7E2: 7 bits / even parity / 2 bits 7N1: 7 bits / none / 1 bit 7N2: 7 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8N1: 8 bits / none / 1 bit 8N2: 8 bits / none / 2 bits | 7E1 |
| SchA | Start character | <u>STX</u> | STX |

*1 The front-mounted key works for switching COM → LOC only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

SR253 Series

(Underlined setting: default)

| Group | Display | Item | Setting | Example |
|------------|-----------|-----------------------------|---|------------|
| Group 1-2 | Operation | Communication mode *1 | <u>LOCAL</u> : Read only COMM: Read/write | COMM |
| Group 5-5A | Add | Machine address | <u>01</u> to 99 | 01 |
| | BPS | Baud rate | 4800 / 9600 / 19200 bps | 19200 |
| | DATA | Communication data format | <u>7E1: 7 bits / even parity / 1 bit</u> 7E2: 7 bits / even parity / 2 bits 7N1: 7 bits / none / 1 bit 7N2: 7 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8N1: 8 bits / none / 1 bit 8N2: 8 bits / none / 2 bits | 7E1 |
| | Mode | Communication protocol mode | <u>Standard: Standard protocol</u> | Standard |
| Group 5-5B | MEM | Communication memory mode | <u>EEP: EEPROM</u> RAM: RAM | EEP |
| | CTRL | Control code | <u>STX_ETX_CR</u> <u>STX_ETX_CRLF</u> | STX_ETX_CR |
| | BCC | Checksum | <u>ADD (addition)</u> ADD_two's cmp (addition + 2's complement number) XOR (exclusive OR) None | ADD |
| | DELY | Delay time | 0 to 99 ms | 40 |

*1 The front-mounted key works for switching COMM → LOCAL only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

SR23 Series / FP23 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|------------------------------------|---|------------|
| COM | Communication mode *1 | <u>LOCAL</u> : Read only COM: Read/write | COM |
| PORT | Communication protocol mode | <u>SHIMADEN</u> : SHIMADEN protocol | SHIMADEN |
| ADDR | Device address | <u>1</u> to 98 | 1 |
| BPS | Baud rate | 4800 / 9600 / 19200 bps | 19200 |
| MEM | Communication memory mode | <u>EEP</u> : EEPROM RAM: RAM R_E: RAM/EEPROM *2 | EEP |
| DATA | Data length | <u>7</u> / 8 | 7 |
| PARI | Parity | <u>EVEN</u> / ODD / NONE | EVEN |
| STOP | Stop bit | <u>1</u> / 2 | 1 |
| DELY | Communication delay time | 1 to 50 ms | 10 |
| CTRL | Communication control code | STX_ETX_CR STX_ETX_CRLF | STX_ETX_CR |
| BCC | Communication BCC data calculation | <u>ADD</u> (addition) ADD_two's cmp (addition + 2's complement number) XOR (exclusive OR) None | ADD |

*1 The front-mounted key works for switching COM → LOC only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

*2 Data in SV, OUT, and COM modes will be written to RAM. Other data will be written to EEPROM.

FP93 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|---------------------------|---|---------|
| Comm | Communication mode *1 | <u>LOC</u> : Read only COM: Read/write | COM |
| Addr | Communication address | <u>1</u> to 255 | 1 |
| bPS | Baud Rate | 4800 / 9600 / 19200 bps | 19200 |
| dAtA | Communication data format | <u>7E1</u> : 7 bits / even parity / 1 bit 8N1: 8 bits / none / 1 bit | 7E1 |
| Stx | Start character | <u>STX</u> | STX |
| bCC | Communication calculation | <u>1</u> : Addition 2: Addition + 2's complement number 3: XOR 4: None | 1 |

*1 The front-mounted key works for switching COM → LOC only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

MR13 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|----------------------------|--|---------|
| Com | Communication mode *1 | <u>LOC</u> : Read only COM: Read/write | COM |
| Addr | Communication address | <u>1</u> to 99 | 1 |
| bPS | Baud rate | 4800 / 9600 / 19200 bps | 19200 |
| dAtA | Communication data format | <u>7E1</u> : 7 bits / even parity / 1 bit 7E2: 7 bits / even parity / 2 bits 7N1: 7 bits / none / 1 bit 7N2: 7 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8N1: 8 bits / none / 1 bit 8N2: 8 bits / none / 2 bits | 7E1 |
| mEm | Communication memory mode | <u>EEP</u> : EEPROM RAM: RAM | EEP |
| Ctrl | Communication control code | 1: STX_ETX_CR 2: STX_ETX_CRLF | 1 |
| bCC | Communication checksum | 1: <u>ADD (addition)</u> 2: ADD_two's cmp (addition + 2's complement number) 3: XOR (exclusive OR) 4: None | 1 |

*1 The front-mounted key works for switching COM → LOC only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

SD16 Series

(Underlined setting: default)

| Parameter Display | Item | Setting | Example |
|-------------------|-------------------------------|--|---------|
| Comm | Communication mode *1 | <u>LOC</u> : Read only COM: Read/write | COM |
| Prot | Communication protocol mode | <u>SHIM</u> : <u>SHIMADEN standard protocol</u> | SHIM |
| Addr | Communication address | <u>1</u> to 100 | 1 |
| dAtA | Communication data format | <u>7E1</u> : 7 bits / even parity / 1 bit 7E2: 7 bits / even parity / 2 bits 7N1: 7 bits / none / 1 bit 7N2: 7 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8N1: 8 bits / none / 1 bit 8N2: 8 bits / none / 2 bits | 7E1 |
| SchA | Communication start character | <u>STX</u> | STX |
| bcc | BCC calculation | 1: <u>ADD (addition)</u> 2: ADD_two's cmp (addition + 2's complement number) 3: XOR 4: None | 1 |
| bPS | Baud rate | 4800 / <u>9600</u> / 19200 bps | 19200 |

*1 The front-mounted key works for switching COM → LOC only.

When writing from the TS2060, place "1" (= communication mode: COM) at address "018Cxx (H)". (xx: Subaddress)

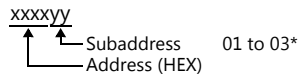
Available Device Memory

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 | |

Address denotations

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



* Specify a channel as a subaddress.

| | |
|---------------------------|--------------|
| SR23 series / FP23 series | : 01 to 02 |
| MR13 series | : 01 to 03 |
| Other models | : 01 (fixed) |

Indirect Device Memory Designation

| | 15 | 8 7 | 0 |
|-----|-----------------|------------------|---|
| n+0 | Model | Device type | |
| n+1 | Address (lower) | Subaddress | |
| n+2 | 00 | Address (higher) | |
| n+3 | 00 | Bit designation | |
| n+4 | 00 | Station number | |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | F2 |
|-----------|-----------------------|--------------|------------------------------|
| Broadcast | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) |
| | | n+1 | Address (lower) + subaddress |
| | | n+2 | Address (higher) |
| | | n+3 | Write data |
| | | | 4 |

7.1.2 Wiring Diagrams

When Connected at CN1:

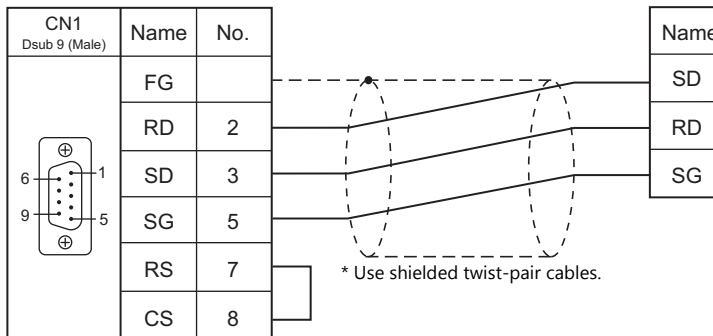


CAUTION

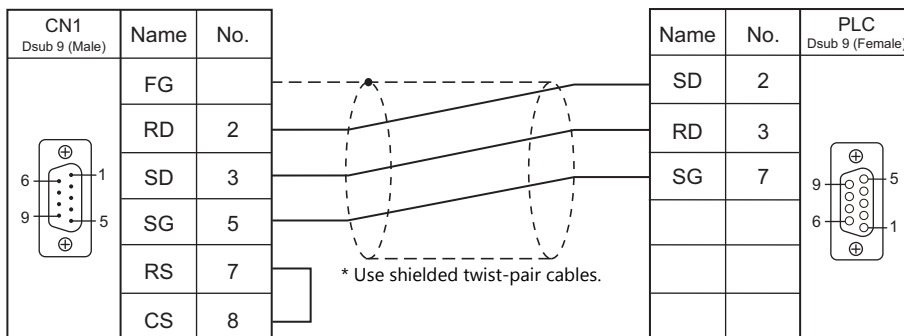
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

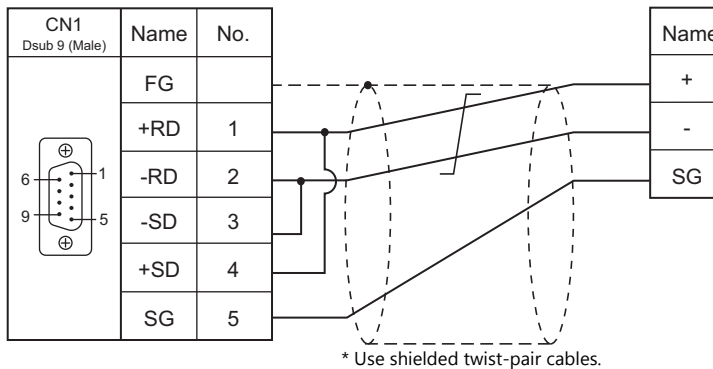


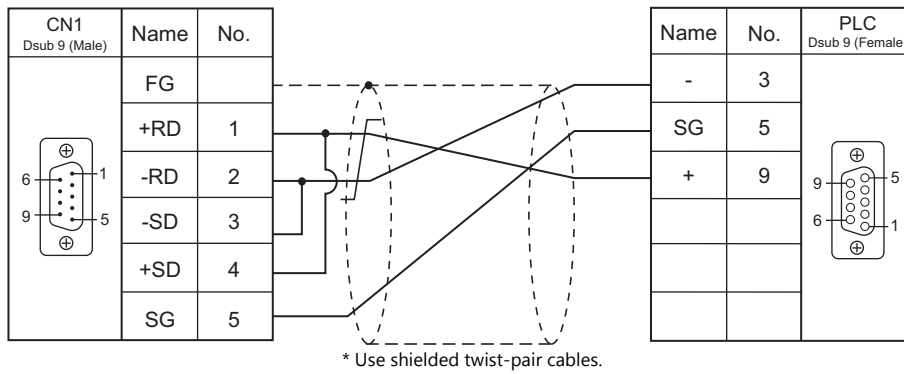
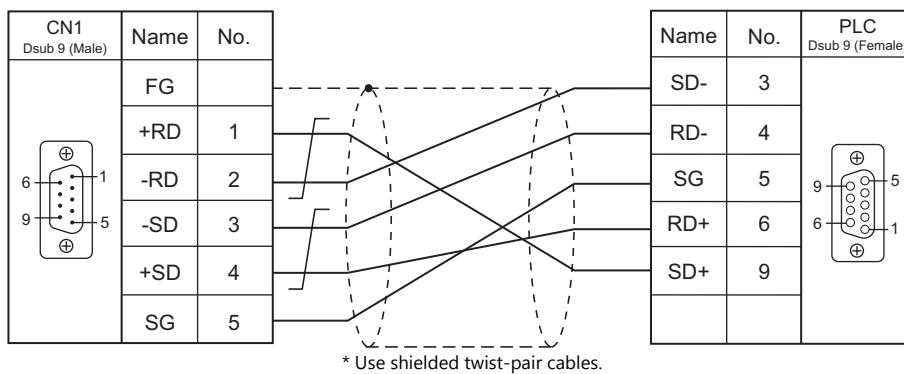
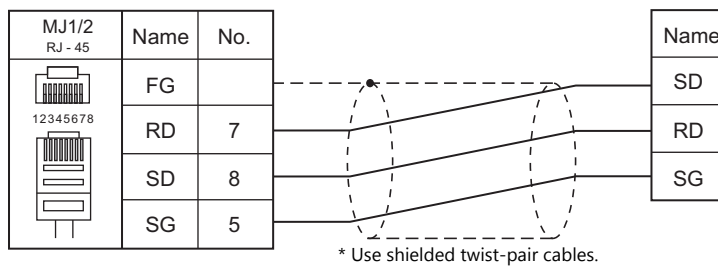
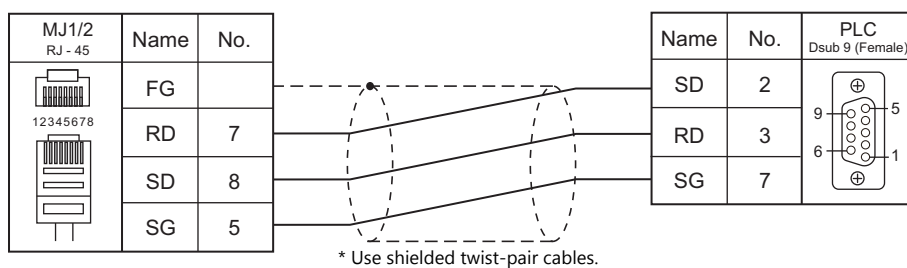
Wiring diagram 2 - C2



RS-422/RS-485

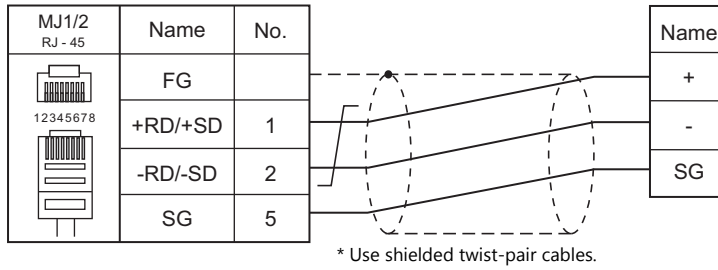
Wiring diagram 1 - C4



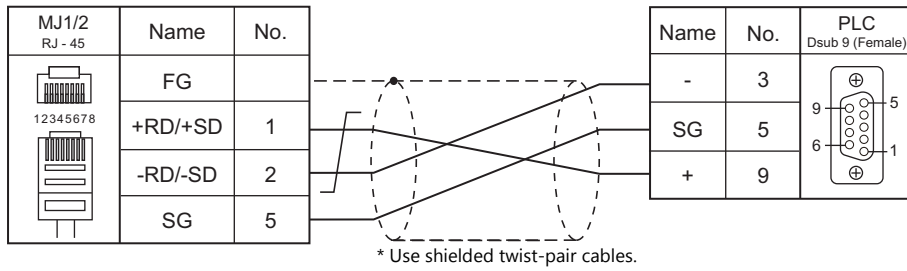
Wiring diagram 2 - C4**Wiring diagram 3 - C4****When Connected at MJ1/MJ2:****RS-232C****Wiring diagram 1 - M2****Wiring diagram 2 - M2**

RS-422/RS-485

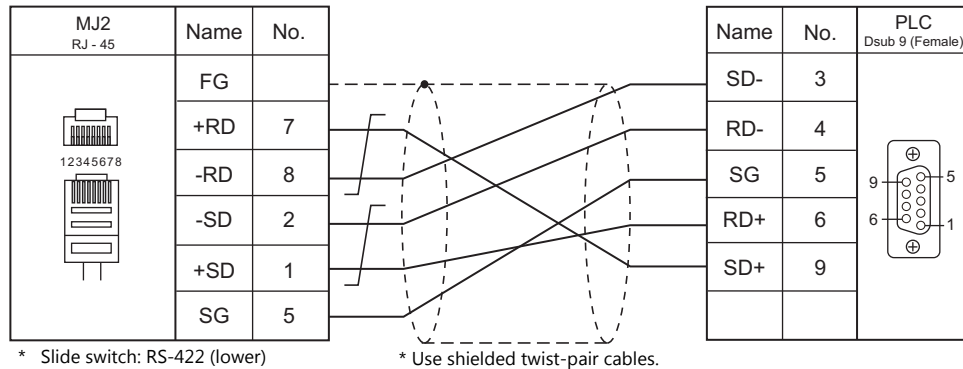
Wiring diagram 1 - M4



Wiring diagram 2 - M4

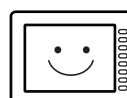


Wiring diagram 3 - M4



MEMO

MONITOUCH



8. SHINKO TECHNOS

8.1 Temperature Controller/Servo/Inverter Connection

8.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Multi-point Temperature Control System

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|---------|-----------------------------|--------------|-----------------------|-----------------------|-----------------------|----------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) *2 | |
| C series | CPT-20A | Power source host link unit | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | Wiring diagram 4 - M4 | S-C.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).

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) | |
| FC series | FCS-23A (C5, C) ^{*2} | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | S-FC.Lst |
| | FCR-13A (C5, C) ^{*2} FCR-23A (C5, C) ^{*2} FCR-15A (C5, C) ^{*2} | | | | | | |
| | RS-485 | | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | | |
| | | | | | | FCD-13A (C5, C) ^{*2} FCD-15A (C5, C) ^{*2} | |
| GC series | GCS-33x-x/x, C5 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | S-GC.Lst |
| JCx-300 series | JCS-33A-x/xx, C5 JCR-33A-x/xx, C5 JCD-33A-x/xx, C5 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | S-JC.Lst |
| ACS-13A | ACS-13A-x/Mx, C5 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | S-ACS13 A.Lst |
| ACD/ACR series | ACD-13A-x/Mx, (C5, C) ^{*2} ACR-13A-x/Mx, (C5, C) ^{*2} ACD-15A-R/Mx, (C5, C) ^{*2} ACR-15A-R/Mx, (C5, C) ^{*2} | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | S-ACDR. Lst |
| | | | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| WCL-13A | WCL-13A-xx/xxx, C5 | RS-485 | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | S-WCL. 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 with option C5 (serial communication RS-485) or C (serial communication RS-232C).

DIN-Rail-Mounted Indicating Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|------------------|--------|--------------|-----------------------|-----------------------|--------------|-----------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) | |
| DCL-33A | DCL-33A-x/xx, C5 | RS-485 | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | S-DCL.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).

Program Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|------------------------|----------------|--------------|-----------------------|-----------------------|--------------|--------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) | |
| PCD-33A | PCD-33A-x/Mx, C5 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | S-PCD33A.Lst |
| PC-900 | PC-9x5-x/M, (C5, C) *2 | Terminal block | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | S-PC900.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 with option C5 (serial communication RS-485) or C (serial communication RS-232C).

8.1.1 C 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-232C / <u>RS-422/485</u> | |
| Baud Rate | <u>9600</u> / 19200 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | 0 to 15 | |


C Series

Device number setting

| STATION No. | Setting | Setting Example |
|--|----------------------|-----------------|
|  | 0 to F (H) (0 to 15) | 0 |

Communication setting DIP switch

(Underlined setting: default)

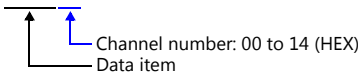
| Switch | Contents | OFF | ON | Setting Example | | | | | | | | | | | | | | | |
|------------|---|--|---|---|---|---|----------|------------|------------|--|----|-----|---|-----|----|--|----|----|---|
| 1 | Baud rate | <u>9600 bps</u> | 19200 bps |  | | | | | | | | | | | | | | | |
| 2 | Terminating resistance | <u>Without terminating resistance</u> | With terminating resistance | | | | | | | | | | | | | | | | |
| 3 | Communication format | <u>OFF</u> : Shinko standard protocol | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | |
| 7 | Digital output setting | <table border="1"><thead><tr><th>7</th><th>8</th><th>Contents</th></tr></thead><tbody><tr><td><u>OFF</u></td><td><u>OFF</u></td><td>Turning ON/OFF by communication command *1</td></tr><tr><td>ON</td><td>OFF</td><td>DO1: warning 1, DO2: warning 2, DO3: heater disconnection warning</td></tr><tr><td>OFF</td><td>ON</td><td>DO1: warning 1, DO2: warning 2, DO3: abnormal loop warning</td></tr><tr><td>ON</td><td>ON</td><td>DO1: warning 1, DO2: heater disconnection warning, DO3: abnormal loop warning</td></tr></tbody></table> | | | 7 | 8 | Contents | <u>OFF</u> | <u>OFF</u> | Turning ON/OFF by communication command *1 | ON | OFF | DO1: warning 1, DO2: warning 2, DO3: heater disconnection warning | OFF | ON | DO1: warning 1, DO2: warning 2, DO3: abnormal loop warning | ON | ON | DO1: warning 1, DO2: heater disconnection warning, DO3: abnormal loop warning |
| 7 | | 8 | Contents | | | | | | | | | | | | | | | | |
| <u>OFF</u> | | <u>OFF</u> | Turning ON/OFF by communication command *1 | | | | | | | | | | | | | | | | |
| ON | | OFF | DO1: warning 1, DO2: warning 2, DO3: heater disconnection warning | | | | | | | | | | | | | | | | |
| OFF | ON | DO1: warning 1, DO2: warning 2, DO3: abnormal loop warning | | | | | | | | | | | | | | | | | |
| ON | ON | DO1: warning 1, DO2: heater disconnection warning, DO3: abnormal loop warning | | | | | | | | | | | | | | | | | |
| 8 | *1 Works only when the data is sent to the address (digital output [0041xx]) on CPT-20A. For more information, refer to the instruction manual for the temperature controller issued by the manufacturer. | | | | | | | | | | | | | | | | | | |

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 | |

Address denotations

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

- On the signal name reference list, every channel number is designated as "00". To access any channel number other than "00", manually input the desired number.

8.1.2 FC 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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

FC Series

Auxiliary function setting mode 1

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in "auxiliary function setting mode 1".

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------------------|--------------------------------|---|
| Communication protocol selection | Shinko standard | Available only with FCS-23A, FCR-13A, FCR-23A and FCD-13A |
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |

* The following settings are fixed; data length 7, stop bit 1 and even parity.

Available Device Memory

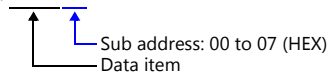
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

| Device Memory | TYPE | Remarks |
|---------------|------|---------|
| --- | 00H | |

Address denotations

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

Example: XXXXY



- On the signal name reference list, every sub address is designated as "00". To access any sub address other than "00", manually input the desired address.

8.1.3 GC 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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

GC Series

Auxiliary function setting mode 1

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in "auxiliary function setting mode 1".

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------------|--------------------------------|---------|
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |

* The following settings are fixed; data length 7, stop bit 1, even parity.

Available Device Memory

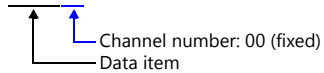
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

| Device Memory | TYPE | Remarks |
|---------------|------|---------|
| --- | 00H | |

Address denotations

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

Example: XXXXY



8.1.4 JCx-300 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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

JCx-300 Series

Auxiliary function setting mode 1

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in "auxiliary function setting mode 1".

(Underlined setting: default)

| Item | Setting | Remarks |
|-------------------------------------|--------------------------------|--|
| Communication protocol selection | <u>Shinko standard</u> | |
| Communication device number setting | 0 to 94 | |
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |
| Parity selection | <u>Even</u> | Cannot be changed when the Shinko standard protocol is selected. |
| Stop bit selection | <u>1 bit</u> | |

* The data length setting is fixed to "7".

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 | |

8.1.5 ACS-13A

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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

ACS-13A

Auxiliary function setting mode

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in "auxiliary function setting mode".

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------------------|--------------------------------|---------|
| Communication protocol selection | Shinko standard | |
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |
| Data bit / parity selection | 7 bits / even | |
| Stop bit selection | 1 bit | |

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 | |

8.1.6 ACD/ACR 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-232C / <u>RS-422/485</u> | |
| Baud Rate | <u>9600</u> / 19200 / 38400 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

ACD/ACR Series

Communication parameter setting group

When the [SET] key is pressed four times and the [MODE] key is pressed in the PV/SV display mode, the controller enters in "input parameter group".

In this state, press the [SET] key several times again. The controller enters in "communication parameter setting group".

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------------------|---|---------|
| Communication protocol selection | <u>Shinko standard</u> | |
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | <u>9600</u> / 19200 / 38400 bps | |
| Data bit / parity selection | 8 bits / no parity 7 bits / no parity 8 bits / even <u>7 bits / even</u> 8 bits / odd 7 bits / odd | |
| Stop bit selection | <u>1 bit</u> 2 bits | |

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 | |

8.1.7 WCL-13A

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-232C / <u>RS-422/485</u> | |
| Baud Rate | <u>9600</u> / 19200 / 38400 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

WCL-13A

Specific function setting group

When the [MODE] key is pressed several times in the PV/SV display mode, the controller enters in "specific function setting group".

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------------------|---------------------------------|---------|
| Communication protocol selection | Shinko standard | |
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | <u>9600</u> / 19200 / 38400 bps | |
| Data bit / parity selection | <u>7 bits</u> / <u>even</u> | |
| Stop bit selection | <u>1 bit</u> | |

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 | |

8.1.8 DCL-33A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|------------------------------------|---------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 31 | |

DCL-33A

Auxiliary function setting mode 1

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in the “auxiliary function setting” mode.

(Underlined setting: default)

| Item | Setting | Remarks |
|-------------------------------------|--------------------------------|--|
| Communication protocol selection | <u>Shinko standard</u> | |
| Communication device number setting | <u>0</u> to 31 | |
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |
| Parity selection | Even | Cannot be changed when the Shinko standard protocol is selected. |
| Stop bit selection | 1 bit | |

* The data length setting is fixed to “7”.

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 | |

8.1.9 PCD-33A

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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

PCD-33A

Auxiliary function setting mode 1

When the [MODE] key is held down for three seconds together with the [▼] key in the PV/SV display mode, the controller enters in "auxiliary function setting mode 1".

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------------------------|---------------------------------|--|
| Communication protocol selection | Shinko standard | |
| Device number setting | <u>0</u> to 94 | |
| Baud rate selection | <u>9600</u> / 19200 / 38400 bps | |
| Parity selection | Even | Cannot be changed when the Shinko standard protocol is selected. |
| Stop bit selection | 1 bit | |

* The data length setting is fixed to "7".

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 | |

8.1.10 PC-900

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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 95 | "95" is used for broadcasting. |

PC-900

Communication parameter

Press the [SET/RST] key in the standby mode or program control execution mode, press the [STOP/MODE] key four times, and then press the [HOLD/ENT] key to select "auxiliary function setting mode". In this state, press the [STOP/MODE] key five times and then press the [HOLD/ENT] key to select "communication parameter". For more information, refer to the instruction manual for the PC-900.

(Underlined setting: default)

| Item | Setting | Remarks |
|------------------------------|------------------------------------|---------|
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |
| Device number setting | <u>0</u> to 94 | |
| Communication mode selection | <u>Serial communication</u> | |

* The following settings are fixed; data length 7, stop bit 1, even parity.

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 | |

8.1.11 Wiring Diagrams

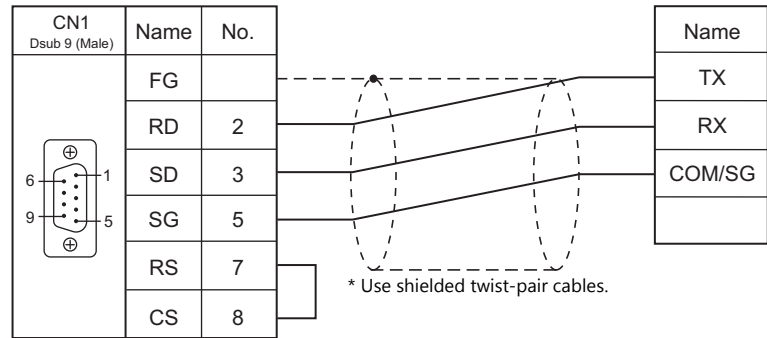
When Connected at CN1:



- 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.

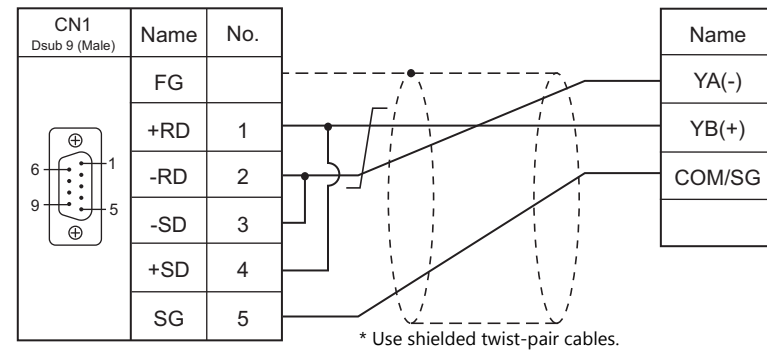
RS-232C

Wiring diagram 1 - C2

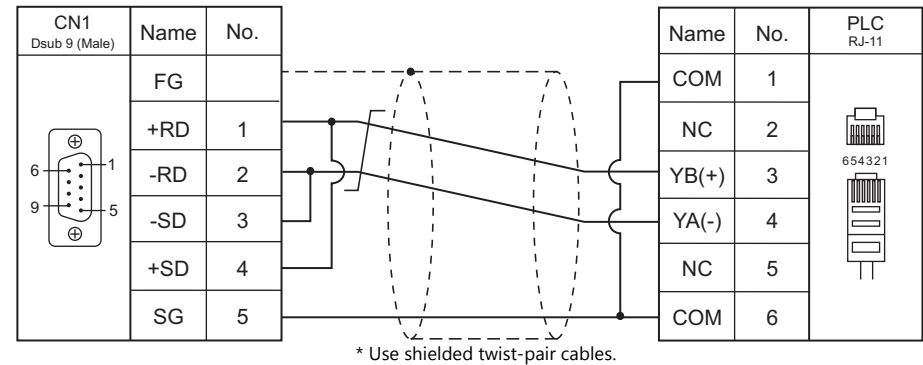


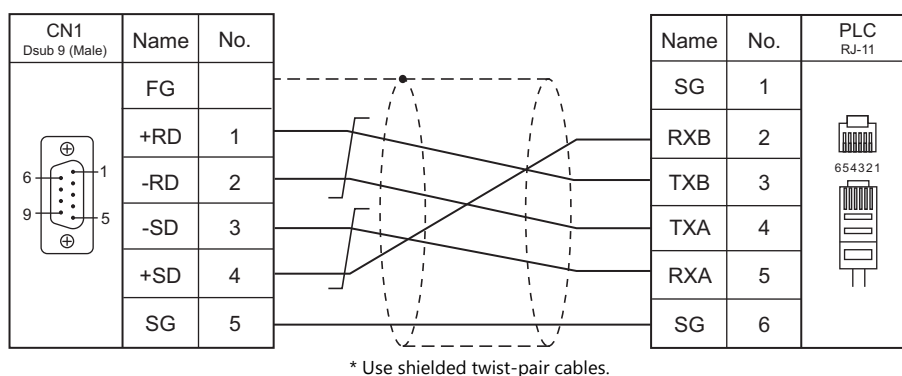
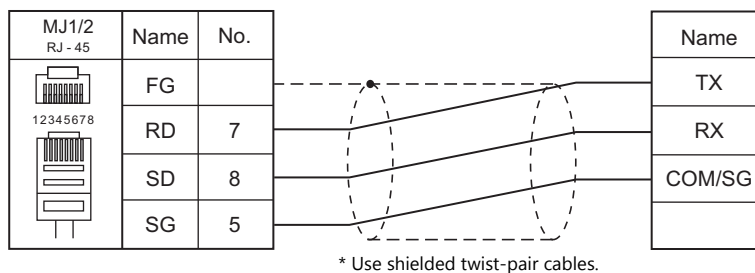
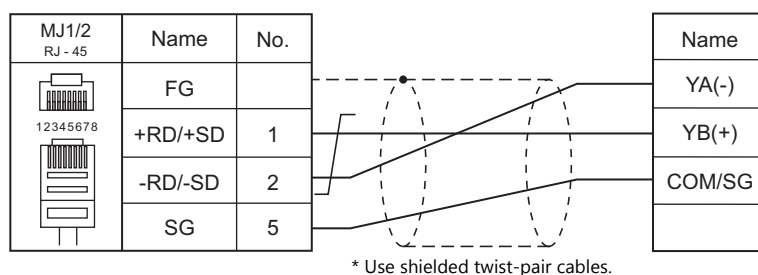
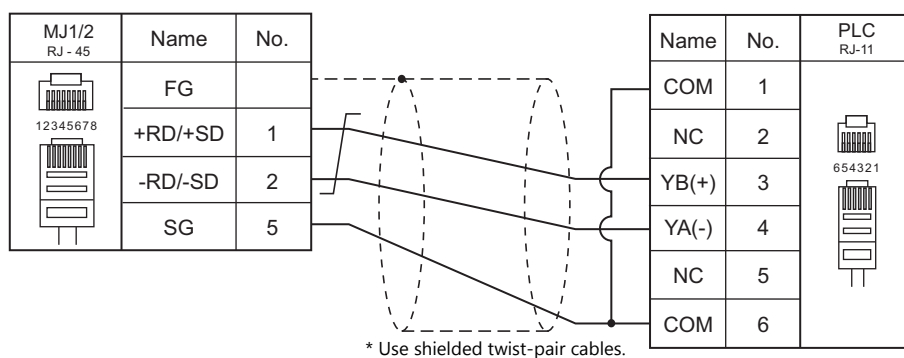
RS-422/RS-485

Wiring diagram 1 - C4

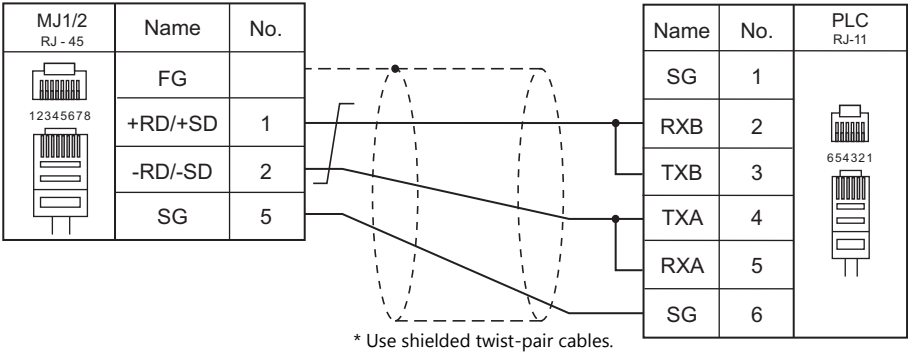


Wiring diagram 2 - C4

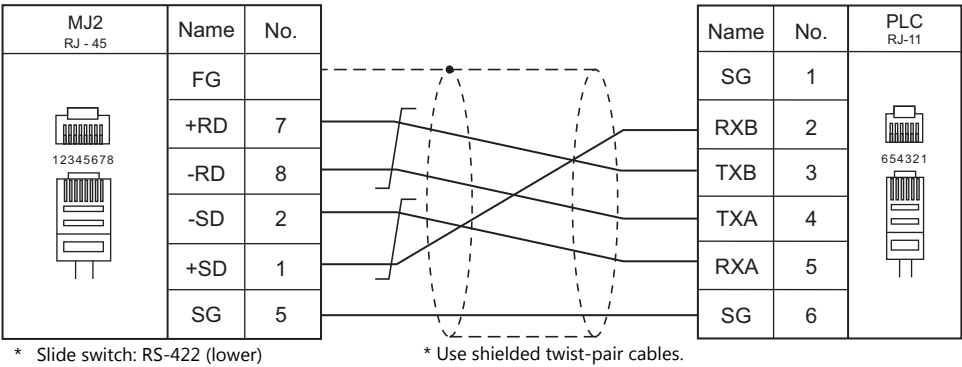


Wiring diagram 3 - C4**When Connected at MJ1/MJ2:****RS-232C****Wiring diagram 1 - M2****RS-422/RS-485****Wiring diagram 1 - M4****Wiring diagram 2 - M4**

Wiring diagram 3 - M4

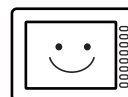


Wiring diagram 4 - M4



MEMO

MONITOUCH



9. Siemens

- 9.1 PLC Connection
- 9.2 Temperature Controller/Servo/Inverter

9.1 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} | |
| S5 (PG port) | S5-90U S5-95U S5-95F S5-100U S5-115U S5-115H S5-115F | Programming port of CPU | RS-232C | Siemens 6ES5 734-1BD20 + Wiring diagram 2 - C2 | Siemens 6ES5 734-1BD20 + Wiring diagram 2 - M2 | | × |
| S7 | S7-300 | CP-341 (3964R/RK512) | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 3 - M4 | |
| | S7-400 | CP-441 (3964R/RK512) | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 3 - M4 | |
| S7-200 PPI | CPU 226 CPU 224 CPU 222 CPU 221 CPU 216 CPU 215 CPU 214 CPU 212 | PPI | RS-485 | × | Wiring diagram 1 - M4 ^{*4} | | × |
| S7-300/ 400 MPI | CPU 312 CPU 312C CPU 313C CPU 313C-2 DP CPU 314 CPU 314C-2 DP CPU 315-2 DP CPU 315-2 PN/DP CPU 315F-2 DP CPU 317-2 DP CPU 317-2 PN/DP CPU 317F-2 DP CPU 319-3 PN/DP CPU 412-1 CPU 412-2 CPU 414-2 CPU 414-3 CPU 416-2 CPU 416-3 CPU 417-4 | MPI (MPI/DP) | RS-485 | × | Wiring diagram 1 - M4 ^{*4} | | × |
| TI500/ 505 | TI545-1103 | Port2 | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | × |
| | TI545-1101 TI545-1102 TI545-1104 TI545-1111 TI555-1101 TI555-1102 TI555-1103 TI555-1104 TI555-1105 TI555-1106 | Port2 | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | |
| | | | RS-422 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 4 - M4 | |
| | TI575-2104 TI575-2105 TI575-2106 | Port1 | RS-232C | Wiring diagram 5 - C2 | Wiring diagram 5 - M2 | | |
| | | Port3 | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 5 - 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 Connection is possible only by the MJ2 port.

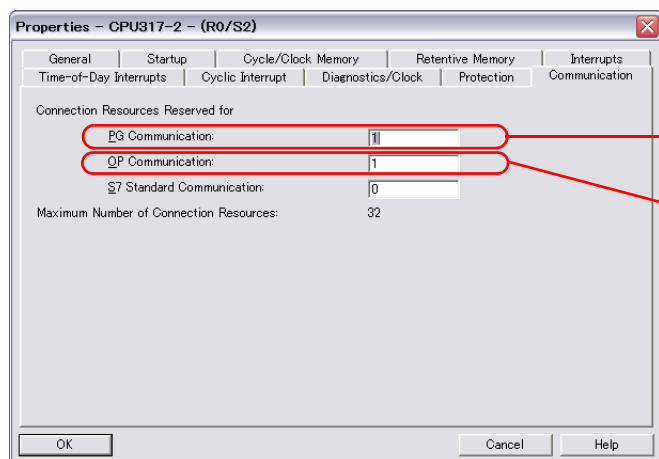
Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit | TCP/IP *1 | UDP/IP | Port No. | Ladder Transfer*2 |
|---|---|-----------------------|-----------|--------|-------------------------------|-------------------|
| S7-200 (Ethernet ISOTCP) | CPU222, CPU224 CPU224XP, CPU226 | CP243-1 CP243-1 IT | ○ | × | 102 fixed (Max. 8 units) | × |
| S7-300/400 (Ethernet ISOTCP) | CPU312, CPU312C CPU313, CPU313C-2 DP CPU314, CPU314C-2 DP CPU315-2 DP CPU315-2 PN/DP CPU315F-2 DP CPU317-2 DP CPU317-2 PN/DP CPU317F-2 DP | CP343-1 Lean | ○ | × | 102 (fixed) *3 | × |
| | CPU315-2 PN/DP CPU317-2 PN/DP CPU319-3 PN/DP | - | | | | |
| | CPU412-1, CPU412-2 CPU414-2, CPU414-3 CPU416-2, CPU416-3 CPU417-4 | CP443-1 | | | | |
| S7-300/400 (Ethernet TCP/IP PG protocol) | CPU312, CPU312C CPU313, CPU313C-2 DP CPU314, CPU314C-2 DP CPU315-2 DP CPU315-2 PN/DP CPU315F-2 DP CPU317-2 DP CPU317-2 PN/DP CPU317F-2 DP | CP343-1 Lean | ○ | × | 102 (fixed) *3 | × |
| | CPU315-2 PN/DP CPU317-2 PN/DP CPU319-3 PN/DP | - | | | | |
| | CPU412-1, CPU412-2 CPU414-2, CPU414-3 CPU416-2, CPU416-3 CPU417-4 | CP443-1 | | | | |
| S7-1200/1500 (Ethernet ISOTCP) | CPU1211C, CPU1212C CPU1214C, CPU1511, CPU1513, CPU1515, CPU1516, CPU1518 | - | ○ | × | 102 (fixed) (Max. 3 units) | × |

*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.

*3 In n : 1 connection, the connectable number of TS2060i units varies depending on the system resource capacity of the PLC. Check the capacity on [Communication] which is displayed by selecting [STEP7 HW configuration] → [CPU] → [Object Properties].



Connectable number of units when the PG protocol is selected
(Including connections with STEP 7)

Connectable number of units when ISOTCP is selected
(Including the number of OP units of Siemens)

9.1.1 S5 (PG Port)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1 : 1</u> / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | RS-232C | |
| Baud Rate | <u>9600</u> bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 31 | |

S5

No particular setting is necessary on S5.

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 |
|---------------------------|------|-------------------|
| DB (Data Block) | 00H | *1 |
| I (input) | 01H | IW as word device |
| Q (output) | 02H | QW as word device |
| F (flag/internal relay) | 03H | FW as word device |
| T (timer/current value) | 04H | |
| C (counter/current value) | 05H | |
| AS (absolute address) | 06H | |

*1 When these device memory are used, registration is required at the PLC.
For more information, refer to the PLC manual issued by the manufacturer.
The assigned device memory is expressed as shown on the right when editing the screen.
Addresses that can be set on MONITOUCH range from DB000000 to DB255255.

Example: DB001000

↑ Address No. (0 to 255)
↑ Block No. (0 to 255)

Indirect Device Memory Designation

| | | | | |
|-----|--------------------------------|---|-----------------|-------------|
| | 15 | 8 | 7 | 0 |
| n+0 | Model | | | Device type |
| n+1 | Address No. (word designation) | | | |
| n+2 | 00 | | Bit designation | |
| n+3 | 00 | | Station number | |

- Designation of addresses for byte devices (I, Q, F, AS):
Specify an address number divided by "2" for "n+1".
Example: Indirect device memory designation of "IW00010"
 $n+1 = 10 \text{ (DEC)} \div 2 = 5 \text{ (DEC)}$
- Bit designation of addresses for byte devices (I, Q, F, AS):
 - An even address number
Specify a byte address number divided by "2" for "n+1" and specify a bit number for "n+2".
Example: Indirect device memory designation of "I000105"
 $n+1 = 10 \div 2 = 5 \text{ (DEC)}$
 $n+2 = 5 \text{ (DEC)}$
 - An odd address number
Specify a byte address number minus "1", divided by "2", for "n+1". Specify a bit number plus "8" for "n+2".
Example: Indirect device memory designation of "I000115"
 $n+1 = (11 - 1) \div 2 = 5 \text{ (DEC)}$
 $n+2 = 5 + 8 = 13 \text{ (DEC)}$
- For DB device memory:
Specify a block number for the higher-order bytes of "n + 1". Specify an address number divided by "2" for the lower-order bytes.

9.1.2 S7

Communication Setting

Editor

Communication setting

(Underlined setting: default)

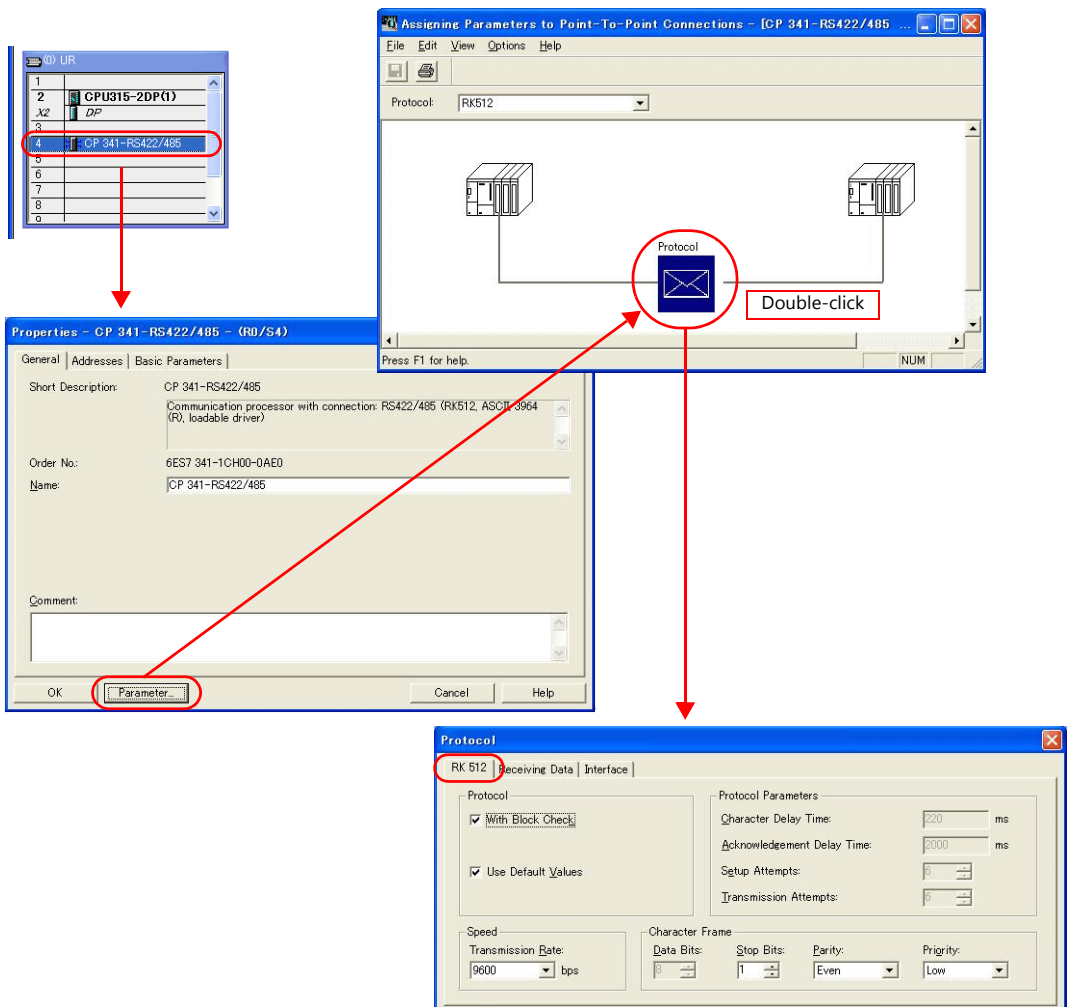
| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 /38400 / 57600 / 76800 / 115K bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bit | |
| Parity | None / Odd / <u>Even</u> | |

S7

Make the setting for communication using the ladder tool “SIMATIC Manager”. For more information, refer to the PLC manual issued by the manufacturer.

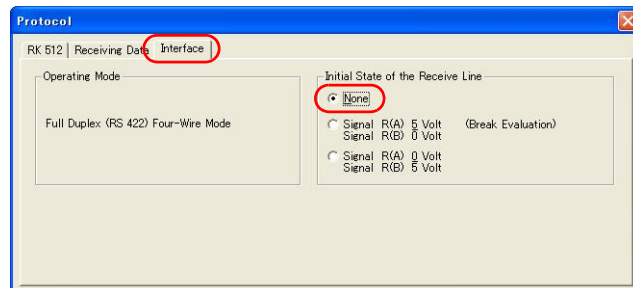
Hardware Configuration ([RK 512] tab window)

Open the [Protocol] dialog and specify the baud rate and the parity, etc. in the [RK 512] tab window.



Hardware Configuration ([Interface] tab window)

Specify "None" for the initial state of the receive line in the [Interface] tab window.



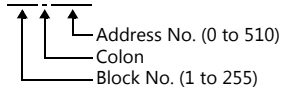
Available Device Memory

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 | *1 |
| I | (input) | 01H | IW as word device |
| Q | (output) | 02H | QW as word device |
| M | (memory word) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |

- *1 When this device memory is used, a registration is required for the PLC.
For more information, refer to the PLC manual issued by the manufacturer.
The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is DB255:0000 to DB255:0510.

Example: DB001 : 0000



Indirect Device Memory Designation

| | | | | |
|-----|--------------------------------|---|-----------------|---|
| | 15 | 8 | 7 | 0 |
| n+0 | Model | | Device type | |
| n+1 | Address No. (word designation) | | | |
| n+2 | 00 | | Bit designation | |
| n+3 | 00 | | Station number | |

- Designation of addresses for byte devices (I, Q, F, AS):
Specify an address number divided by "2" for "n+1".
Example: Indirect device memory designation of "IW00010"
 $n+1 = 10 \text{ (DEC)} \div 2 = 5 \text{ (DEC)}$
- Bit designation of addresses for byte devices (I, Q, F, AS):
 - An even address number
Specify a byte address number divided by "2" for "n+1" and specify a bit number for "n+2".
Example: Indirect device memory designation of "I000105"
 $n+1 = 10 \div 2 = 5 \text{ (DEC)}$
 $n+2 = 5 \text{ (DEC)}$
 - An odd address number
Specify a byte address number minus "1", divided by "2", for "n+1". Specify a bit number plus "8" for "n+2".
Example: Indirect device memory designation of "I000115"
 $n+1 = (11 - 1) \div 2 = 5 \text{ (DEC)}$
 $n+2 = 5 + 8 = 13 \text{ (DEC)}$
- For DB device memory:
Specify a block number for the higher-order bytes of "n + 1". Specify an address number divided by "2" for the lower-order bytes.

9.1.3 S7-200PPI



CAUTION

- Connection is possible only by the MJ2 port.
- Only logical port PLC1 can be selected.

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|-------------------------------------|---------|
| Connection Mode | <u>1 : 1</u> / 1 : n / Multi-link2 | |
| Signal Level | RS-422/485 | |
| Baud Rate | <u>9600</u> / 19200 / 187.5k *1 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 1 to 31 (<u>2</u>) | |

*1 Notes on communication at the baud rate of 187.5k bps:

- When performing slave communication via RS-485, set a send delay time of 5 msec or longer.
- When performing serial communication with another device at PLC2 to PLC8, the maximum baud rate is 115k bps if only one port is used.
When two ports are used at the same time, the maximum baud rate is 57600 bps for each port.

Terminating resistance

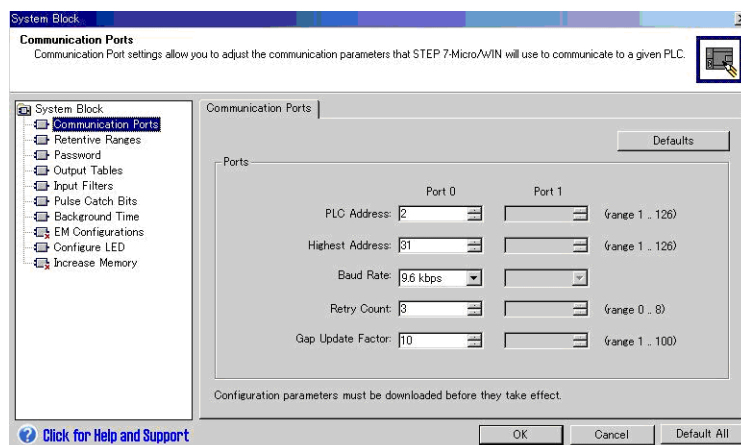
When the TS2060 is the termination, set the DIP switches 4, 5, and 8 on the rear side to ON.

If the terminating resistance is not set, communication may not be properly performed.

S7-200

Make the setting for communication using the ladder tool "STEP 7 MicroWIN".

System block



(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|----------------------------------|---|
| PLC Address | 1 to 31 (<u>2</u>) | Numbers from 1 to 126 can be specified, however, communication with TS2060 cannot be established when a number from 32 to 126 is specified. |
| Highest Address | 1 to <u>31</u> | |
| Baud Rate | <u>9.6k</u> / 19.2k / 187.5 kbps | |

The following settings 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 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 memory) | 00H | VW as word device |
| I | (input) | 01H | IW as word device, possible to write to the unused area |
| Q | (output) | 02H | QW as word device |
| M | (bit memory/internal relay) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |
| HC | (high-speed counter/current value) | 08H | Double-word usable |
| AIW | (analog input) | 09H | |
| AQW | (analog output) | 0AH | |
| SM | (special memory/special relay) | 0BH | SMW as word device |
| S | (stage) | 0CH | SW as word device |

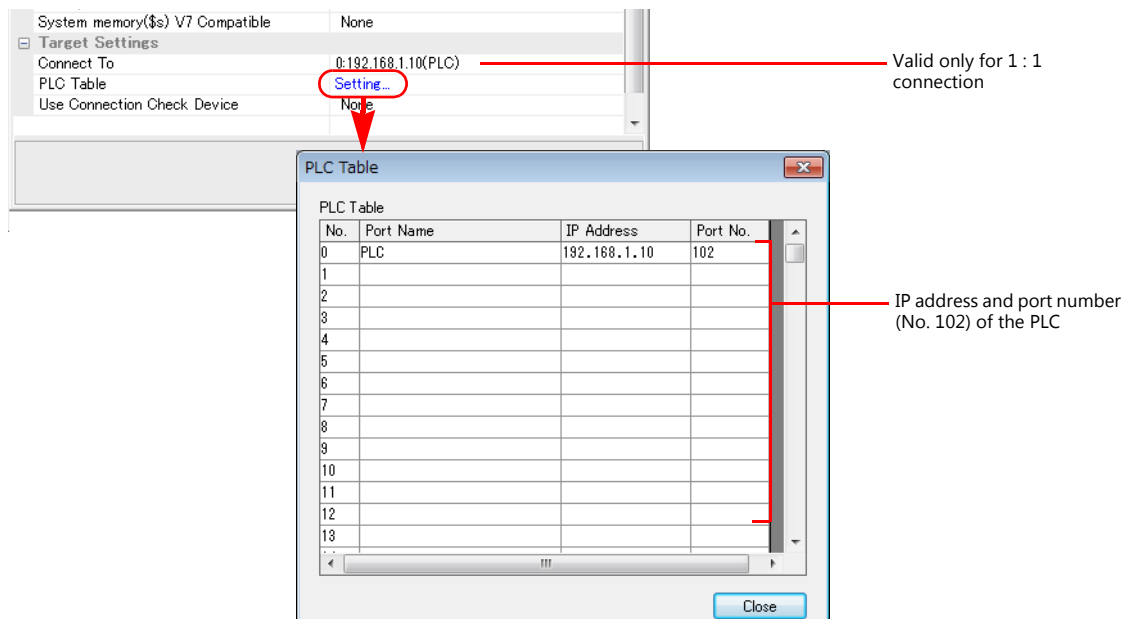
9.1.4 S7-200(Ethernet ISOTCP)

Communication Setting

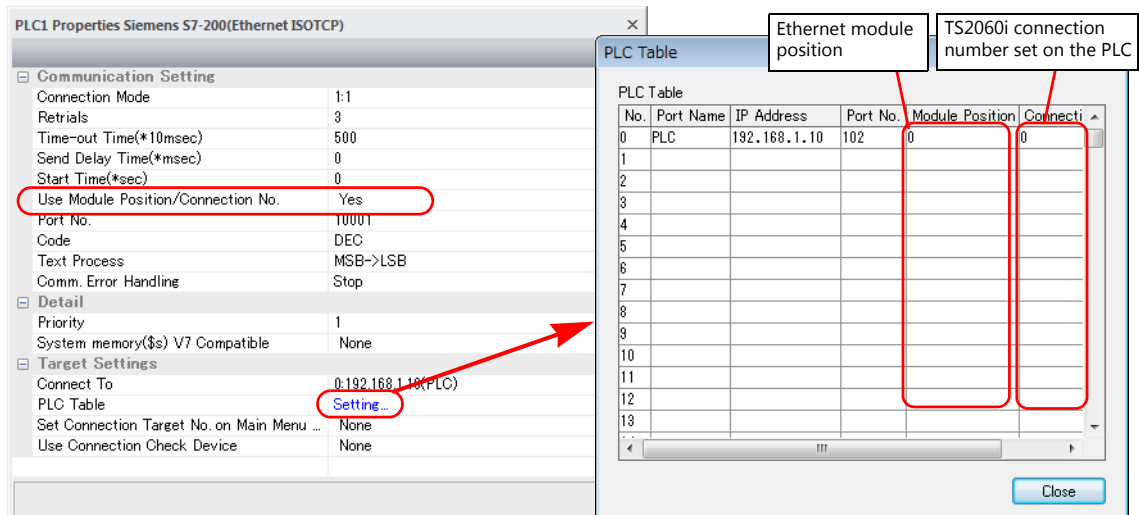
Editor

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. 102) 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 Module Position/Connection No.]
 - [Yes] (default)
Specify the module position and connection number at the [PLC Table] under [Target Settings] on the [PLC Properties] window ([System Setting] → [Hardware Setting]).
Setting range: [Module Position] 0 to 6, [Connection No.] 0 to 7
 - [None]
The module position and connection number will automatically be retrieved.



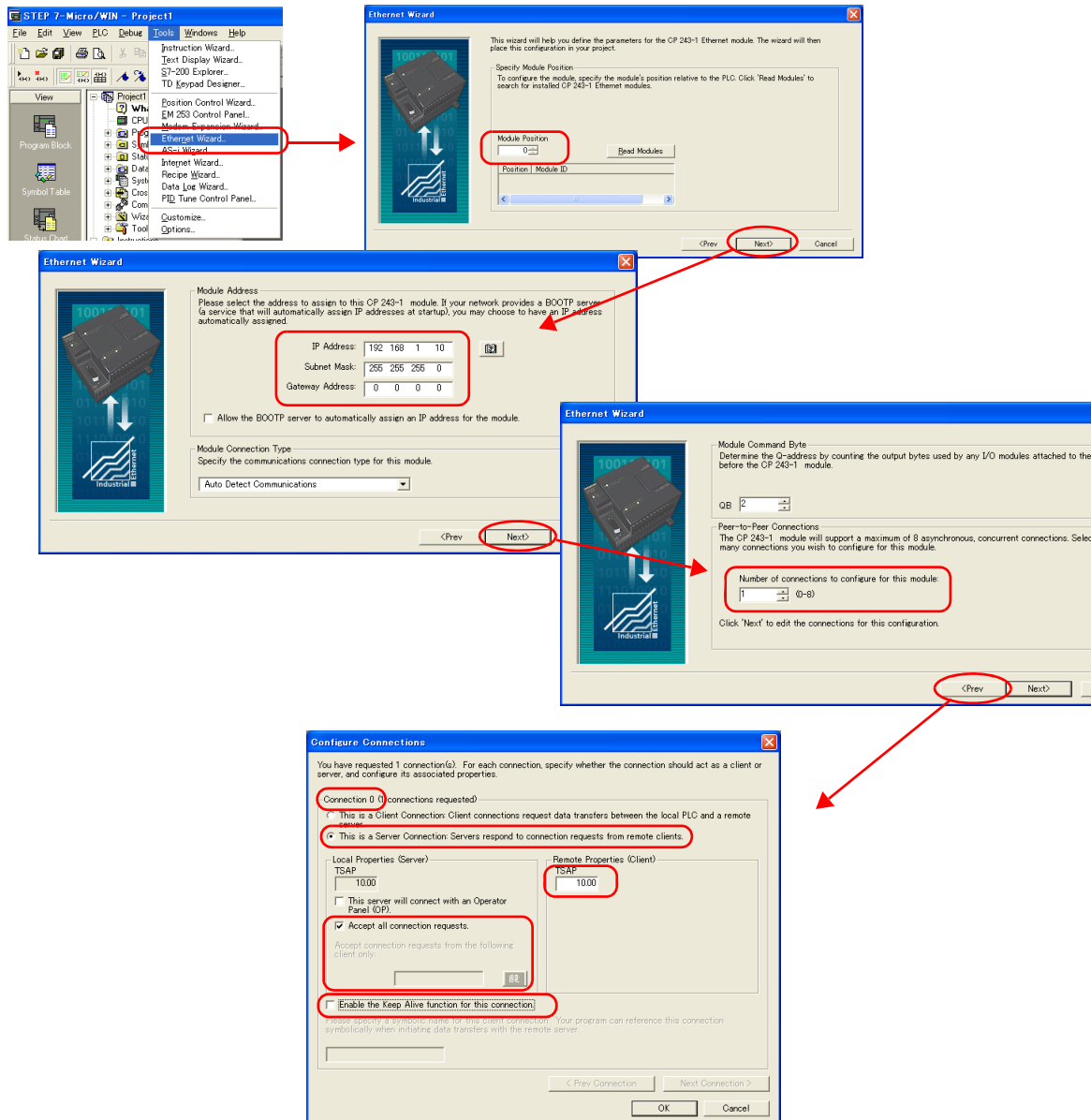
S7-200

Make the following settings in the ladder tool "STEP 7-Micro/WIN".

"ETH0_CTRL" must be executed in the ladder program at each time of scan. For more information, refer to the PLC manual issued by the manufacturer.

Ethernet Wizard

Set the following items including module position, TS2060i connection number, IP address, and subnet mask according to the instructions in Ethernet Wizard.



| Item | | Setting | Remarks |
|--|---|---------------------------------------|--|
| Module Position | | 0 to 6 | Set this value for [Module Position] in V-SFT. |
| IP Address | | Set the IP address of the PLC. | |
| Subnet Mask | | Specify according to the environment. | |
| Gateway Address | | | |
| Number of connections to configure for this module | | 0 to 8 | Number of connecting units |
| Configure Connections | Connection No. | 0 to 7 | Automatically displayed according to [Number of connections to configure for this module]. Set this value for [Connection No.] in V-SFT. |
| | This is a Server Connection | Checked | |
| | Accept all connection requests | Checked | Unchecked: Specify the IP address of TS2060i for [Accept connection requests from the following client only]. |
| | Enable the Keep Alive function for this connection. | Unchecked | |
| | Remote Properties (Client) TSAP | 10.00 | |

Calendar

The TS2060i cannot read the calendar data from this PLC. 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 |
|---------------|-----------------------------|------|-------------------|
| V | (data memory) | 00H | VW as word device |
| I | (input) | 01H | IW as word device |
| Q | (output) | 02H | QW as word device |
| M | (bit memory/internal relay) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |

9.1.5 S7-300/400MPI



CAUTION

- Connection is possible only by the MJ2 port.
- Only logical port PLC1 can be selected.

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---|
| Connection Mode | <u>1:1</u> / 1 : n | A maximum of four MPI-capable units can be connected. |
| Signal Level | RS-422/485 | |
| Baud Rate | <u>19200</u> / 187.5k ^{*1} bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | 0 to 31 (<u>2</u>) | Specify the MPI station number of S7-300/400. |

*1 Notes on communication at the baud rate of 187.5k bps:

- When performing slave communication via RS-485, set a send delay time of 5 msec or longer.
 - When performing serial communication with another device at PLC2 to PLC8, the maximum baud rate is 115k bps if only one port is used.
- When two ports are used at the same time, the maximum baud rate is 57600 bps for each port.

MPI setting

(Underlined setting: default)

| Item | Setting | Remarks |
|---------------------|---------------------------|--|
| Highest MPI Address | <u>15</u> / 31 / 63 / 126 | Specify the highest address in the MPI network. |
| Local Port No. | 0 to 126 (<u>3</u>) | Specify the port number of TS2060. It must be a unique number. |

Terminating resistance

When the TS2060 is the termination, set the DIP switches 4, 5, and 8 on the rear side to ON.
If the terminating resistance is not set, communication may not be properly performed.

S7-300/400MPI

Specify the MPI address and the baud rate using "SIMATIC Manager". 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 |
|---------------|-------------------------|------|-------------------|
| DB | (data block) | 00H | *1 |
| I | (input) | 01H | IW as word device |
| Q | (output) | 02H | QW as word device |
| M | (memory word) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |

- *1 When this device memory is used, a registration is required for the PLC.
For more information, refer to the PLC manual issued by the manufacturer.
The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is DB0001:0000 to DB4095:8190.

Example: DB0001 : 0000

↑ Address No. (0 to 8190)
↑ Colon
↑ Block No. (1 to 4095)

Indirect Device Memory Designation

- DB device memory
Specify an address number divided by "2" for "n + 1".
Specify a block number for "n + 1" to "n + 2".

| | | | | |
|-------|-----------------|-----------------------------------|---|-----------------|
| | 15 | 8 | 7 | 0 |
| n + 0 | 9x (x = 1 to 8) | | | 00 |
| n + 1 | Block number | Address number (word designation) | | |
| n + 2 | 00 | Block number | | |
| n + 3 | Expansion code | | | Bit designation |
| n + 4 | 00 | Station number | | |

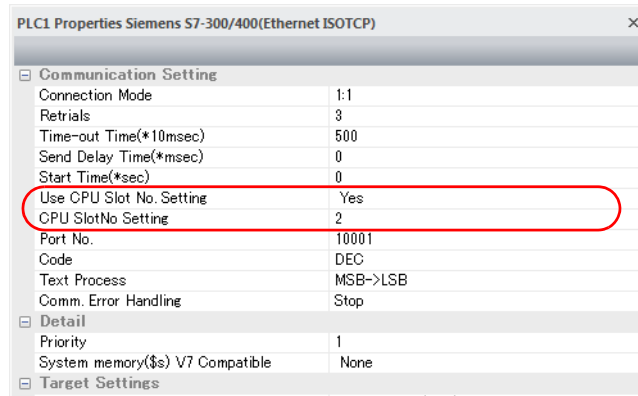
9.1.6 S7-300/400 (Ethernet ISOTCP)

Communication Setting

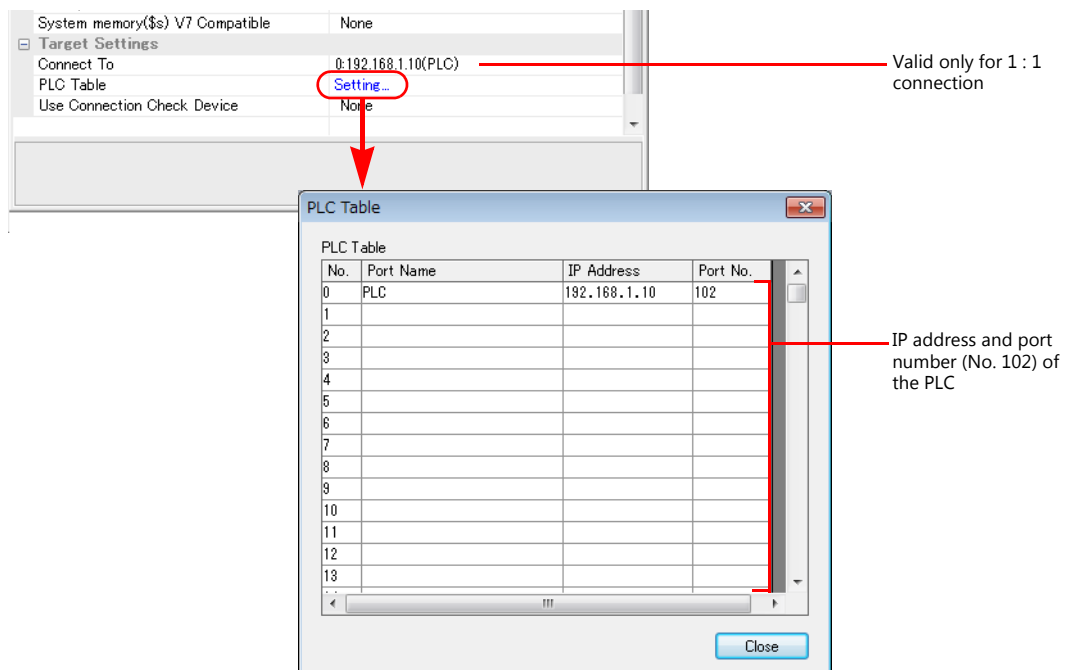
Editor

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] → [Use CPU Slot No. Setting]
 - [Yes]
Set the slot number. Setting range: 2 to 18
 - [None]
The slot number is automatically retrieved.



- IP address and port number (No. 102) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



S7-300/400

Make the communication settings using "SIMATIC Manager". For more information, refer to the PLC manual issued by the manufacturer.

Hardware configuration

Specify the IP address on the Ethernet interface PN-IO screen.

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 | *1 |
| I | (input) | 01H | IW as word device |
| Q | (output) | 02H | QW as word device |
| M | (memory word) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |

- *1 When this device memory is used, a registration is required for the PLC.
For more information, refer to the PLC manual issued by the manufacturer.
The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is DB0001:0000 to DB4095:8190.

Example: DB0001 : 0000

↑ Address No. (0 to 8190)
↑ Colon
↑ Block No. (1 to 4095)

Indirect Device Memory Designation

- DB device memory
Specify an address number divided by "2" for "n + 1".
Specify a block number for "n + 1" to "n + 2".

| | | | |
|-------|-----------------|-----------------------------------|-----------------|
| | 15 | 8 7 | 0 |
| n + 0 | 9x (x = 1 to 8) | | 00 |
| n + 1 | Block number | Address number (word designation) | |
| n + 2 | 00 | Block number | |
| n + 3 | Expansion code | | Bit designation |
| n + 4 | 00 | Station number | |

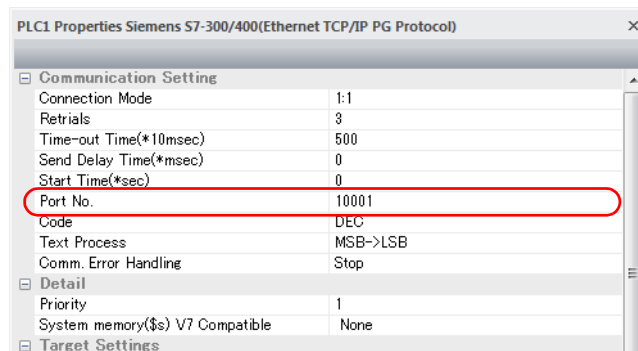
9.1.7 S7-300/400 (Ethernet TCP/IP PG Protocol)

Communication Setting

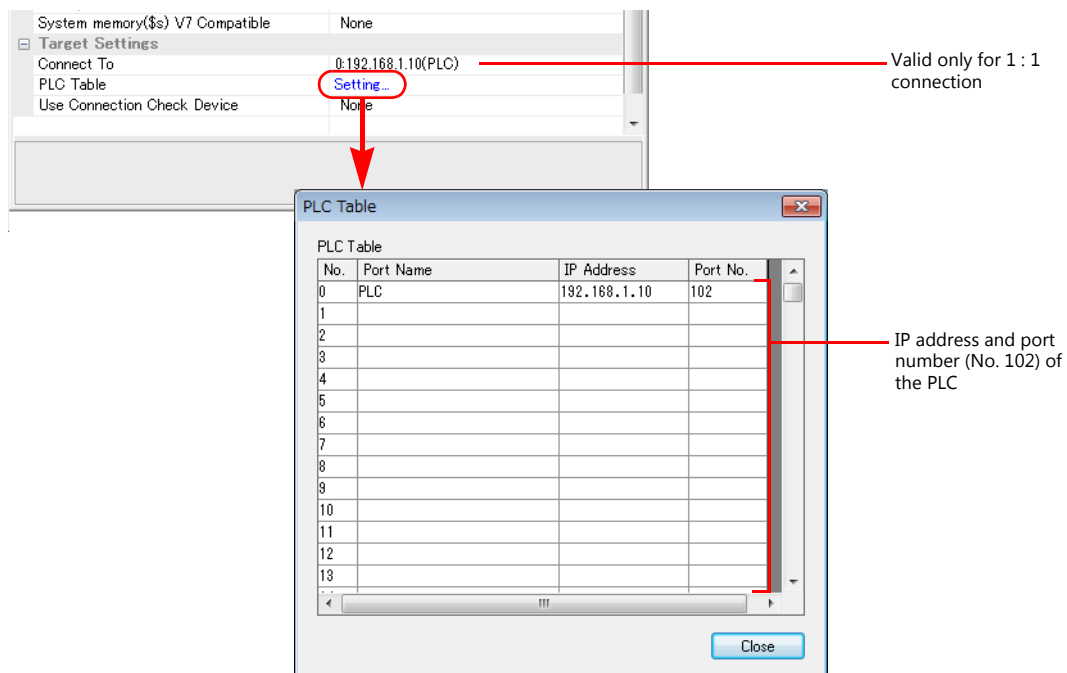
Editor

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

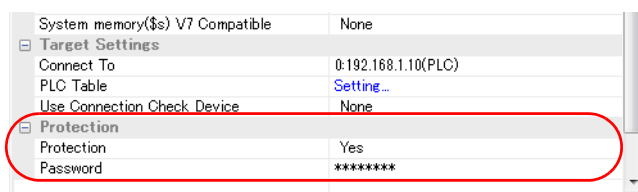
- IP address for the TS2060i unit
 - When specified on the screen program:
[System Setting] → [Hardware Setting] → [Local Port IP Address]
 - When specified on the TS2060i unit:
Main Menu screen → [Ethernet Information] → [Ethernet]
- Port number for the TS2060i unit (for communication with PLC)
[System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



- IP address and port number (No. 102) 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] → [Protection]
If the protection function is used on STEP7, set a password. Otherwise, a communication error will occur.



S7-300/400

Make the communication settings using "SIMATIC Manager". For more information, refer to the PLC manual issued by the manufacturer.

Hardware configuration

Specify the IP address on the Ethernet interface PN-IO screen.

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 | *1 |
| I | (input) | 01H | IW as word device |
| Q | (output) | 02H | QW as word device |
| M | (memory word) | 03H | MW as word device |
| T | (timer/current value) | 04H | |
| C | (counter/current value) | 05H | |

- *1 When this device memory is used, a registration is required for the PLC.
For more information, refer to the PLC manual issued by the manufacturer.
The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is DB0001:0000 to DB4095:8190.

Example: DB0001 : 0000

↑ Address No. (0 to 8190)
↑ Colon
↑ Block No. (1 to 4095)

Indirect Device Memory Designation

- DB device memory
Specify an address number divided by "2" for "n + 1".
Specify a block number for "n + 1" to "n + 2".

| | | | | |
|-------|-----------------|-----------------------------------|---|-----------------|
| | 15 | 8 | 7 | 0 |
| n + 0 | 9x (x = 1 to 8) | | | 00 |
| n + 1 | Block number | Address number (word designation) | | |
| n + 2 | 00 | Block number | | |
| n + 3 | Expansion code | | | Bit designation |
| n + 4 | 00 | Station number | | |

9.1.8 S7-1200/1500 (Ethernet ISOTCP)

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] → [Use CPU Slot No. Setting]
 - [Yes]
Set the slot number. Setting range: 2 to 18
 - [None]
The slot number is automatically retrieved.

| Communication Setting | |
|----------------------------------|----------|
| Connection Mode | 1:1 |
| Retrials | 3 |
| Time-out Time(*10msec) | 500 |
| Send Delay Time(*msec) | 0 |
| Start Time(*sec) | 0 |
| Use CPU Slot No. Setting | Yes |
| CPU SlotNo Setting | 2 |
| Port No. | 10001 |
| Code | DEC |
| Text Process | MSB->LSB |
| Comm. Error Handling | Stop |
| Detail | |
| Priority | 1 |
| System memory(\$s) V7 Compatible | None |
| Target Settings | |

- IP address and port number (No. 102) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

System memory(\$s) V7 Compatible: None

Target Settings

Connect To: 0-192.168.1.10(PLC)

PLC Table: [Setting...](#)

Use Connection Check Device: None

Valid only for 1 : 1 connection

PLC Table

| No. | Port Name | IP Address | Port No. |
|-----|-----------|--------------|----------|
| 0 | PLC | 192.168.1.10 | 102 |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |

IP address and port number (No. 102) of the PLC

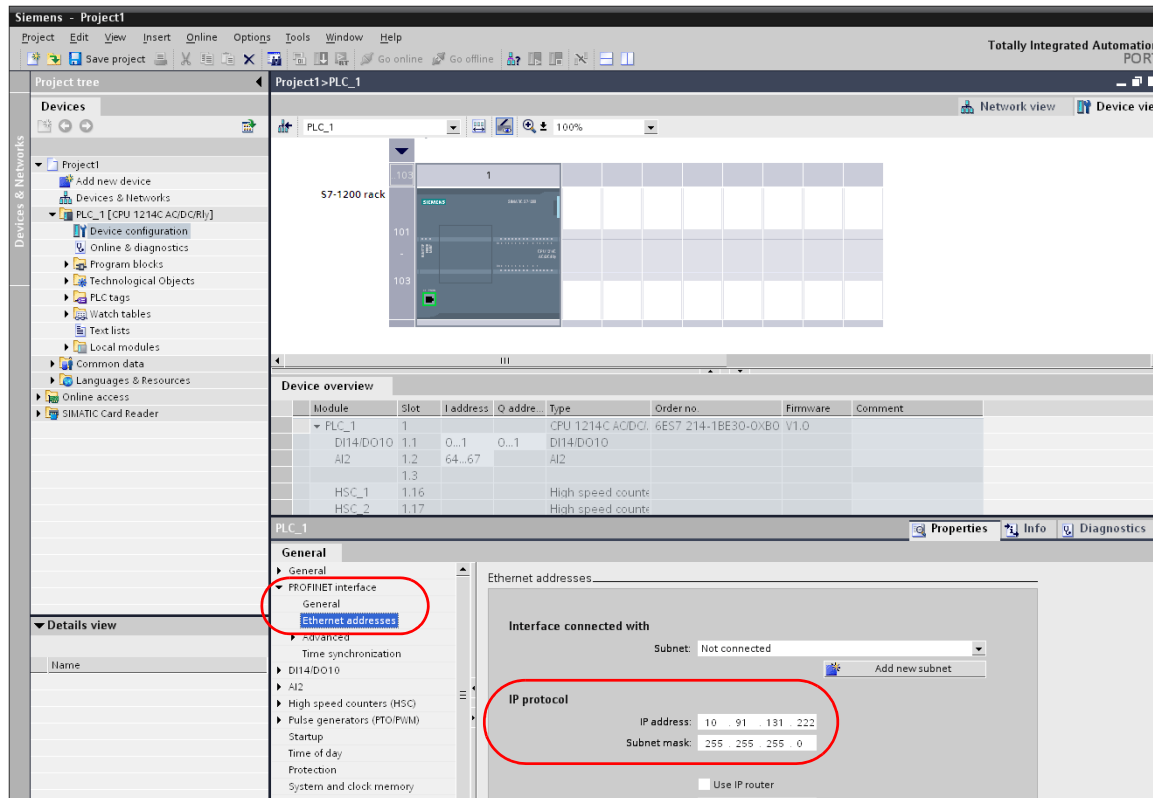
Close

S7-1200

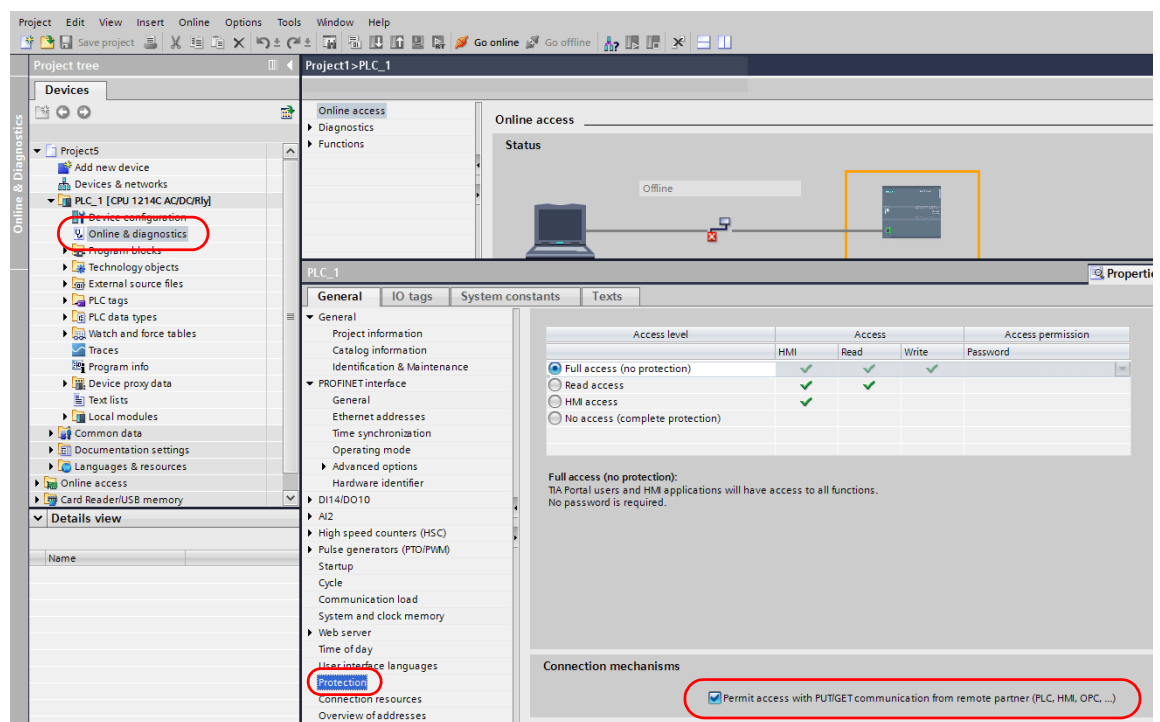
Make the settings using "Totally Integrated Automation Portal" V10 or later. For more information, refer to the PLC manual issued by the manufacturer.

IP address setting

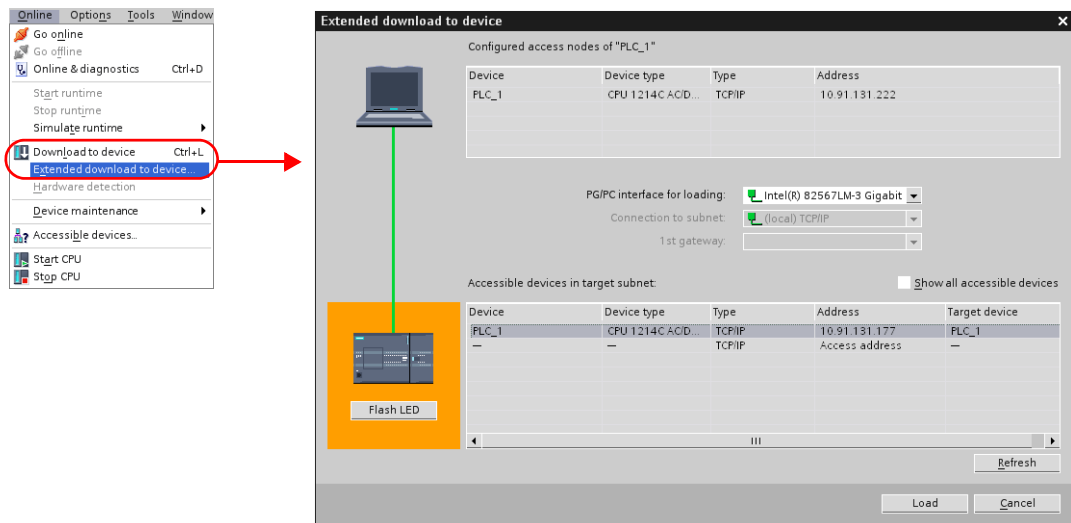
1. Select "PLC_1" in [Network view] or [Device view] in the project.
2. Set the IP address in [Ethernet addresses] ([Properties] → [PROFINET interface]).



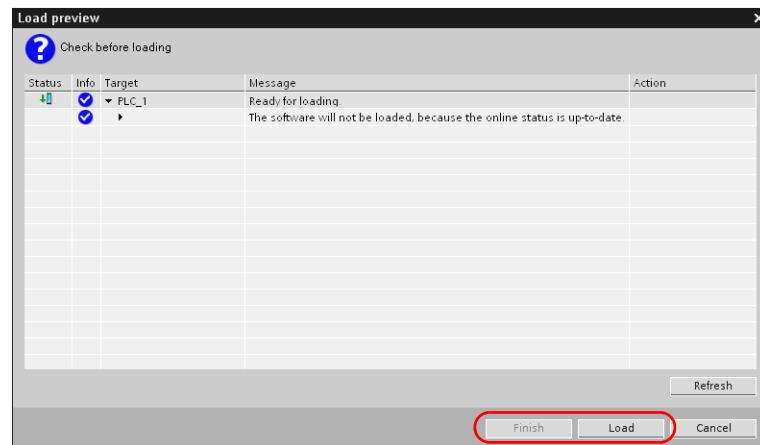
3. From the [Project tree] pane, click [Online & diagnostics] → [Protection]. Check [Permit access with PUT/GET communication from remote partner (PLC, HMI, OPC, ...)] under [Connection mechanisms].



4. Click [Online] → [Download to device] or [Extended Download to device] to display the [Extended download to device] dialog.



5. Select [Access Address] and click [Load].
6. The [Load preview] screen is displayed. Click [Load].

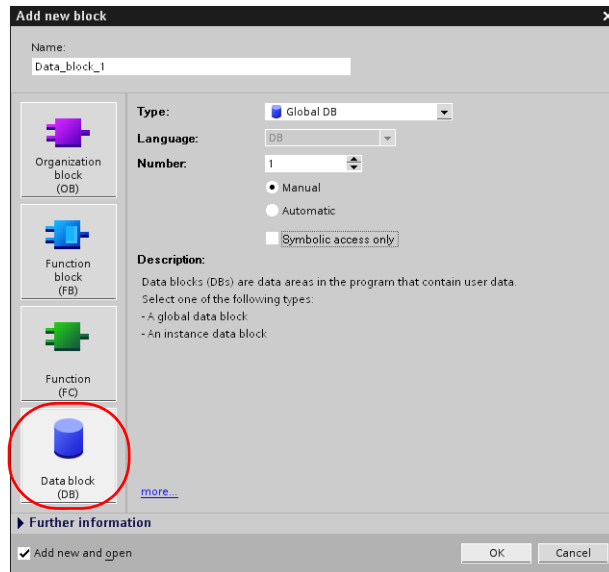


7. Click [Finish]. The IP address setting has been completed.

DB area setting

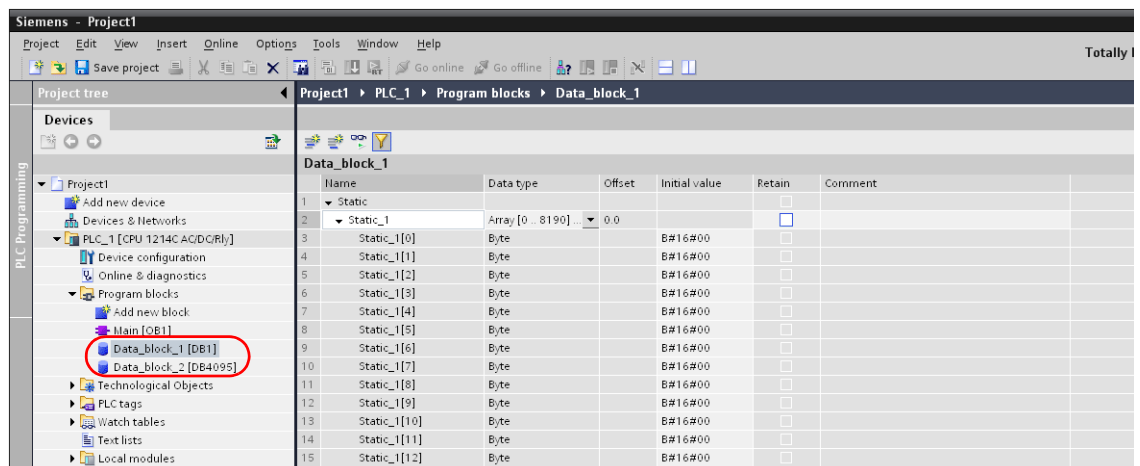
The following settings are required to use the DB device memory.

1. Select [Program blocks] → [Add new block] in the project, and make the following settings.



| Item | | Setting | Remarks |
|------------|----------------------|---|--|
| Data block | Number | Set the block number in the range from 1 to 4095. | Block numbers from 4096 cannot be used with the TS2060i. |
| | Manual / Automatic | Manual | |
| | Symbolic access only | Unchecked | This setting is not available on "Totally Integrated Automation Portal" V12 and later. |

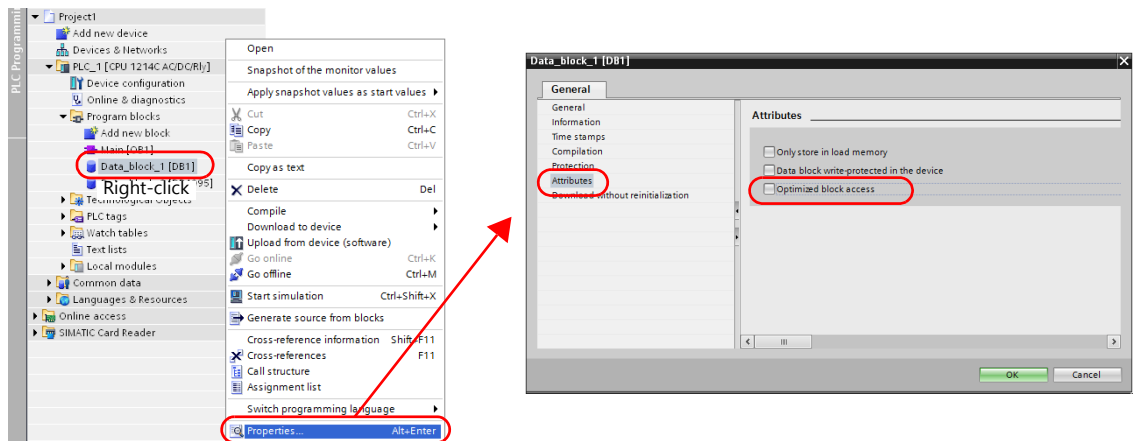
2. The newly created data block is added under [Program blocks] in the project.



- When specifying the byte address in the array format: Select "Array [lo..hi] of type" for "Data type" and enter "lo", "hi" and "type" (byte).
Range of "lo" and "hi": 0 to 8190

Example: Array [0..1024] of type

3. When using "Totally Integrated Automation Portal" V12 or later, select [Properties] on the right-click menu of the created data block, and deselect [Optimized block access] under [Attributes].



4. From the right-click menu of [Project tree], select [Download to device] → [software] to write the settings into the PLC.

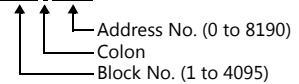
Available Device Memory

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 | *1 |
| I (input) | 01H | IW as word device |
| Q (output) | 02H | QW as word device |
| M (memory word) | 03H | MW as word device |

- *1 When this device memory is used, a registration is required for the PLC. For more information, refer to the PLC manual issued by the manufacturer. The assigned device memory is expressed as shown on the right when editing the screen. The address range available on MONITOUCH is DB0001:0000 to DB4095:8190.

Example: DB0001 : 0000



Indirect Device Memory Designation

- DB device memory
Specify an address number divided by "2" for "n + 1".
Specify a block number for "n + 1" to "n + 2".

| | 15 | 8 7 | 0 |
|-------|-----------------|-----------------------------------|-----------------|
| n + 0 | 9x (x = 1 to 8) | | 00 |
| n + 1 | Block number | Address number (word designation) | |
| n + 2 | 00 | Block number | |
| n + 3 | Expansion code | | Bit designation |
| n + 4 | 00 | Station number | |

9.1.9 TI500 / 505

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / 1:n / Multi-link2 / Multi-link2 (Ethernet) / 1:n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 9600 / <u>19200</u> / 38400 / 57600 / 115200 bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 0 to 31 | |

PLC

TI545/TI555

| Item | No. | | | Remarks | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------|---------------------|---|--|-----------|-----|---|---|----------|----|----|-----|---------|----|-----|----|-------|----|-----|-----|-------|----|----|----|------|-----|----|----|
| <div>ON ← OFF</div> <div><div>1</div><div><div></div><div></div></div></div> <div><div>2</div><div><div></div><div></div></div></div> <div><div>3</div><div><div></div><div></div></div></div> <div><div>4</div><div><div></div><div></div></div></div> <div><div>5</div><div><div></div><div></div></div></div> <div><div>6</div><div><div></div><div></div></div></div> <div><div>7</div><div><div></div><div></div></div></div> <div><div>8</div><div><div></div><div></div></div></div> <div><div>9</div><div><div></div><div></div></div></div> <div><div>10</div><div><div></div><div></div></div></div> | 1 | Port 2 signal level | ON: RS-232C / RS-422 OFF: RS-485 | Only RS-232C supported by 555-1103CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6 | Port 2 Baud rate | | <div>* Supported by 555-1105CPU and 555-1106CPU only</div> | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | | <table><tr><td>Baud Rate</td><td>6</td><td>7</td><td>8</td></tr><tr><td>115200 *</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>57600 *</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>38400</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>19200</td><td>ON</td><td>ON</td><td>ON</td></tr><tr><td>9600</td><td>OFF</td><td>ON</td><td>ON</td></tr></table> | | Baud Rate | 6 | 7 | 8 | 115200 * | ON | ON | OFF | 57600 * | ON | OFF | ON | 38400 | ON | OFF | OFF | 19200 | ON | ON | ON | 9600 | OFF | ON | ON |
| | Baud Rate | | 6 | | 7 | 8 | | | | | | | | | | | | | | | | | | | | | | |
| | 115200 * | | ON | | ON | OFF | | | | | | | | | | | | | | | | | | | | | | |
| 57600 * | ON | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38400 | ON | OFF | OFF | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19200 | ON | ON | ON | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9600 | OFF | ON | ON | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TI575

| Item | Setting | Remarks |
|-------------|---------|---------|
| Baud rate | 9600 | |
| Data length | 7 bits | |
| Parity | Odd | |
| Stop bit | 1 bit | |

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 | (variable memory) | 00H | |
| WX | (word input) | 01H | |
| WY | (word output) | 02H | |
| X | (discrete input) | 03H | |
| Y | (discrete output) | 04H | |
| CR | (control relay) | 05H | |
| TCP | (timer, counter/set value) | 06H | |
| TCC | (timer, counter/current value) | 07H | |
| DCP | (drum count/set value) | 08H | |
| DCC | (drum count/current value) | 09H | Read only |
| DSP | (drum step/set value) | 0AH | |
| DSC | (drum step/current value) | 0BH | |
| K | (constant memory) | 0CH | |
| STW | (system status) | 0DH | |

Indirect Device Memory Designation

| | | | |
|-------|--------------------------------|-----|-----------------|
| | 15 | 8 7 | 0 |
| n + 0 | Model | | Device type |
| n + 1 | Address No. (word designation) | | |
| n + 2 | Expansion code | | Bit designation |
| n + 3 | 00 | | Station number |

- For the device memory address number, specify the value obtained by subtracting "1" from the actual address.
- For the designation of a DCC device memory, specify a drum step number minus "1" for the expansion code.

9.1.10 Wiring Diagrams

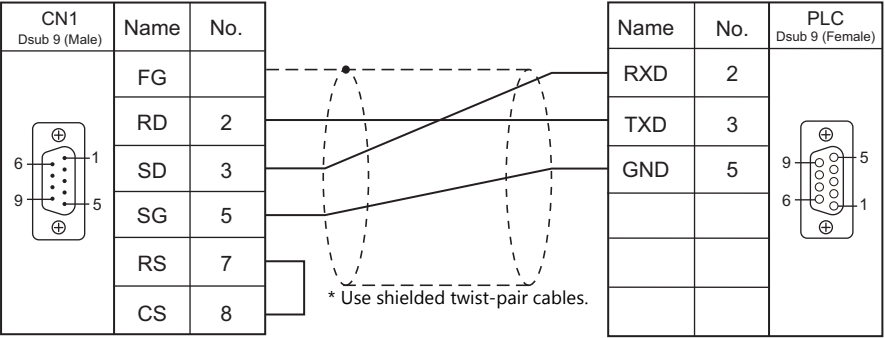
When Connected at CN1:



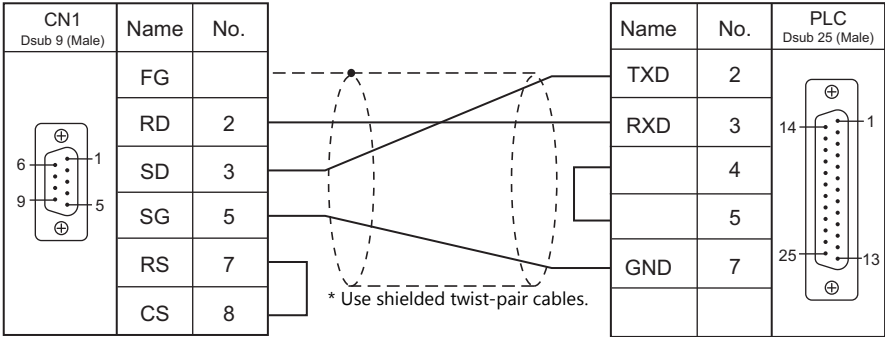
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

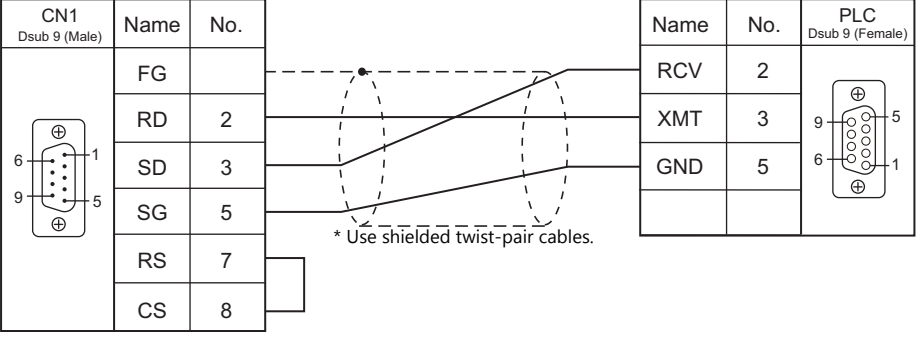
Wiring diagram 1 - C2



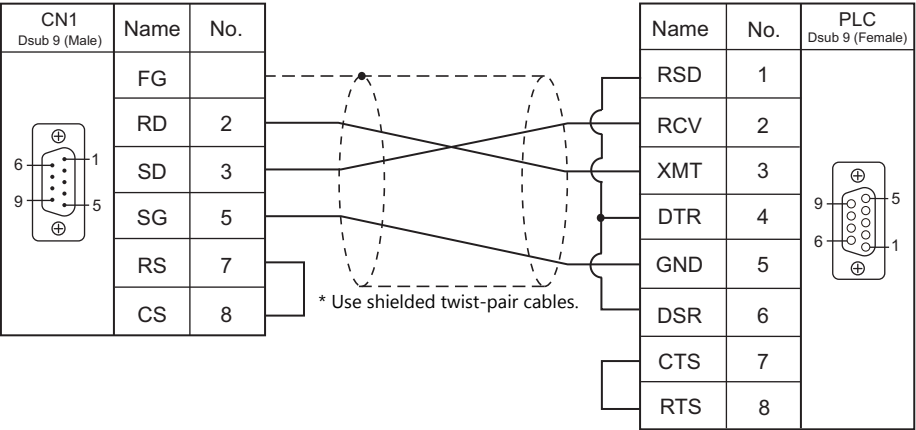
Wiring diagram 2 - C2



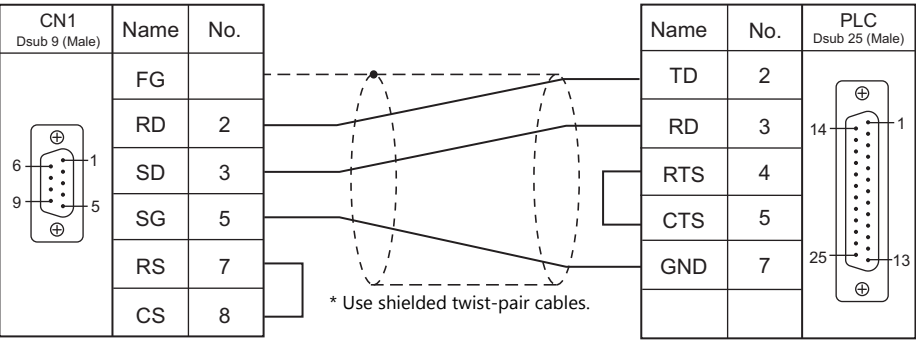
Wiring diagram 3 - C2



Wiring diagram 4 - C2

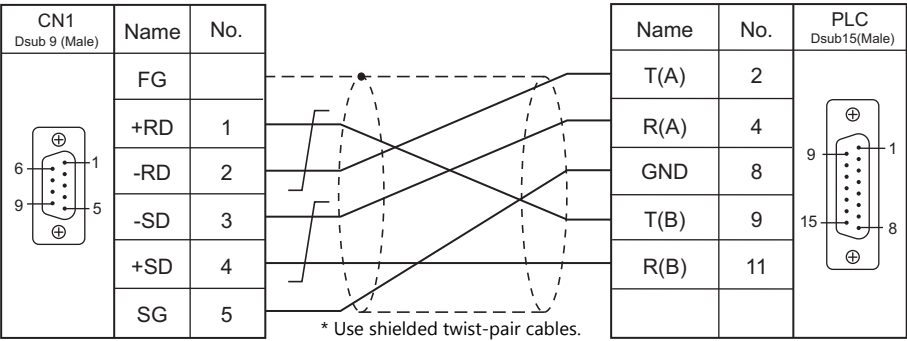


Wiring diagram 5 - C2

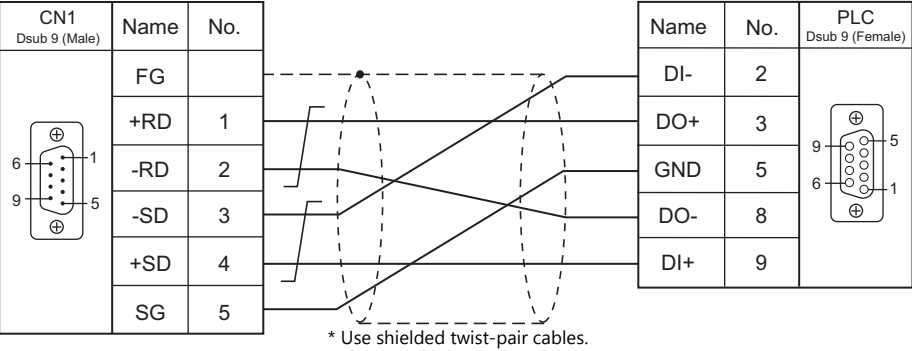


RS-422/RS-485

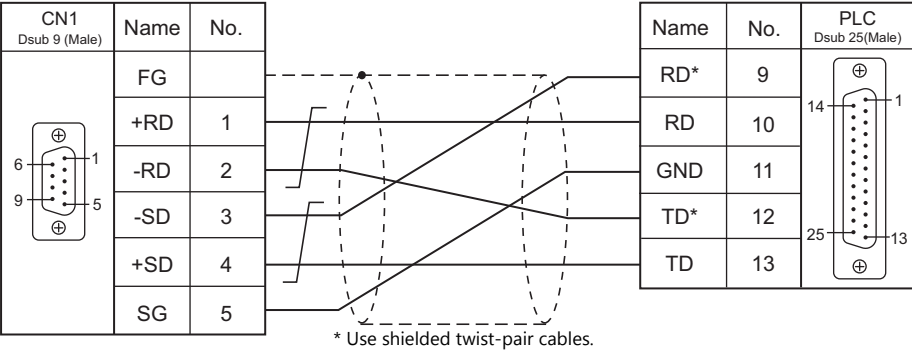
Wiring diagram 1 - C4



Wiring diagram 2 - C4



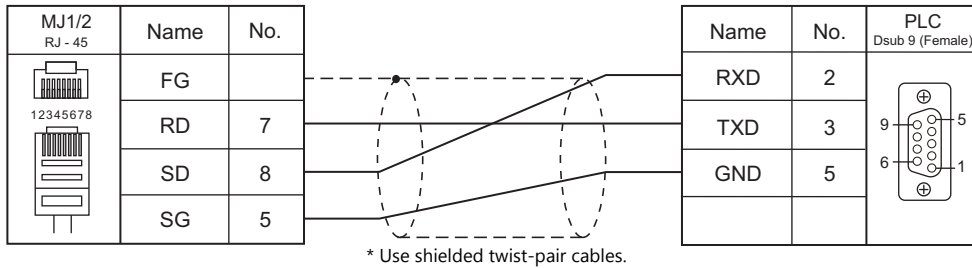
Wiring diagram 3 - C4



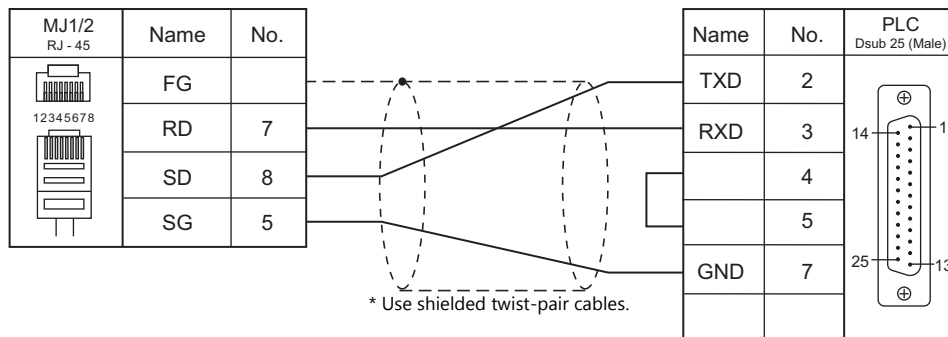
When Connected at MJ1/MJ2:

RS-232C

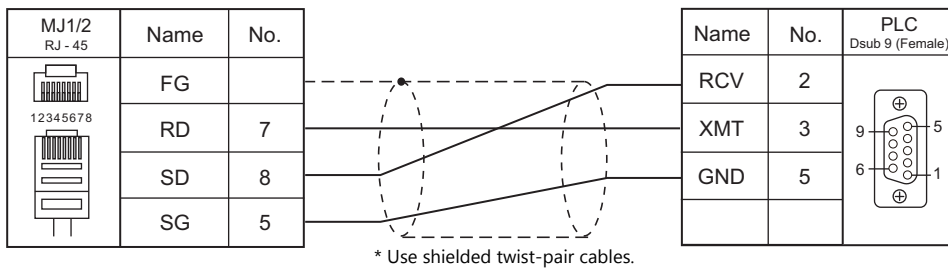
Wiring diagram 1 - M2



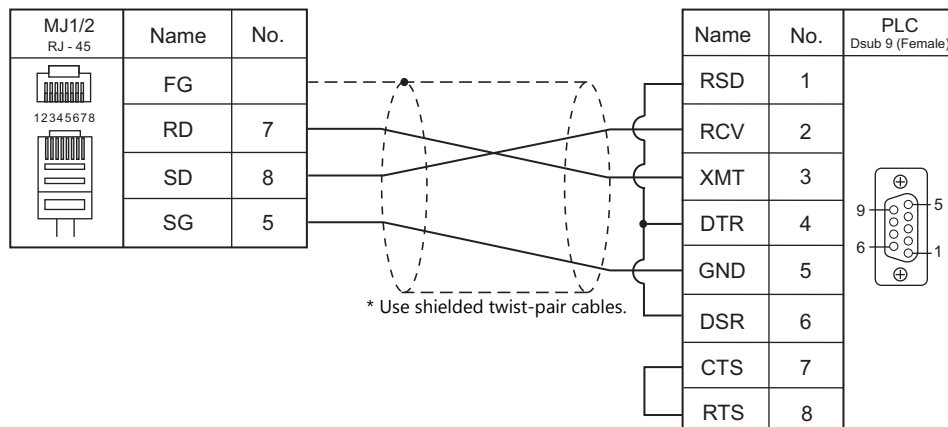
Wiring diagram 2 - M2

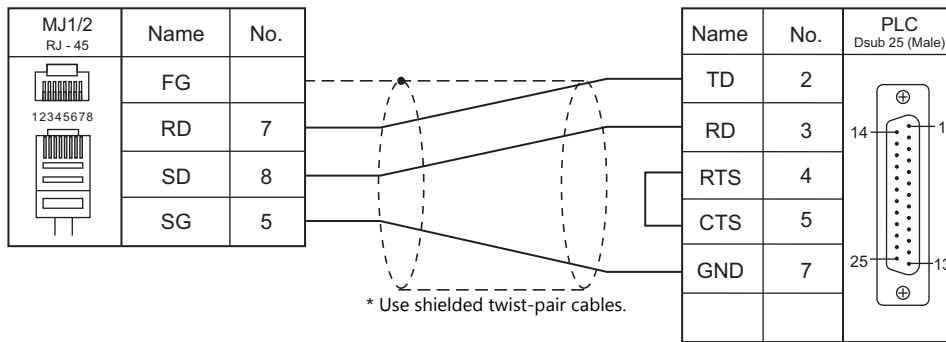


Wiring diagram 3 - M2

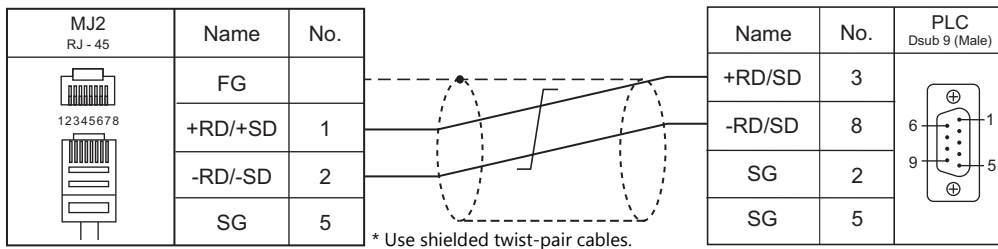


Wiring diagram 4 - M2



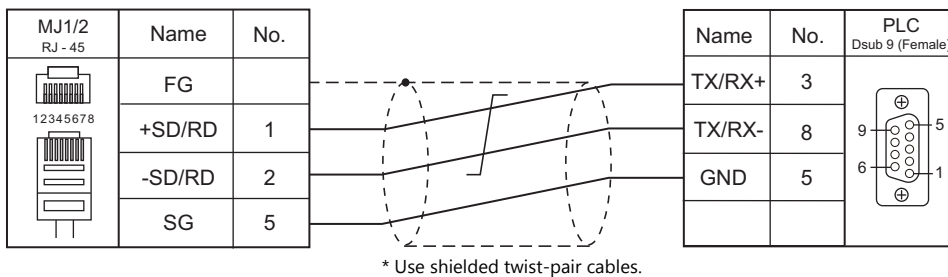
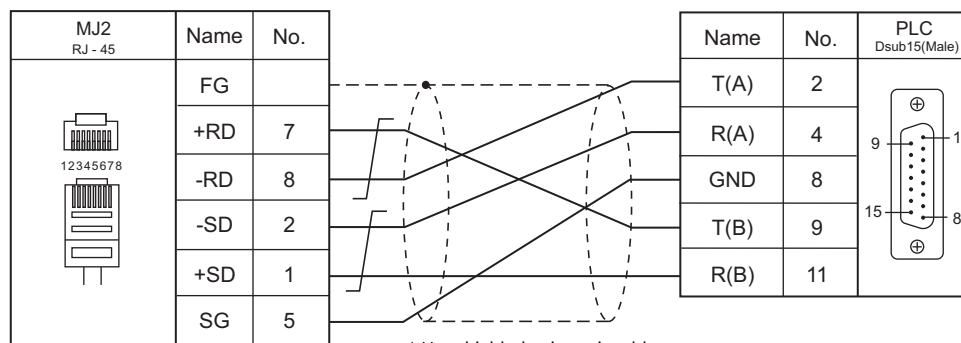
Wiring diagram 5 - M2**RS-422/RS-485****Wiring diagram 1 - M4**

- Connection is possible only by the MJ2 port.
- Set the slide switch for signal selection to the RS485 position (upper).
- Set the DIP switches 4, 5, and 8 on the TS2060 to ON. A terminating resistance for MPI/PP1 communication is applied.



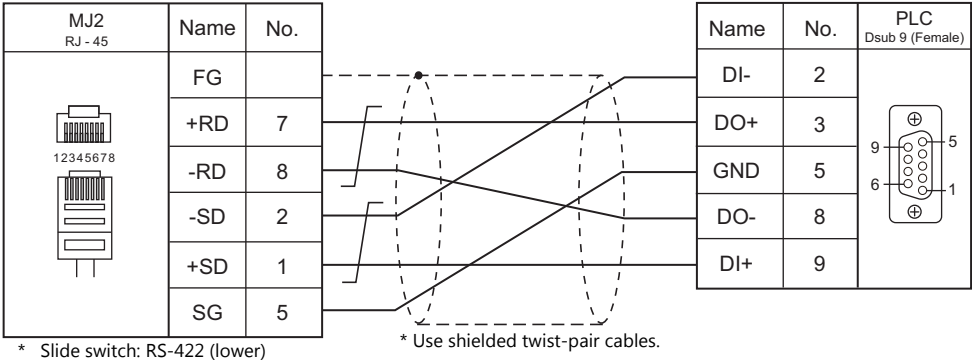
* Slide switch: RS-485 (upper)

* When communication is unstable, connect the SG cable with reference to the environment.

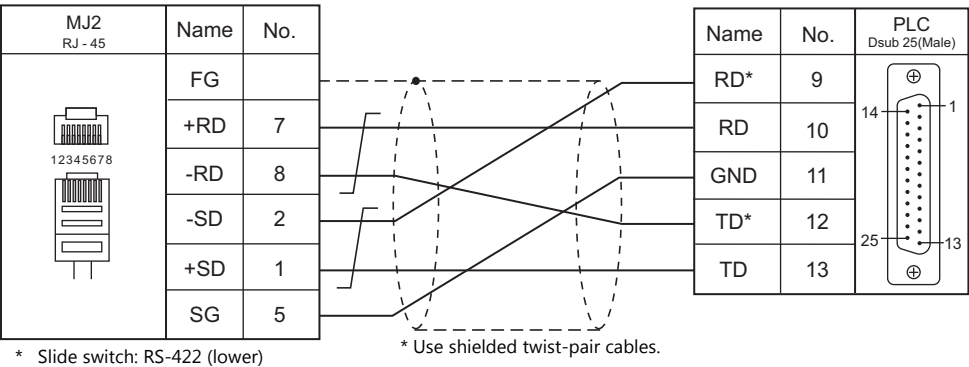
Wiring diagram 2 - M4**Wiring diagram 3 - M4**

* Slide switch: RS-422 (lower)

Wiring diagram 4 - M4



Wiring diagram 5 - M4



9.2 Temperature Controller/Servo/Inverter

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 |
|-----------------------------|--------------------|-----------|----------------------|--------|----------------------|--------------------------|-----------------|
| S120 (Ethernet ISOTCP) | CU310-2 CU320-2 | LAN | ○ | × | 102 (Max. 1 unit) | ○ | SimS120_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".

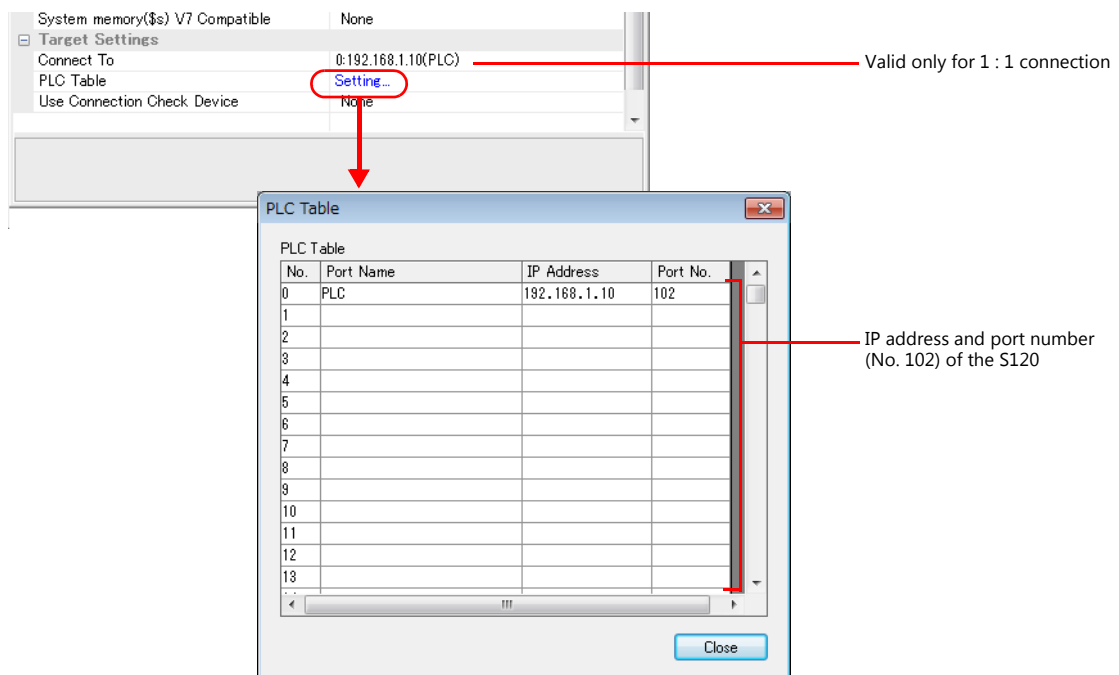
9.2.1 S120 (Ethernet ISOTCP)

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:
LMain 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. 102) of the controller
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



Controller

Make the following settings using "SIMOTION SCOUT" V4.4. For more information, refer to the instruction manual of the controller issued by the manufacturer.

Expert list

| Parameter | Item | Setting | Remarks |
|-----------|-------------------------------|--|-------------------------|
| p8921 | PN IP address of station | Set the IP address of the controller. | Default: 192.168.214.31 |
| p8922 | PN Default Gateway of station | Set the default gateway of the controller. | |
| p8923 | PN Subnet Mask of station | Set the subnet mask of the controller. | |

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 |
|--------------------------|------|-------------|
| DBW (data block (WORD)) | 0DH | |
| DBD (data block (DWORD)) | 0EH | Double-word |

* The assigned device memory is expressed as shown on the right when editing the screen program.
The address range available on MONITOUCH is as described below.

Example: DBW00001 : 00000

↑ Element number in array (0 to 32767)
↑ Colon
↑ Block address (1 to 65535)

Indirect Device Memory Designation

| | | | | | | |
|-------|------------------------------|---|---|---|------------------------|---|
| | 15 | | 8 | 7 | | 0 |
| n + 0 | Models (91H to 98H) | | | | Device type (0DH, 0EH) | |
| n + 1 | Block address (lower 4 bits) | | Element number in array (lower 12 bits) | | | |
| n + 2 | 0 | Element number in array (higher 3 bits) | Block address (higher 12 bits) | | | |
| n + 3 | Expansion code | | | | Bit designation | |
| n + 4 | 00 | | | | Target Port No. | |

Example: Indirect device memory designation of "DBW23000 : 10000" of PLC1:

Specify the model and device type.

n + 0 = 910DH

Convert the element number in the array and the block address into hexadecimal notation.

Element number in array 10000 = 2 710 H

Block address 23000 = 59D 8 H

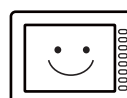
Specify values for "n + 1" and "n + 2".

n + 1 = 8 710 H

n + 2 = 2 59D H

MEMO

MONITOUCH



10. SINFONIA TECHNOLOGY

10.1 PLC Connection

10.1 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) | |
| SELMART | SELMART-100 and later | 01M2-UCI-6x 01M2-UCI-Ax | 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.

10.1.1 SELMART

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---|
| Connection Mode | <u>1</u> : 1 / 1 : n / Multi-link / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> bps | |
| Data Length | <u>7</u> bits | |
| Stop Bit | <u>1</u> bit | |
| Parity | <u>Even</u> | |
| Target Port No. | 1 to 8 | Set the same number as the one set by the DEV. NO. switch on the PLC. |

PLC

An application program is necessary on the PLC to communicate with the TS2060. For more information, refer to the specifications sheet of the PLC.

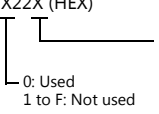
01M2-UCI-6x

DEV. NO. switch

| SW | Setting | Remarks |
|----------|---------|---------|
| DEV. NO. | 1 to 8 | |

SELMART SUPPORT SYSTEM

Set desired values for internal addresses in the PLC. For more information, refer to the specifications sheet of the PLC.

| Address | Item | Setting | Remarks |
|----------------|-------------------|---|--|
| C4096 to C4111 | Card usage status | X22X (HEX)  | The standard entry table is used. When using an expanded entry table, refer to the specifications sheet of the PLC. |
| DEV. NO. 1 | C4333 | Baud rate | 4800 / 9600 / 19200 |
| | C4334 | Communication mode | 0: GD-80 |
| DEV. NO. 2 | C4341 | Baud rate | 4800 / 9600 / 19200 |
| | C4342 | Communication mode | 0: GD-80 |
| DEV. NO. 3 | C4349 | Baud rate | 4800 / 9600 / 19200 |
| | C4350 | Communication mode | 0: GD-80 |
| DEV. NO. 4 | C4357 | Baud rate | 4800 / 9600 / 19200 |
| | C4358 | Communication mode | 0: GD-80 |
| DEV. NO. 5 | C4365 | Baud rate | 4800 / 9600 / 19200 |
| | C4366 | Communication mode | 0: GD-80 |
| DEV. NO. 6 | C4373 | Baud rate | 4800 / 9600 / 19200 |
| | C4374 | Communication mode | 0: GD-80 |
| DEV. NO. 7 | C4381 | Baud rate | 4800 / 9600 / 19200 |
| | C4382 | Communication mode | 0: GD-80 |
| DEV. NO. 8 | C4389 | Baud rate | 4800 / 9600 / 19200 |
| | C4390 | Communication mode | 0: GD-80 |

The following settings are fixed; data length: 7 bits, stop bit: 1 bit and parity: even.
Changes take effect when the power is turned off and on again.

* Be sure to set "mode 0" for the CPU card operation mode.

Calendar

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

01M2-UCI-Ax**DEV. NO. switch (station number)**

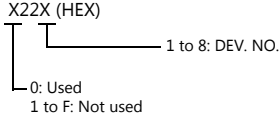
| SW | Setting | Remarks |
|----------|---------|---------|
| DEV. NO. | 1 to 8 | |

UC1-HL switch (unit communication function setting)

| SW | Setting | Remarks |
|----|--------------|--|
| H | 6 | UC1-6X (communication for touch panel) |
| L | 0, 1 / 2 / F | |

SELMART SUPPORT SYSTEM

Set desired values for internal addresses in the PLC. For more information, refer to the specifications sheet of the PLC.

| Address | | Item | Setting | Remarks |
|----------------|-------|--------------------|--|---|
| C4096 to C4111 | | Card usage status | X22X (HEX)  | The standard entry table is used. When using an expanded entry table, refer to the specifications sheet of the PLC. |
| DEV. NO. 1 | C4333 | Baud rate | 4800 / 9600 / 19200 | The standard entry table is used. When using an expanded entry table, refer to the specifications sheet of the PLC. Set the address set by the DEV. NO. switch. |
| | C4334 | Communication mode | 0: GD-80 | |
| DEV. NO. 2 | C4341 | Baud rate | 4800 / 9600 / 19200 | |
| | C4342 | Communication mode | 0: GD-80 | |
| DEV. NO. 3 | C4349 | Baud rate | 4800 / 9600 / 19200 | |
| | C4350 | Communication mode | 0: GD-80 | |
| DEV. NO. 4 | C4357 | Baud rate | 4800 / 9600 / 19200 | |
| | C4358 | Communication mode | 0: GD-80 | |
| DEV. NO. 5 | C4365 | Baud rate | 4800 / 9600 / 19200 | |
| | C4366 | Communication mode | 0: GD-80 | |
| DEV. NO. 6 | C4373 | Baud rate | 4800 / 9600 / 19200 | |
| | C4374 | Communication mode | 0: GD-80 | |
| DEV. NO. 7 | C4381 | Baud rate | 4800 / 9600 / 19200 | |
| | C4382 | Communication mode | 0: GD-80 | |
| DEV. NO. 8 | C4389 | Baud rate | 4800 / 9600 / 19200 | |
| | C4390 | Communication mode | 0: GD-80 | |

The following settings are fixed; data length: 7 bits, stop bit: 1 bit and parity: even.
 Changes take effect when the power is turned off and on again.

*** Be sure to set "mode 0" for the CPU card operation mode.**

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 |
|-------------------|------|-------------|
| D (data register) | 00H | D0 to D1023 |

*** Addresses other than D0 to D1023 can be set on the editor; however it cannot be used actually. If such a address is set, an error code "06" occurs. Do not specify any addresses other than D0 to D1023.**

10.1.2 Wiring Diagrams

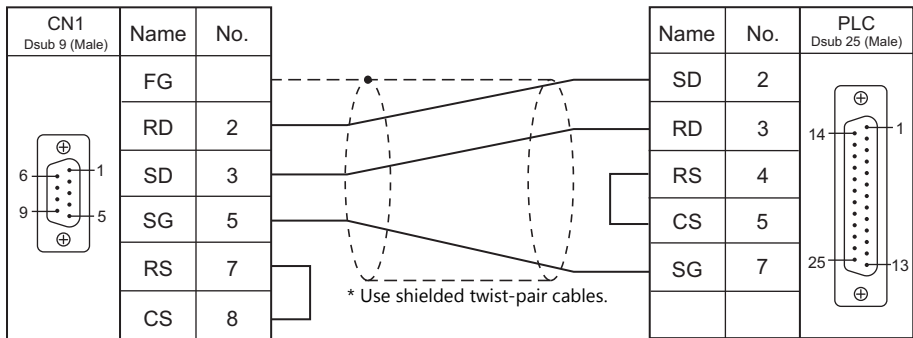
When Connected at CN1:



- 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

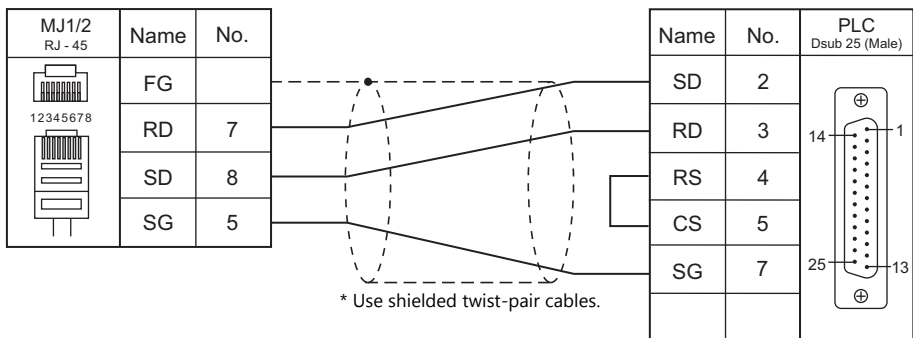
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



11. SUS

11.1 Thermo Controller/Servo/Inverter

11.1 Thermo Controller/Servo/Inverter

Electric Actuator

| PLC Selection on the Editor | Model | | Port | Signal Level | Connection | | | Lst File |
|-----------------------------------|----------------------------------|---|----------------------|--------------|--|--|--------------|-------------|
| | | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) | |
| XA-A* | XA-A1 XA-A2 XA-A3 XA-A4 | XA-20L XA-28L / XA-28H XA-35L / XA-35H XA-42L / XA-42H XA-42D XA-50L / XA-50H XA-E35L | Jog box connector | RS-232C | Wiring diagram 1 - C2 ^{*2} | Wiring diagram 1 - M2 ^{*2} | | SUS_XAA.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 When using a self-made cable, use the cable in a noise-free environment and do not make the cable longer than 10 meters.

11.1.1 XA-A*

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1-1</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | RS-232C | |
| Baud Rate | 38400 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |

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 |
|-------------------------------------|------|-------------------------|
| RA (movement completion check) | 00H | Read only ^{*1} |
| RH (origin return completion check) | 01H | Read only ^{*1} |
| RC (read current position) | 02H | Read only, double-word |
| RY (input reading) | 03H | Read only |
| RWB (output reading) | 04H | |

*1 Check which axis is complete by checking the acquired value.

| Axis | Value | | | | | | | | | | | | | | | |
|--------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Axis 1 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| Axis 2 | ○ | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● |
| Axis 3 | ○ | ○ | ○ | ○ | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ● | ● | ● | ● |
| Axis 4 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ● | ● | ● | ● | ● | ● |

Not completed: ○ Completed: ●

RA (movement completion check)

| Address | Name | Remarks |
|---------|---|---|
| 0 | Checking movement completion of axes 1, 2, 3, and 4 | 0: currently moving, 1: movement complete |

RH (origin return completion check)

| Address | Name | Remarks |
|---------|--|--------------------------------|
| 0 | Checking origin return completion of axes 1, 2, 3, and 4 | 0: not completed, 1: completed |

RC (read current position)

| Address | Name | Remarks |
|---------|----------------------------|---|
| 0 | Current position of axis 1 | Number of pulses (negative values possible if equipped with encoder function) |
| 1 | Current position of axis 2 | Number of pulses (negative values possible if equipped with encoder function) |
| 2 | Current position of axis 3 | Number of pulses (negative values possible if equipped with encoder function) |
| 3 | Current position of axis 4 | Number of pulses (negative values possible if equipped with encoder function) |

RY (input reading)

| Address | Bit Values | | | |
|---------|------------|------|------|------|
| | bit0 | bit1 | bit2 | bit3 |
| 0 | STB | RES | - | - |
| 1 | PRG1 | PRG2 | PRG4 | PRG8 |
| 2 | IN13 | IN14 | IN15 | IN16 |
| 3 | IN9 | IN10 | IN11 | IN12 |
| 4 | IN5 | IN6 | IN7 | IN8 |
| 5 | IN1 | IN2 | IN3 | IN4 |
| 6 | LS1 | LS2 | LS3 | LS4 |

RWB (output reading)

| Address | Bit Values | | | |
|---------|------------|-------|-------|-------|
| | bit0 | bit1 | bit2 | bit3 |
| 0 | IN-P | RUN | RDY | ALM |
| 1 | OUT13 | OUT14 | OUT15 | OUT16 |
| 2 | OUT9 | OUT10 | OUT11 | OUT12 |
| 3 | OUT5 | OUT6 | OUT7 | OUT8 |
| 4 | OUT1 | OUT2 | OUT3 | OUT4 |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|----------------------------|-----------------------|------------------|--|----|
| OMP: point movement | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 4 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | PNO position number: 0 to 3000 | |
| | | n + 3 | AX No. axis pattern setting: 1 to 15 *1 | |
| OSP: deceleration stop | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 2 |
| | | n + 1 | Command: 2 | |
| ORP: movement data reading | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 3 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | PNO position number: 1 to 3000 | |
| | | n + 3 | W (axis 1) X axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 4 to n + 5 | Pos (axis 1) X axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 6 | W (axis 2) Y axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 7 to n + 8 | Pos (axis 2) Y axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 9 | W (axis 3) Z axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 10 to n + 11 | Pos (axis 3) Z axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 12 | W (axis 4) S axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 13 to n + 14 | Pos (axis 4) S axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|----------------------------|-----------------------|------------------|--|----|
| 0MV: Direct movement | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 23 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | VEL (axis 1) X axis speed: 1 to max. speed *2 | |
| | | n + 3 | ACC (axis 1) X axis acceleration/deceleration time (unit: 10 ms): 1 to 200 | |
| | | n + 4 | W (axis 1) X axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 5 to n + 6 | Pos (axis 1) X axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 7 | VEL (axis 2) Y axis speed: 1 to max. speed *2 | |
| | | n + 8 | ACC (axis 2) Y axis acceleration/deceleration time (unit: 10 ms): 1 to 200 | |
| | | n + 9 | W (axis 2) Y axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 10 to n + 11 | Pos (axis 2) Y axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 12 | VEL (axis 3) Z axis speed: 1 to max. speed *2 | |
| | | n + 13 | ACC (axis 3) Z axis acceleration/deceleration time (unit: 10 ms): 1 to 200 | |
| | | n + 14 | W (axis 3) Z axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 15 to n + 16 | Pos (axis 3) Z axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 17 | VEL (axis 4) S axis speed: 1 to max. speed *2 | |
| | | n + 18 | ACC (axis 4) S axis acceleration/deceleration time (unit: 10 ms): 1 to 200 | |
| | | n + 19 | W (axis 4) S axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 20 to n + 21 | Pos (axis 4) S axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 22 | H interpolation 0: No interpolation 1: With interpolation | |
| 0WP: movement data writing | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 15 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | PNO position number: 1 to 3000 | |
| | | n + 3 | W (axis 1) X axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 4 to n + 5 | Pos (axis 1) X axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 6 | W (axis 2) Y axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 7 to n + 8 | Pos (axis 2) Y axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 9 | W (axis 3) Z axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 10 to n + 11 | Pos (axis 3) Z axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |
| | | n + 12 | W (axis 4) S axis movement method 0: No movement 1: Origin as reference 2: Current value as reference, positive movement 3: Current position as reference, negative movement | |
| | | n + 13 to n + 14 | Pos (axis 4) S axis movement position (number of pulses): 0 to 262143 (3FFFF: HEX) | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|---------------------------------------|--------------------|----------------|--|----|
| 0WA: position data memory writing | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 4 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | Write starting PNO: 1 to 3000 * ³ | |
| | | n + 3 | Write finishing PNO: 1 to 3000 * ³ | |
| 0WC: position update | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 4 |
| | | n + 1 | Command: 6 | |
| | | n + 2 | PNO position number: 1 to 3000 | |
| | | n + 3 | AX No. axis pattern setting: 1 to 15 * ¹ | |
| 0RV: version information | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 2 |
| | | n + 1 | Command: 7 | |
| | | n + 2 to n + 3 | Ver version (characters) | |
| | | n + 4 to n + 5 | CPU CPU model type (characters) | |
| 0DM: program execute | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 3 |
| | | n + 1 | Command: 8 | |
| | | n + 2 | PRG program number: 1 to 50 | |
| 0CV: speed/acceleration time settings | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 4 |
| | | n + 1 | Command: 9 | |
| | | n + 2 | VEL speed: 1 to max. speed * ² | |
| | | n + 3 | ACC acceleration/deceleration time (10 ms): 1 to 200 | |
| 0AR: alarm reset | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 2 |
| | | n + 1 | Command: 10 | |

Return data: Data stored from controller to TS2060

*1 Axes are validated by the Ax No. setting value according to the following table.

| Axis | Value | | | | | | | | | | | | | | | |
|--------|-------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Axis 1 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| Axis 2 | ○ | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ● | ● |
| Axis 3 | ○ | ○ | ○ | ○ | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ● | ● | ● | ● |
| Axis 4 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ● | ● | ● | ● | ● | ● |

Invalid: ○

Valid: ●


*2 The setting range varies depending on the actuator type.

| Actuator Type | 20L / 28L / 35L / 42L / E35L | 50L | 28H / 35H | 42H | 50H | 42D |
|---------------------|------------------------------|-----|-----------|-----|-----|-----|
| Max. speed (mm/sec) | 50 | 100 | 150 | 200 | 300 | 400 |

*3 Do not set a value larger than the write starting PNO for the write finishing PNO. The screen display is not updated during EEPROM writing since MONITOUCH needs to receive the response. It takes about 3 seconds to write position information. Do not turn off the power or pull out the plug of MONITOUCH.

11.1.2 Wiring Diagrams

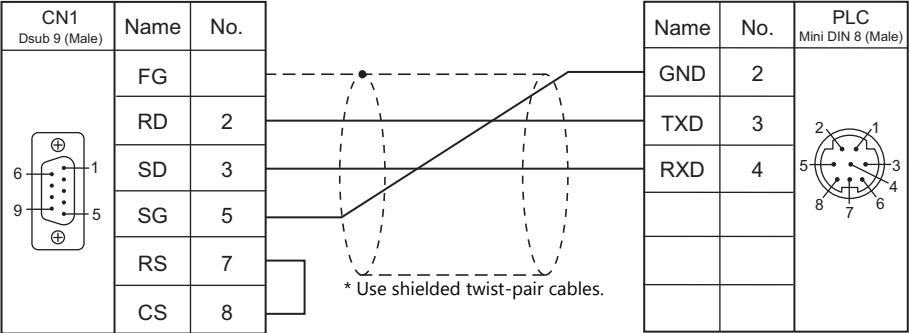
When Connected at CN1:

**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

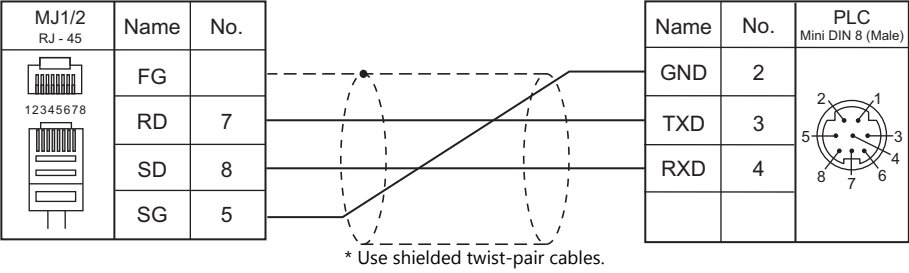
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



12. TECO

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} | |
| TP03 (MODBUS RTU) | TP03-xxSx-x TP03-xxMx-x | PC / PDA port | RS-232C | TECO TP-302PC + Gender changer ^{*4} | TECO TP-302PC + Wiring diagram 1 - M2 | | × |
| | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | |
| | | Expansion card | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | TP03-xxHx-x | PC/PDA port | RS-232C | TECO TP-302PC + Gender changer ^{*4} | TECO TP-302PC + Wiring diagram 1 - M2 | | |
| | | | RS-422 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | |
| | | RS-485 port Expansion card | 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} 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} Use a D-sub gender changer (9-pin, female-to-male) commercially available.

| Manufacturer | Model |
|--------------|----------|
| BLACK BOX | FA440-R2 |
| MISUMI | DGC-9PP |

12.1.1 TP03 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1</u> :1 / 1:n / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 76800 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 / <u>2</u> bits | |
| Parity | Odd / Even / <u>None</u> | |
| Target Port No. | <u>1</u> to 31 | |

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor.
Set a port number in the communication software. For more information, refer to the PLC manual issued by the manufacturer.

PC/PDA Port

Use bits 0 to 7 at D8321 for the following settings.

| Device Memory | Setting | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|---|--------|---|-----------|---|---|------|---|---|-----|---|---|------|---|---|---|---|-----------|---|---|---|---|----------|---|---|---|---|-----------|---|---|---|---|-----------|---|---|---|---|-----------|
| D8321 | <div><div><div><div><div>7</div><div>6</div><div>5</div><div>4</div><div>3</div><div>2</div><div>1</div><div>0</div></div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div>1</div></div></div></div><div><div><div>↓</div><div>Stop bit</div><div>0: 1 bit</div><div>1: 2 bits</div></div><div><div>↓</div><div>Parity</div><table><tr><td>2</td><td>1</td><td>Parity</td></tr><tr><td>0</td><td>0</td><td>None</td></tr><tr><td>0</td><td>1</td><td>Odd</td></tr><tr><td>1</td><td>1</td><td>Even</td></tr></table></div><div><div>↓</div><div>Data length 1 : 8 bits</div></div></div></div> <div><div><div>↓</div><div>Baud rate</div><table><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>Baud Rate</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>9600 bps</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>19200 bps</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>38400 bps</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>57600 bps</td></tr></table></div></div> | 2 | 1 | Parity | 0 | 0 | None | 0 | 1 | Odd | 1 | 1 | Even | 7 | 6 | 5 | 4 | Baud Rate | 0 | 1 | 1 | 1 | 9600 bps | 1 | 0 | 0 | 0 | 19200 bps | 1 | 0 | 0 | 1 | 38400 bps | 1 | 0 | 1 | 0 | 57600 bps |
| 2 | 1 | Parity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | Odd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | Even | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 6 | 5 | 4 | Baud Rate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 1 | 1 | 9600 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 19200 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 1 | 38400 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | 0 | 57600 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* If the value specified for any item is outside the allowable range, the item will be assumed to be: data length: 8 bits, parity: none, stop bit: 2 bits, or baud rate: 19200 bps.

Calendar

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

RS-485 Port / Expansion Card

Use D8120 for RS-485 port settings and D8320 for expansion card settings.

| Device Memory | Setting | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|--|--------|---|-----------|---|---|------|---|---|-----|---|---|------|---|---|---|---|-----------|---|---|---|---|----------|---|---|---|---|-----------|---|---|---|---|-----------|---|---|---|---|-----------|
| D8120 D8320 | <div><div><div>1514131211109876543210</div><div>00000000</div></div><div><div>Not used</div><div>MODBUS mode 0: MODBUS RTU</div><div>Control bit All 0: NO</div><div>End character 0: NO</div><div>Start character 0: NO</div></div><div><div>Parity</div><table><tr><td>2</td><td>1</td><td>Parity</td></tr><tr><td>0</td><td>0</td><td>None</td></tr><tr><td>0</td><td>1</td><td>Odd</td></tr><tr><td>1</td><td>1</td><td>Even</td></tr></table><div>Stop bit 0: 1 bit 1: 2 bits</div><div>Baud rate</div><table><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>Baud Rate</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td><td>9600 bps</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td><td>19200 bps</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>38400 bps</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td><td>57600 bps</td></tr></table></div><div>Data length 1 : 8 bits</div></div> | 2 | 1 | Parity | 0 | 0 | None | 0 | 1 | Odd | 1 | 1 | Even | 7 | 6 | 5 | 4 | Baud Rate | 0 | 1 | 1 | 1 | 9600 bps | 1 | 0 | 0 | 0 | 19200 bps | 1 | 0 | 0 | 1 | 38400 bps | 1 | 0 | 1 | 0 | 57600 bps |
| 2 | 1 | Parity | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | Odd | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | Even | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 6 | 5 | 4 | Baud Rate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 1 | 1 | 9600 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | 19200 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 1 | 38400 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 1 | 0 | 57600 bps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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 (Digital I relay) | 01H | |
| Y (Digital O relay) | 02H | |
| M (Auxiliary relay) | 03H | |
| CC (Counter [Coil]) | 04H | |
| TC (Timer [Coil]) | 05H | |
| C (Counter [Current value]) | 06H | |
| T (Timer [Current value]) | 07H | |
| CP (Counter [Preset value]) | 08H | |
| TP (Timer [Preset value]) | 09H | |

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 X/Y device memory

Assign an actual address number (OCT) converted to HEX as the address number.

12.1.2 Wiring Diagrams

When Connected at CN1:

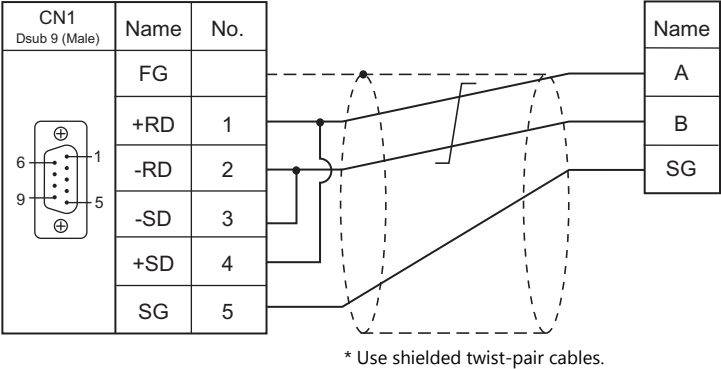


CAUTION

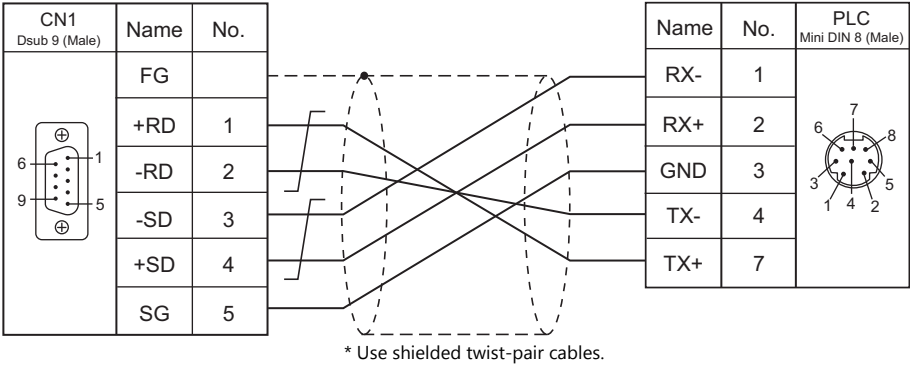
- The CN1 port is available only when the TS2060i is attached the optional “DUR-00”.
- The “DUR-00” cannot be attached to the TS2060 (model name without “i”). Use the MJ1 and MJ2 ports for connection.

RS-422/RS-485

Wiring diagram 1 - C4



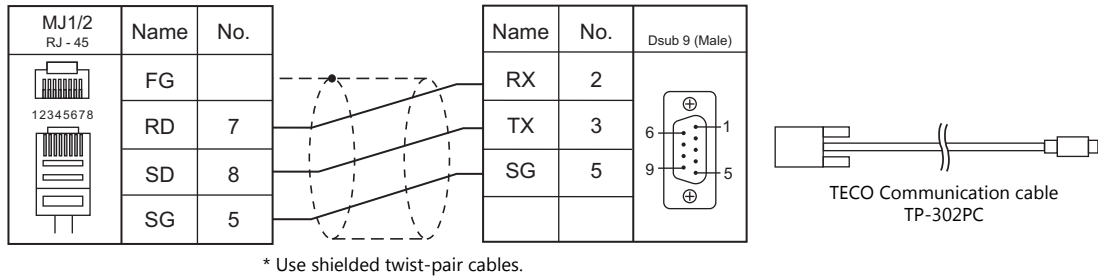
Wiring diagram 2 - C4



When Connected at MJ1/MJ2:

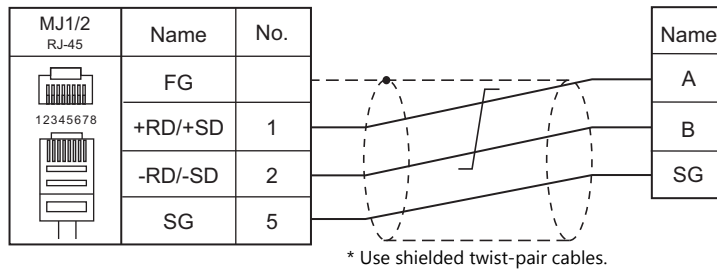
RS-232C

Wiring diagram 1 - M2

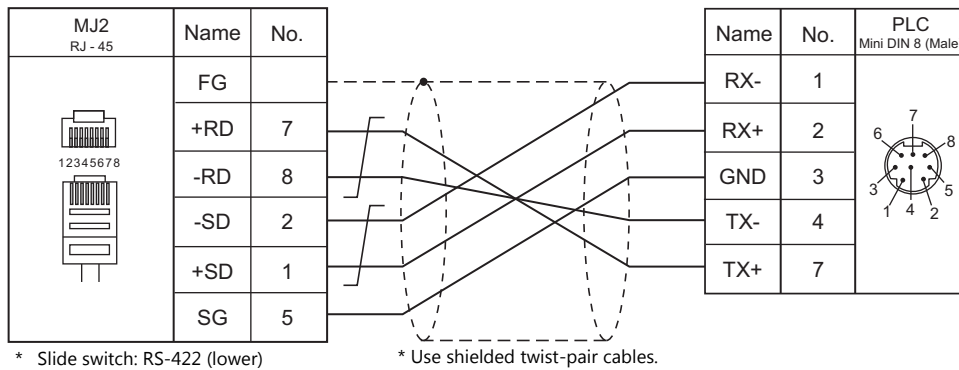


RS-422/RS-485

Wiring diagram 1 - M4

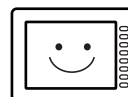


Wiring diagram 2 - M4



MEMO

MONITOUCH



13. Telemecanique

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) | |
| TSX Micro | TSX37-xx TSX57-xx | TER AUX | 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.

13.1.1 TSX Micro

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--------------------------|---|
| Connection Mode | Multi-link | PLC1 to PLC8 valid Local port Nos. 1 to 8 valid (4 as default) |
| Signal Level | RS-422/485 | |
| Baud Rate | <u>9600 bps</u> | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None / <u>Odd</u> / Even | |

PLC

TER / AUX Port

Make PLC settings using the application software "PL7 Junior". For more information, refer to the PLC manual issued by the manufacturer.

| Item | Setting | Remarks |
|--------------------|------------------------|---------|
| CHANNEL 0: | UNI-TELWAY LINK | |
| Transmission speed | 9600 bits/s | |
| Parity | Even / Odd / None | |

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 |
|--------------------|------|-----------|
| MW (Memory Word) | 00H | |
| KW (Constant Word) | 01H | Read only |
| M (Bit Memory) | 02H | |

13.1.2 Wiring Diagrams

When Connected at CN1:

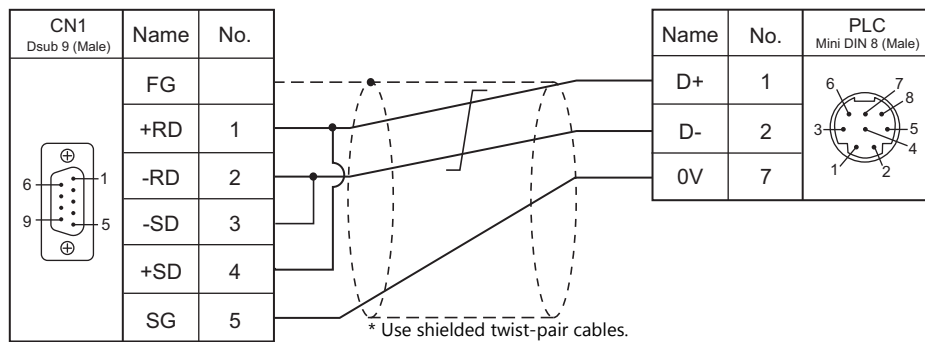


CAUTION

- 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

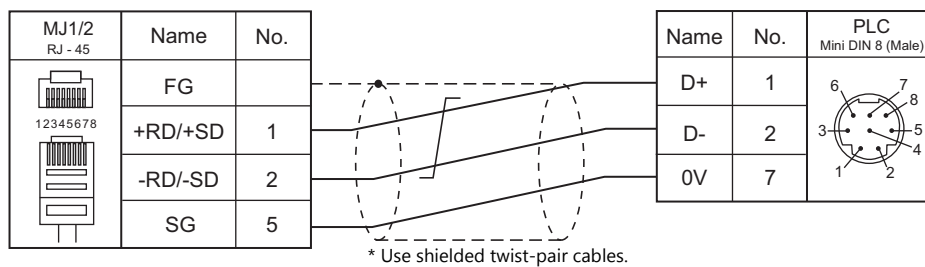
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

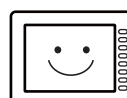
RS-232C

Wiring diagram 1 - M4



MEMO

MONITOUCH



14. TOHO

14.1 Temperature Controller/Servo/Inverter Connection

14.1 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) | |
| TTM-000 | TTM-002-x-x-AM | Terminal block | RS-485 | Wiring diagram 5 - C4 | Wiring diagram 5 - M4 | | TTM-000.Lst |
| | TTM-004-x-x-AM TTM-004S-x-x-AX TTM-X04-x-x-AM TTM-X04S-x-x-AX | | | Wiring diagram 6 - C4 | Wiring diagram 6 - M4 | | |
| | TTM-005-x-x-AM TTM-005S-x-x-AX TTM-006-x-x-AM TTM-006S-x-x-AX TTM-009-x-x-AM TTM-009S-x-x-AX | | | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| | TTM-007-x-x-AM TTM-007S-x-x-AX | | | Wiring diagram 7 - C4 | Wiring diagram 7 - M4 | | |
| | | | | | | | |
| | | | | | | | |
| TTM-00BT | TTM-00BT-0-R-M1 TTM-00BT-1-R-M1 | TB3 | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | TTM-00BT. Lst |
| | TTM-00BT-0-R-M2 TTM-00BT-1-R-M2 | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| TTM-200 (MODBUS RTU) | TTM-204 | Terminal block | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | TD_TTM200. Lst |
| | TTM-205 TTM-209 | | | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | |
| | TTM-207 | | | Wiring diagram 4 - C4 | Wiring diagram 4 - 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).

14.1.1 TTM-000

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 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | 1 / <u>2</u> bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 1 to 32 | |
| BCC Check | Without BCC / <u>With BCC</u> | |

Digital Temperature Controller

Communication setting

Make the communication settings in the communication setting mode (SET6) that is selected by the key on the front of the digital temperature controller.

(Underlined setting: default)

| Communication Setting | Item | Contents | Setting Example |
|-----------------------|------------------------------|---|-----------------|
| - Prt | Communication protocol | <u>0</u> : TOHO communication protocol * Not necessary for TTM-xxx-x-x-AxxM | 0 |
| - Con | Communication parameter | <p>1: Stop bit 1 2: Stop bit 2 n: No parity o: Odd parity e: Even parity 7: Data length 7 bits 8: Data length 8 bits n: Without BCC check b: With BCC check</p> | b8n2 |
| - bps | Communication setting | 4.8: 4800 bps 9.6: <u>9600 bps</u> 19.2: 19200 bps | 9.6 |
| - ADr | Communication address | <u>1</u> to 32 | 1 |
| - Rdt | Response delay time | <u>0</u> to 255 (ms) | 0 |
| - Mod | Communication mode selection | ro: Read only rw: Read/write | rw |

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 |
|----------------------------|------|--|
| MW (monitor data) | 00H | |
| SW (setting data) | 01H | Always set "0" for SW00137 (communication protocol setting). |
| ST (character string data) | 02H | 6-byte character string data |

Read-only device memory

The following types of device memory are read-only.

| Device Memory | Name | Remarks |
|---------------|--|--|
| MW00000 | Measurement value (PV) | When the measurement value exceeds the upper limit, "32767" is displayed. When it falls below the lower limit, "-32768" is displayed. |
| MW00003 | Output status monitoring | |
| MW00005 | DI status monitoring | |
| SW00041 | Input monitoring for event output 1CT | |
| SW00050 | Input monitoring for event output 2CT | |
| SW00064 | Monitoring for remaining time on timer | |
| ST00000 | Measurement value (PV1) | |

Write-only device memory

The following type of device memory is write-only.

| Device Memory | Name | Remarks |
|---------------|--------------------|---------|
| MW00002 | Timer start / stop | |

Indirect Device Memory Designation

Specify the value obtained by subtracting "1" from the actual station number.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | F2 |
|-----------|---------------------|--------------|--------------------------|
| Data save | 1 - 8 (PLC1 - 8) | n | Station numbers 0 to 31* |
| | | n + 1 | Command: 0 |

* Specify the value obtained by subtracting "1" from the actual station number.

14.1.2 TTM-00BT

Communication Setting

Editor

Communication setting

(Underlined setting: default)

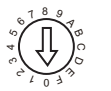
| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | 1 : 1 / <u>1:n</u> / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| Data Length | 8 bits | |
| Stop Bit | 2 bits | |
| Parity | None | |
| Target Port No. | 0 to 15 | |

Digital Temperature Controller

Settings related to communications can be made using switches on the controller. Before changing a setting, be sure to turn off the power to the digital temperature controller.

Unit number (station number)

(Underlined setting: default)

| SW1 | Contents | Setting Example |
|---|----------------------|-----------------|
|  | 0 to F (H) (0 to 15) | 0 |

Baud rate

(Underlined setting: default)

| SW2 | Contents | Setting Example | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-----------------|-----------|-----------|-----------|-----------|---|-----|----|-----|----|---|-----|-----|----|----|---|----------------|--|--|--|---|----------------|--|--|--|--|
| <div><div>ON</div><div><div><div></div><div></div><div></div><div></div></div><div>1234</div></div></div> | <table><thead><tr><th>DIP Switch</th><th>4800 bps</th><th>9600 bps</th><th>19200 bps</th><th>38400 bps</th></tr></thead><tbody><tr><td>1</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>2</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>3</td><td colspan="4">OFF (Not used)</td></tr><tr><td>4</td><td colspan="4">OFF (Not used)</td></tr></tbody></table> | DIP Switch | 4800 bps | 9600 bps | 19200 bps | 38400 bps | 1 | OFF | ON | OFF | ON | 2 | OFF | OFF | ON | ON | 3 | OFF (Not used) | | | | 4 | OFF (Not used) | | | | <div>1: ON 2: OFF 3: OFF 4: OFF</div> <div>Baud rate: 9600 bps</div> |
| DIP Switch | 4800 bps | 9600 bps | 19200 bps | 38400 bps | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | OFF | ON | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | OFF | OFF | ON | ON | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | OFF (Not used) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | OFF (Not used) | | | | | | | | | | | | | | | | | | | | | | | | | | |

The following settings are fixed; data length: 8 bits, stop bit: 2 bits, and parity: none.

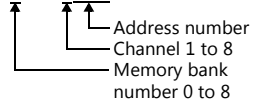
Available Device Memory

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 |
|-------------------|------|---------|
| MW (monitor data) | 00H | |
| SW (setting data) | 01H | |

* The memory bank number (0 to 8) and channel number (1 to 8) are required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: #2 : SW5134



Address denotations

- To specify the memory bank currently in use, set "0" for the memory bank number. When specifying other memory banks, set the corresponding numbers.
- On the signal name reference list, every channel is designated as "0". Manually input the number (1 to 8) of the channel to use.

Read-only device memory

The following types of device memory are read-only.

| Device Memory | Name | Remarks |
|---------------|-----------------------------------|---------|
| MW000 | Measurement value (PV1) | *1 |
| MW003 | Control output monitor (OM1) | |
| SW041 | CT measurement value 1 (CM1) | *2 |
| SW050 | CT measurement value 2 (CM2) | *2 |
| SW083 | CT measurement value 3 (CM3) | *2 |
| SW092 | CT measurement value 4 (CM4) | *2 |
| SW101 | CT measurement value 5 (CM5) | *2 |
| SW110 | CT measurement value 6 (CM6) | *2 |
| SW119 | CT measurement value 7 (CM7) | *2 |
| SW130 | DI monitor (DIM) | |
| SW131 | Event output monitor 1 to 5 (EMI) | |
| SW132 | Event output monitor 6 to 8 (EM2) | |
| SW133 | Alarm monitor (ALM) | |

*1 When the measurement value exceeds the upper limit, "32767" is displayed. When it falls below the lower limit, "-32768" is displayed.

*2 When the measurement value exceeds the upper limit, "32767" is displayed. When it falls below the lower limit or measurement is impossible, "-32768" is displayed.

Indirect Device Memory Designation

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

- Specify the channel number (1 to 8) and address for the device memory number (address).

Example: Channel 5, address 134:

Specify "5134" (DEC) for the device memory number (address).

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | F2 |
|-----------|---------------------|--------------|-----------------|
| Data save | 1 - 8 (PLC1 - 8) | n | Station number |
| | | n + 1 | Command: 0 |
| | | n + 2 | Channel (1 - 8) |
| | | | 3 |

14.1.3 TTM-200 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Temperature Controller

Communication setting

Make the communication settings in the communication setting mode (SET17) that is selected by the key on the front of the digital temperature controller.

(Underlined setting: default)

| Communication Setting | Item | Contents | Setting Example |
|-----------------------|-----------------------------------|---|-----------------|
| <i>PRT</i> | Communication protocol *1 | 1: MODBUS RTU | 1 |
| <i>COM</i> | Communication parameter | 8N1: data length 8, without parity, stop bit 1 8N2: <u>data length 8, without parity, stop bit 2</u> 8o1: data length 8, odd parity, stop bit 1 8o2: data length 8, odd parity, stop bit 2 8E1: data length 8, even parity, stop bit 1 8E2: data length 8, even parity, stop bit 2 | 8N2 |
| <i>bps</i> | Communication setting | 4.8: 4800 bps 9.6: <u>9600 bps</u> 19.2: 19200 bps 38.4: 38400 bps | 9.6 |
| <i>ADR</i> | Communication address | <u>1</u> to 31 | 1 |
| <i>RWT</i> | Communication response delay time | <u>0</u> to 255 (ms) | 0 |
| <i>Mod</i> | Communication switching | 0: Writing prohibited 1: <u>Writing enabled</u> 2: Master of simultaneous rise in temperature 3: Slave of simultaneous rise in temperature | 1 |

*1 Select "Modbus RTU" for the communication protocol on the digital temperature controller when connecting with the TS2060.

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) | 00H | No address of even-numbered digits can be specified. |

14.1.4 Wiring Diagrams

When Connected at CN1:

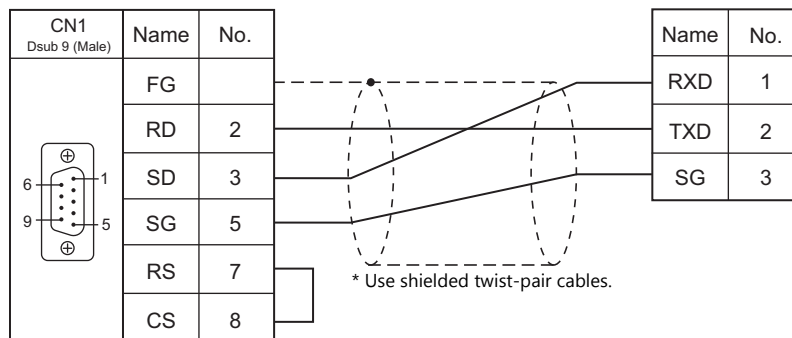


CAUTION

- 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.

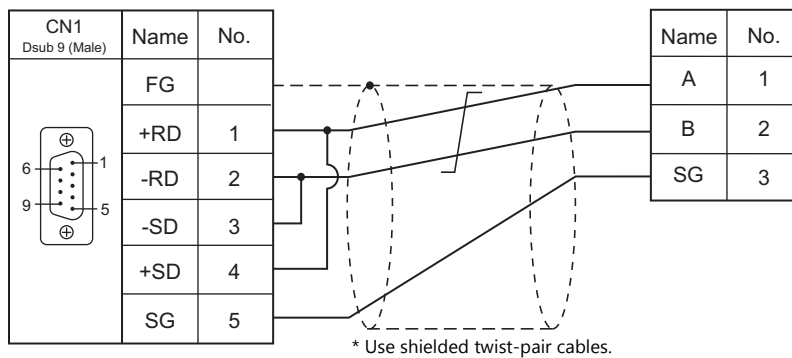
RS-232C

Wiring diagram 1 - C2

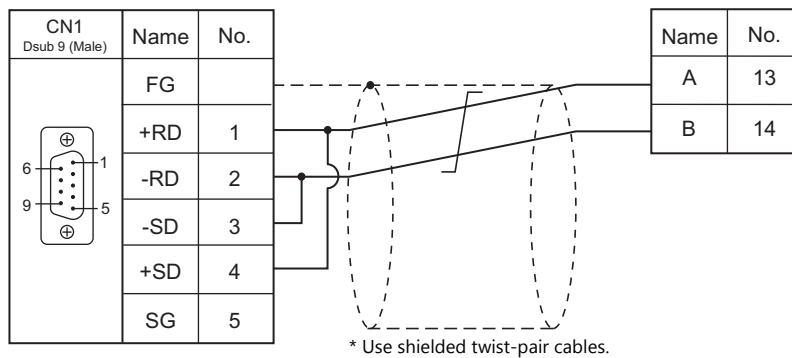


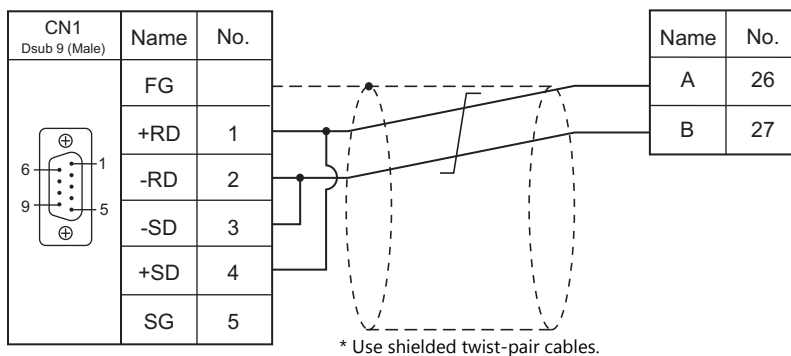
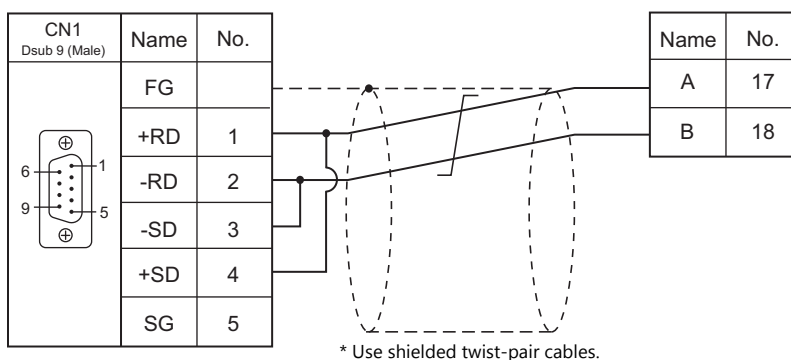
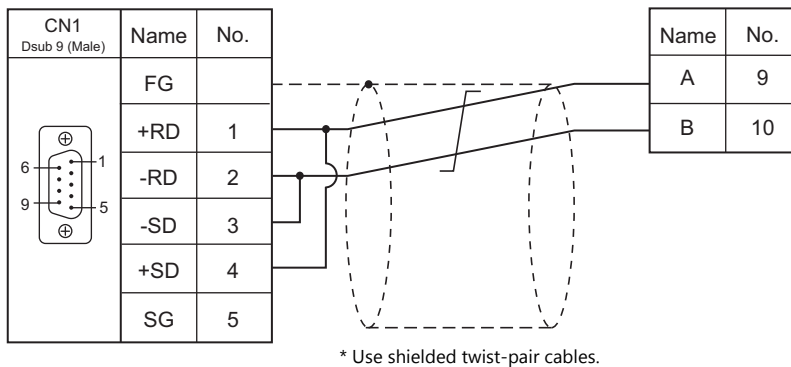
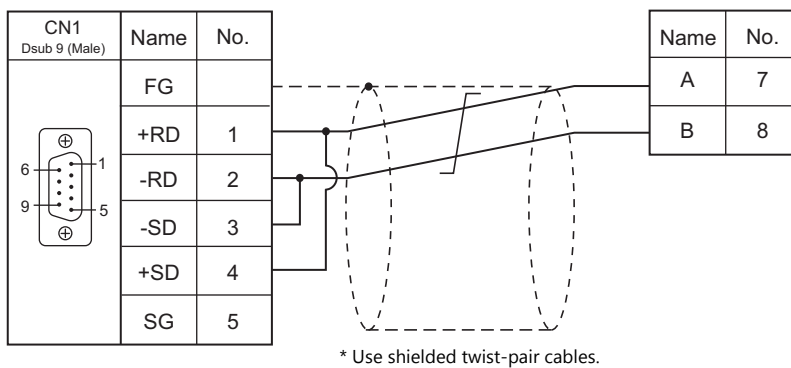
RS-422/RS-485

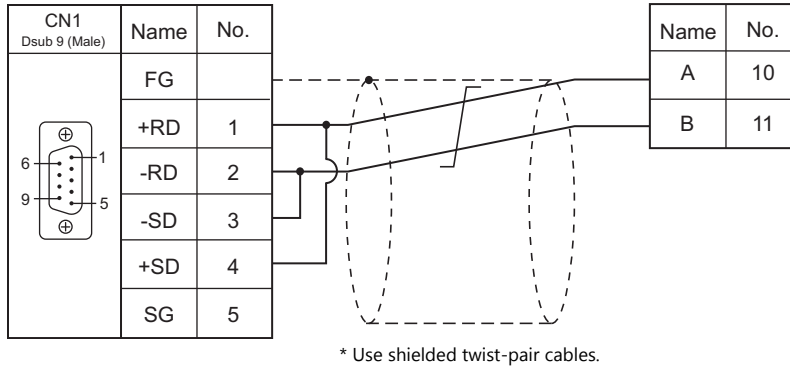
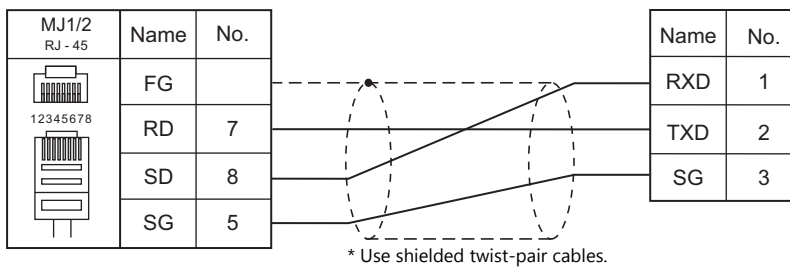
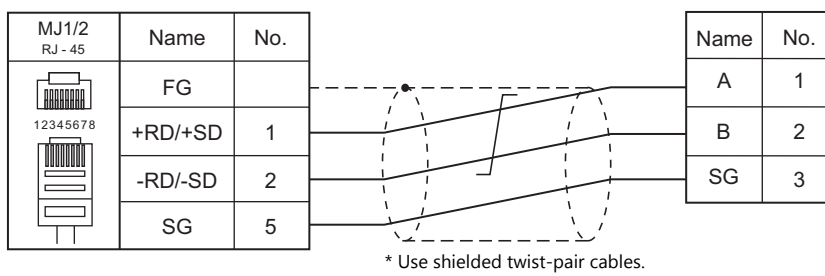
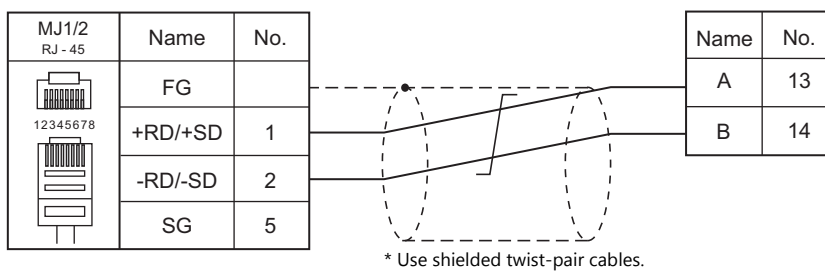
Wiring diagram 1 - C4

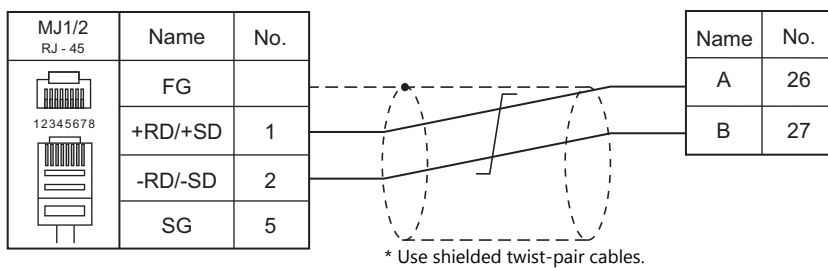
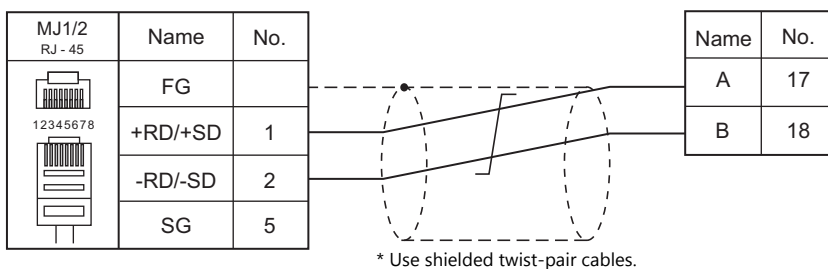
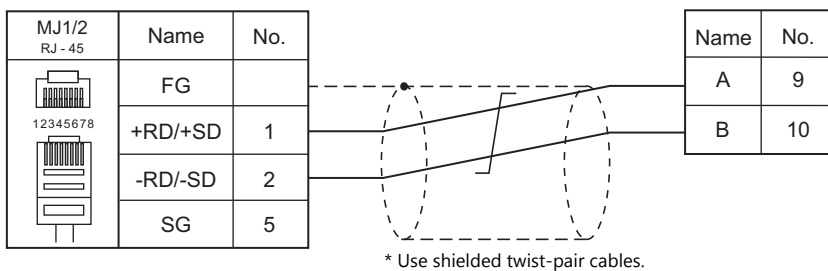
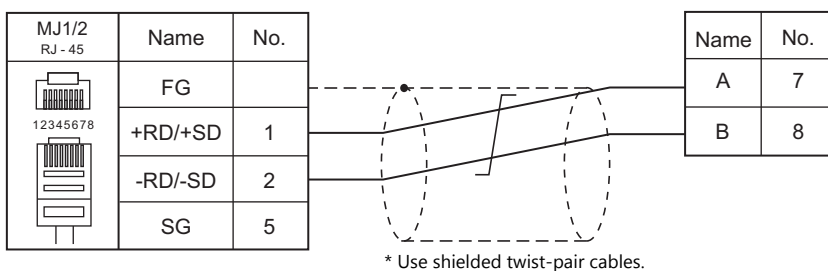
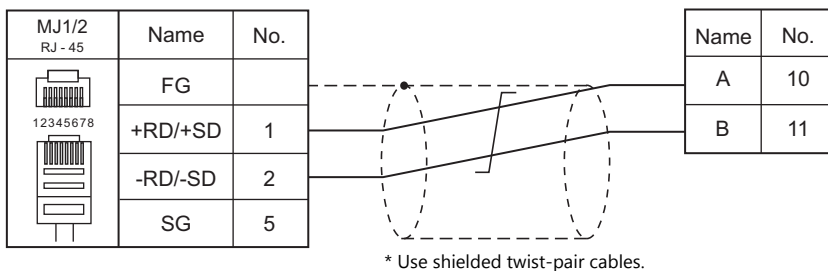


Wiring diagram 2 - C4



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

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**

15. Tokyo Chokoku Marking Products

15.1 Thermo Controller/Servo/Inverter

15.1 Thermo Controller/Servo/Inverter

Portable Dot Marker

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|--------------------------------|------------------|-------------------|--------------|-----------------------|-----------------------|--------------|------------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) | |
| MB3315/1010 | MB3315 MB1010 | RS-232C connector | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | TOCHO_MB. 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).

15.1.1 MB3315/1010

Communication Setting

Editor

Communication setting

| Item | Setting | Remarks |
|-----------------|-------------------|---------|
| Connection Mode | 1 : 1 | |
| Signal Level | RS-232C | |
| Baud Rate | 115200 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |

Available Device Memory

There are no device memory.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (=\$u n) | | F2 |
|-----------------------------|-----------------------|-------------------------|---|-----|
| Operation execution command | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 3 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | Operation execution command 1: Start marking 2: Pause 3: Abort 4: Alarm reset 5: Origin return | |
| Status request | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 2 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | Status 0: Standby 1: Marking operation in progress 2: Paused 3: Origin return in progress 5: Operating for any other reason 99: Alarm occurring | |
| File marking data settings | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | 5+m |
| | | n + 1 | Command: 9 | |
| | | n + 2 | File number: 1 to 255 | |
| | | n + 3 | Field number: 1 to 21 | |
| | | n + 4 | Number of characters in text: 1 to 50 | |
| | | n + 5 to n + (4 + m) | Marking data (max. 50 characters) *1 | |

| Contents | F0 | F1 (= \$u n) | F2 | | |
|---------------------------|---|-------------------------|--|-----|---|
| Marking data settings | 1 to 8 (PLC1 to 8) | n | Station number: 0 (fixed) | | |
| | | n + 1 | Command: 1 | | |
| | | n + 2 | Marking force: 0 to 10 | | |
| | | n + 3 | Marking speed: 0 to 10 | | |
| | | n + 4 | Serial setting: 0 (not used) | | |
| | | n + 5 | Origin return 0: Origin return after marking (normally used) 1: No origin return after marking | | |
| | | n + 6 | Number of sending fields: 1 to 21 | | |
| | | n + 7 to n + (6 + m) | Field data | 7+m | |
| | | | • Character data | | |
| | | | Field data | | |
| | | | n + 7 | | Field number: 1 to 21 |
| | | | n + 8 | | Data type *2 0: Fixed characters 1: Calendar 3: Logo 4: Vertical Y axis 5: Vertical X axis 6: Outer arc 7: Inner arc |
| | | | n + 9 | | Fixed to 0 |
| | | | n + 10 | | Character height (mm) *3 |
| | | | n + 11 | | Character width ratio (%) |
| | | | n + 12 | | Angle (deg) |
| | | | n + 13 | | Character pitch (mm) *3 |
| | | | n + 14 | | Start position X (mm) *3 |
| | | | n + 15 | | Start position Y (mm) *3 |
| | | | n + 16 | | Character (bytes) |
| | | | n + 17 to n + (16 + α) | | Marking data (max. 50 characters) *1 *4 |
| | | | n + (17 + α) | | Arc marking radius (mm) *2 *5 |
| | | | • 2D data (two-dimensional barcode) | | |
| | | | Field data | | |
| | | | n + 7 | | Field number: 21 (fixed) |
| | | | n + 8 | | Data type 0: Fixed characters 1: Calendar |
| | | | n + 9 | | Barcode type 1: QR 2: Data matrix |
| n + 10 | Barcode marking force: 1 to 10 | | | | |
| n + 11 | Barcode marking speed: 1 to 10 | | | | |
| n + 12 | Dimension 0: For QR code 1: One-dimensional 2: Two-dimensional | | | | |
| n + 13 | Fixed to 0 | | | | |
| n + 14 | Angle (deg) | | | | |
| n + 15 | Matrix size (mm) *3 | | | | |
| n + 16 | Start position X (mm) *3 | | | | |
| n + 17 | Start position Y (mm) *3 | | | | |
| n + 18 | Character (bytes) | | | | |
| n + 17 to n + (16 + α) | Marking data (max. 50 characters) *1 | | | | |

Return data: Data stored from controller to TS2060

*1 Set marking data in ASCII format, and all other items in binary format.

*2 When selecting "6: Outer arc" or "7: Inner arc" as the data type, configure the arc marking radius at "n + (17 + α)". For other than "6: Outer arc" or "7: Inner arc", configuration of "n + (17 + α)" is not necessary.

*3 Include the tenths place in the setting value.
Example: 30 = 3.0 mm

*4 When selecting "3: Logo" as the data type, set a logo number between 1 to 31. Set the logo number with a "\$" mark before and after the number, such as "\$01\$".

*5 Set a whole value.
Example: 10 = 10 mm

15.1.2 Wiring Diagrams

When Connected at CN1:

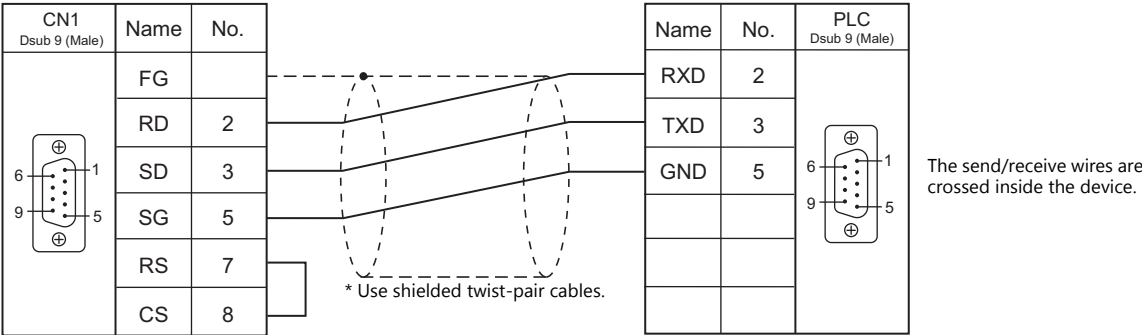


CAUTION

- 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

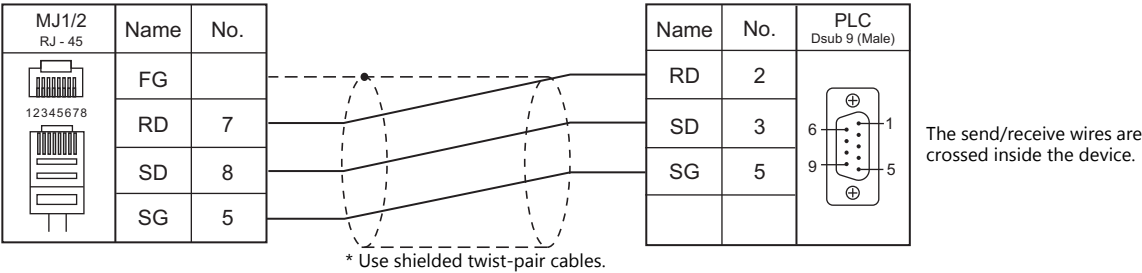
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



16. TOSHIBA

16.1 PLC Connection

16.2 Temperature Controller/Servo/Inverter Connection

16.1 PLC Connection

Serial Connection

| PLC Selection on the Editor | PLC/CPU | | | Unit/Port | Signal Level | Connection | | | Ladder Transfer ^{*3} |
|--|----------------|---------------|--|--------------------|-----------------|--------------------------|--------------------------|----------------------------|----------------------------------|
| | | | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) ^{*2} | |
| T series / V series (T compatible) | T series | T1 | T1-16 T1-28 T1-40 T1-40S | Programmer port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | | | CU111 | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | T1S | T1-40S | LINK port | | Wiring diagram 2 - C4 | | Wiring diagram 2 - M4 | |
| | | T2 | PU224 | LINK port | RS-485 | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | T2E | PU234E | Programmer port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | | | CM232E | | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | T2N | PU215N PU235N PU245N | Programmer port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | | | LINK port | RS-232C | Wiring diagram 3 - C4 | × | Wiring diagram 3 - M4 | |
| | | T3 | PU315 PU325 | LINK port | RS-485 | Wiring diagram 2 - C4 | × | Wiring diagram 2 - M4 | |
| | | T3H | PU325H PU326H | | | | | | |
| | V series | S2T | PU672T PU662T | Programmer port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | × |
| | | | | LINK port | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | S2E | PU612E | Programmer port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | | | LINK port | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | model 2000 | S2PU22A S2PU32A S2PU72A S2PU72D S2PU82 | LINK port | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | model 3000 | S3PU21 S3PU45A S3PU55A S3PU65A | | | Wiring diagram 2 - C4 | | Wiring diagram 2 - M4 | |
| EX series | EX100 | MPU12A | | COMP. LINK | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | × |
| | EX250 EX500 | | | CMP6236A | | | | | |
| | EX2000 | MPU-6620 | | COMP. LINK | | | | | |

*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 | PLC / CPU | | Unit | TCP/IP ^{*1} | UDP/IP | Port No. | Ladder Transfer ^{*2} |
|--|-------------------------|----------------------------|----------------------------|----------------------|--------|-----------------------------------|-------------------------------|
| T series/ V series (T compatible) (Ethernet UDP/IP) | T2N series | PU235N PU245N | LAN port built into CPU | × | ○ | 1024 to 65535 (Default: 10000) | × |
| | T3H series | PU325H PU326H | EN311 | | | | |
| | S2T series | PU672T PU662T | EN6** | | | | |
| | model 2000 | S2PU72 S2PU82 | EN6** | | | | |
| | model 3000 | S3PU45 S3PU55 S3PU65 | EN331 EN7** | | | | |
| nv series (Ethernet UDP/IP) | nv series ^{*3} | PU811 PU866 | EN811 FN812 | | | | |

^{*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.

^{*3} Connection via the LAN port built into the CPU is not available. Only the LAN port of the link unit can be used.

16.1.1 T Series / V Series (T Compatible)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

T1/T1S (Programmer Port)/CU111

System information

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------|---|---------|
| Operation Mode | Computer link (ASCII) | |
| Signal Level | Programmer port: RS-232C CU111: RS-485 | |
| Baud Rate | 9600 bps (fixed) | |
| Parity | None / <u>Odd</u> | |
| Data Length | 8 bits (fixed) | |
| Stop Bit | 1 bit (fixed) | |
| Station No. | <u>1</u> to 31 | |

T1S (Link Port)

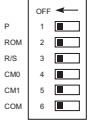
Special register (SW056), system information

(Underlined setting: default)

| Item | Link Port | Remarks |
|----------------|--------------------------|---|
| Operation Mode | Computer link (ASCII) | Special register SW056 = 0 The setting takes effect when the EEPROM write command is executed and the power is turned off and back on again. |
| Signal Level | RS-485 | |
| Baud Rate | 4800 / 9600 / 19200 bps | |
| Parity | None / <u>Odd</u> / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Station No. | <u>1</u> to 31 | |

T2E/T2N (Programmer Port)

Operation mode setting switch

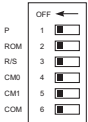
| Switch | Contents | Setting | Remarks |
|---|--------------------------------|---------------------------------------|--|
|  SW6: COM | Programmer port parity setting | OFF: Odd parity ON: Without parity | The setting takes effect when the power is turned off and back on again. |

The following settings are fixed; baud rate: 9600 bps, data length: 8 bits, and stop bit: 1 bit.

T2E (Option Card CM231E/CM232E)

Operation mode setting switch

The settings are made by the DIP switch on the front of the CPU module (PU234E).

| Switch | Contents | Setting | Remarks |
|---|--|---------|--|
|  SW4: CM0 | Option communication mode setting Function: computer link | OFF | The settings take effect when the power is turned off and back on again. |
| SW5: CM1 | | OFF | |

Transmission parameter setting

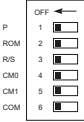
Transmission parameters are set on the system information area of T2E.

(Underlined setting: default)


| Item | Setting | Remarks |
|--------------|-----------------------------------|---|
| Signal Level | CM231E: RS-485 CM232E: RS-232C | The settings take effect when the EEPROM write command is executed and the power is turned off and back on again. |
| Baud Rate | 4800 / 9600 / 19200 bps | |
| Parity | None / <u>Odd</u> / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Station No. | <u>1</u> to 31 | |

T2N (LINK Port)

Operation mode setting switch

| Switch | Contents | Setting | Remarks |
|---|---|---------|--|
|  | SW4: CM0 | OFF | The settings take effect when the power is turned off and back on again. |
| | SW5: CM1 | OFF | |
| | Communication mode setting Function: computer link | | |

Communication port select switch

| Switch | Contents | Setting | Remarks |
|---|----------|--------------|----------------------------|
|  | SW1 | Signal Level | OFF: RS-485 ON: RS-232C |

The following settings are fixed; baud rate: 9600 bps, data length: 8 bits, and stop bit: 1 bit.

Transmission parameter setting

Transmission parameters are set on the system information area of T2N.

(Underlined setting: default)

| Item | Setting | Remarks |
|--------------|-----------------------------------|---|
| Signal Level | CM231E: RS-485 CM232E: RS-232C | The settings take effect when the EEPROM write command is executed and the power is turned off and back on again. |
| Baud Rate | 4800 / 9600 / 19200 bps | |
| Parity | None / <u>Odd</u> / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Station No. | <u>1</u> to 31 | |

T3/T3H (LINK Port)

Transmission parameter setting

Transmission parameters are set on the system information area.

(Underlined setting: default)

| Item | Setting | Remarks |
|--------------|--------------------------|---|
| Signal Level | RS-485 | The settings take effect when the EEPROM write command is executed and the power is turned off and back on again. |
| Baud Rate | 4800 / 9600 / 19200 bps | |
| Parity | None / <u>Odd</u> / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Station No. | <u>1</u> to 31 | |

S2E/S2T (Programmer Port)

Operation mode setting switch

| Switch | Contents | OFF | ON | Remarks |
|--------|--------------------------------|------------|----------------|---------|
| 3 : P | Programmer port parity setting | Odd parity | Without parity | |

The following settings are fixed; baud rate: 9600 bps, data length: 8 bits, and stop bit: 1 bit.

S2E/S2T (LINK Port)

Set special registers and system information using the engineering tool.

After making settings, execute the ROM write command and turn the power off and back it on again to determine the settings.

Operation mode

| Special Register | Setting | Remarks |
|------------------|--------------------------|---------|
| SW069 | 0: Computer link (ASCII) | |

System information

(Underlined setting: default)

| Item | | Setting | Remarks |
|-----------------------|-------------|--------------------------------|---------|
| Computer Link Setting | Station No. | <u>1</u> to 31 | |
| | Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| | Parity | None / <u>Odd</u> / Even | |
| | Data Length | 7 / <u>8</u> bits | |
| | Stop Bit | <u>1</u> / 2 bits | |

model2000/3000

Set module parameters using the engineering tool.

Module parameter

(Underlined setting: default)

| Item | Setting | Remarks |
|--------------------------|--|---------|
| RS-485 Station No. | <u>1</u> to 31 | |
| RS-485 Baud Rate (bit/s) | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| RS-485 Parity Setting | <u>None</u> / Odd / Even | |
| RS-485 Data Length | 7 / <u>8</u> bits | |
| RS-485 Stop Bit | <u>1</u> / 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 register) | 00H | |
| X (input) | 01H | XW as word device |
| Y (output) | 02H | YW as word device |
| R (auxiliary relay) | 05H | RW as word device |
| L (link relay) | 06H | LW as word device, not available with model2000 and model3000. |
| W (link register) | 07H | Not available with model2000 and model3000 |
| F (file register) | 08H | |
| TN (timer/current value) | 09H | Read only, not available with model2000 and model3000 |
| CN (counter/current value) | 0AH | Read only, not available with model2000 and model3000 |
| TS (timer/contact) | 0BH | Read only, not available with model2000 and model3000 |
| CS (counter/contact) | 0CH | Read only, not available with model2000 and model3000 |

16.1.2 T Series / V Series (T Compatible) (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]

| Reset to Default | |
|----------------------------------|------------------|
| Communication Setting | |
| Connection Mode | 1:1 |
| Retrials | 3 |
| Time-out Time(*10msec) | 500 |
| Send Delay Time(*msec) | 0 |
| Start Time(*sec) | 0 |
| Port No. | 10001 |
| Code | DEC |
| Text Process | LSB->MSB |
| Comm. Error Handling | Stop |
| Detail | |
| Priority | 1 |
| System device(\$s) V7 Compatible | None |
| Target Settings | |
| Connect To | 1:192.0.0.2(PLC) |
| PLC Table | Setting... |
| Use Connection Check Device | None |

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

| System device(\$s) V7 Compatible | |
|----------------------------------|------------------|
| None | |
| Target Settings | |
| Connect To | 1:192.0.0.2(PLC) |
| PLC Table | Setting... |
| Use Connection Check Device | None |

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

| No. | Port Name | IP Address |
|-----|-----------|------------|
| 0 | | |
| 1 | PLC | 192.0.0.2 |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |

Close

Set the IP address and port number for the PLC.

PLC

T2N/T3H/S2N Series

Configure a program with the PLC. For details, refer to the PLC manual issued by the manufacturer.

model 2000/model 3000

Make settings using the PLC tool software.

| Item | Setting | Remarks |
|------------------------|---------------------------------------|---------|
| IP Address Type | CIEMAC_1200 type | |
| IP Address Primary | Set the IP address of the PLC. | |
| Subnet Mask Primary | 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 |
|----------------------------|------|---|
| D (data register) | 00H | |
| X (input) | 01H | XW as word device |
| Y (output) | 02H | YW as word device |
| R (auxiliary relay) | 05H | RW as word device |
| L (link relay) | 06H | LW as word device, not available with T2N, model 2000 and model 3000. |
| W (link register) | 07H | Not available with T2N, model 2000 and model 3000 |
| F (file register) | 08H | model 2000: V02.00 or later, model 3000: V02.72 or later only |
| TN (timer/current value) | 09H | Read only, not available with model 2000 and model 3000 |
| CN (counter/current value) | 0AH | Read only, not available with model 2000 and model 3000 |
| TS (timer/contact) | 0BH | Read only, not available with model 2000 and model 3000 |
| CS (counter/contact) | 0CH | Read only, not available with model 2000 and model 3000 |

16.1.3 EX Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)





| Item | Setting | Remarks |
|-----------------|---|-----------------------|
| Connection Mode | <u>1</u> : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | RS-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> bps | |
| Parity | None / <u>Odd</u> / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Target Port No. | 0 to 15 | For EX200/500: 0 to 7 |

PLC

EX100

Make settings by using the switches on the CPU module. The following settings are fixed; data length: 8 bits, and stop bit: 1 bit.



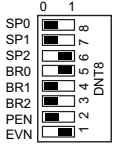
Switch

| Switch | Setting | Remarks |
|----------------------|--|--|
| Communication switch |  LINK: computer link | The settings take effect when the power is turned off and back on again. |
| Station No. |  0 to F (= 0 to 15) | |
| Baud Rate |  9600 bps (BR2: OFF, BR1: OFF) 4800 bps (BR2: OFF, BR1: ON) | |
| Parity |  Odd (PEN: ON, PR: OFF) Even (PEN: ON, PR: ON) None (PEN: OFF, PR: OFF/ON) | |

EX250/EX500

Make settings by using the switches on the CPU module. The following settings are fixed; data length: 8 bits, and stop bit: 1 bit.

Switch

| Switch | Setting | Remarks |
|---------------------|---|--|
| Write enable switch |  | ON: Write enabled |
| Station No. |  | 0 to 7 |
| DNT8 |  | SP0 0: EX control command enabled |
| | | SP1 0: Block write command enabled |
| | | SP2 1: ASCII mode |
| | | BR 9600 bps (BR0: 1, BR1: 0, BR2: 0) 4800 bps (BR0: 0, BR1: 1, BR2: 0) |
| | | PEN EVN Odd (PEN: 0, EVN: 1) Even (PEN: 0, EVN: 0) None (PEN: 1, EVN: 0/1) |

EX2000

Make settings for system information (16. COMPUTER LINK) by using the graphic programmer.

System information

(Underlined setting: default)

| Item | Setting | Remarks |
|-------------|------------------------------|---------|
| STATION No. | <u>1</u> to 31 | |
| BAUD RATE | 4800 / 9600 bps | |
| PARITY | 0: None 1: Odd 2: Even | |
| DATA LENGTH | 8 bits (fixed) | |
| STOP BIT | 1.0: 1 bits 2.0: 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 register) | 00H | |
| X (input) | 01H | XW as word device |
| Y (output) | 02H | YW as word device |
| R (auxiliary relay) | 03H | RW as word device |
| Z (link relay) | 04H | ZW as word device |
| TN (timer/current value) | 05H | Read only |
| CN (counter/current value) | 06H | Read only |

16.1.4 nv Series (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]

| Reset to Default | |
|----------------------------------|------------------|
| Communication Setting | |
| Connection Mode | 1:1 |
| Retrials | 3 |
| Time-out Time(*10msec) | 500 |
| Send Delay Time(*msec) | 0 |
| Start Time(*sec) | 0 |
| Port No. | 10001 |
| Code | DEC |
| Text Process | LSB->MSB |
| Comm. Error Handling | Stop |
| Detail | |
| Priority | 1 |
| System device(\$s) V7 Compatible | None |
| Target Settings | |
| Connect To | 1:192.0.0.2(PLC) |
| PLC Table | Setting... |
| Use Connection Check Device | None |

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

| System device(\$s) V7 Compatible | |
|----------------------------------|------------------|
| None | |
| Target Settings | |
| Connect To | 1:192.0.0.2(PLC) |
| PLC Table | Setting... |
| Use Connection Check Device | None |

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

| No. | Port Name | IP Address |
|-----|-----------|------------|
| 0 | | |
| 1 | PLC | 192.0.0.2 |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |

Close

Set the IP address and port number for the PLC.

PLC

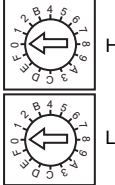
EN811/FN812

IP address type

| MODE | Switch number | Item | Setting | | | |
|--|---------------|------|---------|-----|--|---|
| <div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>MODE</div><div>ON</div></div> | 6 | IPF | | | | |
| | 7 | IP0 | | | | |
| | 8 | IP1 | IPF | IP0 | IP1 | Contents |
| | | | OFF | OFF | OFF | IP172.16.64.xxx (Class B, least significant byte set by station address) |
| OFF | | | OFF | ON | P192.168.0.xxx (Class C, least significant byte set by station address) | |
| | | | ON | ON | ON | Set IP address using PLC tool software. |

Station address (IP address)

Set the least significant byte of the IP address.

| STN | Setting |
|--|--|
|  | <p>Setting range: 01 to FE (HEX)</p> <p>Example: To set "100" (64 HEX), set H to 6 and L to 4.</p> |

Port No.

Make settings using the PLC tool software. Default: 10000

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 | DW as word device |
| %IX (input) | 01H | %IW as word device |
| %QX (output) | 02H | %QW as word device |
| S (system register) | 0DH | SW as word device |
| U (user register) | 0EH | |

* Specification by variable names is not possible for %I (input), %Q (output), or U (user register). Specify addresses.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|-------------------------|-----------------------|--------------|---|----|
| Computer status readout | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n+1 | Command: 0 (H) | |
| | | n+2 | Bit 0 to 3: Run mode Bits 4 to 11: System reserved Bits 12 to 15: Error information | |

Return data: Data stored from PLC to TS2060i

16.1.5 Wiring Diagrams

When Connected at CN1:

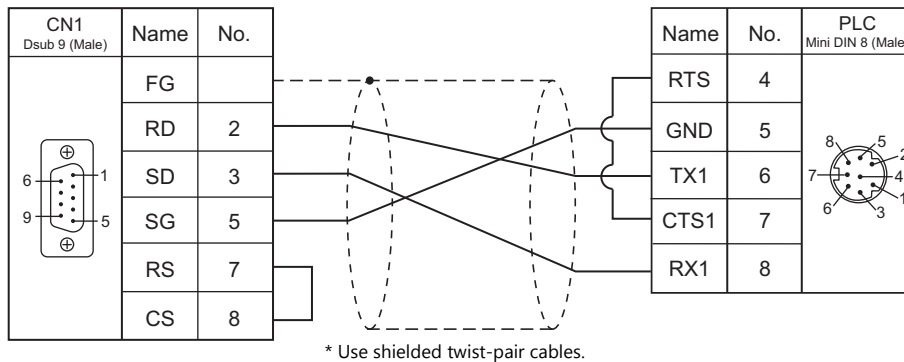


CAUTION

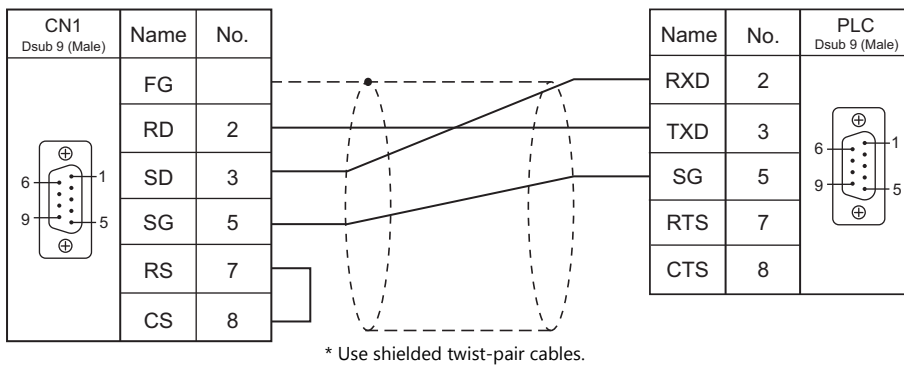
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

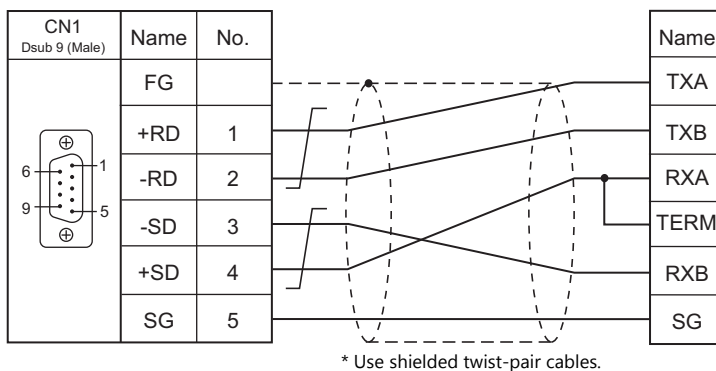


Wiring diagram 2 - C2



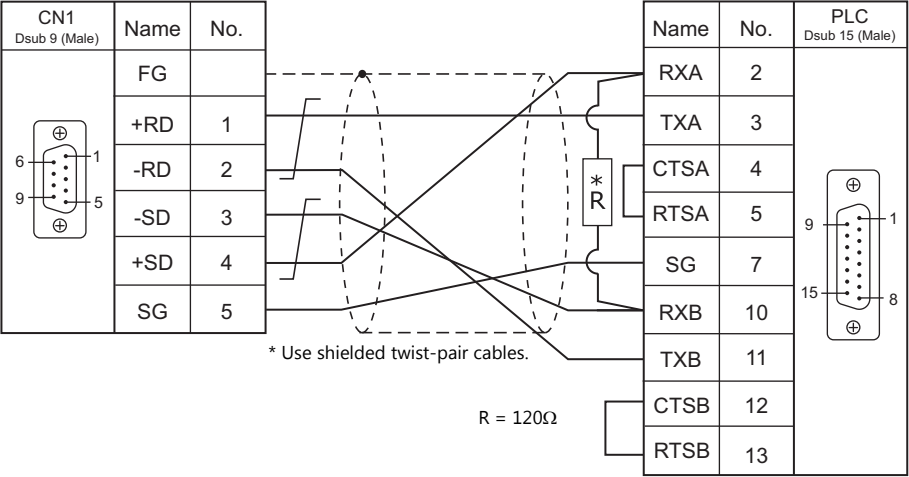
RS-422/RS-485

Wiring diagram 1 - C4

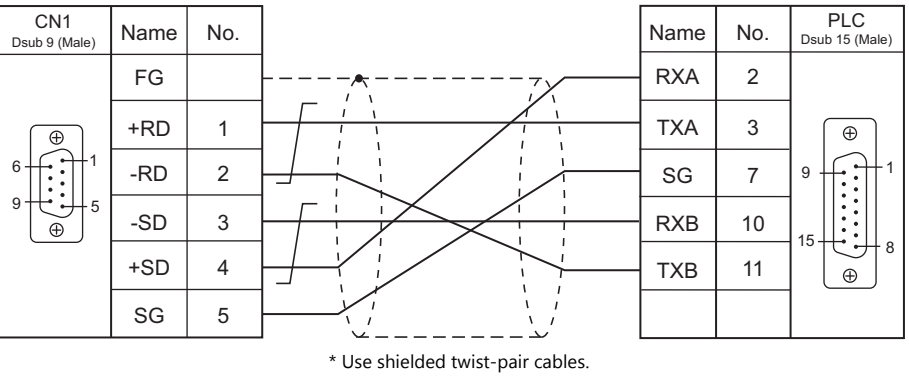


For 1 : 1 connection:
Terminating resistance: 120Ω with RXA
and TERM short-circuited

Wiring diagram 2 - C4



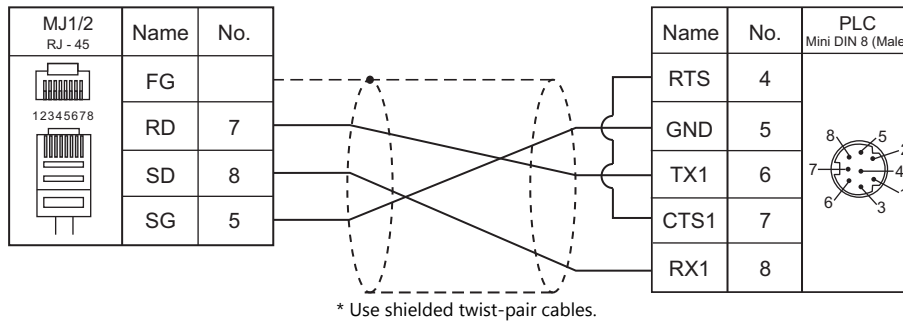
Wiring diagram 3 - C4



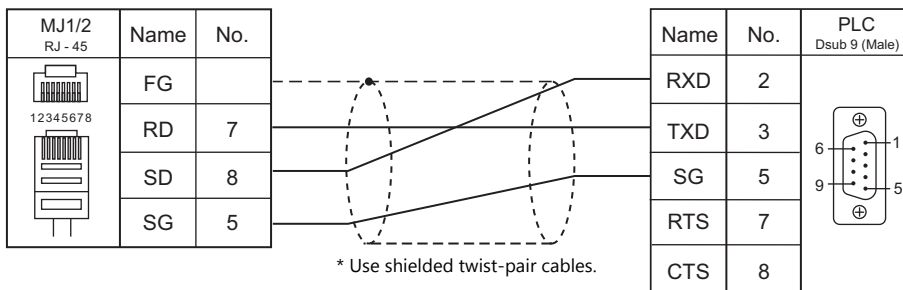
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

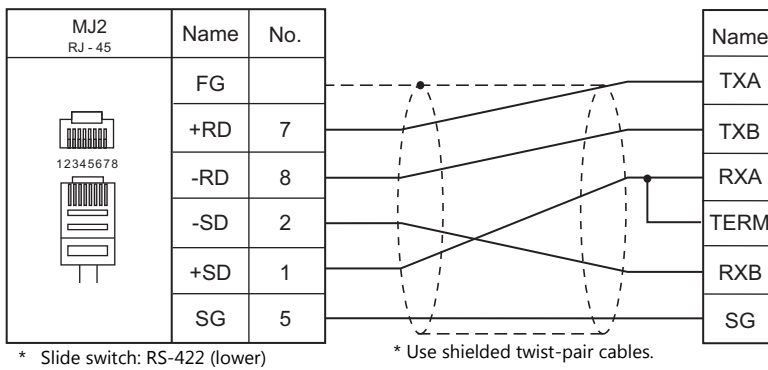


Wiring diagram 2 - M2

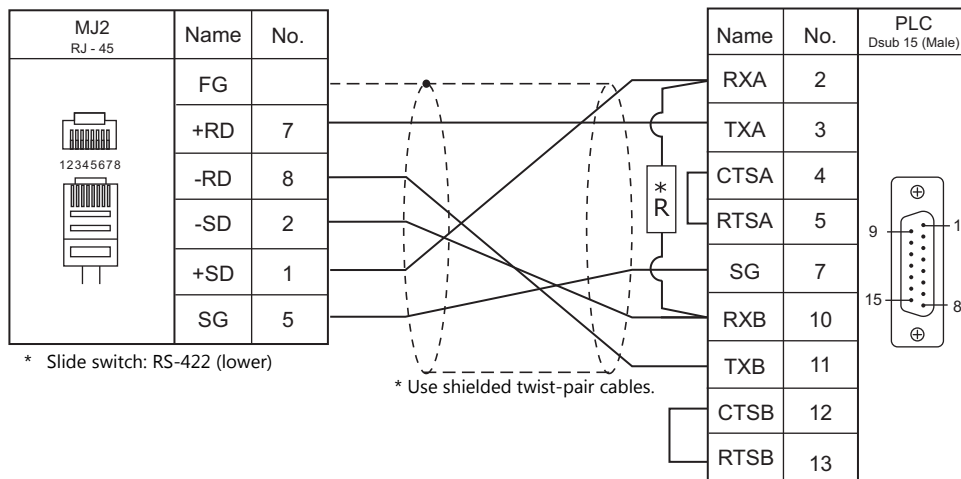
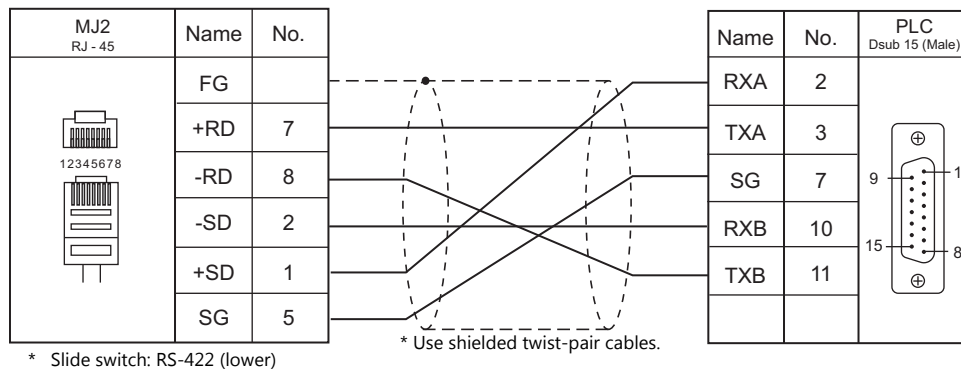


RS-422/RS-485

Wiring diagram 1 - M4



For 1 : 1 connection:
Terminating resistance: 120Ω with RXA
and TERM short-circuited

Wiring diagram 2 - M4**Wiring diagram 3 - M4**

16.2 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) *2 | |
| VF-S7 | VF-S7 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFS7.Lst |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| VF-S9 | VF-S9 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFS9.Lst |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| VF-S11 | VF-S11 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFS11.Lst |
| | | RS2003S | | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| | | RS4002Z | | | | | |
| | | RS4003Z | | | | | |
| VF-S15 | VF-S15 | RS-485 connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFS15.Lst |
| VF-A7 | VF-A7 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFA7.Lst |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| | | RS-485 connector | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 5 - M4 | |
| VF-AS1 | VF-AS1 | 2-wire RS-485 connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFAS1.Lst |
| | | 4-wire RS-485 connector | | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 5 - M4 | |
| VF-P7 | VF-P7 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFP7.Lst |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| | | RS-485 connector | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 5 - M4 | |
| VF-PS1 | VF-PS1 | 2-wire RS-485 connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFPS1.Lst |
| | | 4-wire RS-485 connector | | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 5 - M4 | |
| VF-FS1 | VF-FS1 | Communication connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFFS1.Lst |
| VF-MB1 | VF-MB1 | RS-485 connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFMB1.Lst |
| VF-nC1 | VF-nC1 | RS2001Z | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | VFnC1.Lst |
| | | RS4001Z | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 4 - M4 | |
| | | RS4002Z | | | | | |
| VF-nC3 | VF-nC3 | RS-485 connector | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | VFnC3.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).

16.2.1 VF-S7

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Communication parameter (group No. 08)

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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|--|---------|
| Communication | F800 | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> | 3 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication error trip time | <u>0: Inactive</u> 1 to 100 seconds | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

RS4001Z: baud rate and terminating resistance setting switch

| Switch | Contents | Setting | Setting Example | | | | | | | | | |
|--------|--|--|-----------------|------|------|-----|-----|----|-----|----|----|--|
| 1, 2 | Baud rate * | <table><tr><td></td><td>4800</td><td>9600</td></tr><tr><td>SW1</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>ON</td><td>ON</td></tr></table> | | 4800 | 9600 | SW1 | OFF | ON | SW2 | ON | ON | <div><div><div>↓</div><div>ON</div></div><div><div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div><div>Baud rate: 9600 bps Terminating resistance: Provided</div></div></div></div> |
| | 4800 | 9600 | | | | | | | | | | |
| SW1 | OFF | ON | | | | | | | | | | |
| SW2 | ON | ON | | | | | | | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | | | | | | | | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | | | | | | | | |

* Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

16.2.2 VF-S9

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Communication parameter (group No. 08)

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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|---|---------|
| Communication | F800 | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps | 3 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication error trip time | <u>0: Inactive</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting * | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |

* Necessary for the CPU version V110 and later

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

RS4001Z: baud rate and terminating resistance setting switch

| Switch | Contents | Setting | Setting Example | |
|--------|--|-----------------------------------|--|--|
| 1, 2 | Baud rate * | | <div><div><div>↓</div><div>ON</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div></div></div> <div>Baud rate: 9600 bps Terminating resistance: Provided</div> | |
| | | | | |
| | | | | |
| | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | |

* Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

16.2.3 VF-S11

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|---|---------|
| Communication | F800 | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps | 3 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication error trip time | <u>0: Inactive</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |
| | F829 | Communication protocol selection | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

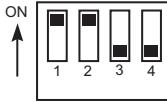
Changes to parameters take effect when the power is turned off and on again.

RS4001Z: baud rate and terminating resistance setting switch

| Switch | Contents | Setting | Setting Example | | | | | | | | | |
|--------|--|--|-----------------|------|------|-----|-----|----|-----|----|----|---|
| 1, 2 | Baud rate * | <table><tr><td></td><td>4800</td><td>9600</td></tr><tr><td>SW1</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>ON</td><td>ON</td></tr></table> | | 4800 | 9600 | SW1 | OFF | ON | SW2 | ON | ON | <div><div><div>↓</div><div>ON</div><div><div><div></div><div></div><div></div><div></div></div><div><div>1</div><div>2</div><div>3</div><div>4</div></div></div></div><div>Baud rate: 9600 bps Terminating resistance: Provided</div></div> |
| | 4800 | 9600 | | | | | | | | | | |
| SW1 | OFF | ON | | | | | | | | | | |
| SW2 | ON | ON | | | | | | | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | | | | | | | | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | | | | | | | | |

* Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

RS4002Z: baud rate and bit length setting (SW1)

| Switch | Contents | Setting | | | | Setting Example | |
|--------|---------------------------|-----------------------------|------|------|-------|--|--|
| 1 to 3 | Baud rate* ¹ | | 4800 | 9600 | 19200 |  | Baud rate: 9600 bps Bit length: 12 bits |
| | | SW1 | OFF | ON | OFF | | |
| | | SW2 | ON | ON | OFF | | |
| | | SW3 | OFF | OFF | ON | | |
| | | | | | | | |
| 4 | Bit length * ² | ON: 11 bits OFF: 12 bits | | | | | |


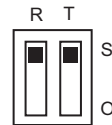

^{*1} Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

^{*2} When the parity is provided, set 12 bits.

RS4002Z: wiring system and terminating resistance setting (SW2)

| Switch | Contents | Setting | | Setting Example | | | | | | | | | | |
|--------|--|---|--|-----------------|---------------|-----|-----|----|-----|-----|----|--|--|--|
| 1, 2 | Wiring system | <table><tr><td></td><td>4-wire system</td><td>2-wire system</td></tr><tr><td>SW1</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>OFF</td><td>ON</td></tr></table> | | 4-wire system | 2-wire system | SW1 | OFF | ON | SW2 | OFF | ON | <div><div><div>ON</div><div>↑</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>Wiring: 4-wire system</div><div>Terminating resistance: Provided</div></div></div> | | |
| | 4-wire system | 2-wire system | | | | | | | | | | | | |
| SW1 | OFF | ON | | | | | | | | | | | | |
| SW2 | OFF | ON | | | | | | | | | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | | | | | | | | | | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | | | | | | | | | | |

RS4003Z: wiring system (SW1), terminating resistance (SW2), and inverter number (SW5) setting

| Switch | Contents | Setting | Setting Example |
|--------|---|--|--|
| SW1 | Wiring system ^{*1} | 2: 2-wire system 4: 4-wire system |  <p>Wiring: 4-wire system</p> |
| SW2 | R Terminating resistance on the receiving side | S: Terminating resistance provided O: Terminating resistance not provided |  <p>Terminating resistance: Provided</p> |
| | T Terminating resistance on the sending side | S: Terminating resistance provided O: Terminating resistance not provided | |
| SW5 | Inverter number ^{*2} | 0 to 15 |  <p>Inverter number: 0</p> |

^{*1} Set the both setting switches in the same positions.

^{*2} When "0" is selected, the setting of the inverter's communication parameter "F802" takes effect.

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 | |

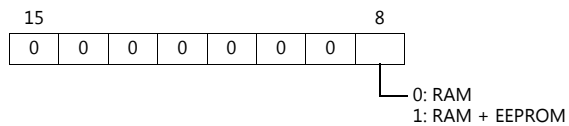
Specify the storage device memory address on the [Device Input] dialog.

RAM: Store in RAM
EEPROM: Store in RAM + EEPROM

Indirect Device Memory Designation

| | | | | |
|-------|------------------|---|---|-----------------|
| | 15 | 8 | 7 | 0 |
| n + 0 | Model (11 to 18) | | | Device type |
| n + 1 | Address No. | | | |
| n + 2 | Expansion code * | | | Bit designation |
| n + 3 | 00 | | | Station number |

* Specify the storage device memory address in the expansion code.



16.2.4 VF-S15

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 | <u>RS-422/485</u> | |
| Baud Rate | 9600 / <u>19200</u> / 38400 bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 63 | 255: Broadcast |

Inverter

Communication parameters

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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|---|--|---------|
| Communication | F800 | Baud rate | 3: 9600 bps 4: <u>19200 bps</u> 5: 38400 bps | 4 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 63 | 0 |
| | F803 | Communication timeout detection time | <u>0.0: Inactive</u> 1 to 100.0 seconds | 0.0 |
| | F805 | Transmission latency setting | <u>0: Off</u> 0.00 to 2.00 seconds | 0 |
| | F829 | Communication protocol selection | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

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 |
|---------------|------|---------|
| -- | 00H | |

Specify the storage target device memory address on the [Device Input] dialog.

RAM: Store to RAM.

EEPROM: Store to RAM and EEPROM.

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 | |

* Specify the storage target device memory address in the expansion code.

| | |
|----|---|
| 15 | 8 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |

0: RAM

1: RAM+EEPROM

16.2.5 VF-A7

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|--|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 | |
| Signal Level | RS-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | Fixed to "1" when 2-wire RS-485 connection is selected and the CPU version is V100 to V305 |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 31 | |

Inverter

RS-485 Communication Port

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|--|---|---------|
| Communication | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time | <u>0: OFF</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting *1 | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |
| | F820 | Baud rate (RS-485 communication port) | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps 5: 38400 bps | 3 |
| | F821 | Wiring system | 0: 2-wire system *2 <u>1: 4-wire system</u> | 1 |
| | F825 | Transmission latency setting *1 | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |

*1 When the CPU version is V100, make a setting for F805. For any version other than V100, make a setting for F825.

*2 Not available with the CPU version of V300 or earlier. Use a 4-wire system for connection.

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

Common Serial Communication Port (RS2001Z / RS4001Z)

When the common serial communication port is used, the communication conversion unit "RS2001Z" or "RS4001Z" is necessary.

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|---|---------|
| Communication | F800 | Baud rate (Common serial) | 2: 4800 bps <u>3: 9600 bps</u> | 3 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time | <u>0: OFF</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

RS4001Z: baud rate and terminating resistance setting switch

| Switch | Contents | Setting | Setting Example | | | | | | | | | |
|--------|--|--|-----------------|------|------|-----|-----|----|-----|----|----|--|
| 1, 2 | Baud rate * | <table><tr><td></td><td>4800</td><td>9600</td></tr><tr><td>SW1</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>ON</td><td>ON</td></tr></table> | | 4800 | 9600 | SW1 | OFF | ON | SW2 | ON | ON | <div><div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div><div>ON</div><div>Baud rate: 9600 bps Terminating resistance: Provided</div></div> |
| | 4800 | 9600 | | | | | | | | | | |
| SW1 | OFF | ON | | | | | | | | | | |
| SW2 | ON | ON | | | | | | | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | | | | | | | | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | | | | | | | | |

* Set the same baud rate as the one set for the communication parameter "F800" of 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 |
|---------------|------|---------|
| -- | 00H | |

Specify the storage device memory address on the [Device Input] dialog.

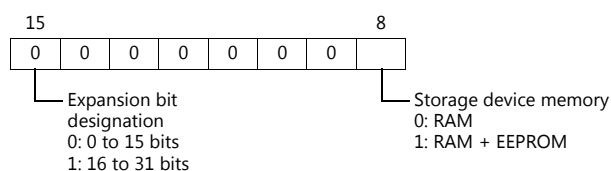
RAM: Store in RAM

EEPROM: Store in RAM + EEPROM

Indirect Device Memory Designation

| | | | | |
|-------|------------------|---|---|---|
| | 15 | 8 | 7 | 0 |
| n + 0 | Model (11 to 18) | | | |
| n + 1 | Device type | | | |
| n + 2 | Address No. | | | |
| n + 3 | Expansion code * | | | |
| n + 4 | Bit designation | | | |
| n + 5 | 00 | | | |
| n + 6 | Station number | | | |

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



16.2.6 VF-AS1

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | 1 : 1 / <u>1:n</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 9600 / <u>19200</u> / 38400 bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 31 | |

Inverter

2-wire RS-485 Communication Port

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|---|---|---------|
| Communication | F800 | Baud rate (2-wire RS-485) | 0: 9600 bps <u>1: 19200 bps</u> 2: 38400 bps | 1 |
| | F801 | Parity (Common to 2-wire and 4-wire) | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time (Common to 2-wire and 4-wire) | <u>0: OFF</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting (2-wire RS-485) | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |
| | F807 | Communication protocol selection (2-wire RS-485) | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

4-wire RS-485 Communication Port

Communication 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)

RS4001Z: baud rate and terminating resistance setting switch

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|---|---|---------|
| Communication | F801 | Parity (Common to 2-wire and 4-wire) | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time (Common to 2-wire and 4-wire) | <u>0: OFF</u> 1 to 100 seconds | 0 |
| | F820 | Baud rate (4-wire RS-485) | 0: 9600 bps <u>1: 19200 bps</u> 2: 38400 bps | 1 |
| | F825 | Transmission latency setting (4-wire RS-485) | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |
| | F829 | Communication protocol selection (4-wire RS-485) | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

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 | |

Specify the storage device memory address on the [Device Input] dialog.

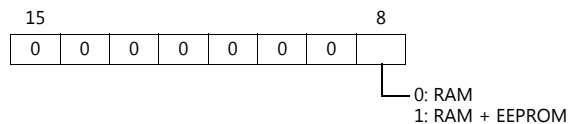
RAM: Store in RAM

EEPROM: Store in RAM + EEPROM

Indirect Device Memory Designation

| | | | | |
|-------|------------------|---|---|-----------------|
| | 15 | 8 | 7 | 0 |
| n + 0 | Model (11 to 18) | | | Device type |
| n + 1 | Address No. | | | |
| n + 2 | Expansion code * | | | Bit designation |
| n + 3 | 00 | | | Station number |

* Specify the storage device memory address in the expansion code.



16.2.7 VF-P7

Settings are the same as those described in "16.2.5 VF-A7".

16.2.8 VF-PS1

Settings are the same as those described in "16.2.6 VF-AS1".

16.2.9 VF-FS1

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 9600 / <u>19200</u> bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 31 | |

Inverter

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|---|---------|
| Communication | F800 | Baud rate | 0: 9600 bps <u>1: 19200 bps</u> | 1 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time | <u>0: OFF</u> 1 to 100 seconds | 0 |
| | F805 | Transmission latency setting | <u>0.00: Normal communication</u> 0.01 to 2.00 seconds | 0.00 |
| | F829 | Communication protocol selection | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

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 | |

Specify the storage device memory address on the [Device Input] dialog.

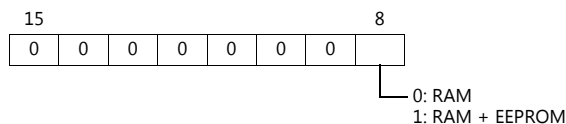
RAM: Store in RAM

EEPROM: Store in RAM + EEPROM

Indirect Device Memory Designation

| | | | | |
|-------|------------------|---|-----------------|-------------|
| | 15 | 8 | 7 | 0 |
| n + 0 | Model (11 to 18) | | | Device type |
| n + 1 | Address No. | | | |
| n + 2 | Expansion code * | | Bit designation | |
| n + 3 | 00 | | Station number | |

* Specify the storage device memory address in the expansion code.



16.2.10 VF-MB1

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 | <u>RS-422/485</u> | |
| Baud Rate | 9600 / <u>19200</u> / 38400bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 63 | 255: Broadcast |

Inverter

Communication parameters

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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|---|--|---------|
| Communication | F800 | Baud rate | 3: 9600 bps 4: <u>19200 bps</u> 5: 38400 bps | 4 |
| | F801 | Parity | 0: None 1: <u>Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | 0 to 63 | 0 |
| | F803 | Communication timeout detection time | <u>0.0: Inactive</u> 1 to 100.0 seconds | 0.0 |
| | F805 | Transmission latency setting | <u>0: Off</u> 0.00 to 2.00 seconds | 0 |
| | F829 | Communication protocol selection | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

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 |
|---------------|------|---------|
| -- | 00H | |

Specify the storage target device memory address on the [Device Input] dialog.

RAM: Store to RAM.

EEPROM: Store to RAM and EEPROM.

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 |

* Specify the storage target device memory address in the expansion code.

| | |
|----|---|
| 15 | 8 |
| 0 | 0 |

0: RAM
1: RAM+EEPROM

16.2.11 VF-nC1

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Communication 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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|----------------------------------|---|---------|
| Communication | F800 | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps | 3 |
| | F801 | Parity | 0: None <u>1: Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 31 | 0 |
| | F803 | Communication timeout time | <u>0: OFF</u> 1 to 100 seconds | 0 |

The data length is fixed to "8 bits".

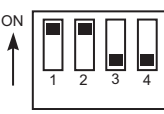
Changes to parameters take effect when the power is turned off and on again.

RS4001Z: baud rate and terminating resistance setting switch

| Switch | Contents | Setting | Setting Example | | | | | | | | | |
|--------|--|--|-----------------|------|------|-----|-----|----|-----|----|----|--|
| 1, 2 | Baud rate * | <table><tr><td></td><td>4800</td><td>9600</td></tr><tr><td>SW1</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>ON</td><td>ON</td></tr></table> | | 4800 | 9600 | SW1 | OFF | ON | SW2 | ON | ON | <div><div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div><div><div>ON</div><div>1</div><div>2</div><div>3</div><div>4</div></div></div> <div>Baud rate: 9600 bps Terminating resistance: Provided</div> |
| | 4800 | 9600 | | | | | | | | | | |
| SW1 | OFF | ON | | | | | | | | | | |
| SW2 | ON | ON | | | | | | | | | | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | | | | | | | | | | |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | | | | | | | | |

* Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

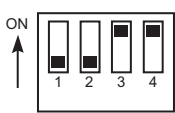
RS4002Z: baud rate and bit length setting switch

| Switch | Contents | Setting | | | | Setting Example | |
|--------|---------------------------|-----------------------------|------|------|-------|--|--|
| 1 to 3 | Baud rate * ¹ | | 4800 | 9600 | 19200 |  | Baud rate: 9600 bps Bit length: 12 bits |
| | | SW1 | OFF | ON | OFF | | |
| | | SW2 | ON | ON | OFF | | |
| | | SW3 | OFF | OFF | ON | | |
| | | | | | | | |
| 4 | Bit length * ² | ON: 11 bits OFF: 12 bits | | | | | |

*¹ Set the same baud rate as the one set for the communication parameter "F800" of the inverter.

*² When the parity is provided, set 12 bits.

RS4002Z: wiring system and terminating resistance setting switch

| Switch | Contents | Setting | | Setting Example | |
|--------|--|-----------------------------------|---------------|--|---|
| 1, 2 | Wiring system | | 4-wire system | 2-wire system | |
| | | SW1 | OFF | ON | |
| | | SW2 | OFF | ON | |
| 3 | Terminating resistance on the receiving side | ON: Provided OFF: Not provided | |  | Wiring: 4-wire system Terminating resistance: Provided |
| 4 | Terminating resistance on the sending side | ON: Provided OFF: Not provided | | | |

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 | |

Specify the storage device memory address on the [Device Input] dialog.

RAM: Store in RAM

EEPROM: Store in RAM + EEPROM

Indirect Device Memory Designation

| | | | |
|-------|------------------|-----------------|---|
| | 15 | 8 7 | 0 |
| n + 0 | Model (11 to 18) | Device type | |
| n + 1 | Address No. | | |
| n + 2 | Expansion code * | Bit designation | |
| n + 3 | 00 | Station number | |

* Specify the storage device memory address in the expansion code.

| | | | | | | | |
|----|----|----|----|----|----|---|---|
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

0: RAM
 1: RAM + EEPROM

16.2.12 VF-nC3

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 | <u>RS-422/485</u> | |
| Baud Rate | 9600 / <u>19200</u> / 38400 bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>0</u> to 63 | 255: Broadcast |

Inverter

Communication parameters

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)

| Parameter | Indication | Item | Setting | Default |
|---------------|------------|--|--|---------|
| Communication | F800 | Baud rate | 3: 9600 bps 4: <u>19200 bps</u> 5: 38400 bps | 4 |
| | F801 | Parity | 0: None 1: <u>Even</u> 2: Odd | 1 |
| | F802 | Inverter number (station number) | <u>0</u> to 63 | 0 |
| | F803 | Communication error timeout time detection | <u>0.0: Inactive</u> 1 to 100.0 seconds | 0.0 |
| | F805 | Transmission latency setting | <u>0: Off</u> 0.00 to 2.00 seconds | 0 |
| | F829 | Communication protocol selection | <u>0: Toshiba inverter protocol</u> | 0 |

The data length is fixed to "8 bits".

Changes to parameters take effect when the power is turned off and on again.

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 |
|---------------|------|---------|
| -- | 00H | |

Specify the storage target device memory address on the [Device Input] dialog.

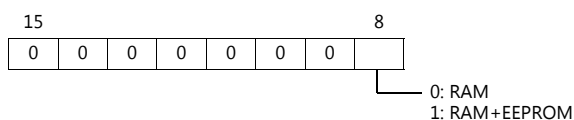
RAM: Store to RAM.

EEPROM: Store to RAM and EEPROM.

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 | |

* Specify the storage target device memory address in the expansion code.



16.2.13 Wiring Diagrams

When Connected at CN1:

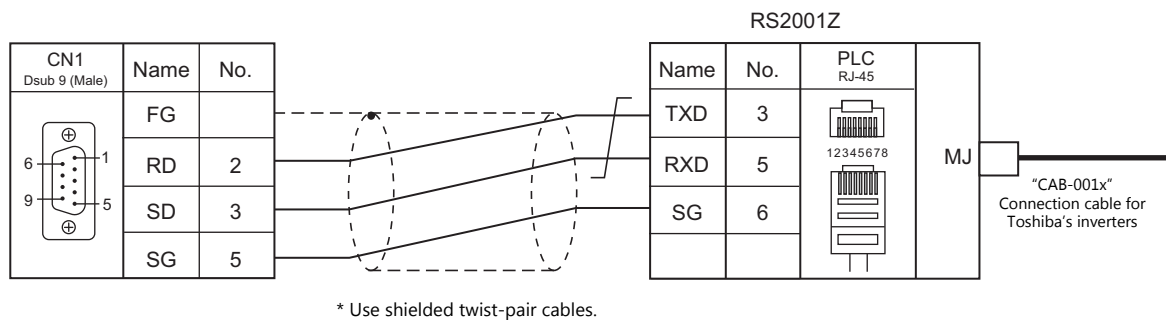


CAUTION

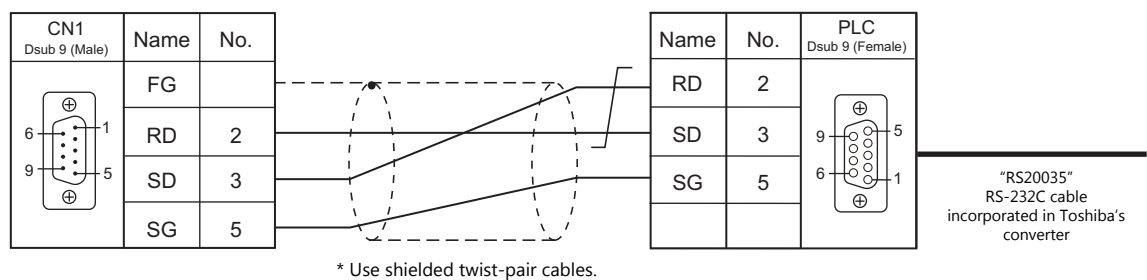
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

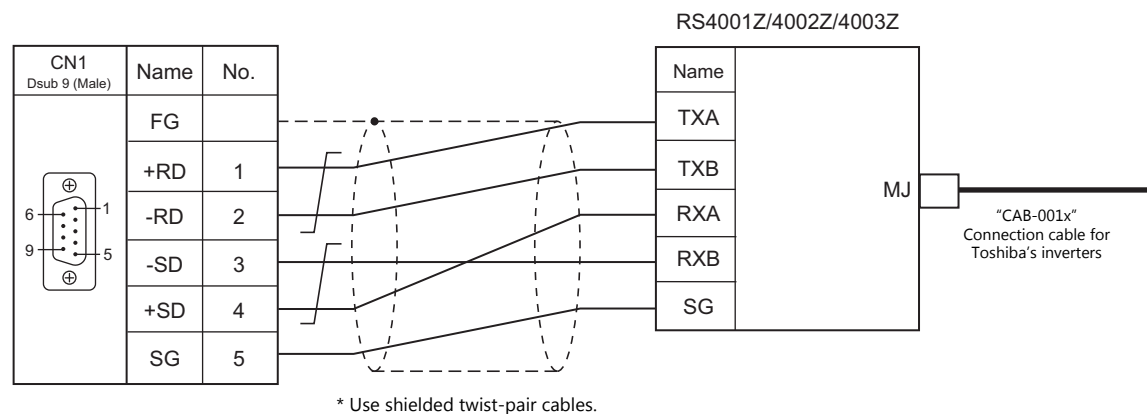


Wiring diagram 2 - C2

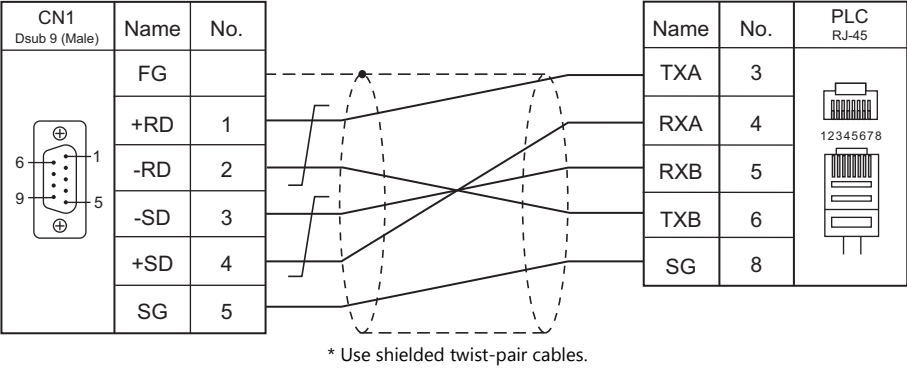


RS-422/RS-485

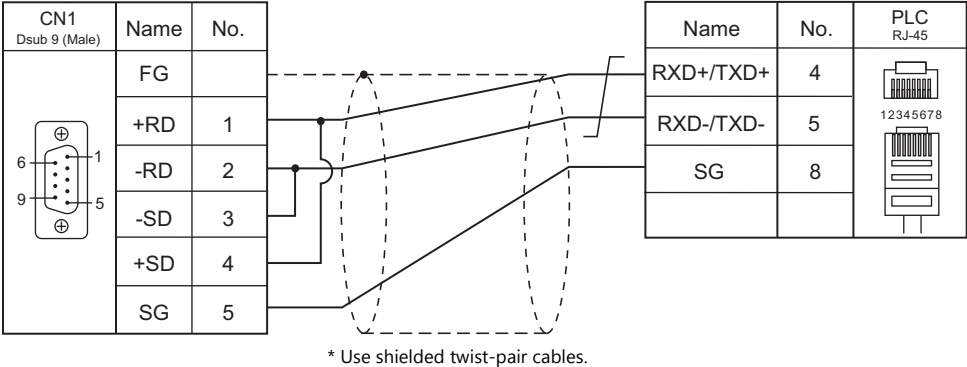
Wiring diagram 1 - C4



Wiring diagram 2 - C4



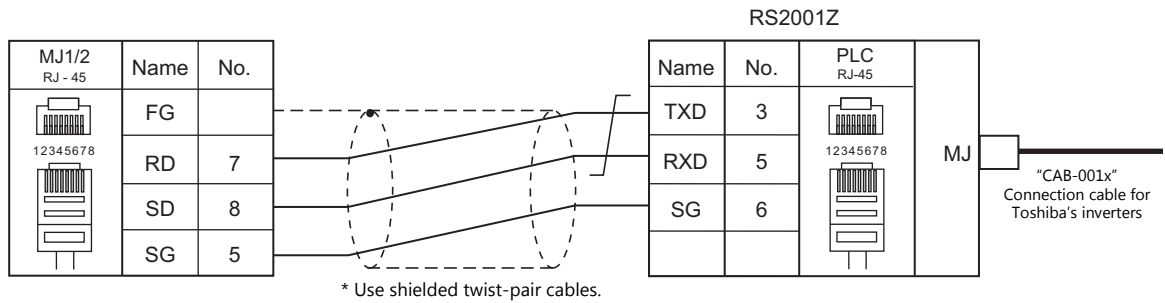
Wiring diagram 3 - C4



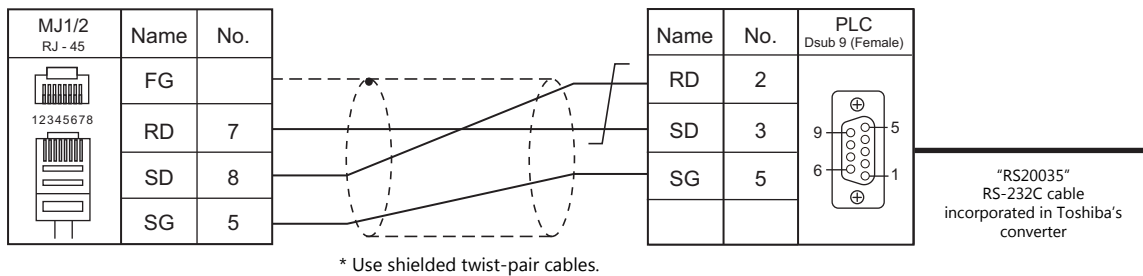
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

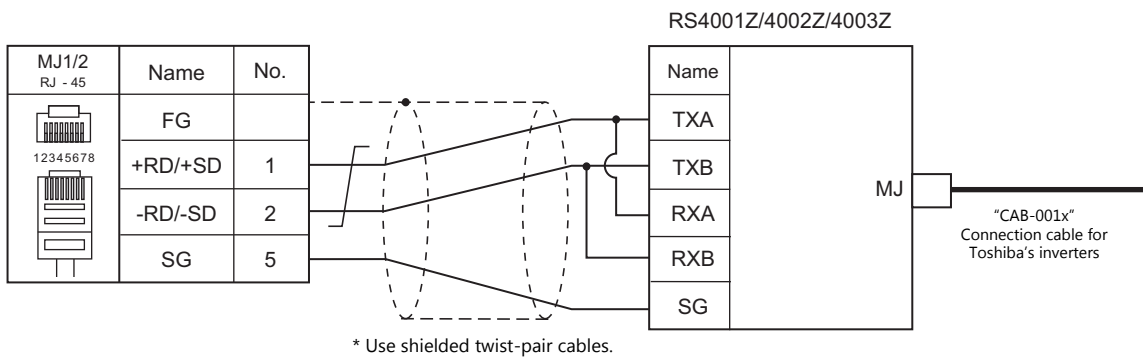


Wiring diagram 2 - M2

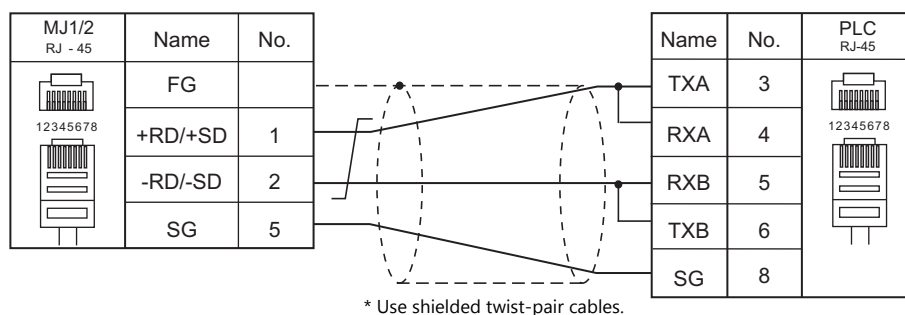


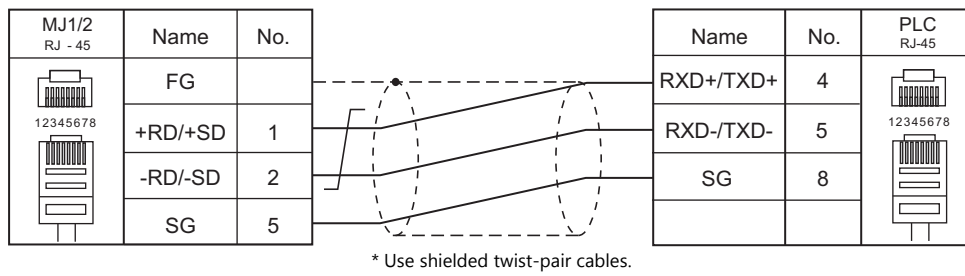
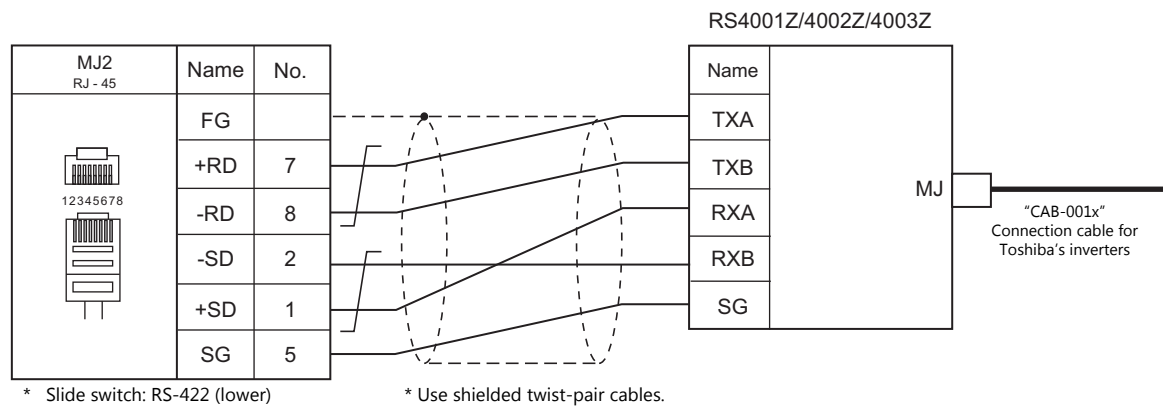
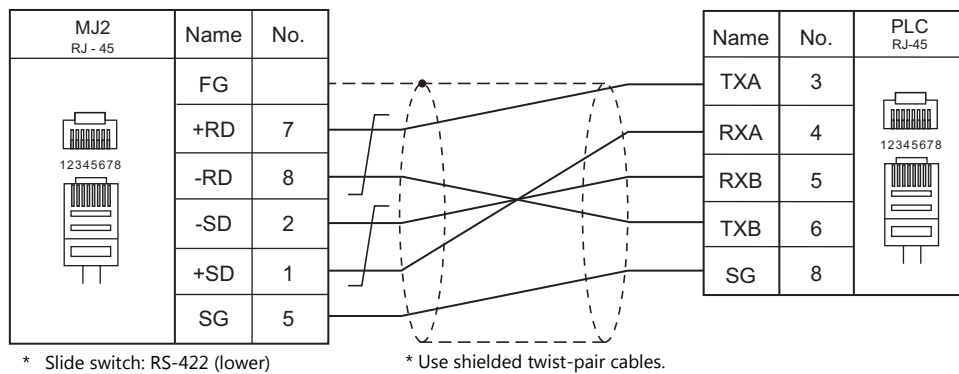
RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4**Wiring diagram 4 - M4****Wiring diagram 5 - M4**

17. TOSHIBA MACHINE

17.1 PLC Connection

17.2 Temperature Controller/Servo/Inverter Connection

17.1 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) | |
| TC200 | TC200 | TCCUH | Port of the CPU | RS-232C port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | | TCCMW TCCMO | | | | | | |
| | | TCCUHS TCCUHSC TCCUHSAC | Port of the CPU | | | | | | |
| | | | TCCMWA TCCMWS TCCMOA TC232CA | | | | | | |
| | TCmini | TC3-01 | CN16 | RS-232C | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN17A CN17B | | RS-485 *3 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | | | | | | | | | |
| | | TC3-02 | CN18 | RS-232C | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN20A CN20B | | RS-485 *4 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| | | TC5-02 | CN18 | RS-232C | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN24A CN24B | | RS-485 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | | |
| | | TC5-03 | CN13 | RS-232C | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN14 CN18 | | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| | | TC8-00 | CN13 | RS-232C | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN11 | | RS-485*5 | Wiring diagram 4 - C4 | Wiring diagram 4 - M4 | | |
| | | TC9-00 | CN11 | RS-485 | RS-485 | 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 For the ladder transfer function, see the TS2060 Reference Manual 2.

*3 CPUs version LT3CU01-D0 or later support RS-485. Check the CPU version.

*4 CPUs version LT3CU02-F0 or later support RS-485. Check the CPU version.

*5 CPUs version LT8CU00-A0 or later support RS-485. Check the CPU version.

17.1.1 TC200

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / 1:n / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | *1 |
| Baud Rate | <u>9600</u> / 19200 / 38400 / 57600 / 115200 bps | |
| Parity | <u>None</u> | |
| Data Length | <u>8 bits</u> | |
| Stop Bit | <u>2 bits</u> | |

*1 For RS-422/485 communications, set a transmission delay time to 4 msec or longer.

TC200

TCCUH

Make the setting for communication using the ladder tool.

(Underlined setting: default)

| Item | Setting | Remarks |
|----------------|-------------------------|---|
| Baud Rate | <u>9600</u> / 19200 bps | Set the baud rate in the system flag "A00F" OFF: 9600 bps ON: 19200 bps |
| Parity | <u>None</u> | |
| Data Length | <u>8 bits</u> | |
| Stop Bit | <u>2 bit</u> | |
| Station Number | <u>1</u> | |

TCCMW / TCCMO

No particular setting is necessary on the PLC. The PLC always performs communication functions using the following parameters. Be sure to match the settings to those made under [Communication Setting] of the editor.

| Item | Setting | Remarks |
|----------------|-----------------|---------|
| Baud Rate | 9600 bps | |
| Parity | None | |
| Data Length | 8 bits | |
| Stop Bit | 2 bit | |
| Station Number | 1 | |

Function setting switch (MODE)

| Switch | Setting | Remarks |
|--------|---------|-----------------------|
| 3 | ON | Link master station |
| 4 | OFF | Link slave station |
| 5 | OFF | Remote master station |
| 6 | OFF | Remote slave station |

TCCUHS / TCCUHSC / TCCUHSAC

Set the communication format in the application software.

(Underlined setting: default)

| Item | Setting | Remarks | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|---|-------------|------|-----------------|-----------------|------|------|------|---|---|---|------|---|---|---|-------|---|---|---|-------|---|---|-------|---|---|--------|
| Baud rate | <u>9600</u> / 19200 / 38400 / 57600 / 115200 bps | <table><tr><th colspan="3">System Flag</th><th rowspan="2">Baud Rate (bps)</th></tr><tr><th>A00F</th><th>A154</th><th>A155</th></tr><tr><td>0</td><td>0</td><td>0</td><td>9600</td></tr><tr><td>1</td><td>0</td><td>0</td><td>19200</td></tr><tr><td rowspan="3">-</td><td>1</td><td>0</td><td>38400</td></tr><tr><td>0</td><td>1</td><td>57600</td></tr><tr><td>1</td><td>1</td><td>115200</td></tr></table> | System Flag | | | Baud Rate (bps) | A00F | A154 | A155 | 0 | 0 | 0 | 9600 | 1 | 0 | 0 | 19200 | - | 1 | 0 | 38400 | 0 | 1 | 57600 | 1 | 1 | 115200 |
| | | System Flag | | | Baud Rate (bps) | | | | | | | | | | | | | | | | | | | | | | |
| | | A00F | A154 | A155 | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0 | 0 | 0 | 9600 | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 | 0 | 0 | 19200 | | | | | | | | | | | | | | | | | | | | | | |
| | | - | 1 | 0 | 38400 | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0 | 1 | 57600 | | | | | | | | | | | | | | | | | | | | | | |
| | | | 1 | 1 | 115200 | | | | | | | | | | | | | | | | | | | | | | |

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

TCCMWA / TCCMWS / TCCMOA / TC232CA

Be sure to match the settings to those made under [Communication Setting] of the editor.

| Item | Setting | Remarks |
|-----------|----------------------------------|------------------------------------|
| Baud rate | 9600 / 19200 / 38400 / 57600 bps | 57600 bps not supported by TC232CA |

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Function setting switches (MODE)

| Switch | ON/OFF | Setting | Remarks |
|--------|--------|-----------------------|--|
| 3 | ON | Link master station | Communication disabled with this switch set to OFF |
| 4 | OFF | Link slave station | |
| 5 | OFF | Remote master station | |
| 6 | OFF | Remote slave station | |

TCmini**TC3-01****CN16**

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (4800/9600/19200/38400 bps), no baud rate setting is needed on the PLC.

CN17A/CN17B

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (4800/9600/19200/38400 bps), no baud rate setting is needed on the PLC.

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|--------------|-----------------------------------|--|
| Software setting | D11F | Mode setting | 4: Host communication mode | Setting changes take effect when the power is turned off and on again. |

| Setting Item | Jumper | Item | Setting |
|------------------|--------|-------------------------------------|---|
| Hardware setting | JP2 | Terminating resistance | With terminating resistance |
| | JP3 | Half duplex / full duplex selection | JP2: Jumper |
| | JP4 | | JP3: Jumper |
| | JP15 | | JP4: Jumper Jumper across pins 2 and 3 of JP15 |

TC3-02**CN18**

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (4800/9600/19200/38400 bps), no baud rate setting is needed on the PLC.

CN20A/CN20B

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (4800/9600/19200/38400 bps), no baud rate setting is needed on the PLC.

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|--------------|-----------------------------------|--|
| Software setting | D26F | Mode setting | 4: Host communication mode | Setting changes take effect when the power is turned off and on again. |

| Setting Item | DIP Switch (SW2) | | Contents | Setting | | | | | | |
|------------------|---|--|---|-------------------------------------|--------------|-------|-------|-------|-------|-------|
| Hardware setting | <div><div>ON</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>12345678</div></div></div> | | SW2-1 SW2-2 SW2-3 SW2-4 SW2-7 | Half duplex / full duplex selection | | SW2-1 | SW2-2 | SW2-3 | SW2-4 | SW2-7 |
| | | | | | | | | | | |
| | | | SW2-6 | Terminating resistance | ON: Provided | | | | | |

TC5-02**CN18**

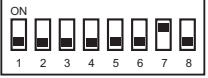
Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (9600/19200/38400 bps), no baud rate setting is needed on the PLC.

CN24A/CN24B

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|-------------------|---|--|
| Software setting | D37E | Baud rate setting | 0: 9600 bps 1: 19200 bps 2: 38400 bps | Setting changes take effect when the power is turned off and on again. |
| | D37F | Mode setting | 3: Host communication mode | |

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

| Setting Item | DIP Switch (SW2) | Contents | Setting |
|------------------|---|----------|------------------------|
| Hardware setting |  | SW2-7 | Terminating resistance |
| | | | ON: Provided |

TC5-03**CN13**

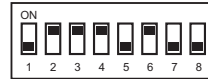
Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (9600/19200/38400 bps), no baud rate setting is needed on the PLC.

CN14/CN18

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|-------------------|---|--|
| Software setting | D37E | Baud rate setting | 0: 9600 bps 1: 19200 bps 2: 38400 bps | Setting changes take effect when the power is turned off and on again. |
| | D37F | Mode setting | 3: Host communication mode | |

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

| Setting Item | DIP Switch (SW1) | | Contents | Setting | | | | | | |
|------------------|---|--|---|-------------------------------------|---------------------|-----------|-----------|-----------|------------|-------|
| Hardware setting |  | | SW1-1 SW1-2 SW1-3 SW1-4 SW1-7 | Half duplex / full duplex selection | | SW1-1 | SW1-2 | SW1-3 | SW1-4 | SW1-7 |
| | | | | Half duplex | OFF | ON | ON | ON | OFF | |
| | | | SW1-6 | Terminating resistance | ON: Provided | | | | | |

TC8-00**CN13**

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

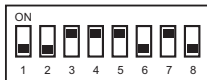
Because of the baud rate auto-detection feature (9600/19200/38400 bps), no baud rate setting is needed on the PLC.

CN11

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

Because of the baud rate auto-detection feature (9600/19200/38400 bps), no baud rate setting is needed on the PLC.

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|--------------|---------------------------------------|--|
| Software setting | D37F | Mode setting | 8004H: Host communication mode | Setting changes take effect when the power is turned off and on again. |

| Setting Item | DIP Switch (SW5) | Contents | Setting |
|------------------|---|---|-------------------------------------|
| Hardware setting |  | SW5-1 SW5-2 SW5-3 SW5-4 SW5-5 | Half duplex / full duplex selection |
| | | SW5-7 | Terminating resistance |
| | | | ON: Provided |

TC9-00**CN11**

| Setting Item | Register | Contents | Setting | Remarks |
|------------------|----------|-------------------|---|--|
| Software setting | D12E | Baud rate setting | 0: 9600 bps 1: 19200 bps 2: 38400 bps | Setting changes take effect when the power is turned off and on again. |
| | D12F | Mode setting | 0: Host communication mode | |

Parity: none, data length: 8 bits, stop bit: 2 bits, station No. 1 (fixed)

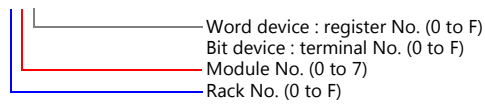
Available Device Memory

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 (universal register 1) | 00H | |
| B (universal register 2) | 01H | |
| X (input relay) | 02H | XW as word device |
| Y (output relay) | 03H | YW as word device |
| R (internal relay) | 04H | RW as word device |
| G (extension internal relay 1) | 05H | GW as word device |
| H (extension internal relay 2) | 06H | HW as word device |
| L (latch relay) | 07H | LW as word device |
| S (shift register) | 08H | SW as word device |
| E (edge relay) | 09H | EW as word device |
| P (timer counter register 1/current value) | 0AH | |
| V (timer counter register 2/set value) | 0BH | |
| T (timer/contact) | 0CH | TW as word device |
| C (counter/contact) | 0DH | CW as word device |
| A (special auxiliary relay) | 0EH | AW as word device |
| U (universal register 3) | 0FH | TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| M (universal register 4) | 10H | TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| Q (universal register 5) | 11H | TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| I (input relay 2) | 12H | IW as word device; supported by TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| O (output relay 2) | 13H | OW as word device; supported by TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| J (extension internal relay 3) | 14H | JW as word device; supported by TCCMWA / TCCMWS / TCCMOA / TC232CA only |
| K (extension internal relay 4) | 15H | KW as word device; supported by TCCMWA / TCCMWS / TCCMOA / TC232CA only |

Address denotations

Ex.) F70



Indirect Device Memory Designation

| | | | | |
|-----|--------------------------------|---|---|---|
| | 15 | 8 | 7 | 0 |
| n+0 | Models | | | |
| n+1 | Address No. (word designation) | | | |
| n+2 | 00 | | | |
| n+3 | 00 | | | |

Address No. (n+1)

- Word device (D, B, V, P, U, M, Q)

| | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----------|---|---|---|------------|---|---|--------------|---|---|---|
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Not used | | | | | Rack No. | | | | Module No. | | | Resister No. | | | |

Ex.) D 052F (Rack No. 5, Module No. 2, Resister No. F)

n+1 = 0000 0010 1010 1111(BIN) = 02AF(HEX)

- Bit device (X, Y, R, G, H, L, S, E, T, C, A, I, O, J, K)

| | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----|---|---|---|----------|---|---|---|------------|---|---|
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Not used | | | | | | | | | Rack No. | | | | Module No. | | |

Ex.) R 0F1A (Rack No. F, Module No. 1, Terminal No. A)

n+1 = 0000 0000 0111 1001(BIN) = 0079(HEX)

Bit designation (n+2)

- When you use the command of BSET/BCLR/BINV, set the terminal No.

Ex.) R 0F1A (Rack No. F, Module No. 1, terminal No. A)

n+2 = 000A(HEX)

17.1.2 Wiring Diagrams

When Connected at CN1:

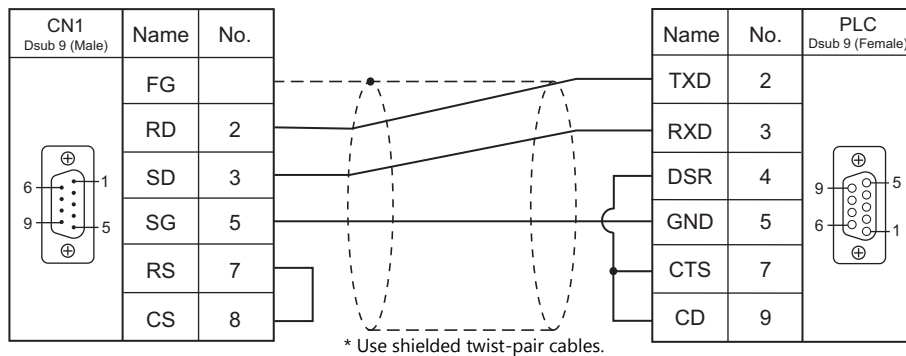


CAUTION

- 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.

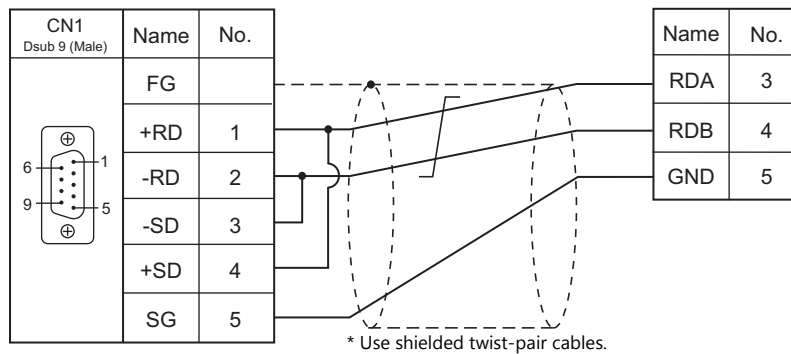
RS-232C

Wiring diagram 1 - C2

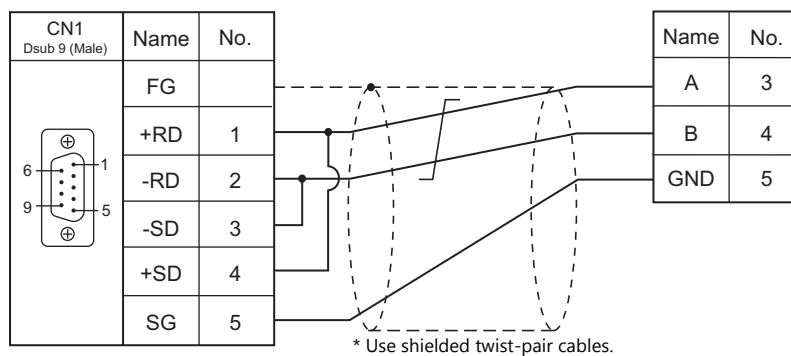


RS-422/RS-485

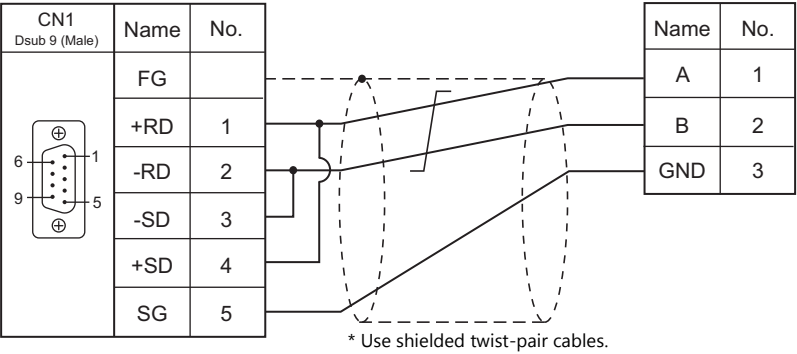
Wiring diagram 1 - C4



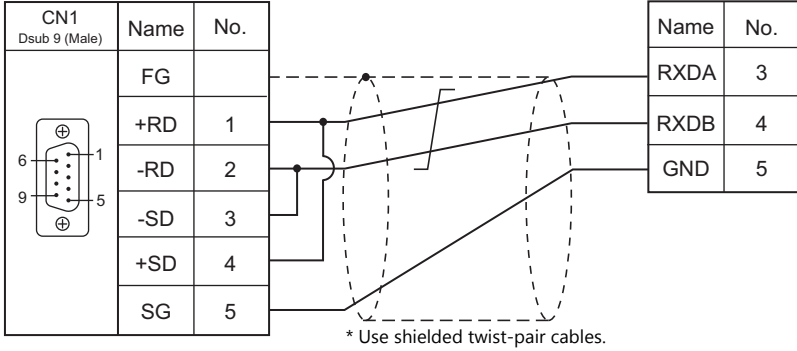
Wiring diagram 2 - C4



Wiring diagram 3 - C4



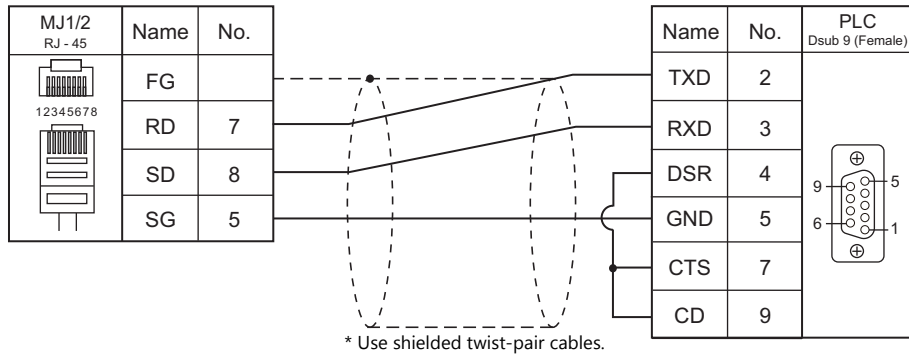
Wiring diagram 4 - C4



When Connected at MJ1/MJ2:

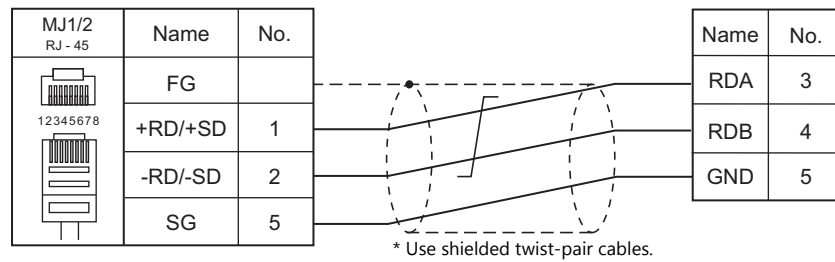
RS-232C

Wiring diagram 1 - M2

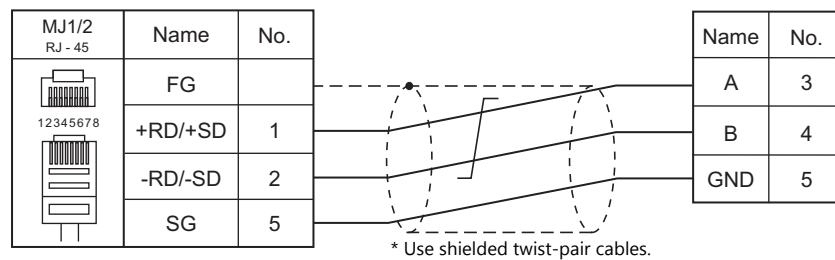


RS-422/RS-485

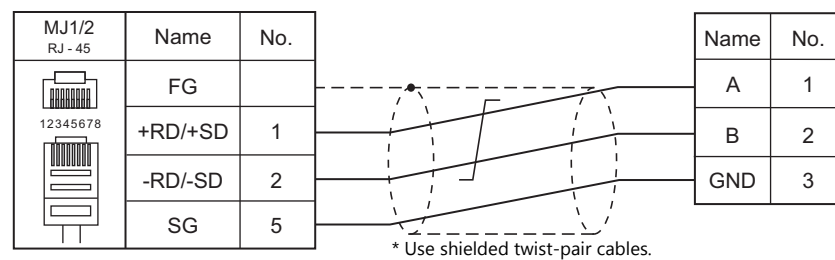
Wiring diagram 1 - M4

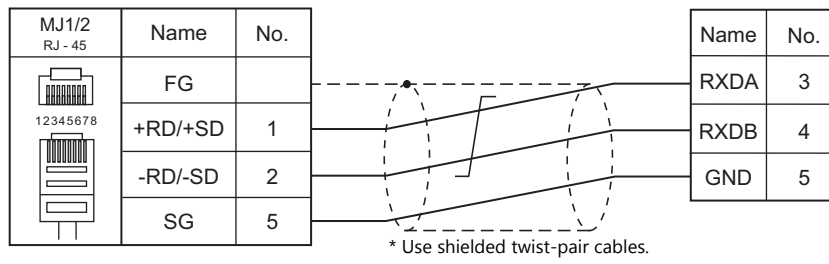


Wiring diagram 2 - M4



Wiring diagram 3 - M4



Wiring diagram 4 - M4

17.2 Temperature Controller/Servo/Inverter Connection

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 | |
| VELCONIC series | NCBOY-80 | VLPSX-xxxPx-xRx | CN14 | 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).

17.2.1 VELCONIC Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1</u> : n | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | <u>4800</u> / 9600 / 19200 / 38400 / 57600 / 115K bps | |
| Parity | <u>None</u> / Odd / Even | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |

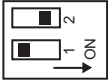
Servo Amplifier

Parameter

The communication parameters can be set using keys attached to the servo amplifier. Set the following parameters under [Communication Setting] of the editor.

| Parameter | Item | Setting | Remarks |
|-----------|-------------------|---|--|
| A.n- | Axis number | 0 to 63 | The setting takes effect when the power is turned off and back on again. |
| PP45 | Baud rate setting | <u>0</u> : 4800 bps 1: 9600 bps 2: 19.2k bps 3: 38.4k bps 4: 57.6k bps 6: 115.2k bps | |
| PP48 | RS-485 setting | <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;"> 0 0 </div> <div> Parity <u>0</u>: None 1: Even 2: Odd </div> </div> <div style="margin-top: 10px;"> Stop bit <u>0</u>: <u>1</u> bit 1: 2 bits </div> | |
| UP01 | Control mode | 23: RS-485 (VLBus-A) | |


Terminating resistance setting (SW1)

| SW1 | Item | Setting | | | | | | | | | |
|---|----------------------------|---|--|----------------------------|-----------------------------------|-------|-----|----|-------|----|----|
|  | SW1-1 SW1-2 | Terminating resistance | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th></th><th>When one unit is connected</th><th>When multiple units are connected</th></tr> </thead> <tbody> <tr> <td>SW1-1</td><td>OFF</td><td>ON</td></tr> <tr> <td>SW1-2</td><td>ON</td><td>ON</td></tr> </tbody> </table> | | When one unit is connected | When multiple units are connected | SW1-1 | OFF | ON | SW1-2 | ON | ON |
| | When one unit is connected | When multiple units are connected | | | | | | | | | |
| SW1-1 | OFF | ON | | | | | | | | | |
| SW1-2 | ON | ON | | | | | | | | | |

Available Device Memory

The macro commands "PLC_CTL" is used for reading and writing data.
For more information on the macro command, see "PLC_CTL" (page 17-13).

| Contents | F0 | F1 (= \$u n) | | | | | | | | | | | | | | | | F2 | |
|--|---------------------|--|--|----|----|----|----------|----|---|-----|---------|---|---|---|--------|---|---|----|---|
| Device memory information designation | 1 - 8 (PLC1 - 8) | n + 7 | Data to read (D1'/D0') * | | | | | | | | | | | | | | | | 7 |
| | | D1' | | | | | | | | D0' | | | | | | | | | |
| | | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| | | Bit 0 to 7: OUT58 to OUT5F : MIN0 to MIN7 (IN0 to IN7: input monitor) Bit 8 to 14: OUT50 to OUT56 : PN0 to PN6 (point number) Bit 15: OUT57 : RPAFIN (respond to parameter change) | | | | | | | | | | | | | | | | | |
| | | n + 8 | Data to read (D3'/D2') * | | | | | | | | | | | | | | | | |
| | | | D3' | | | | | | | | D2' | | | | | | | | |
| | | | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | Bit 0 to 15: OUT40 to OUT4F : FEED0 to FEED15 / CURR0 to CURR15 (number of rotations/current) | | | | | | | | | | | | | | | | |
| | | n + 9 to n + 10 | Data to read (D7'/D6'/D5'/D4') * | | | | | | | | | | | | | | | | |
| | | | D7' | | | | D6' | | | | D5' | | | | D4' | | | | |
| | | | 31 to 24 | | | | 23 to 16 | | | | 15 to 8 | | | | 7 to 0 | | | | |
| | | | Bit 0 to 31: OUT20 to OUT3F : POSI0 to POSI31 (current value) | | | | | | | | | | | | | | | | |
| | | n + 11 | Data to read (D9'/D8') * | | | | | | | | | | | | | | | | |
| | | | D9' | | | | | | | | D8' | | | | | | | | |
| | | | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| | | | Bit 0: OUT18 : LSALM (LS error) Bit 1: OUT19 : TENBL (teaching enabled) Bit 2: OUT1A : BLV (battery voltage drop) Bit 3: OUT1B : WARN (warning) Bit 4: OUT1C : POK (positioning OK) Bit 5: OUT1D : MFEED (rotation monitor) Bit 6: OUT1E : MCURR (current monitor) Bit 7: OUT1F : SSTOP (stopped due to error) Bit 8: OUT10 : SST (servo normal output) Bit 9: OUT11 : SRDY (servo ready) Bit 10: OUT12 : GRUN (servo locked) Bit 11: OUT13 : MZM (home position memorize in progress) Bit 12: OUT14 : HOME (stopped at home position) Bit 13: OUT15 : DEN (operation finish) Bit 14: OUT16 : INP (in position) Bit 15: OUT17 : AFSTP / CLA (temporarily stopped/current control in progress) | | | | | | | | | | | | | | | | |

 Return data: Data stored from servo amplifier to TS2060

* Data must be written before executing reading of data. Specify control values of the servo amplifier for the device memory address of data to write (n + 2 to n + 6). Then data is stored in the device memory address of data to read (n + 7 to n + 11).

17.2.2 Wiring Diagrams

When Connected at CN1:

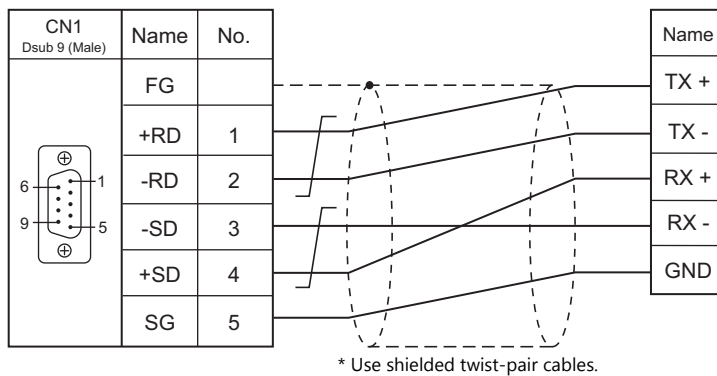


CAUTION

- 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

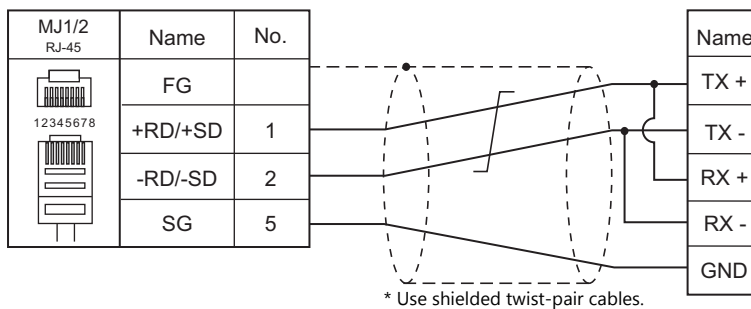
Wiring diagram 1 - C4



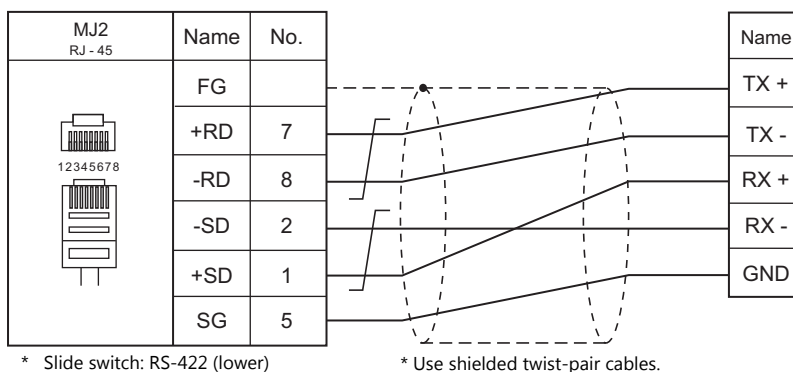
When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4

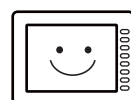


Wiring diagram 2 - M4



MEMO

MONITOUCH



18. TOYO DENKI

18.1 PLC Connection

18.1 PLC 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} | |
| μGPCsx series | TD1PS-xx | NP1L-RS1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | | NP1L-RS2 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | RS-485 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| | SHPC-xxx | SHPC-161 | RS-232C | Wiring diagram 2 - M2 | Wiring diagram 2 - M2 | | |
| | | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 1 - M4 | |
| μGPCsx CPU | TD1PS-xx | CPU port | RS-485 | Hakko Electronics' cable "D9-FU-SPHCPU" ^{*4} | × | Hakko Electronics' cable "MJ2-FU-SPHCPU" ^{*4} | |
| | SHPC-xxx | CPU port | RS-485 | | × | | |

^{*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 selection to the 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-SPHCPU-□M (□ = 2, 3, 5 m)

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit | TCP/IP ^{*1} | UDP/IP | Port No. | Keep Alive ^{*2} | Ladder Transfer ^{*3} |
|-----------------------------|----------|----------------------------|----------------------|--------|------------------------------|--------------------------|-------------------------------|
| μGPCsx series (Ethernet) | TD1PS-xx | NP1L-ET1 | ○ | × | Self port standard No. + 251 | ○ | × |
| | SHPC-xxx | CPU with built-in Ethernet | | | | | |

^{*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.

Network Connection (TS2060i Only)

OPCN-1

| PLC Selection on the Editor | CPU | Unit on PLC | Unit on TS2060i | Ladder Transfer |
|-----------------------------|----------|-------------|-----------------|-----------------|
| μGPCsx (OPCN-1) | TD1PS-xx | NP1L-JP1 | CUR-00 | × |
| | SHPC-xxx | SHPC-193 | 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 VTS2060i | Ladder Transfer |
|-----------------------------|----------|-------------|------------------|-----------------|
| μGPCsx (SX BUS) | TD1PS-xx | - | CUR-06 | × |

18.1.1 μ GPCsx Series

Communication Setting

Editor

Communication setting

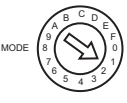
(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---|
| Connection Mode | <u>1:1</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / 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. | <u>0</u> to 31 | |

PLC

NP1L-RS1, NP1L-RS2, NP1L-RS4

Mode setting

| MODE | Setting | RS1, 2, 4 | RS-232C Port | RS-485 Port | Remarks |
|--|---------|-----------|-------------------------|-------------------------|---------|
|  | 0 | | General equipment | General equipment | |
| | 1 | | Loader | General equipment | |
| | 2 | | General equipment | Loader | |
| | 3 | | Loader | Loader | |
| | 4 | | General equipment | General equipment | |
| | 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 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.

SHPC-161

Set communication parameters from "IO allocation" of the PLC loader.

Be sure to match the settings to those made under [Communication Setting] of the editor.

| Item | Setting | Remarks |
|--------------------------|---------|---------|
| Mode | POD | |
| Baud Rate | 38400 | |
| Communication parameters | 8-E-1 | |

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 |
|---------------------------|------|---|
| I (input) | 00H | i as word device |
| O (output) | 01H | o as word device |
| Z (announce) | 02H | z as word device * ¹ |
| G (global) | 03H | g as word device * ¹ |
| gr (global (real number)) | 04H | Real number, available only with even-numbered device memory addresses * ¹ |
| RI (retain) | 05H | ri as word device * ¹ |
| rr (retain (real number)) | 06H | Real number, available only with even-numbered device memory addresses * ¹ |

*¹ The CPU number is required in addition to the device memory type and address. The assigned device memory is indicated as shown below when editing the screen program.

Example: 1:i00000

Address number

Device memory type

CPU No.

Indirect Device Memory Designation

Specify the CPU number in the expansion code.

18.1.2 μ GPCsx CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | RS-422/485 | |
| Baud Rate | 38400 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | <u>0</u> to 31 | |

PLC

NP1PS

No particular setting is necessary on the PLC.

Communication parameters are fixed to 38400 bps (baud rate), 8 bits (data length), 1 bit (stop bit), and even (parity).

SHPC-xxx

Set the baud rate under "TOOL I/F definition" from "IO allocation" of the PLC loader.

| Item | Setting Example | Remarks |
|-----------|-----------------|---------|
| Baud Rate | 38400 bps | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "18.1.1 μ GPCsx Series".

18.1.3 μ GPCsx 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 specifying on the screen program:
[System Setting] → [Hardware Setting] → [Local Port IP Address]

The IP Address Setting dialog box shows the LAN2 tab selected. The 'Set IP' checkbox is checked. The 'Select IP Address from Network Table' checkbox is unchecked, and the 'No.' is set to 0. The IP Address is set to 192.168.0.1. The Subnet Mask is set to 255.255.255.0. The Port No. is set to 10000. The Send Timeout is set to 15 seconds. The Retrials are set to 3. The Device Protect checkbox is unchecked, and the Memory Card Device checkbox is also unchecked. The OK and キャンセル buttons are at the bottom.

- 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." set on the PLC plus 251.

The Target Settings dialog box shows the 'Connect To' dropdown menu set to 'PLC Table'. The 'Setting' dropdown menu is set to '0:192.168.0.1(PLC)'. The 'Use Connection Check Device' checkbox is unchecked. The OK and キャンセル buttons are at the bottom.

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

The PLC Table dialog box shows a table with the following data:

| No. | Port Name | IP Address | Port No. |
|-----|-----------|-------------|----------|
| 0 | PLC | 192.168.0.1 | 507 |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |

The 'Port No.' for the first entry is 507. The Close button is at the bottom right.

When the self port standard number set on the PLC is "256", specify "507" (256 + 251).

Set the IP address, port number 507 and whether or not to use the KeepAlive function of the PLC.

PLC

NP1L-ET1

Set parameters for the Ethernet unit in the system definitions of the PLC loader.

| Item | Setting Example | Remarks |
|--|----------------------|---------|
| Local module IP address (HH.HL.LH.LL) | <u>192.168.0.1</u> | |
| Subnet mask (HH.HL.LH.LL) | <u>255.255.255.0</u> | |
| Self-port Standard No. | <u>256</u> | |

SHPC-xxx

Set Ethernet operation definitions for the CPU from "IO allocation" of the PLC loader.

| Item | Setting Example | Remarks |
|--------------------------|-----------------|---------|
| Ethernet definition | Valid | |
| IP address | 192.168.0.1 | |
| Subnet mask | 255.255.255.0 | |
| PLC command port (num) 1 | 507 | |

Available Device Memory

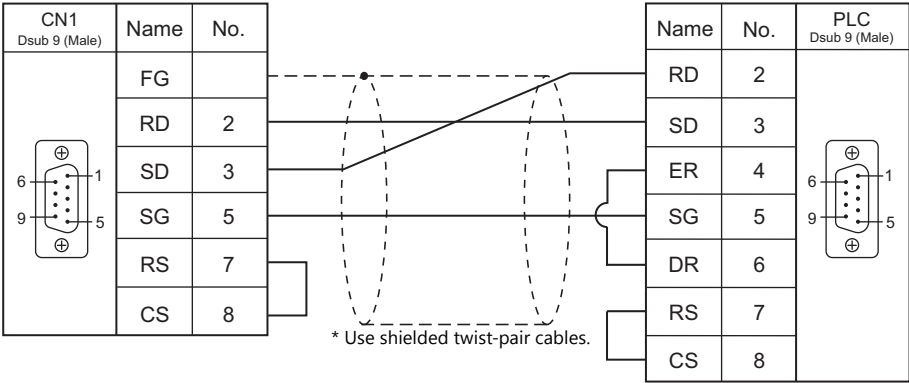
The contents of "Available Device Memory" are the same as those described in "18.1.1 μ GPCsx Series".

18.1.4 Wiring Diagrams

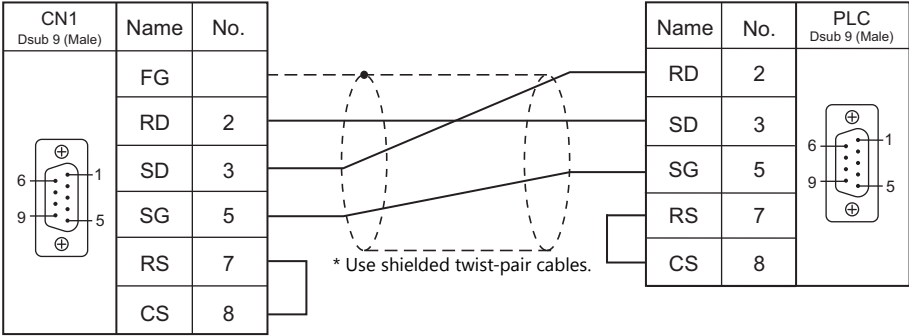
When Connected at CN1:

RS-232C

Wiring diagram 1 - C2

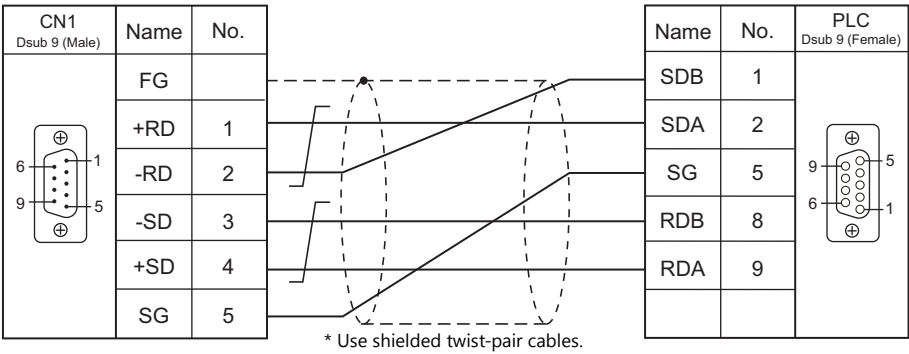


Wiring diagram 2 - C2



RS-422/485

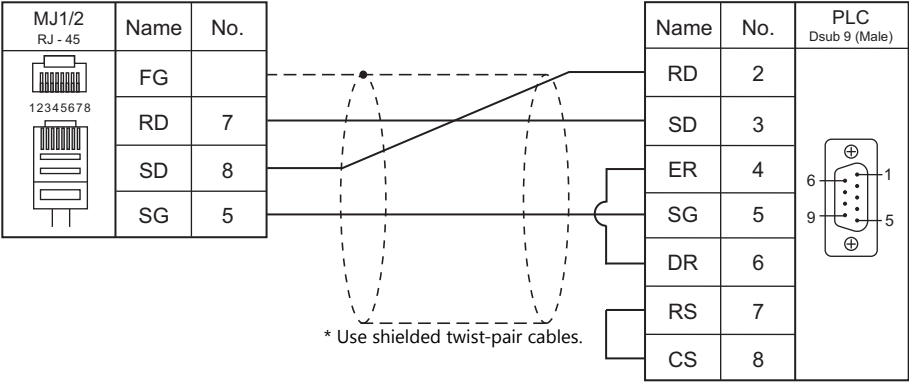
Wiring diagram 1 - C4



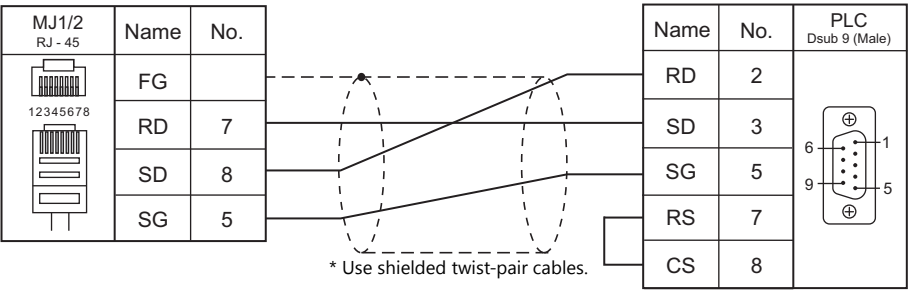
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

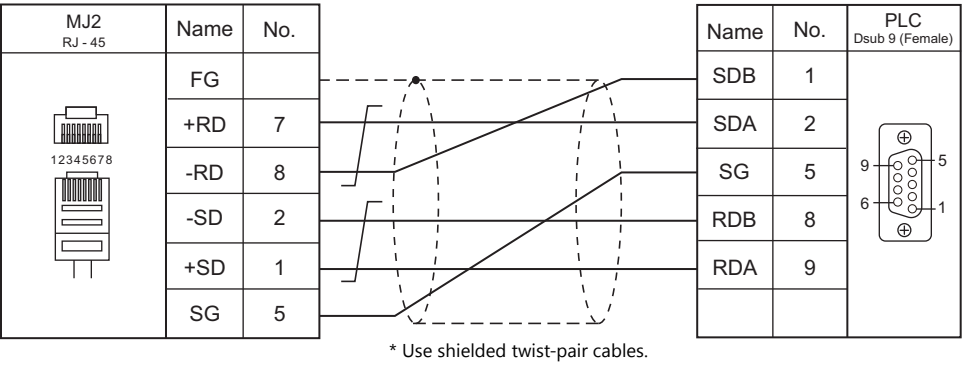


Wiring diagram 2 - M2



RS-422/485

Wiring diagram 1 - M4



19. TURCK

19.1 PLC Connection

19.1 PLC Connection

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | LAN Port | TCP/IP ^{*1} | UDP/IP | Port No. | Ladder Transfer ^{*2} | Lst File |
|--|--------------------------|-------------|----------------------|--------|------------------------|-------------------------------|-----------------|
| BL Series Distributed I/O (MODBUS TCP/IP) | BL20-GW-EN BL20-PG-EN | 10/100 MBit | ○ | × | 502 (Max. 10 units) | × | BL_Mod_Eth. Lst |
| | BL67-GW-EN BL67-PG-EN | 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.

19.1.1 BL Series Distributed I/O (MODBUS TCP/IP)

Communication Setting

Editor

Communication setting

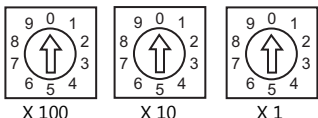
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- 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].

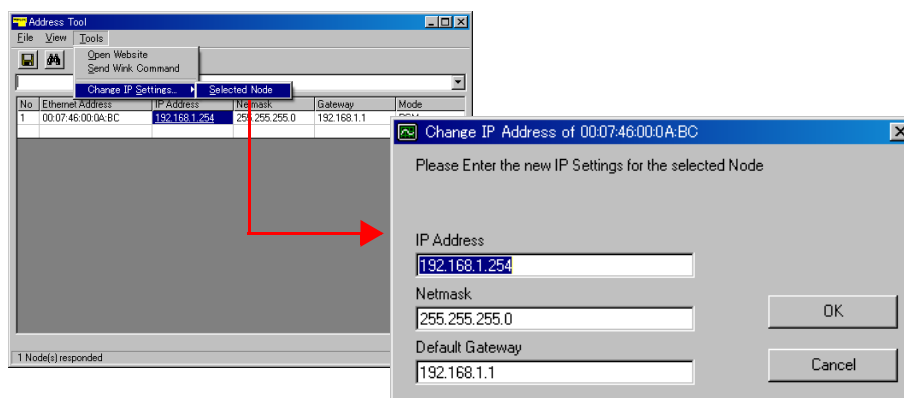
PLC

Configure the IP address using the rotary switch and "I/O Assistant" ladder software.

Rotary switch

| SW | Setting | Remarks |
|---|---|---|
| IP Address Setting  | 000: 192.168.1.254 1 to 254: Specify the least significant byte of the IP address. 500: Specify using I/O Assistant | For 1 to 254, the three high-order bytes enable I/O Assistant settings. |

Address tool (I/O Assistant)



| Item | Setting | Remarks |
|-----------------|---------------------------------------|---------|
| IP Address | Set the IP address of the PLC. | |
| Netmask | Set the subnet mask of the PLC. | |
| Default Gateway | 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 |
|---------------|------|---------|
| --- | 02H | |

20. Ultra Instruments

20.1 PLC Connection

20.1 PLC Connection

Serial Connection

| PLC Selection on the Editor | CPU | Unit/Port | Signal Level | Wiring diagram | | | Ladder Transfer ^{*2} |
|-----------------------------|------------|----------------------------|--------------|-----------------------|-----------------------|--------------|-------------------------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) | |
| UIC CPU (MODBUS ASCII) | UIC-CPU-01 | RS-232C communication port | 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.

20.1.1 UIC CPU (MODBUS ASCII)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1:1</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | RS-232C | |
| Baud Rate | 9600 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |
| Target Port No. | 1 | |

PLC

For more information, refer to the PLC manual issued by the manufacturer.

| Item | Setting | Remarks |
|-----------------|---------|---------------------|
| Baud Rate | 9600 | Settings are fixed. |
| Target Port No. | 1 | |
| Data Length | 8 | |
| Stop Bit | 1 | |
| Parity | None | |

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.

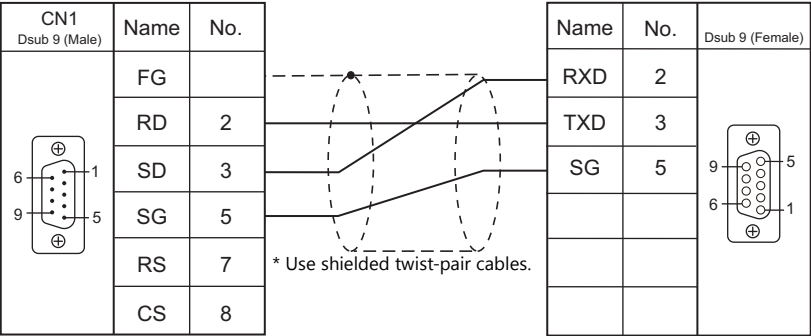
| Device Memory | TYPE | Remarks |
|-------------------|------|-----------|
| D (data memory) | 00H | Read only |
| I (input) | 01H | |
| O (output) | 02H | |
| F (flag) | 03H | |
| S (status memory) | 04H | |

20.1.2 Wiring Diagrams

When Connected at CN1:

RS-232C

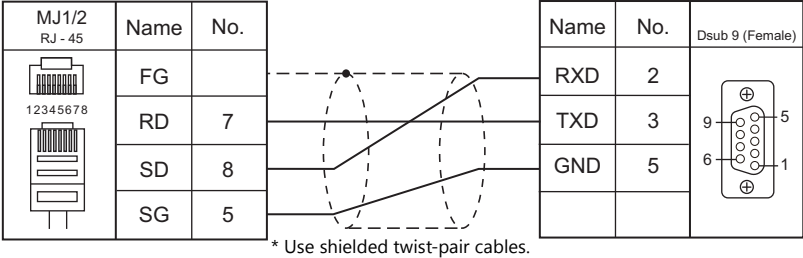
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



MEMO

MONITOUCH



21. ULVAC

21.1 Thermo Controller/Servo/Inverter

21.1 Thermo Controller/Servo/Inverter

Vacuum Gauge

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|-------|---------------------------|--------------|-----------------------|-----------------------|--------------|---------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) | |
| G-TRAN series | SH2-2 | Serial communication port | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | UL_GT .Lst |
| | | | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | SW1-2 | Serial communication port | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - 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).

21.1.1 G-TRAN Series

Communication Setting

Editor


Communication setting

(Underlined setting: default)

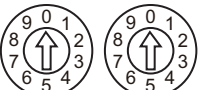
| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | <u>9600</u> / 19200 / 38400 bps | |
| Data Length | 8 bits | |
| Stop Bit | 1 bit | |
| Parity | None | |
| Target Port No. | 0 to 99 | |

SH2

Baud rate




| bps | Setting | Baud Rate | Remarks |
|--|---------|-----------|---------|
|  | 0 | 9600 bps | |
| | 1 | 19200 bps | |
| | 2 | 38400 bps | |

Station number

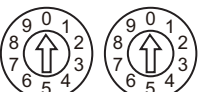
| MSD / LSD | Setting | Remarks |
|---|---------|---|
|  | 0 to 99 | MSD: tens place, LSD: ones place "00" may be allocated to the host for RS-485 communication. |

SW1

Baud rate

| bps | Baud Rate | Remarks |
|---|-----------|---------|
|  | 9600 bps | |
|  | 19200 bps | |
|  | 38400 bps | |

Station number

| MSD / LSD | Setting | Remarks |
|---|---------|---|
|  | 0 to 99 | MSD: tens place, LSD: ones place "00" may be allocated to the host for RS-485 communication. |

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 |
|---|------|--|
| S (status) | 00H | |
| FIL (filament current check) | 01H | Read only, available only for SH2 models |
| T (model, software version acquisition) | 02H | Read only |
| ERR (error details check) | 03H | Read only, available only for SH2 models ^{*1} |

^{*1} Use a character display part.

S (status)

| Address | Name | Remarks |
|---------|--------|---------|
| 0 | Status | |

FIL (filament current check)

| Address | Name | Remarks |
|---------|------------------------|---------|
| 0 | Filament current value | |

T (model, software version acquisition)

| Address | Name | Remarks |
|---------|---|---------|
| 0 | 1st and 2nd bytes of model and software version | |
| 1 | 3rd and 4th bytes of model and software version | |
| 2 | 5th and 6th bytes of model and software version | |
| 3 | 7th byte of model and software version | |

ERR (error details check)


| Address | Name | Remarks |
|---------|---------------|-----------------------|
| 0 | Error details | Character string data |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | F2 |
|---|-----------------------|--------------|--|
| Measurement value and status reading | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 0 |
| | | n + 2 | Measured pressure (significand) ^{*1} |
| | | n + 3 | Measured pressure (power of ten) ^{*1} |
| | | n + 4 | Status |
| Zero point adjustment ^{*2} | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 1 |
| Atmospheric pressure adjustment | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 2 |
| Zero point, atmospheric pressure adjustment reset ^{*2} | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 3 |
| Set point 1 setting value reading | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 4 |
| | | n + 2 | Setting value (significand) ^{*1} |
| | | n + 3 | Setting value (power of ten) ^{*1} |
| Set point 2 setting value reading | 1 to 8 (PLC1 to 8) | n | Station number |
| | | n + 1 | Command: 5 |
| | | n + 2 | Setting value (significand) ^{*1} |
| | | n + 3 | Setting value (power of ten) ^{*1} |

| Contents | F0 | F1 (= \$u n) | | F2 |
|-----------------------------------|-----------------------|--------------|--|----|
| Set point 1 setting value writing | 1 to 8 (PLC1 to 8) | n | Station number | 4 |
| | | n + 1 | Command: 6 | |
| | | n + 2 | Setting value (significand) ^{*1} | |
| | | n + 3 | Setting value (power of ten) ^{*1} | |
| Set point 2 setting value writing | 1 to 8 (PLC1 to 8) | n | Station number | 4 |
| | | n + 1 | Command: 7 | |
| | | n + 2 | Setting value (significand) ^{*1} | |
| | | n + 3 | Setting value (power of ten) ^{*1} | |

 Return data: Data stored from controller to TS2060

^{*1} To read/write the cube of 5.00*10, store "5" (5.00) for "n + 2 (significand)" and "3" for "n + 3 (power of ten)".
Enable 2 decimal places for data display parts to show significands.

^{*2} Available only for SW1 models

21.1.2 Wiring Diagrams

When Connected at CN1:

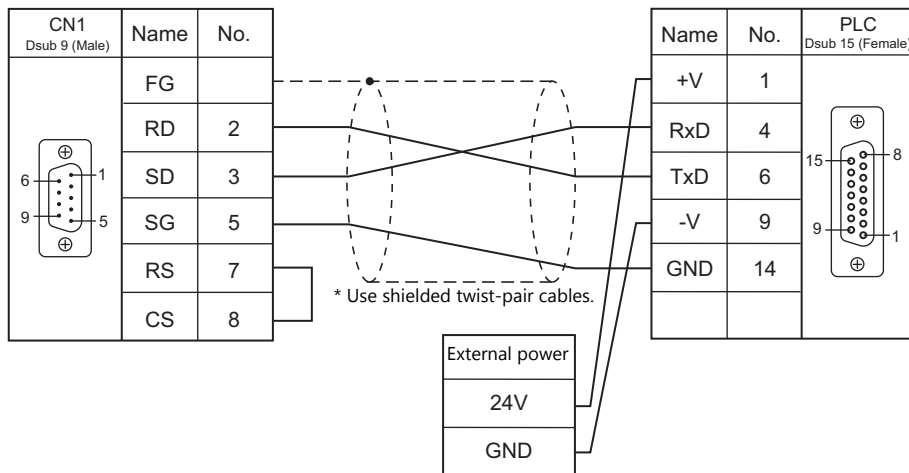


CAUTION

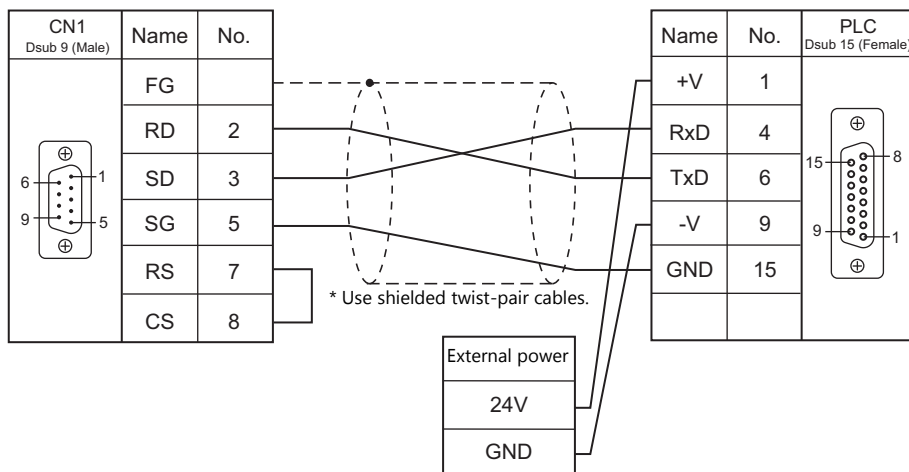
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

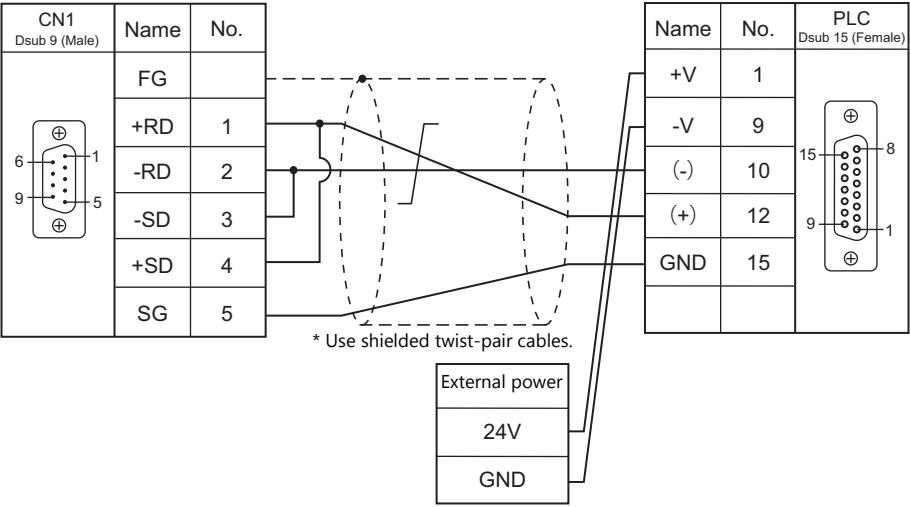


Wiring diagram 2 - C2



RS-422/485

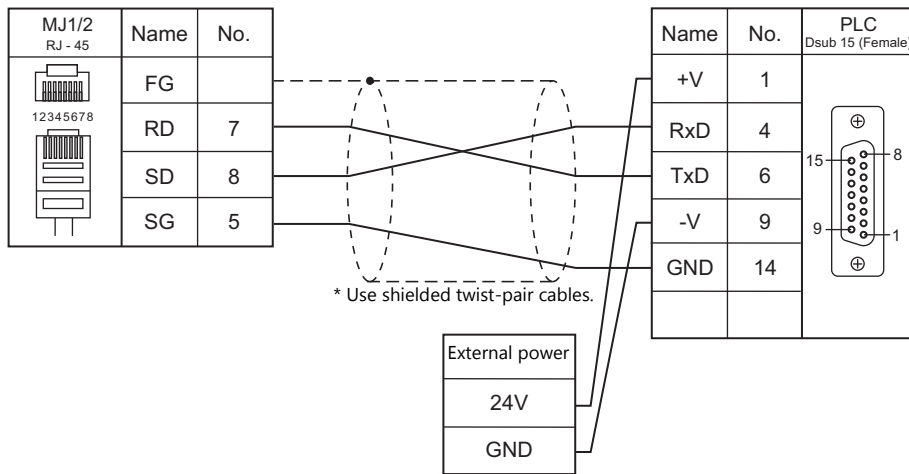
Wiring diagram 1 - C4



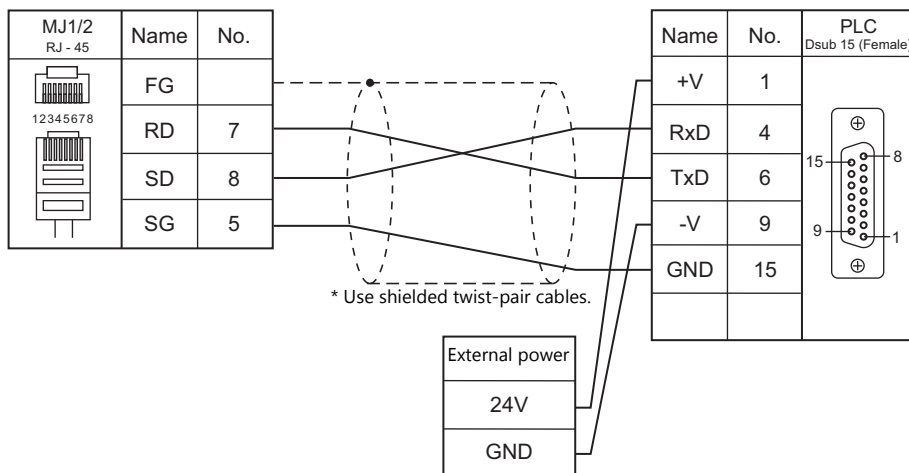
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

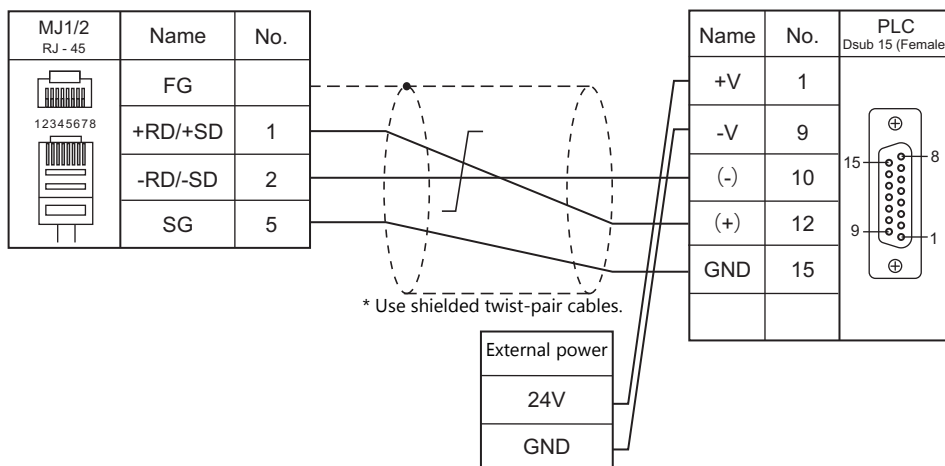


Wiring diagram 2 - M2



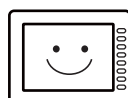
RS-422/485

Wiring diagram 1 - M4



MEMO

MONITOUCH



22. UNIPULSE

22.1 Temperature Controller/Servo/Inverter Connection

22.1 Temperature Controller/Servo/Inverter Connection

Digital Indicator

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|-------|----------------------------|--------------|-----------------------|-----------------------|-----------------------|--------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) *2 | |
| F340A | F340A | Option RS-232C interface | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | UP_F340A.Lst |
| F371 | F371 | Built-in RS-232C interface | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | UP_F371.Lst |
| | | Option RS-485 interface | 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).

Load Cell Indicator

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|-------|--------------------------|--------------|-----------------------|-----------------------|-----------------------|--------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) *2 | |
| F800 | F800 | Option RS-232C interface | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 2 - M2 | | UP_F800.Lst |
| | | Option RS-485 interface | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | |
| F805A | F805A | RS-232C interface | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 2 - M2 | | UP_F805A.Lst |
| | | Option RS-485 interface | RS-485 | Wiring diagram 1 - 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).

Weighing Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|-----------------------------|-------|----------------------------|--------------|-----------------------|-----------------------|-----------------------|--------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 *1 | MJ2 (4-wire) *2 | |
| F720A | F720A | Built-in RS-232C interface | RS-232C | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | UP_F720A.Lst |
| | | Option RS-485 interface | 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).

22.1.1 F340A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

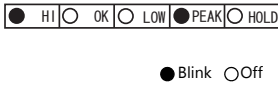
| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | 1 : 1 / <u>1:n</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits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

Digital Indicator

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

Setting mode 4

(Underlined setting: default)

| Parameter | Item | Setting | Setting Example |
|---|--------------------|-------------------------------------|---|
| Mode 4 / RS-232C  | Communication mode | 0: Communication mode 0 * | 02000 Communication mode: 0 Baud rate: 9600 bps Character length: 7 bits Parity bit: Odd Stop bit: 1 bit |
| | Baud rate | 2: 4800 bps 3: <u>9600 bps</u> | |
| | Character length | 0: 7 bits 1: 8 bits | |
| | Parity bit | 0: None 1: <u>Odd</u> 2: Even | |
| | Stop bit | 0: <u>1 bit</u> 1: 2 bits | |

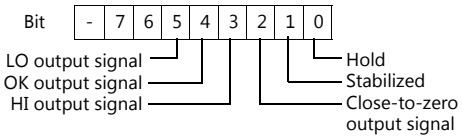
* When establishing a communication with the TS2060, be sure to select "communication mode 0".

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 (specified value, status read out) | 00H | Double-word, read only |
| W (setting value) | 01H | Double-word, W24 and W34: read only |

R (Specified Value, Status Read Out)

| Address | Name | Remarks |
|---------|--|-----------|
| 0 | Specified value read out | Read only |
| 10 | Status read out  | Read only |

W (Setting Value)

| Address | Name | Remarks |
|---------|--|-----------|
| 01 | Upper limit | *1 |
| 02 | Lower limit | *1 |
| 03 | Comparison between upper limit and lower limit | *1 |
| 04 | Hysteresis | *1 |
| 05 | Digital offset | *1 |
| 06 | Close to zero | *1 |
| 11 | Digital filter | *1 |
| 12 | Analog filter | *1 |
| 13 | MD (stabilized time) | *1 |
| 14 | MD (stabilized width) | *1 |
| 15 | Zero tracking (time) | *1 |
| 16 | Zero tracking (width) | *1 |
| 17 | Hold mode | *1 |
| 18 | Automatic print | *1 |
| 19 | Hold value print | *1 |
| 21 | LOCK | |
| 22 | Minimum scale | *2 |
| 23 | Display count | *2 |
| 24 | Applied voltage | Read only |
| 31 | BCD data update rate | *1 |
| 32 | RS-232C | *1 |
| 33 | D/A zero setting | *1 |
| 34 | D/A full scale setting | Read only |

*1 Writing is prohibited when the setting value is "LOCK". The setting value "LOCK" is specified in "setting mode 3" of F340A.

*2 Writing is prohibited when the calibration value is "LOCK". The calibration value "LOCK" is specified in "setting mode 3" of F340A.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|-----------------------|---------------------|--------------|----------------|----|
| Hold | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0 | |
| Hold reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 1 | |
| Digital zero *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 2 | |
| Digital zero reset *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 3 | |
| Print command *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 4 | |

*1 Valid only when "1" is set for the calibration value "LOCK". The calibration value "LOCK" is specified in "setting mode 3" of F340A.

*2 Outputs a print command to SIF.

22.1.2 F371

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicator

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

Built-in RS-232C Interface

Communication setting

(Underlined setting: default)

| Item | Setting | Setting Example |
|--------------------|--------------------------------|----------------------|
| Communication Mode | Communication mode 0 * | Communication mode 0 |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | 9600 bps |
| Character Length | 7 / <u>8</u> bits | 7 bits |
| Stop Bit | <u>1</u> / 2 bits | 1 bit |
| Parity Bit | <u>None</u> / Odd / Even | None |
| Terminator | <u>CR</u> / CR + LF | CR |

* When establishing a communication with the TS2060, be sure to select "communication mode 0".

RS-485 Communication Interface (Option)

Option setting

(Underlined setting: default)

| Item | Setting | Setting Example |
|------------------------|---|-----------------------------|
| Communication Mode | Communication mode 0 * | Communication mode 0 |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | 9600 bps |
| Character Length | 7 / <u>8</u> bits | 7 bits |
| Stop Bit | <u>1</u> / 2 bits | 1 bit |
| Parity Bit | <u>None</u> / Odd / Even | None |
| Terminator | <u>CR</u> / CR + LF | CR |
| ID | <u>0000</u> to 9999 | 0000 |
| Terminating Resistance | With terminating resistance / <u>Without terminating resistance</u> | With terminating resistance |
| Communication Mode | 2-wire / <u>4-wire</u> | 2-wire |

* When establishing a communication with the TS2060, be sure to select "communication mode 0".

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 (specified value, status read out) | 00H | Double-word, read only |
| W (setting value) | 01H | Double-word |
| RG (waveform data read out) | 02H | Double-word, read only |

R (Specified Value, Status Read Out)

| Address | Name | Remarks |
|---------|--------------------------|-----------|
| 0 | Specified value read out | Read only |
| 10 | Status read out | Read only |
| 11 | Status read out | Read only |

W (Setting Value)

| Address | Name | Remarks |
|---------|-------------------------------------|---------|
| 11 | Higher-higher limit | *1 |
| 12 | Higher limit | *1 |
| 13 | Lower limit | *1 |
| 14 | Lower-lower limit | *1 |
| 15 | Hysteresis | *1 |
| 48 | Digital offset setting | *2 |
| 16 | Close to zero | *1 |
| 21 | Hold mode | |
| 81 | Hold range setting | |
| 22 | Hold time | *1 |
| 23 | Auto start level | *1 |
| 24 | Minimum count | |
| 25 | Local maximum value detection level | |
| 26 | Inflection point judgment value | |
| 27 | Detection time A | |
| 28 | Detection time B | |
| 31 | Graph mode | |
| 32 | Interval time | |
| 33 | Trigger level | *1 |
| 34 | Level detection mode | *1 |
| 1F | Setting CH | |
| 44 | Calibration value select | *2 |
| 29 | Hold point shift amount | |

*1 Writing is prohibited when the setting value is "LOCK". The setting value "LOCK" is specified for "motion setting" of F371.

*2 Writing is prohibited when the calibration value is "LOCK". The calibration value "LOCK" is specified for "motion setting" of F371.


RG (Waveform Data Read Out)

| Address | Name | Remarks |
|---------|-------------------|-----------|
| 0 | Waveform data 0 | Read only |
| 1 | Waveform data 1 | Read only |
| : | : | : |
| 199 | Waveform data 199 | Read only |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|---|---------------------|----------------|----------------|----|
| Digital zero | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 2 | |
| Digital zero reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 3 | |
| Print command *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 4 | |
| Waveform hold point data read out *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | Data No. | |
| | | n + 3 to n + 4 | Data | |

 Return data: Data stored from controller to TS2060

*1 Outputs a print command to SIF.

*2 Return data is given when "HOLD" is set to ON on the hold screen of F371 and "START" is selected on the graph screen.

22.1.3 F800

Communication Setting

Editor

Communication setting

(Underlined setting: default)


| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | 1 : 1 / <u>1 : D</u> / Multi-link2 / Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 31 | |
| CR/LF | <u>CR/LF</u> / CR | |

Load Cell Indicator

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

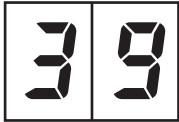
Setting mode 2

(Underlined setting: default)

| Parameter | Item | Setting | Setting Example |
|--|------------------|---|---|
| RS-232C/485 I/F setting  | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps 6: 38400 bps | 30101 Baud rate: 9600 bps Character length: 7 bits Parity bit: Odd Stop bit: 1 bit Terminator: CR + LF |
| | Character length | <u>0: 7 bits</u> 1: 8 bits | |
| | Parity bit | 0: None <u>1: Odd</u> 2: Even | |
| | Stop bit | <u>0: 1 bit</u> 1: 2 bits | |
| | Terminator | 0: CR <u>1: CR + LF</u> | |

Setting mode 3 (only for RS-485 communication)

(Underlined setting: default)

| Parameter | Item | Setting | Setting Example |
|--|------|---------------------|-----------------|
| ID number  | ID * | <u>0000</u> to 9999 | 0001 |

* When multiple units of F800 are connected, the ID number must be set to a value other than "0000".

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 (specified value, status read out) | 00H | Double-word, read only |
| W (setting value) | 01H | Double-word |

R (Specified Value, Status Read Out)

| Address | Name | Remarks |
|---------|---|-----------|
| 0000 | Total weight read out | Read only |
| 0001 | Net weight read out | Read only |
| 0002 | Tare read out | Read only |
| 0010 | Status read out 1 HOLD | Read only |
| 0011 | Status read out 1 Zero error | Read only |
| 0012 | Status read out 1 Stabilized | Read only |
| 0013 | Status read out 1 Taring | Read only |
| 0014 | Status read out 1 Total weight display / net weight display | Read only |
| 0015 | Status read out 1 LOCK / terminal at rear | Read only |
| 0020 | Status read out 2 Bulk supply | Read only |
| 0021 | Status read out 2 Medium supply | Read only |
| 0022 | Status read out 2 Fine supply | Read only |
| 0023 | Status read out 2 Insufficient | Read only |
| 0024 | Status read out 2 Correct amount | Read only |
| 0025 | Status read out 2 Excessive amount | Read only |
| 0026 | Status read out 2 Finish | Read only |
| 0030 | Status read out 3 Close to zero | Read only |
| 0031 | Status read out 3 Lower limit | Read only |
| 0032 | Status read out 3 Upper limit | Read only |
| 0033 | Status read out 3 Discharge | Read only |
| 0040 | Status read out 4 Weight error | Read only |
| 0041 | Status read out 4 Error | Read only |
| 0042 | Status read out 4 Operation mode | Read only |
| 0043 | Status read out 4 Weight value overflow | Read only |
| 0044 | Status read out 4 Calibration error | Read only |
| 0045 | Status read out 4 Sequence error | Read only |
| 0050 | Cumulative count read out | Read only |
| 0051 | Cumulative value read out | Read only |

W (Setting Value)

| Address | Name | Remarks |
|---------|-----------------------------|---------|
| 00 | Code No. | |
| 10 | Bulk supply | *1 |
| 11 | Below the preset amount | *1 |
| 12 | Preset amount | *1 |
| 13 | Excessive amount | *1 |
| 14 | Insufficient | *1 |
| 15 | Gap | *1 |
| 16 | Automatic gap control value | *1, *2 |
| 17 | Offset supply time | *1, *2 |
| 20 | Timer | *2 |
| 21 | Comparison prohibit time | *2 |
| 22 | Upper limit | *2 |
| 23 | Lower limit | *2 |
| 24 | Close to zero | |
| 25 | Taring setting | |
| 26 | AZ count | *2 |
| 27 | Judgment count | *2 |
| 28 | Discharge time | *2 |
| 29 | Weighing start time | |

| Address | Name | Remarks |
|---------|-----------------------------------|---------------|
| 30 | Sequence mode | *2 |
| 31 | Weighing function 1 | *2 |
| 32 | Weighing function 2 | *2 |
| 33 | Weighing function 3 | *2 |
| 34 | Function key prohibited | *2 |
| 35 | Filter | *2 |
| 36 | Motion detection | *2 |
| 37 | Zero tracking | *2 |
| 40 | Weight value | *2 |
| 41 | Maximum weighing value | *2 |
| 42 | Minimum scale | *2 |
| 43 | Net weight excessive | *2 |
| 44 | Total weight excessive | *2 |
| 45 | Function select | *2 |
| 46 | Gravitational acceleration offset | *2 |
| 50 | Maximum weight | *1, read only |
| 51 | Minimum weight | *1, read only |
| 52 | Maximum - minimum | *1, read only |
| 53 | Average weight | *1, read only |
| 54 | Population standard deviation | *1, read only |
| 55 | Sample standard deviation | *1, read only |

*1 Set for each code.

*2 Writing is prohibited when "LOCK" is set.


"LOCK" can be set by short-circuiting the LOCK terminal on the terminal block at the rear of F800. For more information, refer to the instruction manual of F800.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|--------------------------------------|---------------------|---------------|----------------|----|
| Zero calibration *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | Error result | |
| Span calibration *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | Error result | |
| Switching to total weight display *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 2 | |
| Switching to net weight display *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 3 | |
| Taring | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 4 | |
| Taring reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 5 | |
| Digital zero | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 6 | |
| Digital zero reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 7 | |
| Totalize command | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 8 | |
| Cumulative data clear | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 9 | |
| Cumulative data all clear | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 10 | |
| Cumulative data read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | Code No. | |
| | | n + 3 - n + 4 | Weighing value | |
| Weighing data read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | Code No. | |
| | | n + 3 - n + 4 | Weighing value | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|-------------------------------|---------------------|--------------|---------------------|----|
| Time-out change ^{*3} | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | Time-out value (ms) | |

 Return data: Data stored from controller to TS2060

- *1 Calibration is performed based on the value at W40, W41 and W42.
Since a response is given after completion of the calibration on F800, it takes time before the receipt of a response after the calibration command is executed. Before executing the calibration command, execute the time-out change command.
- *2 The display cannot be changed when "1: external input mode" is set for "total weight/net weight display change" of extended function 1 in setting mode 4 of F800.
- *3 Used to change the time-out time of TS2060 to apply when the PLC_CTL command is used. It takes time before a response is sent back after the calibration command is executed. Set a time-out time according to your use environment. The default value is "0", and the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] dialog is applied.

22.1.4 F805A

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 | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 31 | |
| CR/LF | <u>CR/LF</u> / CR | |

Load Cell Indicator

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

Built-in RS-232C Interface

Communication setting

(Underlined setting: default)

| Setting Items | Setting | Remarks |
|---------------------|--------------------------------|---------|
| Baud rate selection | 4800 / <u>9600</u> / 19200 bps | |
| Character length | <u>7</u> / 8 bits | |
| Parity bit | None / <u>Odd</u> / Even | |
| Stop bit | <u>1</u> / 2 bits | |
| Terminator | CR / <u>CR + LF</u> | |

RS-485 Communication Interface (Option)


Setting mode 4

(Underlined setting: default)

| Item | Setting | Remarks |
|------------------|--------------------------------|---------|
| Baud rate | 4800 / <u>9600</u> / 19200 bps | |
| Character length | <u>7</u> / 8 bits | |
| Parity bit | None / <u>Odd</u> / Even | |
| Stop bit | <u>1</u> / 2 bits | |
| Terminator | CR / <u>CR + LF</u> | |
| ID * | <u>0</u> - 99 | |

* When multiple units of F805A are connected, the ID number must be set to a value other than "0".

Rt switch

| Rt switch | OFF | ON | Remarks |
|---|----------------------------|---------------------------|---------|
| Rt ON  OFF | Terminating resistance OFF | Terminating resistance ON | |

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 (specified value / status read out) | 00H | Double-word, read only |
| W (setting value) | 01H | Double-word |

R (Specified Value / Status Read Out)

| Address | Name | Remarks |
|---------|---|-----------|
| 0000 | Total weight read out | Read only |
| 0001 | Net weight read out | Read only |
| 0002 | Tare read out | Read only |
| 0010 | Status read out 1 Hold | Read only |
| 0011 | Status read out 1 Zero error | Read only |
| 0012 | Status read out 1 Stabilized | Read only |
| 0013 | Status read out 1 Taring | Read only |
| 0014 | Status read out 1 Weight display | Read only |
| 0015 | Status read out 1 LOCK / terminal at rear | Read only |
| 0016 | Status read out 1 LOCK (soft) | Read only |
| 0020 | Status read out 2 Bulk supply | Read only |
| 0021 | Status read out 2 Medium supply | Read only |
| 0022 | Status read out 2 Fine supply | Read only |
| 0023 | Status read out 2 Insufficient | Read only |
| 0024 | Status read out 2 Correct amount | Read only |
| 0025 | Status read out 2 Excessive amount | Read only |
| 0026 | Status read out 2 Finish | Read only |
| 0030 | Status read out 3 Close to zero | Read only |
| 0031 | Status read out 3 Lower limit | Read only |
| 0032 | Status read out 3 Upper limit | Read only |
| 0033 | Status read out 3 Discharge | Read only |
| 0034 | Status read out 3 Total final | Read only |
| 0040 | Status read out 4 Weight error | Read only |
| 0041 | Status read out 4 Error | Read only |
| 0042 | Status read out 4 Operation mode | Read only |
| 0043 | Status read out 4 Weight value overflow | Read only |
| 0044 | Status read out 4 Calibration error | Read only |
| 0045 | Status read out 4 Sequence error | Read only |
| 0050 | Cumulative count read out | Read only |
| 0051 | Cumulative value read out | Read only |

W (Setting Value)

| Address | Name | Remarks |
|---------|--|---------|
| 0000 | Code No. | *1 |
| 0100 | Bulk supply | *1 |
| 0110 | Below the preset amount | *1 |
| 0120 | Preset amount | *1 |
| 0130 | Excessive amount | *1 |
| 0140 | Insufficient | *1 |
| 0150 | Gap | *1 |
| 0160 | Automatic gap control value | *1, *2 |
| 0170 | Offset supply time | *1, *2 |
| 0180 | Total comparison selection | *1 |
| 0190 | Total final | *1 |
| 01A0 | Total times | *1 |
| 0200 | With or without upper and lower limit comparison | *2 |
| 0210 | Comparison between upper limit and lower limit | *2 |
| 0220 | Upper limit | *2 |
| 0230 | Lower limit | *2 |
| 0240 | With or without close to zero comparison | *2 |

| Address | Name | Remarks |
|---------|--|-----------|
| 0250 | Close to zero | *2 |
| 0260 | With or without comparison between excess and insufficient | *2 |
| 0270 | Comparison between excess and insufficient mode | *2 |
| 0280 | Completion signal output mode | *2 |
| 0290 | Completion output time | *2 |
| 02A0 | Judgment time | *2 |
| 02B0 | Comparison prohibit time | *2 |
| 02C0 | Cut-out control mode | *2 |
| 02D0 | Automatic gap correction factor | *2 |
| 02E0 | With or without automatic gap correction | *2 |
| 02F0 | Average times for automatic gap correction | *2 |
| 0300 | Display count | *2 |
| 0310 | Digital filter | *2 |
| 0320 | Analog filter | *2 |
| 0330 | Stabilized time filter | *2 |
| 0331 | MD mode | *2 |
| 0340 | MD time | *2 |
| 0350 | MD width | *2 |
| 0360 | ZT time | *2 |
| 0370 | ZT width | *2 |
| 0380 | DZ control value | *2 |
| 0400 | Sequence mode | *2 |
| 0401 | Near zero check at start | *2 |
| 0402 | Weight value check at start | *2 |
| 0403 | With or without offset supply | *2 |
| 0404 | Discharge gate control | *2 |
| 0410 | Judgment count | *2 |
| 0420 | AZ count | *2 |
| 0430 | Discharge time | *2 |
| 0440 | START/STOP key prohibit | *2 |
| 0500 | Digital taring | *2 |
| 0501 | G/N display switch | *2 |
| 0502 | Sign for discharge control | *2 |
| 0503 | TARE/DZ key prohibit | *2 |
| 0504 | GROSS/NET key prohibit | *2 |
| 0510 | Taring setting | *2 |
| 0520 | Automatic totalize command | *2 |
| 0530 | Weighing code specification | *2 |
| 0540 | Setting code specification | *2 |
| 0550 | Setting per code key prohibit | *2 |
| 0600 | Weight value | *3 |
| 0610 | Maximum weighing value | *3 |
| 0620 | Minimum scale | *3 |
| 0630 | Net weight excessive | *2 |
| 0640 | Total weight excessive | *2 |
| 0650 | Decimal place | *3 |
| 0660 | Unit setting | *2 |
| 0670 | 1/4 memory | *2 |
| 0680 | Gravitational acceleration offset | *2 |
| 0690 | Applied voltage | *3 |
| 0700 | Graphic mode | *2 |
| 0710 | Trigger level | *2 |
| 0720 | X (time) axis end point | *2 |
| 0730 | Y (weight) axis start point | *2 |
| 0740 | Z (weight) axis end point | *2 |
| 0800 | Average weight | Read only |
| 0810 | Maximum weight | Read only |
| 0820 | Minimum weight | Read only |
| 0830 | Population standard deviation | Read only |
| 0840 | Sample standard deviation | Read only |
| 0850 | Maximum - minimum | Read only |
| 0900 | LOCK (soft) | |
| 0910 | Language | *2 |

| Address | Name | Remarks |
|---------|--------------------------|---------|
| 0920 | System speed | *2 |
| 0930 | Backlight ON | *2 |
| 0940 | Backlight OFF | *2 |
| 0A00 | Totalize command | *2 |
| 0A01 | One-touch taring | *2 |
| 0A02 | Taring range | *2 |
| 0A03 | Taring display | *2 |
| 0A04 | Digital taring expansion | *2 |
| 0A10 | SIFI ID | *2 |
| 0A20 | Overscale display | *2 |
| 0B00 | D/A output mode | *2 |
| 0B10 | D/A zero output | *2 |
| 0B20 | D/A full scale | *2 |
| 0B60 | Data update rate | *2 |
| 0B70 | D/A output ch | *2 |

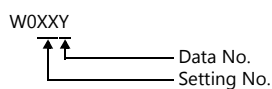
*1 Specify for each code.

*2 Writing is prohibited when "LOCK (soft)" is set.

*3 Writing is prohibited when "LOCK (soft, hard)" is set.

Address denotations

The address denotation of the device memory W is shown below.




PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Descriptions | F0 | F1 (= \$u n) | | F2 |
|-----------------------------|---------------------|---------------|----------------|----|
| Zero calibration | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | Error result | |
| Span calibration | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | Error result | |
| Display change total weight | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 2 | |
| Display change net weight | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 3 | |
| Taring | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 4 | |
| Taring reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 5 | |
| Digital zero | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 6 | |
| Digital zero reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 7 | |
| Totalize command | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 8 | |
| Cumulative data clear | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 9 | |
| Cumulative data all clear | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 10 | |
| Cumulative data read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | Code No. | |
| | | n + 3 - n + 4 | Weighing value | |

| Descriptions | F0 | F1 (= \$u n) | | F2 |
|------------------------|---------------------|---------------|---------------------|----|
| Weighing data read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | Code No. | |
| | | n + 3 - n + 4 | Weighing value | |
| Time-out change *1 | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | Time-out value (ms) | |
| Backlight ON | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 14 | |

 Return data: Data stored from controller to TS2060

*1 Used to change the time-out time of the TS2060 to apply when the PLC_CTL command is used. It takes time before a response is sent back after the calibration command is executed. Set a time-out time according to your use environment. The default value is "0", and the value varies according to the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] dialog.

22.1.5 F720A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

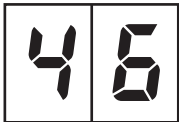
Weighing Controller

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

Built-in RS-232C Interface

Setting mode 4

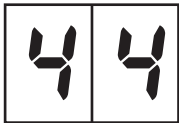
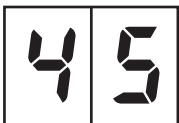
(Underlined setting: default)

| Parameter | Item | Setting | Setting Example |
|--|--------------------|--|--|
| RS-232C I/F setting  | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps 5: 38400 bps | 30101 Baud rate: 9600 bps Character length: 7 bits Parity bit: Odd Stop bit: 1 bit Communication mode: Communication mode 0 (CR + LF) |
| | Character length | <u>0: 7 bits</u> 1: 8 bits | |
| | Parity bit | 0: None <u>1: Odd</u> 2: Even | |
| | Stop bit | <u>0: 1 bit</u> 1: 2 bits | |
| | Communication mode | 0: Communication mode 0 (CR) <u>1: Communication mode 0 (CR + LF)</u> | |

RS-485 Communication Interface (Option)

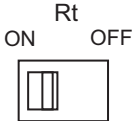
Setting mode 4

(Underlined setting: default)

| Parameter | Item | Setting | Setting Example |
|---|------------------|---|---|
| RS-485 I/F setting  | Baud rate | 2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps 5: 38400 bps | 30101 Baud rate: 9600 bps Character length: 7 bits Parity bit: Odd Stop bit: 1 bit Terminator: CR + LF |
| | Character length | <u>0: 7 bits</u> 1: 8 bits | |
| | Parity bit | 0: None <u>1: Odd</u> 2: Even | |
| | Stop bit | <u>0: 1 bit</u> 1: 2 bits | |
| | Terminator | 0: CR <u>1: CR + LF</u> | |
| ID setting  | ID * | <u>0000</u> to 9999 | 0001 |

* When multiple units of F720A are connected, the ID number must be set to a value other than "0000".

Rt switch

| Rt switch | OFF | ON | Remarks |
|---|----------------------------|---------------------------|---------|
|  | Terminating resistance OFF | Terminating resistance ON | |

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 (specified value, status read out) | 00H | Double-word, read only |
| W (setting value) | 01H | Double-word |

R (Specified Value, Status Read Out)

| Address | Name | Remarks |
|---------|--------------------------------------|-----------|
| 0000 | Total weight read out | Read only |
| 0001 | Net weight read out | Read only |
| 0002 | Tare read out | Read only |
| 0010 | Status read out 1 Hold | Read only |
| 0011 | Status read out 1 Zero error | Read only |
| 0012 | Status read out 1 Stabilized | Read only |
| 0013 | Status read out 1 Taring | Read only |
| 0014 | Status read out 1 Weight display | Read only |
| 0015 | Status read out 1 Rear terminal LOCK | Read only |
| 0020 | Status read out 2 Bulk supply | Read only |
| 0021 | Status read out 2 Medium supply | Read only |
| 0022 | Status read out 2 Fine supply | Read only |
| 0023 | Status read out 2 Insufficient | Read only |
| 0024 | Status read out 2 Correct amount | Read only |
| 0025 | Status read out 2 Excessive amount | Read only |
| 0026 | Status read out 2 Finish | Read only |
| 0030 | Status read out 3 Close to zero | Read only |

| Address | Name | Remarks |
|---------|---|-----------|
| 0031 | Status read out 3 Lower limit | Read only |
| 0032 | Status read out 3 Upper limit | Read only |
| 0040 | Status read out 4 Weight error | Read only |
| 0041 | Status read out 4 Error | Read only |
| 0042 | Status read out 4 Operation mode | Read only |
| 0043 | Status read out 4 Weight value overflow | Read only |
| 0044 | Status read out 4 Calibration error | Read only |
| 0045 | Status read out 4 Sequence error | Read only |
| 0050 | Cumulative count read out | Read only |
| 0051 | Cumulative value read out | Read only |

W (Setting Value)

| Address | Name | Remarks |
|---------|--|-----------|
| 10 | Bulk supply | *1 |
| 11 | Below the preset amount | *1 |
| 12 | Preset amount | *1 |
| 13 | Excessive amount | *1 |
| 14 | Insufficient | *1 |
| 15 | Gap | *1 |
| 16 | Automatic gap control value | *2 |
| 17 | Offset supply time | *2 |
| 20 | Judgment time | *2 |
| 21 | Comparison prohibit time | *2 |
| 22 | Upper limit | *1 |
| 23 | Lower limit | *1 |
| 24 | Close to zero | *1 |
| 25 | Taring setting | *1 |
| 26 | AZ count | *2 |
| 27 | Judgment count | *2 |
| 28 | Completion output time | *2 |
| 30 | Sequence mode | *2 |
| 31 | Weighing function 1 | *2 |
| 32 | Weighing function 2 | *2 |
| 33 | Weighing function 3 | *2 |
| 34 | Function key prohibited | *2 |
| 35 | Analog filter | *2 |
| 36 | Digital filter | *2 |
| 37 | Motion detection | *2 |
| 38 | Zero tracking time | *2 |
| 39 | Zero tracking width | *2 |
| 3A | Setting LOCK | |
| 40 | Weight value | *2, *3 |
| 41 | Maximum weighing value | *2, *3 |
| 42 | Minimum scale | *2, *3 |
| 43 | Net weight excessive | *2, *3 |
| 44 | Total weight excessive | *2, *3 |
| 45 | Function select | *2 |
| 46 | Gravitational acceleration offset (area number input) | *2 |
| 47 | DZ control value | *2, *3 |
| 48 | Gravitational acceleration offset (acceleration input) | *2 |
| 50 | Extended function select 1 | *2 |
| 51 | Taring function limitation | *2 |
| 52 | D/A output mode | *2 |
| 53 | D/A zero output setting | *2 |
| 54 | D/A full scale | *2 |
| 55 | Input select | *2 |
| 56 | Output select | *2 |
| 80 | Average weight | Read only |
| 81 | Maximum | Read only |
| 82 | Minimum | Read only |
| 83 | Population standard deviation | Read only |


| Address | Name | Remarks |
|---------|---------------------------|-----------|
| 84 | Sample standard deviation | Read only |
| 85 | Maximum - minimum | Read only |
| 86 | Cumulative count | Read only |
| 87 | Latest cumulative data | Read only |

- *1 Writing is prohibited when LOCK1 is ON. "LOCK1" can be set at "setting value LOCK" in setting mode 4 of F720A.
 *2 Writing is prohibited when LOCK2 is ON. "LOCK2" can be set at "setting value LOCK" in setting mode 4 of F720A.
 *3 Writing is prohibited when the LOCK switch is set in the ON position. The LOCK switch is provided at the rear of F720A.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|--------------------------------------|---------------------|---------------|---------------------|----|
| Zero calibration *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | Error result | |
| Span calibration *1 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | Error result | |
| Switching to total weight display *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 2 | |
| Switching to net weight display *2 | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 3 | |
| Taring | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 4 | |
| Taring reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 5 | |
| Digital zero | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 6 | |
| Digital zero reset | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 7 | |
| Totalize command | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 8 | |
| Cumulative data clear | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 9 | |
| Cumulative data read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | Fixed value 00 | |
| | | n + 3 - n + 4 | Weighing value | |
| Time-out change *3 | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | Time-out value (ms) | |

 Return data: Data stored from controller to TS2060

- *1 Calibration is performed based on the value at W40, W41 and W42.
 Since a response is given after completion of the calibration on F720A, it takes time before the receipt of a response after the calibration command is executed. Before executing the calibration command, execute the time-out change command.
 *2 The display cannot be changed when "1: external input mode" is set for "total weight/net weight display change" of extended function 1 in setting mode 4 of F720A.
 *3 Used to change the time-out time of TS2060 to apply when the PLC_CTL command is used. It takes time before a response is sent back after the calibration command is executed. Set a time-out time according to your use environment. The default value is "0", and the value varies according to the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] dialog.

22.1.6 Wiring Diagrams

When Connected at CN1:

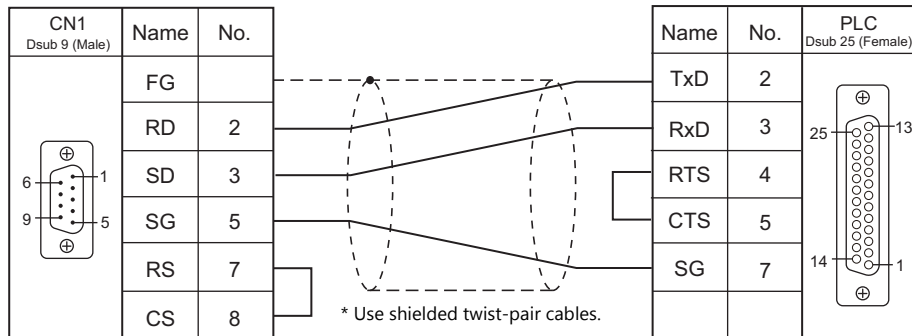


CAUTION

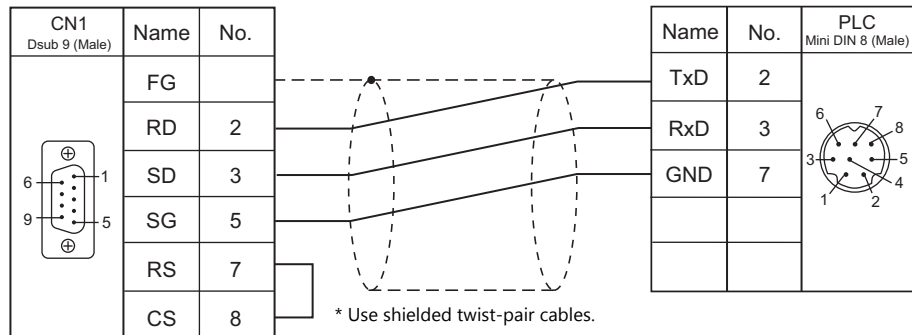
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

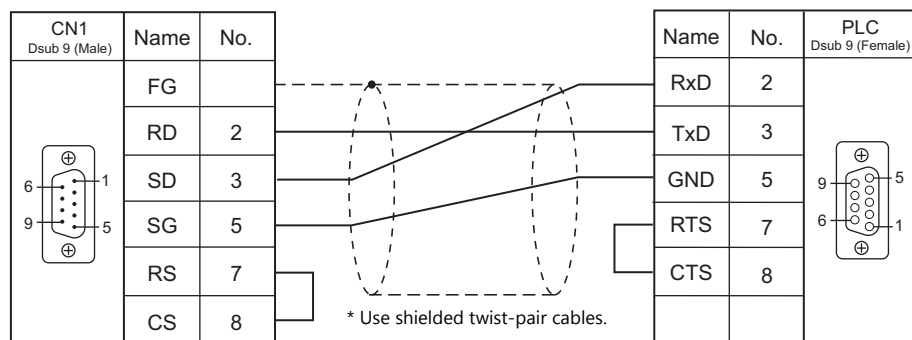
Wiring diagram 1 - C2

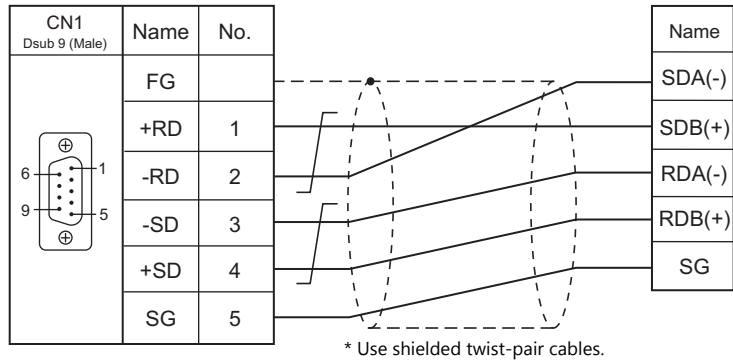
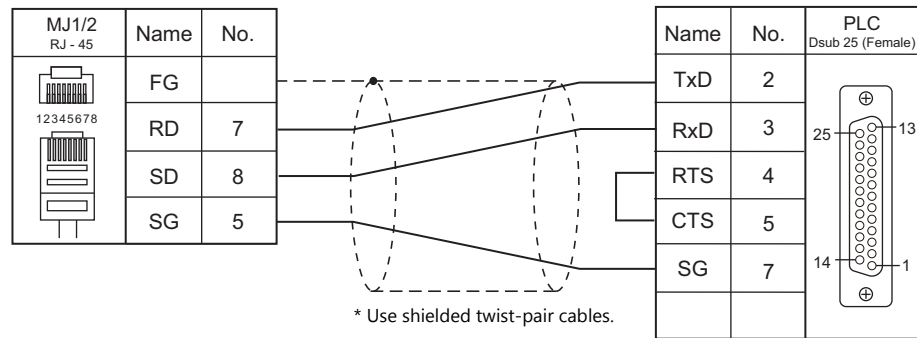
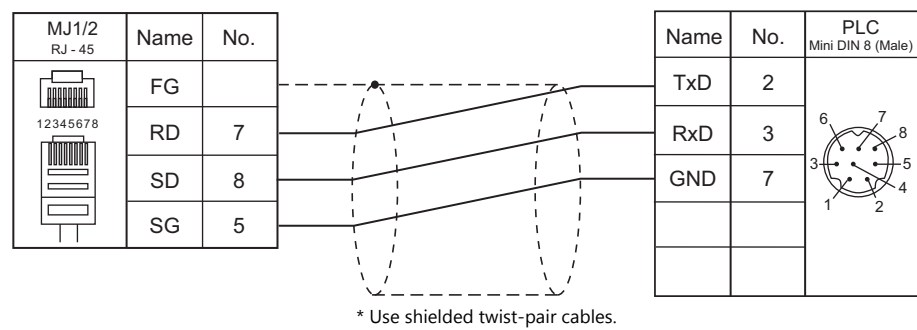


Wiring diagram 2 - C2

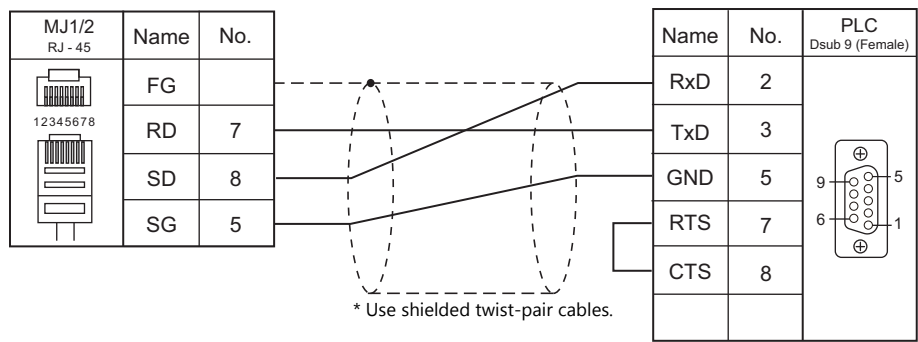


Wiring diagram 3 - C2



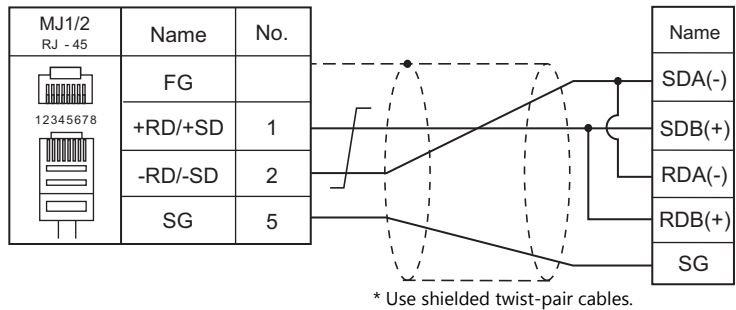
RS-485**Wiring diagram 1 - C4****When Connected at MJ1/MJ2:****RS-232C****Wiring diagram 1 - M2****Wiring diagram 2 - M2**

Wiring diagram 3 - M2

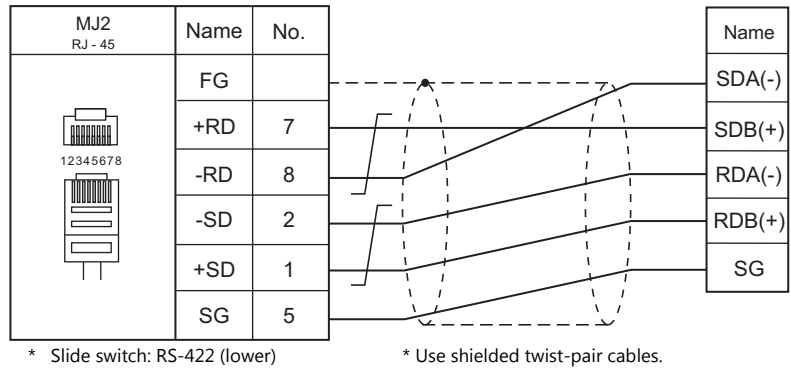


RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



23. UNITRONICS

23.1 PLC Connection

23.1 PLC Connection

Serial Connection

| PLC Selection on the Editor | PLC | Port | Signal Level | Connection | | | Ladder Transfer ^{*2} |
|--------------------------------------|--|-----------|--------------|-----------------------|-----------------------|--------------|-------------------------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) | |
| M90/M91/ Vision Series (ASCII) | M90 | COM1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | M91 V130 V350-35-R2 | COM1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | V230 V260 V280 V290 V530 | COM1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | COM2 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | V120 V290-19-C30BT/40BT V560 V570 V1040 V1210 | COM1/COM2 | 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.

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | Model | Unit | TCP/IP ^{*1} | UDP/IP | Port No. | Ladder Transfer ^{*2} |
|--|--|------------------------|----------------------|--------|--|-------------------------------|
| Vision Series (ASCII Ethernet TCP/IP) | V230 V260 V280 V290 V530 V560 V570 V1040 V1210 | V200-19-ET1 | ○ | × | 0 to 65535 (Default: 20256) (Max. 4 units) | × |
| | V130 V350 | V100-17-ET2 | | | | |
| | V1040 V1210 | Built-in Ethernet port | | | | |

*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 M90/M91/Vision Series (ASCII)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---|
| Connection Mode | <u>1:1</u> / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / 19200 / 38400 / <u>57600</u> / 115K bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 0 to 31 | Specify "0" for RS-422/485 communication. On the PLC side, specify a number from "64" to "127". |

PLC

Parameter

Parameters must be set in Information Mode or by creating a ladder program using the software "VisiLogic". For more information, refer to the instruction manual issued by UNITRONICS.

When using RS-485 communication, be sure to create the ladder program.

M91

RS232/RS485 Jumper Setting

(Underlined setting: default)

| Jumper Setting | | Item | Setting | | | Remarks | | | | | | | | |
|---|------------------------------|---|---|-------|-------|----------|-------|---|--------------|-------|---|---|--|--|
| <div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div><div>A</div><div>B</div></div> | No. 1 No. 2 | Signal level | <table><tr><td></td><td>No. 1</td><td>No. 2</td></tr><tr><td>RS232</td><td>A</td><td>A</td></tr><tr><td>RS485</td><td>B</td><td>B</td></tr></table> | | No. 1 | No. 2 | RS232 | A | A | RS485 | B | B | | |
| | | No. 1 | No. 2 | | | | | | | | | | | |
| | RS232 | A | A | | | | | | | | | | | |
| | RS485 | B | B | | | | | | | | | | | |
| No. 3 No. 4 | RS485 terminating resistance | <table><tr><td></td><td>No. 3</td><td>No. 4</td></tr><tr><td>Provided</td><td>A</td><td>A</td></tr><tr><td>Not provided</td><td>B</td><td>B</td></tr></table> | | No. 3 | No. 4 | Provided | A | A | Not provided | B | B | | | |
| | No. 3 | No. 4 | | | | | | | | | | | | |
| Provided | A | A | | | | | | | | | | | | |
| Not provided | B | B | | | | | | | | | | | | |

V130 / V350-35-R2

RS232 to RS485 Jumper Setting

(Underlined setting: default)

| Jumper Setting | | Item | Setting | | | Remarks | | | | | | |
|---|------|------------------------------|---|--|--|----------|-----|-----|--------------|-----|-----|--|
| <div><div><div>232</div><div>485</div></div><div>COMM</div></div> | COMM | Signal level | <table><tr><td>RS232</td><td>232</td><td>232</td></tr><tr><td>RS485</td><td>485</td><td>485</td></tr></table> | | | RS232 | 232 | 232 | RS485 | 485 | 485 | |
| RS232 | 232 | 232 | | | | | | | | | | |
| RS485 | 485 | 485 | | | | | | | | | | |
| <div><div><div>ON</div><div>OFF</div></div><div>TERM</div></div> | TERM | RS485 terminating resistance | <table><tr><td>Provided</td><td>ON</td><td>ON</td></tr><tr><td>Not provided</td><td>OFF</td><td>OFF</td></tr></table> | | | Provided | ON | ON | Not provided | OFF | OFF | |
| Provided | ON | ON | | | | | | | | | | |
| Not provided | OFF | OFF | | | | | | | | | | |

V230 / V260 / V280 / V290 / V530**RS232/RS485 Jumper Setting**

(Underlined setting: default)

| Jumper Setting | | Item | Setting | | | | | Remarks | | | | | | | | | | | | | | | | | | | | |
|--|-------|--|--|-------|--|--|--|---------|-------|-------|-------|-------|-------|---|---|---|---|-------|---|---|---|---|--------------------------|---|---|---|---|--|
| <div><div><div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div></div></div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>A</div><div>B</div></div> <div>No. 1 No. 2 No. 3 No. 4</div> | | Signal level/ RS485 terminating resistance | <table><tr><td></td><td>No. 1</td><td>No. 2</td><td>No. 3</td><td>No. 4</td></tr><tr><td>RS232</td><td>A</td><td>A</td><td>A</td><td>A</td></tr><tr><td>RS485</td><td>B</td><td>B</td><td>B</td><td>B</td></tr><tr><td>RS485 With resistance</td><td>A</td><td>A</td><td>B</td><td>B</td></tr></table> | | | | | | No. 1 | No. 2 | No. 3 | No. 4 | RS232 | A | A | A | A | RS485 | B | B | B | B | RS485 With resistance | A | A | B | B | |
| | No. 1 | No. 2 | No. 3 | No. 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| RS232 | A | A | A | A | | | | | | | | | | | | | | | | | | | | | | | | |
| RS485 | B | B | B | B | | | | | | | | | | | | | | | | | | | | | | | | |
| RS485 With resistance | A | A | B | B | | | | | | | | | | | | | | | | | | | | | | | | |


V120**RS232/RS485 Jumper Setting**

(Underlined setting: default)

| Jumper Setting | | Item | Setting | | | Remarks | | | | | | | | |
|--|----------------|---|--|--|-------|---------|-----------------|---|---|--------------|---|---|--|--|
| <div><div><div>A</div><div>B</div></div><div><div>1</div><div>2</div></div><div><div></div><div></div></div></div> | No. 1 No. 2 | Signal level (COM1) | <table><tr><td></td><td>No. 1</td><td>No. 2</td></tr><tr><td><u>RS232</u></td><td>A</td><td>A</td></tr><tr><td>RS485</td><td>B</td><td>B</td></tr></table> | | No. 1 | No. 2 | <u>RS232</u> | A | A | RS485 | B | B | | |
| | No. 1 | No. 2 | | | | | | | | | | | | |
| <u>RS232</u> | A | A | | | | | | | | | | | | |
| RS485 | B | B | | | | | | | | | | | | |
| <div><div><div>A</div><div>B</div></div><div><div>3</div><div>4</div></div><div><div></div><div></div></div></div> | No. 3 No. 4 | RS485 terminating resistance (COM1) | <table><tr><td></td><td>No. 3</td><td>No. 4</td></tr><tr><td><u>Provided</u></td><td>A</td><td>A</td></tr><tr><td>Not provided</td><td>B</td><td>B</td></tr></table> | | No. 3 | No. 4 | <u>Provided</u> | A | A | Not provided | B | B | | |
| | No. 3 | No. 4 | | | | | | | | | | | | |
| <u>Provided</u> | A | A | | | | | | | | | | | | |
| Not provided | B | B | | | | | | | | | | | | |
| <div><div><div></div><div></div></div><div><div>5</div><div>6</div></div><div><div>A</div><div>B</div></div></div> | No. 5 No. 6 | Signal level (COM2) | <table><tr><td></td><td>No. 5</td><td>No. 6</td></tr><tr><td><u>RS232</u></td><td>A</td><td>A</td></tr><tr><td>RS485</td><td>B</td><td>B</td></tr></table> | | No. 5 | No. 6 | <u>RS232</u> | A | A | RS485 | B | B | | |
| | No. 5 | No. 6 | | | | | | | | | | | | |
| <u>RS232</u> | A | A | | | | | | | | | | | | |
| RS485 | B | B | | | | | | | | | | | | |
| <div><div><div>B</div><div>A</div></div><div><div>7</div><div>8</div></div><div><div></div><div></div></div></div> | No. 7 No. 8 | RS485 terminating resistance (COM2) | <table><tr><td></td><td>No. 7</td><td>No. 8</td></tr><tr><td><u>Provided</u></td><td>A</td><td>A</td></tr><tr><td>Not provided</td><td>B</td><td>B</td></tr></table> | | No. 7 | No. 8 | <u>Provided</u> | A | A | Not provided | B | B | | |
| | No. 7 | No. 8 | | | | | | | | | | | | |
| <u>Provided</u> | A | A | | | | | | | | | | | | |
| Not provided | B | B | | | | | | | | | | | | |

V290-19-C30B/V290-19-T40B/V560/V570/V1040/V1210**RS232/RS485 DIP Switch Settings**

(Underlined setting: default)

| Dip SW | Item | Setting | | | | | | Remarks | |
|---|--|--------------------------|-------|-------|-------|-------|-------|---------|--|
| <div>ON</div>  | Signal level RS485 terminating resistance | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 | No. 6 | These settings are common to both COM1 and COM2. |
| | | <u>RS232</u> | ON | ON | ON | OFF | ON | OFF | |
| | | RS485 | OFF | OFF | OFF | ON | OFF | ON | |
| | | RS485 With resistance | ON | ON | OFF | ON | OFF | ON | |

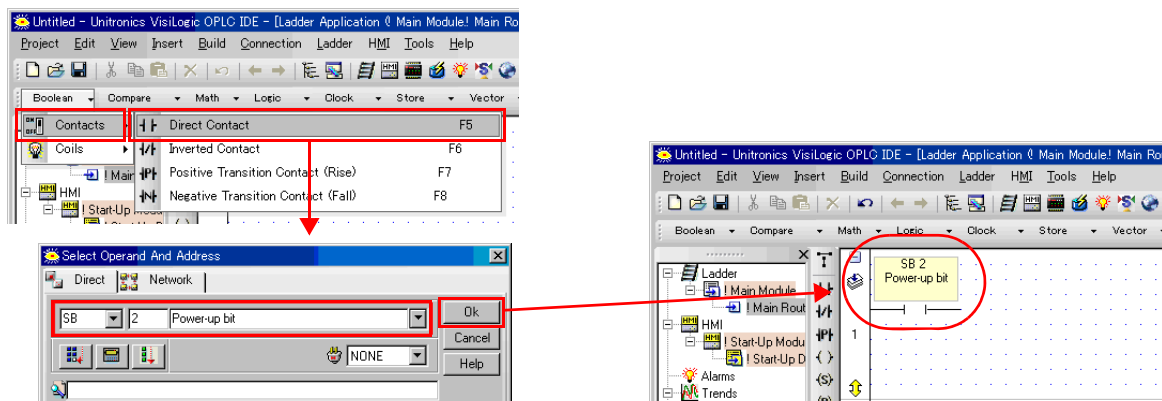
VisiLogic

(Underlined setting: default)

| Item | | Setting | Remarks |
|----------------|-----------|--|--|
| Direct Contact | | SB: 2 | For more information, refer to the VisiLogic instruction manual. |
| Set PLC Name | | Specify a desired name. | |
| Com Init | Com Port | COM1 / COM2 | |
| | Data Bits | 7 / 8 | |
| | Standard | RS232 / RS485 | |
| | Baud Rate | 4800 / 9600 / 19200 / 38400 / 54600 / 115200 bps | |
| | Parity | NONE / EVEN / ODD | |
| | Stop Bits | 1 / 2 | |

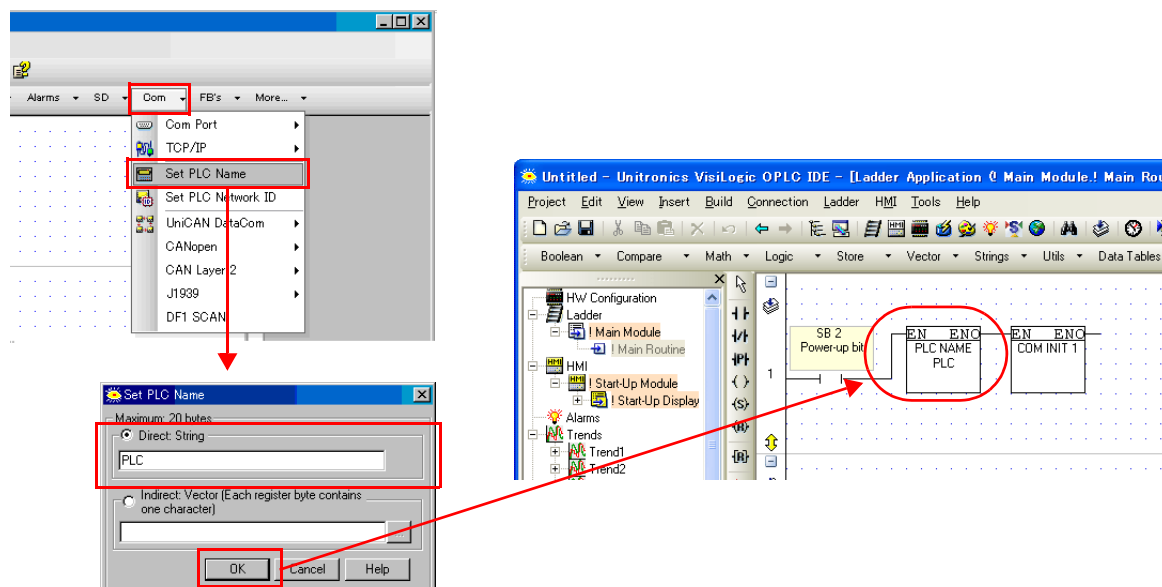
Direct Contact

Specify "2" for the SB address and register it into the ladder program.



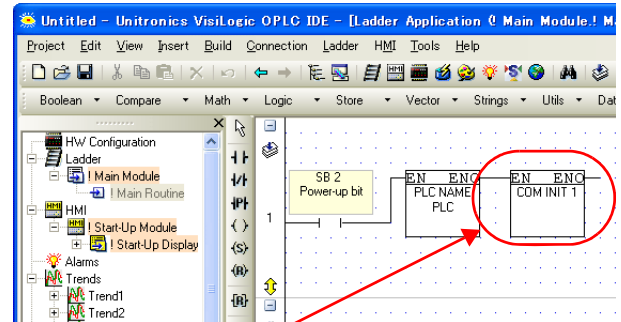
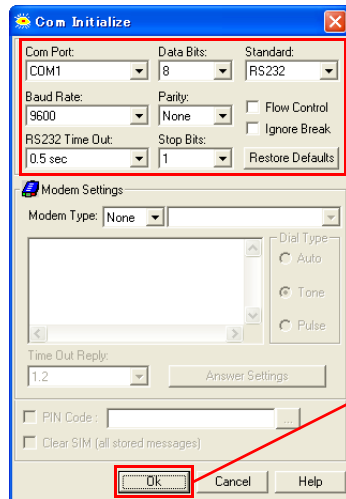
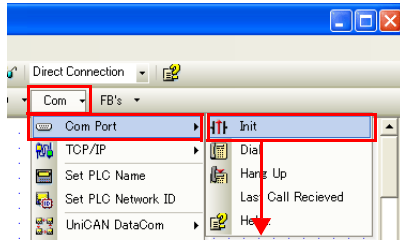
Set PLC Name

Specify a desired PLC name.



Com Init

Make settings for [COM Port], [Data Bits], [Standard], [Baud Rate], [Parity] and [Stop Bits].



Available Device Memory

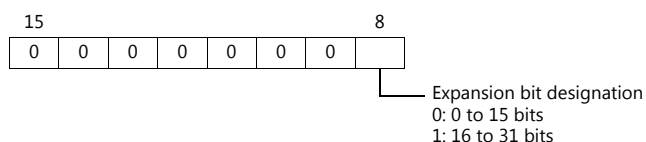
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

| Device Memory | | TYPE | Remarks |
|---------------|--------------------|------|---|
| MB | (Memory bit) | 00H | |
| MI | (Memory int) | 01H | |
| ML | (Memory long) | 02H | Double-word |
| MD | (Memory double) | 03H | Double-word |
| MF | (Memory float) | 04H | Real number. Bit designation is not possible. |
| SB | (System bit) | 05H | |
| SI | (System int) | 06H | |
| SL | (System long) | 07H | Double-word |
| SD | (System double) | 08H | Double-word |
| INP | (Input) | 09H | Read only |
| OUT | (Output) | 0AH | |
| TS | (Timer scan bit) | 0BH | Read only |
| TP | (Timer preset) | 0CH | Double-word, read only |
| TC | (Timer current) | 0DH | Double-word, read only |
| CS | (Counter scan bit) | 0EH | Read only |
| CP | (Counter preset) | 0FH | Read only |
| CC | (Counter current) | 10H | Read only |

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 |
|---|---------------------|-----------------|---|----|
| PLC operation status setting | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0000H | |
| | | n + 2 | PLC status 0: Run 1: Stop 2: Memory init and reset 3: Reset 4: Switch to BootStrap ^{*1} | |
| Sending key data from remote unit ^{*2} | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0001H | |
| | | n + 2 | Key data | |
| Unit ID read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0002H | |
| | | n + 2 | Unit ID | |
| Unit ID setting | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0003H | |
| | | n + 2 | Unit ID | |
| Version acquisition | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0004H | |
| | | n + 2 to n + 29 | Version, model type (CHAR data) | |

Return data: Data stored from PLC to TS2060

*1 After the setting is made, the PLC must be shut off and restarted.

*2 This command is used when a password is entered into the PLC from the TS2060. Since the password consists of four digits, the command must be executed four times.

Detail of the key data:

40 to 49: "0" to "9"

23.1.2 Vision Series (ASCII 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]

| PLC1 Properties UNITRONICS Vision Series(ASCII Ethernet TCP/IP) | |
|---|------------------------------|
| Communication Setting | |
| Connection Mode | 1:1 |
| Retrials | 3 |
| Time-out Time(*10msec) | 500 |
| Send Delay Time(*msec) | 0 |
| Start Time(*sec) | 0 |
| Port No. | 10001 |
| Code | DEC |
| Text Process | LSB->MSB |
| Comm. Error Handling | Stop |
| Detail | |
| Priority | 1 |
| System memory(\$s) V7 Compatible | None |
| Target Settings | |
| Connect To | 0:200.168.1.2(Vision Series) |
| PLC Table | Setting... |
| Use Connection Check Device | None |

- IP address and port number of the PLC
Register on the [PLC Table] 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, port number and whether or not to use the KeepAlive function of the PLC.

| PLC Table | | | |
|-----------|---------------|-------------|----------|
| No. | Port Name | IP Address | Port No. |
| 0 | Vision Series | 200.168.1.2 | 20256 |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |

PLC

Parameter

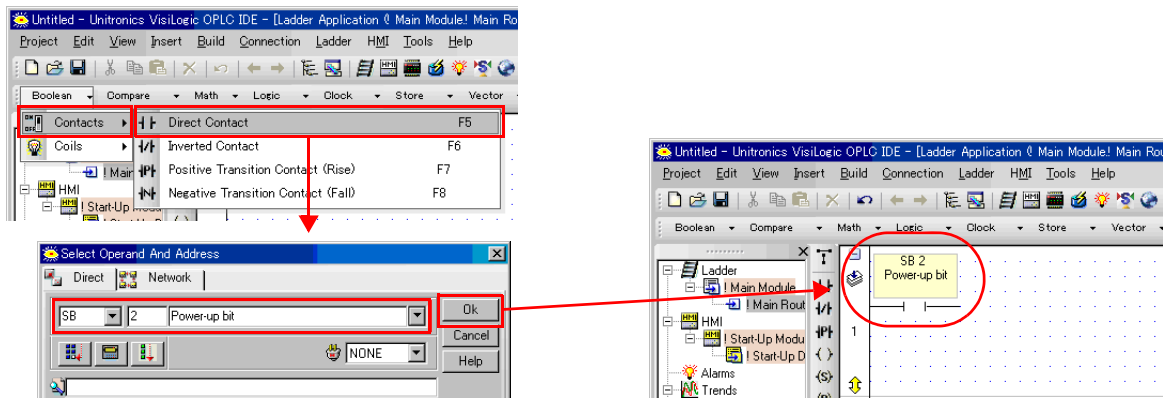
Parameters must be set in Information Mode or by creating a ladder program using the software "VisiLogic". For more information, refer to the instruction manual issued by UNITORONICS.

VisiLogic

| Item | | Setting | Remarks |
|----------------|-----------------|---------------------------------------|--|
| Direct Contact | | SB: 2 | For more information, refer to the VisiLogic instruction manual. |
| Set PLC Name | | Specify a desired name. | |
| Com Init | IP Address | IP address of the Vision Series | |
| | Subnet Mask | Specify according to the environment. | |
| | Default Gateway | Specify according to the environment. | |
| Socket Init | Socket | Socket1 | |
| | Protocol | TCP | |
| | Local Port | 0 to 65535 (default: 20256) | |
| | Master/Slave | Slave | |

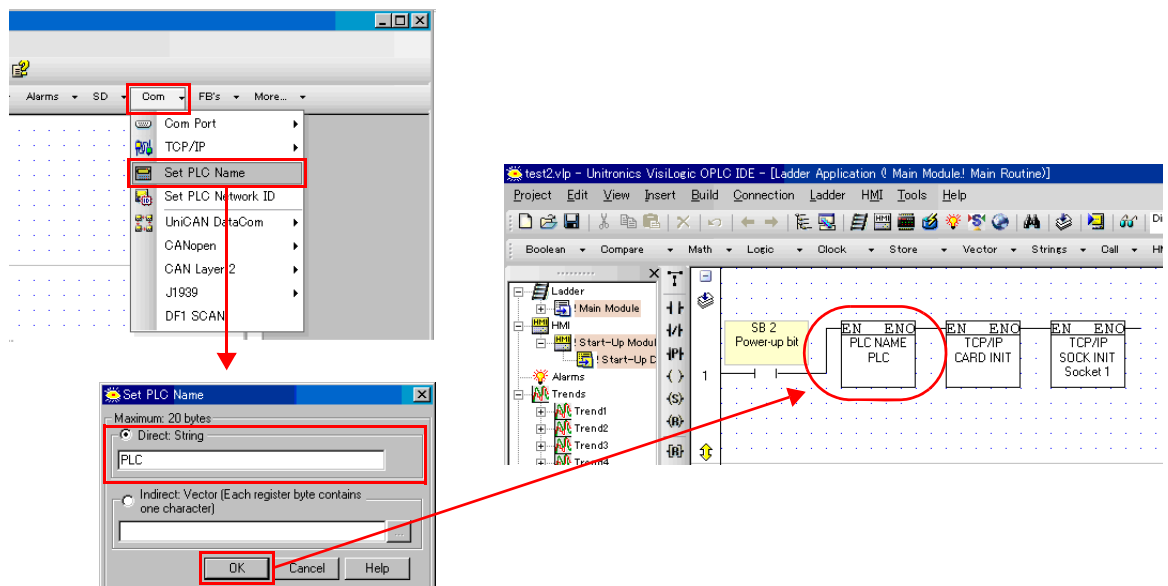
Direct Contact

Specify "2" for the SB address and register it into the ladder program.



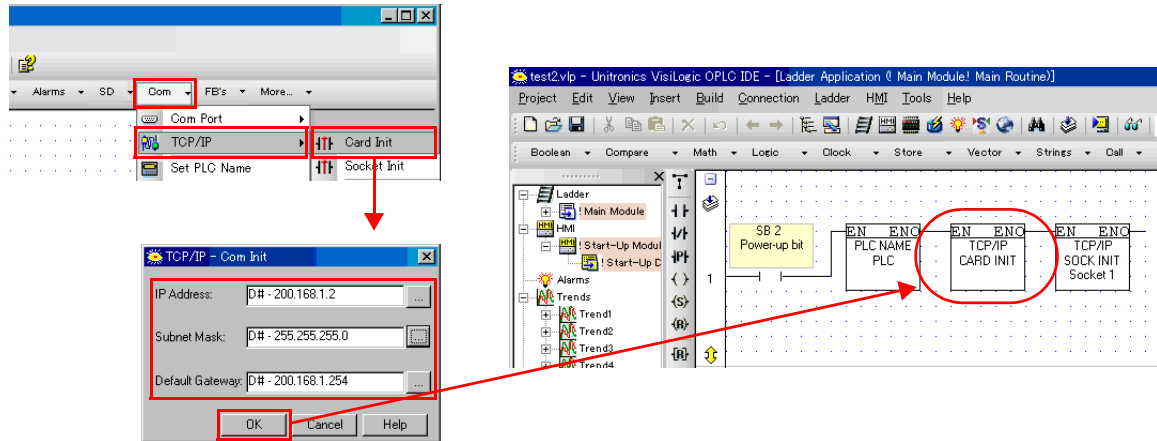
Set PLC Name

Specify a desired PLC name.



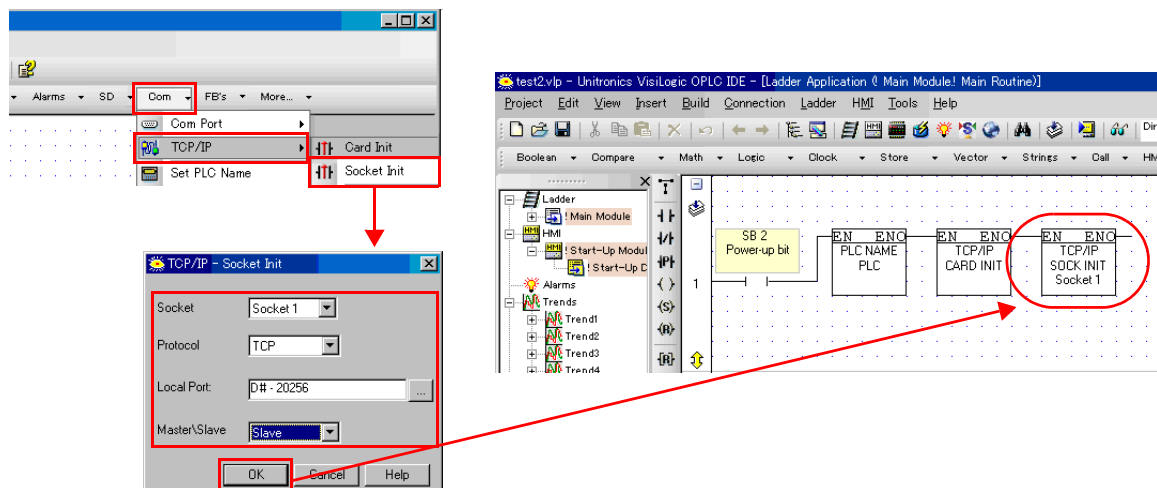
Com Init

Specify the IP address, subnet mask and default gateway.



Socket Init

Make settings for [Socket], [Protocol], [Local Port], and [Master/Slave].



Available Device Memory

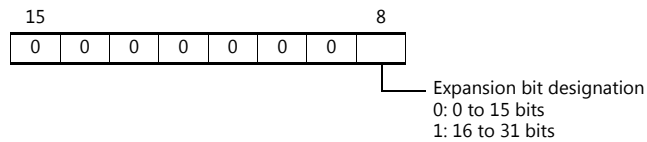
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

| Device Memory | | TYPE | Remarks |
|---------------|--------------------|------|---|
| MB | (Memory bit) | 00H | |
| MI | (Memory int) | 01H | |
| ML | (Memory long) | 02H | Double-word |
| MD | (Memory double) | 03H | Double-word |
| MF | (Memory float) | 04H | Real number. Bit designation is not possible. |
| SB | (System bit) | 05H | |
| SI | (System int) | 06H | |
| SL | (System long) | 07H | Double-word |
| SD | (System double) | 08H | Double-word |
| INP | (Input) | 09H | Read only |
| OUT | (Output) | 0AH | |
| TS | (Timer scan bit) | 0BH | Read only |
| TP | (Timer preset) | 0CH | Double-word, read only |
| TC | (Timer current) | 0DH | Double-word, read only |
| CS | (Counter scan bit) | 0EH | Read only |
| CP | (Counter preset) | 0FH | Read only |
| CC | (Counter current) | 10H | Read only |

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 |
|--------------------------------------|---------------------|-----------------|--|----|
| PLC operation status setting | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0000H | |
| | | n + 2 | PLC status 0: Run 1: Stop 2: Memory init and reset 3: Reset 4: Switch to BootStrap *1 | |
| Sending key data from remote unit *2 | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0001H | |
| | | n + 2 | Key data | |
| Unit ID read out | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0002H | |
| | | n + 2 | Unit ID | |
| Unit ID setting | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0003H | |
| | | n + 2 | Unit ID | |
| Version data acquisition | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 0004H | |
| | | n + 2 to n + 29 | Version, model type (CHAR data) | |

Return data: Data stored from PLC to TS2060i

*1 After the setting is made, the PLC must be shut off and restarted.

*2 This command is used when a password is entered into the PLC from the TS2060i. Since the password consists of four digits, the command must be executed four times.

Detail of the key data:

40 to 49: "0" to "9"

23.1.3 Wiring Diagrams

When Connected at CN1:

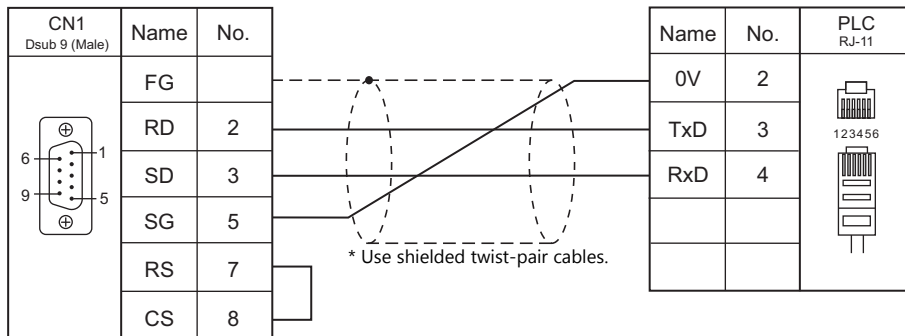


CAUTION

- 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.

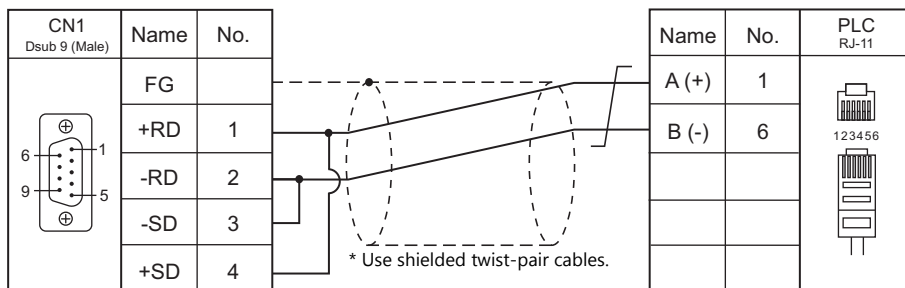
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

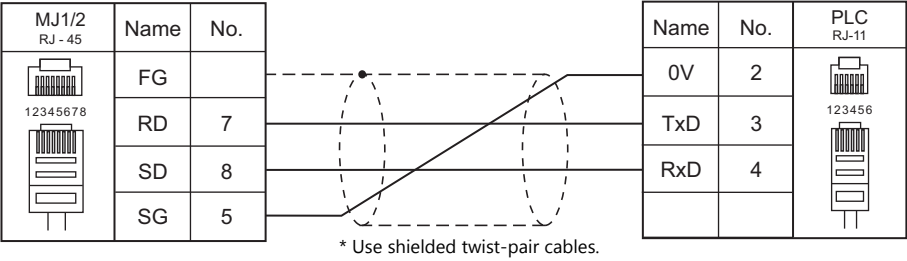
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

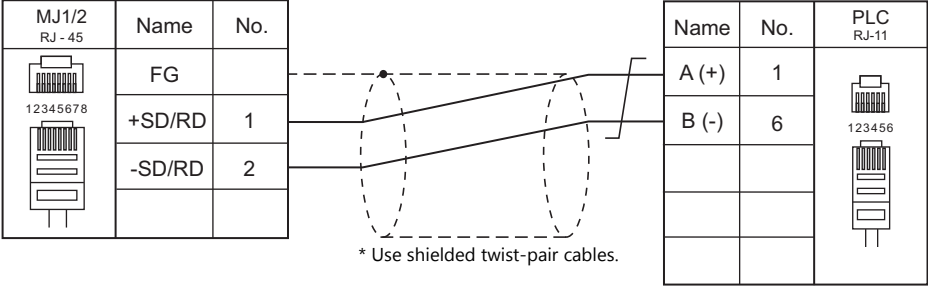
RS-232C

Wiring diagram 1 - M2



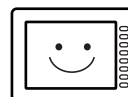
RS-422/RS-485

Wiring diagram 1 - M4



MEMO

MONITOUCH



24. VIGOR

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} | |
| M series | M1-CPU1 | COM PORT | M-232R | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | | M-485R | 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.

24.1.1 M Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400bps | |
| Data Length | 7 bits | |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Target Port No. | <u>0</u> to 255 | |

PLC

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

M-232R / M-485R

(Underlined setting: default)

| Item | | Setting | Remarks |
|----------------------|----------------|---------------------------------------|------------------------------------|
| Application | | Computer Link | |
| Computer Link Detail | Station Number | 0 to 255 | |
| | Baud Rate | 4800 / 9600 / <u>19200</u> / 38400bps | 38400 bps supported by M-485R only |

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 / Special register) | 00H | D0 to D8191, D9000 to D9255 |
| X | (Input relay) | 01H | |
| Y | (Output relay) | 02H | |
| M | (Internal relay / Special relay) | 03H | M0 to M5119, M9000 to M9255 |
| S | (Internal relay / Step relay) | 04H | |
| T | (Timer / Current value) | 05H | |
| C | (Counter / Current value) | 06H | |
| 32C | (High-speed counter / Current value) | 07H | Double-word |
| TS | (Timer / Contact) | 08H | |
| CS | (Counter / Contact) | 09H | |
| TC | (Timer / Coil) | 0AH | |
| CC | (Counter / Coil) | 0BH | |

24.1.2 Wiring Diagrams

When Connected at CN1:

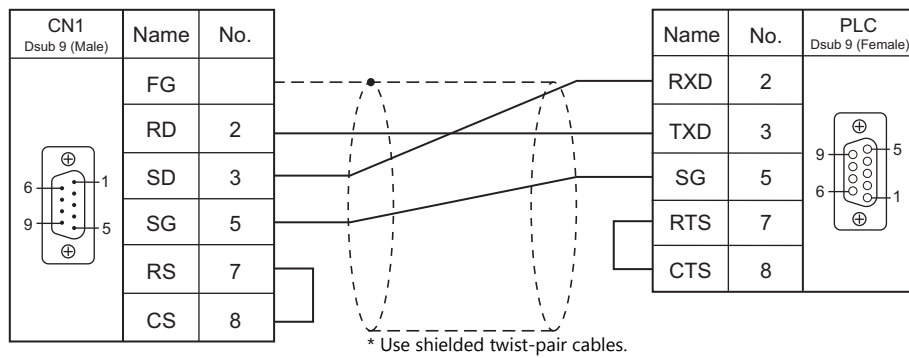


CAUTION

- 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.

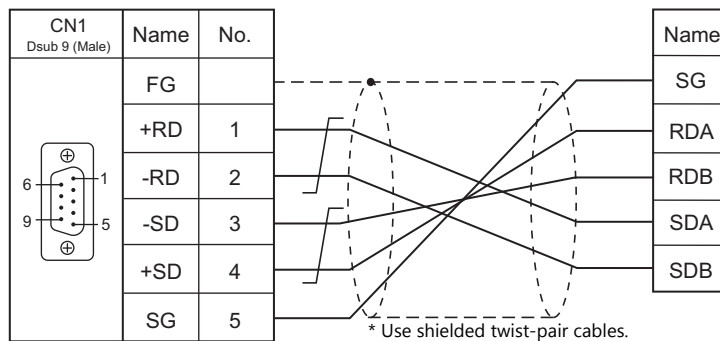
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

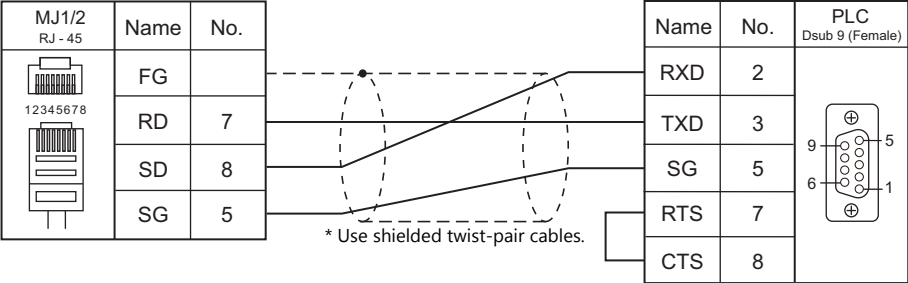
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

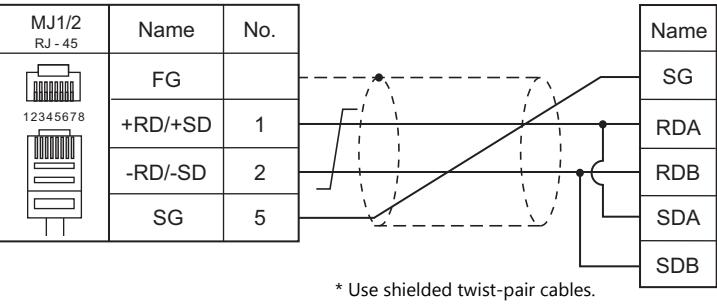
RS-232C

Wiring diagram 1 - M2

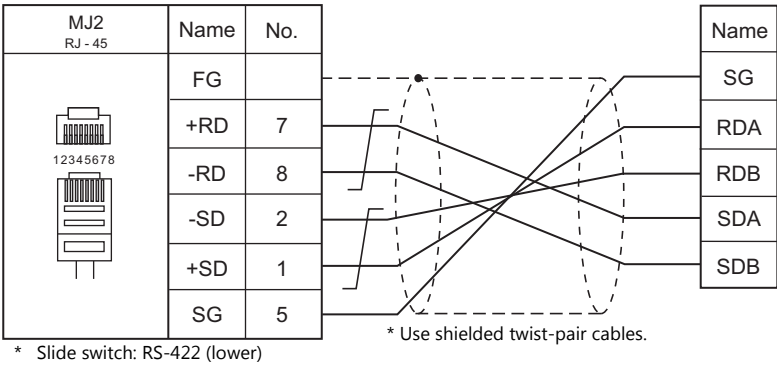


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



25. WAGO

25.1 PLC 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} | |
| 750 series (MODBUS RTU) | 750-314 750-316 750-814 750-816 750-873 | Fieldbus connector | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | 750-312 750-315 750-812 750-815 | | RS-422 | 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.

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit | TCP/IP ^{*1} | UDP/IP | Port No. | Ladder Transfer ^{*2} |
|---------------------------------|--|----------------------------|----------------------|--------|---------------------------|-------------------------------|
| 750 series (MODBUS Ethernet) | 750-341 750-342 750-841 750-842 750-871 750-873 | CPU with built-in Ethernet | ○ | ○ | 502 (fixed) ^{*3} | × |

*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.

*3 A maximum of 15 units including the ladder tool can be connected.

25.1.1 750 Series (MODBUS RTU)

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 | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps | Up to 19200 bps is available on 750-312, 750-314, 750-812 and 750-814. 4800 and 38400 bps are not available on 750-873. |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 0 to 255 | Select station No. 0 for a broadcast command. |

Bus Coupler / Bus Controller

750-312 / 750-314 / 750-315 / 750-316

Node address rotary switch

| Address | Contents | Setting Example |
|--|----------|-----------------|
|   | 1 to 99 | 1 |

DIP switch FR

(Underlined setting: default)

| DIP Switch FR | Contents | | | | Setting Example | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------|--------------|------------|-----------------|------------|-----|-------------|---------------|--------------|------------|------------|-----------------|------------|-----------|-----------|-----------|-----|-----|----|------------|------|--------|-----|------------|-----|---|-----|-----------|-----|----|-----|---|--|
| FR1 FR2 FR3 | <table><tr><th>Baud Rate</th><th>FR1</th><th>FR2</th><th>FR3</th></tr><tr><td>4800 bps</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td><u>9600 bps</u></td><td><u>OFF</u></td><td><u>ON</u></td><td><u>ON</u></td></tr><tr><td>19200 bps</td><td>ON</td><td>ON</td><td>ON</td></tr><tr><td>38400 bps*</td><td>OFF</td><td>OFF</td><td>OFF</td></tr><tr><td>57600 bps*</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>115 kbps*</td><td>OFF</td><td>ON</td><td>OFF</td></tr></table> | | | | Baud Rate | FR1 | FR2 | FR3 | 4800 bps | ON | OFF | ON | <u>9600 bps</u> | <u>OFF</u> | <u>ON</u> | <u>ON</u> | 19200 bps | ON | ON | ON | 38400 bps* | OFF | OFF | OFF | 57600 bps* | ON | OFF | OFF | 115 kbps* | OFF | ON | OFF | <div><div><div>ON</div><div><div></div><div></div></div></div>FR1</div> <div><div></div><div><div></div><div></div></div></div> FR2 <div><div></div><div><div></div><div></div></div></div> FR3 <div><div><div></div><div></div></div><div></div></div> FR4 <div><div><div></div><div></div></div><div></div></div> FR5 <div><div><div></div><div></div></div><div></div></div> FR6 | |
| | Baud Rate | FR1 | FR2 | FR3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4800 bps | ON | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>9600 bps</u> | <u>OFF</u> | <u>ON</u> | <u>ON</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19200 bps | ON | ON | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 38400 bps* | OFF | OFF | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 57600 bps* | ON | OFF | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 115 kbps* | OFF | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * Available only on 750-315 and 750-316. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FR4 FR5 FR6 | <table><tr><th>Parity</th><th>Data Length</th><th>Stop Bit</th><th>FR4</th><th>FR5</th><th>FR6</th></tr><tr><td><u>None</u></td><td rowspan="4"><u>8 bits</u></td><td rowspan="4"><u>1 bit</u></td><td><u>OFF</u></td><td><u>OFF</u></td><td><u>OFF</u></td></tr><tr><td>Even</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>Odd</td><td>OFF</td><td>ON</td><td>OFF</td></tr><tr><td>None</td><td>2 bits</td><td>ON</td><td>ON</td><td>OFF</td></tr></table> | Parity | Data Length | Stop Bit | FR4 | FR5 | FR6 | <u>None</u> | <u>8 bits</u> | <u>1 bit</u> | <u>OFF</u> | <u>OFF</u> | <u>OFF</u> | Even | ON | OFF | OFF | Odd | OFF | ON | OFF | None | 2 bits | ON | ON | OFF | Baud rate: 9600 bps Parity: None Data length: 8 bits Stop bit: 1 bit | | | | | | | |
| | Parity | Data Length | Stop Bit | FR4 | FR5 | FR6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <u>None</u> | <u>8 bits</u> | <u>1 bit</u> | <u>OFF</u> | <u>OFF</u> | <u>OFF</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Even | | | ON | OFF | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Odd | | | OFF | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | None | | | 2 bits | ON | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* Before making settings on the DIP switch FR, be sure to turn off the power to the bus coupler.

DIP switch P

(Underlined setting: default)

| DIP Switch P | Contents | OFF | | ON | | Setting Example | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---------------------------------|---|------------|-----------------|------------|-----------------|----|----|----|---------------------|------------|------------|------------|----------|----|-----|-----|----------|-----|----|-----|----------|----|----|-----|--------|-----|-----|----|--------|----|-----|----|---------|-----|----|----|---------|----|----|----|---|--|
| P1 P2 P3 | End of communication frame data | <table><tr><th>End of Data</th><th>P1</th><th>P2</th><th>P3</th></tr><tr><td><u>Three frames</u></td><td><u>OFF</u></td><td><u>OFF</u></td><td><u>OFF</u></td></tr><tr><td>100 msec</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>200 msec</td><td>OFF</td><td>ON</td><td>OFF</td></tr><tr><td>500 msec</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>1 sec.</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>1 msec</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>10 msec</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>50 msec</td><td>ON</td><td>ON</td><td>ON</td></tr></table> | | | | End of Data | P1 | P2 | P3 | <u>Three frames</u> | <u>OFF</u> | <u>OFF</u> | <u>OFF</u> | 100 msec | ON | OFF | OFF | 200 msec | OFF | ON | OFF | 500 msec | ON | ON | OFF | 1 sec. | OFF | OFF | ON | 1 msec | ON | OFF | ON | 10 msec | OFF | ON | ON | 50 msec | ON | ON | ON | <div><div>ON</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>P1</div><div>P2</div><div>P3</div><div>P4</div><div>P5</div><div>P6</div><div>P7</div><div>P8</div></div> | |
| | | End of Data | P1 | P2 | P3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <u>Three frames</u> | <u>OFF</u> | <u>OFF</u> | <u>OFF</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 100 msec | ON | OFF | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 200 msec | OFF | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 500 msec | ON | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 sec. | OFF | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1 msec | ON | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 10 msec | OFF | ON | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 msec | ON | ON | ON | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P4 | Data transfer mode | ASCII mode | | <u>RTU mode</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P5 | Error check code | Ignored | | <u>Executed</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P6 | Others | <u>OFF</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* Before making settings on the DIP switch P, be sure to turn off the power to the bus coupler.

Terminating resistance

Make settings only when 750-312 or 750-315 is used.

- For 2-wire system
- For 4-wire system



750-812 / 750-814 / 750-815 / 750-816

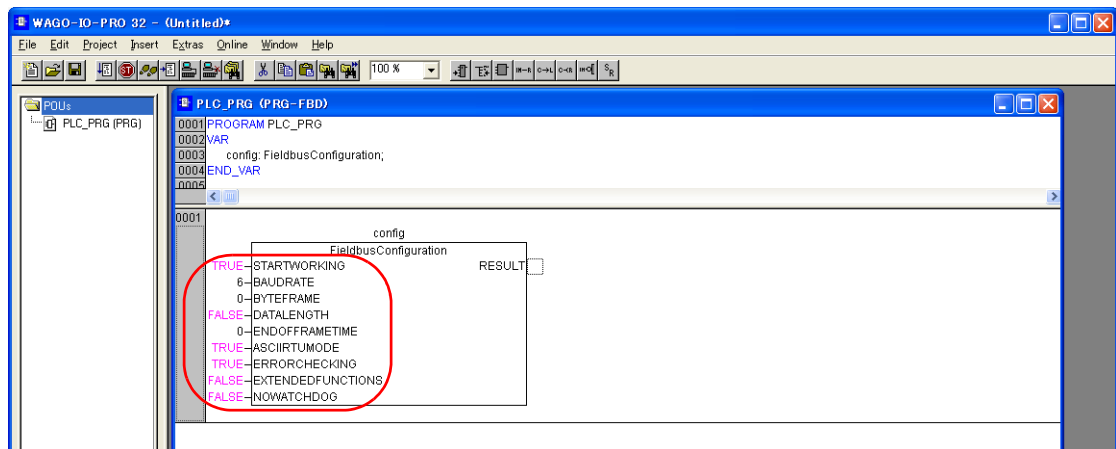
Node address rotary switch

| Address | Contents | Setting Example |
|--|----------|-----------------|
| <div> <div>x1</div> </div> <div> <div>x10</div> </div> | 1 to 99 | 1 |

PLC-PRG (PRG-FBD)

Set communication parameters using the ladder tool "WAGO-I/O-PRO 32" or "WAGO-I/O-PRO CAA". For more information, refer to the PLC manual issued by the manufacturer.

- * When setting the communication parameters, set the node address rotary switch to "0" and the operation mode switch in the upper ("run") or center ("stop") position.



(Underlined setting: default)

| Setting Items | Contents | Setting Example | | | | | | | | | | | | | | | | | | |
|------------------------|--|--------------------|-----------|-----------------------|--------------|------------------------|-------------|-----------|---|-----------|----|-----------|----|----------|----|-------|---|-------|---|---|
| STARTWORKING | TRUE | TRUE | | | | | | | | | | | | | | | | | | |
| BAUDRATE | <table><tr><th>Baud rate</th><th>Value</th></tr><tr><td>4800 bps</td><td>5</td></tr><tr><td><u>9600 bps</u></td><td><u>6</u></td></tr><tr><td>19200 bps</td><td>7</td></tr><tr><td>38400 bps</td><td>0*</td></tr><tr><td>57600 bps</td><td>1*</td></tr><tr><td>115 kbps</td><td>2*</td></tr></table> <p>* Available only on 750-815 and 750-816.</p> | Baud rate | Value | 4800 bps | 5 | <u>9600 bps</u> | <u>6</u> | 19200 bps | 7 | 38400 bps | 0* | 57600 bps | 1* | 115 kbps | 2* | 6 | | | | |
| Baud rate | Value | | | | | | | | | | | | | | | | | | | |
| 4800 bps | 5 | | | | | | | | | | | | | | | | | | | |
| <u>9600 bps</u> | <u>6</u> | | | | | | | | | | | | | | | | | | | |
| 19200 bps | 7 | | | | | | | | | | | | | | | | | | | |
| 38400 bps | 0* | | | | | | | | | | | | | | | | | | | |
| 57600 bps | 1* | | | | | | | | | | | | | | | | | | | |
| 115 kbps | 2* | | | | | | | | | | | | | | | | | | | |
| BYTEFRAME | <table><tr><th>Parity</th><th>Stop Bits</th><th>Value</th></tr><tr><td><u>No</u></td><td rowspan="3">1</td><td><u>0</u></td></tr><tr><td>Even</td><td>1</td></tr><tr><td>Odd</td><td>2</td></tr><tr><td>No</td><td>2</td><td>3</td></tr></table> | Parity | Stop Bits | Value | <u>No</u> | 1 | <u>0</u> | Even | 1 | Odd | 2 | No | 2 | 3 | 0 | | | | | |
| Parity | Stop Bits | Value | | | | | | | | | | | | | | | | | | |
| <u>No</u> | 1 | <u>0</u> | | | | | | | | | | | | | | | | | | |
| Even | | 1 | | | | | | | | | | | | | | | | | | |
| Odd | | 2 | | | | | | | | | | | | | | | | | | |
| No | 2 | 3 | | | | | | | | | | | | | | | | | | |
| DATALength | 8: FALSE | FALSE | | | | | | | | | | | | | | | | | | |
| ENDOFFRAMETIME | <table><tr><th>End of Frame Time</th><th>Value</th></tr><tr><td><u>3 x Frame Time</u></td><td><u>0</u></td></tr><tr><td>100 ms</td><td>1</td></tr><tr><td>200 ms</td><td>2</td></tr><tr><td>500 ms</td><td>3</td></tr><tr><td>1s</td><td>4</td></tr><tr><td>1 ms</td><td>5</td></tr><tr><td>10 ms</td><td>6</td></tr><tr><td>50 ms</td><td>7</td></tr></table> | End of Frame Time | Value | <u>3 x Frame Time</u> | <u>0</u> | 100 ms | 1 | 200 ms | 2 | 500 ms | 3 | 1s | 4 | 1 ms | 5 | 10 ms | 6 | 50 ms | 7 | 0 |
| End of Frame Time | Value | | | | | | | | | | | | | | | | | | | |
| <u>3 x Frame Time</u> | <u>0</u> | | | | | | | | | | | | | | | | | | | |
| 100 ms | 1 | | | | | | | | | | | | | | | | | | | |
| 200 ms | 2 | | | | | | | | | | | | | | | | | | | |
| 500 ms | 3 | | | | | | | | | | | | | | | | | | | |
| 1s | 4 | | | | | | | | | | | | | | | | | | | |
| 1 ms | 5 | | | | | | | | | | | | | | | | | | | |
| 10 ms | 6 | | | | | | | | | | | | | | | | | | | |
| 50 ms | 7 | | | | | | | | | | | | | | | | | | | |
| ASCIIRTUMODE | RTU: TRUE | TRUE | | | | | | | | | | | | | | | | | | |
| ERRORCHECKING | <table><tr><th>Error Check</th><th>Value</th></tr><tr><td>ignored</td><td>FALSE</td></tr><tr><td><u>being processed</u></td><td><u>TRUE</u></td></tr></table> | Error Check | Value | ignored | FALSE | <u>being processed</u> | <u>TRUE</u> | TRUE | | | | | | | | | | | | |
| Error Check | Value | | | | | | | | | | | | | | | | | | | |
| ignored | FALSE | | | | | | | | | | | | | | | | | | | |
| <u>being processed</u> | <u>TRUE</u> | | | | | | | | | | | | | | | | | | | |
| EXTENDEDFUNCTIONS | <table><tr><th>Extended Functions</th><th>Value</th></tr><tr><td><u>without</u></td><td><u>FALSE</u></td></tr><tr><td>available</td><td>TRUE</td></tr></table> | Extended Functions | Value | <u>without</u> | <u>FALSE</u> | available | TRUE | FALSE | | | | | | | | | | | | |
| Extended Functions | Value | | | | | | | | | | | | | | | | | | | |
| <u>without</u> | <u>FALSE</u> | | | | | | | | | | | | | | | | | | | |
| available | TRUE | | | | | | | | | | | | | | | | | | | |
| NOWATCHDOG | <table><tr><th>Watchdog</th><th>Value</th></tr><tr><td><u>switched on</u></td><td><u>FALSE</u></td></tr><tr><td>switched off</td><td>TRUE</td></tr></table> | Watchdog | Value | <u>switched on</u> | <u>FALSE</u> | switched off | TRUE | FALSE | | | | | | | | | | | | |
| Watchdog | Value | | | | | | | | | | | | | | | | | | | |
| <u>switched on</u> | <u>FALSE</u> | | | | | | | | | | | | | | | | | | | |
| switched off | TRUE | | | | | | | | | | | | | | | | | | | |

Terminating resistance

Make settings only when 750-812 or 750-815 is used.

- For 2-wire system
- For 4-wire system

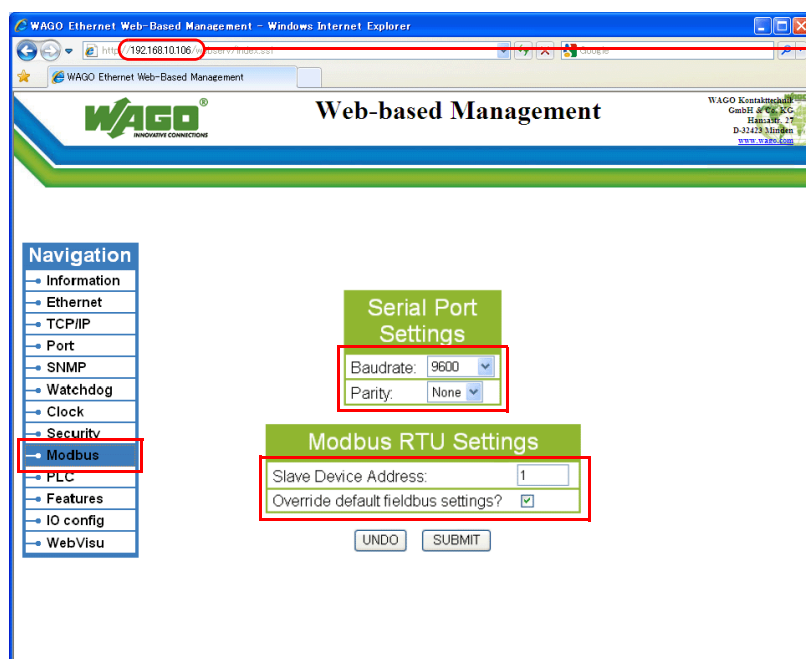


750-873

Connect the computer to 750-873 and start the web browser.

Click [Modbus] on the browser menu. The password entry dialog appears. To log on as an administrator, enter "admin" for the user name and "wago" for the password, and click [OK].

Make settings for [Serial Port Settings] and [Modbus RTU Settings] on the screen. For more information, refer to the PLC manual issued by the manufacturer.



Enter the IP address of the bus coupler or bus controller on Internet Explorer, and press the [Enter] key to display the browser menu.

(Underlined setting: default)

| Item | | Setting | Remarks |
|----------------------|-------------------------------------|--|---------|
| Serial Port Settings | Baudrate | <u>9600</u> / 19200 / 57600 / 115K bps | |
| | Parity | <u>None</u> / Odd / Even | |
| Modbus RTU Settings | Slave Device Address | 1 to 255 | |
| | Override default fieldbus settings? | Checked | |

* After settings are made, click [SUBMIT], and turn the power off and back on again.

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 |
|------------------------------|------|--------------------|
| %MX (internal contact point) | 00H | %MW as word device |
| %IX (input variable) | 01H | %IW as word device |
| %QX (output variable) | 02H | %QW as word device |

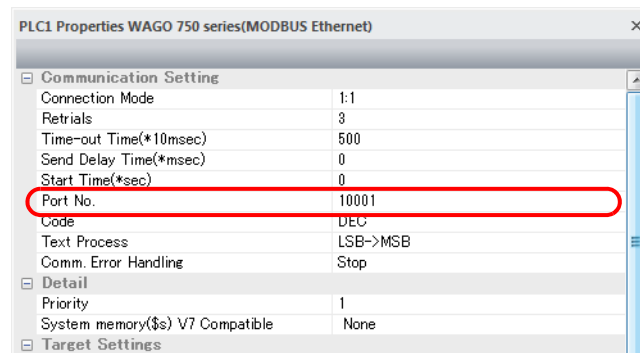
25.1.2 750 Series (MODBUS Ethernet)

Communication Setting

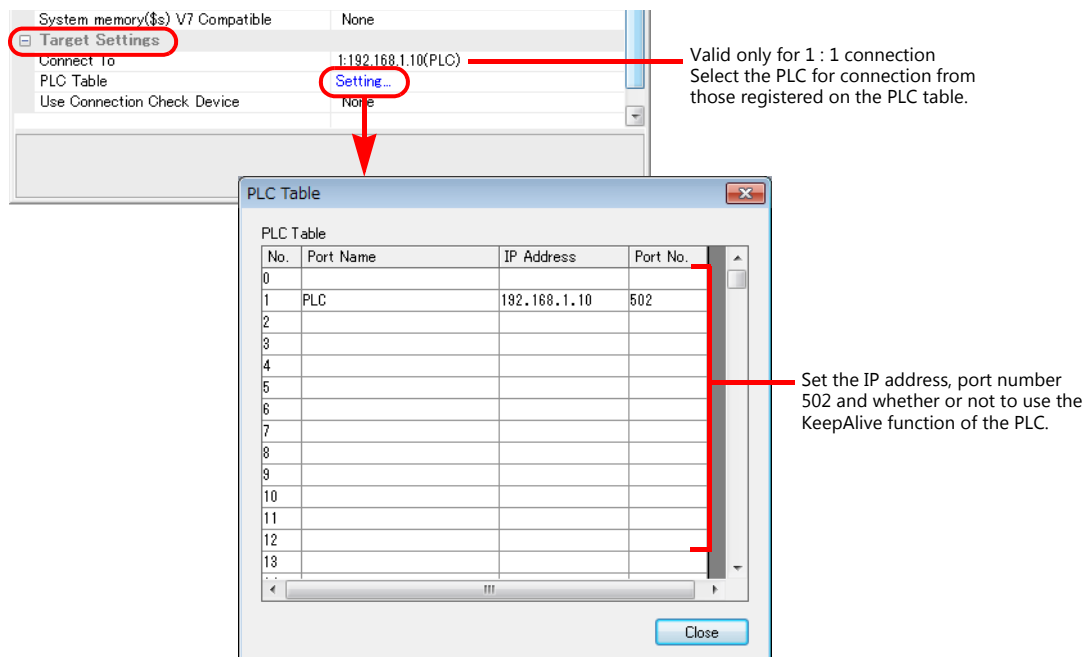
Editor

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]
- Connection port on the TS2060i unit:
The [Target Port No.] for the connected device on the [Hardware Setting] window ([System Setting] → [Hardware Setting])
 - When using TCP/IP:
Select [Built-in LAN (TCP)].
 - When using UDP/IP:
Select [Built-in LAN (UDP)].
- 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].

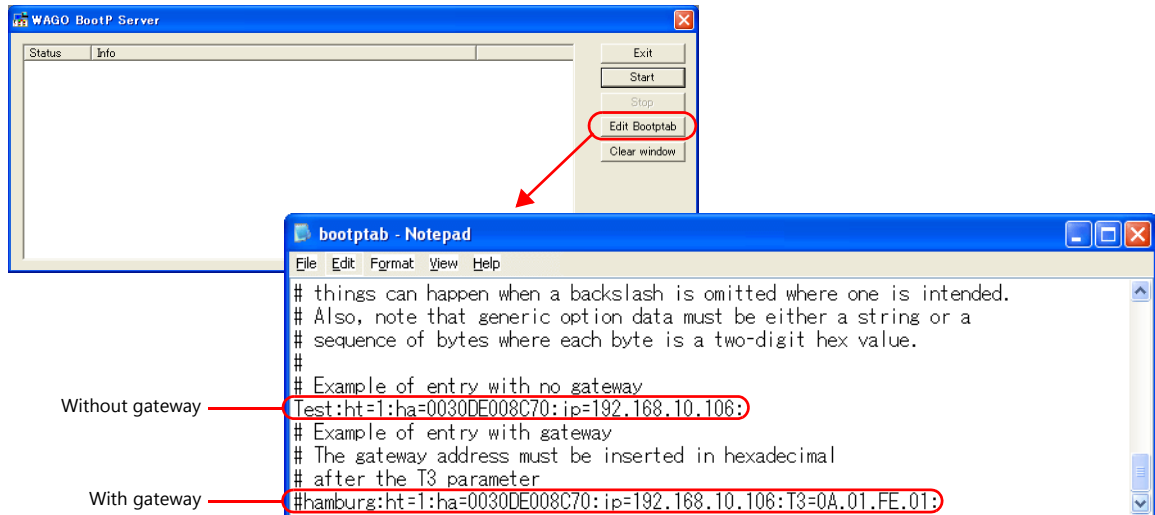


Bus Coupler / Bus Controller

Make PLC settings by using "WAGO BootP Server" or "WAGO Ethernet Settings". For more information, refer to the PLC manual issued by the manufacturer.

- * For 750-342 and 750-842, only "WAGO BootP Server" can be used.

WAGO BootP Server



Example: Test:ht=1:ha=0030DE008C70:ip=192.168.10.106:

Node name MAC address IP address
Hardware type

- * When setting the subnet mask (sm) and gateway (gw), make settings following the IP address as shown below:

Example: Test:ht=1:ha=003-DE000002:ip=192.168.10.106:sm=255.255.255.0:T3=0A.01.FE.01:

Node name MAC address IP address Subnet mask Gateway (HEX)
Hardware type

| Contents | Setting |
|------------------|--|
| Node name | Use one-byte alphanumeric characters. |
| Hardware type | ht=1 |
| MAC address | ha =MAC address (shown on the bus coupler or bus controller) |
| IP address table | ip =IP address of the PLC |
| Subnet mask | sm =subnet mask |
| Gateway | T3 =gateway address (HEX) * To be set when the bus coupler or bus controller lies beyond the gateway |

- * When making settings for 750-871, set all DIP switches in the OFF positions.
- * The port number is fixed to "502".

Delete either "#" mark at the beginning of "with gateway" or "without gateway" and save the text file. The setting with no "#" mark will take effect.

Notes on setting the IP address using "BootP Server"

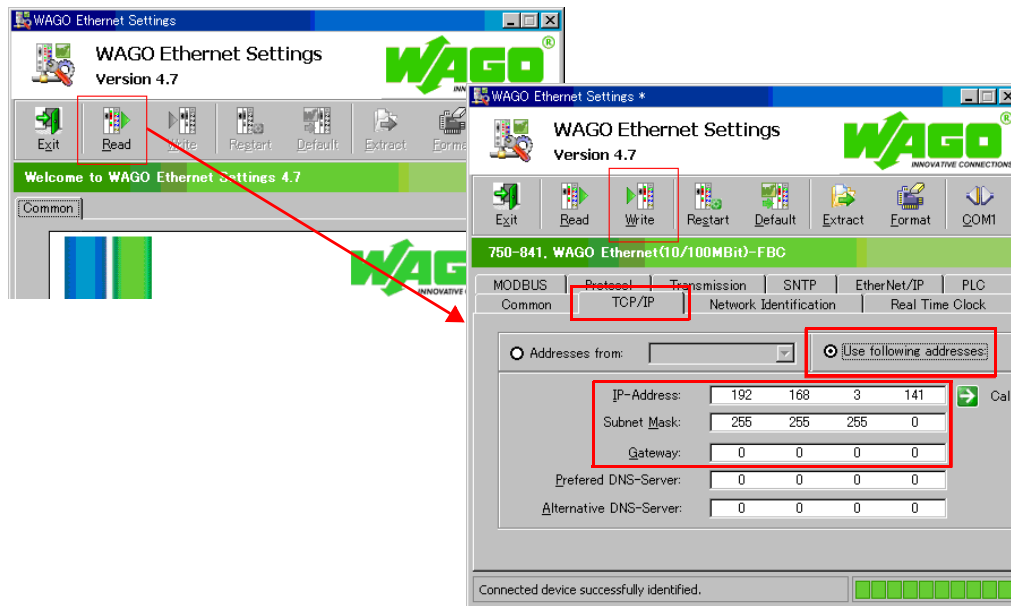
In the initial condition, the IP address set on "BootP Server" is cleared when the power is turned off and back on again. To retain the IP address even when the power has been turned off and back on again, the BootP protocol must be disabled after the IP address is set.

Connect the computer to the bus coupler or bus controller, and start the web browser. Remove the check mark from [BootP] for [Port] on the browser menu.

Click [SUBMIT] and turn the power off and back it on again. The BootP protocol becomes disabled.

- * When [Port] is clicked, the password may be required. For more information, see "Enabling Modbus UDP and Modbus TCP protocols" (page 25-8).

WAGO Ethernet Settings ([TCP/IP] tab window)



| Contents | Setting | Remarks |
|-------------|---|---------|
| IP-Address | Make settings in accordance with the network environment. | |
| Subnet Mask | | |
| Gateway | | |

- * When making settings for 750-871, set all DIP switches in the OFF positions.
- * The port number is fixed to "502".

Enabling Modbus UDP and Modbus TCP protocols

When both Modbus UDP and Modbus TCP protocols are checked (enabled), communication using either protocol becomes possible without selecting a communication protocol on the bus coupler or bus controller. For more information, refer to the PLC manual issued by the manufacturer.

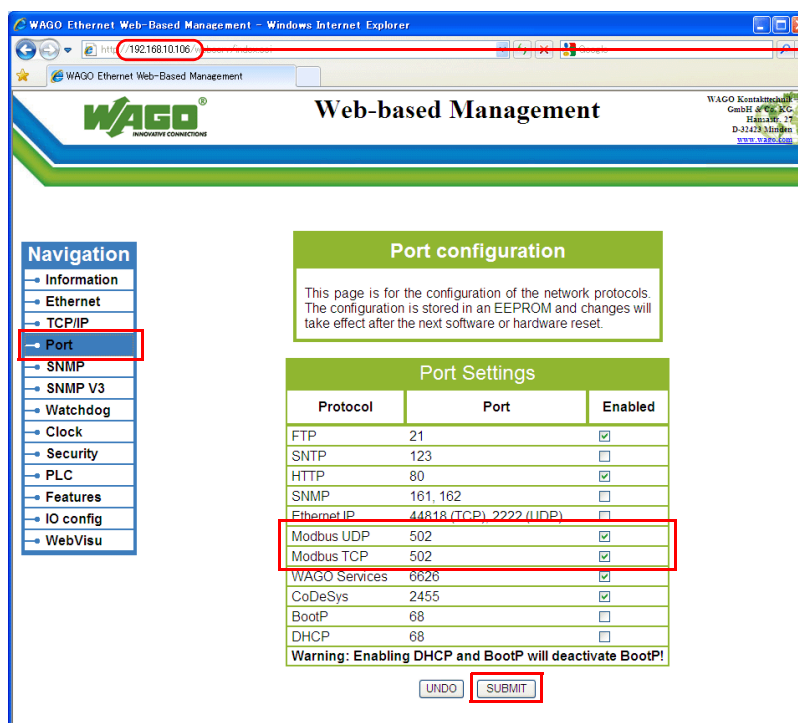
- Setting on the web browser

Connect the computer to the bus coupler or bus controller, and start the web browser.

Click [Port] on the browser menu. The password entry dialog appears. To log on as an administrator, enter "admin" for the user name and "wago" for the password, and click [OK].

Check both [Modbus UDP] and [Modbus TCP]. Click [SUBMIT], and turn the power off and back on again.

- * In the initial condition, both Modbus UDP and Modbus TCP are enabled (checked).

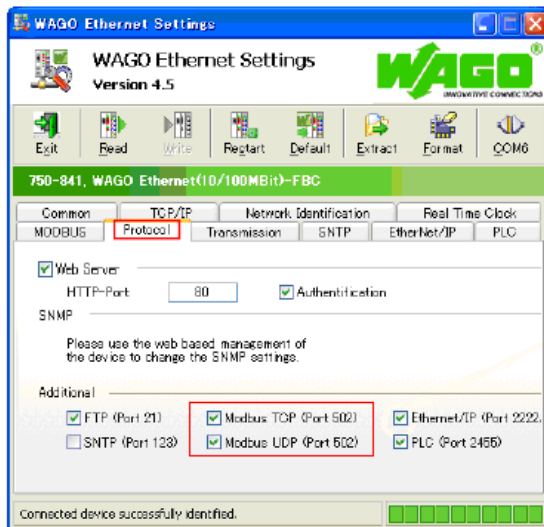


Enter the IP address of the bus coupler or bus controller on Internet Explorer, and press the [Enter] key to display the browser menu.

- Setting on the [WAGO Ethernet Settings] window ([Protocol] tab window)

**"WAGO Ethernet Settings" cannot be used with 750-342 or 750-842.

Check ☐ Modbus TCP (Port 502) and ☐ Modbus UDP (Port 502) in the [Protocol] tab window and write the settings into the bus coupler or bus controller.



750-871

The least significant byte of the IP address can be set by the DIP switch.

Note that the IP address must be set on "WAGO BootP Server" or "WAGO Ethernet Settings" in advance.

When any of the DIP switches is set in the ON position upon power-on, the IP address set by the DIP switch will take effect.

| DIP Switch | Setting Example | Remarks |
|------------|-------------------------|--|
| | 50 [DEC] (00110010 BIN) | Set the least significant byte of the IP address (1 to 254). Switch 1 = LSB, switch 8 = MSB |

750-873

Connect the computer to the bus coupler or bus controller, and start the web browser. Be sure to uncheck [Override default fieldbus settings?] for [Modbus RTU Settings] in the [Modbus] browser menu.

- * When [Modbus] is clicked, the password may be required. For more information, see "750-873" (page 25-5).
- * In the initial condition, [Override default fieldbus settings?] is unchecked.

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 |
|------------------------------|------|--------------------|
| %MX (internal contact point) | 00H | %MW as word device |
| %IX (input variable) | 01H | %IW as word device |
| %QX (output variable) | 02H | %QW as word device |

25.1.3 Wiring Diagrams

When Connected at CN1:

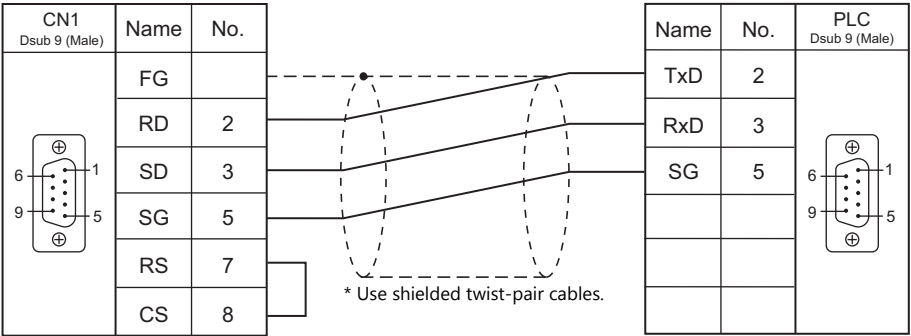


CAUTION

- 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.

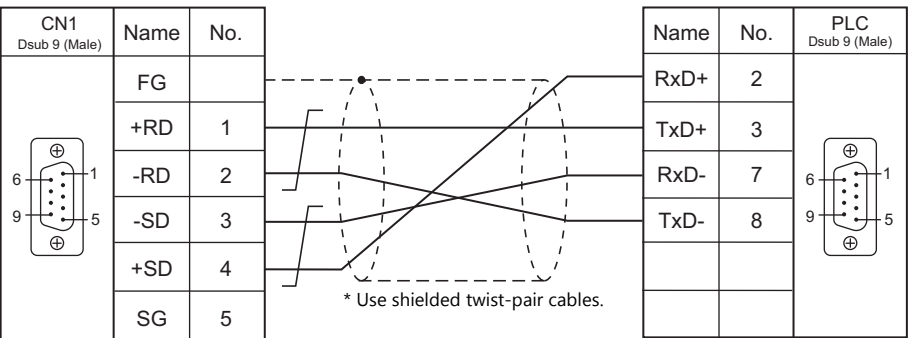
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

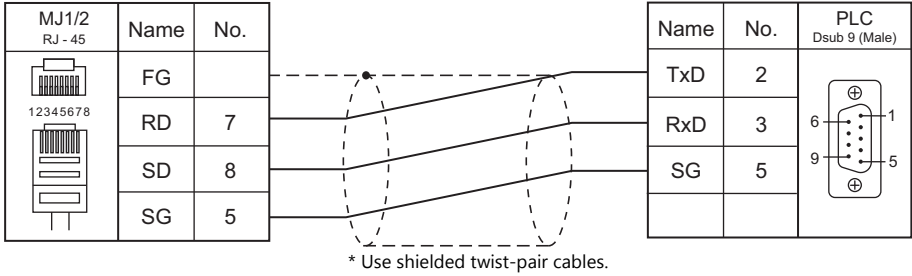
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

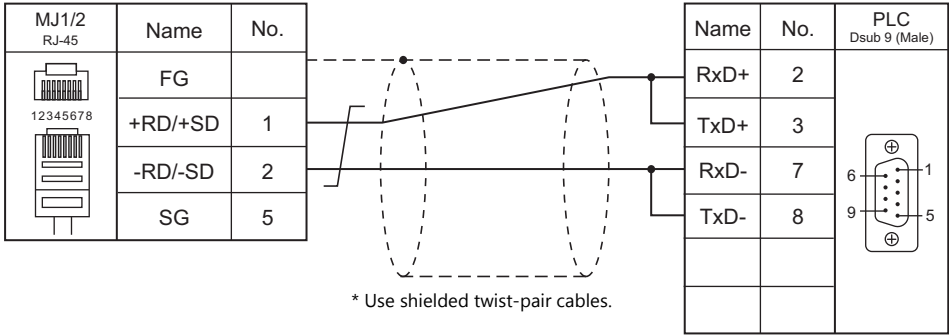
RS-232C

Wiring diagram 1 - M2

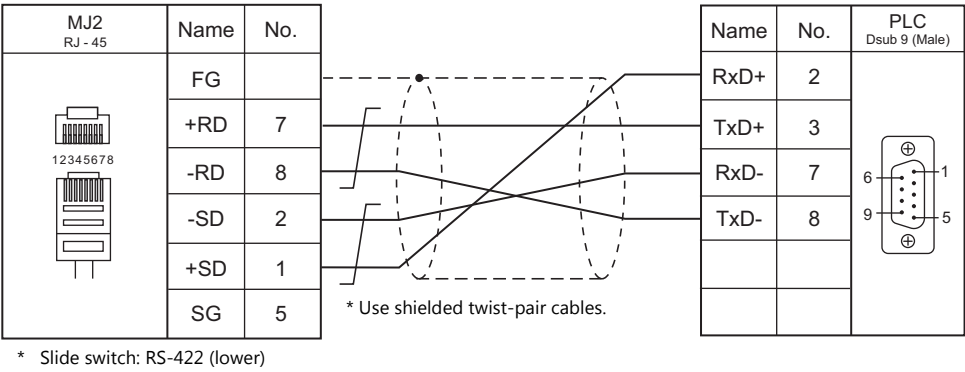


RS-422/RS-485

Wiring diagram 1 - M4

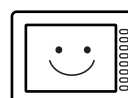


Wiring diagram 2 - M4



MEMO

MONITOUCH



26. XINJE

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) | |
| XC Series (MODBUS RTU) | XC2 XC3 XC5 XCM | COM1 (Mini-DIN 8-pin) | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | COM2 (Mini-DIN 8-pin) | | | | | | |
| | | COM2 (Terminal block) | | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | | |
| | | XC-COM-BD | COM3 | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - 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.

26.1.1 XC Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

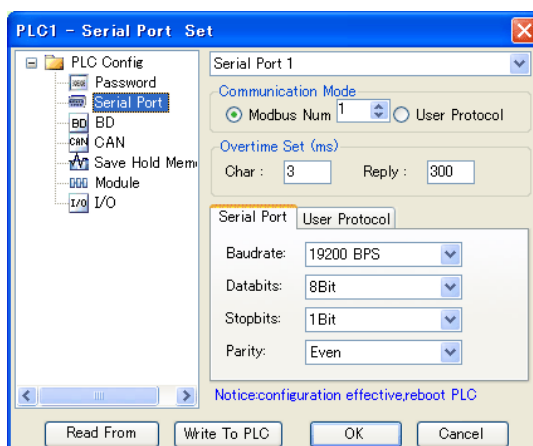
| Item | Setting | Remarks |
|-----------------|--|--------------|
| Connection Mode | <u>1:1</u> / 1:n / Multi-link2 Multi-link2 (Ethernet) / 1:n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115200 bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | 0 to 254 | 0: Broadcast |

PLC

Make communication settings by using the application software "XCPPPro" or writing the setting values directly into the FD address.

For more information, refer to the PLC manual issued by the manufacturer.

PLC Config



(Underlined setting: default)

| Item | | Setting | Remarks |
|-------------|--------------------|------------|---|
| Serial Port | Serial Port 1 - 3 | | Select a COM port to which the TS2060 is connected. |
| | Communication Mode | Modbus Num | <u>1</u> to 254 |
| | Serial Port | Baudrate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115200 Bps |
| | | Databits | 7 / <u>8</u> Bits |
| | | Stopbits | <u>1</u> / 2 Bits |
| | | Parity | None / Odd / <u>Even</u> |
| BD | BD Config | | BD Serial Port |
| | | | This setting is used when using "XC-COM-BD". |

After writing the settings, turn the PLC power off and on again.

FD address

| Port | FD | Setting | Remarks | | | | | | | | | | | | | | | |
|------|--------|--|---|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|
| COM1 | FD8210 | Communication mode: Station number setting | Changes can be made using the application software. Of the settings made with the application software and FD address, the one made last will be used. | | | | | | | | | | | | | | | |
| | FD8211 | Communication format: Baud rate, data length, stop bit, parity settings <div><div>bit</div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table><div><div>Parity</div><div>0: None 1: Odd 2: Even</div><div>Stopbits</div><div>0: 2 Bits 2: 1 Bit</div><div>Databits</div><div>0: 8 Bits 1: 7 Bits</div><div>Baudrate</div><div>4: 4800 BPS 5: 9600 BPS 6: 19200 BPS 7: 38400 BPS 8: 57600 BPS 9: 115200 BPS</div></div></div> | | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 15 | 14 | 13 | | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| COM2 | FD8220 | Same as COM1 | | | | | | | | | | | | | | | | |
| | FD8221 | | | | | | | | | | | | | | | | | |
| COM3 | FD8230 | Same as COM1 | | | | | | | | | | | | | | | | |
| | FD8231 | | | | | | | | | | | | | | | | | |

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 | |
| M (auxiliary relays) | 01H | |
| X (input relay) | 02H | |
| Y (output relay) | 03H | |
| S (status relays) | 04H | |
| T (timer) | 05H | |
| TD (timer data) | 06H | |
| C (counter) | 07H | |
| CD (counter data) | 08H | |
| FD (flashROM register) | 09H | |

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 X or Y device memory:
 Convert the address from octal notation (OCT) to decimal (DEC) and divide by 16. Specify the quotient as the address number. Specify the remainder for bit designation.
 Example: Indirect device memory designation of "X31"
 $31 \text{ (OCT)} \rightarrow 25 \text{ (DEC)} \div 16 = 1 \text{ remainder } 9$
 Specify "1" (DEC) for the address number, and "9" (DEC) for the bit designation.

26.1.2 Wiring Diagrams

When Connected at CN1:

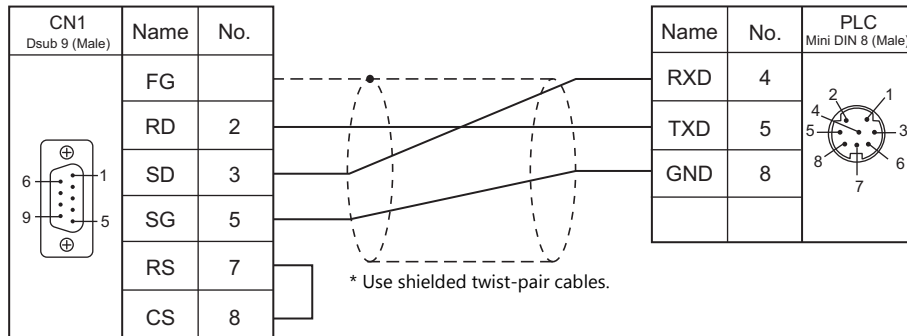


CAUTION

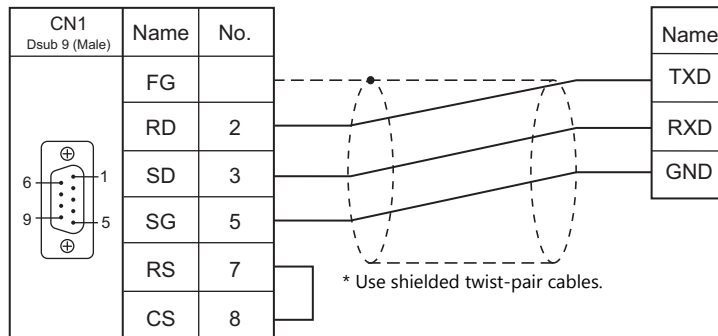
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Wiring diagram 1 - C2

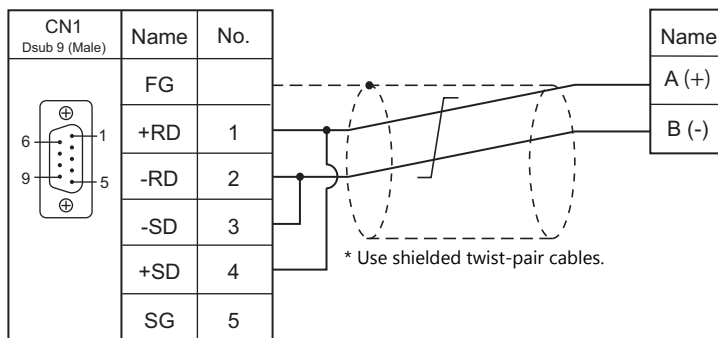


Wiring diagram 2 - C2



RS-422/RS-485

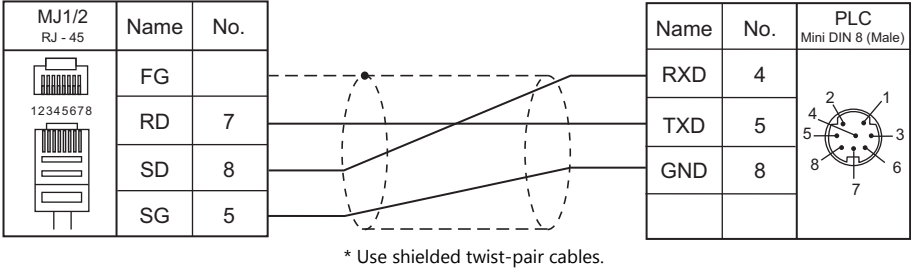
Wiring diagram 1 - C4



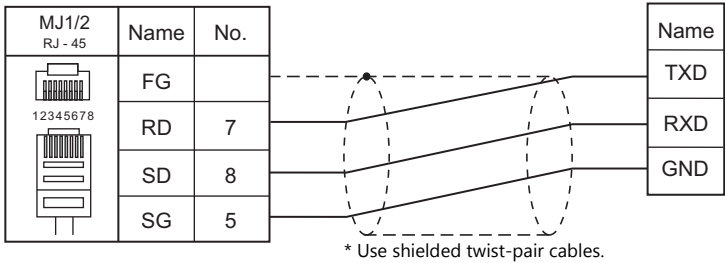
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

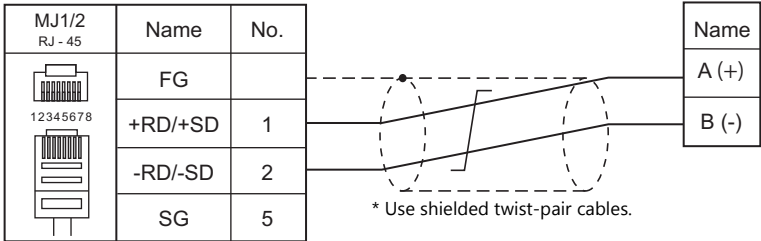


Wiring diagram 2 - M2



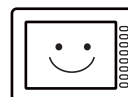
RS-422/RS-485

Wiring diagram 1 - M4



MEMO

MONITOUCH



27. YAMAHA

27.1 Temperature Controller/Servo/Inverter Connection

27.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Robot Controller

| PLC Selection on the Editor | Model | Port | Signal Level | Connection | | | Lst File |
|--------------------------------|--------|------|-----------------|-----------------------|-----------------------|--------------|--------------|
| | | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 ^{*1} | MJ2 (4-wire) | |
| RCX142 | RCX142 | COM | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | Y_RCX142.lst |
| | RCX222 | | | | | | |
| | RCX240 | | | | | | |

^{*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).

27.1.1 RCX142

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / Multi-link2 | |
| Signal Level | <u>RS-232C</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 bps | |
| Data Length | 7 / <u>8 bits</u> | |
| Stop Bit | <u>1 bit</u> | |
| Parity | None / <u>Odd</u> / Even | |
| CR/LF | <u>CR</u> / CR/LF | |

Robot Controller

RCX142/RCX240

Set communication parameters using the MPB programming box (RPB programming box for RCX240). For more information, refer to the instruction manual for the robot controller issued by the manufacturer.

(Underlined setting: default)

| Mode | Sub Menu | Item | Setting | Remarks |
|--------|----------|-----------------------------------|--|---------|
| SYSTEM | CMU | 1. CMU mode | ONLINE | |
| | | 2. Data bits ^{*1} | 7 / <u>8 bits</u> | |
| | | 3. Baud rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 bps | |
| | | 4. Stop bit | <u>1</u> / 2 bits | |
| | | 5. Parity | NON / <u>ODD</u> / EVEN | |
| | | 6. Termination code | CR / <u>CRLE</u> | |
| | | 7. XON/XOFF control ^{*2} | NO | |
| | | 8. RTS/CTS control ^{*2} | NO | |

*1 If Japanese is selected for the interface language, set the data bit to "8".

RCX222

Set communication parameters using the RPB programming box. For more information, refer to the instruction manual for the robot controller issued by the manufacturer.

(Underlined setting: default)

| Mode | Sub Menu | Item | Setting | Remarks |
|--------|----------|----------------------------|--|---------|
| SYSTEM | CMU | 1. CMU mode | ONLINE | |
| | | 2. Data bits ^{*1} | 7 / <u>8 bits</u> | |
| | | 3. Baud rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 bps | |
| | | 4. Stop bit | <u>1</u> / 2 bits | |
| | | 5. Parity | NON / <u>ODD</u> / EVEN | |
| | | 6. Termination code | CR / <u>CRLE</u> | |
| | | 7. Flow control | NO | |

*1 If Japanese is selected for the interface language, set the data bit to "8".

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 |
|---|------|------------------------|
| LANG (interface language) | 00H | |
| ACSL (access level) | 01H | |
| ARM1 (arm status (main robot)) | 02H | |
| ARM2 (arm status (sub robot)) | 03H | |
| BRKP (break point) | 04H | |
| EXEL (execution level) | 05H | |
| MODS (mode status) | 06H | |
| ORIG (origin return status) | 07H | Read only |
| ABSR (absolute reset status) | 08H | Double-word, read only |
| SERV (servo status) | 09H | Double-word, read only |
| SEQE (sequence program execution status) | 0AH | |
| UNIT (point unit coordinate system) | 0BH | |
| VERS (version) | 0CH | Read only |
| WHR1 (current position in pulse coordinate system (main group)) | 0DH | Double-word, read only |
| WHR2 (current position in pulse coordinate system (sub group)) | 0EH | Double-word, read only |
| WXY1 (current position in XY coordinate system (main group)) | 0FH | Double-word, read only |
| WXY2 (current position in XY coordinate system (sub group)) | 10H | Double-word, read only |
| SIFT (shift status) | 11H | Read only |
| HAND (hand status) | 12H | Read only |
| MEMR (remaining memory capacity) | 13H | Double-word, read only |
| EMGS (emergency stop status) | 14H | Read only |
| SELF (error status in self-diagnosis) | 15H | Read only |
| OPTS (option slot status) | 16H | Read only |
| PRGS (program execution status) | 17H | Read only |
| TSKS (running or suspended status of task) | 18H | Read only |
| TSKM (task operation status) | 19H | Read only |

LANG (interface language)

| Address | Name | Setting Range |
|---------|--------------------|---------------------------|
| 0 | Interface language | 0: Japanese 1: English |

ACSL (access level)

| Address | Name | Setting Range |
|---------|--------------|---------------|
| 0 | Access level | 0 to 3 |

ARM1 (arm status (main robot))

| Address | Name | Setting Range |
|---------|--|---|
| 0 | Current arm setting | 0: Right-hand system 1: Left-hand system |
| 1 | Arm setting at the time of program reset | 0: Right-hand system 1: Left-hand system |

ARM2 (arm status (sub robot))

| Address | Name | Setting Range |
|---------|--|---|
| 0 | Current arm setting | 0: Right-hand system 1: Left-hand system |
| 1 | Arm setting at the time of program reset | 0: Right-hand system 1: Left-hand system |

BRKP (break point)

| Address | Name | Setting Range |
|---------|------------------------------|---------------|
| 0 | Line number of break point 1 | 0 to 19999 |
| 1 | Line number of break point 2 | 0 to 19999 |
| 2 | Line number of break point 3 | 0 to 19999 |
| 3 | Line number of break point 4 | 0 to 19999 |

EXEL (execution level)

| Address | Name | Setting Range |
|---------|-----------------|---------------|
| 0 | Execution level | 0 to 8 |

MODS (mode status)

| Address | Name | Setting Range |
|---------|-------------|---|
| 0 | Mode status | 0: AUTO 1: PROGRAM 2: MANUAL 3: SYSTEM |

ORIG (origin return status)

| Address | Name | Setting Range |
|---------|----------------------|----------------------------------|
| 0 | Origin return status | 0: Completed 1: Not completed |

ABSR (absolute reset status)

| Address | Name | Setting Range |
|---------|---|--|
| 0 | Completed or not completed | 0: Completed 1: Not completed |
| 1 | Status of each axis (output only when address 0 is set to "1" (absolute reset not completed)) | 00000000 to 99999999 XXXXXXX └─ Axis 1 0: Not completed : 1: Completed └─ Axis 8 9: Not applicable |

SERV (servo status)

| Address | Name | Setting Range |
|---------|---------------------------|---|
| 0 | Motor power ON/OFF status | 0: Motor power ON 1: Motor power OFF |
| 1 | Status of each axis | 00000000 to 99999999 XXXXXXX └─ Axis 1 0: Mechanical brake ON + dynamic brake ON : 1: Servo ON └─ Axis 8 2: Mechanical brake OFF + dynamic brake OFF 9: Not applicable |

SEQE (sequence program execution status)

| Address | Name | Setting Range |
|---------|------------------|---|
| 0 | Availability | 0: Disabled 1: Enabled 3: Enabled, and output cleared at the time of emergency stop |
| 1 | Execution status | 0: Stopped 1: In progress |

UNIT (point unit coordinate system)

| Address | Name | Setting Range |
|---------|------------------------------|---|
| 0 | Point unit coordinate system | 0: Joint coordinates in units of pulse 1: Cartesian coordinates in units of mm or deg. |

VERS (version)

| Address | Name | Setting Range |
|---------|---------------------|---------------|
| 0 | Host version | |
| 1 | Host revision | |
| 2 | MPB/RPB version | |
| 3 | Driver version 1 | |
| 4 | Driver version 2 | |
| 5 | Driver version 3 | |
| 6 | Driver version 4 | |
| 7 | Driver version 5 | |
| 8 | Driver version 6 | |
| 9 | Driver version 7 | |
| 10 | Driver version 8 | |
| 11 | Option unit version | |

WHR1 (current position in pulse coordinate system (main group))

| Address | Name | Setting Range |
|---------|--|-------------------|
| 0 | Current position of axis 1 in the pulse coordinate system (main group) | -999999 to 999999 |
| 1 | Current position of axis 2 in the pulse coordinate system (main group) | -999999 to 999999 |
| 2 | Current position of axis 3 in the pulse coordinate system (main group) | -999999 to 999999 |
| 3 | Current position of axis 4 in the pulse coordinate system (main group) | -999999 to 999999 |
| 4 | Current position of axis 5 in the pulse coordinate system (main group) | -999999 to 999999 |
| 5 | Current position of axis 6 in the pulse coordinate system (main group) | -999999 to 999999 |

WHR2 (current position in pulse coordinate system (sub group))

| Address | Name | Setting Range |
|---------|---|-------------------|
| 0 | Current position of axis 1 in the pulse coordinate system (sub group) | -999999 to 999999 |
| 1 | Current position of axis 2 in the pulse coordinate system (sub group) | -999999 to 999999 |
| 2 | Current position of axis 3 in the pulse coordinate system (sub group) | -999999 to 999999 |
| 3 | Current position of axis 4 in the pulse coordinate system (sub group) | -999999 to 999999 |
| 4 | Current position of axis 5 in the pulse coordinate system (sub group) | -999999 to 999999 |
| 5 | Current position of axis 6 in the pulse coordinate system (sub group) | -999999 to 999999 |

WXY1 (current position in XY coordinate system (main group))

| Address | Name | Setting Range |
|---------|--|-------------------|
| 0 | Current position of axis 1 in units of "mm" (main group) | -999999 to 999999 |
| 1 | Current position of axis 2 in units of "mm" (main group) | -999999 to 999999 |
| 2 | Current position of axis 3 in units of "mm" (main group) | -999999 to 999999 |
| 3 | Current position of axis 4 in units of "mm" (main group) | -999999 to 999999 |
| 4 | Current position of axis 5 in units of "mm" (main group) | -999999 to 999999 |
| 5 | Current position of axis 6 in units of "mm" (main group) | -999999 to 999999 |

WXY2 (current position in XY coordinate system (sub group))

| Address | Name | Setting Range |
|---------|---|-------------------|
| 0 | Current position of axis 1 in units of "mm" (sub group) | -999999 to 999999 |
| 1 | Current position of axis 2 in units of "mm" (sub group) | -999999 to 999999 |
| 2 | Current position of axis 3 in units of "mm" (sub group) | -999999 to 999999 |
| 3 | Current position of axis 4 in units of "mm" (sub group) | -999999 to 999999 |
| 4 | Current position of axis 5 in units of "mm" (sub group) | -999999 to 999999 |
| 5 | Current position of axis 6 in units of "mm" (sub group) | -999999 to 999999 |

SIFT (shift status)

| Address | Name | Setting Range |
|---------|--------------------------------------|---------------|
| 0 | Shift number selected for main robot | 0 to 9 |
| 1 | Shift number selected for sub robot | 0 to 9 |

HAND (hand status)

| Address | Name | Setting Range |
|---------|-------------------------------------|---------------|
| 0 | Hand number selected for main robot | 0 to 3 |
| 1 | Hand number selected for sub robot | 4 to 7 |

MEMR (remaining memory capacity)

| Address | Name | Setting Range |
|---------|------------------------------------|---------------|
| 0 | Remaining source area (unit: byte) | |
| 1 | Remaining object area (unit: byte) | |

EMGS (emergency stop status)

| Address | Name | Setting Range |
|---------|-----------------------|--------------------------------|
| 0 | Emergency stop status | 0: Normal 1: Emergency stop |

SELF (error status in self-diagnosis)

| Address | Name | Setting Range |
|------------|----------------|---|
| 0 to 49 | Error status 1 | [Error group No.] . [Error category No.] : [Error message] (CHAR) |
| 50 to 99 | Error status 2 | |
| 100 to 149 | Error status 3 | |
| 150 to 199 | Error status 4 | |
| 200 to 249 | Error status 5 | |

OPTS (option slot status)

| Address | Name | Setting Range |
|------------|----------------------|--------------------------|
| 0 to 49 | Option slot status 1 | Option board name (CHAR) |
| 50 to 99 | Option slot status 2 | |
| 100 to 149 | Option slot status 3 | |
| 150 to 199 | Option slot status 4 | |

PRGS (program execution status)

| Address | Name | Setting Range |
|---------|------------------------------------|---------------------|
| 0 to 49 | Name of currently selected program | Program name (CHAR) |
| 50 | Current task number | 1 to 8 |
| 51 | Line number of current program | 1 to 9999 |
| 52 | Priority of current task | 17 to 47 |

TSKS (running or suspended status of task)

| Address | Name | Setting Range |
|---------|---|---------------|
| 0 | Number of task currently running or suspended (No. 1) | 1 to 8 |
| 1 | Number of task currently running or suspended (No. 2) | 1 to 8 |
| 2 | Number of task currently running or suspended (No. 3) | 1 to 8 |
| 3 | Number of task currently running or suspended (No. 4) | 1 to 8 |
| 4 | Number of task currently running or suspended (No. 5) | 1 to 8 |
| 5 | Number of task currently running or suspended (No. 6) | 1 to 8 |
| 6 | Number of task currently running or suspended (No. 7) | 1 to 8 |
| 7 | Number of task currently running or suspended (No. 8) | 1 to 8 |

TSKM (task operation status)

| Address | Name | Setting Range |
|---------|---|--|
| 0 | Number of line being executed in task (No. 1) | 1 to 9999 |
| 1 | Task status (No. 1) | 0: In progress 1: Suspended 2: Stopped |
| 2 | Priority (No. 1) | 17 to 47 |
| 3 | Number of line being executed in task (No. 2) | 1 to 9999 |
| 4 | Task status (No. 2) | 0: In progress 1: Suspended 2: Stopped |
| 5 | Priority of task (No. 2) | 17 to 47 |
| 6 | Number of line being executed in task (No. 3) | 1 to 9999 |
| 7 | Task status (No. 3) | 0: In progress 1: Suspended 2: Stopped |
| 8 | Priority of task (No. 3) | 17 to 47 |
| 9 | Number of line being executed in task (No. 4) | 1 to 9999 |
| 10 | Task status (No. 4) | 0: In progress 1: Suspended 2: Stopped |
| 11 | Priority of task (No. 4) | 17 to 47 |
| 12 | Number of line being executed in task (No. 5) | 1 to 9999 |
| 13 | Task status (No. 5) | 0: In progress 1: Suspended 2: Stopped |
| 14 | Priority of task (No. 5) | 17 to 47 |
| 15 | Number of line being executed in task (No. 6) | 1 to 9999 |
| 16 | Task status (No. 6) | 0: In progress 1: Suspended 2: Stopped |
| 17 | Priority of task (No. 6) | 17 to 47 |
| 18 | Number of line being executed in task (No. 7) | 1 to 9999 |
| 19 | Task status (No. 7) | 0: In progress 1: Suspended 2: Stopped |
| 20 | Priority of task (No. 7) | 17 to 47 |
| 21 | Number of line being executed in task (No. 8) | 1 to 9999 |
| 22 | Task status (No. 8) | 0: In progress 1: Suspended 2: Stopped |
| 23 | Priority of task (No. 8) | 17 to 47 |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|----------------|--|----|
| Program operation | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | 0: RESET 1: RUN 2: STEP 3: SKIP 4: NEXT 5: STOP | |
| Switching of execution task | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 1 | |
| Manual speed change | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 2 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Manual movement speed: 1 to 100 | |
| Moving to absolute reset position | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Designated axis: 1 to 6 | |
| | | n + 4 | Direction of movement 0: Positive direction 1: Negative direction | |
| Absolute reset for each axis | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Designated axis: 1 to 6 | |
| Memory area initialization | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | 0: Program data 1: Point data 2: Shift data 3: Hand data 4: Pallet data 5: Point comment data 6: All of above data (program, point, shift, hand, pallet and point comment) 7: Parameter data 8: All data | |
| Communication port initialization | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 6 | |
| Error log initialization | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 7 | |
| Resetting of internal emergency stop flag | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 8 | |
| Acquisition of controller configuration status | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 9 | |
| | | n + 2 to n + 3 | Acquired text | |
| Acquisition of message line information displayed on MPB/RPB | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 10 | |
| | | n + 2 to n + 3 | Acquired text | |
| Acquisition of error message | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | Top number of acquired data: 1 to 500 | |
| | | n + 3 | Last number of acquired data: 1 to 500 | |
| | | n + 4 - n + 5 | Acquired text | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|------------------|--|----|
| Acquisition of speed setting status | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | Setting for automatic movement speed (main group): 1 to 100 | |
| | | n + 3 | Setting for manual movement speed (main group): 1 to 100 | |
| | | n + 4 | Setting for automatic movement speed (sub group): 1 to 100 | |
| | | n + 5 | Setting for manual movement speed (sub group): 1 to 100 | |
| Command execution interruption | 1 - 8 (PLC1 - 8) | n | Station number | 2 |
| | | n + 1 | Command: 13 | |
| Reading of point data | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 14 | |
| | | n + 2 | Point number: 0 to 9999 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Point data 1 | |
| | | n + 6 to n + 7 | Point data 2 | |
| | | n + 8 to n + 9 | Point data 3 | |
| | | n + 10 to n + 11 | Point data 4 | |
| | | n + 12 to n + 13 | Point data 5 | |
| | | n + 14 to n + 15 | Point data 6 | |
| Writing of point data | 1 - 8 (PLC1 - 8) | n | Station number | 17 |
| | | n + 1 | Command: 15 | |
| | | n + 2 | Point number: 0 to 9999 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Point data 1 | |
| | | n + 6 to n + 7 | Point data 2 | |
| | | n + 8 to n + 9 | Point data 3 | |
| | | n + 10 to n + 11 | Point data 4 | |
| | | n + 12 to n + 13 | Point data 5 | |
| | | n + 14 to n + 15 | Point data 6 | |
| Reading of parameter (controller) | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 16 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 0: Entire controller | |
| | | n + 6 to n + 7 | Parameter data | |
| | | n + 8 to n + 9 | Comment | |
| Reading of parameter (main robot / main robot + sub robot) | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 16 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 1: Main robot 2: Main robot + sub robot | |
| | | n + 6 to n + 7 | Parameter data (main robot) | |
| | | n + 8 to n + 9 | Parameter data (sub robot) | |
| | | n + 10 to n + 11 | Comment | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|------------------|--|--------------------|
| Reading of parameter (4-axis/8-axis) | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 16 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 3: 4-axis 4: 8-axis | |
| | | n + 6 to n + 7 | Parameter data (axis 1) | |
| | | n + 8 to n + 9 | Parameter data (axis 2) | |
| | | n + 10 to n + 11 | Parameter data (axis 3) | |
| | | n + 12 to n + 13 | Parameter data (axis 4) | |
| | | n + 14 to n + 15 | Parameter data (axis 5) | |
| | | n + 16 to n + 17 | Parameter data (axis 6) | |
| | | n + 18 to n + 19 | Parameter data (axis 7) | |
| | | n + 20 to n + 21 | Parameter data (axis 8) | |
| | | n + 22 to n + 23 | Comment | |
| Writing of parameter (controller) | 1 - 8 (PLC1 - 8) | n | Station number | $8 + (m + 1) / 2$ |
| | | n + 1 | Command: 17 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 0: Entire controller | |
| | | n + 6 to n + 7 | Parameter data | |
| Writing of parameter (main robot / main robot + sub robot) | 1 - 8 (PLC1 - 8) | n | Station number | $10 + (m + 1) / 2$ |
| | | n + 1 | Command: 17 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 1: Main robot 2: Main robot + sub robot | |
| | | n + 6 to n + 7 | Parameter data (main robot) | |
| | | n + 8 to n + 9 | Parameter data (sub robot) | |
| Writing of parameter (4-axis/8-axis) | 1 - 8 (PLC1 - 8) | n | Station number | $22 + (m + 1) / 2$ |
| | | n + 1 | Command: 17 | |
| | | n + 2 to n + 4 | Parameter label (six alphabetical characters) | |
| | | n + 5 | Type 3: 4-axis 4: 8-axis | |
| | | n + 6 to n + 7 | Parameter data (axis 1) | |
| | | n + 8 to n + 9 | Parameter data (axis 2) | |
| | | n + 10 to n + 11 | Parameter data (axis 3) | |
| | | n + 12 to n + 13 | Parameter data (axis 4) | |
| | | n + 14 to n + 15 | Parameter data (axis 5) | |
| | | n + 16 to n + 17 | Parameter data (axis 6) | |
| | | n + 18 to n + 19 | Parameter data (axis 7) | |
| Reading of shift coordinate value definition | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 18 | |
| | | n + 2 | Shift coordinate number: 0 to 9 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Shift coordinate 1 (S) | |
| | | n + 6 to n + 7 | Shift coordinate 2 (S) | |
| | | n + 8 to n + 9 | Shift coordinate 3 (S) | |
| | | n + 10 to n + 11 | Shift coordinate 4 (S) | |
| | | n + 12 to n + 13 | Shift coordinate 1 (SP) | |
| | | n + 14 to n + 15 | Shift coordinate 2 (SP) | |
| | | n + 16 to n + 17 | Shift coordinate 3 (SP) | |
| | | n + 18 to n + 19 | Shift coordinate 4 (SP) | |
| | | n + 20 to n + 21 | Shift coordinate 1 (SM) | |
| | | n + 22 to n + 23 | Shift coordinate 2 (SM) | |
| | | n + 24 to n + 25 | Shift coordinate 3 (SM) | |
| | | n + 26 to n + 27 | Shift coordinate 4 (SM) | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|--|---------------------|------------------|--|----|
| Writing of shift coordinate value definition | 1 - 8 (PLC1 - 8) | n | Station number | 28 |
| | | n + 1 | Command: 19 | |
| | | n + 2 | Shift coordinate number: 0 to 9 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Shift coordinate 1 (S) | |
| | | n + 6 to n + 7 | Shift coordinate 2 (S) | |
| | | n + 8 to n + 9 | Shift coordinate 3 (S) | |
| | | n + 10 to n + 11 | Shift coordinate 4 (S) | |
| | | n + 12 to n + 13 | Shift coordinate 1 (SP) | |
| | | n + 14 to n + 15 | Shift coordinate 2 (SP) | |
| | | n + 16 to n + 17 | Shift coordinate 3 (SP) | |
| | | n + 18 to n + 19 | Shift coordinate 4 (SP) | |
| | | n + 20 to n + 21 | Shift coordinate 1 (SM) | |
| | | n + 22 to n + 23 | Shift coordinate 2 (SM) | |
| | | n + 24 to n + 25 | Shift coordinate 3 (SM) | |
| | | n + 26 to n + 27 | Shift coordinate 4 (SM) | |
| Reading of hand definition | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 20 | |
| | | n + 2 | Hand number: 0 to 7 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Hand 1 | |
| | | n + 6 to n + 7 | Hand 2 | |
| | | n + 8 to n + 9 | Hand 3 | |
| Writing of hand definition | 1 - 8 (PLC1 - 8) | n + 10 | Hand attachment to R axis 0: None 1: Attached | 11 |
| | | n | Station number | |
| | | n + 1 | Command: 21 | |
| | | n + 2 | Hand number: 0 to 7 | |
| | | n + 3 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 4 to n + 5 | Hand 1 | |
| | | n + 6 to n + 7 | Hand 2 | |
| | | n + 8 to n + 9 | Hand 3 | |
| | | n + 10 | Hand attachment to R axis 0: None 1: Attached | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|------------------------------|---------------------|------------------|--|----|
| Reading of pallet definition | 1 - 8 (PLC1 - 8) | n | Station number | 3 |
| | | n + 1 | Command: 22 | |
| | | n + 2 | Pallet number: 0 to 19 | |
| | | n + 3 | NX | |
| | | n + 4 | NY | |
| | | n + 5 | NZ | |
| | | n + 6 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 7 to n + 8 | Coordinate data 1 for P [1] | |
| | | n + 9 to n + 10 | Coordinate data 2 for P [1] | |
| | | n + 11 to n + 12 | Coordinate data 3 for P [1] | |
| | | n + 13 to n + 14 | Coordinate data 4 for P [1] | |
| | | n + 15 to n + 16 | Coordinate data 5 for P [1] | |
| | | n + 17 to n + 18 | Coordinate data 6 for P [1] | |
| | | n + 19 to n + 20 | Coordinate data 1 for P [2] | |
| | | n + 21 to n + 22 | Coordinate data 2 for P [2] | |
| | | n + 23 to n + 24 | Coordinate data 3 for P [2] | |
| | | n + 25 to n + 26 | Coordinate data 4 for P [2] | |
| | | n + 27 to n + 28 | Coordinate data 5 for P [2] | |
| | | n + 29 to n + 30 | Coordinate data 6 for P [2] | |
| | | n + 31 to n + 32 | Coordinate data 1 for P [3] | |
| | | n + 33 to n + 34 | Coordinate data 2 for P [3] | |
| | | n + 35 to n + 36 | Coordinate data 3 for P [3] | |
| | | n + 37 to n + 38 | Coordinate data 4 for P [3] | |
| | | n + 39 to n + 40 | Coordinate data 5 for P [3] | |
| | | n + 41 to n + 42 | Coordinate data 6 for P [3] | |
| | | n + 43 to n + 44 | Coordinate data 1 for P [4] | |
| | | n + 45 to n + 46 | Coordinate data 2 for P [4] | |
| | | n + 47 to n + 48 | Coordinate data 3 for P [4] | |
| | | n + 49 to n + 50 | Coordinate data 4 for P [4] | |
| | | n + 51 to n + 52 | Coordinate data 5 for P [4] | |
| | | n + 53 to n + 54 | Coordinate data 6 for P [4] | |
| | | n + 55 to n + 56 | Coordinate data 1 for P [5] | |
| | | n + 57 to n + 58 | Coordinate data 2 for P [5] | |
| | | n + 59 to n + 60 | Coordinate data 3 for P [5] | |
| | | n + 61 to n + 62 | Coordinate data 4 for P [5] | |
| | | n + 63 to n + 64 | Coordinate data 5 for P [5] | |
| | | n + 65 to n + 66 | Coordinate data 6 for P [5] | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|------------------------------|---------------------|------------------|---|----|
| Writing of pallet definition | 1 - 8 (PLC1 - 8) | n | Station number | 67 |
| | | n + 1 | Command: 23 | |
| | | n + 2 | Pallet number: 0 to 19 | |
| | | n + 3 | NX | |
| | | n + 4 | NY | |
| | | n + 5 | NZ | |
| | | n + 6 | Coordinate system 0: Pulse (integer) 1 or greater: mm (decimal places) | |
| | | n + 7 to n + 8 | Coordinate data 1 for P [1] | |
| | | n + 9 to n + 10 | Coordinate data 2 for P [1] | |
| | | n + 11 to n + 12 | Coordinate data 3 for P [1] | |
| | | n + 13 to n + 14 | Coordinate data 4 for P [1] | |
| | | n + 15 to n + 16 | Coordinate data 5 for P [1] | |
| | | n + 17 to n + 18 | Coordinate data 6 for P [1] | |
| | | n + 19 to n + 20 | Coordinate data 1 for P [2] | |
| | | n + 21 to n + 22 | Coordinate data 2 for P [2] | |
| | | n + 23 to n + 24 | Coordinate data 3 for P [2] | |
| | | n + 25 to n + 26 | Coordinate data 4 for P [2] | |
| | | n + 27 to n + 28 | Coordinate data 5 for P [2] | |
| | | n + 29 to n + 30 | Coordinate data 6 for P [2] | |
| | | n + 31 to n + 32 | Coordinate data 1 for P [3] | |
| | | n + 33 to n + 34 | Coordinate data 2 for P [3] | |
| | | n + 35 to n + 36 | Coordinate data 3 for P [3] | |
| | | n + 37 to n + 38 | Coordinate data 4 for P [3] | |
| | | n + 39 to n + 40 | Coordinate data 5 for P [3] | |
| | | n + 41 to n + 42 | Coordinate data 6 for P [3] | |
| | | n + 43 to n + 44 | Coordinate data 1 for P [4] | |
| | | n + 45 to n + 46 | Coordinate data 2 for P [4] | |
| | | n + 47 to n + 48 | Coordinate data 3 for P [4] | |
| | | n + 49 to n + 50 | Coordinate data 4 for P [4] | |
| | | n + 51 to n + 52 | Coordinate data 5 for P [4] | |
| | | n + 53 to n + 54 | Coordinate data 6 for P [4] | |
| | | n + 55 to n + 56 | Coordinate data 1 for P [5] | |
| | | n + 57 to n + 58 | Coordinate data 2 for P [5] | |
| | | n + 59 to n + 60 | Coordinate data 3 for P [5] | |
| | | n + 61 to n + 62 | Coordinate data 4 for P [5] | |
| | | n + 63 to n + 64 | Coordinate data 5 for P [5] | |
| | | n + 65 to n + 66 | Coordinate data 6 for P [5] | |
| Reading of device port | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 24 | |
| | | n + 2 | Device port 0: DI port 1: DO port 2: MO port 3: TO port 4: LO port 5: SI port 6: SO port | |
| | | n + 3 | Port number: 0 to 7, 10 to 17, 20 to 27 | |
| | | n + 4 | Point data | |
| Writing of device port | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 25 | |
| | | n + 2 | Device port 1: DO port 2: MO port 3: TO port 4: LO port 6: SO port | |
| | | n + 3 | Port number: 0 to 7, 10 to 17, 20 to 27 | |
| | | n + 4 | Point data | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|---|---------------------|----------------|--|------------------|
| Reading of dynamic variable (Data type: integer/real number) | 1 - 8 (PLC1 - 8) | n | Station number | 15 |
| | | n + 1 | Command: 26 | |
| | | n + 2 to n + 9 | Variable name (max. 16 characters) | |
| | | n + 10 | Variable type 0: Simple variable 1: One-dimensional array variable 2: Two-dimensional array variable 3: Three-dimensional array variable | |
| | | n + 11 | Subscript for one dimension *1 | |
| | | n + 12 | Subscript for two dimensions *2 | |
| | | n + 13 | Subscript for three dimensions *3 | |
| | | n + 14 | Data type 0: Integer 1: Real number | |
| Reading of dynamic variable (Data type: text) | 1 - 8 (PLC1 - 8) | n | Station number | 15 |
| | | n + 1 | Command: 26 | |
| | | n + 2 to n + 9 | Variable name (max. 16 characters) | |
| | | n + 10 | Variable type 0: Simple variable 1: One-dimensional array variable 2: Two-dimensional array variable 3: Three-dimensional array variable | |
| | | n + 11 | Subscript for one dimension *1 | |
| | | n + 12 | Subscript for two dimensions *2 | |
| | | n + 13 | Subscript for three dimensions *3 | |
| | | n + 14 | Data type 2: Text | |
| Writing of dynamic variable (Data type: integer/real number) | 1 - 8 (PLC1 - 8) | n | Station number | 17 |
| | | n + 1 | Command: 27 | |
| | | n + 2 to n + 9 | Variable name (max. 16 characters) | |
| | | n + 10 | Variable type 0: Simple variable 1: One-dimensional array variable 2: Two-dimensional array variable 3: Three-dimensional array variable | |
| | | n + 11 | Subscript for one dimension *1 | |
| | | n + 12 | Subscript for two dimensions *2 | |
| | | n + 13 | Subscript for three dimensions *3 | |
| | | n + 14 | Data type 0: Integer 1: Real number | |
| Writing of dynamic variable (Data type: text) | 1 - 8 (PLC1 - 8) | n | Station number | 15 + (m + 1) / 2 |
| | | n + 1 | Command: 27 | |
| | | n + 2 to n + 9 | Variable name (max. 16 characters) | |
| | | n + 10 | Variable type 0: Simple variable 1: One-dimensional array variable 2: Two-dimensional array variable 3: Three-dimensional array variable | |
| | | n + 11 | Subscript for one dimension *1 | |
| | | n + 12 | Subscript for two dimensions *2 | |
| | | n + 13 | Subscript for three dimensions *3 | |
| | | n + 14 | Data type 2: Text | |
| Robot language execution | 1 - 8 (PLC1 - 8) | n | Station number | 2 + (m + 1) / 2 |
| | | n + 1 | Command: 28 | |
| | | n + 2 - | Command text: m | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|----------------------------|---------------------|----------------|--|----|
| Inching | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 29 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Specified axis 1: X axis 2: Y axis 3: Z axis 4: R axis 5: A axis 6: B axis | |
| | | n + 4 | Direction of movement 0: Positive direction 1: Negative direction | |
| JOG | 1 - 8 (PLC1 - 8) | n | Station number | 5 |
| | | n + 1 | Command: 30 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Specified axis 1: X axis 2: Y axis 3: Z axis 4: R axis 5: A axis 6: B axis | |
| | | n + 4 | Direction of movement 0: Positive direction 1: Negative direction | |
| Origin return | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 31 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Specified axis 1: X axis 2: Y axis 3: Z axis 4: R axis 5: A axis 6: B axis | |
| | | n + 4 | Direction of movement 0: Positive direction 1: Negative direction | |
| Teaching | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 32 | |
| | | n + 2 | 0: Main robot 1: Sub robot | |
| | | n + 3 | Point number: 0 to 9999 | |
| | | n + 4 | Variable number: 0 to 7 | |
| Reading of static variable | 1 - 8 (PLC1 - 8) | n | Station number | 4 |
| | | n + 1 | Command: 34 | |
| | | n + 2 | Data type 0: Integer (SGI) 1: Real number (SGR) | |
| | | n + 3 | Variable number: 0 to 7 | |
| | | n + 4 to n + 5 | Data | |
| Writing of static variable | 1 - 8 (PLC1 - 8) | n | Station number | 6 |
| | | n + 1 | Command: 35 | |
| | | n + 2 | Data type 0: Integer (SGI) 1: Real number (SGR) | |
| | | n + 3 | Variable number: 0 to 7 | |
| | | n + 4 to n + 5 | Data | |

Return data: Data stored from controller to TS2060

*1 Valid in the case where a number other than "0" (simple variable) is specified for the variable type.

*2 Valid in the case where "2" (two-dimensional array variable) or "3" (three-dimensional array variable) is specified for the variable type.

*3 Valid in the case where "3" (three-dimensional array variable) is specified for the variable type.

27.1.2 Wiring Diagrams

When Connected at CN1:

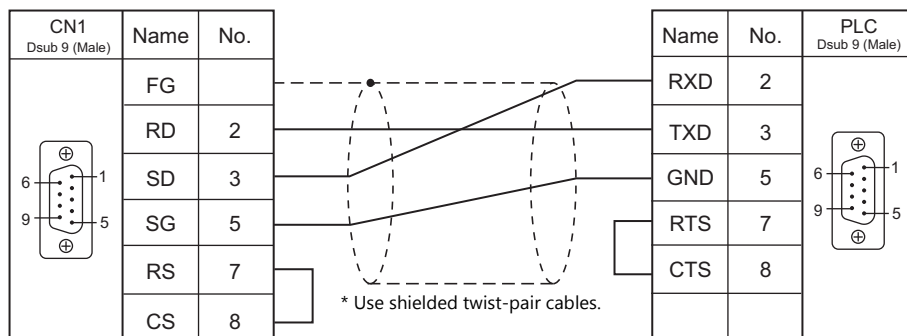


CAUTION

- 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

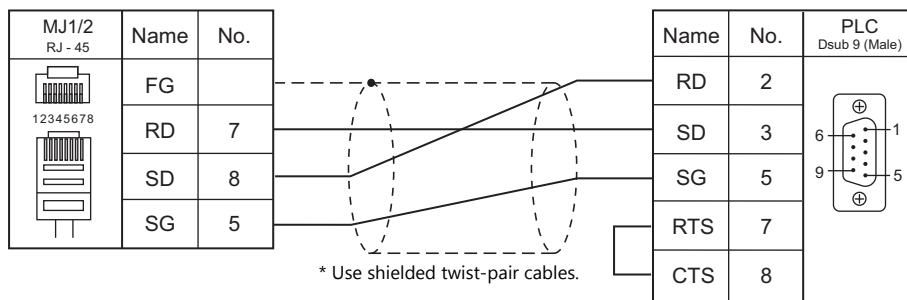
Wiring diagram 1 - C2



When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



28. Yaskawa Electric

28.1 PLC Connection

28.2 Temperature Controller/Servo/Inverter Connection

28.1 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} | |
| Memobus | GL60 series | JAMSC-IF60 JAMSC-IF61 JAMSC-IF611 | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | × |
| | | JAMSC-IF612 JAMSC-IF613 | | RS-422 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 6 - M4 | |
| | GL120 GL130 series | Memobus port on the CPU module | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | JAMSC-120NOM 27100 | | RS-422 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | Wiring diagram 7 - M4 | |
| | PROGIC-8 | PORT2 on the CPU unit | | RS-232C | Wiring diagram 2 - C2 | Wiring diagram 2 - M2 | | |
| CP9200SH/ MP900 | CP9200SH | CP-217IF | CN1 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN2 | | Wiring diagram 3 - C2 | Wiring diagram 3 - M2 | | |
| | | | CN3 | RS-422 | Wiring diagram 3 - C4 | Wiring diagram 3 - M4 | Wiring diagram 8 - M4 | |
| | MP920 MP930 | Memobus port on the CPU module | | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | 217IF | CN1 CN2 | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | | |
| | | | CN3 | RS-422 | Wiring diagram 4 - C4 | Wiring diagram 4 - M4 | Wiring diagram 9 - M4 | |
| | MP2200 MP2300 MP2300S | 217IF-01 218IF-01 | PORT | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | |
| | | 217IF-01 | RS422/485 | RS-422 | Wiring diagram 5 - C4 | Wiring diagram 5 - M4 | Wiring diagram 10 - M4 | |
| MP2000 series | MP2200 MP2300 MP2300S | 217IF-01 218IF-01 218IF-02 260IF-01 261IF-01 215AIF-01 | PORT | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | |
| | | 217IF-01 | RS422/485 | RS-422 | Wiring diagram 5 - C4 | Wiring diagram 5 - M4 | Wiring diagram 10 - M4 | |
| MP3000 series | MP3200 MP3300 | 217IF-01 218IF-01 218IF-02 260IF-01 261IF-01 215AIF-01 | PORT | RS-232C | Wiring diagram 4 - C2 | Wiring diagram 4 - M2 | | |
| | | 217IF-01 | RS422/485 | RS-422 | Wiring diagram 5 - C4 | Wiring diagram 5 - M4 | Wiring diagram 10 - 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)

To speed up communications, we recommend you to select "CP/MP Expansion Memobus (UDP/IP)".

| PLC Selection on the Editor | CPU | Unit | TCP/IP *1 | UDP/IP | Port No. | Keep Alive *2 | Ladder Transfer *3 |
|--|---|---|-----------|--------|--|---------------|--------------------|
| MP2300 (MODBUS TCP/IP) | MP2300S MP2400 | 218IFA (built-in LAN port) | ○ | × | Set the desired number using the tool. | × | × |
| | MP2200 MP2300 MP2300S | 218IF-01 | | | | | |
| CP/MP Expansion Memobus (UDP/IP) | MP2300S MP2400 | 218IFA (built-in LAN port) | × | ○ | Set the desired number using the tool. | × | × |
| | MP2200 MP2300 MP2300S | 218IF-01 | | | | | |
| MP2000 series (UDP/IP) | MP2200 (CPU-03) MP2310 MP2300S MP2400 | 218IFA (Built-in LAN port) | × | ○ | Default 9999 | × | × |
| | MP2200 (CPU-04) | 218IFC (Built-in LAN port) | | | Default 10000 | | |
| | MP2200 (CPU-01/02/03/04) MP2300 MP2310 MP2300S | 218IF-01 | | | Default 9999 | | |
| | | 218IF-02 263IF-01 | | | Default 9999 | | |
| MP3000 Series (Ethernet UDP/IP) | MP3200 MP3300 | 218IFD (Built-in LAN port) | × | ○ | Default 9999 | ○ | × |
| | | 218IF-01 | | | Default 10000 | | |
| | | 218IF-02 263IF-01 | | | Default 9999 | | |
| MP3000 Series Expansion Memobus (Ethernet) | MP3200 MP3300 | 218IFD (Built-in LAN port) 218IF-01 218IF-02 | ○ | ○ | Set the desired number using the tool. | ○ | |

*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.

28.1.1 Memobus

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-------------------|-----------------------------------|--|
| Connection Mode | <u>1</u> :1 / 1 : n / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |
| Transmission Mode | <u>Type 1</u> / Type 2 | For GL60 series or PROGIC-8: Type 1: special binary code For GL120/130 series: Type 2: standard binary code |

PLC

Be sure to match the settings to those made under [Communication Setting] of the editor. For more information, refer to the PLC manual issued by the manufacturer.

| Item | Setting | Remarks |
|------------------|-------------------------|----------|
| Signal Level | RS-232C / RS-422 | |
| Baud Rate | 4800 / 9600 / 19200 bps | |
| Data Length | 8 bits | RTU mode |
| Stop Bit | 1 bit | |
| Parity | Even | |
| Station No. | 1 to 31 | |
| Error Check | CRC | |
| Port Delay Timer | 0 | |

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 |
|------------------------|------|--|
| 4 (holding register) | 00H | |
| 3 (input register) | 01H | Including constant register, read only |
| R (link register) | 02H | |
| A (extension register) | 03H | |
| 0 (coil) | 04H | |
| D (link coil) | 05H | |
| 1 (input relay) | 06H | Read only |
| 7 (constant register) | 07H | |

28.1.2 CP9200SH/MP900

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1</u> :1 / 1:n / Multi-link2 / Multi-link2 (Ethernet) / 1:n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 76800 bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |

PLC

CP-217IF

Be sure to match the settings to those made under [Communication Setting] of the editor.
For more information on communication settings, refer to the PLC manual issued by the manufacturer.

Memobus Port on the CPU Module (MP920, MP930) / 217IF

Module configuration

| Item | Setting | Remarks |
|-----------------------|----------------|--|
| Transmission Protocol | Memobus | |
| Master/Slave | Slave | |
| Device Address | 1 to 31 | |
| Serial I/F | RS-232 | |
| Transmission Mode | RTU | |
| Data Length | 8 bits | |
| Parity Bit | Even | |
| Stop Bit | 1 stop | |
| Baud Rate | 19.2K | For connection via RS-422 on "217IF", 76800 bps can also be selected. For more information, refer to the PLC manual issued by the manufacturer. |

217IF-01, 218IF-01**Module configuration**


| Item | Setting | Remarks |
|-----------------------------|---------------------------|--|
| Transmission Protocol | Memobus | |
| Master/Slave | Slave | |
| Device Address | 1 | |
| Serial I/F | RS-232 / RS-485 | |
| Transmission Mode | RTU | |
| Data Length | 8 bits | |
| Parity Bit | Even | |
| Stop Bit | 1 stop | |
| Baud Rate | 19.2K | The maximum baud rate available is 76.8 kbps. |
| Automatic Reception | Specified / Not Specified | To speed up communications, select [Not Specified]. When [Not Specified] is selected, the MSG-RCV function is required. For more information, refer to the PLC manual issued by the manufacturer. |
| Automatic Reception Setting | As desired | Make the setting when [Specified] is selected for [Automatic Reception]. |

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 |
|-----------------------|------|------------------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device, read only |
| MB (coil) | 04H | MW as word device |
| IB (input relay) | 06H | IW as word device, read only |

When setting device memory MB/IB, set the bit numbers in the hexadecimal notation.


 Bit No.: HEX

28.1.3 MP2300 (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 and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

218IFA (Built-in LAN Port)

Module configuration

| Item | Setting | Remarks |
|---------------------|----------------------------------|---|
| IP Address | Set the IP address of "218IFA". | |
| Subnet Mask | Set the subnet mask of "218IFA". | |
| Local Port | 256 to 65535 | Cannot set the same number as the one set for another connection number. |
| Target IP Address | 000.000.000.000 | Connected in the "Unpassive open" mode * |
| Target Port | 0000 | |
| Connection Type | TCP | |
| Protocol Type | MODBUS TCP/IP | |
| Code | BIN | |
| Automatic Reception | Valid | When "Valid" is checked, the operation equivalent to the MSG-RCV function is automatically performed. |

* Gives a response to the connection request issued by the station whose address is within the range specified by the subnet mask regardless of its IP address setting.

218IF-01 (MP2200, MP2300)

Make the settings as shown below and create a program of the MSG-RCV function. For more information, refer to the PLC manual issued by the manufacturer.

Module configuration

| Item | Setting | Remarks |
|-------------------|-----------------------------------|--|
| IP Address | Set the IP address of "218IF-01". | |
| Local Port | 256 to 65534 | Cannot set the same number as the one set for another connection number. |
| Target IP Address | 000.000.000.000 | Connected in the "Unpassive open" mode * |
| Target Port | 0000 | |
| Connection Type | TCP | |
| Protocol Type | MODBUS TCP/IP | |
| Code | BIN | |

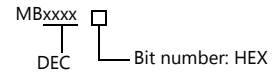
* Gives a response to the connection request issued by the station whose address is within the range specified by the subnet mask regardless of its IP address setting.

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 |
|---------------|--------------------|------|------------------------------|
| MW | (holding register) | 00H | MB as bit device |
| IW | (input register) | 01H | IB as bit device, read only |
| MB | (coil) | 04H | MW as word device |
| IB | (input relay) | 06H | IW as word device, read only |

When setting device memory MB/IB, set the bit numbers in the hexadecimal notation.



28.1.4 CP/MP Expansion Memobus (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]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

218IFA (Built-in LAN Port)

Module configuration

| Item | Setting | Remarks |
|---------------------|-------------------------------------|---|
| IP Address | Set the IP address of "218IFA". | |
| Subnet Mask | Set the subnet mask of "218IFA". | |
| Local Port | 256 to 65535 | Except 9998 and 10000. Cannot set the same number as the one set for another connection number. |
| Target IP Address | Set the IP address of the TS2060i. | |
| Target Port | Set the port number of the TS2060i. | |
| Connection Type | UDP | |
| Protocol Type | Extension Memobus | |
| Code | BIN | |
| Automatic Reception | Valid | When "Valid" is checked, the operation equivalent to the MSG-RCV function is automatically performed. |

218IF-01

Make the settings as shown below and create a program of the MSG-RCV function. For more information, refer to the PLC manual issued by the manufacturer.

Module configuration

| Item | Setting | Remarks |
|-------------------|-------------------------------------|--|
| IP Address | Set the IP address of "218IF-01". | |
| Local Port | 255 to 65535 | Cannot set the same number as the one set for another connection number. |
| Target IP Address | Set the IP address of the TS2060i. | |
| Target Port | Set the port number of the TS2060i. | |
| Connection Type | UDP | |
| Protocol Type | Extension Memobus | |
| Code | BIN | |

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 |
|---------------|--------------------|------|------------------------------|
| MW | (holding register) | 00H | MB as bit device |
| IW | (input register) | 01H | IB as bit device, read only |
| MB | (coil) | 04H | MW as word device |
| IB | (input relay) | 06H | IW as word device, read only |

When setting device memory MB/IB, set the bit numbers in the hexadecimal notation.

MBxxxx ☐
DEC Bit number: HEX

28.1.5 MP2000 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|---------|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 76800 bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |

PLC

217IF-01, 218IF-01, 218IF-02, 260IF-01, 261IF-01, 215AIF-01

Module configuration

| Item | Setting | Remarks |
|-----------------------|----------------|---|
| Transmission Protocol | Memobus | |
| Master/Slave | Slave | |
| Device Address | 1 | |
| Serial I/F | RS-232/RS-485 | |
| Transmission Mode | RTU | |
| Data Length | 8Bit | |
| Parity Bit | even | |
| Stop Bit | 1Stop | |
| Baud Rate | 19.2K | The maximum baud rate available is 76.8 kbps. |

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 |
|-----------------------|------|----------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device |
| MB (coil) | 04H | MW as word device *1 |
| IB (input relay) | 06H | IW as word device |
| SW (system register) | 08H | SB as bit device |
| SB (system) | 09H | SW as word device *1 |
| OW (output register) | 0AH | OB as bit device |
| OB (output) | 0BH | OW as word device |

*1 When setting device memory MB/SB, set the bit numbers in the hexadecimal notation.

MBxxxx

 |

 DEC

 Bit No.: HEX

28.1.6 MP2000 Series (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]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Module configuration

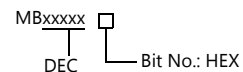
| Item | Setting | Remarks |
|-----------------------------------|----------------------|---|
| IP Address | Set the IP address. | |
| Subnet Mask | Set the subnet mask. | |
| System Port (engineering port) | 256 to 65535 | Default 9999: 218IFA / 218IF-02 / 2613IF-01 10000: 218IF-01 |

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 |
|-----------------------|------|----------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device |
| MB (coil) | 04H | MW as word device *1 |
| IB (input relay) | 06H | IW as word device |
| SW (system register) | 08H | SB as bit device |
| SB (system) | 09H | SW as word device *1 |
| OW (output register) | 0AH | OB as bit device |
| OB (output) | 0BH | OW as word device |

*1 When setting device memory MB/SB, set the bit numbers in the hexadecimal notation.



28.1.7 MP3000 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|---|---------|
| Connection Mode | <u>1</u> : <u>1</u> / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 9600 / <u>19200</u> / 38400 / 57600 / 76800 bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 63 | |

PLC

217IF-01, 218IF-01, 218IF-02, 260IF-01, 261IF-01, 215AIF-01

Module configuration

| Item | Setting | Remarks |
|-----------------------|----------------|---|
| Transmission Protocol | Memobus | |
| Master/Slave | Slave | |
| Device Address | 1 | |
| Serial I/F | RS-232/RS-485 | |
| Transmission Mode | RTU | |
| Data Length | 8 bits | |
| Parity Bit | even | |
| Stop Bit | 1 Stop | |
| Baud Rate | 19.2 K | The maximum baud rate available is 76.8 kbps. |

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 |
|--------------------------|------|-----------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device |
| MB (coil) | 04H | MW as word device, *1 |
| IB (input relay) | 06H | IW as word device |
| SW (system register) | 08H | SB as bit device |
| SB (system) | 09H | SW as word device, *1 |
| OW (output register) | 0AH | OB as bit device |
| OB (output) | 0BH | OW as word device |
| GW (data relay register) | 0CH | GB as bit device |
| GB (data relay) | 0DH | GW as word device, *1 |

*1 When setting device memory MB/SB/GB, set the bit numbers in hexadecimal notation.

MBxxxxx
|
DEC Bit No.: HEX

28.1.8 MP3000 Series (Ethernet UDP/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 of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Module configuration

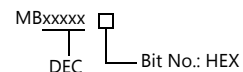
| Item | Setting | Remarks |
|-----------------------------------|---------------------------------------|---|
| IP address | Set the IP address. | |
| Subnet mask | Set the subnet mask. | |
| Gateway IP Address | Specify according to the environment. | |
| Engineering Port (system port) | 256 to 65535 | Default 9999 : 218IFD / 218IF-02 / 263IF-01 10000: 218IF-01 * 9998 and 10000 cannot be set for “218IFD”. |

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 |
|--------------------------|------|-----------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device |
| MB (coil) | 04H | MW as word device, *1 |
| IB (input relay) | 06H | IW as word device |
| SW (system register) | 08H | SB as bit device |
| SB (system) | 09H | SW as word device, *1 |
| OW (output register) | 0AH | OB as bit device |
| OB (output) | 0BH | OW as word device |
| GW (data relay register) | 0CH | GB as bit device |
| GB (data relay) | 0DH | GW as word device, *1 |

*1 When setting device memory MB/SB/GB, set the bit numbers in hexadecimal notation.



28.1.9 MP3000 Series Expansion Memobus (Ethernet)

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 of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

218IFD (Built-in LAN Port)

Module configuration

| Item | Setting | Remarks |
|---------------------|---|---|
| IP address | Set the IP address of "218IFD". | |
| Subnet mask | Set the subnet mask of "218IFD". | |
| Gateway IP Address | Set the gateway IP address of "218IFD". | |
| Local Port | 256 to 65535 | Except 9998 and 10000. Cannot set the same number as the one set for another connection number. |
| Target IP Address | Set the IP address of the TS2060i. | |
| Target Port | Set the port number of the TS2060i. | |
| Connection Type | TCP/UDP | |
| Protocol Type | Extension Memobus | |
| Code | BIN | |
| Automatic Reception | Valid | When "Valid" is checked, the operation equivalent to the MSG-RCV function is automatically performed. |

218IF-01, 218IF-02

Make the settings as shown below and create a program of the MSG-RCV function. For more information, refer to the PLC manual issued by the manufacturer.

Module configuration

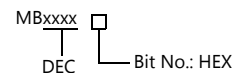
| Item | Setting | Remarks |
|-------------------|-------------------------------------|--|
| IP address | Set the IP address of "218IF-01". | |
| Local Port | 255 to 65535 | Cannot set the same number as the one set for another connection number. |
| Target IP Address | Set the IP address of the TS2060i. | |
| Target Port | Set the port number of the TS2060i. | |
| Connection Type | TCP/UDP | |
| Protocol Type | Extension Memobus | |
| Code | BIN | |

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 |
|--------------------------|------|-----------------------------|
| MW (holding register) | 00H | MB as bit device |
| IW (input register) | 01H | IB as bit device, read only |
| MB (coil) | 04H | MW as word device, *1 |
| IB (input relay) | 06H | IW as word device |
| SW (system register) | 08H | SB as bit device |
| SB (system) | 09H | SW as word device, *1 |
| OW (output register) | 0AH | OB as bit device |
| OB (output) | 0BH | OW as word device |
| GW (data relay register) | 0CH | GB as bit device |
| GB (data relay) | 0DH | GW as word device, *1 |

*1 When setting device memory MB/IB/GB, set the bit numbers in hexadecimal notation.



28.1.10 Wiring Diagrams

When Connected at CN1:

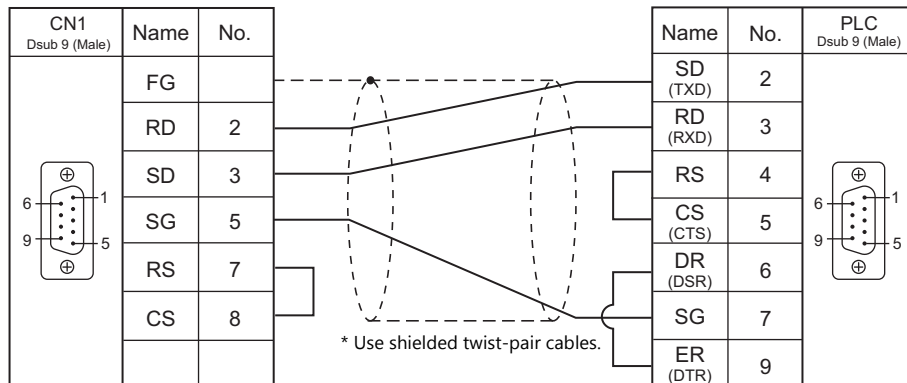


CAUTION

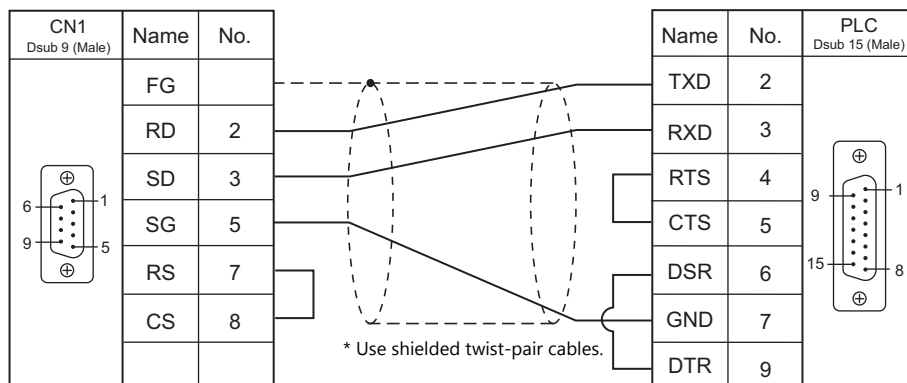
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

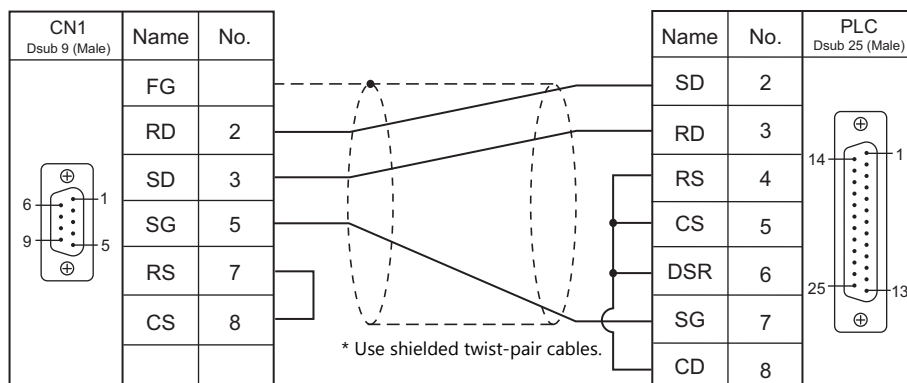
Wiring diagram 1 - C2



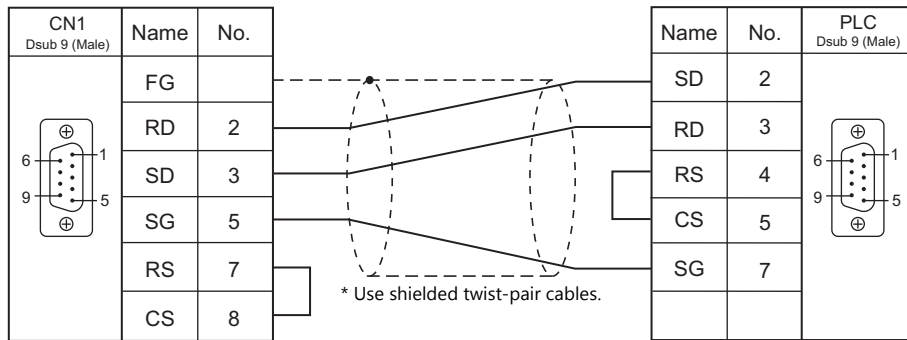
Wiring diagram 2 - C2



Wiring diagram 3 - C2

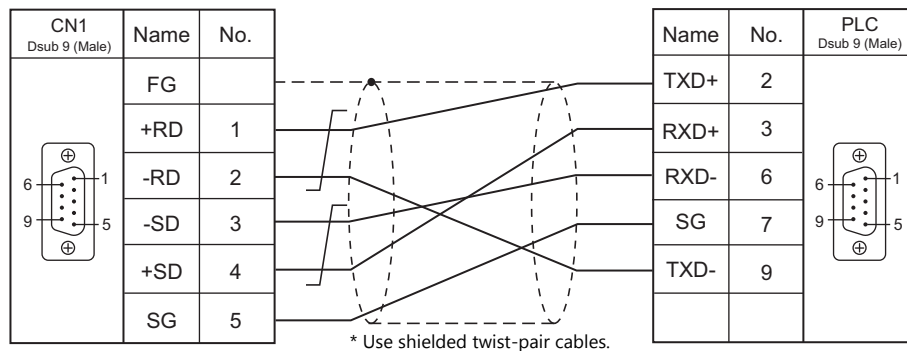


Wiring diagram 4 - C2

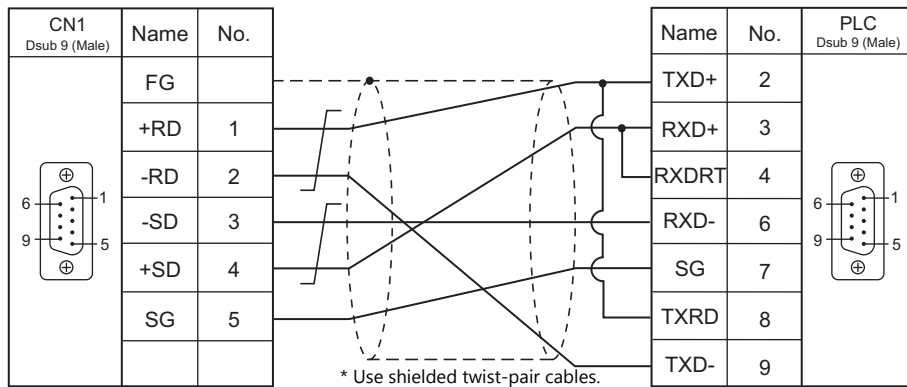


RS-422/RS-485

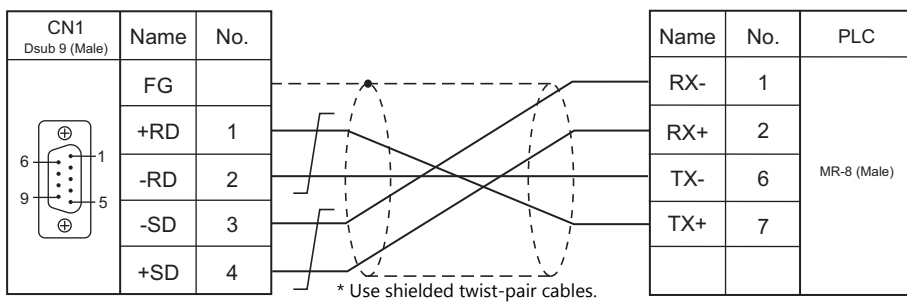
Wiring diagram 1 - C4



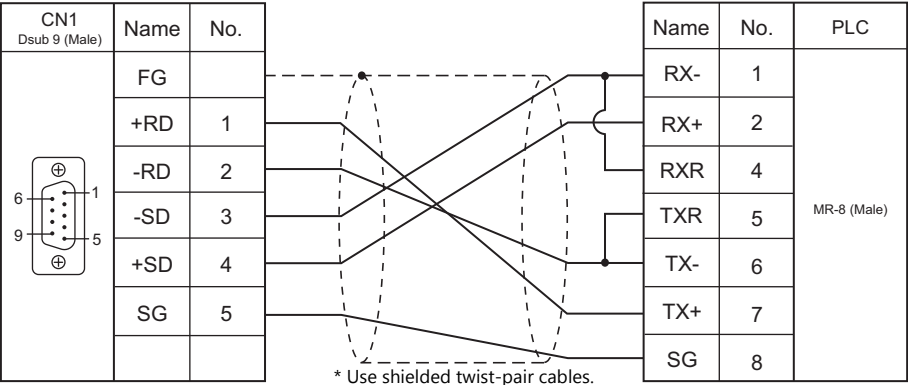
Wiring diagram 2 - C4



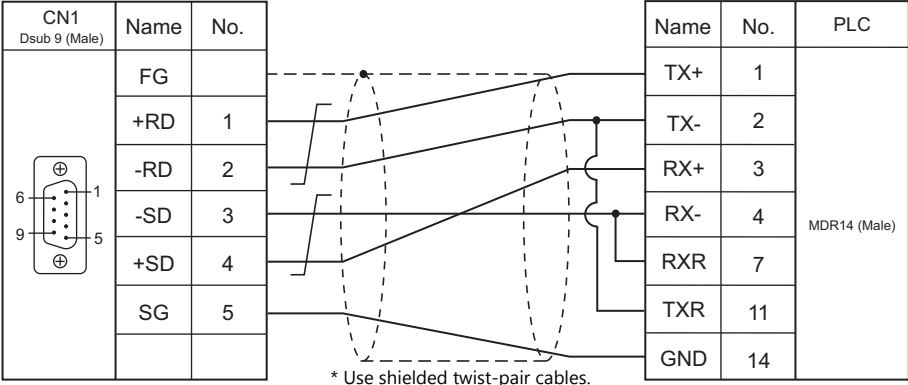
Wiring diagram 3 - C4



Wiring diagram 4 - C4



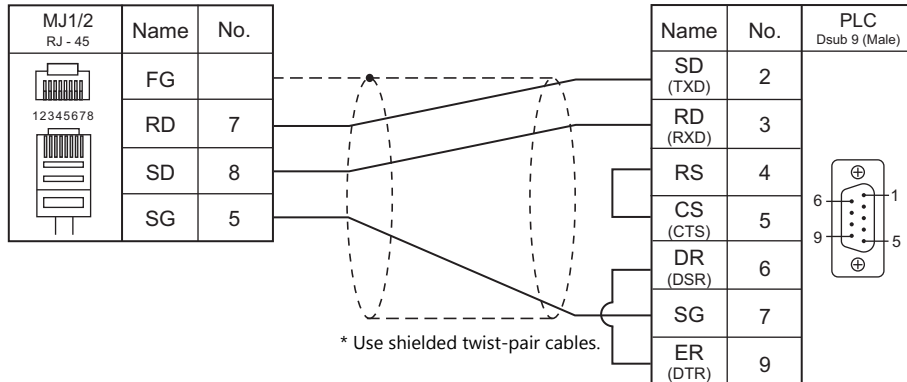
Wiring diagram 5 - C4



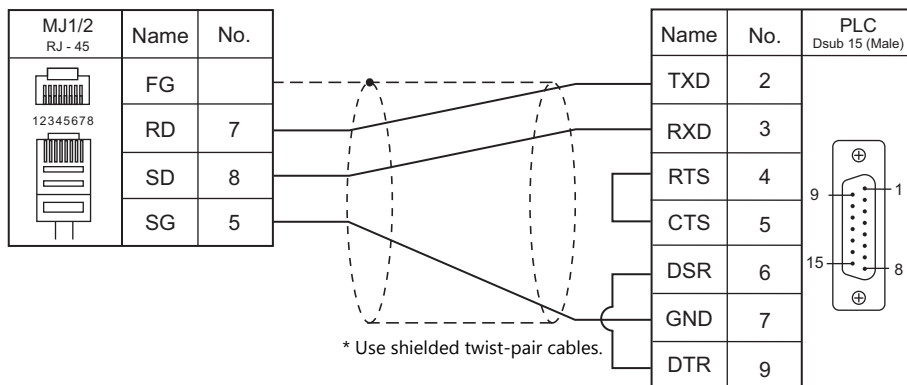
When Connected at MJ1/MJ2:

RS-232C

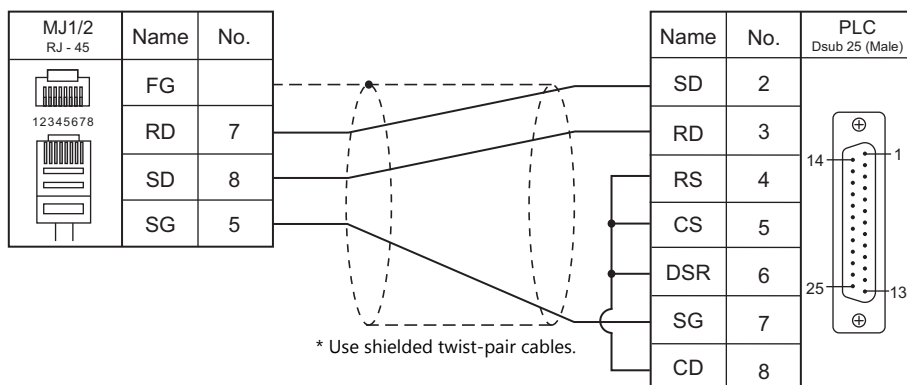
Wiring diagram 1 - M2



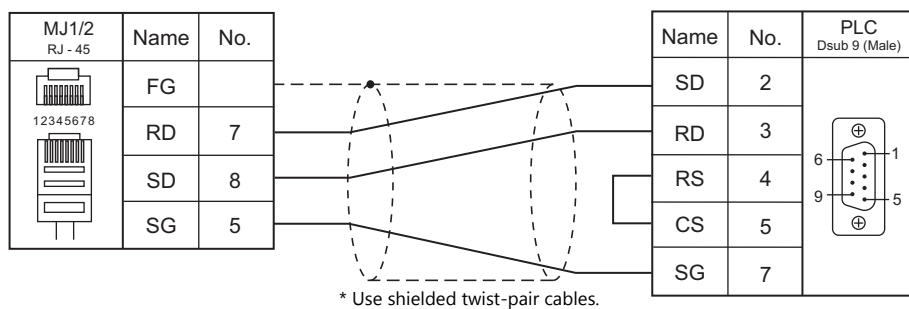
Wiring diagram 2 - M2

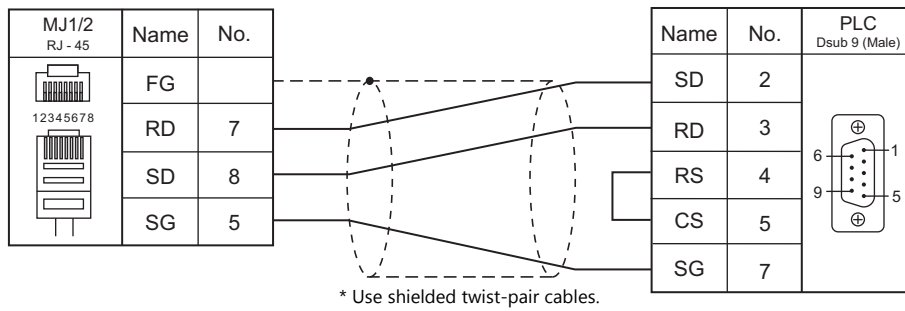
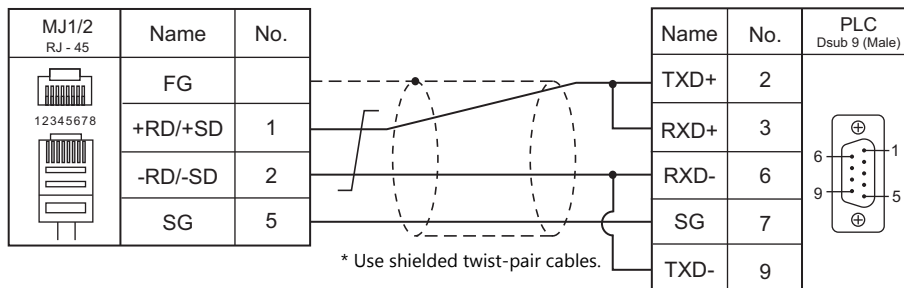
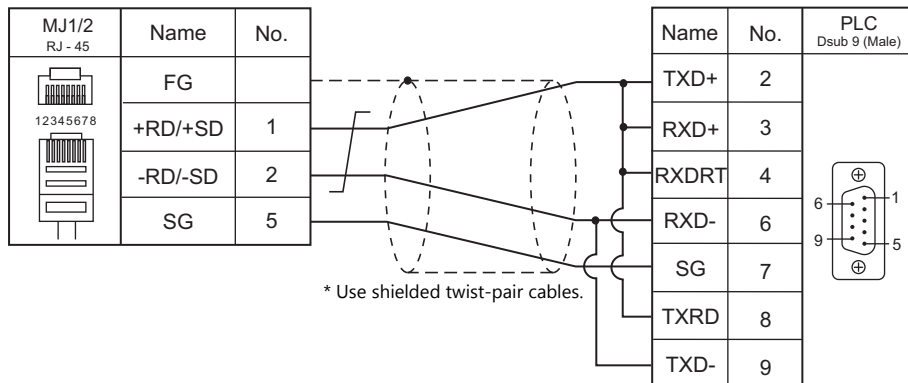
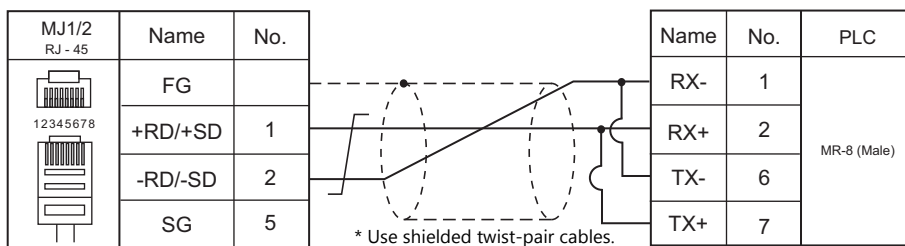


Wiring diagram 3 - M2

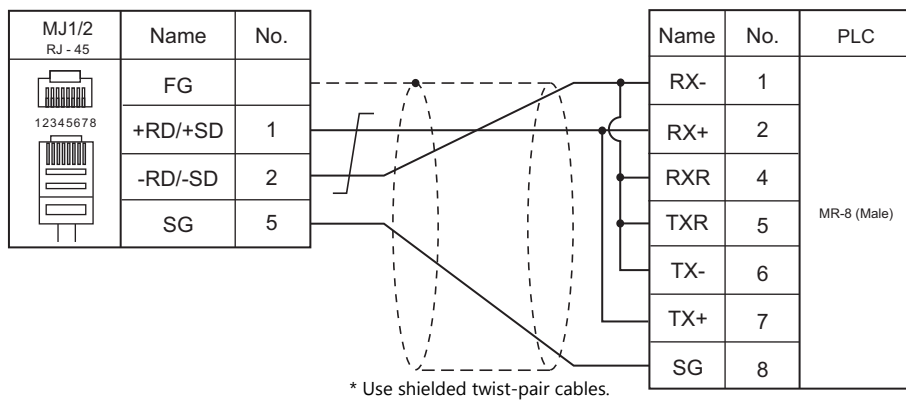


Wiring diagram 4 - M2

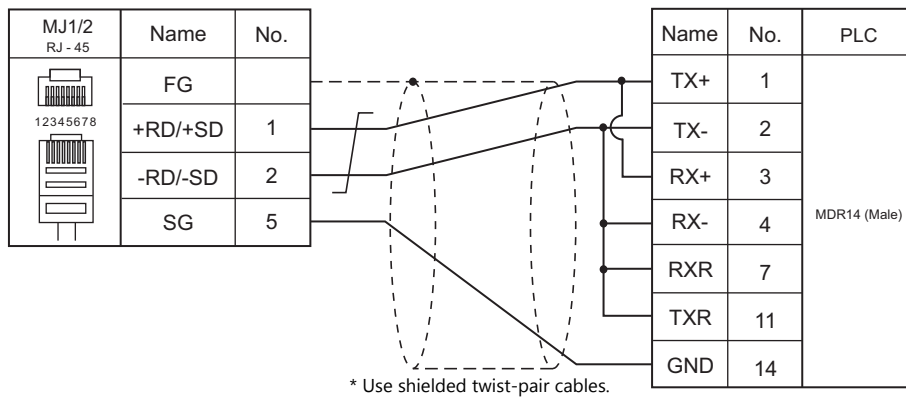


Wiring diagram 5 - M2**RS-422/RS-485****Wiring diagram 1 - M4****Wiring diagram 2 - M4****Wiring diagram 3 - M4**

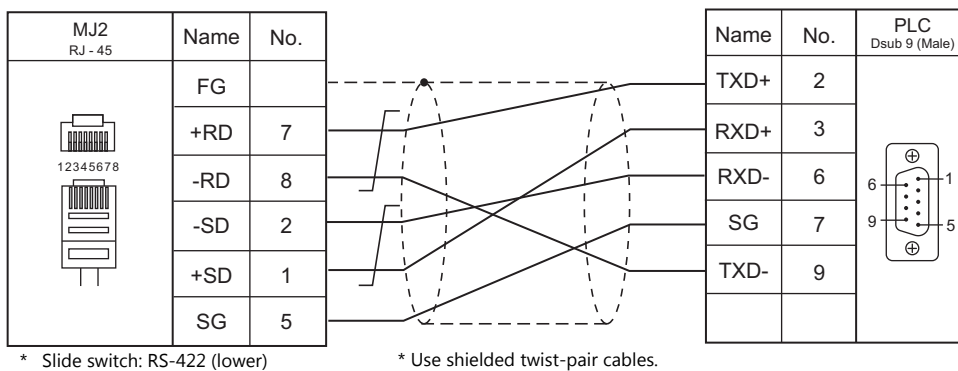
Wiring diagram 4 - M4



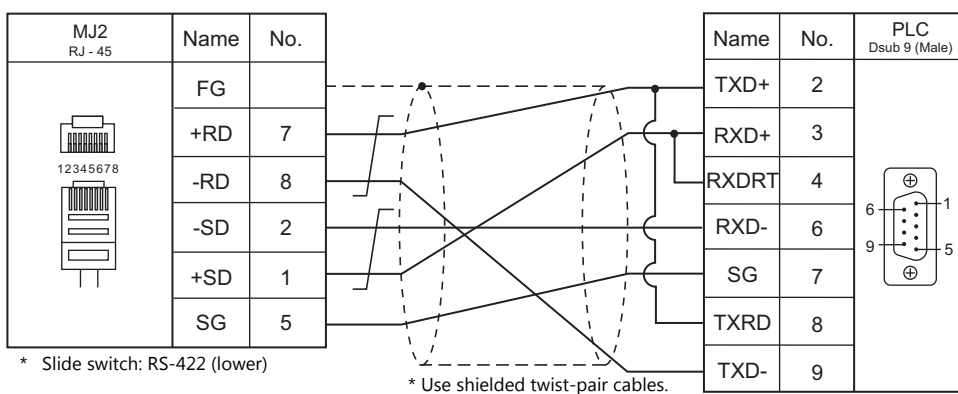
Wiring diagram 5 - M4

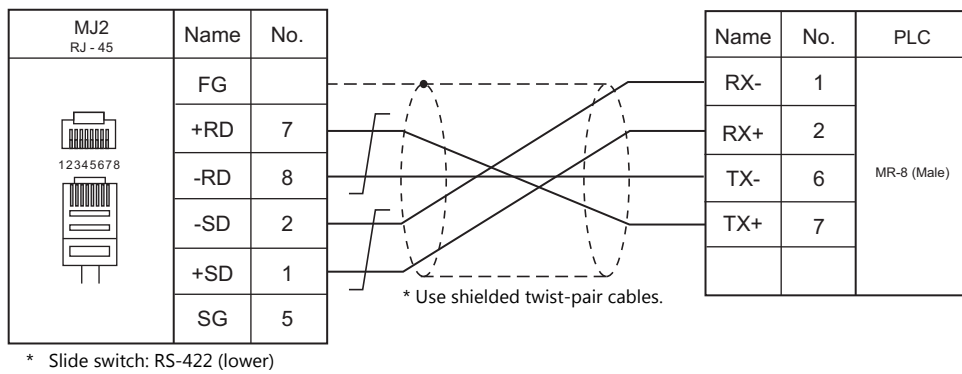
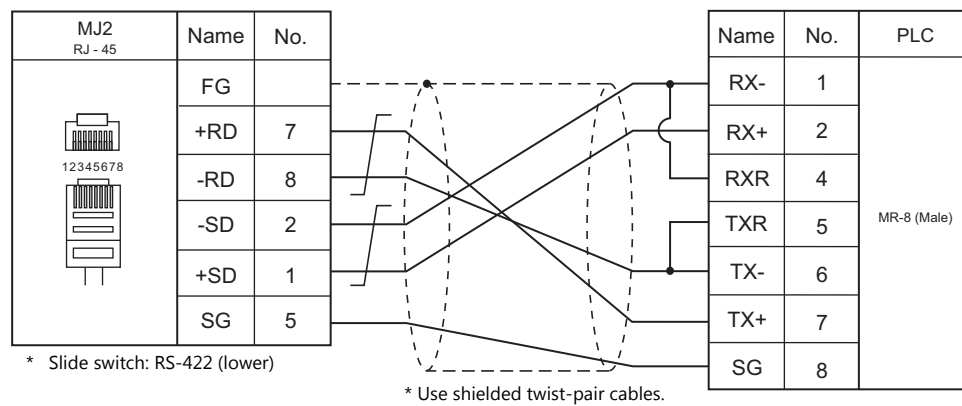
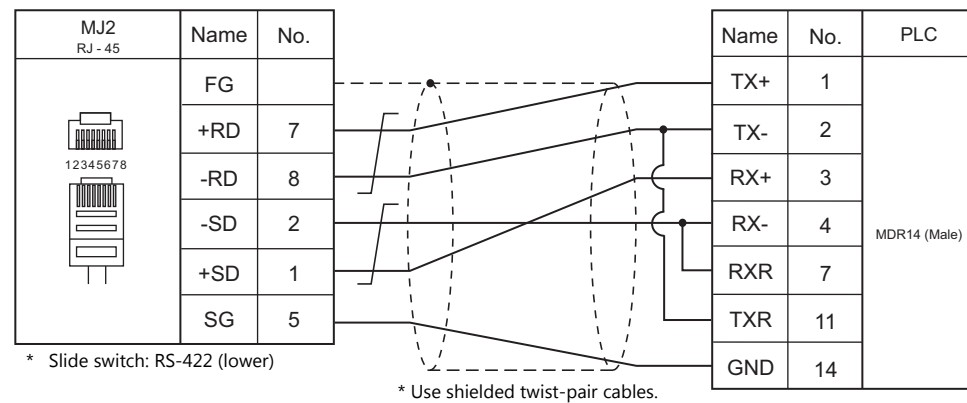


Wiring diagram 6 - M4



Wiring diagram 7 - M4



Wiring diagram 8 - M4**Wiring diagram 9 - M4****Wiring diagram 10 - M4**

28.2 Temperature Controller/Servo/Inverter Connection

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit/Port | TCP/IP ^{*1} | UDP/IP | Port No. | Keep Alive ^{*2} | Lst File |
|-----------------------------|---------|------------------------------|----------------------|--------|--------------------------|--------------------------|--------------|
| DX200 (high-speed Ethernet) | FS100 | LAN | × | ○ | 10040 (Max. 16 units) | ○ | DX200Eth.Lst |
| | FS100L | LAN | | | | | |
| | DX100 | LAN | | | | | |
| | DX200 | LAN | | | | | |
| | YRC1000 | LAN2 (CN106) LAN3 (CN107) | | | | | |

*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)".

28.2.1 DX200 (High-speed Ethernet)

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. 10040) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

Controller

LAN interface setting

| Item | Setting | Remarks |
|--------------------------|----------------------|---------|
| IP Address (LAN2)/(LAN3) | Set manually. | |
| IP address | Set the IP address. | |
| Subnet mask | Set the subnet mask. | |

Transmission parameter setting

| Item | Setting | Remarks |
|---|--------------------------------|---------|
| RS022 Instance 0 permission | 1: Instance 0 permitted | |
| RS029 Loading permission of job/variable during playback | 1: Valid | |
| RS034 Timer A: Sequence monitoring timer For control of invalid responses and non-responses | 200 | |
| RS035 Timer B: Text reception monitoring timer For control of cases where the text termination character is not received | 200 | |

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 |
|---------------|---|------|-----------------------------------|
| IO | (IO data) | 00H | Specify an odd-numbered address. |
| RD | (register data) | 01H | |
| B | (byte type variables) | 02H | Specify an even-numbered address. |
| I | (integer type variables) | 03H | |
| D | (double-precision integer type variables) | 04H | Double-word |
| R | (real number type variables) | 05H | Real number |
| S | (32-byte character type variables) | 06H | |
| P | (robot position type variables) | 07H | Double-word |
| BP | (base position type variables) | 08H | Double-word |
| EX | (external axis type variables) | 09H | Double-word |
| 7201 | (status information read (data 1)) | 0AH | Double-word, read only |
| 7202 | (status information read (data 2)) | 0BH | Double-word, read only |
| S7301 | (executing job information read (job name)) | 0CH | Read only |
| 7302 | (executing job information read (line number)) | 0DH | Double-word, read only |
| 7303 | (executing job information read (step number)) | 0FH | Double-word, read only |
| 7304 | (executing job information read (speed override value)) | 10H | Double-word, read only |
| S74 | (axis configuration information read) | 11H | Read only *1 |
| 76 | (position deviation read) | 12H | Double-word, read only *1 |
| 77 | (torque data read) | 13H | Double-word, read only *1 |
| S8801 | (management time acquisition (operation start time)) | 14H | Read only |
| S8802 | (management time acquisition (elapsed time)) | 15H | Read only |

*1 Specify the element number and the array number for data as shown to the right.

S74XXX : YYYYY
 | |
 Element number Data array number

Indirect Device Memory Designation

| | 15 | 8 7 | 0 |
|-------|-------------------|-----|--------------------|
| n + 0 | Models (11 to 18) | | Device memory type |
| n + 1 | Address No. | | |
| n + 2 | 00 | | Bit |
| n + 3 | 00 | | Target Port No. |

- For IO device memory
 - Word designation
Specify an odd-numbered address for "n + 1".
 - Bit designation
For an odd-numbered byte address:
Specify the byte address for "n + 1" and the bit number for "n + 2".
For an even-numbered byte address:
Specify the byte address minus "1" for "n + 1" and specify the bit number plus "8" for "n + 2".
- For B device memory
 - Word designation
Specify an even-numbered address for "n + 1".
 - Bit designation
For an even-numbered byte address:
Specify the byte address for "n + 1" and the bit number for "n + 2".
For an odd-numbered byte address:
Specify the byte address minus "1" for "n + 1" and specify the bit number plus "8" for "n + 2".
- For S74, 76, and 77 device memory
Specify the data array number for "n + 1" and the element number for "n + 2".

| | 15 | 8 7 | 0 |
|-------|-------------------|-----|-----------------------------|
| n + 0 | Models (91 to 98) | | Device type (11H, 12H, 13H) |
| n + 1 | Data array | | |
| n + 2 | Element number | | |
| n + 3 | 00 | | Bit |
| n + 4 | 00 | | Target Port No. |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|---|----|
| Alarm data read command (alarm code) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm code | |
| | | n + 4 | | |
| Alarm data read command (alarm data) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 2 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm data | |
| | | n + 4 | | |
| Alarm data read command (alarm type) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm type | |
| | | n + 4 | | |
| Alarm data read command (time of alarm occurrence) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Time of alarm occurrence (string of 16 characters) | |
| | | : | | |
| | | n+10 | | |
| Alarm data read command (alarm character string name) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 5 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm character string name (string of 32 characters) | |
| | | : | | |
| | | n + 18 | | |
| Alarm data read command (sub code data additional information character string) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 6 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data additional information character string (string of 16 characters) | |
| | | : | | |
| | | n + 10 | | |
| Alarm data read command (sub code data character string) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 7 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data character string (string of 96 characters) | |
| | | : | | |
| | | n + 50 | | |
| Alarm data read command (sub code data character string reverse display information) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 8 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data character string reverse display information (string of 96 characters) | |
| | | : | | |
| | | n+50 | | |
| Alarm history read command (alarm code) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 9 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm code | |
| | | n + 4 | | |
| Alarm history read command (alarm data) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 10 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm data | |
| | | n + 4 | | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|--|----|
| Alarm history read command (alarm type) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 11 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm type | |
| | | n + 4 | | |
| Alarm history read command (time of alarm occurrence) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 12 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Time of alarm occurrence (string of 16 characters) | |
| | | : | | |
| | | n + 10 | | |
| Alarm history read command (alarm character string name) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Alarm character string name (string of 32 characters) | |
| | | : | | |
| | | n + 18 | | |
| Alarm history read command (sub code data additional information character string) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 14 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data additional information character string (string of 16 characters) | |
| | | : | | |
| | | n + 10 | | |
| Alarm history read command (sub code data character string) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 15 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data character string (string of 96 characters) | |
| | | : | | |
| | | n + 50 | | |
| Alarm history read command (sub code data character string reverse display information) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 16 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Sub code data character string reverse display information (string of 96 characters) | |
| | | : | | |
| | | n + 50 | | |
| Robot position data read command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 4 |
| | | n + 1 | Command: 17 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Element number | |
| | | n + 4 | Data specified with elements | |
| | | n + 5 | | |
| Alarm reset / error cancel command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 18 | |
| | | n + 2 | Data array number | |
| Hold stop / servo on/off command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 5 |
| | | n + 1 | Command: 19 | |
| | | n + 2 | Data array number | |
| | | n + 3 | 1: On | |
| | | n + 4 | 2: Off | |
| Step/cycle/continuous switching command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 5 |
| | | n + 1 | Command: 20 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Data 1 | |
| | | n + 4 | | |
| Character string display command to the programming pendant | 1 to 8 (PLC1 to 8) | n | Target Port No. | 18 |
| | | n + 1 | Command: 21 | |
| | | n + 2 | Message to display | |
| | | : | | |
| | | n + 17 | | |
| Start-up (job start) command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 2 |
| | | n + 1 | Command: 22 | |

| Contents | F0 | F1 (=\$u n) | | F2 |
|---|-----------------------|-------------|---|----|
| Job selection command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 21 |
| | | n + 1 | Command: 23 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Job name (string of 32 characters) | |
| | | : | | |
| | | n + 18 | | |
| | | n + 19 | Line number (0 to 9999) | |
| | | n + 20 | | |
| System information acquisition command | 1 to 8 (PLC1 to 8) | n | Target Port No. | 3 |
| | | n + 1 | Command: 24 | |
| | | n + 2 | Data array number | |
| | | n + 3 | System software version (string of 24 characters) | |
| | | : | | |
| | | n + 14 | | |
| | | n + 15 | Model name / application name (string of 16 characters) | |
| | | : | | |
| | | n + 22 | Parameter version (string of 8 characters) | |
| | | n + 23 | | |
| | | : | | |
| | | n + 26 | | |
| Move instruction command (Cartesian coordinate type) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 53 |
| | | n + 1 | Command: 25 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Control group specification (robot) | |
| | | n + 4 | | |
| | | n + 5 | Control group specification (station) | |
| | | n + 6 | | |
| | | n + 7 | Speed classification | |
| | | n + 8 | | |
| | | n + 9 | Speed specification | |
| | | n + 10 | | |
| | | n + 11 | Specification of coordinate to operate | |
| | | n + 12 | | |
| | | n + 13 | X coordinate value (unit: μm) | |
| | | n + 14 | | |
| | | n + 15 | Y coordinate value (unit: μm) | |
| | | n + 16 | | |
| | | n + 17 | Z coordinate value (unit: μm) | |
| | | n + 18 | | |
| | | n + 19 | Tx coordinate value (unit: 0.0001 degrees) | |
| | | n + 20 | | |
| | | n + 21 | Ty coordinate value (unit: 0.0001 degrees) | |
| | | n + 22 | | |
| | | n + 23 | Tz coordinate value (unit: 0.0001 degrees) | |
| | | n + 24 | | |
| | | n + 25 | Reserved | |
| | | n + 26 | | |
| | | n + 27 | Form | |
| | | n + 28 | | |
| | | n + 29 | Extended form | |
| | | n + 30 | | |
| | | n + 31 | Tool number (0 to 63) | |
| | | n + 32 | | |
| | | n + 33 | User coordinate specification (1 to 63) | |
| | | n + 34 | | |
| | | n + 35 | Base axis 1 position (unit: μm) | |
| | | n + 36 | | |
| | | n + 37 | Base axis 2 position (unit: μm) | |
| | | n + 38 | | |
| | | n + 39 | Base axis 3 position (unit: μm) | |
| n + 40 | | | | |

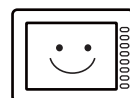
| Contents | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|---|----|
| Move instruction command (Cartesian coordinate type) | 1 to 8 (PLC1 to 8) | n + 41 | Station axis 1 position (pulse value) | 53 |
| | | n + 42 | | |
| | | n + 43 | Station axis 2 position (pulse value) | |
| | | n + 44 | | |
| | | n + 45 | Station axis 3 position (pulse value) | |
| | | n + 46 | | |
| | | n + 47 | Station axis 4 position (pulse value) | |
| | | n + 48 | | |
| | | n + 49 | Station axis 5 position (pulse value) | |
| | | n + 50 | | |
| | | n + 51 | Station axis 6 position (pulse value) | |
| | | n + 52 | | |
| Move instruction command (pulse type) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 45 |
| | | n + 1 | Command: 26 | |
| | | n + 2 | Data array number | |
| | | n + 3 | Control group specification (robot) | |
| | | n + 4 | | |
| | | n + 5 | Control group specification (station) | |
| | | n + 6 | | |
| | | n + 7 | Speed classification | |
| | | n + 8 | | |
| | | n + 9 | Speed specification | |
| | | n + 10 | | |
| | | n + 11 | Robot axis 1 pulse value | |
| | | n + 12 | | |
| | | n + 13 | Robot axis 2 pulse value | |
| | | n + 14 | | |
| | | n + 15 | Robot axis 3 pulse value | |
| | | n + 16 | | |
| | | n + 17 | Robot axis 4 pulse value | |
| | | n + 18 | | |
| | | n + 19 | Robot axis 5 pulse value | |
| | | n + 20 | | |
| | | n + 21 | Robot axis 6 pulse value | |
| | | n + 22 | | |
| | | n + 23 | Tool number (0 to 63) | |
| | | n + 24 | | |
| | | n + 25 | User coordinate specification (1 to 63) | |
| | | n + 26 | | |
| | | n + 27 | Base axis 1 position (unit: μm) | |
| | | n + 28 | | |
| | | n + 29 | Base axis 2 position (unit: μm) | |
| | | n + 30 | | |
| | | n + 31 | Base axis 3 position (unit: μm) | |
| | | n + 32 | | |
| | | n + 33 | Station axis 1 position (pulse value) | |
| | | n + 34 | | |
| | | n + 35 | Station axis 2 position (pulse value) | |
| | | n + 36 | | |
| | | n + 37 | Station axis 3 position (pulse value) | |
| | | n + 38 | | |
| | | n + 39 | Station axis 4 position (pulse value) | |
| | | n + 40 | | |
| | | n + 41 | Station axis 5 position (pulse value) | |
| | | n + 42 | | |
| | | n + 43 | Station axis 6 position (pulse value) | |
| | | n + 44 | | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|--------------------------------------|-----------------------|--------------|---------------------------|-------|
| General commands (read commands) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 8 |
| | | n + 1 | Command: 27 | |
| | | n + 2 | Command number | |
| | | n + 3 | Data array number | |
| | | n + 4 | Element number | |
| | | n + 5 | Processing | |
| | | n + 6 | Processing classification | |
| | | n + 7 | Answer data size | |
| | | n + 8 | Answer data | |
| | | : | | |
| n + m | | | | |
| General commands (write commands) | 1 to 8 (PLC1 to 8) | n | Target Port No. | 8 + m |
| | | n + 1 | Command: 28 | |
| | | n + 2 | Command number | |
| | | n + 3 | Data array number | |
| | | n + 4 | Element number | |
| | | n + 5 | Processing | |
| | | n + 6 | Processing classification | |
| | | n + 7 | Request data size | |
| | | n + 8 | Request data | |
| | | : | | |
| n + m | | | | |

Return data: Data stored from controller to TS2060i

MEMO

MONITOUCH



29. Yokogawa Electric

29.1 PLC Connection

29.2 Temperature Controller/Servo/Inverter Connection

29.1 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} | |
| FA-M3 | F3SP21-0N F3SP25-2N F3SP35-5N | PROGRAMMER port | RS-232C | Yokogawa's "KM11-xT" + Gender changer ^{*5} | Yokogawa's "KM11-xT" + Wiring diagram 2 - M2 | | ○ |
| | F3SP20-0N F3SP21-0N F3SP25-2N F3SP35-5N | F3LC01-1N ^{*4} | RS-232C | Wiring diagram 1 - C2 or Hakko Electronics' cable "D9-YO2-09" ^{*6} | Wiring diagram 1 - M2 | | × |
| | | F3LC11-1N | | Wiring diagram 1 - C4 or Hakko Electronics' cable "D9-YO4-0T" ^{*7} | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | |
| FA-M3R | F3SP28-3N/3S F3SP38-6N/6S F3SP53-4H/4S F3SP58-6H/6S F3SP59-7S | PROGRAMMER port | RS-232C | Yokogawa's "KM11-xT" + Gender changer ^{*5} | Yokogawa's "KM11-xT" + Wiring diagram 2 - M2 | | ○ |
| | F3SP28-3N/3S F3SP38-6N/6S F3SP53-4H/4S F3SP58-6H/6S F3SP59-7S F3SP66-4S F3SP67-6S F3SP71-4N/4S F3SP76-7N/7S | F3LC11-1N F3LC11-1F F3LC12-1F | RS-232C | Wiring diagram 1 - C2 or Hakko Electronics' cable "D9-YO2-09" ^{*6} | Wiring diagram 1 - M2 | | × |
| | | F3LC11-2N F3LC11-2F | RS-422 | Wiring diagram 1 - C4 or Hakko Electronics' cable "D9-YO4-0T" ^{*7} | Wiring diagram 1 - M4 | Wiring diagram 2 - M4 | |
| | F3SP66-4S F3SP67-6S | SIO port | RS-232C | Yokogawa's "KM21-2T" + Gender changer ^{*5} | Yokogawa's "KM21-2T" + Wiring diagram 2 - M2 | | × |
| FA-M3V | F3SP71-4N/4S F3SP76-7N/7S | F3LC11-1N F3LC11-1F F3LC12-1F | RS-232C | Wiring diagram 1 - C2 or Hakko Electronics' cable "D9-YO2-09" ^{*6} | Wiring diagram 1 - M2 | | × |
| | | F3LC11-2N F3LC11-2F | RS-422 | Wiring diagram 1 - C4 or Hakko Electronics' cable "D9-YO4-0T" ^{*7} | 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.

^{*4} When the link unit "F3LC01-1N" is used, the communication setting and available device memory are the same as those for "FA-500". However, "B" (common register) cannot be used.

^{*5} Use a D-sub gender changer (9-pin, female-to-male) commercially available.

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

^{*6} Cable length: D9-YO2-09- □ M (□ = 2, 3, 5)

^{*7} Cable length: D9-YO4-0T- □ M (□ = 2, 15)

Ethernet Connection (TS2060i Only)

| PLC Selection on the Editor | CPU | Unit/Port | TCP/IP *1 | UDP/IP | Port No. | Keep Alive *2 | Ladder Transfer *3 |
|---|--|-------------------------|-----------|--------|-------------------|---------------|--------------------|
| FA-M3/FA-M3R (Ethernet UDP/IP) | FA-M3/FA-M3R | F3LE01-5T | × | ○ | 12289 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 | | |
| | F3SP66-4S F3SP67-6S F3SP71-4N F3SP76-7N | T/TX | | | 12289 12291 | | |
| | | | | | | | |
| FA-M3/FA-M3R (Ethernet UDP/IP ASCII) | FA-M3/FA-M3R | F3LE01-5T | × | ○ | 12289 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 | | |
| | F3SP66-4S F3SP67-6S | T/TX | | | 12289 12291 | | |
| | | | | | | | |
| FA-M3/FA-M3R (Ethernet TCP/IP) | FA-M3/FA-M3R | F3LE01-5T | ○ | × | 12289 *4 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 *4 | | |
| | F3SP66-4S F3SP67-6S | T/TX | | | 12289 12291 *4 | | |
| | | | | | | | |
| FA-M3/FA-M3R (Ethernet TCP/IP ASCII) | FA-M3/FA-M3R | F3LE01-5T | ○ | × | 12289 *4 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 *4 | | |
| | F3SP66-4S F3SP67-6S | T/TX | | | 12289 12291 *4 | | |
| | | | | | | | |
| FA-M3V (Ethernet) | F3SP71-4N/4S F3SP76-7N/7S | F3LE01-5T | ○ | ○ | 12289 *4 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 *4 | | |
| | | 10BASE-T/ 100BASE-TX | | | 12289 12291 | | |
| | | | | | | | |
| FA-M3V (Ethernet ASCII) | F3SP71-4N/4S F3SP76-7N/7S | F3LE01-5T | ○ | ○ | 12289 *4 | ○ | × |
| | | F3LE11-0T F3LE12-0T | | | 12289 12291 *4 | | |
| | | 10BASE-T/ 100BASE-TX | | | 12289 12291 | | |
| | | | | | | | |

*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 For TCP/IP connection, the number of TS2060i units that can be connected to one port is limited.

3LE01-5T/F3LE11-0T/CPU built-in LAN port: Max. 8 units

F3LE12-0T: Max. 9 units

29.1.1 FA-M3/FA-M3R

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-------------------|---|---------|
| Connection Mode | <u>1:1</u> / 1:n / Multi-link / Multi-link2 | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / <u>115K</u> bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 0 to 31 | |
| Transmission Mode | With Sum Check / <u>Without Sum Check</u> | |

PLC

CPU Programmer Port / SIO Port

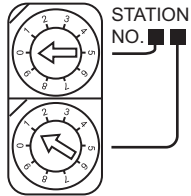
(Underlined setting: default)

| Item | Programmer port | SIO Port |
|---------------------|---|---|
| Communication Mode | <u>9600 bps, even parity</u> 9600 bps, no parity 19200 bps, even parity 19200 bps, no parity 38400 bps, even parity 38400 bps, no parity 57600 bps, even parity 57600 bps, no parity 115200 bps, even parity 115200 bps, no parity | 9600 bps, even parity 9600 bps, no parity 19200 bps, even parity 19200 bps, no parity 38400 bps, even parity 38400 bps, no parity 57600 bps, even parity 57600 bps, no parity <u>115200 bps, even parity</u> 115200 bps, no parity |
| PC Link Function | Use | |
| Sum check | Provided / <u>Not provided</u> | |
| Terminal Character | None | |
| Protection Function | None | |
| Data Length | 8 | |

PC Link Module

Station number setting


(Underlined setting: default)

| Station Number Setting | Setting | Setting Example |
|---|-----------------|-----------------|
|  | <u>01</u> to 32 | 01 |

Baud rate setting switch


F3LC01-1N / F3LC11-1N / F3LC11-2N

(Underlined setting: default)

| Baud Rate Setting Switch | Setting | Baud Rate | Remarks |
|---|----------|-----------------|---------|
|  | 4 | 4800 bps | |
| | <u>5</u> | <u>9600 bps</u> | |
| | 6 | 19200 bps | |

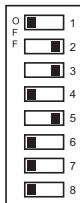
F3LC11-1F / F3LC12-1F / F3LC11-2F

(Underlined setting: default)

| Baud Rate Setting Switch | Setting | Baud Rate | Remarks |
|---|----------|-------------------|---------|
|  | 4 | 4800 bps | |
| | 5 | 9600 bps | |
| | 7 | 19200 bps | |
| | 9 | 38400 bps | |
| | A | 57.6 kbps | |
| | B | 76.8 kbps | |
| | <u>C</u> | <u>115.2 kbps</u> | |

Data format setting switch

(Underlined setting: default)

| Switch | Functions | OFF | ON | Setting Example |
|--------|---------------------|---------------------|----------|---|
| 1 | Data length | 7 | <u>8</u> |  |
| 2 | Parity | <u>Not provided</u> | Provided | |
| 3 | | <u>Odd</u> | Even | |
| 4 | Stop bit | <u>1</u> | 2 | |
| 5 | Sum check | <u>Not provided</u> | Provided | |
| 6 | Terminal character | <u>Not provided</u> | Provided | |
| 7 | Protection function | <u>Not provided</u> | Provided | |
| 8 | - | - | - | |

Function setting switch

All OFF

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 | |
| R | (common register) | 01H | |
| V | (index register) | 02H | |
| W | (link register) | 03H | |
| Z | (special register) | 04H | |
| TP | (count-down timer/current value) | 05H | |
| TS | (timer/set value) | 06H | Read only |
| CP | (count-down counter/current value) | 07H | |
| CS | (counter/set value) | 08H | Read only |
| X | (input relay) | 09H | |
| Y | (output relay) | 0AH | |
| I | (internal relay) | 0BH | |
| E | (common relay) | 0CH | |
| L | (link relay) | 0DH | |
| M | (special relay) | 0EH | |
| B | (file register) | 0FH | |
| SW | (special module register) | 10H | |
| SL | (special module register) | 11H | Double-word |
| F | (cache register) | 12H | Available only with F3SP71-4N/4S and F3SP76-7N/7S CPU. |

* The CPU number is required in addition to the device type and address. The assigned device memory is expressed as shown on the right when editing the screen.

Example: 1 : D00001

Address
Device type
CPU number

SW/SL device memory

The SW or SL device memory is used to read/write data from/into the data position number of the specified special module. For more information, refer to the PLC manual issued by the manufacturer.

The address denotation of the SW or SL device memory is shown below.

a : bb : c : SW0001

Data position number
Device type
CPU number (1 to 4H)
Slot number (1 to 10H)
Unit number (0 to 7H)

Indirect Device Memory Designation

- For X/Y device memory

| | | | |
|-------|------------------|-----|-----------------|
| | 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 the expansion code, specify the value obtained by subtracting "1" from the actual CPU number.

Example: When specifying "X935" by indirect device memory designation



Converting "A" into a binary number
9 (DEC) = 1001 (BIN)

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

Labels: Z (bits 03-00), X (bits 09-04)

Converting "BB" into a binary number
35 (DEC) = 100011 (BIN)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |

Labels: Y (bits 07-04), Bit No. (bits 03-00). Bit No. Obtained by subtracting "1" from this value.

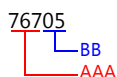
Arranging the values X, Y and Z in the following order

| | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

Labels: X (bits 11-08), Z (bits 07-06), Fixed to 0 (bits 05-04), Y (bits 03-00)

0000100100000010 (BIN) = 902 (HEX): Address No.
0011 (BIN) = 3 (HEX) - 1 = 2 (HEX): Bit No.

Example: When specifying "X76705" by indirect device memory designation



Converting "AAA" into a binary number
767 (DEC) = 1011111111 (BIN)

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Labels: Z (bits 03-00), X (bits 09-04)

Converting "BB" into a binary number
05 (DEC) = 101 (BIN)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

Labels: Y (bits 07-04), Bit No. (bits 03-00). Bit No. Obtained by subtracting "1" from this value.

Arranging the values X, Y and Z in the following order

| | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Labels: X (bits 11-08), Z (bits 07-06), Fixed to 0 (bits 05-04), Y (bits 03-00)

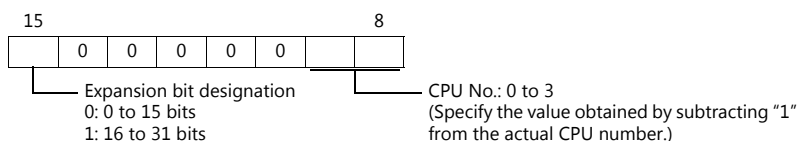
1111111110000000 (BIN) = FF80 (HEX): Address No.
0101 (BIN) = 5 (HEX) - 1 = 4 (HEX): Bit No.

- For SW/SL device memory

| | | | | |
|-------|-----------------------|---|------------------------|---|
| | 15 | 8 | 7 | 0 |
| n + 0 | Model | | | |
| n + 1 | Device type | | | |
| n + 2 | Address No. *1 | | | |
| n + 3 | Unit number (0 to 7H) | | Slot number (1 to 10H) | |
| n + 4 | Expansion code *2 | | Bit designation | |
| n + 5 | 00 | | Station number | |

*1Specify the data position for the address number. The value to specify is obtained by subtracting "1" from the actual data position.

*2Specify the expansion bit and the CPU number in the expansion code.



- Other than X/Y/SW/SL device memory

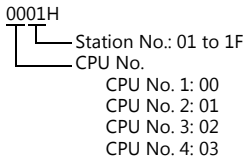
For the device memory address number, specify the value obtained by subtracting "1" from the actual address.
For the expansion code, specify the value obtained by subtracting "1" from the actual CPU number.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Contents | F0 | F1 (= \$u n) | F2 |
|-----------------------------------|---------------------|---|----|
| User log registration number read | 1 - 8 (PLC1 - 8) | n CPU No. + station No. 0001H └─ Station No.: 01 to 1F └─ CPU No. CPU No. 1: 00 CPU No. 2: 01 CPU No. 3: 02 CPU No. 4: 03 | 2 |
| | | n + 1 Command: FFFFH | |
| | | n + 2 Registration number (Stores the same number as the one stored in special register Z105.) | |
| Latest user log read | 1 - 8 (PLC1 - 8) | n CPU No. + station No. 0001H └─ Station No.: 01 to 1F └─ CPU No. CPU No. 1: 00 CPU No. 2: 01 CPU No. 3: 02 CPU No. 4: 03 | 2 |
| | | n + 1 Command: 0000H | |
| | | n + 2 Header 0: Normal -1: Error (data not exist/communication error) | |
| | | n + 3 Year (ASCII) | |
| | | n + 4 Month (ASCII) | |
| | | n + 5 Day (ASCII) | |
| | | n + 6 Hour (ASCII) | |
| | | n + 7 Minute (ASCII) | |
| | | n + 8 Second (ASCII) | |
| | | n + 9 Main code (DEC) | |
| | | n + 10 Sub code (DEC) | |
| "n"th user log read | 1 - 8 (PLC1 - 8) | n CPU No. + station No. 0001H └─ Station No.: 01 to 1F └─ CPU No. CPU No. 1: 00 CPU No. 2: 01 CPU No. 3: 02 CPU No. 4: 03 | 2 |
| | | n + 1 Command: 0001H to 003FH | |
| | | n + 2 Header 0: Normal -1: Error (data not exist/communication error) | |
| | | n + 3 Year (ASCII) | |
| | | n + 4 Month (ASCII) | |
| | | n + 5 Day (ASCII) | |
| | | n + 6 Hour (ASCII) | |
| | | n + 7 Minute (ASCII) | |
| | | n + 8 Second (ASCII) | |
| | | n + 9 Main code (DEC) | |
| | | n + 10 Sub code (DEC) | |

| Contents | F0 | F1 (= \$u n) | F2 |
|-------------------------|---------------------|--------------|----|
| Latest system log read | 1 - 8 (PLC1 - 8) | n | 2 |
| | | | |
| | | n + 1 | |
| | | n + 2 | |
| | | n + 3 | |
| | | n + 4 | |
| | | n + 5 | |
| | | n + 6 | |
| | | n + 7 | |
| | | n + 8 | |
| | | n + 9 | |
| | | n + 10 - | |
| "n"th system log read | 1 - 8 (PLC1 - 8) | n | 2 |
| | | | |
| | | n + 1 | |
| | | n + 2 | |
| | | n + 3 | |
| | | n + 4 | |
| | | n + 5 | |
| | | n + 6 | |
| | | n + 7 | |
| | | n + 8 | |
| | | n + 9 | |
| | | n + 10 - | |
| Alarm information clear | 1 - 8 (PLC1 - 8) | n | 2 |
| | | n + 1 | |

| Contents | F0 | F1 (= \$u n) | | F2 |
|-----------------------------|---------------------|------------------|--|----|
| Mounted module name readout | 1 - 8 (PLC1 - 8) | n | CPU No. + station No.  | 3 |
| | | n + 1 | Command: FFFDH | |
| | | n + 2 | Unit No.: 0 to 7 | |
| | | n + 3 to n + 4 | Module name (ASCII) | |
| | | n + 5 | Module information of slot 1 *2 | |
| | | n + 6 | I/O type (DEC) 0: Without I/O relay 1: Input relay only 2: Output relay only 3: With both input and output | |
| | | n + 7 to n + 8 | Number of I/O relays (DEC) | |
| | | n + 9 | Module name (ASCII) | |
| | | n + 10 | Module information of slot 2 *2 | |
| | | n + 11 | I/O type (DEC) 0: Without I/O relay 1: Input relay only 2: Output relay only 3: With both input and output | |
| | | n + 12 | Number of I/O relays (DEC) | |
| | | : | : | |
| | | n + 63 to n + 64 | Module name (ASCII) | |
| | | n + 65 | Module information of slot 16 *2 | |
| | | n + 66 | I/O type (DEC) 0: Without I/O relay 1: Input relay only 2: Output relay only 3: With both input and output | |
| | | n + 67 | Number of I/O relays (DEC) | |

Return data: Data stored from PLC to TS2060

*1 Additional information (max. 11 words)

- For "system error"
No additional information
- For "basic error"

| | |
|------------------|--|
| n + 10 to n + 13 | Block name (8 bytes) |
| n + 14 to n + 16 | Command number: 5-digit string pattern in decimal notation (5 bytes) |

- For "sequence error"

| | |
|------------------|--|
| n + 10 to n + 13 | Program name (8 bytes) |
| n + 14 to n + 17 | Subprogram name (8 bytes) |
| n + 18 to n + 20 | Row number: 5 digits in decimal notation (5 bytes) |

- For "I/O error"

| | |
|------------------|--------------------------|
| n + 10 to n + 11 | Slot number (4 bytes) |
| n + 12 to n + 13 | Detailed error (4 bytes) |

*2 When no module is mounted, "(space)" is assigned for the module name and "0" is assigned for the I/O type and the number of I/O relays.

29.1.2 FA-M3/FA-M3R (Ethernet UDP/IP)

Communication Setting

Editor

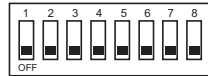
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication (TS2060i Only)”.

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

PLC

Ethernet Module

Condition setting switch

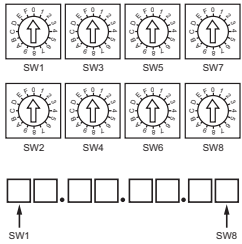
| SW9 | BIT | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|--|----------|-----|----|-------|-------|---------------|----------|-----|----|-------|-------|---------------|-------|---------------|-------|
|  | 1 | Data format setting | <div>F3LE01-5T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></table> <div>F3LE11-0T/F3LE12-0T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></table> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserved | OFF | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out* ¹ | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

*1 F3LE01-5T only

*2 Port number: 12289

IP address setting switch

(Underlined setting: default)

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|--|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

T/TX, 10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting | Remarks |
|---------------------------|----------------------|---------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 - 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 - 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 1: UDP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 1: binary code | |
| | HLLINK_PROTOCOL_B | 1: UDP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 1: binary code | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.3 FA-M3/FA-M3R (Ethernet UDP/IP ASCII)

Communication Setting

Editor

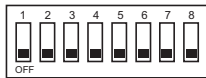
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- 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

Ethernet Module

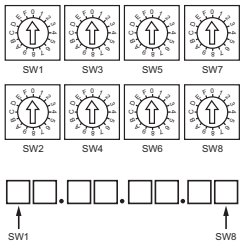
Condition setting switch

| SW9 | BIT | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|--|----------|-----|----|-------|--------------|--------|----------|-----|----|-------|--------------|--------|-------|--------|--------------|
|  | 1 | Data format setting | <div>F3LE01-5T<table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></table></div> <div>F3LE11-0T/F3LE12-0T<table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></table></div> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserved | OFF | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out* ¹ | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

*1 F3LE01-5T only

IP address setting switch

(Underlined setting: default)

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|--|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

T/TX, 10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting | Remarks |
|---------------------------|----------------------|----------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 to 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 to 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 1: UDP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 0: ASCII format | |
| | HLLINK_PROTOCOL_B | 1: UDP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 0: ASCII format | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.4 FA-M3/FA-M3R (Ethernet TCP/IP)

Communication Setting

Editor

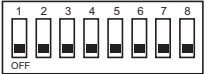
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication (TS2060i Only)”.

- 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].

PLC

Ethernet Module

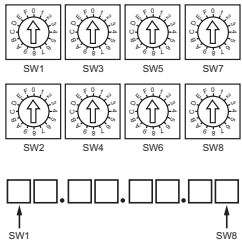
Condition setting switch

| SW9 | BIT | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|--|----------|-----|----|-------|-------|---------------|----------|-----|----|-------|-------|---------------|-------|---------------|-------|
|  | 1 | Data format setting | <div>F3LE01-5T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></table> <div>F3LE11-0T/F3LE12-0T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></table> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserved | OFF | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out ^{*1} | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

*1 F3LE01-5T only

*2 Port number: 12289

IP address setting switch

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|--|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

T/TX, 10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting | Remarks |
|---------------------------|----------------------|---------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 - 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 - 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 0: TCP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 1: binary code | |
| | HLLINK_PROTOCOL_B | 0: TCP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 1: binary code | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.5 FA-M3/FA-M3R (Ethernet TCP/IP ASCII)

Communication Setting

Editor

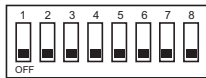
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS2060i Only)".

- 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

Ethernet Module

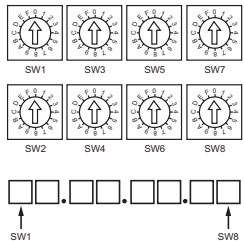
Condition setting switch

| SW9 | BIT | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|--|----------|-----|----|-------|--------------|--------|----------|-----|----|-------|--------------|--------|-------|--------|--------------|
|  | 1 | Data format setting | <div>F3LE01-5T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></table> <div>F3LE11-0T/F3LE12-0T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></table> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserved | OFF | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out* ¹ | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

*1 F3LE01-5T only

IP address setting switch

(Underlined setting: default)

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|--|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

T/TX, 10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting | Remarks |
|---------------------------|----------------------|----------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 to 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 to 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 0: TCP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 0: ASCII format | |
| | HLLINK_PROTOCOL_B | 0: TCP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 0: ASCII format | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.6 FA-M3V

Communication Setting

Editor

Communication setting

(Underlined setting: default)

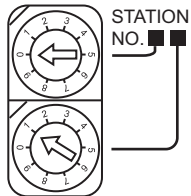
| Item | Setting | Remarks |
|-------------------|---|---------|
| Connection Mode | <u>1:1</u> / 1 : n / Multi-link / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | <u>RS-232C</u> / RS-422/485 | |
| Baud Rate | 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / <u>115K</u> bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Target Port No. | 0 to 31 | |
| Transmission Mode | With Sum Check / <u>Without Sum Check</u> | |

PLC

PC Link Module

Station number setting


(Underlined setting: default)

| Station No. | Setting | Example |
|---|-----------------|---------|
|  | <u>01</u> to 32 | 01 |

Baud rate setting switch


F3LC11-1N / F3LC11-2N

(Underlined setting: default)

| Baud Rate Setting Switch | Setting | Baud Rate | Remarks |
|---|----------|-----------------|---------|
|  | 4 | 4800 bps | |
| | <u>5</u> | <u>9600 bps</u> | |
| | 6 | 19200 bps | |


F3LC11-1F / F3LC12-1F / F3LC11-2F

(Underlined setting: default)

| Baud Rate Setting Switch | Setting | Baud Rate | Remarks |
|---|----------|-------------------|---------|
|  | 4 | 4800 bps | |
| | 5 | 9600 bps | |
| | 7 | 19200 bps | |
| | 9 | 38400 bps | |
| | A | 57.6 Kbps | |
| | B | 76.8 Kbps | |
| | <u>C</u> | <u>115.2 Kbps</u> | |

Data format setting switch

(Underlined setting: default)

| Switches | Function | OFF | ON | Example |
|----------|---------------------|---------------------|----------|---|
| 1 | Data length | 7 | <u>8</u> |  |
| 2 | Parity | <u>Not provided</u> | Provided | |
| 3 | | <u>Odd</u> | Even | |
| 4 | Stop bit | <u>1</u> | 2 | |
| 5 | Checksum | <u>Not provided</u> | Provided | |
| 6 | Terminal character | <u>Not provided</u> | Provided | |
| 7 | Protection function | <u>Not provided</u> | Provided | |
| 8 | - | - | - | |

Function setting switch

All OFF

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

29.1.7 FA-M3V (Ethernet)

Communication Setting

Editor

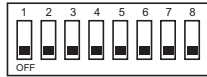
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication (TS2060i Only)”.

- 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]
- Connection port on the TS2060i unit:
The [Target Port No.] for the connected device on the [Hardware Setting] window ([System Setting] → [Hardware Setting])
 - When using TCP/IP:
Select [Built-in LAN (TCP)].
 - When using UDP/IP:
Select [Built-in LAN (UDP)].
- 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

Ethernet Module

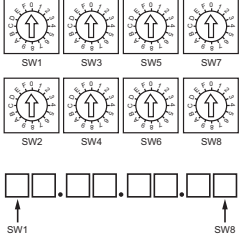
Condition setting switch

| SW9 | BIT | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|--|----------|-----|----|-------|-------|---------------|----------|-----|----|-------|-------|---------------|-------|---------------|-------|
|  | 1 | Data format setting | <div>F3LE01-5T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></table> <div>F3LE11-0T/F3LE12-0T</div> <table><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></table> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserve | OFF | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out ^{*1} | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

^{*1} F3LE01-5T only

IP address setting switch

(Underlined setting: default)

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|---|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example: HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting Values | Remarks |
|---------------------------|----------------------|----------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 to 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 to 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 0: TCP/IP 1: UDP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 1: binary code | |
| | HLLINK_PROTOCOL_B | 0: TCP/IP 1: UDP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 1: binary code | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.8 FA-M3V (Ethernet ASCII)

Communication Setting

Editor

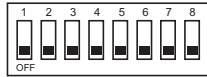
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication (TS2060i Only)”.

- 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]
- Connection port on the TS2060i unit:
The [Target Port No.] for the connected device on the [Hardware Setting] window ([System Setting] → [Hardware Setting])
 - When using TCP/IP:
Select [Built-in LAN (TCP)].
 - When using UDP/IP:
Select [Built-in LAN (UDP)].
- 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

Ethernet Module

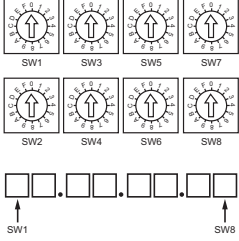
Condition setting switch

| SW9 | Bits | Contents | Setting | | | | | | | | | | | | | | | |
|---|---|---------------------|---|----------|-----|----|-------|--------------|--------|----------|-----|----|-------|--------------|--------|-------|--------|--------------|
|  | 1 | Data format setting | F3LE01-5T <table border="1"><thead><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr></thead><tbody><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr></tbody></table> F3LE11-0T/F3LE12-0T <table border="1"><thead><tr><th>Port No.</th><th>OFF</th><th>ON</th></tr></thead><tbody><tr><td>12289</td><td>ASCII</td><td>Binary</td></tr><tr><td>12291</td><td>Binary</td><td>ASCII</td></tr></tbody></table> | Port No. | OFF | ON | 12289 | ASCII | Binary | Port No. | OFF | ON | 12289 | ASCII | Binary | 12291 | Binary | ASCII |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | Port No. | OFF | ON | | | | | | | | | | | | | | | |
| | 12289 | ASCII | Binary | | | | | | | | | | | | | | | |
| | 12291 | Binary | ASCII | | | | | | | | | | | | | | | |
| | 2 | Write protection | OFF: not protected | | | | | | | | | | | | | | | |
| | 3 | System reserve | OFF | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | Line handling at TCP time-out ^{*1} | OFF: close | | | | | | | | | | | | | | | | |
| 8 | Operation mode | OFF: normal | | | | | | | | | | | | | | | | |

*1 F3LE01-5T only

IP address setting switch

(Underlined setting: default)

| IP Address Setting Switch | Setting | Remarks |
|---|-----------------------------------|---|
|  | <u>0.0.0.0</u> to 255.255.255.255 | Set in hexadecimal notation. Example: HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210 |

10BASE-T/100BASE-TX Ports

CPU properties

| Setting | Setting Items | Setting Values | Remarks |
|---------------------------|----------------------|----------------------------|-------------|
| NETWORK | NETWORK_SELECT | 1 | |
| ETHERNET | ETHER_MY_IPADDRESS | 0.0.0.0 to 255.255.255.255 | IP address |
| | ETHER_SUBNET_MASK | 0.0.0.0 to 255.255.255.255 | Subnet mask |
| HIGHER-LEVEL_LINK_SERVICE | HLLINK_PROTOCOL_A | 0: TCP/IP 1: UDP/IP | Port 12289 |
| | HLLINK_DATA_FORMAT_A | 0: ASCII format | |
| | HLLINK_PROTOCOL_B | 0: TCP/IP 1: UDP/IP | Port 12291 |
| | HLLINK_DATA_FORMAT_B | 0: ASCII format | |
| | HLLINK_PROTECT | 0: write enabled | |

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "29.1.1 FA-M3/FA-M3R".

PLC_CTL

The contents of "PLC_CTL" are the same as those described in "29.1.1 FA-M3/FA-M3R".

* The station number can be specified in the range from 0 to FFH.

For the station number, specify the PLC table number set for [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

29.1.9 Wiring Diagrams

When Connected at CN1:



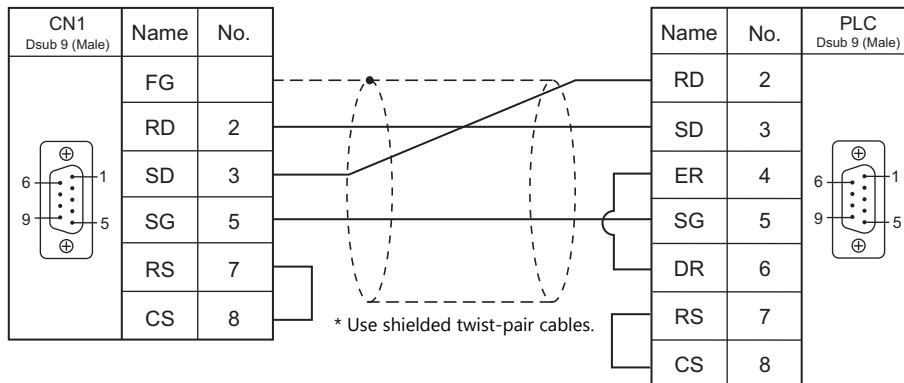
CAUTION

- 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

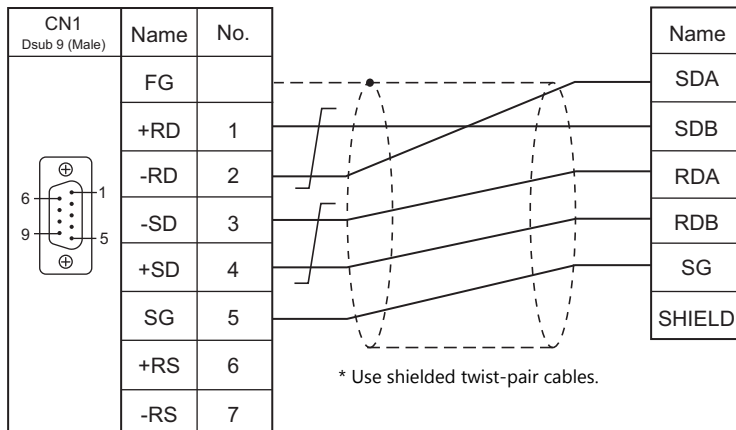
Hakko Electronics' cable "D9-YO2-09-□ M" (□ = 2, 3, 5)



RS-422/RS-485

Wiring diagram 1 - C4

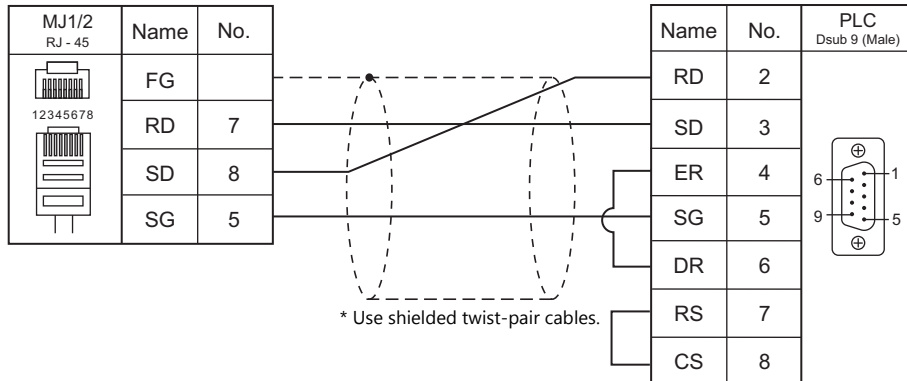
Hakko Electronics' cable "D9-YO4-0T-□ M" (□ = 2, 15)



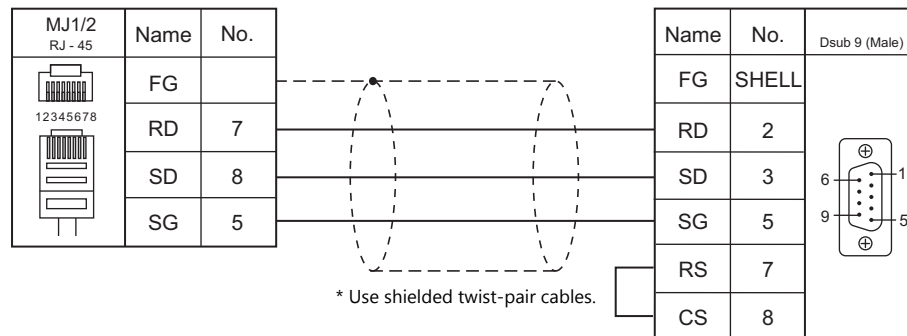
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

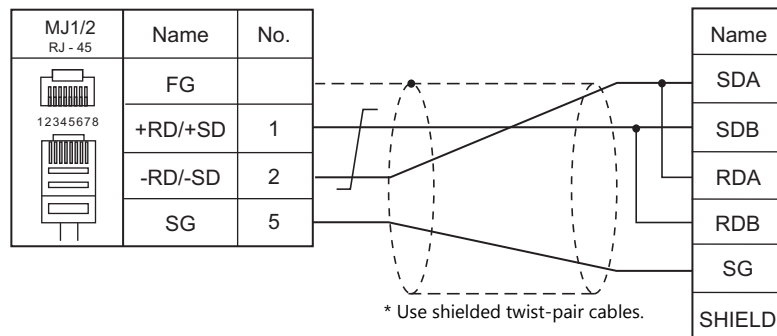


Wiring diagram 2 - M2

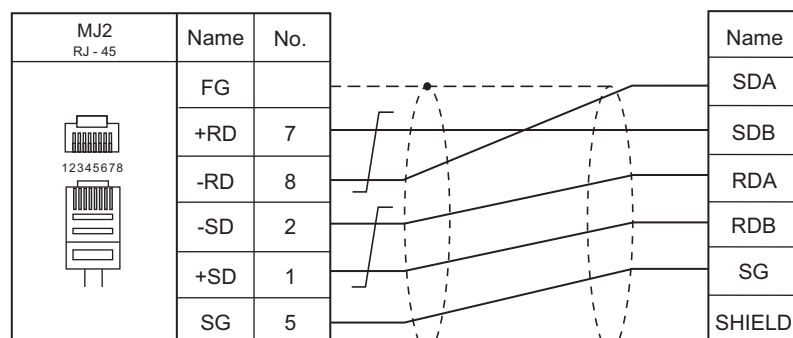


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



* Slide switch: RS-422 (lower)

* Use shielded twist-pair cables.

29.2 Temperature Controller/Servo/Inverter 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) | |
| UT100 | UT130-xx/RS UT150-xx/RS UT152-xx/RS UT155-xx/RS | RS-485 port | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | UT100.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 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 | |
| UT750 | UT750-01 UT750-11 UT750-51 | RS-485 port | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 3 - M4 | UT750.Lst |
| | | High-speed RS-485 port | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| UT550 | UT550-01, 02 UT550-11, 12 UT550-21, 22 UT550-31, 32 UT550-41, 42 | RS-485 port | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 3 - M4 | UT550.Lst |
| UT520 | UT520-07 | RS-485 port | RS-485 | | | | UT350.Lst |
| UT350 | UT350-01 UT350-21 UT350-31 | RS-485 port | RS-485 | | | | |
| UT320 | UT320-01 UT320-21 UT320-31 | RS-485 port | RS-485 | | | | |
| UT450 | UT450-01, 02 UT450-11, 12 UT450-21, 22 UT450-31, 32 UT450-41, 42 | RS-485 port | RS-485 | | | | UT450.Lst |
| UT32A/35A (MODBUS RTU) | UT32A-x10-0x-00 UT32A-NNN-0x-xx/CH1 UT35A-xx1-0x-00 UT35A-NNN-0x-xx/CH3 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 3 - M4 | YOKOGAWA UT30A (MODBUS RTU).Lst |
| | UT32A-x10-0x-00/LP UT32A-NNN-0x-xN/LCH1 | | | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| UT52A/55A (MODBUS RTU) | UT52A-NNN-0x-xx/CH1 UT55A-x10-0x-00 UT55A-x2x-0x-00 UT55A-xx1-0x-00 UT55A-x2x-01-00/MDL UT55A-NNN-0x-xx/CH3 UT55A-NNN-0x-xx/C4 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 3 - M4 | YOKOGAWA UT50A (MODBUS RTU).Lst |
| | UT52A-x10-0x-00 UT52A-010-01-00/MDL UT52A-NNN-0x-xx/RCH1 UT52A-NNN-0x-xN/LCH1 UT55A-x10-0x-00/LP UT55A-x2x-0x-00/LP UT55A-x2x-01-00/LP/MDL UT55A-NNN-0x-xx/AC4 UT55A-NNN-0x-xx/LC4 | | | Wiring diagram 2 - C4 | Wiring diagram 2 - M4 | | |
| UT75A (MODBUS RTU) | UT75A-xx1-0x-00 | Terminal block | RS-485 | Wiring diagram 1 - C4 | Wiring diagram 1 - M4 | Wiring diagram 3 - M4 | YOKOGAWA UT75A (MODBUS RTU).Lst |
| | UT75A-x1x-0x-00 UT75A-x2x-0x-00 | | | 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).

Multi-point 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} | |
| UT2400/2800 | UT2400-1, 1/HB UT2400-2, 2/HB UT2400-3, 3/HB UT2400-4, 4/HB UT2800-1, 1/HB UT2800-2, 2/HB UT2800-3, 3/HB UT2800-4, 4/HB | RS-485 port | RS-422 | Wiring diagram 3 - C4 | × | Wiring diagram 4 - M4 | UT2000.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).

Ethernet Connection (TS2060i Only)

Chart Recorder

| PLC Selection on the Editor | CPU | Unit/Port | TCP/IP ^{*1} | UDP/IP | Port No. | Keep Alive ^{*2} | Lst File |
|------------------------------------|--|---------------|----------------------|--------|--|--------------------------|-----------------|
| μR10000/20000 (Ethernet TCP/IP) | 436101-x/C7 436102-x/C7 436103-x/C7 436104-x/C7 436106-x/C7 | Ethernet port | ○ | × | 34260 (Max. 3 units: 1 for administrator and 2 for users) | ○ | μR10000_Eth.Lst |
| | 437101-x/C7 437102-x/C7 437103-x/C7 437104-x/C7 437106-x/C7 437112-x/C7 437118-x/C7 437124-x/C7 | | | | | | |

*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)".

29.2.1 UT100

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|------------------------------------|--|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |
| Sum Check | Provided / <u>Not provided</u> | Make the same setting as PSL (communication protocol selection) of the temperature controller. |

* Select "Without Sum Check" for the transmission mode on the editor when "1: PC link communication (with checksum)" is specified for P.SL (Protocol selection) on the controller.

Temperature Controller

The communication parameters can be set using keys attached to 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 |
|---------------|---------|-----------------------|---|---------|
| Communication | PSL | Protocol selection | <u>0: PC link communication</u> 1: PC link communication (with checksum) | 0 |
| | ADR | Communication address | <u>1</u> to 31 | 1 |
| | BPS | Baud rate | 4.8: 4800 bps <u>9.6: 9600 bps</u> | 9.6 |
| | PRI | Parity | NON: None <u>EVN</u> : Even ODD: Odd | EVN |
| | STP | Stop bit | <u>1</u> / 2 bits | 1 |
| | DLN | Data length | 7 / <u>8</u> bits | 8 |

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 register) | 00H | |
| I (input relay) | 01H | |

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

29.2.2 UT750

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|--|
| Connection Mode | 1 : 1 / <u>1:n</u> / Multi-link2 | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 31 | |
| Sum Check | Provided / <u>Not provided</u> | Make the same setting as PSL (communication protocol selection) of the temperature controller. |

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)

| Parameter | Port | Indication | Item | Setting | Example |
|---------------|------------------------|------------|----------------------|--|---------|
| Communication | RS-485 port | PSL1 | Protocol selection 1 | <u>0: Personal computer link communication</u> 1: Personal computer link communication (with sum check) | 0 |
| | | BPS1 | Baud rate 1 | 3: 4800 bps <u>4: 9600 bps</u> | 4 |
| | | PRI1 | Parity 1 | 0: None <u>1: Even</u> 2: Odd | 1 |
| | | STP1 | Stop bit 1 | <u>1</u> / 2 bits | 1 |
| | | DLN1 | Data length 1 | 7 / <u>8</u> bits | 8 |
| | | ADR1 | Address 1 | <u>1</u> to 31 | 1 |
| | High-speed RS-485 port | PSL2 | Protocol selection 2 | <u>0: Personal computer link communication</u> 1: Personal computer link communication (with sum check) | 0 |
| | | BPS2 | Baud rate 2 | 3: 4800 bps <u>4: 9600 bps</u> 5: 19200 bps 6: 38400 bps | 4 |
| | | PRI2 | Parity 2 | 0: None <u>1: Even</u> 2: Odd | 1 |
| | | STP2 | Stop bit 2 | <u>1</u> / 2 bits | 1 |
| | | DLN2 | Data length 2 | 7 / <u>8</u> bits | 8 |
| | | ADR2 | Address 2 | <u>1</u> to 31 | 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 |
|-------------------|------|---------|
| D (data register) | 00H | |
| I (input relay) | 01H | |

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

29.2.3 UT550

Settings are the same as those described in "29.2.1 UT100".

29.2.4 UT520

Settings are the same as those described in "29.2.1 UT100".

29.2.5 UT350

Settings are the same as those described in "29.2.1 UT100".

29.2.6 UT320

Settings are the same as those described in "29.2.1 UT100".

29.2.7 UT450

Settings are the same as those described in "29.2.1 UT100".

29.2.8 UT32A/35A (MODBUS RTU)

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 | <u>RS-422/485</u> | |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 bps | |
| Data Length | <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 99 | 0: Broadcast address for Modbus device 249: Broadcast address for UT Advanced device |

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)

| Menu | Parameter | Name | Setting |
|--------|-----------|--------------------|--|
| RS-485 | PSL | Protocol selection | <u>MBRTU (8): Modbus communication (RTU)</u> |
| | BPS | Baud Rate | 4800 (3): 4800bps 9600 (4): 9600 bps <u>19200 (5): 19200 bps</u> 38400 (6): 38400 bps |
| | PRI | Parity | NONE (0): None <u>EVEN (1): Even</u> ODD (2): Odd |
| | STP | Stop Bit | <u>1 (1): 1 bit</u> 2 (2): 2 bits |
| | DLN | Data Length | <u>8bit (8): 8 bits</u> |
| | ADR | Address | <u>1</u> 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 |
|----------------|------|---------|
| D (D Register) | 00H | |
| I (I Relay) | 01H | |

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

29.2.9 UT52A/55A (MODBUS RTU)

Settings are the same as those described in "29.2.8 UT32A/35A (MODBUS RTU)".

Note however, for UT52A, a baud rate of "38400 bps" is available only with standard models for which the Type 2 suffix code is "1".

For UT55A, a baud rate of "38400 bps" is available only with standard models for which the Type 3 suffix code is "1".

29.2.10 UT75A (MODBUS RTU)

Settings are the same as those described in "29.2.8 UT32A/35A (MODBUS RTU)".

Note however, a baud rate of "38400 bps" is available only with standard models for which the Type 3 suffix code is "1".

29.2.11 UT2400/2800

Communication Setting

Editor

Communication setting

(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|------------------------------------|---|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 | |
| Signal Level | <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / Odd / <u>Even</u> | |
| Target Port No. | <u>1</u> to 16 | |
| CR | <u>Checked</u> / Unchecked | |
| CPU No. * | 01 / 02 | 01: 1 to 4CH 02: 5 to 8CH (available only with UT2800) |

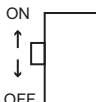
* Set the CPU number on the [Device Input] dialog.
 "CPU No. 2" is not provided for UT2400. It can be specified only when UT2800 is used.

Multi-point Temperature Controller

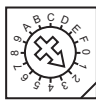
Be sure to match the settings to those made under [Communication Setting] of the editor.

Communication mode selector switch

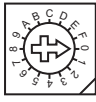
(Underlined setting: default)

| Communication Mode Selector Switch | OFF | ON | Remarks |
|---|---------------------------|--|---------|
|  | Ladder communication mode | <u>Personal computer link communication mode</u> | |

Communication condition setting switch

| Communication Condition Setting Switch | Setting | Baud Rate | Parity | Data Length | Stop Bit | Setting Example |
|---|---------|-----------|--------|-------------|----------|--|
|  | 0 | 9600 bps | None | 8 | 1 | 2: 9600 bps Even 8 bits 1 bit |
| | 1 | | Odd | | | |
| | 2 | | Even | | | |
| | 3 | 4800 bps | None | | | |
| | 4 | | Odd | | | |
| | 5 | | Even | | | |

Unit No. selector switch

| Unit No. Selector Switch | Setting | Station Number | Setting Example |
|---|---------|----------------|---------------------|
|  | 0 to F | 1 to 16 | 0: Station number 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 |
|---------------|-----------------|------|---------|
| D | (data register) | 00H | |
| I | (input relay) | 01H | |

* The CPU number is required in addition to the device type and address.
The assigned device memory is expressed as shown on the right when editing the screen.

Example: 1 : D00001

Address number
Device type
CPU number

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.
Specify the CPU number in the expansion code.

29.2.12 μ R10000/20000 (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].

Chart Recorder

Make the following settings.

After turning on the chart recorder, hold down the [MENU] key for 3 seconds to change to the Setting mode. Then switch to the Basic Setting mode by holding down the [DISP] and [FUNC] keys for 3 seconds. Display the Ethernet menu by pressing the [DISP] key several times.

| Basic Setting Mode | Item | Indication | Remarks |
|--------------------|------------|------------|-------------|
| Ethernet | IP address | A | IP address |
| | | M | Subnet mask |
| | | G | Gateway |

Login

For communication with the chart recorder, login is required.

Log in using the PLC_CTL macro command (command: 67).

Limitations

The TS2060i can only access the server for settings and measurement. Access to servers for maintenance and diagnosis as well as device information is not available.

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 |
|---|------|------------------------------------|
| SN (unit setting) | 00H | |
| SC (chart speed setting) | 01H | |
| VT (recording interval setting) | 02H | |
| SZ (zone recording setting) | 03H | |
| ST (tag setting) | 04H | |
| SG (message setting) | 05H | |
| SE (secondary chart speed setting) | 06H | |
| SV (moving average setting) | 07H | |
| SF (input filter setting) | 08H | |
| BD (alarm delay duration setting) | 09H | |
| VF (display (VFD) and internal light brightness setting) | 0AH | |
| SJ (timer settings for TLOG calculations) | 0BH | |
| FR (interval setting for FIFO buffer writing) | 0CH | |
| VP (start/end printout ON/OFF setting) | 0DH | |
| XI (integration time setting for A/D converter) | 0FH | |
| XB (burnout detection setting) | 10H | |
| UC (dot color change) | 11H | |
| UO (pen offset compensation setting) | 12H | |
| UM (report data type setting for periodic printing) | 13H | |
| UB (bar graph display mode setting) | 14H | |
| UI (moving average ON/OFF setting) | 15H | |
| UJ (input filter ON/OFF setting) | 16H | |
| UK (partial expanded recording ON/OFF setting) | 17H | |
| UL (display/printout language setting) | 18H | |
| XN (date format setting) | 19H | |
| UT (time printout format setting) | 1AH | |
| XR (remote control input setting) | 1BH | |
| UN (recording pen channel assignment change) | 1DH | |
| US (calculation error data setting) | 1EH | |
| YB (host and domain name setting) | 1FH | |
| YA (IP address setting) | 20H | |
| YD (login function ON/OFF setting) | 21H | The login function cannot be used. |
| YK (KeepAlive setting) | 22H | |
| UQ (calibration correction setting mode, correction points setting) | 23H | |
| UH ([FUNC] key menu selection setting) | 24H | |

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

| Description | F0 | F1 (= \$u n) | | F2 |
|--|--------------------|--------------|-----------------------------|---|
| Input range setting (SR) Measurement mode: SKIP, VOLT/TC/RTD/DI | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 0 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Measurement mode 0: SKIP | Measurement mode 1: VOLT 2: TC 3: RTD 4: DI |
| | | n + 4 | - | Range *1 |
| | | n + 5 | - | Span left end value |
| | | n + 6 | - | Span right end value |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|-----------------------|--------------|---|-------|
| Input range setting (SR) Measurement mode: 1-5V, DELTA | 1 to 8 (PLC1 to 8) | n | Station number | 10/7 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Measurement mode 5: 1-5V | |
| | | n + 4 | Span left end value | |
| | | n + 5 | Span right end value | |
| | | n + 6 | Scaling left end value | |
| | | n + 7 | Scaling right end value | |
| | | n + 8 | Scaling decimal place | |
| | | n + 9 | 1-5V low-cut ON/OFF 0: Off 1: On | |
| Input range setting (SR) Measurement mode: SCALE, SQRT | 1 to 8 (PLC1 to 8) | n | Station number | 11/12 |
| | | n + 1 | Command: 0 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Measurement mode 7: SCALE | |
| | | n + 4 | Input type 1: VOLT 2: TC 3: RTD 4: DI | |
| | | n + 5 | Range *1 | |
| | | n + 6 | Span left end value | |
| | | n + 7 | Span right end value | |
| | | n + 8 | Scaling left end value | |
| | | n + 9 | Scaling right end value | |
| | | n + 10 | Scaling decimal place | |
| | | n + 11 | - | |
| Acquisition of input range setting (SR) Measurement mode: SKIP, VOLT/TC/RTD/DI | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Measurement mode 0: SKIP | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| Acquisition of input range setting (SR) Measurement mode: 1-5V, DELTA | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Measurement mode 5: 1-5V | |
| | | n + 5 | Span left end value | |
| | | n + 6 | Span right end value | |
| | | n + 7 | Scaling left end value | |
| | | n + 8 | Scaling right end value | |
| | | n + 9 | Scaling decimal place | |
| | | n + 10 | 1-5V low-cut ON/OFF 0: Off 1: On | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|--|------|
| Acquisition of input range setting (SR) Measurement mode: SCALE, SQRT | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 1 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Measurement mode 7: SCALE | |
| | | | Measurement mode 8: SQRT | |
| | | n + 5 | Input type 1: VOLT 2: TC 3: RTD 4: DI | |
| | | | Range *1 | |
| | | n + 6 | Range *1 | |
| | | n + 7 | Span left end value | |
| | | n + 8 | Span right end value | |
| | | n + 9 | Scaling left end value | |
| | | n + 10 | Scaling right end value | |
| Calibration correction setting (VL) | 1 to 8 (PLC1 to 8) | n | Station number | 5+2m |
| | | n + 1 | Command: 2 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Calibration correction function 0: Off 1: On | |
| | | n + 4 | Number of settings (both correction point and value): 1 to 16 | |
| | | n + 5 | Correction point 1 (m = 1) | |
| | | n + 6 | Correction value 1 (m = 1) | |
| | | n + 7 | Correction point 2 (m = 2) | |
| | | n + 8 | Correction value 2 (m = 2) | |
| | | : | : | |
| Acquisition of calibration correction setting (VL) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 3 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Calibration correction function 0: Off 1: On | |
| | | n + 5 | Number of settings (both correction point and value): 1 to 16 | |
| | | n + 6 | Correction point 1 | |
| | | n + 7 | Correction value 1 | |
| | | n + 8 | Correction point 2 | |
| | | n + 9 | Correction value 2 | |
| | | : | : | |
| Alarm setting (SA) | 1 to 8 (PLC1 to 8) | n | Station number | 5/9 |
| | | n + 1 | Command: 4 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Alarm number | |
| | | n + 4 | Alarm ON/OFF 0: Off | |
| | | | Alarm ON/OFF 1: On | |
| | | n + 5 | - | |
| | | | Alarm type 1: H (upper limit) 2: L (lower limit) 3: h (difference upper limit) 4: l (difference lower limit) 5: R (change rate upper limit) 6: r (change rate lower limit) 7: T (delay upper limit) 8: t (delay lower limit) | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| | | | Relay output 0: No relay output 1: Output relay | |
| | | n + 8 | - | |
| | | | Relay number (n + 7 = 1) | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|---|--|
| Acquisition of alarm setting (SA) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 5 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Alarm number | |
| | | n + 4 | CH No. | |
| | | n + 5 | Alarm number | |
| | | n + 6 | Alarm ON/OFF 0: Off | Alarm ON/OFF 1: On |
| | | n + 7 | - | Alarm type 1: H (upper limit) 2: L (lower limit) 3: h (difference upper limit) 4: l (difference lower limit) 5: R (change rate upper limit) 6: r (change rate lower limit) 7: T (delay upper limit) 8: t (delay lower limit) |
| | | n + 8 | - | Alarm value |
| | | n + 9 | - | Relay output 0: No relay output 1: Output relay |
| | | n + 10 | - | Relay number |
| Channel recording ON/OFF settings (VR) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 6 | |
| | | n + 2 | Model 0: Pen | Model 1: Dot |
| | | n + 3 | CH No. | |
| | | n + 4 | Periodic printing ON/OFF 0: Off 1: On | Analog recording ON/OFF 0: Off 1: On |
| | | n + 5 | - | Periodic printing ON/OFF 0: Off 1: On |
| Acquisition of channel recording ON/OFF settings (VR) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 7 | |
| | | n + 2 | Model 0: Pen | Model 1: Dot |
| | | n + 3 | CH No. | |
| | | n + 4 | CH No. | |
| | | n + 5 | Periodic printing ON/OFF 0: Off 1: On | Analog recording ON/OFF 0: Off 1: On |
| | | n + 6 | - | Periodic printing ON/OFF 0: Off 1: On |
| Batch and lot number settings (VH) Batch | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 8 | |
| | | n + 2 | Subcommand 0: Batch | |
| | | n + 3 | Item 0: Batch | |
| | | n + 4 | No. of characters | |
| | | n + 5 | Batch number (m = 1) | |
| | | n + 6 | Batch number (m = 2) | |
| | | : | : | |
| Batch and lot number settings (VH) Lot number | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 8 | |
| | | n + 2 | Subcommand 1: Lot (4 digits) | Subcommand 2: Lot (6 digits) |
| | | n + 3 | Item 1: Lot | |
| | | n + 4 | Lot number | Lot number (lower word) |
| | | n + 5 | - | Lot number (higher word) |

| Description | F0 | F1 (= \$u n) | | | F2 |
|---|-----------------------|--------------|--|---|---------------------------------|
| Acquisition of batch and lot number settings (VH) | 1 to 8 (PLC1 to 8) | n | Station number | | |
| | | n + 1 | Command: 9 | | |
| | | n + 2 | Subcommand 0: Batch | Subcommand 1: Lot (4 digits) | Subcommand 2: Lot (6 digits) |
| | | n + 3 | Item 0: Batch | Item 1: Lot | Item 1: Lot |
| | | n + 4 | Item 0: Batch | Lot number | Lot number (lower word) |
| | | n + 5 | No. of characters | - | Lot number (higher word) |
| | | n + 6 | Batch number | - | - |
| | | n + 7 | Batch number | - | - |
| | | : | : | - | - |
| Batch comment settings (VC) | 1 to 8 (PLC1 to 8) | n | Station number | | |
| | | n + 1 | Command: 10 | | |
| | | n + 2 | Mode 0: Start printout 1: End printout 2: Start printout 2 3: End printout 2 | | |
| | | n + 3 | Line number | | |
| | | n + 4 | No. of characters | | |
| | | n + 5 | Batch comment (m = 1) | | |
| | | n + 6 | Batch comment (m = 2) | | |
| | | : | : | | |
| | | | | | |
| Acquisition of batch comment settings (VC) | 1 to 8 (PLC1 to 8) | n | Station number | | |
| | | n + 1 | Command: 11 | | |
| | | n + 2 | Mode 0: Start printout 1: End printout 2: Start printout 2 3: End printout 2 | | |
| | | n + 3 | Line number | | |
| | | n + 4 | Mode 0: Start printout 1: End printout 2: Start printout 2 3: End printout 2 | | |
| | | n + 5 | Line number | | |
| | | n + 6 | Batch comment | | |
| | | n + 7 | Batch comment | | |
| | | : | : | | |
| Start/end printout action settings (VA) | 1 to 8 (PLC1 to 8) | n | Station number | | |
| | | n + 1 | Command: 12 | | |
| | | n + 2 | Mode 0: Start 2: Start2 | Mode 1: End 3: End2 | |
| | | n + 3 | Chart speed before start printout | Chart speed after end printout | |
| | | n + 4 | - | Lot number automatic update ON/OFF 0: Off 1: On | |
| | | n + 5 | - | Offset compensation record output ON/OFF 0: Off 1: On | |
| | | n + 6 | - | Chart speed for offset compensation record output 0: C.Speed 1: 450 mm/h | |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|--------------------|--------------|---|------------------------|
| Acquisition of start/end printout action settings (VA) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 13 | |
| | | n + 2 | Mode 0: Start 1: End 2: Start2 3: End2 | |
| | | n + 3 | Mode 0: Start 2: Start2 | |
| | | n + 4 | Chart speed before start printout | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| Alarm-related settings (XA) | 1 to 8 (PLC1 to 8) | n | Station number | Variable ^{*3} |
| | | n + 1 | Command: 14 | |
| | | n + 2 | Diagnosis output ON/OFF 0: Off 1: On | |
| | | n + 3 | Reflash alarm operation 0: Off 1: On | |
| | | n + 4 | AND logic relay ^{*2} | |
| | | n + 5 | Relay energized/de-energized operation 0: Energize 1: De_energize | |
| | | n + 6 | Relay hold/non-hold operation 0: Hold 1: Nonhold | |
| | | n + 7 | Alarm status display hold/non-hold operation 0: Hold 1: Nonhold | |
| | | n + 8 | Interval for change rate upper limit alarm | |
| | | n + 9 | Interval for change rate lower limit alarm | |
| | | n + 10 | Measurement channel alarm hysteresis 0: Off 1 to 10: 0.1 to 1.0 | |
| | | n + 11 | Computation channel alarm hysteresis 0: Off 1 to 10: 0.1 to 1.0 | |
| Acquisition of alarm-related settings (XA) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 15 | |
| | | n + 2 | Diagnosis output ON/OFF 0: Off 1: On | |
| | | n + 3 | Reflash alarm operation 0: Off 1: On | |
| | | n + 4 | AND logic relay ^{*2} | |
| | | n + 5 | Relay energized/de-energized operation 0: Energize 1: De_energize | |
| | | n + 6 | Relay hold/non-hold operation 0: Hold 1: Nonhold | |
| | | n + 7 | Alarm status display hold/non-hold operation 0: Hold 1: Nonhold | |
| | | n + 8 | Interval for change rate upper limit alarm | |
| | | n + 9 | Interval for change rate lower limit alarm | |
| | | n + 10 | Measurement channel alarm hysteresis 0: Off 1 to 10: 0.1 to 1.0 | |
| | | n + 11 | Computation channel alarm hysteresis 0: Off 1 to 10: 0.1 to 1.0 | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|--------------------|--------------|---|-----|
| Compensation setting of standard setting (XJ) | 1 to 8 (PLC1 to 8) | n | Station number | 4/5 |
| | | n + 1 | Command: 16 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Compensation setting of standard setting 0: Internal | |
| | | n + 4 | - | |
| Acquisition of standard setting compensation setting (XJ) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 17 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Compensation setting of standard setting 0: Internal | |
| | | n + 5 | - | |
| Items-to-print setting (UP) | 1 to 8 (PLC1 to 8) | n | Station number | 9 |
| | | n + 1 | Command: 18 | |
| | | n + 2 | Model 0: Pen 1: Dot | |
| | | n + 3 | Channel number / tag selection 0: CH 1: Tag | |
| | | n + 4 | Alarm printing setting 0: Off 1: On1 2: On2 | |
| | | n + 5 | Recording start printout ON/OFF 0: Off 1: On | |
| | | n + 6 | New chart speed printout ON/OFF 0: Off 1: On | |
| | | n + 7 | Scaling printout ON/OFF 0: Off 1: On | |
| | | n + 8 | Recording color printing ON/OFF 0: Off 1: On | |
| Acquisition of items-to-print setting (UP) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 19 | |
| | | n + 2 | Model 0: Pen 1: Dot | |
| | | n + 3 | Channel number / tag selection 0: CH | |
| | | n + 4 | Alarm printing setting 0: Off 1: On1 2: On2 | |
| | | n + 5 | Recording start printout ON/OFF 0: Off 1: On | |
| | | n + 6 | New chart speed printout ON/OFF 0: Off 1: On | |
| | | n + 7 | Scaling printout ON/OFF 0: Off 1: On | |
| | | n + 8 | Recording color printing ON/OFF 0: Off 1: On | |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|-----------------------|--------------|--|---|
| Periodic printing interval setting (UR) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 20 | |
| | | n + 2 | Decision of printing interval 0: Auto | Decision of printing interval 1: Manual |
| | | n + 3 | Standard time | |
| | | n + 4 | Periodic printing mode 0: No periodic printing 1: Print instantaneous values 2: Print report data between intervals | Interval 0: 10 minutes 1: 12 minutes 2: 25 minutes 3: 20 minutes 4: 30 minutes 5: 1 hour 6: 2 hours 7: 3 hours 8: 4 hours 9: 6 hours 10: 8 hours 11: 12 hours 12: 24 hours |
| | | n + 5 | - | Periodic printing mode 0: No periodic printing 1: Print instantaneous values 2: Print report data between intervals |
| Acquisition of periodic printing interval setting (UR) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 21 | |
| | | n + 2 | Decision of printing interval 0: Auto | Decision of printing interval 1: Manual |
| | | n + 3 | Standard time | |
| | | n + 4 | Periodic printing mode 0: No periodic printing 1: Print instantaneous values 2: Print report data between intervals | Interval 0: 10 minutes 1: 12 minutes 2: 25 minutes 3: 20 minutes 4: 30 minutes 5: 1 hour 6: 2 hours 7: 3 hours 8: 4 hours 9: 6 hours 10: 8 hours 11: 12 hours 12: 24 hours |
| | | n + 5 | - | Periodic printing mode 0: No periodic printing 1: Print instantaneous values 2: Print report data between intervals |
| Personalize function ON/OFF setting (UF) | 1 to 8 (PLC1 to 8) | n | Station number | |
| | | n + 1 | Command: 22 | |
| | | n + 2 | Bias function 0: Not 1: Use | |
| | | n + 3 | Square root computation low-cut function 0: Not 1: Use | |
| | | n + 4 | 1-5V input low-cut function 0: Not 1: Use | |
| | | n + 5 | Alarm delay function 0: Not 1: Use | |
| | | n + 6 | Calibration function 0: Not 1: Use | |

Variable ^{*3}

| Description | F0 | F1 (=\$u n) | | | | F2 |
|---|-----------------------|-------------|--|---|---------------------------|-----|
| Acquisition of personalize function ON/OFF setting (UF) | 1 to 8 (PLC1 to 8) | n | Station number | | | 2 |
| | | n + 1 | Command: 23 | | | |
| | | n + 2 | Bias function 0: Not 1: Use | | | |
| | | n + 3 | Square root computation low-cut function 0: Not 1: Use | | | |
| | | n + 4 | 1-5V input low-cut function 0: Not 1: Use | | | |
| | | n + 5 | Alarm delay function 0: Not 1: Use | | | |
| | | n + 6 | Calibration function 0: Not 1: Use | | | |
| TLOG timer setting (XQ) | 1 to 8 (PLC1 to 8) | n | Station number | | | 4/8 |
| | | n + 1 | Command: 24 | | | |
| | | n + 2 | Timer No. | | | |
| | | n + 3 | Timer type 0: Off | Timer type 1: Absolute | Timer type 2: Relative | |
| | | n + 4 | - | Interval 0: 10 minutes 1: 12 minutes 2: 25 minutes 3: 20 minutes 4: 30 minutes 5: 1 hour 6: 2 hours 7: 3 hours 8: 4 hours 9: 6 hours 10: 8 hours 11: 12 hours 12: 24 hours | Interval (hours) | |
| | | n + 5 | - | Standard time | Interval (minutes) | |
| | | n + 6 | - | Timeout reset ON/OFF 0: Off 1: On | | |
| | | n + 7 | - | Printout ON/OFF 0: Off 1: On | | |
| Acquisition of TLOG timer setting (XQ) | 1 to 8 (PLC1 to 8) | n | Station number | | | 3 |
| | | n + 1 | Command: 25 | | | |
| | | n + 2 | Timer No. | | | |
| | | n + 3 | Timer No. | | | |
| | | n + 4 | Timer type 0: Off | Timer type 1: Absolute | Timer type 2: Relative | |
| | | n + 5 | - | Interval 0: 10 minutes 1: 12 minutes 2: 25 minutes 3: 20 minutes 4: 30 minutes 5: 1 hour 6: 2 hours 7: 3 hours 8: 4 hours 9: 6 hours 10: 8 hours 11: 12 hours 12: 24 hours | Interval (hours) | |
| | | n + 6 | - | Standard time | Interval (minutes) | |
| | | n + 7 | - | Timeout reset ON/OFF 0: Off 1: On | | |
| | | n + 8 | - | Printout ON/OFF 0: Off 1: On | | |
| DNS setting (XJ) DNS: off | 1 to 8 (PLC1 to 8) | n | Station number | | | 3 |
| | | n + 1 | Command: 26 | | | |
| | | n + 2 | DNS ON/OFF 0: Off | | | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|---|----------|
| DNS setting (XJ) DNS: on | 1 to 8 (PLC1 to 8) | n | Station number | Variable |
| | | n + 1 | Command: 26 | |
| | | n + 2 | DNS ON/OFF 1: On | |
| | | n + 3 | Primary DNS server address (first digit (left-most)) | |
| | | n + 4 | Primary DNS server address (second digit) | |
| | | n + 5 | Primary DNS server address (third digit) | |
| | | n + 6 | Primary DNS server address (fourth digit (right-most)) | |
| | | n + 7 | Secondary DNS server address (first digit (left-most)) | |
| | | n + 8 | Secondary DNS server address (second digit) | |
| | | n + 9 | Secondary DNS server address (third digit) | |
| | | n + 10 | Secondary DNS server address (fourth digit (right-most)) | |
| | | n + 11 | Domain suffix 1 Number of characters *4 | |
| | | n + 12 | Domain suffix 2 Number of characters *4 | |
| | | n + 13 | Domain suffix 1 | |
| | | : | : | |
| | | n + 44 | Domain suffix 1 | |
| | | n + 45 | Domain suffix 2 | |
| | | : | : | |
| | | n + 76 | Domain suffix 2 | |
| Acquisition of DNS setting (XJ) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 27 | |
| | | n + 2 | DNS ON/OFF 0: Off | |
| | | n + 3 | - | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| | | n + 6 | - | |
| | | n + 7 | - | |
| | | n + 8 | - | |
| | | n + 9 | - | |
| | | n + 10 | - | |
| | | n + 11 | - | |
| | | : | - | |
| | | n + 42 | - | |
| | | n + 43 | - | |
| | | : | - | |
| | | n + 74 | - | |
| Communication timeout setting (YQ) | 1 to 8 (PLC1 to 8) | n | Station number | 3/4 |
| | | n + 1 | Command: 28 | |
| | | n + 2 | Communication timeout ON/OFF 0: Off | |
| | | n + 3 | - | |
| Acquisition of communication timeout setting (YQ) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 29 | |
| | | n + 2 | Communication timeout ON/OFF 0: Off | |
| | | n + 3 | - | |
| Printing position adjustment (UA) | 1 to 8 (PLC1 to 8) | n | Station number | 6/5 |
| | | n + 1 | Command: 30 | |
| | | n + 2 | Model 0: Pen | |
| | | n + 3 | Printing position 0: Zero (0 % position) 1: Full (100 % position) | |
| | | n + 4 | Pen No.: 1 to 4 | |
| | | n + 5 | Adjustment value | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|--------------|---|-------------|
| Setting mode menu selection (UG) | 1 to 8 (PLC1 to 8) | n | Station number | Variable *3 |
| | | n + 1 | Command: 31 | |
| | | n + 2 | Range 0: Off 1: On | |
| | | n + 3 | Bias 0: Off 1: On | |
| | | n + 4 | Alarm 0: Off 1: On | |
| | | n + 5 | Unit 0: Off 1: On | |
| | | n + 6 | Chart speed 0: Off 1: On | |
| | | n + 7 | Other Notes 0: Off 1: On | |
| | | n + 8 | Calibration correction 0: Off 1: On | |
| | | n + 9 | Operation 0: Off 1: On | |
| | | n + 10 | Batch name 0: Off 1: On | |
| | | n + 11 | Batch details 0: Off 1: On | |
| Acquisition of Setting mode menu selection (UG) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 32 | |
| | | n + 2 | Range 0: Off 1: On | |
| | | n + 3 | Bias 0: Off 1: On | |
| | | n + 4 | Alarm 0: Off 1: On | |
| | | n + 5 | Unit 0: Off 1: On | |
| | | n + 6 | Chart speed 0: Off 1: On | |
| | | n + 7 | Other Notes 0: Off 1: On | |
| | | n + 8 | Calibration correction 0: Off 1: On | |
| | | n + 9 | Operation 0: Off 1: On | |
| | | n + 10 | Batch name 0: Off 1: On | |
| | | n + 11 | Batch details 0: Off 1: On | |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|-----------------------|--------------|--|-----|
| Start/end printout and message format ON/OFF setting (UE) | 1 to 8 (PLC1 to 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 33 | |
| | | n + 2 | Start/end printout ON/OFF 0: Not | |
| | | n + 3 | Message format ON/OFF 0: Not 1: Use | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| Acquisition of start/end printout and message format ON/OFF setting (UE) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 34 | |
| | | n + 2 | Start/end printout ON/OFF 0: Not | |
| | | n + 3 | Message format ON/OFF 0: Not 1: Use | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| Basic Setting mode exit (YE) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 35 | |
| | | n + 2 | Settings ON/OFF 0: Store (settings enabled) 1: Abort (settings disabled) | |
| Basic Setting mode exit (XE) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 36 | |
| | | n + 2 | Settings ON/OFF 0: Store (settings enabled) 1: Abort (settings disabled) | |
| Operation mode change (DS) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 37 | |
| | | n + 2 | Mode type 0: Operation mode 1: Basic Setting mode | |
| Recording start/stop (PS) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 38 | |
| | | n + 2 | Recording start/stop 0: Start 1: Stop | |
| Screen/channel switching (UD) | 1 to 8 (PLC1 to 8) | n | Station number | 3/4 |
| | | n + 1 | Command: 39 | |
| | | n + 2 | Command 0: Return to data display screen 2: Change displayed channel | |
| | | n + 3 | - | |
| Alarm acknowledgement operation (alarm ACK) (AK) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 40 | |
| | | n + 2 | 0 fixed | |
| Computation start/stop/reset (TL) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 41 | |
| | | n + 2 | Operation type 0: Math start 1: Math stop 2: Math reset | |
| Manual printout start/stop (MP) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 42 | |
| | | n + 2 | Operation type 0: Printout start 1: Printout stop | |
| List 1 (settings) printout start/stop (LS) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 43 | |
| | | n + 2 | Recording start/stop 0: Start 1: Stop | |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|-----------------------|--------------|--|----|
| List 2 (basic settings) printout start/stop (SU) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 44 | |
| | | n + 2 | Recording start/stop 0: Start 1: Stop | |
| Message printout (MS) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 45 | |
| | | n + 2 | Message No.: 1 to 5 | |
| Alarm printout buffer clear (AC) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 46 | |
| | | n + 2 | 0 fixed | |
| Message printout buffer clear (MC) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 47 | |
| | | n + 2 | 0 fixed | |
| Periodic printing report data reset (VG) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 48 | |
| | | n + 2 | Fixed to 2 | |
| Settings initialization (YC) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 49 | |
| | | n + 2 | Initialization type 0: Initialization of Setting mode and Basic Setting mode settings 1: Initialization of Setting mode settings | |
| Stop printing position adjustment (UY) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 50 | |
| | | n + 2 | 0 fixed | |
| Acquisition of printing position adjustment status (UY) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 51 | |
| | | n + 2 | Execution status 0: Stopped 1: In execution | |
| Byte output order setting (BO) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 52 | |
| | | n + 2 | Byte order 0: MSB 1: LSB | |
| Acquisition of byte output order setting (BO) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 53 | |
| | | n + 2 | Byte order 0: MSB 1: LSB | |
| Status filter setting (IF) | 1 to 8 (PLC1 to 8) | n | Station number | 6 |
| | | n + 1 | Command: 56 | |
| | | n + 2 | Status information filter 1: 0 to 255 | |
| | | n + 3 | Status information filter 2: 0 to 255 | |
| | | n + 4 | Status information filter 3: 0 to 255 | |
| | | n + 5 | Status information filter 4: 0 to 255 | |
| Acquisition of status filter setting (IF) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 57 | |
| | | n + 2 | Status information filter 1: 0 to 255 | |
| | | n + 3 | Status information filter 2: 0 to 255 | |
| | | n + 4 | Status information filter 3: 0 to 255 | |
| | | n + 5 | Status information filter 4: 0 to 255 | |
| Ethernet disconnection (CC) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 58 | |
| | | n + 2 | 0 fixed | |
| Output of decimal point position, unit information, setting data (FE) | 1 to 8 (PLC1 to 8) | n | Station number | 6 |
| | | n + 1 | Command: 59 | |
| | | n + 2 | Address *5 | |
| | | n + 3 | Output data type: 1 (decimal point position, unit information) | |
| | | n + 4 | First channel for output | |
| | | n + 5 | Last channel for output | |
| | | n + 6 and up | Receive data *6 | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|-----------------------|-----------------|---|-----|
| Output latest measurement/calculation data (FD) | 1 to 8 (PLC1 to 8) | n | Station number | 5 |
| | | n + 1 | Command: 60 | |
| | | n + 2 | Address *5 | |
| | | n + 3 | First channel for output | |
| | | n + 4 | Last channel for output | |
| | | n + 5 and up | Receive data *6 | |
| Output statistical calculation results (FY) | 1 to 8 (PLC1 to 8) | n | Station number | 6 |
| | | n + 1 | Command: 61 | |
| | | n + 2 | Address *5 | |
| | | n + 3 | Output data type 0: Inst 1: Report 2: Tlog1 3: Tlog2 | |
| | | n + 4 | First channel for output | |
| | | n + 5 | Last channel for output | |
| | | n + 6 and up | Receive data *6 | |
| FIFO data output (FF) | 1 to 8 (PLC1 to 8) | n | Station number | 7/4 |
| | | n + 1 | Command: 62 | |
| | | n + 2 | Address *5 | |
| | | n + 3 | Operation type 0: Get 3: Get_new | |
| | | n + 4 | First channel for output | |
| | | n + 5 | Last channel for output | |
| | | n + 6 | Blocks to output 0: All blocks Other than 0: The specified number | |
| Status information output (IS) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 63 | |
| | | n + 2 | Status information 1: 0 to 255 | |
| | | n + 3 | Status information 2: 0 to 255 | |
| | | n + 4 | Status information 3: 0 to 255 | |
| | | n + 5 | Status information 4: 0 to 255 | |
| | | n + 6 and up | Receive data *6 | |
| User information output (FU) | 1 to 8 (PLC1 to 8) | n | Station number | 2 |
| | | n + 1 | Command: 64 | |
| | | n + 2 | Physical layer | |
| | | n + 3 | User level | |
| | | n + 4 to n + 11 | User name | |
| Login | 1 to 8 (PLC1 to 8) | n | Station number | 4 |
| | | n + 1 | Command: 67 | |
| | | n + 2 | Login function: 0 (not use) | |
| | | n + 3 | Login level 0: Admin (administrator) 1: User | |
| Bias setting (VB) | 1 to 8 (PLC1 to 8) | n | Station number | 4/5 |
| | | n + 1 | Command: 70 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Bias ON/OFF 0: Off | |
| | | n + 4 | - | |
| Acquisition of bias setting (VB) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 71 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Bias ON/OFF 0: Off | |
| | | n + 5 | - | |

| Description | F0 | F1 (= \$u n) | | F2 |
|---|--------------------|------------------|---|------------|
| Partial expanded recording setting (SP) | 1 to 8 (PLC1 to 8) | n | Station number | 4/6 |
| | | n + 1 | Command: 72 | |
| | | n + 2 | CH No. | |
| | | n + 3 | Partial expanded recording setting ON/OFF 0: Off | |
| | | n + 4 | - | |
| | | n + 5 | - | |
| Acquisition of partial expanded recording setting (SP) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 73 | |
| | | n + 2 | CH No. | |
| | | n + 3 | CH No. | |
| | | n + 4 | Partial expanded recording setting ON/OFF 0: Off | |
| | | n + 5 | - | |
| Computing equation setting (SO) | 1 to 8 (PLC1 to 8) | n | Station number | 4/Variable |
| | | n + 1 | Command: 74 | |
| | | n + 2 | Computation channel No. ^{*7} | |
| | | n + 3 | Computing equation ON/OFF 0: Off | |
| | | n + 4 | - | |
| | | n + 5 to n + 124 | - | |
| | | n + 125 | - | |
| | | n + 126 | - | |
| | | n + 127 | - | |
| | | n + 128 | - | |
| | | n + 129 | - | |
| Acquisition of computing equation setting (SO) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 75 | |
| | | n + 2 | Computation channel No. ^{*7} | |
| | | n + 3 | Computation channel No. ^{*7} | |
| | | n + 4 | Computing equation ON/OFF 0: Off | |
| | | n + 5 to n + 124 | - | |
| | | n + 125 | - | |
| | | n + 126 | - | |
| | | n + 127 | - | |
| | | n + 128 | - | |
| | | n + 129 | - | |
| Computing equation constant setting (SK) | 1 to 8 (PLC1 to 8) | n | Station number | 9 |
| | | n + 1 | Command: 76 | |
| | | n + 2 | Constant number: 1 to 30 | |
| | | n + 3 | Constant sign (+, -) | |
| | | n + 4 | Constant significand (characteristic) (lower word) | |
| | | n + 5 | Constant significand (characteristic) (higher word) | |
| | | n + 6 | Constant significand (mantissa) (lower word) | |
| | | n + 7 | Constant significand (mantissa) (higher word) | |
| | | n + 8 | Constant exponent (0 if not necessary) | |
| Acquisition of computing equation constant setting (SK) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 77 | |
| | | n + 2 | Constant number: 1 to 30 | |
| | | n + 3 | Constant number | |
| | | n + 4 | Constant sign (+, -) | |
| | | n + 5 | Constant significand (characteristic) (lower word) | |
| | | n + 6 | Constant significand (characteristic) (higher word) | |
| | | n + 7 | Constant significand (mantissa) (lower word) | |
| | | n + 8 | Constant significand (mantissa) (higher word) | |
| | | n + 9 | Constant exponent | |

| Description | F0 | F1 (= \$u n) | | F2 |
|--|-----------------------|--------------|---|----|
| Communication input data setting (CM) | 1 to 8 (PLC1 to 8) | n | Station number | 9 |
| | | n + 1 | Command: 78 | |
| | | n + 2 | Communication input data No. | |
| | | n + 3 | Communication input data sign (+, -) | |
| | | n + 4 | Communication input data significand (characteristic) (lower word) | |
| | | n + 5 | Communication input data significand (characteristic) (higher word) | |
| | | n + 6 | Communication input data significand (mantissa) (lower word) | |
| | | n + 7 | Communication input data significand (mantissa) (higher word) | |
| | | n + 8 | Communication input data exponent (0 if not necessary) | |
| Acquisition of communication input data setting (CM) | 1 to 8 (PLC1 to 8) | n | Station number | 3 |
| | | n + 1 | Command: 79 | |
| | | n + 2 | Communication input data No. | |
| | | n + 3 | Communication input data No. | |
| | | n + 4 | Communication input data No. sign (+, -) | |
| | | n + 5 | Communication input data No. significand (characteristic) (lower word) | |
| | | n + 6 | Communication input data No. significand (characteristic) (higher word) | |
| | | n + 7 | Communication input data No. significand (mantissa) (lower word) | |
| | | n + 8 | Communication input data No. significand (mantissa) (higher word) | |
| | | n + 9 | Communication input data No. exponent | |

Return data: Data stored from chart recorder to TS2060i

Command parameters

The available number of parameters for each command varies depending on the device used (model and specifications). If a parameter is unavailable, subsequent parameters are moved up. Be sure to modify the number of words to be transferred in PLC_CTL [F2] according to the actual parameters.

For more information, refer to the manual issued by the manufacturer.

*1 Available range setting values vary depending on the setting mode. Set the following values for range settings.

| Measurement mode | Range Type | Value |
|-------------------|------------|-------|
| VOLT, SQRT, DELTA | 20mV | 0 |
| | 60mV | 1 |
| | 200mV | 2 |
| | 2V | 3 |
| | 6V | 4 |
| | 20V | 5 |
| | 50V | 6 |
| 1-5V | 1-5V | 0 |
| TC | R | 0 |
| | S | 1 |
| | B | 2 |
| | K | 3 |
| | E | 4 |
| | J | 5 |
| | T | 6 |
| | N | 7 |
| | W | 8 |
| | L | 9 |
| | U | 10 |
| | Wre | 11 |
| RTD | Pt100 | 0 |
| | JPt100 | 1 |
| DI | Voltage | 0 |
| | Contact | 1 |

*2 Set AND logic relays as shown below.

| Measurement mode | Value |
|------------------|-------|
| NONE | 0 |
| I01 | 1 |
| I01-I02 | 2 |
| I01-I03 | 3 |
| I01-I04 | 4 |
| I01-I05 | 5 |
| I01-I06 | 6 |
| I01-I11 | 7 |
| I01-I12 | 8 |
| I01-I13 | 9 |
| I01-I14 | 10 |
| I01-I15 | 11 |
| I01-I16 | 12 |
| I01-I21 | 13 |
| I01-I22 | 14 |
| I01-I23 | 15 |
| I01-I24 | 16 |
| I01-I25 | 17 |
| I01-I26 | 18 |
| I01-I31 | 19 |
| I01-I32 | 20 |
| I01-I33 | 21 |
| I01-I34 | 22 |
| I01-I35 | 23 |
| I01-I36 | 24 |

*3 The number of parameters for each command varies depending on the device used (special specifications).

*4 When "0" is specified for the number of characters, subsequent strings can be omitted. Input the second data in the next place.

*5 Specify the \$u device memory address for storing received data.

*6 For information on receive data formats, refer to the manual issued by the manufacturer.

*7 Set computation channel numbers as shown below.

0A: 31, 0B: 32, 0C: 33, ---, 1P: 54

*8 When a computing equation is shorter than "n + 124", set the next parameter in the next space.

29.2.13 Wiring Diagrams

When Connected at CN1:

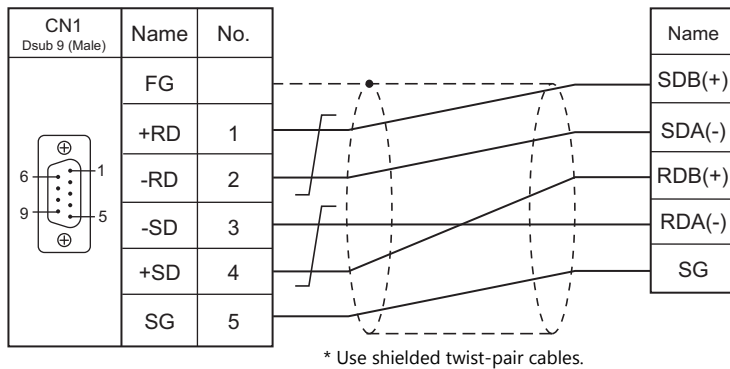


CAUTION

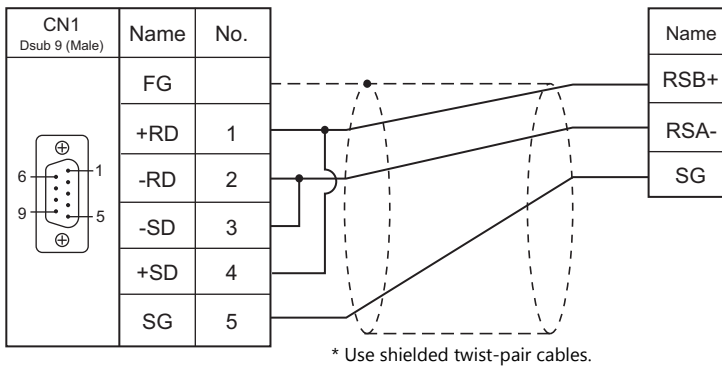
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-422/RS-485

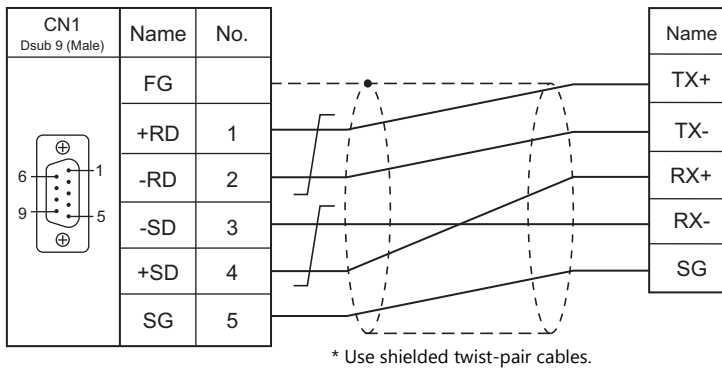
Wiring diagram 1 - C4



Wiring diagram 2 - C4



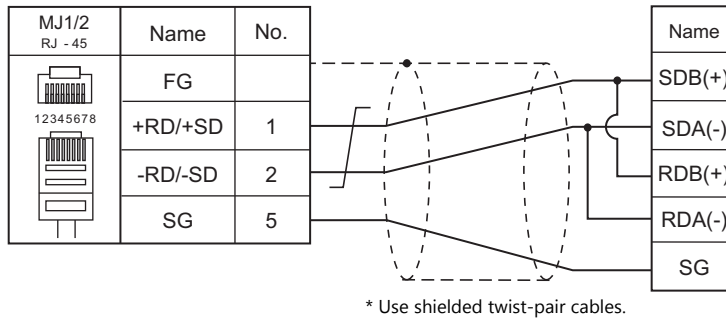
Wiring diagram 3 - C4



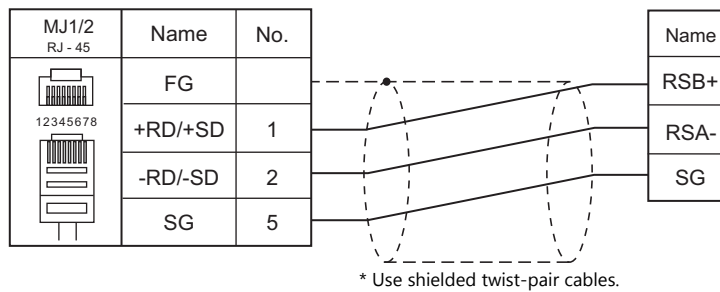
When Connected at MJ1/MJ2:

RS-422/RS-485

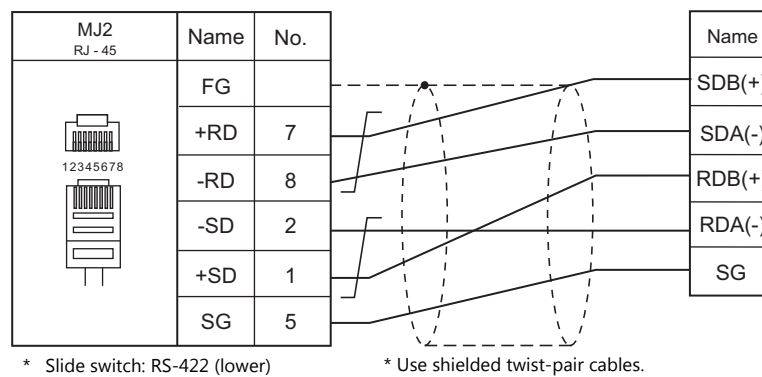
Wiring diagram 1 - M4



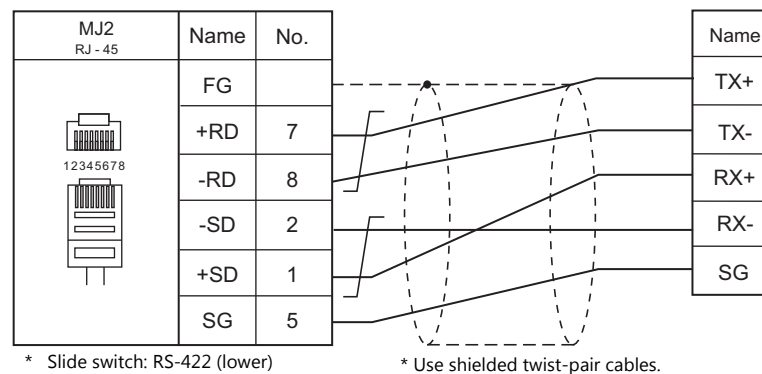
Wiring diagram 2 - M4



Wiring diagram 3 - M4

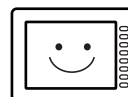


Wiring diagram 4 - M4



MEMO

MONITOUCH



30. MODBUS

30.1 PLC Connection

30.1 PLC Connection

Serial Connection

The TS2060 works as the Modbus RTU master station. It can be connected with devices that support Modbus RTU communication.

| PLC Selection on the Editor | Applicable Device | Signal Level | Connection | | |
|-----------------------------|---------------------------|--------------|-----------------------|------------------------|-----------------------------|
| | | | CN1 TS2060i+DUR-00 | MJ1/MJ2 * ¹ | MJ2 (4-wire) * ² |
| MODBUS RTU | Modbus RTU slave device | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | |
| | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 2 - M4 |
| | | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 1 - M4 | |
| MODBUS RTU EXT Format | Modbus RTU slave device | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | |
| | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 2 - M4 |
| | | RS-485 | Wiring diagram 2 - C4 | Wiring diagram 1 - M4 | |
| MODBUS ASCII | MODBUS ASCII slave device | RS-232C | Wiring diagram 1 - C2 | Wiring diagram 1 - M2 | |
| | | RS-422 | Wiring diagram 1 - C4 | × | Wiring diagram 2 - M4 |
| | | 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).

*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).

Ethernet Connection (TS2060i Only)

The TS2060i works as the Modbus TCP/IP master station. It can be connected with devices that support Modbus TCP/IP slave communication.

| PLC Selection on the Editor | Applicable Device | TCP/IP | UDP/IP | Port No. |
|--------------------------------------|----------------------------|--------|--------|----------|
| MODBUS TCP/IP (Ethernet) | Modbus TCP/IP slave device | ○ | × | 502 * |
| MODBUS TCP/IP (Ethernet) Sub Station | Modbus TCP/IP slave device | | | |
| MODBUS TCP/IP (Ethernet) EXT Format | Modbus TCP/IP slave device | | | |

* Depending on the device specification, an arbitrary port number can be specified.

30.1.1 MODBUS RTU

Communication Setting

Editor

Communication setting

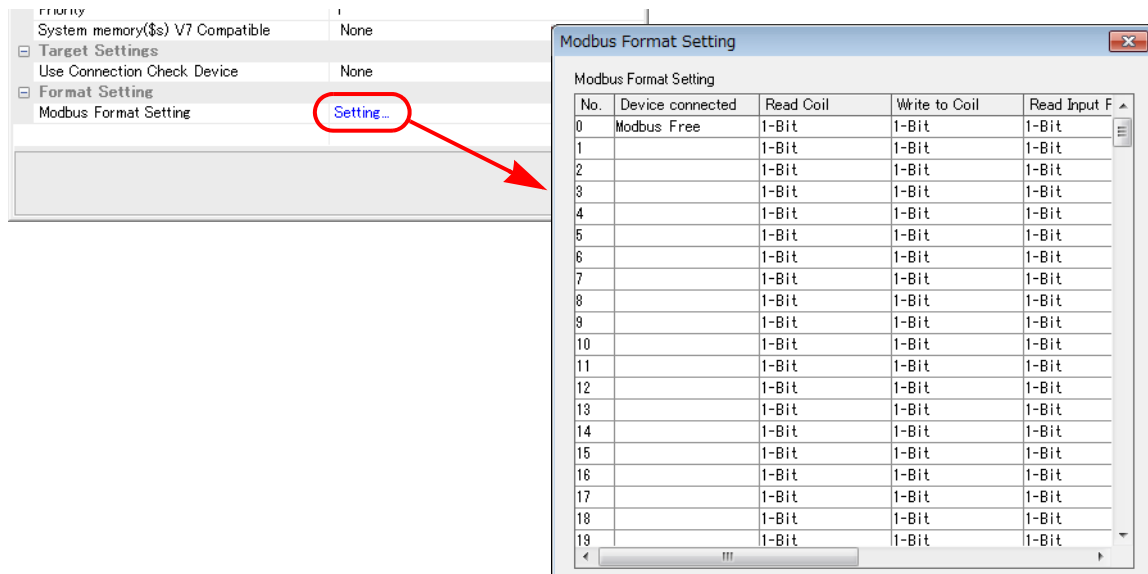
(Underlined setting: default)

| Item | Setting | Remarks |
|-----------------|--|--------------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | RS-232C / RS-422/485 | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 255 | 0: Broadcast |

Modbus format setting

Make communication format settings for each connected device.

* If the maximum number of words to be read or written varies among the address ranges, select [MODBUS RTU EXT Format] for [Model] in the connection device selection dialog and make the extended format setting. For more information, see page 30-4.



| | |
|------------------------|--|
| No. 1 to 255 | Port number of the connected device |
| Read Coil | Format setting |
| Write to Coil | Set the number of words to be read or written at one time of communication for each device. For details on the maximum value that can be set on V-SFT, see the table shown below.*1 |
| Read Input Relay | The format setting also serves as the function code*1 setting used for Modbus communication. The available function codes vary depending on the device. Refer to the instruction manual of the connected device as well as the table shown below*1, and set the options on the dialog correctly. |
| Read Holding Register | |
| Write Holding Register | |
| Read Input Register | |

*1 Format setting on V-SFT and function code for the Modbus communication

| V-SFT Format Setting | | | Modbus Communication Function Code |
|------------------------|-----------------|-----------------|------------------------------------|
| Operation | | Maximum Setting | |
| Read Coil | | 992 bits | 01H |
| Write to Coil | 1 bit | 1 word | 05H |
| | 16 bits or more | 992 bits | 0FH |
| Read Input Relay | | 992 bits | 02H |
| Read Holding Register | | 62 words | 03H |
| Write Holding Register | 1 word | 1 word | 06H |
| | 2 words or more | 62 words | 10H |
| Read Input Register | | 62 words | 04H |

PLC

Make communication settings of the connected device according to the settings made for the TS2060. For more information on settings, refer to the instruction 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 |
|----------------------|------|---------|
| 0 (output coil) | 00H | |
| 1 (input relay) | 01H | |
| 4 (holding register) | 02H | |
| 3 (input register) | 03H | |

Notes on Creating Screen Programs

On the editor, the device memory address is specified in decimal notation. Thus, when the address of a connected device is expressed in hexadecimal notation, convert the address into decimal one and add "1".

Setting example

- When specifying the PV (current value) RAM address "3814H" for Modbus RTU connection with Yamatake's "SDC35":
 - Convert the hexadecimal address into the decimal one.
 $3814\text{HEX} \rightarrow 14356\text{DEC}$
 - Add "1" to the decimal address.
 $14356 + 1 = 14357\text{DEC}$
 - On the editor, specify "14357" for the holding register (4).

30.1.2 MODBUS RTU EXT Format

In the case with some Modbus RTU devices, the function code to be used or the maximum value to be read or written at one time varies depending on the address range even in the same device memory.

When [MODBUS RTU EXT Format] is selected, the address range as well as the communication format can be set as desired according to the specifications of the connected device. With [MODBUS RTU EXT Format] selected, since access will not be made to any address other than those specified in the format setting, communication can be performed effectively.

Communication Setting

Editor

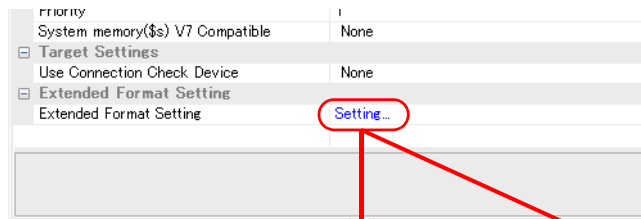
Communication setting

(Underlined setting: default)

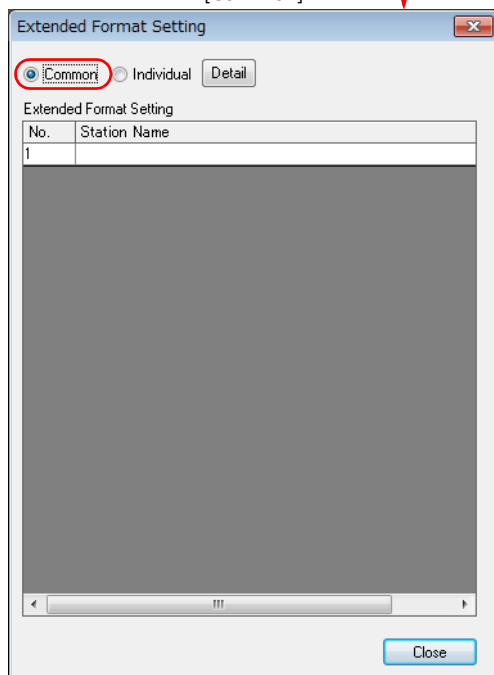
| Item | Setting | Remarks |
|-----------------|--|--------------|
| Connection Mode | 1 : 1 / <u>1 : n</u> / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) | |
| Signal Level | RS-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps | |
| Data Length | 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 255 | 0: Broadcast |

Extended format setting

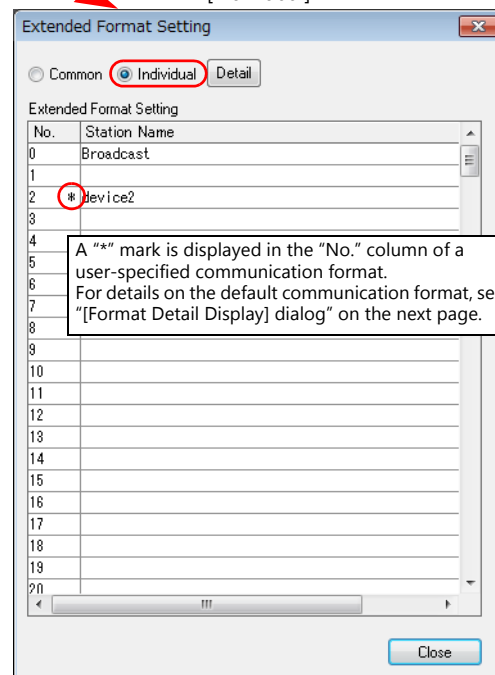
Make communication format settings for the connected device.



[Common]



[Individual]



| | |
|--------------|---|
| Common | Used to set the communication format commonly to all station numbers. |
| Discrete | Used to set a communication format for respective station numbers. |
| Detail | Displays the [Format Detail Display] dialog. |
| No. | Displays the station number of the connected device. |
| Station Name | Sets and displays the station name of the connected device. |

[Format Detail Display] dialog

Register the communication format for each of the specified address range. Make the setting according to the device specification.

Four types of communication formats shown to the left have been registered by default.

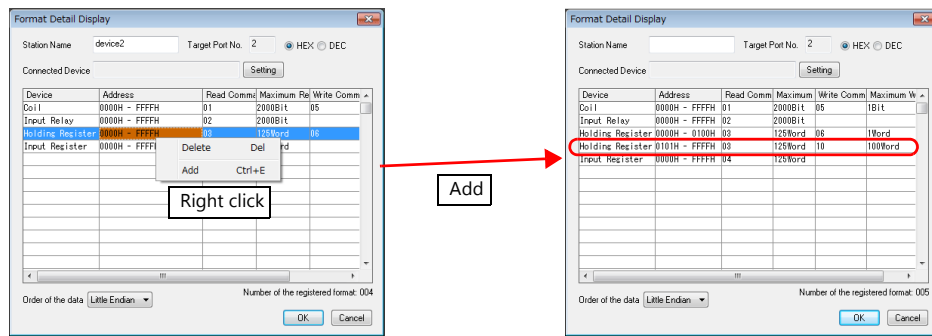
| | |
|---------------------------------|---|
| Station Name | Register a desired station name. |
| Target Port No. | When [Discrete] is selected, the number of the selected station is automatically displayed. |
| HEX/DEC | Select the address notation. HEX / DEC |
| Device | Displays the currently registered device memory name. Coil / Input Relay / Holding Register / Input Register (default settings: one each, deletion impossible) |
| Address | Specify the address range for each device memory. HEX: 0000 to FFFF DEC: 1 to 65536 * The address range must not be duplicated. |
| Read Command | Set the communication format used for reading from or writing into the specified address range. • [Read Command] / [Write Command] Specify the function code ^{*1} to use for Modbus communication. The available function codes vary depending on the device. Refer to the instruction manual of the connected device as well as the table shown below ^{*1} , and set the options on the dialog correctly. • [Maximum Read Value] / [Maximum Write Value] Set the maximum value to be read or written at one time. Make the setting according to the device specification. For details on the maximum value that can be set for each device memory by using V-SFT, see the table shown below. ^{*1} |
| Maximum Read Value | |
| Write Command | |
| Maximum Write Value | |
| Order of the data | Specify the ordering of data. Little Endian / Big Endian |
| Number of the registered format | Displays the number of currently registered formats. Default: 4 (deletion impossible) Max.: 255 |

*1 Device memory setting on V-SFT and function code for the Modbus communication

| V-SFT Format Setting | | | | Modbus Communication Function Code |
|----------------------|-------|-----------------|-----------------------|------------------------------------|
| Operation | | | Max. Read/Write Value | |
| Coil | Read | | 2000 bits | 01H |
| | Write | 1 bit | 1 bit | 05H |
| | | 2 bits or more | 800 bits | 0FH |
| Input Relay | Read | | 2000 bits | 02H |
| Holding Register | Read | | 125 words | 03H |
| | Write | 1 word | 1 word | 06H |
| | | 2 words or more | 100 words | 10H |
| Input Register | Read | | 125 words | 04H |

Adding a format

To add a format, select a device memory, right-click on the selected device memory and select [Add].



Setting example

When connecting a device which has the following specifications to station number 1:

| Function Code | Operation | Max. Communication Points | Available Address | Example |
|---------------|----------------------------------|---------------------------|--|---------|
| 01H | Read coil | 4000 | HEX: 0000 to 00FF DEC: 1 to 256 | (1) |
| | | | HEX: 2EE0 to 4E1F DEC: 12001 to 20000 | (2) |
| 05H | Write single coil | 1 | HEX: 0000 to 00FF DEC: 1 to 256 | (1) |
| 0FH | Write multiple coils | 1000 | HEX: 2EE0 to 4E1F DEC: 12001 to 20000 | (2) |
| 03H | Read holding register | 200 | HEX: 0000 to 103F DEC: 1 to 8000 | (3) |
| | | | HEX: 2EE0 to 2FDF DEC: 12001 to 12256 | (4) |
| 06H | Write single holding register | 1 | HEX: 2EE0 to 2FDF DEC: 12001 to 12256 | (4) |
| 10H | Write multiple holding registers | 50 | HEX: 0000 to 1F3F DEC: 1 to 8000 | (3) |

- Read/write coil

(1) 0000 to 00FF (HEX)

- Register "01H" (function code for reading) to [Read Command] or "05H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 4000. Accordingly, register "2000 bits" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1. Accordingly, register "1 bit" for [Maximum Write Value] on V-SFT.

(2) 2EE0 to 4E1F (HEX)

- Register "01H" (function code for reading) to [Read Command] or "0FH" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 4000. Accordingly, register "2000 bits" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1000. Accordingly, register "800 bits" for [Maximum Write Value] on V-SFT.

- Read/write holding register

(3) 0000 to 1F3F (HEX)

- Register "03H" (function code for reading) to [Read Command] or "10H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 200. Accordingly, register "125 words" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 50. Accordingly, register "50 words" for [Maximum Write Value] on V-SFT.

(4) 2EE0 to 2FDF (HEX)

- Register "03H" (function code for reading) to [Read Command] or "06H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 200. Accordingly, register "125 words" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1. Accordingly, register "1 word" for [Maximum Write Value] on V-SFT.

30.1.3 MODBUS ASCII

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-232C / <u>RS-422/485</u> | |
| Baud Rate | 4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps | |
| Data Length | 7 / <u>8</u> bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | None / <u>Odd</u> / Even | |
| Target Port No. | 0 to 255 | 0: Broadcast |

Format setting

Make communication format settings for each connected device. (See page 30-2.)

PLC

Make communication settings of the connected device according to the settings made for the TS2060. For more information on settings, refer to the instruction manual issued by the manufacturer.

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "30.1.1 MODBUS RTU".

30.1.4 MODBUS TCP/IP (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
- Port number for the TS2060i unit at [Communication Setting] in the [PLC Properties] window ([Hardware Setting])
- PLC's IP address and port number for [PLC Table] under [Target Settings] in the [PLC Properties] window ([Hardware Setting])
- [Format Setting] in the [PLC Properties] window ([Hardware Setting])

Format setting

Make communication format settings for each connected device. (See page 30-2.)

- * **If the maximum number of words to be read or written varies among the address ranges, select [MODBUS TCP/IP (Ethernet) EXT Format] for [Series] in the [Connection Device Selection] dialog and make extended format settings. For more information, see page 30-10.**

PLC

Make communication settings of the connected device according to the settings made for the TS2060i. For more information on settings, refer to the instruction 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 |
|----------------------|------|---------|
| 0 (output coil) | 00H | |
| 1 (input relay) | 01H | |
| 4 (holding register) | 02H | |
| 3 (input register) | 03H | |

Notes on Creating Screen Program

On the editor, the device memory address is specified in decimal notation. Thus, when the address of a connected device is expressed in hexadecimal notation, convert the address into decimal one and add “1”. (See page 30-3.)

30.1.5 MODBUS TCP/IP (Ethernet) EXT Format

In the case with some Modbus TCP/IP (Ethernet) devices, the function code to be used or the maximum value to be read or written at one time varies depending on the address range even in the same device memory.
When [MODBUS TCP/IP (Ethernet) EXT Format] is selected, the address range as well as the communication format can be set as desired according to the specifications of the connected device. With [MODBUS TCP/IP (Ethernet) EXT Format] selected, since access will not be made to any address other than those specified in the format setting, communication can be performed effectively.

Communication Setting

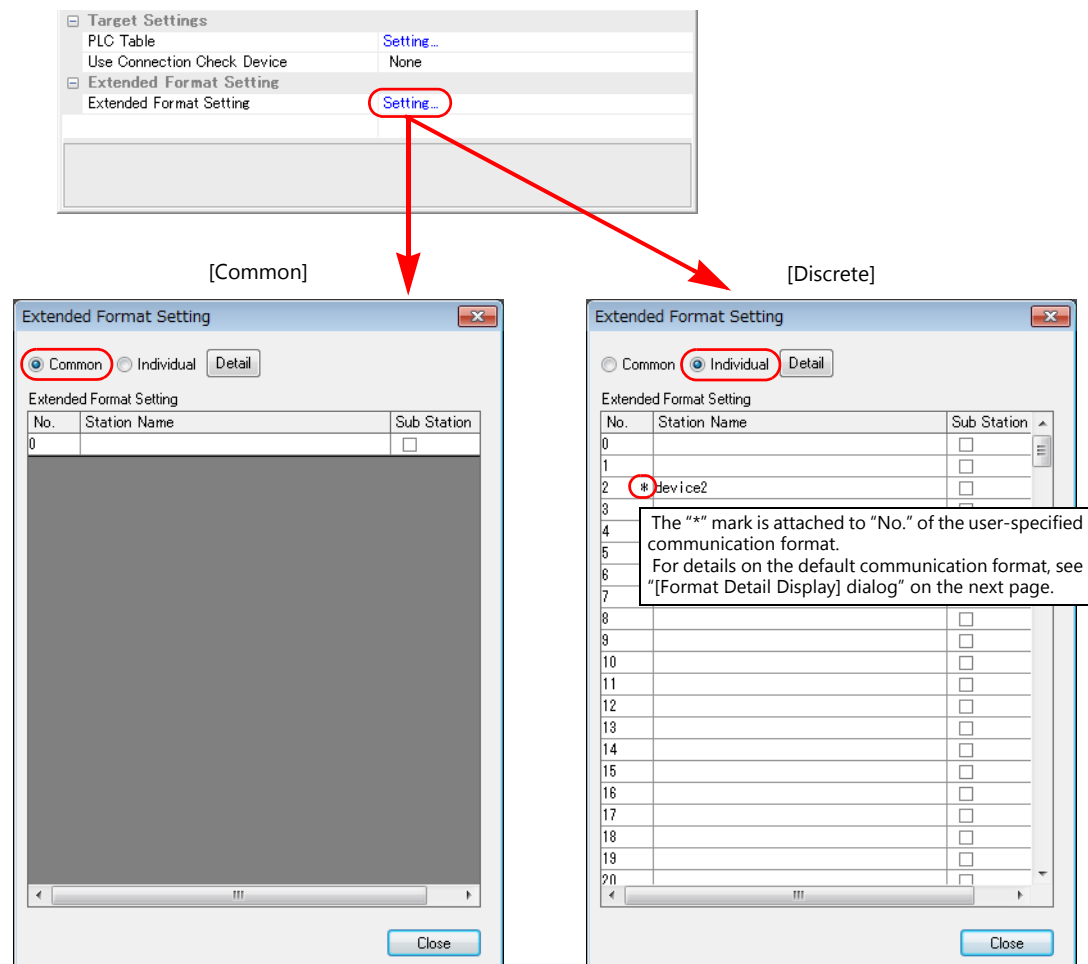
Editor

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

- IP address for the TS2060i unit
- Port number for the TS2060i unit at [Communication Setting] in the [PLC Properties] window ([Hardware Setting])
- PLC's IP address and port number for [PLC Table] under [Target Settings] in the [PLC Properties] window ([Hardware Setting])
- [Extended Format Setting] in the [PLC Properties] window ([Hardware Setting])

Extended format setting

Make communication format settings for the connected device.



| | |
|--------------|---|
| Common | Used to set the communication format commonly to all station numbers. |
| Discrete | Used to set a communication format for respective station numbers. |
| Detail | Displays the [Format Detail Display] dialog. |
| No. | Displays the station number of the connected device. |
| Station Name | Sets and displays the station name of the connected device. |
| Sub Station | Check the box when Modbus TCP/IP communication is to be performed with a device requiring a unit ID specification. When this box is checked, the unit ID can be specified when setting the device memory address. (Without check: The unit ID is fixed to "FFH".) |

[Format Detail Display] dialog

Register the communication format for each of the specified address range. Make the setting according to the device specification.

Four types of communication formats shown to the left have been registered by default.

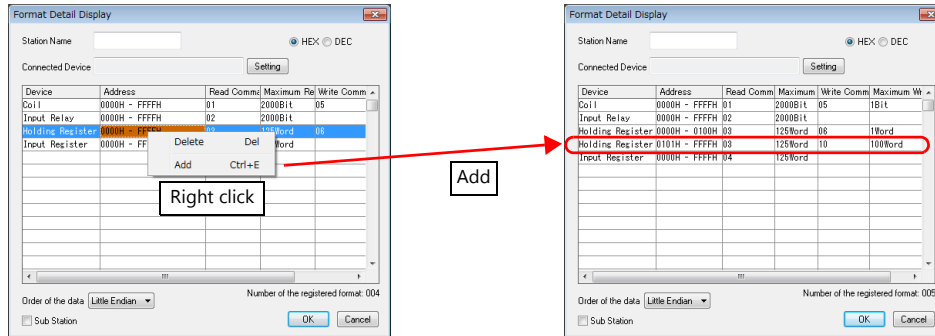
| | |
|--------------------------------------|--|
| Station Name | Register a desired station name. |
| Target Port No. | When [Discrete] is selected, the number of the selected station is automatically displayed. |
| HEX/DEC | Select the address notation. HEX / DEC |
| Device | Displays the currently registered device memory name. Coil / Input Relay / Holding Register / Input Register (default settings: one each, deletion impossible) |
| Address | Specify the address range for each device memory. HEX: 0000 to FFFF DEC: 1 to 65536 * The address range must not be duplicated. |
| Read Command | Set the communication format used for reading from or writing into the specified address range. <ul style="list-style-type: none"> [Read Command] / [Write Command] Specify the function code^{*1} to use for Modbus communication. The available function codes vary depending on the device. Refer to the instruction manual of the connected device as well as the table shown below^{*1}, and set the options on the dialog correctly. [Maximum Read Value] / [Maximum Write Value] Set the maximum value to be read or written at one time. Make the setting according to the device specification. For details on the maximum value that can be set for each device memory by using V-SFT, see the table shown below.^{*1} |
| Maximum Read Value | |
| Write Command | |
| Maximum Write Value | |
| Order of the data | Specify the ordering of data. Little Endian / Big Endian |
| <input type="checkbox"/> Sub Station | Check this box when using the sub station function. |
| Number of the registered format | Displays the number of currently registered formats. Default: 4 (deletion impossible) Max.: 255 |

*1 Device memory setting on V-SFT and function code for the Modbus communication

| V-SFT Format Setting | | | | Modbus Communication Function Code |
|----------------------|-------|-----------------|-----------------------|------------------------------------|
| Operation | | | Max. Read/Write Value | |
| Coil | Read | | 2000 bits | 01H |
| | | | | |
| | Write | 1 bit | 1 bit | 05H |
| Input Relay | Read | 2 bits or more | 800 bits | 0FH |
| | | | 2000 bits | 02H |
| Holding Register | Read | | 125 words | 03H |
| | | | | |
| | Write | 1 word | 1 word | 06H |
| Input Register | Read | 2 words or more | 100 words | 10H |
| | | | 125 words | 04H |

Adding a format

To add a format, select a device memory, right-click on the selected device memory and select [Add].



Example

When connecting a device which has the following specifications to station number 1:

| Function Code | Operation | Max. Communication Points | Available Address | | Example |
|---------------|----------------------------------|---------------------------|-------------------|---------------------|---------|
| 01H | Read coil | 4000 | HEX: 0000 to 00FF | DEC: 1 to 256 | (1) |
| | | | HEX: 2EE0 to 4E1F | DEC: 12001 to 20000 | (2) |
| 05H | Write single coil | 1 | HEX: 0000 to 00FF | DEC: 1 to 256 | (1) |
| 0FH | Write multiple coils | 1000 | HEX: 2EE0 to 4E1F | DEC: 12001 to 20000 | (2) |
| 03H | Read holding register | 200 | HEX: 0000 to 103F | DEC: 1 to 8000 | (3) |
| | | | HEX: 2EE0 to 2FDF | DEC: 12001 to 12256 | (4) |
| 06H | Write single holding register | 1 | HEX: 2EE0 to 2FDF | DEC: 12001 to 12256 | (4) |
| 10H | Write multiple holding registers | 50 | HEX: 0000 to 1F3F | DEC: 1 to 8000 | (3) |

- Read/write coil

(1) 0000 to 00FF (HEX)

- Register "01H" (function code for reading) to [Read Command] or "05H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 4000. Accordingly, register "2000 bits" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1. Accordingly, register "1 bit" for [Maximum Write Value] on V-SFT.

(2) 2EE0 to 4E1F (HEX)

- Register "01H" (function code for reading) to [Read Command] or "0FH" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 4000. Accordingly, register "2000 bits" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1000. Accordingly, register "800 bits" for [Maximum Write Value] on V-SFT.

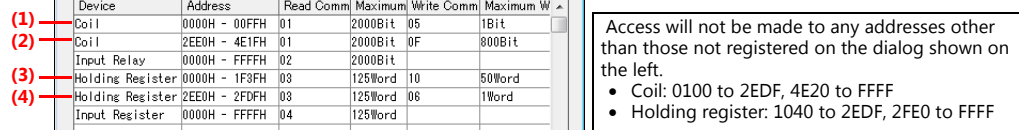
- Read/write holding register

(3) 0000 to 1F3F (HEX)

- Register "03H" (function code for reading) to [Read Command] or "10H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 200. Accordingly, register "125 words" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 50. Accordingly, register "50 words" for [Maximum Write Value] on V-SFT.

(4) 2EE0 to 2FDF (HEX)

- Register "03H" (function code for reading) to [Read Command] or "06H" (function code for writing) to [Write Command].
- The maximum number of communication points to be read is 200. Accordingly, register "125 words" for [Maximum Read Value] on V-SFT.
- The maximum number of communication points to be written is 1. Accordingly, register "1 word" for [Maximum Write Value] on V-SFT.



PLC

Make communication settings of the connected device according to the settings made for the TS2060i. For more information on settings, refer to the instruction manual issued by the manufacturer.

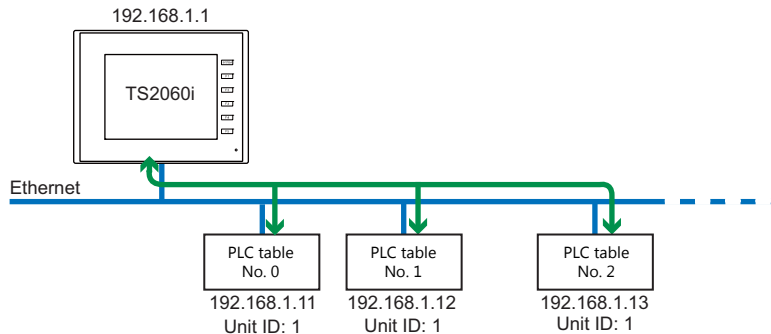
Available Device Memory

The contents of "Available Device Memory" are the same as those described in "30.1.4 MODBUS TCP/IP (Ethernet)".

30.1.6 MODBUS TCP/IP (Ethernet) Sub Station

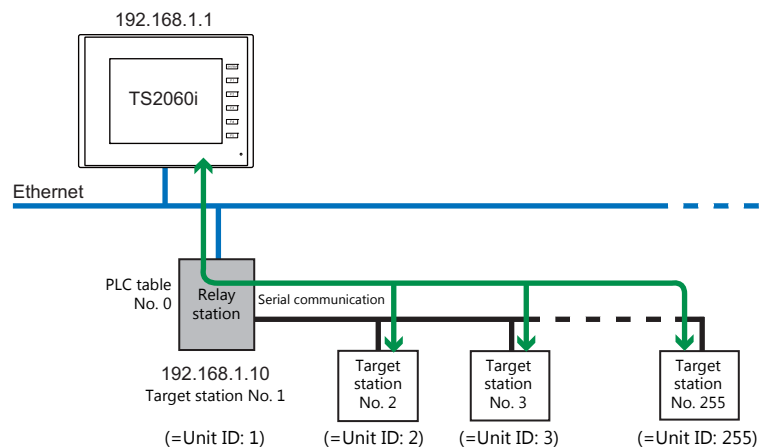
- Modbus TCP/IP (Ethernet) communication with devices which require unit ID specifications

- [Connection Mode]: "1 : n"



- Serial communication with Modbus devices via relay station

- [Connection Mode]: "1 : 1"



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
- Port number for the TS2060i unit at [Communication Setting] in the [PLC Properties] window ([Hardware Setting])
- PLC's IP address and port number for [PLC Table] under [Target Settings] in the [PLC Properties] window ([Hardware Setting])
- [Format Setting] in the [PLC Properties] window ([Hardware Setting])

Modbus format setting

Make communication format settings for each connected device. (See page 30-2.)

PLC

Make communication settings of the connected device according to the settings made for the TS2060i. For more information on settings, refer to the instruction 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 |
|---------------|--------------------|------|---------|
| 0 | (output coil) | 00H | |
| 1 | (input relay) | 01H | |
| 4 | (holding register) | 02H | |
| 3 | (input register) | 03H | |

Notes on Creating Screen Programs

- On the editor, the device memory address is specified in decimal notation. Thus, when the address of a connected device is expressed in hexadecimal notation, convert the address into decimal one and add "1". (See page 30-3.)
- Set the unit ID when specifying the device memory address.
 - [Connection Mode]: "1 : 1"

The 'Memory Input' dialog box shows the 'Type' as 'PLC1 Internal'. The 'Unit ID' is set to '1', which is highlighted with a red box. The 'Indirect' checkbox is unchecked. The 'OK' button is visible at the bottom.

- [Connection Mode]: "1 : n"

The 'Memory Input' dialog box shows the 'Type' as 'PLC1 Internal'. The 'Port No.' is set to '1' and the 'Unit ID' is set to '1', both highlighted with red boxes. The 'OK' button is visible at the bottom.

For [Port No.], specify the number on [PLC Table].

The 'PLC Table' dialog box displays a table with the following data:

| No. | Port Name | IP Address | Port No. |
|-----|-----------|--------------|----------|
| 0 | PLC1 | 192.168.1.11 | 502 |
| 1 | PLC2 | 192.168.1.12 | 502 |
| 2 | PLC3 | 192.168.1.13 | 502 |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |

The 'No.' column is highlighted with a red box, and a red arrow points from the 'Port No.' field in the 'Memory Input' dialog to this column. The 'Close' button is at the bottom right.

30.1.7 Wiring Diagrams

When Connected at CN1:

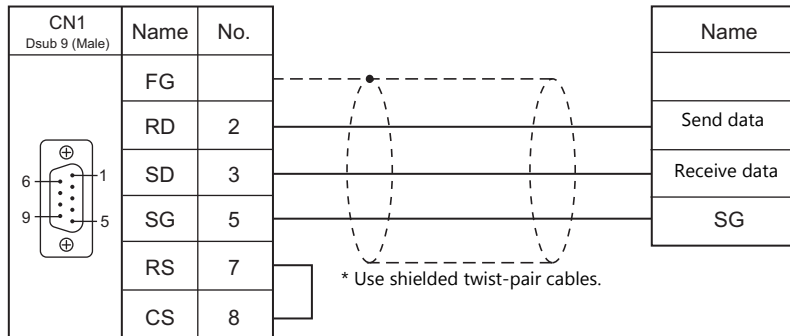


CAUTION

- 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.

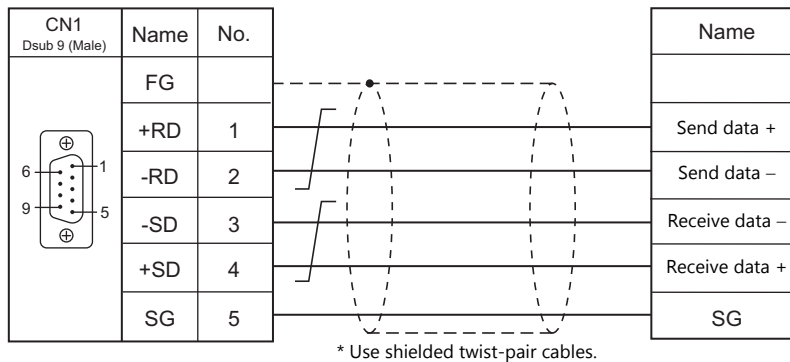
RS-232C

Wiring diagram 1 - C2

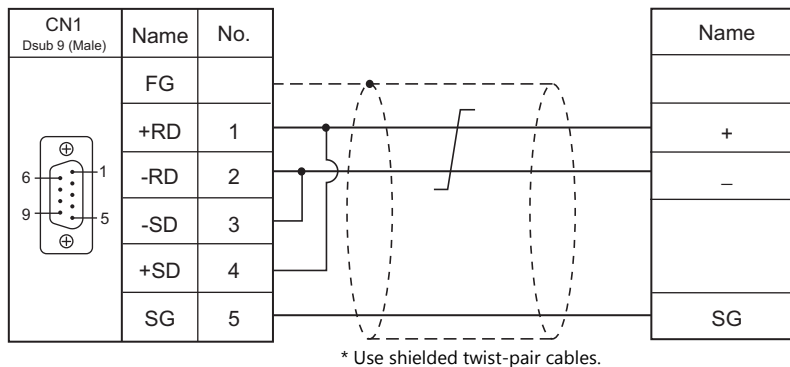


RS-422/RS-485

Wiring diagram 1 - C4



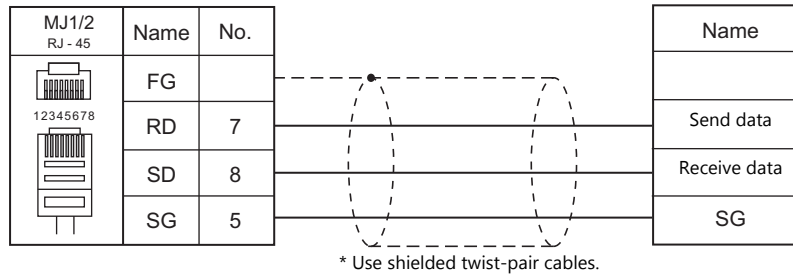
Wiring diagram 2 - C4



When Connected at MJ1/MJ2:

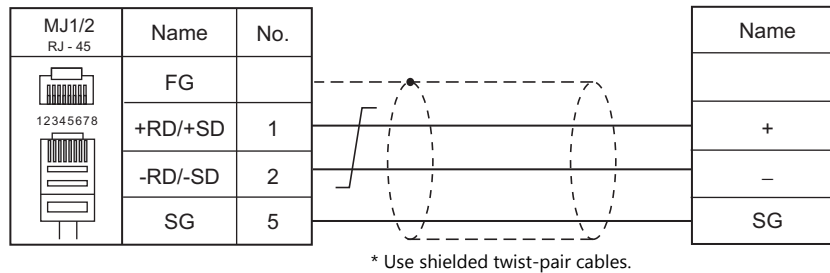
RS-232C

Wiring diagram 1 - M2

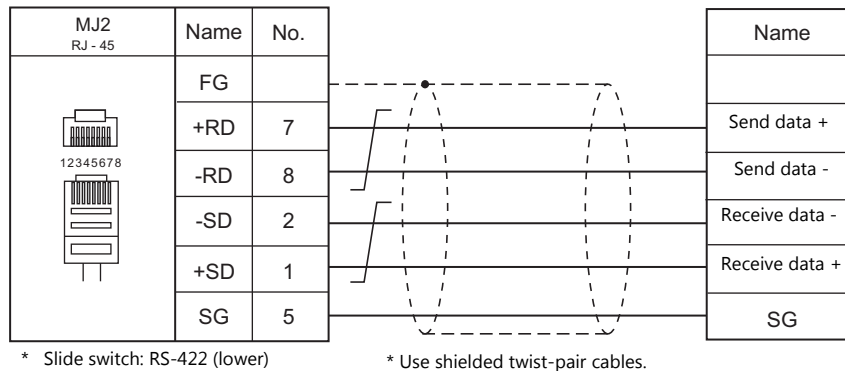


RS-422/RS-485

Wiring diagram 1 - M4

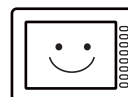


Wiring diagram 2 - M4



MEMO

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31. Barcode Reader

31.1 Barcode Reader Connection

31.1 Barcode Reader Connection

Barcode readers can be connected to the serial port or USB-A port (TS2060i only). The models shown below can be connected.

For a list of operation-verified barcode readers, visit our website
(http://monitouch.fujielectric.com/img/en/pdf/barcode_list_e.pdf).

Serial Connection

| | Signal Level | Wiring Diagram | |
|--|--------------|--------------------------|--------------------------|
| | | CN1 | MJ1/MJ2 *1 |
| Barcode readers of various manufacturers | 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, see "1.2.2 MJ1/MJ2" (page 1-6).
- *2 The +5 V external power supply signal is not available with the TS2060 (model name without "i"). Prepare a separate power supply.

Match communication settings of the barcode reader to those made on the TS2060. For more information on settings, refer to the specifications issued by the manufacturer.

USB Connection (TS2060i Only)

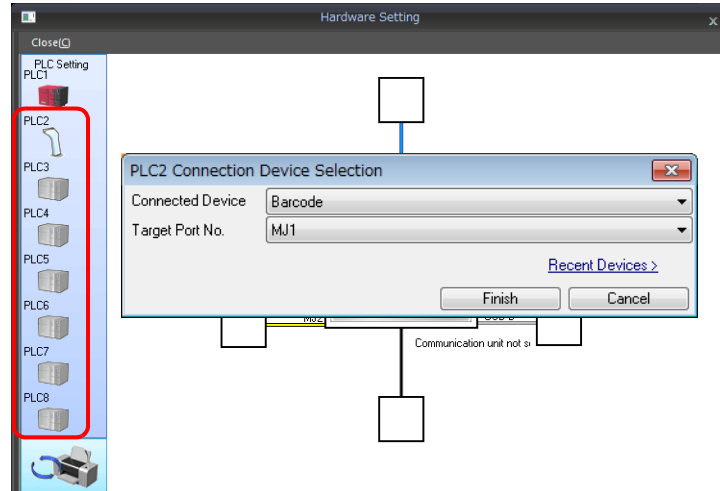
Use a barcode reader which is compatible with USB-HID.

31.1.1 Communication Setting

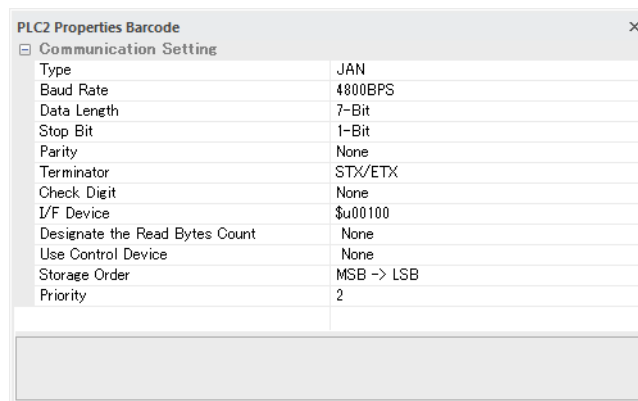
Editor

Device selection

Select [Barcode] at [Connected Device] for the logical ports PLC2 to 8. [Barcode] cannot be selected for PLC1.



Communication setting



(Underlined setting: default)

| Item | Setting | Remarks |
|--------------------------------|--|--|
| Type | <u>JAN</u> /ITF/CODABAR/CODE39/ANY/CODE128 ^{*1} | Valid for serial connection |
| Baud Rate | <u>4800</u> /9600/19200 bps | |
| Data Length | <u>7</u> / 8 bits | |
| Stop Bit | <u>1</u> / 2 bits | |
| Parity | <u>None</u> / Odd / Even | |
| Terminator | <u>STX/ETX</u> /CR/LF/CR | |
| Check Digit | <u>None</u> / Do Not Delete / Delete | |
| I/F Device | Refer to "31.1.2 I/F Device Memory" (page 31-3). | |
| Designate the Read Bytes Count | | |
| Use Control Device | Refer to "31.1.3 Control Device Memory" (page 31-4). | |
| Use Start/End Code | <ul style="list-style-type: none"> Yes Data is saved with "*" attached. <u>None</u> Data is saved without "*". | Enabled when [CODABAR] or [CODE39] is selected for [Type]. |
| Storage Order | LSB→MSB/MSB→LSB | Data is stored into the I/F device in order according to the setting specified here. |

^{*1} When [CODE128] is selected, 128 characters of ASCII code (numbers, alphabet, symbols, control characters) can be used; however, control characters cannot be read on a USB barcode reader. When using control characters, connect the barcode reader via serial connection.

31.1.2 I/F Device Memory

I/F device memory stores barcode information. The number of words used varies depending on the setting.

I/F Device Memory

Type: JAN / ITF / CORDABAR / CODE39

| Device Memory | Contents | | | | | | | | | | | | | | | | | | |
|---|--|----|----|----|----|----|----|---|---|---|---|--|---|--|---|---|--|--|--|
| n | Flag / the number of bytes read | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>-</td><td>0</td></tr><tr><td>0</td><td></td><td>0</td><td></td><td>0</td><td>0</td><td></td><td></td><td></td></tr></table> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | - | 0 | 0 | | 0 | | 0 | 0 | | | |
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | - | 0 | | | | | | | | | | |
| | 0 | | 0 | | 0 | 0 | | | | | | | | | | | | | |
| <div>Communication error</div> <div>Reading complete</div> <div>The number of bytes read (0 to 256 bytes)</div> | | | | | | | | | | | | | | | | | | | |
| * Be sure to reset the bits not in use to "0". | | | | | | | | | | | | | | | | | | | |
| n + 1 | Data read (ASCII) * "0" (null code) is attached to the last. | | | | | | | | | | | | | | | | | | |
| : | | | | | | | | | | | | | | | | | | | |
| n + m | | | | | | | | | | | | | | | | | | | |

Type : ANY

| Device Memory | Contents | | | | | | | | | | | | | | | | | | |
|--|---|----|----|----|----|----|----|---|---|---|---|--|---|--|---|---|---|---|---|
| n | Flag | | | | | | | | | | | | | | | | | | |
| | <table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>-</td><td>0</td></tr><tr><td>0</td><td></td><td>0</td><td></td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td></tr></table> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | - | 0 | 0 | | 0 | | 0 | 0 | 0 | - | 0 |
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | - | 0 | | | | | | | | | | |
| | 0 | | 0 | | 0 | 0 | 0 | - | 0 | | | | | | | | | | |
| <div><div></div><div></div></div> <div>Communication error Reading complete</div> | | | | | | | | | | | | | | | | | | | |
| * Be sure to reset the bits not in use to "0". | | | | | | | | | | | | | | | | | | | |
| n + 1 | The number of bytes read (0 to 2048 bytes) | | | | | | | | | | | | | | | | | | |
| n + 2 | Data read (ASCII) * "0" (null code) is attached to the last. | | | | | | | | | | | | | | | | | | |
| : | | | | | | | | | | | | | | | | | | | |
| n + m | | | | | | | | | | | | | | | | | | | |

Details of flag

| | |
|--------------------------|---|
| Communication error | When an error occurs in communication between the barcode reader and the TS2060, "1" is set. Check the communication settings and wiring. |
| Reading complete | When data received from the barcode reader has been written into the I/F device memory, "1" is set. When this bit is set, reset it to "0" before reading the next data. |
| The number of bytes read | Stores the number of bytes read from the barcode reader. |

Read Bytes Setting

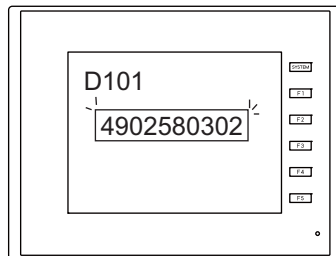
The number of bytes that can be read is determined according to the settings at [Type] and [Read Bytes Setting].

| Type | Read Bytes Setting | Allowable Number of Bytes |
|---|--------------------|--|
| JAN ITF CODERBAR CODE39 CODE128 | Not specified | Variable according to the code to be read Max. 254 bytes |
| | Specified | Fixed to the specified number of words (2 to 254 bytes) |
| ANY | Not specified | Variable according to the code to be read Max. 2046 bytes |
| | Specified | Fixed to the specified number of words (2 to 2046 bytes) |

- Example

I/F Device Memory: D100
 Read Bytes Setting: Specified
 Bytes: 10 bytes
 Text Process: LSB → MSB

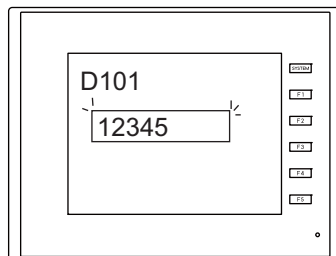
- If data greater than 10 bytes ("4902580302474") is read:
 10 bytes of data are stored and the remaining data is discarded.



| I/F Device Memory | Value |
|-------------------|-----------------------------|
| D100 | Flag Number of read data |
| D101 | 3934HEX |
| D102 | 3230HEX |
| D103 | 3835HEX |
| D104 | 3330HEX |
| D105 | 3230HEX |
| D106 | Not used |

10 bytes

- If data of 10 bytes or smaller ("12345") is read:
 "HEX 0" is assigned to the address where no data is stored.



| I/F Device Memory | Value |
|-------------------|-----------------------------|
| D100 | Flag Number of read data |
| D101 | 3231HEX |
| D102 | 3433HEX |
| D103 | 0035HEX |
| D104 | 0000HEX |
| D105 | 0000HEX |
| D106 | Not used |

10 bytes

31.1.3 Control Device Memory

Reading operation of the barcode reader can be controlled by using read enable bit of the control device memory.

Control Device Memory

| | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|
| 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 | 0 | 0 | 0 |

Not used

Read enable bit
0: Disabled
1: Enabled

- Bit 0: Read enable bit
 Data is stored into I/F device memory when bit 0 is set.

* A bit array of the PLC control device memory may be different from the one shown above depending on the PLC model. Set the bit according to the PLC specification.

31.1.4 Wiring Diagrams

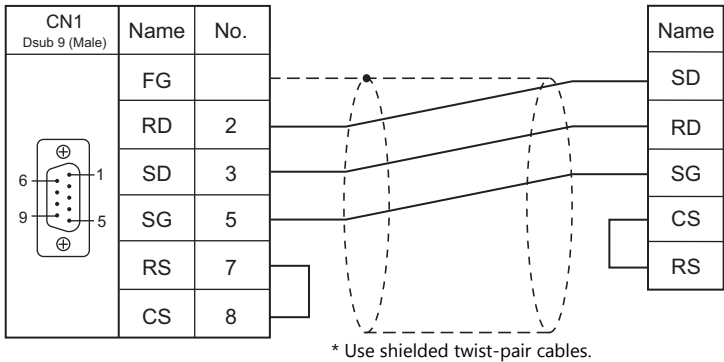
When Connected at CN1:



- 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



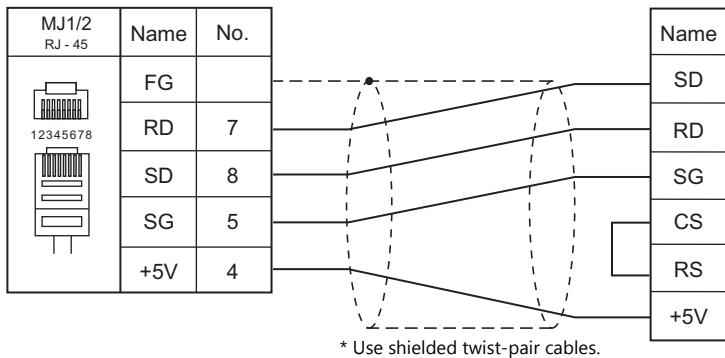
When Connected at MJ1/MJ2:



- For barcode readers with CS/RS control, it may be necessary to install a jumper between the CS and RS to maintain proper operation.
- Allowable current for the external power supply +5V at MJ1/MJ2 is 150 mA in total.
- The +5 V external power supply signal is not available with the TS2060 (model name without "i"). Prepare a separate power supply.

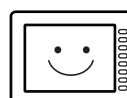
RS-232C

Wiring diagram 1 - M2



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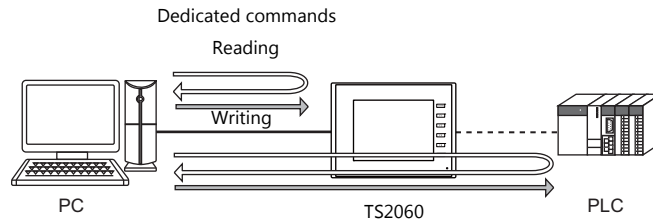
32. Slave Communication Function

- 32.1 V-Link
- 32.2 Modbus RTU Slave Communication
- 32.3 Modbus TCP/IP Slave Communication (TS2060i Only)
- 32.4 Modbus ASCII Slave Communication

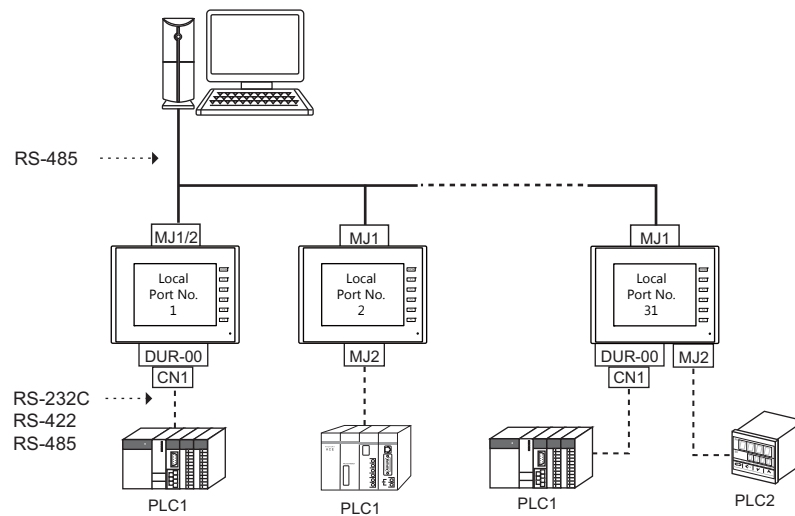
32.1 V-Link

32.1.1 Overview

- "V-Link" is the network where the computer 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.



- Use CN1^{*}, MJ1 or MJ2 for connection with a general-purpose computer.
 - * CN1 is available only when the TS2060i is attached the "DUR-00".
- Data of the connected devices can be collected through communications with the TS2060. Data collection is available even between devices of different manufacturers.
- Either signal level RS-232C or RS-485 can be selected.
 - With RS-232C, one TS2060 unit can be connected; with RS-485, a maximum of 31 TS2060 units can be connected.
 - RS-485 connection

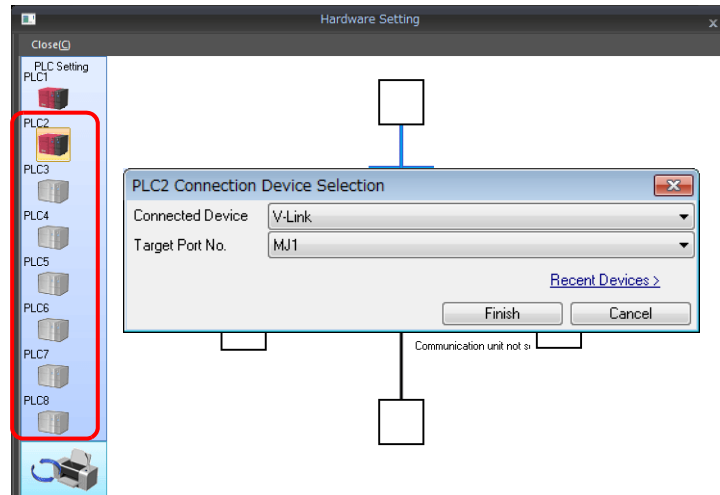


32.1.2 Communication Setting

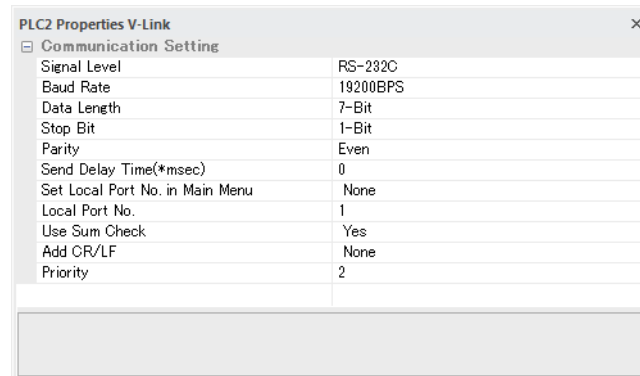
Editor

Device selection

Select [V-Link] at [Connected Device] for the logical ports PLC2 to 8. [V-Link] cannot be selected for PLC1.



Communication setting



(Underlined setting: default)

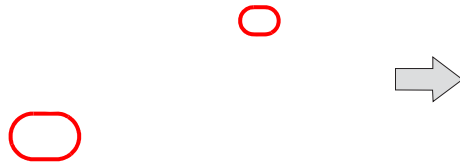
| Item | Setting |
|-----------------|---|
| Signal Level | <u>RS-232C</u> / RS-485 |
| Baud Rate | 4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115 Kbps |
| Data Length | <u>7</u> / 8 bits |
| Stop Bit | <u>1</u> / 2 bits |
| Parity | None / Odd / <u>Even</u> |
| Send Delay Time | <u>0</u> to 255 msec |
| Local Port No. | <u>1</u> to 254 (Maximum connectable units: 31) |
| Use Sum Check | <u>Yes</u> / None |
| Add CR/LF | Yes / <u>None</u> |

MONITOUCH

Local port number setting (Main Menu screen)

The local port can 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.

32.1.3 Wiring Diagrams

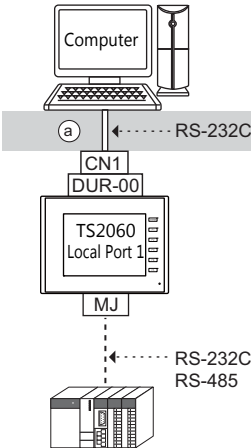
When Connected at CN1:



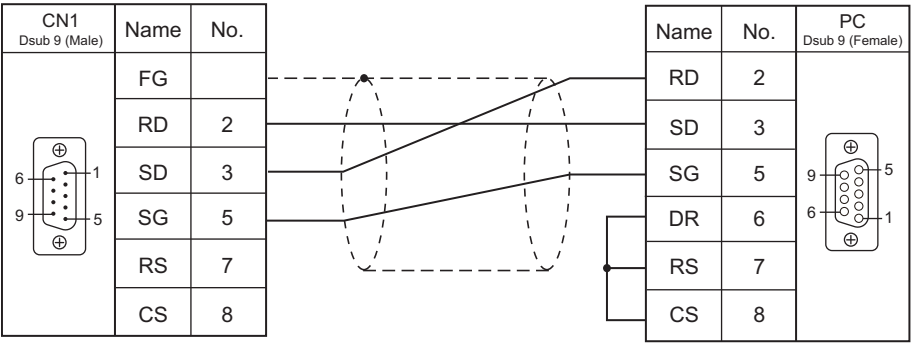
- The CN1 port is available only when the TS2060i is attached the optional “DUR-00”.
- The “DUR-00” cannot be attached to the TS2060 (model name without “i”). Use the MJ1 and MJ2 ports for connection.

RS-232C

Connect the CN1 port to the computer via RS-232C.

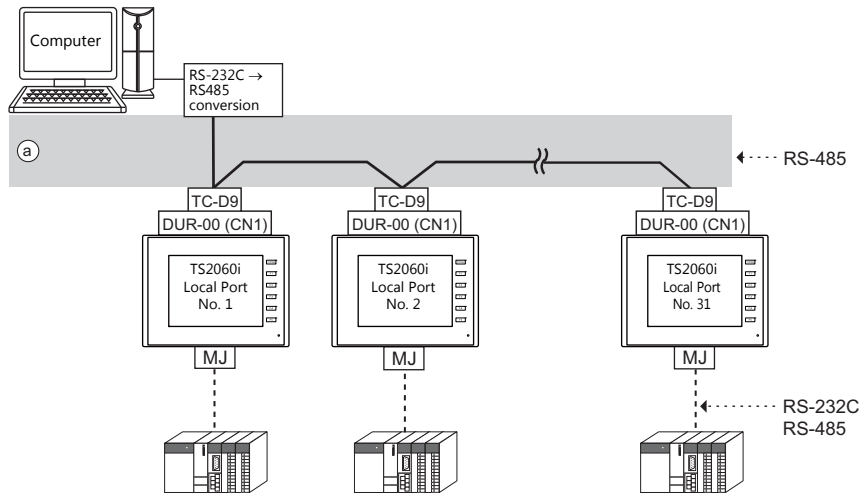


- Wiring example of above (a)



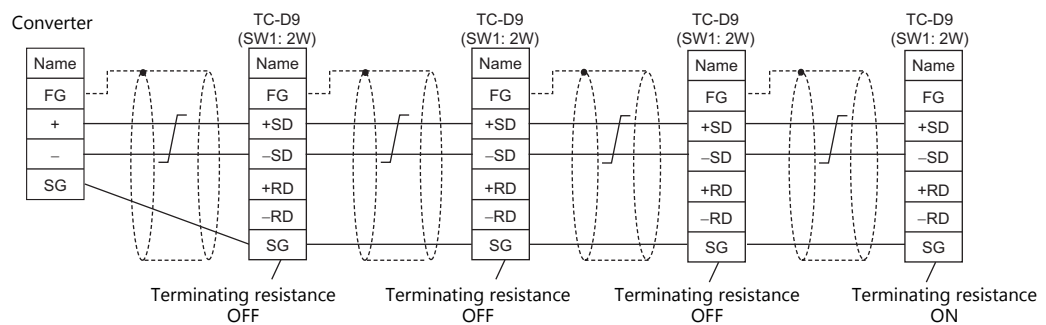
RS-485

Connect the CN1 port to the computer via RS-485. A maximum of 31 units of the TS2060i can be connected.

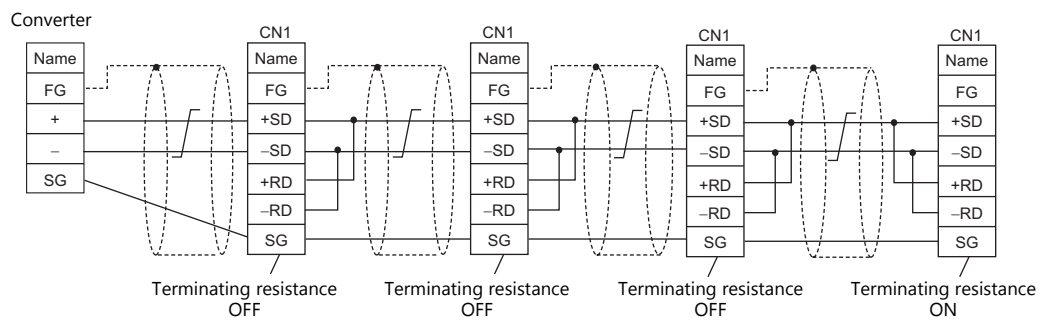


- Wiring example of above (a)

- When a TC-D9 is used:




- When no TC-D9 is used



When Connected at MJ1/MJ2:

Use Hakko Electronics' cable "V6-TMP" (3, 5, or 10 m) for connection with a computer.

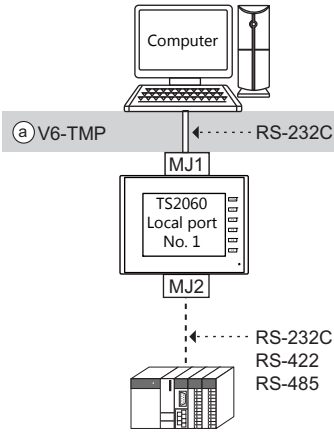
**CAUTION**

- There are six wires in the V6-TMP cable as shown on the right. The wires to be used are determined depending on the signal level setting. For the wires not used, be sure to properly insulate with tape, etc.

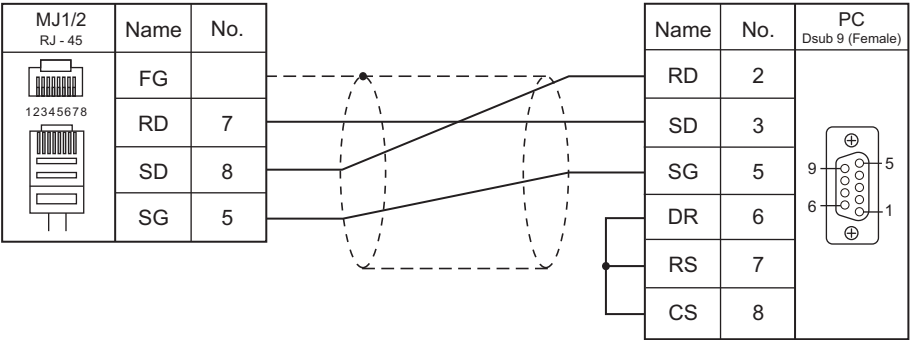
V6-TMP

| | Pin No. |
|--------|---------|
| Black | : 1 |
| Green | : 2 |
| Brown | : 4 |
| Red | : 5 |
| Orange | : 7 |
| Yellow | : 8 |

RS-232C

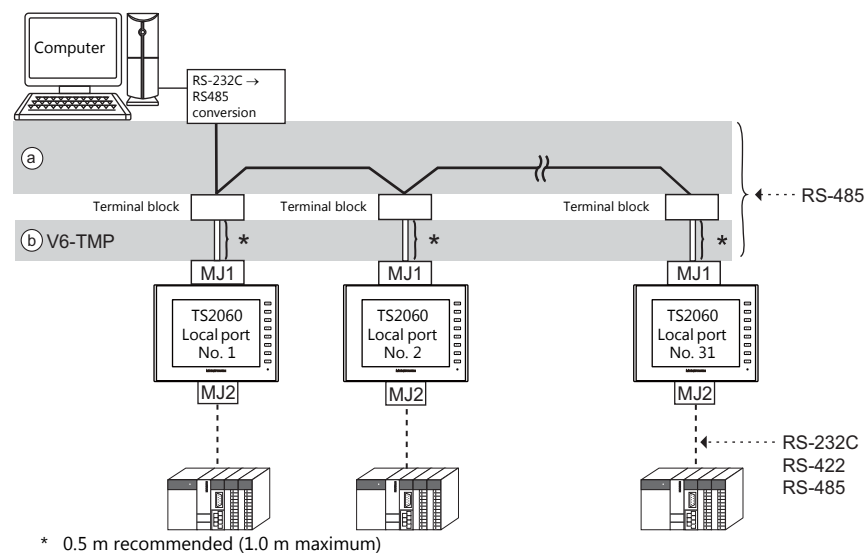


- Wiring example of above (a)

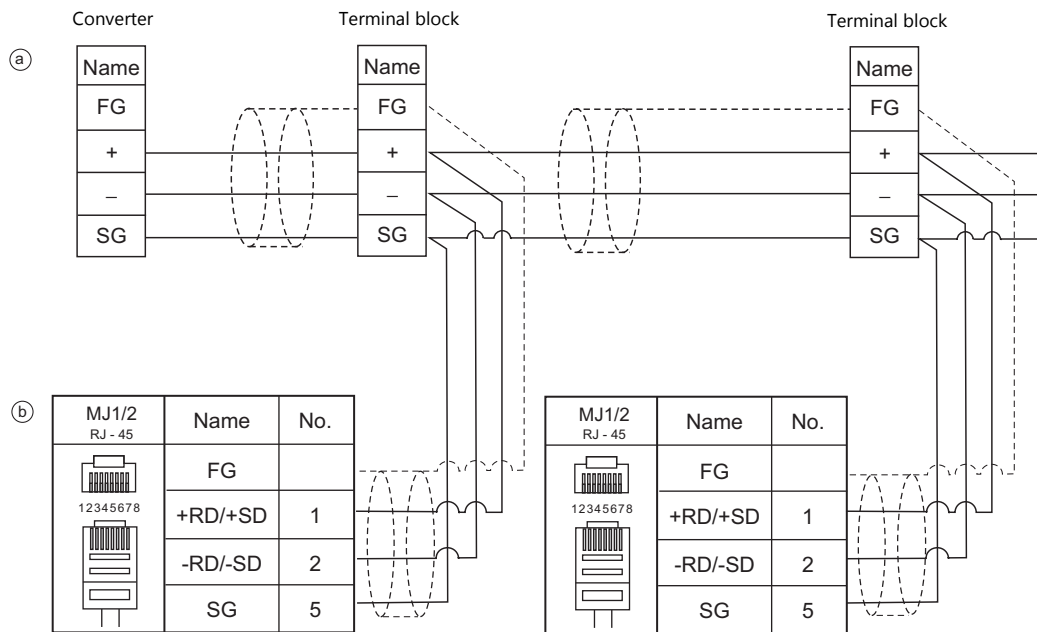


* For MJ2, set the slide switch for changing signals to RS-232C/485 (up position). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

RS-485 (TS2060: Max. 31 Units)



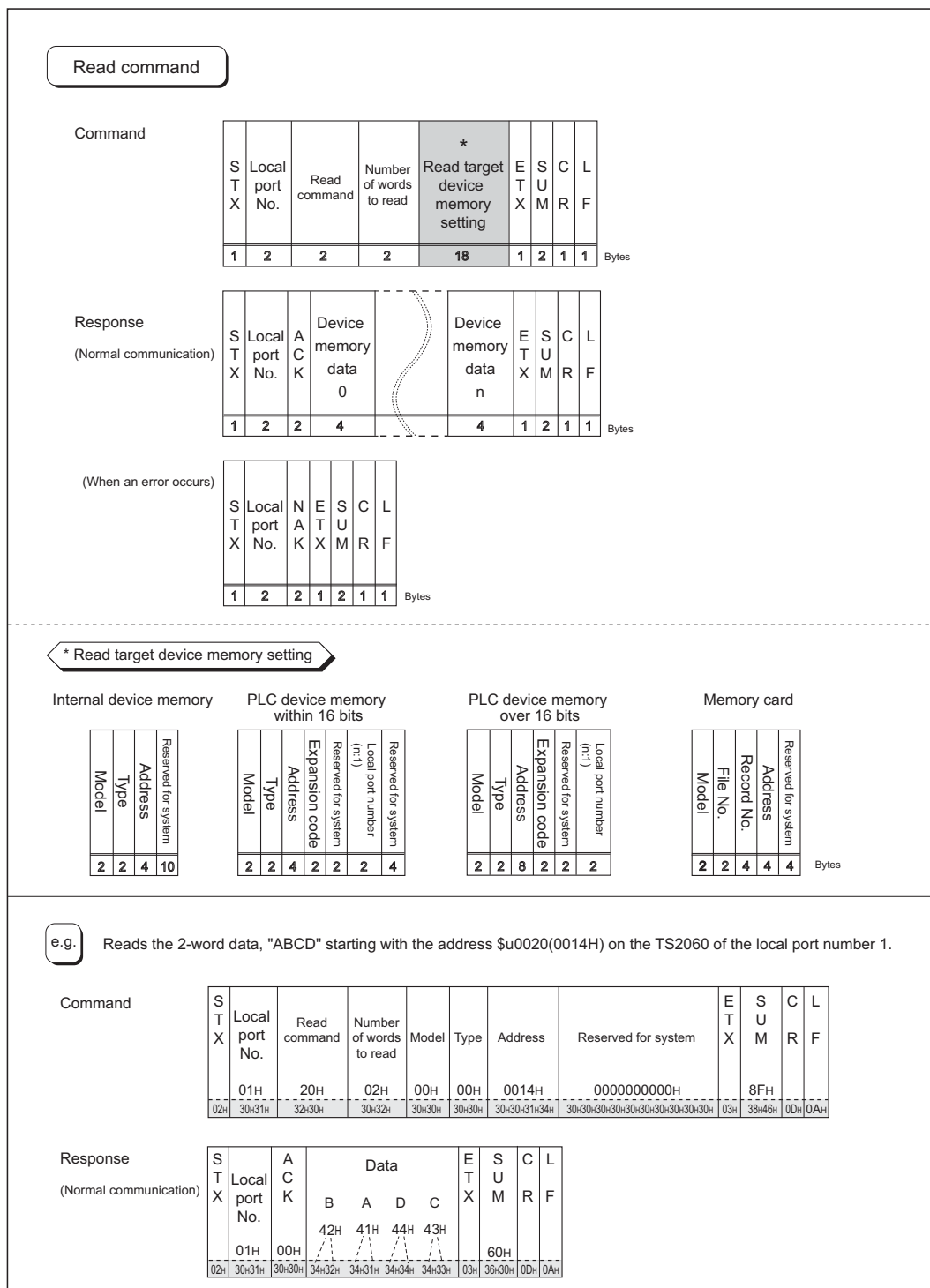
- Wiring example of above (a) and (b)



* For MJ2, set the slide switch for changing signals to RS-232C/485 (up position). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

32.1.4 Protocol

Read (with Sum Check and CR/LF)



Items for Protocols

Transmission control code: 1 byte

| Signal Name | Code (Hexadecimal) | Content |
|-------------|--------------------|-----------------------------|
| STX | 02H | Start of transmission block |
| ETX | 03H | End of transmission block |
| CR | 0DH | Carriage return |
| LF | 0AH | Line feed |

Local port number: 2 bytes

Local port numbers are used so that the host computer can identify each TS2060 for access. The data range is from 01H to 1FH (1 to 31). Convert into ASCII codes before use. Set the TS2060 local port number for [Local Port No.] on the editor. See page 32-2.

Command: 2 bytes

Available commands are shown below. Convert into ASCII codes before use.

| Name | Code (Hexadecimal) | ASCII | Content |
|-------|--------------------|-------|-------------------------|
| Read | 20H | 32 30 | Read from device memory |
| Write | 21H | 32 31 | Write to device memory |

The number of words to be read or written: 2 bytes

Set the number of words to be read or written by one command. The data range is from 01H to FFH (1 to 255). Convert into ASCII codes before use.

Device Memory address to be read or written: 18 bytes

Specify the device memory address to be accessed.

Set the following code in the format as shown for "Read target device memory setting" on page 32-8 and "Write target device memory setting" on page 32-9.

Convert into ASCII codes before use.

- Model

| Device Memory | Word Address | | Double-word Address | |
|------------------------|--------------------|-------|---------------------|-------|
| | Code (Hexadecimal) | ASCII | Code (Hexadecimal) | ASCII |
| Internal device memory | 00H | 3030 | 80H | 3830 |
| PLC1 device memory | 11H | 3131 | 91H | 3931 |
| PLC2 device memory | 12H | 3132 | 92H | 3932 |
| PLC3 device memory | 13H | 3133 | 93H | 3933 |
| PLC4 device memory | 14H | 3134 | 94H | 3934 |
| PLC5 device memory | 15H | 3135 | 95H | 3935 |
| PLC6 device memory | 16H | 3136 | 96H | 3936 |
| PLC7 device memory | 17H | 3137 | 97H | 3937 |
| PLC8 device memory | 18H | 3138 | 98H | 3938 |
| Memory card | 02H | 3032 | - | |

- Type

| | Type | Code (Hexadecimal) | ASCII |
|-------------------------|---|--------------------|-------|
| Internal device memory | \$u (user device memory) | 00H | 3030 |
| | \$s (system device memory) | 01H | 3031 |
| | \$L (non-volatile word device memory) | 02H | 3032 |
| | \$LD (non-volatile double-word device memory) | 03H | 3033 |
| | \$T (temporary user device memory) | 04H | 3034 |
| | \$P (device memory for 8-way communication) | 05H | 3035 |
| PLC1-to-8 device memory | Depends on the PLC to be used. Set [TYPE No.] of the device memory used for each device memory. | | |

- Address
Specify the device memory address to be accessed.

- Expansion code

When accessing to the device memory shown below, set the expansion code in addition to the type and address.

| Model | Expansion Code |
|-------------------------|--|
| \$P | PLC 1 to 8 |
| Fuji Electric PLC | File No. of the MICREX-F series, CPU No. of MICREX-SX series |
| JTEKT PLC | PRG No. |
| MITSUBISHI ELECTRIC PLC | Unit No. of SPU device memory |
| OMRON PLC | Bank No. |
| SHARP PLC | File No. of Fn device memory |
| Yokogawa Electric PLC | CPU No. |

* If there is no need to set the expansion code, set "00" (= 3030 in the ASCII code).

- Port number

Set the port number used for 1 : n connection (multi-drop)

For 1 : 1 connection or n:1 connection (multi-link), the port number setting is not used. Alternatively, set "00" (= 3030 in the ASCII code).

- File number

Specify the file number set in the [Memory Card Setting] dialog of the V-SFT editor.

- Record number

Specify the record number set in the [Memory Card Setting] dialog of the V-SFT editor.

- System reserved

Enter "0" (= 30 in the ASCII code) for the number of bytes.

The number of bytes for "system reserved" varies depending on the model.

Example:

| Model | Bytes | Code (Hexadecimal) | ASCII |
|-------------------------------|-------|--------------------|----------------------|
| TS2060 internal device memory | 10 | 0000000000H | 30303030303030303030 |

Sum Check Code (SUM): 2 Bytes

Data is added up (SUM), and the lower one byte (8 bits) of the sum is converted into a two-digit ASCII code (hexadecimal).

A sum check code is shown below.

Example: Transmission mode: without CR/LF, with sum check

Command: 20 (data read)

Address: 10 words from \$u1000 (03E8H)

When reading, a sum check will be performed as shown below.

| STX | Port No. 01H | Command 20H | Read words 0AH | Device model 00H | Device type 00H | Address 03E8H | System reserved 0 0 0 0 0 0 0 0 0H | ETX | SUM B9H |
|-----|-----------------|----------------|-------------------|---------------------|--------------------|------------------|---------------------------------------|-----|------------|
| 02H | 30H31H | 32H30H | 30H41H | 30H30H | 30H30H | 30H 33H 45H 38H | 30H 30H 30H 30H 30H 30H 30H 30H 30H | 03H | 42H39H |

$$02H + 30H + 31H + 32H + 30H + 30H + 41H + 30H + 30H + 30H + 30H + 30H + 33H + 45H + 38H$$

$$+ 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 03H = 4B9H$$

Response Code: 2 Bytes

"ACK" code is received at normal termination, and "NAK" code at abnormal termination. These are converted to ASCII codes and received. The following table shows the details of each code.

| Signal Name | Code (Hexadecimal) | ASCII | Contents |
|-------------|-----------------------|-------|---|
| ACK | 00H | 30 30 | Normal termination |
| NAK | 02H | 30 32 | Overrun/Framing error An overrun or framing error is detected in the received data. Send the command again. |
| | 03H | 30 33 | Parity error A parity error is detected in the received data. Send the command again. |
| | 04H | 30 34 | Sum check error A sum error occurs with the received data. |
| | 06H | 30 36 | Count error The device memory read/write count is "0". |
| | 0FH | 30 46 | ETX error No ETX code is found. |
| | 11H | 31 31 | Character error A character not used in the received data is found (other than 0 to F). Check the character and send the command again. |
| | 12H | 31 32 | Command error An invalid command is given. |
| | 13H | 31 33 | Device Memory setting error The address or device memory number is invalid. |

32.1.5 1-byte Character Code List

| | | | | | | | | | | | | | | | | | |
|-------|---|-------|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Upper | | | | | | | | | | | | | | | |
| Lower | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| | 0 | | | SP | 0 | @ | P | ' | p | | | | | | | | |
| | 1 | | | ! | 1 | A | Q | a | q | | | | | | | | |
| | 2 | | | " | 2 | B | R | b | r | | | | | | | | |
| | 3 | | | # | 3 | C | S | c | s | | | | | | | | |
| | 4 | | | \$ | 4 | D | T | d | t | | | | | | | | |
| | 5 | | | % | 5 | E | U | e | u | | | | | | | | |
| | 6 | | | & | 6 | F | V | f | v | | | | | | | | |
| | 7 | | | ' | 7 | G | W | g | w | | | | | | | | |
| | 8 | | | (| 8 | H | X | h | x | | | | | | | | |
| | 9 | | |) | 9 | I | Y | i | y | | | | | | | | |
| | A | | | * | : | J | Z | j | z | | | | | | | | |
| | B | | | + | ; | K | [| k | { | | | | | | | | |
| | C | | | , | < | L | ¥ | l | | | | | | | | | |
| | D | | | - | = | M |] | m | } | | | | | | | | |
| | E | | | . | > | N | ^ | n | ~ | | | | | | | | |
| | F | | | / | ? | O | _ | o | ■ | | | | | | | | |

32.2 Modbus RTU Slave Communication

For details on Modbus RTU slave communication, refer to the Modbus Slave Communication Specifications manual provided separately.

32.3 Modbus TCP/IP Slave Communication (TS2060i Only)

For details on Modbus TCP/IP slave communication, refer to the Modbus Slave Communication Specifications manual provided separately.

32.4 Modbus ASCII Slave Communication

For details on Modbus ASCII slave communication, refer to the Modbus Slave Communication Specifications manual provided separately.

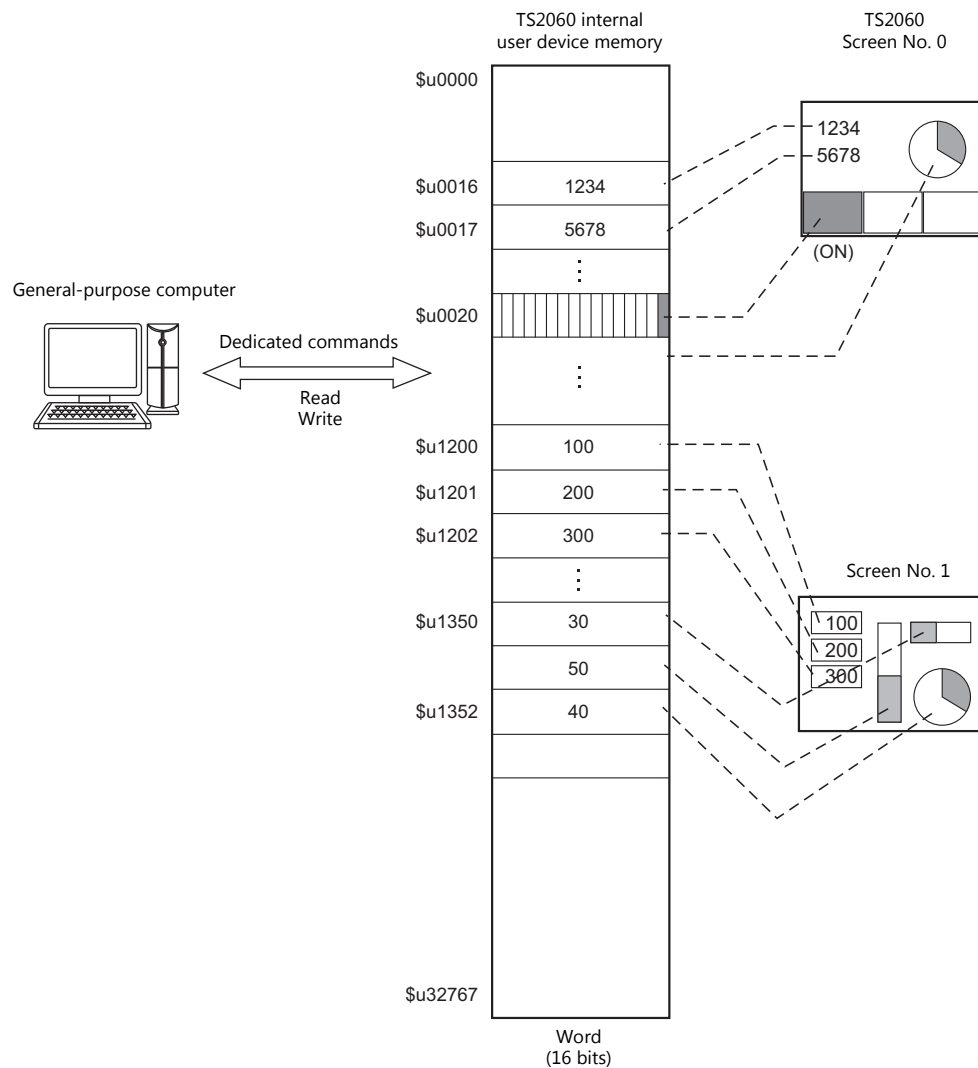
33. Universal Serial Communication

- 33.1 Overview
- 33.2 Wiring Diagrams
- 33.3 Hardware Settings
- 33.4 Standard Type Protocol
- 33.5 Device Memory Map

33.1 Overview

Overview of Communication

- As shown in the diagram below, when a general-purpose computer communicates with the TS2060, the general-purpose computer acts as the host and the TS2060 acts as the slave.
- Switch, lamp, data display, etc., are allocated within the internal user device memory (\$u0 to 32767). Assign device memory addresses for system, lamp, data display, and mode within this range.
- When a screen number is specified from the host, a write action takes place to the internal device memory address specified for the screen. When a screen is changed internally by a switch, etc., the changed screen number is read, and written in the internal device memory address specified for the screen.



Differences between Connecting to General-purpose Computer and Connecting to PLC

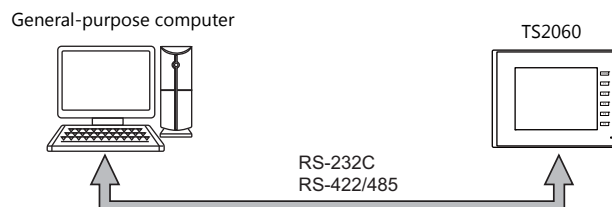
- Input format (code)
The input format used for screen number, block number, message number, etc, is fixed in [DEC].
- Write area
When connecting to the PLC, only the three words shaded in the diagram below are used, but when connecting to a general-purpose computer, all 16 words shown below are used.

| Address | Name | Contents |
|---------------------------|----------|---------------------|
| n + 0 | CFMDAT | Sub command/data |
| n + 1 | SCRN_COM | Screen status |
| n + 2 | SCRN_No | Displayed screen |
| n + 3 | SW0 | No. 0 switch data |
| n + 4 | SW1 | No. 1 switch data |
| n + 5 | ENT0 | Entry information 0 |
| n + 6 | ENT1 | Entry information 1 |
| n + 7 | ENT2 | Entry information 2 |
| n + 8 | GREPNS | Global response |
| n + 9 • • n + 15 | | Reserved (7 words) |

System Configuration

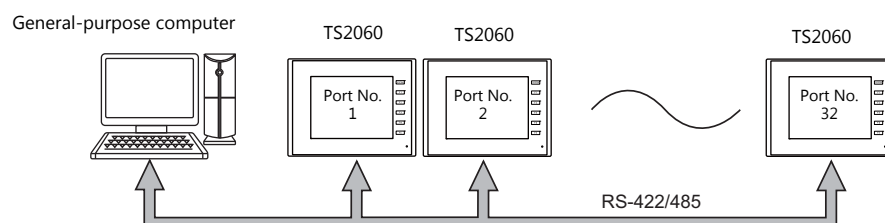
1 : 1 connection

- The transmission distance available via RS-232C is 15 m and RS-422/485 is 500 m at the maximum.
- It is possible to use an interrupt* when connecting a computer to a V series in a 1 : 1 connection.
 - * For RS-485 (2-wire connection), interrupts cannot be used. For details on interrupts, see page 33-32.



1 : n connection

- 1 : n connection is available via RS-422/485. A maximum of 32 TS2060 units can be connected.
- The transmission distance available is 500 m at the maximum.
- For 1 : n connection, interrupts cannot be used.



33.2 Wiring Diagrams

When Connected at CN1:

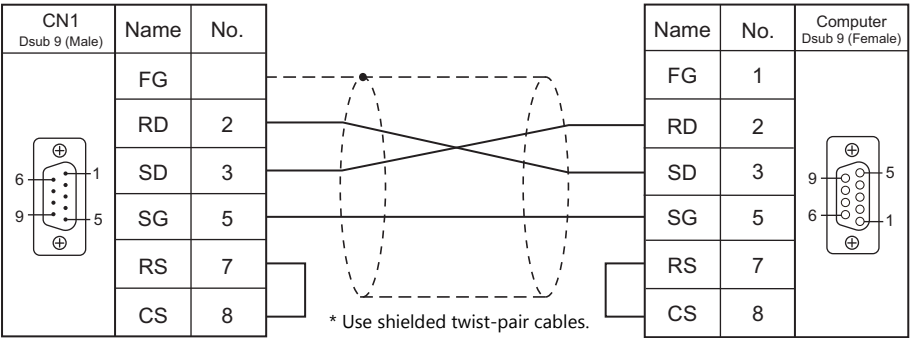


CAUTION

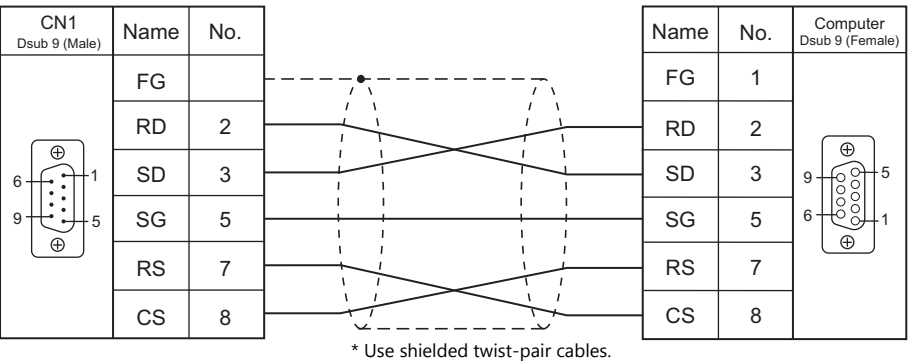
- The CN1 port is available only when the TS2060i is attached the optional "DUR-00".
- The "DUR-00" cannot be attached to the TS2060 (model name without "i"). Use the MJ1 and MJ2 ports for connection.

RS-232C

Without flow control

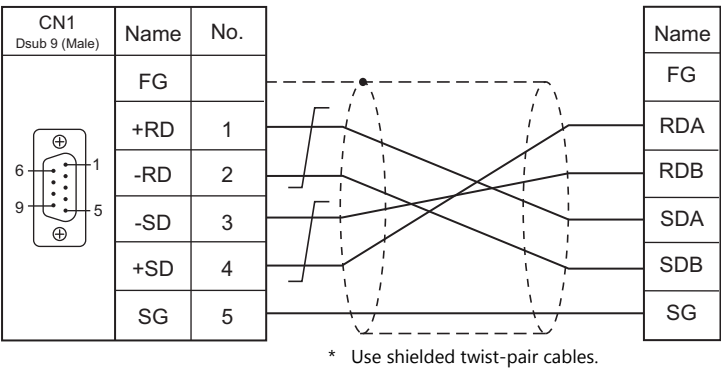


With flow control



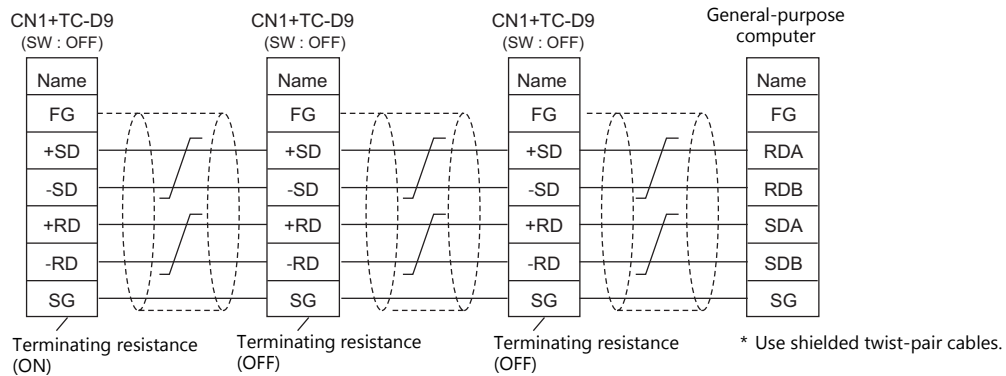
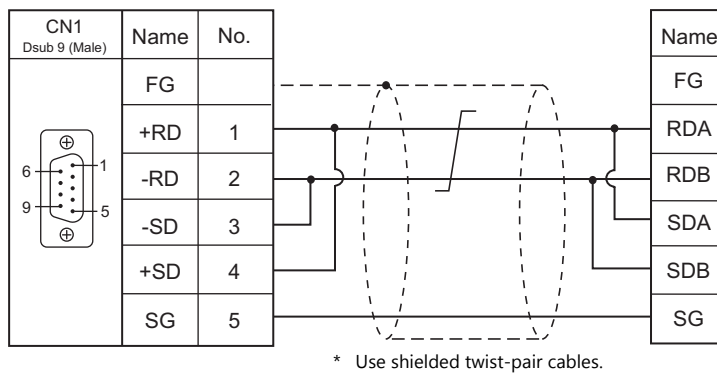
RS-422

1 : 1 connection

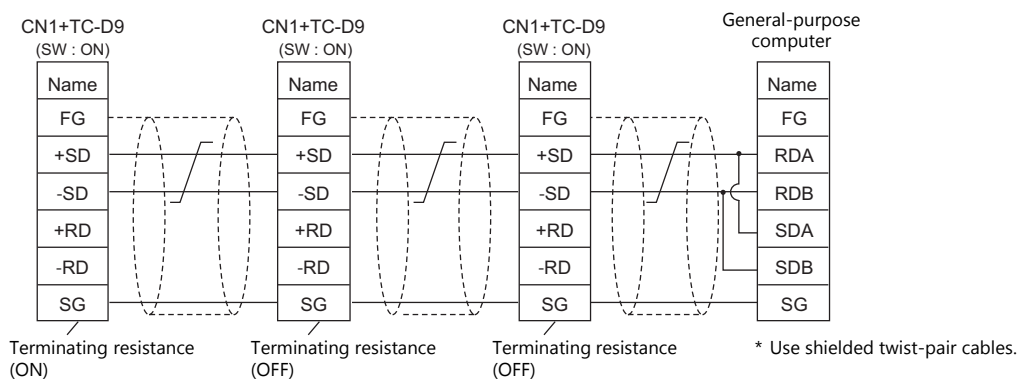


1 : n connection

* It is convenient to use the optional terminal converter "TC-D9".

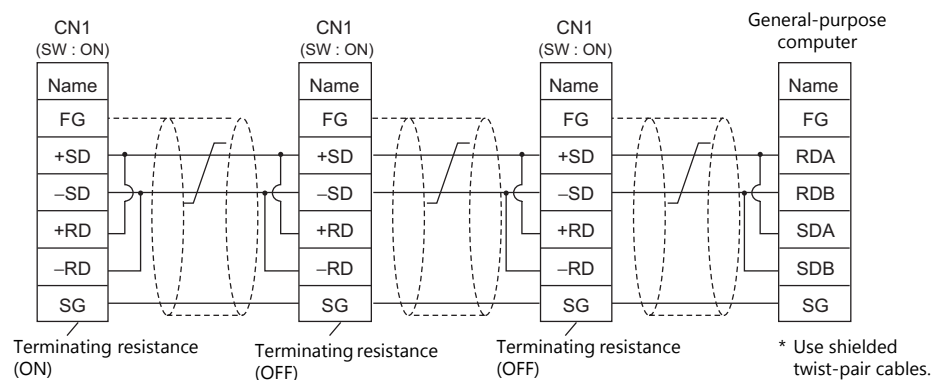
**RS-485****1 : 1 connection****1 : n connection**

- With TC-D9



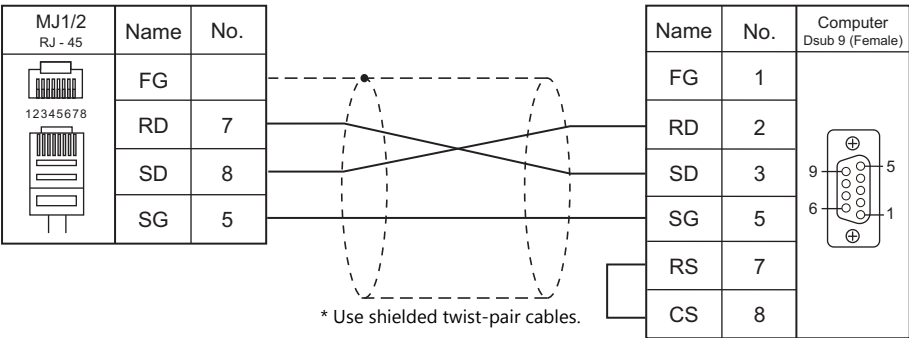
- Without TC-D9

Install jumpers between +RD/+SD and -RD/-SD.



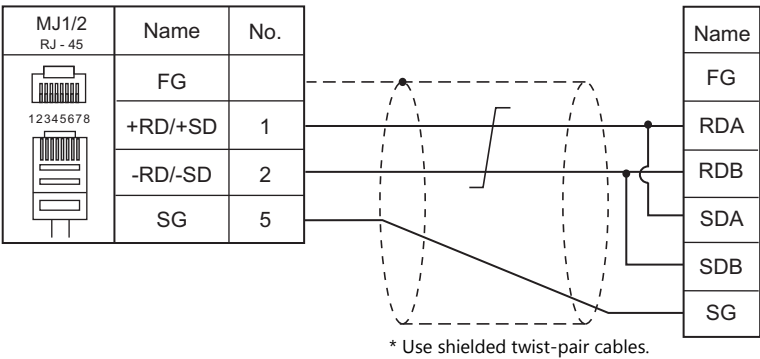
When Connected at MJ1/MJ2:

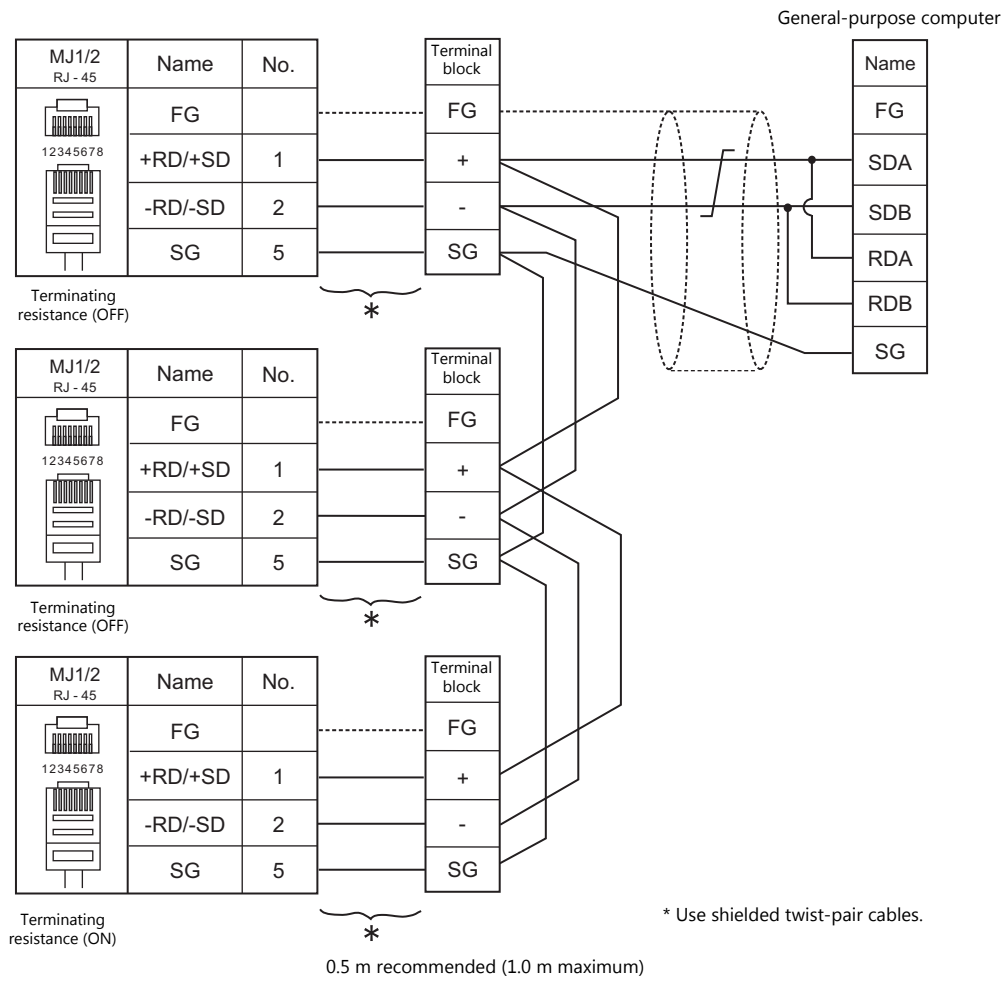
RS-232C



RS-485

1 : 1 connection



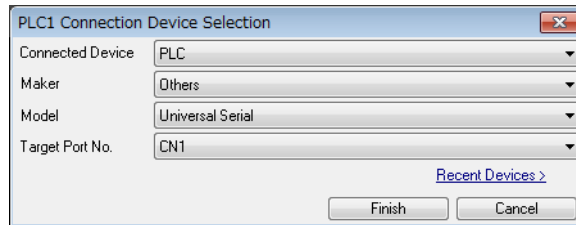
1 : n connection

* For MJ2, set the slide switch for changing signals to RS-232C/485 (up position). For details, refer to "1.2.2 MJ1/MJ2" (page 1-6).

33.3 Hardware Settings

PLC Settings

Connecting Device Selection



PLC1 Connection Device Selection

Connected Device: PLC

Maker: Others

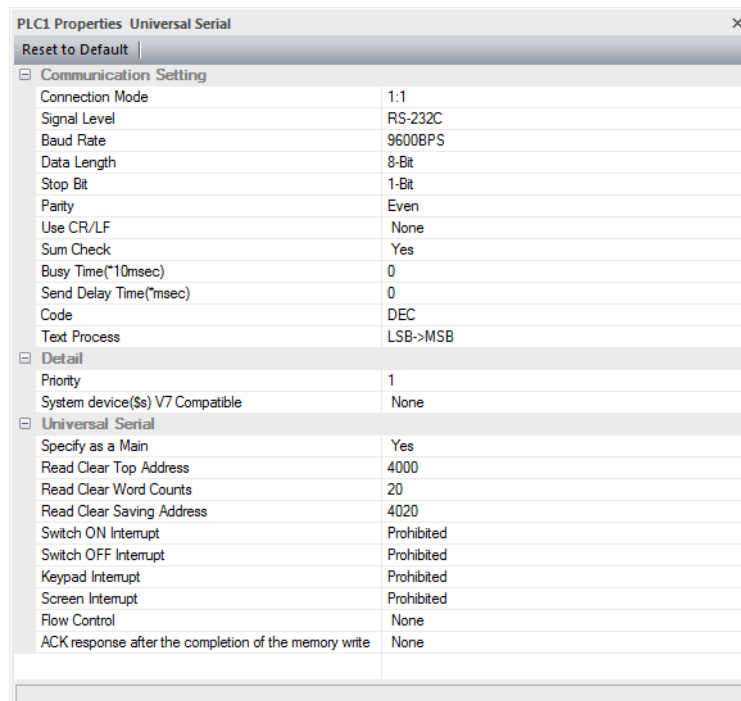
Model: Universal Serial

Target Port No.: CN1

[Recent Devices >](#)

Finish Cancel

PLC Properties



PLC1 Properties - Universal Serial

Reset to Default

☒ Communication Setting

| | |
|------------------------|----------|
| Connection Mode | 1:1 |
| Signal Level | RS-232C |
| Baud Rate | 9600BPS |
| Data Length | 8-Bit |
| Stop Bit | 1-Bit |
| Parity | Even |
| Use CR/LF | None |
| Sum Check | Yes |
| Busy Time(*10msec) | 0 |
| Send Delay Time(*msec) | 0 |
| Code | DEC |
| Text Process | LSB->MSB |

☒ Detail

| | |
|----------------------------------|------|
| Priority | 1 |
| System device(\$s) V7 Compatible | None |

☒ Universal Serial

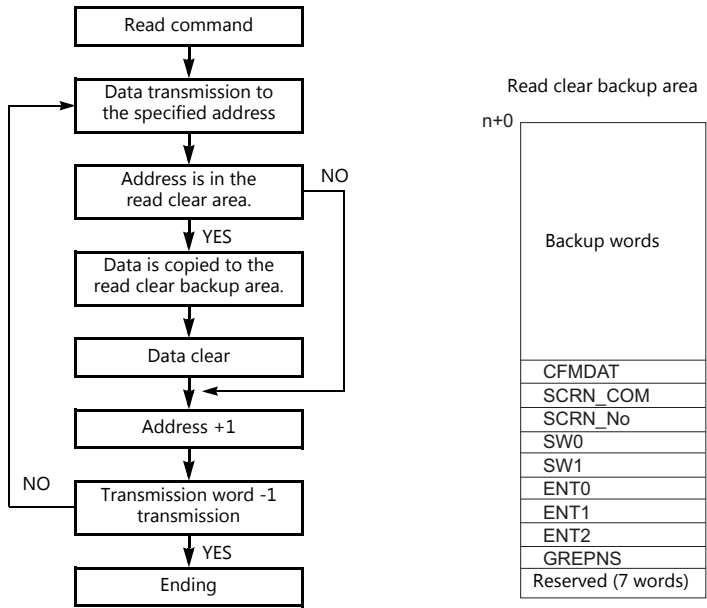
| | |
|---|------------|
| Specify as a Main | Yes |
| Read Clear Top Address | 4000 |
| Read Clear Word Counts | 20 |
| Read Clear Saving Address | 4020 |
| Switch ON Interrupt | Prohibited |
| Switch OFF Interrupt | Prohibited |
| Keypad Interrupt | Prohibited |
| Screen Interrupt | Prohibited |
| Flow Control | None |
| ACK response after the completion of the memory write | None |

| Item | | Contents |
|-----------------------|-----------------|--|
| Communication Setting | Connection Mode | Set the connection method for the TS2060 and host. 1 : 1 Select when connecting one TS2060 unit to one host. 1 : n Select when connecting multiple TS2060 units to one host. |
| | Signal Level | Set the signal level used for communication between the host and the TS2060. RS-232C/RS-422/485 |
| | Baud Rate | Set the communication speed between the host and the TS2060. 4800/9600/19200/38400/57600/76800/115K bps |
| | Data Length | 8 bits (fixed) |
| | Stop Bit | Select a stop bit. 1 bit / 2 bits |
| | Parity | Select an option for parity bit. None / Odd / Even |
| | Local Port No. | This option is valid when 1 : n connection is used. Set the port number of the TS2060. |
| | Use CR/LF | Set whether or not to use a CR/LF code at the end of transmission data. |
| | Sum Check | Set whether or not to add a sum check code at the end of transmission data. |
| | Busy Time | Refer to page 33-24. |
| | Send Delay Time | Set the time for TS2060 to send a response to a host after receiving a command from a host. |
| | Code | DEC (fixed) |

| Item | | Contents |
|-----------------------|---|--|
| Communication Setting | Text Process | When using text process, choose either [LSB → MSB] or [MSB → LSB] in order to make arrangements for the order of the first and the second bytes in one word. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> 15 [LSB → MSB] <div style="border: 1px solid black; padding: 2px; display: inline-block;">MSB</div> 2nd byte </div> <div style="text-align: center;"> 0 <div style="border: 1px solid black; padding: 2px; display: inline-block;">LSB</div> 1st byte </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> 15 [MSB → LSB] <div style="border: 1px solid black; padding: 2px; display: inline-block;">MSB</div> 1st byte </div> <div style="text-align: center;"> 0 <div style="border: 1px solid black; padding: 2px; display: inline-block;">LSB</div> 2nd byte </div> </div> |
| | | |
| Universal Serial | Specify as a Main | Specify which connection to use as the main connection when multiple universal serial connections are made at PLCs 1 to 8. This is set to [Yes] when there is only one universal serial connection. * When [None] is selected, the following limitations apply. <ul style="list-style-type: none"> The following interruption communications occur simultaneously when the connection specified as the main interrupts. <ul style="list-style-type: none"> - Interruption function of a switch - Interruption function of a "Write" switch on the keypad or on the keyboard - Interruption function of screen internal switching Responses to commands for global stations cannot be output. The read clear functions are not available. \$s111 cannot be used. The contents of the connection specified as the main are displayed. |
| | Read Clear Top Address ^{*2} | This setting is available when [Specify as a Main] is set to [Yes]. Set the top address number of the read clear area. The read clear area is the starting area from which the TS2060 clears data that was previously read. Due to the fact that it is cleared to "0", once this area is read, the data remains at "0" even if you attempt to read again when a read response error occurs. |
| | Read Clear Word Counts ^{*2} | This setting is available when [Specify as a Main] is set to [Yes]. Set the number of words that will be used for clearing the read area. |
| | Read Clear Saving Address ^{*2} | This setting is available when [Specify as a Main] is set to [Yes]. Set the top address for the read clear backup area. The area size will be the same as the previously described read clear area. The number of words written in the read clear backup area is the same as the number specified for the read clear area. |
| | Switch ON Interrupt ^{*1} | Select whether or not to enable or disable an interrupt when the switch changes from OFF to ON. |
| | Switch OFF Interrupt ^{*1} | Select whether or not to enable or disable an interrupt when the switch changes from ON to OFF. |
| | Keypad Interrupt ^{*1} | Select whether or not to enable or disable an interrupt when the "Write" switch on the keypad or on the keyboard is pressed and it changes from OFF to ON. |
| | Screen Interrupt ^{*1} | Select whether or not to enable or disable an interrupt when the screen change switch is pressed. |
| | Flow Control | This option is valid only for 1 : 1 communication via RS-232C using CN1. * * CN1 is available only when the TS2060i is attached the "DUR-00". Select [Yes] when disabling an interrupt from the TS2060i (e.g. when the host cannot receive interrupt data). This following actions take place. <ul style="list-style-type: none"> Interrupt enabled when CS (pin 8) on the TS2060i side is ON Interrupt disabled when CS (pin 8) on the TS2060i side is OFF When CS is ON, interruption information stored by then is output in succession. (Interruption information for 3 times can be stored at the most.) |
| | Output OFF | This option is valid only for 1 : 1 communication via RS-422 using 4-wire connection. Normally, TS2060 uses the same cables to send or receive data regardless of 4-wire of 2-wire connections. For this reason, send output remains OFF (High impedance) except for sending signals from TS2060. However, depending on the host specifications, send output OFF operation from the TS2060 is not required. In this case, specify [None]. |
| | 2-Wire System | Select [Yes] for 1 : 1 communication via RS-422/485 using 2-wire connection. Interruptions are disabled. |
| | ACK response after the completion of memory write | To send an ACK response upon receiving the initial write request of a write command (WM, WC), specify [None]. To send an ACK response after completing command processing, specify [Yes]. |

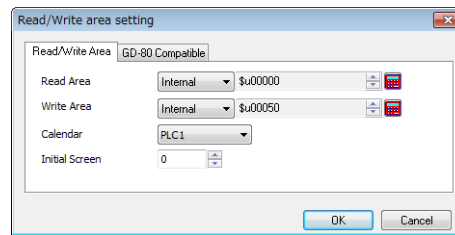
*1 Interruption settings can be changed from the host using the [WI] command during communication. For details on interruption, refer to "33.4.4 Interrupt (ENQ)".

*2 Read clear and read clear backup action
The action that occurs when a read command from the host tries to access to the read clear area is shown in the following diagram.
Backup data of the write area in the system device memory is allocated following the read clear backup area.



Control Device Memory

Read/Write Area



Read Area

This device memory area is necessary to change the screen display status by giving a command from the host. Be sure to set the \$u device memory. Address allocation is shown in the table below. For more information, see “1.4.2 MONITOUCH Settings” (page 1-54).

| Address | Name | Contents |
|---------|----------|-------------------------|
| n + 0 | RCVDAT | Sub command/data |
| n + 1 | SCRN_COM | Screen status command |
| n + 2 | SCRN_No | External screen command |

| 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 | | | | | | | | | | | | |
| | | | | <div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <p>(1) Free</p> <p>(2) BZ0 [0 → 1] (leading edge)</p> <p>(3) BZ1 [0 → 1] (leading edge)</p> <p>(4) BZ2 [1] (level)</p> <p>(5) Calendar setting ([0 → 1] (leading edge))</p> <p>(6) System reserved</p> </div> <div style="width: 5%; text-align: center;"> <p>(1) Free</p> <p>(2) BZ0</p> <p>(3) BZ1</p> <p>(4) BZ2</p> <p>(5) Calendar setting</p> <p>(6) System reserved</p> </div> <div style="width: 55%; text-align: right;"> <p>(1) Free</p> <p>(2) BZ0 [0 → 1] (leading edge)</p> <p>(3) BZ1 [0 → 1] (leading edge)</p> <p>(4) BZ2 [1] (level)</p> <p>(5) Calendar setting ([0 → 1] (leading edge))</p> <p>(6) System reserved</p> </div> </div> | | | | | | | | | | | |
| (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 watchdog 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 connected 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: <ul style="list-style-type: none"> • 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 device] in [GD-80 Compatible] ([Read/Write Area] → [GD-80 Compatible]). Then setting this bit (ON) updates the calendar data. | | | | | | | | | | | |
| (6) System reserve | | | | This bit is reserved by the system. This bit must be "0". | | | | | | | | | | | |

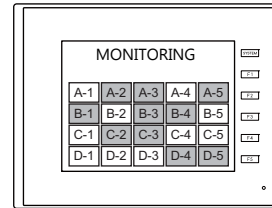
*1 Watchdog

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, forcibly 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".

Change data in [Read Area] "n". (Bits 0 to 7)



Data in [Write Area] "n" is changed. (Bits 0 to 7)



*2 Display scanning

This operation can be utilized for display scanning. Change data in bits 0 to 7 in [Read Area] "n" when giving a graphic change command and check that the same data is saved in bits 0 to 7 in [Write Area] "n". This can prove that the graphic change command is received and executed correctly.

[A-1] - [A-5]
ON-display commands

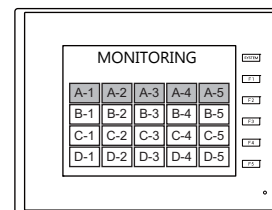
+ Change data in [Read Area] "n".
(Bits 0 to 7)



Data in [Read Area] "n"
(Bits 0 to 7)

= Data in [Write Area] "n"
(Bits 0 to 7)

[A-1] to [A-5] ON-display: Normal termination



*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)

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

- (1) Overlap 0
- (2) Overlap 1
- (3) Overlap 2
- (4) Overlap 3
- (5) System reserved
- (6) Global macro execution [0 → 1] (leading edge)
- (7) Data sheet output [0 → 1] (leading edge)
- (8) Screen hard copy [0 → 1] (leading edge)
- (9) Backlight (level)
- (10) System reserved
- (11) Screen internal switching (level)
- (12) Screen forced switching [0 → 1] (leading edge)
- (13) Data read refresh [0 → 1] (leading edge)

| | |
|---|---|
| (1) Overlap 0 (2) Overlap 1 (3) Overlap 2 | <p>These bits are used for controlling show/hide operations of overlaps.</p> <ul style="list-style-type: none"> Normal overlap or call-overlap [0 → 1] (leading edge ^{*1}): Show [1 → 0] (leading edge ^{*1}): Hide Multi-overlap [0] (level ^{*2}): Hide [1] (level ^{*2}): Show <p>It is necessary to specify a library number from No. 0 to 9999 for [Device for Overlap Library No. to Display] for a multi-overlap display.</p> |
| (4) Overlap 3 | <p>This bit is used for controlling show/hide operations of the global overlap screen.</p> <p>[0 → 1]: Show [1 → 0]: Hide</p> <p>It is necessary to specify a library number from No. 0 to 9999 for [Device for Overlap Library No. to Display] in the [Global Overlap Setting] window.</p> |
| (5) System reserve | 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 Device] in the window 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 data output | 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 reserve | 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.

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

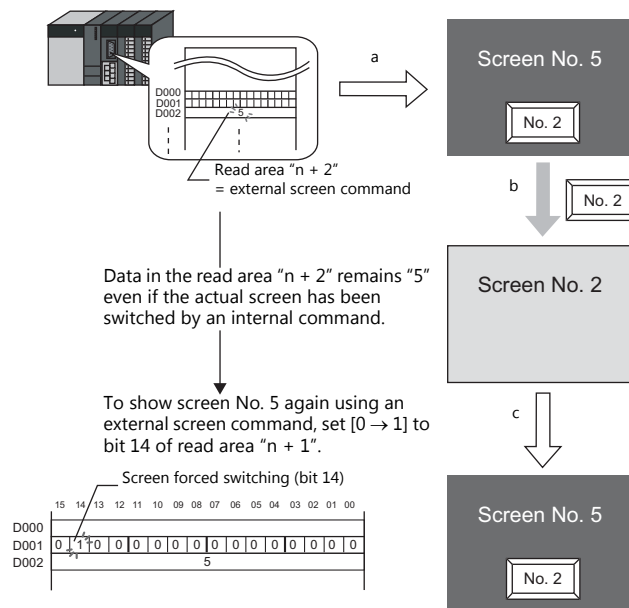
*3 Usage Example

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 a according to read area "n + 2"

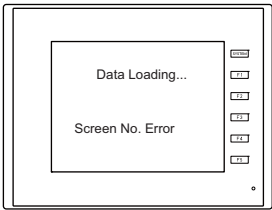
In this case, however, the same value is stored in read area "n + 2" so the command is not valid. In such a case, it is possible to forcibly switch the screen to the screen number contained in read area "n + 2" at the leading edge [0 → 1] of bit 14.



Reset this bit (OFF) after checking that bit 14 of write area "n + 1" is ON, or the value stored in write area "n + 2" is the same as the value in read area "n + 2".

| Read area "n + 2" (screen number command) | | | | | | | | | | | | | | | |
|---|----|----|----|---|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| | | | | | | | | | | | | | | | |
| (1) Screen number | | | | | | | | | | | | | | | |
| (1) Screen number command *1 | | | | 0 - 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 initially is specified.

Write Area

This device memory area is used to store information regarding screen number, overlap display, and entry mode when the screen display status is changed by a command received from the host. Be sure to set the \$u device memory. Address allocation is shown in the table below.

| Address | Name | Contents |
|----------------------|----------|---------------------|
| n + 0 | CFMDAT | Sub command/data |
| n + 1 | SCRN_COM | Screen status |
| n + 2 | SCRN_No | Displayed screen |
| n + 3 | SW0 | No. 0 switch data |
| n + 4 | SW1 | No. 1 switch data |
| n + 5 | ENT0 | Entry information 0 |
| n + 6 | ENT1 | Entry information 1 |
| n + 7 | ENT2 | Entry information 2 |
| n + 8 | GREPNS | Global response |
| n + 9 : n + 15 | | Reserved (7 words) |

n + 0 - n + 2

| 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 finished display processing. |
| (2) BZ0 | |
| (3) BZ1 | |
| (4) BZ2 | |
| (5) Calendar setting | |
| (6) System reserve | Always "0" |

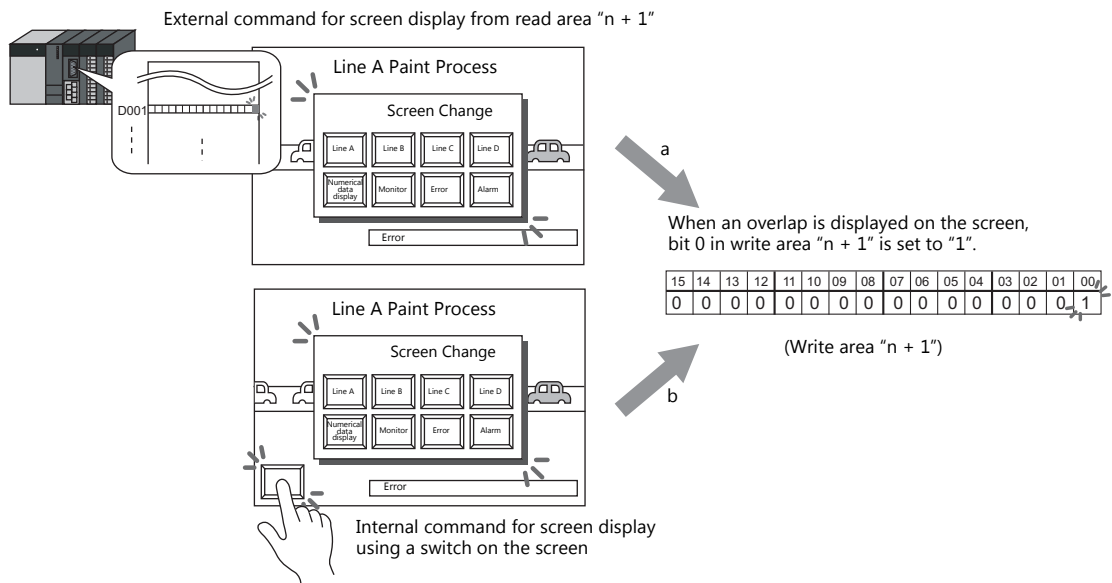
| Write area "n + 1" (screen status) | | | | | | | | | | | | | | | |
|------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| | | | 0 | | | | | | 0 | 0 | 0 | | | | |

(1) Overlap 0
 (2) Overlap 1
 (3) Overlap 2
 (4) Overlap 3
 (5) System reserved
 (6) Serial extension I/O
 (7) Global macro execution
 (8) Printer busy
 (9) Print data transferring
 (10) Backlight
 (11) System reserved
 (12) Screen internal switching
 (13) Screen forced switching
 (14) Data read refresh

| | |
|--|---|
| (1) Overlap 0 (2) Overlap 1 (3) Overlap 2 (4) Overlap 3 | Overlap status ^{*1} [0]: Hide [1]: Show |
| (5) System reserve | 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 | 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 reserve | This bit is reserved by the system. This bit must be "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 device memory address \$s16. For more information on the internal device memory (\$s), refer to the TS2060 Reference Manual.
*3 Data of bit 11 is output to internal device memory address \$s17. For more information on the internal device memory (\$s), refer to the TS2060 Reference Manual.

| 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 - 9999 Screen number currently displayed | | | | | | | | | | | | | | |

n + 3 (SW0) switch data No. 0, n + 4 (SW1) switch data No. 1

When a switch, for which [Output Action] is set to [Momentary/Momentary W] and [Output Device] is set in location from \$s0080 to 0095, is pressed, the status and the number of the switch is stored.

n + 3, n + 4 (SW0/SW1)

| | | | | | | | | | | | | | | | |
|----------------------------------|----|----|----|----|----|----|----|---------------|----|----|----|----|----|----|----|
| 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| Switch status 0: OFF 1: ON | | | | | | | | Switch number | | | | | | | |

For the relationship between the switch output device memory and the switch number, see page 33-36.

n + 5 (ENT0) entry information 0, n + 6 (ENT1) entry information 1

The same contents as n + 0 and n + 1 of the [Info. Output Device] that is set in the entry mode are written. Write operation occurs when the key whose function is set to "Write" is pressed in the entry mode.

When the entry selection has changed, write operation will not occur.

When (n + 5) entry information 0 is read by the host, the writing completed bit (bit 15) is reset.

Data is written in the backup (escape) area before it is read (see page 33-9).

n + 7 (ENT2) entry information 2

The entry mode window number where a write operation was executed is written.

The relationship between the window number and base and the window number and overlap is shown in the following table.

| Window No. | Contents |
|------------|----------------------|
| 0 | Base entry mode |
| 1 | Overlap 0 entry mode |
| 2 | Overlap 1 entry mode |
| 3 | Overlap 2 entry mode |

- In case of using the entry mode for the table data display

When the bit No. 12 of "Command Device" in the [Entry] dialog is ON [1], the line number and the column number will be output to the address n + 1 and the block number to the address n + 2 of the "Info. Output Device". Note that therefore, in only this case the window number cannot be referred because the block number is output to the address n + 7 (ENT2) of the write area.

n + 8 (GREPNS) global response

A response is written when a global port number is used in 1 : n communication. The contents of a response are shown in the following table.

For details on the global port number, see page 33-22.

| Device Contents | Description |
|-----------------|---|
| 0000 | Global command not received |
| 0100 | ACK |
| Others | Identical to NAK code (see page 33-23). |

n + 9 to n + 15

System reserved

Calendar

Select a device memory from which the calendar data is read without using the TS2060 built-in clock. For more information on the built-in clock, refer to the TS2060 Reference Manual.

PLC1 to 8

Calendar data is read from the selected device memory.

The calendar data will be updated when:

- The power is turned on.
- STOP→RUN
- The date changes.
- At the leading edge of a bit (0 → 1) in the calendar device memory in the reading area

Initial Screen

Set the number of the screen to be displayed when power to the V series is turned on.

GD-80 Compatible

This setting is not valid because the GD-80 series cannot be used for universal serial communication.

33.4 Standard Type Protocol

33.4.1 Standard Type Protocol

The connection mode and transmission mode are set under [System Setting] → [Communication Setting]. The mode contents are as follows.

- Connection mode

1 : 1: Select it when connecting one TS2060 unit to one host.

1 : n: Select it when connecting multiple TS2060 units to one host. A maximum of 32 units can be connected.
(Multi-drop specifications)


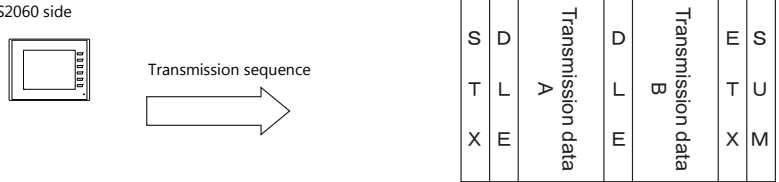

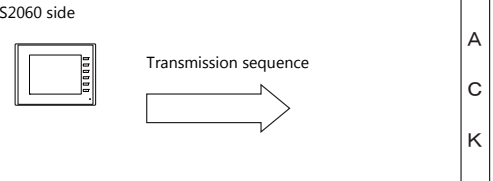
- Transmission mode

There are four transmission modes, depending on whether or not a sum check or CR/LF code is attached to the end of transmission and received data, as shown below.

| Transmission Mode | Sum Check | CR/LF |
|-------------------|--------------|--------------|
| 1 | Not provided | Not provided |
| 2 | Provided | Not provided |
| 3 | Not provided | Provided |
| 4 | Provided | Provided |

Connection (1 : 1), Transmission Mode (with Sum Check)



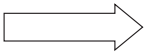
This protocol is used when one host communicates with one TS2060 unit (1 : 1).

| Contents | Protocol |
|--|--|
| Reading the TS2060 data at the host side | <div>  <p>Host side</p> </div> <div>  <p>TS2060 side</p> </div> <p>Transmission sequence</p> <p>or</p> <div> <p>Error code</p> <p>N A K</p> </div> |
| Writing data from the host to the TS2060 | <div>  <p>Host side</p> </div> <div>  <p>TS2060 side</p> </div> <p>Transmission sequence</p> <p>or</p> <div> <p>Error code</p> <p>N A K</p> </div> |

- When 1 : 1 connection is used, an interrupt can be used. For more information, see page 33-32.

Connection (1 : 1), Transmission Mode (with Sum Check and CR/LF)



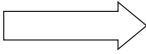


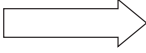
This protocol is used when one host communicates with one TS2060 unit (1 : 1).

| Contents | Protocol |
|--|---|
| Reading the TS2060 data at the host side | <div><div><div></div><div>Host side</div></div><div><div><div>STX</div><div>Command</div><div>DLE</div><div>Transmission data A</div><div>DLE</div><div>Transmission data B</div><div>ETX</div><div>SUM</div><div>CR</div><div>LF</div></div></div></div> <div><div><div></div><div>TS2060 side</div></div><div>Transmission sequence</div><div></div></div> <div><div><div>STX</div><div>DLE</div><div>Transmission data A</div><div>DLE</div><div>Transmission data B</div><div>ETX</div><div>SUM</div><div>CR</div><div>LF</div></div></div> <div>or</div> <div><div><div>NACK</div><div>Error code</div><div>CR</div><div>LF</div></div></div> |

- When 1 : 1 connection is used, an interrupt can be used. For more information, see page 33-32.







Connection (1 : n), Transmission Mode (with Sum Check)

It is possible to connect as many as 32 TS2060 units to one host.
(For information on the global command, see page 33-25.)

| Contents | Protocol |
|--|---|
| Reading the TS2060 data at the host side | <div>  <p>Host side</p> </div> <div>  <p>TS2060 side</p> </div> <p>Transmission sequence</p>  <div> <div> <div>Transmission data A</div> <div>Transmission data B</div> <div>S U M</div> </div> <div> <div>Transmission data A</div> <div>Transmission data B</div> <div>S T X</div> </div> </div> <p>or</p> <div> <div>Error code</div> <div>Port No.</div> <div>N A K</div> </div> |
| Writing data from the host to the TS2060 | <div>  <p>Host side</p> </div> <div>  <p>TS2060 side</p> </div> <p>Transmission sequence</p>  <div> <div>Transmission data A</div> <div>Transmission data B</div> <div>S U M</div> </div> <div> <div>A C K</div> <div>Port No.</div> </div> <p>or</p> <div> <div>Error code</div> <div>Port No.</div> <div>N A K</div> </div> |

Connection (1 : n), Transmission Mode (with Sum Check and CR/LF)

It is possible to connect as many as 32 TS2060 units to one host.
(For information on the global command, see page 33-25.)

| Contents | Protocol |
|--|--|
| Reading the TS2060 data at the host side | <div><div> Host side</div><div><div>STX</div><div>Command Port No.</div><div>DLE</div><div>Transmission data A</div><div>DLE</div><div>Transmission data B</div><div>ETX</div><div>SUM</div><div>CR</div><div>LF</div></div></div> <div><div> TS2060 side</div><div>Transmission sequence </div><div><div>STX</div><div>Port No.</div><div>DLE</div><div>Transmission data A</div><div>DLE</div><div>Transmission data B</div><div>ETX</div><div>SUM</div><div>CR</div><div>LF</div></div><div>or</div><div><div>NACK</div><div>Port No.</div><div>Error code</div><div>CR</div><div>LF</div></div></div> |
| Writing data from the host to the TS2060 | <div><div> Host side</div><div><div>STX</div><div>Command Port No.</div><div>DLE</div><div>Transmission data A</div><div>DLE</div><div>Transmission data B</div><div>ETX</div><div>SUM</div><div>CR</div><div>LF</div></div></div> <div><div> TS2060 side</div><div>Transmission sequence </div><div><div>ACK</div><div>Port No.</div><div>CR</div><div>LF</div></div><div>or</div><div><div>NACK</div><div>Port No.</div><div>Error code</div><div>CR</div><div>LF</div></div></div> |

33.4.2 Protocol Contents

Transmission Control Code

The transmission control codes are shown in the table below.

| Signal Name | Code (Hexadecimal) | Contents |
|-------------|--------------------|--------------------------------|
| STX | 02H | Start of transmission block |
| ETX | 03H | End of transmission block |
| ENQ | 05H | Interrupt |
| ACK | 06H | Positive acknowledge |
| CR | 0DH | Carriage return |
| DLE | 10H | Change contents within a block |
| NAK | 15H | Negative acknowledge |
| LF | 0AH | Line feed |

Port Number

Port numbers can be set for connection mode "1 : n".

They are used so that the host computer can identify each TS2060 for access.

The data range is from 00H to 1FH (0 to 31) and is converted into a two-digit ASCII code (HEX) before use. Set port numbers of the TS2060 at [Local Port No.] under [Communication Setting].

Global port number (FFH)

When the global port number [FFH] is set, commands are sent to all TS2060 units at one time.

Commands for which global port numbers are active are shown below. If commands other than these are used, a command error will occur.

| Signal Name | Name | Contents |
|-------------|-----------|--|
| WM | Write | Write data device memory |
| WC | Write CHR | Write data device memory as characters |

Responses to global port numbers are not transmitted to the host. However, responses are written in write area n + 8.

| Device Contents | Description |
|-----------------|---|
| 0000H | Global command not received |
| 0100H | ACK |
| Others | Identical to NAK code (see page 33-23.) |

Command

Available commands are shown below. The details on commands are described on pages shown at "Refer to:".

| Signal Name | Name | Contents | Refer to: |
|-------------|-----------------------|---|------------|
| RM | Read | Read data device memory | page 33-26 |
| WM | Write | Write data device memory (1024 words maximum) | page 33-28 |
| TR | Retry | Retry when NAK [01] is BUSY | page 33-29 |
| WI | Interrupt Setting | Allow interrupt (Connection mode 1 : 1) | page 33-30 |
| RI | Read interrupt status | Read interrupt setting status (Connection mode 1 : 1) | page 33-31 |
| RC | Read CHR | Read data device memory as characters | page 33-25 |
| WC | Write CHR | Write data device memory as characters (2048 bytes maximum) | page 33-27 |

Sum Check Code (SUM)

Data is added up (SUM), and the lower one byte (8 bits) of the sum is converted into a two-digit ASCII code (HEX).

Example:

Transmission mode: without CR/LF, with sum check

The sum check code is added as shown below when data "3882" (0F2AH) is transmitted to the address "\$u1453" (05ADH) using the command [WM] (data writing).

| STX | Command | DLE | Address | Count | Device memory data | ETX | SUM |
|-----|---------|-----|-----------------|-----------------|--------------------|-----|---------|
| | "W" "M" | | "0" "5" "A" "D" | "0" "0" "0" "1" | "0" "F" "2" "A" | | "4" "D" |
| 02H | 57H 4DH | 10H | 30H 35H 41H 44H | 30H 30H 30H 31H | 30H 46H 32H 41H | 03H | 34H 44H |

$$02H + 57H + 4DH + 10H + 30H + 35H + 41H + 44H + 30H + 30H + 30H + 31H + 30H + 46H + 32H + 41H + 03H = 34DH$$

* In the case of an interrupt, data from ENQ to ETX is subject to a sum check.

Error Codes

An error code is sent along with an NAK response as a two-digit ASCII code (HEX).

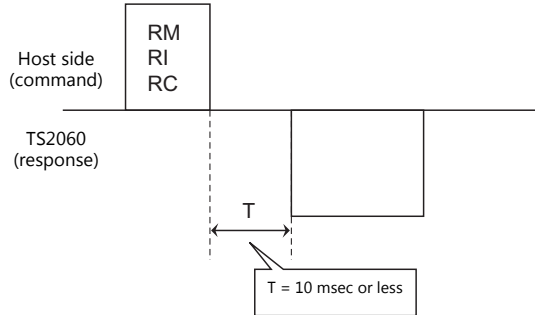
| Error Codes | Contents |
|-------------|--|
| 01H | The TS2060 is currently engaged in display processing. The received command is on standby due to display processing. Wait a few moments and re-transmit the command. |
| 02H | Overrun/Framing error An overrun or framing error is detected in the received data. Send the command again. |
| 03H | Parity error A parity error is detected in the received data. Send the command again. |
| 04H | Sum check error A sum error occurs with the received data. |
| 05H | Address error The address specified by the device memory read/write command is incorrect. Check the address or counter and re-transmit the command. |
| 06H | Count error The device memory read/write count is "0". |
| 07H | Screen error The data to be written in read area n + 2 (screen status command), as specified by a write command, is not registered on the screen. Check the screen number and re-transmit the data. |
| 08H | Format error The number of DLEs is 0 or greater than 6. |
| 09H | Received data over The number of write command data received from the host exceeded that of data shown below. <ul style="list-style-type: none"> Write memory command = 1024 words Write CHR command = 2048 bytes |
| 0BH | Retry command error When a retry command is received, there is no BUSY status (NAK [01]) command. |
| 0FH | ETX error No ETX code is found. |
| 10H | DLE error No DLE code is found. |
| 11H | Character error A character not used in the received data is found (other than 0 to F). Check the character and send the command again. |
| 12H | Command error An invalid command is given. |

Response Time and BUSY

Response time varies depending on the type of command.

RM / RI / RC

These commands immediately send a response once receipt of data is complete.
No NAK [01] (BUSY) signal is given.



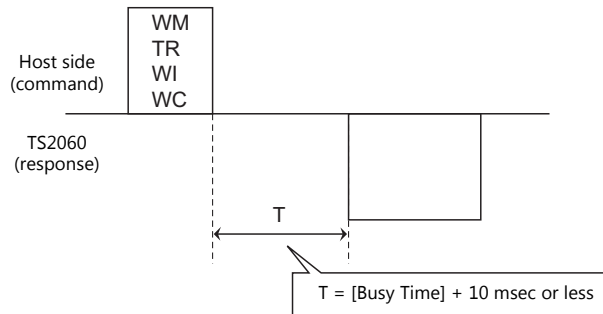
WM / TR / WI / WC

Once receipt of data is complete, these commands first check the display status. If the display status is found to be complete, a response is sent and a command is executed.

If the status is BUSY and the display is completed within the time set in [Busy Time], a response is sent.

If the display is not completed within the specified time, an NAK [01] (BUSY) signal is sent. In this case, it is necessary to retransmit the command.

When [Busy Time] is set as [0], the machine waits until the display is complete, and then a response is transmitted after a command is executed.



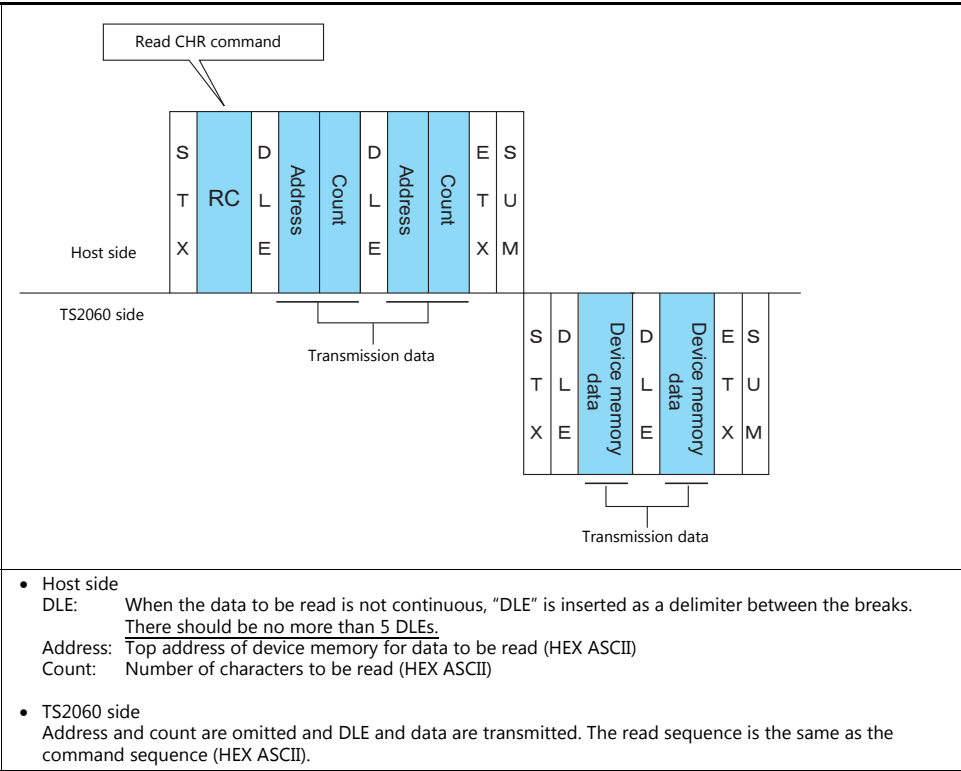
33.4.3 Command

RC: Read CHR

This command is used to read data in device memory as characters.

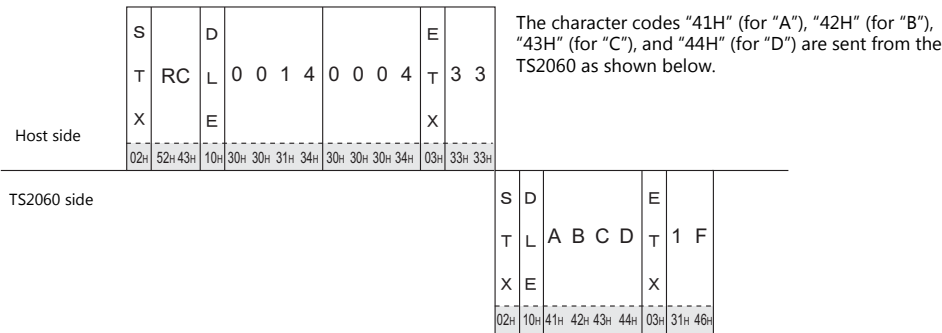
- * When character data is sent, 1 character (1 byte) is converted into a two-byte ASCII code and transmitted by the read memory command. When the read CHR command is given, character data is not converted into the ASCII code before transmission, and thus, the transmission time is decreased by approximately 1/2.

Details of read CHR



Example:

Call up 4 characters that are written at the top of the address \$u0020 (0014H).

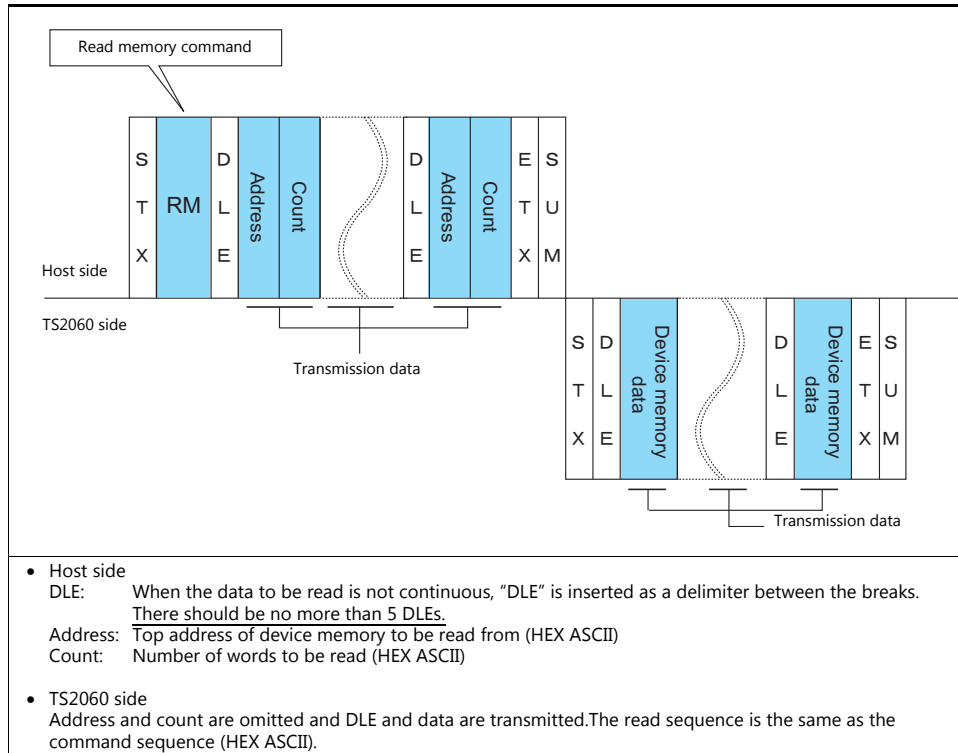


RM: Read Memory

This command is used to read data in device memory.

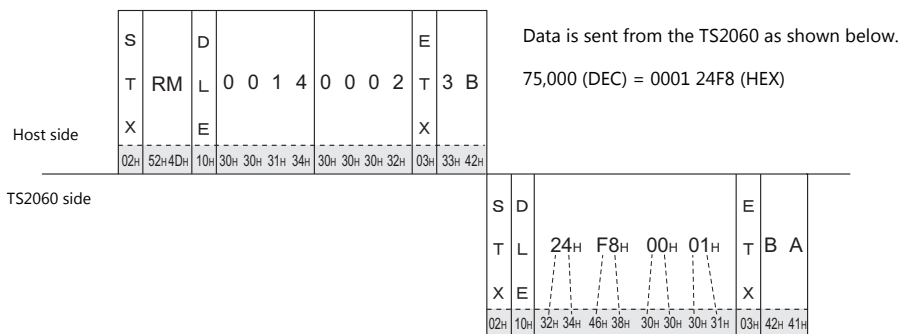
- * Communication speed is increased when you use the read CHR command to read characters.

Details of read memory



Example:

Read the double-word data "75,000" (DEC) contained in the address \$u0020 (0014H).

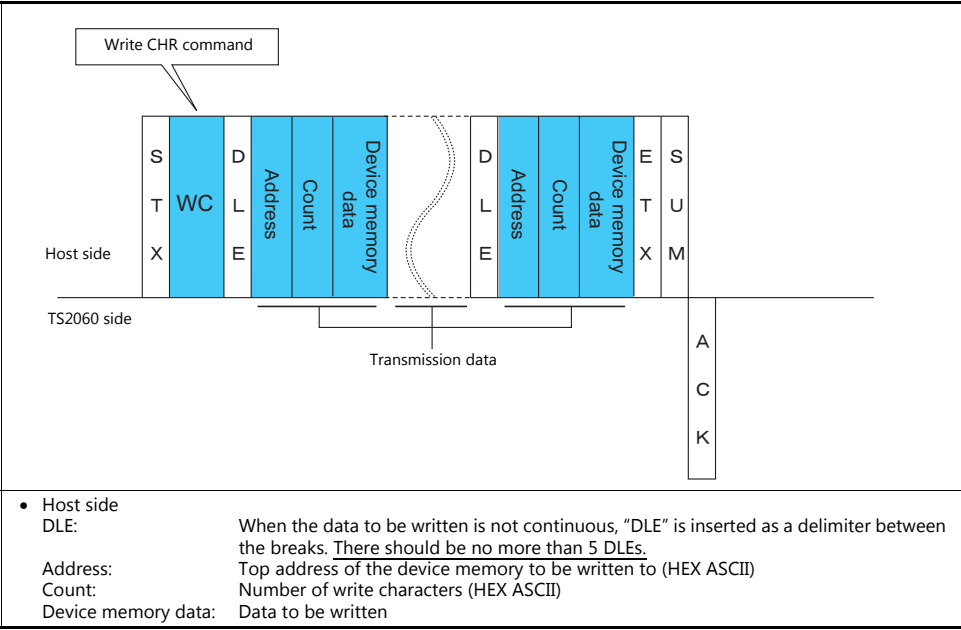


WC: Write CHR

This command is used to write data to device memory as characters.

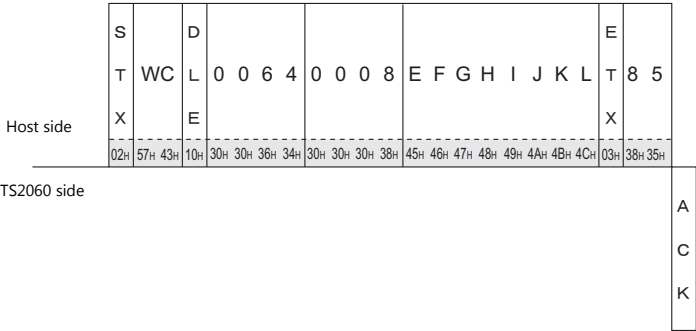
- * When character data is sent, 1 character (1 byte) is converted into a two-byte ASCII code and transmitted by the write memory command. When the write CHR command is given, character data is not converted into the ASCII code before transmission, and thus, the transmission time is decreased by approximately 1/2. (Character codes from 00 to 1F cannot be used.)

Details of write CHR



Example:

Send data to display the following characters on the TS2060.
\$u0100 (0064H), EF
\$u0101 (0065H), GH
\$u0102 (0066H), IJ
\$u0103 (0067H), KL

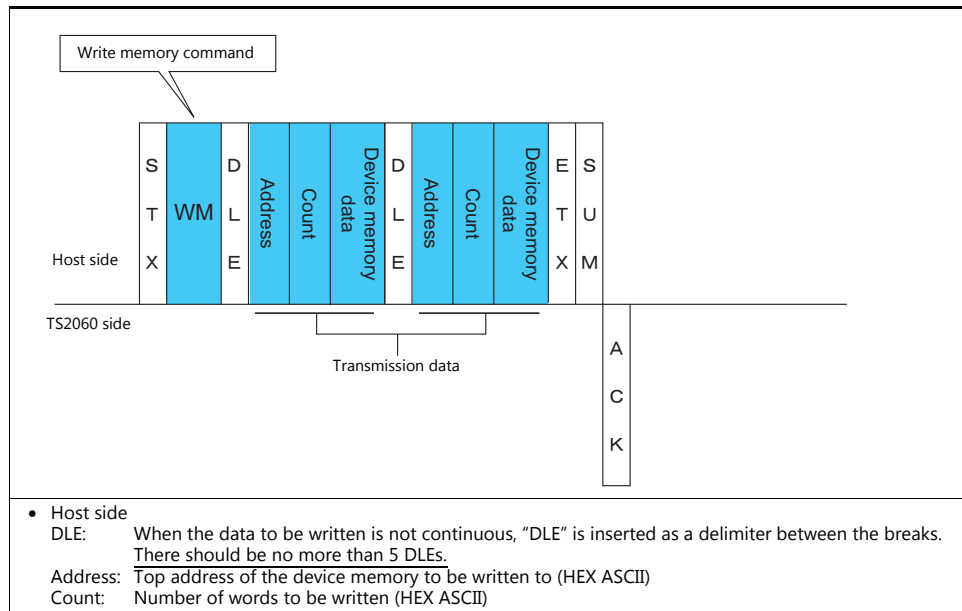


WM: Write Memory

This command is used to write data to device memory.

- * Communication speed is increased when you use the write CHR command to write characters.

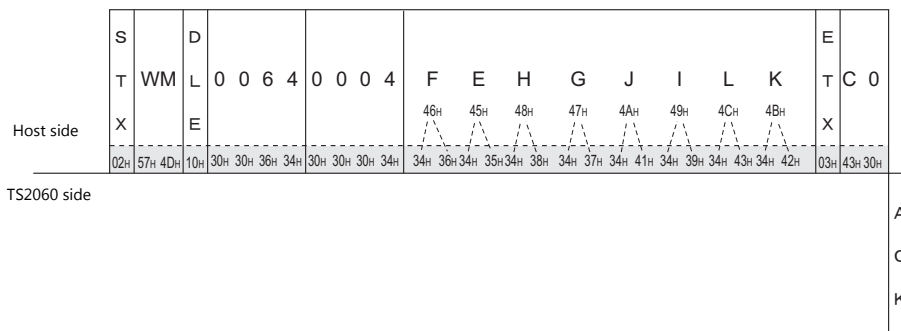
Details of write memory



Example:

Send data to display the following characters on the TS2060.

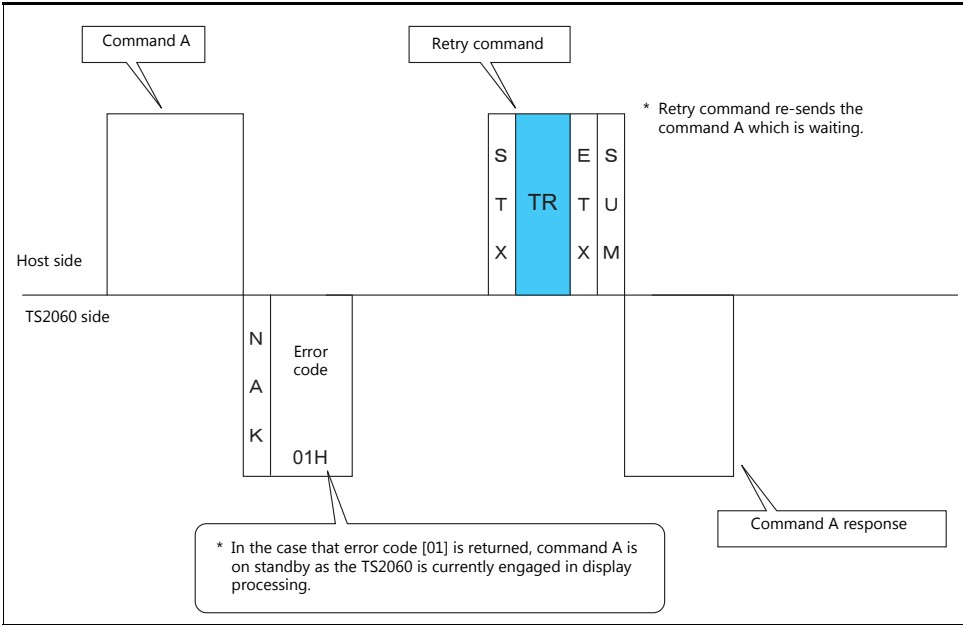
- \$u0100 (0064H), EF (= 4645 H)
- \$u0101 (0065H), GH (= 4847 H)
- \$u0102 (0066H), IJ (= 4A49 H)
- \$u0103 (0067H), KL (= 4C4B H)



TR: Retry Command

This command is used to re-send a write command/write CHR command when an NAK error code [01] is returned.

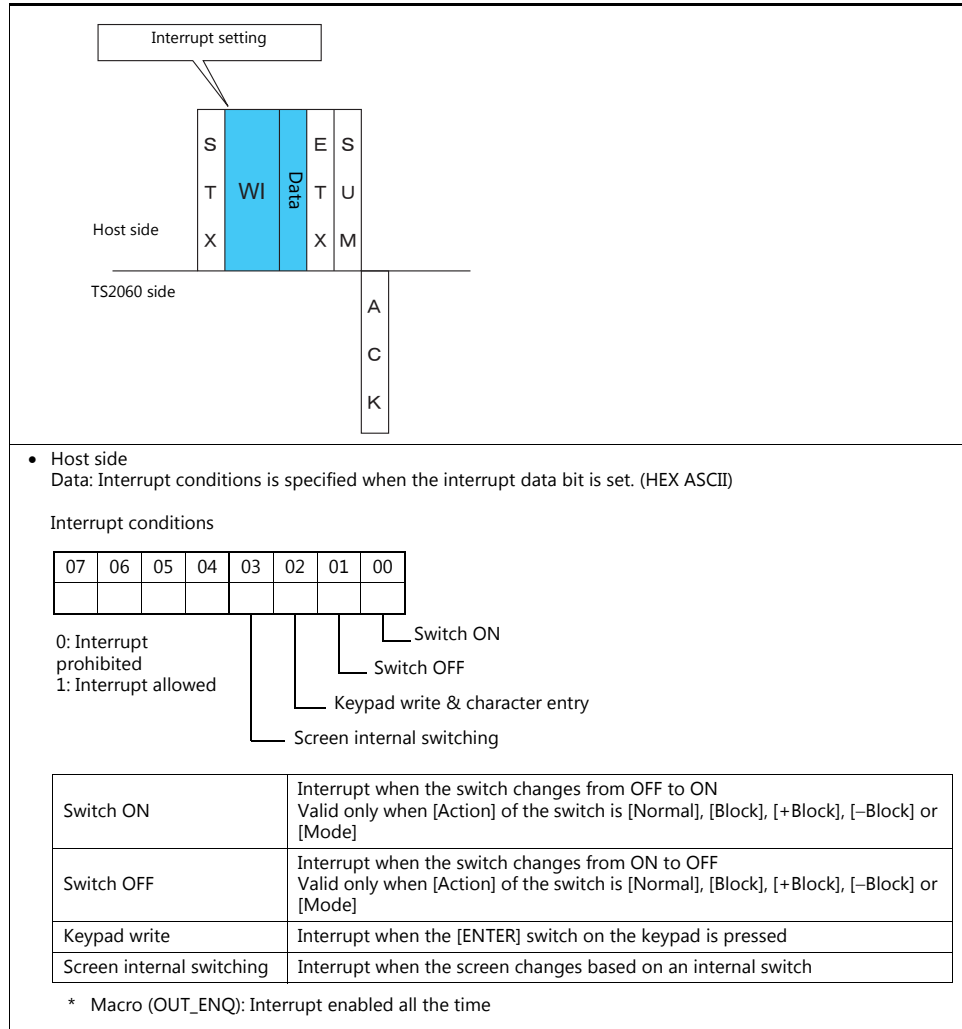
Details of retry



WI: Interrupt Setting Command

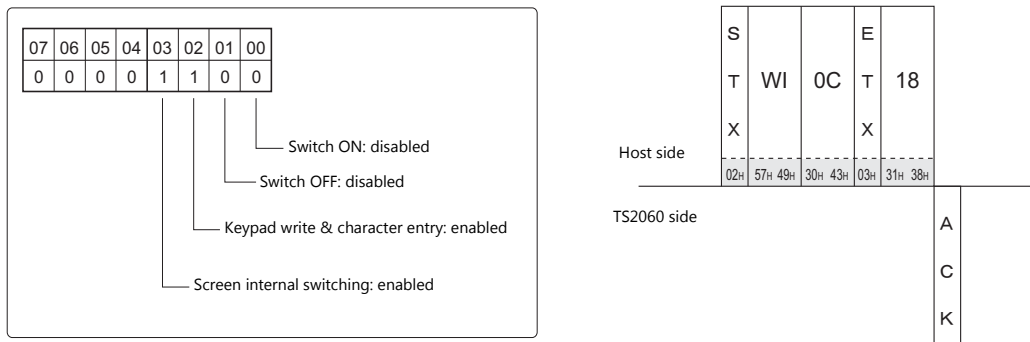
This command is used to send interrupt conditions. It can be used for 1 : 1 connection.

Details of interrupt setting command



Example:

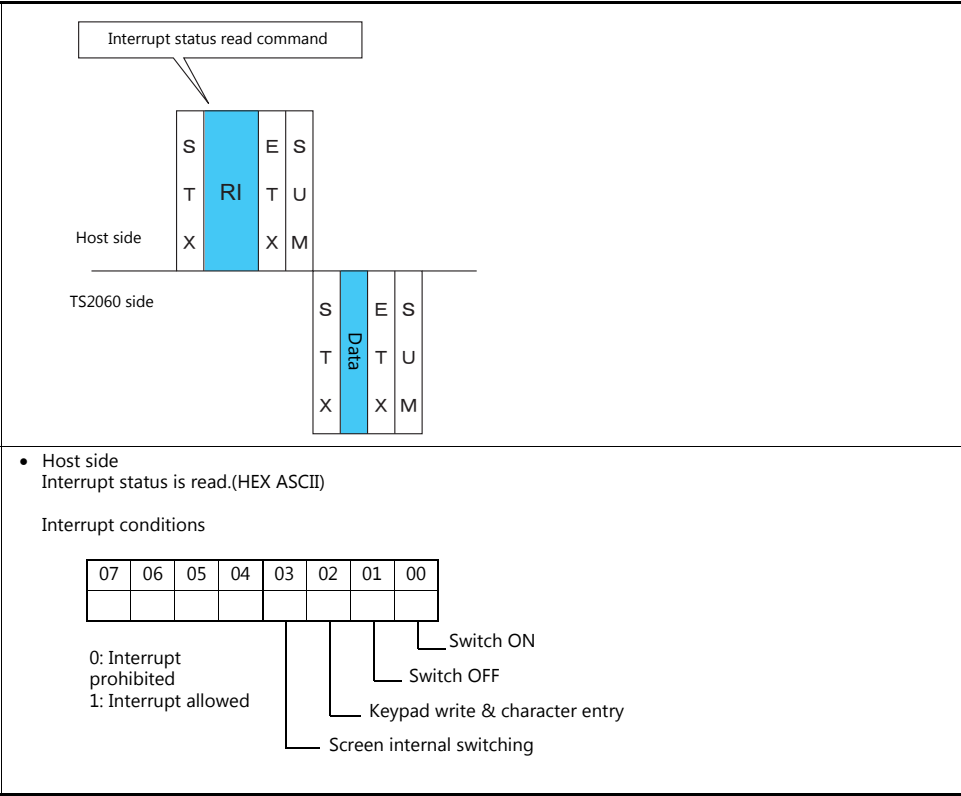
Interrupt settings are as shown below.



RI: Interrupt Status Read Command

This command is used to read interrupt setting status. It can be used for 1 : 1 connection.

Details of interrupt status read command



33.4.4 Interrupt (ENQ)

The interrupt command can be used for 1 : 1 connection.* Interrupt data becomes the contents of write areas n + 2 to n + 7. (See page 33-13.)

* For RS-485 (2-wire connection), interrupts cannot be used.

Interrupt codes and conditions

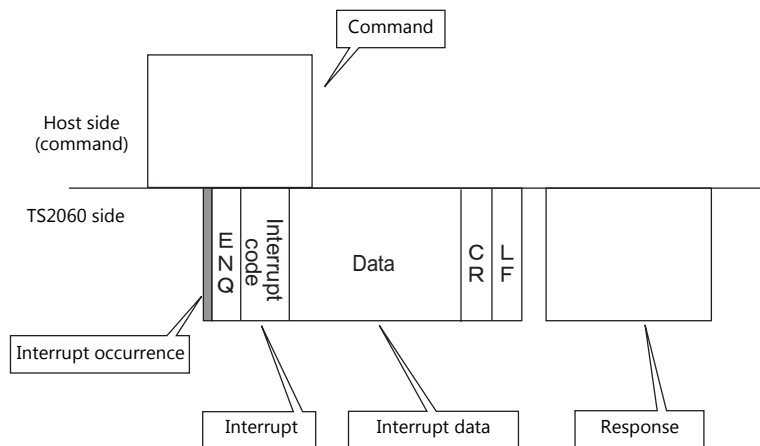
An interrupt code is sent to the host for the following actions.

| Interrupt Codes | Interrupt Conditions |
|-----------------|--|
| 00H | The regular switch is changed from ON to OFF or OFF to ON when it is pressed. * When universal serial connection is made at multiple ports, all ports are interrupted at the same time. |
| 01H | The "Write" switch on the keypad or on the keyboard is changed from OFF to ON when it is pressed. * If [Control Prohibition/Enabled of Write Key] is checked, the write enable bit must be set in order to send an interrupt code. * When universal serial connection is made at multiple ports, all ports are interrupted at the same time. |
| 02H | The screen is switched by an internal switch. * When universal serial connection is made at multiple ports, all ports are interrupted at the same time. |
| 10H to 2FH | The macro command [OUT_ENQ] is executed (for PLC1). The macro command [OUT_ENQ_EX] is executed (PLC1 to 8 selected by user). |
| 30H to 3FH | The macro command [OUT_ENQ] is executed (for PLC2). |
| 40H to 4FH | The macro command [OUT_ENQ] is executed (for PLC3). |
| 50H to 5FH | The macro command [OUT_ENQ] is executed (for PLC4). |
| 60H to 6FH | The macro command [OUT_ENQ] is executed (for PLC5). |
| 70H to 7FH | The macro command [OUT_ENQ] is executed (for PLC6). |
| 80H to 8FH | The macro command [OUT_ENQ] is executed (for PLC7). |
| 90H to 9FH | The macro command [OUT_ENQ] is executed (for PLC8). |

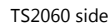
Interrupt timing

When an interrupt condition occurs while the host is transmitting a command or before the TS2060 transmits a response, the interrupt code will be transmitted before the response is transmitted.

To use an interrupt, it is necessary to enable interrupt code detection when a response is received on the host program.



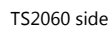
When a regular switch is pressed

[illegible]

For details on the output device memory and the switch number, see page 33-37.

Normally, [1-Output] is set for the switch. Thus, the switch number and switch information is written in write area $n + 3$. However, when the switch as well as a function switch is pressed simultaneously (2-Output), the switch number and switch information is written in write areas $n + 3$ and $n + 4$.

When the [ENT] switch on the keypad is pressed

[illegible]

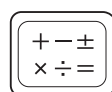
ENT0/1/2 is the same as the write area in system device memory ($n + 5$, $n + 6$, $n + 7$).

TS2060 side

[illegible]

When a macro command (OUT_ENQ) is executed:

With an OUT_ENQ command, you can either convert the data into HEX code and transmit it (word transmission), or you can transmit the data just as it is without converting it (character transmission).
For more information on "OUT_ENQ", refer to the Macro Reference manual.



Word transmission

TS2060 side

| | | | | | | | |
|---|----|----|--|------------------------------------|-----------|---|---|
| E | XX | 00 | Device memory address for transfer | Number of transmission words | Word data | E | S |
| N | | | | | | T | U |
| Q | | | WORD | WORD | | X | M |

Transmission format: word transmission

Interrupt code (10H to 2FH)

Character transmission

TS2060 side

| | | | | | | | |
|---|----|----|--|---|-----------|---|---|
| E | XX | 01 | Device memory address for transfer | Number of transmission characters | Word data | E | S |
| N | | | | | | T | U |
| Q | | | WORD | WORD | | X | M |

Transmission format: character transmission

Interrupt code (10H to 2FH)

1-byte Character Code List

Upper

Lower

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | SP | 0 | @ | P | ' | p | | | | | | | | |
| 1 | | | ! | 1 | A | Q | a | q | | | | | | | | |
| 2 | | | " | 2 | B | R | b | r | | | | | | | | |
| 3 | | | # | 3 | C | S | c | s | | | | | | | | |
| 4 | | | \$ | 4 | D | T | d | t | | | | | | | | |
| 5 | | | % | 5 | E | U | e | u | | | | | | | | |
| 6 | | | & | 6 | F | V | f | v | | | | | | | | |
| 7 | | | ' | 7 | G | W | g | w | | | | | | | | |
| 8 | | | (| 8 | H | X | h | x | | | | | | | | |
| 9 | | |) | 9 | I | Y | i | y | | | | | | | | |
| A | | | * | : | J | Z | j | z | | | | | | | | |
| B | | | + | ; | K | [| k | { | | | | | | | | |
| C | | | , | < | L | ¥ | l | | | | | | | | | |
| D | | | - | = | M |] | m | } | | | | | | | | |
| E | | | . | > | N | ^ | n | ~ | | | | | | | | |
| F | | | / | ? | O | _ | o | ■ | | | | | | | | |

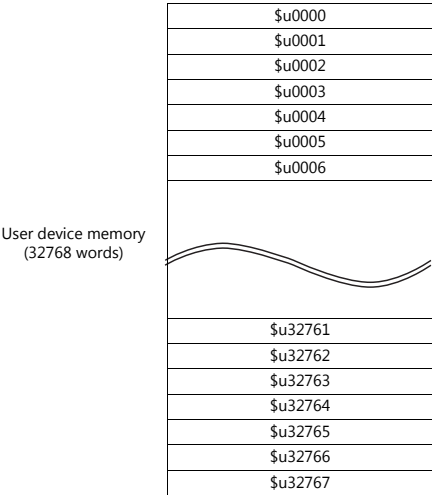
33.5 Device Memory Map

Device Memory

Inside the TS2060, there is internal device memory necessary for screen display called “user device memory (\$u)”, as well as device memory that the TS2060 uses for the system called “system device memory (\$s)”.

User Device Memory (\$u)

32768 words are available for user device memory. This area is usable as desired for screen programs. Also the host computer can write to and read from the area.
The device memory map is as shown below.



System Device Memory (\$s)

2048 words are available for system device memory. System device memory is device memory that writes TS2060 action status when the V Series is currently displaying something. With this written information, it is possible to check overlap status, buffer area, printer, backlight, and slave station status in multi-drop connection mode. In the table below, a small part (\$s80 to 95) of system device memory is extracted. For other device memory addresses, refer to the TS2060 Reference Manual 1.

* System device memory cannot be read or written from the host computer.

Address \$s0080 to 95

Set [Output Device] in location (\$s0080 to 95) of system device memory, and select [Momentary] for [Output Action] of a switch. When the switch is pressed, output device memory is set (0 → 1) and the corresponding switch number is written in system setting areas n + 3 and n + 4. (See page 33-15.)

The relationship between the output device memory and the switch number is shown in the following diagram. For details about the output of a switch, see page 33-34.

| Address | Contents | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \$s80 | Universal serial switch output 0 Switch No. 0 to 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| \$s81 | Universal serial switch output 1 Switch No. 16 to 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td><td>16</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | | | | | | | | | | | | | | | | | |
| \$s82 | Universal serial switch output 2 Switch No. 32 to 47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td><td>32</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | | | | | | | | | | | | | | | | | |
| \$s83 | Universal serial switch output 3 Switch No. 48 to 63 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td><td>48</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 63 | 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 63 | 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 | 53 | 52 | 51 | 50 | 49 | 48 | | | | | | | | | | | | | | | | | |
| \$s84 | Universal serial switch output 4 Switch No. 64 to 79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td><td>64</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 | 71 | 70 | 69 | 68 | 67 | 66 | 65 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 | 71 | 70 | 69 | 68 | 67 | 66 | 65 | 64 | | | | | | | | | | | | | | | | | |
| \$s85 | Universal serial switch output 5 Switch No. 80 to 95 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td><td>80</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 | 86 | 85 | 84 | 83 | 82 | 81 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 95 | 94 | 93 | 92 | 91 | 90 | 89 | 88 | 87 | 86 | 85 | 84 | 83 | 82 | 81 | 80 | | | | | | | | | | | | | | | | | |
| \$s86 | Universal serial switch output 6 Switch No. 96 to 111 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td><td>96</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 111 | 110 | 109 | 108 | 107 | 106 | 105 | 104 | 103 | 102 | 101 | 100 | 99 | 98 | 97 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 111 | 110 | 109 | 108 | 107 | 106 | 105 | 104 | 103 | 102 | 101 | 100 | 99 | 98 | 97 | 96 | | | | | | | | | | | | | | | | | |
| \$s87 | Universal serial switch output 7 Switch No. 112 to 127 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>127</td><td>126</td><td>125</td><td>124</td><td>123</td><td>122</td><td>121</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td><td>112</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 127 | 126 | 125 | 124 | 123 | 122 | 121 | 120 | 119 | 118 | 117 | 116 | 115 | 114 | 113 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 127 | 126 | 125 | 124 | 123 | 122 | 121 | 120 | 119 | 118 | 117 | 116 | 115 | 114 | 113 | 112 | | | | | | | | | | | | | | | | | |
| \$s88 | Universal serial switch output 8 Switch No. 128 to 143 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>MSB</div><div>LSB</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div>No.<div><table><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td>143</td><td>142</td><td>141</td><td>140</td><td>139</td><td>138</td><td>137</td><td>136</td><td>135</td><td>134</td><td>133</td><td>132</td><td>131</td><td>130</td><td>129</td><td>128</td></tr></table></div></div> | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 143 | 142 | 141 | 140 | 139 | 138 | 137 | 136 | 135 | 134 | 133 | 132 | 131 | 130 | 129 |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | | | | | | | | | | | | | |
| 143 | 142 | 141 | 140 | 139 | 138 | 137 | 136 | 135 | 134 | 133 | 132 | 131 | 130 | 129 | 128 | | | | | | | | | | | | | | | | | |

| Address | Contents | | | | | | | | | | | | | | | | |
|---------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| \$s89 | Universal serial switch output 9 Switch No. 144 to 159 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 159 | 158 | 157 | 156 | 155 | 154 | 153 | 152 | 151 | 150 | 149 | 148 | 147 | 146 | 145 | 144 | |
| \$s90 | Universal serial switch output 10 Switch No. 160 to 175 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 175 | 174 | 173 | 172 | 171 | 170 | 169 | 168 | 167 | 166 | 165 | 164 | 163 | 162 | 161 | 160 | |
| \$s91 | Universal serial switch output 11 Switch No. 176 to 191 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 191 | 190 | 189 | 188 | 187 | 186 | 185 | 184 | 183 | 182 | 181 | 180 | 179 | 178 | 177 | 176 | |
| \$s92 | Universal serial switch output 12 Switch No. 192 to 207 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 207 | 206 | 205 | 204 | 203 | 202 | 201 | 200 | 199 | 198 | 197 | 196 | 195 | 194 | 193 | 192 | |
| \$s93 | Universal serial switch output 13 Switch No. 208 to 223 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 223 | 222 | 221 | 220 | 219 | 217 | 218 | 216 | 215 | 214 | 213 | 212 | 211 | 210 | 209 | 208 | |
| \$s94 | Universal serial switch output 14 Switch No. 224 to 239 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 239 | 238 | 237 | 236 | 235 | 234 | 233 | 232 | 231 | 230 | 229 | 228 | 227 | 226 | 225 | 224 | |
| \$s95 | Universal serial switch output 15 Switch No. 240 to 255 | | | | | | | | | | | | | | | | |
| | MSB | | | | | | | | | | | | | | | LSB | |
| | No. | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | 255 | 254 | 253 | 252 | 251 | 250 | 249 | 248 | 247 | 246 | 245 | 244 | 243 | 242 | 241 | 240 | |
| : | | | | | | | | | | | | | | | | | |

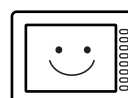
Address \$s0111

This address stores the local port number.

- * The local port number specified for [Specify as a Main] in the [PLC Properties] window is stored.

MEMO

MONITOUCH



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 | | ○ | | | | | |
| | Q170MCP (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) | ○ | ○ | | | | | |
| | ESAK | ○ | ○ | ○ | ○ | | | |
| | ESAK-T | ○ | ○ | ○ | ○ | ○ | | |
| | ESAN/E5EN/E5CN/E5GN | ○ | ○ | ○ | | | | |
| | ESAR/E5ER | ○ | ○ | ○ | | | | |
| | E5CK | ○ | ○ | ○ | ○ | | | |
| | E5CK-T | ○ | ○ | ○ | ○ | ○ | | |
| | E5CN-HT | ○ | ○ | ○ | ○ | ○ | | |
| | E5EK | ○ | ○ | ○ | ○ | | | |
| | E5ZD | ○ | ○ | ○ | ○ | | | |
| | E5ZE | ○ | ○ | ○ | ○ | | | |
| | E5ZN | ○ | ○ | ○ | ○ | | | |
| Oriental Motor | V600/620/680 | ○ | ○ | ○ | | | | |
| | KM20 | ○ | ○ | ○ | ○ | | | |
| Panasonic | KM100 | ○ | ○ | ○ | ○ | | | |
| | V680S (Ethernet TCP/IP) | ○ | ○ | | | | | |
| | High-efficiency AR series (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | CRK series (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | FP Series (RS232C/422) | ○ | ○ | ○ | | | ○ | |
| | FP Series (TCP/IP) | ○ | ○ | | | | | |
| | FP Series (UDP/IP) | ○ | ○ | | | | | |
| | FP-X (TCP/IP) | ○ | ○ | | | | | |
| | FP7 Series (RS232C/422) | ○ | ○ | ○ | ○ | ○ | | |
| RKC | FP7 Series (Ethernet) | ○ | ○ | | | | | |
| | LP-400 | ○ | | ○ | | | | |
| | KW Series | ○ | ○ | ○ | ○ | ○ | | |
| | MINAS A4 series | ○ | ○ | ○ | ○ | ○ | | |
| | 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) | ○ | ○ | ○ | ○ | ○ | | |
| RS Automation | SRV (MODBUS RTU) | ○ | ○ | ○ | | | | |
| | MA900/MA901 (MODBUS RTU) | ○ | ○ | ○ | | | | |
| | SRZ (MODBUS RTU) | ○ | ○ | ○ | | | | |
| | FB100/FB400/FB900 (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | NX7/NX Plus Series (70P/700P/CCU+) | ○ | ○ | ○ | ○ | ○ | ○ | |
| | N7/NX Series (70/700/750/CCU) | ○ | ○ | ○ | | | ○ | |
| | NX700 Series (Ethernet) | ○ | ○ | | | | | |
| | X8 Series | ○ | ○ | ○ | ○ | ○ | ○ | |
| SAIA | X8 Series (Ethernet) | ○ | ○ | | | | | |
| | CSD5 (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| SAMSUNG | Moscon-F50 (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | SPC series | ○ | ○ | ○ | ○ | ○ | ○ | |
| SANMEI | N_plus | ○ | ○ | ○ | ○ | ○ | ○ | |
| | SECNET | ○ | ○ | ○ | | | ○ | |
| SanRex | Cuty Axis | ○ | ○ | ○ | ○ | ○ | | |
| | 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 | ○ | ○ | ○ | | | | |
| | UT520 | ○ | ○ | ○ | | | | |
| Yokogawa Electric | UT350 | ○ | ○ | ○ | | | | |
| | UT320 | ○ | ○ | ○ | | | | |
| | UT2400/2800 | ○ | ○ | ○ | | | | |
| | UT450 | ○ | ○ | ○ | | | | |
| | UT32A/35A (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | UT52A/55A (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | UT75A (MODBUS RTU) | ○ | ○ | ○ | ○ | ○ | | |
| | μR10000/20000 (Ethernet TCP/IP) | ○ | ○ | | | | | |
| | Universal serial | ○ | ○ | | | | | |
| None | 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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