Fuji Electric

MONITOUCH

Connection Manual [2]

Contents

TECHNOSHOT

TS1000 Smart

Record of Revisions

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

Printing Date	Reference No.	Revised Contents
August, 2018	2214NE0	First edition

Preface

Thank you for selecting the MONITOUCH TS1000 Smart.
For correct set-up of the TS1000 Smart, you are requested to read through this manual to understand more about the product.
For more information about the TS1000 Smart, refer to the following related manuals.

Manual Name	Contents	Reference No.
TS Reference Manual [1]	Explains the functions and operation of the TS.	1065NE
TS Reference Manual [2]		1066NE
V Series Macro Reference	Provides an overview of macros and explains macro editor operations and macro command descriptions in detail.	1056NE
TS1000 Smart Connection Manual [1]	Explains the connection and communication parameters for the TS1000 Smart and controllers in detail. Included Makers A&D, Agilent, ALLEN BRADLEY, Automationdirect, Azbil, Banner, Baumuller, BECKHOFF, Bosch Rexroth, CHINO, CIMON, DELTA, DELTA TAU DATA SYSTEMS, EATON Cutler-Hammer, EMERSON, FANUC, FATEK AUTOMATION, FESTO, FUFENG, Fuji Electric, Gammaflux, GE Fanuc, High-Pressure Gas Industry, Hitachi, Hitachi Industrial Equipment Systems, HYUNDAI	2213NE
TS1000 Smart Connection Manual [2]	Explains the connection and communication parameters for the TS1000 Smart and controllers in detail. Included Makers IAI, IDEC, Jetter, JTEKT, KEYENCE, KOGANEI, KOYO ELECTRONICS, Lenze, LS, MITSUBISHI ELECTRIC, MODICON, MOELLER, MOOG, M-SYSTEM, OMRON, Oriental Motor, Panasonic, RKC, RS Automation	2214NE
TS1000 Smart Connection Manual [3]	Explains the connection and communication parameters for the TS1000 Smart and controllers in detail. Included Makers SAIA, SAMSUNG, SanRex, SANMEI, SHARP, SHIMADEN, SHINKO TECHNOS, Siemens, SINFONIA TECHNOLOGY, SUS, TECO, Telemecanique, TOHO, Tokyo Chokoku Marking Products, TOSHIBA, TOSHIBA MACHINE, TOYO DENKI, TURCK, ULVAC, Ultra Instruments, UNIPULSE, UNITRONICS, VIGOR, WAGO, XINJE, YAMAHA, Yaskawa Electric, Yokogawa Electric, MODBUS, Barcode Reader, Slave Communication Function, Universal Serial Communication	2215NE
TS1000 Smart Hardware Specifications	Explains hardware specifications and precautions when handling the TS1000 Smart.	2216NE

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

TS Types and Model Names

The notations used in this manual and the corresponding models are as shown below.

Notation	Model
TS	TS1100Si, TS1070Si, TS1070S
TSi	TS1100Si, TS1070Si
TS1000 Smart	TS1100Si, TS1070Si, TS1070S
TS1000S	

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 TS1000S 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.
- 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 TS1000S 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 TS1000S will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Tighten the mounting screws on the fixtures of the TS1000S uniformly to the specified torque. Excessive tightening may deform 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 TS1000S to an equal torque of 4 lbf-in (0.45 N·m). Improper tightening of screws may result in fire, malfunction, or other serious trouble.
- The TS1000S 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 TS1000S in accordance with the specified voltage and wattage. Overvoltage, overcurrent, overwattage, or incorrect cable connection could cause fire, malfunction, or damage to the unit.
- Do not use a positive ground for the 24-V power supply to the TS1000S. If a positive ground is used and an external communication device such as a computer is connected, the 24-V power supply may short circuit and cause damage. If a positive ground is unavoidable, refer to "Positive Grounding" in the TS1000 Smart Hardware Specifications.
- Prevent any conductive particles from entering the TS1000S. Failure to do so may lead to fire, damage, or malfunction.

⚠CAUTION

- Do not attempt to repair the TS1000S yourself. Contact Hakko Electronics or the designated contractor for repairs.
- Do not repair, disassemble, or modify the TS1000S. 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 TS1000S 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 TS1000S, it must be treated as industrial waste.
- Before touching the TS1000S, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- Never remove a storage device (USB flash drive) when the storage device is being accessed. Doing so may destroy the data on the storage device. Only remove a storage device when the Main Menu screen is displayed or after pressing the [Storage Removal] switch.
- 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.

[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 TS1000S 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 TS1000S in the correct orientation. Failure to do so may lead to damage or malfunction.
- Do not use thinners for cleaning because it may discolor the TS1000S 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 TS1000S 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 TS1000S. 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 TS1000S 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 TS1000S may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the characteristics of liquid crystal.
- Each unit varies slightly with respect to brightness and colors.

Contents

16. OMRON

17. Oriental Motor

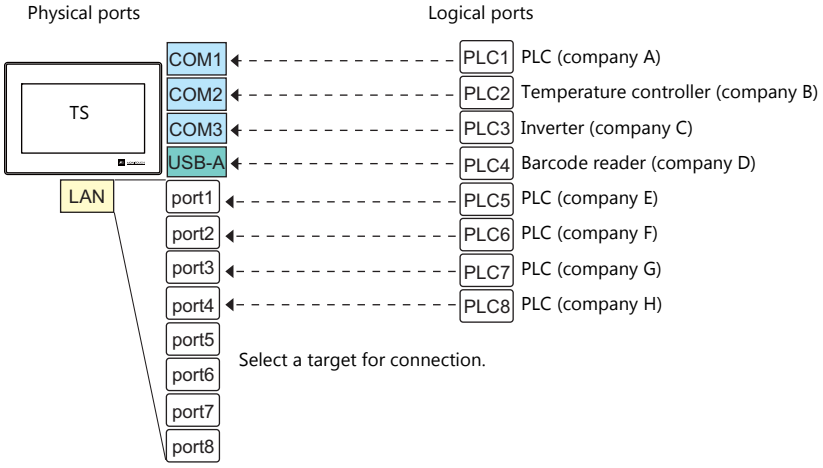
18. Panasonic

1. Overview

1.1 System Configuration

1.1.1 Overview

The TS series is equipped with six physical ports consisting of three serial ports, one LAN port, one USB-A port, and one USB-miniB port. The LAN port can open eight ports simultaneously. Through these ports, the TS series can be connected to a maximum of eight different models of devices and communicate with them at the same time. Communicating in this manner is called 8-way communication.



Physical Ports			Number of Ports	Applicable Devices		Remarks
				8-way Communication	Other than 8-way	
Serial	COM1	RS-422/485	1	PLC, temperature controller, servo, inverter, V-Link, slave communication (Modbus RTU)	-	
	COM2	RS-232C	1	PLC, temperature controller, servo, inverter, barcode reader, V-Link, slave communication (Modbus RTU)	Serial printer	The same connector is used for COM2 and COM3.
	COM3	RS-485 (2-wire)	1	PLC, temperature controller, servo, inverter, V-Link, slave communication (Modbus RTU)	-	
Ethernet	LAN		8	PLC, slave communication (Modbus TCP/IP)	Computer, network camera, VNC client	TSi only
USB	USB-A		1	Barcode reader	Printer (EPSON STYLUS PHOTO series), USB flash drive, keyboard, mouse, USB-hub	
	USB-miniB		1	-	Printer (PictBridge), computer (screen program transfer)	

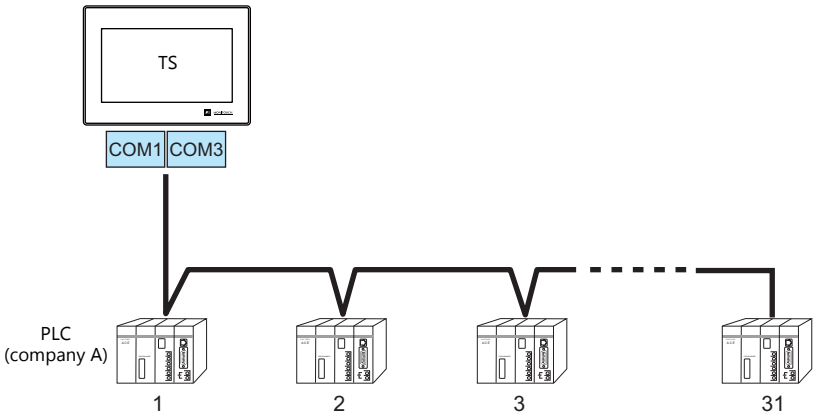
- Only the logical port PLC1 can be selected for the following devices and functions. Thus, they cannot be connected at the same time.
  - Devices
    Without PLC connection, Allen-Bradley Control Logix, Siemens S7-200PPI,
    Siemens S7-300/400 MPI connection
  - Functions
    Multi-link2, multi-link, ladder transfer, ladder monitor, Micrex SX variable name cooperation function

1.1.2 System Composition

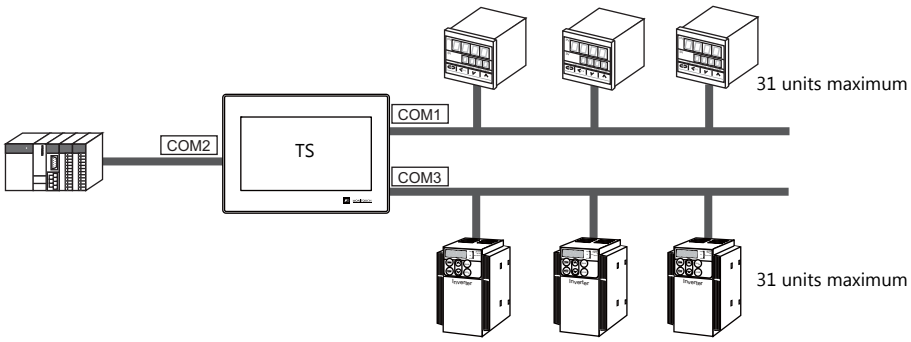
Serial Communication

- 1 : 1 Connection
  A communication port is selectable from COM1, COM2, and COM3.
  For more information, refer to "1 : 1 Connection" (page 1-9) in "1.3 Connection Methods".

- 1 : n Connection
  A communication port is selectable from COM1 and COM3. 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 1-15) in "1.3 Connection Methods".



- 3-way Connection
  The TS can 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 of the COM1 and COM3 ports.
  The connection method is the same as those for 1 : 1 and 1 : n connection.

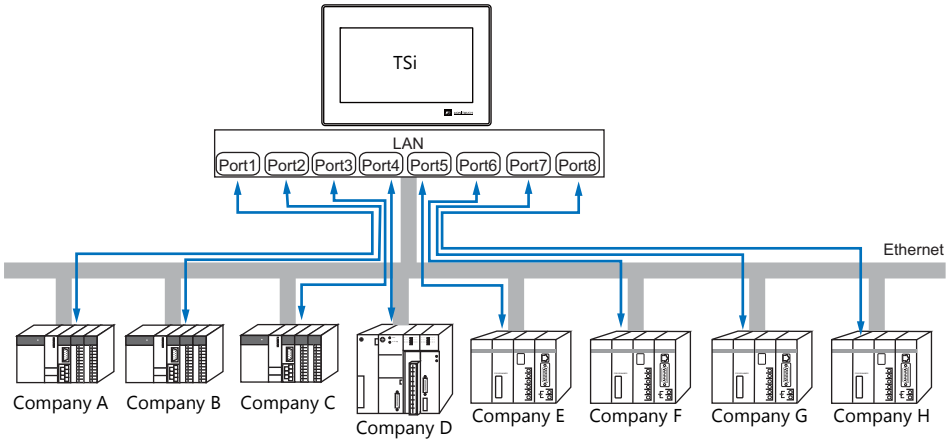


- n : 1 Connection
  Multiple TS units can be connected to one PLC or temperature controller.
  For more information, refer to "n : 1 Connection (Multi-link2)" (page 1-18), "n : 1 Connection (Multi-link2 (Ethernet)) (TS1100Si/TS1070Si Only)" (page 1-24), "n : 1 Connection (Multi-link)" (page 1-30) in "1.3 Connection Methods".

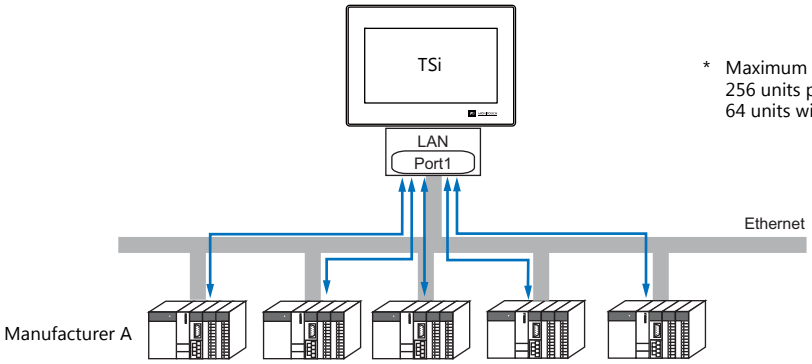
- n : n Connection
  Multiple TS units can be connected to multiple PLCs.
  For more information, refer to "n : n Connection (1 : n Multi-link2 (Ethernet)) (TS1100Si/TS1070Si Only)" (page 1-27) in "1.3 Connection Methods".

Ethernet Communication (TS1100Si/TS1070Si Only)

Because eight communication ports can be opened, the TSi 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 TSi is allowed to carry out 1 : n communication via one port.



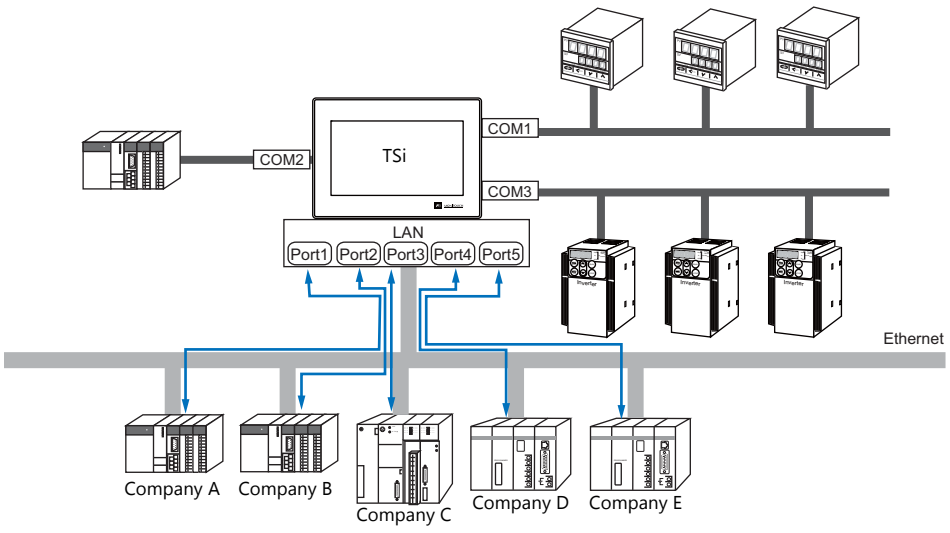
* Maximum units:
256 units per port for UDP/IP
64 units with eight ports for TCP/IP

* For more information, refer to "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)" (page 1-34) in "1.3 Connection Methods".

Mixed Serial-Ethernet Communication (TS1100Si/TS1070Si Only)

In the case of mixed serial-Ethernet communication, the TSi 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 (TS1100Si/TS1070Si Only)".

1.2 Physical Ports

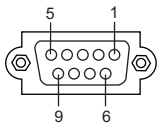
1.2.1 COM1

This connector is used to connect controllers via RS-422 (4-wire system) or RS-485 (2-wire system).

Use DIP switches 2 and 3 to switch between RS-422 (4-wire system) and RS-485 (2-wire system).
Sliding the DIP switches to ON connects +RD with +SD (pins 1 and 4) and -RD with -SD (pins 2 and 3) in the TS unit.
For more information on DIP switches, see "1.2.5 DIP Switch (DIPSW) Setting" (page 1-8).

- RS-422 (4-wire system): DIP switches 2 and 3 OFF
- RS-485 (2-wire system): DIP switches 2 and 3 ON

Pin Arrangement

COM1 Dsub 9pin, Female	Pin No.	Signal	RS-422/ RS-485
	1	+RD	Receive data (+)
	2	–RD	Receive data (–)
	3	–SD	Send data (–)
	4	+SD	Send data (+)
	5	SG	Signal ground
	6	NC	Not used
	7	NC	Not used
	8	NC	Not used
	9	NC	Not used

Recommended Connector for Communication Cable

Recommended Connector	
DDK's 17JE-23090-02(D8C)-CG	D-sub 9-pin, male, inch screw thread (#4-40UNC), with hood, lead and cadmium-free type

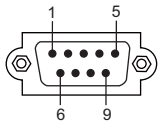
Applicable Devices

Applicable Devices
PLC, temperature controller, inverter, servo, V-Link, slave communication (Modbus RTU)

1.2.2 COM2/COM3

This connector is used to connect controllers via RS-232C or RS-485 (2-wire system).
Communications via RS-232C (COM2) and RS-485 (COM3) can take place at the same time.

Pin Arrangement

COM2/COM3 D-sub 9-pin, Male	Pin No.	RS-232C(COM2)		RS-485(COM3)	
		Signal	Contents	Signal	Contents
	1	-	-	–SD/RD	Send/receive data (–)
	2	RD	Receive data	-	-
	3	SD	Send data	-	-
	4	NC	Not used	-	-
	5	SG	Signal ground	-	-
	6	-	-	+SD/RD	Send/receive data (+)
	7	RTS	Request to send	-	-
	8	CTS	Permission to send	-	-
	9	-	-	SG	Signal ground

Recommended Connector for Communication Cable

Recommended Connector	
DDK's 17JE-23090-02(D8C)A-CG	D-sub 9-pin, female, inch screw thread (#4-40UNC), with hood, lead and cadmium-free type

Applicable Devices

Applicable Devices
PLC, temperature controller, inverter, servo, barcode reader, V-Link, slave communication (Modbus RTU)

1.2.3 LAN (TS1100Si/TS1070Si Only)

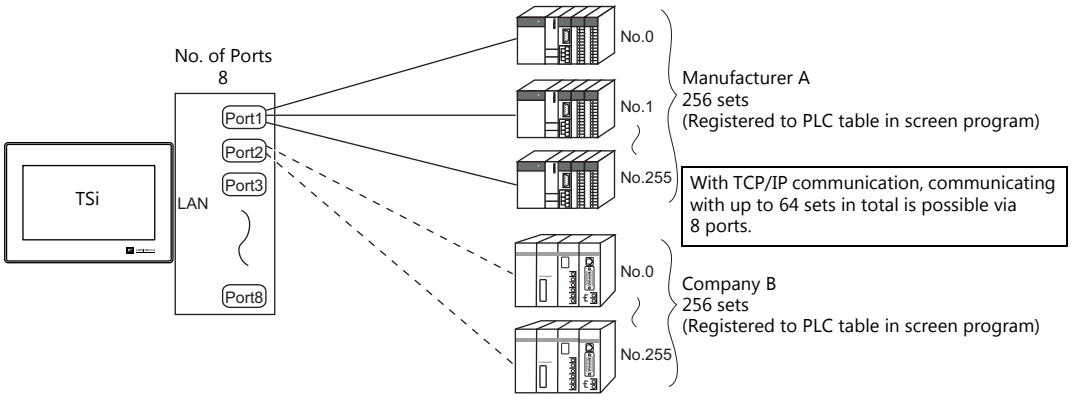
CAUTION

- Only the TS1100Si and TS1070Si are equipped with a LAN connector. Ethernet communication is not possible with the TS1070S.

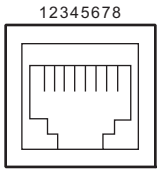
LAN Port Specifications

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

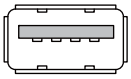
LAN RJ-45	No.	Name	Contents
	1	TX+	Send signal +
	2	TX–	Send signal –
	3	RX+	Receive signal +
	4	NC	Not used
	5		
	6	RX–	Receive signal –
	7	NC	Not used
	8		

Applicable Devices

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

1.2.4 USB

USB Port Specifications

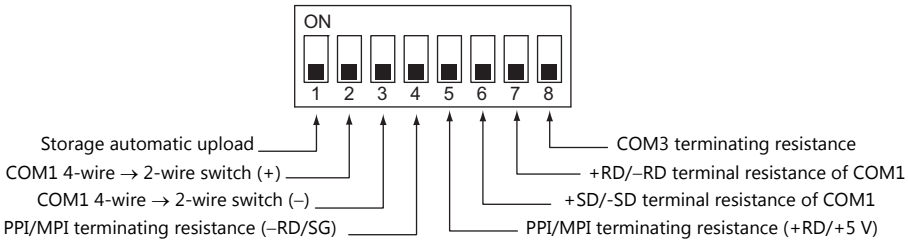
Item		Specifications
USB-A 	Applicable standards	USB versions 2.0
USB mini-B 	Baud Rate	High-speed 480 Mbps / Full-speed 12 Mbps / Low-speed 1.5 Mbps

Applicable Devices

Port	Applicable Devices
USB-A	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)

1.2.5 DIP Switch (DIPSW) Setting

DIP switches 1 to 8 are mounted. Turn off the power when setting DIP switches.
All the DIP switches are factory-set to OFF before shipment.



DIPSW1* (Storage automatic upload)

Set this DIP switch to ON when automatically uploading the screen program from the storage such as a USB flash drive. For more information, refer to the TS1000 Smart Hardware Specifications manual.

* Set the DIPSW1 to OFF whenever automatic upload is not performed.

DIPSW2 and DIPSW3 (COM1 4-wire → 2-wire switch)

Setting these DIP switches to ON connects +RD with +SD (pins 1 and 4) and -RD with -SD (pins 2 and 3) in the TS unit.

- Set DIPSW2 and 3 to ON when connecting a controller to COM1 via RS-422/485 (2-wire system).
- Set DIPSW2 and 3 to OFF when connecting a controller to COM1 via RS-422/485 (4-wire system).

DIPSW4 and DIPSW5 (PPI/MPI terminating resistance setting)

Set DIPSW4 and 5 to ON when connecting a Siemens PLC (PPI/MPI) to COM1.

DIPSW6, DIPSW7, and DIPSW8 (terminating resistance setting)

- Set DIPSW7 to ON when connecting a controller to COM1 via RS-422/485 (2-wire system).
- Set DIPSW6 and 7 to ON when connecting a controller to COM1 via RS-422/485 (4-wire system).
- Set DIPSW8 to ON when connecting a controller to COM3 via RS-422/485 (2-wire system).

1.3 Connection Methods

1.3.1 Serial Communication

1 : 1 Connection

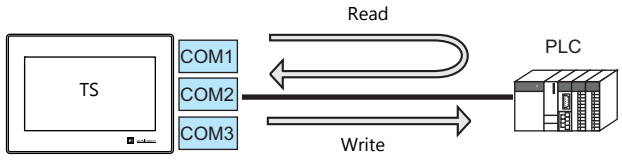
Overview

- One set of the TS 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 COM1, COM2, and COM3.

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 TS (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 TS 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.

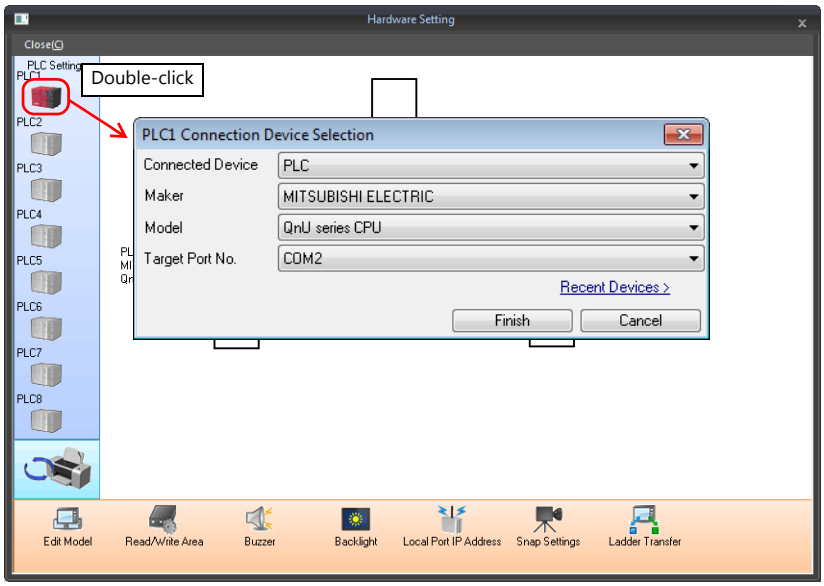


V-SFT Ver. 6 Settings

Hardware Settings

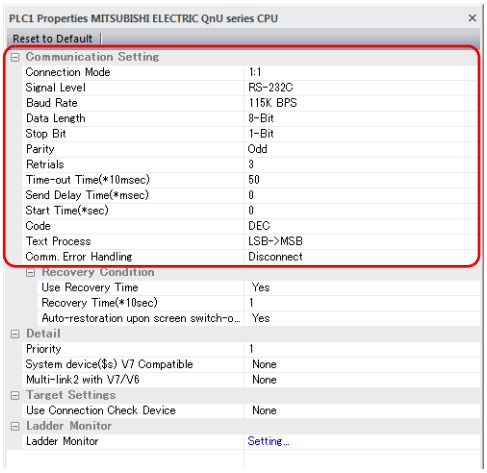
Selecting a device to be connected

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 1-40).

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.

COM1

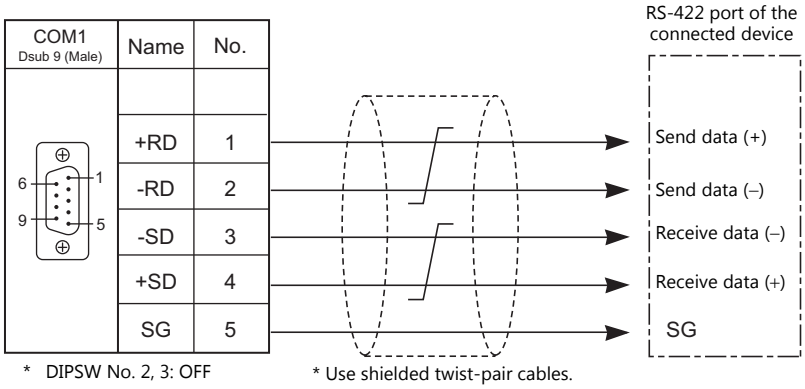
Use DIP switches 2 and 3 to switch between RS-422 and RS-485.
Sliding the DIP switches to ON connects +RD with +SD (pins 1 and 4) and -RD with -SD (pins 2 and 3) in the TS unit.
For more information on DIP switches, see "1.2.5 DIP Switch (DIPSW) Setting" (page 1-8).

- RS-422 (4-wire system): DIP switches 2 and 3 OFF
- RS-485 (2-wire system): DIP switches 2 and 3 ON

RS-422/485 connection

- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- Connect +SD with –SD and +RD with –RD, respectively, using a twist-pair cable.
- If the PLC has the terminal for signal ground (SG), connect a wire.
- To use a terminal block for connection, use Hakko Electronics' "TC-D9" optionally available.
- DIP switches on the back of the TS unit are used to set the terminating resistance. For more information, see "1.2.5 DIP Switch (DIPSW) Setting" (page 1-8).

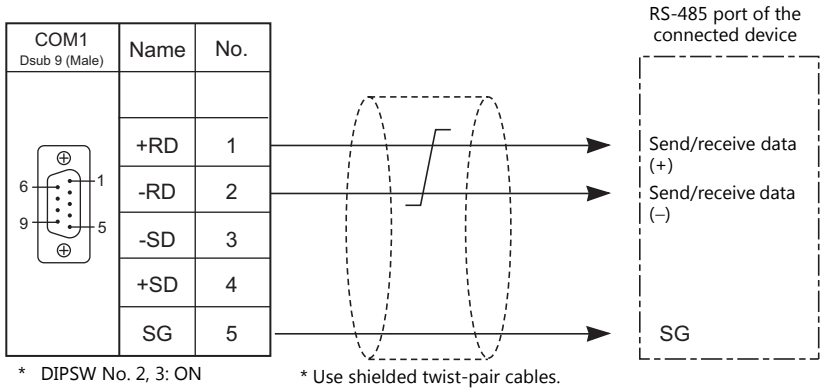
- RS-422 (4-wire system)



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

- RS-485 (2-wire system)

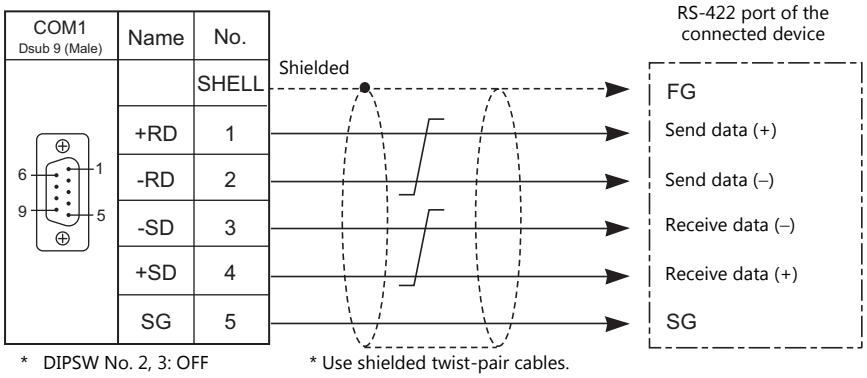


* DIPSW No. 2, 3: ON

* Use shielded twist-pair cables.

- If noise disturbs communications, connect a shielded cable to the "SHELL" connector of the TS unit, or between the FG terminal of the connected device and the "SHELL" connector of the TS unit.

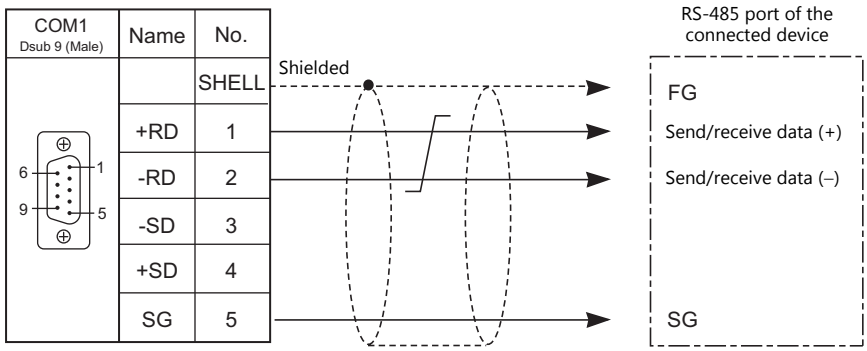
  - RS-422 (4-wire system)



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

  - RS-485 (2-wire system)



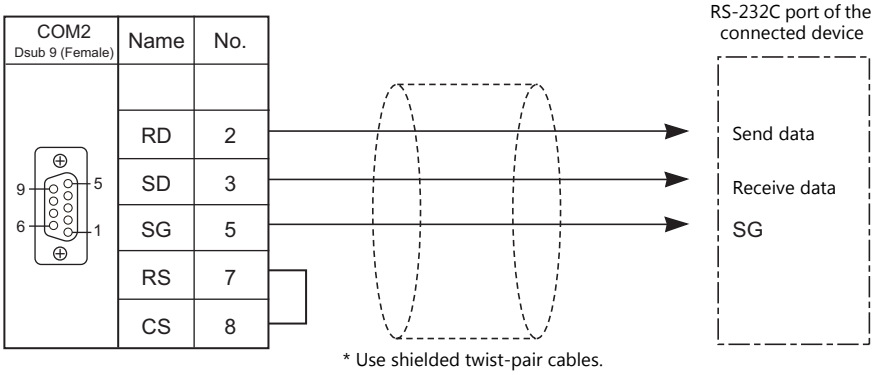
* DIPSW No. 2, 3: ON

* Use shielded twist-pair cables.

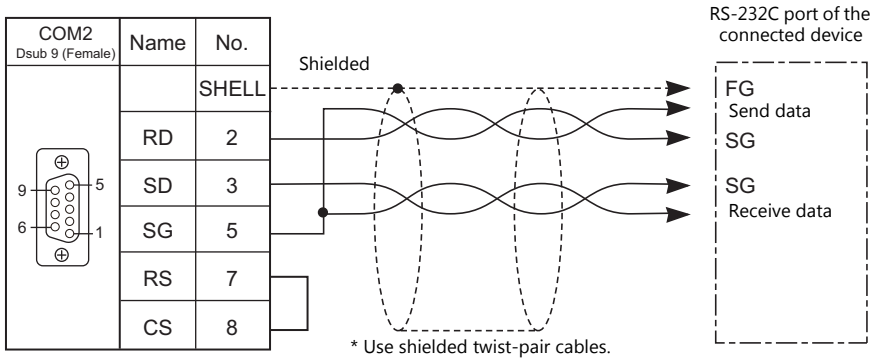
COM2

RS-232C connection

- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.



- If noise disturbs communications, establish connections between SD and SG and between RD and SG, respectively, using a twist-pair cable, and connect a shielded cable to the "SHELL" connector of the TS unit, or between the FG terminal of the connected device and the "SHELL" connector of the TS unit.

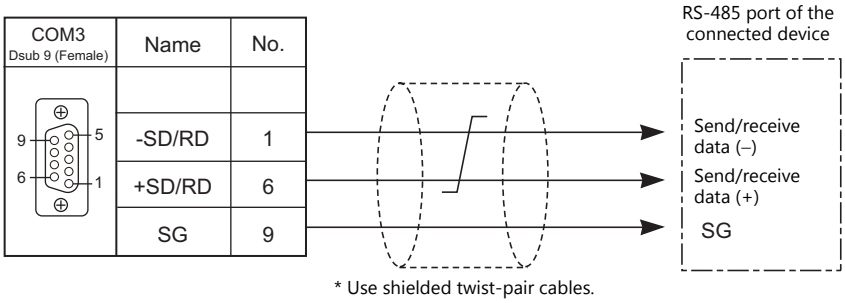


COM3

RS-485 connection

- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- DIP switches on the back of the TS unit are used to set the terminating resistance.
  For more information, see "1.2.5 DIP Switch (DIPSW) Setting" (page 1-8).

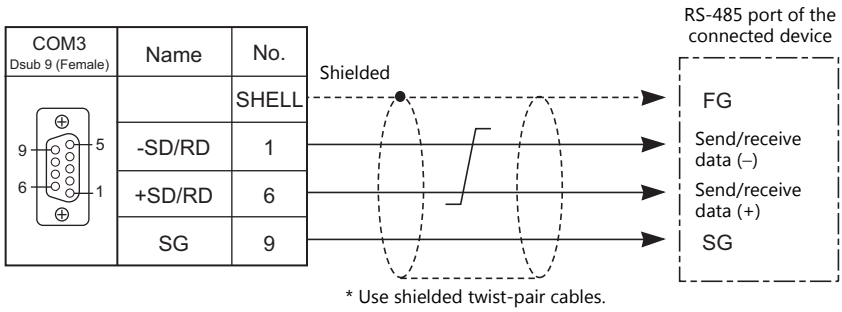
  - RS-485 (2-wire system)



* Use shielded twist-pair cables.

- If noise disturbs communications, connect a shielded cable to the "SHELL" connector of the TS unit, or between the FG terminal of the connected device and the "SHELL" connector of the TS unit.

  - RS-485 (2-wire system)

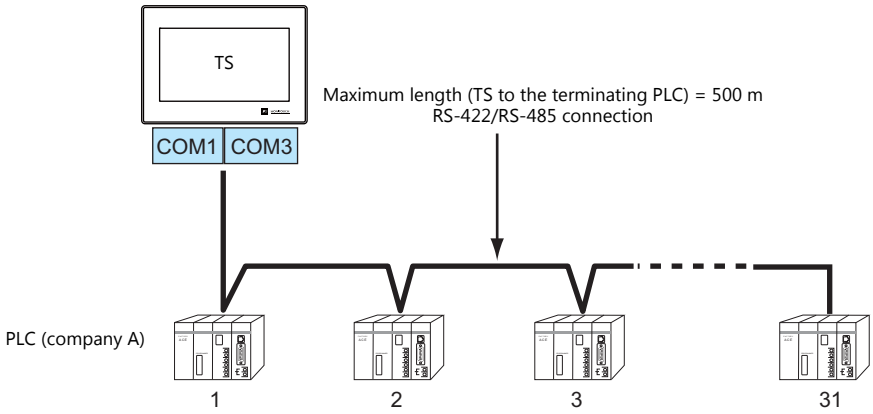


* Use shielded twist-pair cables.

1 : n Connection (Multi-drop)

Overview

- Multi-drop connection connects one TS unit to multiple PLCs of the same model as 1 : n connection. (Maximum connectable PLCs: 31)
- You can make settings for 1:n communication in the [Communication Setting] tab window for the logical ports PLC1 - PLC8. Select either COM1 or COM3 as the communication port. Note that COM1 supports only RS-422 (4-wire system) connection.



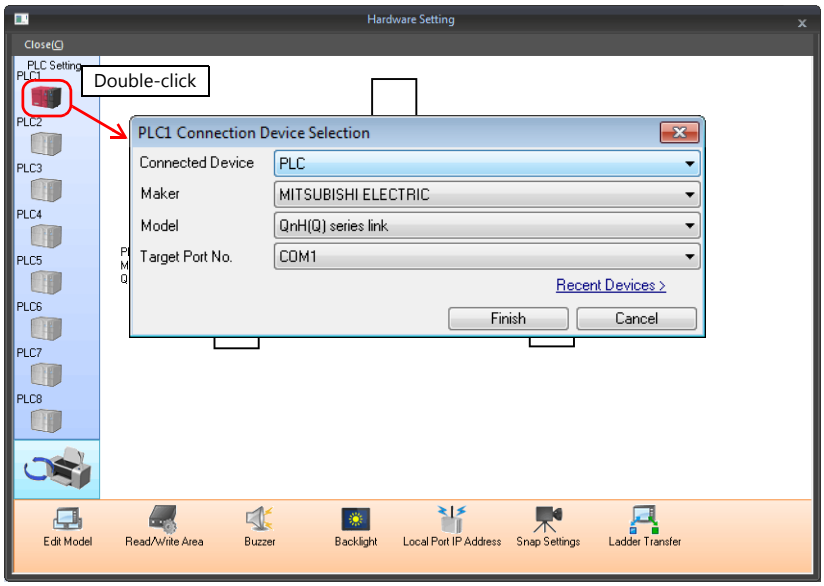
- For models that support multi-drop connection, refer to the list provided at the end of this manual or the chapters on individual manufacturers.

V-SFT Ver. 6 Settings

Hardware Settings

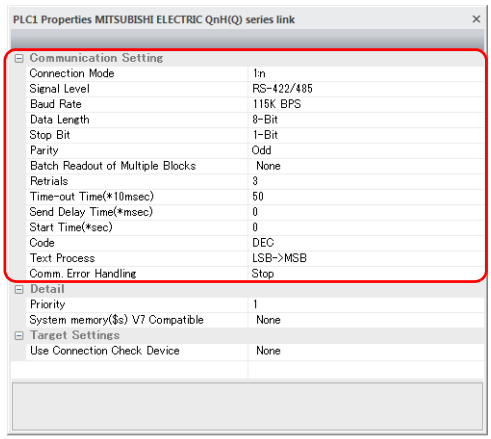
Selecting a device to be connected

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 1-40).

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

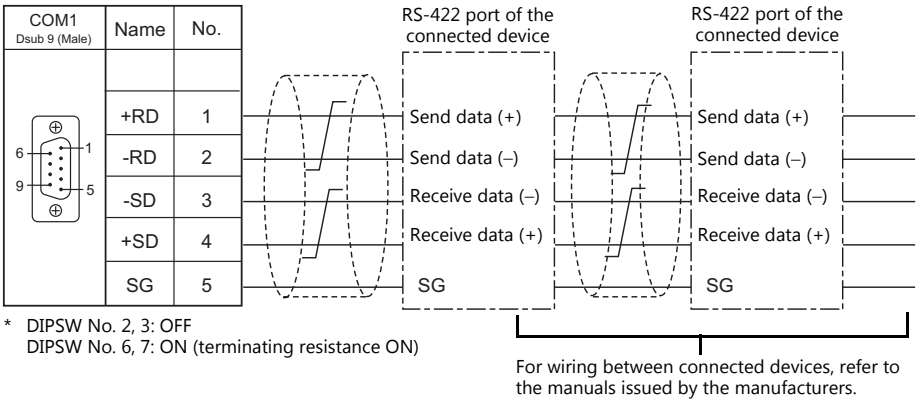
DANGER Be sure to turn off the power before connecting cables. Otherwise, electrical shock or damage may occur.

COM1

The wiring between a TS 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.

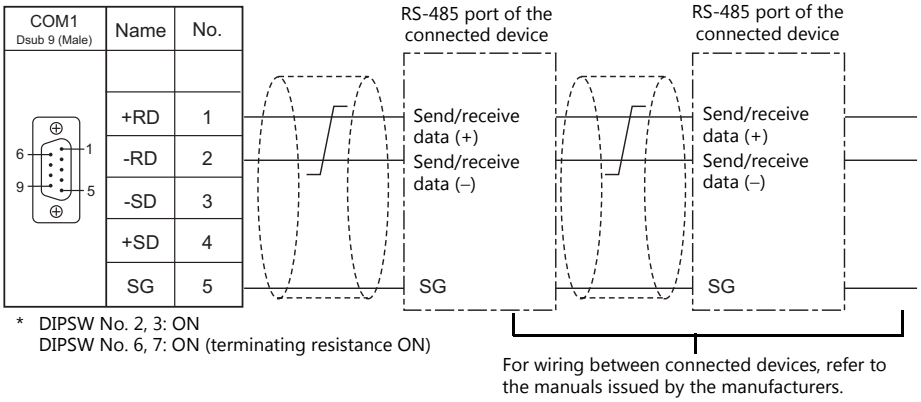
RS-422 (4-wire system) connection

- Connection example



RS-485 (2-wire system) connection

- Connection example

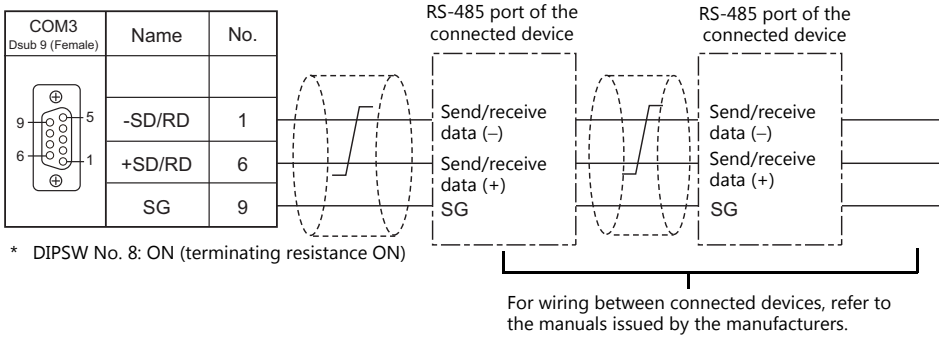


COM3

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

RS-485 (2-wire system) connection

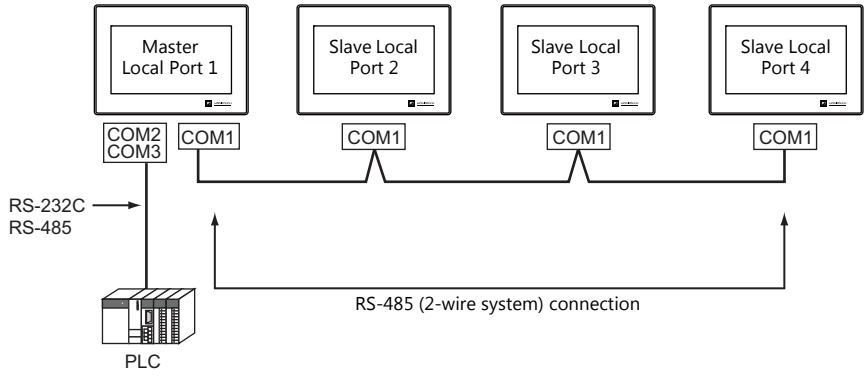
- Connection example



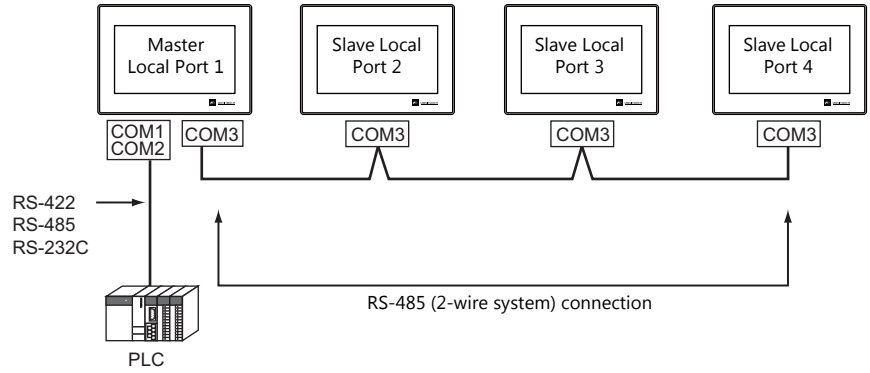
n : 1 Connection (Multi-link2)

Overview

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



  - Connection example 2:

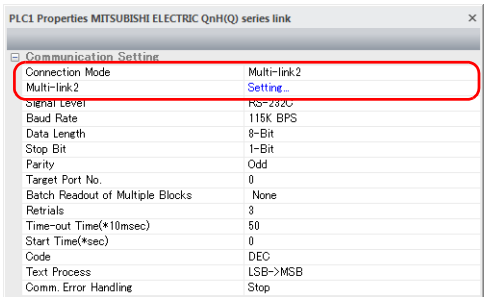


- You can make settings for multi-link2 in the [Communication Setting] tab window for PLC1.
- Multi-link2 enables PLC1 device memory data to be shared among the TS units. However, sharing data of PLC2 - PLC8 is not possible.
- V7 and V6 cannot be concurrently used with the TS series. However, S8, V8, and TS2060 can be used with the TS series.
  * The V7 and V6 series can be used together with certain PLC models. For more information, refer to “Multi-link2 with V7/V6” (page 1-20).
- The communication speed between the master and the PLC depend on the setting made on the PLC. The maximum communication speed between TS units is 115 kbps, which is higher than the one available with multi-link connection described in “n : 1 Connection (Multi-link)” (page 1-30).
- For PLCs that support multi-link2 connection, see the 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.
- 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 1-9).

PLC Properties

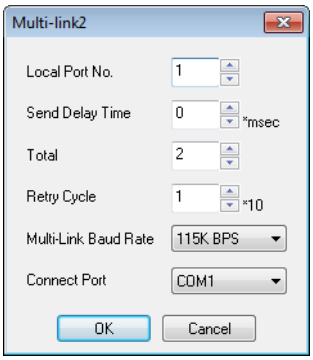


Item		Contents
Communication Setting	Connection Mode	Multi-link2
	Multi-link2	Click [Setting] to display the [Multi-link2] dialog, then make the necessary settings in this dialog. For more information on settings, see "Multi-link2" (page 1-19).
Detail	Multi-link2 with V7/V6	Select this when multi-link2 is used for connecting the TS together with V7 or V6 units. For more information, see "Multi-link2 with V7/V6" (page 1-20).
	Multi-link2 with V9	Select this when multi-link2 is used for connecting the TS together with V9 units.

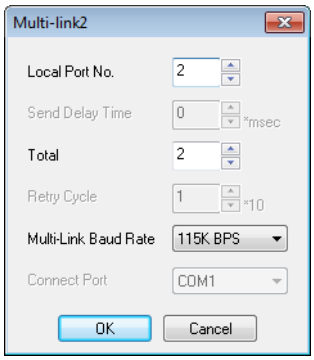
Multi-link2

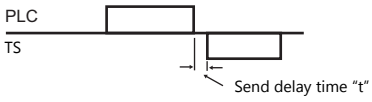
For a master, set all of the items. For a slave, set only those items marked "♦".

- Master



- Slave



Item	Contents
Local Port No.♦	1 to 4 Specify a port number of the TS. 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 TS unit, the system will not operate correctly.
Send Delay Time	Specify a delay time that elapses before the TS 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 TS units connected in the multi-link2 connection. The setting must be the same as other TS 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 TS units. The setting must be the same as other TS units on the same communication line.
Connect Port	COM1/COM3 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

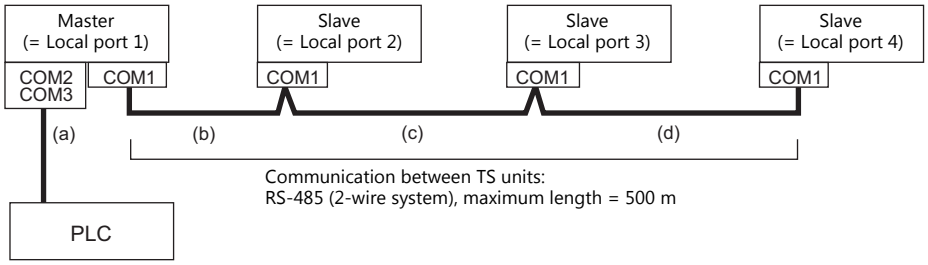
PLC models that support connection together with the V7 and V6 series are listed below.

Manufacturer	PLC Selection on Editor
MITSUBISHI ELECTRIC	A series link QnA series link 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) 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 COM1 port of the master with the COM1 ports of the slaves

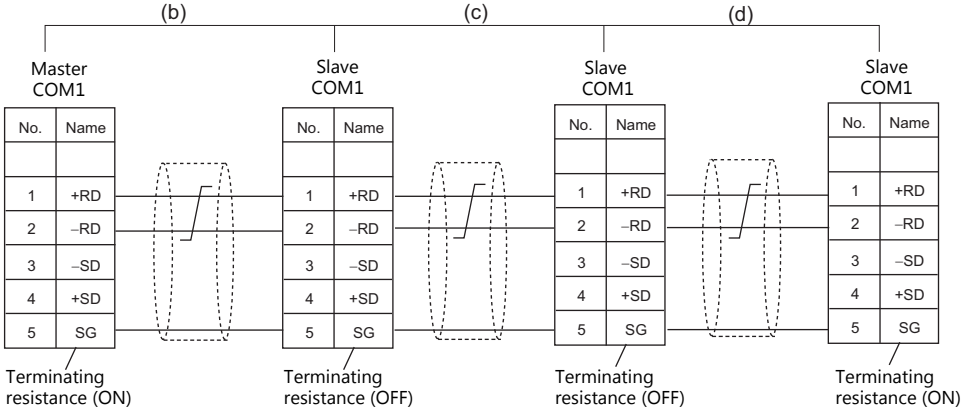


(a) Master ↔ PLC connection
Select either connection port COM2 or COM3.
The communication settings and connection method are the same as that for 1 : 1 connection.

(b)(c)(d)Master ↔ slaves connection
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.

Wiring diagram

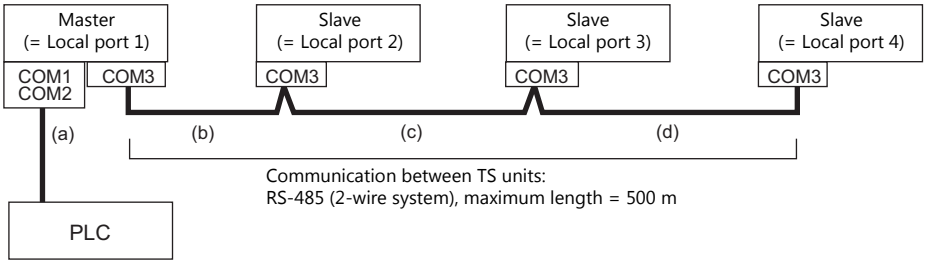
- DIPSW No. 2, 3: ON (COM1 RS-485: 2-wire connection)
- DIPSW No. 7: Terminal resistance setting



* For master-to-PLC connection via COM3, also set the DIPSW 8 to ON on the master.

Connection Method 2

Connecting the COM3 port of the master with the COM3 ports of the slaves

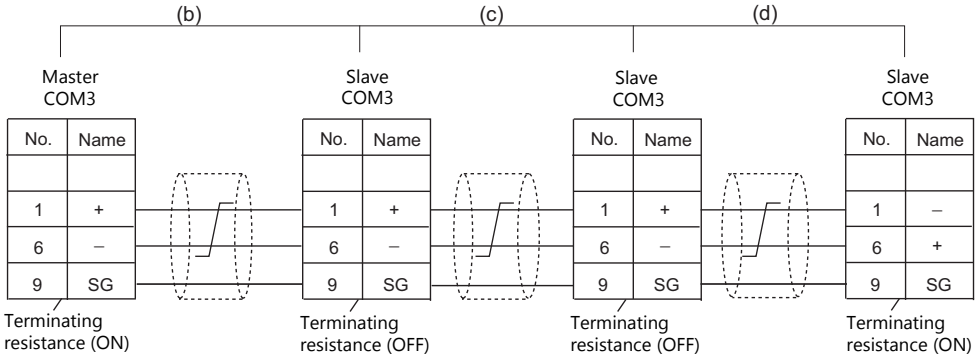


(a) Master ↔ PLC connection
Select either connection port COM1 or COM2.
The communication settings and connection method are the same as that for 1 : 1 connection.

(b)(c)(d)Master ↔ slaves connection
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.

Wiring diagram

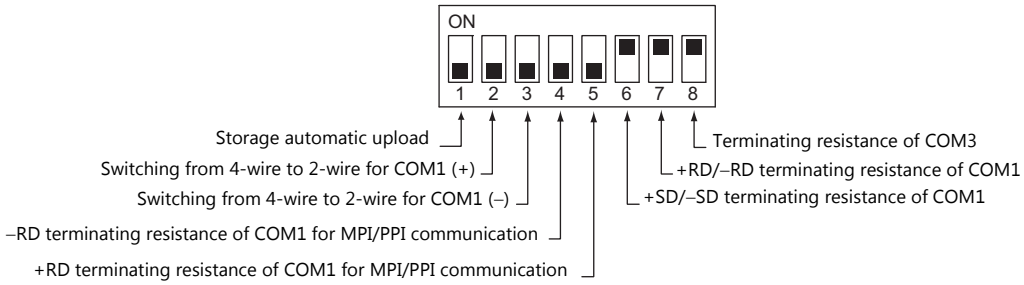
- DIPSW No. 8: Terminating resistance setting



* For master-to-PLC connection via COM1 based on RS-422 (4-wire system), also set the DIPSW 6 and 7 to ON on the master.
For master-to-PLC connection via COM1 based on RS-485 (2-wire system), also set the DIPSW 2, 3, and 7 to ON on the master.

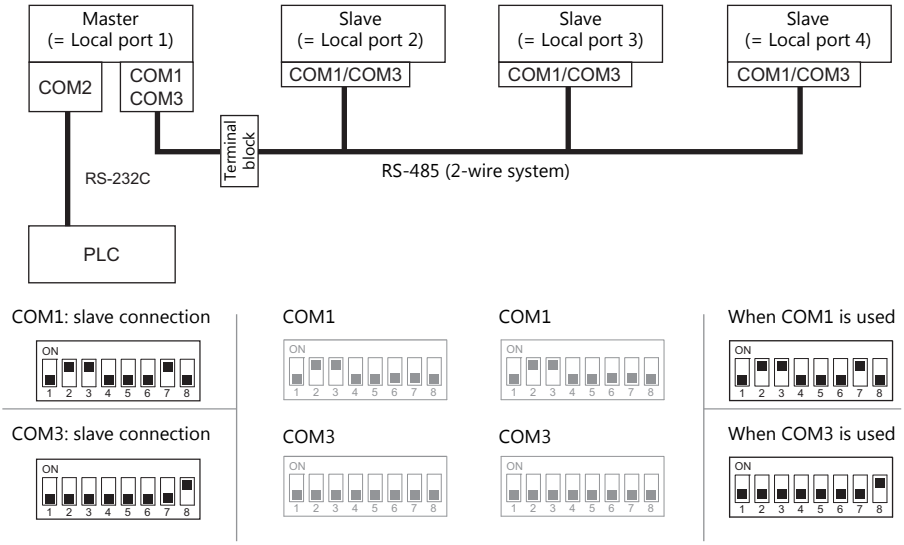
Terminating Resistance Setting

The terminating resistance should be set using the DIP switch.



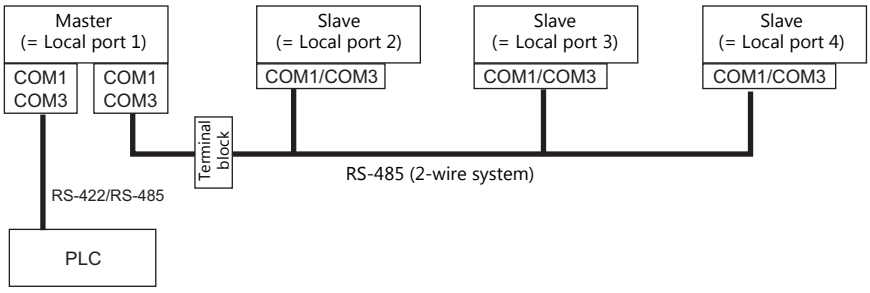
When the PLC is connected to the master via RS-232C:

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



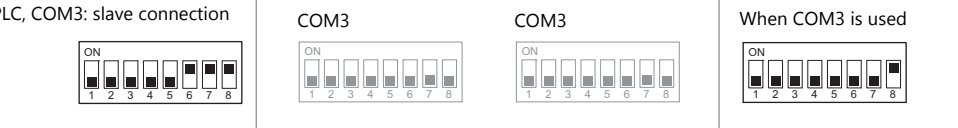
When the PLC is connected to the master via RS-422/RS-485:

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



- RS-485
  COM1: PLC, COM3: slave connection
  COM3: PLC, COM1: slave connection

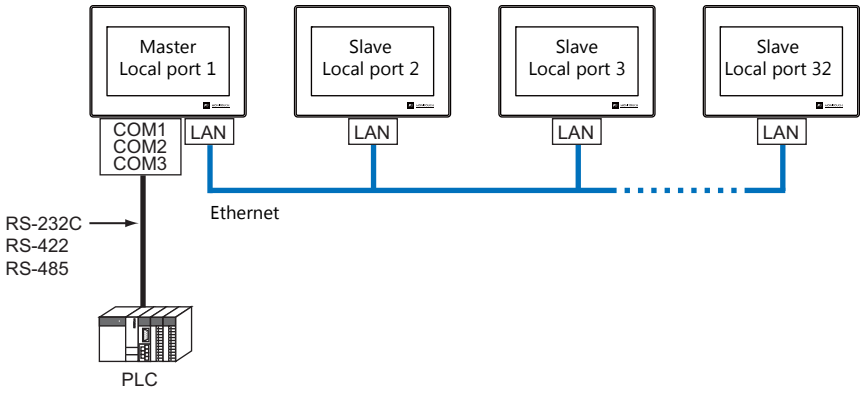
- RS-422
  COM1: PLC, COM3: slave connection



n : 1 Connection (Multi-link2 (Ethernet)) (TS1100Si/TS1070Si Only)

Overview

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



- You can make settings for multi-link2 (Ethernet) in the [Communication Setting] tab window for PLC1.
- Multi-link2 (Ethernet) enables PLC1 device memory data to be shared among the TS units. However, sharing data of PLC2 - PLC8 is not possible.
- S8, V7, and V6 cannot be concurrently used with the TS series.
- The communication speed between the master station and the PLC depends on the setting made on the PLC; however, communication among TS units is performed via Ethernet, thus, high-speed communication is possible among them.
- For PLCs that support multi-link2 (Ethernet) connection, see the list provided at the end of this manual.
  The method for connecting a master TS and a PLC is the same as that 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.

Available Models

Available TS models

Model	Communication Port between Master and Slave	Protocol
TS1100Si TS1070Si	Built-in LAN	UDP/IP

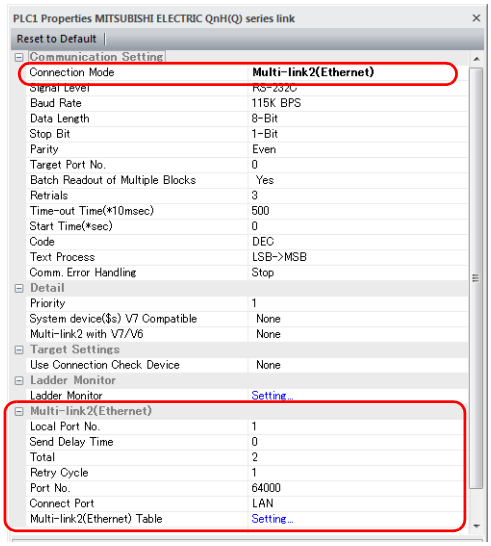
Available PLC models

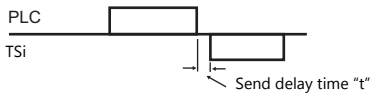
For details, see "Connection Compatibility List" provided at the end of this manual.

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 1-9).

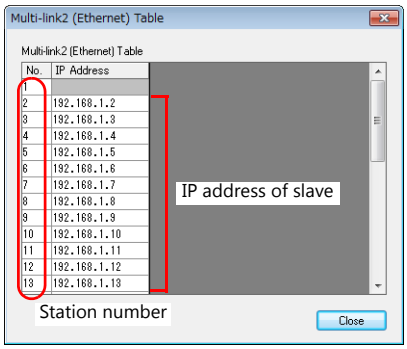
PLC Properties



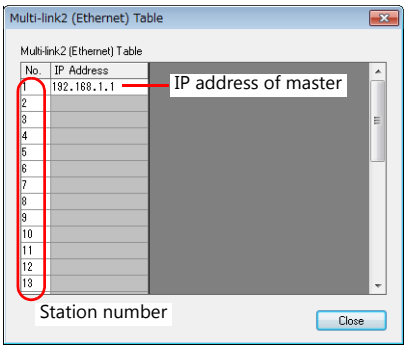
Item		Contents
Communication Setting	Connection Mode	Multi-link2 (Ethernet)
Multi-link2 (Ethernet)	Local Port No.	1: Master 2 to 32: Slave * Note that if the port number specified is the same as that already set for another TSi unit, the system will not operate correctly.
	Send Delay Time	Specify a delay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

Multi-link2 (Ethernet) table

- Master



- Slave



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

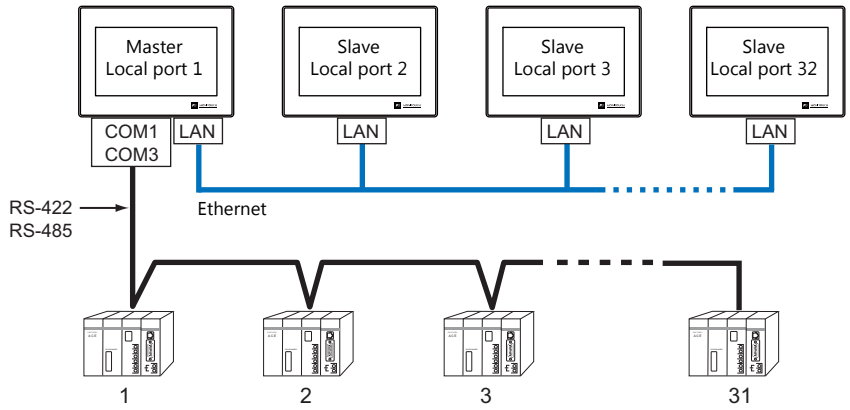
Wiring

The connection between the master and the PLC is the same as the one for 1 : 1 connection. Refer to “Wiring” (page 1-11) in “1 : 1 Connection”.
Use a LAN cable to connect a master with slaves.

n : n Connection (1 : n Multi-link2 (Ethernet)) (TS1100Si/TS1070Si Only)

Overview

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



- You can make settings for 1 : n multi-link2 (Ethernet) in the [Communication Setting] tab window for PLC1.
- 1 : n multi-link2 (Ethernet) enables PLC1 device memory data to be shared among the TS units. However, sharing data of PLC2 - PLC8 is not possible.
- S8, V7, and V6 cannot be concurrently used with the TS series.
- The communication speed between the master station and the PLC depends on the setting made on the PLC; however, communication among TS units is performed via Ethernet, thus, high-speed communication is possible among them.
- For PLCs that support 1 : n multi-link2 (Ethernet) connection, see the list provided at the end of this manual.
  The method for connecting a master TS and a PLC is the same as that 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.

Available Models

Available TS models

Model	Communication Port between Master and Slave	Protocol
TS1100Si TS1070Si	Built-in LAN	UDP/IP

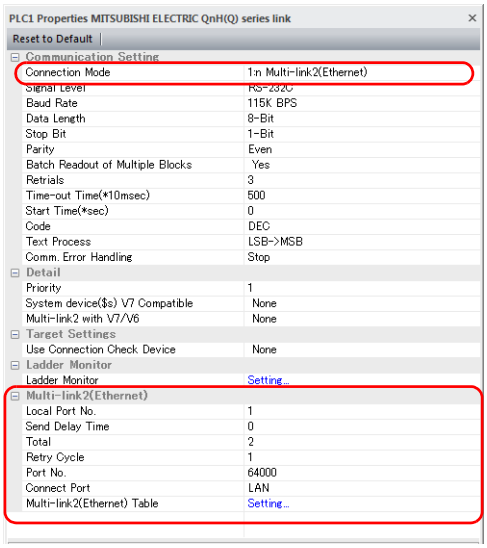
Available PLC models

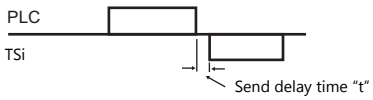
For details, see "Connection Compatibility List" provided at the end of this manual.

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 1-15) in “1 : n Connection (Multi-drop)”.

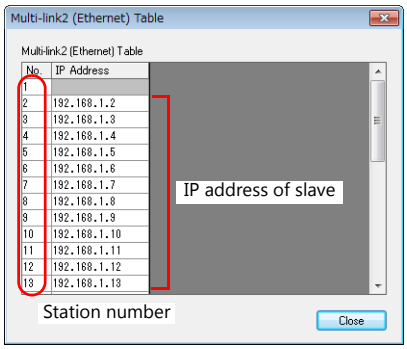
PLC Properties



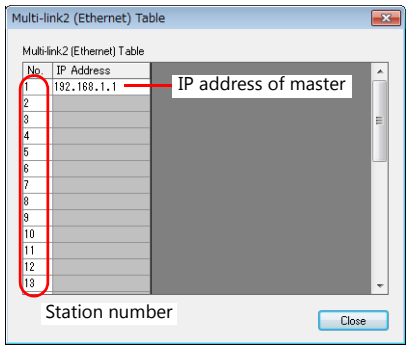
Item		Contents
Communication Setting	Connection Mode	1 : n Multi-link2 (Ethernet)
Multi-link2 (Ethernet)	Local Port No.	1: Master 2 to 32: Slave * Note that if the port number specified is the same as that already set for another TSi unit, the system will not operate correctly.
	Send Delay Time	Specify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

Multi-link2 (Ethernet) table

- Master



- Slave



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

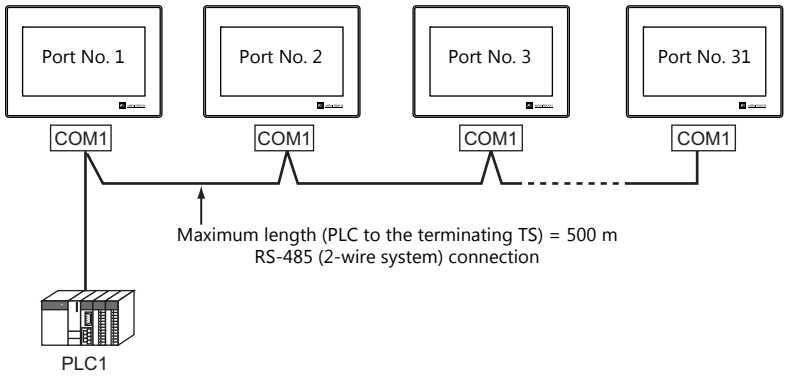
Wiring

The connection between the master and the PLC is the same as the one for 1 : n connection. Refer to “Wiring” (page 1-16) in “1 : n Connection (Multi-drop)”.
Use a LAN cable to connect a master with slaves.

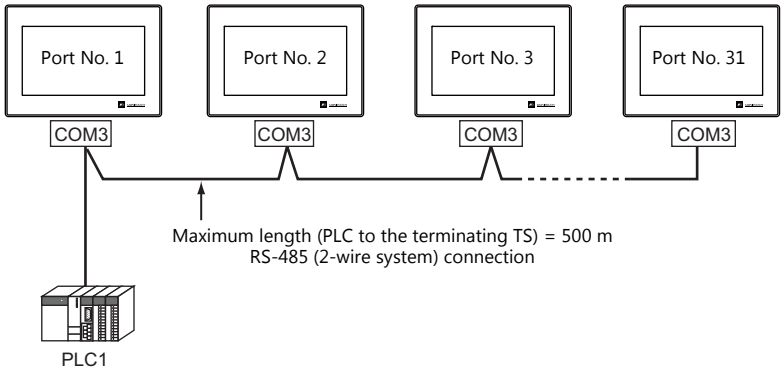
n : 1 Connection (Multi-link)

Overview

- One PLC can be connected to a maximum of 31 TS units. In addition to TS, connecting to S8, V8, V7 or V6 is also possible. Connection together with V9 units is not.
  - Connection example 1:



  - Connection example 2:

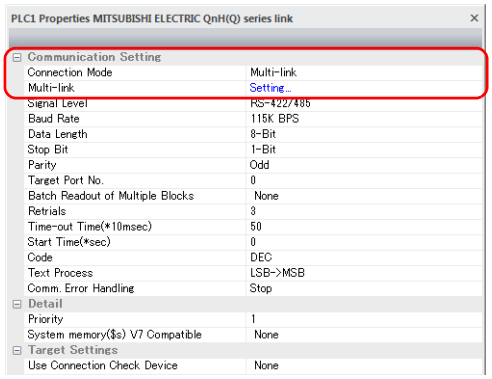


- You can make settings for multi-link at the PLC1. Select the port for connection from between physical ports COM1 and COM3.
- Only a PLC for the signal level RS422/RS485 and with a port number is available. RS-485 (2-wire system) connection is adopted to connect a TS unit and a PLC. For available models, see the list 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

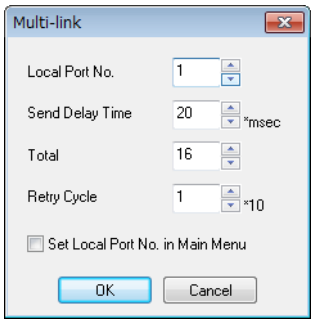
Make settings on [System Setting] → [Hardware Setting] → [PLC Properties]. The differences with respect to a 1 : 1 connection and the points where care is required are explained here.
For details on other settings, refer to Hardware Settings in "1 : 1 Connection" (page 1-9).

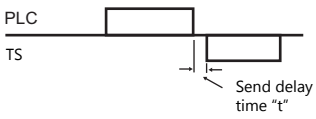
PLC Properties



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 1-31).

Multi-link



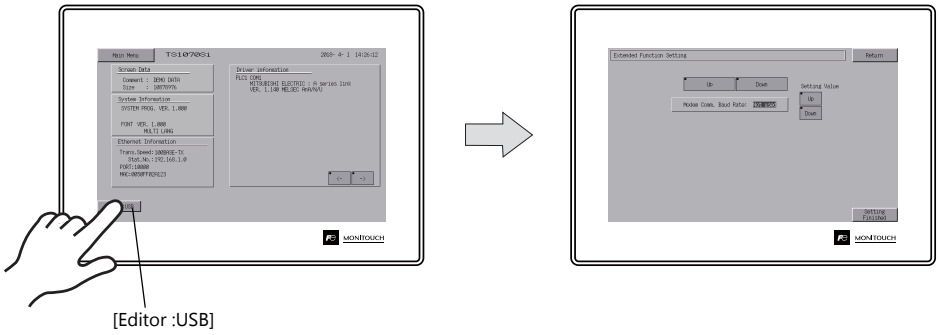
Item	Contents
Local Port No.	1 to 32 Specify a port number of the TS. * Note that if the port number specified is the same as that already set for another TS unit, the system will not operate correctly.
Send Delay Time *1	0 to 255 msec (Default setting: 20 msec) Specify a delay time that elapses before the TS sends the next command after receiving data from the PLC. 
Total *1	2 to 32 Set the maximum number of TS units to be connected in multi-link connection. *2
Retry Cycle *1	1 to 100 (× 10) When the TS 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 TS.

*1 For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the TS 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].

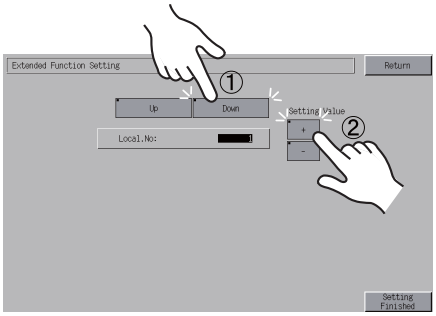
Settings on TS

When [Set Local Port No. in Main Menu] is checked in the [Communication Setting] tab window for Multi-link, the local port number must be set on the Main Menu screen of the TS series.

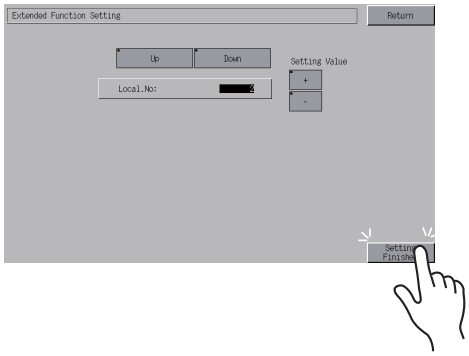
1. Transfer the screen program.
2. Bring up the Main Menu screen on the TS series.
3. Hold down the [Editor: USB] switch at the lower left corner of the screen for 3 seconds or longer. The Extended Function Setting screen is displayed.



4. Select the [Local No.] menu using the upper [Up] and [Down] switches (No. 1 in the figure below), and then specify the local port number using the [+] and [–] 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 TS1000 Smart Hardware Specifications.

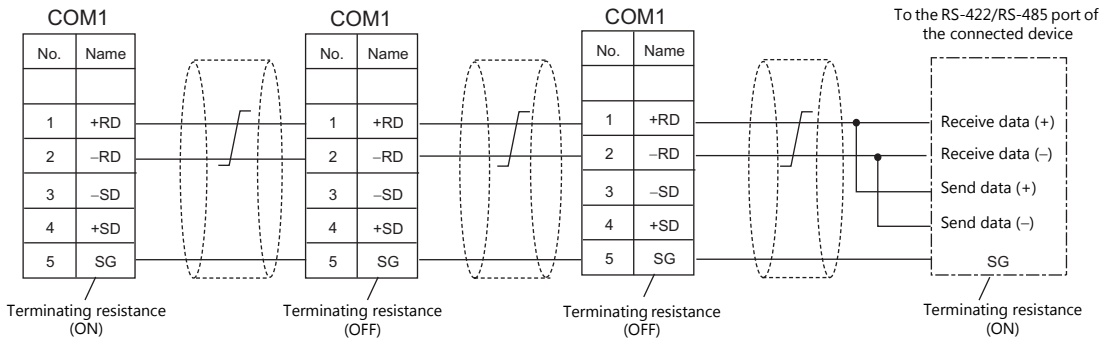
The local port number specified here is commonly used for V-Link, Modbus slave and Multi-link communications. Set a number within the range of these communications.

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

Wiring

When Connected at COM1:

- DIPSW No. 2, 3: ON (RS-485: 2-wire connection)
- DIPSW No. 7: Terminating resistance setting

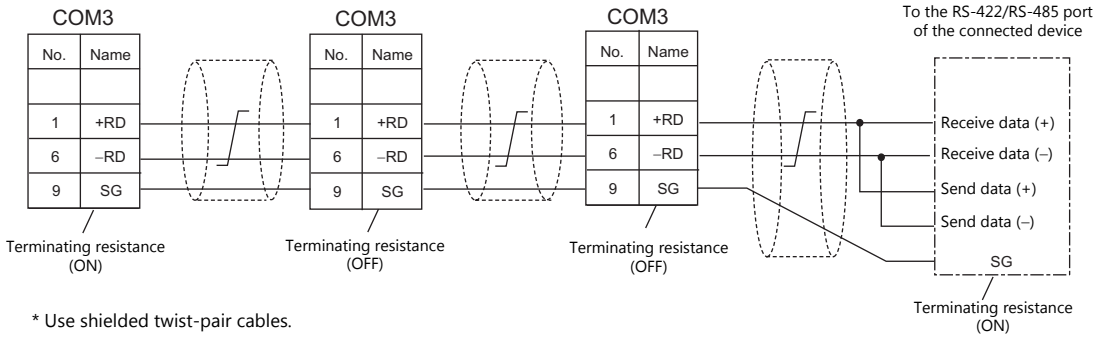


* Use shielded twist-pair cables.

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

When Connected at COM3:

- DIPSW No. 8: Terminating resistance setting



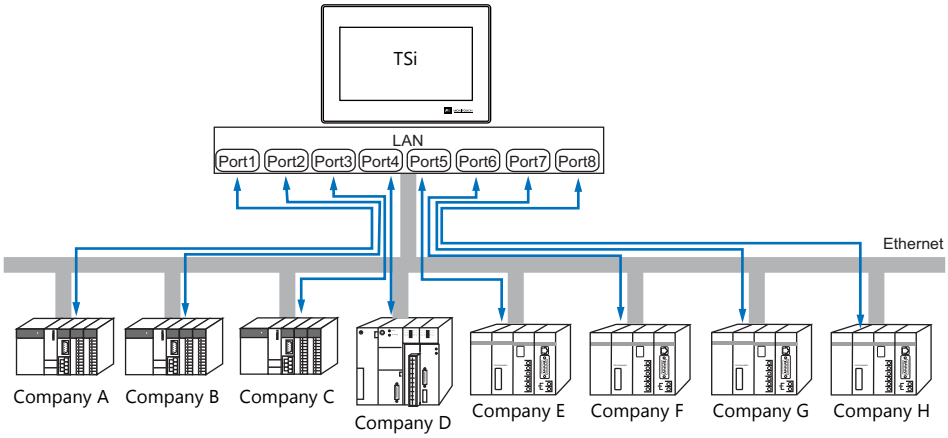
* Use shielded twist-pair cables.

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

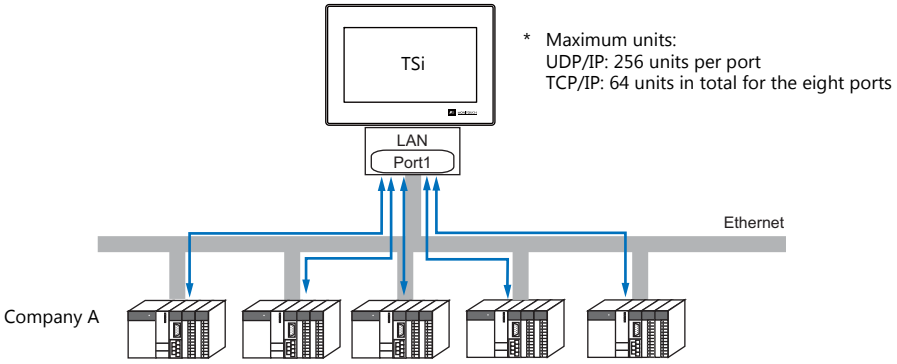
1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)

Overview

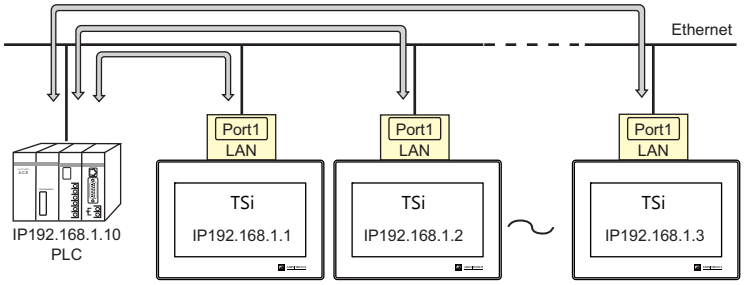
- Because eight communication ports can be opened, the TS series is allowed to communicate with eight models of PLCs at the same time.



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



- If multiple TS 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.



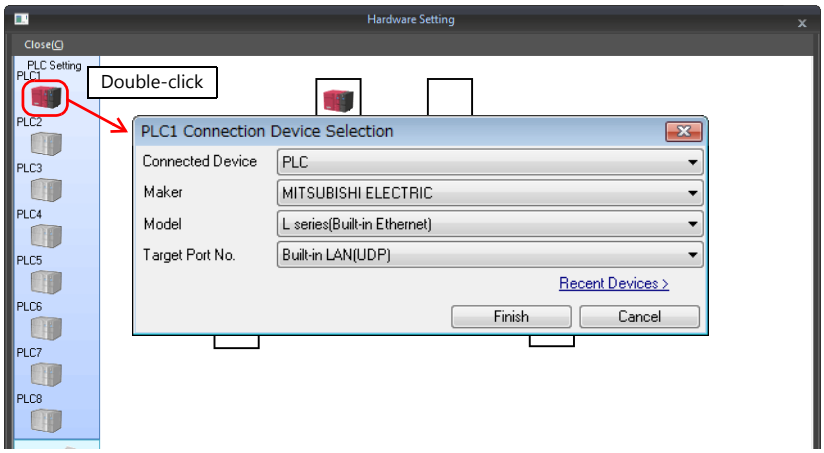
- You can make settings for Ethernet communication in the [Communication Setting] tab window for the logical ports PLC1 - PLC8.

V-SFT Ver. 6 Settings

Hardware Settings

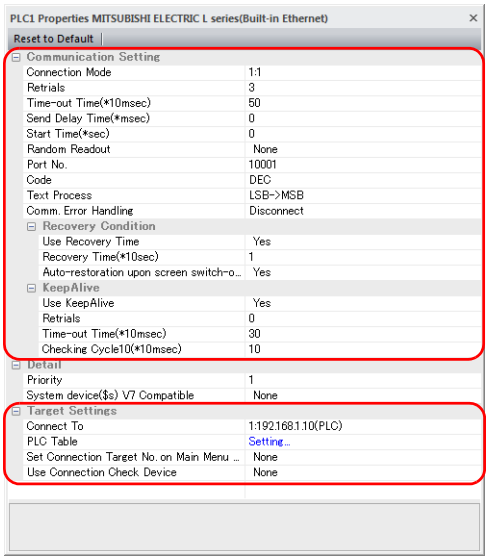
Selecting a device to be connected

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

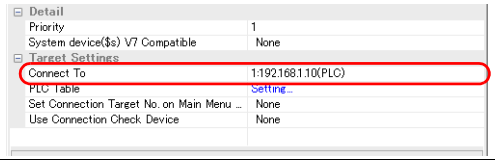
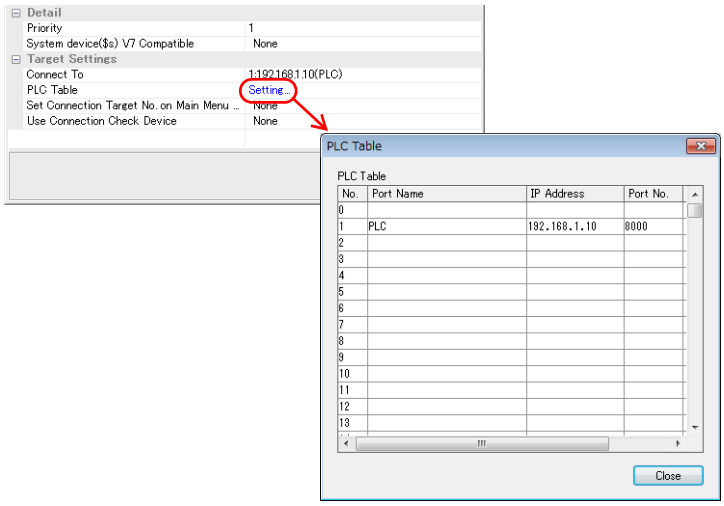


PLC properties

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

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

* For settings other than the above, see "1.4 Hardware Settings" (page 1-40).

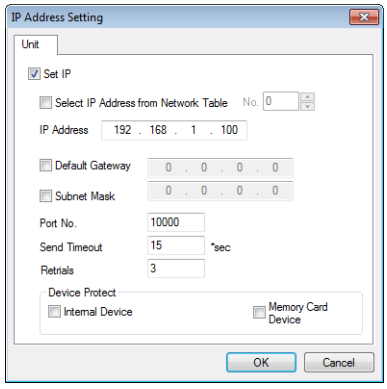
IP Address Setting of the TSi

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

Setting Using the V-SFT Editor

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

Local port IP address setting



Item	Contents
Select IP Address from Network Table	This is valid when the IP address of the TSi 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 1-54).
IP Address *1	Set the IP address for the TSi.
Default Gateway *1	Set the default gateway.
Subnet Mask *1	Set the subnet mask. When this box is not checked, the subnet mask is automatically assigned based on the byte at the extreme left of the IP address. Example: When IP address is "172.16.200.185", "255.255.0.0" is set. When IP address is "192.168.1.185", "255.255.255.0" is set.
Port No. *1	Set a port number from 1024 to 65535. (Excluding 8001 and 8020)

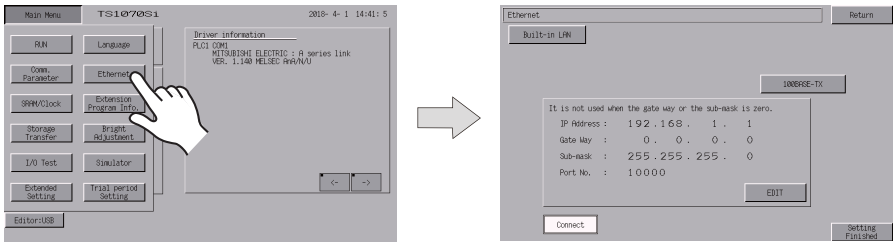
Item	Contents
Send Timeout	Specify the timeout time to send the EREAD/EWRITE/SEND/MES command.
Retrials	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Device Protect Internal Device Memory Card Device	Check either check box to write-protect the device memory from computers or other stations.

*1 For more information on each setting item, see "Basics of ethernet settings" (page 1-55).

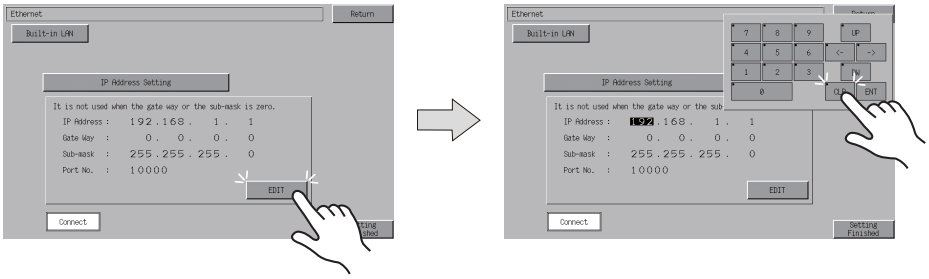
Setting from the Main Menu Screen on TS

Set the IP address on the Main Menu screen of the TS series.
If IP address setting has been performed on the V-SFT editor, this setting will be taken as the valid one.

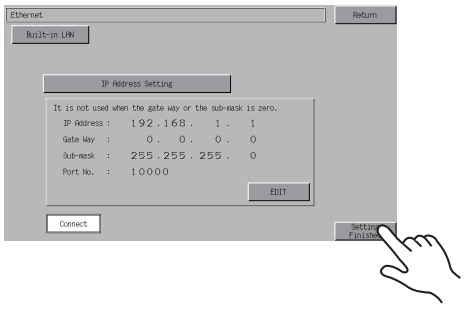
1. Hold down any one of the four corners of the screen for 2 seconds or longer and remove your finger. Then within 1 second, hold down one of the other three corners for 2 seconds or longer. The System Menu is displayed.
2. While the System Menu is displayed, press the [MODE] switch. The screen switches to the Main Menu screen.
3. Pressing the [Main Menu] switch at the top left corner brings up the drop-down window.
4. Press the [Ethernet] switch to display the Ethernet screen.



5. Press the [EDIT] switch and set each item.

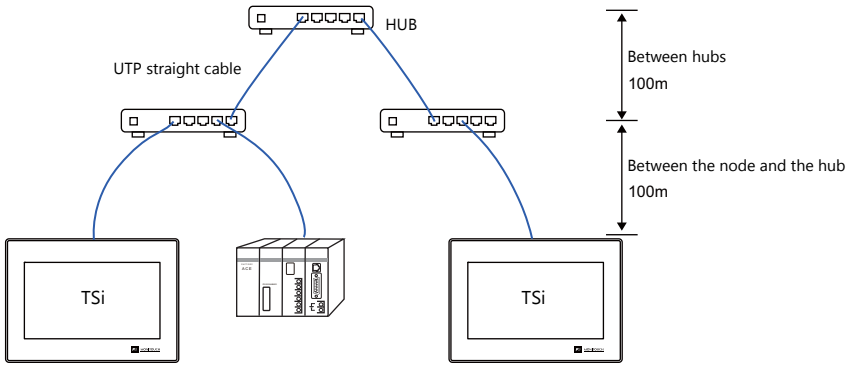


6. Press the [Setting Finished] switch to end setting. Check the IP address displayed at "Ethernet Information" on the Main Menu screen.

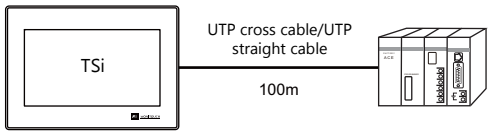


Connection Example

With hub



Without hub



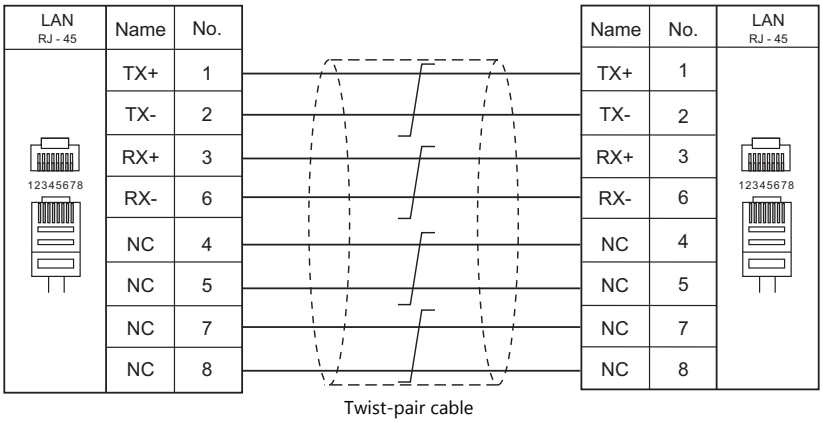
* The Auto-MDIX function is available.
Connection without a hub is possible even when using a straight cable.

Wiring

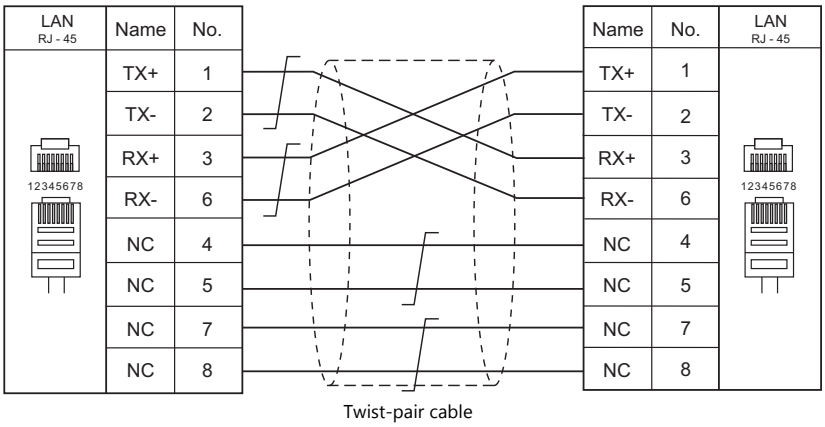
⚠CAUTION

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

- Straight cable



- Cross cable

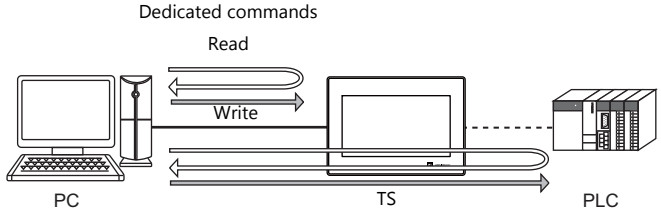


1.3.3 Slave Communication

Connecting via V-Link, Modbus RTU, or Modbus TCP/IP is applicable to slave communication using the TS. 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 TS, 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 COM1, COM2, and COM3.
- For more information, refer to "V-Link" in book 3 of the TS1000 Smart Connection Manual.

MODBUS RTU

- The TS is connected to a Modbus RTU master via serial connection.
- The device memory table for Modbus slave communication is prepared for the TS. 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 (TS1100Si/TS1070Si Only)

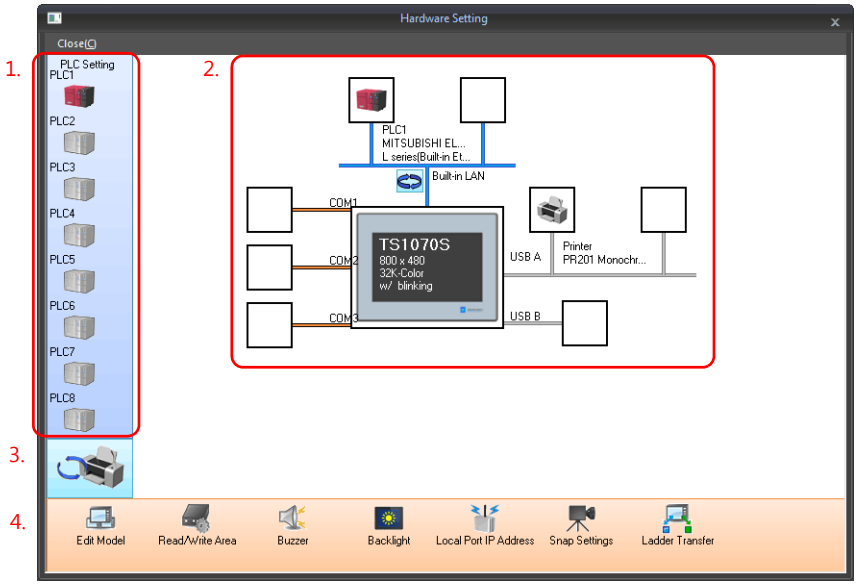
- The TSi is connected to a Modbus TCP/IP master via Ethernet communication.
- The device memory table for Modbus slave communication is prepared for the TSi. The master is allowed to gain access to the device memory table and read/write the PLC data.
- For more information, refer to the Modbus Slave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

1.3.4 Other Connections

For connection to a serial printer that is not in 8-way communication, the COM2 serial port is used.

1.4 Hardware Settings

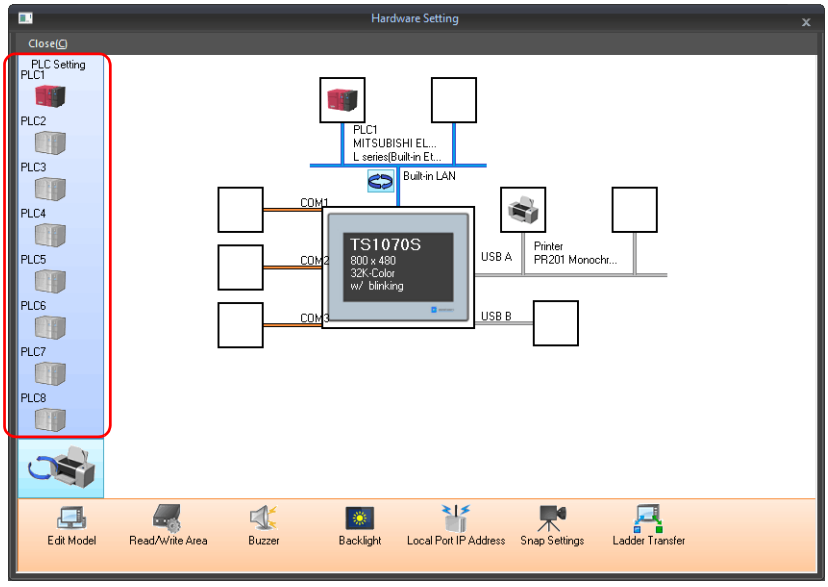
Select and set the devices to connect to the TS on the Hardware Setting screen.



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.	PLC Setting / Other Setting switch	Switch between PLC settings and other settings. The icon changes each time it is clicked.
4.	TS Settings	Make settings on the TS.

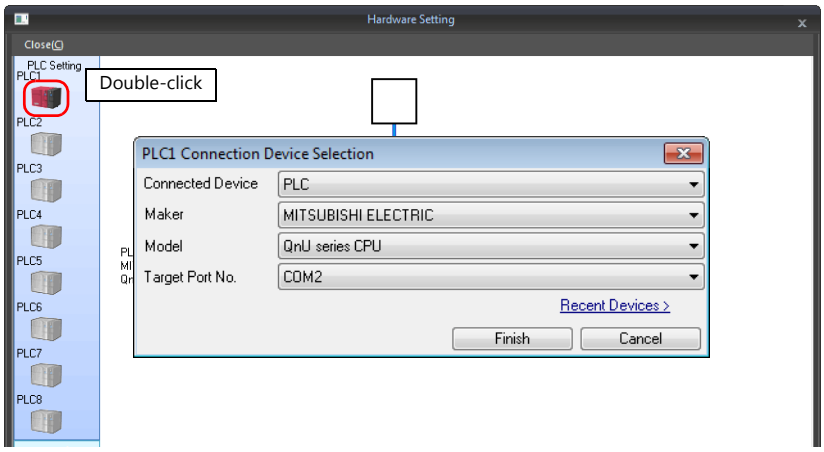
1.4.1 PLC Settings

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 TS Main Menu screen.
For information on the Main Menu screen, refer to the TS1000 Smart Hardware Specifications.



Selecting a Device to be Connected

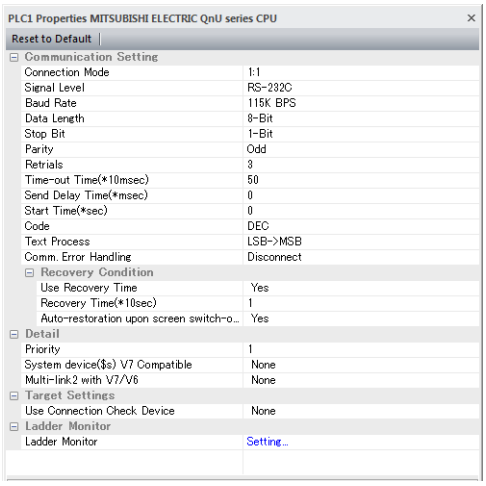
Double-click on a PLC icon in the [Hardware Setting] window to display the window shown below.



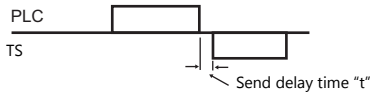
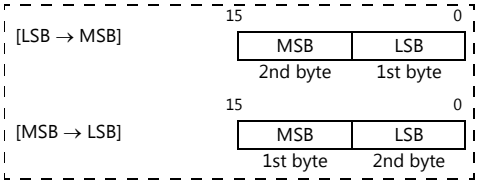
Item	Contents
Connected Device	Select the device to connect.
Maker	Select the maker of the device.
Model	Select the model of the device to connect. Refer to the respective chapter of each maker and select the appropriate model.
Target Port No.	Select the port to which the device connects to on the TS.

PLC Properties

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



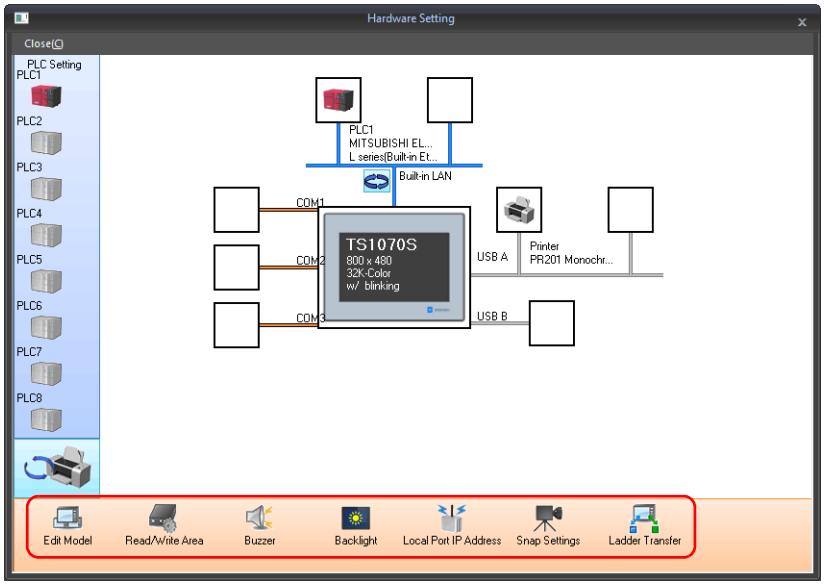
Item		Contents
Communication Setting	Connection Mode	Select a connection mode. 1 : 1 / 1 : n / Multi-link / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet) Available options vary, depending on which device is connected. For details, see Connection Compatibility List provided at the end of this 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 Siemens S7-200PPI or S7-300/400MPI via COM1.
	Data Length *1	Select a data length. 7 / 8 bits
	Stop Bit *1	Select a stop bit. 1 / 2 bits
	Parity *1	Select an option for parity bit. None / Odd / Even
	Target Port No. *1	Specify a port number of the connected device. 0 to 31 (Modbus RTU: 1 to 255)

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

Item		Contents
Detail	Priority	[1] (higher priority) - [8] (lower priority) Specify the priority taken during 8-way communication. If interrupts from two or more devices occur at the same time, communication with these devices will take place in order of priority.
	System device ($s) V7 Compatible (PLC1)	This is set to [Yes] if the V7-series screen program (including temperature control network/PLC2Way settings) has been converted to data for the TS. System information relevant to 8-way communication will be stored in device memory addresses $P1 and $s. * For more information, see "1.5.1 $Pn (For 8-way Communication)" (page 1-59).
	System device ($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 TS. • [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 1-59).
	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 TS Reference Manual 2.
Target Settings	Connect To	Set this for Ethernet communication. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)" (page 1-34).
	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.

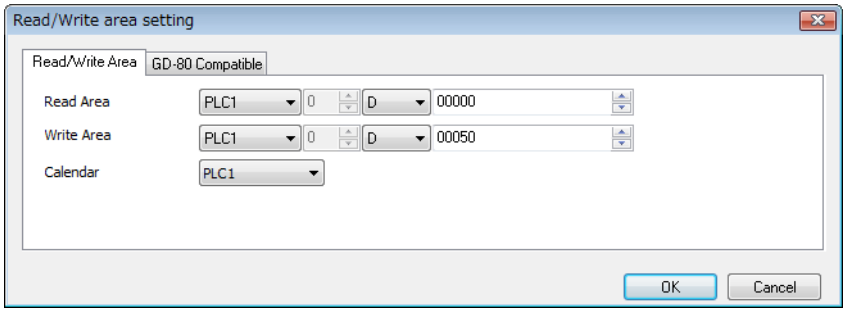
1.4.2 TS Settings



Select Edit Model

Set the model of the TS to edit.
For more information, refer to the TS Reference Manual 1.

Read/Write Area

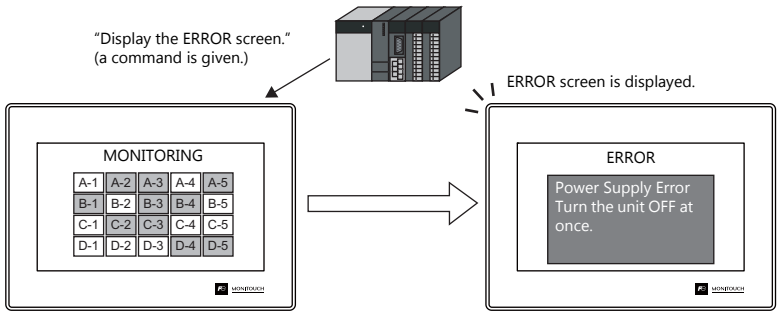


Item	Contents
Read Area	Specify a device memory address used to give commands for display or operation from the PLC to the TS. Three words (at the minimum) *1 of consecutive addresses are secured. For more information, see "Read area" (page 1-45).
Write area	This is the area, to which the screen numbers or overlaps displayed on the TS or a buzzer state will be written. Three words of consecutive addresses are secured. For more information, see "Write area" (page 1-49).
Calendar	This setting is valid when the TS's internal clock *2 is not used. The setting allows the calendar data to be read from the device via the selected port at PLC1 - PLC8. The calendar data will be updated when: • The power is turned on. • STOP → RUN • The date changes. (AM 1:23:45) • 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 device memory (three words maximum), sampling data device memory (variable depending on the setting)
*2 For more information on the internal clock, refer to the TS Reference Manual 1.

Read area

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



Device memory addresses are allocated as shown below.

	Address	Contents	Operation
Read area =	n	Sub command/data	TS ← PLC
	n + 1	Screen status command	
	n + 2	Screen number command	

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

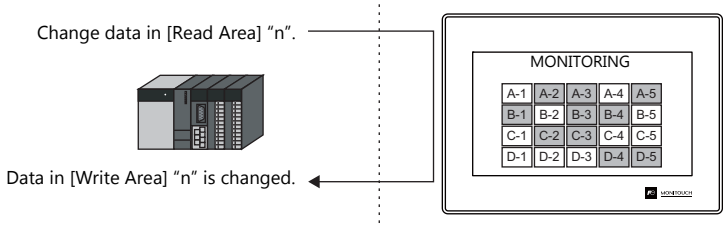
Read area "n" (sub command/data)

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

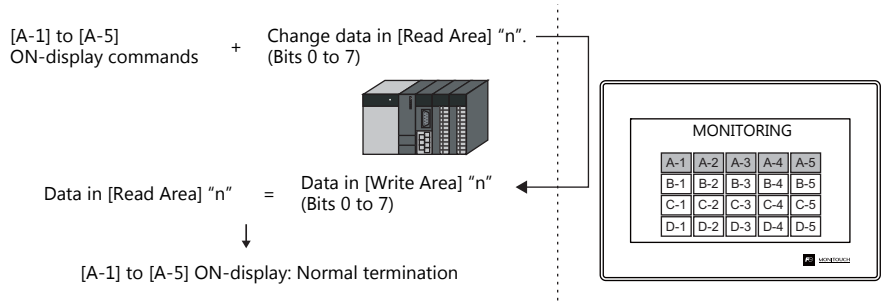
(1) Free
(2) BZ0 [0 → 1] (leading edge)
(3) BZ1 [0 → 1] (leading edge)
(4) BZ2 [1] (level)
(5) Calendar setting ([0 → 1] (leading edge)
(6) System reserved

(1) Free	When data is saved in this area, the same data is written to [Write Area] "n" after the screen has been displayed. Utilizing this operation, these bits can be used for watch dog monitoring *1 or display scanning *2.
(2) BZ0	A beep (peep) sounds at the leading edge [0 → 1].
(3) BZ1	An error buzzer (peep-peep) sounds at the leading edge [0 → 1].
(4) BZ2	A buzzer (ffeee) sounds continuously while the bit remains [1]. When setting this bit, check [Use Continuous Buzzer Sound] ([System Setting] → [Unit Setting] → [General Setting])
(5) Calendar setting *3	This bit is valid when the built-in clock is not used. This bit should be used differently depending on whether the connecting PLC is equipped with the calendar function.
	When the TS is connected to a PLC with calendar function: When calendar data in the PLC is updated, it can forcibly be read by setting this bit (at the leading edge of [0 → 1]). In addition to calendar data update using this bit, calendar data in the PLC is automatically read and updated when: • The power is turned on. • STOP → RUN • The date changes (AM 1:23:45).
	When the TS is connected to a PLC without calendar function: A virtual calendar area can be provided by setting [Calendar device] in the [GD-80 Compatible] tab window ([Read/Write Area] → [GD-80 Compatible]). Then setting this bit (ON) updates the calendar data.
(6) System reserved	This bit is reserved by the system. This bit must be "0".

*1 Watchdog
When the PLC is communicating with the TS, there is no means for the PLC to know whether or not the TS 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 TS is correctly doing operations through communications with the PLC. This verification is called "watchdog".

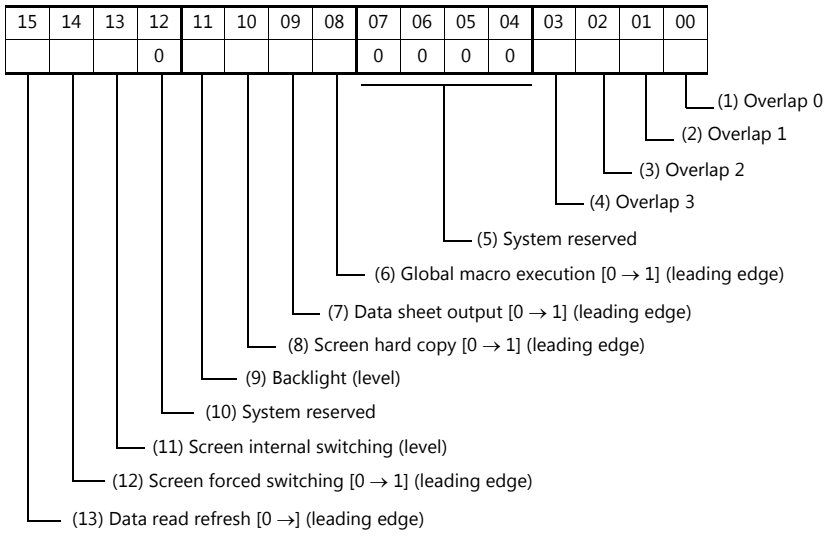


*2 Display scanning
This operation can be utilized for display scanning. Forcibly change data in the [Read Area] "n" when giving a graphic change command and check that the same data is saved in the [Write Area] "n". This can prove that the graphic change command is received and executed correctly.



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

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

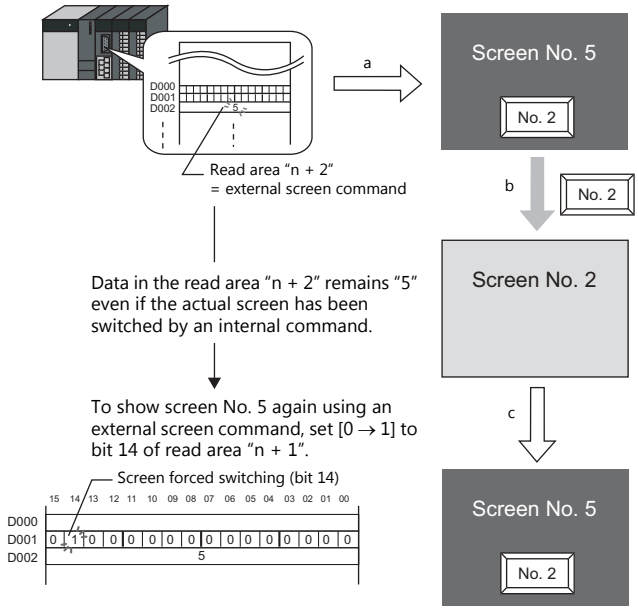


(1) Overlap 0 (2) Overlap 1 (3) Overlap 2	These bits are used for controlling show/hide operations of overlaps. • Normal overlap or call-overlap [0 → 1] (leading edge *1): Show [1 → 0] (falling edge *1): Hide • Multi-overlap [0] (level *2): Hide [1] (level *2): Show It is necessary to specify library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

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

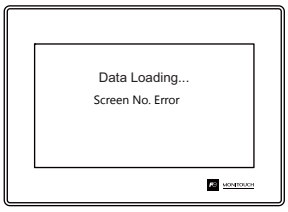
*3 Usage Example
Step a: Screen change according to read area "n + 2"
Step b: Screen change with an internal switch
Step c: Screen change to the same screen number as step 1 according to read area "n + 2"
In this case, however, the same value is stored in read area "n + 2" so the command is not valid.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



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

Read area "n + 2" (screen number command)	
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.

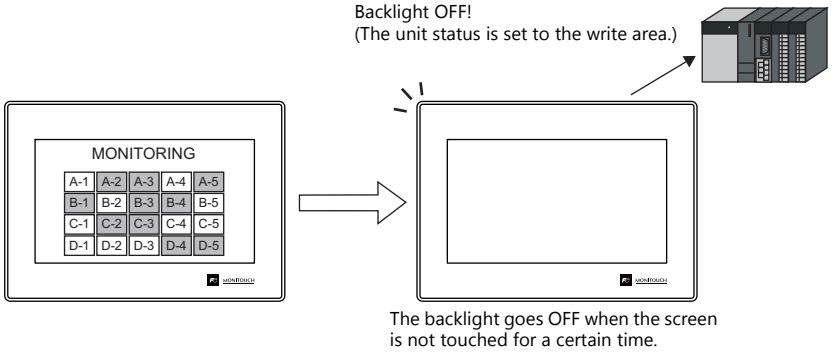
*1 Screen No. Error
When the TS has started communications with the PLC, the screen of the screen number specified in read area "n + 2" is displayed. If the screen number specified in read area "n + 2" does not exist in the screen program, "Screen No. Error" is displayed on the TS.



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

Write area

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



Device memory addresses are allocated as shown below.

Write area =

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

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

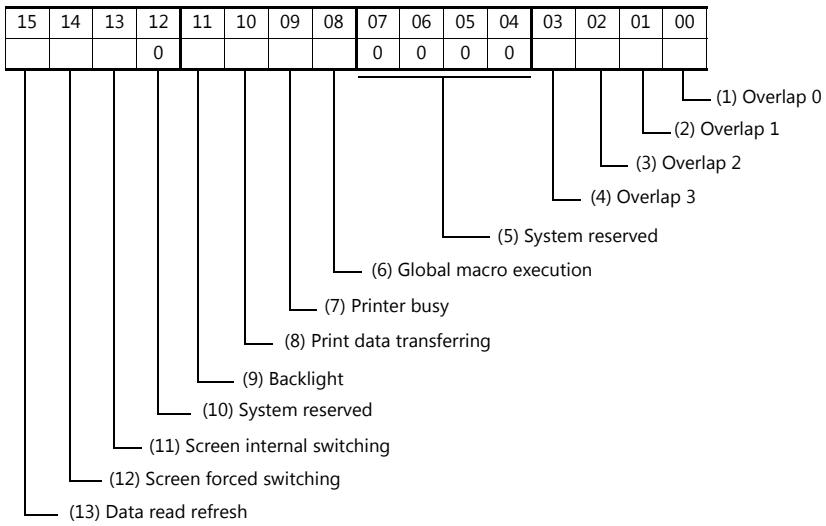
Write Area "n" (output of read area "n")

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

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

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

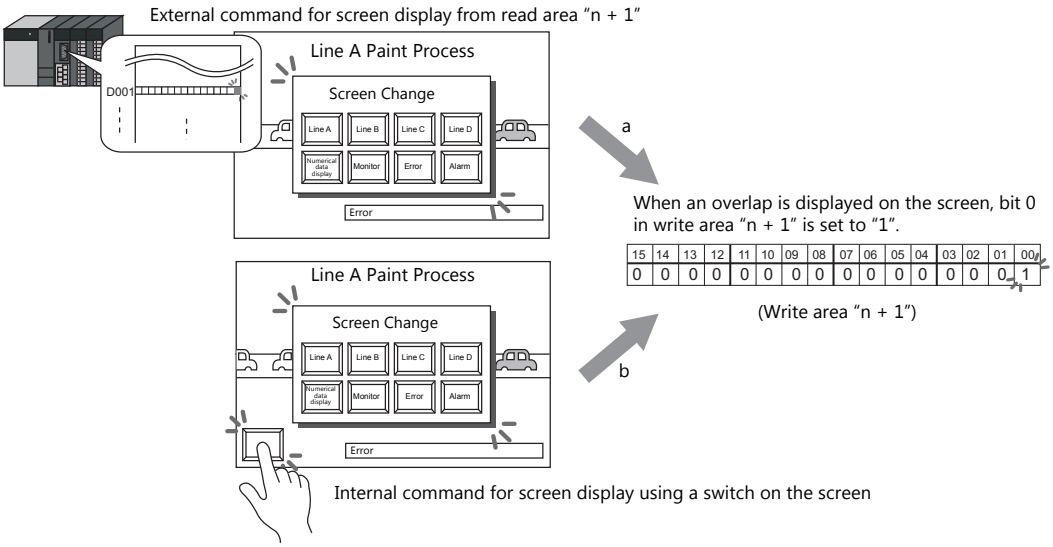
Write area "n + 1" (screen status)



(1) Overlap 0 (2) Overlap 1 (3) Overlap 2 (4) Overlap 3	Overlap status *1 [0]: Hide [1]: Show
(5) System reserved	Always "0"
(6) Global macro execution	This bit reflects the data in bit 8 of read area "n + 1".
(7) Printer busy	Printer status *2 [0]: Not busy [1]: Busy
(8) 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
(9) 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.
(10) System reserved	Always "0"
(11) Screen internal switching	This bit reflects the data in bit 13 of read area "n + 1".
(12) Screen forced switching	This bit reflects the data in bit 14 of read area "n + 1".
(13) 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 TS Reference Manual 1.

*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 TS Reference Manual 1.

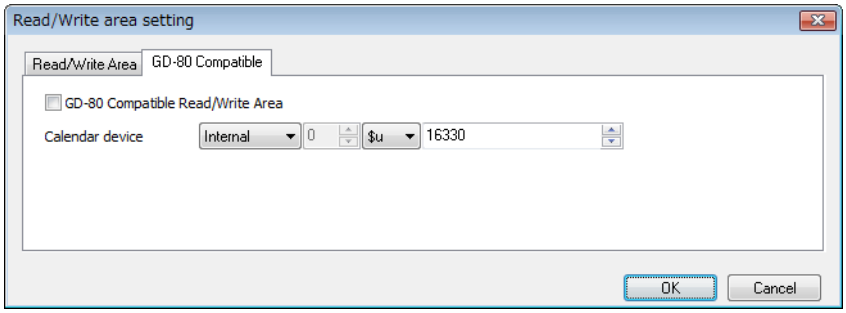
Write area "n + 2" (displayed screen number)

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

(1) Screen number

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

GD-80 Compatible



Item	Contents
GD-80 Compatible Read/Write Area	When converting screen program files created on the GD-80/81S series into those of the TS, this option is automatically checked. • Unchecked: The device memory addresses allocated to the TS are applied to the read and write areas. (See page 1-44.) • Checked: The device 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 TS built-in clock is not used.

Calendar device memory

Follow the steps below to set the calendar device memory.

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

Device 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 device 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.

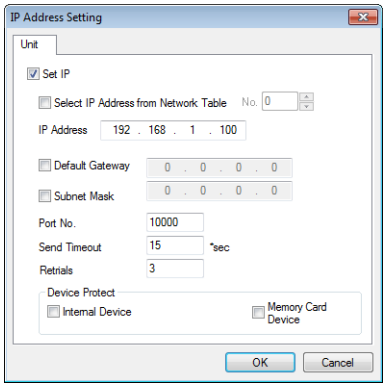
Buzzer

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

Backlight

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

Local IP Address (TS1100Si/TS1070Si Only)



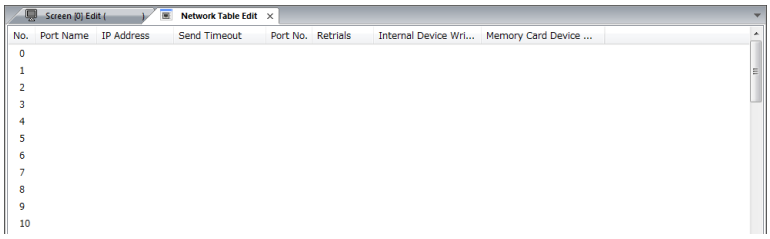
Item	Contents
Select IP Address from Network Table	This is valid when the IP address of the TSi has been registered in the network table. Select a network table number from 0 to 255 to set the IP address. * For more information on the network table, refer to "Network table" (page 1-54).
IP Address *1	Set the IP address for the TSi.
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	Set a timeout period for transmitting macro commands EREAD, EWRITE, SEND, MES or Ethernet DLL functions.
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 1-55).

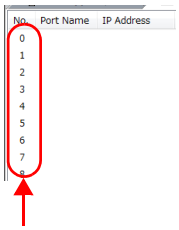
Network table

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

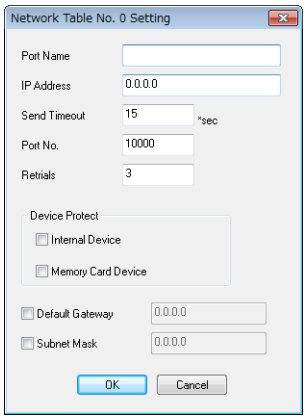
Select [System Setting] → [Ethernet Communication] → [Network Table] and register.



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



Network table number



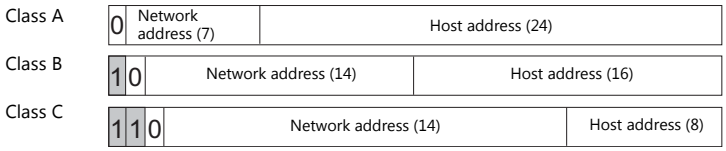
Item	Contents
Port Name	Set the name of the TSi or the computer.
IP Address *1	Set the IP address of the TSi or the computer.
Send Timeout *2	Set a timeout period for transmitting macro commands EREAD, EWRITE, SEND, MES or Ethernet DLL functions.
Port No. *1	Set the port number of the TSi or the computer.
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 1-55).
*2 Invalid if TSi units or PCs at other ports are registered. Only valid when set as the local port IP of the TSi unit.

Basics of ethernet settings

IP address

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



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

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

Port No.

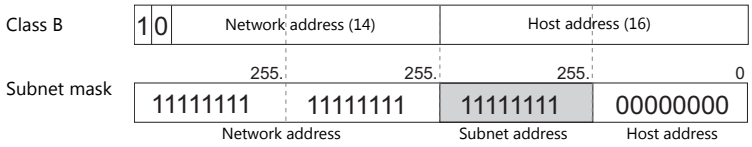
Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit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

Default gateway

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

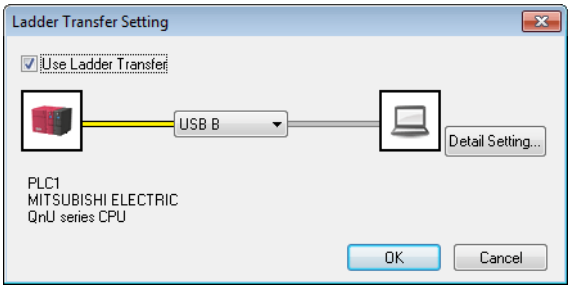
Subnet mask

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



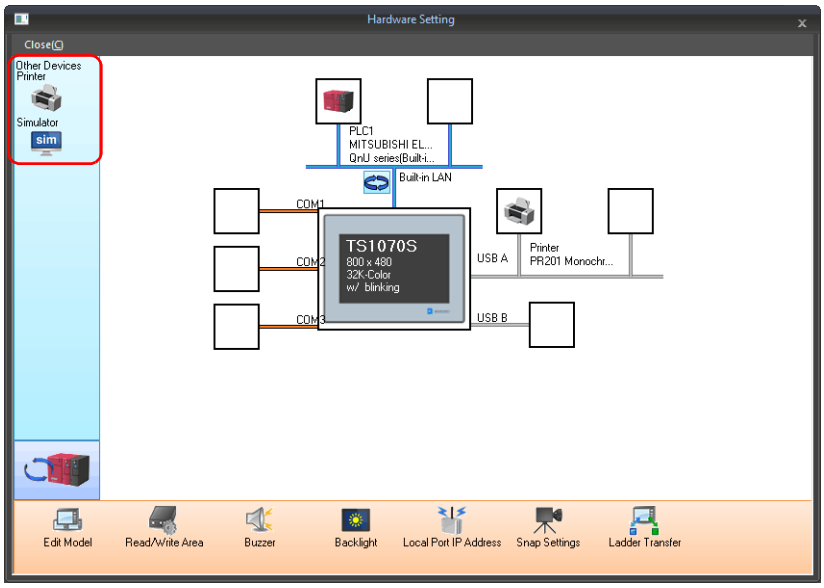
<Unusable subnet masks>
- All bits are set to "0"..... 0.0.0.0
- All bits are set to "1"..... 255.255.255.255

Ladder Transfer



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

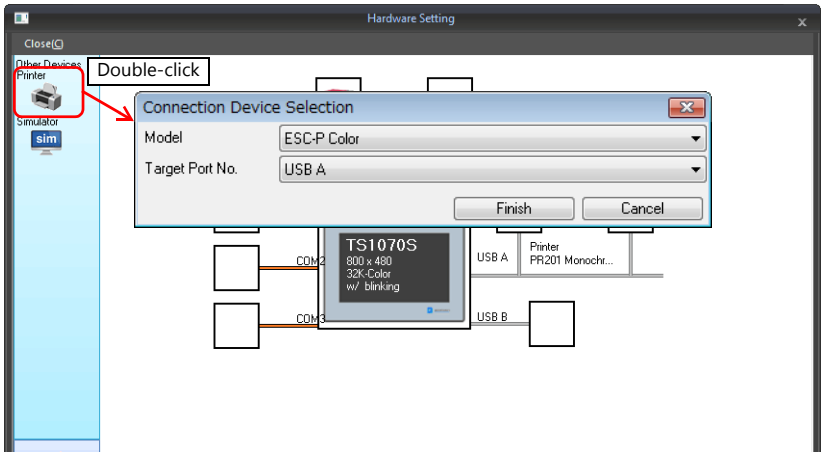
1.4.3 Other Equipment



Printer

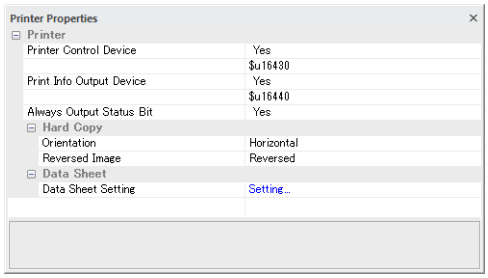
Configure these settings when connecting a printer.

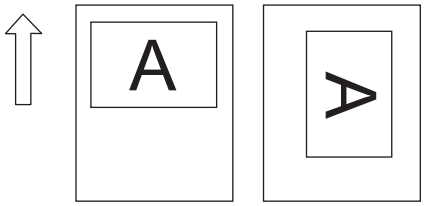
Selecting the printer model



Item	Contents
Model	Select the model of the printer to connect.
Target Port No.	Select the port to connect the printer cable to. USB A: Select when connecting an EPSON, STYLUS PHOTO compatible printer. Also use this setting when connecting a parallel printer using a commercially available parallel-to-USB cable. USB B: Select when connecting a PictBridge-compatible printer. COM2: Select when connecting with the serial interface of a printer.

Printer properties



Item		Contents
Always Output Status Bit		The TS outputs [0 → 1] when starting to transfer data upon receiving a print command, and outputs [1 → 0] upon finishing transfer. However, these signals may not be output if the print data is small. Select [Yes] to output a signal regardless of the data size. The output area is as follows: • Bit 1 of the device memory for printer information output • Bit 0 of internal device memory $s16 $s16 MSB LSB 15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0: End (standby) 1: Transferring print data
Hard Copy	Orientation	Specify the printing orientation of the screen on paper. In vertical output, the screen is rotated 90° clockwise with respect to the printing paper and printed out. • Printing examples of hard copies: Horizontal Vertical 
	Reversed Image	Reversed: Screens are printed with black and white inverted. Normal: Screens are printed as they are displayed on the TS.
Data Sheet	Data Sheet Setting	Make settings for printing data sheets. For more information, refer to the TS 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 the TS.
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 TS Reference Manual 1.

Simulator

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

1.5 System Device Memory for Communication Confirmation

The TS 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
  This is the system device memory for confirming the Ethernet status. For more information, see "1.5.2 $s518 (Ethernet Status Confirmation) (TS1100Si/TS1070Si 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, refer to the TS Reference Manual 1.

1.5.1 $Pn (For 8-way Communication)

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

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

$Pn List

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

$Pn (n = 1 to 8)	$s *1	Contents	Device Type
000	111 (PLC1)	TS local port number Stores the local port number of the TS. (Universal serial communication, slave communication, etc.)	← TS
:	-	:	
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.	→ TS
:	-	:	
010	128 (PLC1)	Link down information (station No. 0 - 15) 0: Normal 1: Down	← TS
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 1-63) 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	→ TS
100	730 (PLC2)	Error status Station No. 00 status (page 1-64)	← TS
101	731 (PLC2)	Error status Station No. 01 status (page 1-64)	
102	732 (PLC2)	Error status Station No. 02 status (page 1-64)	
103	733 (PLC2)	Error status Station No. 03 status (page 1-64)	
104	734 (PLC2)	Error status Station No. 04 status (page 1-64)	
105	735 (PLC2)	Error status Station No. 05 status (page 1-64)	
106	736 (PLC2)	Error status Station No. 06 status (page 1-64)	
107	737 (PLC2)	Error status Station No. 07 status (page 1-64)	
108	738 (PLC2)	Error status Station No. 08 status (page 1-64)	
109	739 (PLC2)	Error status Station No. 09 status (page 1-64)	

$Pn (n = 1 to 8)	$s *1	Contents	Device Type
110	740 (PLC2)	Error status Station No. 10 status (page 1-64)	
:	:	:	
120	750 (PLC2)	Error status Station No. 20 status (page 1-64)	
:	:	:	
130	760 (PLC2)	Error status Station No. 30 status (page 1-64)	
131	761 (PLC2)	Error status Station No. 31 status (page 1-64)	
132	820 (PLC2)	Error status Station No. 32 status (page 1-64)	
133	821 (PLC2)	Error status Station No. 33 status (page 1-64)	
:	:	:	
140	828 (PLC2)	Error status Station No. 40 status (page 1-64)	
:	:	:	
150	838 (PLC2)	Error status Station No. 50 status (page 1-64)	
:	:	:	← TS
160	848 (PLC2)	Error status Station No. 60 status (page 1-64)	
:	:	:	
170	858 (PLC2)	Error status Station No. 70 status (page 1-64)	
:	:	:	
180	868 (PLC2)	Error status Station No. 80 status (page 1-64)	
:	:	:	
190	878 (PLC2)	Error status Station No. 90 status (page 1-64)	
:	:	:	
199	887 (PLC2)	Error status Station No. 99 status (page 1-64)	
200	-	Error status Station No. 100 status (page 1-64)	
:	:	:	
350	-	Error status Station No. 250 status (page 1-64)	
:	:	:	
355	-	Error status Station No. 255 status (page 1-64)	
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	← TS
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	
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	← TS
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 TS Reference Manual 2). 0: Periodical reading/synchronized reading executed Other than 0: Periodical reading/synchronized reading stopped	
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.	→ TS
495	764 (PLC2)*3	Device memory map writing prohibited flag (refer to the TS 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: $s800 to 805 are used for writing from the Modbus master. Refer to the Modbus Slave Communication Specifications.	
501	801 (PLC3)		
502	802 (PLC3)		→ TS
503	803 (PLC3)		
504	804 (PLC3)		
505	805 (PLC3)		
:	:	:	
508	765 (PLC2)	Error response code (page 1-66) If "800BH" (error code received) is stored for the error status ($Pn100 to 355), it is possible to check the error code.	
509	766 (PLC2)		
510	767 (PLC2)		← TS
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.

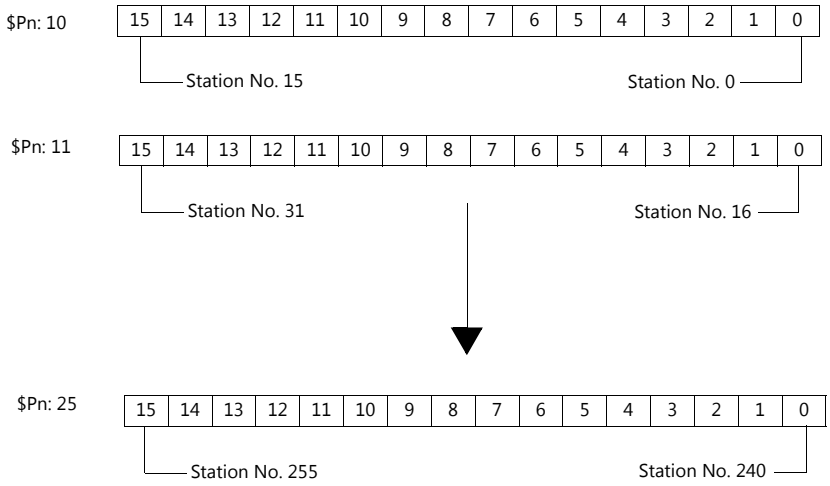
*3 If executing device memory map control using $s762, $s763 and $s764, select yes for [System device ($s) V7 Compatible] under [Detail] on the [PLC Properties] window for PLC2. Note that $P2: 493/494/495 cannot be used in this case.

Details

$Pn: 10 to 25

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

0: Normal
1: Down

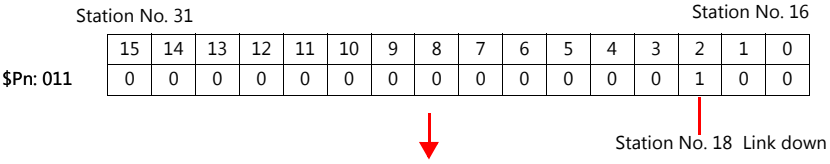


$Pn:99

The update timing for the link down information stored in $Pn:010 to 025 is set here.

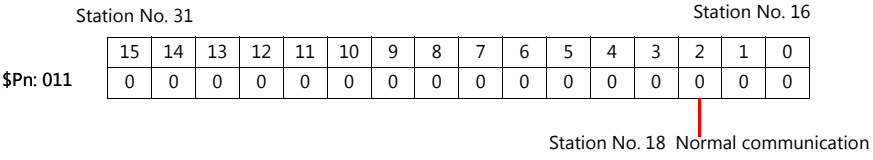
0: Always updated with the latest information
Other than 0: Only updated when a communication error occurs

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

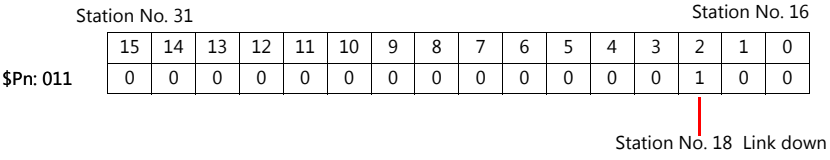


After resetting communications

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



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

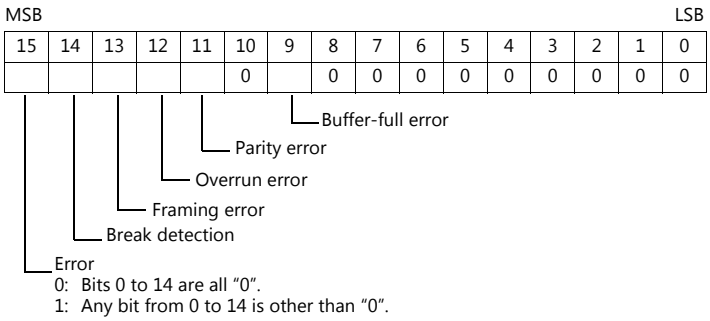


$Pn: 100 to 355

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 TS 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 TS and the connected device are matched.
  2) Check the cable connection.
  3) Data may be disrupted because of noise. Fix noise.

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

$Pn: 356 to 451

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

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

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

System reserve

1: ID tag recognized

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

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

Errors other than the above are stored as shown below.

MSB LSB

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

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

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

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

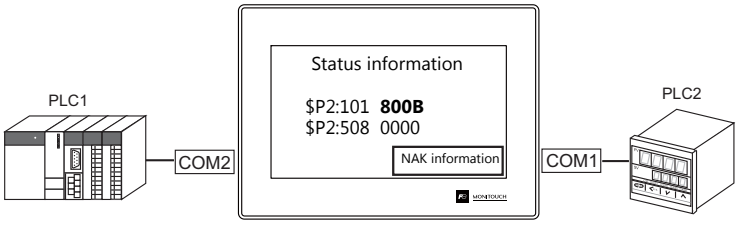
$Pn: 508 to 511

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

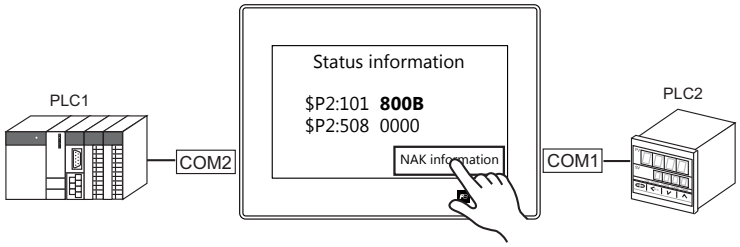
> Notes on use
> - Use $u/$T as the target internal device memory.
> - Use the macro command MOV (W). MOV (D) cannot be used.
> - "0" is stored to device memory addresses that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

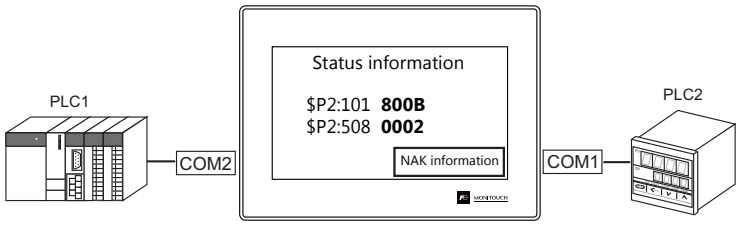
1) On receipt of an error code at station No. 1 of PLC2, "800BH" is stored in $P2:101.



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



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



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

1.5.2 $s518 (Ethernet Status Confirmation) (TS1100Si/TS1070Si Only)

Stores the current status of the Ethernet.

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

Error details

No.	Contents	Solution
201	Send error	Check that the setting on the target station is consistent with the network table setting.
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.
350	Send buffer full	The line is busy. Consult the network administrator of your company.
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.
1005	Ethernet send registration error	Turn the power off and back on again. If the problem persists, the unit may be faulty. Contact your local distributor.
1006	I/F unit unregistered interrupt	
1007	ETHER_INIT_FAIL	
1202	MAC address error	The MAC address is not registered. Repair is necessary.
2001	Undefined error	Turn the power off and back on again. If the problem persists, the unit may be faulty. Contact your local distributor.

MEMO

2. IAI

2.1 Temperature Controller/Servo/Inverter Connection

2.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

X-SEL Controller

PLC Selection on the Editor	Model		Port	Signal Level	TS Port	Connection	Lst File
X-SEL controller	Orthogonal	XSEL-K XSEL-KE XSEL-KT/KET	HOST port	RS-232C	COM2	Wiring diagram 1 - COM2	IAI_XSEL.Lst
	Scalar	XSEL-KX					
	Orthogonal	XSEL-J XSEL-P XSEL-Q	TP port	RS-232C	COM2	Wiring diagram 2 - COM2	
	Scalar	XSEL-JX XSEL-PX XSEL-QX					

Robo Cylinder

PLC Selection on the Editor	Model	Unit/Port	Signal Level	TS Port	Connection	Lst File
ROBO CYLINDER (RCP2/ERC)	RCP2 ERC	SIO	RS-485	COM1	"Wiring diagram 1 - COM1 "	IAI_ROBO.Lst
				COM3	"Wiring diagram 1 - COM3 "	
			RS-232C	COM2	"Wiring diagram 3 - COM2 " *1	
					"Wiring diagram 4 - COM2 " *2	
ROBO CYLINDER (RCS/E-CON)	RCS E-CON	PORT IN	RS-485	COM1	"Wiring diagram 1 - COM1 "	IAI_ROBO.Lst
				COM3	"Wiring diagram 1 - COM3 "	
			RS-232C	COM2	"Wiring diagram 3 - COM2 " *1	
					"Wiring diagram 4 - COM2 " *2	
PCON/ACON/ SCON (MODBUS RTU)	PCON ACON SCON	SIO	RS-485	COM1	"Wiring diagram 1 - COM1 "	IAI_PCON.Lst
				COM3	"Wiring diagram 1 - COM3 "	
			RS-232C	COM2	"Wiring diagram 3 - COM2 " *1	
					"Wiring diagram 4 - COM2 " *2	

*1 Use the IAI's RS-485 conversion adaptor "RCB-CV-MW" and IAI's external device communication cable "CB-RCA-SIO020 (050)".
*2 Use the IAI's SIO converter "RCB-TU-SIO-A/B".

2.1.1 X-SEL Controller

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 31	

X-SEL Controller

Application software

Set parameters using the application software.

(Underlined setting: default)

Parameter	Parameter Name	Setting
I/O parameter 90	Channel 1 usage	2 (IAI protocol B)
I/O parameter 91	Channel 1 code	0 to 31
I/O parameter 92	Baud rate	9600 / 19200 / 38400 bps
I/O parameter 93	Data length	8
I/O parameter 94	Stop bit	1
I/O parameter 95	Parity	None
Other parameter 46	Bit pattern	1

Mode switch

Select [AUTO].

System I/O connector

If the servo cannot be turned on, check the wiring of the system I/O connector.

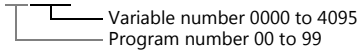
- **XSEL-K/KE/KT/KET/KX/J/JX (with built-in cutout relay)**
  Set the normally-closed type emergency stop input between the EMG terminals or short-circuit these terminals. When they are open, operation is disabled due to an emergency stop.
  For the ENB terminals, set the normally-closed safety gate input or short-circuit them. When they are open, operation is disabled due to the shutout of the power.
- **XSEL-P/PX (with built-in cutout relay)**
  Short-circuit terminals of “EMG1 line+” and “EMGin +24V”. For “EMG1 line-” and “EMGin IN”, connect the normally-closed type emergency stop switch or short-circuit them. When they are open, operation is disabled due to an emergency stop.
  Short-circuit terminals of “ENB1 line+” and “ENBin +24V”. For “ENB1 line-” and “ENBin IN”, connect the normally-closed type enable switch or short-circuit them. When they are open, operation is disabled due to the shutout of the power.
- **XSEL-Q/QX (with external cutout relay)**
  Install wiring by referring to the specifications sheet of X-SEL.

Available Device Memory

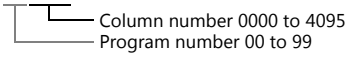
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
20B	(input port)	00H	Read only, virtual input port not available
20C	(output port)	01H	Virtual output port not available
20D	(flag)	02H	
20E	(integer variable) *1	03H	Double-word
210	(string) *2	04H	
208	(effective point data count)	05H	Read only
212	(axis status)	06H	Double-word, read only
213	(program status)	07H	Read only
215	(system status)	08H	Read only
253	(program)	09H	Write only
2A1	(scalar axis status)	0AH	Double-word, read only

*1 For 20E (integer variable) XXYYYY



*2 For 210 (string) XXYYYY



208 (Effective Point Data Count)

Address	Name
0	Effective point data count

212 (Axis Status)

Address	Name
0	Axis 1 axis status
1	Axis 1 axis sensor input status
2	Axis 1 axis-related error code
3	Axis 1 encoder status
4	Axis 1 current position
10	Axis 2 axis status
11	Axis 2 axis sensor input status
12	Axis 2 axis-related error code
13	Axis 2 encoder status
14	Axis 2 current position
20	Axis 3 axis status
21	Axis 3 axis sensor input status
22	Axis 3 axis-related error code
23	Axis 3 encoder status
24	Axis 3 current position
30	Axis 4 axis status
31	Axis 4 axis sensor input status
32	Axis 4 axis-related error code
33	Axis 4 encoder status
34	Axis 4 current position

213 (Program Status)

Address	Name
0	Status
1	Running program step number
2	Program-sensitive error code
3	Error occurrence step

215 (System Status)

Address	Name
0	System mode
1	Most significant level system error number
2	Most recent system error number
3	System status byte 1
4	System status byte 2
5	System status byte 3
6	System status byte 4

253 (Program)

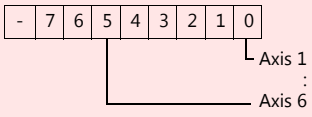
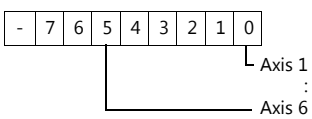
Address	Name	Value
Program number	Program	0: Program end 1: Program execution 2: Program pause 3: Program one step execution 4: Program execution restart

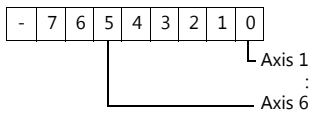
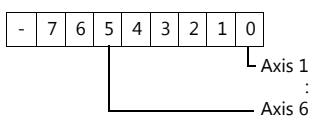
2A1 (Scalar Axis Status)

Address	Name
0	Workpiece coordinate system number
1	Tool coordinate system number
2	Axis common status
3	Axis 1 axis status
4	Axis 1 axis sensor input status
5	Axis 1 axis-related error code
6	Axis 1 encoder status
7	Axis 1 current position
10	Workpiece coordinate system number
11	Tool coordinate system number
12	Axis common status
13	Axis 2 axis status
14	Axis 2 axis sensor input status
15	Axis 2 axis-related error code
16	Axis 2 encoder status
17	Axis 2 current position
20	Workpiece coordinate system number
21	Tool coordinate system number
22	Axis common status
23	Axis 3 axis status
24	Axis 3 axis sensor input status
25	Axis 3 axis-related error code
26	Axis 3 encoder status
27	Axis 3 current position
30	Workpiece coordinate system number
31	Tool coordinate system number
32	Axis common status
33	Axis 4 axis status
34	Axis 4 axis sensor input status
35	Axis 4 axis-related error code
36	Axis 4 encoder status
37	Axis 4 current position

PLC_CTL

Real numbers used on the TS are IEEE 32-bit single precision ones.

Contents	F0	F1 (= $u n)		F2
Version inquiry	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 201 (HEX)	
		n + 2	Unit type 0: Main CPU application area 1: Main CPU core area 2: Driver CPU	
		n + 3	Device number	
		n + 4	Model code	
		n + 5	Unit code	
		n + 6	Version number	
		n + 7	Year (4-digit)	
		n + 8	Month	
		n + 9	Day	
		n + 10	Hour	
		n + 11	Minute	
		n + 12	Second	
Effective point data count inquiry	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 208 (HEX)	
		n + 2	Effective point data count	
Effective point data inquiry	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 209 (HEX)	
		n + 2	Inquiry point number	
		n + 3	Effective point data count	
		n + 4	Point number	
		n + 5	Axis pattern: m (number of ON bits) 	
		n + 6	Acceleration	
		n + 7	Deceleration	
		n + 8	Speed	
		n + 9 to n + 10	Axis pattern 1 / Position data	
		n + 11 -	:	
			Axis pattern m / Position data	
Real variable inquiry Disabled for X-SEL version 0.41 or earlier	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 20F (HEX)	
		n + 2	Program number	
		n + 3	Inquiry start variable number	
		n + 4	Inquiry data count: m (1 to 10)	
		n + 5	Response start variable number	
		n + 6	Response variable data count: m	
		n + 7 to n + 8	Data count 1 / Data for variable	
		n + 9 -	:	
			Data count m / Data for variable	
Axis status inquiry For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 212 (HEX)	
		n + 2	Inquiry axis pattern: m (number of ON bits) 	
		n + 3	Status / Axis status	
		n + 4	Status / Axis sensor input status	
		n + 5	Status / Axis-related error code	
		n + 6	Status / Encoder status	
		n + 7 to n + 8	Status / Current position	
		n + 9 -	Status (m = 2) / :	
			:	

Contents	F0	F1 (= $u n)		F2
Program status inquiry	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 213 (HEX)	
		n + 2	Program number	
		n + 3	Status	
		n + 4	Running program step number	
		n + 5	Program-sensitive error code	
		n + 6	Error occurrence step number	
System status inquiry	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 215 (HEX)	
		n + 2	System mode	
		n + 3	Most significant level system error number	
		n + 4	Most recent system error number	
		n + 5	System status byte 1	
		n + 6	System status byte 2	
		n + 7	System status byte 3	
		n + 8	System status byte 4	
Error detailed information inquiry	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 216 (HEX)	
		n + 2	Type 1 0: System error 1: Axis error 2: Program error 3: Error in error list record	
		n + 3	Type 2 In the event of a system error: 0: Most significant level error 1: Most recent error In the event of an axis error: Axis number In the event of a program error: Program number In the event of an error in error list record: Record number	
		n + 4	Error number	
		n + 5 to n + 6	Detailed information 1	
		n + 7 to n + 8	Detailed information 2	
		n + 9 to n + 10	Detailed information 3	
		n + 11 to n + 12	Detailed information 4	
		n + 13 to n + 14	Detailed information 5	
		n + 15 to n + 16	Detailed information 6	
		n + 17 to n + 18	Detailed information 7	
		n + 19 to n + 20	Detailed information 8	
		n + 21 to n + 27	System reserved	
		n + 28	Number of message bytes	
		n + 29 -	Message character string (equivalent to message bytes)	
Servo ON/OFF	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 232 (HEX)	
		n + 2	Axis pattern 	
		n + 3	Servo 0: OFF 1: ON	
Origin return For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 233 (HEX)	
		n + 2	Axis pattern 	
		n + 3	End search speed for origin return (mm/sec)	
		n + 4	Creep speed for origin return (mm/sec)	

Contents	F0	F1 (= $u n)		F2
Traverse by absolute command For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	6 + 2m
		n + 1	Command: 234 (HEX)	
		n + 2	Axis pattern: m (number of ON bits) Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Acceleration	
		n + 4	Deceleration	
		n + 5	Speed	
		n + 6 to n + 7	Axis pattern (m = 1)	Absolute coordinate data
		n + 8 -	Axis pattern (m = 2)	Absolute coordinate data
			:	
Traverse by relative command For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	6 + 2m
		n + 1	Command: 235 (HEX)	
		n + 2	Axis pattern: m (number of ON bits) Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Acceleration	
		n + 4	Deceleration	
		n + 5	Speed	
		n + 6 to n + 7	Axis pattern (m = 1)	Relative coordinate data
		n + 8 -	Axis pattern (m = 2)	Relative coordinate data
			:	
Jog/inching traverse	1 - 8 (PLC1 - 8)	n	Station number	9
		n + 1	Command: 236 (HEX)	
		n + 2	Axis pattern m Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Acceleration	
		n + 4	Deceleration	
		n + 5	Speed	
		n + 6 to n + 7	Inching distance (absolute command) 0: Distance not designated = jog	
		n + 8	Direction 0: Negative direction 1: Positive direction	
Traverse by point number command For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 237 (HEX)	
		n + 2	Axis pattern Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Acceleration	
		n + 4	Deceleration	
		n + 5	Speed	
		n + 6	Point number	
Operation stop and cancel	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 238 (HEX)	
		n + 2	Stop axis pattern Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Additional command	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="3">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="15">Successive writing within designated point data range</td><td rowspan="15">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="15">4 + (4 + 2m) t
= α</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 244 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Change start point data number</td></tr>
<tr><td>n + 3</td><td colspan="2">Change point data count: t (1 to 2)</td></tr>
<tr><td>n + 4</td><td rowspan="8">Point data

t = 1</td><td>Axis pattern: m (number of ON bits)
Bit - 7 6 5 4 3 2 1 0
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 5</td><td>Acceleration</td></tr>
<tr><td>n + 6</td><td>Deceleration</td></tr>
<tr><td>n + 7</td><td>Speed</td></tr>
<tr><td>n + 8 to n + 9</td><td>Axis pattern (m = 1)</td><td>Position data</td></tr>
<tr><td rowspan="2">n + 10 - α</td><td>Axis pattern (m = 2)</td><td>Position data</td></tr>
<tr><td colspan="2">:</td></tr>
<tr><td colspan="2">Point data (t = 2)</td><td>:</td></tr>
<tr><td>α + 1</td><td colspan="3">Change start point data number</td></tr>
<tr><td>α + 2</td><td colspan="3">Change complete point data count</td></tr>
<tr><td rowspan="15">Change point data successive writing</td><td rowspan="15">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="15">4 + (4 + 2m) t
= α</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 245 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Change point data count: t (1 to 2)</td></tr>
<tr><td>n + 3</td><td rowspan="8">Point data

t = 1</td><td>Change point data number</td></tr>
<tr><td>n + 4</td><td>Axis pattern: m (number of ON bits)
Bit - 7 6 5 4 3 2 1 0
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 5</td><td>Acceleration</td></tr>
<tr><td>n + 6</td><td>Deceleration</td></tr>
<tr><td>n + 7</td><td>Speed</td></tr>
<tr><td>n + 8 to n + 9</td><td>Axis pattern (m = 1)</td><td>Position data</td></tr>
<tr><td rowspan="2">n + 10 to α</td><td>Axis pattern (m = 2)</td><td>Position data</td></tr>
<tr><td colspan="2">:</td></tr>
<tr><td colspan="2">Point data (t = 2)</td><td></td></tr>
<tr><td>α + 1</td><td colspan="3">Change complete point data count</td></tr>
<tr><td rowspan="4">Point data clear</td><td rowspan="4">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="4">4</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 246 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Clear start point data number</td></tr>
<tr><td>n + 3</td><td colspan="2">Clear point data count</td></tr>
<tr><td rowspan="10">Real variable change</td><td rowspan="10">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="10">5 + 2m</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 24D (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
<tr><td>n + 3</td><td colspan="2">Change start variable number</td></tr>
<tr><td>n + 4</td><td colspan="2">Change variable data count: m (1 to 10)</td></tr>
<tr><td>n + 5 to n + 6</td><td>Variable data (m = 1)</td><td>Real variable data</td></tr>
<tr><td rowspan="2">n + 7 -</td><td>Variable data (m = 2)</td><td>Real variable data</td></tr>
<tr><td colspan="2">:</td></tr>
<tr><td>n +
{5 + (2*m)}</td><td colspan="2">Change complete data count</td></tr>
<tr><td rowspan="2">Alarm reset</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 252 (HEX)</td></tr>
<tr><td rowspan="3">Program execution</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 253 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
<tr><td rowspan="3">Program end</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 254 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Program pause	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 255 (HEX)	
		n + 2	Program number	
Program one step execution	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 256 (HEX)	
		n + 2	Program number	
Program execution restart	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 257 (HEX)	
		n + 2	Program number	
Software reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 25B (HEX)	
Request for drive source recovery	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 25C (HEX)	
Request for operation pause cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 25E (HEX)	
Speed change For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 262 (HEX)	
		n + 2	Axis pattern Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Speed	
Successive inquiry within designated range for coordinate system definition data For scalar	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 2A0 (HEX)	
		n + 2	Type 0: Workpiece coordinate system definition data 1: Tool coordinate system definition data	
		n + 3	Inquiry target top number for coordinate system definition data	
		n + 4	Inquiry record count t (1 to 32)	
		n + 5 to n + 6	Coordinate system definition data t = 1: Coordinate offset X axis	
		n + 7 to n + 8	Coordinate system definition data t = 1: Coordinate offset Y axis	
		n + 9 to n + 10	Coordinate system definition data t = 1: Coordinate offset Z axis	
		n + 11 to n + 12	Coordinate system definition data t = 1: Coordinate offset R axis	
		n + 13 -	Coordinate system definition data t = 2	
		:	:	
Scalar axis status inquiry For scalar	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 2A1 (HEX)	
		n + 2	Inquiry axis pattern: m (number of ON bits) Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6	
		n + 3	Type 0: Base coordinate system 1: Selected workpiece coordinate system 2: System reserved 3: Coordinate system for each axis	
		n + 4	Workpiece coordinate system number	
		n + 5	Tool coordinate system number	
		n + 6	Axis common status	
		n + 7	Axis pattern m = 1: Axis status	
		n + 8	Axis pattern m = 1: Axis sensor input status	
		n + 9	Axis pattern m = 1: Axis-related error code	
		n + 10	Axis pattern m = 1: Encoder status	
		n + 11 to n + 12	Axis pattern m = 1: Current position	
		n + 13 -	Axis pattern (m = 2)	
		:	:	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="4">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="20">Successive inquiry within designated range for interference check zone definition data

For scalar</td><td rowspan="20">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="3">Station number</td><td rowspan="20">4</td></tr>
<tr><td>n + 1</td><td colspan="3">Command: 2A2 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="3">Inquiry top number for interference check zone definition data</td></tr>
<tr><td>n + 3</td><td colspan="3">Inquiry record count t (1 to 16)</td></tr>
<tr><td>n + 4</td><td rowspan="12">Interference check zone definition data
t = 1</td><td colspan="2">Effective axis pattern: m (number of ON bits)

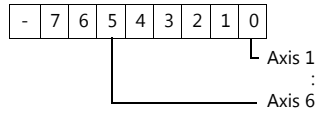
Bit - 7 6 5 4 3 2 1 0
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 5 to n + 6</td><td>Axis pattern (m = 1)</td><td>Interference check zone definition coordinate 1</td></tr>
<tr><td>n + 7 -</td><td>Axis pattern (m = 2)</td><td>Interference check zone definition coordinate 1</td></tr>
<tr><td>:</td><td>:</td><td>:</td></tr>
<tr><td>n + (5 + 2m)</td><td>Axis pattern (m = 1)</td><td>Interference check zone definition coordinate 2</td></tr>
<tr><td>:</td><td>Axis pattern (m = 2)</td><td>Interference check zone definition coordinate 2</td></tr>
<tr><td>:</td><td>:</td><td>:</td></tr>
<tr><td>n + (5 + 4m)</td><td colspan="2">Physical output port number at break-in or global flag number</td></tr>
<tr><td>n + (6 + 4m)</td><td colspan="2">Error type definition at break-in</td></tr>
<tr><td>n + (7 + 4m)</td><td colspan="2">System reserved</td></tr>
<tr><td>:</td><td colspan="3">Interference check data t = 2</td></tr>
<tr><td>:</td><td colspan="3">:</td></tr>
<tr><td rowspan="12">Traverse by absolute command

For scalar</td><td rowspan="12">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="3">Station number</td><td rowspan="12">7 + 2m</td></tr>
<tr><td>n + 1</td><td colspan="3">Command: 2D4 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="3">Axis pattern: m (number of ON bits)

Bit - 7 6 5 4 3 2 1 0
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 3</td><td colspan="3">Acceleration</td></tr>
<tr><td>n + 4</td><td colspan="3">Deceleration</td></tr>
<tr><td>n + 5</td><td colspan="3">Speed</td></tr>
<tr><td>n + 6</td><td colspan="3">Positioning type</td></tr>
<tr><td>n + 7 to n + 8</td><td>Axis pattern (m = 1)</td><td colspan="2">Absolute coordinate data</td></tr>
<tr><td>n + 9 to n + 10</td><td>Axis pattern (m = 2)</td><td colspan="2">Absolute coordinate data</td></tr>
<tr><td>:</td><td colspan="3">:</td></tr>
<tr><td rowspan="12">Traverse by relative command

For scalar</td><td rowspan="12">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="3">Station number</td><td rowspan="12">7 + 2m</td></tr>
<tr><td>n + 1</td><td colspan="3">Command: 2D5 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="3">Inquiry axis pattern: m (number of ON bits)

Bit - 7 6 5 4 3 2 1 0
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 3</td><td colspan="3">Acceleration</td></tr>
<tr><td>n + 4</td><td colspan="3">Deceleration</td></tr>
<tr><td>n + 5</td><td colspan="3">Speed</td></tr>
<tr><td>n + 6</td><td colspan="3">Positioning type</td></tr>
<tr><td>n + 7 to n + 8</td><td>Axis pattern (m = 1)</td><td colspan="2">Relative coordinate data</td></tr>
<tr><td>n + 9 to n + 10</td><td>Axis pattern (m = 2)</td><td colspan="2">Relative coordinate data</td></tr>
<tr><td>:</td><td colspan="3">:</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Traverse by point number command For scalar	1 - 8 (PLC1 - 8)	n	Station number	8
		n + 1	Command: 2D6 (HEX)	
		n + 2	Inquiry axis pattern: m (number of ON bits) 	
		n + 3	Acceleration	
		n + 4	Deceleration	
		n + 5	Speed	
		n + 6	Positioning type	
		n + 7 to n + 8	Point number	

Return data: Data stored from controller to TS

2.1.2 ROBO CYLINDER (RCP2/ERC)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 /115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 15	

ROBO CYLINDER

RCP2

Application software

Set parameters using the application software.

(Underlined setting: default)

Parameter No.	Parameter Name	Setting
Parameter 16	SIO baud rate	9600 / 19200 / 38400 / 115200 bps

Axis number setting switch (ADRS)

ADRS	Setting	Remarks
	0 to F (0 to 15)	

After changing the setting, be sure to turn the power off and back on again.

PORT switch (PORT)

PORT	Setting	Remarks
PORT  ON OFF	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, check the wiring of the emergency stop terminal block.

- **RCP2-C / RCP2-CF (with built-in cutout relay)**
  Connect the EMG switch between the S1 terminal and the 24-V terminal.
  When the EMG switch is not used, short-circuit them.
  Short-circuit the terminals S2 and EMG, and MPI and MPO, respectively.

- **RCP2-CG (with external cutout relay)**
  Install wiring by referring to the specifications sheet of RCP2.

ERC

Application software

Set parameters using the application software.

(Underlined setting: default)

Parameter No.	Parameter Name	Setting
Parameter 16	Serial communication speed	9600 / 19200 / 38400 / 115200 bps

Item	Parameter Name	Setting
Axis number assignment	Axis number table	0 to 15

RCB-TU-SIO-A/B

PORT switch (PORT)

PORT	Setting	Remarks
	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.
When the EMG switch is not used, short-circuit them.

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
SW	(status)	00H	Read only
PD	(positioning data)	01H	Double-word, write only
CW	(control data)	02H	Write only
4D	(window area)	03H	Double-word
MD	(window area (in mm))	04H	Double-word

PLC_CTL

Contents	F0	F1 (= $u n)		F2
Non-volatile memory area ↓ Transfer to window area	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 51 (HEX)	
		n + 2	Position number RCP2: 0 to 63 ERC: 0 to 7	
Window area ↓ Transfer to non-volatile memory area	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 56 (HEX)	
		n + 2	Position number RCP2: 0 to 63 ERC: 0 to 7	
		n + 3 to n + 4	Total number of writing times	
Remaining amount of movement cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 64 (HEX)	

Contents	F0	F1 (= $u n)		F2
Speed, acceleration setting (in mm)	1 - 8 (PLC1 -8)	n	Station number	4
		n + 1	Command: 66 (HEX)	
		n + 2	Speed	
		n + 3	Acceleration	
Speed, acceleration setting	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 76 (HEX)	
		n + 2	Speed	
		n + 3	Acceleration	
Deceleration stop	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6B (HEX)	
Alarm reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 72 (HEX)	

Return data: Data stored from controller to TS

2.1.3 ROBO CYLINDER (RCS/E-CON)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 15	

ROBO CYLINDER

RCS

Application software

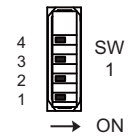
Set parameters using the application software.

(Underlined setting: default)

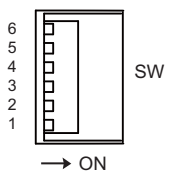
Parameter No.	Parameter Name	Setting
Parameter 16	SIO baud rate	9600 / 19200 / 38400 / 58600 / 115200 bps

RCS axis number setting switch

RCS-C: SW1



RCS-E: SW (switch No. 1 to 4)



Axis number	Switch number 1	2	3	4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

Remarks: Always turn the switches 5 and 6 of RCS-E.

When changing the switch setting, turn the power off.

PORT switch (PORT)

PORT	Setting	Remarks
	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.
When the EMG switch is not used, short-circuit them.

E-CON

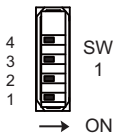
Application software

Set parameters using the application software.

(Underlined setting: default)

Parameter No.	Parameter Name	Setting
Parameter 16	Serial communication speed	9600 / 19200 / <u>38400</u> / 115200 bps

RCS axis number setting switch

SW1	Setting					Remarks
	Axis number	Switch number				
		1	2	3	4	
	<u>0</u>	OFF	OFF	OFF	OFF	
	1	ON	OFF	OFF	OFF	
	2	OFF	ON	OFF	OFF	
	3	ON	ON	OFF	OFF	
	4	OFF	OFF	ON	OFF	
	5	ON	OFF	ON	OFF	
	6	OFF	ON	ON	OFF	
	7	ON	ON	ON	OFF	
	8	OFF	OFF	OFF	ON	
	9	ON	OFF	OFF	ON	
	10	OFF	ON	OFF	ON	
	11	ON	ON	OFF	ON	
	12	OFF	OFF	ON	ON	
	13	ON	OFF	ON	ON	
	14	OFF	ON	ON	ON	
	15	ON	ON	ON	ON	

When changing the switch setting, turn the power off.

PORT switch (PORT)

PORT	Setting	Remarks
	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.
When the EMG switch is not used, short-circuit them.

RCB-TU-SIO-A/B

PORT switch (PORT)

PORT	Setting	Remarks
	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.
When the EMG switch is not used, short-circuit them.

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
SW	(status)	00H	Read only
PD	(positioning data)	01H	Double-word, write only
CW	(control data)	02H	Write only
4D	(window area)	03H	Double-word
MD	(window area (in mm))	04H	Double-word

PLC_CTL

Contents	F0	F1 (= $u n)		F2
Non-volatile memory area ↓ Transfer to window area	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 51 (HEX)	
		n + 2	Position number RCP2: 0 to 15 E-CON: 0 to 63	
Window area ↓ Transfer to non-volatile memory area	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 56 (HEX)	
		n + 2	Position number	
		n + 3 to n + 4	Total number of writing times	
Remaining amount of movement cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 64 (HEX)	
Speed, acceleration setting (in mm)	1 - 8 (PLC1 -8)	n	Station number	4
		n + 1	Command: 66 (HEX)	
		n + 2	Speed	
		n + 3	Acceleration	
Speed, acceleration setting	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 76 (HEX)	
		n + 2	Speed	
		n + 3	Acceleration	
Deceleration stop	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6B (HEX)	
Alarm reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 72 (HEX)	

Return data: Data stored from controller to TS

2.1.4 PCON / ACON / SCON (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 15	Set the same number as the IAI axis number.

PCON / ACON / SCON

Exclusive software

Set parameters using the exclusive software.

(Underlined setting: default)

Parameter No.	Parameter Name	Setting
Parameter 16	SIO baud rate	9600 / 19200 / 38400 / 115200 bps

Axis number setting switch (ADRS)

ADRS	Setting	Remarks
	0 to F (0 to 15)	

After changing the setting, be sure to turn the power off and back on again.

Mode select switch

Select [MANU].

Emergency stop terminal block

When the servo cannot be turned on, check the emergency stop terminal block.

- **ACON-C, PCON-C/CF (with built-in cutout relay)**
  Connect the EMG switch between the S1 terminal and the 24-V terminal.
  When the EMG switch is not used, short-circuit them.
  Short-circuit the terminals S2 and EMG-, and MPI and MPO, respectively.

- **ACON-CY/PL/PO/SE, PCON-CY/PL/PO/SE (with built-in cutout relay)**
  Connect the EMG switch between the EMG- terminal and the 24-V terminal.
  When the EMG switch is not used, short-circuit them.
  Short-circuit the MPI terminal and the MPO terminal.

- **ACON-CG / PCON-CG (with external cutout relay)**
  Install wiring by referring to the specifications sheet of ACON/PCON.

- **SCON**
  Connect the EMG switch between the S1 terminal and the EMG- terminal.
  When the EMG switch is not used, short-circuit them.
  Short-circuit the S2 terminal and the EMG+ terminal.

RCB-TU-SIO-A/B

PORT switch (PORT)

PORT	Setting	Remarks
 SW1	**ON**	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.
When the EMG switch is not used, short-circuit them.

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.

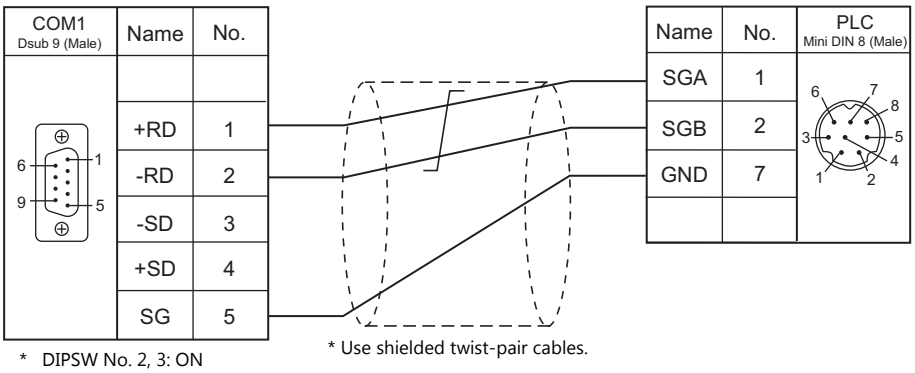
Device Memory		TYPE	Remarks
Coil	(coil)	00H	
Register	(holding register)	02H	

2.1.5 Wiring Diagrams

When Connected at COM1:

RS-485

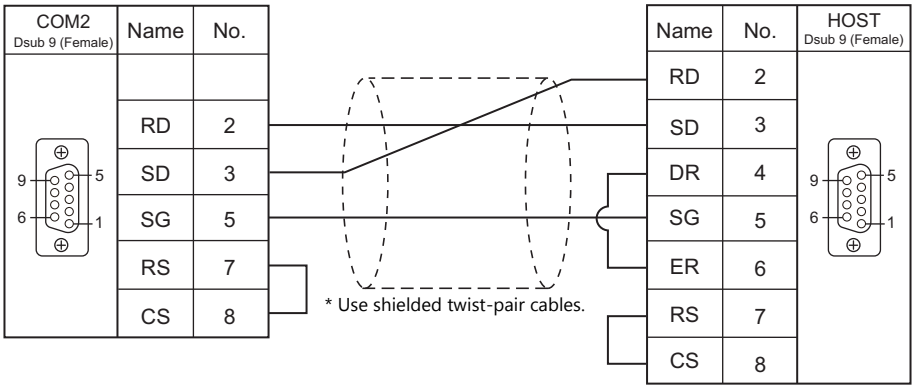
Wiring diagram 1 - COM1



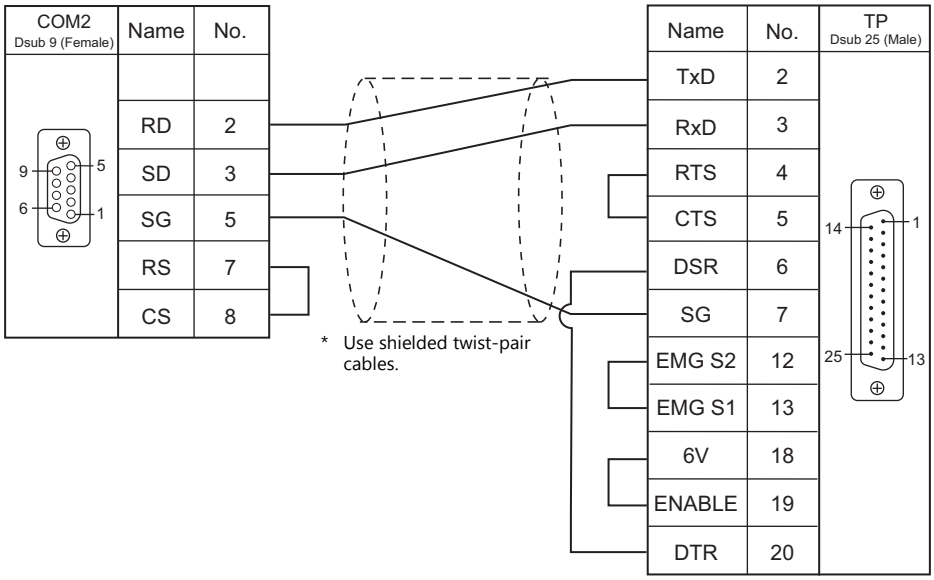
When Connected at COM2:

RS-232C

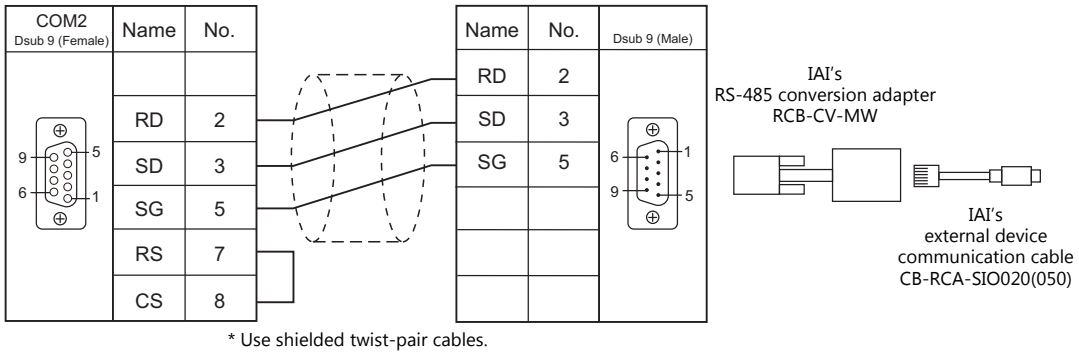
Wiring diagram 1 - COM2



Wiring diagram 2 - COM2

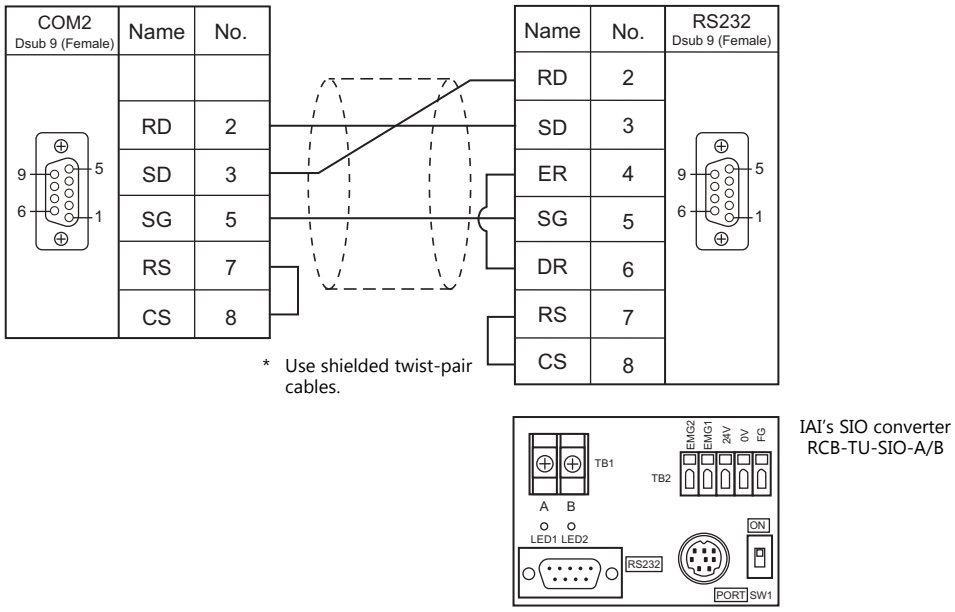


Wiring diagram 3 - COM2



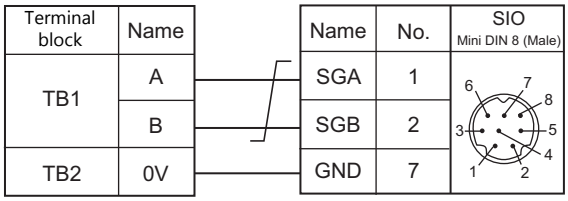
* Use shielded twist-pair cables.

Wiring diagram 4 - COM2



* Use shielded twist-pair cables.

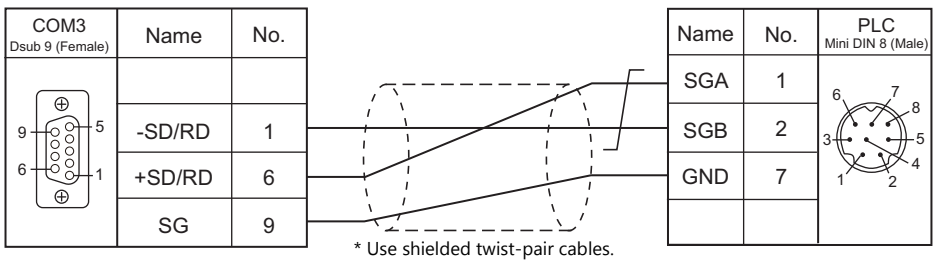
IAI's SIO converter
RCB-TU-SIO-A/B



When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



* Use shielded twist-pair cables.

MEMO

3. IDEC

3.1 PLC Connection

3.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	TS Port	Connection	Ladder Transfer *1
MICRO 3	FC2A-Cxxxx	Loader port		RS-232C	COM2	IDEC's "FC2A-KC1" +Wiring diagram 1 - COM2	×
						IDEC's "FC2A-KC2" +Wiring diagram 2 - COM2	
		FC2A-LC1		RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
MICRO Smart	FC4A-Cxxxxx *2 FC4A-Dxxxxx *3	Port 1	CPU (built-in)	RS-232C	COM2	Wiring diagram 3 - COM2	
						IDEC's "FC4A-KC1C" +Wiring diagram 4 - COM2	
						IDEC's "FC4A-KC2C" +Wiring diagram 5 - COM2	
		Port 2	FC4A-PC1 FC4A-HPC1	RS-232C	COM2	Wiring diagram 6 - COM2	
						IDEC's "FC4A-KC1C" +Wiring diagram 4 - COM2	
						IDEC's "FC4A-KC2C" +Wiring diagram 5 - COM2	
			FC4A-PC2 FC4A-HPC2	RS-485	COM1	Wiring diagram 2 - COM1	
					COM3	Wiring diagram 2 - COM3	
			FC4A-PC3 FC4A-HPC3	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
MICRO Smart pentra	FC5A-Cxxxxx FC5A-Dxxxxx	Port 1	CPU (built-in)	RS-232C	COM2	Wiring diagram 3 - COM2	
						IDEC's "FC4A-KC1C" +Wiring diagram 4 - COM2	
						IDEC's "FC4A-KC2C" +Wiring diagram 5 - COM2	
		Port 2	FC4A-PC1 FC4A-HPC1	RS-232C	COM2	Wiring diagram 6 - COM2	
						IDEC's "FC4A-KC1C" +Wiring diagram 4 - COM2	
						IDEC's "FC4A-KC2C" +Wiring diagram 5 - COM2	
			FC4A-PC2 FC4A-HPC2	RS-485	COM1	Wiring diagram 2 - COM1	
					COM3	Wiring diagram 2 - COM3	
			FC4A-PC3 FC4A-HPC3	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		Port 3 to 7	FC5A-SIF2 *4	RS-232C	COM2	Wiring diagram 7 - COM2	
			FC5A-SIF4 *4	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 With "FC4A-C10Rxx", only port 1 can be used.
*3 When the communication board "FC4A-PCx" is used with "FX4A-Dxxxxx", IDEC's HMI base module "FC4A-HPH1" is necessary.
*4 "FC5A-C10Rxx" and "FC5A0C16Rxx" cannot be used.
A maximum of 3 units of "FC5A-C24Rxx" or 5 units of "FC5A-Dxxxxx" can be added.

3.1.1 MICRO 3

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Function setting (communication)

(Underlined setting: default)

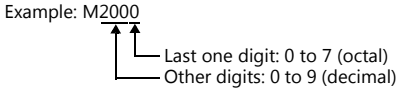
Item	Setting	Remarks
Communication Device No. Setting	0	
Loader Port Communication Mode	Arbitrary setting mode	
Communication Condition Selection Input No.	X0000	
Baud Rate	4800 / 9600 / 19200 bps	
Data Bit	7 / 8 bits	
Parity	None / Odd / Even	
Stop Bit	1 / 2 bits	
Terminator Code	CR	
Receive Timeout	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
D	(data register)	00H	
I	(input)	01H	*1
Q	(output)	02H	*1
M	(internal relay)	03H	*1
R	(shift register)	04H	
TS	(timer/set value)	05H	
TN	(timer/enumerated value)	06H	
T	(timer/contact)	07H	Read only
CS	(counter/set value)	08H	
CN	(counter/enumerated value)	09H	
C	(counter/contact)	0AH	Read only

*1 The assigned device memory is expressed as shown on the right when editing the screen.
The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.



3.1.2 MICRO Smart

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Function setting (communication)

(Underlined setting: default)

Item	Setting	Remarks
Communication Type	Maintenance communication	
Baud Rate (bps)	4800 / 9600 / 19200 bps	
Data Bit Length	7 / 8 bits	
Parity	None / Odd / Even	
Stop Bit Length	1 / 2 bits	
Receive Timeout Time	Make settings in accordance with the network environment.	
Communication Device No.	0	
Communication Selection Input	X0000	

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	
I	(input)	01H	*1
Q	(output)	02H	*1
M	(internal relay)	03H	*1
R	(shift register)	04H	
TS	(timer/set value)	05H	
TN	(timer/enumerated value)	06H	
T	(timer/contact)	07H	Read only
CS	(counter/set value)	08H	
CN	(counter/enumerated value)	09H	
C	(counter/contact)	0AH	Read only

*1 The assigned device memory is expressed as shown on the right when editing the screen.
The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.

Example: M2000
Last one digit: 0 to 7 (octal)
Other digits: 0 to 9 (decimal)

3.1.3 MICRO Smart Pentra

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Function setting (communication)

(Underlined setting: default)

Item	Setting	Remarks
Communication Type	Maintenance communication	
Baud Rate (bps)	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	For the add-on communication module "FC5A-SIF2", the maximum available rate is 38400 bps. 115 kbps is available only for the add-on communication module "FC5A-SIF4".
Data Bit Length	7 / 8 bits	
Parity	None / Odd / Even	
Stop Bit Length	1 / 2 bits	
Receive Timeout Time	Make settings in accordance with the network environment.	
Communication Device No.	0	
Communication Selection Input	X0000	

Function setting (other 2)

(Underlined setting: default)

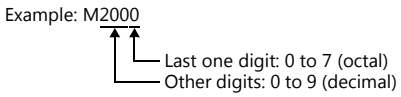
Item	Setting	Remarks
32-bit Data Storage Setting	From lower word / From higher word	From lower word: little endian From higher word: big endian

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	
I	(input)	01H	*1
Q	(output)	02H	*1
M	(internal relay)	03H	*1
R	(shift register)	04H	
TS	(timer/set value)	05H	
TN	(timer/enumerated value)	06H	
T	(timer/contact)	07H	Read only
CS	(counter/set value)	08H	
CN	(counter/enumerated value)	09H	
C	(counter/contact)	0AH	Read only

*1 The assigned device memory is expressed as shown on the right when editing the screen.
The addresses are expressed in “bytes”. For word designation, specify an even-numbered address.

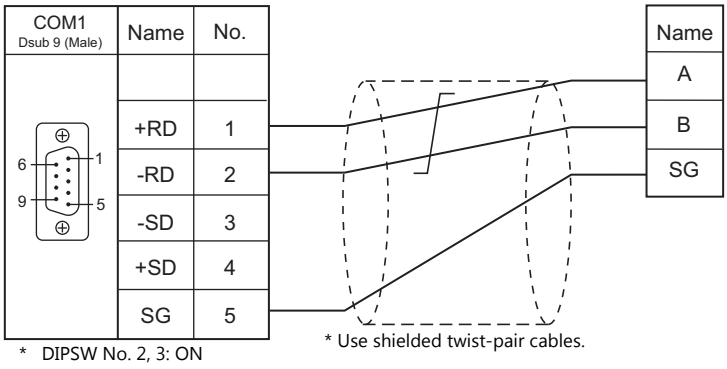


3.1.4 Wiring Diagrams

When Connected at COM1:

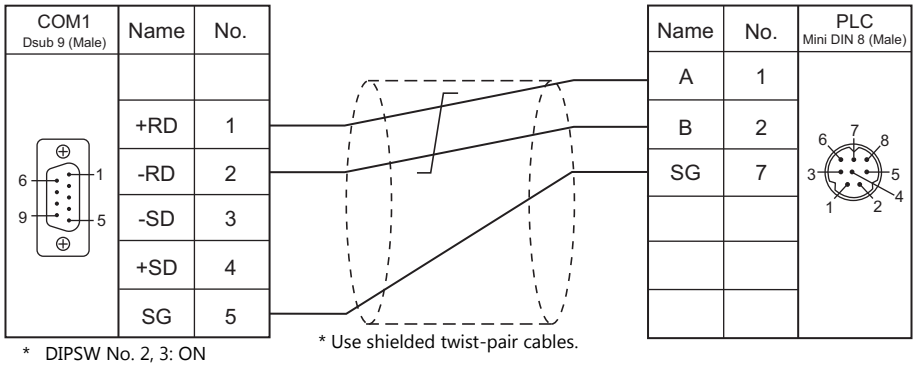
RS-485

Wiring diagram 1 - COM1



* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1

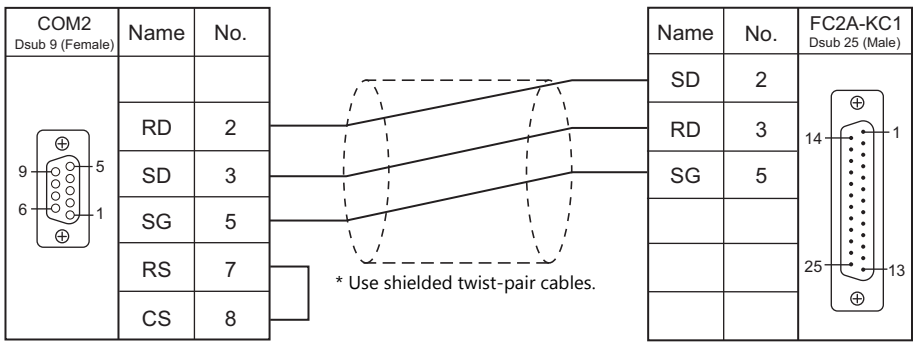


* DIPSW No. 2, 3: ON

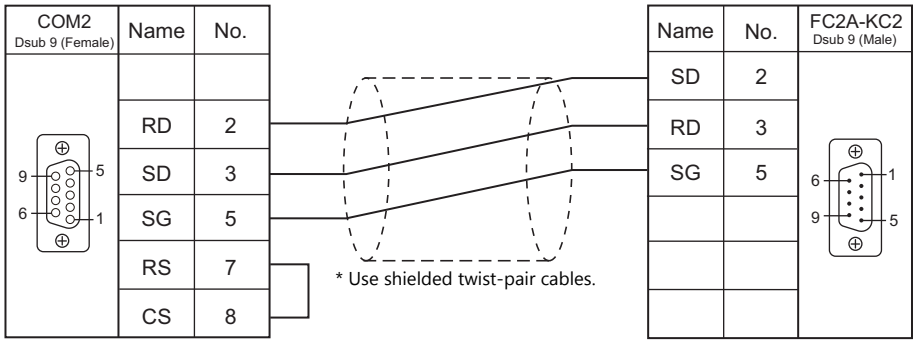
When Connected at COM2:

RS-232C

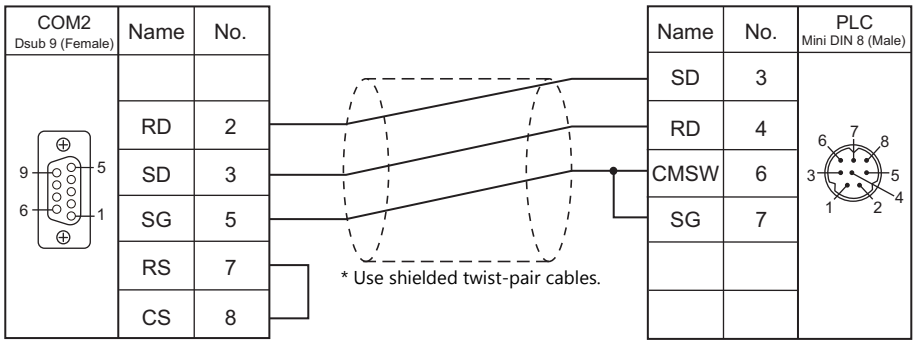
Wiring diagram 1 - COM2



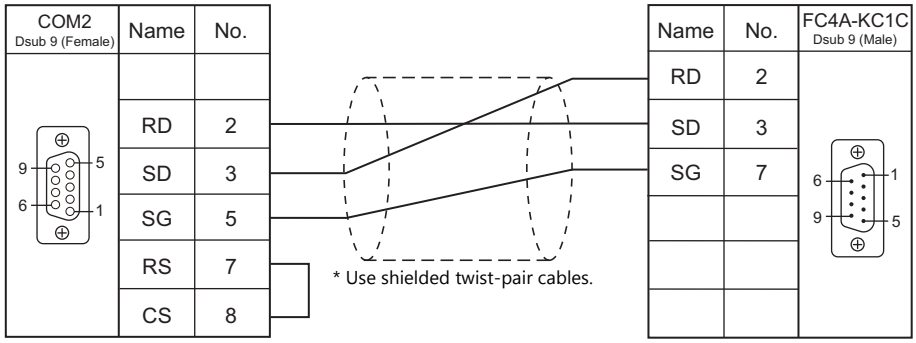
Wiring diagram 2 - COM2



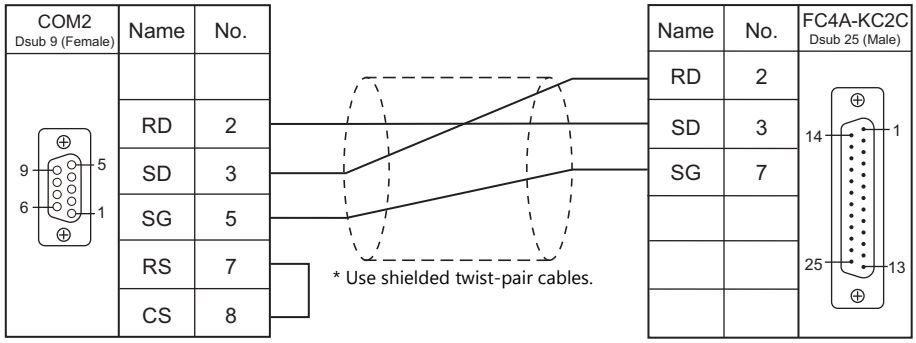
Wiring diagram 3 - COM2



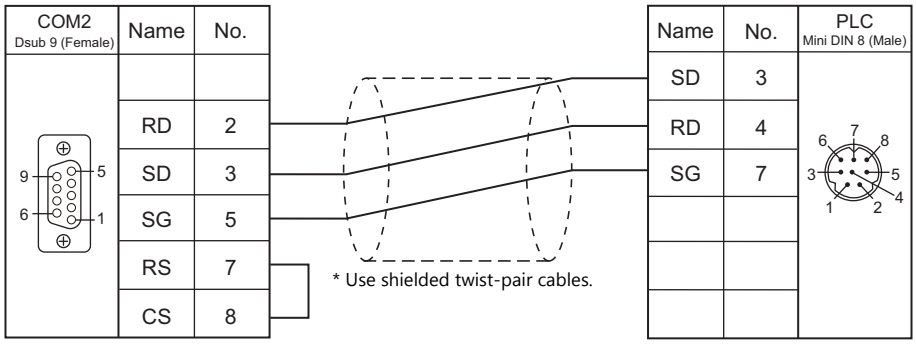
Wiring diagram 4 - COM2



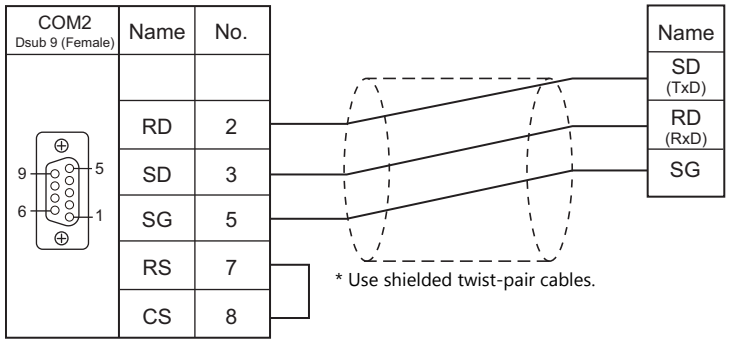
Wiring diagram 5 - COM2



Wiring diagram 6 - COM2



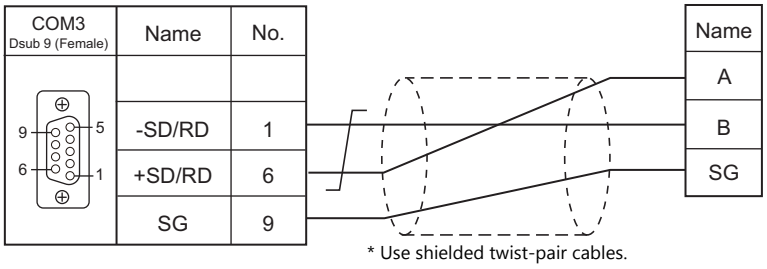
Wiring diagram 7 - COM2



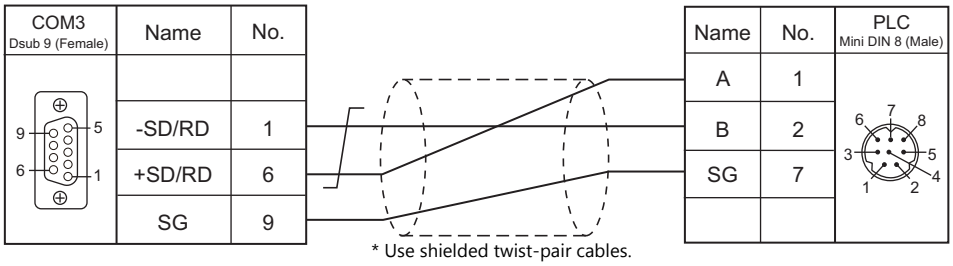
When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



Wiring diagram 2 - COM3



4. Jetter

4.1 PLC Connection

Ethernet Connection (TS1100Si/TS1070Si Only)

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
JetControl Series2/3 (Ethernet UDP/IP) *2	JC241 JC243 JC246	Built-in Ethernet (X51)	×	○	50000 (fixed)	×
	JC340 JC350 JC360	Built-in Ethernet (X14/X15)				

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 JC24x and JC3x0 can be connected in a mixed manner.

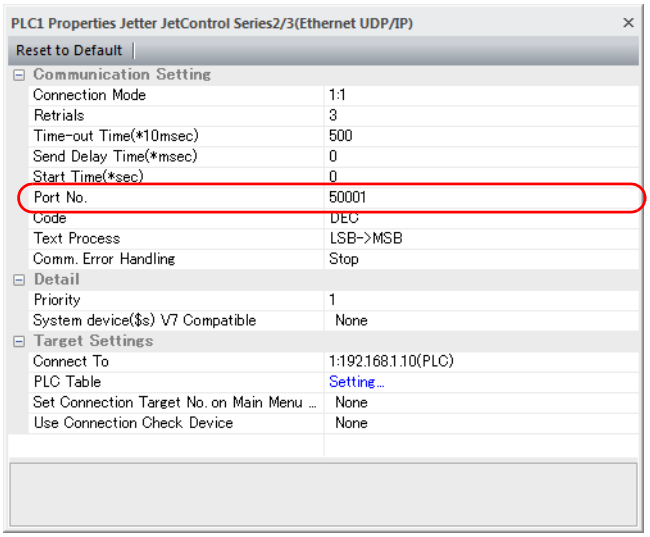
4.1.1 JetControl Series2/3 (Ethernet UDP/IP)

Communication Setting

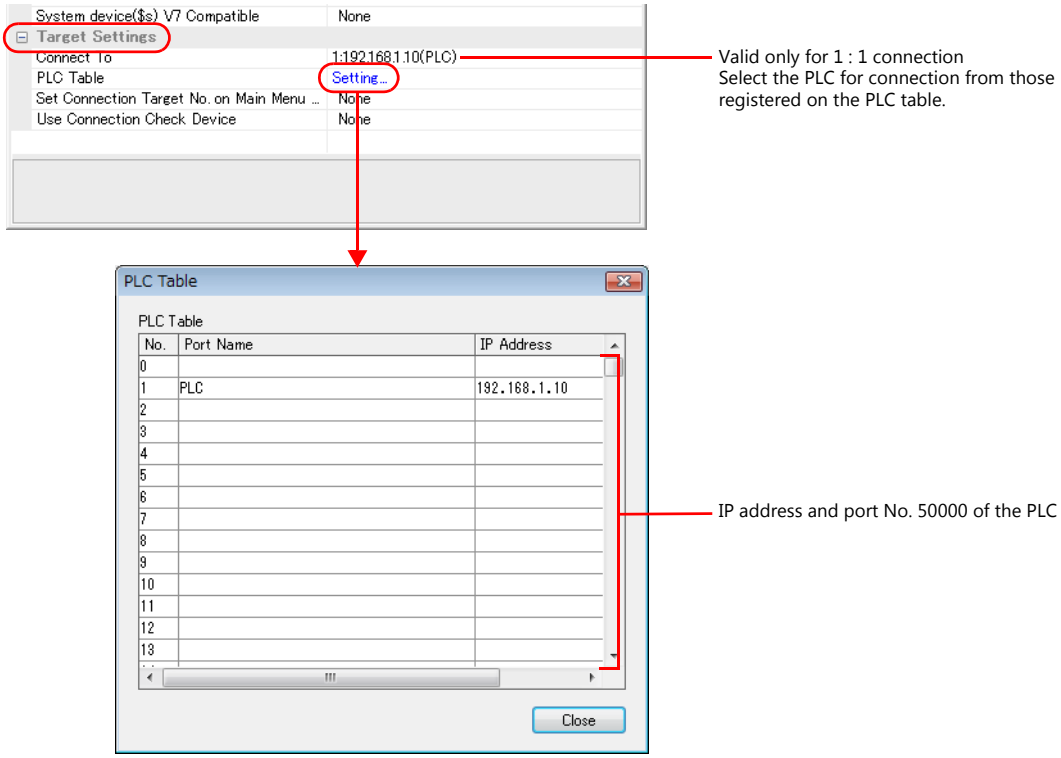
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port No. 50001 on the TSi unit
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



- IP address and port number (No. 50000) for the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

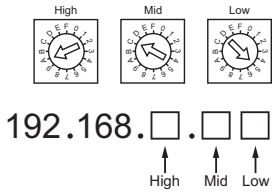


PLC

JC241/JC243/JC246

Set an IP address using the rotary switch or in the "cfgvar.ini" file.
For usage of the "cfgvar.ini" file, refer to the PLC manual issued by the manufacturer.

Rotary switches

Rotary Switch	Setting	Example
	192.168.0.1 to 192.168.15.254	IP address 192.168.10.197 10 (DEC) = A (HEX) 197 (DEC) = C5 (HEX) High =A (HEX), Mid = C (HEX), Low = 5 (HEX) * The IP address is set as "192.168.10.15" on condition that High = 0, Mid = 0, and Low = 0.

Calendar

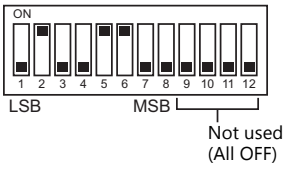
This model is not equipped with the calendar function. Use the built-in clock of the TSi.

JC340/JC350/JC360

Set an IP address using the DIP switches or in the "Config.ini" file.
For usage of the "Config.ini" file, refer to the PLC manual issued by the manufacturer.

DIP switches

The least significant byte of the IP address can be set by the DIP switches.
The high-order three bytes of the IP address can be set in the "Config.ini" file. For more information, refer to the PLC manual issued by the manufacturer.

DIP Switch	Example	Remarks
	50 [DEC] (00110010 BIN)	Set the least significant byte of the IP address (1 to 254). Switch 1 = LSB, switch 8 = MSB * When all DIP switches are OFF, the IP address is set as "192.168.10.15".

Calendar

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

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
FT	(Float)	01H	Real number. Bit designation is not possible.
I	(Input)	02H	Read only, *1
O	(Output)	03H	*1
FG	(Flag)	04H	FG0 to FG1048575 valid, *1
ST	(String)	05H	Double-word, STRING type, *2

*1 Use the Register device for word access.
*2 A maximum of 25 bytes is allowed for string display.

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

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

- For bit designation, an expansion code setting is required.
  00H: when designating bit 0 to 15
  01H: when designating bit 16 to 31
- When using Input or Output device memory, specify a quotient of "(real address number –1) divided by 16" for the address number. Specify the remainder for the bit designation.

5. JTEKT

5.1 PLC Connection

5.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
TOYOPUC	PC2 L2	PC/CMP-LINK (TPU-5174)	RS-485	COM1	Wiring diagram 1 - COM1	×
		PC/CMP2-LINK (TPU-5138)				
		3PORT-LINK (TLU-2769)				
		2PORT-LINK (TLU-2695)				
	PC3J/2J	PC/CMP-LINK (THU-2755)				
		PC/CMP2-LINK (THU-5139)				
		2PORT-LINK (THU-2927)				
	PC3J	Built-in link (L1) (TIC-5339)		COM3	Wiring diagram 1 - COM3	
		Optional link (L2) (TIU-5366)				
	PC3JL	Built-in link (L1) (TIC-5783)				
		Optional link (L2) (TIC-5783)				
	PC3JD	Built-in link (L1) (TIC-5642)				
TOYOPUC-Plus	Plus CPU	Serial port built into CPU (CN6)	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
		Plus EX (CN2) (TCU-6741)	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
		Plus EX2 (CN2) (TCU-6858)	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
		Plus 2P-EFR (CN3) (TCU-6929)	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	

*1 For the ladder transfer function, see the TS Reference Manual 2.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Keep Alive *2	Ladder Transfer *3
TOYOPUC (Ethernet)	PC3J PC2J *1	FL/ET-T-V2 (THU-5998)	×	○	As desired 1025 to 65534 (Max. 8 units)	○	×
		FL/ET-T-V2H (THU-6289)					
		EN-I/F-T (THU-5781)					
TOYOPUC (Ethernet PC10 mode)	PC10G (version 3.00 or later) PC10GE	Built-in Ethernet (L1/L2)	×	○	As desired 1025 to 65534 (Max. 32 units)	○	×
TOYOPUC-Plus (Ethernet)	Plus CPU	CN1 (CN1)	○	○	As desired 1025 to 65534 (Max. 32 units)	○	×
		Plus EX (CN1)					
		Plus EX2 (CN1)					
		Plus EFR (CN1)					
		Plus EFR2 (CN1)					
		Plus 2P-EFR (CN1)/(CN2)					
TOYOPUC-Nano (Ethernet)	TOYOPUC-Nano	Built-in Ethernet (L1/L2)	○	×	As desired 1025 to 65534 (Max. 32 units)	○	×
		2ET (L1/L2)	○	○	As desired 1025 to 65534 (Max. 8 units)		

*1 The PC2J CPU may not be used depending on the CPU version. For more information, refer to the PLC manual issued by the manufacturer.
*2 For KeepAlive functions, see “1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)”.
*3 For the ladder transfer function, see the TS Reference Manual 2.

5.1.1 TOYOPUC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
Parity	Even	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	0 to 31	
Transmission Mode	Data Area Single / Data Area Division	Select [Data Area Single] for PL2/L2.

PLC

Built-in Link / Optional Link

Hellowin link parameter setting

(Underlined setting: default)

Item	Setting	Remarks
Rack No.	Built-in	
Slot No.	For the built-in link: standard For the optional link: option	
Link Module Name	Computer link	
Station No.	0 to 37 (octal)	
Data Length	7 / 8 bits	ASCII
Stop Bit	1 / 2 bits	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
2-wire/4-wire	2-wire system	Can be selected only for “TIC-5783”. Set the 2W/4W change-over switch to “2W”.

* The parity setting is fixed to even.

TLU-2769 / TLU-2695

Rotary switch

Switch	Setting	Remarks
SW1	0	Station 0 Set the number from 00 to 37 in octal notation. SW1 denotes the higher-order digit, and SW2 denotes the lower-order digit.
SW2	0	
SW3	1	Baud rate 1: 19200, 2: 9600, 3: 4800

Short bar

SET No.	Setting	Contents
SET2	ON	Data length: 7 bits
SET3	ON	Stop bit: 2 bits
SET4	CMP-LINK	Card type: computer link

THU-2755 / THU-5139 / THU-2927

Rotary switch

Switch	Setting	Remarks
SW1	0	Station 0 Set the number from 00 to 37 in octal notation. SW1 denotes the higher-order digit, and SW2 denotes the lower-order digit.
SW2	0	
SW3	1	Baud rate 1: 19200, 2: 9600, 3: 4800

DIP switch

Switch No.	Setting	Contents
SW4-4	ON	Data length: 7 bits
SW4-3	OFF	Stop bit: 2 bits
SW4-2	ON	Module selection: computer link
SW4-1	OFF	2-wire system or not used

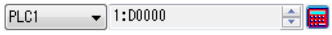
Available Device Memory

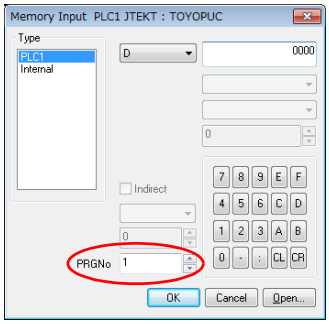
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	PRG No. when [Data Area Division] is selected
R	(link register)	01H	PRG No. when [Data Area Division] is selected
B	(file register)	02H	PRG No. when [Data Area Division] is selected
N	(current value register)	03H	PRG No. when [Data Area Division] is selected
X	(input)	04H	WX as word device
Y	(output)	05H	WY as word device
M	(internal relay)	06H	WM as word device, PRG No. when [Data Area Division] is selected
K	(keep relay)	07H	WK as word device, PRG No. when [Data Area Division] is selected
L	(link relay)	08H	WL as word device, PRG No. when [Data Area Division] is selected
T	(timer/contact)	09H	WT as word device, PRG No. when [Data Area Division] is selected
C	(counter/contact)	0AH	WC as word device, PRG No. when [Data Area Division] is selected
U	(extensional data register)	0BH	
H	(extensional set value register)	0CH	
EN	(extensional current value register)	0DH	
EX	(extensional input)	0EH	WEX as word device
EY	(extensional output)	0FH	WEY as word device
EM	(extensional internal relay)	10H	WEM as word device
EK	(extensional keep relay)	11H	WEK as word device
EL	(extensional link relay)	12H	WEL as word device
ET	(extensional timer/contact)	13H	WET as word device
EC	(extensional counter/contact)	14H	WEC as word device
V	(special register)	15H	WV as word device

PRG No. setting

If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) in addition to device type and address number. The assigned device memory is expressed as shown below when editing the screen. The PRG No. is invalid for the device memory in the common area.





Example: 1: D0000
- Address number
- Device type
- PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

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

* If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.
Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

5.1.2 TOYOPUC (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

Hellowin

Settings can be made using the software "Hellowin" or ladder programs. For settings using ladder programs, refer to the PLC manual issued by the manufacturer.

I/O module setting

Item	Setting
Identification Code	B3
Module Type	Special / Communication
Module Name	Time chart module, computer link, Ethernet, S-NET

Link parameter setting

Item	Setting
Rack No.	Select a number where the unit is mounted.
Slot No.	Select a number where the unit is mounted.
Link Module Name	Ethernet

Ethernet setting

Item	Setting
Local Node IP Address	Set the IP address of the PLC.
Connection 1 - 8 *	Protocol: UDP Own Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the TSi is registered
Initialization	Initialization based on Link Parameter

* When multiple TSi units are connected, make the settings for each unit. A maximum of eight units can be connected at one time.

Other node table setting

Item	Setting
Table 1 to 16	Check each box under "Used".
Other Node IP Address	Set the IP address of the TSi.
Other Node Port No.	Set the port number of the TSi.

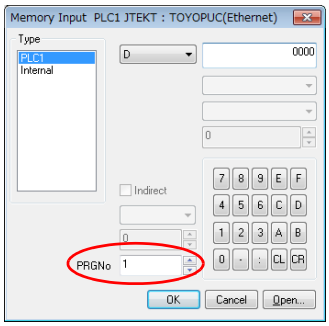
Available Device Memory

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	PRG No. when [Data Area Division] is selected
R	(link register)	01H	PRG No. when [Data Area Division] is selected
B	(file register)	02H	PRG No. when [Data Area Division] is selected
N	(current value register)	03H	PRG No. when [Data Area Division] is selected
X	(input)	04H	WX as word device
Y	(output)	05H	WY as word device
M	(internal relay)	06H	WM as word device, PRG No. when [Data Area Division] is selected
K	(keep relay)	07H	WK as word device, PRG No. when [Data Area Division] is selected
L	(link relay)	08H	WL as word device, PRG No. when [Data Area Division] is selected
T	(timer/contact)	09H	WT as word device, PRG No. when [Data Area Division] is selected
C	(counter/contact)	0AH	WC as word device, PRG No. when [Data Area Division] is selected
U	(extensional data register)	0BH	
H	(extensional set value register)	0CH	
EN	(extensional current value register)	0DH	
EX	(extensional input)	0EH	WEX as word device
EY	(extensional output)	0FH	WEY as word device
EM	(extensional internal relay)	10H	WEM as word device
EK	(extensional keep relay)	11H	WEK as word device
EL	(extensional link relay)	12H	WEL as word device
ET	(extensional timer/contact)	13H	WET as word device
EC	(extensional counter/contact)	14H	WEC as word device
V	(special register)	15H	WV as word device

PRG No. setting

If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) in addition to device type and address number. The assigned device memory is expressed as shown below when editing the screen. The PRG No. is invalid for the device memory in the common area.



Example: 1: D0000

Address number
Device type
PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

	15 – 8	7 – 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Station number

* If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.
Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

5.1.3 TOYOPUC (Ethernet PC10 Mode)

Communication Setting

Editor

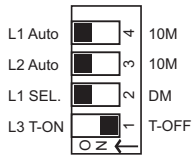
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

Settings are possible either in the software "PCwin" or ladder programs. For settings using ladder programs, refer to the PLC manual issued by the manufacturer.

Communication Setting Switches L1 and L2

SW	No.	Item	Setting
	1	L3 SN-IF use setting	**OFF: Not used (T-OFF)**
	2	L1 communication setting	**ON: Link parameter (L1 SEL.)**
	3	L2 baud rate switching	ON: Auto negotiation (L2 Auto) OFF: 10M bps (10M)
	4	L1 baud rate switching	ON: Auto negotiation (L1 Auto) OFF: 10M bps (10M)

PCwin

Link parameter setting

Item	Setting
Rack No.	**Built-in**
Slot No.	L1 / L2
Link Module Name	Ethernet (32 ports)

Ethernet setting

Item	Setting
Local Node IP Address	Set the IP address of the PLC.
Setting 1/Setting 2/ Setting 3/Setting 4/	Setting 1: Connection 1 to 8 Setting 2: Connection 9 to 16 Setting 3: Connection 17 to 24 Setting 4: Connection 25 to 32
Connection 1 - 32 *	Protocol: UDP Local Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the TSi is registered
Initialization	Initialize using the link parameter

* When multiple TSi units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting

Item	Setting
Setting 1/Setting 2	Setting 1: Table 1 to 16 Setting 2: Table 17 to 32
Table 1 to 32	Check each box for "Use".
Other Node IP Address	Set the IP address of the TSi.
Other Node Port No.	Set the port number of the TSi.

If "TOYOPUC (Ethernet PC10 mode)" is selected as a connected model in V-SFT and if establishing communication with PC10G or PC10GE is intended, set the following dialogs.

- PC10G: PC10 mode
- PC10GE: PC10 extended mode

PCwin settings

Click [Option] → [Setting] → [Interchangeable]. In the tab window, check either box below.

- PC10G: Check [☑ PC10 mode].
- PC10GE: Check [☑ PC10 extended mode].

In the [CPU operation mode] dialog, check either [PC10 mode] or [PC10 Extension].

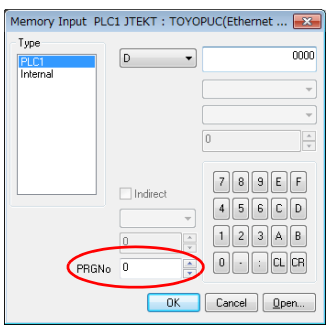
Available Device Memory

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	PRG No. designation
R	(link register)	01H	PRG No. designation
N	(current value register)	03H	PRG No. designation
X	(input)	04H	WX as word device
Y	(output)	05H	WY as word device
M	(internal relay)	06H	WM as word device, PRG No. designation
K	(keep relay)	07H	WK as word device, PRG No. designation
L	(link relay)	08H	WL as word device, PRG No. designation
T	(timer/contact)	09H	WT as word device, PRG No. designation
C	(counter/contact)	0AH	WC as word device, PRG No. designation
U	(extension data register)	0BH	
H	(extension set value register)	0CH	
EN	(extension current value register)	0DH	
EX	(extension input)	0EH	WEX as word device
EY	(extension output)	0FH	WEY as word device
EM	(extension internal relay)	10H	WEM as word device
EK	(extension keep relay)	11H	WEK as word device
EL	(extension link relay)	12H	WEL as word device
ET	(extension timer/contact)	13H	WET as word device
EC	(extension counter/contact)	14H	WEC as word device
V	(special relay)	15H	WV as word device, PRG No. designation, read only
GX	(extension input)	16H	WGX as word device
GY	(extension output)	17H	WGY as word device
GM	(extension internal relay)	18H	WGM as word device
EB	(extension buffer register)	19H	
FR	(extension flash register)	1AH	

PRG No. setting

In addition to device type and address number, a program number ([PRG No.]) must be specified. The assigned device memory is expressed as shown below when editing the screen. The PRG No. is invalid for the device memory in the common area.



Example: 1: D0000

Address number
Device type
PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

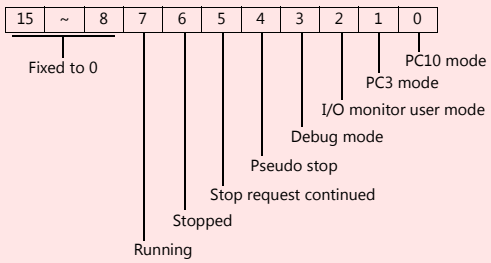
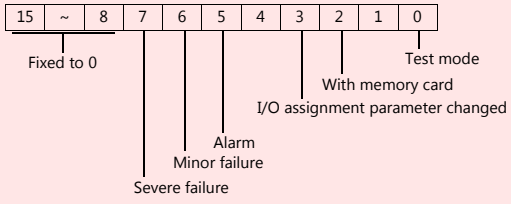
- For the address number of 65536 or greater:

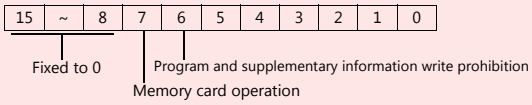
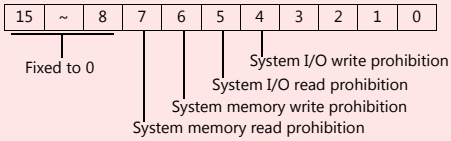
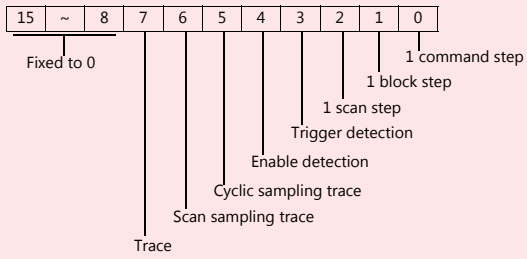
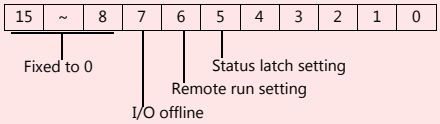
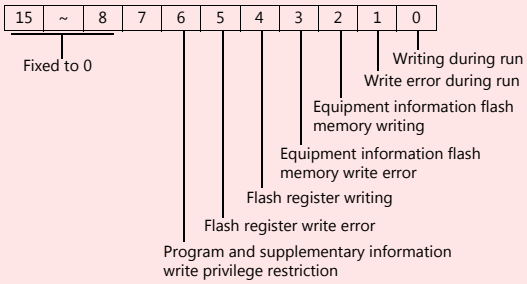
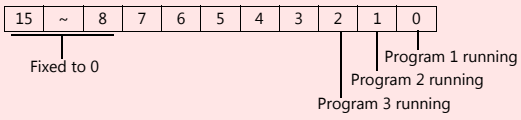
	15	8 7	0
n + 0	Model	Device type	
n + 1	Lower address No.		
n + 2	Higher address No.		
n + 3	Expansion code *	Bit designation	
n + 4	00	Station number	

* Specify a program number ([PRG No.]) for the expansion code. Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="4">Write to FR register flash memory *</td><td rowspan="4">1 to 8
(PLC1 to 8)</td><td>n</td><td>Station number</td><td rowspan="4">3</td></tr>
<tr><td>n+1</td><td>Command: 0</td></tr>
<tr><td>n+2</td><td>ExNo. (HEX)
<table><tr><th>ExNo.</th><th>Address</th></tr><tr><td>40H</td><td>FR000000 to FR007FFF</td></tr><tr><td>41H</td><td>FR008000 to FR00FFFF</td></tr><tr><td>42H</td><td>FR010000 to FR017FFF</td></tr><tr><td>43H</td><td>FR018000 to FR01FFFF</td></tr><tr><td>:</td><td>:</td></tr><tr><td>:</td><td>:</td></tr><tr><td>7EH</td><td>FR1F0000 to FR1F7FFF</td></tr><tr><td>7FH</td><td>FR1F8000 to FR1FFFFF</td></tr></table></td></tr>
<tr><td>n+3</td><td>Execution result
0: Successful
1: Error
2: Writing</td></tr>
<tr><td rowspan="4">CPU status readout</td><td rowspan="4">1 to 8
(PLC1 to 8)</td><td>n</td><td>Station number</td><td rowspan="4">2</td></tr>
<tr><td>n+1</td><td>Command: 1</td></tr>
<tr><td>n+2</td><td>Data 1
 
</td></tr>
<tr><td>n+3</td><td>Data 2
 
</td></tr>
</table>

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="6">CPU status readout</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n+4</td><td>Data 3
 
</td><td rowspan="6">2</td></tr>
<tr><td>n+5</td><td>Data 4
 
</td></tr>
<tr><td>n+6</td><td>Data 5
 
</td></tr>
<tr><td>n+7</td><td>Data 6
 
</td></tr>
<tr><td>n+8</td><td>Data 7
 
</td></tr>
<tr><td>n+9</td><td>Data 8
 
</td></tr>
</table>

Return data: Data stored to TSi from PC10G

* Writing to the FR register flash memory is performed in units of 64 kB. When writing to addresses in memory, specify an "Ex No." corresponding to the desired addresses for 64 kB of data.
Communication between the TSi and PC10G pauses during writing.

5.1.4 TOYOPUC-Plus

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C/ RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Parity	**Even**	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	0 to 31	
Transmission Mode	Standard mode / Expanded mode	

PLC

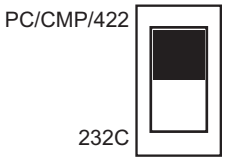
Link parameters

(Underlined setting: default)

Item	Setting	Remarks
Rack No.	Built-in	
Slot No.	Serial port built into CPU: standard Serial port built into expansion board: option	
Link module name	Computer link	
Station No.	0 to 37 (octal)	
Data length	7 / 8 bits	
Stop bit	1 / 2 bits	
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
2-wire/4-wire	2-wire	

* The parity setting is fixed to even.

RS-232C/RS-422 selector switch

SW1	Setting	Remarks
	PC/CMP/422: RS-422 232C: RS-232C	

* Only when using the built-in serial port of the Plus CPU.

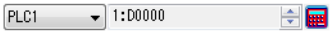
Available Device Memory

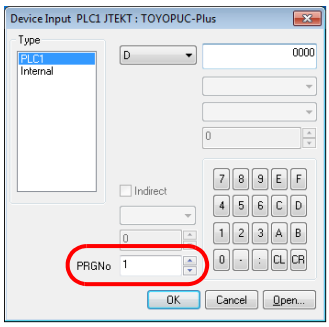
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	PRG No. when [Expanded mode] is selected
R	(link register)	01H	PRG No. when [Expanded mode] is selected
N	(current value register)	03H	PRG No. when [Expanded mode] is selected
X	(input)	04H	WX as word device, PRG No. when [Expanded mode] is selected
Y	(output)	05H	WY as word device, PRG No. when [Expanded mode] is selected
M	(internal relay)	06H	WM as word device, PRG No. when [Expanded mode] is selected
K	(keep relay)	07H	WK as word device, PRG No. when [Expanded mode] is selected
L	(link relay)	08H	WL as word device, PRG No. when [Expanded mode] is selected
T	(timer/contact)	09H	WT as word device, PRG No. when [Expanded mode] is selected
C	(counter/contact)	0AH	WC as word device, PRG No. when [Expanded mode] is selected
U	(extensional data register)	0BH	Available only when [Expanded mode] is selected
H	(extensional set value register)	0CH	
EN	(extensional current value register)	0DH	
EX	(extensional input)	0EH	WEX as word device
EY	(extensional output)	0FH	WEY as word device
EM	(extensional internal relay)	10H	WEM as word device
EK	(extensional keep relay)	11H	WEK as word device
EL	(extensional link relay)	12H	WEL as word device
ET	(extensional timer/contact)	13H	WET as word device
EC	(extensional counter/contact)	14H	WEC as word device
V	(special relay)	15H	WV as word device, read only, PRG No. when [Expanded mode] is selected
GX	(extensional input)	16H	WGX as word device, PRG No., only when [Expanded mode] is selected
GY	(extensional output)	17H	WGY as word device, PRG No., only when [Expanded mode] is selected
GM	(extensional internal relay)	18H	WGM as word device, PRG No., only when [Expanded mode] is selected

PRG No. setting

If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) in addition to memory type and address number. The assigned device memory is expressed as shown below when editing the screen. The PRG No. is invalid for the device memory in the common area.





Example: 1: D0000

- Address number
- Device type
- PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater

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

* If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.
Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

5.1.5 TOYOPUC-Plus (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

PCwin

I/O module setting

Item	Setting
Rack No.	**0**
Slot No.	0: Plus CPU 2 or 3: Plus EX or Plus EX2 / Plus EFR or Plus EFR2
Module type	Slot No. 0: I/O Slot No. 2 or 3: Special/Communication
Module name	Slot No. 0: Plus CPU Slot No. 2 or 3: Plus EX or Plus EX2 / Plus EFR or Plus EFR2

Link parameter setting

Item	Setting	Remarks
Rack No.	Built-in: Built-in port of CPU 0: Expansion board	
Slot No.	L1: Built-in port of CPU 2: Expansion board (1st board) 3: Expansion board (2nd board)	Settings are fixed as follows for Plus 2P-EFR. 2: CN1 3: CN2
Link module name	Ethernet / Ethernet (32 ports)	

Ethernet setting

Item	Setting
Own Node IP Address	Set the IP address of the PLC.
Connection 1 - 32 *	Protocol: UDP / TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open Own Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the TSi is registered
Initialize	Initialization based on Link Parameter

* When multiple TSi units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting

Item	Setting
Table 1 to 32	Check each box under "Used".
Other Node IP Address	Set the IP address of the TSi series unit.
Other Node Port No.	Set the port number of the TSi.

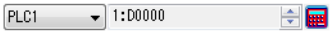
Available Device Memory

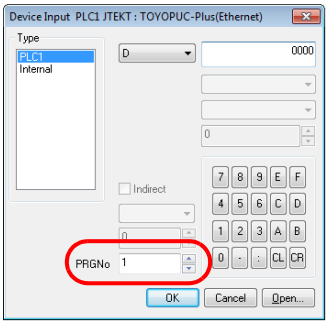
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	PRG No. when [Expanded mode] is selected
R	(link register)	01H	PRG No. when [Expanded mode] is selected
N	(current value register)	03H	PRG No. when [Expanded mode] is selected
X	(input)	04H	WX as word device, PRG No. when [Expanded mode] is selected
Y	(output)	05H	WY as word device, PRG No. when [Expanded mode] is selected
M	(internal relay)	06H	WM as word device, PRG No. when [Expanded mode] is selected
K	(keep relay)	07H	WK as word device, PRG No. when [Expanded mode] is selected
L	(link relay)	08H	WL as word device, PRG No. when [Expanded mode] is selected
T	(timer/contact)	09H	WT as word device, PRG No. when [Expanded mode] is selected
C	(counter/contact)	0AH	WC as word device, PRG No. when [Expanded mode] is selected
U	(extensional data register)	0BH	Available only when [Expanded mode] is selected
H	(extensional set value register)	0CH	
EN	(extensional current value register)	0DH	
EX	(extensional input)	0EH	WEX as word device
EY	(extensional output)	0FH	WEY as word device
EM	(extensional internal relay)	10H	WEM as word device
EK	(extensional keep relay)	11H	WEK as word device
EL	(extensional link relay)	12H	WEL as word device
ET	(extensional timer/contact)	13H	WET as word device
EC	(extensional counter/contact)	14H	WEC as word device
V	(special relay)	15H	WV as word device, read only, PRG No. when [Expanded mode] is selected
GX	(extensional input)	16H	WGX as word device, PRG No., only when [Expanded mode] is selected
GY	(extensional output)	17H	WGY as word device, PRG No., only when [Expanded mode] is selected
GM	(extensional internal relay)	18H	WGM as word device, PRG No., only when [Expanded mode] is selected

PRG No. setting

If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) in addition to memory type and address number. The assigned device memory is expressed as shown below when editing the screen. The PRG No. is invalid for the device memory in the common area.





Example: 1: D0000

Address number
Device type
PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater

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

* If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.
Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

5.1.6 TOYOPUC-Nano (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

Built-in Ethernet (L1/L2)

Link parameter setting

Item	Setting	Remarks
Rack No.	**Built-in**	
Slot No.	L1/L2	
Link Module Name	**Ethernet (32 ports)**	

Ethernet setting

Item		Setting	Remarks
Local Node IP Address		Set the IP address of the PLC.	
Connection 1 to 32 *	Open Protocol	TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open	
	Own Node Port No.	PLC port number	
	Other Node Table No.	Table number for which the TSi is registered	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Initialize		**Initialization based on Link Parameter**	

* When multiple TSi units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting

Item	Setting	Remarks
Table 1 to 32	Check each box under "Used".	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Other Node IP Address	Set the IP address of the TSi series unit.	
Other Node Port No.	Set the port number of the TSi.	

2ET (L1/L2)

I/O module setting

Item	Setting
Module Type	**Special / Communication**
Module Name	**2ET**

Link parameter setting

Item	Setting	Remarks
Rack No.	Select where the "2ET" is mounted.	
Slot No.		
Link Module Name	**Ethernet (32 ports)**	
Port	Port A (L1) / Port B (L2)	

Ethernet setting

Item		Setting	Remarks
Local Node IP Address		Set the IP address of the PLC.	
Connection 1 to 8 *	Open Protocol	TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open / UDP	
	Own Node Port No.	PLC port number	
	Other Node Table No.	Table number for which the TSi is registered	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Initialize		**Initialization based on Link Parameter**	

* When multiple TSi units are connected, make the settings for each unit. A maximum of 8 units can be connected at one time. Connections 9 to 32 cannot be used.

Other node table setting

Item	Setting	Remarks
Table 1 to 16	Check each box under "Used".	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Other Node IP Address	Set the IP address of the TSi series unit.	
Other Node Port No.	Set the port number of the TSi.	

* Tables 17 to 32 cannot be used.

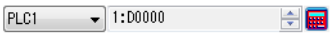
Available Device Memory

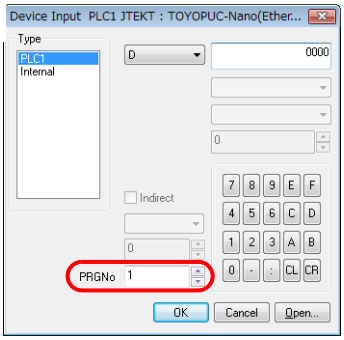
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	PRG No. designation
R	(link register)	01H	PRG No. designation
N	(current value register)	03H	PRG No. designation
X	(input)	04H	WX as word device, PRG No. designation
Y	(output)	05H	WY as word device, PRG No. designation
M	(internal relay)	06H	WM as word device, PRG No. designation
K	(keep relay)	07H	WK as word device, PRG No. designation
L	(link relay)	08H	WL as word device, PRG No. designation
T	(timer/contact)	09H	WT as word device, PRG No. designation
C	(counter/contact)	0AH	WC as word device, PRG No. designation
U	(extensional data register)	0BH	
H	(extensional set value register)	0CH	
EN	(extensional current value register)	0DH	
EX	(extensional input)	0EH	WEX as word device
EY	(extensional output)	0FH	WEY as word device
EM	(extensional internal relay)	10H	WEM as word device
EK	(extensional keep relay)	11H	WEK as word device
EL	(extensional link relay)	12H	WEL as word device
ET	(extensional timer/contact)	13H	WET as word device
EC	(extensional counter/contact)	14H	WEC as word device
V	(special relay)	15H	WV as word device, read only, PRG No. designation
GX	(extensional input)	16H	WGX as word device
GY	(extensional output)	17H	WGY as word device
GM	(extensional internal relay)	18H	WGM as word device
EB	(extensional buffer register)	19H	
FR	(extensional flash register)	1AH	
P	(edge detection)	1BH	WP as word device, PRG No. designation
S	(special register)	1CH	PRG No. designation
EP	(extensional edge detection)	1DH	WEP as word device
EV	(extensional special relay)	1EH	WEV as word device
ES	(extensional special register)	1FH	

PRG No. setting

In addition to device memory type and address number, a program number ([PRG No.]) must be specified. The assigned device memory is expressed as shown below when editing the screen program. The PRG No. is invalid for the device memory in the common area.





Example: 1: D0000

Address number
Device memory type
PRG No.: 1 to 3

Indirect Device Memory Designation

- Address No. 0 to 65535

	15	8 7	0
n + 0	Model		Device memory type
n + 1	Address No.		
n + 2	Expansion code *		Bit designation
n + 3	00		Target Port No.

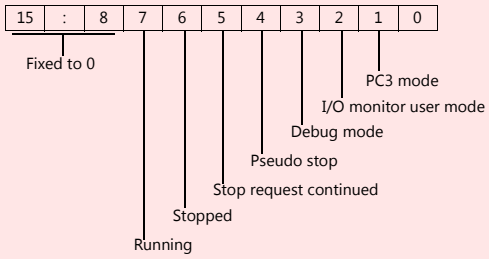
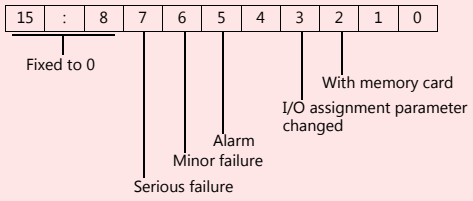
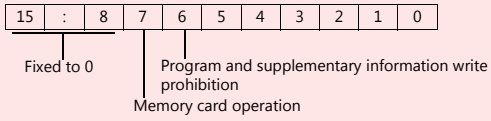
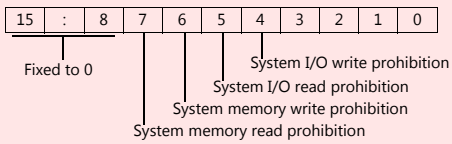
- For the address number of 65536 or greater

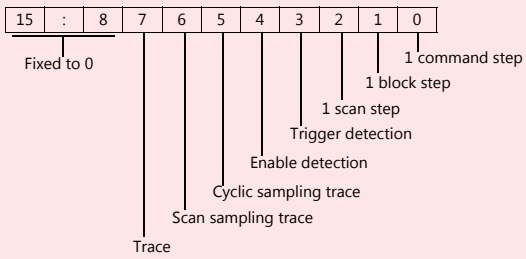
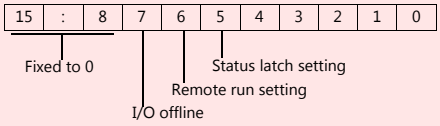
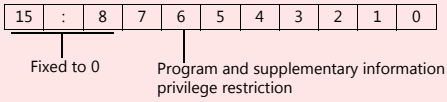
	15	8 7	0
n + 0	Model		Device memory type
n + 1	Lower address No.		
n + 2	Higher address No.		
n + 3	Expansion code *		Bit designation
n + 4	00		Target Port No.

* Specify a program number ([PRG No.]) for the expansion code. Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.
PRG No. 1: 0
PRG No. 2: 1
PRG No. 3: 2

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="4">Write to FR register flash memory *</td><td rowspan="4">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="4">3</td></tr>
<tr><td>n + 1</td><td>Command: 0</td></tr>
<tr><td>n + 2</td><td>ExNo. (HEX)
<table><tr><th>ExNo.</th><th>Address</th></tr><tr><td>40H</td><td>FR000000 to FR007FFF</td></tr><tr><td>41H</td><td>FR008000 to FR00FFFF</td></tr><tr><td>42H</td><td>FR010000 to FR017FFF</td></tr><tr><td>43H</td><td>FR018000 to FR01FFFF</td></tr><tr><td>:</td><td>:</td></tr><tr><td>:</td><td>:</td></tr><tr><td>7EH</td><td>FR1F0000 to FR1F7FFF</td></tr><tr><td>7FH</td><td>FR1F8000 to FR1FFFFF</td></tr></table></td></tr>
<tr><td>n + 3</td><td>Execution result
0: Successful
1: Error
2: Writing</td></tr>
<tr><td rowspan="6">CPU status readout</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="6">2</td></tr>
<tr><td>n + 1</td><td>Command: 1</td></tr>
<tr><td>n + 2</td><td>Data 1
 
</td></tr>
<tr><td>n + 3</td><td>Data 2
 
</td></tr>
<tr><td>n + 4</td><td>Data 3
 
</td></tr>
<tr><td>n + 5</td><td>Data 4
 
</td></tr>
</table>

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="4">CPU status readout</td><td rowspan="4">1 to 8
(PLC1 to 8)</td><td>n + 6</td><td>Data 5
 
</td><td rowspan="4">2</td></tr>
<tr><td>n + 7</td><td>Data 6
 
</td></tr>
<tr><td>n + 8</td><td>Data 7
 
</td></tr>
<tr><td>n + 9</td><td>Data 8: Fixed to “0”</td></tr>
</table>

Return data: Data stored from TOYOPUC-Nano to TSi

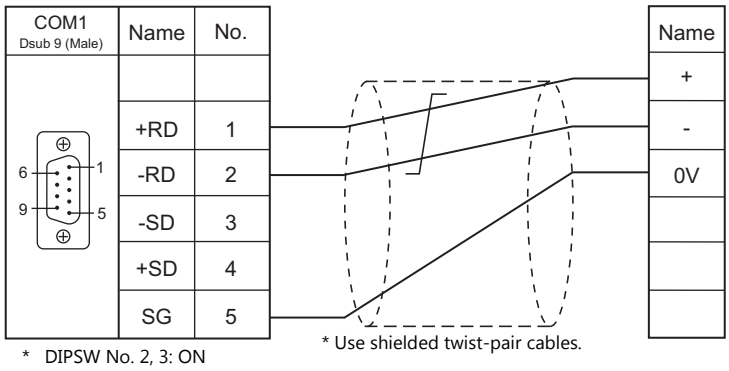
* Writing to the FR register flash memory is performed in units of 64 kB. When writing to addresses in memory, specify an “Ex No.” corresponding to the desired addresses for 64 kB of data.
Communication between the TSi and TOYOPUC-Nano pauses during writing.

5.1.7 Wiring Diagrams

When Connected at COM1:

RS-485

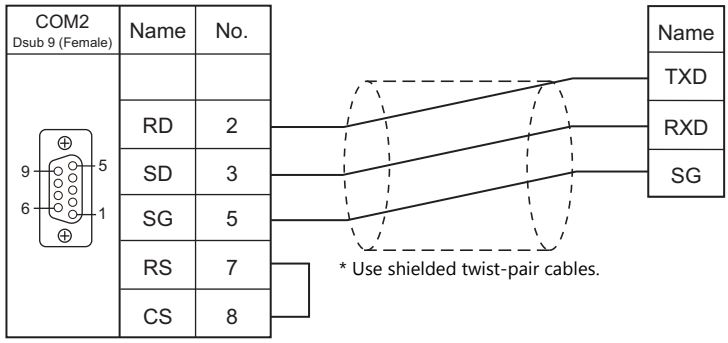
Wiring diagram 1 - COM1



When Connected at COM2:

RS-232C

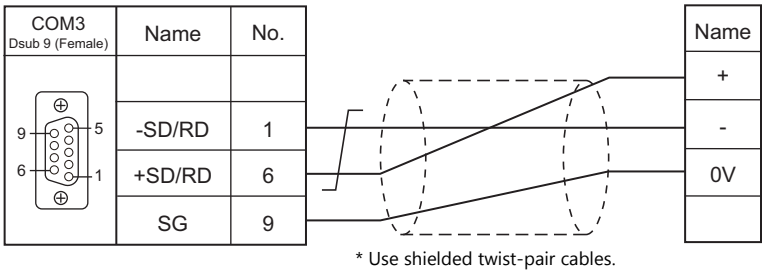
Wiring diagram 1 - COM2



When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



6. KEYENCE

6.1 PLC Connection

6.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	TS Port	Connection	Ladder Transfer *1
KZ series link	KZ-300 KZ-350	KZ-L2	Port 1	RS-232C	COM2	Wiring diagram 5 - COM2	
			Port 2	RS-232C	COM2	Wiring diagram 4 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
KZ-A500 CPU	KZ-A500	CPU modular port		RS-232C	COM2	Wiring diagram 1 - COM2	
KZ/KV series CPU	KZ-10 KZ-16 KZ-24 KZ-40 KZ-80 KZ-300 KZ-350 KV series	CPU modular port		RS-232C	COM2	Wiring diagram 2 - COM2	
KZ24/300 CPU	KZ-24 KZ-300					Hakko Electronics' "D9-KI2-KV-2M" + Gender changer	
KV10/24 CPU	KV-10 KV-24 KV-40						
KV-700	KV-700	CPU modular port		RS-232C	COM2	Wiring diagram 2 - COM2	×
						Hakko Electronics' "D9-KI2-KV-2M" + Gender changer	
		KV-L20 KV-L20R	Port 1	RS-232C	COM2	Wiring diagram 3 - COM2	
			Port 2	RS-232C	COM2	Wiring diagram 4 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
KV-1000	KV-1000	CPU modular port		RS-232C	COM2	Wiring diagram 2 - COM2	
						Hakko Electronics' "D9-KI2-KV-2M" + Gender changer	
		KV-L20R	Port 1	RS-232C	COM2	Wiring diagram 3 - COM2	
			Port 2	RS-232C	COM2	Wiring diagram 4 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
KV-3000/5000	KV-3000	CPU modular port		RS-232C	COM2	Wiring diagram 2 - COM2	
						Hakko Electronics' "D9-KI2-KV-2M" + Gender changer	
	KV-3000 KV-5000	KV-L20V	Port 1	RS-232C	COM2	Wiring diagram 3 - COM2	
			Port 2	RS-232C	COM2	Wiring diagram 4 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	

*1 For the ladder transfer function, see the TS Reference Manual 2.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Ladder Transfer *2
KV-700 (Ethernet TCP/IP)	KV-700	KV-LE20	○	×	8500	×	×
KV-1000 (Ethernet TCP/IP)	KV-1000		○	×	8500		
KV-3000/5000 (Ethernet TCP/IP)	KV-3000 KV-5000	KV-LE20V	○	×	8500		
	KV-5000	CPU (built-in)					
KV-7000 (Ethernet TCP/IP)	KV-7300 KV-7500	KV-LE20V	○	×	8500 (Max. 8 units)	○	×
		KV-LE21V					
		KV-EP21V					
	KV-7500	CPU (built-in)					

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)”.
*2 For the ladder transfer function, see the TS Reference Manual 2.

6.1.1 KZ Series Link

Communication Setting

Editor

Communication setting

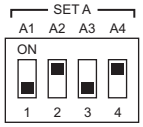
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 9	

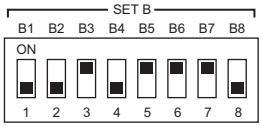
PLC

Port 1

Operation mode setting switch (SET A)

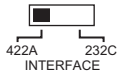
SET A		Item	Setting	
	A1	Port 1	**OFF**	**Link mode**
	A2		**ON**	

Communication parameter setting switch (SET B)

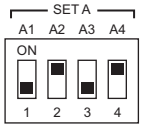
SET B		Item	Setting	Remarks
	B1	Baud rate	B1 B2 B3 Baud Rate OFF ON OFF 4800 bps ON ON OFF 9600 bps OFF OFF ON 19200 bps OFF ON ON 38400 bps	Common to Port 1 and 2
	B2			
	B3			
	B4	Bit length	OFF: 7 bit ON: 8 bit	
	B5	Parity check	B5 B6 Parity OFF OFF None ON OFF Odd ON ON Even	
	B6			
	B7	Stop bit	OFF: 1 bit ON: 2 bit	
	B8	System reserve	**Fixed to OFF**	

Port 2

Port select switch (INTERFACE)

INTERFACE	Item	Setting
	Signal level switch	422A: RS-422 232C: RS-232C

Operation mode setting switch (SET A)

SET A		Item	Setting	
	A3	Port 2	**OFF**	**Link mode**
	A4		**ON**	

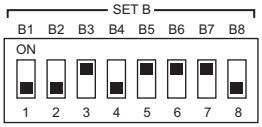
Terminator select switch (TERMINATOR)

TERMINATOR	Item	Setting	Remarks
	Terminating resistance	OFF: Without terminating resistance ON: With terminating resistance	Turn off for RS-232C connection.

Station number setting switch (STATION No.)

STATION No.	Item	Setting
	Target port No.	0 to 9

Communication parameter setting switch (SET B)

SET B		Item	Setting	Remarks
	B1	Baud rate	B1 B2 B3 Baud Rate OFF ON OFF 4800 bps ON ON OFF 9600 bps OFF OFF ON 19200 bps OFF ON ON 38400 bps	Common to Port 1 and 2
	B2			
	B3			
	B4	Bit length	OFF: 7 bits ON: 8 bits	
	B5	Parity check	B5 B6 Parity OFF OFF None ON OFF Odd ON ON Even	
	B6			
	B7	Stop bit	OFF: 1 bit ON: 2 bits	
	B8	System reserve	**Fixed to OFF**	

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS.

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	
CH	(input/output/internal auxiliary relay)	01H	

6.1.2 KZ-A500 CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Port setting switch

SW1	SW2	Baud Rate
ON	OFF	4800 bps
OFF	OFF	9600 bps
OFF	ON	19200 bps
ON	ON	38400 bps

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	

6.1.3 KZ/KV Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS.

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	

6.1.4 KZ24/300 CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C	
Baud Rate	9600 / 19200 / 38400 bps	38400 bps is the highest. If a baud rate higher than 57600 bps is set, communication is performed at 9600 bps.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	**0**	

PLC

No particular setting is necessary on the PLC.

Calendar

This model is not equipped with the calendar function. Use the calendar function of the TS.

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	

6.1.5 KV10/24 CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2	
Signal Level	RS-232C	
Baud Rate	9600 / 19200 / 38400 / 57600 bps	57600 bps is the highest. If a baud rate higher than 76800 bps is set, communication is performed at 9600 bps.
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	

6.1.6 KV-700

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	

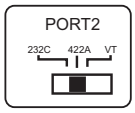
PLC

KV-700 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20

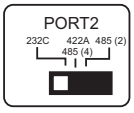
Unit editor setting

Port	Item	Setting	Remarks
Port 1	Operation Mode	KV BUILDER Mode	
	RS/CS Flow Control	No	
Port 2	Operation Mode	KV BUILDER Mode	
	Interface	RS-232C / RS-422A	Change the setting using the PORT 2 selector switch attached to the side. 
	Station No.	0 to 9	

* These settings can be checked on the access window of the CPU. For more information, refer to the PLC manual issued by the manufacturer.

KV-L20R

Unit editor setting

Port	Item	Setting	Remarks
Basic Port	Station No.	0 to 9	Common to Port 1 and 2.
Port 1	Operation Mode	KV BUILDER/KV STUDIO Mode	
	RS/CS Flow Control	No	
Port 2	Operation Mode	KV BUILDER/KV STUDIO Mode	
	Interface	RS-232C/RS-422A/485 (4-wire system)	PORT 2 selector switch attached to the side 

* These settings can be checked on the access window of the CPU. 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
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	
CTC	(high-speed counter comparator/set value)	0AH	
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	

6.1.7 KV-700 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

KV-LE20

Unit editor setting

(Underlined setting: default)

Item	Setting	Remarks
Baud Rate	100/10 Mbps Auto / 10 Mbps	Set to "10 Mbps" (fixed) if the communication status is unstable.
IP Address	0.0.0.0 to 255.255.255.255	
Subnet Mask	0.0.0.0 to 255.255.255.255	
Port Number (KVS, DB)	8500	TCP/IP

* These settings can be checked on the access window of the CPU. 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
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	
CTC	(high-speed counter comparator/set value)	0AH	
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	

6.1.8 KV-1000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	

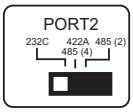
PLC

KV-1000 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20R

Unit editor setting

Port	Item	Setting	Remarks
Basic Port	Station No.	0 to 9	Common to Port 1 and 2.
Port 1	Operation Mode	KV BUILDER/KV STUDIO Mode	
	RS/CS Flow Control	No	
Port 2	Operation Mode	KV BUILDER/KV STUDIO Mode	
	Interface	RS-232C/ RS-422A/485 (4-wire system)	PORT 2 selector switch attached to the side 

* These settings can be checked on the access window of the CPU. 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
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	
CTC	(high-speed counter comparator/set value)	0AH	
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	
MR	(internal auxiliary relay)	0EH	
LR	(latch relay)	0FH	
EM	(extended data memory 1)	10H	
FM	(extended data memory 2)	11H	
Z	(index register)	12H	

6.1.9 KV-1000 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

The communication setting is the same as the one described in "6.1.7 KV-700 (Ethernet TCP/IP)".

Available Device Memory

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

Device Memory		TYPE	Remarks
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	
CC	(counter/current value)	03H	
TS	(timer/set value)	04H	
CS	(counter/set value)	05H	
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	
CTC	(high-speed counter comparator/set value)	0AH	
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	
MR	(internal auxiliary relay)	0EH	
LR	(latch relay)	0FH	
EM	(extended data memory 1)	10H	
FM	(extended data memory 2)	11H	
Z	(index register)	12H	

6.1.10 KV-3000 / 5000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	

PLC

KV-3000 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20V

Unit editor setting

Port	Item	Setting	Remarks
Basic Port	Station number	0 to 9	Common to Port 1 and 2.
Port 1	Operation mode	KV BUILDER/KV STUDIO mode	
	RS/CS flow control	No	
Port 2	Operation mode	KV BUILDER/KV STUDIO mode	
	Interface	RS-232C/ RS-422A/485 (4-wire system)	

* These settings can be checked on the access window of the CPU. 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
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	Double-word
CC	(counter/current value)	03H	Double-word
TS	(timer/set value)	04H	Double-word
CS	(counter/set value)	05H	Double-word
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	Double-word
CTC	(high-speed counter comparator/set value)	0AH	Double-word
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	
MR	(internal auxiliary relay)	0EH	
LR	(latch relay)	0FH	
EM	(extended data memory 1)	10H	
FM	(extended data memory 2)	11H	
Z	(index register)	12H	Double-word
B	(link relay)	13H	
VB	(work relay)	14H	
ZF	(file register)	15H	
W	(link register)	16H	
VM	(work memory)	17H	

6.1.11 KV-3000 / 5000 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

The communication setting is the same as the one described in "6.1.7 KV-700 (Ethernet TCP/IP)".

Available Device Memory

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

Device Memory		TYPE	Remarks
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	Double-word
CC	(counter/current value)	03H	Double-word
TS	(timer/set value)	04H	Double-word
CS	(counter/set value)	05H	Double-word
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CTH	(high-speed counter/current value)	09H	Double-word
CTC	(high-speed counter comparator/set value)	0AH	Double-word
CT	(high-speed counter comparator/contact)	0BH	
CR	(control relay)	0CH	
CM	(control memory)	0DH	
MR	(internal auxiliary relay)	0EH	
LR	(latch relay)	0FH	
EM	(extended data memory 1)	10H	
FM	(extended data memory 2)	11H	
Z	(index register)	12H	Double-word
B	(link relay)	13H	
VB	(work relay)	14H	
ZF	(file register)	15H	
W	(link register)	16H	
VM	(work memory)	17H	

6.1.12 KV-7000 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

Make settings by using the software "KV STUDIO". Configure settings for each unit used.
The communication setting is the same as the one described in "6.1.7 KV-700 (Ethernet TCP/IP)".

Available Device Memory

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

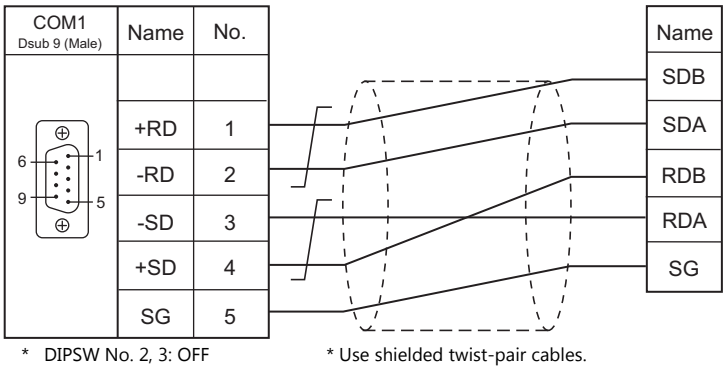
Device Memory		TYPE	Remarks
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	Double-word
CC	(counter/current value)	03H	Double-word
TS	(timer/set value)	04H	Double-word
CS	(counter/set value)	05H	Double-word
T	(timer/contact)	06H	
C	(counter/contact)	07H	
TM	(temporary data memory)	08H	
CR	(control relay)	0CH	
CM	(control memory)	0DH	
MR	(internal auxiliary relay)	0EH	
LR	(latch relay)	0FH	
EM	(extended data memory 1)	10H	
FM	(extended data memory 2)	11H	
Z	(index register)	12H	Double-word
B	(link relay)	13H	
VB	(work relay)	14H	
ZF	(file register)	15H	
W	(link register)	16H	
VM	(work memory)	17H	

6.1.13 Wiring Diagrams

When Connected at COM1:

RS-422

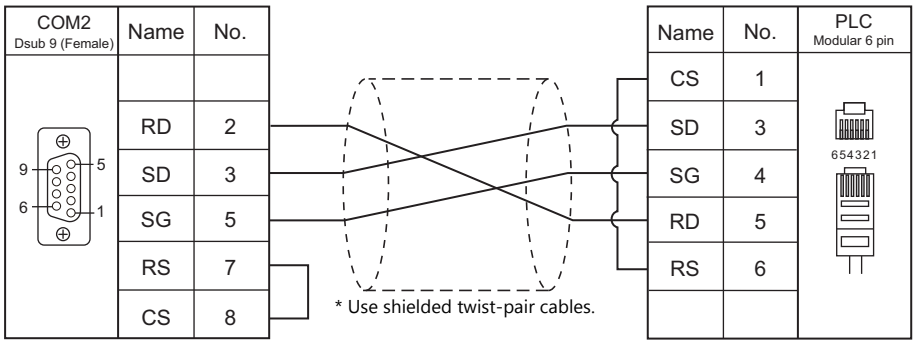
Wiring diagram 1 - COM1



When Connected at COM2:

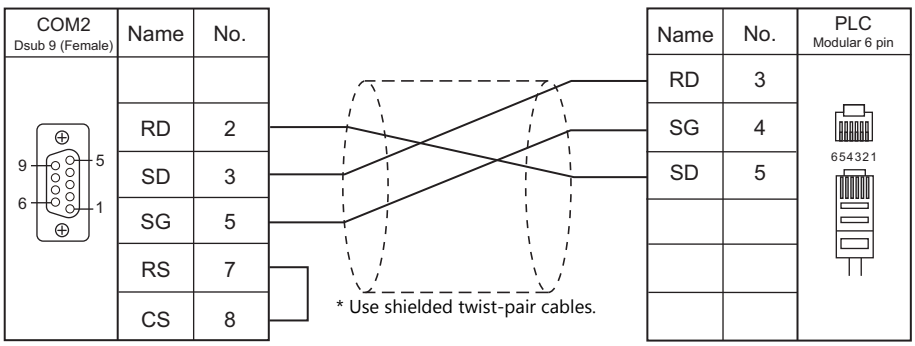
RS-232C

Wiring diagram 1 - COM2

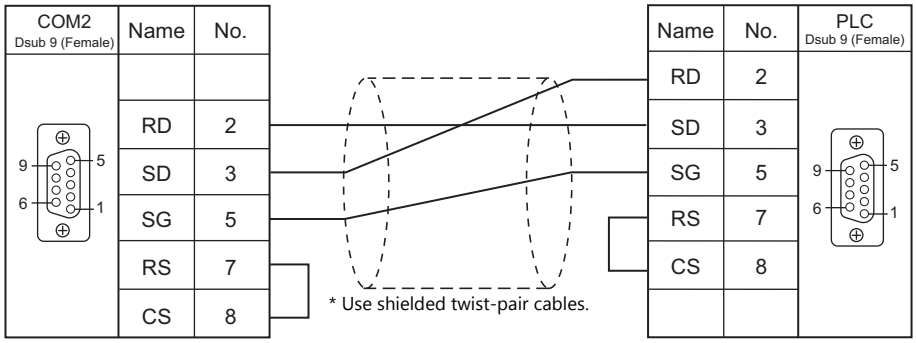


Wiring diagram 2 - COM2

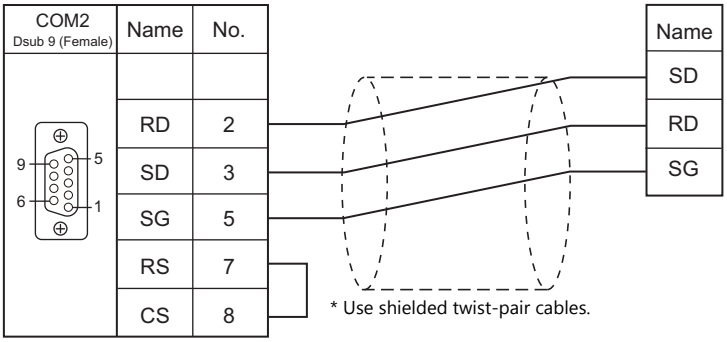
Hakko Electronics' "D9-KI2-KV-2M"



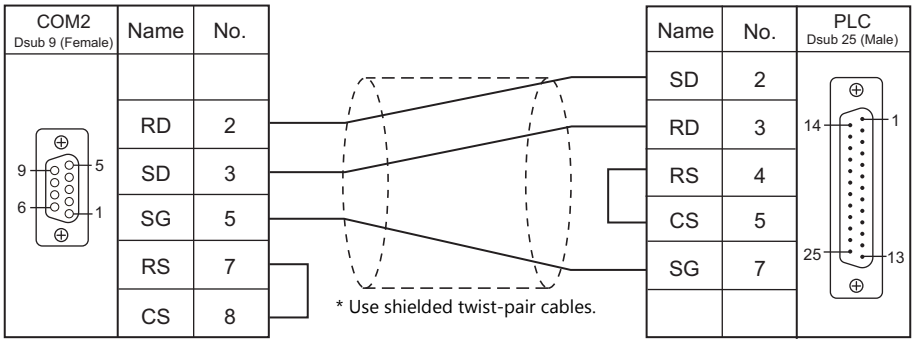
Wiring diagram 3 - COM2



Wiring diagram 4 - COM2



Wiring diagram 5 - COM2



7. KOGANEI

7.1 Temperature Controller / Servo / Inverter

7.1 Temperature Controller / Servo / Inverter

Serial Connection

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
IBFL-TC	IBFL-TC	Connector a / b	RS-485	COM1	Wiring diagram 1 - COM1	IBFL-TC.Lst
				COM3	Wiring diagram 1 - COM3	

7.1.1 IBFL-TC

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	**115200 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Odd**	
Target Port No.	0 to 15	

Takt Time Controller

Specify the station number with the rotary switch.
Setting range: 0 to 15

Available Device Memory

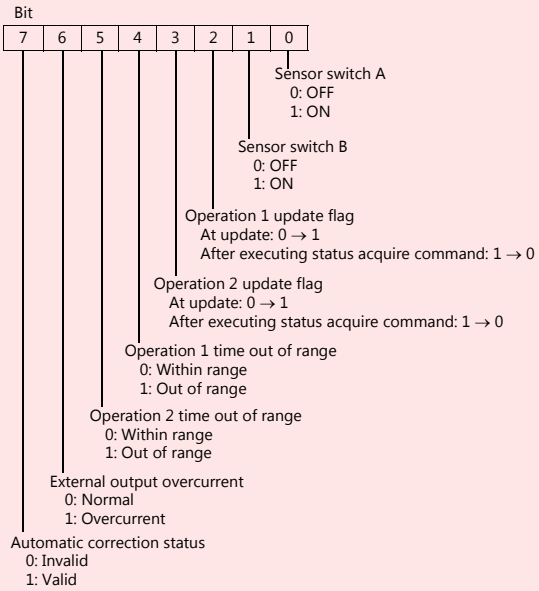
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
P (parameter)	00H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Writing of parameter (Flash ROM)	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
Opening adjustment *1	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 2	
		n + 2	Port on the iB-Flow unit 1: A side 2: B side 3: Both A and B sides	
		n + 3	Pulse sending speed 10: Normally 20: When moving to home position	
		n + 4	Send pulse count *2 0 - 9000, -12000 (home return)	
Acquire operation time *3	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 3	
		n + 2	Operation time to acquire 11: Operation 1 (A to B operation) 12: Operation 2 (B to A operation)	
		n + 3	Operation time (unit: 10 msec)	
Start measurement	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Switching offset status *4	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 5	
		n + 2	0: Invalid 1: Valid	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Acquire IBFL-TC status *5</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 6</td></tr>
<tr><td>n + 2</td><td>IBFL-TC status
 
</td></tr>
<tr><td rowspan="3">Version data acquisition</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 7</td></tr>
<tr><td>n + 2 - n + 9</td><td>Version (16 characters)
IBFL-TC Ver.x.xx</td></tr>
</table>

Return data: Data stored from PLC to TS

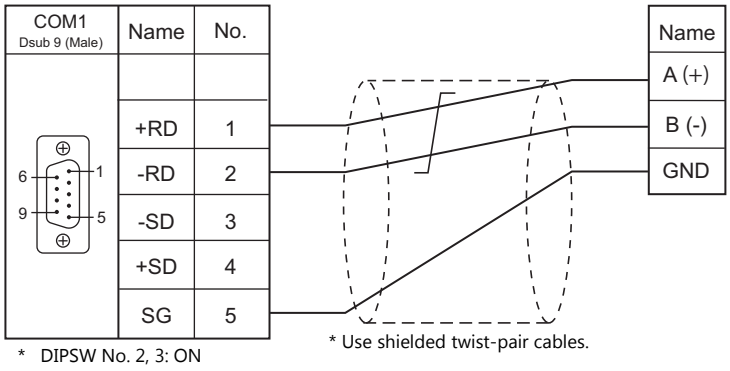
*1 The opening will not be changed when the iB-Flow is not connected to the takt time controller.
*2 When "9" is specified, the opening is equivalent to 0.1%.
Do not exceed "9000" with respect to the zero position when specifying the pulse count.
*3 The last operation time will be acquired.
Execute operation time acquisition when measurement start is executing.
*4 Command will not be accepted if the external input (IN) port of the IBFL-TC is Low level.
If correction status is set to "Invalid", operation time measurement stops and error output (Operation time out of range) turns OFF (Within range).
*5 If correction status is set to "Invalid", operation time measurement stops and the forth and fifth bits (Operation time out of range) turn OFF (Within range). To acquire operation time again, execute the "Start measurement" command.

7.1.2 Wiring Diagrams

When Connected at COM1:

RS-485

Wiring diagram 1 - COM1

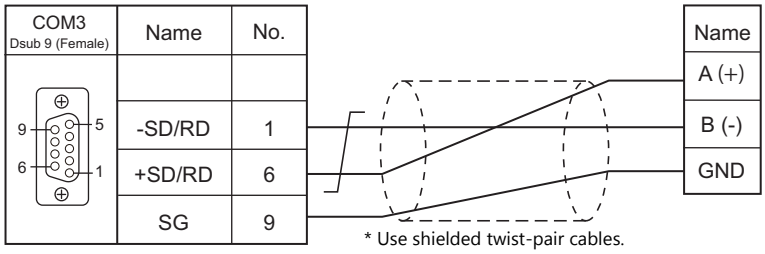


* DIPSW No. 2, 3: ON

When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



8. KOYO ELECTRONICS

8.1 PLC Connection

8.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	TS Port	Connection	Ladder Transfer *1
SU/SG series	SU-5	U-01DM	RS-232C	COM2	Wiring diagram 1 - COM2	×
			RS-422	COM1	Wiring diagram 4 - COM1	
	SU-5E SU-6B SU-6H	Universal communication port	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
		U-01DM	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 4 - COM1	
	SU-5M SU-6M	Universal communication port 1	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
		Universal communication port 2	RS-232C	COM2	Wiring diagram 3 - COM2	
		Universal communication port 3	RS-422	COM1	Wiring diagram 2 - COM1	
		U-01DM	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 4 - COM1	
	SZ-4	Universal communication port (PORT2)	RS-232C	COM2	Wiring diagram 3 - COM2	
	SZ-4M	Universal communication port (PORT2)	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 3 - COM1	
	SG-8	Universal communication port	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
		G-01DM (CN2)	RS-232C	COM2	Wiring diagram 1 - COM2	
		G-01DM (CN1)	RS-422	COM1	Wiring diagram 4 - COM1	
		G-01DM (CN2)			Wiring diagram 5 - COM1	
	PZ3	Universal communication port	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 3 - COM1	
SR-T (K protocol)	SR-1T	Universal communication port	RS-485	COM1	Wiring diagram 6 - COM1	
				COM3	Wiring diagram 1 - COM3	
SU/SG (K-Sequence)	SU-5E SU-6B	Programmer communication port	RS-232C	COM2	Wiring diagram 4 - COM2	
		Universal communication port	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
	SU-5M SU-6M	Programmer communication port	RS-232C	COM2	Wiring diagram 4 - COM2	
		Universal communication port 1	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
		Universal communication port 2	RS-232C	COM2	Wiring diagram 3 - COM2	
		Universal communication port 3	RS-422	COM1	Wiring diagram 2 - COM1	
	SZ-4	Programmer communication port (PORT1)	RS-232C	COM2	Wiring diagram 3 - COM2	
		Universal communication port (PORT2)				
	SZ-4M	Programmer communication port (PORT1)				
		Universal communication port (PORT2)	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 3 - COM1	
SU/SG (MODBUS RTU)	SU-5M SU-6M	Universal communication port 1	RS-232C	COM2	Wiring diagram 1 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
		Universal communication port 3	RS-422	COM1	Wiring diagram 2 - COM1	
	SZ-4M	Universal communication port (PORT2)	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 3 - COM1	

*1 For the ladder transfer function, see the TS Reference Manual 2.

8.1.1 SU/SG

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 90	

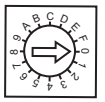
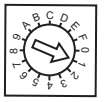
SU-5

Host Link Module (U-01DM)

Online/offline selector switch (SW1)

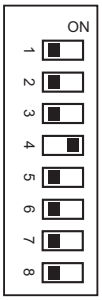
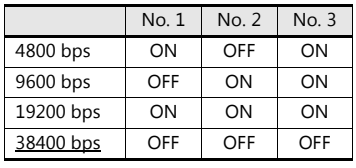
SW1	Setting
Online  Offline	**Online**

Rotary switch (SW2, SW3)

SW2, SW3	Item	Setting	Remarks
SW2  ×10 SW3  ×1	Station number	01 to 5A (HEX)	

DIP switch (SW4)

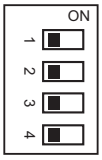
(Underlined setting: default)

SW4		Item	Setting	Remarks
	No. 1 No. 2 No. 3	Baud rate		
	No. 4	Parity	OFF: No parity ON: Odd parity	
	No. 5	Self diagnosis	**OFF: Not provided**	
	No. 6 No. 7 No. 8	Response delay time	OFF: 0 ms	

	No. 1	No. 2	No. 3
4800 bps	ON	OFF	ON
9600 bps	OFF	ON	ON
19200 bps	ON	ON	ON
38400 bps	OFF	OFF	OFF

DIP switch (SW5)

(Underlined setting: default)

SW5		Item	Setting	Remarks
	No. 1	P-P setting	**OFF**	
	No. 2	Master/slave setting	**OFF: Slave**	
	No. 3	Time-out selection	**OFF: Normal operation**	
	No. 4	ASCII/HEX selection	**OFF: HEX**	

SU-5E/6B

Universal Communication Port

System parameter setting

Set the station number, parity and data type using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

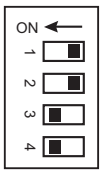
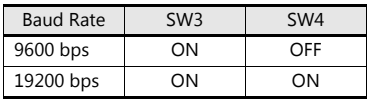
Item	Setting	Remarks
Parity	Odd / None	
Station number	1 to 90	Valid only when DIP switch No. 2 is set to OFF
Data type	**HEX**	

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

DIP switch

The DIP switch provided at the rear of the CPU is used to make the following settings.

(Underlined setting: default)

Switch		Item	Setting	Remarks
	No. 1	Battery mode	OFF: Without battery ON: With battery	
	No. 2	Station number setting	OFF: According to the system parameter setting ON: Fixed to 01	
	No. 3	Baud rate		
	No. 4			

Baud Rate	SW3	SW4
9600 bps	ON	OFF
19200 bps	ON	ON

Host Link Module (U-01DM)

Settings are the same as those described in “SU-5” (page 8-2).

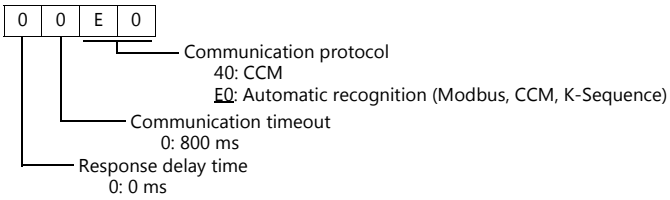
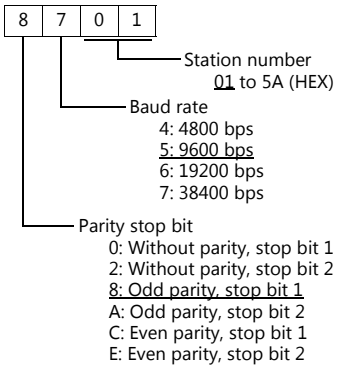
SU-5M/6M

Universal Communication Port 1

Set special registers "R772" and "R773", then specify "AA5A" (HEX) for the setting completion register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "AAEA" (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R772		00E0H CCM
R773		8701H 38400 bps Odd parity Stop bit 1 Station number 01

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Universal Communication Port 2

Set special registers "R774" and "R775", then specify "A5AA" (HEX) for the setting completion register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "AEAA" (HEX), it is regarded as erroneous.

Parameter setting register

Register	Setting	Setting Example
R774	Same as the setting register R772 for the universal port 1	00E0H
R775	Same as the setting register R773 for the universal port 1	8701H

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Universal Communication Port 3

Set special registers "R776" and "R777", then specify "5AAA" (HEX) for the setting completion register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "EAAA" (HEX), it is regarded as erroneous.

Parameter setting register

Register	Setting	Setting Example
R776	Same as the setting register R772 for the universal port 1	00E0H
R777	Same as the setting register R773 for the universal port 1	8701H

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Host Link Module (U-01DM)

Settings are the same as those described in "SU-5" (page 8-2).

SU-6H

Universal Communication Port

Set special registers "R772" and "R773", then specify "AA5A" (HEX) for the setting completion register "R767". When the set value at R767 is changed to "AAAA" (HEX), it is regarded as normal; if it is changed to "AAEA" (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

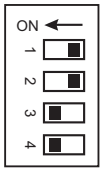
Register	Setting	Setting Example
R772	0 0 E 0 Communication protocol 40: CCM E0: Automatic recognition (Modbus, CCM, K-Sequence) Communication timeout 0: 800 ms Response delay time 0: 0 ms	00E0H CCM
R773	8 7 0 1 Station number * 01 to 5A (HEX) Baud rate 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps Parity stop bit 0: Without parity, stop bit 1 2: Without parity, stop bit 2 8: Odd parity, stop bit 1 A: Odd parity, stop bit 2 C: Even parity, stop bit 1 E: Even parity, stop bit 2	8701H 38400 bps Odd parity Stop bit 1 Station number 01

* Valid only when DIP switch No. 2 is set to OFF

DIP switch

The DIP switch provided at the rear of the CPU is used to make the following settings.

(Underlined setting: default)

Switch		Item	Setting	Remarks
	No. 1	Battery mode	OFF: Without battery ON: With battery	
	No. 2	Station number setting	OFF: According to the parameter setting ON: Fixed to 01	
	No. 3 No. 4	–	Invalid	

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Host Link Module (U-01DM)

Settings are the same as those described in "SU-5" (page 8-2).

SZ-4

Universal Communication Port (PORT2)

System parameter setting

Set the station number, parity and data type using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

Item	Setting	Remarks
Parity	Odd / None	
Station number	1 to 90	
Data type	**HEX**	

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

Parameter setting register

Set the baud rate at special register "R7632".

(Underlined setting: default)

Register	Setting	Setting Example
R7632	0 0 0 3 Baud rate 02: 9600 bps 03: 19200 bps Send delay time 00: 0 ms	0003H 19200 bps

SZ-4M

Universal Communication Port (PORT2)

Set special registers "R7655" and "R7656", then specify "0500" (HEX) for the setting completion register "R7657". When the set value at R7657 is changed to "0A00" (HEX), it is regarded as normal; if it is changed to "0E00" (HEX), it is regarded as erroneous.

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R7655	0 0 4 0 Communication protocol 40: CCM Communication timeout 0: Specified time Response delay time 0: 0 ms	0040H CCM
R7656	Bit 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Data type 0: HEX Baud rate 100: 4800 bps 101: 9600 bps 110: 19200 bps 111: 38400 bps Station No. 01 to 5A (HEX) 0000001: Station number 1 0000010: Station number 2 0000011: Station number 3 1011000: Station number 88 1011001: Station number 89 1011010: Station number 90 Stop bit 0: 1 bit 1: 2 bits Parity 00: No parity 10: Odd parity 11: Even parity	8701H 38400 bps Odd parity Stop bit 1 Station number 01 HEX denotation

SG-8

Universal Communication Port

System parameter setting

Set the station number using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

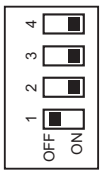
Item	Setting	Remarks
Station number	1 to 90	Valid only when DIP switch No. 2 is set to OFF
Data type	**HEX**	

The following settings are fixed; data length: 8 bits, parity: odd, and stop bit: 1 bit.

DIP switch

The DIP switch provided at the rear of the CPU is used to make the following settings.

(Underlined setting: default)

Switch		Item	Setting	Remarks
	No. 1	Signal level	OFF: RS-422 ON: RS-232C	
	No. 2	Station number setting	OFF: According to the system parameter setting ON: Fixed to 01	
	No. 3	Baud rate	<table><tr><th></th><th>SW3</th><th>SW4</th></tr><tr><td>9600 bps</td><td>ON</td><td>OFF</td></tr><tr><td>19200 bps</td><td>ON</td><td>ON</td></tr></table>	
	No. 4			

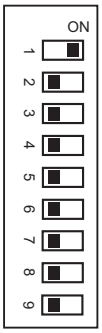
Host Link Module (G-01DM)

Online/offline selector switch

Selector Switch	Setting
ONLINE  OFFLINE	**Online**

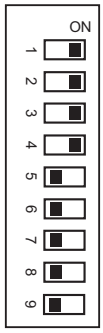
DIP switch (SW1)

(Underlined setting: default)

SW1		Item	Setting	Remarks
	No. 1 No. 2 No. 3 No. 4 No. 5 No. 6 No. 7	Station number setting	1 to 90 <table><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr><tr><td>1</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr><tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr><tr><td>3</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr><tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr><tr><td>88</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>89</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>90</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	For more information on any station number settings other than those given on the left, refer to the PLC manual issued by the manufacturer.
	No. 8	P-P setting	**OFF**	
	No. 9	Master/slave setting	**OFF: Slave**	

DIP switch (SW2)

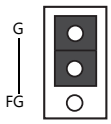
(Underlined setting: default)

SW2	Item	Setting	Remarks
	No. 1 No. 2 No. 3	Baud rate	
	No. 4	Parity	OFF: No parity ON: Odd parity	
	No. 5	Self diagnosis	**OFF: Not provided**	
	No. 6	Turnaround delay	**OFF: Not provided**	
	No. 7 No. 8	Response delay time	**OFF: 0 ms**	
	No. 9	ASCII/HEX selection	**OFF: HEX**	

	SW1	SW2	SW3
4800 bps	ON	OFF	ON
9600 bps	OFF	ON	ON
19200 bps	ON	ON	ON

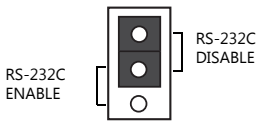
Short plug 1

Short plug 1 is used to short-circuit the FG (frame ground) and 0-V power for the communication system.

Plug	Setting	Remarks
	G side: Not short-circuited FG side: Short-circuited	

Short plug 2

Short plug 2 is used to switch the signal level of the CH2 port.

Plug	Setting	Remarks
	RS-232C ENABLE: RS-232C RS-232C DISABLE: RS-422	

PZ3

Universal Communication Port

Settings are the same as those described in “SZ-4” (page 8-6).

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(data register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
S	(stage)	04H	
GI	(link input)	05H	
GQ	(link output)	06H	
T	(timer/contact)	07H	
C	(counter/contact)	08H	

8.1.2 SR-T (K Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	**19200**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Odd**	
Target Port No.	0 to 31	

PLC

Universal Communication Port

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

Item	Setting	
Baud rate	**19200 bps**	
Parity	**Odd**	
Data length	**8 bits**	
Stop bit	**1 bit**	
Data type	**HEX**	

Calendar

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

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	(word device)	00H	
X	(input)	01H	Common to X and Y
Y	(output)	02H	Common to X and Y
M	(internal relay)	03H	
S	(stage)	04H	
K	(keep relay)	05H	
L	(link relay)	06H	
T	(timer/contact)	07H	
C	(counter/contact)	08H	

8.1.3 SU/SG (K-Sequence)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

SU-5M/6M

Programmer Communication Port

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

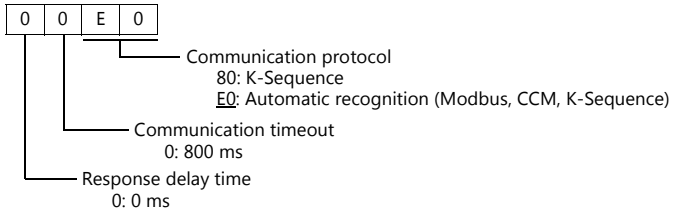
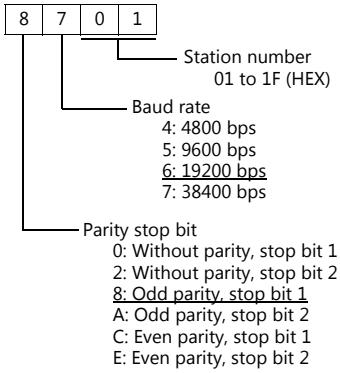
Item	Setting	
Baud Rate	**9600 bps**	
Parity	**Odd**	
Data Length	**8**	
Stop Bit	**1**	
Data Type	**HEX**	

Universal Communication Port 1

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

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R772		00E0H K-Sequence
R773		8701H 38400 bps Odd parity Stop bit 1 Station number 01

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Universal Communication Port 2

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

Parameter setting register

Register	Setting	Setting Example
R774	Same as the setting register R772 for the universal port 1	00E0H
R775	Same as the setting register R773 for the universal port 1	8701H

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Universal Communication Port 3

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

Parameter setting register

Register	Setting	Setting Example
R776	Same as the setting register R772 for the universal port 1	00E0H
R777	Same as the setting register R773 for the universal port 1	8701H

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

SZ-4/SZ-4M

Programmer Communication Port (PORT1) / Universal Communication Port (PORT2)

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

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

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(data register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
S	(stage)	04H	
GI	(link input)	05H	
GQ	(link output)	06H	
T	(timer/contact)	07H	
C	(counter/contact)	08H	

8.1.4 SU/SG (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 90	

SU-5M/6M

Universal Communication Port 1

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

Parameter setting register

(Underlined setting: default)

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

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

Universal Communication Port 3

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

Parameter setting register

Register	Setting	Setting Example
R776	Same as the setting register R772 for the universal port 1	00E0H
R777	Same as the setting register R773 for the universal port 1	8701H

Communication parameter settings can also be made by using the system parameter setting of the programmer. For more information, refer to the PLC manual issued by the manufacturer.

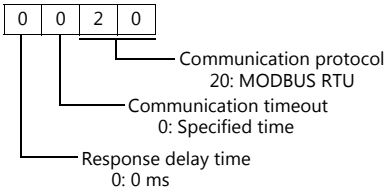
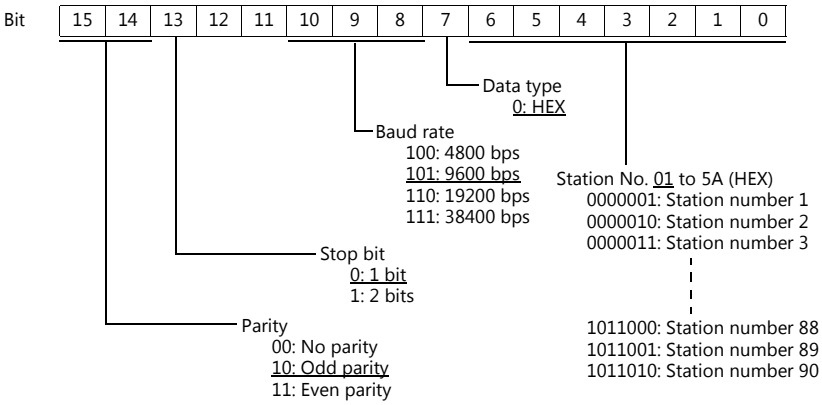
SZ-4M

Universal Communication Port (PORT2)

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

Parameter setting register

(Underlined setting: default)

<table>
<tr><th>Register</th><th>Setting</th><th>Setting Example</th></tr>
<tr><td>R7655</td><td> 
</td><td>0020H</td></tr>
<tr><td>R7656</td><td> 
</td><td>8701H

38400 bps
Odd parity
Stop bit 1
Station number 01
HEX denotation</td></tr>
</table>

Communication parameter settings can also be made by using the system parameter setting of the programmer. 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.

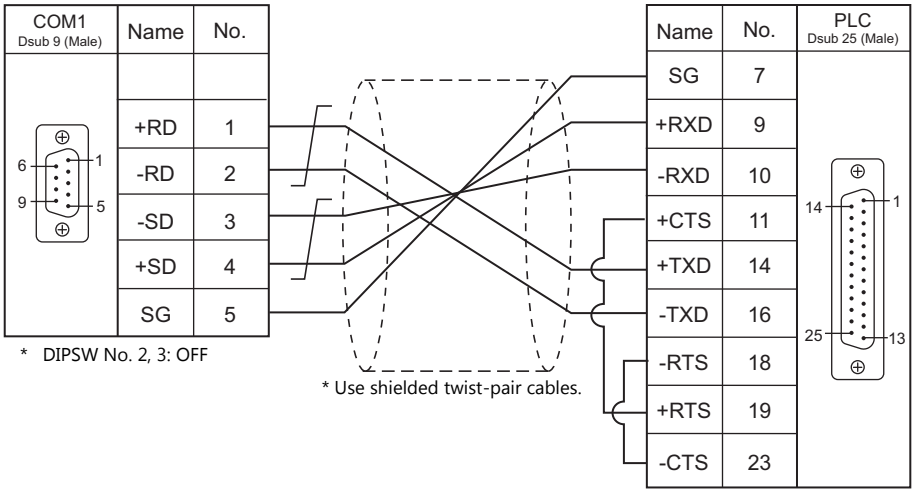
Device Memory		TYPE	Remarks
R	(data register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
S	(stage)	04H	
GI	(link input)	05H	
GQ	(link output)	06H	
T	(timer/contact)	07H	
C	(counter/contact)	08H	

8.1.5 Wiring Diagrams

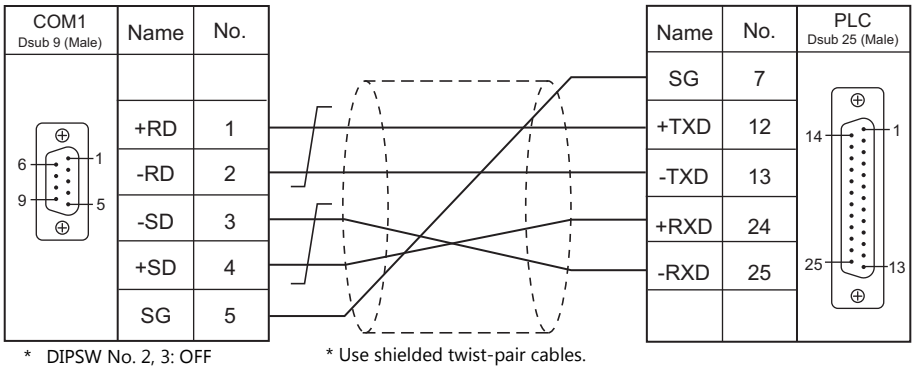
When Connected at COM1:

RS-422/RS-485

Wiring diagram 1 - COM1

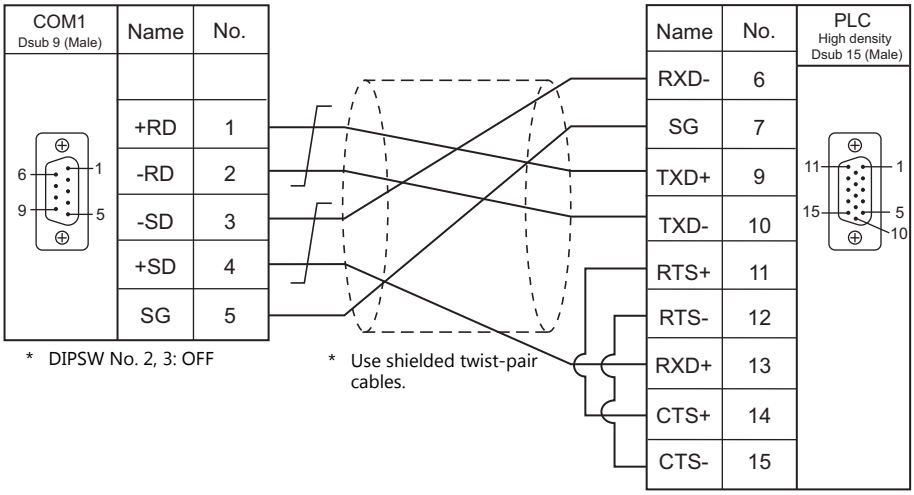


Wiring diagram 2 - COM1

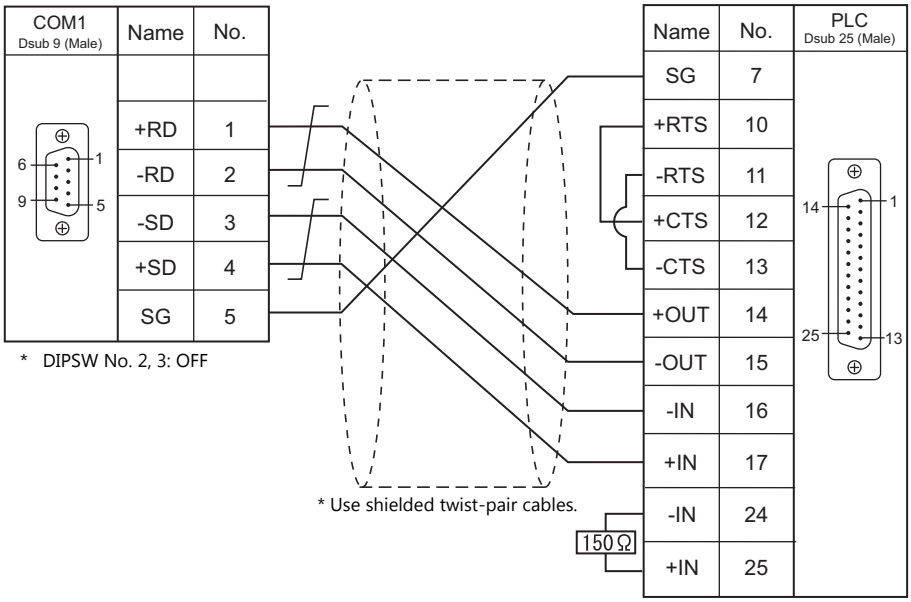


* SU-6M: Terminal block connectable

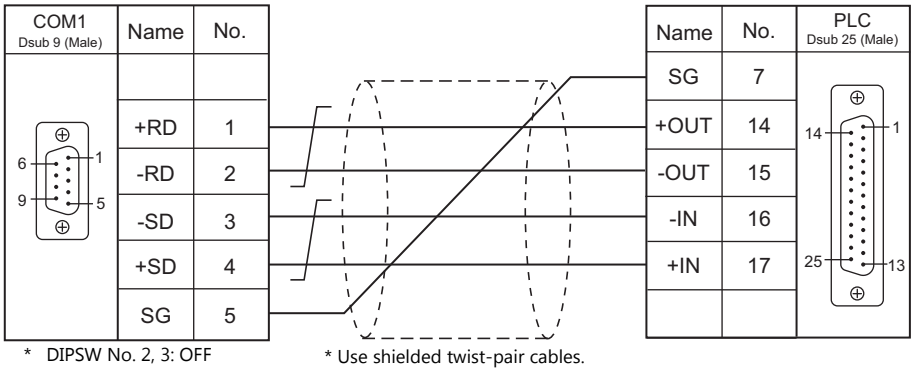
Wiring diagram 3 - COM1



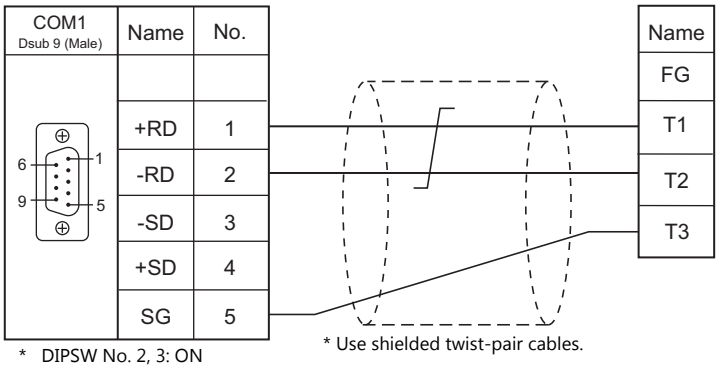
Wiring diagram 4 - COM1



Wiring diagram 5 - COM1



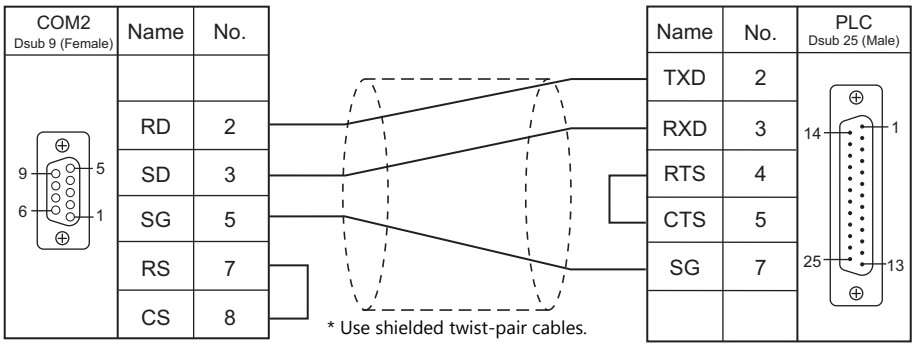
Wiring diagram 6 - COM1



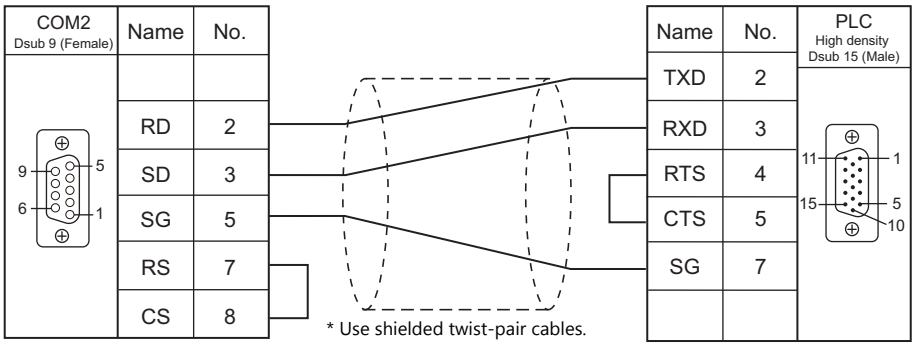
When Connected at COM2:

RS-232C

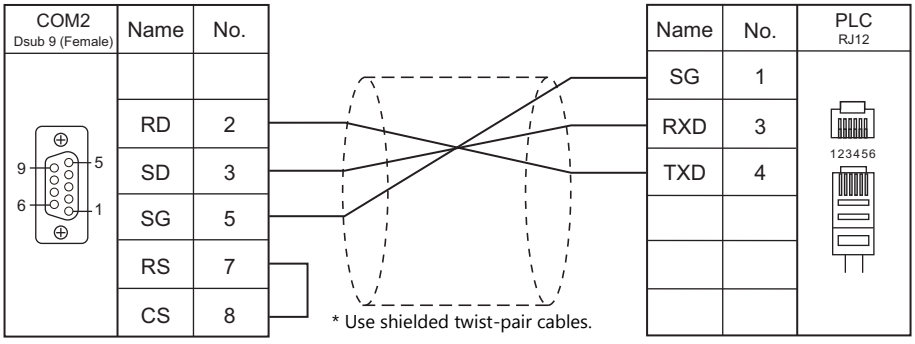
Wiring diagram 1 - COM2



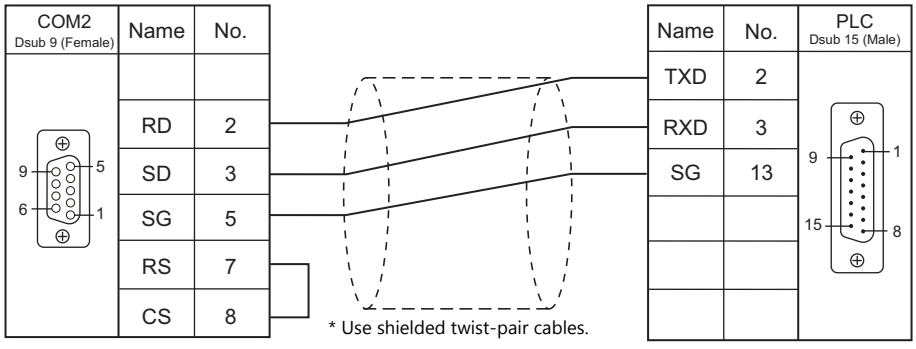
Wiring diagram 2 - COM2



Wiring diagram 3 - COM2



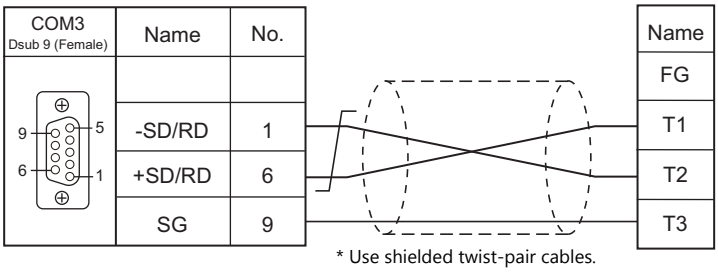
Wiring diagram 4 - COM2



When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



* Use shielded twist-pair cables.

MEMO

9. Lenze

9.1 Temperature Controller/Servo/Inverter Connection

Ethernet Connection

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Lst File
ServoDrive9400 (Ethernet TCP/IP)	E94AxxExxx4xxxENNN E94AxxExxx4xxxNNEN E94ARNExxx4A22ENNN E94ARNExxx4A22NNEN	MXI1 MXI2	○	×	9410 (Max. 1 unit)	○	Lenze_Eth.Lst

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

9.1.1 ServoDrive (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 9410) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

ServoDrive

Configure using the Lenze Engineer software tool or by using the keypad on the upper part of the PLC.
For details, refer to the ServoDrive manual issued by the manufacturer.

Code	Setting Value		Remarks
C13000	IP address (MXI1)	C13000/1: 1st byte C13000/2: 2nd byte C13000/3: 3rd byte C13000/4: 4th byte	For details, refer to the ServoDrive manual issued by the manufacturer.
C13001	Subnet mask (MXI1)	C13001/1: 1st byte C13001/2: 2nd byte C13001/3: 3rd byte C13001/4: 4th byte	
C13002	Default gateway (MXI1)	C13002/1: 1st byte C13002/2: 2nd byte C13002/3: 3rd byte C13002/4: 4th byte	
C14000	IP address (MXI2)	C14000/1: 1st byte C14000/2: 2nd byte C14000/3: 3rd byte C14000/4: 4th byte	
C14001	Subnet mask (MXI2)	C14001/1: 1st byte C14001/2: 2nd byte C14001/3: 3rd byte C14001/4: 4th byte	
C14002	Default gateway (MXI2)	C14002/1: 1st byte C14002/2: 2nd byte C14002/3: 3rd byte C14002/4: 4th byte	

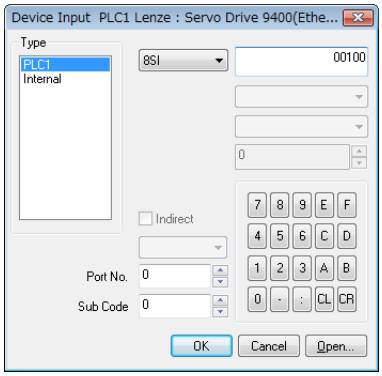
Available Device Memory

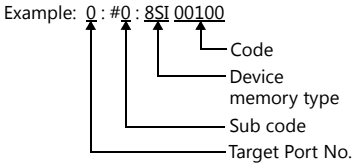
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
8SI	(INTEGER 8)	00H	
16SI	(INTEGER 16)	01H	
32SI	(INTEGER 32)	02H	Double-word
8UI	(UNSIGNED 8)	03H	
16UI	(UNSIGNED 16)	04H	
32UI	(UNSIGNED 32)	05H	Double-word
8B	(BITFIELD 8)	06H	
16B	(BITFIELD 16)	07H	
32B	(BITFIELD 32)	08H	Double-word

Specification of codes and sub codes

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





Indirect Device Memory Designation

	15	8 7
n + 0	Model	Device memory type
n + 1	Code	
n + 2	Sub code *	
n + 3	Expansion code	Bit designation
n + 4	00	Target Port No.

* Set "0" if not using a sub code.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Character string reading	1 to 8 (PLC1 to 8)	n	Target Port No.	5
		n + 1	Command: 0	
		n + 2	Code	
		n + 3	Sub code	
		n + 4	Data type 0: VISBLE_STRING 1: OCTET_STRING	
		n + 5	No. of Bytes m: 1 to 256	
		n + 6	Character string + NULL (m+1 bytes)	
		:		
		n + 134		
Character string writing	1 to 8 (PLC1 to 8)	n	Target Port No.	6+ (m + 1) /2
		n + 1	Command: 1	
		n + 2	Code	
		n + 3	Sub code	
		n + 4	Data type 0: VISBLE_STRING 1: OCTET_STRING	
		n + 5	No. of Bytes m: 1 to 256	
		n + 6	Character string (m bytes)	
		:		
		n + 133		

Return data: Data stored from servo to TS

10. LS

10.1 PLC Connection

10.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
MASTER-KxxxS	K200S	K3P-07AS	RS-232C port on the CPU unit	RS-232C	COM2	Wiring diagram 1 - COM2	
		K3P-07CS					
	K300S	K4P-15AS					
	K1000S	K7P-30AS					
MASTER-KxxxS CNET	K200S	K3P-07AS K3P-07BS K3P-07CS	K3F-CU2A	RS-232C	COM2	Wiring diagram 2 - COM2	
			K3F-CU4A	RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
	K300S	K4P-15AS	K4F-CUEA	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
	K1000S	K7P-30AS	K7F-CUEA	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
GLOFA CNET	GM6	GM6-CPUA GM6-CPUB GM6-CPUC	G6L-CUEB	RS-232C	COM2	Wiring diagram 2 - COM2	
			G6L-CUEC	RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
	GM4	GM4-CPUA	G4L-CUEA	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
	GM3	GM3-CPUA	G3L-CUEA	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	
GLOFA GM7 CNET	GM7	G7M-DR G7M-DT	G7L-CUEB	RS-232C	COM2	Wiring diagram 1 - COM2	
			G7L-CUEC	RS-422	COM1	Wiring diagram 1 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	×
GLOFA GM series CPU	GM6	GM6-CPUA GM6-CPUB GM6-CPUC	RS-232C port on the CPU unit	RS-232C	COM2	Wiring diagram 1 - COM2	
	GM4	GM4-CPUA					
	GM3	GM3-CPUA					
	GM7	G7M-DR G7M-DT					
XGT/XGK series CNET	XGK-CPUH XGK-CPUA XGK-CPUS XGK-CPUE		XGL-C22A	RS-232C	COM2	Wiring diagram 1 - COM2	
			XGL-CH2A	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-422	COM1	Wiring diagram 2 - COM1	
				RS-485	COM3	Wiring diagram 2 - COM3	
			XGL-C42A	RS-422	COM1	Wiring diagram 2 - COM1	
				RS-485	COM3	Wiring diagram 2 - COM3	
XGT/XGK series CPU	XGK-CPUH XGK-CPUA XGK-CPUS XGK-CPUE		RS-232C port on the CPU unit	RS-232C	COM2	Wiring diagram 1 - COM2	
XGT/XGI series CNET	XGI-CPUH XGI-CPUU XGI-CPUS		XGL-C22A	RS-232C	COM2	Wiring diagram 1 - COM2	
			XGL-CH2A	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-422	COM1	Wiring diagram 2 - COM1	
				RS-485	COM3	Wiring diagram 2 - COM3	
			XGL-C42A	RS-422	COM1	Wiring diagram 2 - COM1	
				RS-485	COM3	Wiring diagram 2 - COM3	
XGT/XGI series CPU	XGI-CPUH XGI-CPUU XGI-CPUS		RS-232C port on the CPU unit	RS-232C	COM2	Wiring diagram 1 - COM2	

*1 For the ladder transfer function, see the TS Reference Manual 2.

Ethernet Connection

PLC Selection on the Editor	PLC/CPU		Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Ladder Transfer *2
MASTER-K series (Ethernet)	K200S series	K3P-07AS K3P-07BS K3P-07CS	G6L-EUTB G6L-EUFB	○	○	TCP/IP: 2004 fixed (Max. 16 units) UDP/IP: 2005 fixed	○	×
	K300S series	K4P-15AS	G4L-EUTB G4L-EUFB G4L-EU5B	○	○	TCP/IP: 2004 fixed (Max. 16 units) UDP/IP: 2005 fixed		
	K1000S series	K7P-30AS	G3L-EUTB G3L-EUFB G3L-EU5B	○	○	TCP/IP: 2004 fixed (Max. 16 units) UDP/IP: 2005 fixed		
GLOFA GM series (Ethernet UDP/IP)	GM6		G6L-EUTB	×	○	2005 fixed	×	
XGT/XGK series (Ethernet)	XGK-CPUH XGK-CPUA XGK-CPUS XGK-CPUE XGK-CPUU		XGL-EFMT	○	○	TCP/IP: 2004 fixed (Max. 16 units) UDP/IP: 2005 fixed		
XGT/XGI series (Ethernet)	XGI-CPUH XGI-CPUU XGI-CPUS		XGL-EFMT	○	○	TCP/IP: 2004 fixed (Max. 16 units) UDP/IP: 2005 fixed		

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*2 For the ladder transfer function, see the TS Reference Manual 2.

10.1.1 MASTER-KxxxS

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	**RS-232C**	
Baud Rate	9600 / 19200 / 38400 / 57600 / 76800 / 115200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	

PLC

No particular setting is necessary on the PLC.

Calendar

Although this model is equipped with the calendar function, the TS cannot read and write to the calendar. Use the built-in clock of the TS.

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
P	(input/output relay)	00H	Input relay: read only
M	(auxiliary relay)	01H	
L	(link relay)	02H	
K	(keep relay)	03H	
F	(special relay)	04H	Read only
T	(timer/current value)	05H	
C	(counter/current value)	06H	
D	(data register)	07H	
TC	(timer/contact)	09H	
CC	(counter/contact)	0AH	

10.1.2 MASTER-KxxxS CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

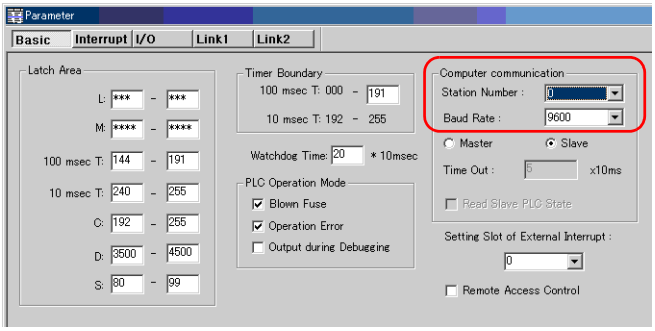
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 76800 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

MODE switch

MODE Switch		Operation Mode		Remarks
	K3F-CU2A K3F-CU4A	1: Dedicated		
	K4F-CUEA K7F-CUEA	RS-232C	3, 5: Dedicated	Stand-alone mode
		RS-422	3, 4, 7: Dedicated	

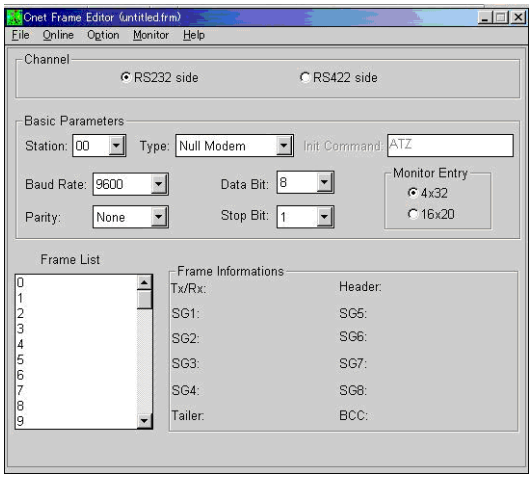
KGL_WIN for Windows



(Underlined setting: default)

Item	Setting	Remarks
Station Number	0 to 31	
Baud Rate	9600 / 19200 / 38400 bps	

Cnet Frame Editor



(Underlined setting: default)

Item	Setting	Remarks
Channel	RS232C / RS422	
Baud Rate	9600 / 19200 / 38400 / 76800 bps	76800: Valid only when [Channel: RS422 side] is selected
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Station	0 to 31	
Type	RS422 / RS485	To be set only when [Channel: RS422 side] is selected

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
P	(input/output relay)	00H	PW as word device, input relay: read only
M	(auxiliary relay)	01H	MW as word device
L	(link relay)	02H	LW as word device
K	(keep relay)	03H	KW as word device
F	(special relay)	04H	FW as word device, read only
T	(timer/current value)	05H	
C	(counter/current value)	06H	
D	(data register)	07H	
TC	(timer/contact)	09H	
CC	(counter/contact)	0AH	

10.1.3 MASTER-K Series (Ethernet)

Communication Setting

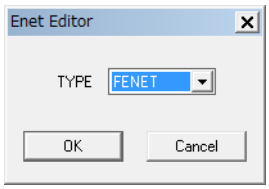
Editor

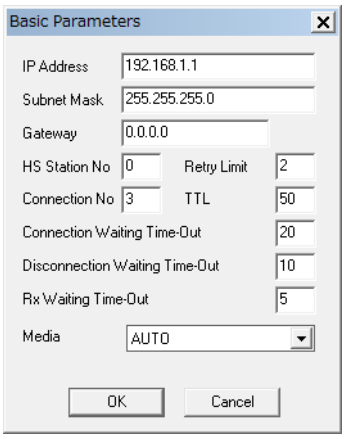
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Start "Enet Editor" version 2.01 or later, and select [FENET].
Set the IP address on the [Basic Parameters] dialog.





The port numbers are 2004 for TCP/IP and 2005 for UDP/IP (both fixed).
For details, refer to the PLC manual issued by the manufacturer.

Calendar

Although this model is equipped with the calendar function, the TSi cannot read and write to the calendar. Use the built-in clock of the TSi.

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
P	(input/output relay)	00H	PW as word device, input relay: read only
M	(auxiliary relay)	01H	MW as word device
L	(link relay)	02H	LW as word device
K	(keep relay)	03H	KW as word device
F	(special relay)	04H	FW as word device, FW0 to FW1023: read only
T	(timer/current value)	05H	
C	(counter/current value)	06H	
D	(data register)	07H	
TC	(timer/contact)	09H	
CC	(counter/contact)	0AH	

10.1.4 GLOFA CNET

Communication Setting

Editor

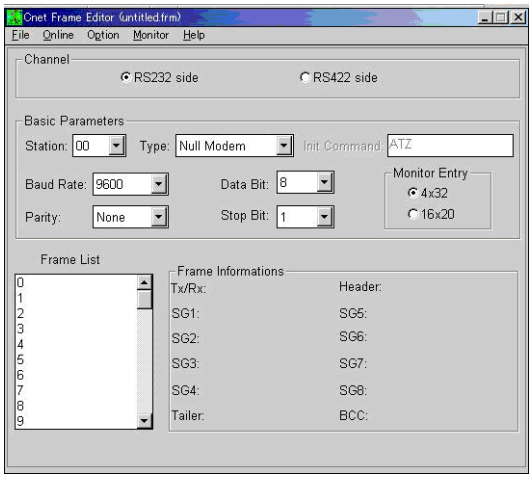
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 76800 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

Cnet frame editor



(Underlined setting: default)

Item	Setting	Remarks
Channel	RS232C / RS422	
Baud Rate	9600 / 19200 / 38400 / 76800 bps	76800: Valid only when [Channel: RS422 side] is selected
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Station	0 to 31	
Type	RS422 / RS485	To be set only when [Channel: RS422 side] is selected

Calendar

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

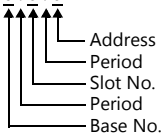
Available Device Memory

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

Device Memory		TYPE	Remarks
M	(internal memory)	00H	MW as word device
Q	(output)	01H	QW as word device, *1
I	(input)	02H	IW as word device, *1

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

Example: Q 0 . 0 . 0

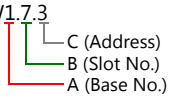


Indirect Device Memory Designation

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

- Using Q or I device memory
  - Word access

    QW1.7.3

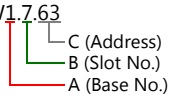
    

    Address number = A × 32 + B × 4 + C = 1 × 32 + 7 × 4 + 3 = 63

    Specify “63” (DEC) for the address number.

  - Bit access

    QW1.7.63

    Address number = A × 32 + B × 4 + (quotient of C divided by 16)
    = 1 × 32 + 7 × 4 + (63 ÷ 16) = 63
    Bit designation = remainder when C is divided by 16 = (63 ÷ 16) = 15

    Specify “63” (DEC) for the address number, and “15” (DEC) for the bit designation.

10.1.5 GLOFA GM7 CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

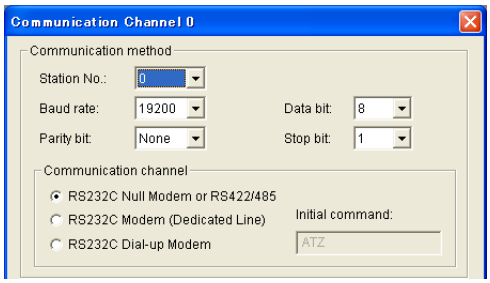
PLC

Mode switches

TM/TC MODE		Setting		Remarks
G7L-CUEB		BUILT IN CNET	**OFF**	
		ROM MODE	OFF/ON	

* G7L-CUEC is not provided with mode switches.

Communication Channel 0



(Underlined setting: default)

Item	Setting	Remarks
Station No.	0 to 31	
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 bps	
Data bit	7 / 8 bits	
Parity bit	None / Odd / Even	
Stop bit	1 / 2 bits	

Calendar

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

Available Device Memory

The contents of “Available Device Memory” are the same as those described in “10.1.4 GLOFA CNET”.

10.1.6 GLOFA GM Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.
The following settings are fixed; baud rate: 38400 bps, data length: 8 bits, without parity, and stop bit: 1 bit.

Calendar

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

Available Device Memory

The contents of “Available Device Memory” are the same as those described in “10.1.4 GLOFA CNET”.

10.1.7 GLOFA GM Series (Ethernet UDP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2005) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Set the IP address using "Enet Editor".
The port number is fixed to "2005".
For more information, refer to the PLC manual issued by the manufacturer.

Calendar

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

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "10.1.4 GLOFA CNET".

10.1.8 XGT/XGK Series CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

Set parameters using “XG_PD”. For more information, refer to the PLC manual issued by the manufacturer.

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Type	RS-232C / RS-422	
Speed	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data bit	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Station	0 to 31	

Calendar

This model is equipped with a calendar function; however, the calendar data cannot be written from the TS. 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
P	(input/output relay)	00H	PW as word device, input relay: read only
M	(auxiliary relay)	01H	MW as word device
L	(link relay)	02H	LW as word device
K	(keep relay)	03H	KW as word device
F	(special relay)	04H	FW as word device; FW0 to FW1023: read only
T	(timer/current value)	05H	
C	(counter/current value)	06H	
D	(data register)	07H	
TC	(timer/contact)	09H	
CC	(counter/contact)	0AH	
N	(communication data register)	0BH	
R	(file register)	0CH	RW as word device
ZR	(file register)	0DH	
U	(analog data register)	0EH	UW as word device, *1

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

Example: U 3 1 . 31 . F

- Bit address: 0 to F (hexadecimal)
- Period
- Special module No.: 0 to 31 (decimal)
- Period
- Slot No.: 0 to F (hexadecimal)
- Base No.: 0 to 7 (decimal)

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

Example: Indirect device memory designation of “UW1F.31”

UW1F.31

- B (Special module No.)
- A (Base No. + Slot No.)

Address number = A converted to decimal × 32 + B = 1F (HEX) → 31 (DEC) × 32 + 31 = 1023

Specify “1023” (DEC) for the address number.

10.1.9 XGT/XGK Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	**RS-232C**	
Baud Rate	**115200 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	

PLC

No particular setting is necessary on the PLC.
The following settings are fixed; baud rate: 115200 bps, data length: 8 bits, without parity, and stop bit: 1 bit.

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "10.1.8 XGT/XGK Series CNET".

10.1.10 XGT / XGK Series (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Go to [Standard Settings] in XG-PD and set the IP address.
The port numbers are 2004 for TCP/IP and 2005 for UDP/IP (both fixed).
For more information, refer to the PLC manual issued by the manufacturer.

Calendar

Although this model is equipped with the calendar function, the TSi cannot read and write to the calendar. Use the built-in clock of the TSi.

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "10.1.8 XGT/XGK Series CNET".

10.1.11 XGT / XGI Series CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

Set parameters in XG-PD. For more information, refer to the PLC manual issued by the manufacturer.

Communication settings

(Underlined setting: default)

Item	Setting	Remarks
Type	RS-232C / RS-422	
Speed	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Data bit	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity bit	None / Odd / Even	
Station Number	0 to 31	

Calendar

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

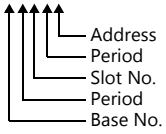
Available Device Memory

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
M	(internal memory)	00H	MW as word device
Q	(output)	01H	QW as word device, *1
I	(input)	02H	IW as word device, *1
R	(internal memory)	03H	RW as word device
W	(internal memory)	04H	WW as word device
F	(system flag)	05H	FW as word device; FW0 to FW1919: read only
K	(PID flag)	06H	KW as word device
L	(link flag)	07H	LW as word device
N	(P2P flag)	08H	NW as word device
U	(analog data register)	09H	UW aw word device, *1

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

Example: Q 0 . 0 . 0



Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

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

- Using Q or I device memory
  - Word access

    QW127.15.3

    C (Address)
    B (Slot No.)
    A (Base No.)

    Address number = A × 64 + B × 4 + C = 127 × 64 + 15 × 4 + 3 = 8191

    Specify "8191" (DEC) for the address number.

  - Bit access

    Q127.15.63

    C (Address)
    B (Slot No.)
    A (Base No.)

    Address number = A × 64 + B × 4 + (quotient of C divided by 16)
    = 127 × 64 + 15 × 4 + (63 ÷ 16) = 8191
    Bit designation = remainder when C is divided by 16 = (63 ÷ 16) = 15

    Specify "8191" (DEC) for the address number, and "15" (DEC) for the bit designation.

- Using U device memory
  - Word access

    UW7.15.31

    C (Address)
    B (Slot No.)
    A (Base No.)

    Address number = A × 512 + B × 32 + C = 7 × 512+ 15 × 32 + 31 = 4095

    Specify "4095" (DEC) for the address number.

  - Bit access

    U7.15.511

    C (Address)
    B (Slot No.)
    A Base No.)

    Address number = A × 512 + B × 32 + (quotient of C divided by 16)
    = 7 × 512 + 15 × 32 + (511÷16) = 4095

    Specify "4095" (DEC) for the address number, and "15" (DEC) for the bit designation.

10.1.12 XGT / XGI Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	**115200 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	

PLC

No particular setting is necessary on the PLC.
Baud rate: 115200 bps, data length: 8 bits, without parity, stop bit: 1 bit (fixed)

Calendar

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

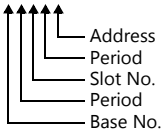
Available Device Memory

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
M	(internal memory)	00H	MW as word device; MW0 to MW65535 valid
Q	(output)	01H	QW as word device, *1
I	(input)	02H	IW as word device, *1
R	(internal memory)	03H	RW as word device
W	(internal memory)	04H	WW as word device
F	(system flag)	05H	FW as word device; FW0 to FW1919: read only
K	(PID flag)	06H	KW as word device
L	(link flag)	07H	LW as word device
N	(P2P flag)	08H	NW as word device
U	(analog data register)	09H	UW as word device, *1

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

Example: QW 0 . 0 . 0

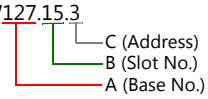


Indirect Device Memory Designation

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

- Using Q or I device memory
  - Word access

    QW127.15.3

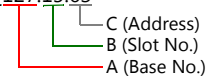
    

    Address number = A × 64 + B × 4 + C = 127 × 64 + 15 × 4 + 3 = 8191

    Specify "8191" (DEC) for the address number.

  - Bit access

    Q127.15.63

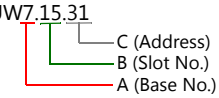
    

    Address number = A × 64 + B × 4 + (quotient of C divided by 16)
    = 127 × 64 + 15 × 4 + 63 ÷ 16) = 8191
    Bit designation = remainder when C is divided by 16 = (63 ÷ 16) = 15

    Specify "8191" (DEC) for the address number, and "15" (DEC) for the bit designation.

- Using U device memory
  - Word access

    UW7.15.31

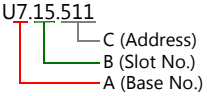
    

    Address number = A × 512 + B × 32 + C = 7 × 512 + 15 × 32 + 31 = 4095

    Specify "4095" (DEC) for the address number.

  - Bit access

    U7.15.511

    Address number = A × 512 + B × 32 + (quotient of C divided by 16)
    = 7 × 512 + 15 × 32 + (511 ÷ 16) = 4095

    Specify "4095" (DEC) for the address number, and "15" (DEC) for the bit designation.

10.1.13 XGT / XGI Series (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Go to [Standard Settings] in XG-PD and set the IP address.
The port numbers are 2004 for TCP/IP and 2005 for UDP/IP (both fixed).
For more information, refer to the PLC manual issued by the manufacturer.

Calendar

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

Available Device Memory

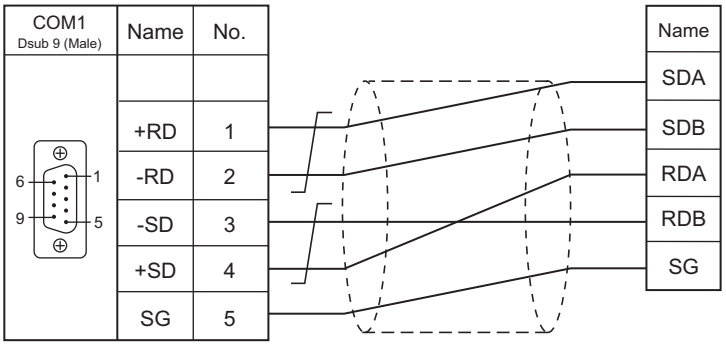
The contents of "Available Device Memory" are the same as those described in "10.1.11 XGT / XGI Series CNET".

10.1.14 Wiring Diagrams

When Connected at COM1:

RS-422

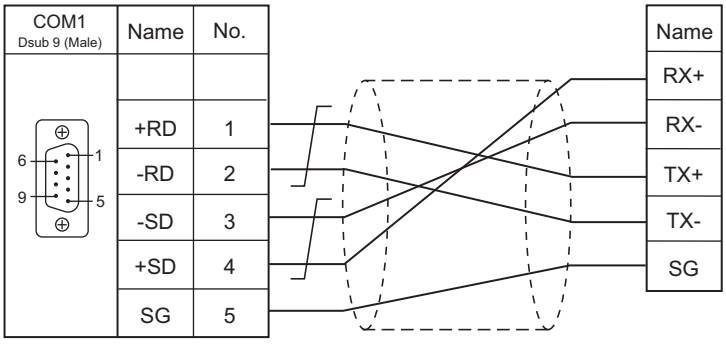
Wiring diagram 1 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

Wiring diagram 2 - COM1



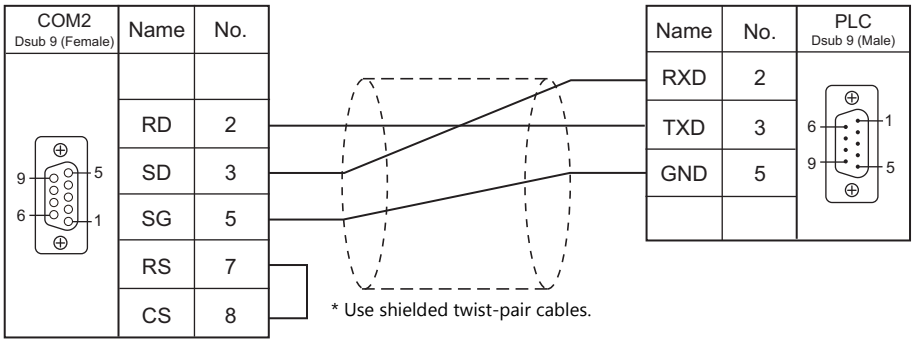
* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

When Connected at COM2:

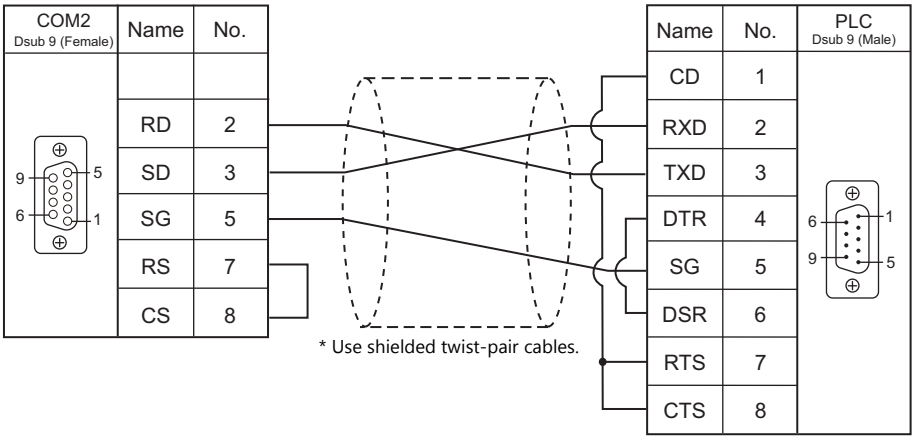
RS-232C

Wiring diagram 1 - COM2



* Use shielded twist-pair cables.

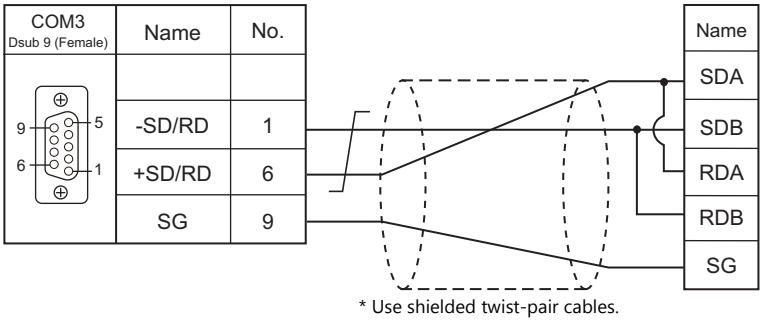
Wiring diagram 2 - COM2



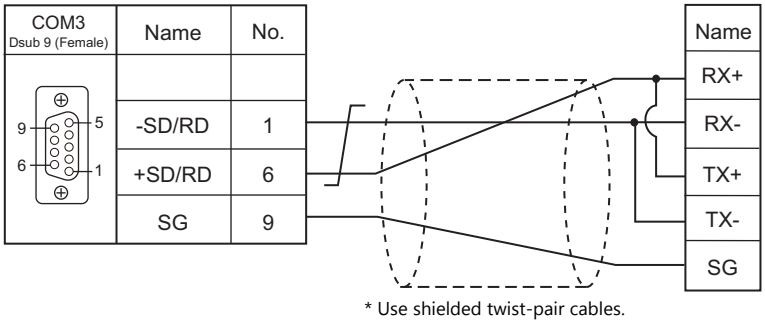
When Connected at COM3:

RS-485

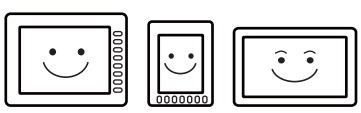
Wiring diagram 1 - COM3



Wiring diagram 2 - COM3



MEMO



11. MITSUBISHI ELECTRIC

11.1 PLC Connection

Serial Connection

A/QnA/QnH/L Series Standard Type Link Unit

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
A series link A-Link + Net10	A2A, A3A	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C	COM2	Wiring diagram 2 - COM2	×
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A2U, A3U, A4U	AJ71UC24	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A1, A2, A3 A1N, A2N, A3N A3H, A3M, A73	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A0J2, A0J2H	A0J2C214-S1	RS-232C	COM2	Wiring diagram 2 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A2US	A1SJ71UC24-R2 A1SJ71UC24-PRF	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
		A1SJ71UC24-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A1S, A1SJ, A2S	A1SJ71C24-R2 A1SJ71C24-PRF	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
		A1SJ71C24-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	A2CCPUC24	Link port built into CPU	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
	QnH (A mode)	A1SJ71UC24-R2	RS-232C	COM2	Wiring diagram 1 - COM2	
		A1SJ71UC24-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
QnA series link	Q2A, Q3A, Q4A	AJ71QC24 AJ71QC24N	RS-232C	COM2	Wiring diagram 2 - COM2	×
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
		AJ71QC24-R4(CH1)	RS-422	COM1	Wiring diagram 2 - COM1	
		AJ71QC24-R4(CH2)	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
	Q2ASx	A1SJ71QC24 A1SJ71QC24N A1SJ71QC24-R2	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
QnH (Q) series link	Q00, Q01, Q00J Q02, Q02H Q06H Q12H Q25H	QJ71C24 QJ71C24N QJ71C24-R2 QJ71C24N-R2 QJ71C24N-R4	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
	Q00UJ,Q00U Q01U,Q02U Q03UD(E), Q04UD(E)H Q06UD(E)H, Q10UD(E)H Q13UD(E)H, Q20UD(E)H Q26UD(E)H, Q50UDEH Q100UDEH	QJ71C24N QJ71C24N-R2 QJ71C24N-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
QnH (Q) series link (multi CPU)	Q02, Q02H Q06H Q12H Q25H	QJ71C24 QJ71C24N QJ71C24-R2 QJ71C24N-R2 QJ71C24N-R4	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	×
					Wiring diagram 1 - COM2	
	Q00UJ,Q00U Q01U,Q02U Q03UD(E), Q04UD(E)H Q06UD(E)H, Q10UD(E)H Q13UD(E)H, Q20UD(E)H Q26UD(E)H, Q50UDEH Q100UDEH	QJ71C24N QJ71C24N-R2 QJ71C24N-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
L series link	L02CPU L26CPU-BT	LJ71C24 LJ71C24-R2	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	

*1 For the ladder transfer function, see the TS Reference Manual 2.

QnH/QnU/Q170M/L Series CPU

PLC Selection on the Editor	CPU	Port	Signal Level	TS Port	Connection	Ladder Transfer *1
QnH (Q) series CPU	Q02, Q02H Q06H Q12H Q25H	Tool port	RS-232C	COM2	Hakko Electronics' "D9-QCPU2" + Gender changer	○
QnH (Q) series CPU (multi CPU)		Tool port *2				
Q00J/00/01 CPU	Q00J,Q00,Q01	Tool port				
QnU series CPU	Q00UJ, Q00U Q01U, Q02U Q03UD, Q04UDH Q06UDH, Q10UDH Q13UDH, Q20UDH Q26UDH	Tool port				
Q170MCPU (multi CPU)	Q170M Q170MSCPU-S1	Tool port				
L series CPU	L02SCPU L02SCPU-P	Tool port				

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 Available for the CPU function version B or later.

FX Series

PLC Selection on the Editor	CPU	Port	Signal Level	TS Port	Connection	Ladder Transfer *1
FX2N/1N series CPU	FX2N FX1N FX2NC FX1NC	Tool port *1	RS-422	COM1	Hakko Electronics' "D9-MI4-FX"	○
					Hakko Electronics' "D9-MB-CPUQ" + Mitsubishi's "FX-20P-CADP"	
FX1S series CPU	FX1S					
FX series link (A protocol)	FX2N	FX2N-232-BD	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	×
					Wiring diagram 3 - COM2	
		FX2N-485-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
		FX2N-422-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-FX"	
	FX1N FX1S	FX1N-232-BD	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	
					Wiring diagram 3 - COM2	
		FX1N-485-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
		FX1N-422-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-FX"	
	FX0N FX1NC FX2NC	FX0N-232ADP	RS-232C	COM2	Wiring diagram 4 - COM2	
		FX2NC-232ADP	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	
					Wiring diagram 3 - COM2	
		FX0N-485ADP FX2NC-485ADP	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
FX3U/3UC/3G series CPU	FX3U FX3UC	Tool port *1	RS-422	COM1	Hakko Electronics' "D9-MI4-FX"	○
		FX3U-422-BD				
	FX3G FX3S	Tool port *1			Hakko Electronics' "D9-MB-CPUQ" + Mitsubishi's "FX-20P-CADP"	
		FX3G-422-BD				

PLC Selection on the Editor	CPU	Port	Signal Level	TS Port	Connection	Ladder Transfer *1
FX3U/3UC/3G series link (A protocol)	FX3G FX3S	FX3G-232-BD	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	×
					Wiring diagram 3 - COM2	
		FX3G-485-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	FX3U	FX3U-232-BD	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	
					Wiring diagram 3 - COM2	
		FX3U-485-BD	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
	FX3UC	FX3U-232-BD FX3U-232-ADP	RS-232C	COM2	Hakko Electronics' "D9-MI2-FX2N-2M" + Gender changer	
					Wiring diagram 3 - COM2	
		FX3U-485ADP FX3U-485BD	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 "D9-MI4-0T" is equipped with a Y-shaped terminal at the PLC side. Modification is necessary before use.

iQ Series

PLC Selection on the Editor	CPU	Port	Signal Level	TS Port	Connection	Ladder Transfer *1
iQ-R series link	R04 R08 R16 R32 R120	RJ71C24 RJ71C24-R2	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	×
					Wiring diagram 1 - COM2	
			RS-422	COM1	Hakko Electronics' "D9-MI4-0T"	
					Wiring diagram 1 - COM1	
		RJ71C24-R4	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	
					Wiring diagram 1 - COM1	
FX5U/5UC series	FX5U FX5UC	Built-in RS-485 terminal block FX5-485-BD FX5-485-ADP	RS-422	COM1	Hakko Electronics' "D9-MI4-0T" *2	×
					Wiring diagram 1 - COM1	
		FX5-232-BD FX5-232-ADP	RS-232C	COM2	Hakko Electronics' "D9-MI2-09" + Gender changer	
					Wiring diagram 1 - COM2	

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 "D9-MI4-0T" is equipped with a Y-shaped terminal at the PLC side. Modification is necessary before use.

Ethernet Connection

QnA/QnH/Q170/L Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Ladder Transfer *2
QnA series (Ethernet)	Q2A, Q3A, Q4A	AJ71QE71 AJ71QE71-B5	×	○	Auto-open: 5000 Open setting: As desired (max. 16 units)	○	×
	Q2ASx	A1SJ71QE71-B2 A1SJ71QE71-B5			Open setting: As desired (max. 16 units)		
QnH (Q) series (Ethernet)	Q02, Q02H Q06H Q12H Q25H Q00J, Q00, Q01	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	○	×
	Q02U Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH	QJ71E71-B2 QJ71E71-100	×	○			
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH	CPU with built-in Ethernet	×	○			
QnH (Q) series (Ethernet ASCII)	Q02, Q02H Q06H Q12H Q25H Q00J, Q00, Q01	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	○	×
	Q02U Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH	QJ71E71-B2 QJ71E71-100	×	○			
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH	CPU with built-in Ethernet	×	○			
QnH (Q) series (multi CPU) (Ethernet)	Q02, Q02H Q06H Q12H Q25H	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Auto-open: 5000 Open setting: As desired (max. 16 units)	○	×
	Q02U Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH	QJ71E71-B2 QJ71E71-100	×	○			
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH		×	○	Open setting (max. 16 units)		
QnH (Q) series (multi CPU) (Ethernet)	Q02, Q02H Q06H Q12H Q25H	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	○	×
	Q02U Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH	QJ71E71-B2 QJ71E71-100	×	○			
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH		×	○			
QnU series (Built-in Ethernet)	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○	×
Q170 series (multi CPU) (Ethernet)	Q170M Q170MSCPU-S1 Q172DCPU-S1 Q173DCPU-S1	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○	×

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Ladder Transfer *2
L series (Built-in Ethernet)	L02CPU L26CPU-BT	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○	×

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*2 For the ladder transfer function, see the TS Reference Manual 2.

FX Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*2	Ladder Transfer *3
FX3U/3GE series (Ethernet)	FX3U (Version V2.21 or greater)	FX3U-ENET-L	×	○	Open setting: As desired (max. 2 units)	○	×
		FX3U-ENET			Open setting: As desired (max. 4 units)		
	FX3UC *1 (Version V2.21 or greater)	FX3U-ENET-L	×	○	Open setting: As desired (max. 2 units)		
	FX3GE	CPU with built-in Ethernet	×	○	Open setting: As desired (max. 4 units)		

*1 FX2NC-CNV-IF or FX3UC-1PS-5V (Mitsubishi Electric) is required.
*2 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*3 For the ladder transfer function, see the TS Reference Manual 2.

iQ Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Ladder Transfer *2
iQ-R series (Built-in Ethernet)	R04 R08 R16 R32 R120	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○	×
iQ-R series (Ethernet)	R04 R08 R16 R32 R120	RJ71E71	○	○	Open setting: As desired (max. 16 units)	○	×
FX-5U/5UC series (Ethernet)	FX-5U FX-5UC	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 8 units)	○	×

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*2 For the ladder transfer function, see the TS Reference Manual 2.

11.1.1 A Series Link

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Transmission Mode	Transmission Mode 1 / Transmission Mode 4	Transmission Mode 1: Without CR/LF Transmission Mode 4: With CR/LF
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

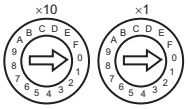
PLC

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

Mode setting

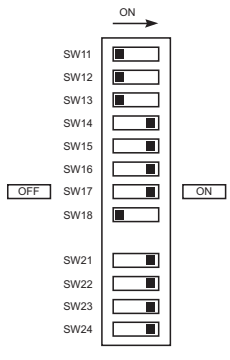
Mode	Setting	Contents	
	1	RS-232C	Dedicated protocol MODE 1
	4		Dedicated protocol MODE 4
	5	RS-422	Dedicated protocol MODE 1
	8		Dedicated protocol MODE 4

Station number setting

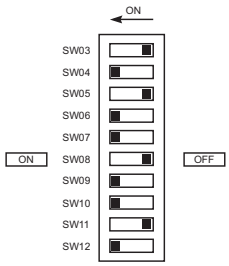
Station No.	Setting	Contents
	0 to 31	Station number ×10: the tens place ×1: the ones place

Transmission setting

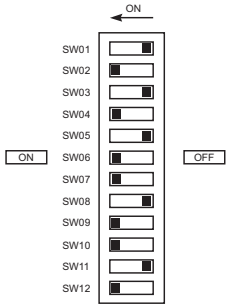
AJ71UC24

Switch	Contents	OFF	ON	Example: RS-232C, 19200 bps
SW11	Main channel	RS-232C	RS-422	
SW12	Data bit	7	8	
	Baud rate	9600	19200	
SW13		ON	OFF	
SW14		OFF	ON	
SW15		ON	ON	
SW16	Parity bit	Not provided	Provided	
SW17	Parity	Odd	Even	
SW18	Stop bit	1	2	
SW21	Sum check	Not provided	**Provided**	
SW22	Write while running	Disabled	**Enabled**	
SW23	Standard type link unit / multi-drop link unit	Multi	**Standard**	
SW24	Master station / local station	-	-	

A1SJ71C24-R2, A1SJ71UC24-R2

Switch	Contents	ON	OFF	Example: RS-232C, 19200 bps
SW03	Not used	-	-	
SW04	Write while running	**Enabled**	Disabled	
	Baud rate	9600	19200	
SW05		ON	OFF	
SW06		OFF	ON	
SW07		ON	ON	
SW08	Data bit	8	7	
SW09	Parity bit	Provided	Not provided	
SW10	Parity	Even	Odd	
SW11	Stop bit	2	1	
SW12	Sum check	**Provided**	Not provided	

A1SJ71UC24-R4, A1SJ71C24-R4

Switch	Contents	ON	OFF	Example: RS-422, 19200 bps
SW01	Master station / local station	-	-	
SW02	Standard type link unit / multi-drop link unit	**Standard**	Multi	
SW03	Not used	-	-	
SW04	Write while running	**Enabled**	Disabled	
	Baud rate	9600	19200	
SW05		ON	OFF	
SW06		OFF	ON	
SW07		ON	ON	
SW08	Data bit	8	7	
SW09	Parity bit	Provided	Not provided	
SW10	Parity	Even	Odd	
SW11	Stop bit	2	1	
SW12	Sum check	**Provided**	Not provided	

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	
W	(link register)	01H	
R	(file register)	02H	Cannot be set when the CPU is operated by ROM.
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer memory)	0FH	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

11.1.2 QnA Series Link

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

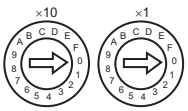
PLC

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

Mode setting

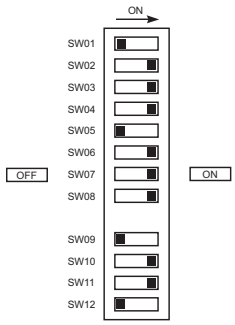
Mode	Setting	Contents
	5	Dedicated protocol binary mode Mode 5

Station number setting

Station No.	Setting	Contents
	0 to 31	Station number ×10: the tens place ×1: the ones place

Transmission setting

AJ71QC24, AJ71QC24N, A1SJ71QC24

Switch	Contents	OFF	ON	Example: 19200 bps
SW01	Operation	**Independent**	Link	
SW02	Data bit	7	**8**	
SW03	Parity bit	Not provided	Provided	
SW04	Parity	Odd	Even	
SW05	Stop bit	1	2	
SW06	Sum check	Not provided	**Provided**	
SW07	Write while running	Disabled	**Enabled**	
SW08	Setting change	Disabled	Enabled	
SW09	Baud rate *1			
SW10				
SW11				
SW12				

9600	19200	38400	57600	115200
ON	OFF	ON	OFF	ON
OFF	ON	ON	ON	ON
ON	ON	ON	OFF	OFF
OFF	OFF	OFF	ON	ON

*1 AJ71C24 (-R2/-R4): Max. 19200 bps
AJ71C24N (-R2/-R4): Max. 115200 bps (When CH1 and CH2 are used at the same time, a maximum of 115200 bps can be set in total.)

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

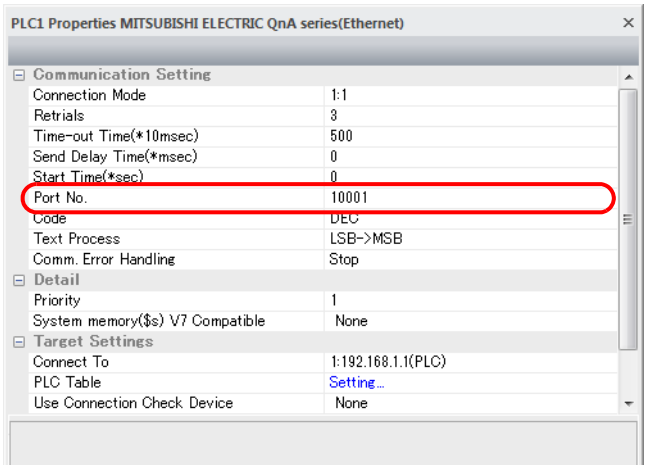
11.1.3 QnA Series (Ethernet)

Communication Setting

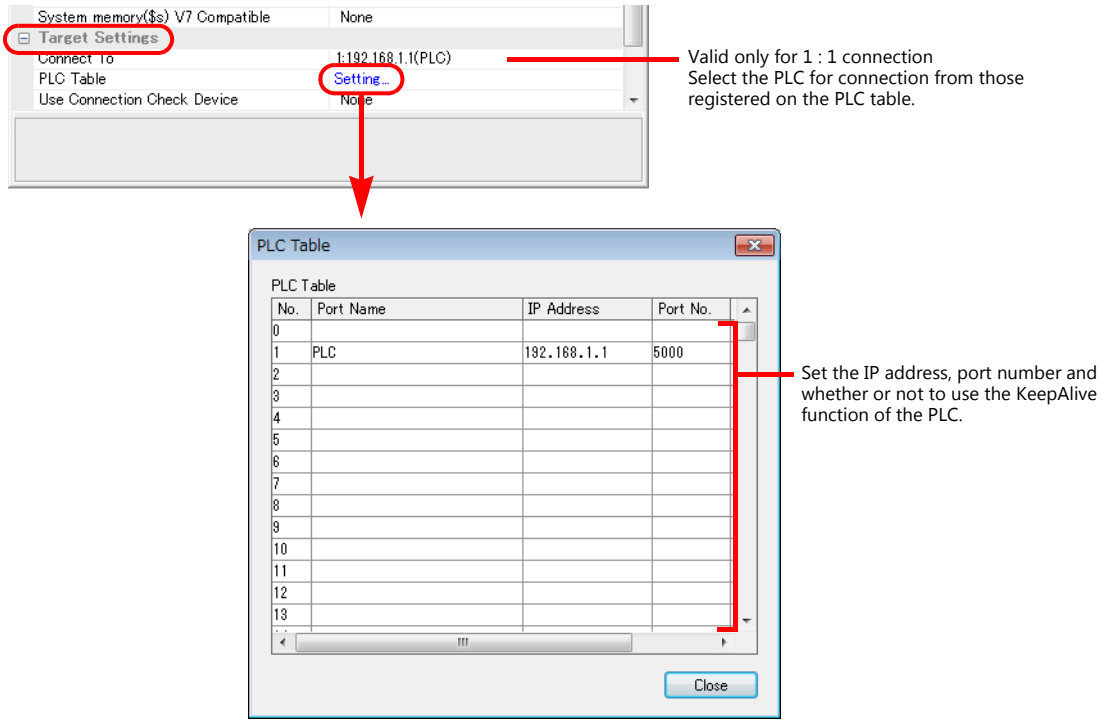
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

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



- IP address and port number of the PLC
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings]

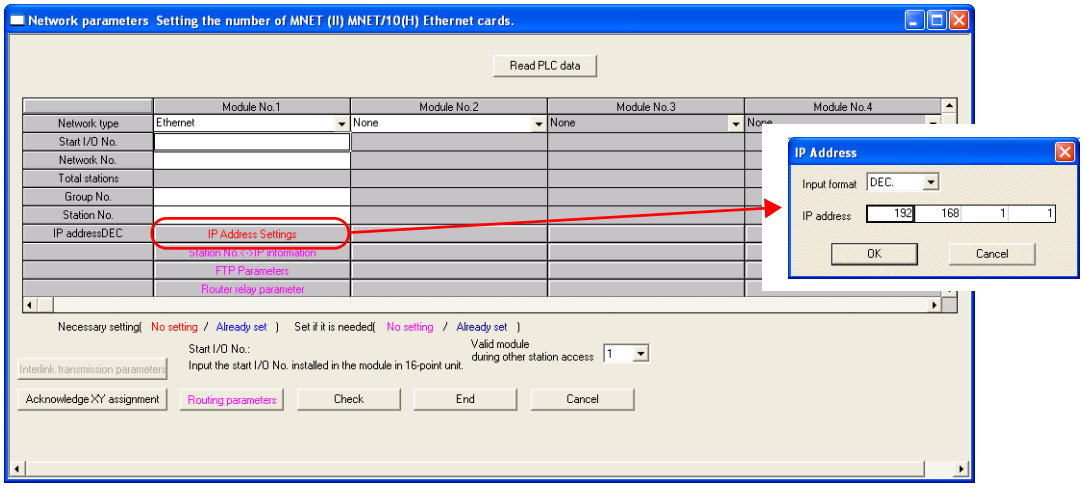


PLC

PC parameter

Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



Item	Setting	Remarks
Network type	Ethernet	For more information, refer to the manual of the PLC.
Station I/O No.	Make settings in accordance with the network environment.	
Network No.		
Group No.		
Station No.		
IP address (DEC)		

Port No.

There are two types of ports: one is opened automatically by “auto-open UDP port” (default: 5000 DEC), and the other is opened by open processing.
For more information, refer to the corresponding PLC manual.

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

11.1.4 QnH (Q) Series Link

Communication Setting

Editor

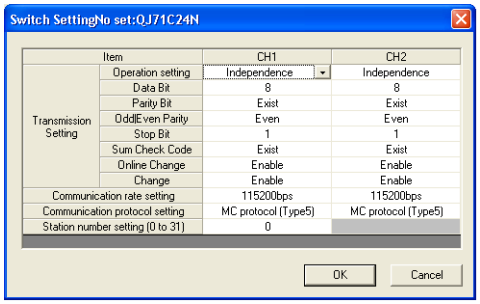
Communication setting

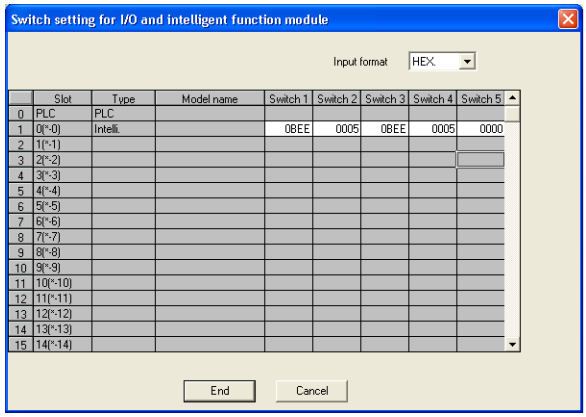
(Underlined setting: default)

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

PLC (PC Parameter)

Switch setting for I/O and intelligent function module





Switch	Contents	Example
Switch 1	CH1: baud rate, transmission setting Bit 15 - 8 7 - 0 Baud rate | Transmission setting bps / Setting: 4800 04H; 9600 05H; 19200 07H; 38400 09H; 57600 0AH; 115200 0BH Bit / Contents / OFF / ON: 0 Operation: **Independent** / Link; 1 Data bit: 7 / **8**; 2 Parity bit: Not provided / Provided; 3 Parity: Odd / Even; 4 Stop bit: 1 / 2; 5 Sum check: Not provided / **Provided**; 6 Write while running: Prohibited / **Allowed**; 7 Setting change: Prohibited / Allowed	0BEEH 115 kbps 8 bits 1 bit Even
Switch 2	CH1: communication protocol — MC protocol mode 5 binary code	0005H
Switch 3	CH2: baud rate, transmission setting (the same as those for switch 1)	0BEEH
Switch 4	CH2: communication protocol — MC protocol mode 5 binary code	0005H
Switch 5	Station number setting — 0 to 31	0000H

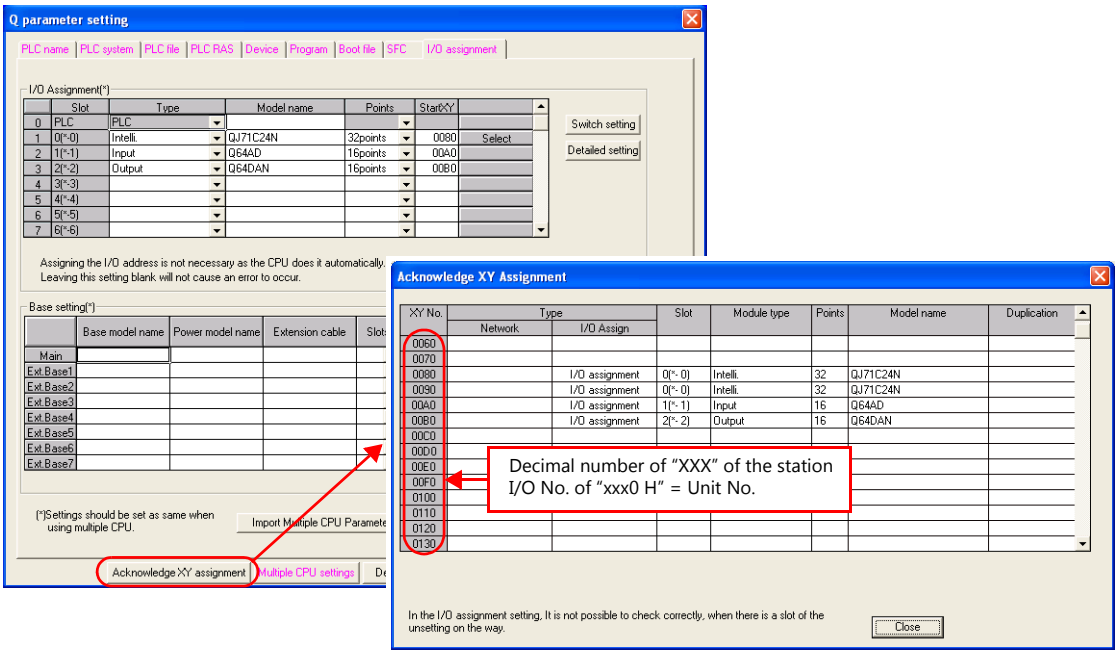
Available Device Memory

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit.

Example:
When the following settings are made for "Q02HCPU" and connection is established:



With the use of buffer memory of the serial communication unit: Unit No. = "8" (DEC)
With the use of buffer memory of the input unit: Unit No. = "10" (DEC)
With the use of buffer memory of the output unit: Unit No. = "11" (DEC)

11.1.5 QnH (Q) Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal level	RS-232C	
Baud rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data length	8 bits	
Stop bit	1 bit	
Parity	Odd	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

11.1.6 QnH (Q) Series (Ethernet)

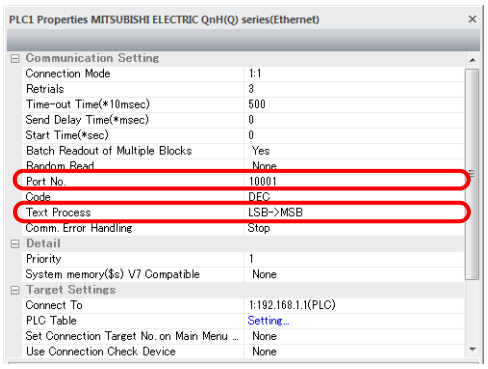
Communication Setting

Editor

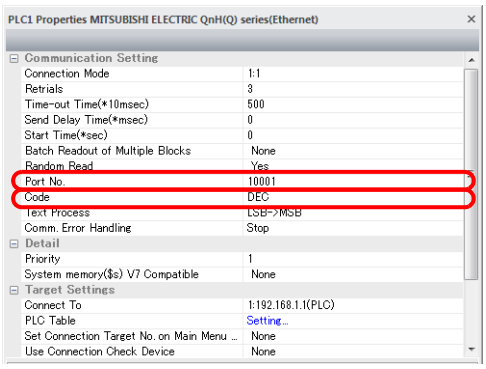
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
  - When connecting to the Ethernet unit, select [Yes] for the [Batch Readout of Multiple Blocks] setting.
  - When connecting to the built-in Ethernet port on the QnU series, select [Yes] for the [Random Readout] setting.

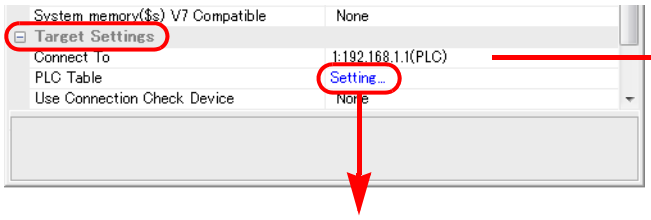
When connecting to the Ethernet unit



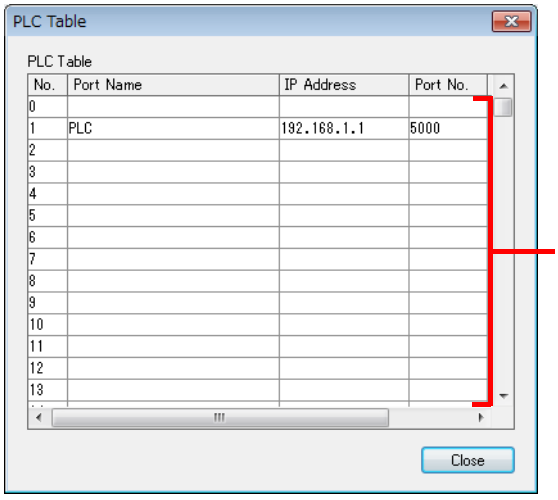
When connecting to the built-in Ethernet port on the QnU series



- 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

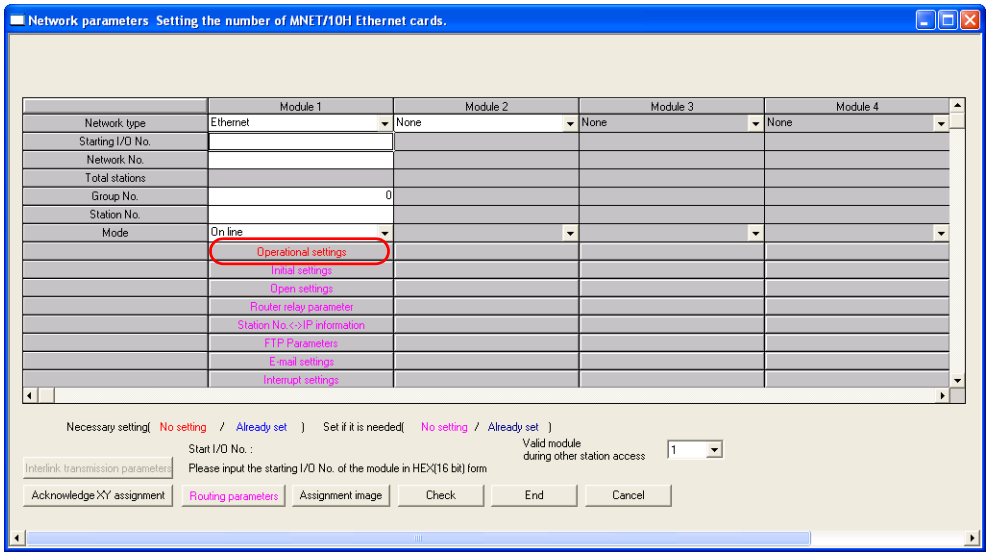
Make the PLC setting using the programming tool “GX-Developer”. For more information, refer to the PLC manual issued by the manufacturer.

Ethernet unit

PC parameter

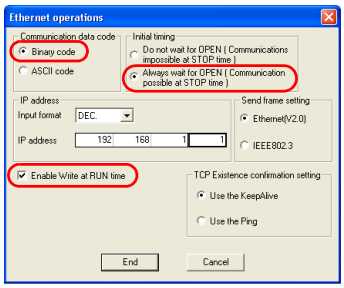
Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



Item	Setting	Remarks
Network type	Ethernet	For more information, refer to the manual of the PLC.
Station I/O No.	Make settings in accordance with the network environment.	
Network No.		
Group No.		
Station No.		

Ethernet operations



Item	Setting	Remarks
Communication data code	**Binary code**	
Initial timing	**Always wait for OPEN (Communication possible at STOP time)**	
IP address (DEC)	Make settings in accordance with the network environment.	
Enable Write at RUN time	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, “error code received 0055” occurs.

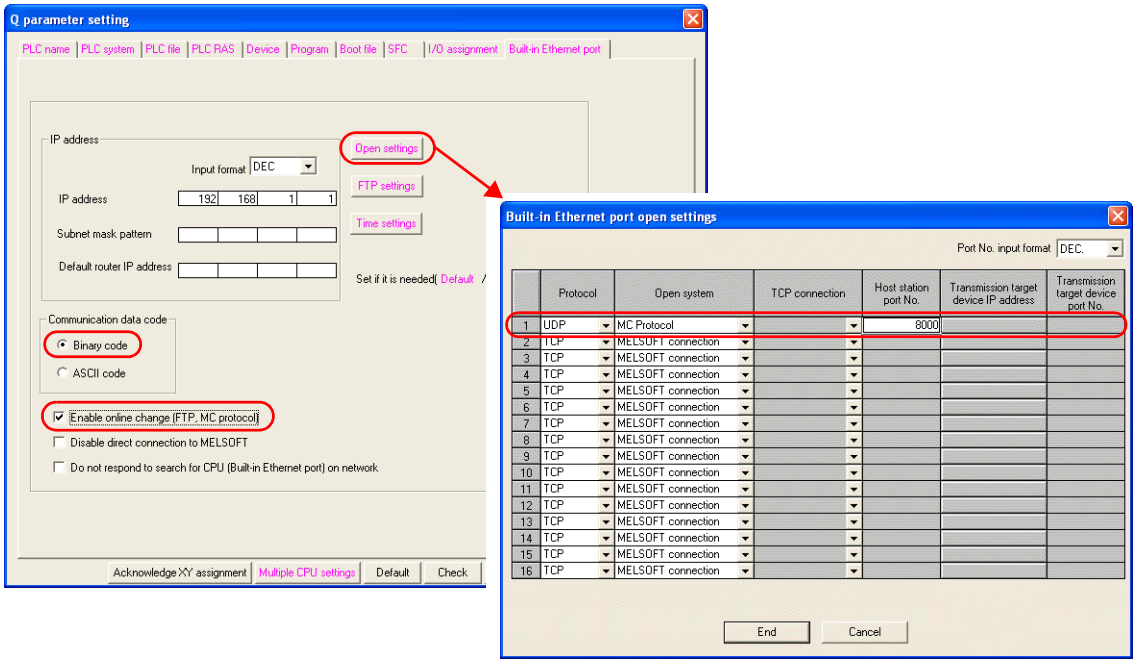
Port No.

There are two types of ports: one is opened automatically by “auto-open UDP port” (default: 5000 DEC), and the other is opened by open processing. When using the open processing, make settings for [Open settings] on the [Network parameters] dialog. For more information, refer to the corresponding PLC manual.

Built-in Ethernet port

PC parameter

Make the settings for the IP address and the open settings in the [Built-in Ethernet port] tab window.



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	**Binary code**	
Enable online change (FTP, MC protocol)	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, “error code received 0055” occurs.
Protocol	**UDP**	
Open system	**MC Protocol**	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	Invalid on QnU series Built-in port, *1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	Invalid on QnU series Built-in port
TC	(timer/coil)	0CH	Invalid on QnU series Built-in port
CS	(counter/contact)	0DH	Invalid on QnU series Built-in port
CC	(counter/coil)	0EH	Invalid on QnU series Built-in port
H	(link unit buffer memory)	0FH	Invalid on QnU series Built-in port
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

11.1.7 QnU Series CPU

The communication setting and available device memory are the same as those described in "11.1.5 QnH (Q) Series CPU".

11.1.8 Q00J/00/01 CPU

The communication setting and available device memory are the same as those described in "11.1.5 QnH (Q) Series CPU".

11.1.9 QnH (Q) Series Link (Multi CPU)

The communication setting and available device memory are the same as those described in "11.1.4 QnH (Q) Series Link".

11.1.10 QnH (Q) Series (Multi CPU) (Ethernet)

The communication setting and available device memory are the same as those described in "11.1.6 QnH (Q) Series (Ethernet)".

11.1.11 QnH (Q) Series CPU (Multi CPU)

The communication setting and available device memory are the same as those described in "11.1.5 QnH (Q) Series CPU".

11.1.12 QnH (Q) Series (Ethernet ASCII)

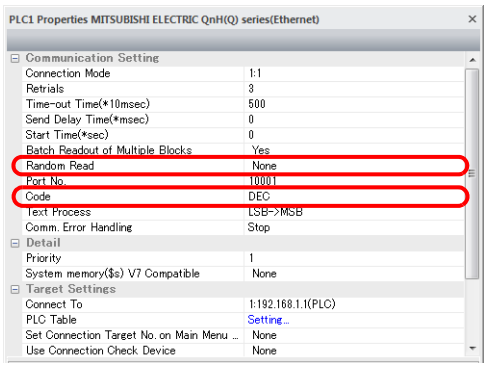
Communication Setting

Editor

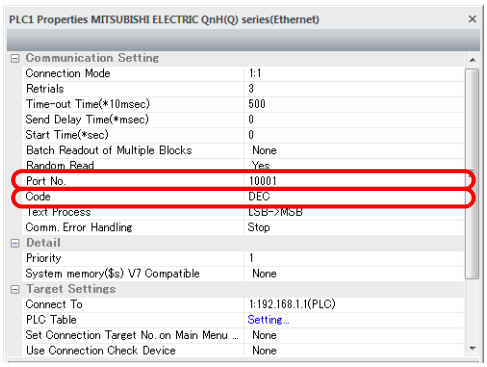
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
  - When connecting to the Ethernet unit, select [Yes] for the [Batch Readout of Multiple Blocks] setting.
  - When connecting to the built-in Ethernet port on the QnU series, select [Yes] for the [Random Readout] setting.

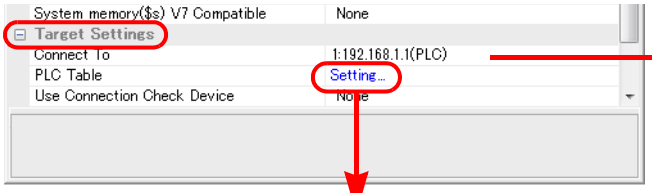
When connecting to the Ethernet unit



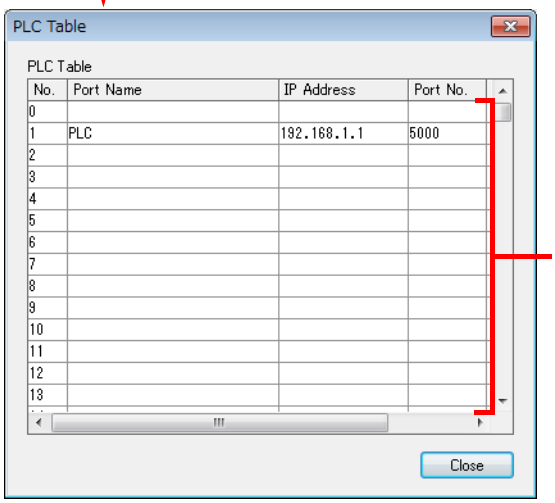
When connecting to the built-in Ethernet port on the QnU series



- 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

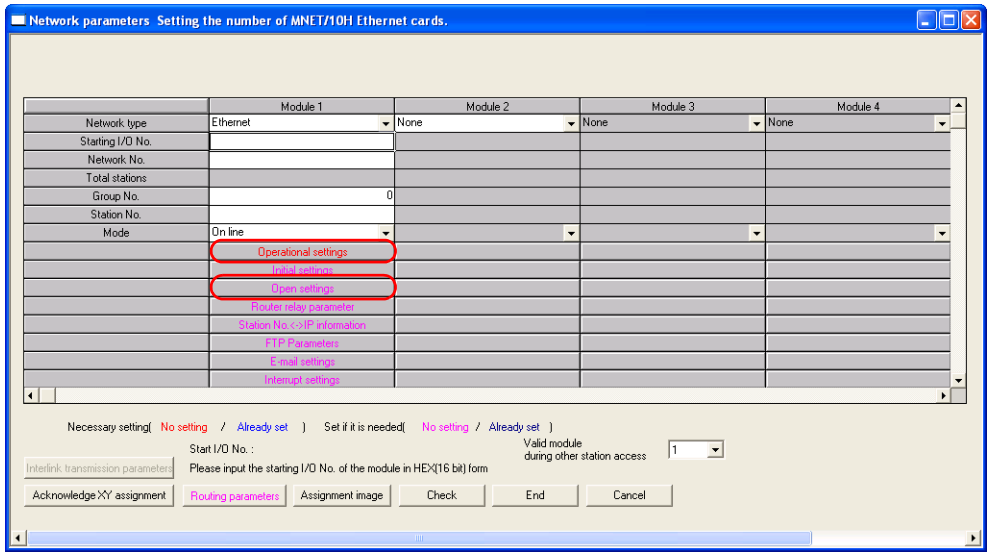
Make the PLC setting using the programming tool “GX-Developer”. For more information, refer to the PLC manual issued by the manufacturer.

Ethernet unit

PC parameter

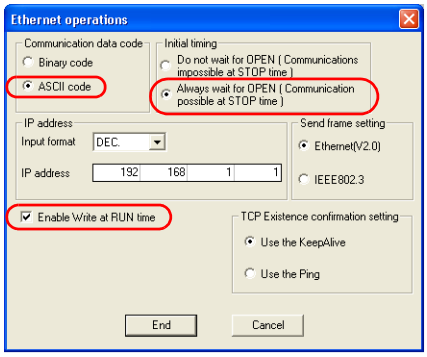
Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



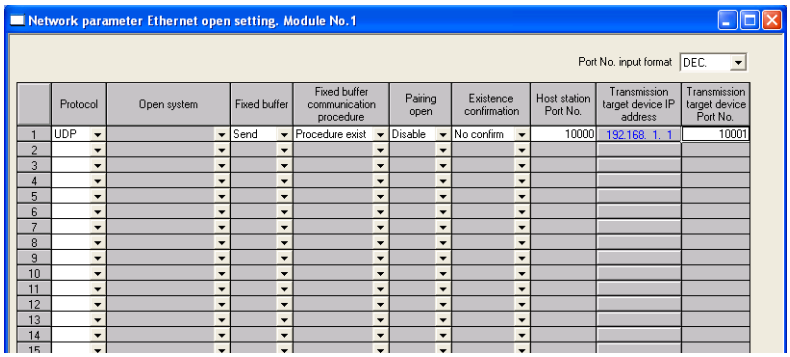
Item	Setting	Remarks
Network type	Ethernet	For more information, refer to the manual of the PLC.
Station I/O No.	Make settings in accordance with the network environment.	
Network No.		
Group No.		
Station No.		

Ethernet operations



Item	Setting	Remarks
Communication data code	**ASCII code**	
Initial timing	**Always wait for OPEN (Communication possible at STOP time)**	
IP address (DEC)	Make settings in accordance with the network environment.	
Enable Write at RUN time	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, “error code received 0055” occurs.

Open setting

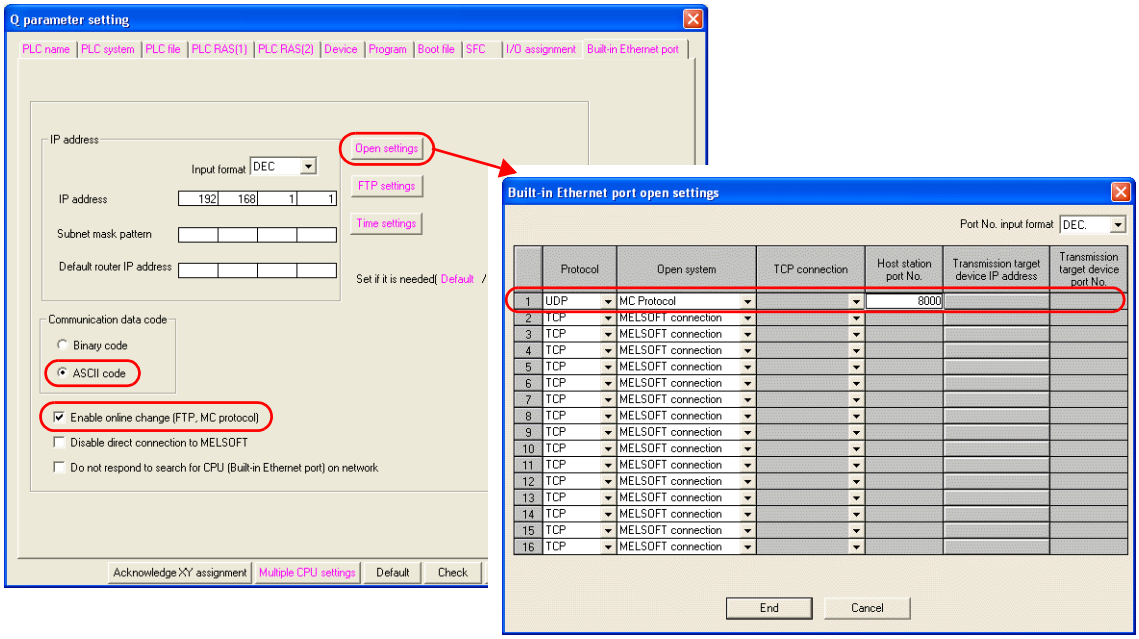


Item	Setting	Remarks
Protocol	**UDP**	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5002.
Transmission target device IP address (DEC)	IP address of TSi	
Transmission target device Port No. (DEC)	Port No. of TSi	

Built-in Ethernet port

PC parameter

Make the settings for the IP address and the open settings in the [Built-in Ethernet port] tab window.



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	**ASCII code**	
Enable online change (FTP, MC protocol)	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	**UDP**	
Open system	**MC Protocol**	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	Invalid on QnU series Built-in port, *1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	Invalid on QnU series Built-in port
TC	(timer/coil)	0CH	Invalid on QnU series Built-in port
CS	(counter/contact)	0DH	Invalid on QnU series Built-in port
CC	(counter/coil)	0EH	Invalid on QnU series Built-in port
H	(link unit buffer memory)	0FH	Invalid on QnU series Built-in port
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

11.1.13 QnH (Q) Series (Multi-CPU) (Ethernet ASCII)

The communication setting and available device memory are the same as those described in "11.1.12 QnH (Q) Series (Ethernet ASCII)".

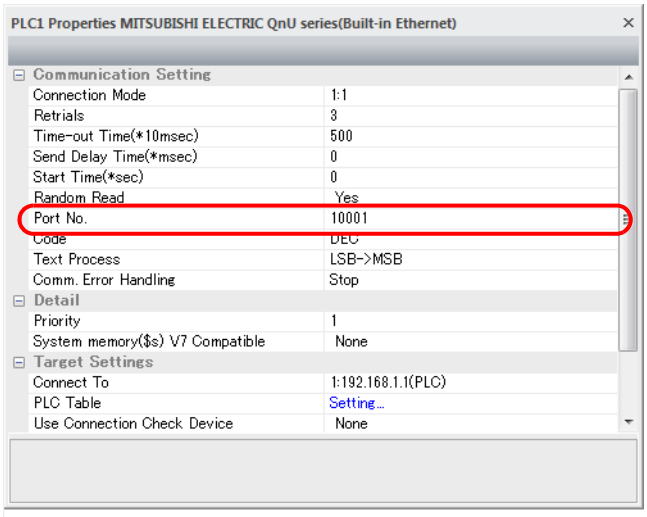
11.1.14 QnU Series (Built-in Ethernet)

Communication Setting

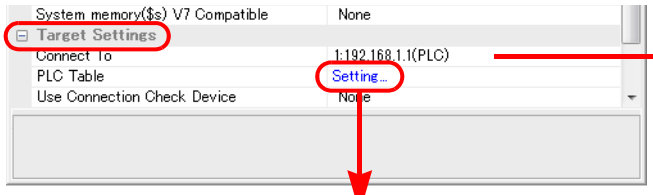
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

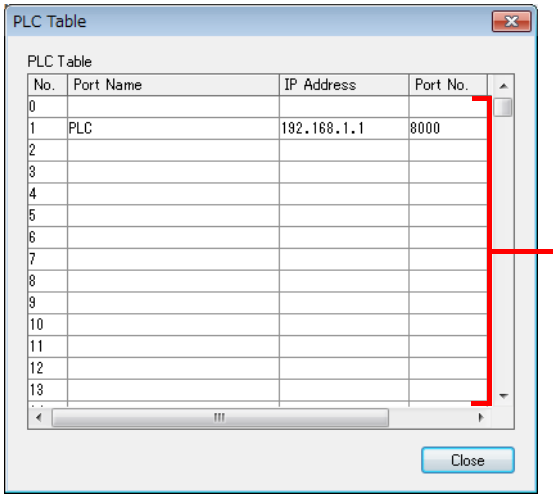
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [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].



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.

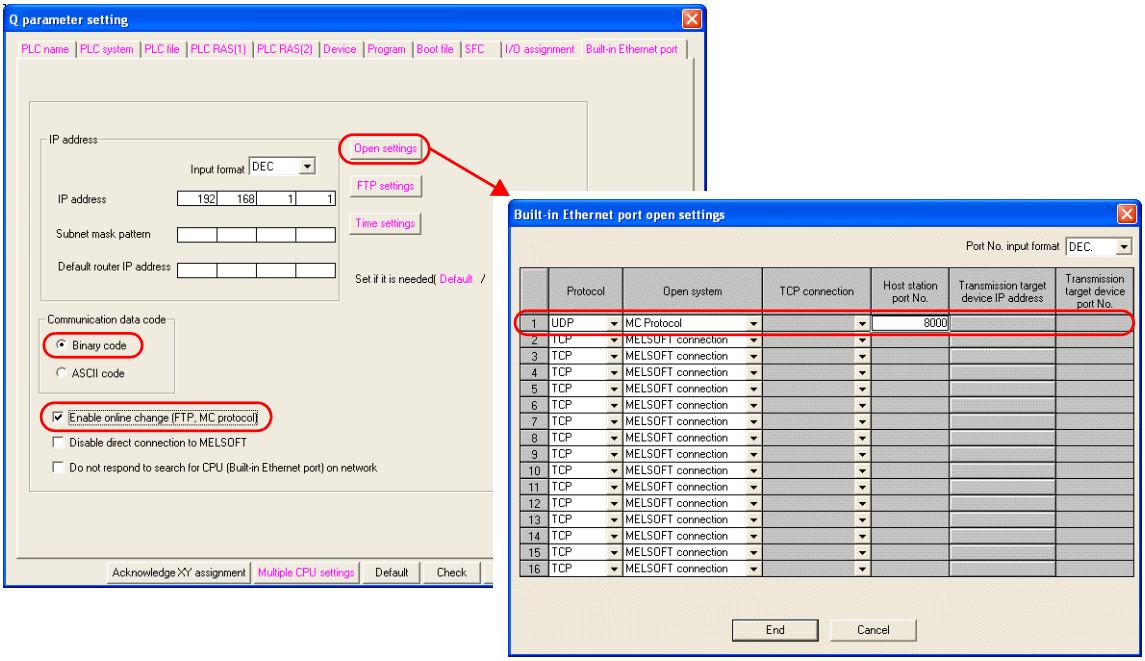
PLC

Make the PLC setting using the programming tool “GX-Developer”. For more information, refer to the PLC manual issued by the manufacturer.

QnU Series Built-in Ethernet

PC parameter

Make the settings for the IP address and the open settings in the Built-in Ethernet port tab window.



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	**Binary code**	
Enable online change (FTP, MC protocol)	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, “error code received 0055” occurs.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	**MC Protocol**	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

11.1.15 L Series Link

Communication Setting

Editor

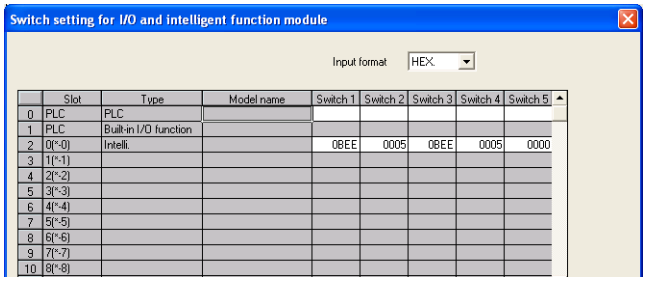
Communication setting

(Underlined setting: default)

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

PLC (PC Parameter)

Switch setting for I/O and intelligent function module



Switch	Contents		Example
Switch 1	CH1: baud rate, transmission setting		0BEEH
Switch 2	CH1: communication protocol	MC protocol mode 5 binary code	0005H
Switch 3	CH2: baud rate, transmission setting (the same as those for switch 1)		0BEEH
Switch 4	CH2: communication protocol	MC protocol mode 5 binary code	0005H
Switch 5	Station number setting	0 to 31	0000H

Bit 15 - 8 7 - 0

Baud rate	Transmission setting

bps	Setting
4800	04H
9600	05H
19200	07H
38400	09H
57600	0AH
115200	0BH

Bit	Contents	OFF	ON
0	Operation	**Independent**	Link
1	Data bit	7	**8**
2	Parity bit	Not provided	Provided
3	Parity	Odd	Even
4	Stop bit	1	2
5	Sum check	Not provided	**Provided**
6	Write while running	Prohibited	**Allowed**
7	Setting change	Prohibited	Allowed

115 kbps
8 bits
1 bit
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
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-15.

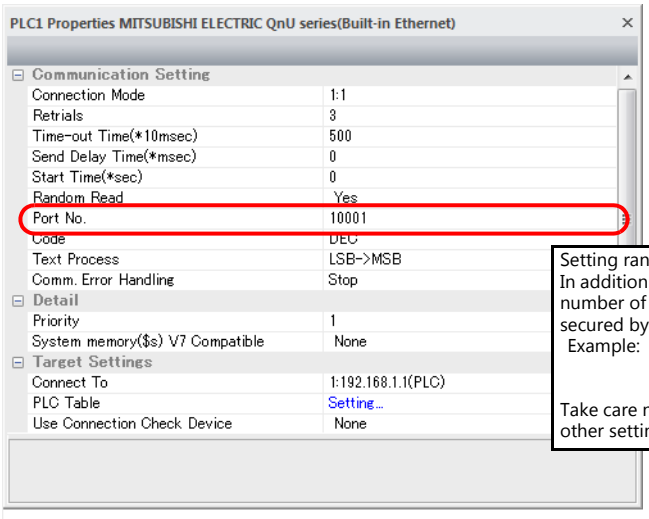
11.1.16 L Series (Built-in Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

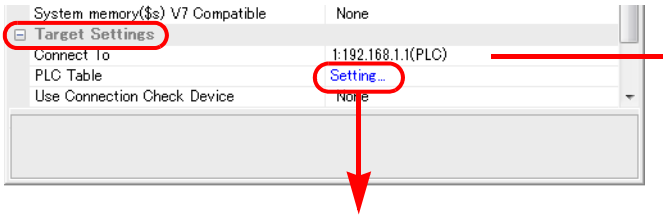
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port numbers 1024 to 65000 for the TSi unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



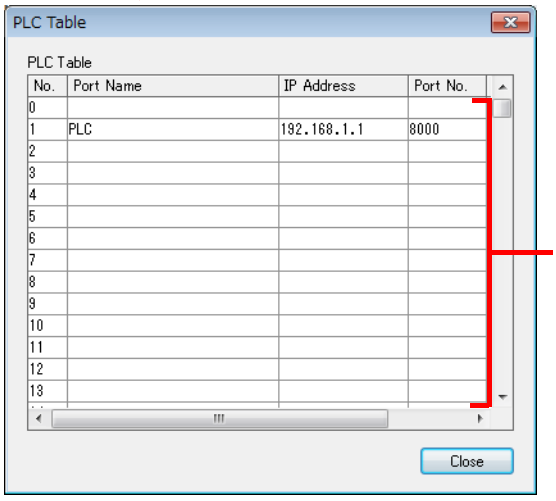
Setting range: 1024 to 65000
In addition to the specified port number, the port number of "the specified port number +20" is secured by the system.
Example: When specifying port number 10001, the port number 10021 is also used.

Take care not to use the same port numbers with other settings.

- 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.



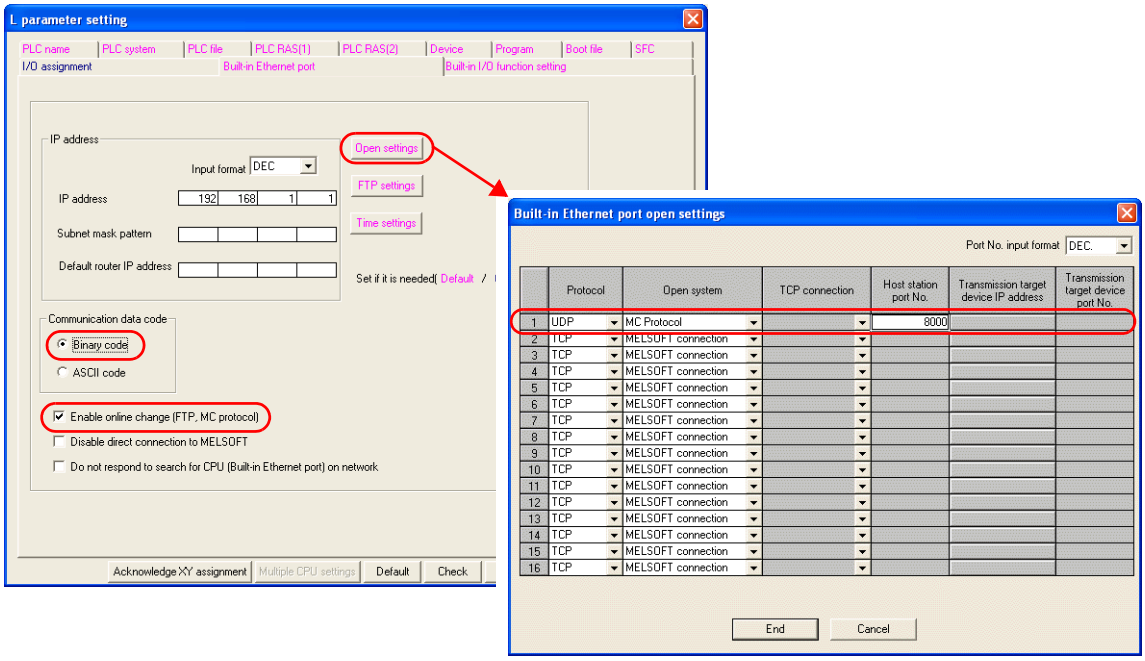
Set the IP address, port number and whether or not to use the KeepAlive function of the PLC.

PLC

Make the PLC setting using the programming tool “GX-Developer”. For more information, refer to the PLC manual issued by the manufacturer.

L Series Built-in Ethernet

Make the settings for the IP address and the open settings in the Built-in Ethernet port tab window.



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	**Binary code**	
Enable online change (FTP, MC protocol)	**Checked**	It is not possible to write value from TSi to PLC when unchecked. If so, “error code received 0055” occurs.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	**MC Protocol**	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No.5000 to 5009.

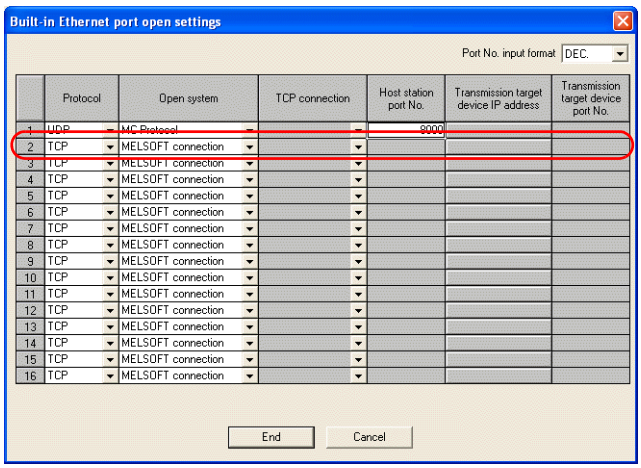
Available Device Memory

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-15.

Accessing the SPU device memory from the TSi
Add [Open system: MELSOFT connection] on the [Built-in Ethernet port open settings] dialog.
Add one port per one TSi unit. (maximum 8 ports can be registered)



Item	Setting	Remarks
Protocol	**TCP**	
Open system	**MELSOFT connection**	

11.1.17 L Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115Kbps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
SPU	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-15.

11.1.18 FX2N/1N Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1:1 / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	D8000 and later: special register
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	Double-word, *1
M	(auxiliary relay)	04H	M8000 and later: special relay
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

11.1.19 FX1S Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	D0 to 255, D8000 or later (special register)
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	Double-word, *1
M	(auxiliary relay)	04H	M0 to 511, M8000 or later (special relay)
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	
DX	(file register)	0AH	Use DX for D1000 to 2999.

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

11.1.20 FX Series Link (A Protocol)

Communication Setting

Editor

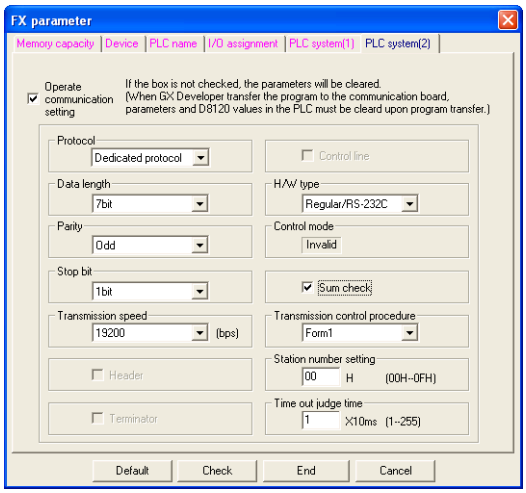
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Transmission Mode	Transmission Mode 1 / Transmission Mode 4	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC (PC Parameter)

PLC system (2)



(Underlined setting: default)

Item	Setting	Remarks
Operate communication setting	**Checked**	• RS-232C When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, sum check and form 1: D8120 = 6896H • RS-422 When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, sum check and form 1: D8120 = 6096H
Protocol	**Dedicated protocol**	
Data length	7 bits / 8 bits	
Parity	None / Odd / Even	
Stop bit	1 bit / 2 bits	
Transmission speed	4800 / 9600 / 19200 bps	
H/W type	RS-232C / RS-485	
Sum check	**Checked**	
Transmission control protocol	Form 1 / Form 4	
Station number setting	00 to 0FH	

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	D8000 and later: special register
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	*1
32CN	(32-bit counter/current value)	03H	*2
M	(auxiliary relay)	04H	M8000 and later: special relay
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	

*1 CN200 to CN255 equals 32CN (32-bit counter).
*2 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

11.1.21 FX-3U/3UC/3G Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	7 bits	
Stop Bit	1 bit	
Parity	Even	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	D8000 and later: special register
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	*1
M	(auxiliary relay)	04H	M8000 and later: special relay
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	
R	(extension register)	0BH	

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input Upper 16 bits are ignored.
For output "0" is written for upper 16 bits.

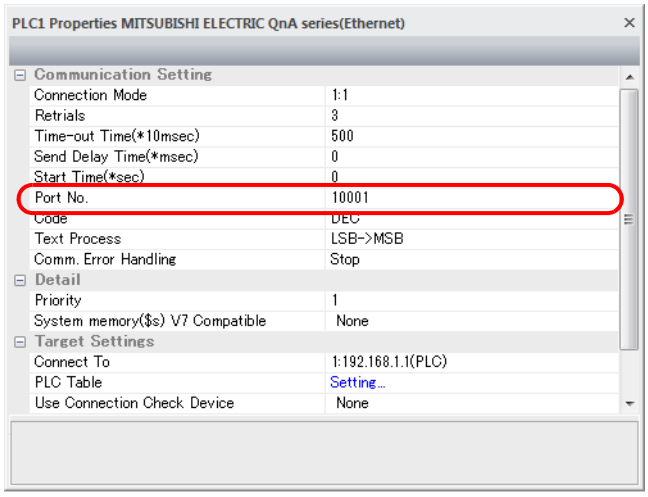
11.1.22 FX-3U/3GE Series (Ethernet)

Communication Setting

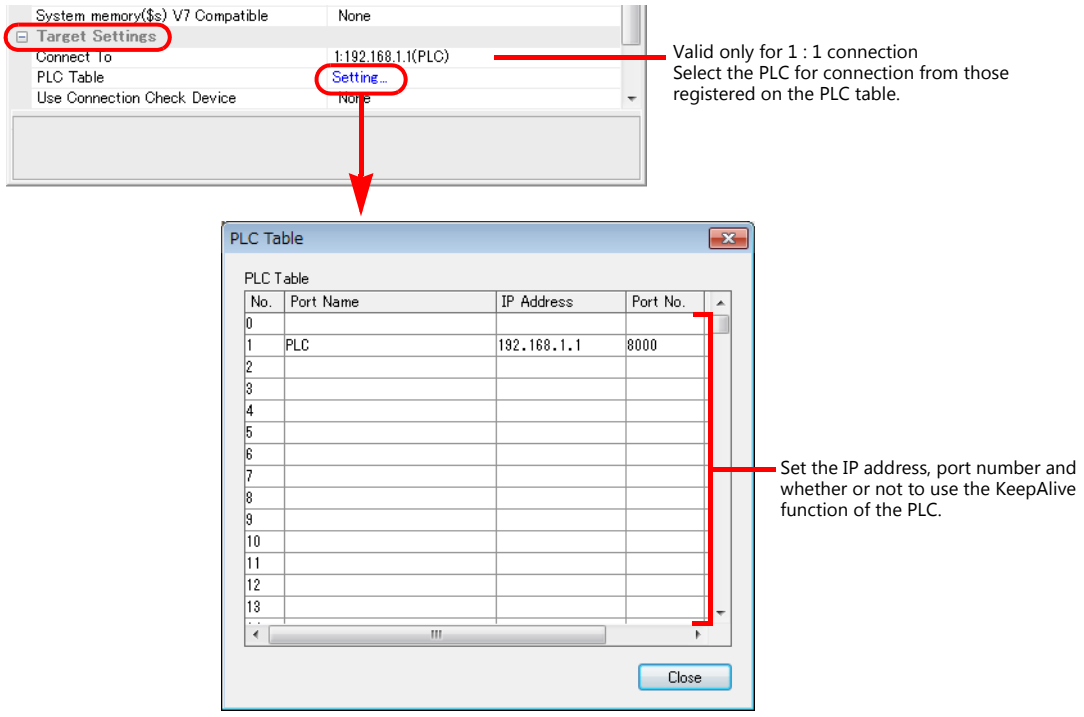
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi 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

FX3U-ENET-L

Make PLC settings using the configuration tool "FX3U-ENET-L".

Ethernet operational settings

Item	Setting	Remarks
Communication data code	**Binary code**	
Initial timing	**Always wait for OPEN (Communication possible at STOP time)**	
IP address (DEC)	Specify according to the environment.	

Ethernet open settings

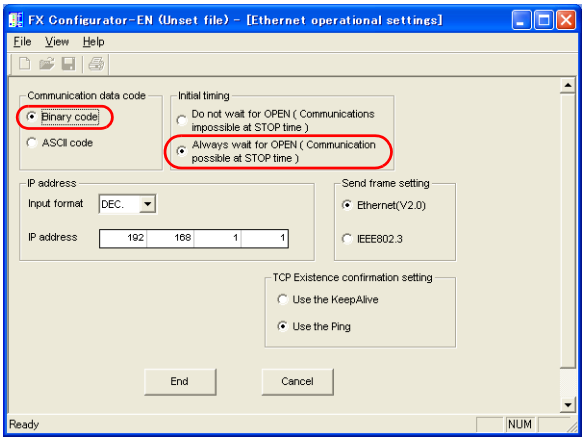
Use row No. 3 or No. 4 for setting.

Item	Setting	Remarks
Protocol	**UDP**	
Open system	**MC protocol**	
Existence confirmation	No confirm	
Host station Port No. (DEC)	As desired	1025 to 5548, 5552 to 65534
Transmission target device IP address	IP address of the TSi	
Transmission target device Port No. (DEC)	Port number of the TSi	

FX3U-ENET

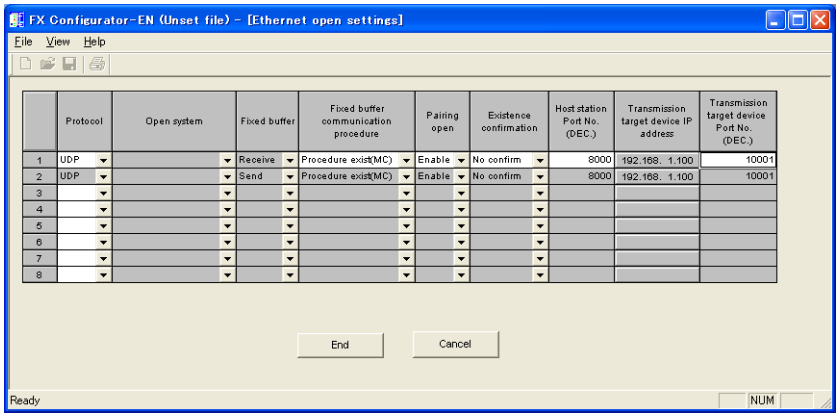
Make the PLC setting using the programming tool "FX-Configurator-EN". For more information, refer to the PLC manual issued by the manufacturer.

Ethernet operational settings



Item	Setting	Remarks
Communication data code	**Binary code**	
Initial timing	**Always wait for OPEN (Communication possible at STOP time)**	
IP address (DEC)	Make settings in accordance with the network environment.	

Open setting



Item	Setting	Remarks
Protocol	**UDP**	
Fixed buffer	**Receive, Send**	
Fixed buffer communication procedure	**Procedure exist (MC)**	
Pairing open	**Enable**	
Existence confirmation	No confirm	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	1025 to 5548, 5552 to 65534
Transmission target device IP address (DEC)	IP address of TSi	
Transmission target device Port No. (DEC)	Port No. of TSi	

FX3GE Built-in Ethernet Port

Make PLC settings using the programming tool "GX Works2".

PC parameter

Specify the IP address and open settings on the Ethernet port setting dialog.

Item	Setting	Remarks
IP address (DEC)	Specify according to the environment.	For more information, refer to the manual of the PLC.
Communication data code	**Binary code**	
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	**MC Protocol**	
Host station port No. (DEC)	Specify according to the environment.	
Transmission target device IP address (DEC)	Set the IP address of the TSi unit.	Only for UDP/IP.
Transmission target device port No. (DEC)	Set the port number of the TSi unit to be used for PLC communication.	

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	D8000 and later: special register
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	*1
M	(auxiliary relay)	04H	M8000 and later: special relay
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	
R	(extension register)	0BH	

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input Upper 16 bits are ignored.
For output "0" is written for upper 16 bits.

11.1.23 FX 3U/3UC/3G Series Link (A Protocol)

Communication Setting

Editor

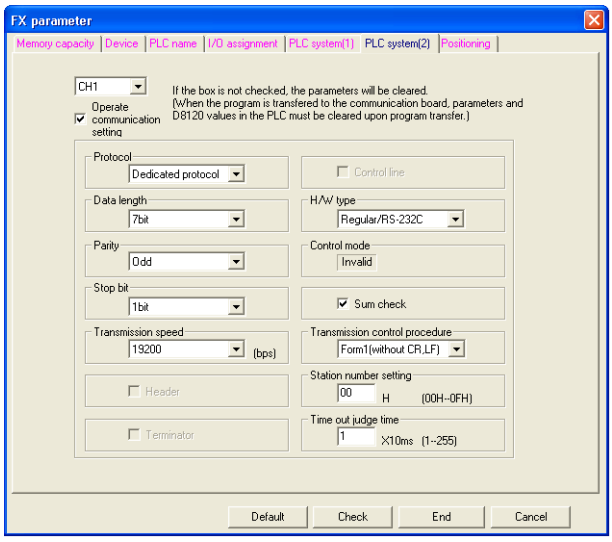
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Transmission Mode	Transmission Mode 1 / Transmission Mode 4	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC (PC Parameter)

PLC system (2)



(Underlined setting: default)

Item	Setting	Remarks
Operate communication setting	**Checked**	• RS-232C When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, sum check and form 1: D8120 (D8420) = 6896H • RS-422 When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, smacked and form 1: D8120 (D8420) = 6096H * CH1 : D8120, CH2 : D8420
Protocol	**Dedicated protocol**	
Data length	7 bits / 8 bits	
Parity	None / Odd / Even	
Stop bit	1 bit / 2 bits	
Transmission speed	4800 / 9600 / 19200 / 38400 bps	
H/W type	RS-232C / RS-485	
Sum check	**Checked**	
Transmission control protocol	Form 1 / Form 4	
Station number setting	00 to 0FH	

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	D8000 and later: special register
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	*1
M	(auxiliary relay)	04H	M8000 and later: special relay
S	(state)	05H	
X	(input relay)	06H	Read only
Y	(output relay)	07H	
TS	(timer/contact)	08H	
CS	(counter/contact)	09H	
R	(extension register)	0BH	

*1 For items where double-words can be used (Num. Display, Graph, Sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of lower 16 bits.
For input: Upper 16 bits are ignored.
For output: "0" is written for upper 16 bits.

11.1.24 FX5U/5UC series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

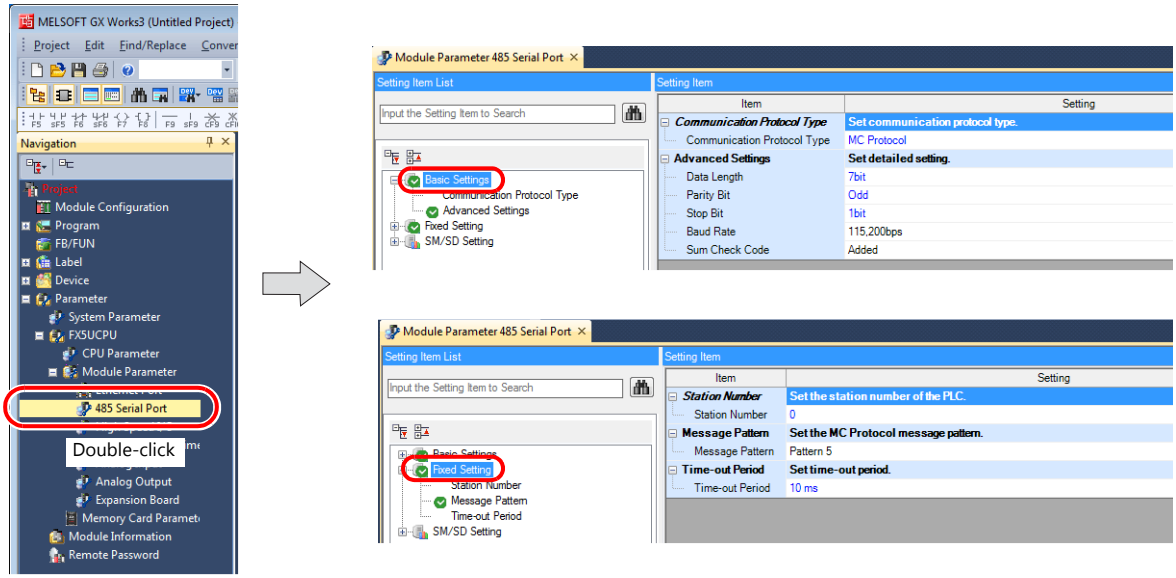
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 /115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

Make PLC settings using the programming tool “GX Works3”.

Built-in RS-485 Port

[Module Parameter] → [485 Serial Port]

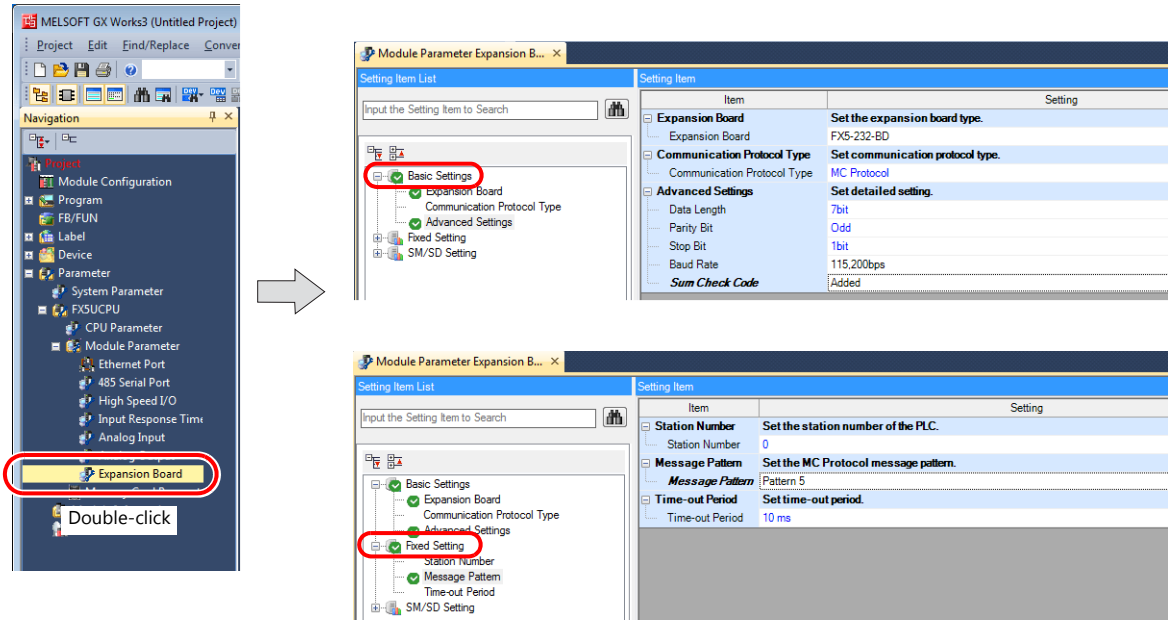


(Underlined setting: default)

Item		Setting	Remarks
Basic Settings	Communication Protocol Type	**MC Protocol**	
	Data Length	**8 bits**	
	Parity Bit	None / Odd / Even	
	Stop bit	1bit / 2bit	
	Baud Rate	4,800 / 9,600 / 19,200 / 38,400 / 57,600/ 115,200 bps	
	Sum Check Code	**Added**	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	**Pattern 5**	

FX5-232-BD/FX5-485-BD

[Module Parameter] → [Expansion Board]

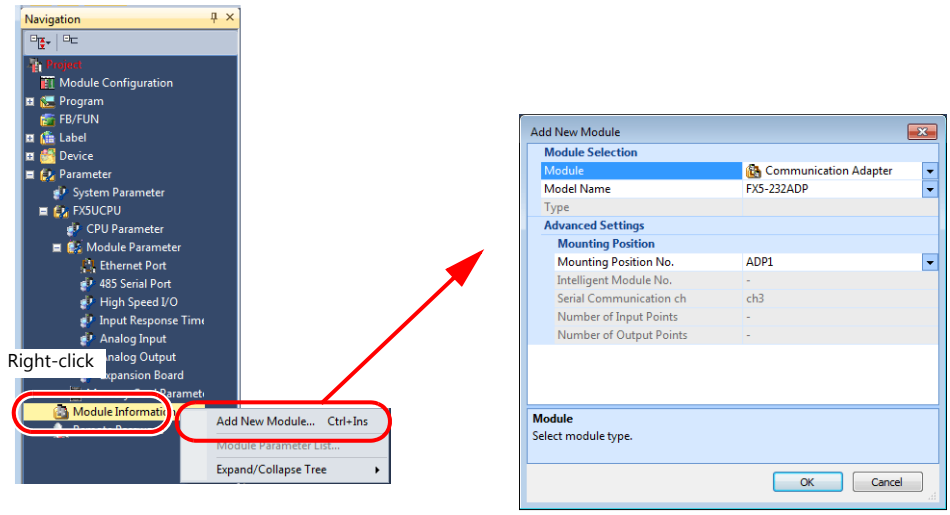


(Underlined setting: default)

Item		Setting	Remarks
Basic Settings	Expansion Board	FX5-232-BD / FX5-485-BD	
	Communication Protocol Type	**MC Protocol**	
	Data Length	**8 bits**	
	Parity Bit	None / Odd / Even	
	Stop Bit	1bit / 2bit	
	Baud Rate	4,800 / 9,600 / 19,200 / 38,400 / 57,600/ 115,200 bps	
	Sum Check Code	**Added**	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	**Pattern 5**	

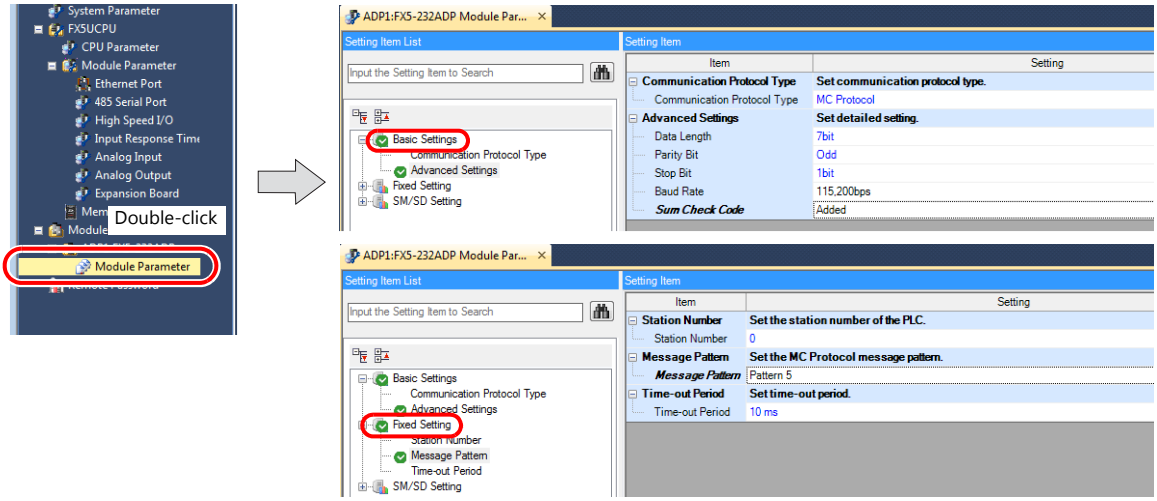
FX5-232ADP/FX5-485ADP

[Module Information] → [Add New Module]



Item		Setting	Remarks
Module Selection	Module	Communication Adapter	
	Model Name	FX5-232ADP / FX5-485ADP	
Advanced Settings	Mounting Position No.	Specify according to the environment.	

[Module Parameter]



(Underlined setting: default)

Item		Setting	Remarks
Basic Settings	Communication Protocol Type	**MC Protocol**	
	Data Length	**8 bits**	
	Parity Bit	None / Odd / Even	
	Stop Bit	1bit / 2bit	
	Baud Rate	4,800 / 9,600 / 19,200 / 38,400 / 57,600/ 115,200 bps	
	Sum Check Code	**Added**	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	**Pattern 5**	

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
Un\G	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
Set the unit number in hexadecimal notation.

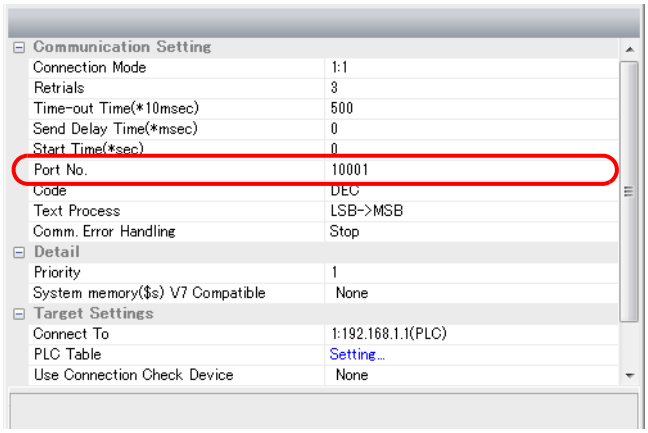
11.1.25 FX-5U/5UC Series (Ethernet)

Communication Setting

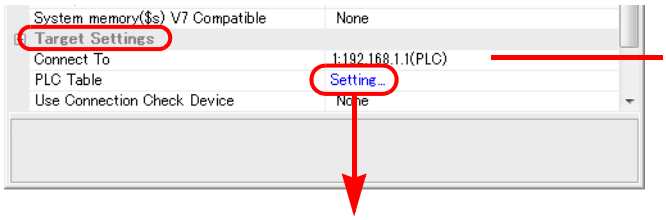
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

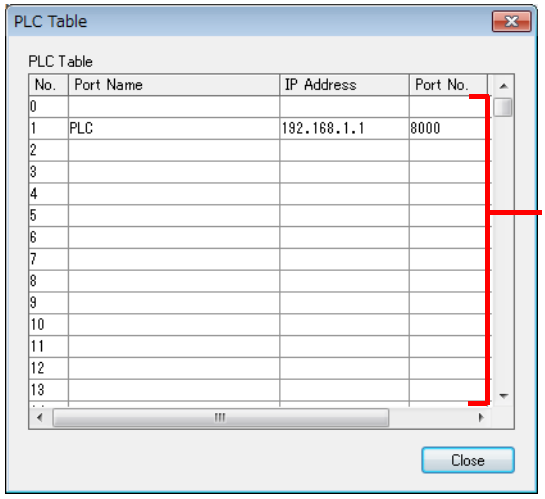
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [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].



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



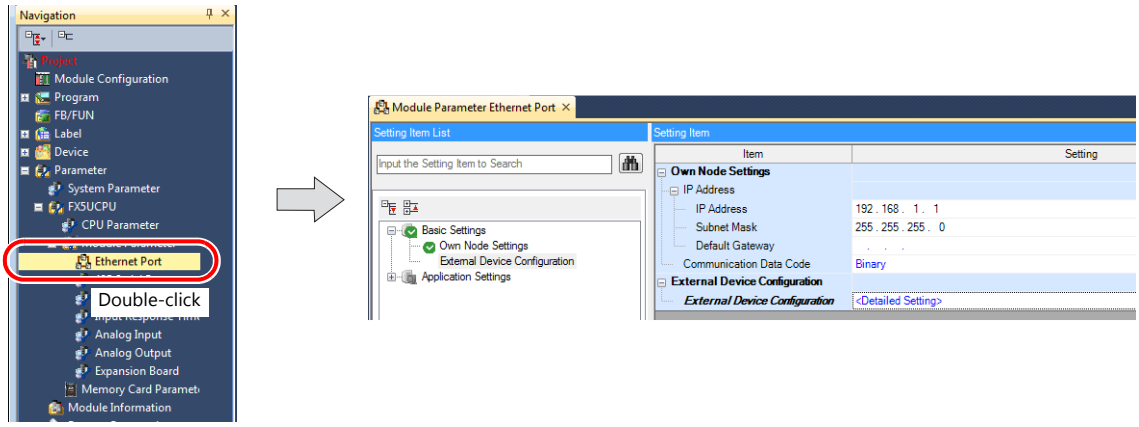
Set the IP address, port number and whether or not to use the KeepAlive function for the PLC.

PLC

Make PLC settings using the programming tool “GX Works3”.

Built-in Ethernet Port

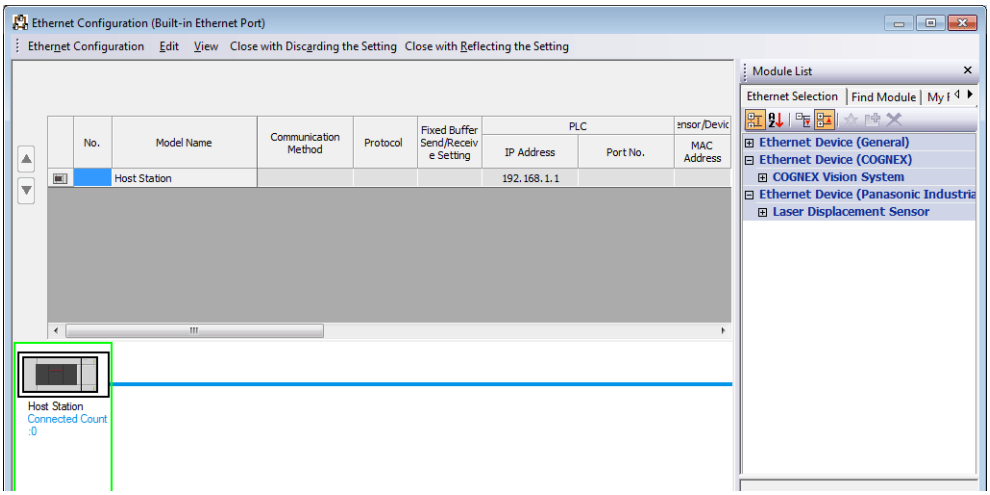
[Module Parameter] → [Ethernet Port]



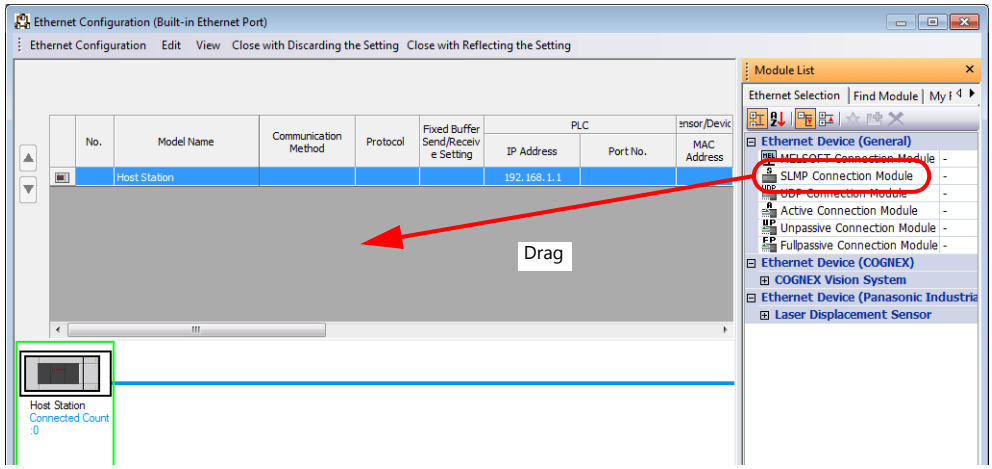
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Communication Data Code	**Binary**	
External Device Configuration	Specify the TSi as a SLMP connection module.	

Setting procedure for [External Device Configuration]

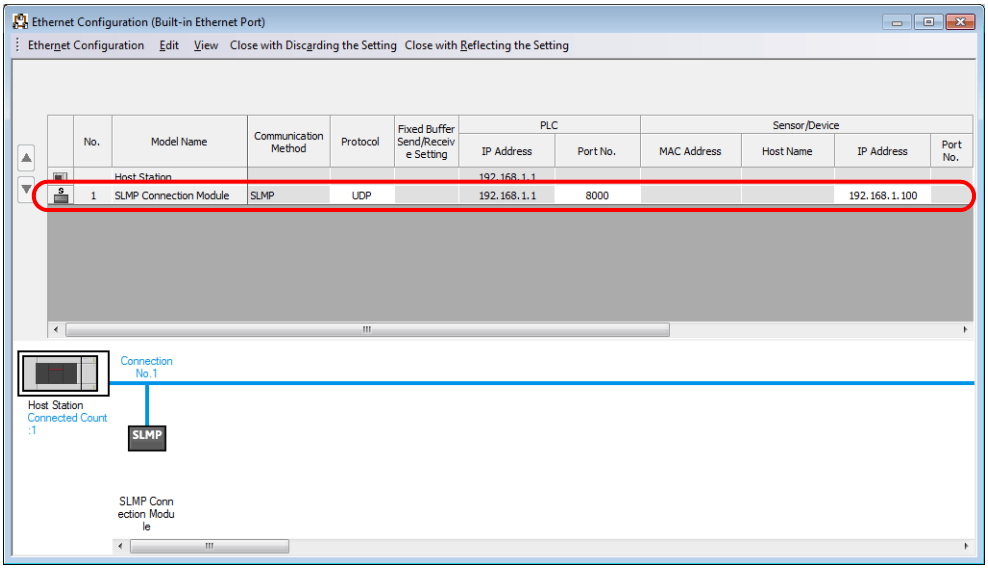
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item		Setting	Remarks
Protocol		UDP / TCP	
PLC	Port No.	Set the port number of the host station (PLC).	1025 to 4999, 5010 to 65534
Sensor/Device	IP Address	Set the IP address of the TSi unit.	Only for protocol UDP

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.

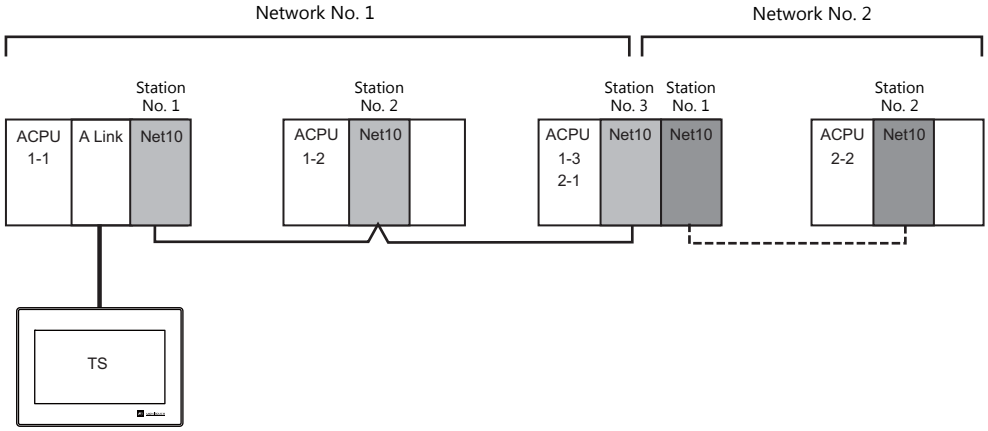
Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
Un\G	(special unit buffer memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
Set the unit number in hexadecimal notation.

11.1.26 A-Link + Net10

The A-link + Net10 can only be selected by the logical port PLC1.

The TS can communicate with an A series on the network (Net10) via the standard type link unit.



- When the TS is connected to a standard type link unit that is mounted on a CPU connected to a data-link system and network system, the TS can access other CPUs on NET II (/B) and NET/10. In such a case, select "A-Link + Net10" for the V-SFT PLC type.
- Accessing other CPUs on NET II (/B) and NET/10 with the TS
  - On NET II (/B), only CPUs on the same network as the CPU installed with the standard type link unit for connection with the TS (No.1 in above figure) can be accessed.
    (Available station numbers: 0 to 64)
  - On NET/10, CPUs on networks other than the network with the CPU installed with the standard type link unit for connection with the TS (No.1 in above figure) can be accessed as well (No.2 in above figure).
    (Available station numbers: 1 to 64)
- Reading and writing device memory for the CPU installed with the standard type link unit for connection with the TS (1-1 in above figure)
  Set station number 31 for device memory settings on the V-SFT.
  The response time becomes the same level as with connection between the TS and PLC (1 : 1).
  * Note that the response time is slow when writing and reading CPU device memory with station numbers other than "31" since transient transmission is used.
  * Do not use station number "31" for PLCs on a network.
- For details on NET II (/B) data link and NET/10 network systems, refer to instruction manuals issued by Mitsubishi.

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	**1 : n**	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Transmission Mode	Transmission Mode 1 / Transmission Mode 4	Transmission Mode 1: Without CR/LF Transmission Mode 4: With CR/LF
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

PLC

For details on settings for NET II (/B) data link and NET/10 network systems, refer to instruction manuals issued by Mitsubishi.

Standard type link unit

Other than the station number, settings are the same as for "11.1.1 A Series Link".
Specify "0" for the station number.

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "11.1.1 A Series Link".

When setting the device memory on the V-SFT, specify the station number as well.
Specify the network number using a macro. For more information, refer to the following.

Network specification macro

When accessing a PLC on a network number other than that directly connected via NET/10, execute "SYS (OUT_ENQ) F1" with the screen open macro, and specify the network number to connect to.
Station numbers on multiple networks cannot be accessed from the same screen.

Macro command "SYS (OUT_ENQ) F1"

Contents	F0	F1 (=$u n)	
Network specification	OUT_ENQ	n	0 (fixed)
		n+1	2 (fixed)
		n+2	System code 1: NET/10 2: NET II (/B)
		n+3	Network No. (fixed to 0 when n+2=2)

Use this macro with the screen open macro. If used at any other time, a communication error will result since a network change takes place immediately.

For more information on macros, refer to the separate V Series Macro Reference manual.
Also refer to "network registration" in the "Standard Link / Multi-drop Link Unit" manual from Mitsubishi.

11.1.27 Q170MCPU (Multi CPU)

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Odd**	

PLC

When using the PLC for the first time, the operating system must be installed. For more information, refer to the PLC manual issued by the manufacturer.
No communication setting is required.

Available Device Memory

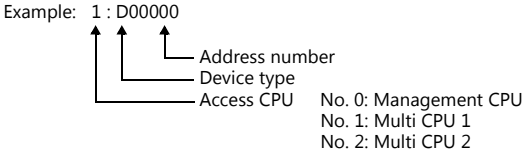
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	Available only for the sequencer CPU
TN	(timer/current value)	03H	Available only for the sequencer CPU
CN	(counter/current value)	04H	Available only for the sequencer CPU
SPU	(special unit buffer memory)	05H	Available only for the sequencer CPU, *1
M	(internal relay)	06H	
L	(latch relay)	07H	Available only for the sequencer CPU
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	Available only for the sequencer CPU
TC	(timer/coil)	0CH	Available only for the sequencer CPU
CS	(counter/contact)	0DH	Available only for the sequencer CPU
CC	(counter/coil)	0EH	Available only for the sequencer CPU
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	Available only for the sequencer CPU
SW	(special link register)	13H	Available only for the sequencer CPU
ZR	(file register/for continuous access)	14H	Available only for the sequencer CPU
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	Available only for the sequencer CPU
SC	(totalizing timer/coil)	17H	Available only for the sequencer CPU
SN	(totalizing timer/current value)	18H	Available only for the sequencer CPU
Z	(index register)	19H	Available only for the sequencer CPU
#	(motion register)	1AH	Available only for the motion CPU

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-15.

Specifying the access CPU

In addition to the device type and address, an access CPU must be specified. The assigned device memory is expressed as shown below when editing the screen.



*** Q170MCPU is equipped with the sequencer CPU and motion CPU in one unit.**
The multi CPU unit No. is fixed as shown below:
Management CPU: Sequencer CPU
Multi CPU 1: Sequencer CPU
Multi CPU 2: Motion CPU

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

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

* For the SPU device memory, specify the unit number in the expansion code.
For any other devices memory, specify the access CPU number in the expansion code.
Management CPU: 0 Multi CPU: 1 or 2

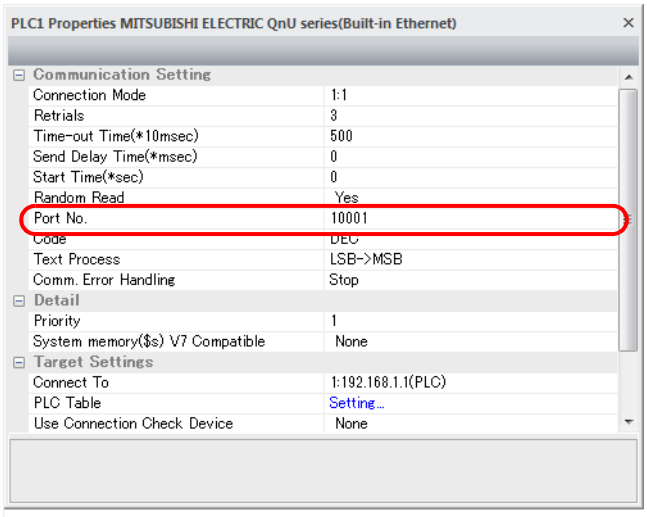
11.1.28 Q170 Series (Multi CPU) (Ethernet)

Communication Setting

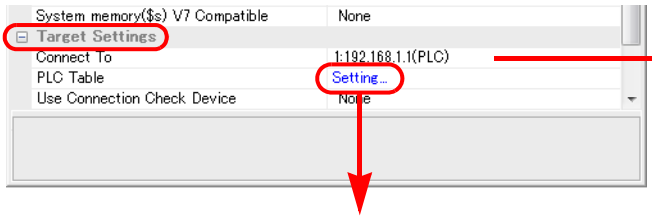
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

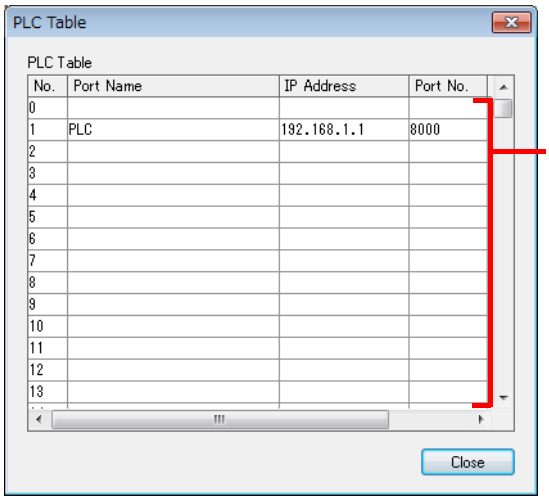
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [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].



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.

On the MT Developer 2, the port number is specified in hexadecimal notation. When specifying the port number on the editor, convert it into a decimal number.

PLC

When using the PLC for the first time, the operating system must be installed.
Make communication settings using the programming tool “MT-Developer2”. For more information, refer to the PLC manual issued by the manufacturer.

Built-in Ethernet port setting

Specify the IP address and open method on the built-in Ethernet port setting dialog.

Item	Setting	Remarks
IP address (DEC)	Specify according to the environment.	For more information, refer to the manual of the PLC.
Communication data code	**Binary code**	
Enable writing during running	**Checked**	Data can be written from TSi to PLC only when this box is checked. If writing of data is attempted while the box is unchecked, the error “Error code received Receive code 0055” will occur.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open type	**MC protocol**	
Local port No. (HEX)	Specify according to the environment.	1388H to 1391H cannot be specified because they are occupied by the system. When making a setting on the editor, convert the number specified here into a decimal number.

Calendar

Normally the calendar of the sequencer CPU, which is specified in the read or write area, is used.
However, if different numbers are specified in the read area and the write area, the calendar of the CPU specified in the read area is used.
If any device other than the sequencer CPU is specified in the read area and write area, the calendar of the smallest-numbered sequencer CPU is used.

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
R	(file register)	02H	Available only for the sequencer CPU
TN	(timer/current value)	03H	Available only for the sequencer CPU
CN	(counter/current value)	04H	Available only for the sequencer CPU
M	(internal relay)	06H	
L	(latch relay)	07H	Available only for the sequencer CPU
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	Available only for the sequencer CPU
TC	(timer/coil)	0CH	Available only for the sequencer CPU
CS	(counter/contact)	0DH	Available only for the sequencer CPU
CC	(counter/coil)	0EH	Available only for the sequencer CPU
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	Available only for the sequencer CPU
SW	(special link register)	13H	Available only for the sequencer CPU
ZR	(file register/for continuous access)	14H	Available only for the sequencer CPU
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	Available only for the sequencer CPU
SC	(totalizing timer/coil)	17H	Available only for the sequencer CPU
SN	(totalizing timer/current value)	18H	Available only for the sequencer CPU
Z	(index register)	19H	Available only for the sequencer CPU
#	(motion register)	2AH	Available only for the motion CPU

Specifying the access CPU

In addition to the device type and address, an access CPU must be specified. The assigned device memory is expressed as shown below when editing the screen.

Example: 1 : D00000

- Address number
- Device type
- Access CPU
  - No. 0: Management CPU
  - No. 1: Multi CPU 1
  - No. 2: Multi CPU 2
  - No. 3: Multi CPU 3
  - No. 4: Multi CPU 4

*** The multi CPU unit numbers are assigned as shown below:**
- For Q170MCPU
Management CPU: Motion CPU
Multi CPU 1: Sequencer CPU
Multi CPU 2: Motion CPU

- For Q172DCPU-S1/Q173DCPU-S1
Management CPU: Motion CPU
Multi CPU 1 to 4: Determined according to the slot position of the CPU

Indirect Device Memory Designation

- For the address number of 0 to 65535:

	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 address number of 65536 or greater:

	15 – 8	7 – 0
n + 0	Model	Device type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Station number

* Specify the access CPU number in the expansion code.
Management CPU: 0 Multi CPU: 1 or 4

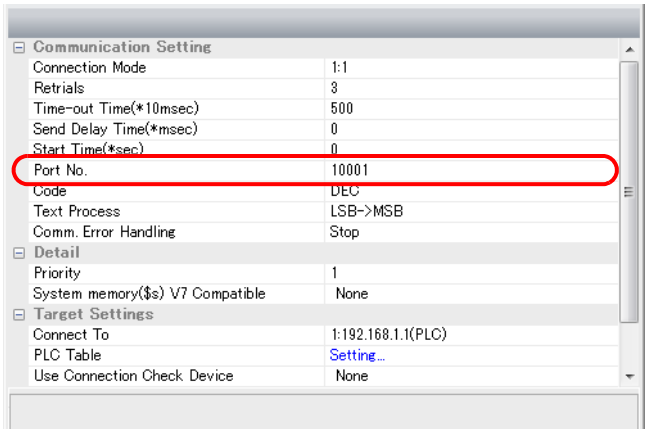
11.1.29 iQ-R Series (Built-in Ethernet)

Communication Setting

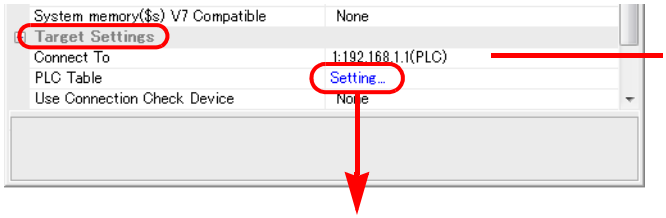
Editor

Make the following settings on the editor. For more information, see 1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only).

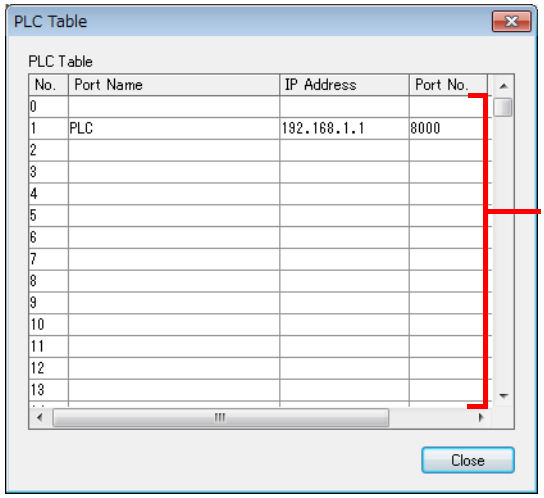
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [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].



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

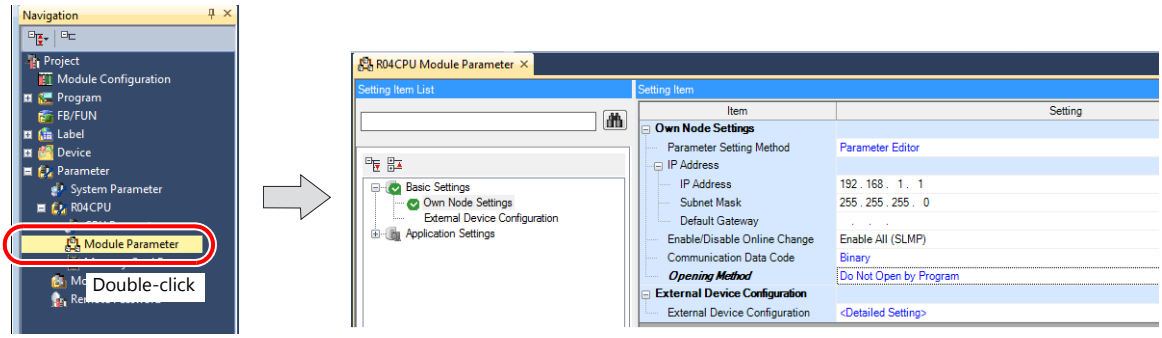


Set the IP address, port number and whether or not to use the KeepAlive function for the PLC.

PLC

Make PLC settings using the programming tool “GX Works3”.

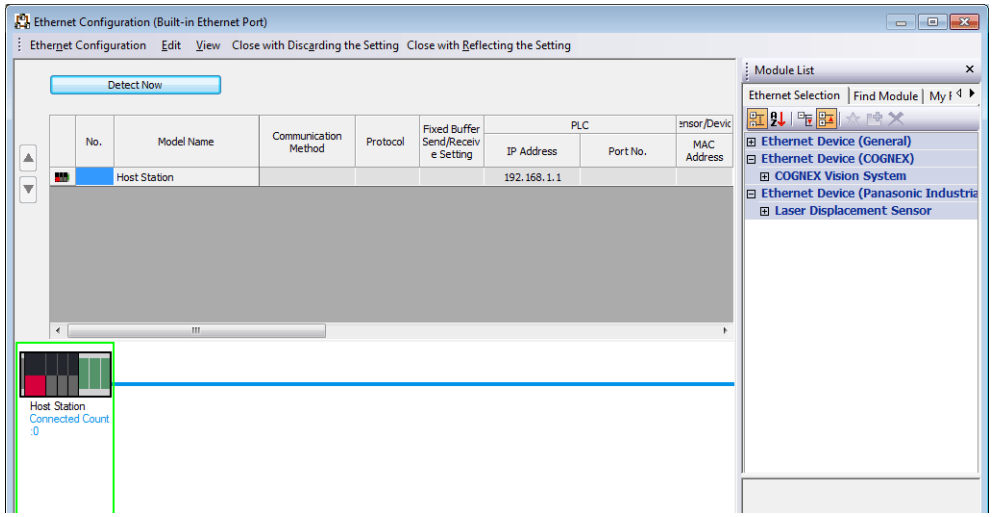
[Module Parameter]



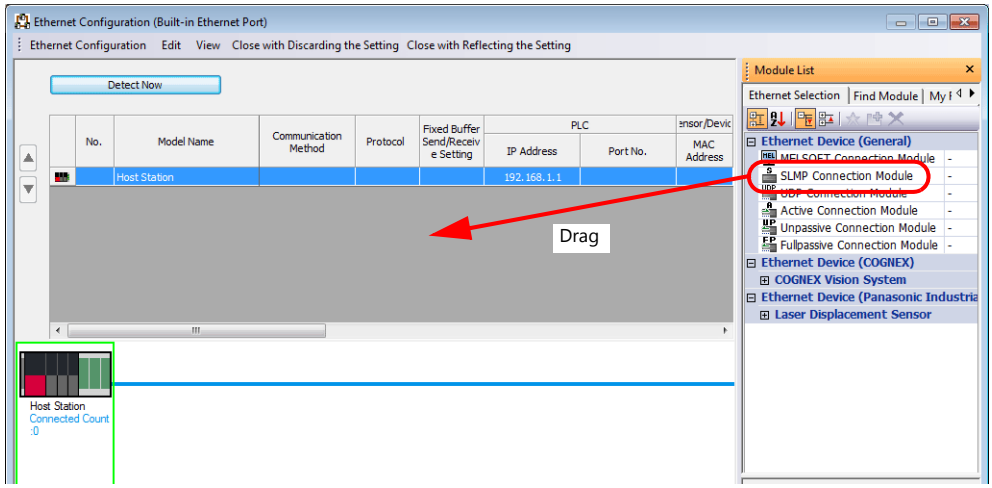
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Enable/Disable Online Change	**Enable All (SLMP)**	
Communication Data Code	**Binary**	
Opening Method	**Do Not Open by Program**	
External Device Configuration	Specify the TSi as a SLMP connection module.	

Setting procedure for [External Device Configuration]

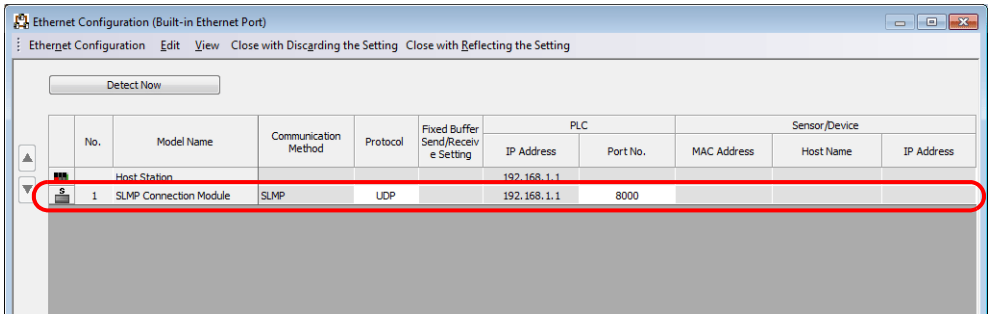
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item		Setting	Remarks
Protocol		UDP / TCP	
PLC	Port No.	Set the port number of the host station (PLC).	1025 to 4999, 5010 to 65534

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
Un\G	(unit access device memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	
LTN	(long timer/current value)	24H	Double-word
LSTN	(long totalizing timer/current value)	27H	Double-word
LCN	(long counter/current value)	2AH	Double-word
LZ	(long index register/current value)	2BH	Double-word
RD	(refreshing data register)	2CH	
U3En\G	(CPU buffer memory access device memory)	2DH	*2
U3En\HG	(CPU buffer memory access device memory (periodical area))	2EH	*2

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

Example: U00\G000000000
Address number (DEC)
Unit number (HEX)

*2 Specify the CPU number.

Example: U3E0\G000000000
Address number (DEC)
CPU number: 0 to 3

Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.

Example: 1 : D00000

- Address number
- Device type
- Access CPU No. 0: Management CPU
  No. 1: Multi CPU 1
  No. 2: Multi CPU 2
  No. 3: Multi CPU 3
  No. 4: Multi CPU 4

Indirect Device Memory Designation

- For the address number of 0 to 65535:

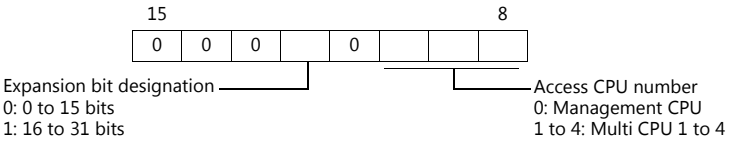
	15 8	7 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

- For the address number of 65536 or greater

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

* Specify an expansion code for the following device memory.

- Un\G
  Specify the unit number in the expansion code.
- U3En\G, U3En\HG
  Specify the CPU number in the expansion code.
- LTN, LSTN, LCN, LZ
  In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).
  Also specify the access CPU number when connecting multiple CPUs.



- Other than Un\G, U3En\G, U3En\HG
  When connecting multiple CPUs, specify the access CPU number in the expansion code.
  Management CPU: 0 Multi CPU: 1 to 4

11.1.30 iQ-R Series link

Communication Setting

Editor

Communication setting

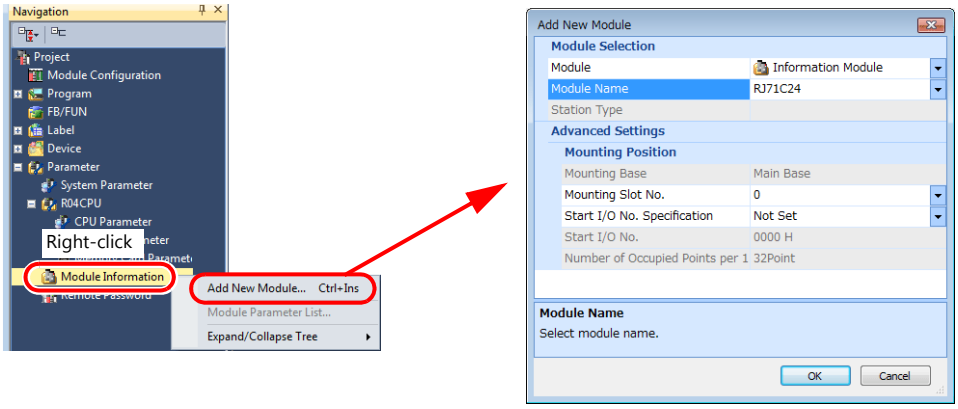
(Underlined setting: default)

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

PLC

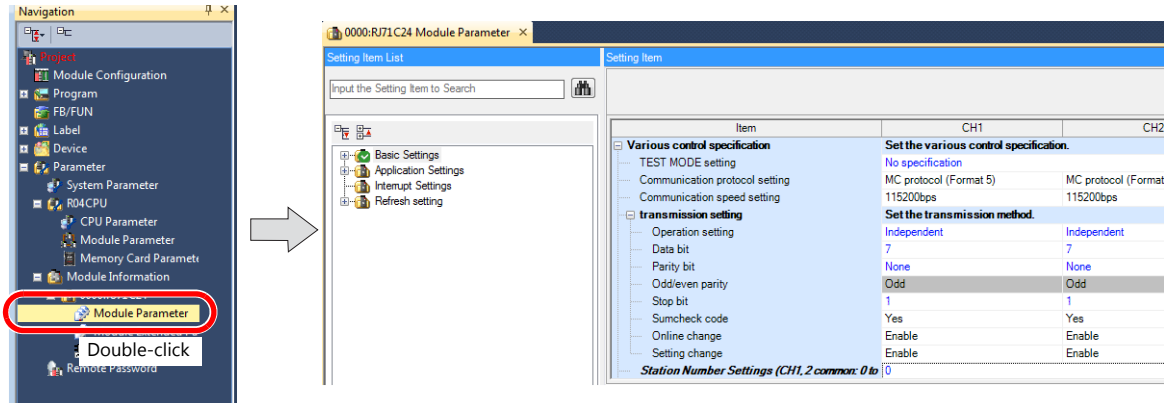
Make PLC settings using the programming tool "GX Works3".

[Module Information] → [Add New Module]



Item		Setting	Remarks
Module Selection	Module	Information Module	
	Module Name	RJ71C24 / RJ71C24-R2 / RJ71C24-R4	
Mounting Position		Specify according to the environment.	

[Module Parameter]



(Underlined setting: default)

Item		Setting	Remarks
Basic Settings	Communication protocol setting	**MC protocol (Format 5)**	
	Communication speed setting	4800 / 9600 / 19200 / 38400 / 57600/ 115200 bps	
	Operation setting	**Independent**	
	Data bit	**8**	
	Parity bit	None / Yes	
	Odd/even parity	Odd / Even	
	Stop Bit	1 / 2	
	Sumcheck code	**Yes**	
	Online change	**Enable**	
	Setting change	**Enable**	
	Station Number Settings	0 to 31	

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
Un\G	(unit access device memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer device memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	
LTN	(long timer/current value)	24H	Double-word
LSTN	(long totalizing timer/current value)	27H	Double-word
LCN	(long counter/current value)	2AH	Double-word
LZ	(long index register/current value)	2BH	Double-word
RD	(refreshing data register)	2CH	
U3En\G	(CPU buffer memory access device memory)	2DH	*2
U3En\HG	(CPU buffer memory access device memory (periodical area))	2EH	*2

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
Set the unit number in hexadecimal notation.

Example: U00\G000000000
Address number (DEC)
Unit number (HEX)

*2 Specify the CPU number.

Example: U3E0\G000000000
Address number (DEC)
CPU number: 0 to 3

Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.

Example: 1 : D00000

- Address number
- Device type
- Access CPU
  - No. 0: Management CPU
  - No. 1: Multi CPU 1
  - No. 2: Multi CPU 2
  - No. 3: Multi CPU 3
  - No. 4: Multi CPU 4

Indirect Device Memory Designation

- For the address number of 0 to 65535:

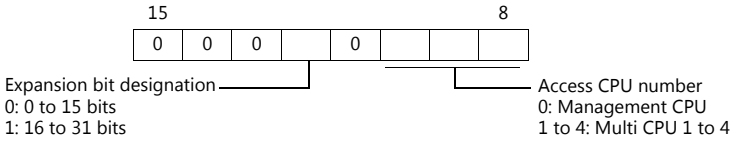
	15 8	7 0
n + 0	Model	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

- For the address number of 65536 or greater

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

* Specify an expansion code for the following device memory.

- Un\G
  Specify the unit number in the expansion code.
- U3En\G, U3En\HG
  Specify the CPU number in the expansion code.
- LTN, LSTN, LCN, LZ
  In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).
  Also specify the access CPU number when connecting multiple CPUs.



- Other than Un\G, U3En\G, U3En\HG
  When connecting multiple CPUs, specify the access CPU number in the expansion code.
  Management CPU: 0 Multi CPU: 1 to 4

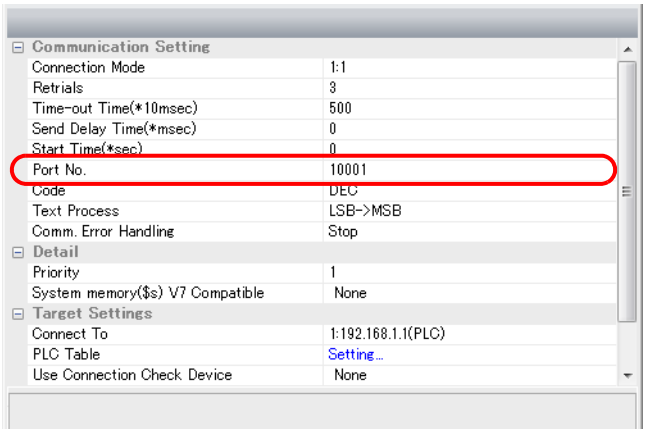
11.1.31 iQ-R Series (Ethernet)

Communication Setting

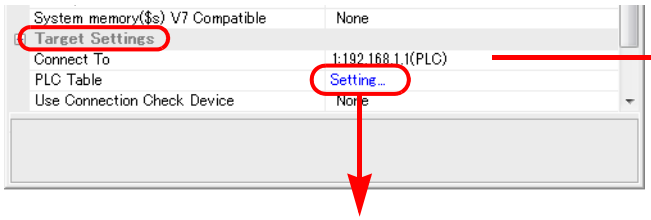
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

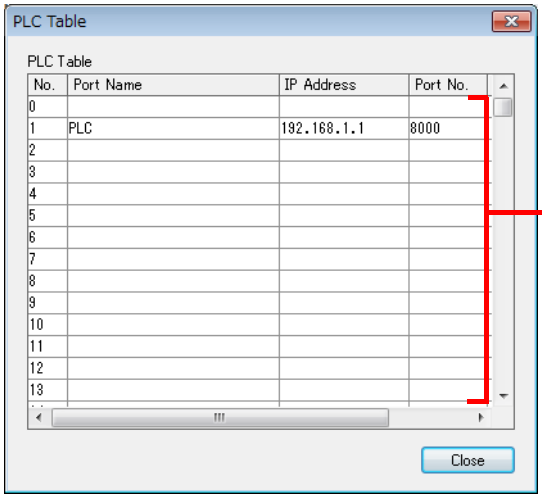
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
  [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].



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

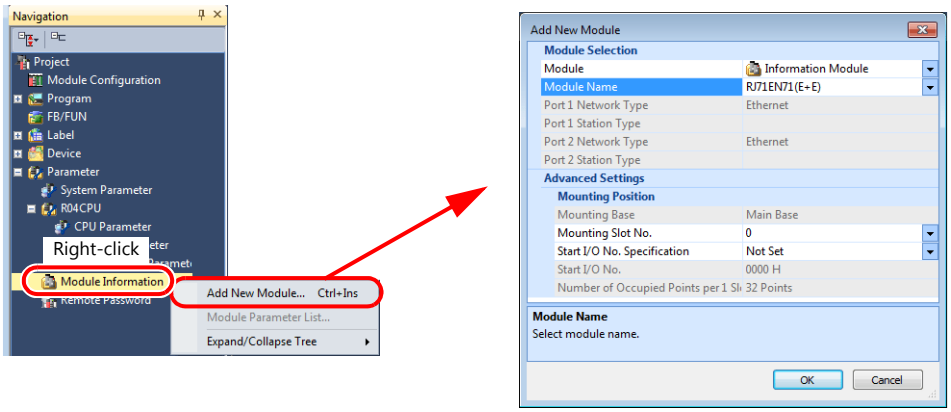


Set the IP address, port number and whether or not to use the KeepAlive function for the PLC.

PLC

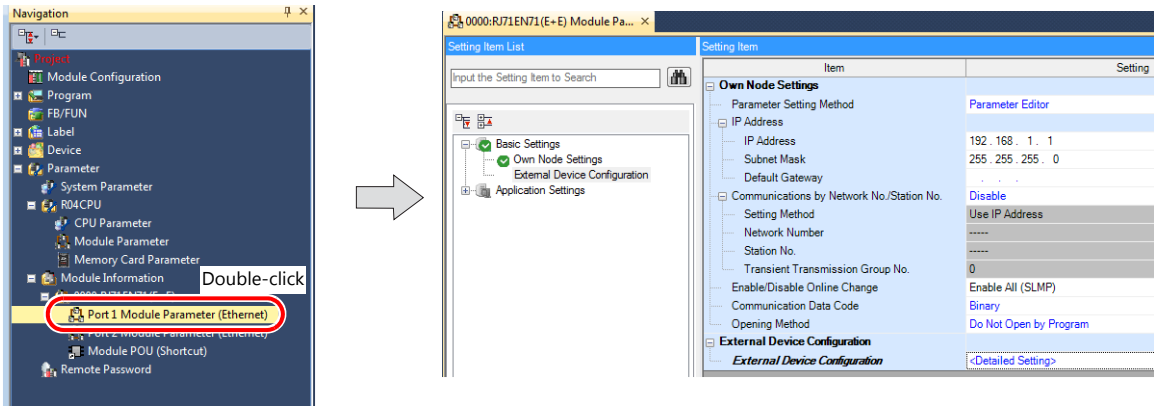
Make PLC settings using the programming tool "GX Works3".

[Module Information] → [Add New Module]



Item		Setting	Remarks
Module Selection	Module	Information Module	
	Module Name	RJ71EN71 (E+CCIEC): Ethernet connection available with port 1 only RJ71EN71 (E+CCiEF): Ethernet connection available with port 1 only RJ71EN71 (E+E): Ethernet connection available with both port 1 and 2	
Mounting Position		Specify according to the environment.	

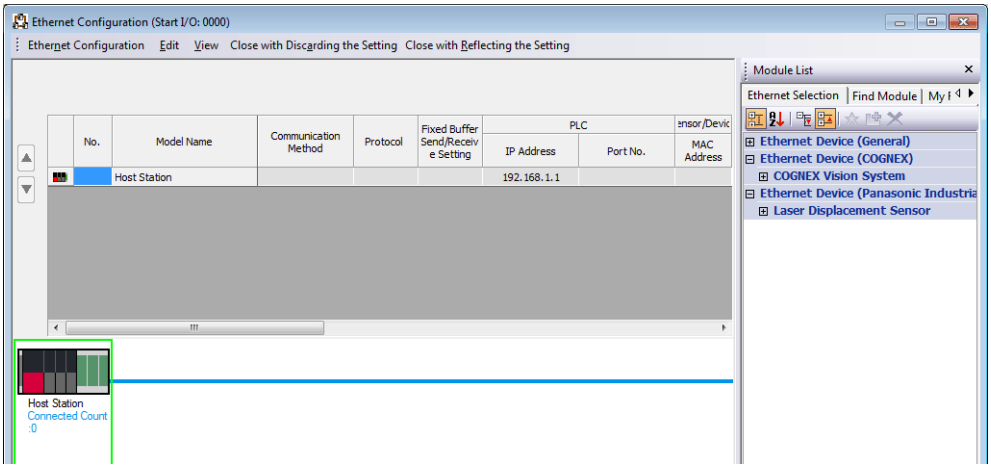
[Module Parameter]



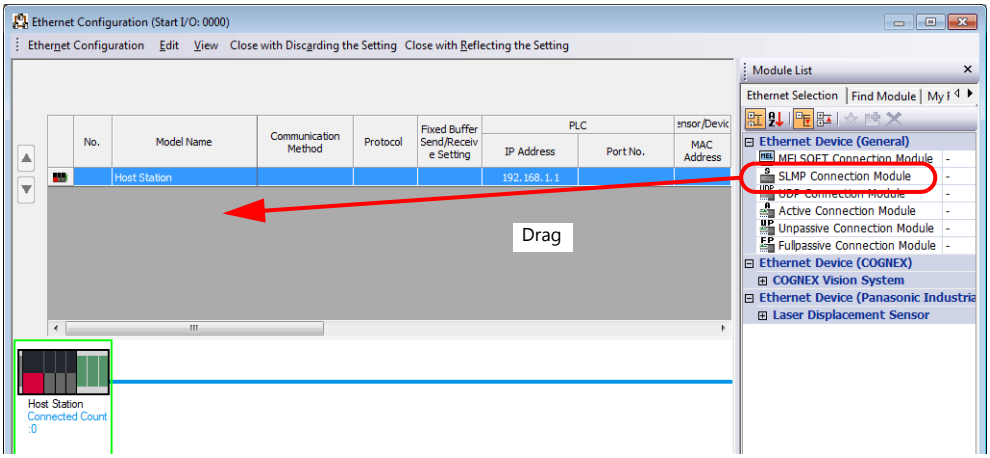
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Enable/Disable Online Change	**Enable All (SLMP)**	
Communication Data Code	**Binary**	
Opening Method	**Do Not Open by Program**	
External Device Configuration	Specify the TSi as a SLMP connection module.	

Setting procedure for [External Device Configuration]

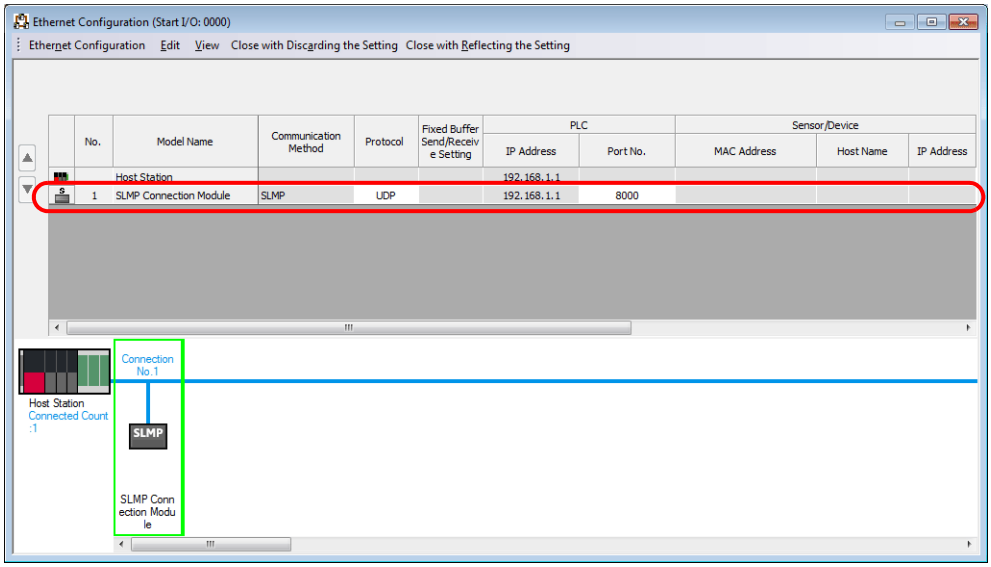
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item		Setting	Remarks
Protocol		UDP / TCP	
PLC	Port No.	Set the port number of the host station (PLC).	1025 to 4999, 5010 to 65534

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	
W	(link register)	01H	
R	(file register)	02H	
TN	(timer/current value)	03H	
CN	(counter/current value)	04H	
Un\G	(unit access device memory)	05H	*1
M	(internal relay)	06H	
L	(latch relay)	07H	
B	(link relay)	08H	
X	(input)	09H	
Y	(output)	0AH	
TS	(timer/contact)	0BH	
TC	(timer/coil)	0CH	
CS	(counter/contact)	0DH	
CC	(counter/coil)	0EH	
H	(link unit buffer device memory)	0FH	
SD	(special register)	10H	
SM	(special relay)	11H	
SB	(special link relay)	12H	
SW	(special link register)	13H	
ZR	(file register (for continuous access))	14H	
F	(annunciator)	15H	
SS	(totalizing timer/contact)	16H	
SC	(totalizing timer/coil)	17H	
SN	(totalizing timer/current value)	18H	
Z	(index register)	19H	
LTN	(long timer/current value)	24H	Double-word
LSTN	(long totalizing timer/current value)	27H	Double-word
LCN	(long counter/current value)	2AH	Double-word
LZ	(long index register/current value)	2BH	Double-word
RD	(refreshing data register)	2CH	
U3En\G	(CPU buffer memory access device memory)	2DH	*2
U3En\HG	(CPU buffer memory access device memory (periodical area))	2EH	*2

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
Set the unit number in hexadecimal notation.

Example: U00\G000000000
Address number (DEC)
Unit number (HEX)

*2 Specify the CPU number.

Example: U3E0\G000000000
Address number (DEC)
CPU number: 0 to 3

Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.

Example: 1 : D00000
Address number
Device type
Access CPU
No. 0: Management CPU
No. 1: Multi CPU 1
No. 2: Multi CPU 2
No. 3: Multi CPU 3
No. 4: Multi CPU 4

Indirect Device Memory Designation

- For the address number of 0 to 65535:

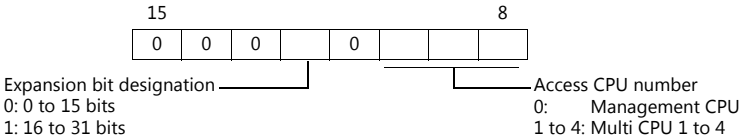
	15	8 7	0
n + 0	Model		Device type
n + 1	Address No.		
n + 2	Expansion code *		Bit designation
n + 3	00		Station number

- For the address number of 65536 or greater

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

* Specify an expansion code for the following device memory.

- Un\G
  Specify the unit number in the expansion code.
- U3En\G, U3En\HG
  Specify the CPU number in the expansion code.
- LTN, LSTN, LCN, LZ
  In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).
  Also specify the access CPU number when connecting multiple CPUs.



- Other than Un\G, U3En\G, U3En\HG
  When connecting multiple CPUs, specify the access CPU number in the expansion code.
  Management CPU: 0 Multi CPU: 1 to 4

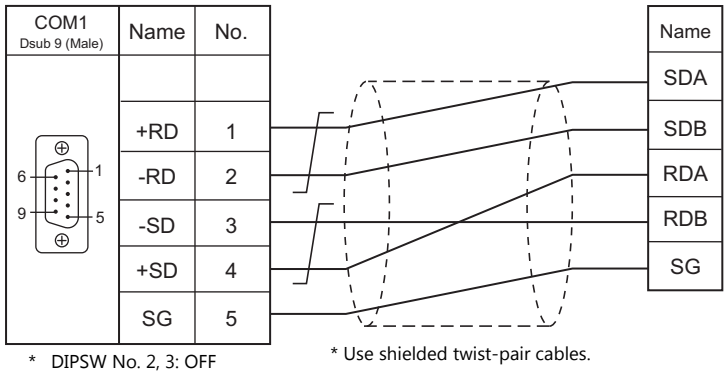
11.1.32 Wiring Diagrams

When Connected at COM1:

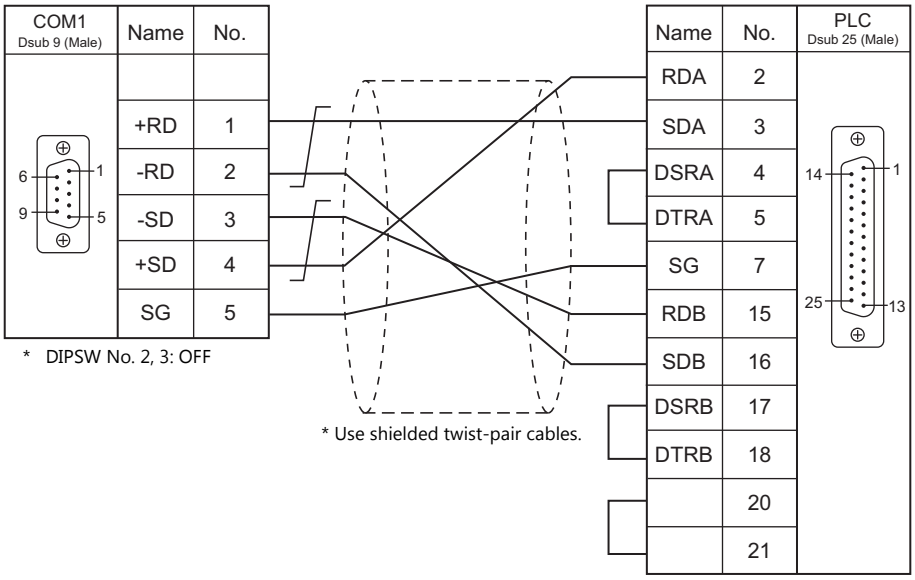
RS-422

Wiring diagram 1 - COM1

Hakko Electronics' cable "D9-MI4-0T-☐M" (☐ = 2, 3, 5, 10, 15)



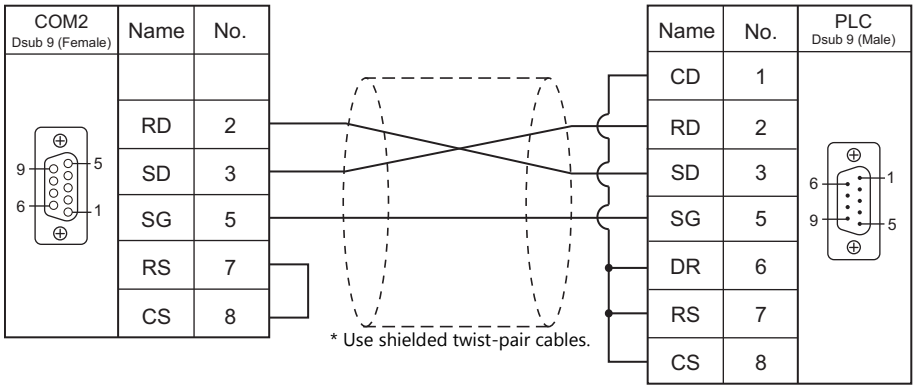
Wiring diagram 2 - COM1



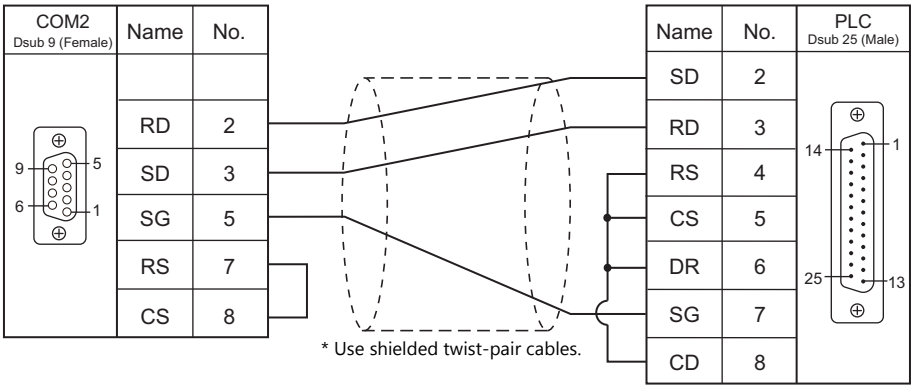
When Connected at COM2:

RS-232C

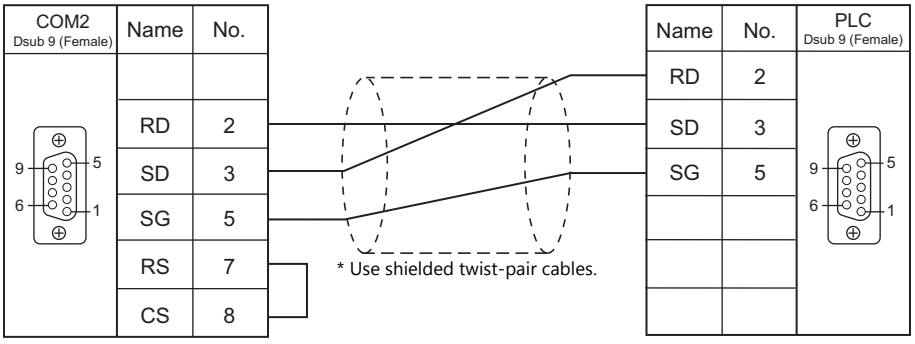
Wiring diagram 1 - COM2



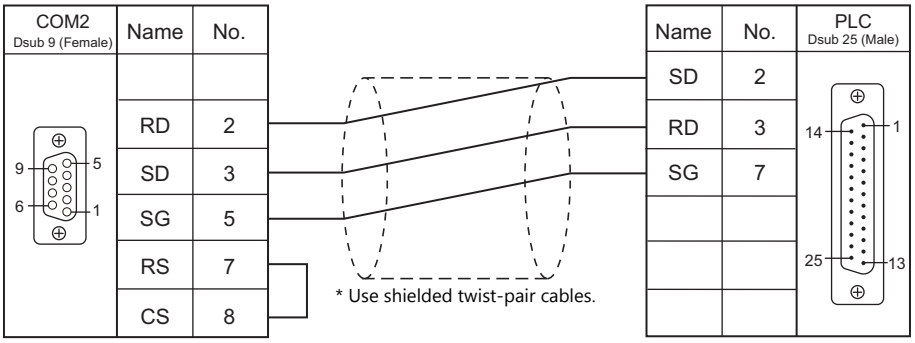
Wiring diagram 2 - COM2



Wiring diagram 3 - COM2



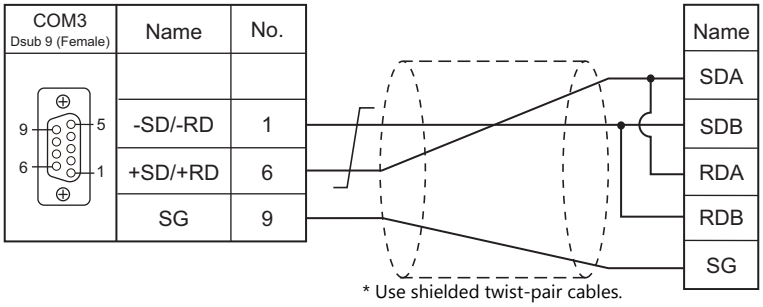
Wiring diagram 4 - COM2



When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



11.2 Temperature Controller/Servo/Inverter Connection

Inverter

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
FR-*500	FR-A500 FR-E500 FR-F500	PU connector	RS-422	COM1	Wiring diagram 1 - COM1	FR-E500.Lst
			RS-485	COM3	Wiring diagram 1 - COM3	
	FR-S500	RS-485 connector	RS-422	COM1	Wiring diagram 1 - COM1	
			RS-485	COM3	Wiring diagram 1 - COM3	
FR-V500	FR-V500	PU connector	RS-422	COM1	Wiring diagram 1 - COM1	FR-V500.Lst
			RS-485	COM3	Wiring diagram 1 - COM3	
FR-E700	FR-E700	PU connector	RS-422	COM1	Wiring diagram 1 - COM1	FR-E700.Lst
			RS-485	COM3	Wiring diagram 1 - COM3	

Servo

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
MR-J2S-*A	MR-J2S-*A	CN3	RS-232C	COM2	Wiring diagram 1 - COM2	M_J2S_A.Lst
			RS-422	COM1	Wiring diagram 2 - COM1	
MR-J3-*A	MR-J3-*A	CN3	RS-422	COM1	Wiring diagram 1 - COM1	MRJ3.Lst
MR-J3-*T	MR-J3-*T	CN3				MRJ3_T.Lst
MR-J4-*A	MR-J4-*A	CN3				MRJ4_A.Lst

11.2.1 FR-*500

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

(Underlined setting: default)

Parameter No.		Item	Setting	Setting Example
A500 E500 F500	S500 F500J			
77	77	Parameter writing permission	0: Writing allowed when PU operation stops 1: Writing prohibited 2: Writing allowed during operation	2: Writing allowed during operation
79	79	Operation mode selection *2	0 / 1 / 2 / 3 / 4 / 6 / 7 / 8	1: PU operation *3 2: External operation *3
117	n1	Communicating station number	0 to 31	0
118	n2	Baud rate	4800 / 9600 / 19200 bps	19200 bps
119	n3	Data length / stop bit length	0: 8 bits / 1 bit 1: 8 bits / 2 bits 10: 7 bits / 1 bit 11: 7 bits / 2 bits	1: 8 bits / 2 bits
120	n4	Parity check	0: None 1: Odd 2: Even	2: Even
121	n5	Communication retrial times	0 to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	n6	Communication check intervals *1	0 / 0.1 to 999.8 / 9999	9999: Communication check stop
123	n7	Wait time	0 to 150 / 9999	9999: Can be set with the communication data
-	n8	Operation command write	0: Computer 1: External	0: Computer
-	n9	Speed command write	0: Computer 1: External	0: Computer
-	n10	Link start mode selection	0: 1: Computer link operation mode	1: Computer link operation mode
124	n11	CR/LF selection	0: CR/LF not provided 1: CR provided, LF not provided 2: CR/LF provided	1: CR provided, LF not provided
146	-	Frequency setting *2	0 / 1 / 9999	9999

*1 When the value in the range from 0.1 to 999.8 is set:
If the TS does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.

*2 When the inverter, FR-A500, FR-E500 or FR-F500, is turned on with the settings of Pr.79 = 0 and Pr.146 = 9999, the inverter enters in the PU operation mode.
When the inverter, FR-S500 or FR-F500J, is turned on with the settings of Pr.79 = 2 and n10 = 1, the inverter enters in the computer link operation mode.

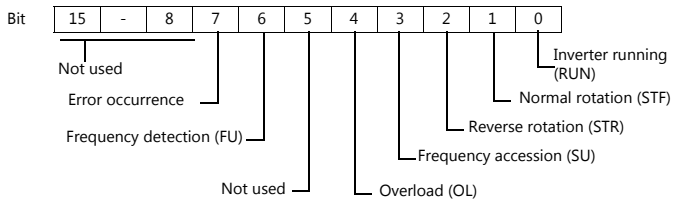
*3 In the case of FR-A500, FR-E500 or FR-F500, when the running frequency change and operation command specification are made on the TS, select the PU operation mode. In the case of FR-S500 or FR-F500J, when the running frequency change and operation command specification are made on the TS, select the computer link operation mode. If those settings are not made on the TS, set an appropriate value according to the purpose of usage.

Available Device Memory

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

Device Memory		TYPE	Remarks
P	(parameter)	00H	Refer to the list file or the parameter list for the inverter.
D	(parameter)	01H	Refer to the table below.

D (Parameter)

<table>
<tr><th>Address</th><th colspan="2">Name</th></tr>
<tr><td>D0</td><td>Operation mode</td><td>When issuing a command, such as a run command, from the TS, select “Communication and Run”.
FR-E500 : 0002 H
FR-A500 : 0002 H
FR-F500 : 0002 H
FR-S500 : 0000 H</td></tr>
<tr><td>D1</td><td colspan="2">Output frequency (Rotation)</td></tr>
<tr><td>D2</td><td colspan="2">Output current</td></tr>
<tr><td>D3</td><td colspan="2">Output voltage</td></tr>
<tr><td>D4</td><td colspan="2">Alarm contents (last / most recent)
<table>
<tr><th>Data</th><th>Contents</th><th>Data</th><th>Contents</th><th>Data</th><th>Contents</th><th>Data</th><th>Contents</th></tr>
<tr><td>H00</td><td>none</td><td>H22</td><td>OV3</td><td>H80</td><td>GF</td><td>HB2</td><td>RET</td></tr>
<tr><td>H10</td><td>OC1</td><td>H30</td><td>THT</td><td>H81</td><td>LF</td><td>HC2</td><td>P24</td></tr>
<tr><td>H11</td><td>OC2</td><td>H31</td><td>THM</td><td>H90</td><td>OHT</td><td>HF3</td><td>E.3</td></tr>
<tr><td>H12</td><td>OC3</td><td>H40</td><td>FIN</td><td>HA0</td><td>OPT</td><td>HF6</td><td>E.6</td></tr>
<tr><td>H20</td><td>OV1</td><td>H60</td><td>OLT</td><td>HB0</td><td>PE</td><td>HF7</td><td>E.7</td></tr>
<tr><td>H21</td><td>OV2</td><td>H70</td><td>BE</td><td>HB1</td><td>PUE</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>D5</td><td colspan="2">Alarm contents (three times before / two times before)</td></tr>
<tr><td>D6</td><td colspan="2">Alarm contents (five times before / four times before) *</td></tr>
<tr><td>D7</td><td colspan="2">Alarm contents (seven times before / six times before) *</td></tr>
<tr><td>D8</td><td colspan="2">Inverter status monitor
 
</td></tr>
<tr><td>D9</td><td colspan="2">Changeover to second parameter</td></tr>
</table>

* These memory addresses are not available for FR-S500

CAUTION

When setting device memory:
By default, only the “List” file of “FR-E500” can be browsed by pressing the [Refer] button.
If an inverter such as “A500”, “F500”, or “S500” is used, refer to the parameter list described in each inverter’s manual and then set the device memory.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)					F2
Writing running frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00EEH				
		n + 2	Running frequency				
Writing running frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00EDH				
		n + 2	Running frequency				
All alarms clear	1 - 8 (PLC1 - 8)	n	Station number				2
		n + 1	Command: 00F4H				
Operation command	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00FAH				
		n + 2	0000H: Stop 0002H: Normal rotation (STF) 0004H: Reverse rotation (STR)				
All parameter clear	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00FCH				
		n + 2	Pr. Data	Communication Pr.	Calibration	Other Pr.	00ECH 00F3H 00FFH
			9696H	○	×	○	○
			9966H	○	○	○	○
			5A5AH	×	×	○	○
			55AAH	×	○	○	○
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number				2
		n + 1	Command: 00FDH				

11.2.2 FR-V500

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

(Underlined setting: default)

Parameter No.	Item	Setting	Setting Example
77	Parameter writing permission	0: Writing allowed when PU operation stops 1: Writing prohibited 2: Writing allowed during operation	2: Writing allowed during operation
79	Operation mode selection *2	0 / 1 / 2 / 3 / 4 / 6 / 7 / 8	1: PU operation
117	Communicating station number	0 to 31	0
118	Baud rate	4800 / 9600 / 19200 bps	19200 bps
119	Data length / stop bit length	0: 8 bits / 1 bit 1: 8 bits / 2 bits 10: 7 bits / 1 bit 11: 7 bits / 2 bits	1: 8 bits / 2 bits
120	Parity check	0: None 1: Odd 2: Even	2: Even
121	Communication retrial times	0 to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	Communication check intervals *1	0 / 0.1 to 999.8 / 9999	9999: Communication check stop
123	Wait time	0 to 150 / 9999	9999: Can be set with the communication data
124	CR/LF selection	0: CR/LF not provided 1: CR provided, LF not provided 2: CR/LF provided	1: CR provided, LF not provided
146	Frequency setting *2	0 / 1 / 9999	9999

*1 When the value in the range from 0.1 to 999.8 is set:
If the TS does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.

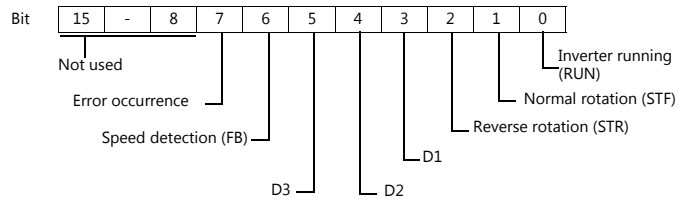
*2 When the inverter is turned on with the settings of Pr.79=0 and Pr.146=9999, the inverter enters in the PU operation mode.

Available Device Memory

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

Device Memory	TYPE	Remarks
P (parameter)	00H	Refer to the list file or the parameter list for the inverter.
D (parameter)	01H	Refer to the table below.

D (Parameter)

Address	Name
D0	Operation mode When issuing a command, such as a run command, from the TS, select "Communication and Run". 0002 H
D1	Rotation speed
D2	Output current
D3	Output voltage
D4	Alarm contents (last / most recent)
D5	Alarm contents (three times before / two times before)
D6	Alarm contents (five times before / four times before)
D7	Alarm contents (seven times before / six times before)
D8	Inverter status monitor 
D9	Changeover to second parameter
D10	Special monitor
D11	Special monitor selection No.

Data	Contents	Unit	Data	Contents	Unit
H01	Output frequency	0.01 Hz	H10	Output terminal status	-
H02	Output current	0.01 A	H11	Load meter	0.1%
H03	Output voltage	0.1V	H12	Motor exciting current	0.01A
H05	Speed setting	1 r/min	H13	Position pulse	-
H06	Operation speed	1 r/min	H14	Total power-on time	1h
H07	Motor torque	0.1%	H17	Operating time	1h
H08	Converter output	0.1 V	H18	Motor load ratio	0.1%
H09	Regenerative brake	0.1%	H20	Torque command	0.1%
H0A	Electric thermal load ratio	0.1%	H21	Torque current command	0.1%
H0B	Output current peak value	0.01 A	H22	Motor output	0.01 kW
H0C	Output voltage peak value of converter	0.1 V	H23	Feed back pulse	-
H0F	Input terminal status	-			

Input terminal status

Bit	15	-	8	RES	CH	DI4	DI3	DI2	DI1	STR	STF

Output terminal status

Bit	15	-	4	ABC	D03	D02	D01

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)					F2
Writing setting speed (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00EEH				
		n + 2	Running frequency				
Writing setting speed (RAM)	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00EDH				
		n + 2	Running frequency				
All alarms clear	1 - 8 (PLC1 - 8)	n	Station number				2
		n + 1	Command: 00F4H				
Operation command	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00FAH				
		n + 2	0000H: Stop 0002H: Normal rotation (STF) 0004H: Reverse rotation (STR)				
All parameter clear	1 - 8 (PLC1 - 8)	n	Station number				3
		n + 1	Command: 00FCH				
		n + 2	Pr. Data	Communication Pr.	Calibration	Other Pr.	00ECH 00F3H 00FFH
			9696H	○	×	○	○
			9966H	○	○	○	○
			5A5AH	×	×	○	○
			55AAH	×	○	○	○
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number				2
		n + 1	Command: 00FDH				

11.2.3 MR-J2S-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

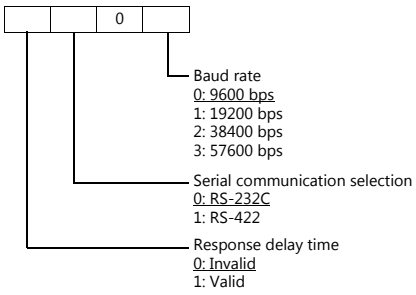
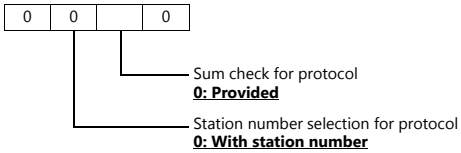
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 bps	
Data Length	**8 bits (fixed)**	
Stop Bit	**1 bit (fixed)**	
Parity	**Even (fixed)**	
Target Port No.	0 to 31	

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
15	SNO	Station number setting	0 to 31
16	BPS	Communication function selection	
53	OP8	Function selection 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
F01	(status display/fraction display)	00H	Real number, read only
05	(parameter)	01H	Double-word
F05	(parameter/fraction display)	02H	Real number
12	(external I/O signals)	03H	Double-word, partially read only
33	(alarm history)	04H	Double-word, read only
02	(current alarm)	05H	Read only
F35	(status display at alarm occurrence/fraction display)	06H	Real number, read only
42	(other commands)	0DH	Double-word, read only
81	(clear status display data)	0EH	Write only
82	(clear alarm history)	0FH	Write only
8B	(operation mode selection)	10H	Write only
90	(I/O device prohibition/cancel)	11H	Write only
92	(input device ON/OFF)	12H	Double-word, write only
A0	(test operation mode data)	13H	Double-word, write only

Set the target device memory on the [Device Input] dialog.

- RAM: Store to RAM.
- EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

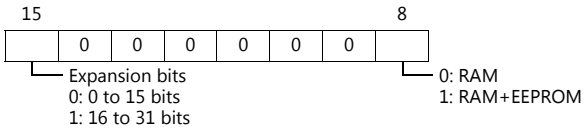
- Address No. 0 to 65535

	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 address number of 65536 or greater

	15 8	7 0
n + 0	Model	Device memory type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Station number

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n+3 to n+10	Software version	

Return data: Data stored from servo amplifier to TS

11.2.4 MR-J3-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

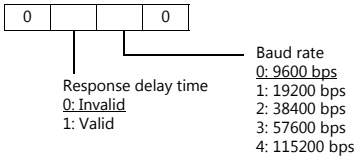
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits (fixed)**	
Stop Bit	**1 bit (fixed)**	
Parity	**Even (fixed)**	
Target Port No.	0 to 31	

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
PC20	SNO	Station number setting	0 to 31
PC21	SOP	Communication function selection	

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
F01	(status display)	00H	Real number, read only
12	(external I/O signals)	03H	Double-word, partially read only, storage destination device invalid
33	(alarm history)	04H	Double-word, read only
02	(current alarm)	05H	Read only
F35	(status display at alarm occurrence)	06H	Real number, read only
42	(other commands)	0DH	Double-word, read only
81	(clear status display data)	0EH	Write only, storage destination device invalid
82	(clear alarm history)	0FH	Write only, storage destination device invalid
8B	(operation mode selection)	10H	Storage destination device invalid
90	(I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92	(input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0	(test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01	(status display name and unit)	14H	Read only
04	(parameters)	15H	Storage destination device invalid
05A	(basic setting parameters)	16H	Double-word, *1
05B	(gain/filter parameters)	17H	Double-word, *1
05C	(extension setting parameters)	18H	Double-word, *1
05D	(I/O setting parameters)	19H	Double-word, *1
F05A	(basic setting parameters)	1AH	Real number, *1
F05B	(gain/filter parameters)	1BH	Real number, *1
F05C	(extension setting parameters)	1CH	Real number, *1
F05D	(I/O setting parameters)	1DH	Real number, *1

Device Memory		TYPE	Remarks
06A	(basic setting parameters upper limit)	1EH	Double-word, read only, *1
06B	(gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C	(extension setting parameters upper limit)	20H	Double-word, read only, *1
06D	(I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A	(basic setting parameters upper limit)	22H	Real number, read only, *1
F06B	(gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C	(extension setting parameters upper limit)	24H	Real number, read only, *1
F06D	(I/O setting parameters upper limit)	25H	Real number, read only, *1
07A	(basic setting parameters lower limit)	1EH	Double-word, read only, *1
07B	(gain/filter parameters lower limit)	1FH	Double-word, read only, *1
07C	(extension setting parameters lower limit)	20H	Double-word, read only, *1
07D	(I/O setting parameters lower limit)	21H	Double-word, read only, *1
F07A	(basic setting parameters lower limit)	22H	Real number, read only, *1
F07B	(gain/filter parameters lower limit)	23H	Real number, read only, *1
F07C	(extension setting parameters lower limit)	24H	Real number, read only, *1
F07D	(I/O setting parameters lower limit)	25H	Real number, read only, *1
S08A	(basic setting parameters symbol)	2EH	Read only, *1
S08B	(gain/filter parameters symbol)	2FH	Read only, *1
S08C	(extension setting parameters symbol)	30H	Read only, *1
S08D	(I/O setting parameters symbol)	31H	Read only, *1
09A	(write enable/disable of basic setting parameters)	32H	Read only, *1
09B	(write enable/disable of gain/filter parameters)	33H	Read only, *1
09C	(write enable/disable of extension setting parameters)	34H	Read only, *1
09D	(write enable/disable of I/O setting parameters)	35H	Read only, *1

*1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten.
Do not change the value for "040001" on the servo amplifier side.

- Set the target device memory on the [Device Input] dialog.
  - RAM: Store to RAM.
  - EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

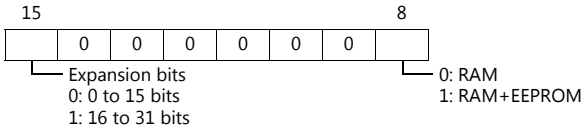
- Address No. 0 to 65535

	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 address number of 65536 or greater

	15	8 7	0
n + 0	Model		Device memory type
n + 1	Lower address No.		
n + 2	Higher address No.		
n + 3	Expansion code *		Bit designation
n + 4	00		Station number

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n + 3 to n + 10	Software version	

Return data: Data stored from servo amplifier to TS

11.2.5 MR-J3-*T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

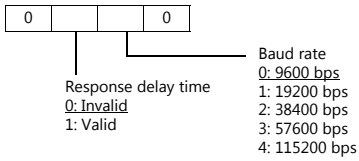
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits (fixed)**	
Stop Bit	**1 bit (fixed)**	
Parity	**Even (fixed)**	
Target Port No.	0 to 31	

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
PC20	SNO	Station number setting	0 to 31
PC21	SOP	Communication function selection	

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
F01	(status display)	00H	Real number, read only
12	(external I/O signals)	03H	Double-word, partially read only, storage destination device invalid
33	(alarm history)	04H	Double-word, read only
02	(current alarm)	05H	Read only
F35	(status display at alarm occurrence)	06H	Real number, read only
42	(other commands)	0DH	Double-word, read only
81	(clear status display data)	0EH	Write only, storage destination device invalid
82	(clear alarm history)	0FH	Write only, storage destination device invalid
8B	(operation mode selection)	10H	Storage destination device invalid
90	(I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92	(input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0	(test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01	(status display name and unit)	14H	Read only
04	(parameters)	15H	Storage destination device invalid
05A	(basic setting parameters)	16H	Double-word, *1
05B	(gain/filter parameters)	17H	Double-word, *1
05C	(extension setting parameters)	18H	Double-word, *1
05D	(I/O setting parameters)	19H	Double-word, *1
F05A	(basic setting parameters)	1AH	Real number, *1
F05B	(gain/filter parameters)	1BH	Real number, *1
F05C	(extension setting parameters)	1CH	Real number, *1
F05D	(I/O setting parameters)	1DH	Real number, *1

Device Memory		TYPE	Remarks
06A	(basic setting parameters upper limit)	1EH	Double-word, read only, *1
06B	(gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C	(extension setting parameters upper limit)	20H	Double-word, read only, *1
06D	(I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A	(basic setting parameters upper limit)	22H	Real number, read only, *1
F06B	(gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C	(extension setting parameters upper limit)	24H	Real number, read only, *1
F06D	(I/O setting parameters upper limit)	25H	Real number, read only, *1
07A	(basic setting parameters lower limit)	1EH	Double-word, read only, *1
07B	(gain/filter parameters lower limit)	1FH	Double-word, read only, *1
07C	(extension setting parameters lower limit)	20H	Double-word, read only, *1
07D	(I/O setting parameters lower limit)	21H	Double-word, read only, *1
F07A	(basic setting parameters lower limit)	22H	Real number, read only, *1
F07B	(gain/filter parameters lower limit)	23H	Real number, read only, *1
F07C	(extension setting parameters lower limit)	24H	Real number, read only, *1
F07D	(I/O setting parameters lower limit)	25H	Real number, read only, *1
S08A	(basic setting parameters symbol)	2EH	Read only, *1
S08B	(gain/filter parameters symbol)	2FH	Read only, *1
S08C	(extension setting parameters symbol)	30H	Read only, *1
S08D	(I/O setting parameters symbol)	31H	Read only, *1
09A	(write enable/disable of basic setting parameters)	32H	Read only, *1
09B	(write enable/disable of gain/filter parameters)	33H	Read only, *1
09C	(write enable/disable of extension setting parameters)	34H	Read only, *1
09D	(write enable/disable of I/O setting parameters)	35H	Read only, *1
F40	(point table: point data)	36H	Real number
50	(point table: servo motor speed)	37H	Double-word
54	(point table: acceleration time constant)	38H	Double-word
58	(point table: deceleration time constant)	39H	Double-word
60	(point table: dwell)	3AH	Double-word
64	(point table: auxiliary function)	3BH	Double-word
45	(point table: M code)	3CH	Double-word

*1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten.
Do not change the value for "040001" on the servo amplifier side.

- Set the target device memory on the [Device Input] dialog.
  - RAM: Store to RAM.
  - EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

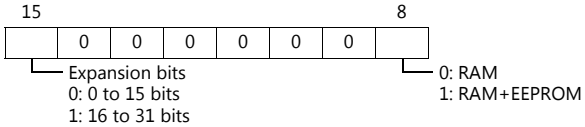
- Address No. 0 to 65535

	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 address number of 65536 or greater

	15 8	7 0
n + 0	Model	Device memory type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Station number

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n + 3 to n + 10	Software version	
Option unit parameter Read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0005H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
Option unit parameter Write	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 0084H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (low-order)	
		n + 6	Write mode 0: RAM 1: EEPROM	
Option unit parameter upper limit values read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0006H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter upper limit value (low-order)	
		n + 5	Parameter upper limit value (high-order)	
Option unit parameter lower limit values read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0007H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter lower limit value (low-order)	
		n + 5	Parameter lower limit value (high-order)	
Option unit parameter symbols read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0008H	
		n + 2	Parameter No. *1	
		n + 3 to n + 7	Symbols	
Option unit parameter write-enable/disable read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0009H	
		n + 2	Parameter No. *1	
		n+3	0: Write enabled 1: Write disabled	

Return data: Data stored from servo amplifier to TS

*1 Option unit parameter No.

No.	Contents
2	MR-J3-D01 Input signal device selection 1 (CN10-21, 26)
3	MR-J3-D01 Input signal device selection 2 (CN10-27, 28)
4	MR-J3-D01 Input signal device selection 3 (CN10-29, 30)
5	MR-J3-D01 Input signal device selection 4 (CN10-31, 32)
6	MR-J3-D01 Input signal device selection 5 (CN10-33, 34)
7	MR-J3-D01 Input signal device selection 6 (CN10-35, 36)
8	MR-J3-D01 Output signal device selection 1 (CN10-46, 47)
9	MR-J3-D01 Output signal device selection 2 (CN10-48, 49)

No.	Contents
10	Function selection O-1
12	Function selection O-3
13	MR-J3-D01 Analog monitor 1 output
14	MR-J3-D01 Analog monitor 2 output
15	MR-J3-D01 Analog monitor 1 offset
16	MR-J3-D01 Analog monitor 2 offset
21	MR-J3-D01 Override offset
22	MR-J3-D01 Analog torque limit offset

11.2.6 MR-J4-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

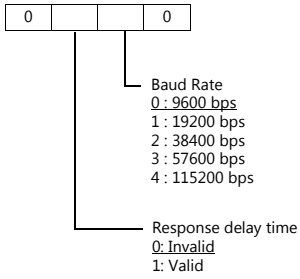
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits (fixed)**	
Stop Bit	**1 bit (fixed)**	
Parity	**Even (fixed)**	
Target Port No.	0 to 31	

Servo amplifier

Expansion setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting
PC20	SNO	Station number setting	0 to 31
PC21	SOP	Communication function selection	

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
F01	(status display)	00H	Real number, read only
12	(external I/O signals)	03H	Double-word, storage destination device invalid
33	(alarm history)	04H	Double-word, read only
02	(current alarm)	05H	Read only
F35	(status display at alarm occurrence)	06H	Real number, read only
F6C	(latch data of current position)	07H	Real number, read only
6D	(value of general-purpose register (Rx))	08H	Double-word
F6D	(value of general-purpose register (Rx))	09H	Real number
6E	(value of general-purpose register (Dx))	0AH	Double-word, storage destination device invalid
F6E	(value of general-purpose register (Dx))	0BH	Real number, storage destination device invalid
42	(other commands)	0DH	Double-word, read only
81	(clear status display data)	0EH	Write only, storage destination device invalid
82	(clear alarm history)	0FH	Write only, storage destination device invalid
8B	(operation mode selection)	10H	Storage destination device invalid
90	(I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92	(input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0	(test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01	(status display: names and units)	14H	Read only

Device Memory		TYPE	Remarks
04	(parameter group)	15H	Storage destination device invalid
05A	(basic setting parameters)	16H	Double-word, *1
05B	(gain/filter parameters)	17H	Double-word, *1
05C	(extension setting parameters)	18H	Double-word, *1
05D	(I/O setting parameters)	19H	Double-word, *1
F05A	(basic setting parameters)	1AH	Real number, *1
F05B	(gain/filter parameters)	1BH	Real number, *1
F05C	(extension setting parameters)	1CH	Real number, *1
F05D	(I/O setting parameters)	1DH	Real number, *1
06A	(basic setting parameters upper limit)	1EH	Double-word, read only, *1
06B	(gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C	(extension setting parameters upper limit)	20H	Double-word, read only, *1
06D	(I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A	(basic setting parameters upper limit)	22H	Real number, read only, *1
F06B	(gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C	(extension setting parameters upper limit)	24H	Real number, read only, *1
F06D	(I/O setting parameters upper limit)	25H	Real number, read only, *1
07A	(basic setting parameters lower limit)	26H	Double-word, read only, *1
07B	(gain/filter parameters lower limit)	27H	Double-word, read only, *1
07C	(extension setting parameters lower limit)	28H	Double-word, read only, *1
07D	(I/O setting parameters lower limit)	29H	Double-word, read only, *1
F07A	(basic setting parameters lower limit)	2AH	Real number, read only, *1
F07B	(gain/filter parameters lower limit)	2BH	Real number, read only, *1
F07C	(extension setting parameters lower limit)	2CH	Real number, read only, *1
F07D	(I/O setting parameters lower limit)	2DH	Real number, read only, *1
S08A	(basic setting parameters symbol)	2EH	Read only, *1
S08B	(gain/filter parameters symbol)	2FH	Read only, *1
S08C	(extension setting parameters symbol)	30H	Read only, *1
S08D	(I/O setting parameters symbol)	31H	Read only, *1
09A	(write enable/disable of basic setting parameters)	32H	Read only, *1
09B	(write enable/disable of gain/filter parameters)	33H	Read only, *1
09C	(write enable/disable of extension setting parameters)	34H	Read only, *1
09D	(write enable/disable of I/O setting parameters)	35H	Read only, *1
F40	(point table: point data)	36H	Real number, *2
50	(point table: speed data)	37H	Double-word
54	(point table: acceleration time constant)	38H	Double-word
58	(point table: deceleration time constant)	39H	Double-word
60	(point table: dwell time)	3AH	Double-word
64	(point table: auxiliary function)	3BH	Double-word
45	(point table: M code)	3CH	Double-word
05E	(extension setting 2 parameters)	3DH	Double-word, *1
05F	(extension setting 3 parameters)	3EH	Double-word, *1
05L	(linear servo/DD motor setting parameters)	3FH	Double-word, *1
05T	(positioning control parameters)	40H	Double-word, *1
F05E	(extension setting 2 parameters)	41H	Real number, *1
F05F	(extension setting 3 parameters)	42H	Real number, *1
F05L	(linear servo/DD motor parameters)	43H	Real number, *1
F05T	(positioning control parameters)	44H	Real number, *1
06E	(extension setting 2 parameters upper limit)	45H	Double-word, read only, *1
06F	(extension setting 3 parameters upper limit)	46H	Double-word, read only, *1
06L	(linear servo/DD motor parameters upper limit)	47H	Double-word, read only, *1
06T	(positioning control parameters upper limit)	48H	Double-word, read only, *1
F06E	(extension setting 2 parameters upper limit)	49H	Real number, read only, *1
F06F	(extension setting 3 parameters upper limit)	4AH	Real number, read only, *1
F06L	(linear servo/DD motor parameters upper limit)	4BH	Real number, read only, *1
F06T	(positioning control parameters upper limit)	4CH	Real number, read only, *1
07E	(extension setting 2 parameters lower limit)	4DH	Double-word, read only, *1
07F	(extension setting 3 parameters lower limit)	4EH	Double-word, read only, *1
07L	(linear servo/DD motor parameters lower limit)	4FH	Double-word, read only, *1
07T	(positioning control parameters lower limit)	50H	Double-word, read only, *1
F07E	(extension setting 2 parameters lower limit)	51H	Real number, read only, *1

Device Memory		TYPE	Remarks
F07F	(extension setting 3 parameters lower limit)	52H	Real number, read only, *1
F07L	(linear servo/DD motor parameters lower limit)	53H	Real number, read only, *1
F07T	(positioning control parameters lower limit)	54H	Real number, read only, *1
S08E	(extension setting 2 parameters symbol)	55H	Read only, *1
S08F	(extension setting 3 parameters symbol)	56H	Read only, *1
S08L	(linear servo/DD motor parameters symbol)	57H	Read only, *1
S08T	(positioning control parameters symbol)	58H	Read only, *1
09E	(write enable/disable of extension setting 2 parameters)	59H	Read only, *1
09F	(write enable/disable of extension setting 3 parameters)	5AH	Read only, *1
09L	(write enable/disable of linear servo/DD motor parameters)	5BH	Read only, *1
09T	(write enable/disable of positioning control parameters)	5CH	Read only, *1
1A	(latch display of current position)	5DH	Double-word, read only
F1A	(latch display of current position)	5EH	Real number, read only
6F	(number of general-purpose registers)	5FH	Double-word, read only
40	(other commands 2)	60H	Read only

*1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten.
Do not change the value for "040001" on the servo amplifier side.

*2 The possible setting range changes according to the third digit of "05T0001" (point data unit) and the first digit of "05T0003" (feed length magnification (STM)).
Write data upon checking "05T0001" and "05T0003".

- 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

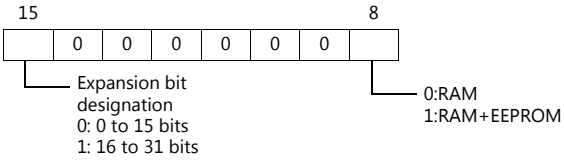
- Address No. 0 to 65535

	15 8	7 0
n + 0	Model	Device memory type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Target Port No.

- For the address number of 65536 or greater

	15 8	7 0
n + 0	Model	Device memory type
n + 1	Lower address No.	
n + 2	Higher address No.	
n + 3	Expansion code *	Bit designation
n + 4	00	Target Port No.

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Software version	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n + 3 to n + 10	Software version	
Option unit parameter read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0005H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
Option unit parameter write	1 to 8 (PLC1 to 8)	n	Target Port No.	7
		n + 1	Command: 0084H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
		n + 6	Write area 0 : RAM 1 : EEPROM	
Option unit parameter upper limit values read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0006H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter upper limit value (low-order)	
		n + 5	Parameter upper limit value (high-order)	
Option unit parameter lower limit values read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0007H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter lower limit value (low-order)	
		n + 5	Parameter lower limit value (high-order)	
Option unit parameter symbols read	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0008H	
		n + 2	Parameter No. *1	
		n + 3 to n + 7	Symbols	
Option unit parameter write-enable/disable read	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0009H	
		n + 2	Parameter No. *1	
		n + 3	0: Write enabled 1: Write disabled	

Return data: Data stored from servo amplifier to TS

*1 Option unit parameter No.

Error numbers	Contents
2	MR-D01 Input signal device selection 1
3	MR-D01 Input signal device selection 2
4	MR-D01 Input signal device selection 3
5	MR-D01 Input signal device selection 4
6	MR-D01 Input signal device selection 5
7	MR-D01 Input signal device selection 6
8	MR-D01 Output signal device selection 1
9	MR-D01 Output signal device selection 2
10	Function selection O-1
11	Function selection O-2

Error numbers	Contents
12	Function selection O-3
13	MR-D01 Analog monitor 1 output
14	MR-D01 Analog monitor 2 output
15	MR-D01 Analog monitor 1 offset
16	MR-D01 Analog monitor 2 offset
21	MR-D01 Override offset
22	MR-D01 Analog torque limit offset
28	MR-D01 Input signal device selection 7
29	MR-D01 Input signal device selection 8

11.2.7 FR-E700

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

When setting run commands and set frequency commands from the TS, select the Network operation mode. For more information, refer to the Instruction Manual (Applied) of inverter.
Be sure to reset the inverter after making the initial settings of the parameters. Otherwise, communication is not possible.

(Underlined setting: default)

Parameter No.	Item	Setting	Setting Example
77	Parameter writing permission	0: Writing allowed when PU operation stops 1: Writing prohibited 2: Writing allowed during operation	2
79	Operation mode selection *3	0 / 1 / 2 / 3 / 4 / 6 / 7	2 : External operation mode
117	PU communication station number	0 to 31	0
118	PU communication speed	4800 / 9600 / 19200 / 38400 bps	19200 bps
119	PU communication stop bit length (data length)	0: 8 bits / 1 bit 1: 8 bits / 2 bits 10: 7 bits / 1 bit 11: 7 bits / 2 bits	1
120	PU communication parity check	0: None 1: Odd 2: Even	2
121	Number of PU communication retries	0 to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	PU communication check time interval	0 *1 0.1 to 999.8 *2 9999	9999: No communication check
123	PU communication waiting time setting	0 to 150 / 9999	9999: Can be set with the communication data
124	PU communication CR/LF selection	0: Without CR/LF 1: With CR 2: With CR/LF	1
338	Communication operation command source	0: communication 1: external	0
339	Communication speed command source	0: communication 1: external (communication invalid) 2: external (communication valid)	0
340	Communication startup mode selection *3	0: As set in Pr.79 1: Network operation mode 10: PU operation mode/Network operation mode selection from operation panel	1
549	Protocol selection	**0: Mitsubishi inverter protocol** 1: Modbus-RTU protocol	0
550	NET mode operation command source selection	0: communication option 2: PU connector 9999: Automatic communication option recognition	9999 When using a communication option set 2.

Parameter No.	Item	Setting	Setting Example
551	PU mode operation command source selection	2: PU connector 3: USB connector 4: Operation panel 9999: USB automatic recognition	9999

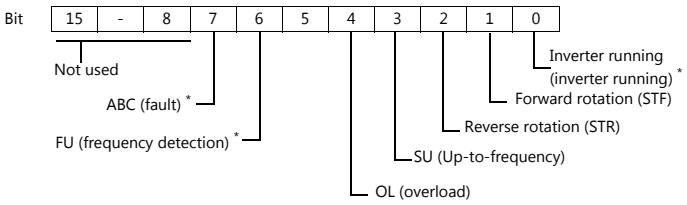
*1 RS-485 communication is possible. Note that a communication fault (E.PUE) occurs as soon as the inverter is switched to the operation mode with command source.
*2 When the value in the range from 0.1 to 999.8 is set:
If the TS does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.
*3 When the inverter is turned on with the settings of Pr.79=0/2/6 and Pr.340=1, the inverter enters in the Network operation mode.

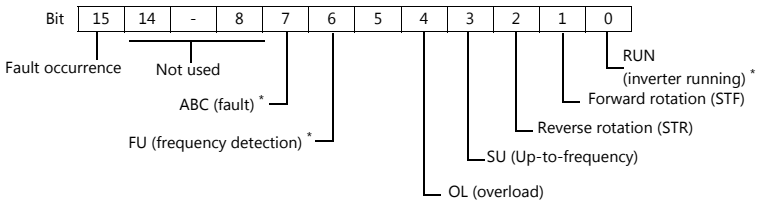
Available Device Memory

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

Device Memory	TYPE	Remarks
P (parameter)	00H	Refer to the list file or the parameter list for the inverter.
D (parameter)	01H	Refer to the table below.

D (Parameter)

Address	Name	
D0	Operation mode	0000 H: Network operation 0001 H: External operation 0002 H: PU operation
D1	Pr.37=0 : Frequency display, setting Pr.37≠0 : Machine speed at 60 Hz	
D2	Output current	
D3	Output voltage	
D4	Fault description (First fault in past / Latest fault)	
D5	Fault description (Third fault in past / Second fault in past)	
D6	Fault description (Fifth fault in past / Fourth fault in past)	
D7	Fault description (Seventh fault in past / Sixth fault in past)	
D8	Inverter status monitor  * Definitions change according to the Pr.190 to 192.	
D9	Second parameter changing	
D10	Special monitor	

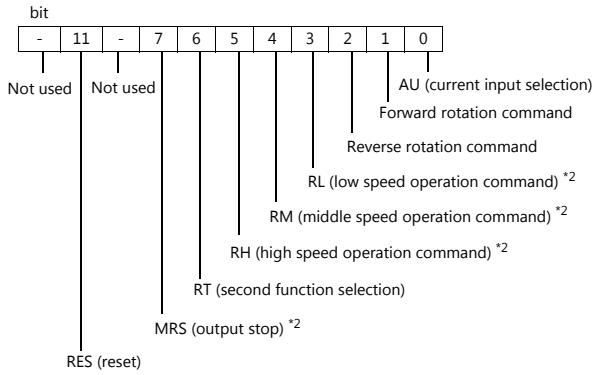
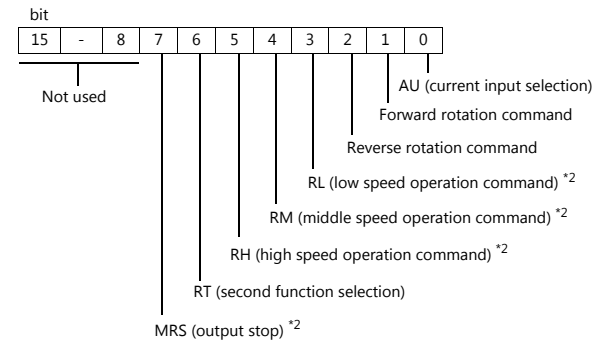
<table>
<tr><th>Address</th><th>Name</th></tr>
<tr><td>D11</td><td>
Special monitor selection No.
<table>
<tr><th>Data</th><th>Contents</th><th>Unit</th></tr>
<tr><td>H01</td><td>Output frequency / speed</td><td>0.01 Hz
/ 0.001</td></tr>
<tr><td>H02</td><td>Output current</td><td>0.01 A</td></tr>
<tr><td>H03</td><td>Output voltage</td><td>0.1V</td></tr>
<tr><td>H05</td><td>Frequency setting / speed setting</td><td>0.01 HZ
/ 0.001</td></tr>
<tr><td>H07</td><td>Motor torque</td><td>0.1 %</td></tr>
<tr><td>H08</td><td>Converter output voltage</td><td>0.1 V</td></tr>
<tr><td>H09</td><td>Regenerative brake duty</td><td>0.1 %</td></tr>
<tr><td>H0A</td><td>Electric thermal relay function load factor</td><td>0.1 %</td></tr>
<tr><td>H0B</td><td>Output current peak value</td><td>0.01 A</td></tr>
<tr><td>H0C</td><td>Converter output voltage peak value</td><td>0.1 V</td></tr>
<tr><td>H0E</td><td>Output power</td><td>0.01 kW</td></tr>
<tr><td>H0F</td><td>Input terminal status *1</td><td>-</td></tr>
</table>
<table>
<tr><th>Data</th><th>Contents</th><th>Unit</th></tr>
<tr><td>H10</td><td>Output terminal status *2</td><td>-</td></tr>
<tr><td>H14</td><td>Cumulative energization time</td><td>1 h</td></tr>
<tr><td>H17</td><td>Actual operating time</td><td>1 h</td></tr>
<tr><td>H18</td><td>Motor load factor</td><td>0.1%</td></tr>
<tr><td>H19</td><td>Cumulative power</td><td>1 kWh</td></tr>
<tr><td>H34</td><td>PID set point</td><td>0.1 %</td></tr>
<tr><td>H35</td><td>PID measured value</td><td>0.1 %</td></tr>
<tr><td>H36</td><td>PID deviation</td><td>0.1 %</td></tr>
<tr><td>H3A</td><td>Option input terminal status1 *3</td><td>-</td></tr>
<tr><td>H3B</td><td>Option input terminal status2 *3</td><td>-</td></tr>
<tr><td>H3C</td><td>Option output terminal status *3</td><td>-</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
*1 Input terminal status
<table>
<tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>RES</td><td>-</td><td>MRS</td><td>-</td><td>RH</td><td>RM</td><td>RL</td><td>-</td><td>-</td><td>STR</td><td>STF</td></tr>
</table>
*2 Output terminal status
<table>
<tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>ABC</td><td>FU</td><td>-</td><td>-</td><td>-</td><td>RUN</td></tr>
</table>
*3 Refer to the manual of the inverter.
</td></tr>
<tr><td>D12</td><td>
Inverter status monitor (expansion)


* Definitions change according to the Pr.190 to 192.
</td></tr>
</table>

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (= $u n)		F2
Read set frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 006EH	
		n + 2	0 to 65535Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001	
Read set frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 006DH	
		n + 2	0 to 65535Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001	
Write set frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 00EEH	
		n + 2	0 to 40000Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001	
Write set frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 00EDH	
		n + 2	0 to 40000Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001	
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 00FDH	
		n + 2	9696H: Makes the inverter reset without reply after receiving command. 9966H: Returns ACK and makes the inverter reset after receiving a command.	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="6">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="8">All parameter clear</td><td rowspan="8">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="8">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00FCH</td></tr>
<tr><td rowspan="6">n + 2</td><td>Pr.
Data</td><td>Communication Pr.</td><td>Calibration Pr.</td><td>Other Pr.</td><td>00ECH
00F3H
00FFH</td></tr>
<tr><td>9696H *1</td><td>○</td><td>×</td><td>○</td><td>○</td></tr>
<tr><td>9966H *1</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>5A5AH</td><td>×</td><td>×</td><td>○</td><td>○</td></tr>
<tr><td>55AAH</td><td>×</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="3">Write run command
(Expansion)</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00F9H</td></tr>
<tr><td>n + 2</td><td colspan="5">0000H: stop
 
</td></tr>
<tr><td rowspan="3">Write run command</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00FAH</td></tr>
<tr><td>n + 2</td><td colspan="5">0000H: stop
 
</td></tr>
<tr><td rowspan="2">All alarms clear</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00F4H</td></tr>
</table>

Return data: Data stored from controller to TS

*1 When executing this command, the setting values of communication parameter for TS are also returned to the initial values. Set the parameter again.

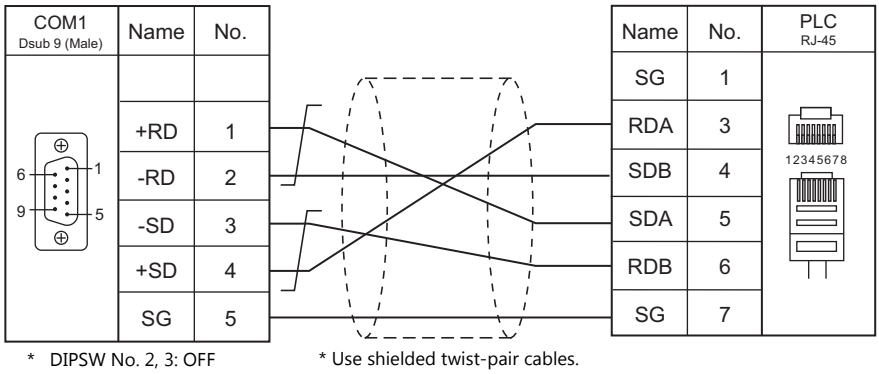
*2 The description changes depending on the setting of Pr.180 to 184.

11.2.8 Wiring Diagrams

When Connected at COM1:

RS-422

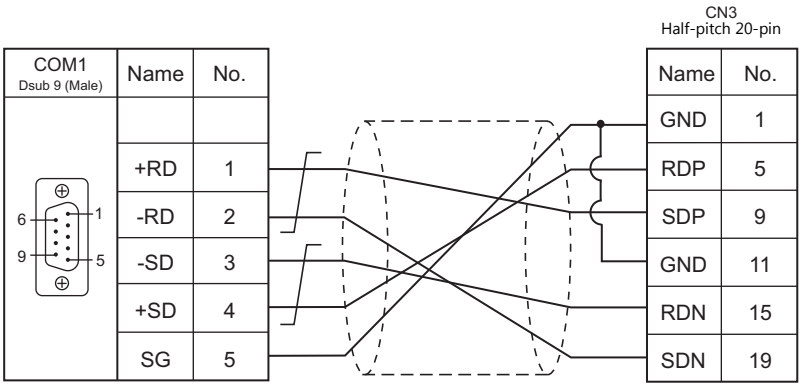
Wiring diagram 1 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

Wiring diagram 2 - COM1



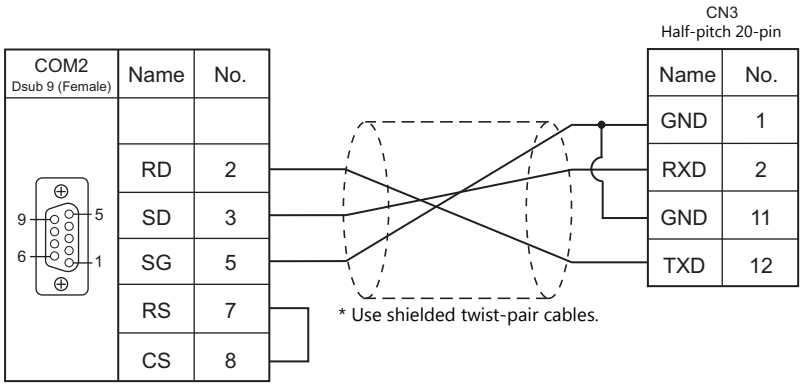
* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

When Connected at COM2:

RS-232C

Wiring diagram 1 - COM2

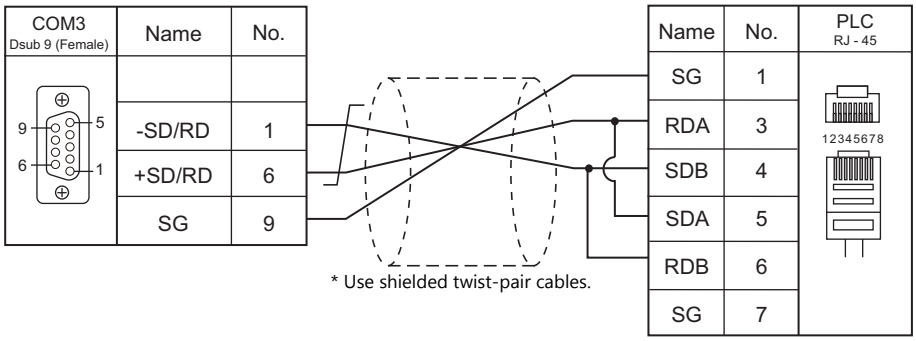


* Use shielded twist-pair cables.

When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



MEMO

12. MODICON

12.1 PLC Connection

12.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
Modbus RTU	Quantum	140 CPU 113 02 140 CPU 113 03 140 CPU 331 10 140 CPU 434 12A 140 CPU 434 12B 140 CPU 434 12U 140 CPU 534 14U 140 CPU 651 50 140 CPU 651 60 140 CPU 671 60(HSBY)	COMM1	RS-232C	COM2	Wiring diagram 1 - COM2	×

*1 For the ladder transfer function, see the TS Reference Manual 2.

12.1.1 Modbus RTU

Communication Setting

Editor

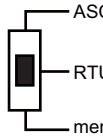
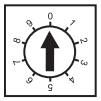
Communication setting

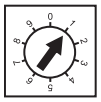
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	

PLC

Communication setting

<table>
<tr><th colspan="2">Switch</th><th>Setting</th><th>Contents</th><th>Remarks</th></tr>
<tr><td colspan="2"> 
</td><td>Communication setting</td><td>RTU</td><td>9600 bps, 8 bits, 1 bit , even (fixed)</td><td rowspan="2">When the communication setting switch is set to “mem”, the parameters set in the PLC programming software take effect.
(Communication at 19200 bps maximum is allowed.)
For more information, refer to the PLC manual issued by the manufacturer.</td></tr>
<tr><td> 

Example: Station No. 1</td><td>Device address</td><td>1 to 64</td><td>
<table>
<tr><th>Station No. (1 to 64)</th><th>SW1 (the tens place)</th><th>SW2 (the ones place)</th></tr>
<tr><td>1 to 9</td><td>0</td><td>1 to 9</td></tr>
<tr><td>10 to 19</td><td>1</td><td rowspan="5">0 to 9</td></tr>
<tr><td>20 to 29</td><td>2</td></tr>
<tr><td>30 to 39</td><td>3</td></tr>
<tr><td>40 to 49</td><td>4</td></tr>
<tr><td>50 to 59</td><td>5</td></tr>
<tr><td>60 to 64</td><td>6</td><td>0 to 4</td></tr>
</table>
</td></tr>
</table>

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	Read only
0	(output coil)	04H	
1	(input relay)	06H	Read only

Notes on Creating Screen Programs

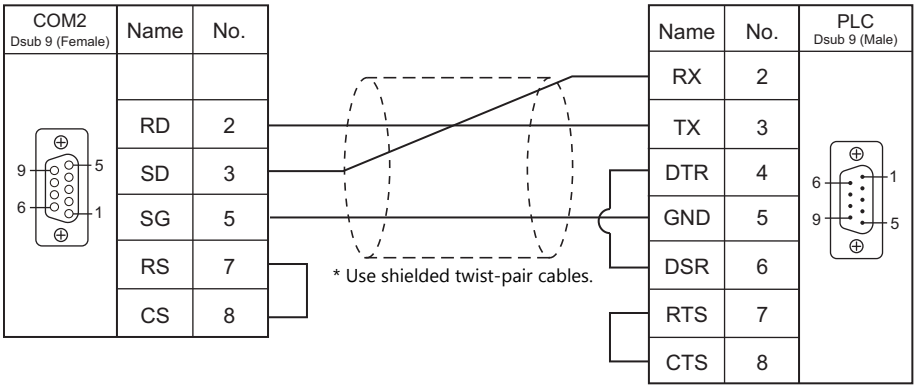
On the editor, the device memory address is specified in decimal notation. Thus, when the address of a connected device is expressed in hexadecimal notation, convert the address into decimal one and add “1”.

12.1.2 Wiring Diagrams

When Connected at COM2:

RS-232C

Wiring diagram 1 - COM2



MEMO

13. MOELLER

13.1 PLC Connection

13.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
PS4	PS4-141-MM1 PS4-151-MM1 PS4-201-MM1 PS4-201-MM5 PS4-271-MM1 PS4-341-MM1	PRG port	RS-232C	COM2	Wiring diagram 1 - COM2	×
					MOELLER's "ZB4-303-KB1" + Wiring diagram 2 - COM2	

*1 For the ladder transfer function, see the TS Reference Manual 2.

13.1.1 PS4

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	**RS-232C**	
Baud Rate	**9600 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	

PLC

PRG port

The communication parameters are fixed; baud rate: 9600 bps, signal level: RS-232C, data length: 8 bits, stop bit: 1 bit, parity: none.
For establishing communication with the TS, register a device memory in the PLC software "S40". 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
MW (Merker)	00H	M as bit device, *1

*1 The assigned device memory is expressed as shown below when editing the screen.
The addresses are expressed in "bytes". For word designation, specify an even-numbered address.

- Word device

  Example: MW200
  - Address number (even number only)

- Bit device

  Example: M200 . 0
  - Bit number: 0 to 7
  - Period
  - Byte address number

Indirect Device Memory Designation

n+0	Model	Device type
n+1	Address No. *1	
n+2	Expansion code	Bit designation *2
n+3	00	Station number

*1 Word designation
Specify an address number divided by "2".
Example: In the case of MW10, specify "5" (10 divided by 2) for the address number.

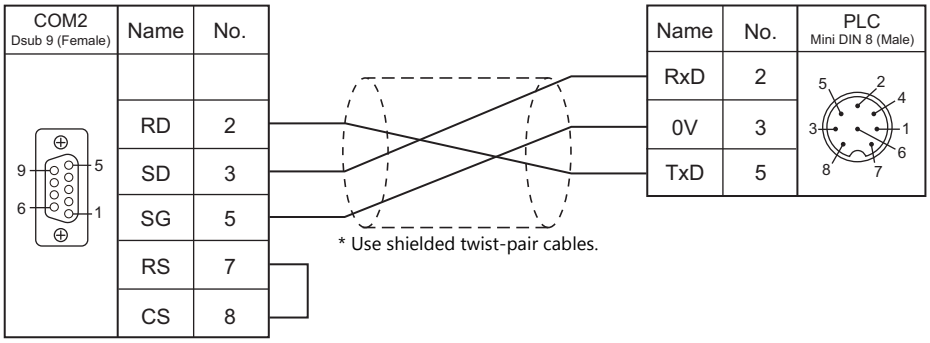
*2 Bit designation
Example: In the case of bits 0 to 7 of MW10, specify "5" for the address number and "0" to "7" for the bit designation.
Example: In the case of bits 0 to 7 of MW11, specify "5" for the address number and "8" to "15" for the bit designation.

13.1.2 Wiring Diagrams

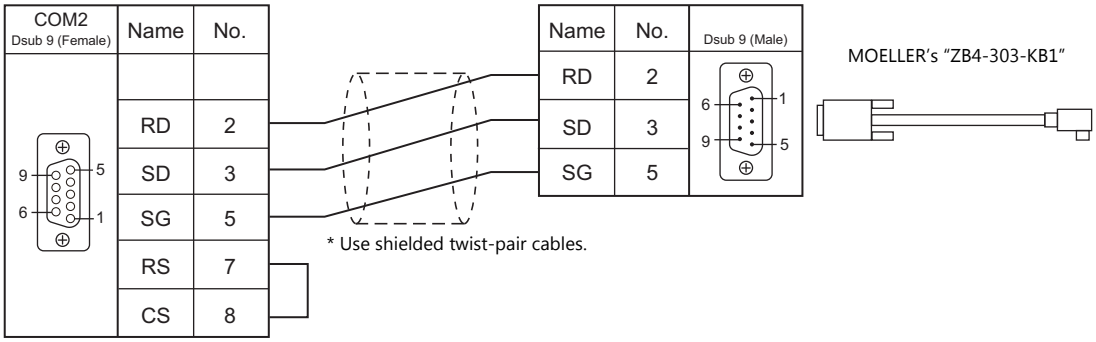
When Connected at COM2:

RS-232C

Wiring diagram 1 - COM2



Wiring diagram 2 - COM2



MEMO

14. MOOG

14.1 Temperature Controller/Servo/Inverter Connection

14.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Servo Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
J124-04x series	J124-04x	CN1	RS-422	COM1	Wiring diagram 1 - COM1	MOOG.List

14.1.1 J124-04x Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

J124-04x

Be sure to match the settings to those made under [Communication Setting] of the editor.
For more information, refer to the instruction manual for the digital controller issued by the manufacturer.

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.

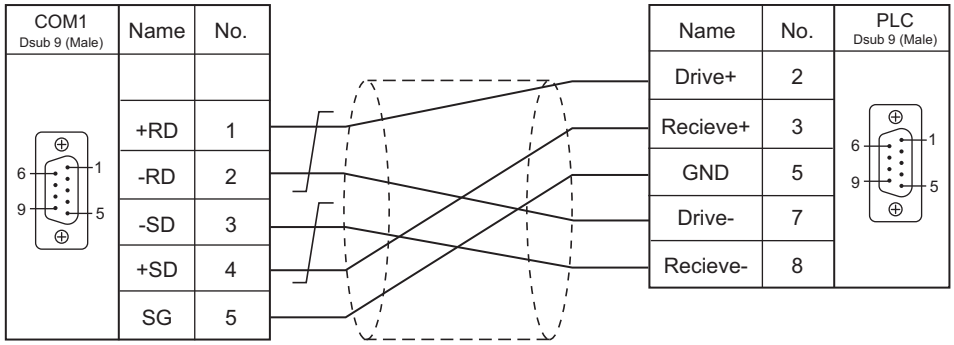
Device Memory	TYPE	Remarks
(parameter)	00H	Double-word

14.1.2 Wiring Diagrams

When Connected at COM1:

RS-422

Wiring diagram 1 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

MEMO

15. M-SYSTEM

15.1 Temperature Controller/Servo/Inverter Connection

15.1 Temperature Controller/Servo/Inverter Connection

Remote I/O

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
R1M series (MODBUS RTU)	R1M series	D-sub connector	RS-232C	COM2	Wiring diagram 1 - COM2	MSYS_R1M.Lst
		Terminal block	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	

15.1.1 R1M Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 15	

Remote I/O

Make PLC settings by using the software "R1CON". For more information, refer to the PLC manual issued by the manufacturer.

Modbus settings (RTU)

(Underlined setting: default)

Item	Setting	Remarks
Node Address	1 to F H (= 1 to 15)	Set by the address setting rotary switch.
Baud Rate	9600 / 19200 / 38400 bps	
Bit Length	8 bits	
Parity	NONE / ODD / EVEN	
Stop Bit	1 / 2 bits	

Available Device Memory

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

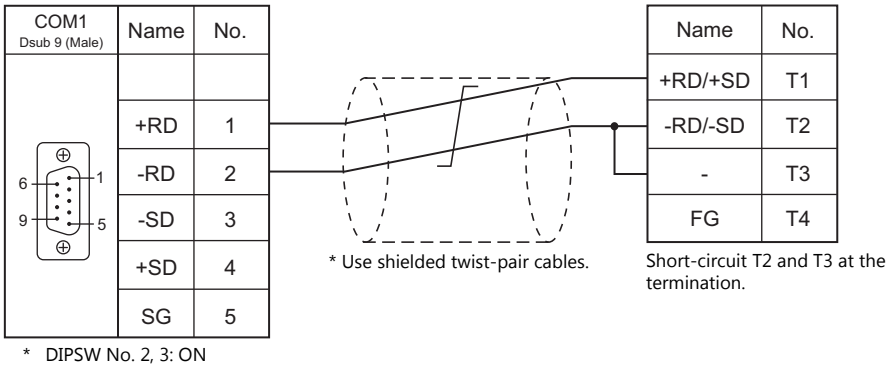
Device Memory		TYPE	Remarks
0	(output coil)	00H	
1	(input relay)	01H	Read only
4	(holding register)	02H	
3	(input register)	03H	Read only

15.1.2 Wiring Diagrams

When Connected at COM1:

RS-485

Wiring diagram 1 - COM1

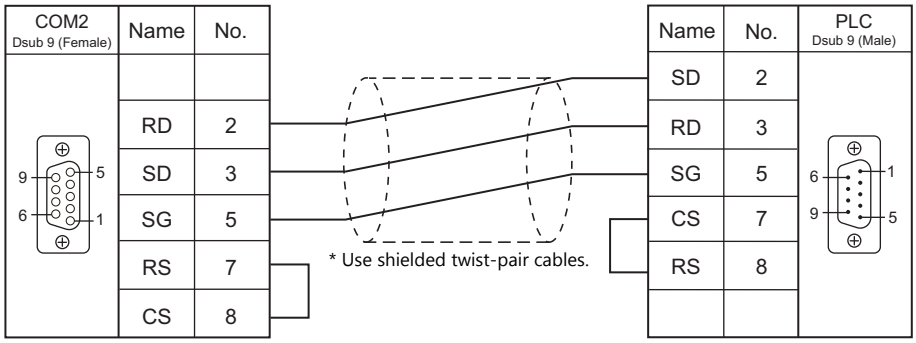


* DIPSW No. 2, 3: ON

When Connected at COM2:

RS-232C

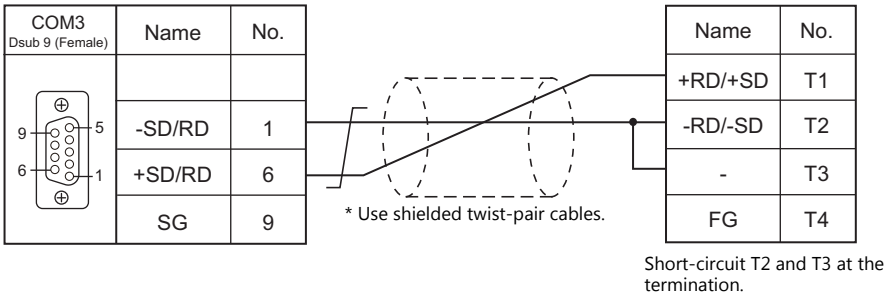
Wiring diagram 1 - COM2



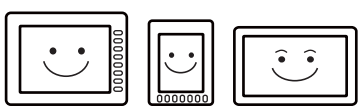
When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



MEMO

MONITOUCH 

16. OMRON

16.1 PLC Connection

Serial Connection

SYSMAC C/CV

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
SYSMAC C	C20H,C28H,C40H	RS-232C port	RS-232C	COM2	Wiring diagram 1 - COM2	○
	C120, C120F C200H C500, C500F C1000H C2000, C2000H	C120-LK201-V1	RS-232C	COM2	Wiring diagram 3 - COM2	
		C120-LK202-V1	RS-422	COM1	Wiring diagram 1 - COM1	
	C200H C200HS-CPU01, 03 C200HS-CPU21, 23 C200HS-CPU31, 33	C200H-LK201 C200H-LK201-V1	RS-232C	COM2	Wiring diagram 3 - COM2	
		C200H-LK202 C200H-LK202-V1	RS-422	COM1	Wiring diagram 1 - COM1	
	C200HS-CPU21, 23 C200HS-CPU31, 33 CQM1-CPU21 CQM1-CPU41, 42, 43, 44	RS-232C port	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
					Wiring diagram 2 - COM2	
	C500, C500F C1000H C2000, C2000H	C500-LK203	RS-232C	COM2	Wiring diagram 3 - COM2	
			RS-422	COM1	Wiring diagram 1 - COM1	
	C200HX C200HG C200HE	RS-232C port	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
					Wiring diagram 2 - COM2	
		C200HW-COM02 C200HW-COM03 C200HW-COM04 C200HW-COM05 C200HW-COM06	RS-422	COM1	Wiring diagram 2 - COM1	
	SRM1-C02	RS-232C port	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
					Wiring diagram 2 - COM2	
	CPM1A	Peripheral port	RS-232C	COM2	OMRON's "CQM1-CIF02" + Wiring diagram 4 - COM2	
	CPM2A	RS-232C port	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
					Wiring diagram 2 - COM2	
		Peripheral port	RS-232C	COM2	OMRON's "CQM1-CIF02" + Wiring diagram 4 - COM2	
	CPM2C	CS1W-CN118	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
		CPM2C-CIF01			Wiring diagram 2 - COM2	
		CPM2C-CIF11	RS-422	COM1	Wiring diagram 4 - COM1	
SYSMAC CV	CV500 CV1000 CV2000 CVM1	Host link port built into CPU	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	×
					Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 5 - COM1	
		CV500-LK201	RS-232C PORT1	COM2	Wiring diagram 3 - COM2	
			RS-232C PORT2	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
					Wiring diagram 2 - COM2	
			RS-422	COM1	Wiring diagram 2 - COM1	

*1 For the ladder transfer function, see the TS Reference Manual 2.

SYSMAC CS1/CJ1

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	TS Port	Connection	Ladder Transfer *1
SYSMAC CS1/CJ1 SYSMAC CS1/CJ1 DNA	CS1	RS-232C port		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	○
		CS1W-SCU21 CS1W-SCU21-V1				Wiring diagram 2 - COM2	
		CS1W-SCU31-V1		RS-422	COM1	Wiring diagram 3 - COM1	
		CS1W-SCB21 CS1W-SCB21-V1		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
		CS1W-SCB41 CS1W-SCB41-V1	Port 1			Wiring diagram 2 - COM2	
			Port 2	RS-422	COM1	Wiring diagram 3 - COM1	
	CJ1H CJ1M	RS-232C port		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
		CJ1W-SCU21 CJ1W-SCU21-V1 CJ1W-SCU22				Wiring diagram 2 - COM2	
		CJ1W-SCU31-V1		RS-422	COM1	Wiring diagram 3 - COM1	
		CJ1W-SCU32		RS-422	COM1	Wiring diagram 4 - COM1	
		CJ1W-SCU41 CJ1W-SCU41-V1	Port 1	RS-422	COM1	Wiring diagram 3 - COM1	
			Port 2	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
						Wiring diagram 2 - COM2	
		CJ1W-SCU42	Port 1	RS-422	COM1	Wiring diagram 4 - COM1	
			Port 2	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
						Wiring diagram 2 - COM2	
	CJ2H CJ2M	RS-232C port *2		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
		CP1W-CIF01*3				Wiring diagram 2 - COM2	
		CP1W-CIF11*3		RS-422	COM1	Wiring diagram 4 - COM1	
		CP1W-CIF12*3		RS-485	COM3	Wiring diagram 1 - COM3	
		CJ1W-SCU21 CJ1W-SCU21-V1 CJ1W-SCU22		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
						Wiring diagram 2 - COM2	
		CJ1W-SCU31-V1		RS-422	COM1	Wiring diagram 3 - COM1	
		CJ1W-SCU32		RS-422	COM1	Wiring diagram 4 - COM1	
		CJ1W-SCU41 CJ1W-SCU41-V1	Port 1	RS-422	COM1	Wiring diagram 3 - COM1	
			Port 2	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
						Wiring diagram 2 - COM2	
		CJ1W-SCU42	Port 1	RS-422	COM1	Wiring diagram 4 - COM1	
			Port 2	RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
						Wiring diagram 2 - COM2	
	CP1E (N/NA) *4 CP1H CP1L	RS-232C port *5		RS-232C	COM2	Hakko Electronics' "D9-OM2-09" + Gender changer	
		CP1W-CIF01				Wiring diagram 2 - COM2	
		CP1W-CIF11 CP1W-CIF12		RS-422	COM1	Wiring diagram 4 - COM1	
				RS-485	COM3	Wiring diagram 1 - COM3	

*1 For the ladder transfer function, see the TS Reference Manual 2.
*2 No built-in serial communication port is provided for CJ2M-3x.
*3 Can be used only with CJ2M-3x.

*4 CP1E (E type) cannot be connected because it is not equipped with a built-in serial communication port and the optional board cannot be installed on it.
*5 Only CP1E (N/NA type) is equipped with the built-in serial communication port.

Ethernet Connection

SYSMAC CS1/CJ1

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Ladder Transfer *2
SYSMAC CS1/CJ1 (Ethernet) SYSMAC CS1/CJ1 (Ethernet Auto) SYSMAC CS1/CJ1 DNA (Ethernet)	CS1	CS1W-ETN01 CS1W-ETN11 CS1W-ETN21	×	○	9600	○	×
	CJ1	CJ1W-ETN11 CJ1W-ETN21					

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*2 For the ladder transfer function, see the TS Reference Manual 2.

NX/NJ Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Ladder Transfer *2
NJ Series (EtherNet/IP)	NX701	Built-in EtherNet/IP port	○	×	Fixed to 44818 Max. 32 units connectable	×	×
	NJ101 NJ301 NJ501	Built-in EtherNet/IP port					
		CJ1W-EIP21					

*1 For KeepAlive functions, see 1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only).
*2 For the ladder transfer function, see the TS Reference Manual 2.

16.1.1 SYSMAC C

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	
Transmission Mode	Transmission Mode 1 / Transmission Mode 2	Transmission Mode 1: BCD without signs Transmission Mode 2: BCD with signs

Transmission mode 2

When the transmission mode 2 (BCD with signs) is selected, data in the PLC device memory can be displayed on the TS as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.
[F]: Regards higher 4 bits as [–0].
[A]: Regards higher 4 bits as [–1].

- Displayable range 1 word: –1999 to +9999
  2 words: –19999999 to +99999999

  Example:

PLC Device Memory	Indication on the TS
0000 to 9999	0 to 9999
F001 to F999	–1 to –999
A000 to A999	–1000 to –1999
00000000 to 99999999	0 to 99999999
F0000001 to F9999999	–1 to –9999999
A0000000 to A9999999	–10000000 to –19999999

- Setting procedure: Num. Display [Input Type: BCD]
  [Display Type: DEC] (w/ sign –, w/ sign +–)

PLC

C20H / C28H / C40H

Standard setting

Item	Setting	Remarks
Start Bit	1 bit	Communication parameter format can be specified in the DM920 to DM923 device memory. For more information, refer to the PLC manual issued by the manufacturer.
Data Length	7 bits	
Parity	Even	
Stop Bit	2 bits	
Baud Rate	9600 bps	

C120-LK201-V1 / C120-LK202-V1

Switch setting

Switch	No.	Setting	Contents
SW1	1 to 5	OFF	Unit No. 0
	6 to 7	OFF	Not used
	8	ON	Starts operation at power-up
SW2	1	OFF	19200 bps
	2	OFF	
	3	ON	
	4	OFF	
	5	OFF	Not used
	6	OFF	1 : n protocol
	7	ON	Disables command levels 1, 2, and 3
	8	ON	
SW3	1	ON	CTS switch: always ON
	2	OFF	
	3	ON	LK201-V1: internal synchronization LK202-V1: terminating resistance provided
	4	OFF	
	5	ON	
	6	OFF	
	7 to 8	OFF	Not used

The communication parameter setting is fixed to 7 bits for data length, 2 bits for stop bit, and even for parity.

C200H-LK201-V1 / C200H-LK202-V1

Front switch setting

Switch	Setting	Contents
SW1	0	Higher-order digit of the unit No. (×10)
SW2	0	Lower-order digit of the unit No. (×1)
SW3	6	19200 bps
SW4	2	Disables command levels 1, 2 and 3 / 7 / 2 / even

Back switch setting

Unit	Switch	Setting	Contents
LK201	SW1	OFF	Not used
	SW2	OFF	
	SW3	ON	1 : n protocol
	SW4	OFF	5-V power not supplied
	CTS switch	0	0 V (always ON)
LK202	Terminating resistance	ON	Provided
	Protocol	OFF	1 : n protocol

C500H-LK203

Back switch setting

Switch		Setting	Contents
5-V power supply		OFF	
I/O port		-	RS-232C/RS422
Synchronization		Internal	
Terminating resistance		Provided	Applicable for RS-422
CTS		0V	0 V
SW1	1 to 5	OFF	Unit No. 0
	6	OFF	7 / 2 / even
	7	OFF	
	8	ON	Monitor
SW2	1	OFF	19200 bps
	2	OFF	
	3	ON	
	4	OFF	
	5	ON	System No. 0
	6	OFF	1 : n protocol
	7	ON	Disables levels 1, 2, and 3
	8	ON	

C200HX / C200HG / C200HE

DIP switch

Item	Setting		Remarks
SW5	ON	Standard setting	7, 2, E, 9600 bps, Unit No. 0
	OFF	PC system setting	Communication settings are made by setting DM6645 to 6648. For more information, refer to the PLC manual issued by the manufacturer. Setting example DM6645: "0001H" Communication is performed according to the setting for DM6646. DM6646: "0304H" 7, 2, E, 19200 bps DM6648: "0000H" Unit No. 0

C200HW-COM02 - 06

DIP switch

For the port A of C200HW-CCM03/06 (RS-422), the DIP switch setting is available.

DIP Switch	Contents	Setting
SW1	Change-over of 2-wire or 4-wire system	4 (4-wire system)
SW2	Terminator	ON

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

CPM2A

Communication condition setting switch

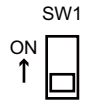
Communication Condition Setting Switch	Setting	Contents
	OFF	The peripheral port and RS-232C port are operated according to the communication protocol and communication format set on the PLC system setting.

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

CPM1A/CPM2C

Communication port function setting switch (only for CPM2C)

Communication Port Function Setting Switch	Setting	Contents
	OFF	The RS-232C port is operated according to the communication protocol and communication format set on the PLC system setting.

PLC system setting (peripheral port)

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

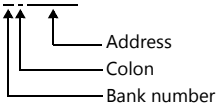
Available Device Memory

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
HR	(holding relay)	02H	
LR	(link relay)	03H	
AR	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 7.
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to 7 in the expansion code.

16.1.2 SYSMAC CV

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	
Transmission Mode	Transmission Mode 1 / Transmission Mode 2	Transmission Mode 1: BCD without signs Transmission Mode 2: BCD with signs

Transmission mode 2

When the transmission mode 2 (BCD with signs) is selected, data in the PLC device memory can be displayed on the TS as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.
[F]: Regards higher 4 bits as [–0].
[A]: Regards higher 4 bits as [–1].

- Displayable range 1 word: –1999 to +9999
  2 words: –19999999 to +99999999

  Example:

PLC Device Memory	Indication on the TS
0000 to 9999	0 to 9999
F001 to F999	–1 to –999
A000 to A999	–1000 to –1999
00000000 to 99999999	0 to 99999999
F0000001 to F9999999	–1 to –9999999
A0000000 to A9999999	–10000000 to –19999999

- Setting procedure: Num. Display [Input Type: BCD]
  [Display Type: DEC] (w/ sign –, w/ sign +–)

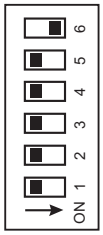
PLC

CPU Unit

Communication selector switch

Communication Selector Switch	Setting
RS-232  RS-422	Upper: RS-232C Lower: RS-422

Basic setting DIP switch

DIP Switch		Setting	Remarks
	No. 3	OFF: Host link communication	
	No. 4	OFF: The host communication port is operated according to the communication condition set on the PLC system setting.	ON: Fixed to 9600 bps for baud rate, 0 for station number, 7 bits for data length, 2 bits for stop bit and even parity
	No. 6	ON: With terminating resistance	Invalid during RS-232C communication

PLC system setting (host link port)

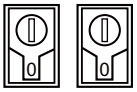
Item		Setting	Remarks
Port Setting	Default Setting	Unchecked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
	Baud Rate	4800 / 9600 / 19200	
	Parameter	7, 2, E	
Unit No.		00	

Host Link Unit

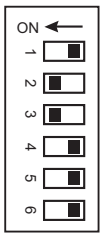
Communication selector switch

Communication Selector Switch	Setting
RS-232  RS-422	Communication port 2 Upper: RS-232C Lower: RS-422

Unit No. selector switch

Unit No. Selector Switch	Setting
NODE No.  $X10^1$ $X10^0$	Communication port 2 Unit No.: 00 to 31 (DEC)

Basic setting DIP switch

DIP Switch		Setting	Remarks
	No. 1	OFF: The link unit is operated according to the communication condition set on the CPU advanced unit system setting.	ON: Fixed to 9600 bps for baud rate, 0 for station number, 7 bits for data length, 2 bits for stop bit and even parity CPU fixed
	No. 2	ON: Switching CTS for communication port 1	
	No. 3	ON: Switching CTS for communication port 2	Invalid during RS-422 communication
	No. 4	OFF: Not used	
	No. 5	OFF: Normal operation	

CPU advanced unit system setting

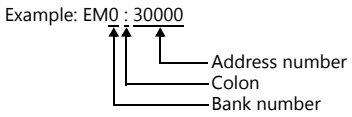
Set parameters for communication port 1 or 2.

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
AR	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 7.
The assigned device memory is expressed as shown on the right when editing the screen.



Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to 7 in the expansion code.

16.1.3 SYSMAC CS1/CJ1

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	
Transmission Mode	Transmission Mode 1 / Transmission Mode 2	Transmission Mode 1: BCD without signs Transmission Mode 2: BCD with signs

Transmission mode 2

When the transmission mode 2 (BCD with signs) is selected, data in the PLC device memory can be displayed on the TS as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.
[F]: Regards higher 4 bits as [–0].
[A]: Regards higher 4 bits as [–1].

- Displayable range 1 word: –1999 to +9999
  2 words: –19999999 to +99999999

  Example:

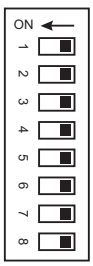
PLC Device Memory	Indication on the TS
0000 to 9999	0 to 9999
F001 to F999	–1 to –999
A000 to A999	–1000 to –1999
00000000 to 99999999	0 to 99999999
F0000001 to F9999999	–1 to –9999999
A0000000 to A9999999	–10000000 to –19999999

- Setting procedure: Num. Display [Input Type: BCD]
  [Display Type: DEC] (w/ sign –, w/ sign +–)

PLC

CJ1/CS1/CJ2 (Built-in RS-232C Port / CP1W-CIFxx)

DIP switch

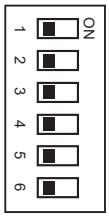
Switch		Contents	Setting
	SW1	User memory writing	OFF: enabled
	SW2	Automatic user program transfer at power-up	OFF: not executed
	SW3	CJ1/CJ2: Blank CS1: message of the programming console (Japanese/English)	OFF
	SW4	CJ2: Blank CS1/CJ1: peripheral port communication condition	OFF: CX-Programmer connection
	SW5	RS-232C communication setting	OFF: According to the setting made on the PLC system setting
	SW6	User-specified switch	OFF
	SW7	Simple-backup type specification	OFF
	SW8	Fixed to OFF	OFF

PC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Parameter	7, 2, E	
Mode	Host link	
Unit No.	00	

CP1W-CIF11/12 DIP switch

Make the operation setting for the RS-422/485 optional board (CP1W-CIF11/12) by using the DIP switch provided on the backside.

Switch		Contents	Setting
	SW1	Terminating resistance	ON: Provided
	SW2	2-wire / 4-wire selection	ON: 2-wire system OFF: 4-wire system
	SW3	2-wire / 4-wire selection	ON: 2-wire system OFF: 4-wire system
	SW4	Not used	OFF
	SW5	RS control for RD	OFF: Without control
	SW6	RS control for SD	ON: With control (when 2-wire system is selected) OFF: Without control (when 4-wire system is selected)

CJ1/CS1/CJ2 (Serial Communication Board/Unit)

Advanced unit setting

Item	Setting	Remarks
Random Setting	Provided	
Serial Communication Mode	Default (host link) / Host link	When "Default (host link)" is selected, the unit operates as the unit No. 0.
Data Length	7 bits / 8 bits	
Stop Bit	2 bits / 1 bit	
Parity	Even, odd, none	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Send Delay Time	Default: 0 ms	
Send Delay Time Random Setting	0	
CTS control	None	
Host link unit No.	00	

DM area setting

m = D30000 + 100 x unit No. (CH)

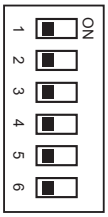
DM Area				Bit	Contents	Setting
Board		Unit				
Port 1	Port 2	Port 1	Port 2			
D32000	D32010	m	m + 10	15	Port setting	1: Random setting
				14 to 12	Reserved	-
				11 to 08	Host link	0 or 5
				07 to 05	Reserved	-
				04	Start bit	0: 1 bit
				03	Data length	0: 7 bits 1: 8 bits
				02	Stop bit	0: 2 bits 1: 1 bit
				01	Parity	0: Provided 1: None
				00	Parity	0: Even 1: Odd

DM Area				Bit	Contents	Setting
Board		Unit				
Port 1	Port 2	Port 1	Port 2			
D32001	D32011	m + 1	m + 11	15 to 04	Reserved	-
				03 to 00	Baud rate	0: 9600 5: 4800 6: 9600 7: 19200 8: 38400 9: 57600 A: 115200
D32002	D32012	m + 2	m + 12	15	Send delay time	0: 0 ms 1: Random setting
				14 to 00	Send delay time random setting	0 to 7530H Unit: 10 ms
D32003	D32013	m + 3	m + 13	15	CTS control	0: None 1: Provided
				14	1 : n/1 : 1 protocol setting	1: 1 : 1 protocol 0: 1 : n protocol
				13 to 11	Reserved	-
				10 to 08	Host link-compatible model mode	
				07 to 00	Unit No.	00 to 1FH

CP1 (Built-in RS-232C Port / CP1W-CIFxx)

CPU DIP switch

Set the communication conditions for the CP1H/CP1L optional board slot by using the CPU DIP switch.

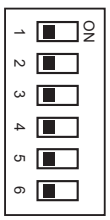
Switch		Contents	Setting
	SW4	Optional slot 1 communication condition	OFF: According to the setting made on the PLC system setting
	SW5	Optional slot 2 communication condition	OFF: According to the setting made on the PLC system setting

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Parameter	7, 2, E	
Mode	Host link	
Unit No.	00 to 31	

CP1W-CIF11/12 DIP switch

Make the operation setting for the RS-422/485 optional board (CP1W-CIF11/12) by using the DIP switch provided on the backside.

Switch		Contents	Setting
	SW1	Terminating resistance	ON: Provided
	SW2	2-wire / 4-wire selection	ON: 2-wire system OFF: 4-wire system
	SW3	2-wire / 4-wire selection	ON: 2-wire system OFF: 4-wire system
	SW4	Not used	OFF
	SW5	RS control for RD	OFF: Without control
	SW6	RS control for SD	ON: With control (when 2-wire system is selected) OFF: Without control (when 4-wire system is selected)

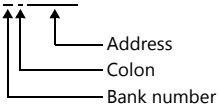
Available Device Memory

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
H	(holding relay)	02H	
A	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1, not available on the CP1 series
W	(internal relay)	08H	
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 18 (HEX).
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000

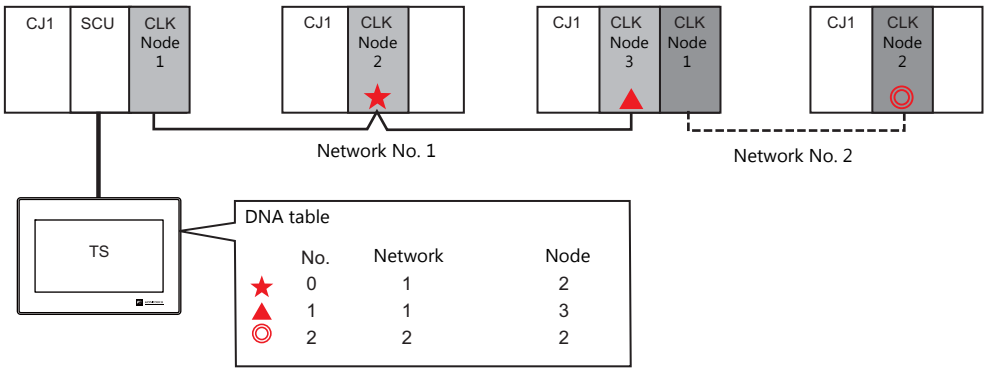


Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to 18 (HEX) in the expansion code.

16.1.4 SYSMAC CS1/CJ1 (DNA)

The TS can communicate with CS1/CJ1 on the network (Controller Link) via the serial unit.



Communication Setting

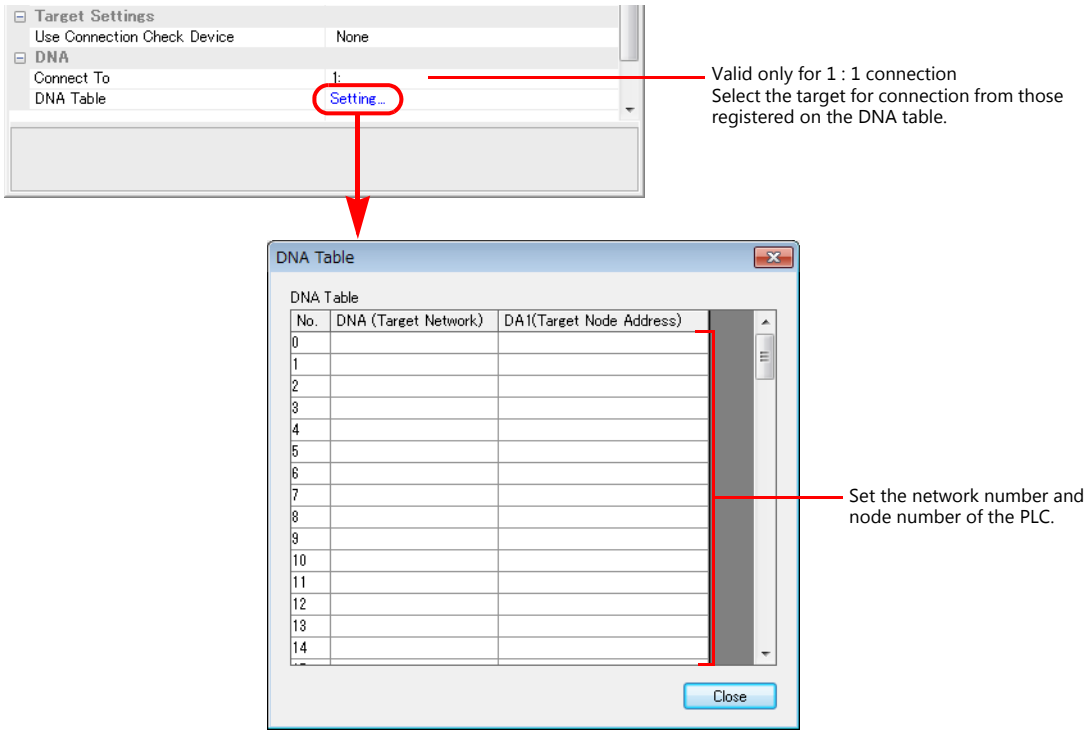
Editor

Communication settings

The communication setting is the same as the one described in "16.1.3 SYSMAC CS1/CJ1".

DNA

[System Setting] → [Hardware Setting] → [PLC Properties] → [DNA]



Item	Setting
DNA	Set the network number of the communication target.
DA1	Set the node address of the communication target.

PLC

Communication setting

The communication setting is the same as the one described in "16.1.3 SYSMAC CS1/CJ1".

CX-Integrator

Set the PLC routing table on "CX-Integrator". Two types of routing tables are available: local network table and relay network table.
An error will occur unless these settings are made correctly. For more information, refer to the PLC manual issued by the manufacturer.

- Local network table
  Set the unit number and network number of the communication unit.
- Relay network table
  Set the network number of the access target (final network No.) and the first relay point (relay network No., relay node No.).

Rotary switch

Switch	Setting
NODE No.	Set the node number of the Controller Link unit.

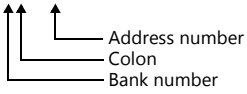
Available Device Memory

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
H	(holding relay)	02H	
A:	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1, not available on the CP1 series
W	(internal relay)	08H	
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to C (HEX).
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to C (HEX) in the expansion code.

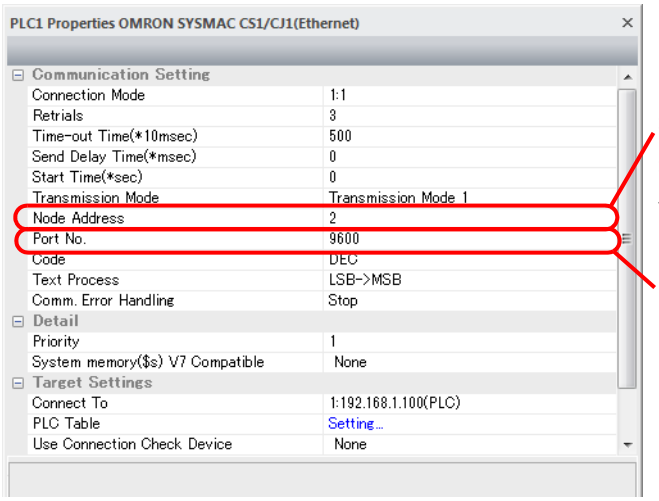
16.1.5 SYSMAC CS1/CJ1 (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

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

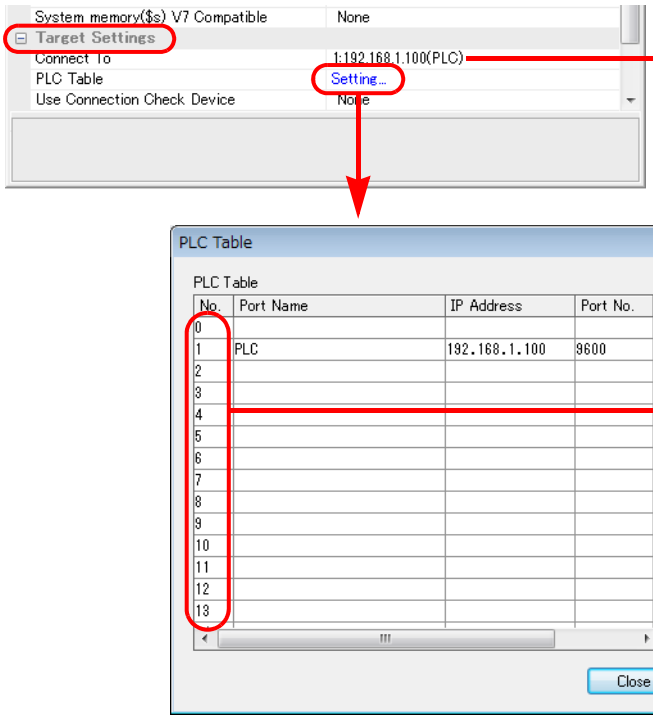


Set the node number of the TSi.

Set the same number as the TSi node number specified for [IP Address Table] on the PLC.

Set the same number as the one specified for [FINS/UDP Port] on the PLC.

- 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.

PLC table No. = PLC node address

Set the IP address, port number and whether or not to use the KeepAlive function to the same number as the PLC node address.

PLC

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

Parameter setting

Item	Setting
IP Address	IP address of the PLC
Subnet Mask	Subnet mask of the PLC
IP Address Conversion	IP address table
IP Address Table	IP address and node number of the PLC IP address and node number of the TSi
FINS/UDP Port	Default (9600)

Rotary switch

Switch	Setting
NODE No.	Set the FINS node number of the Ethernet unit. Match the node number to the one registered in the IP address table.

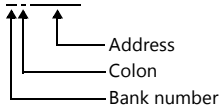
Available Device Memory

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
H	(holding relay)	02H	
A	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1
W	(internal relay)	08H	
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to C (HEX).
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to C (HEX) in the expansion code.

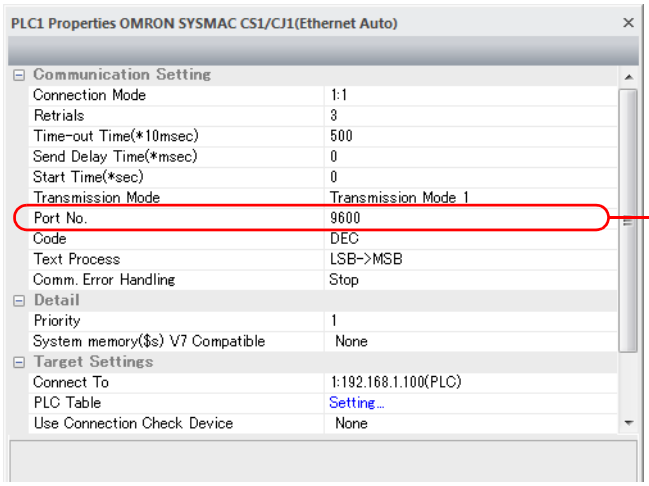
16.1.6 SYSMAC CS1/CJ1 (Ethernet Auto)

Communication Setting

Editor

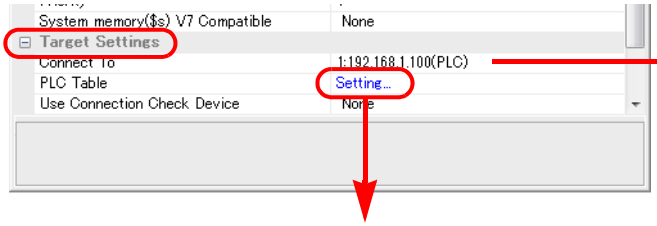
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

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

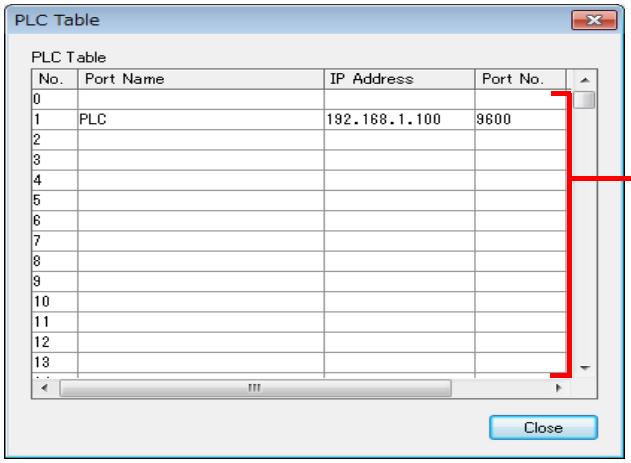


Set the same number as the one specified for [FINS/UDP Port] on the PLC.

- 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

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

Parameter setting

Item	Setting
IP Address (FINS node address)	IP address of the PLC Set the same number as the node number of the rotary switch for the lowest byte which is to be the FINS node address.
Subnet Mask	Subnet mask of the PLC
IP Address Conversion	Automatic generation (dynamic)
FINS/UDP Port	Default (9600)

Rotary switch

Switch	Setting
NODE No.	Set the FINS node number of the Ethernet unit. Match the node number to the lower byte of the IP address.

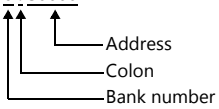
Available Device Memory

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
DM	(data memory)	00H	
CH	(input/output/internal auxiliary relay)	01H	
H	(holding relay)	02H	
A	(auxiliary memory relay)	04H	
T	(timer/current value)	05H	
C	(counter/current value)	06H	
EMn	(extended data memory)	07H	*1
W	(internal relay)	08H	
TU	(timer/contact)	09H	Read only
CU	(counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to C (HEX). The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000

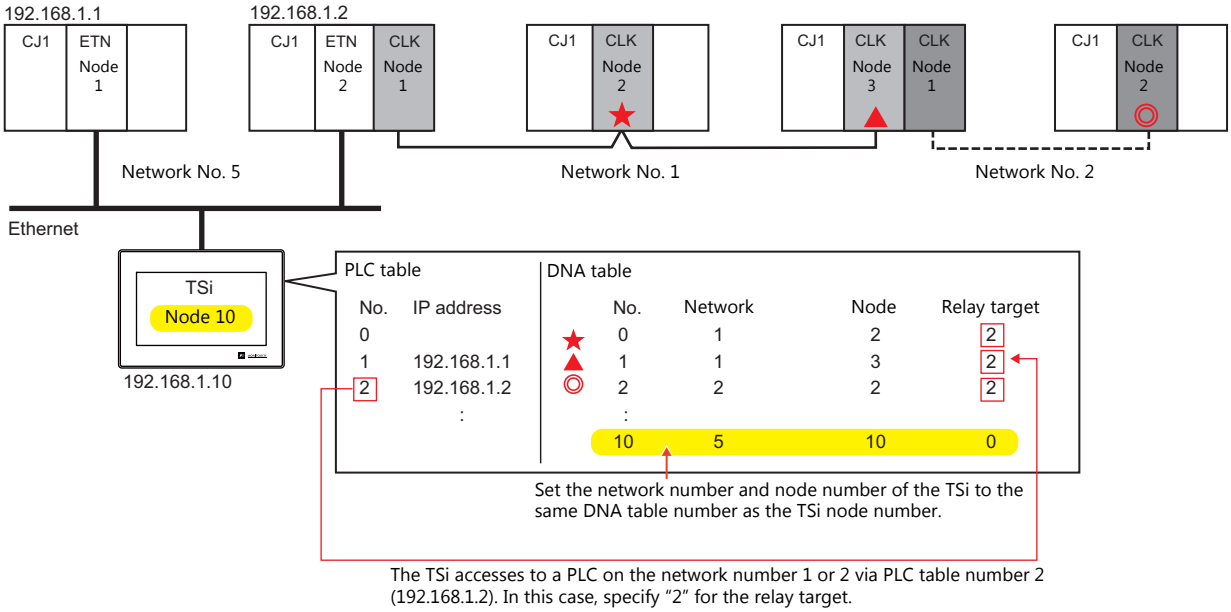


Indirect Device Memory Designation

- EMn (extended data memory)
  Specify the bank number 0 to C (HEX) in the expansion code.

16.1.7 SYSMAC CS1/CJ1 DNA (Ethernet)

The TSi can communicate with CS1/CJ1 on the network (Controller Link) via the Ethernet unit.

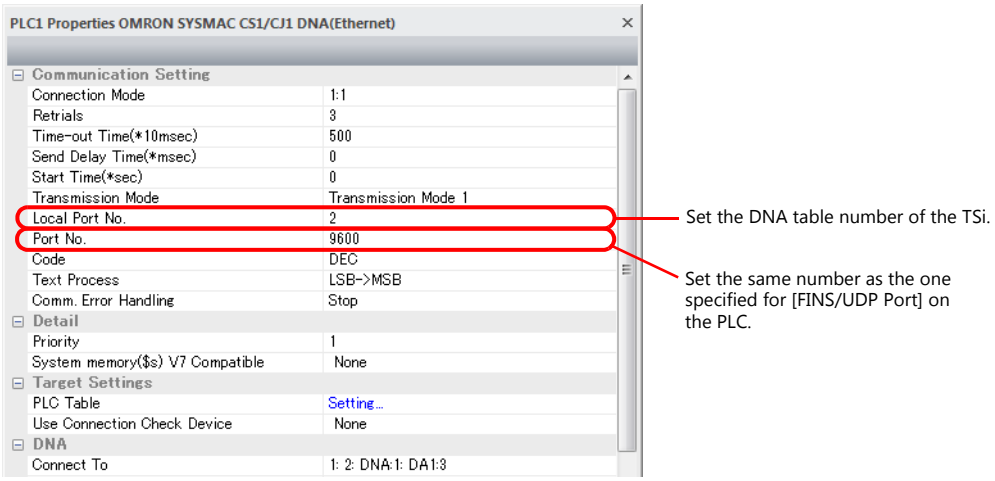


Communication Setting

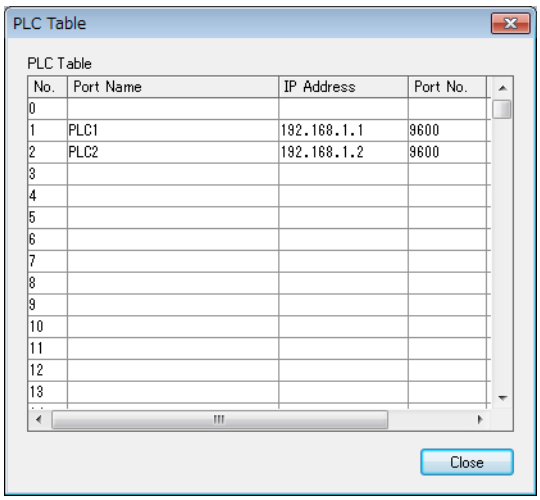
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number (for communication with PLC) and local port number (TSi DNA table number) of the TSi unit
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



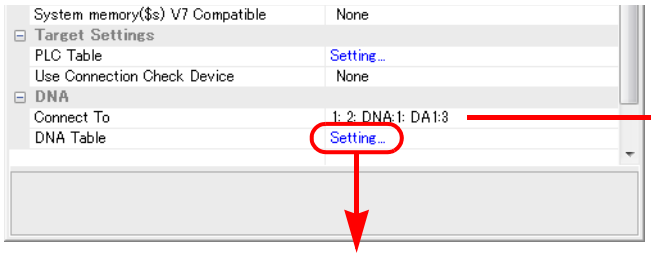
- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



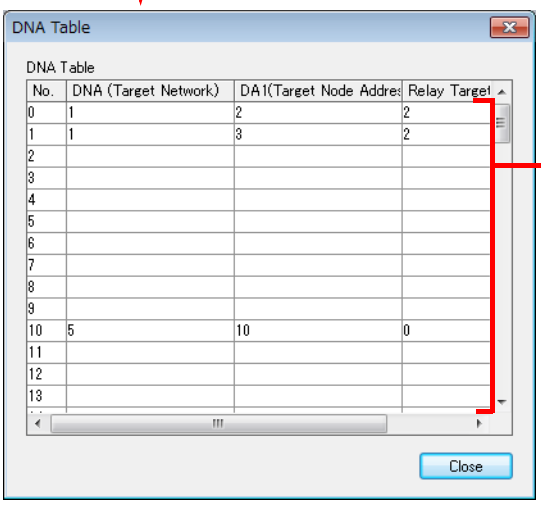
PLC table No. = PLC node address

Set the IP address, port number and whether or not to use the KeepAlive function to the same number as the PLC node address.

- Network number and node number of the PLC, PLC table number of the relay PLC
  Network number and node number of the TSi
  [System Setting] → [Hardware Setting] → [PLC Properties] → [DNA]



Valid only for 1 : 1 connection



Set the network number and node number of the PLC, and the PLC table number of the relay PLC.

Set the network number and node number of the TSi to the same number as the one specified for [Local Port No.] on the TSi.
[Relay Target Network Table No.] is disabled.

PLC

Communication setting

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

Parameter setting

Item	Setting
IP Address	IP address of the PLC
Subnet Mask	Subnet mask of the PLC
IP Address Conversion	IP address table
IP Address Table	IP address and node number of the PLC IP address and node number of the TSi
FINS/UDP Port	Default (9600)

Rotary switch

Switch	Setting
NODE No.	Set the node number of the Ethernet unit or Controller Link unit.

CX-Integrator

Set the PLC routing table on "CX-Integrator". Two types of routing tables are available: local network table and relay network table.
An error will occur unless these settings are made correctly. For more information, refer to the PLC manual issued by the manufacturer.

- Local network table
  Set the unit number and network number of the communication unit.
- Relay network table
  Set the network number of the access target (final network No.) and the first relay point (relay network No., relay node No.).

Available Device Memory

The available device memory is the same as the one described in "16.1.5 SYSMAC CS1/CJ1 (Ethernet)".

16.1.8 NJ Series (EtherNet/IP)

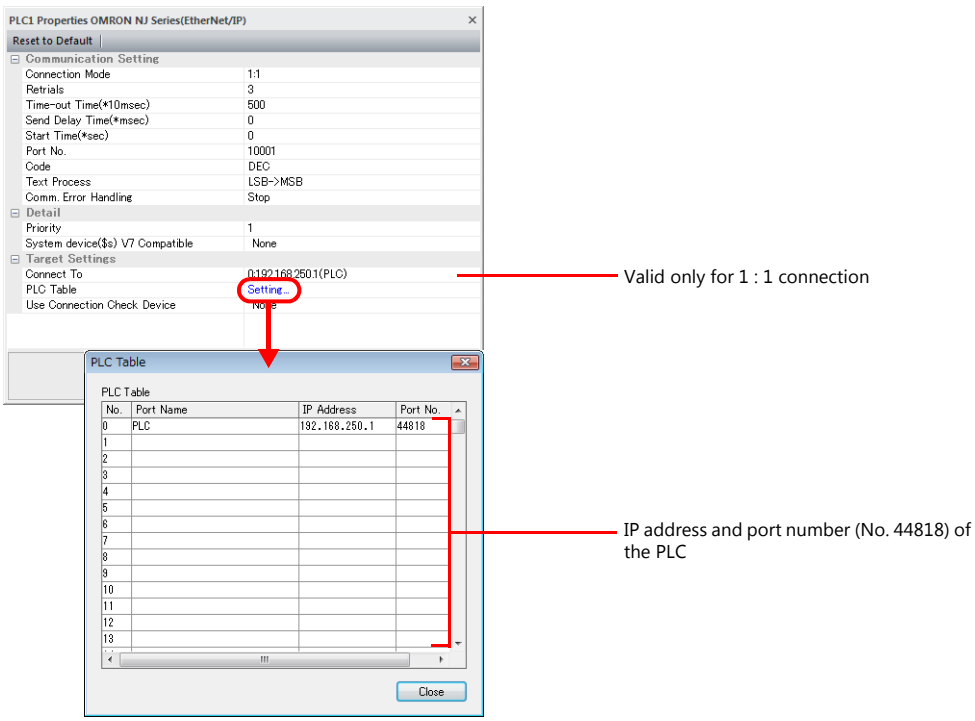
- Connection is possible only by the built-in LAN port of the TSi. The “CUR-03” communication unit cannot be used.
- Only logical port PLC1 can be selected because the tag table is used.

Communication Setting

Editor

Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)”.

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



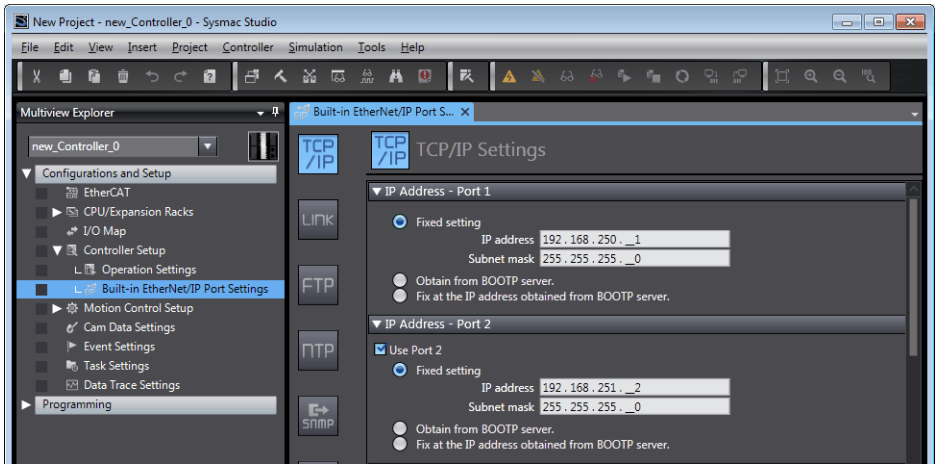
PLC

Set the IP address using the Sysmac Studio ladder tool. For more information, refer to the PLC manual issued by the manufacturer.

Built-in EtherNet/IP port

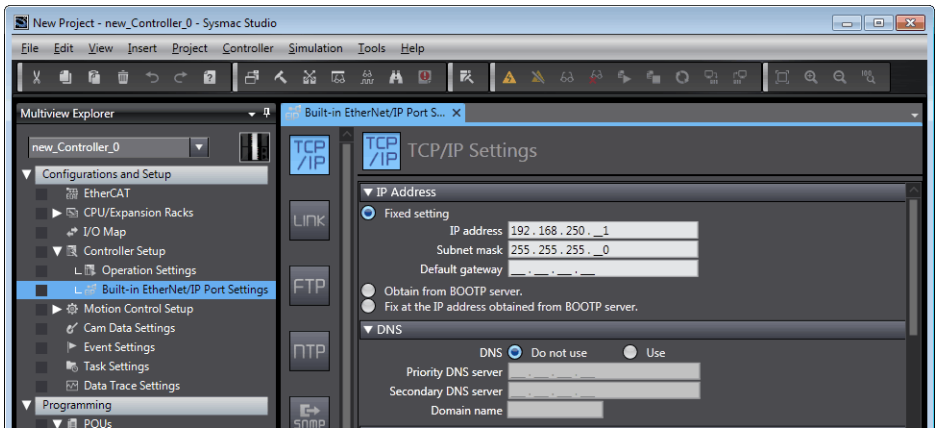
Select [Configurations and Setup] → [Controller Setup] → [Built-in EtherNet/IP Port Settings] on the [Multiview Explorer] pane and configure settings.

NX701



Item				
TCP/IP Settings	IP Address - Port 1	**Fixed setting**	IP address	Specify the IP address for port 1 of the PLC.
			Subnet mask	Specify the subnet mask for port 1 of the PLC.
	IP Address - Port 2	**Fixed setting**	IP address	Specify the IP address for port 2 of the PLC.
			Subnet mask	Specify the subnet mask for port 2 of the PLC.

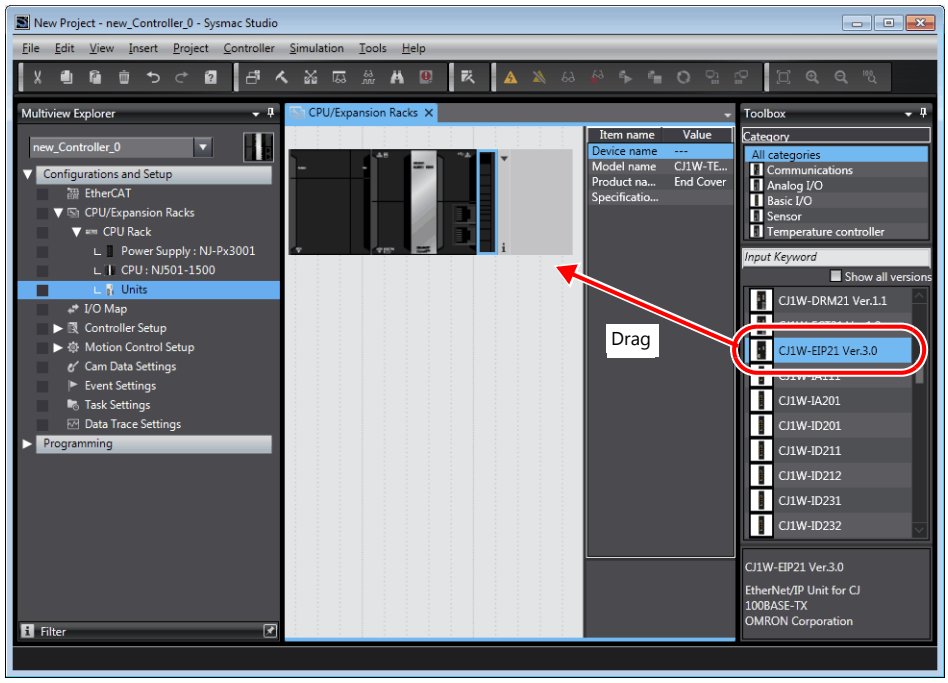
NJ101/NJ301/NJ501



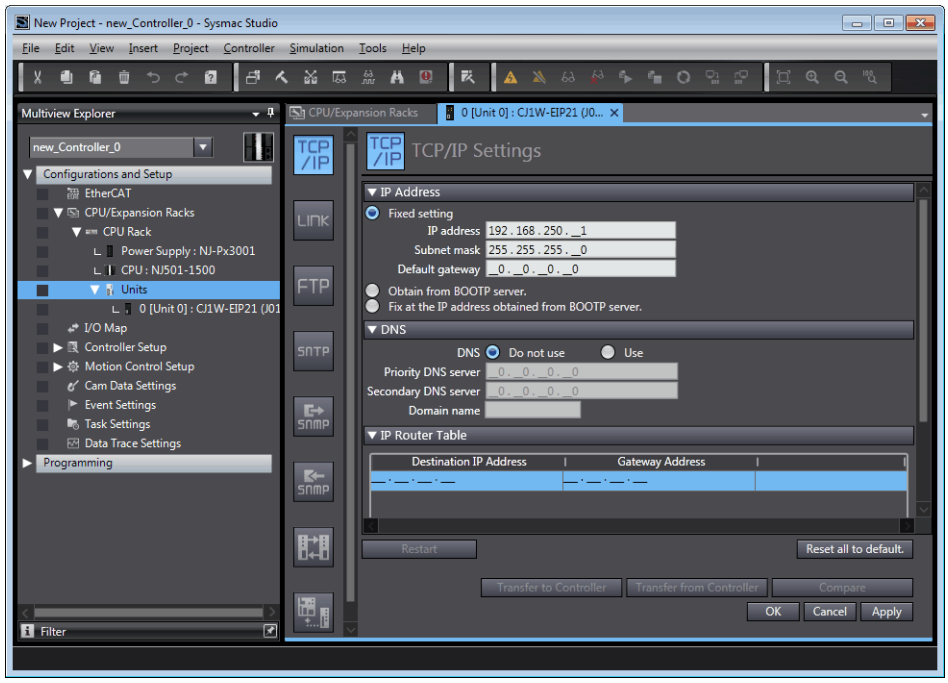
Item				
TCP/IP Settings	IP address	**Fixed setting**	IP address	Specify the IP address for the PLC.
			Subnet mask	Specify the subnet mask for the PLC.
			Default gateway	Specify according to the environment.

CJ1W-EIP21

- Unit registration
  Display the [CPU/Expansion Racks] tab window by double-clicking [CPU/Expansion Racks] under [Configurations and Setup] on the [Multiview Explorer] pane. Then register the unit by dragging "CJ1W-EIP21" from the [Toolbox] pane onto the tab window.



- IP address registration
  Select the newly registered "CJ1W-EIP21" unit on the [Multiview Explorer] pane and configure settings.



Item				
TCP/IP Settings	IP address	**Fixed setting**	IP address	Specify the IP address for the PLC.
			Subnet mask	Specify the subnet mask for the PLC.
			Default gateway	Specify according to the environment.

Available Device Memory

Set the PLC device memory by importing variables (tags) created using the PLC ladder tool into V-SFT.
For details on importing tags, refer to the "OMRON NX/NJ Series Connection" manual.

Data type		Range of Number of Elements for Arrays *1			Remarks
		Index1	Index2	Index3	
BOOL	(1-bit integer)	0 to 65535	0 to 32767	0 to 16383	*2, *3
SINT	(1-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
INT	(2-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	
DINT	(4-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	
REAL	(4-byte floating-point)	0 to 65535	0 to 32767	0 to 16383	
STRING	(character string)	0 to 255	-	-	
USINT	(1-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
UINT	(2-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	
UDINT	(4-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	
BYTE	(1-byte integer)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
WORD	(2-byte integer)	0 to 65535	0 to 32767	0 to 16383	
DWORD	(4-byte integer)	0 to 65535	0 to 32767	0 to 16383	

*1 The ranges given are based on when a maximum value is specified. The maximum setting is 65335, which is the total number of elements (Index1 × Index2 × Index3).
Ranges differ according to the created tag.

*2 With multi-dimensional arrays, PLC device memory is allocated from lower bits.
For access in units of words, such as for numerical data display parts, access is done in accordance with the allocation of PLC device memory.

- BOOL type
When the variable (tag) registration on the PLC is "FLAG[4] [8]"

FLAG (32 bits)																															
3								2								1								0							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

When "FLAG [0] [0]" is specified for a numerical data display part (1 word) on V-SFT, the 16 bits from "FLAG [0] [0]" to "FLAG [1] [7]" are read.

- SINT type
When the variable (tag) registration on the PLC is "DATA[2] [4]"

DATA (8 bytes)							
1				0			
3	2	1	0	3	2	1	0

When "DATA[0][0]" is specified for a numerical data display part (1 word) on V-SFT, the 2 bytes from "DATA[0] [0]" to "DATA[0] [1]" are read.

*3 Only existing data is accessed if the size of the accessed tag is smaller than 2 bytes (1 word) for access in units of words such as for numerical data display parts.

Example: SINT type
When the variable (tag) registration on the PLC is "DATA [3] [3]"

-	DATA (9 bytes)								
-	2			1			0		
-	2	1	0	2	1	0	2	1	0

When "DATA [2] [2]" is specified for a numerical data display part (1 word) on V-SFT, only the single byte of "DATA [2] [2]" is accessed.

*4 For access in units of words, bits 8 to 15 correspond to the next byte device memory.

Indirect Device Memory Designation

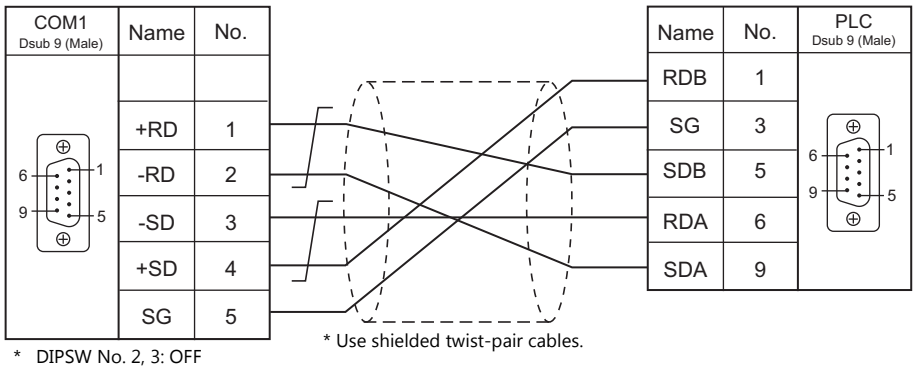
Not available

16.1.9 Wiring Diagrams

When Connected at COM1:

RS-422

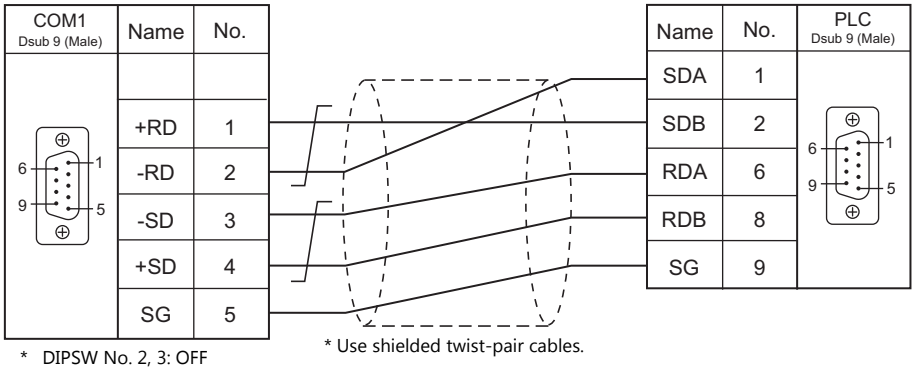
Wiring diagram 1 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

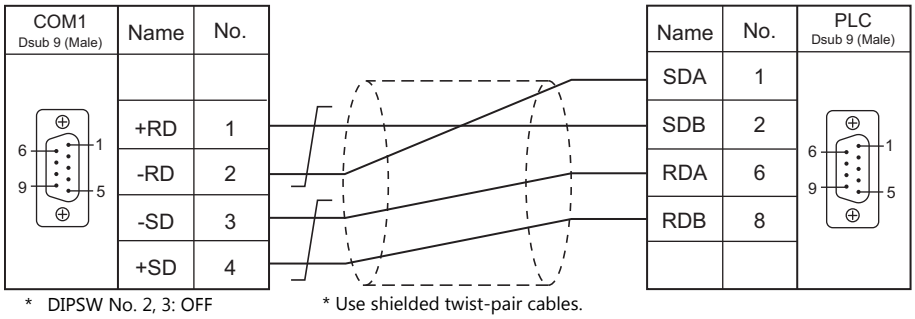
Wiring diagram 2 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

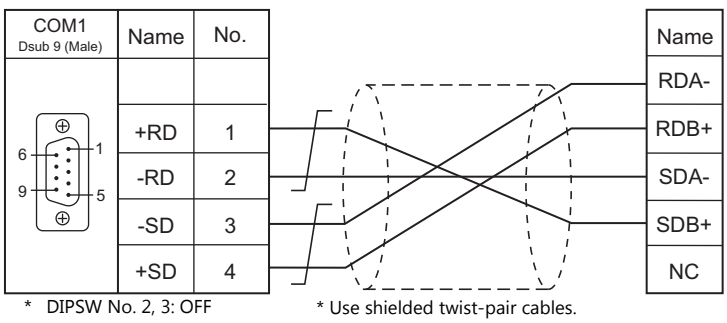
Wiring diagram 3 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

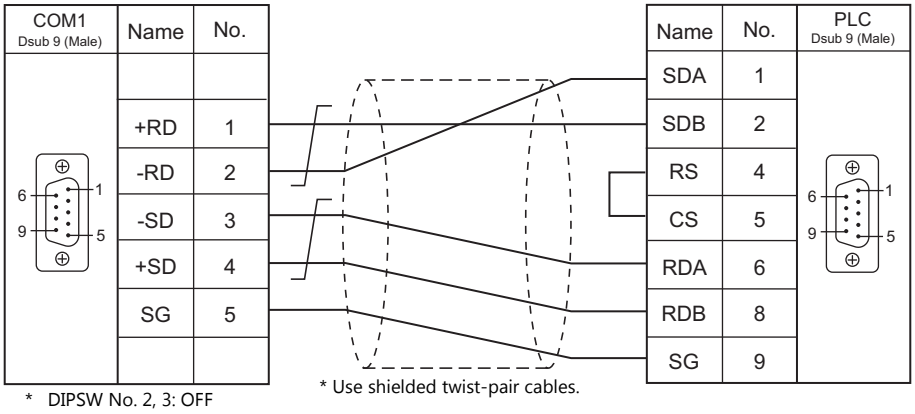
Wiring diagram 4 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

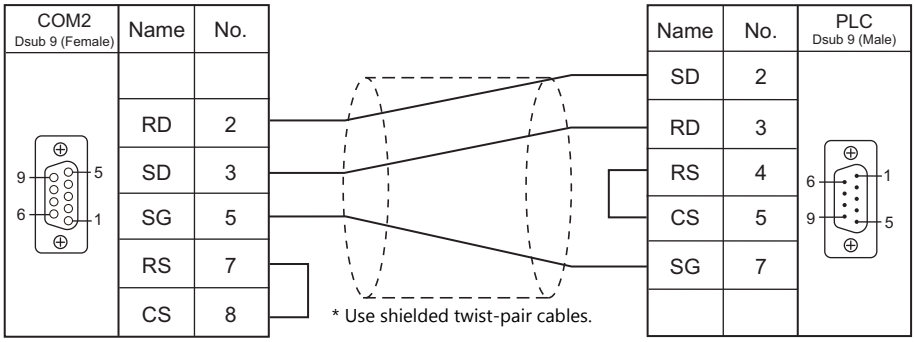
Wiring diagram 5 - COM1



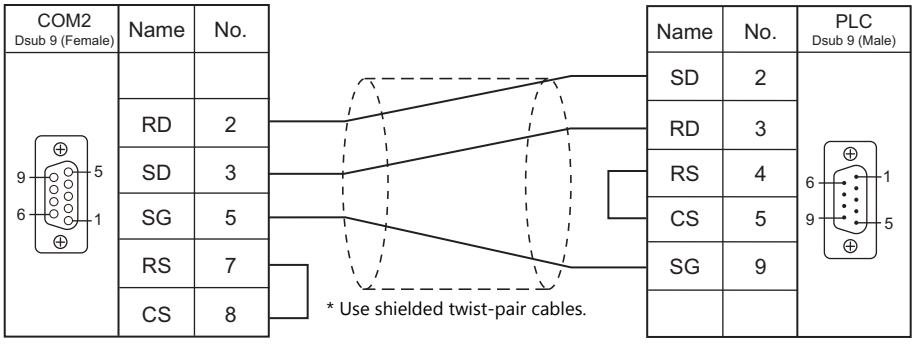
When Connected at COM2:

RS-232C

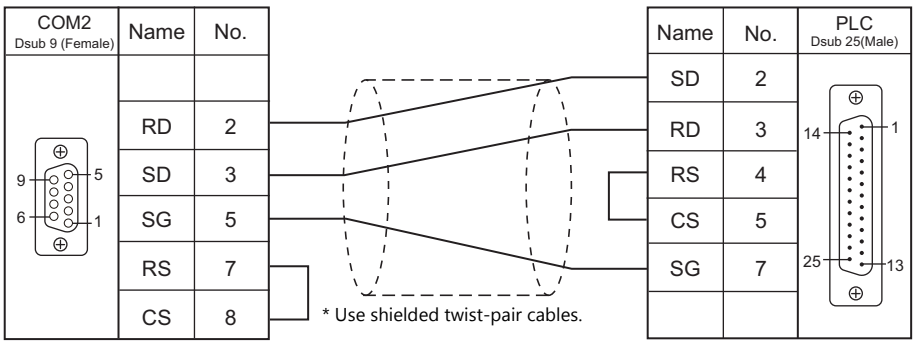
Wiring diagram 1 - COM2



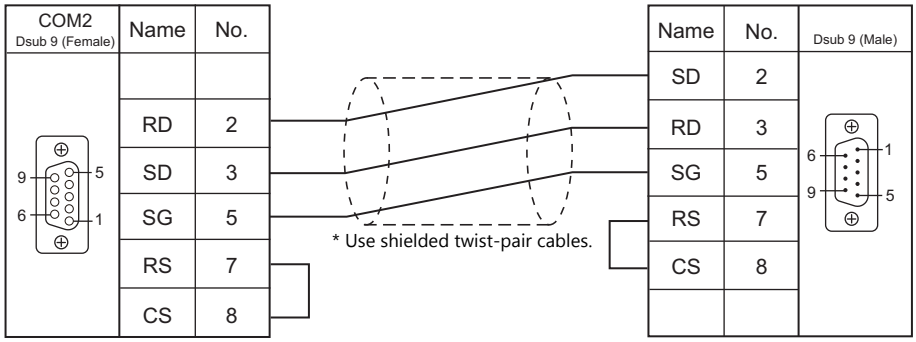
Wiring diagram 2 - COM2



Wiring diagram 3 - COM2



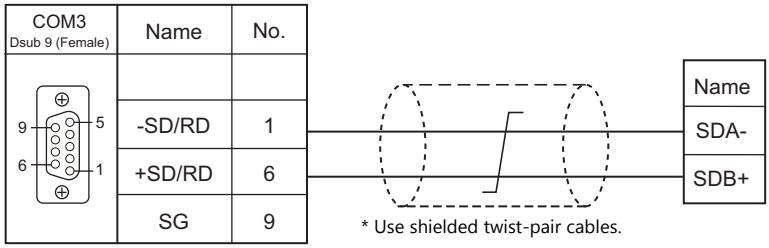
Wiring diagram 4 - COM2



When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



16.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
E5AK	E5AK-xxx01xx	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5AK.Lst
	E5AK-xxx02xx	Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
	E5AK-xxx03xx	Terminal	RS-485	COM1	Wiring diagram 3 - COM1	
				COM3	Wiring diagram 2 - COM3	
E5AK-T	E5AK-Txx01xx	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5AKT.Lst
	E5AK-Txx02xx	Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
	E5AK-Txx03xx	Terminal	RS-485	COM1	Wiring diagram 3 - COM1	
				COM3	Wiring diagram 2 - COM3	
E5AN/E5EN/ E5CN/E5GN	E5AN-xxxx01xxxxFLK E5EN-xxxx01xxxxFLK	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5AN.Lst
	E5CN-xxxx03xxxxFLK E5AN-xxxx03xxxxFLK E5EN-xxxx03xxxxFLK E5GN-xx03x-FLK	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
E5AR/E5ER	E5AR-xxxxxxxxx-FLK E5ER-xxxxxxxxx-FLK	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	E5AR.Lst
				COM3	Wiring diagram 1 - COM3	
E5CK	E5CK-xxx01	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5CK.Lst
	E5CK-xxx03	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
E5CK-T	E5CK-Txx01	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5CKT.Lst
	E5CK-Txx03	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
E5CN-HT	E5CN-HTxxxx01xx-x-FLK E5AN-HTxxxxx01Bxx-x-FLK E5EN-HTxxxxx01Bxx-x-FLK	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5CN-HT.Lst
	E5AN-HTxxxxx02Bxx-x-FLK E5EN-HTxxxxx02Bxx-x-FLK	Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
	E5CN-HTxxxx03xx-x-FLK E5AN-HTxxxxx03Bxx-x-FLK E5EN-HTxxxxx03Bxx-x-FLK	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
E5EK	E5EK-xxx01xx	Terminal	RS-232C	COM2	Wiring diagram 1 - COM2	E5EK.Lst
	E5EK-xxx02xx	Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
	E5EK-xxx03xx	Terminal	RS-485	COM1	Wiring diagram 3 - COM1	
				COM3	Wiring diagram 2 - COM3	
E5ZD	E5ZD-4xx01xx E5ZD-6xx01xx	CN4	RS-232C	COM2	Wiring diagram 2 - COM2	E5ZD.Lst
	E5ZD-8xx01xx	CN501				
	E5ZD-4xx02xx E5ZD-6xx02xx	CN6	RS-422	COM1	Wiring diagram 4 - COM1	
	E5ZD-8xx02xx	CN502				
		TB302		COM1	Wiring diagram 2 - COM1	
	E5ZD-4xx03xx E5ZD-6xx03xx	CN6	RS-485	COM1	Wiring diagram 5 - COM1	
				COM3	Wiring diagram 3 - COM3	
	E5ZD-8xx03xx	CN502	RS-485	COM1	Wiring diagram 5 - COM1	
				COM3	Wiring diagram 3 - COM3	
		TB302	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
E5ZE	E5ZE-8xxx01xx	-	RS-232C	COM2	Wiring diagram 2 - COM2	E5ZE.Lst
	E5ZE-8xxx04xx	Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
			RS-485	COM3	Wiring diagram 4 - COM3	
E5ZN	E5ZN	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	E5ZN.Lst
				COM3	Wiring diagram 1 - COM3	

ID Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
V600/620/680	V600-CA1A-V	Dsub25	RS-232C	COM2	Wiring diagram 2 - COM2	OM_V600.Lst
	V600-CA2A-V	Dsub9	RS-422	COM1	Wiring diagram 4 - COM1	
			RS-485	COM3	Wiring diagram 5 - COM3	
	V600-CD1D	Dsub9	RS-232C	COM2	Wiring diagram 3 - COM2	
	V680-CA5D01-V2 V680-CA5D02-V2	Dsub9	RS-232C			
		Terminal	RS-422	COM1	Wiring diagram 2 - COM1	
			RS-485	COM3	Wiring diagram 2 - COM3	

Power Meter

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
KM20	KM20-B40-FLK	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	OM_KM20.Lst
				COM3	Wiring diagram 1 - COM3	
		K3SC terminal	RS-232C	COM2	Wiring diagram 4 - COM2	
KM100	KM100-Tx-FLK	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	OM_KM100.Lst
				COM3	Wiring diagram 1 - COM3	
		K3SC terminal	RS-232C	COM2	Wiring diagram 4 - COM2	

Ethernet Connection

ID Controller

PLC Selection on the Editor	Model	TCP/IP	UDP/IP	Port No.	Lst File
V680S (Ethernet TCP/IP)	V680S-HMD63-ETN V680S-HMD64-ETN V680S-HMD66-ETN	○	×	502	OM_V680S_Eth.Lst

16.2.1 E5AK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / 2 bits
	LEn	Data length	7 / 8 bits
	Prty	Parity	None / Odd / Even
	bPS	Baud rate	4800 / 9600 / 19200 bps
	U-no	Communication unit No.	0 to 31

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	(parameter)	00H	
S	(special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
			S14 Read only, expansion code 0: group A / 1: group B

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

When monitoring special command S14 (status), specify the group number in the expansion code.
00H: Group A
01H: Group B

16.2.2 E5AK-T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 99	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / 2 bits
	LEn	Data length	7 / 8 bits
	Prty	Parity	None / Odd / Even
	bPS	Baud rate	4800 / 9600 / 19200 bps
	U-no	Communication unit No.	0 to 99

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	(parameter)	00H	
S	(special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
			S14 Read only, expansion code 0: group A / 1: group B
P	(program parameter)	02H	

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

When monitoring special command S14 (status), specify the group number in the expansion code.
00H: Group A
01H: Group B

16.2.3 E5AN/E5EN/E5CN/E5GN

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

E5CN/E5SAN/E5EN

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	PSEL	Protocol selection	**CompoWay/F**
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / 9600 / 19200 / 38400 / 57600 bps
	LEn	Data length	7 / 8 bits
	Sbit	Communication stop bit	1 / 2 bits
	Prty	Parity	None / Odd / Even
Adjustment level	CMWT	Communication writing *1	OFF / **ON**

*1 When writing setting data from the TS, set “ON” for the “communication writing” setting.

E5GN

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / 9600 / 19200 bps
	LEn	Data length	7 / 8 bits
	Sbit	Communication stop bit	1 / 2 bits
	Prty	Parity	None / Odd / Even
Adjustment level	CMWT	Communication writing *1	OFF / **ON**

*1 When writing setting data from the TS, set “ON” for the “communication writing” setting.

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
C0	(setting area 0)	00H	Double-word, read only
C1	(setting area 0)	01H	Double-word
C3	(setting area 1)	03H	Double-word

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Read controller status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0006H	
		n + 2	Operation status (higher byte) 00: Control in execution (Operation in progress while the setting area is "0" with no error occurring) 01: Control not in execution (Other than above)	
			Related information (lower byte) Bit - 7 6 5 4 3 2 1 0 Heater overcurrent (CT1) Heater current hold (CT1) A/D converter error Heater overcurrent (CT2) Heater current hold (CT2) Input error Beyond the display range	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 0030H	
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)	
			Control start/stop 0100H: Channel 1 Run 0101H: Channel 1 Stop	
			Multi-SP 0200H: Target value 1 0201H: Target value 2 0202H: Target value 3 0203H: Target value 4	
			AT execution/cancel 0300H: Cancel 0301H: Execute	
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Move to set area 1	
			0800H: Move to protect level	

Return data: Data stored from temperature controller to TS

*1 8000 (HEX): broadcasting

16.2.4 E5AR/E5ER

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

Communication level setting (LS)

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level (L.S)	PSEL	Protocol selection	**CompoWay/F**
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	9600 / 19200 / 38400 bps
	LEn	Communication data length	7 / 8 bits
	Sbit	Communication stop bit	1 / 2 bits
	Prty	Communication parity	None / Odd / Even
Adjustment level (L.Adj)	CMWT	Communication writing*1	OFF / **ON**

*1 When writing setting data from the TS, set “ON” for the “communication writing” setting.

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
C0	(communication monitor)	00H	Double-word
C1	(communication monitor)	01H	Double-word
C4	(communication monitor)	03H	Double-word
C5	(protection level)	04H	Double-word
C6	(run level)	05H	Double-word
C7	(adjustment level)	06H	Double-word
C8	(adjustment 2 level)	07H	Double-word
C9	(bank setting level)	08H	Double-word
CA	(PID setting level)	09H	Double-word
CB	(approximation setting level)	0AH	Double-word
CC	(default setting level for input)	0BH	Double-word
CD	(default setting level for control)	0CH	Double-word
CE	(default setting level 2 for control)	0DH	Double-word
CF	(warning setting level)	0EH	Double-word
D0	(display adjustment level)	0FH	Double-word
D1	(communication level)	10H	Double-word
D2	(high-performance setting level)	11H	Double-word
D3	(extended control setting level)	12H	Double-word

Indirect Device Memory Designation

	15 – 8	7 – 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="4">Read controller status</td><td rowspan="4">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="4">2</td></tr>
<tr><td>n + 1</td><td>Command: 0006H</td></tr>
<tr><td>n + 2</td><td>Status
Bit - 7 6 5 4 3 2 1 0
ch4 ch3 ch2 ch1
<table><tr><th>Bit</th><th>Operation status</th></tr><tr><td>00</td><td>Control in progress</td></tr><tr><td>01</td><td>Error occurring (outputting manipulated variables at an occurrence of error)</td></tr><tr><td>10</td><td>Resetting (including setting area 1)</td></tr><tr><td>11</td><td>Manual mode</td></tr></table></td></tr>
<tr><td>n + 3</td><td>Relevant information
Bit - 7 6 5 4 3 2 1 0
Blank, Blank
RSP input error
Potentiometer error
Beyond the display range
Input error</td></tr>
<tr><td rowspan="4">Operation instructions</td><td rowspan="4">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number *1</td><td rowspan="4">3</td></tr>
<tr><td>n + 1</td><td>Command: 0030H</td></tr>
<tr><td rowspan="2">n + 2</td><td>Communication writing
0000H: Communication writing OFF (disabled)
0001H: Communication writing ON (enabled)

Control start/stop
0100H: Channel 1 RUN
0101H: Channel 1 STOP
0110H: Channel 2 RUN
0111H: Channel 2 STOP
0120H: Channel 3 RUN
0121H: Channel 3 STOP
0130H: Channel 4 RUN
0131H: Channel 4 STOP
01F0H: All channels Run
01F1H: All channels Stop

Bank selection
0200 to 0207H: Channel 1 Bank Nos. 0 to 7
0210 to 0217H: Channel 2 Bank Nos. 0 to 7
0220 to 0227H: Channel 3 Bank Nos. 0 to 7
0230 to 0237H: Channel 4 Bank Nos. 0 to 7
02F0 to 02F7H: All channels Bank Nos. 0 to 7</td></tr>
<tr><td>AT execution
0300H: Channel 1 PID group number currently selected
0301 to 0308H: Channel 1 PID group Nos. 1 to 8 designation
0310H: Channel 2 PID group number currently selected
0311 to 0318H: Channel 2 PID group Nos. 1 to 8 designation
0320H: Channel 3 PID group number currently selected
0321 to 0328H: Channel 3 PID group Nos. 1 to 8 designation
0330H: Channel 4 PID group number currently selected
0331 to 0338H: Channel 4 PID group Nos. 1 to 8 designation
03F0H: All channels PID group number currently selected
03F1 to 03F8H: All channels PID group Nos. 1 to 8 designation</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Operation instructions	1 - 8 (PLC1 - 8)	n + 2	AT cancellation 0A00H: Channel 1 0A10H: Channel 2 0A20H: Channel 3 0A30H: Channel 4 09F0H: All channels	3
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Move to set area 1	
			0800H: Move to protect level	
			Auto/manual 0900H: Channel 1 Auto mode 0901H: Channel 1 Manual mode 0910H: Channel 2 Auto mode 0911H: Channel 2 Manual mode 0920H: Channel 3 Auto mode 0921H: Channel 3 Manual mode 0930H: Channel 4 Auto mode 0931H: Channel 4 Manual mode 09F0H: All channels Auto mode 09F1H: All channels Manual mode	
			0B00H: Initialize	
			Unlatch 0C00H: Channel 1 Warning unlatch 0C10H: Channel 2 Warning unlatch 0C20H: Channel 3 Warning unlatch 0C30H: Channel 4 Warning unlatch 0CF0H: All channels Warning unlatch	
			SP mode 0D00H: Channel 1 Local SP 0D01H: Channel 1 Remote SP 0D10H: Channel 2 Local SP (Cascade open) 0D11H: Channel 2 Remote SP (Cascade close)	

Return data: Data stored from temperature controller to TS

*1 8000 (HEX): broadcasting

16.2.5 E5CK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / 2 bits
	LEn	Data length	7 / 8 bits
	Prty	Parity	None / Odd / Even
	bPS	Baud rate	4800 / 9600 / 19200 bps
	U-no	Communication unit No.	0 to 31

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	(parameter)	00H	
S	(special command)	01H	Write only, expansion code: fixed to 0

16.2.6 E5CK-T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Station number	0 to 99	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / 2 bits
	LEn	Data length	7 / 8 bits
	Prty	Parity	None / Odd / Even
	bPS	Baud Rate	4800 / 9600 / 19200 bps
	U-no	Communication unit No.	0 to 99

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	(parameter)	00H	
S	(special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
			S14 Read only, expansion code 0: group A / 1: group B
P	(program parameter)	02H	

Indirect Device Memory Designation

	15 to 8	7 to 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

When monitoring special command S14 (status), specify the group number in the expansion code.
00H: Group A
01H: Group B

16.2.7 E5CN-HT

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

E5CN-HT/E5AN-HT/E5EN-HT

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	PSEL	Communication protocol	**CompoWay/F**
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / 9600 / 19200 / 38400 / 57600 bps
	LEn	Data length	7 / 8 bits
	Sbit	Stop bit	1 / 2 bits
	Prty	Parity	None / Odd / Even
Adjustment level	CMWT	Communication writing *1	OFF / **ON**

*1 When writing the setting data from the TS, set "ON" for the "communication writing" setting.

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
C0	(setting area 0)	00H	Double-word, read only
C1	(setting area 0)	01H	Double-word
C3	(setting area 1)	02H	Double-word
C4	(setting area 0)	03H	Double-word
C5	(setting area 0)	04H	Double-word
DA	(setting area 0)	05H	Double-word

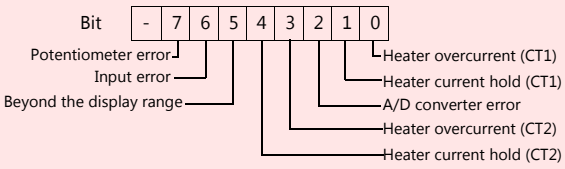
Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Read controller status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0006H	
		n + 2	Operation status (higher byte) 00: Control not in execution (Setting area 1, outputting manipulated variables for manual operation, resetting operation or alarm occurrence) 01: Control in execution (Other than above)	
			Related information (lower byte) 	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 0030H	
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)	
			Control start/stop 0100H: Channel 1 RUN 0101H: Channel 1 STOP	
			AT execution/cancel 0300H: AT cancel 0301H: AT execution at 100% 0302H: AT execution at 40%	
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Shift to set area 1	
			0800H: Protection level shift	
			Auto/manual 0900H: Auto mode 0901H: Manual mode	
			0B00H: Initialize	
			Alarm latch cancel 0C00H: Alarm latch 1 cancel 0C01H: Alarm latch 2 cancel 0C02H: Alarm latch 3 cancel 0C03H: Heater disconnection latch cancel 0C04H: SSR failure latch cancel 0C05H: Heater overcurrent latch cancel 0C0FH: All latch cancel	
			SP mode 0D00H: Program SP mode 0D01H: Remote SP mode 0D02H: Constant value control SP mode	
			Invert direct/reverse operation 0E00H: Not invert 0E01H: Invert	
			Infrared communication 1200H: OFF 1201H: ON	
			Hold 1300H: Hold cancel 1301H: Hold	
			1400H: Advance	
Readout of main unit's attribute	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0005H	
		n + 2 - n + 6	Type (CHAR) * Data following 11th byte or later is discarded.	
		n + 8	Buffer size (HEX)	

Response code: Data stored from temperature controller to TS

*1 8000 (HEX): broadcasting

16.2.8 E5EK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / 2 bits
	LEn	Data length	7 / 8 bits
	Prty	Parity	None / Odd / Even
	bPS	Baud rate	4800 / 9600 / 19200 bps
	U-no	Communication unit No.	0 to 31

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	(parameter)	00H	
S	(special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
			S14 Read only, expansion code 0: group A / 1: group B

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

When monitoring special command S14 (status), specify the group number in the expansion code.
00H: Group A
01H: Group B

16.2.9 E5ZD

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 bps	
Data Length	**7** bits	
Stop Bit	**2** bits	
Parity	**Even**	
Target Port No.	0 to 15	

Temperature Controller

(Underlined setting: default)

Switch	Setting Data	Setting
SW2	Unit No.	0 to F (= 0 to 15)
SW3	Baud rate	5: 4800 bps 6: 9600 bps

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

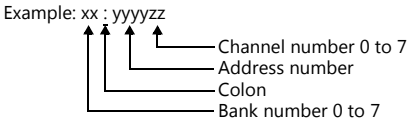
Available Device Memory

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
-	0000 Control temperature	00H	
	0001 Measurement temperature		Bank No. 0
	0002 Operation status		Bank No. 0
	0003 Output value		Bank No. 0
	0004 Output value on the cooling side		Bank No. 0
	0005 Proportional band		
	0006 Integral time		
	0007 Derivative time		
	0008 Control cycle		
	0009 Control cycle on the cooling side		
	000A Output operation		Bank No. 0
	000B Heater disconnection effective channel		Bank No. 0
	000C Alarm status		Bank No. 0
	000D Warning mode: warning 1		Bank No. 0
	000E Warning mode: warning 2		Bank No. 0
	000F Temperature at which an alarm occurs: warning 1		
	0010 Temperature at which an alarm occurs: warning 2		
	0011 Execution memory bank No.		Bank No. 0
	0012 Adjustment sensitivity		
	0013 Adjustment sensitivity on the cooling side		
	0015 Input offset value		
	001D Heater disconnection detection level		
	001F Heater current value		Bank No. 0
	0021 Deadband / overlap band		Bank No. 0
	0022 Cooling coefficient		

Device Memory		TYPE	Remarks
-	0023 Fuzzy strength	00H	
	0024 Fuzzy scale 1		
	0025 Fuzzy scale 2		

Address denotations:



Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No. (lower)	CH No.
n + 2	00	Address No. (higher)
n + 3	Bank No.	Bit designation
n + 4	00	Station number

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Auto tuning	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0 - 7: AT start channel No. 12: Cancel	
Setting data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 3	
		n + 2	0: Save 1: Initialize	
Operation control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	0: Control start 1: Control stop	
		n + 3	Channel No.	

16.2.10 E5ZE

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**7** bits	
Stop Bit	**2** bits	
Parity	**Even**	
Target Port No.	0 to 15	

Temperature Controller

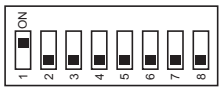
Unit No.

(Underlined setting: default)

UNIT	Setting Items	Setting
	Unit No.	0 to F (= 0 to 15)

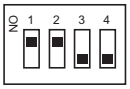
Function

(Underlined setting: default)

FUNCTION		Setting Items	Setting
	SW1 SW2	Baud rate	

	4800	9600	19200
SW1	OFF	ON	OFF
SW2	ON	OFF	OFF

Specification setting (RS-422/485)

FUNCTION		Setting Items	Setting
	SW1 SW2	Interface	
	SW3 SW4	Terminating resistance	

	RS-422	RS-485
SW1	OFF	ON
SW2	OFF	ON

	Provided (RS-422)	Provided (RS-485)	None
SW3	ON	ON	OFF
SW4	ON	OFF	OFF

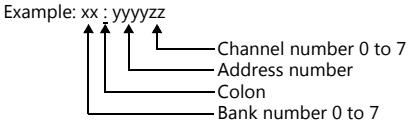
The following settings are fixed; data length: 7, stop bit: 2, and parity: even.

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
-	0000 Control temperature	00H	
	0001 Measurement temperature		Bank No. 0
	0002 Operation status		Bank No. 0
	0003 Output value		Bank No. 0
	0004 Output value on the cooling side		Bank No. 0
	0005 Proportional band		
	0006 Integral time		
	0007 Derivative time		
	0008 Control cycle		
	0009 Control cycle on the cooling side		
	000A Output operation		Bank No. 0
	000B HB warning/HS warning effective channel		Bank No. 0
	000C Alarm status		Bank No. 0
	000D Warning mode: warning 1		Bank No. 0
	000E Warning mode: warning 2		Bank No. 0
	000F Temperature at which an alarm occurs: warning 1		
	0010 Temperature at which an alarm occurs: warning 2		
	0011 Execution memory bank No.		Bank No. 0
	0012 Adjustment sensitivity		
	0013 Adjustment sensitivity on the cooling side		
	0014 Setting unit		Bank No. 0
	0015 Input offset value		
	0016 Manual reset value		
	0017 Current control temperature		
	0018 Output lower limit value		Bank No. 0
	0019 Output upper limit value		
	001A Output lower limit value on the cooling side		
	001B Output upper limit value on the cooling side		
	001C Limit of output change rate		
	001D Heater disconnection detection (HB warning)		
	001E SSR failure detection (HS warning)		Bank No. 0
	001F Heater current value		Bank No. 0
	0020 SSR leakage current value		Bank No. 0
	0021 Deadband / overlap band		Bank No. 0
	0022 Cooling coefficient		
	0023 Fuzzy strength		
	0024 Fuzzy scale 1		
	0025 Fuzzy scale 2		

Address denotations:



Indirect Device Memory Designation

	15 to 8	7 to 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No. (lower)	CH No.
n + 2	00	Address No. (higher)
n + 3	Bank No.	Bit designation
n + 4	00	Station number

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Auto tuning	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0 - 7: AT start channel No. 10: Collective start at all channels 11: Sequential start at all channels 12: Cancel	
Lamp value setting	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 1	
		n + 2	Bank No. / channel No.	
		n + 3	Lamp value	
		n + 4	Unit of time 0: Second 1: Minute 2: Hour	
Lamp value read out	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	Bank No. / channel No.	
		n + 3	Lamp value	
		n + 4	Unit of time 0: Second 1: Minute 2: Hour	
Setting data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 3	
		n + 2	0: Save 1: Initialize	
Operation control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	0: Control start 1: Control stop	
		n + 3	Channel No.	
Manual operation	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 5	
		n + 2	Channel No.	

Return data: Data stored from temperature controller to TS

16.2.11 E5ZN

Communication Setting

Editor

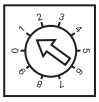
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 15	

Temperature Controller

(Underlined setting: default)

Item		Setting Data	Setting
UNIT		Unit No.	0 to F (= 0 to 15)
BPS		Baud rate	0: 4800 1: 9600 2: 19200 3: 38400
Communication level	LEn	Data length	7 / 8 bits
	Sbit	Stop bit	1 / 2 bits
	Prty	Parity	None / Even / Odd
Adjustment level	CMWT	Communication writing *1	OFF / **ON**

*1 When writing the setting data from the TS, set "ON" for the "communication writing" setting.

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
C0	Setting area 0	00H	Double-word, read only
C1	Setting area 0	01H	Double-word
C3	Setting area 1	02H	Double-word

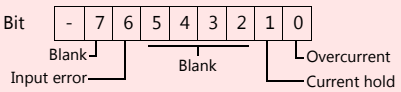
Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Controller status read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 06H	
		n + 2	Operation status (higher byte) 00: Control in execution for all channels (Operation in progress while the setting area is "0" with no error occurring.) 01: Control stopping at any of the channels (Other than above)	
			Related information (lower byte) 	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 0030H	
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)	
			Control start/stop 0100H: Channel 1 run 0101H: Channel 1 stop 0110H: Channel 2 run 0111H: Channel 2 stop 01F0H: All-channel run *2 01F1H: All-channel stop *2	
			Multi-SP 0200H: Channel 1 target value 0 0201H: Channel 1 target value 1 0210H: Channel 2 target value 0 0211H: Channel 2 target value 1 02F0H: All-channel target value 0 *2 02F1H: All-channel target value 1 *2	
			AT execution 0300H: Channel 1 AT cancel 0301H: Channel 1 AT execute 0310H: Channel 2 AT cancel 0311H: Channel 2 AT execute 03F0H: All-channel AT cancel *2 03F1H: All-channel AT execute *2	
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Move to set area 1	
			0800H: Move to protection level	
			Auto/manual 0900H: PV hold	
			0B00H: Initialize	
			Unlatch 0C00H: Channel 1 warning 1 unlatch *2 0C01H: Channel 1 warning 2 unlatch *2 0C031H: Channel 1 warning 3 unlatch *2 0C0FH: Channel 1 all warnings unlatch *2 0C10H: Channel 2 warning 1 unlatch *2 0C11H: Channel 2 warning 2 unlatch *2 0C13H: Channel 2 warning 3 unlatch *2 0C1FH: Channel 2 all warnings unlatch *2 0CF0H: All channels warning 1 unlatch *2 0CF1H: All channels warning 2 unlatch *2 0CF2H: All channels warning 3 unlatch *2 0CFFH: All channels all warnings unlatch *2	

Return data: Data stored from temperature controller to TS

*1 8000 (HEX): broadcasting
*2 Valid only for the product of pulse output type or analog output type

16.2.12 V600/620/680

Communication Setting

Editor

Communication setting

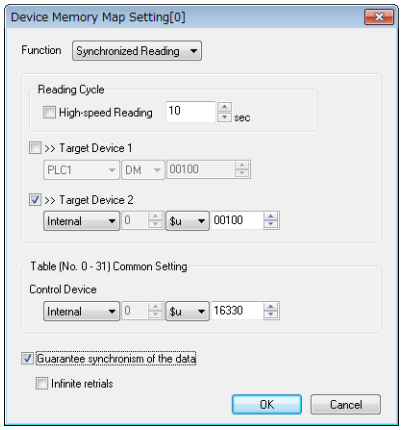
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 115K bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	
Transmission Mode	1 : 1 procedure / 1 : N procedure	The transmission mode is set according to the connection mode. 1 : 1 → 1 : 1 procedure 1 : n → 1 : N procedure Multi-link2 → 1 : 1 procedure / 1 : N procedure

Device memory map setting

Reading or writing to/from the tag can be performed by using the [Synchronized Reading/Synchronized Writing] function of the device memory map.

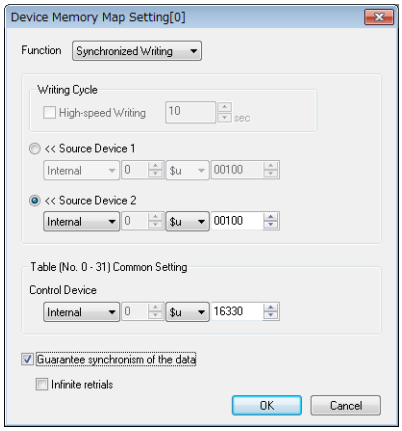
- Synchronized reading
  Reading starts when the control device memory (command bit) is set (ON). Reading is performed at specified cycles until the control device memory (acknowledge bit) is set (ON).



Item	Contents
Reading Cycle	The data at the device memory addresses registered in the device memory map is read when the control device memory (command bit) is set (ON). Reading of data is repeated at specified cycles until the data is read correctly. When the data has correctly been read, the control device memory (acknowledge bit) is set (ON) and reading operation finishes. *1
Control Device	Enter a device memory address as the trigger for synchronized reading. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the TS Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data in the device memory map is read correctly. *2 *3 Check the status/error codes at $Pn 356 to 451 to confirm whether or not reading of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data in the device memory map is read correctly. *3 Status/error codes are stored in $Pn 356 to 451.

*1 When both [Guarantee synchronism of the data] and [Infinite retrials] are not checked, the acknowledge bit is set (ON) when reading of any data at the device memory address registered in the device memory map has been completed successfully.
*2 Set the device memory address of the same station number and channel in the device memory map.
*3 This setting is invalid when the macro command "TBL_READ" is executed.

- Synchronized writing
  Writing starts when the control device memory (command bit) is set (ON). When writing has been finished, the control device memory (acknowledge bit) is set (ON).



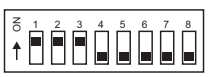
Item	Contents
Writing Cycle	The data is written into the device memory addresses registered in the device memory map when the control device memory (command bit) is set (ON). When writing of data finishes, the control device memory (acknowledge bit) is set (ON) regardless of the result of the writing status.
Control Device	Enter a device memory address as the trigger for synchronized writing. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the TS Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data is correctly written into the address registered in the device memory map. *1 *2 Check the status/error codes at $Pn 356 to 451 to confirm whether or not writing of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data is correctly written into the addresses registered in the device memory map. *2 Status/error codes are stored in $Pn 356 to 451.

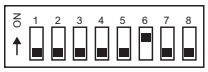
*1 Set the device memory address of the same station number and channel in the device memory map.
*2 This setting is invalid when the macro command "TBL_WRITE" is executed.

ID Controller

V600-CA1A/V600-CA2A

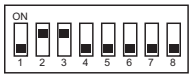
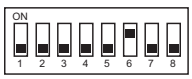
(Default: OFF (all))

<table>
<tr><th colspan="2">DIP Switch</th><th>Setting</th></tr>
<tr><td rowspan="3">DIP switch 1
 
</td><td>SW1
SW2
SW3</td><td>Baud rate setting
<table><tr><th>SW1</th><th>SW2</th><th>SW3</th><th>Baud Rate</th></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>4800</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>9600</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>19200</td></tr></table></td></tr>
<tr><td>SW4
SW5
SW6</td><td>Communication format
<table><tr><th>SW4</th><th>SW5</th><th>SW6</th><th>Data Length</th><th>Stop Bit</th><th>Parity</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td rowspan="4">7</td><td rowspan="2">2</td><td>Even</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>Odd</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td rowspan="2">1</td><td>Even</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>Odd</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td rowspan="4">8</td><td>2</td><td rowspan="2">None</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td rowspan="3">1</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>Even</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>Odd</td></tr></table></td></tr>
<tr><td>SW7
SW8</td><td>Always OFF</td></tr>
</table>

<table>
<tr><th>DIP Switch</th><th></th><th>Setting</th></tr>
<tr><td rowspan="4">DIP switch 2
  </td><td>SW2
SW3
SW4
SW5</td><td>Unit No. (Valid only when “1 : N” is selected by SW6. When “1 : 1” is selected, set all switches to the OFF positions.)
<table><tr><th>SW2</th><th>SW3</th><th>SW4</th><th>SW5</th><th>No.</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>0</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>1</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>2</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>3</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>4</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>5</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>6</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>7</td></tr></table><table><tr><th>SW2</th><th>SW3</th><th>SW4</th><th>SW5</th><th>No.</th></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>8</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>9</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>10</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>11</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>12</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>13</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>14</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>15</td></tr></table></td></tr>
<tr><td>SW6</td><td>Communication protocol
OFF: 1 : 1
ON: 1 : N</td></tr>
<tr><td>SW7</td><td>Terminating resistance at sending side (valid only for RS-422)
OFF: Not provided
ON: Provided</td></tr>
<tr><td>SW8</td><td>Terminating resistance at receiving side (valid only for RS-422)
OFF: Not provided
ON: Provided</td></tr>
</table>

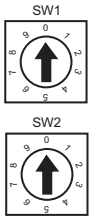
V600-CD1D

(Default: OFF (all))

<table>
<tr><th>DIP Switch</th><th></th><th>Setting</th></tr>
<tr><td rowspan="3">DIP switch 1
  </td><td>SW2
SW3</td><td>Baud rate setting
<table><tr><th>SW2</th><th>SW3</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>ON</td><td>4800</td></tr><tr><td>ON</td><td>OFF</td><td>9600</td></tr><tr><td>ON</td><td>ON</td><td>19200</td></tr></table></td></tr>
<tr><td>SW4
SW5
SW6</td><td>Communication format
<table><tr><th>SW4</th><th>SW5</th><th>SW6</th><th>Data Length</th><th>Stop Bit</th><th>Parity</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td rowspan="4">7</td><td rowspan="2">2</td><td>Even</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>Odd</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td rowspan="2">1</td><td>Even</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>Odd</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td rowspan="4">8</td><td>2</td><td rowspan="2">None</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td rowspan="3">1</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>Even</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>Odd</td></tr></table></td></tr>
<tr><td>SW8</td><td>Always OFF</td></tr>
<tr><td rowspan="3">DIP switch 2
  </td><td>SW3
SW4
SW5</td><td>Unit No. (Valid only when “1 : N” is selected by SW6. When “1 : 1” is selected, set all switches to the OFF positions.)
<table><tr><th>SW3</th><th>SW4</th><th>SW5</th><th>Unit No.</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>0</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>1</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>2</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>3</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>4</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>5</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>6</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>7</td></tr></table></td></tr>
<tr><td>SW6</td><td>Communication protocol
OFF: 1 : 1
ON: 1 : N</td></tr>
<tr><td>SW7
SW8</td><td>Always OFF</td></tr>
</table>

V680

(Default: OFF (all))

Switch Setting		Setting
SW1 SW2	Controller No. setting	0 to 31 (32 to 99: not available)  Higher-order digit: 0 to 3 Lower-order digit: 0 to 9
SW3-1	Switch selection	OFF: DIP switch enabled
SW3-3 SW3-4	Baud rate setting	SW3-3 / SW3-4 / Baud Rate OFF / OFF / 9600 OFF / ON / 19200 ON / OFF / 38400 ON / ON / 115200
SW3-5	Data length setting	OFF: 7 bits ON: 8 bits
SW3-6 SW3-7	Parity	SW3-6 / SW3-7 / Parity OFF / OFF / Even OFF / ON / None ON / OFF / Odd ON / ON / Even
SW3-8	Stop bit	OFF: 2 bits ON: 1 bit
SW3-9	Communication protocol	OFF: 1 : 1 ON: 1 : N
SW3-10	Command system	ON: V600 command format

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
--	Setting area 0	00H	

Indirect Device Memory Designation

	15 ... 8	7 ... 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Channel No.	Bit designation
n + 3	00	Station number

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

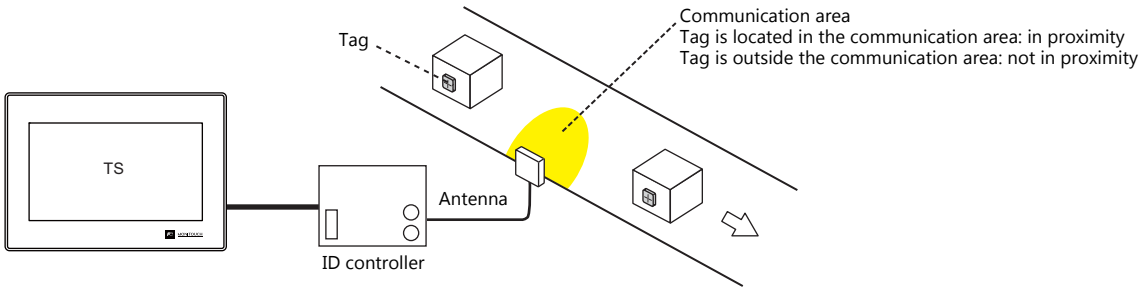
Contents	F0	F1 (= $u n)		F2
Read (specified with ASCII code) Channel 1	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Read data	
Write (specified with ASCII code) Channel 1	1 - 8 (PLC1 - 8)	n	Station number	4 + m
		n + 1	Command: 1	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Write data	
Command process abort	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 2	
Data management Channel 1 Data check command: compare	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 3	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 1 Data check command: calculation	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 1 Writing count management command: subtraction	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 5	
		n + 2	Top address	
		n + 3	Number of updates	
Data management Channel 1 Writing count management command: addition	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 6	
		n + 2	Top address	
		n + 3	Number of updates	
Repeated writing	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 7	
Controller control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 8	
		n + 2	OUT1 operation 0: No operation 1: ON 2: OFF	
		n + 3	OUT2 operation 0: No operation 1: ON 2: OFF	
		n + 4	Current input status (IN1) 0: OFF 1: ON	
		n + 5	Current input status (IN2) 0: OFF 1: ON	
		n + 6	Output status after execution of operation (OUT1) 0: OFF 1: ON	
		n + 7	Output status after execution of operation (OUT2) 0: OFF 1: ON	
Error information read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2 to n + 4	Latest error log information (new)	
		n + 5 to n + 91	Latest error log information (old), max. 29 logs	
Abort (reset)	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 10	
Exit code acquisition Channel 1	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 12	
		n + 2	Exit code *1	

Contents	F0	F1 (= $u n)		F2
Read (specified with ASCII code) Channel 2	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 100	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Read data	
Write (specified with ASCII code) Channel 2	1 - 8 (PLC1 - 8)	n	Station number	4 + m
		n + 1	Command: 101	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Write data	
Data management Channel 2 Data check command: compare	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 103	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 2 Data check command: calculation	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 104	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 2 Writing count management command: subtraction	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 105	
		n + 2	Top address	
		n + 3	Number of updates	
Data management Channel 2 Writing count management command: addition	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 106	
		n + 2	Top address	
		n + 3	Number of updates	
Exit code acquisition Channel 2	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 112	
		n + 2	Exit code *1	

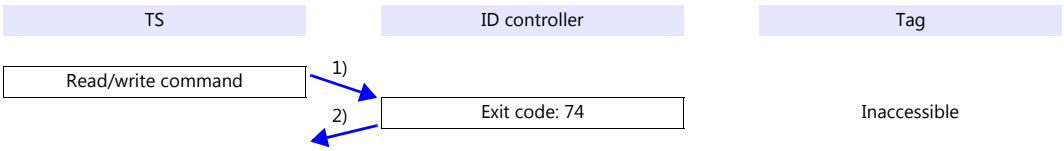
Return data: Data stored from temperature controller to TS

*1 The exit code will not be stored if it cannot be acquired due to timeout or other reasons.

Operation

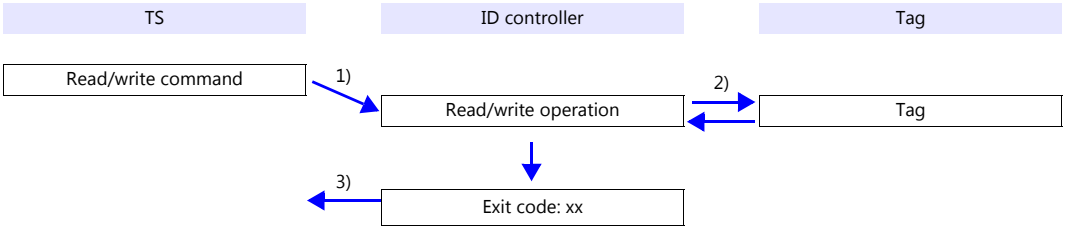


When a tag is located in proximity:



1) The TS sends the read/write command.
2) Since the tag is not located in an accessible position, the TS receives exit code 74 from the ID controller.
3) When [Synchronized Reading] is selected in the [Device Memory Map Setting] dialog and the control device memory (command bit) is set (ON):
   1) is executed at cycles specified for [Reading Cycle].

When a tag is not located in proximity (reading/writing possible):



1) The TS sends the read/write command.
2) The ID controller executes reading/writing from/into the tag.
3) The TS receives the exit code from the ID controller.
   - Exit code (00, 74): Finish
   - Exit code (other than 00 or 74): Steps 1) to 3) are repeated the set number of retrial times.

System Device Memory

$Pn: 356 to 451
When [Guarantee synchronism of the data] is checked in the [Device Memory Map Setting] dialog, a status/error code of each device memory map is stored here. For more information, see “1.5 System Device Memory for Communication Confirmation” (page 1-59).

16.2.13 V680S (Ethernet TCP/IP)

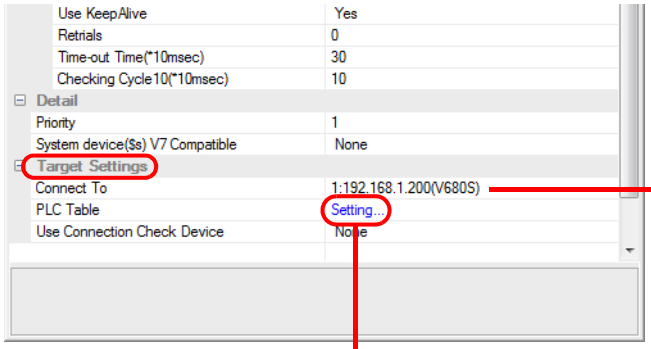
Communication Setting

Editor

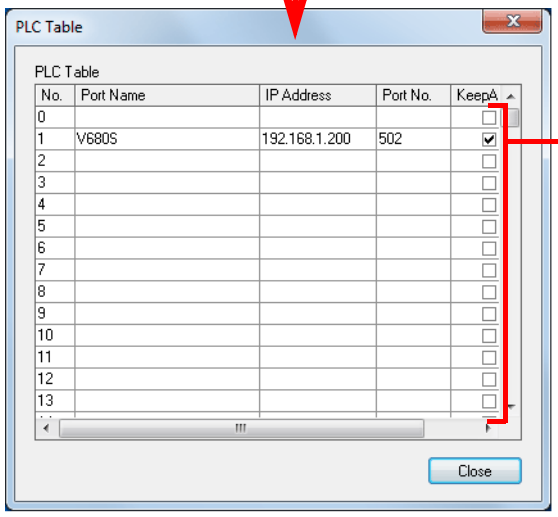
Communication setting

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi series unit (for communication with an external device)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of V680S
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



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

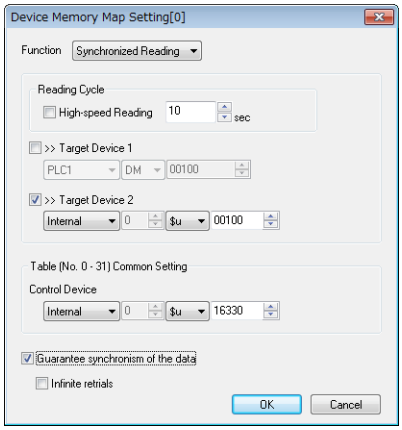


Set the IP address, port number and whether or not to use the KeepAlive function for the V680S.
Port No. = 502

Device memory map settings

Reading or writing to/from the tag can be performed by using the [Synchronized Reading/Synchronized Writing] function of the device memory map.

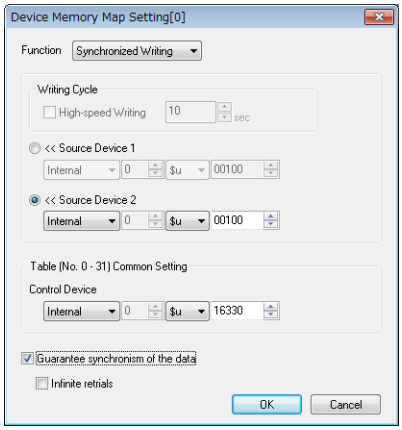
- Synchronized reading
  Reading starts when the control device memory (command bit) is set (ON). Reading is performed at specified cycles until the control device memory (acknowledge bit) is set (ON).



Item	Contents
Reading Cycle	The data at the device memory addresses registered in the device memory map is read when the control device memory (command bit) is set (ON). Reading of data is repeated at specified cycles until the data is read correctly. When the data has correctly been read, the control device memory (acknowledge bit) is set (ON) and reading operation finishes. *1
Control Device	Enter a device memory address as the trigger for synchronized reading. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the TS Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data in the device memory map is read correctly. *2 *3 Check the status/error codes at $Pn 356 to 451 to confirm whether or not reading of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data in the device memory map is read correctly. *3 Status/error codes are stored in $Pn 356 to 451.

*1 When both [Guarantee synchronism of the data] and [Infinite retrials] are not checked, the acknowledge bit is set (ON) when reading of any data at the device memory address registered in the device memory map has been completed successfully.
*2 Set the device memory address of the same station number and channel in the device memory map.
*3 This setting is invalid when the macro command "TBL_READ" is executed.

- Synchronized writing
  Writing starts when the control device memory (command bit) is set (ON). When writing has been finished, the control device memory (acknowledge bit) is set (ON).



Item	Contents
Writing Cycle	The data is written into the device memory addresses registered in the device memory map when the control device memory (command bit) is set (ON). When writing of data finishes, the control device memory (acknowledge bit) is set (ON) regardless of the result of the writing status.
Control Device	Enter a device memory address as the trigger for synchronized writing. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the TS Reference Manual 2.

Item	Contents
Guarantee synchronism of the data	When the box is checked, retry is made until the first data is correctly written into the address registered in the device memory map. *1 *2 Check the status/error codes at $Pn 356 to 451 to confirm whether or not writing of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data is correctly written into the addresses registered in the device memory map. *2 Status/error codes are stored in $Pn 356 to 451.

*1 Set the device memory address of the same station number and channel in the device memory map.
*2 This setting is invalid when the macro command "TBL_WRITE" is executed.

ID Controller

Configure settings using a web browser by starting the V680S in Safe Mode and establishing an Ethernet connection with the host computer.
For information on starting in Safe Mode, refer to the V680S instruction manual.
After making necessary settings, restart the V680S by pressing the [Reboot] button on the web browser.

Network settings

Item	Setting	Remarks
IP Address	Specify according to the environment.	Default: 192.168.1.200
Subnet Mask	Specify according to the environment.	
Gateway address	Specify according to the environment.	

RF tag communication settings

Item	Setting	Remarks
RF tag communications option	Once / FIFO Repeat	[Repeat] cannot be set.

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.

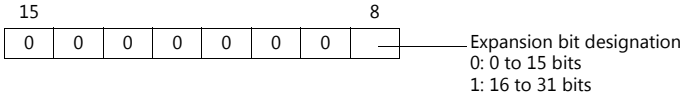
Device Memory		TYPE	Remarks
DATA	Data	00H	
ID	ID	01H	Read only
CMOP	Communications option	02H	
CMCD	Communication conditions	03H	
TCPCD	TCP/IP communication conditions	04H	Double-word
TYPN	Type name	05H	Specify within 64 bytes *1
WEBCD	Web communication conditions	06H	
WEBPS	Web password	07H	Specify within 16 bytes *2
NOIS	Noise	08H	Read only
FRMINF	Format information	09H	Read only
FWV	Firmware version	0AH	Read only
MACA	MAC address	0BH	Read only
RWST	Reader/writer status	0CH	Read only
OPEH	Operation time	0DH	Double-word, read only
ERQ	Query information of latest error communication	0EH	Double-word, read only
CERH	Communication error history	0FH	Double-word, read only
SERH	System error history	10H	Double-word, read only
RSTR	Restoration information	11H	Double-word, read only

*1 A maximum of 63 bytes can be used for the actual specification. The 64th byte is for the null terminator. If the type name is shorter than 63 bytes, designate null for the rest of the bytes.
*2 A maximum of 15 bytes can be used for the actual specification. The 16th byte is for the null terminator. If the password is shorter than 15 bytes, designate null for the rest of the bytes.

Indirect Device Memory Designation

	15 — 8	7 — 0
n + 0	Model (91 to 98)	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).

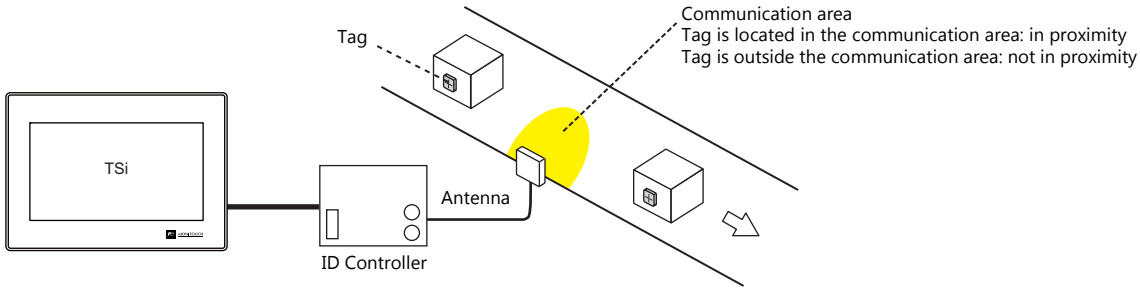


PLC_CTL

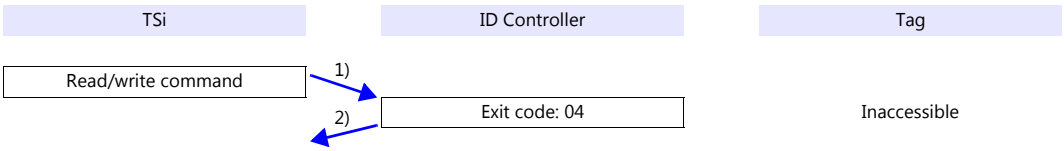
Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Data copy	1 to 8 (PLC1 to 8)	n	Station number	6
		n + 1	Command: 0	
		n + 2	Copy address: 0 to 9FFFH	
		n + 3	Copy word count: 0 to 66H	
		n + 4	IP address (lower 2 bytes)	
		n + 5	IP address (higher 2 bytes)	
Data fill	1 to 8 (PLC1 to 8)	n	Station number	5
		n + 1	Command: 1	
		n + 2	Fill address: 0 to 9FFFH	
		n + 3	Number of fill words: 0 to 9FFFH * 0: Writes to entire area	
		n + 4	Fill data	
Lock	1 to 8 (PLC1 to 8)	n	Station number	4
		n + 1	Command: 2	
		n + 2	Lock number	
		n + 3	Lock count	
RF tag overwrite count control	1 to 8 (PLC1 to 8)	n	Station number	6
		n + 1	Command: 3	
		n + 2	Operation	
		n + 3	Address	
		n + 4	Count (lower word)	
		n + 5	Count (higher word)	
Data restoration	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: 4	
		n + 2	Fixed to 0	
Initialization of settings	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: 5	
		n + 2	Fixed to 0	
Stop	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: 6	
		n + 2	Fixed to 0	
Reset	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: 7	
		n + 2	0: Reboot FFFF (HEX): Forced reset	

Operation

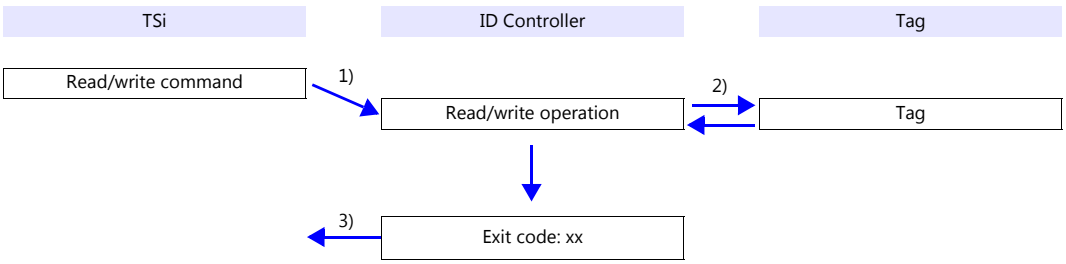


When a tag is not located in proximity (reading/writing possible):



1) The TSi sends the read/write command.
2) Since the tag is not located in an accessible position, the TSi receives exit code 04 from the ID controller.
3) When [Synchronized Reading] is selected in the [Device Memory Map Setting] dialog and the control device memory (command bit) is set (ON):
   1) is executed at cycles specified for [Reading Cycle].

When a tag is not located in proximity (reading/writing possible):



1) The TSi sends the read/write command.
2) The ID controller executes reading/writing from/into the tag.
3) The TSi receives the exit code from the ID controller.
   - Exit code 00: Exit
   - Exit code (other than 00): Steps 1) to 3) are repeated for the set number of retrial times.

System Device Memory

$Pn: 356 to 451

When [Guarantee synchronism of the data] is checked in the [Device Memory Map Setting] dialog, a status/error code of each device memory map is stored here. For more information, see "1.5 System Device Memory for Communication Confirmation" (page 1-59).

16.2.14 KM20

Communication Setting

Editor

Communication setting

(Underlined setting: default)

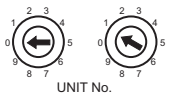
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 99	

Temperature Controller

Communication setting switch

<table>
<tr><th colspan="2">COMMUNICATION SETTING SW</th><th>Setting Data</th><th>Remarks</th></tr>
<tr><td>SW1
SW2
SW3</td><td>Baud rate</td><td><table><tr><th>SW1</th><th>SW2</th><th>SW3</th><th>Baud Rate</th></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>4800</td></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>9600</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>19200</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>38400</td></tr></table></td><td></td></tr>
<tr><td>SW4</td><td>Data bits</td><td>OFF: 7 bits
ON: 8 bits</td><td></td></tr>
<tr><td>SW5</td><td>Stop bit</td><td>OFF: 2 bits
ON: 1 bit</td><td></td></tr>
<tr><td>SW6
SW7</td><td>Parity</td><td><table><tr><th>SW6</th><th>SW7</th><th>Parity</th></tr><tr><td>OFF</td><td>OFF</td><td>Even</td></tr><tr><td>ON</td><td>OFF</td><td>Odd</td></tr><tr><td>OFF</td><td>ON</td><td>None</td></tr></table></td><td></td></tr>
<tr><td>SW8</td><td>Priority setting</td><td>OFF: DIP switch setting
ON: RS-485 communication setting</td><td>CT/5ACT setting</td></tr>
<tr><td>SW9
SW10</td><td>Circuit setting</td><td><table><tr><th>SW6</th><th>SW7</th><th>Circuit</th></tr><tr><td>OFF</td><td>OFF</td><td>Three-phase three-wire</td></tr><tr><td>ON</td><td>OFF</td><td>Single-phase two-wire</td></tr><tr><td>OFF</td><td>ON</td><td>Single-phase three-wire</td></tr></table></td><td>Set this switch correctly according to the measurement environment.
Otherwise, measurement cannot be performed correctly.</td></tr>
</table>

Unit No. setting switch

UNIT No.	Setting Data	Remarks
	00 to 99	

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
C0	Variable area (instantaneous value)	00H	Double-word, read only
C2	Variable area (maximum value)	02H	Double-word, read only
C3	Variable area (minimum value)	03H	Double-word, read only
C000	Parameter area	04H	Double-word

Indirect Device Memory Designation

	15 — 8	7 — 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Status read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 06H	
		n + 2	Operation status	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 30H	
		n + 2	0300H: Integral power consumption zero reset 1200H: Maximum of each measurement value reset 1300H: Minimum of each measurement value reset 9900H: Software reset	

Return data: Data stored from temperature controller to TS

*1 8000 (HEX): broadcasting

16.2.15 KM100

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 99	

Temperature Controller

Communication level

Move to the communication setting level by using the key on the operation panel and make the required settings.
When the [LEVEL] key is held down for three seconds or longer in the run level, the setting level is selected.
When the [LEVEL] key is pressed in the setting level, the communication setting level is selected.
When the [LEVEL] key is held down for one second or longer, the run level is selected again.

(Underlined setting: default)

Item		Setting	Remarks
Communication unit No.	U-no	00 to 99	
Baud rate	bPS	4800 / 9600 / 19200 / 38400	
Data length	LEn	7 / 8	
Stop bit	Sbit	1 / 2	
Parity	Prty	None / Even / Odd	

Available Device Memory

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

Device Memory		TYPE	Remarks
C0	Variable area (instantaneous value)	00H	Double-word, read only
C1	Variable area (average value)	01H	Double-word, read only
C2	Variable area (maximum value)	02H	Double-word, read only
C000	Parameter area	04H	Double-word

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model (91 to 98)	Device type
n + 1	Address No.	
n + 2	Expansion code	Bit designation
n + 3	00	Station number

For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Status read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 06H	
		n + 2	Operation status	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 30H	
		n + 2	0000H: Start calculation of arbitrary integral power consumption	
			0100H: Stop calculation of arbitrary integral power consumption	
			0200H: Arbitrary integral power consumption zero reset	
			0300H: Integral power consumption zero reset	
			0700H: Move to setting level	
			Log data read out 1000H: Moving the read pointer to the top of the stored data 1001H: Reading the log data at the read pointer (The pointer advances.) 1002H: Reading the log data at the read pointer and delete the read data and earlier data from the memory (The pointer advances.)	
			1100H: Delete all log data	
			9900H: Software reset	

Return data: Data stored from temperature controller to TS

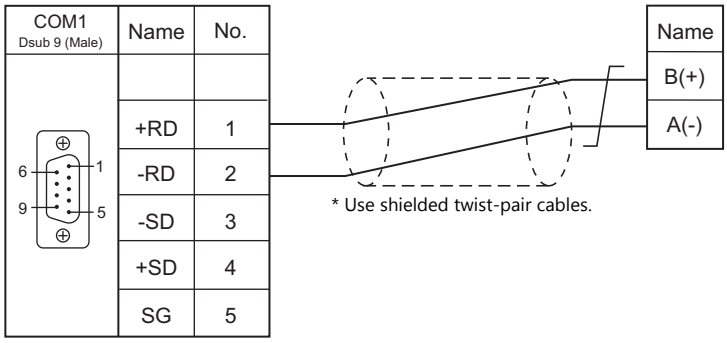
*1 8000 (HEX): broadcasting

16.2.16 Wiring Diagrams

When Connected at COM1:

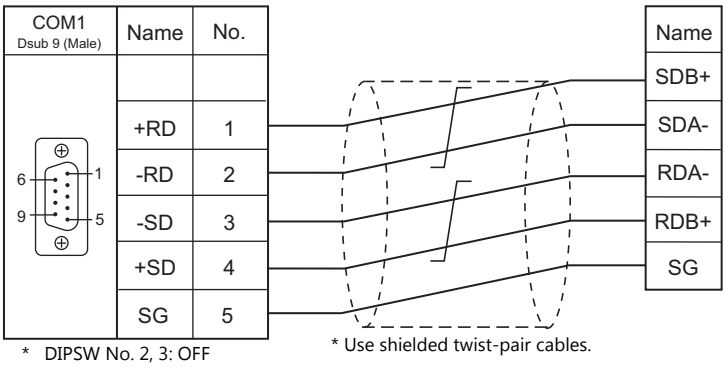
RS-422/RS-485

Wiring diagram 1 - COM1



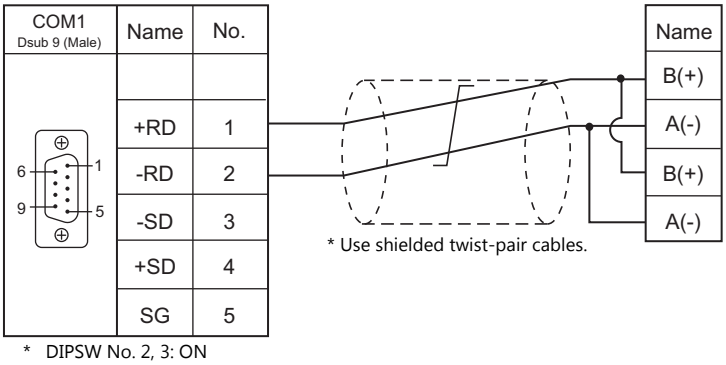
* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1



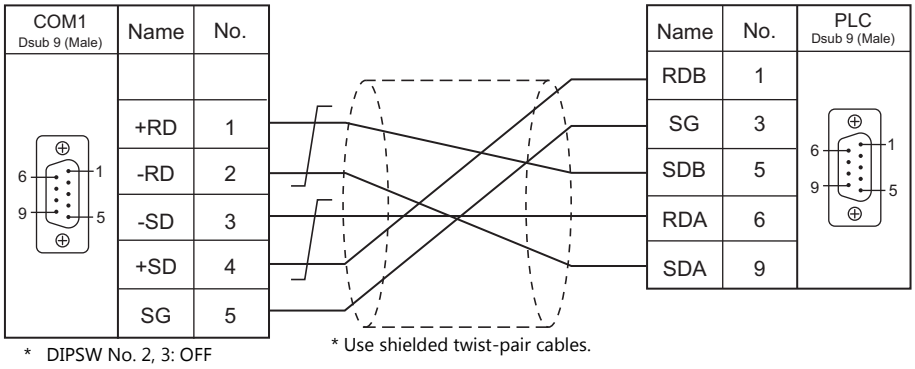
* DIPSW No. 2, 3: OFF

Wiring diagram 3 - COM1

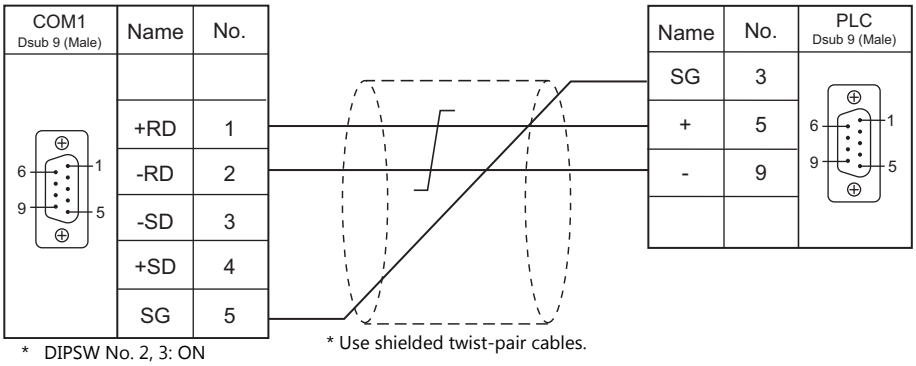


* DIPSW No. 2, 3: ON

Wiring diagram 4 - COM1



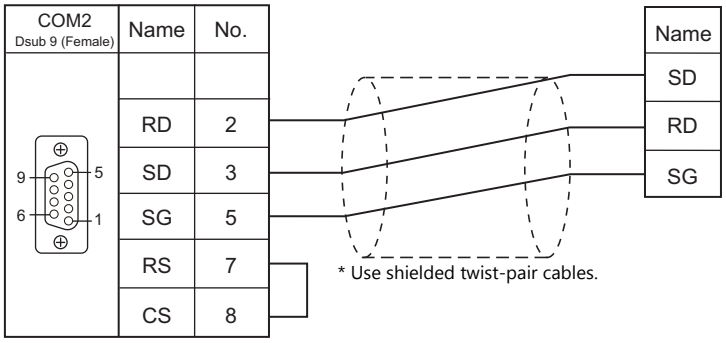
Wiring diagram 5 - COM1



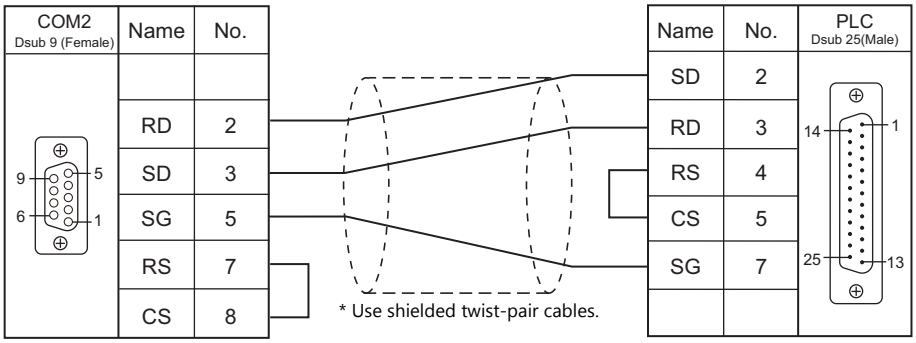
When Connected at COM2:

RS-232C

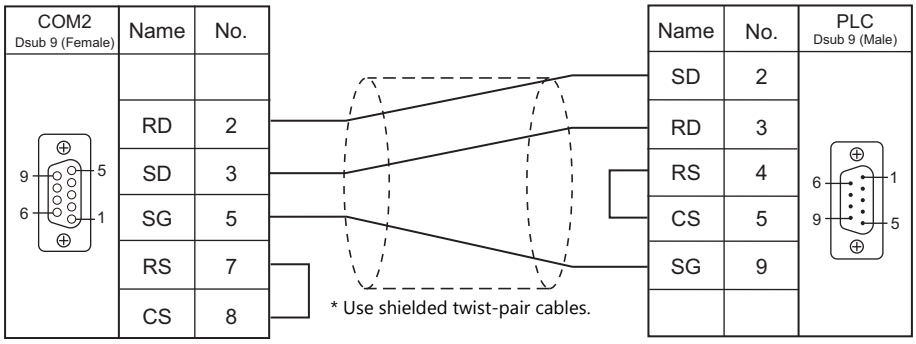
Wiring diagram 1 - COM2



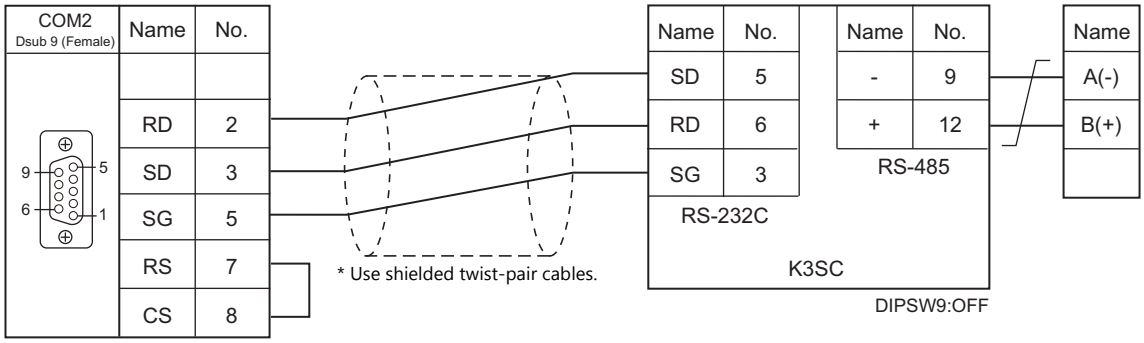
Wiring diagram 2 - COM2



Wiring diagram 3 - COM2



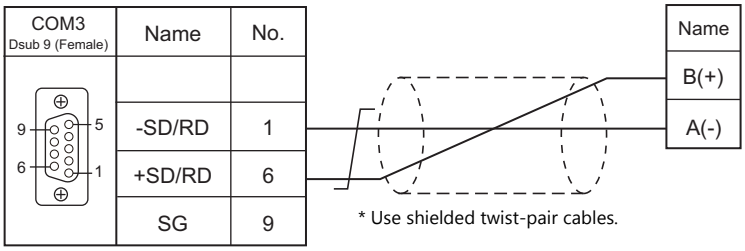
Wiring diagram 4 - COM2



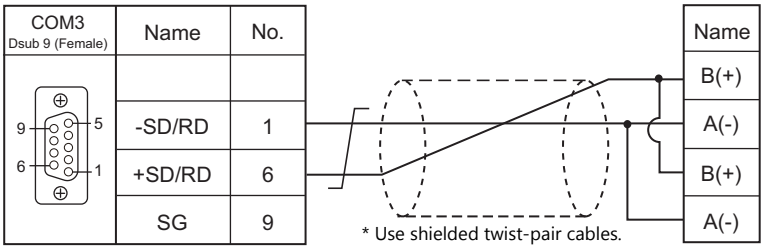
When Connected at COM3:

RS-485

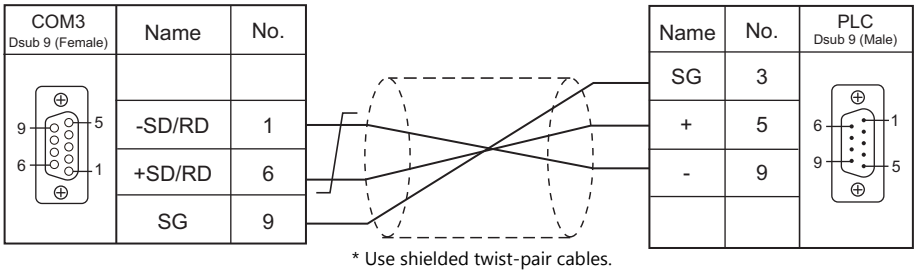
Wiring diagram 1 - COM3



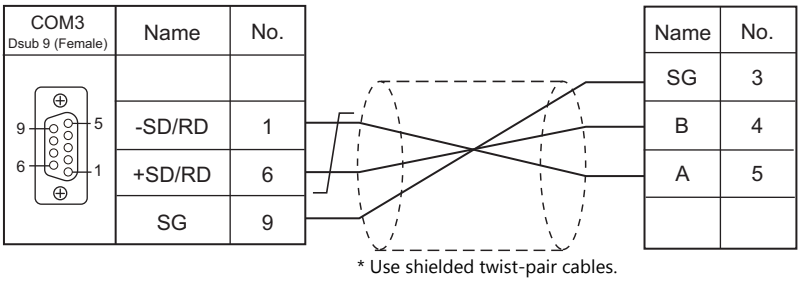
Wiring diagram 2 - COM3



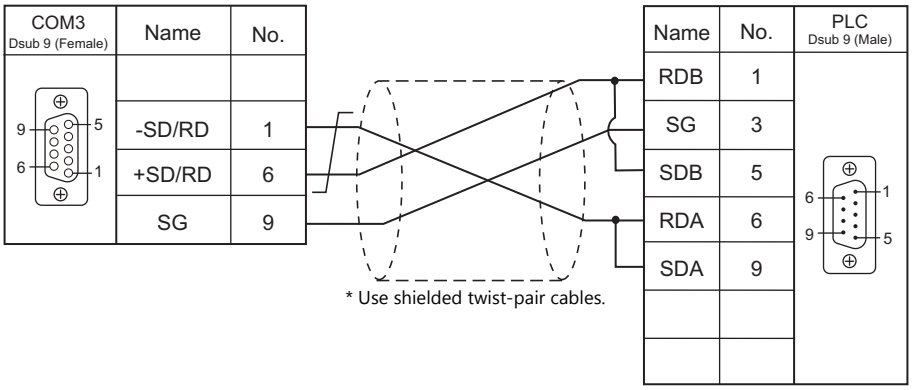
Wiring diagram 3 - COM3



Wiring diagram 4 - COM3



Wiring diagram 5 - COM3



MEMO

17. Oriental Motor

17.1 Temperature Controller / Servo / Inverter Connection

Stepping Motor

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
Highly-efficient AR series (MODBUS RTU)	ARD-KD ARD-AD ARD-CD	CN6 CN7	RS-485	COM1	Wiring diagram 1 - COM1	OM_AR (MODBUS RTU).Lst
				COM3	Wiring diagram 1 - COM3	
CRK series (MODBUS RTU)	CRD503-KD CRD507-KD CRD507H-KD CRD514-KD	CN6 CN7	RS-485	COM1	Wiring diagram 1 - COM1	OM_CRK (MODBUS RTU).Lst
				COM3	Wiring diagram 1 - COM3	

17.1.1 High-efficiency AR Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	0: Broadcast

Stepping Motor

ARD-AD/ARD-CD

MEXE02 (application software)

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.

(Underlined setting: default)

Item	Setting	Remarks
Communication timeout	0 to 10000 ms	0: No check * If the TS performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.
Parity	None / Even / Odd	
Stop bit	1 / 2 bits	

Baud rate setting switch (SW2)

SW2	Setting Item	Setting	Remarks
	Baud rate	0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps 4: 115200 bps	5 to F disabled

Function setting switches (SW4)

SW4	No.	Setting Item	Setting	Remarks
	1	Device number setting	OFF: 1 to 15 ON: 16 to 31	Use this switch together with the device number setting switch (ID).
	2	Protocol setting	**ON: MODBUS protocol**	

Device number setting switch (ID)

ID	Setting Item	Setting	Remarks
	Device number	Device No. / Device Number Setting Switch (ID) / Function Setting Switch (SW4) No. 1 1 to 15 / 1 to F / OFF 16 to 31 / 0 to F / ON	Use this switch together with function setting switch (SW4) No. 1. * Do not use device No. 0.

Terminating resistance setting switches (TERM.)

TERM.	Setting Item	Setting	Remarks
	Terminating resistance	Both ON: With terminating resistance Both OFF: Without terminating resistance	Be sure to set both switches to the same position (ON or OFF). Turning ON either one only may result in communication error.

ARD-KD

MEXE02 (application software)

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.

(Underlined setting: default)

Item	Setting	Remarks
Communication timeout*	<u>0</u> to 10000 ms	0: No check * If the TS performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.
Parity	None / <u>Even</u> / Odd	
Stop bit	<u>1</u> / 2 bits	

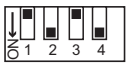
Device number setting switch (SW1)

SW1	Setting Item	Setting	Remarks
	Device number	Device No. / Device Number Setting Switch (ID) / Function Setting Switch (SW3) No. 1 1 to 15 / 1 to F / OFF 16 to 31 / 0 to F / ON	Use this switch together with function setting switch (SW3) No. 1. * Do not use device No. 0.

Baud rate setting switch (SW2)

SW2	Setting Item	Setting	Remarks
	Baud rate	0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps 4: 115200 bps	5 to F disabled

Function setting switches (SW3)

SW3	No.	Setting Item	Setting	Remarks
	1	Device number setting	OFF: 1 to 15 ON: 16 to 31	Use this switch together with the device number setting switch (SW1).
	2	Protocol setting	**ON: MODBUS protocol**	
	3	Not used	**OFF**	
	4	Terminating resistance	ON: With terminating resistance OFF: Without terminating resistance	

Available Device Memory

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

Device Memory	TYPE	Remarks
4 (holding register)	02H	

17.1.2 CRK Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	0: Broadcast

Stepping Motor

MEXE02 (application software)

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.

(Underlined setting: default)

Item	Setting	Remarks
Communication device number	1 to 31	This setting is valid, provided that the device number setting switch (SW1) is set to "F". * Do not use device No. 0.
Communication protocol	**Modbus RTU**	
Parity	None / Even / Odd	
Stop bit	1 / 2 bits	
Communication timeout	0 to 10000 ms	0: No check * If the TS performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.

Device number setting switch (SW1)

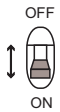
SW1	Setting Item	Setting	Remarks
	Device number	1 to E: 1 to 14 F: Device number of the communication device number parameter in MEXE02	Do not use device No. 0.

Function setting switches (SW2)

SW2	No.	Setting Item	Setting	Remarks
	1	Baud rate	See table below	
	2			
	3			
	4	Connected device	**ON: Universal master device**	

	No. 1	No. 2	No. 3
9600 bps	OFF	OFF	OFF
19200 bps	ON	OFF	OFF
38400 bps	OFF	ON	OFF
57600 bps	ON	ON	OFF
115200 bps	OFF	OFF	ON

Terminating resistance setting switch (SW3)

SW3	Setting Item	Setting	Remarks
	Terminating resistance	ON: With terminating resistance OFF: Without terminating resistance	

Available Device Memory

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

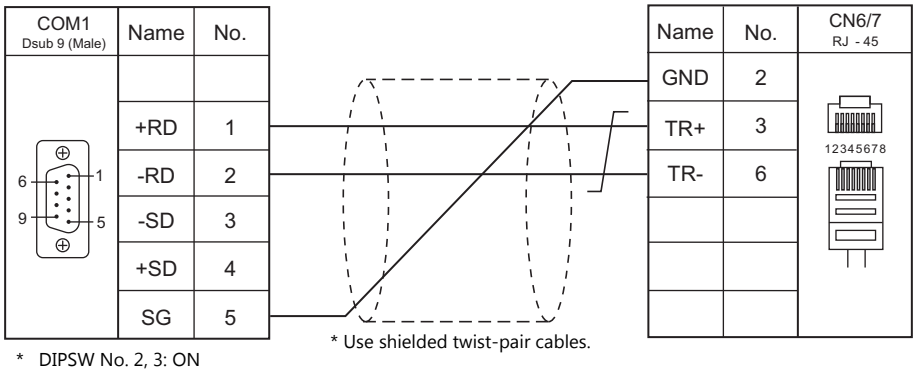
Device Memory	TYPE	Remarks
4 (holding register)	02H	

17.1.3 Wiring diagram

When Connected at COM1:

RS-485

Wiring diagram 1 - COM1

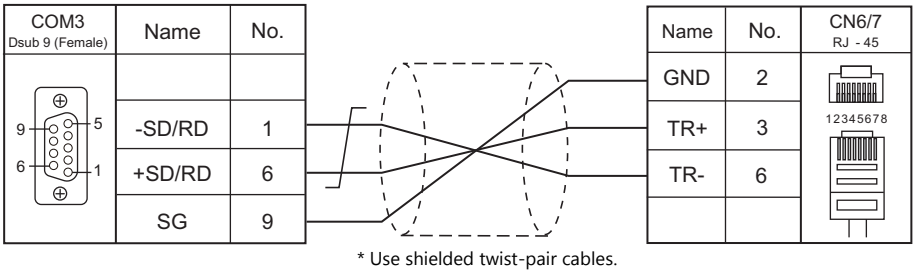


* DIPSW No. 2, 3: ON

When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



18. Panasonic

18.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	TS Port	Connection	Ladder Transfer *1
FP Series (RS232C/422)	FP1	COM port of the CPU		RS-232C	COM2	Wiring diagram 1 - COM2	×
	FP3	AFP3462 (CCU)		RS-232C			
		AFP3463 (C-NET)		RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	FP5	AFP5462 (CCU)		RS-232C	COM2	Wiring diagram 1 - COM2	
	FP10	COM port of the CPU		RS-232C			
		AFP5462 (CCU)		RS-232C			
	FP10S FP10SH	COM port of the CPU		RS-232C			
		AFP3462 (CCU)		RS-232C			
		AFP3463 (C-NET)		RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	FP0	Tool port of the CPU		RS-232C	COM2	Panasonic's "AFC8503" + Wiring diagram 6 - COM2	○
		COM port of the CPU		RS-232C	COM2	Wiring diagram 3 - COM2	×
	FP2 FP2SH	Tool port of the CPU		RS-232C	COM2	Panasonic's "AFC8503" + Wiring diagram 6 - COM2	○
		COM port of the CPU		RS-232C	COM2	Wiring diagram 2 - COM2	×
	FPΣ	Tool port of the CPU		RS-232C	COM2	Panasonic's "AFC8503" + Wiring diagram 6 - COM2	○
		AFPG801	COM1	RS-232C	COM2	Wiring diagram 4 - COM2	×
		AFPG802	COM1, 2	RS-232C	COM2	Wiring diagram 5 - COM2	
		AFPG803	COM1	RS-485	COM1	Wiring diagram 2 - COM1	
					COM3	Wiring diagram 2 - COM3	
		AFPG806	COM1	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			COM2	RS-232C	COM2	Wiring diagram 3 - COM2	
	FP-e	Tool port of the CPU		RS-232C	COM2	Panasonic's "AFC8503" + Wiring diagram 6 - COM2	○
		COM port of the CPU		RS-232C	COM2	Wiring diagram 3 - COM2	×
				RS-485	COM1	Wiring diagram 2 - COM1	
					COM3	Wiring diagram 2 - COM3	
	FP-X	Tool port of the CPU		RS-232C	COM2	Panasonic's "AFC8503" + Wiring diagram 6 - COM2	○
		AFPX-COM1	COM1	RS-232C	COM2	Wiring diagram 4 - COM2	×
		AFPX-COM2	COM1, 2	RS-232C	COM2	Wiring diagram 5 - COM2	
		AFPX-COM3	COM1	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		AFPX-COM4	COM1	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			COM2	RS-232C	COM2	Wiring diagram 3 - COM2	
FP7 Series (RS232C/422)	FP7	COM0 of the CPU		RS-232C	COM2	Wiring diagram 3 - COM2	○
		AFP7CCS1	CH1				
		AFP7CCS2	CH1, CH2				
		AFP7CCM1	CH1	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		AFP7CCM2	CH1, CH2		COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		AFP7CCS1M1	CH1		COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			CH2	RS-232C	COM2	Wiring diagram 3 - COM2	

*1 For the ladder transfer function, see the TS Reference Manual 2.

Ethernet Connection

FP/FP-X Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *5	Ladder Transfer *6
FP Series (TCP/IP) *1	FP2	FP2-ET1	○	×	As desired *2	×	×
FP Series (UDP/IP)			×	○			
FP-X (TCP/IP)	FP-X	AFPX-COM5	○	×	As desired *3		
FP7 Series (Ethernet)	FP7	Built-in Ethernet	○	○	8000 to 65535 *4	○	

*1 To speed up communications, we recommend you to use UDP/IP communication.
*2 Eight connection settings are provided on the PLC; each for one TS unit. Therefore, a maximum of eight TS units can be connected to an Ethernet unit.
*3 A maximum of three units can be connected to one port by setting the "Source Port No." on the PLC communication tool. Therefore, a maximum of three TS units can be connected to an Ethernet unit.
*4 A maximum of 16 TS units can be connected.
*5 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*6 For the ladder transfer function, see the TS Reference Manual 2.

18.1.1 FP Series (RS232C/422)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	
Header	% (Header) / < (Extension Header)	Models on which "< (Extension header)" is available: FP2, FP2SH, FPΣ, FP-X, FP0R
Monitor Registration	Unchecked / Checked	One TS 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 TS units.

PLC

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

FP-X

Tool port setting

(Underlined setting: default)

System Register *1	Contents	
410	Unit No.	1 to 99
412	Communication Mode	**Computer link**
413	Data Length	7 / 8 bits
	Parity	None / Odd / Even
	Stop Bit	1 / 2 bits
415	Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps

*1 System register setting is enabled in the RUN mode.

COM port setting

(Underlined setting: default)

System Register *1		Contents	
COM1	COM2		
410	411	Unit No.	1 to 99
412		Operation Mode	**Computer link**
413	414	Data Length	7 / 8 bits
		Parity	None / Odd / Even
		Stop Bit	1 / 2 bits
415		Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps *2

*1 System register setting is enabled in the RUN mode.
*2 For AFPX COM3, set the switch attached to the back of the cassette as well.
SW1 to 3: ON (RS-485), SW4: ON (terminator ON)
*3 Some restrictions may apply to the communication cassette when the USB port is used on the CPU. For more information, refer to the PLC manual issued by the manufacturer.

FP-Σ

Tool port setting

(Underlined setting: default)

System Register *1	Contents	
410	Unit No.	1 to 99
413	Data Length	7 / 8 bits
	Parity	None / Odd / Even
	Stop Bit	1 / 2 bits
415	Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps

*1 System register setting is enabled in the RUN mode.

COM port setting

(Underlined setting: default)

System Register *1		Contents	
COM1	COM2		
410	411	Unit No.	1 to 99*3
412		Communication Mode	**Computer link**
413	414	Data Length	7 / 8 bits
		Parity	None / Odd / Even
		Stop Bit	1 / 2 bits
415		Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps *2

*1 System register setting is enabled in the RUN mode.
*2 For AFPG806COM1, set the switch attached to the back of the cassette as well.
SW1 to 2: OFF 19200 bps, ON 115 kbps
*3 In addition to system register setting, the station number setting is also possible with the station number setting switch. For more information, refer to the PLC manual issued by the manufacturer.

FP1 / FP0 / FP-e

Tool port setting

(Underlined setting: default)

System Register *1	Contents	
411	Data Length	7 / 8 bits
414	Baud Rate	9600 / 19200
-	Parity	Odd (fixed)
-	Stop Bit	1 (fixed)

*1 System register setting is enabled in the RUN mode.

COM port setting

(Underlined setting: default)

System Register *1	Contents	
412	Communication Mode	**Computer link**
413	Data Length	7 / 8 bits
	Parity	None / Odd / Even
	Stop Bit	1 / 2 bits
414	Baud Rate	4800 / 9600 / 19200
415	Unit No.	1 to 99

*1 System register setting is enabled in the RUN mode.

FP2

Tool port setting

(Underlined setting: default)

System Register *1	Contents	
411	Data Length	7 / 8 bits
414	Baud Rate *2	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps
-	Parity	Odd (fixed)
-	Stop Bit	1 (fixed)

*1 System register setting is enabled in the RUN mode.
*2 Enabled when the DIP switch 1 on the back of the CPU unit is set to the OFF position.

COM port setting

(Underlined setting: default)

System Register *1	Contents	
412	Communication Mode	**Computer link**
413	Data Length	7 / 8 bits
	Parity	None / Odd / Even
	Stop Bit	1 / 2 bits
414	Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps
415	Unit No.	1 to 99

*1 System register setting is enabled in the RUN mode.

FP10/FP10s (COM Port)

Operation mode setting switch

Switch	Setting	Contents
4	OFF	Baud rate: 19200 bps
5	ON	Data length: 8 bits
6	ON	With parity
7	OFF	Odd
8	OFF	Stop bit 1

Station number setting switch

(Underlined setting: default)

Switch		Setting
The tens place	The ones place	01 to 32

FP10SH (COM Port)

Operation mode setting switch (upper)

Switch	Setting	Contents
1	OFF	Not control with a modem
2	OFF	Beginning code STX invalid
3	OFF	Terminating code CR
4	ON	
5	ON	Stop bit 1
6	ON	Odd parity
7	ON	
8	ON	Data length: 8 bits

Operation mode setting switch (lower)

Switch	Setting	Contents
6	ON	Baud rate: 19200 bps
7	ON	
8	OFF	

Station number setting switch (lower)

(Underlined setting: default)

Switch		Setting
The tens place	The ones place	01 to 32

AFP3462 / AFP5462 (CCU)

DIP switch setting

Switch	Setting	Contents
1	ON	Baud rate: 19200 bps
2	OFF	
3	OFF	
4	ON	Data length: 8 bits
5	ON	With parity
6	OFF	Odd
7	OFF	Stop bit 1
8	OFF	CS, CD invalid

AFP3463 (C-NET Link Unit)

DIP switch setting

Switch	Setting	Contents
1	OFF	Baud rate: 19200 bps
2	ON	Data length: 8 bits
3	ON	With parity
4	OFF	Odd
5	OFF	Stop bit 1
6	OFF	-
7	OFF	-
8	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
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, including special relays
L	(link relay)	04H	WL as word device
LD	(link register)	05H	
FL	(file register)	06H	FP2, 3, 5, 10 only
SV	(timer, counter/set value)	07H	
EV	(timer, counter/elapsed time)	08H	
T	(timer/contact)	09H	Read only
C	(counter/contact)	0AH	Read only

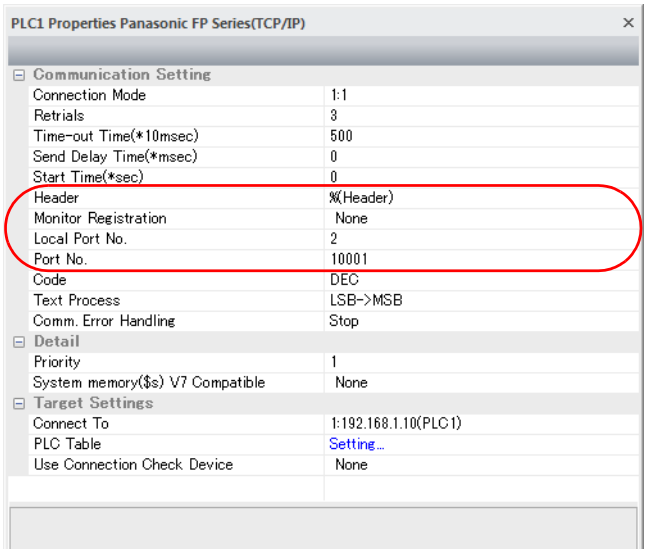
18.1.2 FP Series (TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

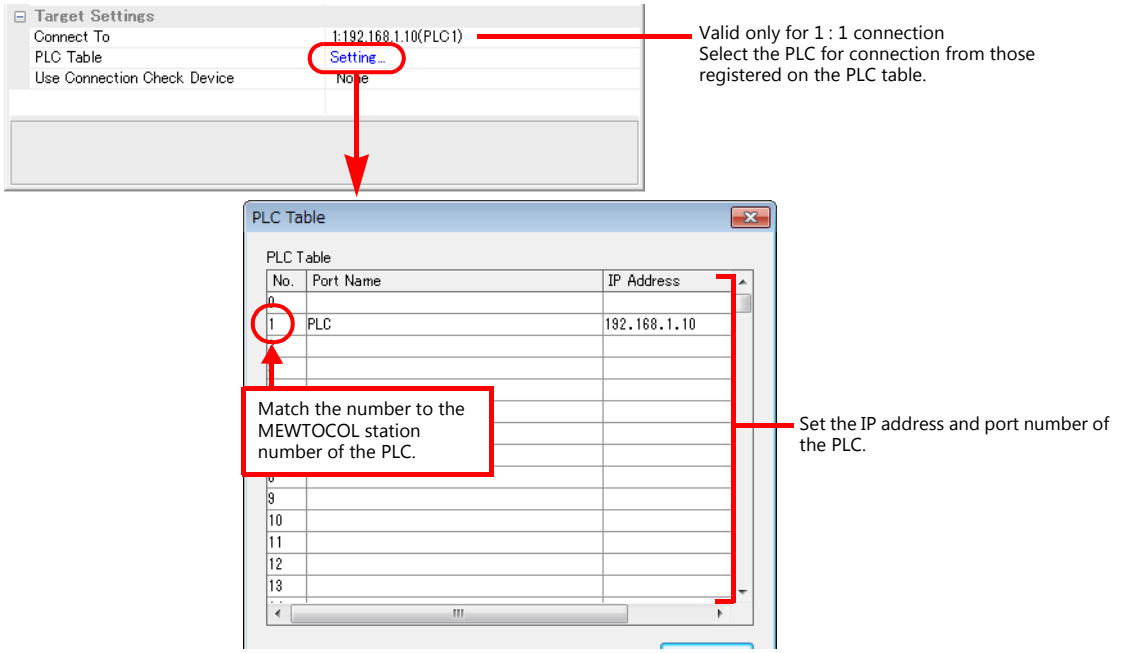
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
 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



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One TSi unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple TSi units in n : 1 connection.
Local Port No.	Set the local port number of the TSi unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
  Set the same PLC table number as the one set for "MEWTOCOL Station Number" ([Initial Information Setting] → [Local Node Setting]).



PLC

Make the mode setting using the Ethernet unit "FP2-ET1".

Mode setting switch

Switch	Setting	Contents	Remarks
2	ON	Auto connection function	

Make the PLC setting using the configuration tool "Configurator ET". For more information, refer to the PLC manual issued by the manufacturer.

Initial information setting

Item		Setting
Local Node Setting	IP Address	IP address of the PLC
	MEWTOCOL Station Number	1 to 31 * The same number must be specified for the PLC table number of the TSi.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the TSi is connected.	Communication Mode	**TCP/IP**
	Open Type	**Unpassive**
	Usage	**MEWTOCOL communication**
	Local Node (PLC) Port Number	As desired
	Target Node IP Address	IP address of the TSi
	Target Node Port Number	Port number of the TSi
	Target Node MEWTOCOL Station Number	1 to 31 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the TSi.
	Connection Setting	Valid

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, including special relays
L	(link relay)	04H	WL as word device
LD	(link register)	05H	
FL	(file register)	06H	FP2, 3, 5, 10 only
SV	(timer, counter/set value)	07H	
EV	(timer, counter/elapsed time)	08H	
T	(timer/contact)	09H	Read only
C	(counter/contact)	0AH	Read only

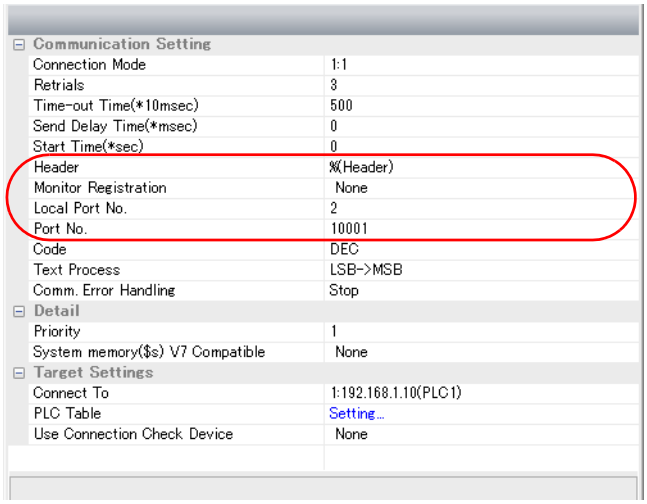
18.1.3 FP Series (UDP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

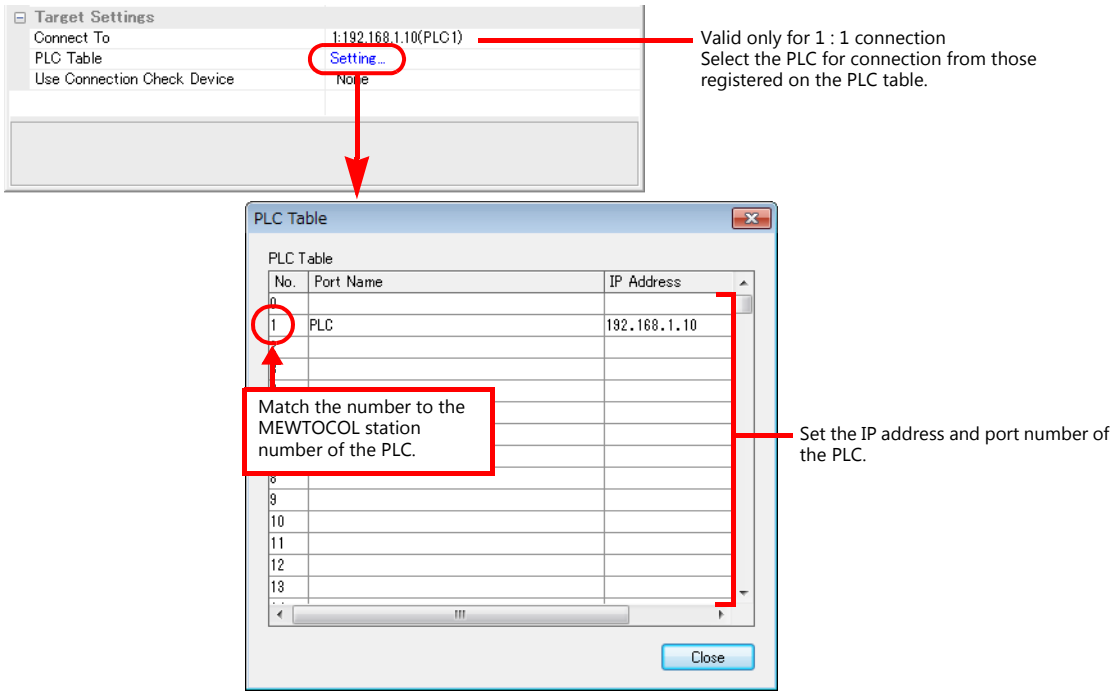
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
 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



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One TSi unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple TSi units in n : 1 connection.
Local Port No.	Set the local port number of the TSi unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
  Set the same PLC table number as the one set for "MEWTOCOL Station Number" ([Initial Information Setting] → [Local Node Setting]).



PLC

Make the mode setting using the Ethernet unit "FP2-ET1".

Mode setting switch

Switch	Setting	Contents	Remarks
2	ON	Auto connection function	

Make the PLC setting using the configuration tool "Configurator ET". For more information, refer to the PLC manual issued by the manufacturer.

Initial information setting

Item		Setting
Local Node Setting	IP Address	IP address of the PLC
	MEWTOCOL Station Number	1 to 31 * The same number must be specified for the PLC table number of the TSi.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the TSi is connected.	Communication Mode	**UDP/IP**
	Open Type	**Unpassive**
	Usage	**MEWTOCOL communication**
	Local Node (PLC) Port Number	As desired
	Target Node IP Address	IP address of the TSi
	Target Node Port Number	Port number of the TSi
	Target Node MEWTOCOL Station Number	1 to 31 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the TSi.
	Connection Setting	Valid

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, including special relays
L	(link relay)	04H	WL as word device
LD	(link register)	05H	
FL	(file register)	06H	FP2, 3, 5, 10 only
SV	(timer, counter/set value)	07H	
EV	(timer, counter/elapsed time)	08H	
T	(timer/contact)	09H	Read only
C	(counter/contact)	0AH	Read only

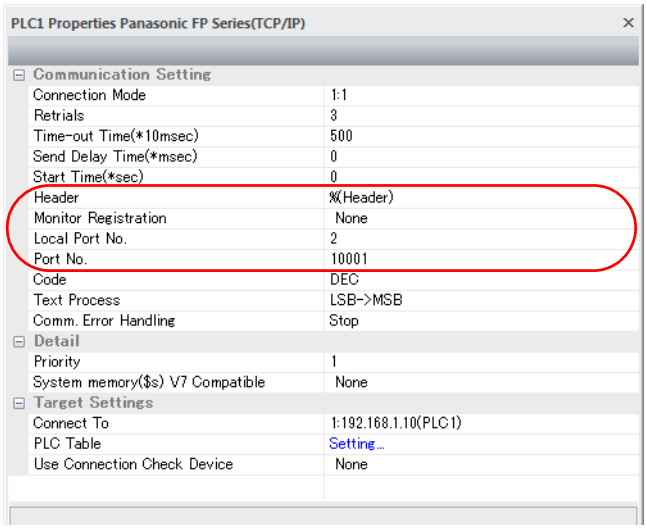
18.1.4 FP-X (TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

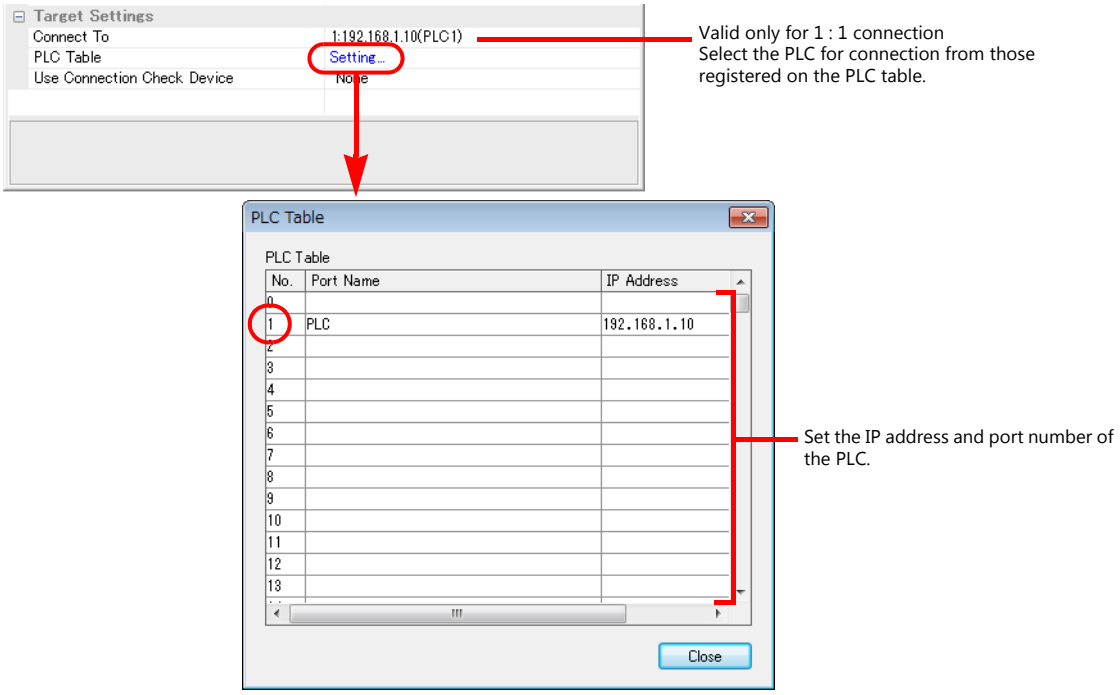
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
 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



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One TSi unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple TSi units in n : 1 connection.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
  Set the same PLC table number as the one set for "No. 410 Unit No." ([Option] → [PLC System Register Setting] → [COM1 Port Setting]).



PLC

Make the PLC setting using the communication tool "Configurator WD" and the programming tool "FPWIN GR". For more information, refer to the PLC manual issued by the manufacturer.

IP address setting (Configurator WD)

Item		Setting
Basic Setting	Unit Name	Unit name of the communication cassette "AFPX-COM5"
	IP Address	IP address of the PLC
	Subnet mask	Subnet mask of the PLC
	Gateway	Gateway of the PLC

Communication setting (Configurator WD)

Item		Setting
Communication Mode		**Computer link**
Action Mode		**Server mode**
Control unit - Communication cassette Setting	Baud rate of COM1 Port	9600 / 115200 bps
Server Setting	Source Port No.	As desired

COM1 port setting (FPWIN GP)

Item			Setting
No. 410	Unit No.		1 to 99 * The same number must be specified for the PLC table number of the TSi.
No. 412	Communication Mode		**Computer link**
No. 413	Communication Format	Data Length	**8 bits**
		Parity	**Odd**
		Stop Bit	**1 bit**
No. 415	Baud rate		9600 / 115200 bps * Match the baud rate to the one set for "Baud rate of COM1 Port" in the [Control unit - Communication cassette Setting] of the [Communication Setting] dialog on the communication tool "Configurator WD".

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, including special relays
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

18.1.5 FP7 Series (RS232C/422)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 255	

PLC

FP7 configuration

Make PLC settings using the programming tool "FPWIN GR7".
For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

Setting Items			Descriptions
Built-in SCU	COM0 setting COM1 setting *1 COM 2 setting *1	Communication mode	**MEWTOCOL-7**
		Target port No.	**1 to 255**
		Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps
		Data length	7 / 8 bits
		Parity	None / Odd / Even
		Stop bit	1 / 2 bits
		CS/RS	**Invalid**
		Transmission latency setting	For RS-232C, RS-422 communication: 0 For RS-485 communication: Change depending on environment
		Beginning code STX	**Invalid**
		Terminating resistance	**CR**
		Modem initialization	**No initialization**

*1 When using communication cassettes, configure CH1 and CH2 as COM1 and COM2 respectively.
CH1 = COM1
CH2 = COM2

AFP7CCS2

Setting Items		Contents	Remarks
	Signal line change	**3W**	Set all switches to 3W.

AFP7CCM1/AFP7CCM2

Setting Item		Contents	Remarks
	Signal level change	**RS-485**	Turn on all three switches of the CH for connection.
	Terminating resistance setting	ON at termination	

AFP7CCS1M1

Setting Item		Contents	Remarks
ON OFF	RS-485 Terminating resistance setting	ON at termination	

Calendar

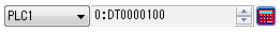
This model is equipped with a calendar function; however, the calendar data cannot be written from the TS. Thus, time correction must be performed on the PLC side.

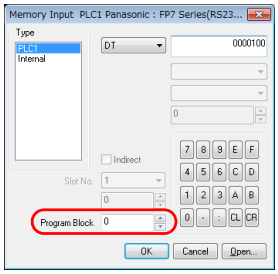
Available Device Memory

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
DT	(data register)	00H	*1
X	(external input)	01H	WX as word device; X0 to X1F and X70 to X9F: read only, *1
Y	(external output)	02H	WY as word device; Y0 to Y9, Y13, Y15 to Y1F, Y70 to Y9F: read only, *1
R	(internal relay)	03H	WR as word device, including special relays, *1
L	(link relay)	04H	WL as word device, *1
LD	(link register)	05H	*1
T	(timer/contact)	09H	Read only, *1
C	(counter/contact)	0AH	Read only, *1
P	(pulse relay)	0BH	Read only, *1
E	(error report relay)	0CH	Read only
SD	(system data)	0DH	Read only
SR	(system relay)	0EH	WS as word device, read only
IN	(direct input)	0FH	WI as word device, read only, *2
OT	(direct output)	10H	WO as word device, *2
UM	(unit memory)	11H	*2
TS	(timer/set value)	12H	Double-word, *1
TE	(timer/elapsed value)	13H	Double-word, *1
CS	(counter/set value)	14H	Double-word, *1
CE	(counter/elapsed value)	15H	Double-word, *1
I	(index register)	16H	Double-word

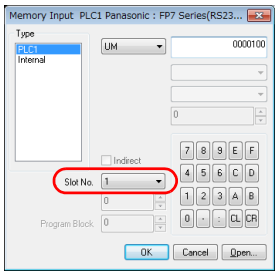
*1 Specify the program block number. Indications on the screen configuration software are as follows.





Example: 1: DT000100
- Address number
- Device type
- Program block number
  - 0: Global device
  - 1 to 999: Local device

*2 Specify the slot number. Indications on the screen configuration software are as follows.

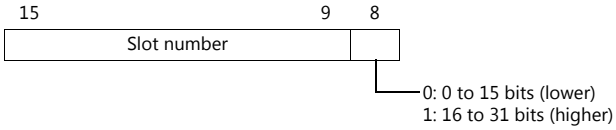


Example: 1: UM000100
- Address number
- Device type
- Slot number: 1 to 99

Indirect Device Memory Designation

	15 – 8	7 – 5	4 – 0
n + 0	Model	Device type	
n + 1	Lower address No.		
n + 2	Program block number		Higher address No.
n + 3	Expansion code *	Bit designation	
n + 4	00	Station number	

* Specify the expansion code as follows.



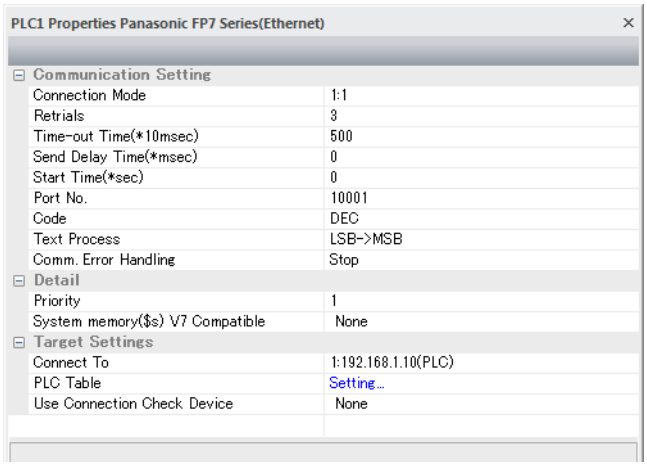
18.1.6 FP7 Series (Ethernet)

Communication Setting

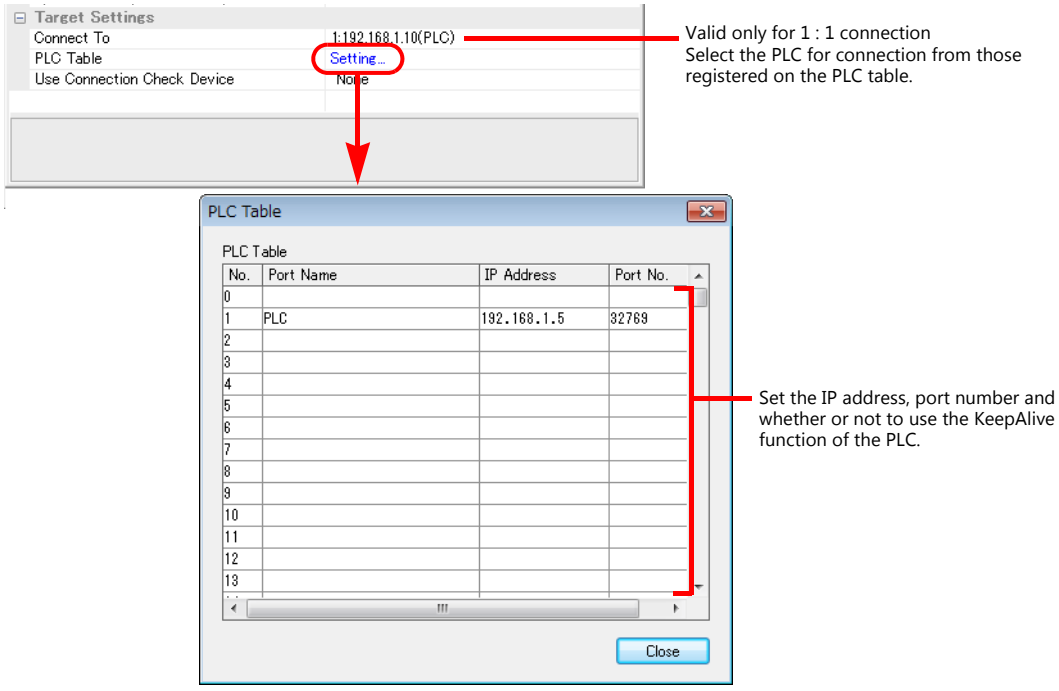
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

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



- IP address and port number (No. 8000 to 65535) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

Make PLC settings using the programming tool “FPWIN GR7”.
For more information, refer to the PLC manual issued by the manufacturer.

FP7 configuration

Setting Item			Setting
Built-in ET-LAN	Basic information on communication	Local IP address	Set the IP address of the PLC.
		Subnet mask	Set the subnet mask of the PLC.
		Default gateway	Set the default gateway of the PLC.
	User connection information settings	Operation mode	**MEWTOCOL-7**
		Connection usage	**Use**
		Open system (server/client)	Server connection (target station as desired) / server connection (target station specified)
		Open system (automatic/manual)	**Open automatically**
		Communication mode	UDP/IP / TCP/IP
		Local port No.	Set the port number of the PLC (8000 to 65535).
		Target port No.	Port number of the TSi (communication mode: TCP/IP, open system (server/client): Not required for server connection (target station as desired))
		Unused connection time	**0**
		Target port setting method	**Specify the IP address (IPv4).**
		Target IP address	IP address of the TSi (communication mode: TCP/IP, open system (server/client): Not required for server connection (target station as desired))

Calendar

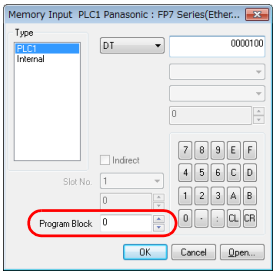
This model is equipped with a calendar function; however, the calendar data cannot be written from the TSi. Thus, time correction must be performed on the PLC side.

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.

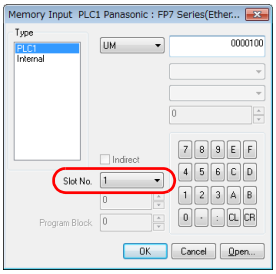
Device Memory		TYPE	Remarks
DT	(data register)	00H	*1
X	(external input)	01H	WX as word device; X0 to X1F and X70 to X9F: read only, *1
Y	(external output)	02H	WY as word device; Y0 to Y9, Y13, Y15 to Y1F, Y70 to Y9F: read only, *1
R	(internal relay)	03H	WR as word device, including special relays, *1
L	(link relay)	04H	WL as word device, *1
LD	(link register)	05H	*1
T	(timer/contact)	09H	Read only, *1
C	(counter/contact)	0AH	Read only, *1
P	(pulse relay)	0BH	Read only, *1
E	(error report relay)	0CH	Read only
SD	(system data)	0DH	Read only
SR	(system relay)	0EH	WS as word device, read only
IN	(direct input)	0FH	WI as word device, read only, *2
OT	(direct output)	10H	WO as word device, *2
UM	(unit memory)	11H	*2
TS	(timer/set value)	12H	Double-word, *1
TE	(timer/elapsed value)	13H	Double-word, *1
CS	(counter/set value)	14H	Double-word, *1
CE	(counter/elapsed value)	15H	Double-word, *1
I	(index register)	16H	Double-word

*1 Specify the program block number. Indications on the screen configuration software are as follows.



Example: 1: DT000100
- Address number
- Device type
- Program block number
  - 0: Global device
  - 1 to 999: Local device

*2 Specify the slot number. Indications on the screen configuration software are as follows.



Example: 1: UM000100
- Address number
- Device type
- Slot number: 1 to 99

Indirect Device Memory Designation

	15 – 8	7 – 5	4 – 0
n + 0	Model	Device type	
n + 1	Lower address No.		
n + 2	Program block number	Higher address No.	
n + 3	Expansion code *	Bit designation	
n + 4	00	Station number	

* Specify the expansion code as follows.

15 – 9	8
Slot number	

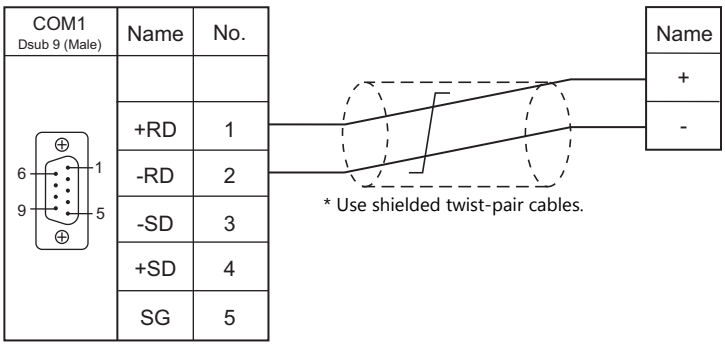
- 0: 0 to 15 bits (lower)
- 1: 16 to 31 bits (higher)

18.1.7 Wiring Diagrams

When Connected at COM1:

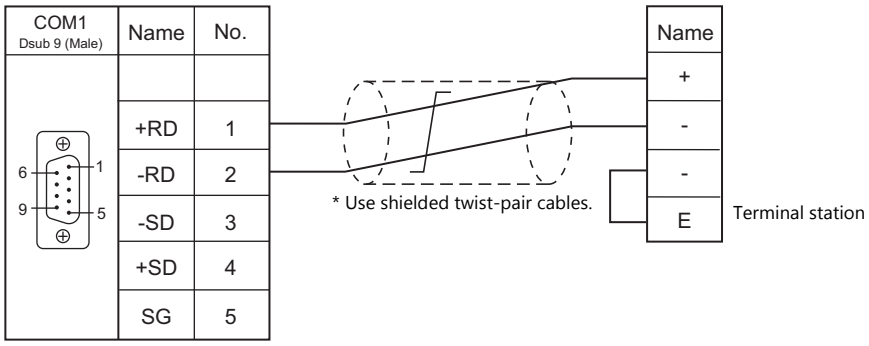
RS-485

Wiring diagram 1 - COM1



* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1

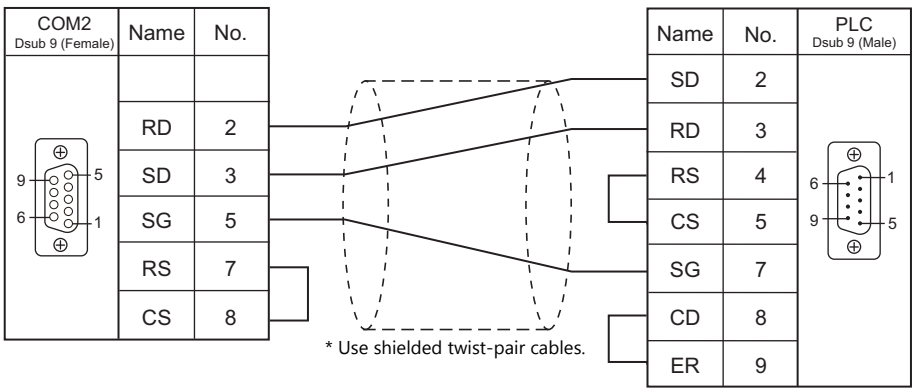


* DIPSW No. 2, 3: ON

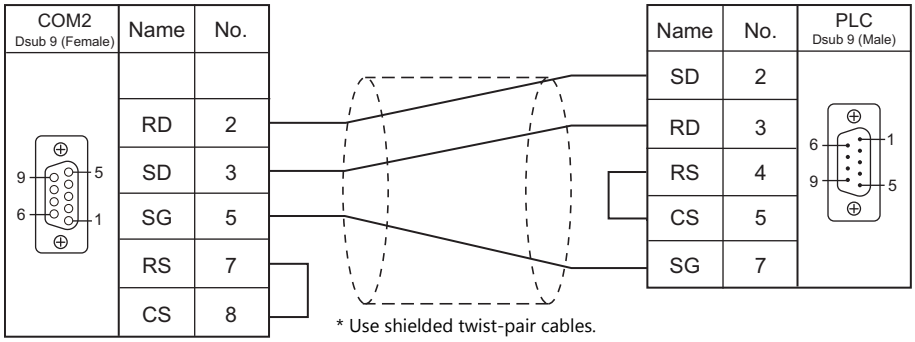
When Connected at COM2:

RS-232C

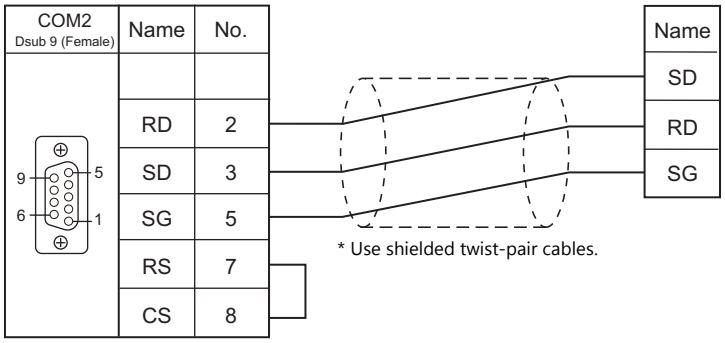
Wiring diagram 1 - COM2



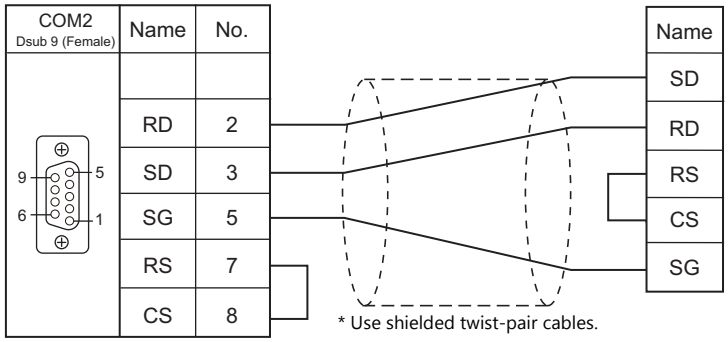
Wiring diagram 2 - COM2



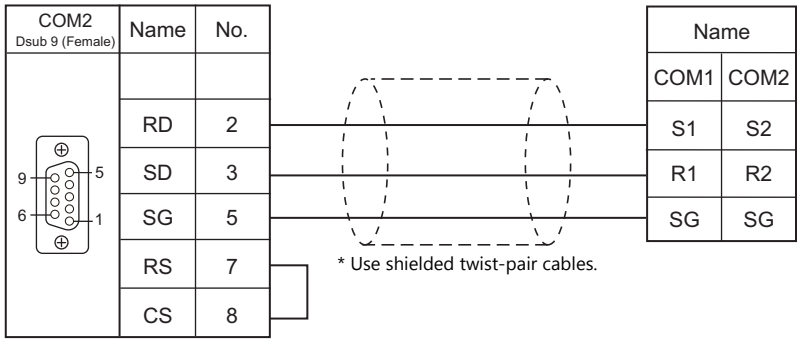
Wiring diagram 3 - COM2



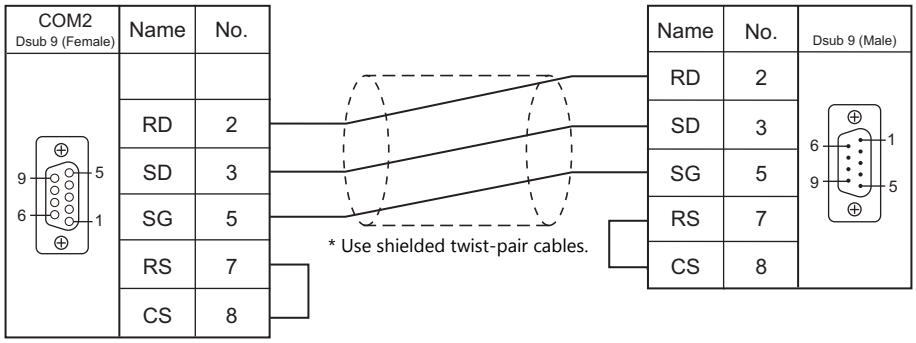
Wiring diagram 4 - COM2



Wiring diagram 5 - COM2



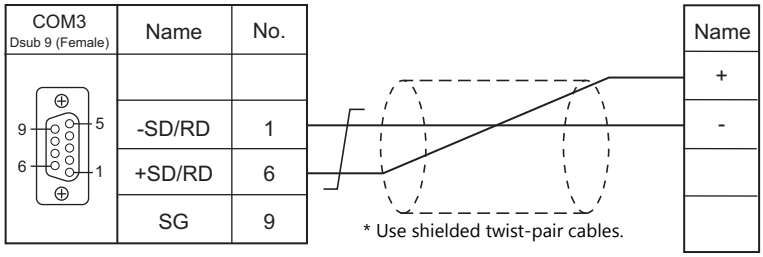
Wiring diagram 6 - COM2



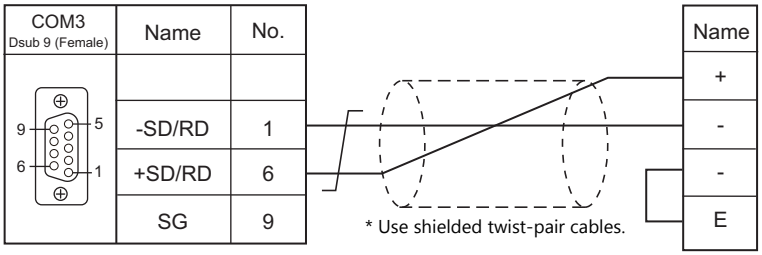
When Connected at COM3:

RS-485

Wiring diagram 1 - COM3



Wiring diagram 2 - COM3



18.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Laser Marker

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
LP-400	LP-410U, LP-410TU, LP-411U, LP-411TU, LP-420S9U, LP-420S9TU, LP-421S9U, LP-421S9TU, LP-425S9U, LP-425S9TU, LP-430U, LP-430TU, LP-431U, LP-431TU, LP-435U, LP-435TU	COM2	RS-232C	COM2	Wiring diagram 1 - COM2	LP-400. Lst

Eco-POWER METER

PLC Selection on the Editor	Model		Port	Signal Level	TS Port	Connection	Lst File
KW Series	KW1M	AKW1110 AKW1111	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	Pana_KW1M. Lst
					COM3	Wiring diagram 1 - COM3	
	KW1M-H	AKW1121	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	KW1M-R	AKW1000 AKW1000K	Terminal	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		AKW1131 AKW1131K	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	KW2G	AKW2010G	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	Pana_KW2G. Lst
					COM3	Wiring diagram 1 - COM3	
	KW2G-H	AKW2020G	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	KW4M	AKW5111 AKW5211	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	Pana_KW4M. Lst
					COM3	Wiring diagram 1 - COM3	
	KW7M	AKW7111	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	Pana_KW7M. Lst
					COM3	Wiring diagram 1 - COM3	
	KW8M	AKW8111 AKW8111H AKW8115	Terminal	RS-485	COM1	Wiring diagram 1 - COM1	Pana_KW8M. Lst
					COM3	Wiring diagram 1 - COM3	

Servo Amplifier

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
MINAS A4 series	MADDTxxxx MBDDTxxxx MCDDTxxxx MDDDTxxxx MEDDTxxxx MFDDTxxxx MGDDTxxxx	CN X4	RS-232C	COM2	Wiring diagram 3 - COM2	PanaA4. Lst
			RS-485	COM1	Wiring diagram 2 - COM1	
				COM3	Wiring diagram 2 - COM3	

18.2.1 LP-400 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	**RS-232C**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Sum Check	Provided / Not provided	
CR/LF	CR / CR/LF	

Laser Marker

Parameter

Set communication parameters using the console. For more information, refer to the instruction manual for the laser marker issued by the manufacturer.

(Underlined setting: default)

Mode	Sub Menu	Item	Setting	Remarks
Environment setting	Communication I/O	Baud Rate	4800 / 9600 / 19200 / 38400 bps	
		Data Length	**8 bits**	
		Parity	None / Odd / Even	
		Stop Bits	1 / 2 bit	
		Delimit	CR / CR+LF	
		Check Sum	None / Provided	

DIP switch

<table>
<tr><th>DPS-8</th><th>SW No.</th><th>Contents</th><th>Setting</th><th>Remarks</th></tr>
<tr><td rowspan="8"> 
</td><td>1</td><td>System reserve</td><td>OFF: System reserved</td><td></td></tr>
<tr><td>2</td><td>External control method</td><td>ON: RS-232C control</td><td></td></tr>
<tr><td>3</td><td>Buzzer at an occurrence of error</td><td>ON: Not sound
OFF: Sound</td><td></td></tr>
<tr><td>4</td><td>Password lock</td><td>ON: Password lock invalid
OFF: Password lock valid</td><td></td></tr>
<tr><td>5</td><td rowspan="2">Method to switch to remote mode</td><td rowspan="2"><table><tr><th>SW5</th><th>SW6</th><th>Operation</th></tr><tr><td>OFF</td><td>OFF</td><td>Pressing the remote button on the front of the controller</td></tr><tr><td>ON</td><td>OFF</td><td>Inputting “REMOTE IN” on the terminal block</td></tr><tr><td>OFF</td><td>ON</td><td>Turning the key switch ON</td></tr></table></td><td rowspan="2"></td></tr>
<tr><td>6</td></tr>
<tr><td>7</td><td>System reserve</td><td>OFF: System reserved</td><td></td></tr>
<tr><td>8</td><td>System reserve</td><td>OFF: System reserved</td><td></td></tr>
</table>

*** Keep the power off when changing the DIP switch setting.**

*** For communications with the TS, be sure to switch to the remote mode.**

Wiring on the terminal block

If printing cannot be performed correctly, check the wiring status on the terminal block.

- Short-circuit A11 "LASER STOP-" and A12 "LASER STOP+". When they are opened, the auto shutter is closed and printing is disabled.
- For B11 "EMER. -" and B12 "EMER. +", connect the normally-closed type emergency stop switch or short-circuit them. When they are opened, the laser power is turned off and printing is disabled.
- Connect the power supply (internal or external) to A2 "IN COM." and B2 "OUT COM.". Otherwise, the laser marker will not be activated.
  When using an internal power supply, short-circuit A1 "+12V OUT" and A2 "IN COM." as well as B1 "0V OUT" and B2 "OUT COM.".
  When using an external power supply, remove short bars from between A1 "+12V OUT" and A2 "IN COM." as well as B1 "0V OUT" and B2 "OUT COM.".

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
FNM	(file name)	00H	
FNO	(file number change)	01H	
STR	(text to print)	02H	
MCS	(text to print (1-byte character))	03H	
LMT	(limit date and time)	04H	
CNT	(counter)	05H	Double-word
LTC	(lot condition)	06H	
CDF	(logo file)	07H	
ALC	(global condition)	08H	Double-word
CDC	(logo condition)	09H	Double-word
FST	(file setting)	0AH	Double-word
WDC	(print line width correction)	0BH	
WTC	(print quality adjustment)	0CH	
TRG	(trigger condition)	0DH	
DLY	(delay)	0EH	
YMD	(year, month, day, time)	0FH	
ERA	(year of Japanese era)	10H	
ENV	(input/output environment)	11H	
PST	(print setting)	12H	
STS	(status request)	13H	Read only
RKC	(rank condition)	14H	
RKS	(rank text)	15H	
OFC	(offset condition)	16H	
OFS	(offset)	17H	Double-word

FNM (file name)

Address	Name	Setting Range
0000	File name	File name (CHAR 20 bytes)

FNO (file number)

Address	Name	Setting Range
0000	File number	0 to 1023, 9999 * * 9999: New

STR (text to print)

Address	Name	Setting Range
0000 to 0029	Text to print in line number 01	Text to print (CHAR 60 bytes)
0030 to 0059	Text to print in line number 02	
:	:	
1770 to 1799	Text to print in line number 60	

MCS (text to print (1-byte character))

Address	Name	Setting Range
0000 to 0014	Text to print in line number 01 (1-byte character)	Text to print (CHAR 30 bytes)
0015 to 0029	Text to print in line number 02 (1-byte character)	
:	:	
0885 to 0899	Text to print in line number 60 (1-byte character)	

LMT (limit date and time)

Address	Name		Setting Range
0101	Limit number 1	Limit	-999 to 999
0102		Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0103		Start day	0: Not including today 1: Including today
0201	Limit number 2	Limit	-999 to 999
0202		Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0203		Start day	0: Not including today 1: Including today
:	:	:	:
0801	Limit number 8	Limit	-999 to 999
0802		Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0803		Start day	0: Not including today 1: Including today

CNT (counter)

Address	Name		Setting Range
0000	Counter 0	Current value	0 to 999999
0001		Initial value	0 to 999999
0002		End value	0 to 999999
0003		Step	0 to 999999
0004		Count source	0 to 7: Counter 0 to 7 8: Trigger input
0005		Flag	0: Not reset when the date changes 1: Reset when the date changes
0100	Counter 1	Current value	0 to 999999
0101		Initial value	0 to 999999
0102		End value	0 to 999999
0103		Step	0 to 999999
0104		Count source	0 to 7: Counter 0 to 7 8: Trigger input
0105		Flag	0: Not reset when the date changes 1: Reset when the date changes
:	:	:	:
0700	Counter 7	Current value	0 to 999999
0701		Initial value	0 to 999999
0702		End value	0 to 999999
0703		Step	0 to 999999
0704		Count source	0 to 7: Counter 0 to 7 8: Trigger input
0705		Flag	0: Not reset when the date changes 1: Reset when the date changes

LTC (lot condition)

Address	Name		Setting Range
0000	Lot function number 0	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0001		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute
0100	Lot function number 1	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0101		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute
:	:	:	:
0700	Lot function number 7	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0701		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute

CDF (logo file)

Address	Name	Setting Range
0000 to 0127	Name of logo file number 00	Logo file name (CHAR 256 bytes)
0128 to 0255	Name of logo file number 01	
:	:	
1920 to 2047	Name of logo file number 15	

ALC (global condition)

Address	Name	Setting Range
0000	X offset	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
0001	Y offset	
0002	Rotation offset	-18000 to +18000: -180.00° to +180.00°
0003	Number of overprint times	1 to 99
0004	Time to stop overprint	0 to 10: 0 to 1.0 sec.
0005	Flip horizontal	0: Not flip 1: Flip
0006	Flip vertical	0: Not flip 1: Flip

CDC (logo condition)

Address	Name		Setting Range
0000	Logo number 0	Area number	0 to F (HEX)
0001		X magnification	10000 to 1000000: 10.000 to 1000.000%
0002		Y magnification	10000 to 1000000: 10.000 to 1000.000%
0003		X position	-300000 to +300000: -300.000 to +300.000 mm
0004		Y position	-300000 to +300000: -300.000 to +300.000 mm
0005		Rotation angle	-18000 to +18000: -180.00° to +180.00°
0006		Laser power offset	0 to 200%
0007		Scan speed correction	5 to 500%
0100	Logo number 1	Area number	0 to F (HEX)
0101		X magnification	10000 to 1000000: 10.000 to 1000.000%
0102		Y magnification	10000 to 1000000: 10.000 to 1000.000%
0103		X position	-300000 to +300000: -300.000 to +300.000 mm
0104		Y position	-300000 to +300000: -300.000 to +300.000 mm
0105		Rotation angle	-18000 to +18000: -180.00° to +180.00°
0106		Laser power offset	0 to 200%
0107		Scan speed correction	5 to 500%
:	:	:	:
1500	Logo number 15	Area number	0 to F (HEX)
1501		X magnification	10000 to 1000000: 10.000 to 1000.000%
1502		Y magnification	10000 to 1000000: 10.000 to 1000.000%
1503		X position	-300000 to +300000: -300.000 to +300.000 mm
1504		Y position	-300000 to +300000: -300.000 to +300.000 mm
1505		Rotation angle	-18000 to +18000: -180.00° to +180.00°
1506		Laser power offset	0 to 200%
1507		Scan speed correction	5 to 500%

FST (file setting)

Address	Name	Setting Range
0000	Laser power (LPW)	0005 to 1000: 000.5 to 100.0 (0.5 increments)
0001	Scan speed (SSP)	LP-430U/430TU/435U/435TU/420S9U/420S9TU/425S9U/425S9TU/410U/410TU 00001 to 12000 mm/s LP-431U/431TU/421S9U/421S9TU/411U/411TU 00001 to 06000 mm/s
0002	Frequency (MPL)	0: 5 kHz 1: 10 kHz 2: 20 kHz
0003	Print interval (INT)	00000 to 30000: 0000.0 to 3000.0 mm
0004	Line speed (LSP)	LP-430U/430TU/420S9U/420S9TU/425S9U/425S9TU/435U/435TU 60 to 240000: 000.060 to 240.000 m/min LP-431U/431TU/421S9U/421S9TU 60 to 120000: 000.060 to 120.000 m/min LP-410U/410TU 60 to 170000: 000.060 to 170.000 m/min LP-411U/411TU 60 to 85000: 000.060 to 085.000 m/min
0005	Encoder pulse (ENC)	00500 to 60000: 005.00 to 600.00 pulse/mm

WDC (print line width correction)

Address	Name	Setting Range
0000	Print line width correction	0010 to 2000: 0.010 to 2.000 mm
0001	Filling interval	0010 to 2000: 0.010 to 2.000 mm

WTC (print quality adjustment)

Address	Name	Setting Range
0000	Laser start point adjustment	-100 to +100
0001	Laser end point adjustment	-100 to +100
0002	Edge adjustment	000 to 100
0003	Curve adjustment	000 to 100
0004	Weight adjustment	000 to 100
0005	Spare scanning time	0000 to 1000: 00.00 to 10.00 msec.

TRG (trigger condition)

Address	Name	Setting Range
0000	Direction of movement	0: Standstill 1: Left 2: Right 3: Forward 4: Backward
0001	Encoder	0: None 1: Provided
0002	Trigger type	0: Trigger 1: Printing at equal intervals

DLY (delay)

Address	Name	Setting Range
0000	When "standstill" is specified for movement direction in trigger condition (TRG0000 = 0): Delay distance When any direction other than "standstill" is specified for movement direction in trigger condition (TRG0000 ≈ 0): Delay time	Delay distance 00000 to 50000: 000.00 to 500.00 mm Delay time 000000 to 005000 msec.

YMD (year, month, day, time)

Address	Name	Setting Range
0000	Year of the Christian era	1980 to 2099
0001	Month	1 to 12
0002	Day	1 to 31
0003	Hour	0 to 23
0004	Minute	0 to 59
0005	Second	0 to 59

ERA (year of Japanese era)

Address	Name	Setting Range
0000	Year of Japanese era	01 to 99

ENV (input/output environment)

Address	Name	Setting Range
0000	One-shot time	002 to 510 msec.
0001	Double trigger detection	0: Without output 1: With output

PST (print setting)

Address	Name	Setting Range
0001	Print mode (MKM)	0: Printing suspend 1: Printing restart
0002	Laser control (LSR)	0: OFF 1: ON

STS (status request)

Address	Name	Setting Range
0000	Error status	0: No error 1: Error occurring
0001	Laser excitation status	0: Excitation OFF 1: During excitation 2: Excitation finish
0002	Standby status	0: Standby 1: During printing
0003	Print ready status	0: Busy 1: Ready
0004	Trigger status	0: Trigger OFF 1: Trigger ON

RKC (rank condition)

Address	Name	Setting Range
0000	Parallel input condition	1: 4 bits × 4 2: 8 bits × 2

RKS (rank text)

Address	Name	Setting Range
0000 to 0008	Set text in rank number 1	Set text (CHAR 18 bytes)
0009 to 0017	Set text in rank number 2	
:	:	
4599 to 4607	Set text in rank number 511	

OFC (offset condition)

Address	Name	Setting Range
00000	Parallel input condition	0: No offset 1: Lower 4 bits 2: Lower 8 bits

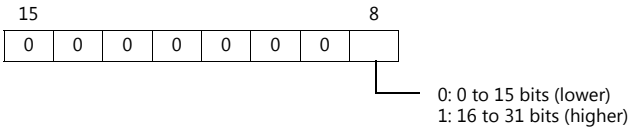
OFS (offset)

Address		Name	Setting Range
00000	Offset number 0	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
00001		Offset Y	
00002		Offset θ	-18000 to +18000: -180.00° to +180.00°
00100	Offset number 1	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
00101		Offset Y	
00102		Offset θ	-18000 to +18000: -180.00° to +180.00°
:		:	:
25500	Offset number 255	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
25501		Offset Y	
25502		Offset θ	-18000 to +18000: -180.00° to +180.00°

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents		F0	F1 (= $u n)			F2
File overwrite		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		2
			n + 1	Command: A1H		
File registration		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: A2H		
			n + 2	File number	LP-430U/430TU/431U/431TU 0 to 1023 LP-435U/435TU/425S9U/425S9TU/ 420S9U/420S9TU/410U/410TU/ 421S9U/421S9TU/411U/411TU 0 to 2047	
Reading of lot text		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		4
			n + 1	Command: 23H		
			n + 2	Lot number: 0 to 7		
			n + 3	Period number		
			n + 4 to n + 5	Start of period *1		
			n + 6 to n + 7	End of period *1		
			n + 8 to n + 16	Set text		
Lot text setting		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		8 + number of words of set text (max. 9 words)
			n + 1	Command: A3H		
			n + 2	Lot number: 0 to 7		
			n + 3	Period number		
			n + 4 to n + 5	Start of period *2		
			n + 6 to n + 7	End of period *2		
			n + 8 to n + 16	Set text		
Reading of step & repeat setting	Setting delete	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 0 (setting delete)		
	Single fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 1 (single adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		
			n + 6 to n + 7	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 8 to n + 9	Y-axis adjustment		
	Print OFF	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 2 (print OFF)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		

*1 When "-1" is set for both start of period and end of period, the reading period is set as undefined.
*2 When writing is executed while "-1" is set for both start of period and end of period, the setting is deleted.

Contents		F0	F1 (= $u n)			F2
Reading of step & repeat setting	All columns fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 3 (all columns adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		
	All lines fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 4 (all lines adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		
	Column fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 5 (column adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		
	Line fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 6 (line adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		

Contents		F0	F1 (= $u n)			F2
Writing of step & repeat setting	Setting delete	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		4
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 0 (setting delete)		
	Single fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		10
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 1 (single adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		
			n + 6 to n + 7	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 8 to n + 9	Y-axis adjustment		
	Print OFF	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		6
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 2 (print OFF)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		
	All columns fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 3 (all columns adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		
	All lines fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 4 (all lines adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		

Contents		F0	F1 (= $u n)			F2
Writing of step & repeat setting	Column fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 5 (column adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		
	Line fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 6 (line adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 7 to n + 8	Y-axis adjustment		

Contents		F0	F1 (= $u n)			F2
Reading of text condition	Straight/ Proportional/ Monospace	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 25H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 0: Straight 1: Proportional 2: Monospace		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm	
			n + 10 to n + 11	Character width		
			n + 12 to n + 13	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 14 to n + 15	Y position		
			n + 16 to n + 17	Spaces between characters/ Entire width	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 18 to n + 19	Spaces between lines		
			n + 20	Tilting angle -18000 to +18000: -180.00° to +180.00°		
			n + 21	Font designation 1: Character font 1 2: Character font 2		
			n + 22	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/ 420S9TU/425S9U/425S9TU/410U/ 410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 4000: 0.000 to 4.000 mm	
			n + 23	Laser power offset: 000 to 200%		
			n + 24	Scan speed correction: 005 to 500%		

Contents		F0	F1 (= $u n)			F2
Reading of text condition	Arc-shaped printing	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 25H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 3: Printing out of the arc (clockwise) 4: Printing inside the arc (counterclockwise)		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm	
			n + 10 to n + 11	Character width		
			n + 12 to n + 13	Center position X -300000 to +300000: -300.000 to +300.000 mm		
			n + 14 to n + 15	Center position Y -300000 to +300000: -300.000 to +300.000 mm		
			n + 16 to n + 17	Radius 0 to +300000: 000.000 to +300.000 mm		
			n + 18 to n + 19	Radius of spaces between lines	LP-430U/430TU/420S9U/420S9TU/410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 20	Start angle -18000 to +18000: -180.00 to +180.00°		
			n + 21	Angle of spaces between characters -18000 to +18000: -180.00 to +180.00°		
			n + 22	Font designation 1: Character font 1 2: Character font 2		
			n + 23	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/420S9TU/425S9U/425S9TU/410U/410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 4000: 0.000 to 4.000 mm	
			n + 24	Laser power offset: 000 to 200%		
			n + 25	Scan speed correction: 005 to 500%		

Contents		F0	F1 (= $u n)			F2
Writing of text condition	Straight/ Proportional/ Monospace	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		25
			n + 1	Command: A5H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 0: Straight 1: Proportional 2: Monospace		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm	
			n + 10 to n + 11	Character width		
			n + 12 to n + 13	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 14 to n + 15	Y position		
			n + 16 to n + 17	Spaces between characters/ Entire width	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 18 to n + 19	Spaces between lines		
			n + 20	Tilting angle -18000 to +18000: -180.00° to +180.00°		
			n + 21	Font designation 1: Character font 1 2: Character font 2		
			n + 22	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/ 420S9TU/425S9U/425S9TU/410U/ 410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 4000: 0.000 to 4.000 mm	
			n + 23	Laser power offset: 000 to 200%		
			n + 24	Scan speed correction: 005 to 500%		

Contents		F0	F1 (= $u n)			F2
Writing of text condition	Arc-shaped printing	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		26
			n + 1	Command: A5H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 3: Printing out of the arc (clockwise) 4: Printing inside the arc (counterclockwise)		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm	
			n + 10 to n + 11	Character width		
			n + 12 to n + 13	Center position X -300000 to +300000: -300.000 to +300.000 mm		
			n + 14 to n + 15	Center position Y -300000 to +300000: -300.000 to +300.000 mm		
			n + 16 to n + 17	Radius 0 to +300000: 000.000 to +300.000 mm		
			n + 18 to n + 19	Radius of spaces between lines	LP-430U/430TU/420S9U/420S9TU/410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 20	Start angle -18000 to +18000: -180.00 to +180.00°		
			n + 21	Angle of spaces between characters -18000 to +18000: -180.00 to +180.00°		
			n + 22	Font designation 1: Character font 1 2: Character font 2		
			n + 23	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/420S9TU/425S9U/425S9TU/410U/410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 4000: 0.000 to 4.000 mm	
			n + 24	Laser power offset: 000 to 200%		
			n + 25	Scan speed correction: 005 to 500%		

Contents		F0	F1 (= $u n)			F2
Counter reset		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		10
			n + 1	Command: A6H		
			n + 2	Counter 0 0: Not reset 1: Reset		
			n + 3	Counter 1 0: Not reset 1: Reset		
			n + 4	Counter 2 0: Not reset 1: Reset		
			n + 5	Counter 3 0: Not reset 1: Reset		
			n + 6	Counter 4 0: Not reset 1: Reset		
			n + 7	Counter 5 0: Not reset 1: Reset		
			n + 8	Counter 6 0: Not reset 1: Reset		
			n + 9	Counter 7 0: Not reset 1: Reset		
Shutter		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: A7H		
			n + 2	Shutter status 0: Shutter close 1: Shutter open		
Print trigger		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: A8H		
			n + 2	Print command 0: Stop 1: Start		
One-point laser irradiation		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: A9H		
			n + 2	0: Stop 1: Start 2: Suspend		
Step & repeat condition	Reading of condition	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		2
			n + 1	Command: 2AH		
			n + 2	Step & repeat 0: None 1: Provided		
			n + 3	Number of lines: 001 to 100		
			n + 4	Number of columns: 001 to 100		
			n + 5 to n + 6	Line step	LP-430U/430TU/420S9U/420S9TU/410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 7 to n + 8	Column step		
			n + 9	Counter motion 0000H: Same for all steps 001xH: Unallocated number 002xH: Serial number 00x0H: From top left toward right 00x1H: From top left toward bottom 00x2H: From top right toward left 00x3H: From top right toward bottom		

Contents		F0	F1 (= $u n)			F2
Step & repeat condition	Writing of condition	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		10
			n + 1	Command: AAH		
			n + 2	Step & repeat 0: None 1: Provided		
			n + 3	Number of lines: 001 to 100		
			n + 4	Number of columns: 001 to 100		
			n + 5 to n + 6	Line step	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 7 to n + 8	Column step		
			n + 9	Counter motion 0000H: Same for all steps 001xH: Unallocated number 002xH: Serial number 00x0H: From top left toward right 00x1H: From top left toward bottom 00x2H: From top right toward left 00x3H: From top right toward bottom		
Text condition (abbreviated form)	Reading of text condition (abbreviated form)	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 2BH		
			n + 2	Condition number (01 to 60)		
			n + 3 to n + 4	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 5 to n + 6	Y position		
			n + 6 to n + 7	Laser power offset: 000 to 200%		
	Writing of text condition (abbreviated form)	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		8
			n + 1	Command: ABH		
			n + 2	Condition number (01 to 60)		
			n + 3 to n + 4	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 5 to n + 6	Y position		
			n + 6 to n + 7	Laser power offset: 000 to 200%		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	QR code	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 10: Model 1 11: Model 2 12: Micro QR		
			n+5	Version Model 1: 0 to 14 Model 2: 0 to 22 Micro QR: 0 to 4		
			n+6	Data input mode 0: Numerals 1: Alphanumerics 2: Binary 3: Kanji characters		
			n+7	Error correction level 1: Standard 2: High reliability 3: Ultra-high reliability		
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+10 to n+11	Y position		
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm		
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm		
	Data matrix code (ECC200)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 20: Data matrix		
			n+5	Data input mode 0: 1-byte 1: Kanji characters		
			n+6	Number of rows		
			n+7	Number of columns		
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+10 to n+11	Y position		
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm		
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 00: CODE39 01: ITF 03: NW-7		
			n+5	Inversion 0: Invalid 1: Valid		
			n+6	Check character CODE39, ITF 0: No 1: Yes NW-7 A to D: Without check character a to d: With check character		
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Ratio wide element width/narrow element width 18 to 34: 1.8 to 3.4		
			n+18	Laser power correction: 0 to 200%		
			n+19	Scan speed correction: 5 to 500%		
	CODE128 JAN	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 02: CODE128 04: JAN/UPC 08: JAN/UPC with human-readable string 09: CODE128 with human-readable string		
			n+5	Inversion 0: Invalid 1: Valid		
			n+6	Check character 0: No 1: Yes		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	CODE128 JAN	1 to 8 (PLC1 to 8)	n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	3
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Ratio double width/narrow element width 14 to 26: 1.4 to 2.6		
			n+18	Ratio triple width/narrow element width 21 to 39: 2.1 to 3.9		
			n+19	Ratio quadruple width/narrow element width 28 to 52: 2.8 to 5.2		
			n+20	Laser power correction: 0 to 200%		
			n+21	Scan speed correction: 5 to 500%		
	RSS-14 Standard & Truncated RSS Limited RSS Expanded	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 30: RSS-14 Standard & Truncated 33: RSS Limited 34: RSS Expanded 40: RSS-14 Standard & Truncated CC-A 43: RSS Limited CC-A 44: RSS Expanded CC-A 50: RSS-14 Standard & Truncated CC-B 53: RSS Limited CC-B 54: RSS Expanded CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Standard module width 0050 to 1000: 0.050 to 1.000 mm		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	RSS-14 Standard & Truncated RSS Limited RSS Expanded	1 to 8 (PLC1 to 8)	n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	3
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Laser power correction: 0 to 200%		
			n+17	Scan speed correction: 5 to 500%		
	RSS-14 Stacked RSS-14 Stacked Omnidirectional	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 31: RSS-14 Stacked 32: RSS-14 Stacked Omnidirectional 41: RSS-14 Stacked CC-A 42: RSS-14 Stacked Omnidirectional CC-A 51: RSS-14 Stacked CC-B 52: RSS-14 Stacked Omnidirectional CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm		
			n+10	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+11 to n+12	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+13 to n+14	Y position		
			n+15 to n+16	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+17	Laser power correction: 0 to 200%		
			n+18	Scan speed correction: 5 to 500%		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	RSS-14 Expanded Stacked	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 35: RSS Expanded Stacked 45: RSS Expanded Stacked CC-A 55: RSS Expanded Stacked CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm		
			n+10	Number of horizontal symbol characters: 2 to 20 (even)		
			n+11	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+12 to n+13	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+14 to n+15	Y position		
			n+16 to n+17	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+18	Laser power correction: 0 to 200%		
			n+19	Scan speed correction: 5 to 500%		
	Composite	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type CC-A composite 46: JAN/UPC 47: UCC/EAN128 48: JAN/UPC with 1D human-readable string 49: UCC/EAN128 with 1D human-readable string CC-B composite 56: JAN/UPC 57: UCC/EAN128 58: JAN/UPC with 1D human-readable string 59: UCC/EAN128 with 1D human-readable string CC-C composite 67: UCC/EAN128 69: UCC/EAN128 with 1D human-readable string		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid		

Contents		F0	F1 (= $u n)			F2
Reading of barcode print condition	Composite	1 to 8 (PLC1 to 8)	n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	3
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Laser power correction: 0 to 200%		
			n+18	Scan speed correction: 5 to 500%		
Writing of barcode print condition	QR code	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		16
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 10: Model 1 11: Model 2 12: Micro QR		
			n+5	Version Model 1: 0 to 14 Model 2: 0 to 22 Micro QR: 0 to 4		
			n+6	Data input mode 0: Numerals 1: Alphanumerics 2: Binary 3: Kanji characters		
			n+7	Error correction level 0: High density 1: Standard 2: High reliability 3: Ultra-high reliability		
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+10 to n+11	Y position		
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm		
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm		

Contents		F0	F1 (= $u n)			F2
Writing of barcode print condition	Data matrix code (ECC200)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		16
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 20: Data matrix		
			n+5	Data input mode 0: 1-byte 1: Kanji characters		
			n+6	Number of rows		
			n+7	Number of columns		
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+10 to n+11	Y position		
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm		
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm		
	CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		20
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 00: CODE39 01: ITF 03: NW-7		
			n+5	Inversion 0: Invalid 1: Valid		
			n+6	Check character CODE39, ITF 0: No 1: Yes NW-7 A to D: Without check character a to d: With check character		
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		

Contents		F0	F1 (= $u n)			F2
Writing of barcode print condition	CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		20
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Ratio wide element width/narrow element width 18 to 34: 1.8 to 3.4		
			n+18	Laser power correction: 0 to 200%		
			n+19	Scan speed correction: 5 to 500%		
	CODE128 JAN	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		22
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 02: CODE128 04: JAN 08: JAN/UPC with human-readable string 09: CODE128 with human-readable string		
			n+5	Inversion 0: Invalid 1: Valid		
			n+6	Check character 0: No 1: Yes		
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Ratio double width/narrow element width 14 to 26: 1.4 to 2.6		
			n+18	Ratio triple width/narrow element width 21 to 39: 2.1 to 3.9		
			n+19	Ratio quadruple width/narrow element width 28 to 52: 2.8 to 5.2		
			n+20	Laser power correction: 0 to 200%		
			n+21	Scan speed correction: 5 to 500%		

Contents		F0	F1 (= $u n)			F2
Writing of barcode print condition	RSS-14 Standard & Truncated RSS Limited RSS Expanded	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		18
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 30: RSS-14 Standard & Truncated 33: RSS Limited 34: RSS Expanded 40: RSS-14 Standard & Truncated CC-A 43: RSS Limited CC-A 44: RSS Expanded CC-A 50: RSS-14 Standard & Truncated CC-B 53: RSS Limited CC-B 54: RSS Expanded CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Laser power correction: 0 to 200%		
			n+17	Scan speed correction: 5 to 500%		
	RSS-14 Stacked RSS-14 Stacked Omnidirectional	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		19
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 31: RSS-14 Stacked 32: RSS-14 Stacked Omnidirectional 41: RSS-14 Stacked CC-A 42: RSS-14 Stacked Omnidirectional CC-A 51: RSS-14 Stacked CC-B 52: RSS-14 Stacked Omnidirectional CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		

Contents		F0	F1 (= $u n)			F2
Writing of barcode print condition	RSS-14 Stacked RSS-14 Stacked Omnidirectional	1 to 8 (PLC1 to 8)	n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110,000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	19
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm		
			n+10	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+11 to n+12	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+13 to n+14	Y position		
			n+15 to n+16	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+17	Laser power correction: 0 to 200%		
			n+18	Scan speed correction: 5 to 500%		
	RSS-14 Expanded Stacked		n	Station number: 0 (fixed)		20
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 35: RSS Expanded Stacked 45: RSS Expanded Stacked CC-A 55: RSS Expanded Stacked CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm		
			n+10	Number of horizontal symbol characters: 2 to 20 (even)		
			n+11	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+12 to n+13	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+14 to n+15	Y position		

Contents		F0	F1 (= $u n)			F2
Writing of barcode print condition	RSS-14 Expanded Stacked	1 to 8 (PLC1 to 8)	n+16 to n+17	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		20
			n+18	Laser power correction: 0 to 200%		
			n+19	Scan speed correction: 5 to 500%		
	Composite	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		19
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type CC-A composite 46: JAN/UPC 47: UCC/EAN128 48: JAN/UPC with 1D human-readable string 49: UCC/EAN128 with 1D human-readable string CC-B composite 56: JAN/UPC 57: UCC/EAN128 58: JAN/UPC with 1D human-readable string 59: UCC/EAN128 with 1D human-readable string CC-C composite 67: UCC/EAN128 69: UCC/EAN128 with 1D human-readable string		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid		
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160,000 mm	
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Laser power correction: 0 to 200%		
			n+18	Scan speed correction: 5 to 500%		
Barcode print data (2-byte characters)	Reading of barcode print data	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 2DH		
			n+2	Barcode number: 0 to 7		
			n+3	Set row number (2-D code): 1 to 9		
			n+4 to n+33	Print data		
	Writing of barcode print data	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4 + print data word count (30 words maximum)
			n+1	Command: ADH		
			n+2	Barcode number: 0 to 7		
			n+3	Set row number (2-D code): 1 to 9		
			n+4 to n+33	Print data		

Contents		F0	F1 (= $u n)			F2
2-D code pattern	Reading of 2-D code pattern	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 2EH		
			n+2	Barcode number: 0 to 7		
			n+3	Pattern number For QR code 0: Quite zone/margin 1: Black module 2: White module 3: Alignment 4: Finder For data matrix code 0: Quite zone/margin 1: Mark module 2: Space module		
			n+4	Character code (DEC) 0000, 2230 to 2239, 8121 to 8152		
			n+5	Laser power correction: 0 to 200%		
			n+6	Scan speed correction: 5 to 500%		
	Writing of 2-D code pattern	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		7
			n+1	Command: AEH		
			n+2	Barcode number: 0 to 7		
			n+3	Pattern number For QR code 0: Quite zone/margin 1: Black module 2: White module 3: Alignment 4: Finder For data matrix code 0: Quite zone/margin 1: Mark module 2: Space module		
			n+4	Character code (DEC) 0000, 2230 to 2239, 8121 to 8152		
			n+5	Laser power correction: 0 to 200%		
			n+6	Scan speed correction: 5 to 500%		
Serial data input		1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3 + data word count (128 words maximum)
			n+1	Command: AFH		
			n+2	Serial data number: 0 to 15		
			n+3 to n+130	Data		
Processing condition setting	Reading of processing condition	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 30H		
			n+2	Processing condition number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4 to n+5	X offset	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+6 to n+7	Y offset		
			n+8	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+9	Laser power correction: 0 to 200%		
			n+10	Scan speed correction: 5 to 500%		

Contents		F0	F1 (= $u n)			F2
Processing condition setting	Writing of processing condition	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		12
			n+1	Command: B0H		
			n+2	Processing condition number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4 to n+5	X offset	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+6 to n+7	Y offset		
			n+8 to n+9	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+10	Laser power correction: 0 to 200%		
			n+11	Scan speed correction: 5 to 500%		
Processing element setting	Reading of processing element setting (straight)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 31H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 0: Straight		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Start point Y coordinate		
			n+9 to n+10	End point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+11 to n+12	End point Y coordinate		
			n+13 to n+14	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	
			n+15 to n+16	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	

Contents		F0	F1 (= $u n)			F2
Processing element setting	Reading of processing element setting (circle)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 31H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 1: Circle		
			n+5 to n+6	Center X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Center Y coordinate		
			n+9 to n+10	Radius	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	
			n+11 to n+12	Dashed line: dash length		
			n+13Å`n+14	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
	Reading of processing element setting (arc)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 31H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 2: Arc		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Start point Y coordinate		
			n+9 to n+10	End point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+11 to n+12	End point Y coordinate		
			n+13 to n+14	Radius 000010 to 300000: 000.010 to 300.000 mm		
			n+15	Drawing direction 0: Counterclockwise 1: Clockwise		
			n+16	Center angle 0: Less than 180 deg 1: 180 deg or more		

Contents		F0	F1 (= $u n)			F2
Processing element setting	Reading of processing element setting (arc)	1 to 8 (PLC1 to 8)	n+17 to n+18	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	4
			n+19 to n+20	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
	Writing of processing element setting (straight)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		17
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 0: Straight		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Start point Y coordinate		
			n+9 to n+10	End point X coordinate	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+11 to n+12	End point Y coordinate		
			n+13 to n+14	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	
			n+15 to n+16	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	

Contents		F0	F1 (= $u n)			F2
Processing element setting	Writing of processing element setting (circle)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		15
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 1: Circle		
			n+5 to n+6	Center X coordinate	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Center Y coordinate		
			n+9 to n+10	Radius	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	
			n+11 to n+12	Dashed line: dash length		
			n+13 to n+14	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
	Writing of processing element setting (arc)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		21
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 2: Arc		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+7 to n+8	Start point Y coordinate		
			n+9 to n+10	End point X coordinate	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+11 to n+12	End point Y coordinate		
			n+13 to n+14	Radius 000010 to 300000: 000.010 to 300.000 mm		
			n+15	Drawing direction 0: Counterclockwise 1: Clockwise		
			n+16	Center angle 0: Less than 180 deg 1: 180 deg or more		

Contents		F0	F1 (= $u n)			F2
Processing element setting	Writing of processing element setting (arc)	1 to 8 (PLC1 to 8)	n+17 to n+18	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	21
			n+19 to n+20	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
Guide LD display		1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: B2H		
			n+2	Display 0: Display stop 1: Center + print area 2: Print image 3: Dual pointer		
Week setting	Reading of week setting	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		2
			n+1	Command: 33H		
			n+2	Update day of the week 0: Sunday (updated at 0:00 midnight) 1: Monday (updated at 0:00 midnight)		
			n+3	The first week 0: The week including and after January 1 1: The week including the first Thursday of January		
	Writing of week setting	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: B3H		
			n+2	Update day of the week 0: Sunday (updated at 0:00 midnight) 1: Monday (updated at 0:00 midnight)		
			n+3	The first week 0: The week including and after January 1 1: The week including the first Thursday of January		

Contents		F0	F1 (= $u n)		F2
Barcode print data (1-/2-byte characters)	Reading of barcode print data (1-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6
			n+1	Command: 35H	
			n+2	Printing character 0: 1-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
			n+6 to n+20	Barcode data	
	Reading of barcode print data (2-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6
			n+1	Command: 35H	
			n+2	Printing character 1: 2-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
			n+6 to n+35	Barcode data	
	Writing of barcode print data (1-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6 + barcode data word count (15 words maximum)
			n+1	Command: B5H	
			n+2	Printing character 0: 1-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite components 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
			n+6 to n+20	Barcode data	
	Writing of barcode print data (2-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6 + barcode data word count (30 words maximum)
			n+1	Command: B5H	
			n+2	Printing character 1: 2-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
			n+6 to n+35	Barcode data	

Return data: Data stored from controller to TS

18.2.2 KW Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 99	
Header	% (Header) / < (Extension Header)	Model on which "< (Extension Header)" is available: KW1M-R

Eco-POWER METER

Communication parameters can be set by operating the keys on the Eco-POWER METER. For more information, refer to the manual for Eco-POWER METER.

KW1M/KW1M-H/KW8M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	**MEWT: MEWTOCOL**
	NO.	Station number setting mode	1 to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

KW1M-R(AKW1000/AKW1000K)

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	**MEWT: MEWTOCOL**
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity
	PORT	Communication port setting mode	232: RS-232C port 485: RS-485 port

Stop bit: 1 (fixed)

AKW1000 and AKW1000K are not provided with the measuring function. Use each device along with a slave device AKW1131 or AKW1131K.
For establishing connection between master and slave devices, refer to the manual for Eco-POWER METER.

KW1M-R(AKW1131/AKW1131K)

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	FORM	Wired/wireless setting mode	**WIRED**
	PROT	Protocol setting mode	**MEWT: MEWTOCOL**
	NO.	Station number setting mode	1 to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

*** Use system program version 2.2 or later.**

KW2G/KW2G-H

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	**MEWT: MEWTOCOL**
	NO	Station number setting mode	1 to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity
	STOP	Stop bit setting mode	1: 1 bit 2: 2 bits

KW4M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	NO.	Station setting mode	1 to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Protocol: MEWTOCOL, stop bit: 1 (fixed)

Terminal station setting

Slide Switch	Item	Setting
	Terminal station setting	General: General station Terminal: Terminal station

KW7M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 2	PROT	Protocol setting mode	**MEWT: MEWTOCOL**
	NO.	Station number setting mode	1 to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps
	FMT	Communication format setting mode	8bit-o: data length 8 bits, odd parity 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

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
DT (data register)	00H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Status read	1 to 8 (PLC1 to 8)	n	Station number: 1 to 99	2
		n+1	Command: 0000H	
		n+2	Model code 1	
		n+3	Model code 2	
		n+4	Version	
		n+5	Operation mode 0: Stopped 1: Running	
		n+6	Error flag 0: Normal 1: Error	
		n+7	Self-diagnosis error number	

Return data: Data stored from Eco-POWER METER to TS

18.2.3 MINAS A4 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 15	

Servo Amplifier

Communication parameters can be set by operating the rotary switch and the keys on the front panel. For more information, refer to the servo amplifier manual.
Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.

Rotary switch (ID)

ID	Item	Setting
	Axis number setting	RS-232C connection: 0 to F RS-485 connection: 1 to F

Parameters

(Underlined setting: default)

Mode	Item	Setting
0C	RS-232C communication baud rate setting	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps
0D	RS-485 communication baud rate setting	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps

Data length: 8, stop bit: 1, parity: none (fixed)

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.

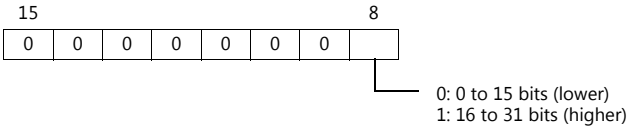
Device Memory		TYPE	Remarks
STS	(status)	00H	Read only
OPLSC	(command pulse counter)	01H	Double-word, read only
FPLSC	(feedback pulse counter)	02H	Double-word, read only
SPD	(current speed)	03H	Read only
TLQ	(current torque command)	04H	Read only
DEVIC	(current deviation counter)	05H	Double-word, read only
INS	(input signal)	06H	Double-word, read only
OUTS	(output signal)	07H	Double-word, read only
STDC	(current speed/torque/counter)	08H	Double-word, read only
SIO	(status, input signal, output signal)	09H	Double-word, read only
FBS	(feedback scale)	0AH	Read only
ABS	(absolute encoder)	0BH	Double-word, read only
FSPLS	(feedback scale deviation/total pulses)	0CH	Double-word, read only
IPM	(parameter (individual))	0DH	* 1
CALM	(current alarm data)	0EH	Read only
IALM	(alarm history (individual))	0FH	Read only
AALM	(alarm history (all))	10H	Read only
IAPM	(parameter/property (individual))	11H	Read only
PAPM	(parameter/property (all))	12H	Read only, except for parameter values (current values), *1

*1 Parameter values will be changed temporarily. When saving parameter changes to EEPROM, use the macro command PLC_CTL.
For more information on the command PLC_CTL, see page 18-67.

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Software version information readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0000H	
		n+2	Software version	
Amplifier model readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0001H	
		n+2	Model code 1st and 2nd characters	
		n+3	Model code 3rd and 4th characters	
		n+4	Model code 5th and 6th characters	
		n+5	Model code 7th and 8th characters	
		n+6	Model code 9th and 10th characters	
		n+7	Model code 11th and 12th characters	
Motor model readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0002H	
		n+2	Model code 1st and 2nd characters	
		n+3	Model code 3rd and 4th characters	
		n+4	Model code 5th and 6th characters	
		n+5	Model code 7th and 8th characters	
		n+6	Model code 9th and 10th characters	
		n+7	Model code 11th and 12th characters	
RS-232 protocol parameter setting	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	5
		n+1	Command: 0003H	
		n+2	Timeout period between characters 1 to 255 (unit: 0.1 sec.)	
		n+3	Protocol timeout period 1 to 255 (unit: 1 sec.)	
		n+4	Retry limit (unit: 1 time)	
RS-485 protocol parameter setting	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	5
		n+1	Command: 0004H	
		n+2	Timeout period between characters 1 to 255 (unit: 0.1 sec.)	
		n+3	Protocol timeout period 1 to 255 (unit: 1 sec.)	
		n+4	Retry limit (unit: 1 time)	
Execute privilege acquisition/release	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	3
		n+1	Command: 0005H	
		n+2	0: Request for execute privilege release 1: Request for execute privilege acquisition	
Parameter write to EEPROM	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0006H	
Alarm history clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0007H	
Alarm clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0008H	
Absolute clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0009H	

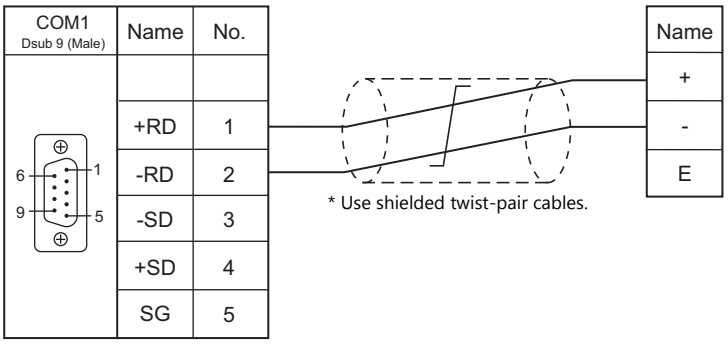
Return data: Data stored from servo amplifier to TS

18.2.4 Wiring Diagrams

When Connected at COM1:

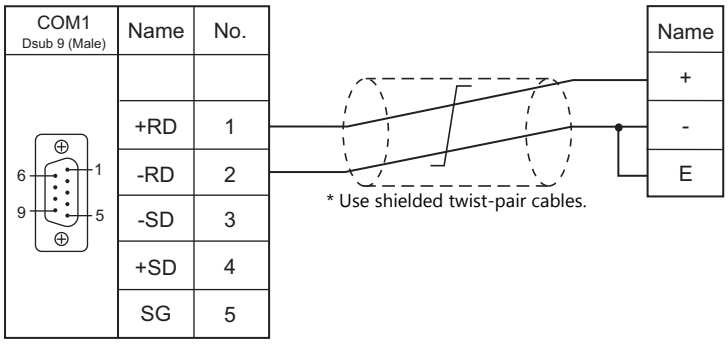
RS-485

Wiring diagram 1 - COM1



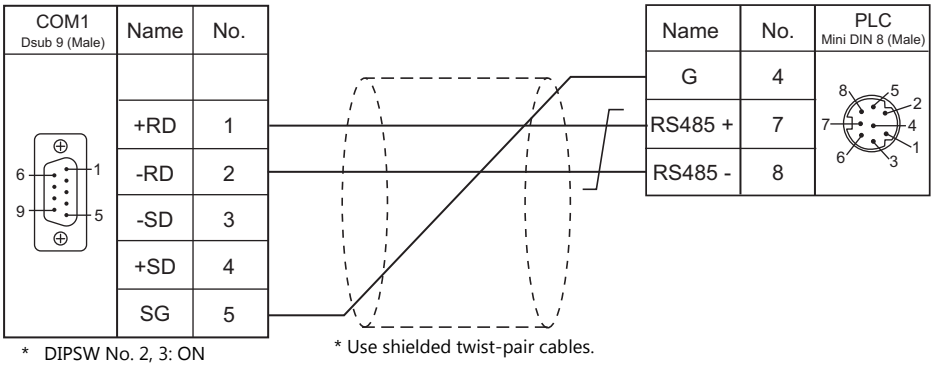
* DIPSW No. 2, 3: ON

Eco-POWER METER connected at the terminal (except for KW4M)



* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1

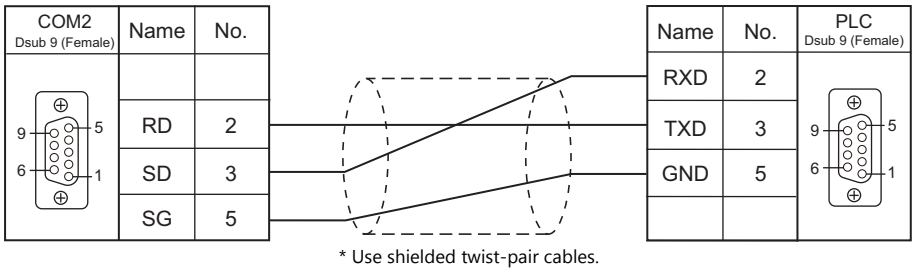


* DIPSW No. 2, 3: ON

When Connected at COM2:

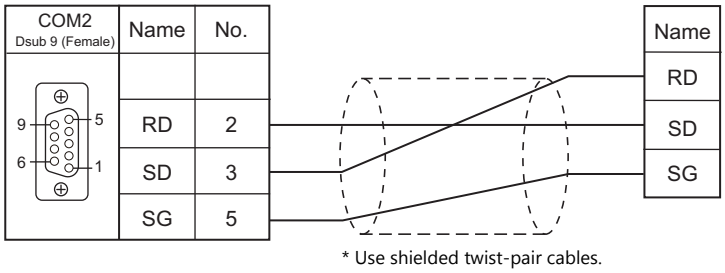
RS-232C

Wiring diagram 1 - COM2



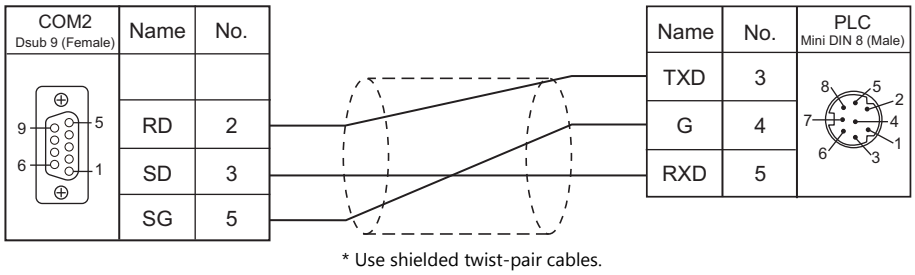
* Use shielded twist-pair cables.

Wiring diagram 2 - COM2



* Use shielded twist-pair cables.

Wiring diagram 3 - COM2

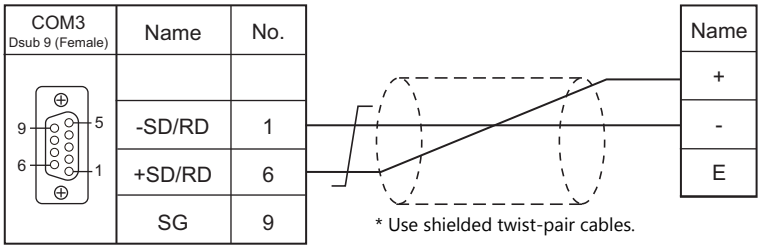


* Use shielded twist-pair cables.

When Connected at COM3:

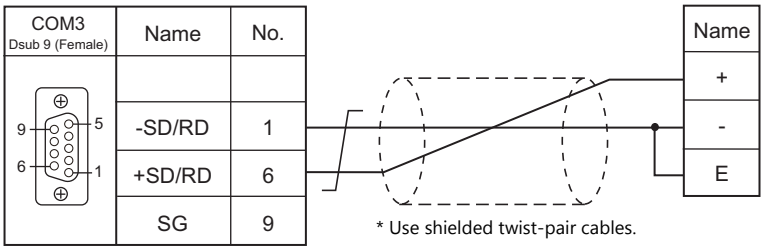
RS-485

Wiring diagram 1 - COM3



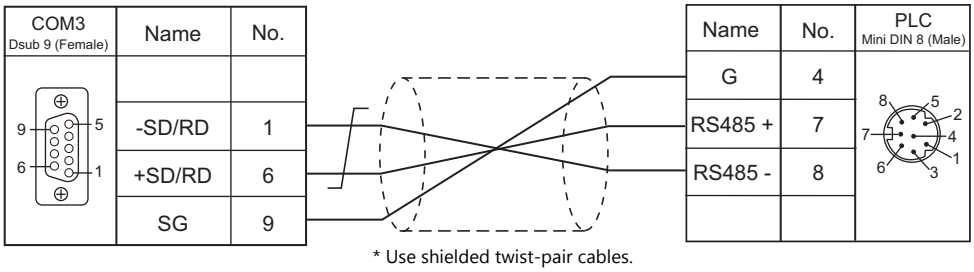
* Use shielded twist-pair cables.

Eco-POWER METER connected at the terminal (except for KW4M)



* Use shielded twist-pair cables.

Wiring diagram 2 - COM3



* Use shielded twist-pair cables.

19. RKC

19.1 Temperature Controller/Servo/Inverter Connection

19.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Module-type Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
SR-Mini (MODBUS RTU)	H-PCP-A-x4N-4 * xx Z-1021	Modular connector 1/2	RS-422A	COM1	Wiring diagram 2 - COM1	SR-Mini.Lst
	H-PCP-B-x4N-4 * xx Z-1021			COM3	Wiring diagram 2 - COM3	
SR-Mini (Standard Protocol)	H-PCP-A-x4N-4 * xx	Modular connector 1/2	RS-422A	COM1	Wiring diagram 2 - COM1	RKC_Std.Lst
	H-PCP-B-x4N-4 * xx			COM3	Wiring diagram 2 - COM3	
SRV (MODBUS RTU)	V-TIO-A-xxxxx-xx*xxx-xx-x-6	Communication terminal	RS-485 (2-wire)	COM1	Wiring diagram 1 - COM1	RKC_SRV.Lst
	V-TIO-C-xxxxx-xx*xxx-xx-x-6			COM3	Wiring diagram 1 - COM3	
SRZ (MODBUS RTU)	Z-TIO-A-x-xxxx/x2-x xxx/Y *1	Communication terminal	RS-485 (2-wire)	COM1	Wiring diagram 1 - COM1	RKC_SRZ_ TIO.Lst
	Z-TIO-B-x-xx/xN2-xxxx/Y *1			COM3	Wiring diagram 1 - COM3	
	Z-DIO-A-x-xx/x-xxx2	Communication terminal	RS-485 (2-wire)	COM1	Wiring diagram 1 - COM1	RKC_SRZ_ DIO.Lst
				COM3	Wiring diagram 1 - COM3	

*1 Select a model on which Modbus communication is available.
"2: Modbus" for the communication protocol is selectable in the initial setting code when "specify quick start code 1 and 2" is selected as the quick start code.

Single Loop Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
CB100/CB400/ CB500/CB700/ CB900 (MODBUS RTU)	CB100xxxx-xx*xx-5x/x Z-1021	Communication terminal	RS-485	COM1	Wiring diagram 1 - COM1	CB100.Lst
	CB400xxxx-xx*xx-5x/x Z-1021					
	CB500xxxx-xx*xx-5x/x Z-1021			COM3	Wiring diagram 1 - COM3	
	CB700xxxx-xx*xx-5x/x Z-1021					
	CB900xxxx-xx*xx-5x/x Z-1021					
REX-F400/F700/F900 (Standard Protocol)	F400xxxx-xx*xx-xxx-1x F700xxxx-xx*xx-xxx-1x F900xxxx-xx*xx-xxx-1x	Communication terminal	RS-232C	COM2	Wiring diagram 1 - COM2	RKC_F400.Lst
	F400xxxx-xx*xx-xxx-4x F700xxxx-xx*xx-xxx-4x F900xxxx-xx*xx-xxx-4x	Communication terminal	RS-422A	COM1	Wiring diagram 3 - COM1	
				COM3	Wiring diagram 3 - COM3	
	F400xxxx-xx*xx-xxx-5x F700xxxx-xx*xx-xxx-5x F900xxxx-xx*xx-xxx-5x	Communication terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
REX-F9000 (Standard Protocol)	F9000-xxx-x*xx/x	Communication terminal	RS-485	COM1	Wiring diagram 1 - COM1	RKC_F9000 .Lst
				COM3	Wiring diagram 1 - COM3	
FB100/FB400/ FB900 (MODBUS RTU)	FB400-xx-x*xxx1/xx-xxxx FB400-xx-x*xxxW/xx-xxxx FB900-xx-x*xxx1/xx-xxxx FB900-xx-x*xxxW/xx-xxxx	Communication terminal	RS-232C	COM2	Wiring diagram 1 - COM2	RKC_FB.Lst
	FB400-xx-x*xxx4/xx-xxxx FB900-xx-x*xxx4/xx-xxxx	Communication terminal	RS-422A	COM1	Wiring diagram 3 - COM1	
				COM3	Wiring diagram 3 - COM3	
	FB100-xx-x*E/xx-xxxx FB100-xx-x*F/xx-xxxx FB100-xx-x*G/xx-xxxx FB100-xx-x*H/xx-xxxx FB100-xx-x*J/xx-xxxx FB400-xx-x*xxx5/xx-xxxx FB400-xx-x*xxxW/xx-xxxx FB400-xx-x*xxxX/xx-xxxx FB400-xx-x*xxxY/xx-xxxx FB900-xx-x*xxx5/xx-xxxx FB900-xx-x*xxxW/xx-xxxx FB900-xx-x*xxxX/xx-xxxx FB900-xx-x*xxxY/xx-xxxx	Communication terminal	RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	

Multi-loop Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	TS Port	Connection	Lst File
MA900/MA901 (MODBUS RTU)	MA900-4xxxx-xx-x*xxx-x6/x	Communication terminal	RS-485	COM1	Wiring diagram 1 - COM1	RKC_MA900.Lst
	MA901-8xxxx-xx-x*xxx-x6/x			COM3	Wiring diagram 1 - COM3	RKC_MA901.Lst

19.1.1 CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

CB100

Communication setting mode

When the [R/S] key is pressed while the [SET] key is held down in the PV/SV display mode, the controller enters in the "communication setting" mode.

(Underlined setting: default)

Indication	Item	Setting	Remarks
Add	Slave address	1 to 31	Communication is not performed when "0" is set.
bPS	Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps	
bIT	Data configuration	0: 8 bits / 1 bit / none 6: 8 bits / 1 bit / even 7: 8 bits / 1 bit / odd	
InT	Interval time setting	0 to 150	Interval time = set value × 1.666 ms

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	

19.1.2 SRV (MODBUS RTU)

Communication Setting

Editor

Communication setting

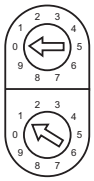
(Underlined setting: default)

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

SRV

Address setting switch

(Underlined setting: default)

Switch	Setting	Remarks
	00 to 30	Higher-order digit setting (× 10) Lower-order digit setting (× 1) The number that is one greater than the set value is the address.

DIP switch setting

Switch	Setting	Contents	Remarks
1	ON	Baud rate: 38400 bps	ON, OFF: 9600 bps OFF, ON: 19200 bps
2	ON		
3	ON	Data bit configuration 8 bits / 1 bit / without parity	ON, OFF, ON: 8 bits / 1 bit / even ON, ON, ON: 8 bits / 1 bit / odd
4	OFF		
5	OFF		
6	ON	Protocol: **Modbus**	
7	OFF	-	
8	OFF	-	

* Communication time settings (send changeover time/data interval delay time) can be made using the switches 4, 5, and 6. For more information, refer to the communication instruction manual for SRV.

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	

19.1.3 SR-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Odd / Even	
Target Port No.	1 to 16	

SR-Mini

DIP switch

Switch	Setting	Contents	Remarks
1	ON	Modbus communication 8 bits / 1 bit / without parity	
2	ON		
3	ON	Baud rate: 9600 bps	OFF, ON: 4800 bps ON, ON: 19200 bps
4	OFF		

Slave address setting switch

(Underlined setting: default)

Switch	Setting	Remarks
	0 to F (= 1 to 16)	The number that is one greater than the set value is the address.

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	

19.1.4 SR-Mini (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	7/ 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 15	

SR-Mini

DIP switch

Switch	Setting	Contents	Remarks
1	OFF	8 bits / 1 bit / without parity	OFF, ON: 7 bits, even parity ON, OFF: 7 bits, odd parity
2	OFF		
3	ON	Baud rate: 9600 bps	OFF, ON: 4800 bps ON, ON: 19200 bps
4	OFF		

Unit address setting switch

(Underlined setting: default)

Switch	Setting	Remarks
	0 to F (= 0 to 15)	

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
GRP0	(normal: R)	00H	Read only
GRP1	(normal: RW)	01H	
GRP2	(initial: R)	02H	Read only
GRP3	(initial: RW)	03H	

* On the signal name reference list, every channel number is designated as "00". Manually enter the value obtained by the following procedure: subtract "1" from the channel to access, and set the hexadecimal number of the obtained value.
The assigned device memory is expressed as shown on the right when editing the screen.

Example: GRP0000001 (measurement value for CH2 temperature)
- Channel number: -1 (HEX)
- Address

Indirect Device Memory Designation

	15 8	7 0
n + 0	Model	Device type
n + 1	Address (lower)	CH No.
n + 2	00	Address (higher)
n + 3	Expansion code	Bit designation
n + 4	00	Station number

19.1.5 REX-F400/F700/F900 (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

REX-F400/F700/F900

Parameter group (PG) 24

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)

Indication	Item	Setting	Remarks
bIT	Communication data bit configuration	0: 8 bits / 1 bit / none 1: 8 bits / 2 bits / none 2: 8 bits / 1 bit / even 3: 8 bits / 2 bits / even 4: 8 bits / 1 bit / odd 5: 8 bits / 2 bits / odd 6: 7 bits / 1 bit / none 7: 7 bits / 2 bits / none 8: 7 bits / 1 bits / even 9: 7 bits / 2 bits / even 10: 7 bits / 1 bit / odd 11: 7 bits / 2 bits / odd	
Add	Device address	0 to 31	
bPS	Baud rate	2: 4800 bps 3: 9600 bps 4: 19200 bps	
InT	Interval time setting	0 to 250 msec	

* The “COMP” mode must be selected for communication with the TS.
Press the [MODE] key to display “Computer Mode Change”, and change the mode from [LOC] to [COMP] by pressing the [∨] key.

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
GRP0	00H	Read only
GRP1	01H	

19.1.6 REX-F9000 (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

REX-F9000

Mode transfer

Indication	Item	Setting	Remarks
LCK	Setting of set data lock function	Select whether to validate or invalidate the set data lock function (PG40: LCK). ULCK: Invalid (unlocked) LCK: Valid (locked)	

Parameter group

(Underlined setting: default)

PG	Indication	Item	Setting	Remarks
PG24	Add	Device Address	0 to 31	
	bPS	Baud rate	2: 4800 bps 3: 9600 bps 4: 19200 bps	
	bIT	Communication data bit configuration	0: 8 bits / 1 bit / none 1: 8 bits / 2 bits / none 2: 8 bits / 1 bit / even 3: 8 bits / 2 bits / even 4: 8 bits / 1 bit / odd 5: 8 bits / 2 bits / odd 6: 7 bits / 1 bit / none 7: 7 bits / 2 bit / none 8: 7 bits / 1 bit / even 9: 7 bits / 2 bits / even 10: 7 bits / 1 bit / odd 11: 7 bits / 2 bits / odd	
	InT	Interval time setting	0 to 250 msec	
	CMPS	Protocol selection	**0: RKC standard communication**	
PG40	LCK	Set data lock level selection	0: Set values (SV) and all parameters cannot be changed. 1: Only set values (SV) can be changed. 2: Only parameter groups (PG) cannot be changed.	Valid when the set data lock function is set to "LCK" by mode transfer
	MLCK	Mode lock level selection	Apply the following mode transfer settings. (○: transfer allowed, ×: transfer not allowed)	

Setting	PID/Autotuning	Auto/Manual	Control RUN/STOP
0	○	○	○
1	○	×	○
2	×	○	○
3	×	×	○
4	○	○	×
5	○	×	×
6	×	○	×
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 with the controller to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
GRP0	00H	Read only
GRP1	01H	

19.1.7 MA900 / MA901 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

MA900/MA901

Setup setting mode

When the [R/S] key is pressed while the [SET] key is held down in the PV/SV monitor mode, the controller enters in the "setup setting" mode.

(Underlined setting: default)

Indication	Item	Setting	Remarks
Add	Slave address	1 to 31	Communication is not performed when "0" is set.
bPS	Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps	
bIT	Data configuration	0: 8 bits / 1 bit / none 2: 8 bits / 1 bit / even 4: 8 bits / 1 bit / odd	
InT	Interval time setting	0 to 250 msec	

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	

19.1.8 SRZ (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Odd / Even	
Target Port No.	Z-TIO: 1 to 16 Z-DIO: 17 to 31	Default: 1

SRZ

DIP switch

Switch	Setting	Contents	Remarks
1	OFF	Baud rate: 19200 bps	OFF, OFF: 4800 bps ON, OFF: 9600 bps OFF, ON: 19200 bps ON, ON: 38400 bps
2	ON		
3	OFF	Data bit configuration 8 bits / without parity / 1 bit	OFF, ON, ON: 8 bits / even /1 bit ON, ON, ON: 8 bits / odd /1 bit
4	OFF		
5	ON		
6	ON	Protocol: **Modbus**	
7	OFF	-	
8	OFF	-	

Slave address setting switch

(Underlined setting: default)

Switch	Setting	Remarks
	0 to F	For Z-TIO, the number that is one greater than the set value is the address. (Range: 1 to 16) For Z-DIO, the number that is seventeen greater than the set value is the address. (Range: 17 to 32 *)

* For connection to TS, the available address setting range is 0 to E (17 to 31).

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	

19.1.9 FB100/FB400/FB900 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

FB100/FB400/FB900

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.

Communication protocol (engineering mode F60)

Indication	Item	Setting	Remarks
CMP1	Communication 1 protocol	**1: MODBUS**	
CMP2	Communication 2 protocol	**1: MODBUS**	

*** The temperature controller must be set to "STOP" (control stop) before making settings.**

Communication parameter (setup setting mode)

(Underlined setting: default)

Port	Indication	Item	Setting	Remarks
Communication 1	Add1	Device address 1	1 to 31	Communication is not performed when "0" is set.
	bPS1	Baud rate 1	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps 38.4: 38400 bps	
	bIT1	Data bit configuration 1	8n1: 8 bits / none / 1 bit 8n2: 8 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	
	InT1	Interval time 1	0 to 250 msec	
Communication 2	Add2	Device address 2	1 to 31	Communication is not performed when "0" is set.
	bPS2	Baud rate 2	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps 38.4: 38400 bps	
	bIT2	Data bit configuration 2	8n1: 8 bits / none / 1 bit 8n2: 8 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	
	InT2	Interval time 2	0 to 250 msec	

Parameter changes will take effect when the temperature controller is turned off and on again or is switched from "STOP" to "RUN".

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.

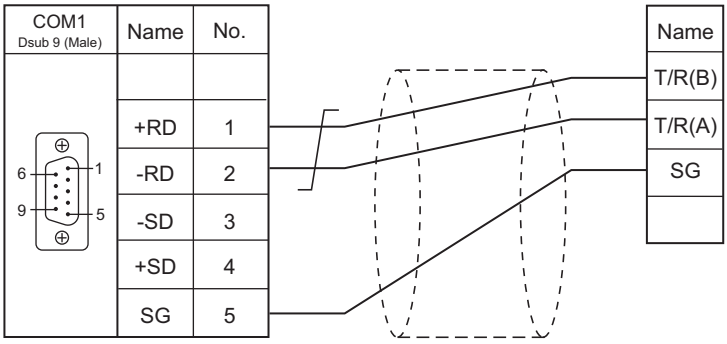
Device Memory	TYPE	Remarks
---	00H	0000 to 0017: Read only

19.1.10 Wiring Diagrams

When Connected at COM1:

RS-422/RS-485

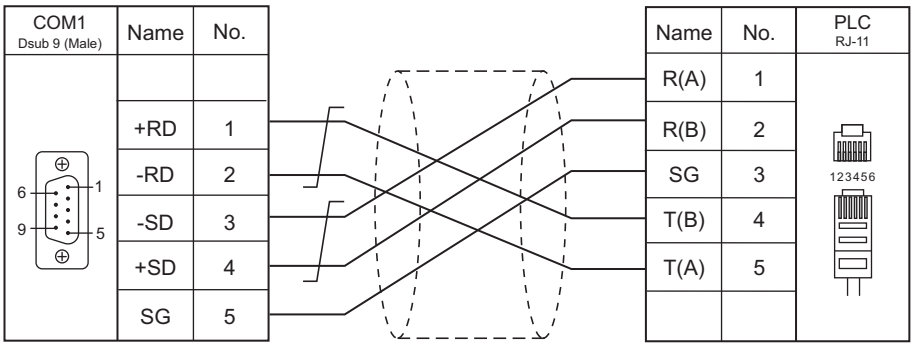
Wiring diagram 1 - COM1



* DIPSW No. 2, 3: ON

* Use shielded twist-pair cables.

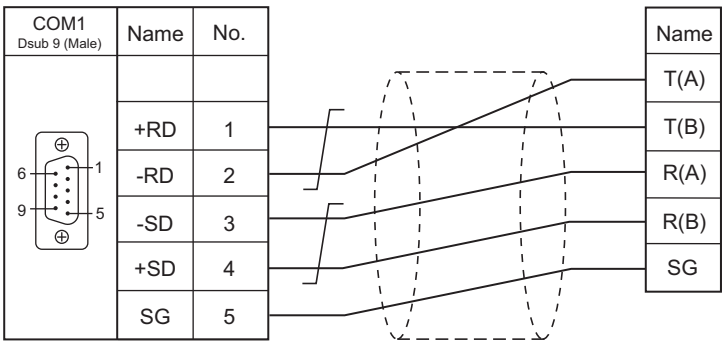
Wiring diagram 2 - COM1



* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

Wiring diagram 3 - COM1



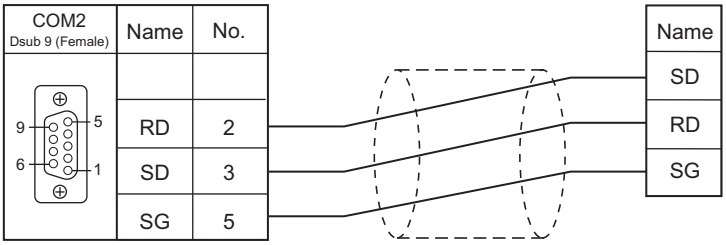
* DIPSW No. 2, 3: OFF

* Use shielded twist-pair cables.

When Connected at COM2:

RS-232C

Wiring diagram 1 - COM2

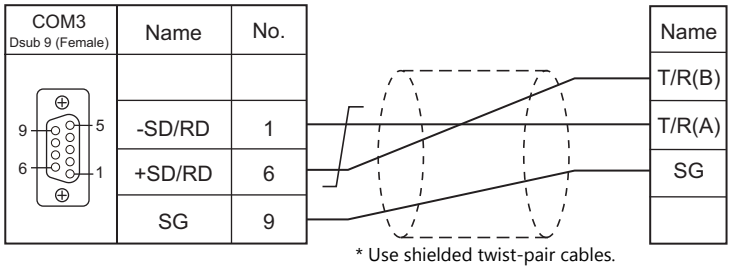


* Use shielded twist-pair cables.

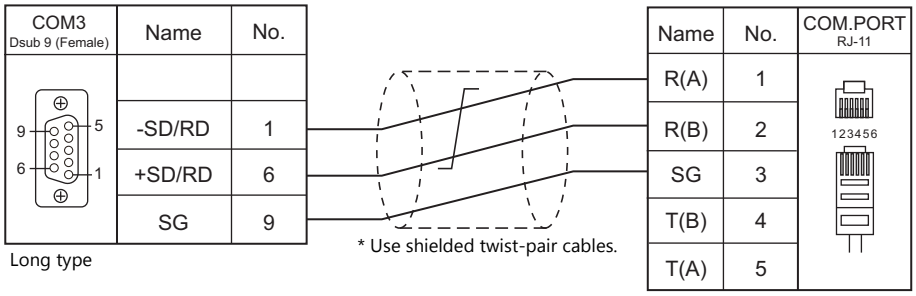
When Connected at COM3:

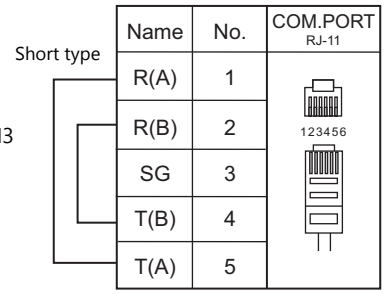
RS-485

Wiring diagram 1 - COM3

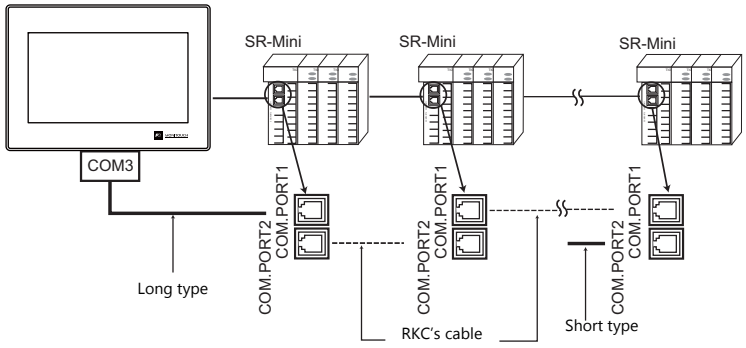


Wiring diagram 2 - COM3

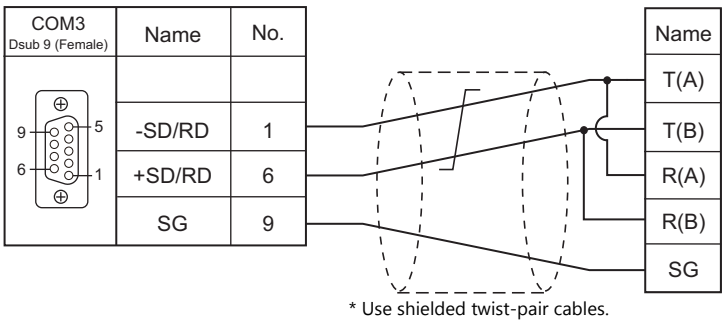




Use a long-type cable for connection between the COM3 at the TS and the controller, an RKC's cable between controllers, and a short-type cable for the terminal controller.



Wiring diagram 3 - COM3



20. RS Automation

20.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
NX7/NX Plus Series (70P/700P/CCU+)	NX70 plus	NX70-CPU70p1	COM port	RS-232C	COM2	Wiring diagram 1 - COM2	×
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			NX70-CCU+ (CCU)	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
		NX70-CPU70p2	COM1/COM2	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			NX70-CCU+ (CCU)	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	NX700 plus	NX-CPU700p	COM1/COM2	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
			NX-CCU+ (CCU)	RS-232C	COM2	Wiring diagram 1 - COM2	
				RS-485	COM1	Wiring diagram 1 - COM1	
					COM3	Wiring diagram 1 - COM3	
	NX7	NX7-xxxDx NX7R-xxADx	COM1	RS-232C	COM2	Wiring diagram 2 - COM2	
				RS-485	COM1	Wiring diagram 2 - COM1	
					COM3	Wiring diagram 2 - COM3	
			COM2	RS-232C	COM2	Wiring diagram 3 - COM2	
				RS-485	COM1	Wiring diagram 3 - COM1	
					COM3	Wiring diagram 3 - COM3	
		NX7S-xxxDx	COM1	RS-232C	COM2	Wiring diagram 1 - COM2	
			COM2	RS-485	COM1	Wiring diagram 3 - COM1	
					COM3	Wiring diagram 3 - COM3	
N7/NX Series (70/700/750/CCU)	N70	CPL9211A	COM port	RS-232C	COM2	Wiring diagram 4 - COM2	×
				RS-422	COM1	Wiring diagram 4 - COM1	○
			CPL9462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	N70α	CPL9210A	COM port	RS-232C	COM2	Wiring diagram 6 - COM2	○
			CPL9462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	N700	CPL7210A CPL7211A	COM port	RS-232C	COM2	Wiring diagram 4 - COM2	×
				RS-422	COM1	Wiring diagram 4 - COM1	○
			CPL7462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	N700α	CPL6210A CPL6210B	TOOL port	RS-232C	COM2	Wiring diagram 5 - COM2	○
			COM port	RS-232C	COM2	Wiring diagram 7 - COM2	×
			CPL7462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	N7000	CPL5221B CPL5231	COM port	RS-232C	COM2	Wiring diagram 4 - COM2	×
				RS-422	COM1	Wiring diagram 4 - COM1	○
			CPL5462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	N7000α	CPL4210 CPL4211	COM1	RS-422	COM1	Wiring diagram 4 - COM1	○
			COM2	RS-232C	COM2	Wiring diagram 7 - COM2	×
			CPL5462 (CCU)	RS-232C	COM2	Wiring diagram 5 - COM2	×
	NX70	NX70-CPU70	TOOL port	RS-232C	COM2	Wiring diagram 1 - COM2	○
			NX70-CCU (CCU)	RS-232C	COM2	Wiring diagram 8 - COM2	×
		NX70-CPU750	TOOL port	RS-232C	COM2	Wiring diagram 1 - COM2	○
			COM port	RS-232C	COM2	Wiring diagram 8 - COM2	×
			NX70-CCU (CCU)	RS-232C	COM2	Wiring diagram 8 - COM2	

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	TS Port	Connection	Ladder Transfer *1
N7/NX Series (70/700/750/CCU)	NX700	NX-CPU750A NX-CPU750B NX-CPU750C NX-CPU750D	TOOL port	RS-232C	COM2	Wiring diagram 1 - COM2	○
			COM port	RS-232C	COM2	Wiring diagram 8 - COM2	×
			NX-CCU (CCU)	RS-232C	COM2	Wiring diagram 8 - COM2	
		NX-CPU700	TOOL port	RS-232C	COM2	Wiring diagram 1 - COM2	○
			NX-CCU (CCU)	RS-232C	COM2	Wiring diagram 8 - COM2	×
X8 Series	X8-M16DDR X8-M14DDT X8-M32DDT		COM0/COM1	RS-232C	COM2	Wiring diagram 9 - COM2	×
				RS-485	COM1	Wiring diagram 5 - COM1	
					COM3	Wiring diagram 4 - COM3	

*1 For the ladder transfer function, see the TS Reference Manual 2.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Ladder Transfer*2
NX700 Series (Ethernet)	NX-CPU750A NX-CPU750B NX-CPU750C NX-CPU750D	NX-Ethernet	○	○	As desired *3	×	×
X8 Series (Ethernet)	X8-M16DDR X8-M14DDT X8-M32DDT	CPU with built-in Ethernet	○	×	50000 (fixed) (Max. 16 units)	○	

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".
*2 For the ladder transfer function, see the TS Reference Manual 2.
*3 Eight connection settings are provided on the PLC; each for one TS unit. Therefore, a maximum of eight TS units can be connected to an Ethernet unit.

20.1.1 NX7/NX Plus Series (70P/700P/CCU+)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

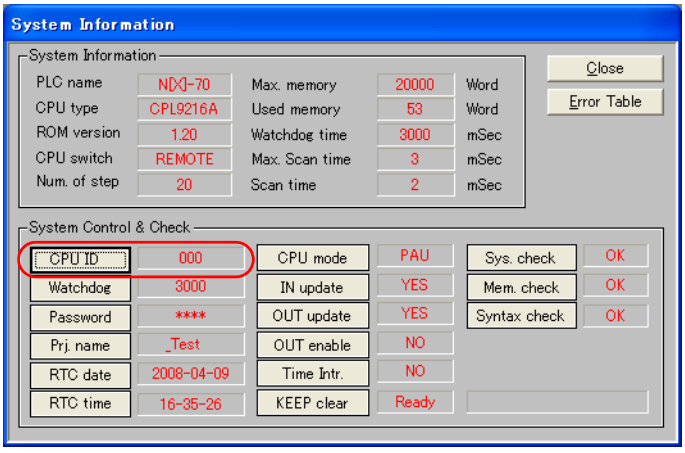
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	For RS-485 connection, set the transmission delay time to 3 msec or longer.
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 /115K bps	57600 bps and 115K bps supported by NX7R only
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 223, 255	

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	

NX70-CPU70p1 (COM Port)

DIP switches

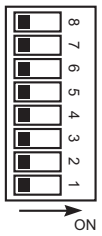
DIPSW		Contents	Setting
	SW1	Terminating resistance (for RS-485 connection)	SW1 / SW2 / Terminating Resistance OFF / OFF / Invalid ON / ON / Valid
	SW2		
	SW3	Program write target	ON: EEPROM OFF: RAM
	SW4	RS-232C / RS-485 selection	ON: RS-485 OFF: RS-232C
	SW5	Baud rate selection	SW5 / SW6 / Baud rate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

NX70-CPU70p2 (COM Port) / NX-CPU700p (COM Port)

DIP switches 1

DIPSW1		Contents	Setting
	SW1	COM1 terminating resistance (for RS-485 connection)	SW1 / SW2 / Terminating Resistance OFF / OFF / Invalid ON / ON / Valid
	SW2		
	SW3	COM2 terminating resistance (for RS-485 connection)	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)	SW5 / SW6 / Baud Rate OFF / OFF / 9600 bps ON / OFF / 38400 bps OFF / ON / 19200 bps ON / ON / 4800 bps
	SW6		
	SW7	Baud rate selection (COM2)	SW7 / SW8 / Baud Rate OFF / OFF / 9600 bps ON / OFF / 38400 bps OFF / ON / 19200 bps ON / ON / 4800 bps
	SW8		

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

DIP switches

DIPSW		Contents	Setting
	SW1	Baud rate selection	<table><tr><th>SW1</th><th>SW2</th><th>SW3</th><th>Baud Rate</th></tr><tr><td>OFF</td><td>OFF</td><td>OFF</td><td>38400 bps</td></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>19200 bps</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>9600 bps</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>4800 bps</td></tr></table>
	SW2		
	SW3		
	SW4	Data length	**ON: 8 bits**
	SW5	Parity check	**OFF: None**
	SW6		
	SW7	Stop bit	**OFF: 1 bit**
	SW8	Reserved	**OFF**

NX7-xxxDx/NX7R-xxADx/NX7S-xxxDx

DIP switches

DIPSW		Contents	Setting
	SW1	RS-232C / RS-485 selection	ON: RS-485 OFF: RS-232C
	SW2	Terminating resistance (with RS-485 selected)	ON: Valid OFF: Invalid

Baud rate setting

The baud rate depends on the value specified for device memory SR509 or SR510.

COM	Baud Rate	Setting	Remarks
COM1= SR509 COM2= SR510	Auto setting:	0000 H	
	4800 bps	8003 H	
	9600 bps	8000 H	
	19200 bps	8001 H	
	38400 bps	8002 H	
	57600 bps	8004 H	Supported by NX7R only
	115K bps	8005 H	Supported by NX7R 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
R	(input/output)	00H	
L	(link relay)	01H	
M	(internal relay)	02H	
K	(keep relay)	03H	
F	(special relay)	04H	
W	(word register)	05H	
TC	(timer, counter)	06H	
SV	(timer/set value)	07H	
PV	(timer/current value)	08H	
SR	(special register)	09H	
D	(word register)	0AH	

20.1.2 N7/NX Series (70/700/750/CCU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / 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	% (Header) / < (Extension Header)	Models on which "< (Expansion Header)" is available: NX-CPU750A / NX-CPU750B / NX-CPU750C / NX-CPU750D / NX70-CPU750
Monitor Registration	Unchecked / Checked	One TS 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 TS 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

20.1.3 X8 Series

Communication Setting

Editor

Communication setting

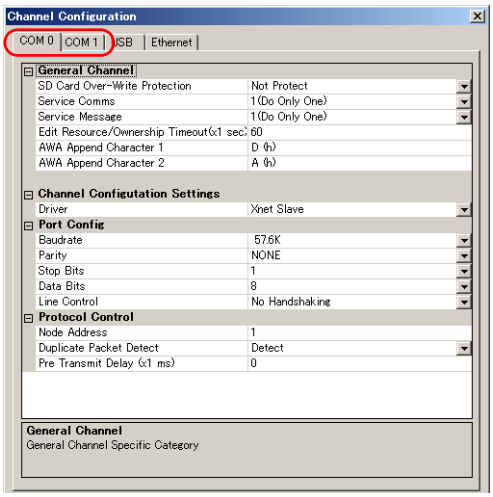
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even	
Target Port No.	0 to 249	

PLC

Make communication settings using the PLC software "XGPC" (version 1.0 or greater). For more information, refer to the PLC manual issued by the manufacturer.

Channel Configuration



Setting Item	Setting	Remarks
Driver	**Xnet Slave**	
Baudrate	4.8K / 9.6K / 19.2K / 38.4K / 57.6K / 115.2K	
Parity	NONE / EVEN	
Stop bits	1 / 2	
Data bits	**8**	
Line Control	No Handshaking / No Handshaking (RS485 Network)	RS-232C connection: No Handshaking RS-485 connection: No Handshaking (RS485 Network)
Node Address	0 to 249	

Available Device Memory

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

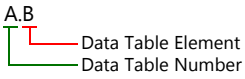
Device Memory		TYPE	Remarks
N	(Integer)	00H	
X	(Input)	01H	
Y	(Output)	02H	
SR	(System Registers)	03H	
B	(Binary)	04H	
F	(Floating Point)	05H	Real number. Bit designation is not possible.
L	(Long)	06H	Double-word
A	(ASCII)	07H	
ST	(String)	08H	STRING type
TM	(Timer)	09H	
CT	(Counter)	0AH	
CR	(Control)	0BH	

Address denotations

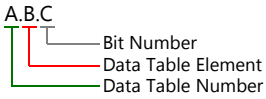
The assigned device memory is expressed as shown below when editing the screen.

- Integer, System Registers, Binary, Floating Point, Long, ASCII, or String addresses

Word designation

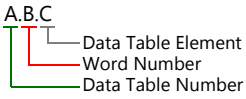


Bit designation

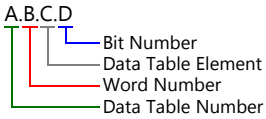


- Input, Output addresses

Word designation

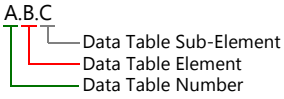


Bit designation

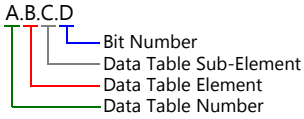


- Timer, Counter, or Control addresses

Word designation



Bit designation



Mnemonics can be used to specify Timer, Counter, or Control addresses.
The following shows the representation using mnemonics:

On PLC	On V-SFT
TimeBase0	TB0
TimeBase1	TB1
Done	DN
TimerTiming	TT
Enable	EN
Underflow	UF
Overflow	OF
CountDown	CD
CountUp	CU
Found	FD
Inhibit	IH

On PLC	On V-SFT
Unload	UL
Error	ER
Empty	EM
EnableUnload	EU
Preset(Low)	PRE(L)
Preset(High)	PRE(H)
Accumulator(Low)	ACC(L)
Accumulator(High)	ACC(H)
Length	LEN
Position	POS

- Mnemonics can be used for bit designation on condition that Data Table Sub-Element = 0.
  Example: TM9.0.0.8 → TM9.0.0.TB0
- Mnemonics can be used for device memory address designation on condition that Data Table Sub-Element = 1 to 4.
  Example: TM9.0.1 → TM9.0.PRE(L)

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

Indirect Device Memory Designation

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

- Device memory other than Timer, Counter, and Control

  Example: Indirect device memory designation of “N20.100”

N20.100
- B(Data Table Element)
- A(Data Table Number)

Converting A to binary
20(DEC)= 10100(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	1	0	1	0	0
				X				Y			

Converting B to binary
100(DEC)= 1100100(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	1	1	0	0	1	0	0
					Z						

Arranging the values X, Y and Z in the following order

n + 1 (lower address number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	1	0	1	0	0	0	0	0	1	1	0	0	1	0	0
			Y							Z					

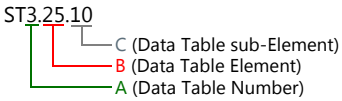
n + 2 (higher address number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
				0 fixed							X				

0000100100000010 (BIN) = 4064 (HEX): Lower address number
0000000000000001 (BIN) = 1 (HEX): Higher address number

- Timer, Counter, or Control device memory

  Example: Indirect device memory designation of “ST3.25.10”



Converting A to binary
3(DEC)= 11(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	0	0	0	1	1

W

Converting B to binary
25(DEC)= 11001(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	1	1	0	0	1

X Y

Converting C to binary
10(DEC)= 1010(BIN)

05	04	03	02	01	00
0	0	1	0	1	0

Z

Arranging the values W, X , Y and Z in the following order

n + 1 (lower address number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	1	1	0	0	1	0	0	1	0	1	0

Y Z

n + 2 (higher address number)

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	1	1	0	0

0 fixed W X

0000011001001010 (BIN) = 64A (HEX): Lower address number
0000000000001100 (BIN) = C (HEX): Higher address number

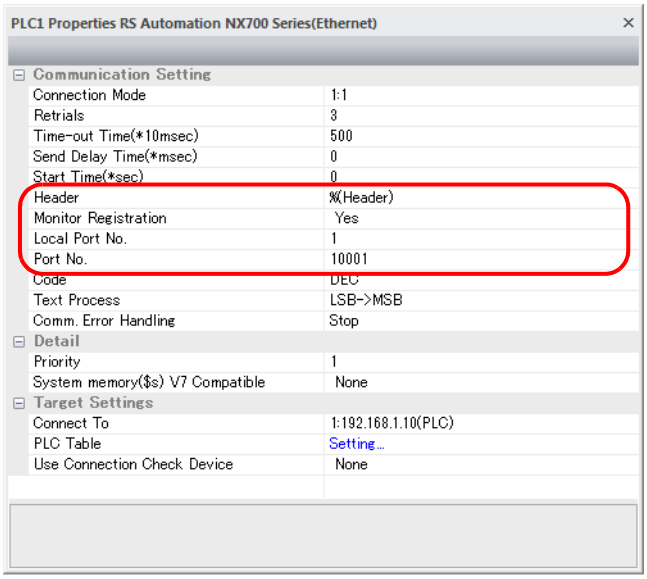
20.1.4 NX700 Series (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

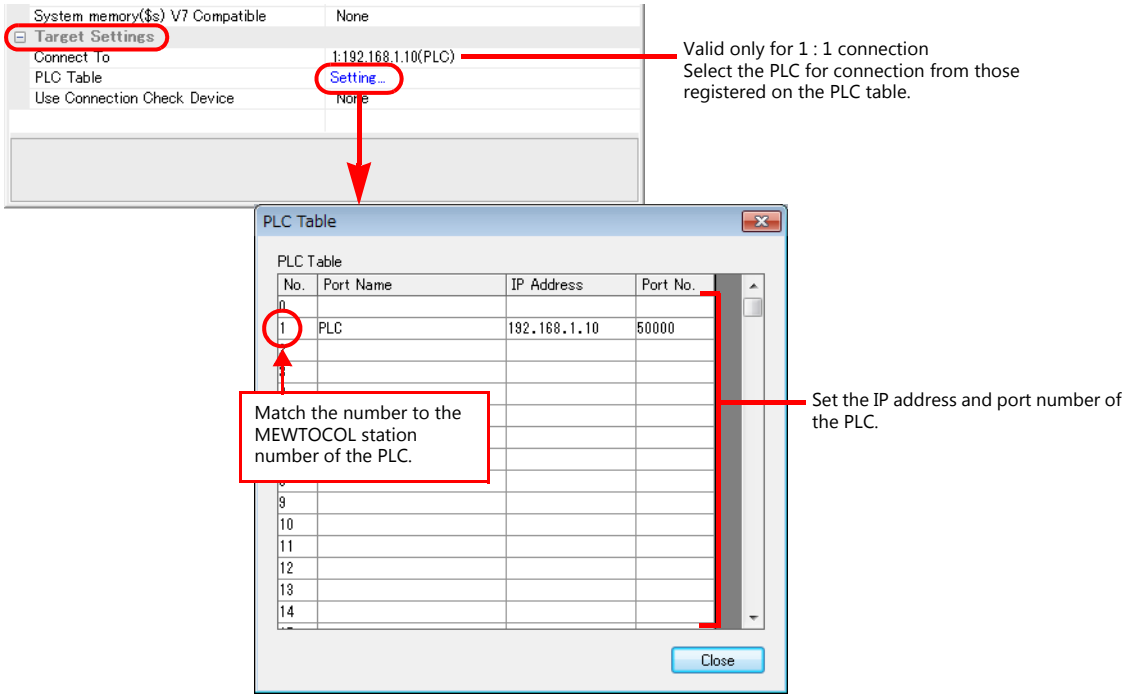
- IP address for the TSi unit
  - When specified on the screen program:
    [System Setting] → [Hardware Setting] → [Local Port IP Address]
  - When specified on the TSi unit:
    Main Menu screen → Main Menu drop-down window → [Ethernet]
- Port number for the TSi unit (for communication with PLC)
 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



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One TSi unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple TSi units in n : 1 connection.
Local Port No.	Set the local port number of the TSi unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
  Set the same PLC table number as the one set for "MEWTOCOL Station Number" ([Initial Information Setting] → [Local Node Setting]).



PLC

Make mode settings using the Ethernet unit "NX-Ethernet".

Mode setting switch

Switch	Setting	Contents	Remarks
2	ON	Auto connection function	

Make the PLC setting using the configuration tool "Configurator ET". For more information, refer to the PLC manual issued by the manufacturer.

Initial information setting

Item		Setting
Local Node Setting	IP Address	Set the IP address of the PLC.
	MEWTOCOL Station Number	1 to 64 * The same number must be specified for the PLC table number of the TSi.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the TSi is connected.	Communication Mode	TCP/IP, UDP/IP
	Open Type	**Unpassive**
	Usage	**MEWTOCOL communication**
	Local Node (PLC) Port Number	As desired
	Target Node IP Address	IP address of the TSi
	Target Node Port Number	Port number of the TSi
	Target Node MEWTOCOL Station Number	1 to 64 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the TSi.
	Connection Setting	Valid

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

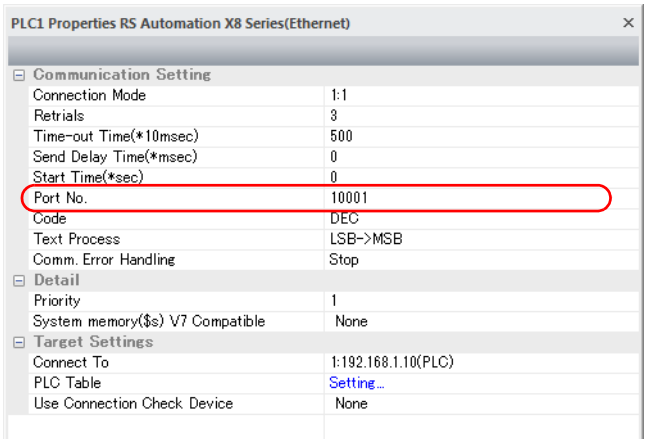
20.1.5 X8 Series (Ethernet)

Communication Setting

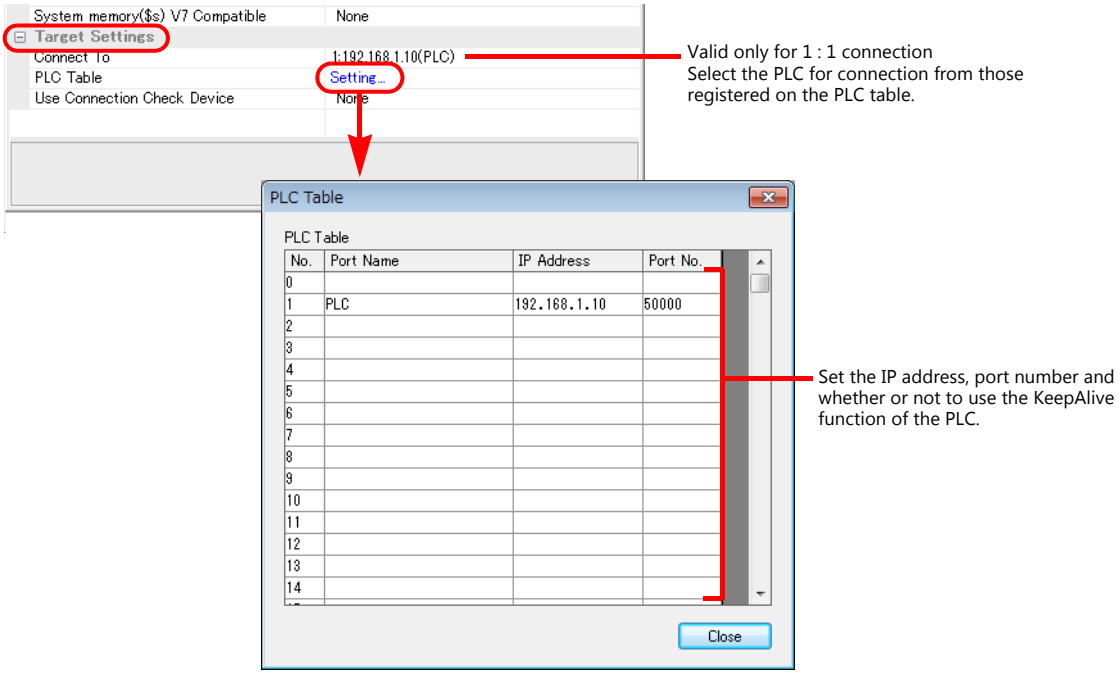
Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication (TS1100Si/TS1070Si Only)".

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



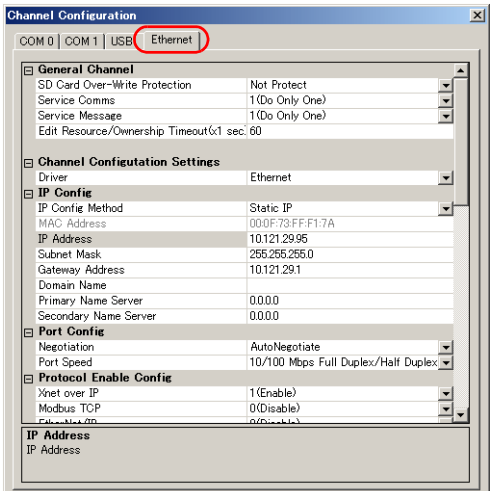
- IP address and port number (No. 50000) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

Set a station number for the PLC using the PLC software "XGPC" (version 1.0 or greater). For more information, refer to the PLC manual issued by the manufacturer.

Channel Configuration



Setting Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway Address	Set according to the environment.	

Available Device Memory

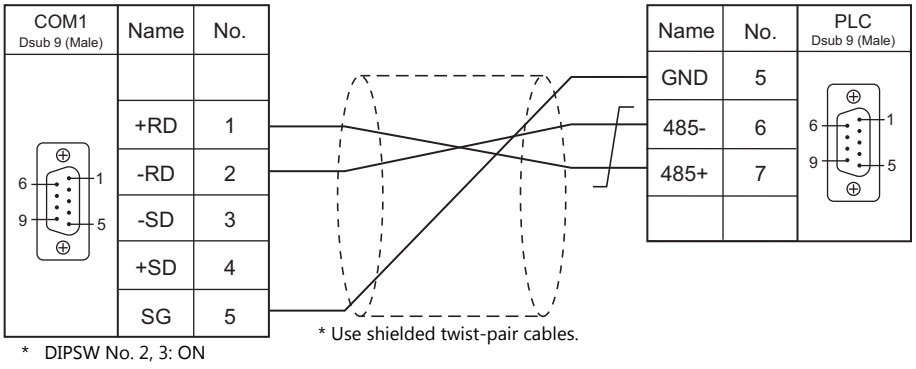
The contents of "Available Device Memory" are the same as those described in "20.1.3 X8 Series".

20.1.6 Wiring Diagrams

When Connected at COM1:

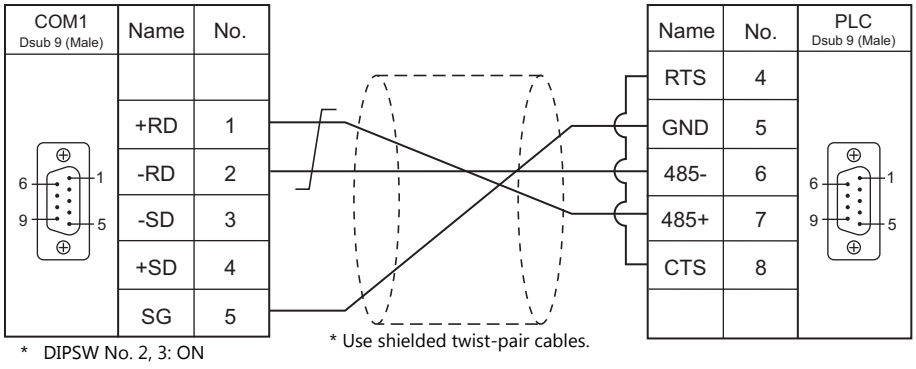
RS-422/RS-485

Wiring diagram 1 - COM1



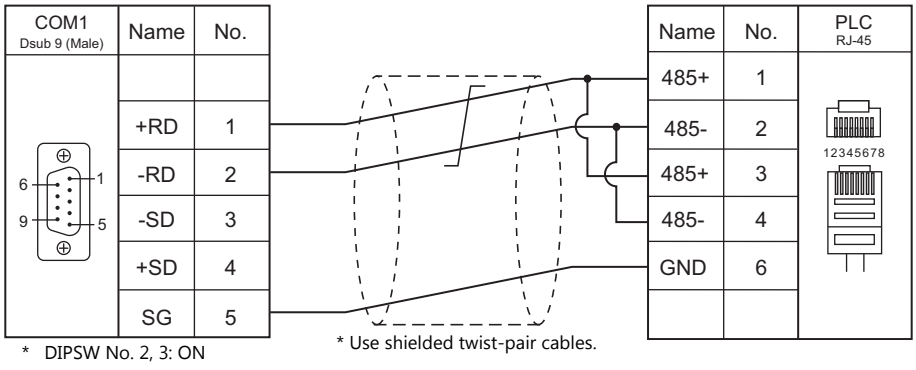
* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1



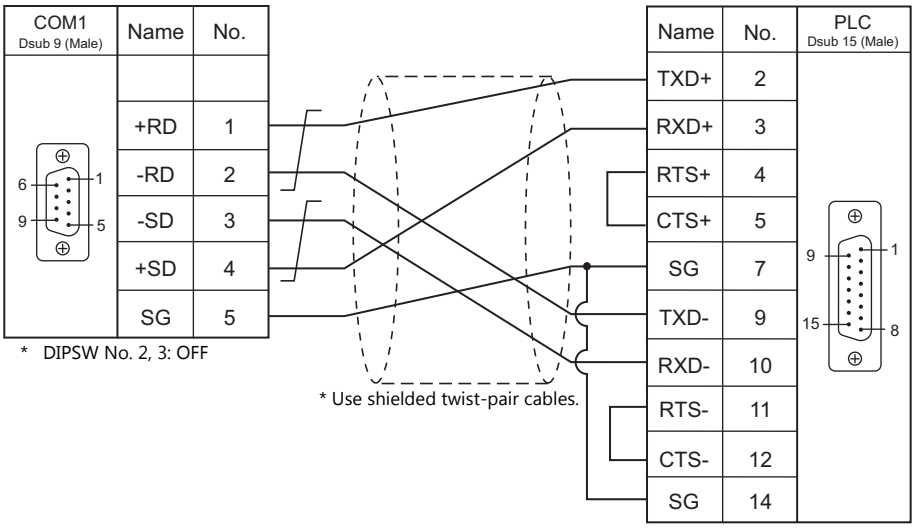
* DIPSW No. 2, 3: ON

Wiring diagram 3 - COM1

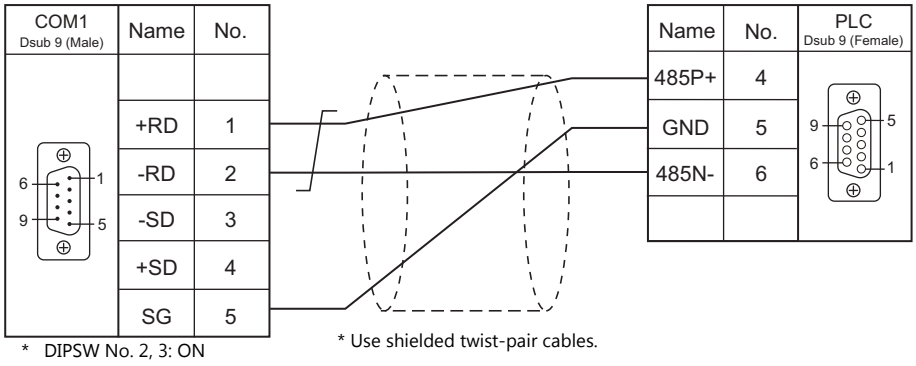


* DIPSW No. 2, 3: ON

Wiring diagram 4 - COM1



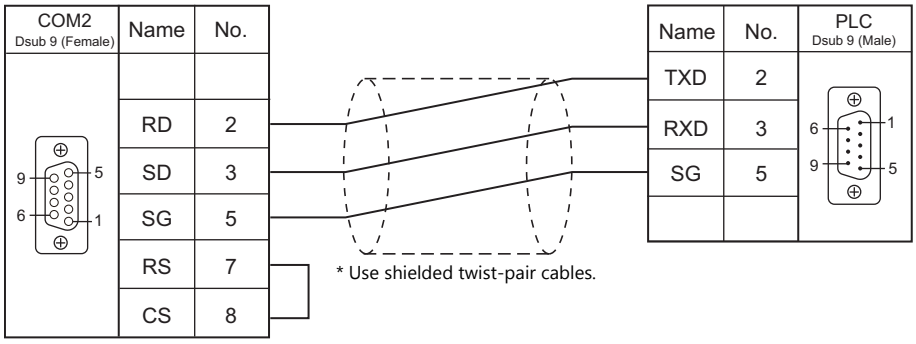
Wiring diagram 5 - COM1



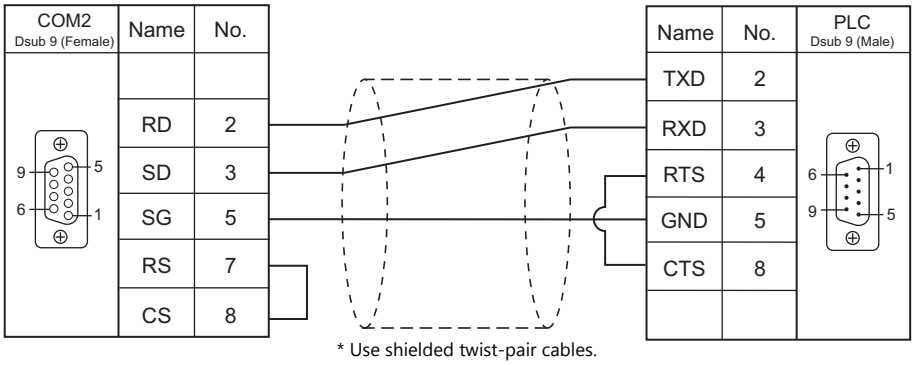
When Connected at COM2:

RS-232C

Wiring diagram 1 - COM2

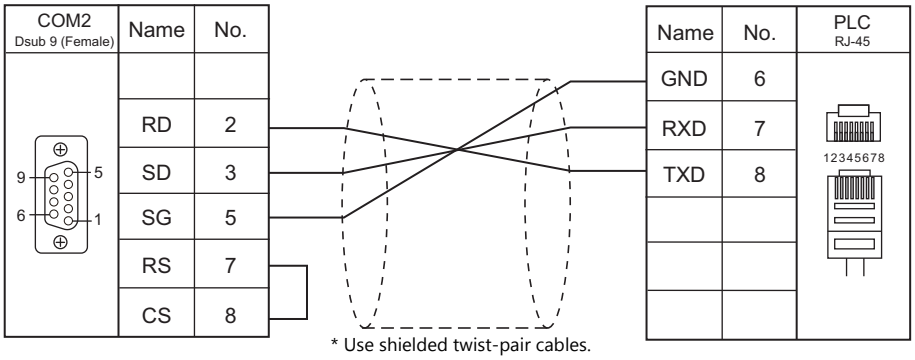


Wiring diagram 2 - COM2



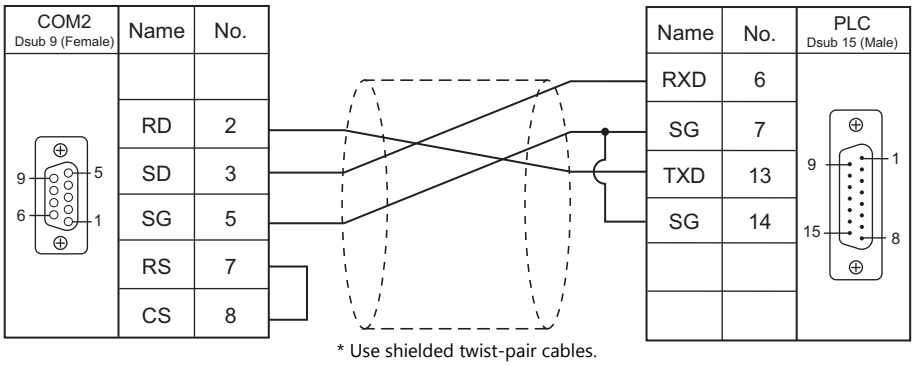
* Use shielded twist-pair cables.

Wiring diagram 3 - COM2



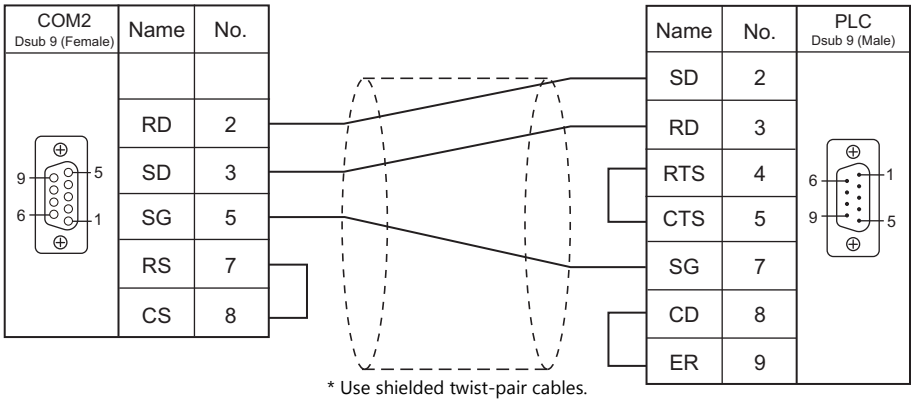
* Use shielded twist-pair cables.

Wiring diagram 4 - COM2



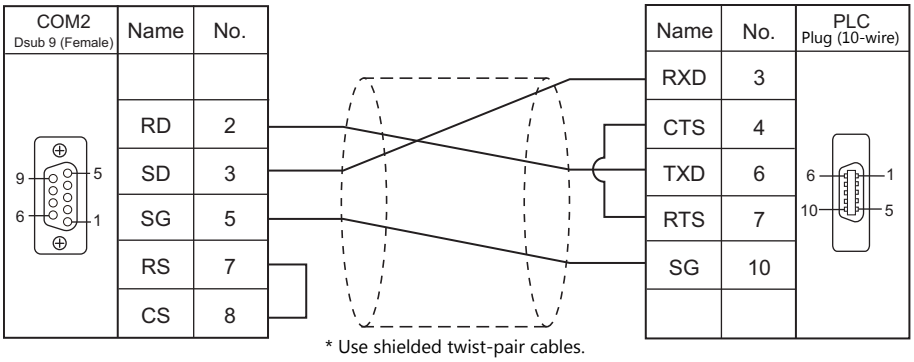
* Use shielded twist-pair cables.

Wiring diagram 5 - COM2

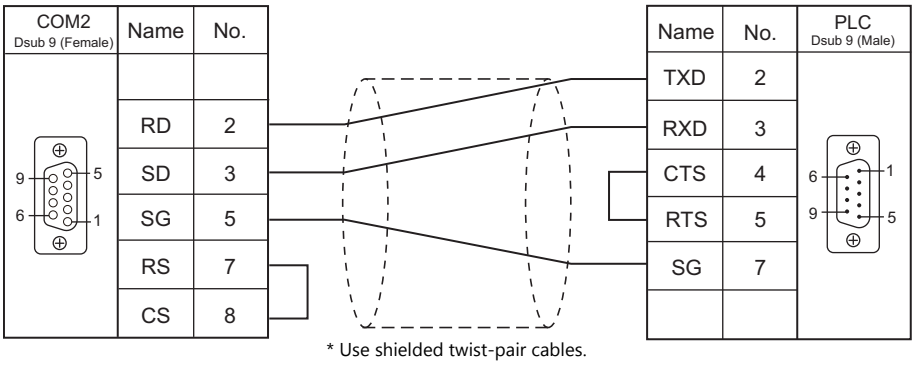


* Use shielded twist-pair cables.

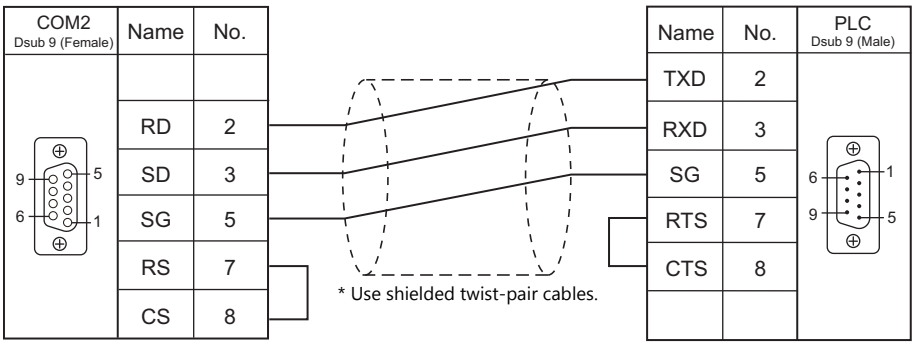
Wiring diagram 6 - COM2



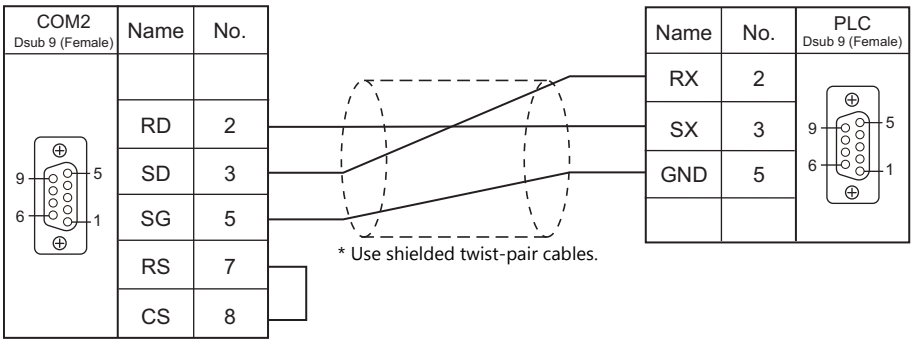
Wiring diagram 7 - COM2



Wiring diagram 8 - COM2



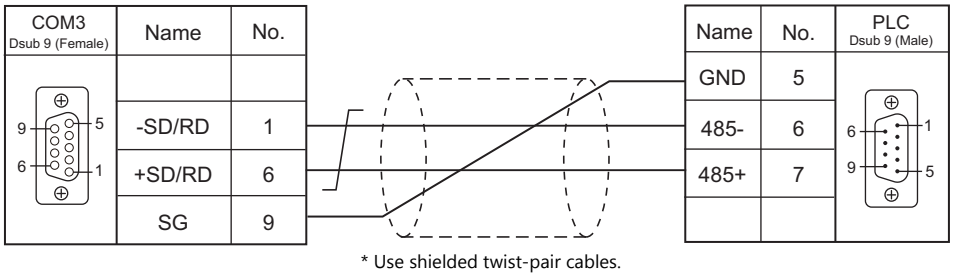
Wiring diagram 9 - COM2



When Connected at COM3:

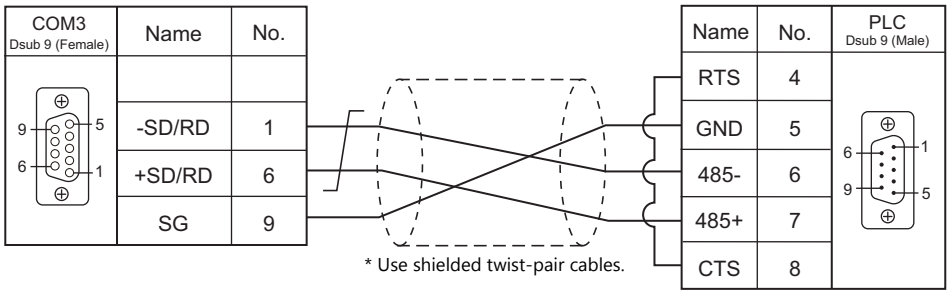
RS-485

Wiring diagram 1 - COM3



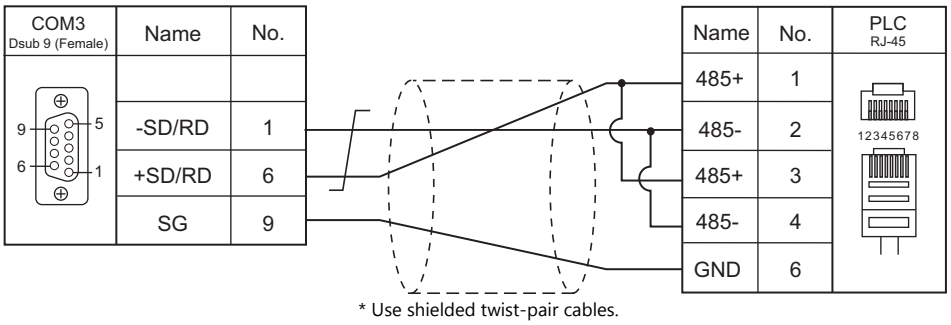
* Use shielded twist-pair cables.

Wiring diagram 2 - COM3



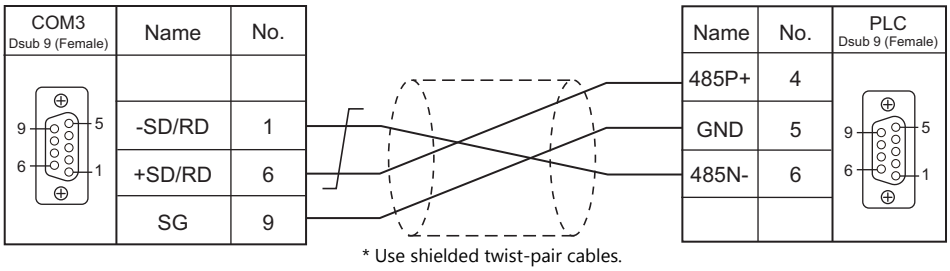
* Use shielded twist-pair cables.

Wiring diagram 3 - COM3



* Use shielded twist-pair cables.

Wiring diagram 4 - COM3



* Use shielded twist-pair cables.

20.2 Temperature Controller/Servo/Inverter Connection

Servo

PLC Selection on the Editor	Model	Unit/Port	Signal Level	TS Port	Connection	Lst File
CSD5 (MODBUS RTU)	CSD5_A5BX1 CSD5_01BX1 CSD5_02BX1 CSD5_04BX1	Communication Port	RS-232C	COM2	Wiring diagram 1 - COM2	RSA_CSD5.Lst
			RS-485	COM1	Wiring diagram 1 - COM1	
				COM3	Wiring diagram 1 - COM3	
Moscon-F50 (MODBUS RTU)	SI-20P2F50 SI-20P4F50 SI-20P7F50 SI-21P5F50 SI-22P2F50 SI-23P7F50 SI-B0P4F50 SI-B0P7F50 SI-B1P5F50 SI-B2P2F50 SI-40P4F50 SI-40P7F50 SI-41P5F50 SI-42P2F50 SI-43P7F50	Communication Port	RS-485	COM1	Wiring diagram 2 - COM1	RSA_Moscon-F50.Lst
				COM3	Wiring diagram 2 - COM3	

20.2.1 CSD5 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	0: Broadcast

Servo

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

(Underlined setting: default)

Parameter	Indication	Setting	Remarks
Station number	Ft-0.07	1 to 247	
Baud rate	Ft-0.09	0: 9600 2: 19200 3: 38400 5: 57600	Set with right-most digit of parameter.
Data length / Parity / Stop bit	Ft-0.09	0: data length 8 bits, without parity, stop bit 1 1: data length 8 bits, even parity, stop bit 1 2: data length 8 bits, odd parity, stop bit 1 3: data length 8 bits, without parity, stop bit 2 4: data length 8 bits, even parity, stop bit 2 5: data length 8 bits, odd parity, stop bit 2	Set with 2nd digit from right of parameter.
Protocol	Ft-0.09	0: RSA-ASCII **1: MODBUS-RTU**	Set with 3rd digit from right of parameter. Always set to 1: Modbus-RTU.
Signal level	Ft-0.09	0: RS232 1: RS485	Set with 4th digit from right of parameter.

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(holding register)	02H	9999: write only
3	(input register)	03H	Read only

20.2.2 Moscon-F50 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2 / Multi-link2 (Ethernet) / 1 : n Multi-link2 (Ethernet)	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Unselected**	
Target Port No.	1 to 247	0: Broadcast

AC Drive

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

(Underlined setting: default)

Parameter	Indication	Setting	Remarks
Station number	b0.08	1 to 247	
Baud rate	b0.09	1: 4800 2: 9600 3: 19200 4: 38400	

The following settings are fixed; signal level: RS-422/485, data length: 8 bits, stop bit: 1 bit, and parity: none.

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
U	(U-variable (Monitoring))	00H	
B	(B-variable (Basic Setup))	01H	
F	(F-variable (Frequency Control))	02H	
S	(S-variable (System Adjustment))	03H	
C	(C-variable (H/W Functionality))	04H	
H	(H-variable (I/O Control))	05H	
P	(P-variable (Protective Function))	06H	
HE	(error status (hardware))	07H	Read only
SE	(error status (software))	08H	Read only
DS	(operation status)	09H	

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

* When specifying device types 00H to 06H, input the address number without decimal points.
Example: For an address of U1.01, enter “101” in n + 1.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Frequency command	1 to 8 (PLC1 to 8)	n	Station number: 0000 to 00F7 (H) *1	3
		n + 1	Command: 0000 (H)	
		n + 2	Frequency	
Reset command	1 to 8 (PLC1 to 8)	n	Station number: 0000 to 00F7 (H) *1	2
		n + 1	Command: 0001 (H)	

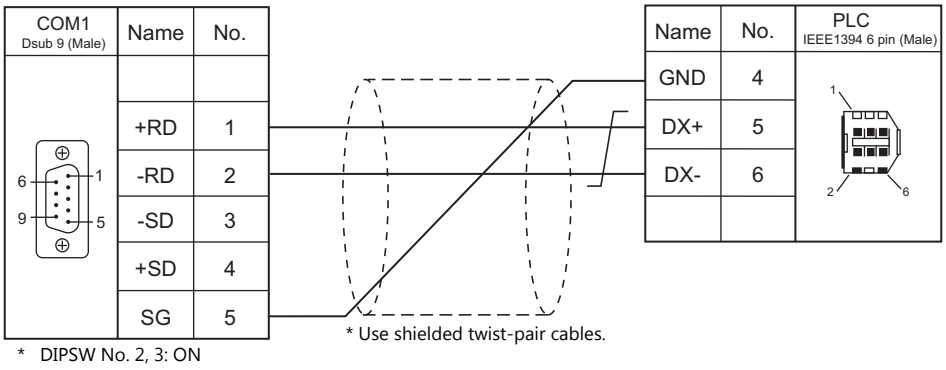
*1 Select station No. 0 for broadcast commands.

20.2.3 Wiring Diagrams

When Connected at COM1:

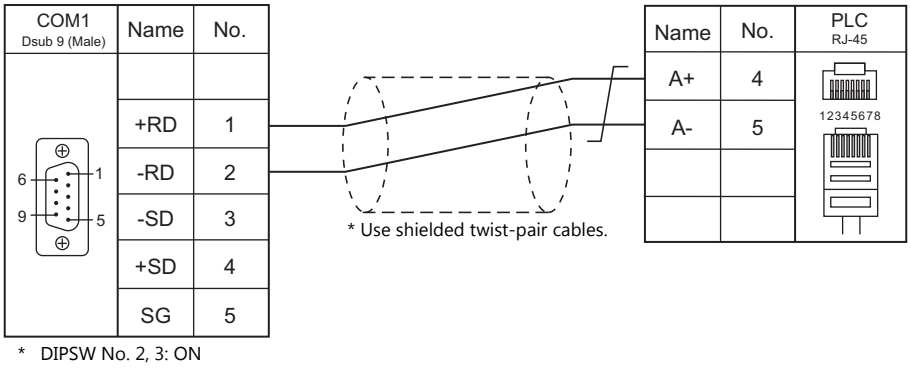
RS-485

Wiring diagram 1 - COM1



* DIPSW No. 2, 3: ON

Wiring diagram 2 - COM1

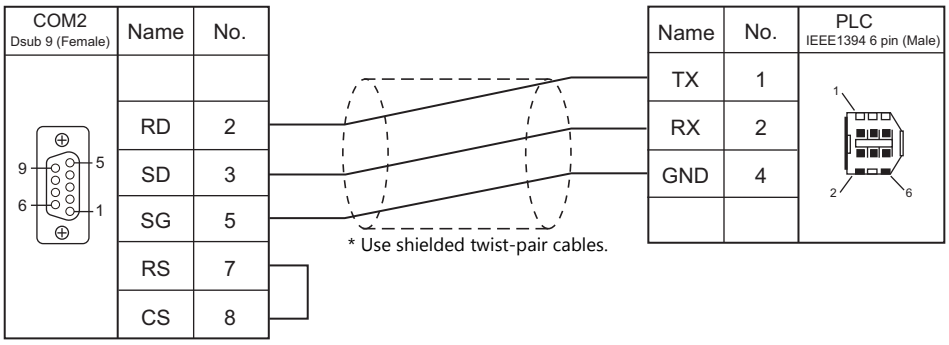


* DIPSW No. 2, 3: ON

When Connected at COM2:

RS-232C

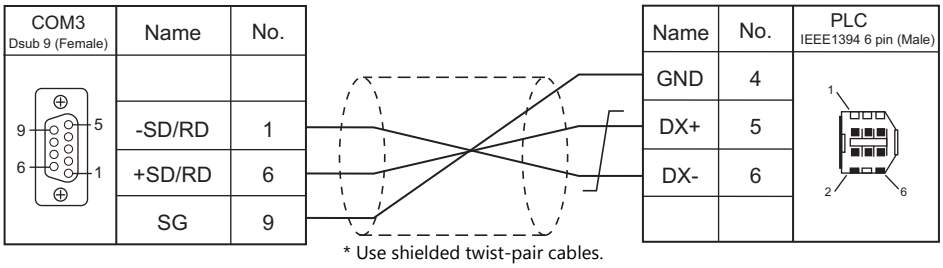
Wiring diagram 1 - COM2



When Connected at COM3:

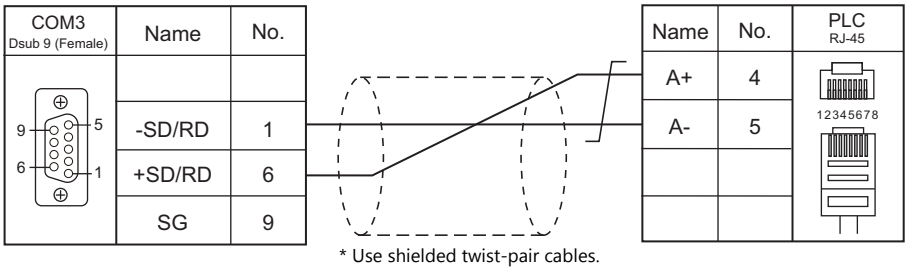
RS-485

Wiring diagram 1 - COM3



* Use shielded twist-pair cables.

Wiring diagram 2 - COM3



* Use shielded twist-pair cables.

Connection Compatibility List

April, 2018

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
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	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
FESTO	FEC	○		○	○		
FUFENG	APC Series Controller	○	○	○	○	○	
Fuji Electric	MICREX-F series	○	○	○			○
	MICREX-F series V4-compatible	○	○	○			
	SPB (N mode) & FLEX-PC series	○	○	○			
	SPB (N mode) & FLEX-PC CPU	○		○			
	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)	○	○				
High-Pressure Gas Industry	R-BLT	○					
Hitachi	HIDIC-S10/2α, S10mini	○		○			
	HIDIC-S10/2α, S10mini (Ethernet)	○	○				
	HIDIC-S10/4α	○		○	○		
	HIDIC-S10V	○		○			
	HIDIC-S10V (Ethernet)	○	○				

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
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	Jet Control Series 2/3 (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)	○	○				
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)	○	○				
MITSUBISHI ELECTRIC	A series link	○	○	○			○
	QnA series link	○	○	○	○	○	
	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)	○	○				

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
MITSUBISHI ELECTRIC	QnH (Q) series CPU (multi CPU)	○		○	○		
	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	○		○	○		
	FX2N/1N series CPU	○		○			
	FX1S series CPU	○		○			
	FX series link (A protocol)	○	○	○			○
	FX-3U/3UC/3G series CPU	○		○			
	FX-3U/3GE series (Ethernet)	○	○				
	FX3U/3UC/3UG series link (A protocol)	○	○	○			○
	FX-5U/5UC series	○	○	○			
	FX-5U/5UC series (Ethernet)	○	○				
	A-Link + Net10		○				
	Q170MCPU (multi CPU)	○		○	○		
	Q170 series (multi CPU) (Ethernet)	○	○				
	iQ-R series (Built-in Ethernet)	○	○				
	iQ-R series link	○	○	○	○	○	
	iQ-R series (Ethernet)	○	○				
	FR-*500	○	○	○			
	FR-V500	○	○	○			
	MR-J2S-*A	○	○	○	○		
	MR-J3-*A	○	○	○	○		
	MR-J3-*T	○	○	○	○		
	MR-J4-*A	○	○	○	○	○	
	FR-E700	○	○	○	○		
MODICON	Modbus RTU	○		○	○		
MOELLER	PS4	○		○	○		
MOOG	J124-04x	○	○	○	○		
M-SYSTEM	R1M series (MODBUS RTU)	○	○	○	○	○	
OMRON	SYSMAC C	○	○	○			○
	SYSMAC CV	○	○	○			○
	SYSMAC CS1/CJ1	○	○	○			
	SYSMAC CS1/CJ1 DNA	○	○				
	SYSMAC CS1/CJ1 (Ethernet)	○	○				
	SYSMAC CS1/CJ1 (Ethernet Auto)	○	○				
	SYSMAC CS1/CJ1 DNA (Ethernet)	○	○				
	NJ Series (EtherNet/IP)	○	○				
	E5AK	○	○	○	○		
	E5AK-T	○	○	○	○	○	
	E5AN/E5EN/E5CN/E5GN	○	○	○			
	E5AR/E5ER	○	○	○			
	E5CK	○	○	○	○		
	E5CK-T	○	○	○	○	○	
	E5CN-HT	○	○	○	○	○	
	E5EK	○	○	○	○		
	E5ZD	○	○	○	○		
	E5ZE	○	○	○	○		
	E5ZN	○	○	○	○		
	V600/620/680	○	○	○			
	KM20	○	○	○	○		
	KM100	○	○	○	○		
	V680S (Ethernet TCP/IP)	○	○				
Oriental Motor	High-efficiency AR series (MODBUS RTU)	○	○	○	○	○	
	CRK series (MODBUS RTU)	○	○	○	○	○	

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
Panasonic	FP Series (RS232C/422)	○	○	○			○
	FP Series (TCP/IP)	○	○				
	FP Series (UDP/IP)	○	○				
	FP-X (TCP/IP)	○	○				
	FP7 Series (RS232C/422)	○	○	○	○	○	
	FP7 Series (Ethernet)	○	○				
	LP-400	○		○			
	KW Series	○	○	○	○	○	
	MINAS A4 series	○	○	○	○	○	
RKC	SR-Mini (MODBUS RTU)	○	○	○			
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)	○	○	○			
	SR-Mini (Standard Protocol)	○	○	○			
	REX-F400/F700/F900(Standard Protocol)	○	○	○	○		
	REX-F9000 (Standard Protocol)	○	○	○	○		
	SRV (MODBUS RTU)	○	○	○			
	MA900/MA901 (MODBUS RTU)	○	○	○			
	SRZ (MODBUS RTU)	○	○	○			
	FB100/FB400/FB900 (MODBUS RTU)	○	○	○	○	○	
RS Automation	NX7/NX Plus Series (70P/700P/CCU+)	○	○	○	○	○	○
	N7/NX Series (70/700/750/CCU)	○	○	○			○
	NX700 Series (Ethernet)	○	○				
	X8 Series	○	○	○	○	○	○
	X8 Series (Ethernet)	○	○				
	CSD5 (MODBUS RTU)	○	○	○	○	○	
	Moscon-F50 (MODBUS RTU)	○	○	○	○	○	
SAIA	PCD	○	○	○			
	PCD S-BUS (Ethernet)	○	○				
SAMSUNG	SPC series	○	○	○	○	○	○
	N_plus	○	○	○	○	○	○
	SECNET	○	○	○			○
SANMEI	Cuty Axis	○	○	○	○	○	
SanRex	DC AUTO (HKD type)	○	○	○	○	○	
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)	○	○				
	TI500/505	○	○	○	○		
	TI500/505 V4-compatible	○	○	○	○		
SINFONIA TECHNOLOGY	SELMART	○	○	○			○
SUS	XA-A*	○		○	○		
TECO	TP-03 (MODBUS RTU)	○	○	○			

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
Telemecanique	TSX Micro						○
TOHO	TTM-000	○	○	○	○	○	
	TTM-00BT	○	○	○			
	TTM-200	○	○	○			
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 series	○		○			
	μGPCsx CPU	○		○			
	μGPCsx series (Ethernet)	○	○				
TURCK	BL Series Distributed I/O (MODBUS TCP/IP)	○	○				
Ultra Instruments	UICCPU (MODBUS RTU)	○		○	○		
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	○	○	○			

Manufacturer	Models	Available Connection Mode					
		1 : 1	1 : n Multi-drop	n : 1 Multi-link2	Multi-link2 Ethernet	1 : n Multi-link2 Ethernet	n : 1 Multi-link
Yokogawa Electric	UT350	○	○	○			
	UT320	○	○	○			
	UT2400/2800	○	○	○			
	UT450	○	○	○			
	UT32A/35A (MODBUS RTU)	○	○	○	○	○	
	UT52A/55A (MODBUS RTU)	○	○	○	○	○	
	UT75A (MODBUS RTU)	○	○	○	○	○	
	µR10000/20000 (Ethernet TCP/IP)	○	○				
None	Universal serial	○	○				
	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)	○	

MEMO

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