e-Front runners

MONITOUCH V8 series

Connection Manual

Hakko Electronics Co., Ltd.

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
January, 2008	2201NE0	First edition
April, 2008	2201NE1	Second edition • "Connection Compatibility List" updated • V806 series added • Connected devices added OMRON, Hitachi Industrial Equipment Systems, Hitachi, Fuji Electric, KOYO ELECTRONICS, ALLEN BRADLEY, Siemens, KEYENCE, Automation Direct, Yamatake, RKC, SHINKO TECHNOS, IAI • Modifications according to additional printing
April, 2009	2201NE2	Third edition • "Connection Compatibility List" updated • Connected devices added MITSUBISHI ELECTRIC, Panasonic, Yokogawa Electric, Fuji Electric, TOSHIBA MACHINE, RKC • Partial amendment
May, 2009	2201NE3	Forth edition • "Connection Compatibility List" updated • Connected devices added ALLEN BRADLEY, GE Fanuc, SAIA, Siemens, MODBUS • Partial amendment

Preface

Thank you for selecting the MONITOUCH V8 series.
For correct set-up of the V8 series, you are requested to read through this manual to understand more about the product.
For more information about the V8 series, refer to the following related manuals.

Manual Name	Contents	Reference No.
V8 series Reference Manual	The functions and instructions of the V8 series are explained.	1055NE
V Series Macro Reference	An overview of macros of V-SFT version 5 as well as macro editor operations and macro command description are explained.	1056NE
V8 Series Introductory Manual	The basic operating procedure of V-SFT version 5 is explained in detail.	1057NE
V8 Series Operation Manual	The information related to the operations of V-SFT version 5, such as software composition, editing procedure or limitations, is explained in detail.	1058NE
V8 Series Hardware Specifications	Notes on usage and hardware specifications for the V8 series are explained.	2016NE
V806 Series Hardware Specifications	Notes on usage and hardware specifications for the V806 series are explained.	2017NE
Specifications for JPCN-1 Communication Unit	Instructions for JPCN-1 are contained.	1026NE
Specifications for T-LINK Communication Unit	Instructions for T-LINK are contained.	1027NE
Specifications for CC-LINK Communication Unit	Instructions for CC-LINK are contained.	1028NE
Specifications for PROFIBUS Communication Unit	Instructions for PROFIBUS are contained.	1036NE
Specifications for FL-NET Communication Unit	Instructions for FL-NET are contained.	1037NE
Communication Unit Specification DeviceNet	Instructions for DeviceNet are contained.	1047NE
Ladder Monitor Specifications	Instructions for the ladder monitor function are contained.	1045NE
V Series DLL Function Specifications	Specifications of DLL files used for Ethernet (HKEtn20.DLL) and CF card (VCFAcs.DLL) are contained.	1059NE

For further details about PLCs, inverters, or temperature controllers, refer to the manual attached to each controller.

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 the item listed with **⚠CAUTION** may have serious ramifications.

⚠DANGER

- Never use the output signal of MONITOUCH 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 the malfunctions of a touch switch. A malfunction of a touch switch will result in machine accident 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, electric shock may occur.
- You must put a cover on the terminals on the unit when you turn the power on and operate the unit. Without the terminal cover in place, electric 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 the liquid crystal spills on skin or clothing, use soap and wash off thoroughly.
- 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, leaks, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or fire.

⚠CAUTION

- Check the appearance of MONITOUCH 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 for a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, please consult your local distributor.
- Operate (or store) MONITOUCH under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage or deterioration.
- Understand the following environmental limits for use and storage of MONITOUCH. 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 temperature, 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 vibration or physical shock may be transmitted.
- Equipment must be correctly mounted so that the main terminal of MONITOUCH will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Tighten the fixtures of MONITOUCH with a torque in the specified range. Excessive tightening may distort the panel surface. Loose tightening may cause MONITOUCH to come off, malfunction or be short-circuited.
- Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws may result in fire or malfunction.
- Tighten terminal screws on the power supply terminal block equally to a torque of 0.8 N•m for the V812 or V810 series, or 1.2 N•m for the V808 series. Improper tightening of screws may result in fire, malfunction, or other trouble.
- MONITOUCH has a glass screen. Do not drop or give physical shock to the unit. Otherwise, the screen may be damaged.
- Connect the cables correctly to the terminals of MONITOUCH in accordance with the specified voltage and wattage. Over-voltage, over-wattage, or incorrect cable connection could cause fire, malfunction or damage to the unit.
- Be sure to establish a ground of MONITOUCH. Ground FG terminal which must be used for the unit. Otherwise, electric shock or a fire may occur.
- Prevent any conductive particles from entering into MONITOUCH. Failure to do so may lead to fire, damage, or malfunction.
- After wiring is finished, remove the paper used as a dust cover before starting to operate MONITOUCH. Operation with the cover attached may result in accident, fire, malfunction, or trouble.
- Do not attempt to repair MONITOUCH at your site. Ask Hakko Electronics or the designated contractor for repair.
- Do not repair, disassemble or modify MONITOUCH. Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, disassembly or modification of MONITOUCH that was performed by an unauthorized person.

CAUTION

- Do not use a sharp-pointed tool when pressing a touch switch. Doing so may damage the display unit.
- Only experts are authorized to set up the unit, connect the cables or perform maintenance and inspection.
- Lithium batteries contain combustible material such as lithium or organic solvent. Mishandling may cause heat, explosion or ignition resulting in fire or injury. Read related manuals carefully and handle the lithium battery correctly as instructed.
- When using a MONITOUCH that has analog switch resolution with resistance film, do not press two or more points 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 activates.
- Take safety precautions during such operations as setting change during running, forced output, start, and stop. Any misoperation may cause unexpected machine motions, resulting in machine accident or damage.
- In facilities where a failure of MONITOUCH could lead to accident threatening human life or other serious damage, be sure that the facilities are equipped with adequate safeguards.
- At the time of disposal, MONITOUCH must be treated as industrial waste.
- Before touching MONITOUCH, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- The LED lamp on the CF card interface cover lights up in red when the power is supplied to the CF card. Never remove the CF card or turn off the power of MONITOUCH while the LED lamp is lit. Doing so may destroy the data on the CF card. Check that the LED lamp has gone off before removing the CF card or turning off the power of MONITOUCH.
- The power lamp flashes when the backlight is at the end of life or is faulty. However, the switches on the screen are operable at this time. Do not touch the screen when the screen becomes dark and the power lamp flashes. Otherwise, a malfunction may occur and result in machine accident or damage.

[General Notes]

- Never bundle control cables nor input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep these cables at least 200 mm away from the high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using MONITOUCH 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 its ends. However, the cable may be grounded only at one end if this is necessary due to unstable communication conditions or for any other reason.
- Plug connectors or sockets of MONITOUCH in the correct orientation. Failure to do so may lead to malfunction.
- If a LAN cable is inserted into the MJ1 or MJ2 connector on the V8 series, the counterpart device may be damaged. Check the indication on the unit and insert a cable into the correct position.
- Do not use thinners for cleaning because they may discolor the MONITOUCH surface. Use alcohol or benzine commercially available.
- If a data receive error occurs when MONITOUCH and the counterpart (PLC, temperature controller, etc.) are started at the same time, read the manual for the counterpart unit and remove the error correctly.
- Avoid discharging static electricity on the mounting panel of MONITOUCH. Static charges can damage the unit and cause malfunctions. Otherwise, malfunction may occur due to noise.
- Avoid prolonged display of any fixed pattern. Due to the characteristics of the liquid crystal display, an afterimage may occur. If a prolonged display of a fixed pattern is expected, use the auto OFF function of the backlight.
- Use a LAN cable commercially available. Using a self-made cable may cause an error in network connection.

[General Notes]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness and colors of the V8 series may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the liquid crystal characteristics.
- There are variations in brightness and colors on each unit.
- Cold cathode tubes are incorporated into the LCD display for backlights. Optical properties (brightness, irregular colors, etc.) may change in a low-temperature environment or over time of operation.

Contents

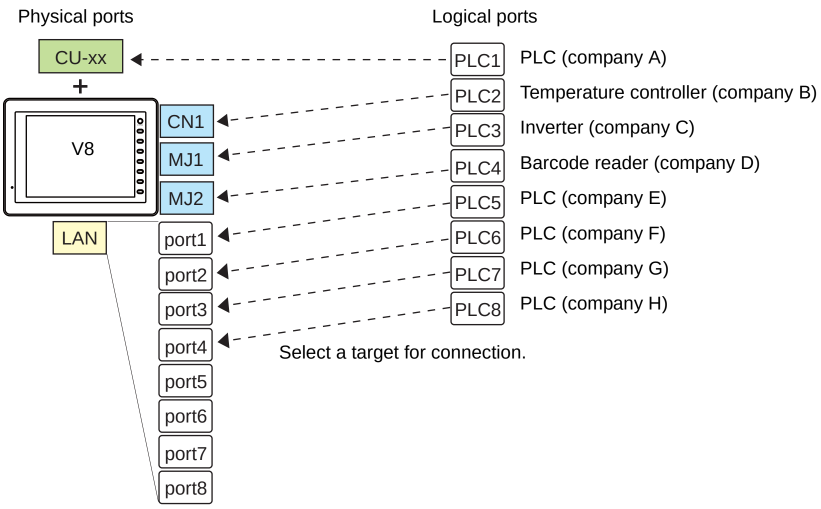
1. Overview

1.1 8-way Communication

1.1.1 Overview

The V8 series is equipped with five physical ports consisting of three serial ports, one LAN port, and one network communication port*1. The LAN port can open eight ports simaltaneously. You can use the physical ports to connect a maximum of eight different models of devices and allow the V8 series to communicate with them at the same time. This is called the 8-way communication.

*1 A communication interface unit (CU-xx) is required to enable network communication.



Physical Ports			No. of Ports	Applicable Devices: 8-way Communication	Applicable Devices: Other than 8-way
Serial	CN1		1	PLC/temperature controller/servo/ inverter/barcode reader	-
	MJ1		1	PLC/temperature controller/servo/ inverter/barcode reader/V-Link/ slave communication (Modbus RTU)	Serial printer CREC V-I/O
	MJ2		1		
Ethernet	LAN		8	PLC/slave communication (Modbus TCP/IP)	-
Network	OPCN-1	CU-00	1	PLC	-
	T-Link	CU-01			
	CC-Link	CU-02			
	Ethernet	CU-03-3			
	PROFIBUS-DP	CU-04			
	SX BUS	CU-06			
	DeviceNet	CU-07*			
	FL-Net	CU-08*			

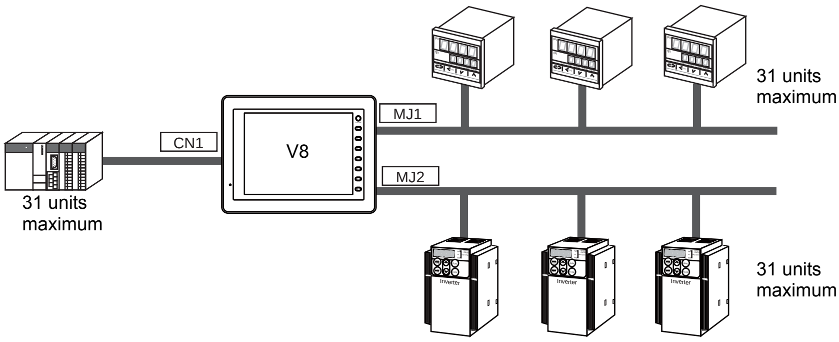
* Under development

- Only the logical port PLC1 can be selected for the following devices and functions. Thus, they cannot be connected at the same time. (* Under development)
  - Devices
    Universal serial connection, network connection (CU-xx), without PLC connection, AB Control Logix, Siemens MPI connection
  - Functions
    Multi-link2, multi-link, ladder transfer, ladder monitor*, Micrex SX variable name cooperation function

1.1.2 System Composition

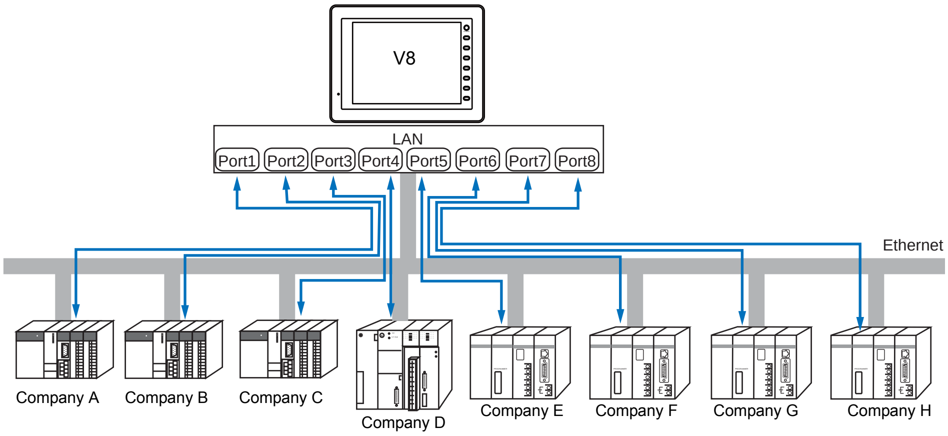
Serial Communication

The V8 series is allowed to communicate with three different models of devices at the same time via three serial ports. A maximum of 31 units of the same model can be connected to each port.

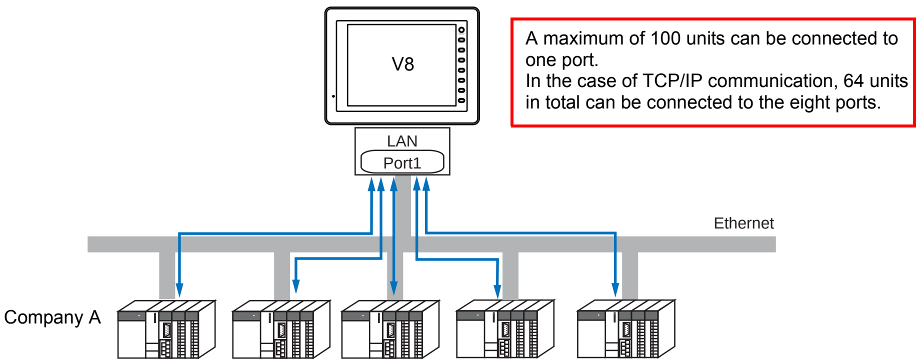


Ethernet Communication

Because eight communication ports can be opened, the V8 series is allowed to communicate with eight models of PLCs at the same time.



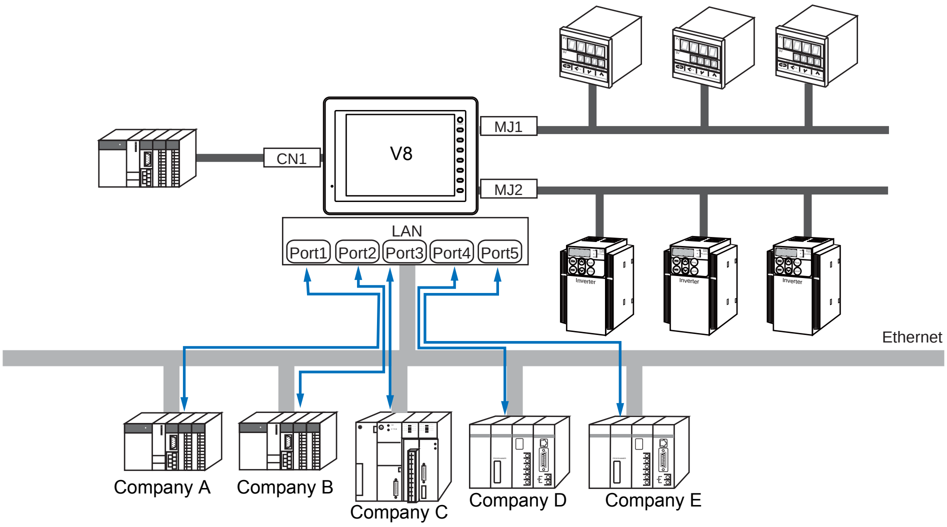
When there are two or more PLCs of the same model, the V8 series is allowed to carry out 1 : n communication via one port.



Mixed Serial-Ethernet Communication

In the case of mixed serial-Ethernet communication, the V8 series 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



1.2 Connection Modes

1.2.1 PLC Connection

The V8 unit(s) can communicate with PLC(s) in serial, Ethernet, or network communication.

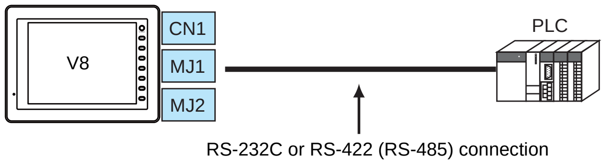
Serial Communication

There are four connection modes below to establish serial communication.

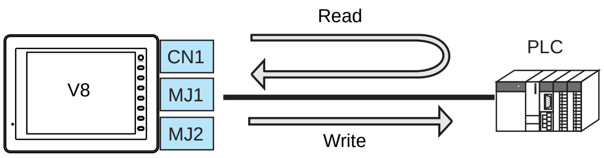
1 : 1 Connection

Overview

- One set of the V8 is connected to one PLC (1 : 1 connection).
- You can make settings for 1 : 1 communication in the [Communication Setting] tab window for the logical ports PLC1 - PLC8. A communication port is selectable from CN1, MJ1, and MJ2.



- The V8 (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 V8 reads the PLC memory for screen display. It is also possible to write switch data or numerical data entered through the keypad directly to the PLC memory.



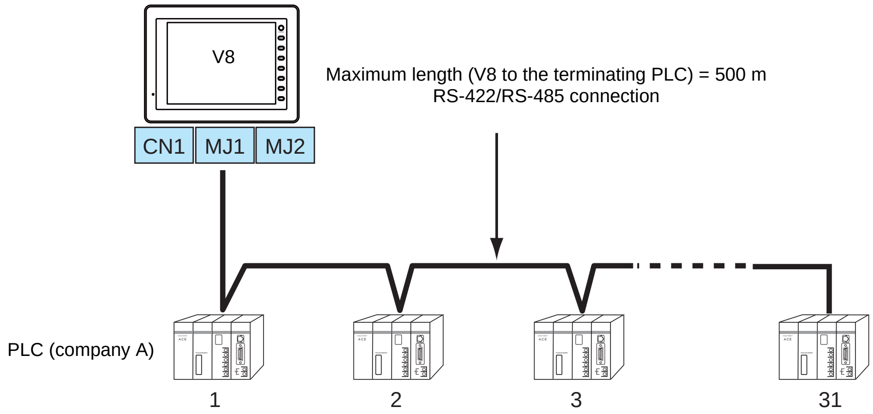
Connection

For more information on connection, see "1.4 Wiring" on page 1-16, "1.5 Settings for the Connected Device" on page 1-24, or the chapters on individual manufacturers.

1 : n Connection (Multi-drop)

Overview

- Multi-drop connection connects one V8 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. A communication port is selectable from CN1, MJ1, and MJ2.



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

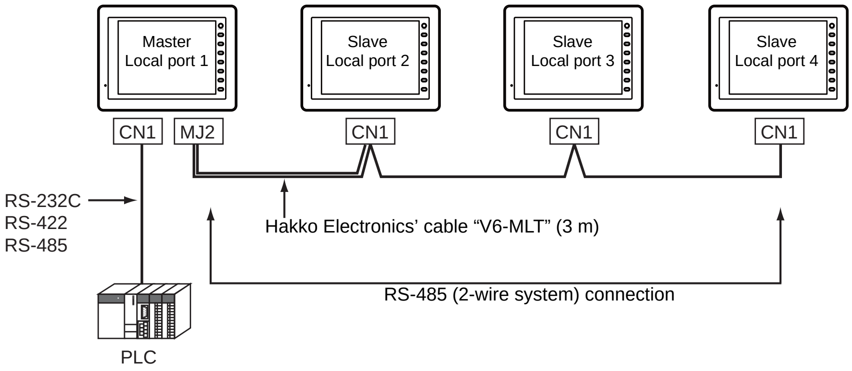
Connection

For more information on connection, see “1.4 Wiring” on page 1-16, “1.5 Settings for the Connected Device” on page 1-24, or the chapters on individual manufacturers.
For description of connecting the PLCs, refer to the manual for the corresponding PLC model.

n : 1 Connection (Multi-link2)

Overview

- One PLC is connected to a maximum of four V8 units. The V7 and V6 series cannot be used together.
- Multi-link2 enables you to establish an original network consisting of a master V8 of local port No. 1 and slave V8 units of local port Nos. 2, 3, and 4. The master V8 communicates with the PLC directly, and the slave V8 units communicate with the PLC through the master.



- You can make settings for multi-link2 in the [Communication Setting] tab window for the logical port PLC1. In the case of, for example, network connection that uses the communication interface unit "CU-xx", this type of connection is available only with PLC1. Therefore, any device used for network connection cannot be connected concurrently for multi-link2.
- A communication port is selectable from CN1, MJ1, and MJ2.
- Multi-link2 enables PLC1 memory data to be shared among the V8 units. However, sharing data of PLC2 - PLC8 is not possible.
- Communication speed between the master station and the PLC depend on the setting made on the PLC. The maximum communication speed between V8 units is 115 kbps, which is higher than the one available with multi-link connection described in "n : 1 Connection (Multi-link)".
- For PLCs that support multi-link2 connection, refer to the list provided at the end of this manual or the chapters on individual manufacturers.
  How to connect a master V8 and a PLC is the same as the method of 1 : 1 connection.
  RS-485 (2-wire system) connection is adopted to connect a master with slaves. At this time, use Hakko Electronics' cable "V6-MLT" for multi-link2 master.

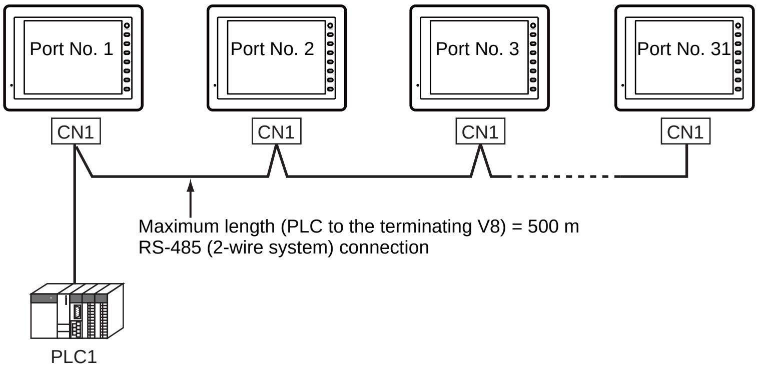
Connection

For more information, see "Appendix 4.1 Multi-link2".

n : 1 Connection (Multi-link)

Overview

- One PLC is connected to a maximum of 31 V8 units. The V8, V7, and V6 series can be used together.
  - Connection Example



- You can make settings for multi-link using the logical port PLC1. For the V8, a communication port is selectable from CN1, MJ1, and MJ2. For the V7 or V6, however, use CN1 only.
- Only a PLC for the signal level RS422/RS485 and with a port number is available. For PLCs that support multi-link connection, refer to the list provided at the end of this manual or the chapters on individual manufacturers.
- RS-485 (2-wire system) connection is adopted to connect a V-series unit and a PLC.

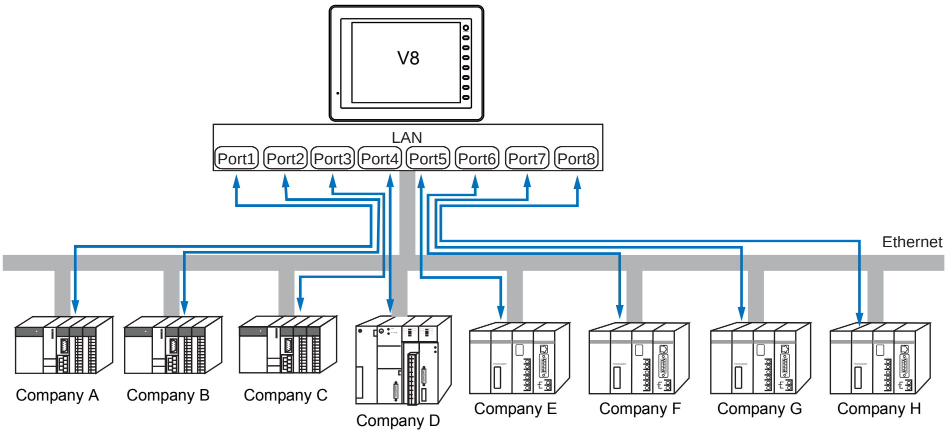
Connection

For more information, see “Appendix 4.2 Multi-link”.

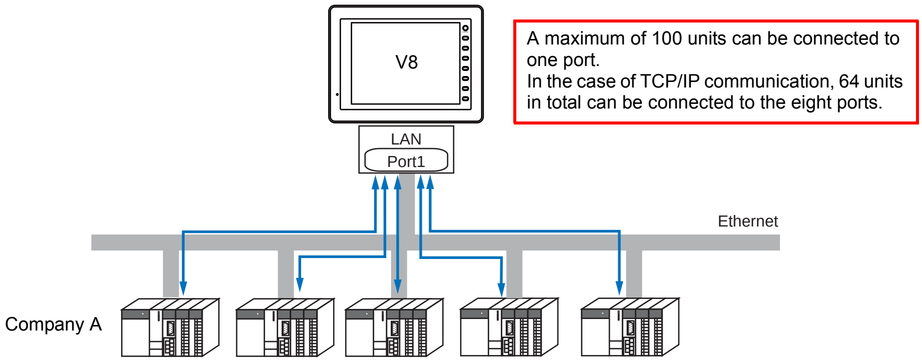
Ethernet Communication

Overview

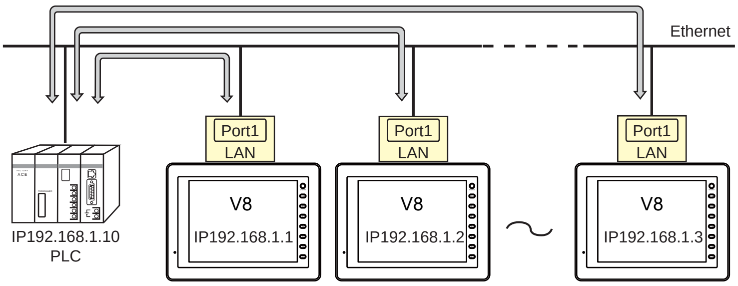
- Because eight communication ports can be opened, the V8 series is allowed to communicate with eight models of PLCs at the same time.



- When there are two or more PLCs of the same model, the V8 series is allowed to carry out 1 : n communication via one single port.



- If multiple V8 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.

Connection

For more information, see “Appendix 2 Ethernet”.

Network Communication

Overview

- An appropriate communication interface unit is required to enable a network communication listed below.

Communication Interface Unit	Network
CU-00	OPCN-1
CU-01	T-Link
CU-02	CC-Link version 1.10
CU-03-3	Ethernet
CU-04	PROFIBUS-DP
CU-06	SX BUS
CU-07*1	DeviceNet
CU-08*1	FL-Net

*1 The driver is under development.

- You can make settings for network communication in the [Communication Setting] tab window for the logical port PLC1. Thus, devices available with only PLC1, as those used for multi-link or multi-link2, cannot be connected concurrently for network communication.

Connection

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

1.2.2 Temperature Controller/Servo/Inverter Connection

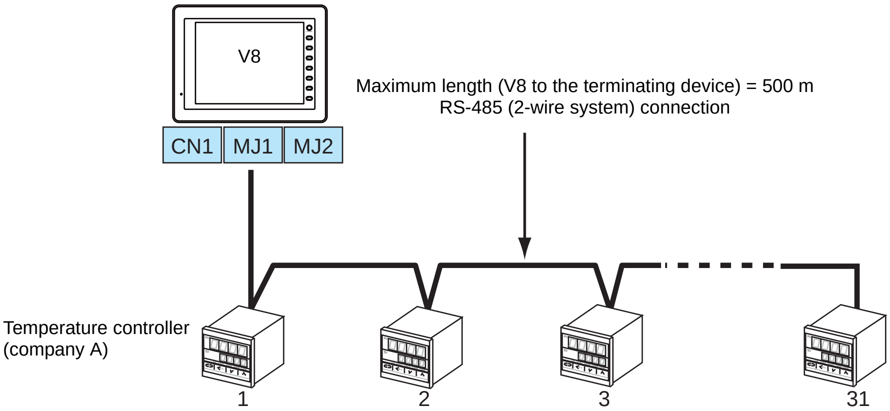
The V8 series is connected to temperature controllers, servos, or inverters via serial communication.

Serial Communication

1 : n Connection

Overview

- The V8 series is connected to multiple temperature controllers, servos, or inverters of the same model as 1 : n connection. (Maximum connectable units: 31)
- You can make settings for temperature controller/servo/inverter communication in the [Communication Setting] tab window for the logical ports PLC1 - PLC8. RS-422 (4-wire system) connection is available only by using CN1 or MJ2 on V806. To establish a connection via RS-422 (4-wire system), use CN1 or MJ2 on the V806.



Connection

For more information on connection, see “1.4 Wiring” on page 1-16, “1.5 Settings for the Connected Device” on page 1-24, or the chapters on individual manufacturers.

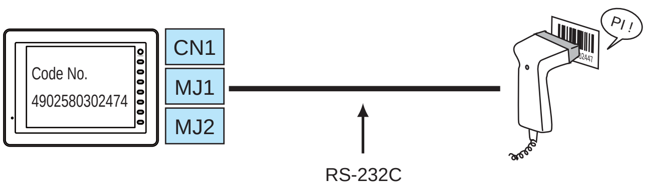
1.2.3 Barcode Reader Connection

The V8 series is connected to a barcode reader in serial communication.

Serial Communication

Overview

- The V8 series is connected to a barcode reader as 1 : 1 connection (RS-232C).
- You can make settings for barcode reader communication in the [Communication Setting] tab window for the logical ports PLC2 - PLC8. A communication port is selectable from CN1, MJ1, and MJ2.



Connection

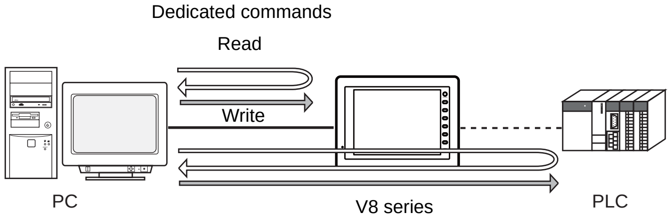
For more information on connection, see “22.1 Barcode Reader Connection”.

1.2.4 Slave Communication

Connecting via V-Link, Modbus RTU, or Modbus TCP/IP is applicable to slave communication using the V8. 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 computer reads from and writes to the internal memory of the V8 series, memory card, or PLC1 to 8 memory using a dedicated protocol.



- You can make settings for V-Link in the [Communication Setting] tab window for the logical ports PLC2 - PLC8. A communication port is selectable from CN1, MJ1, and MJ2.
- For more information, see "23.1 V-Link".

Modbus RTU

- The V8 series is connected to a Modbus RTU master via serial connection.
- The Modbus slave communication memory table is prepared for the V8. The master is allowed to gain access to the memory table and read/write the PLC data.
- For more information, refer to the Modbus Slave Communication manual separately provided.

Modbus TCP/IP

- The V8 is connected to a Modbus TCP/IP master via Ethernet communication.
- The Modbus slave communication memory table is prepared for the V8. The master is allowed to gain access to the memory table and read/write the PLC data.
- For more information, refer to the Modbus Slave Communication manual separately provided.

1.2.5 Other Connections

For connection to a V-I/O, a CREC, or a serial printer that is not in 8-way communication, serial ports of MJ1 and MJ2 are used.

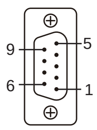
1.3 Physical Port

1.3.1 CN1

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

> When executing communication via RS-232C, set the DIP switches 5 and 7 to OFF. (For more information on the DIP switch, refer to the separate V8 Series Hardware Specifications manual.)

Pin Arrangement

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

Recommended Connector for Communication Cable

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

Applicable Devices

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

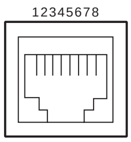
1.3.2 MJ1/MJ2

The MJ1 and MJ2 ports support communication via RS-232C, RS-422 (4-wire system)*1 and RS-485 (2-wire system).
MJ1 is also usable as a screen data transfer port.

*1 MJ2 on V806 only

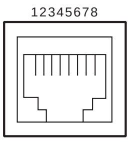
Pin Arrangement

MJ1 (All Models) / MJ2 (V812/V810/V808)

MJ1/MJ2 RJ-45 8-pin	No.	Signal	Contents
	1	+SD/RD	RS-485 + data
	2	–SD/RD	RS-485 – data
	3	+5 V	Externally supplied +5 V * Max. 150 mA
	4		
	5	SG	Signal ground
	6		
	7	RD	RS-232C receive data
	8	SD	RS-232C send data

MJ2 (V806)

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

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

* Allowable current for the external power supply +5 V:
For MJ1 and MJ2, the maximum allowable current is 150 mA in total.
When connecting an optional unit or communication unit, be careful not to exceed the total allowable current for USB-A, MJ1 and MJ2.

Extension Unit	Communication Unit (CU-xx)	Maximum Allowable Current for MJ1 + MJ2 + USB
None	None	650 mA
	Provided	
GU-00 - GU-03	None	
	Provided	550 mA
GU-10, GU-11	None	650 mA
	Provided	250 mA

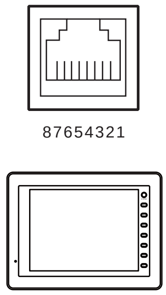
Recommended Cable

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

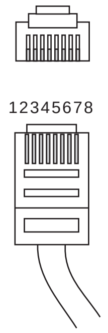
Notes on Configuring a Cable

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

Pin arrangement
on MONITOUCH



Pin arrangement
on the cable



Applicable Devices

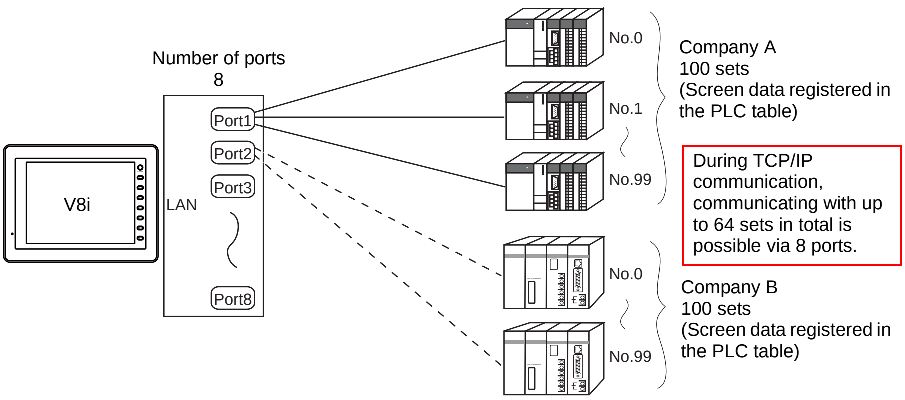
Port	Applicable Devices
MJ1	Computer (screen data transfer)
	PLC, temperature controller, inverter, servo, barcode reader, V-Link, slave communication (Modbus RTU), serial printer, CREC, V-I/O
MJ2	PLC, temperature controller, inverter, servo, barcode reader, V-Link, slave communication (Modbus RTU),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

1.3.3 LAN

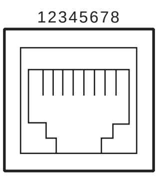
LAN Port Specifications

Item	Specifications	
	100BASE-TX (IEEE802.3u)	10BASE-T (IEEE802.3)
Baud Rate	100 Mbps	10 Mbps
Transmission Method	Base band	
Maximum Node Interval *2	200 m (Cascading connection via repeater hubs: 2 stages)	500 m (Cascading connection via repeater hubs: 4 stages)
Maximum Segment Length	100 m (between the node and the hub)	
Connecting Cable	100Ω, UTP cable, category 5	
Protocol	UDP/IP, TCP/IP *1	
Number of concurrently opened ports*3	8 ports	
Maximum number of connectable devices*3	100 sets each via one single port PLC1 - PLC8	
Maximum number of connectable devices (TCP/IP)*3	64 sets in total via PLC1 - PLC8	

*1 For connection with some PLCs
*2 No limitation for a switching hub
*3 See the figure shown below.



Pin Arrangement

LAN RJ45	No.	Signal	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 data transfer, V-Server, etc.)

1.3.4 Network Communication Port

An optional communication interface unit (CU-xx) is required to perform network communication.
For more information, refer to the specifications for each unit.

1.4 Wiring

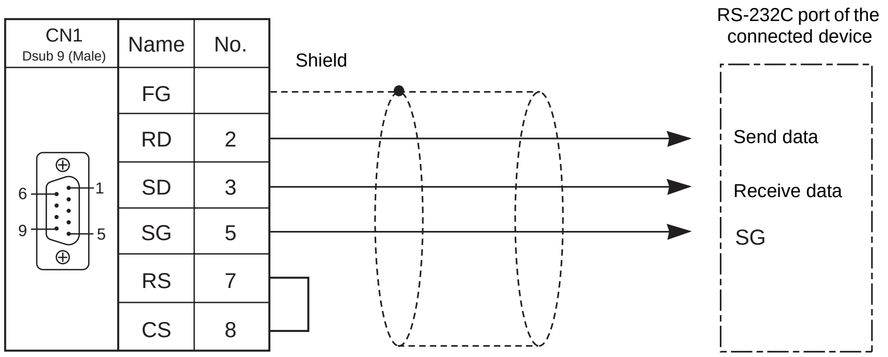
This section provides notes on configuring cables. For device wiring diagrams, refer to the chapters on individual manufacturers.

1.4.1 CN1 Connection

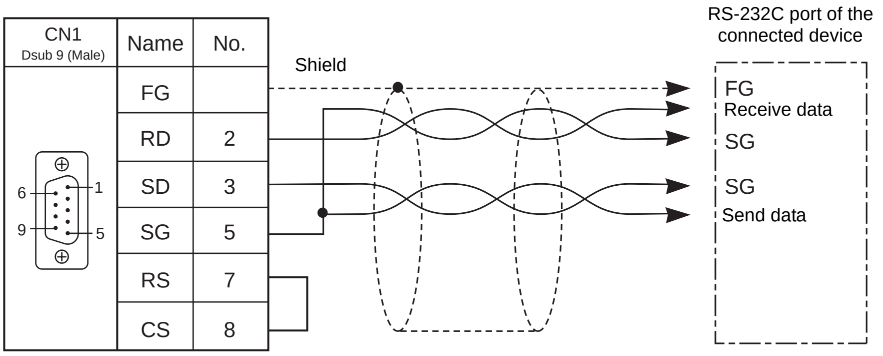
DANGER Be sure to turn off the power before connecting cables. Otherwise, electrical shock or damage may occur.

RS-232C Connection

- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- Connect a shielded cable to either the V8 series or the connected device. The connection diagram shows the case where the shielded cable is connected on the V8 series side. Connect the cable to the FG terminal on the backside of MONITOUCH.

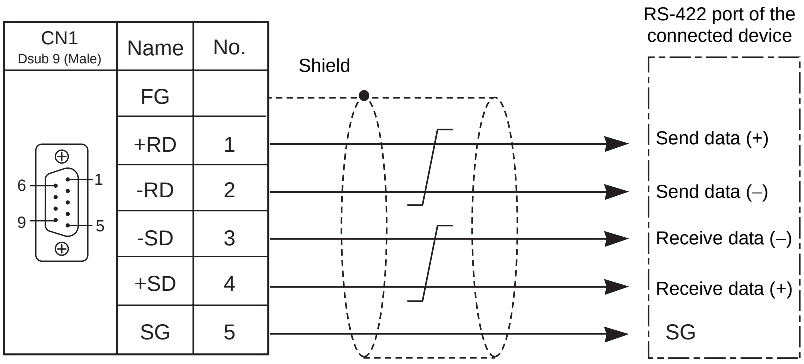


- If noise disturbs communications, establish connections between SD and SG and between RD and SG as pairs respectively, and connect a shielded cable to both the V8 series and the connected device.

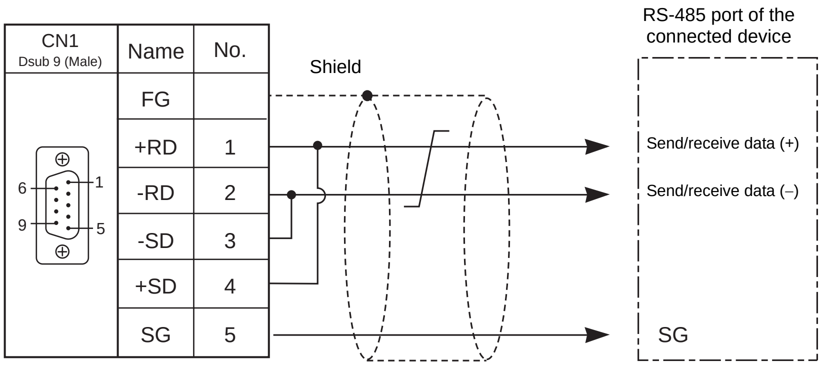


RS-422/485 Connection

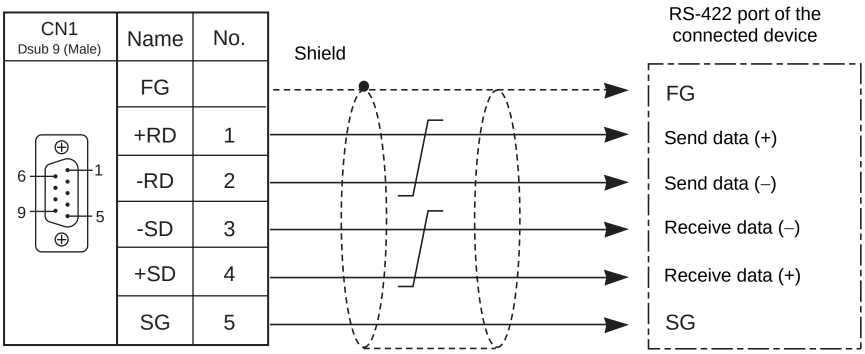
- Prepare a communication cable on your side. Twisted pairs of 0.3 mm sq. or above are recommended.
- Connect twisted pairs between +SD/–SD and +RD/–RD.
- If the PLC has the terminal for signal ground (SG), connect a wire.
- To use a terminal block for connection, use Hakko Electronics' "TC-D9" optionally available.
- The DIP switch on the back of the V8 unit is used to set the terminating resistance. For more information on the DIP switch, refer to the separate V8 Series Hardware Specifications manual.
- Connect a shielded cable to either the V8 series or the connected device. The connection diagram shows the case where the shielded cable is connected on the V8 series side. Connect the cable to the FG terminal on the backside of MONITOUCH.
  - RS-422 (4-wire system)



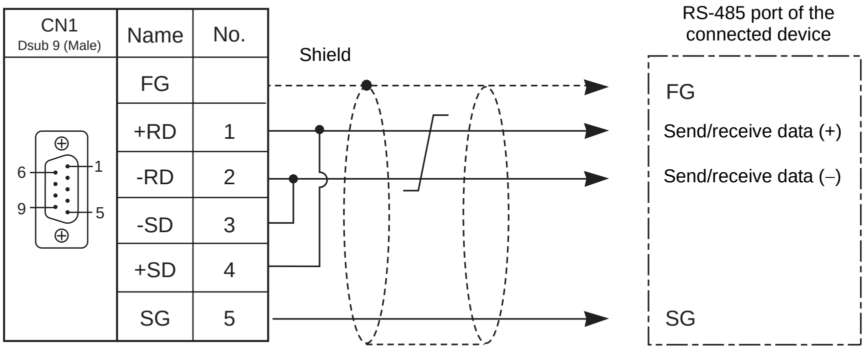
  - RS-485 (2-wire system)



- If noise disturbs communications, connect a shielded cable to both the V8 series and the connected device.
  - RS-422 (4-wire system)



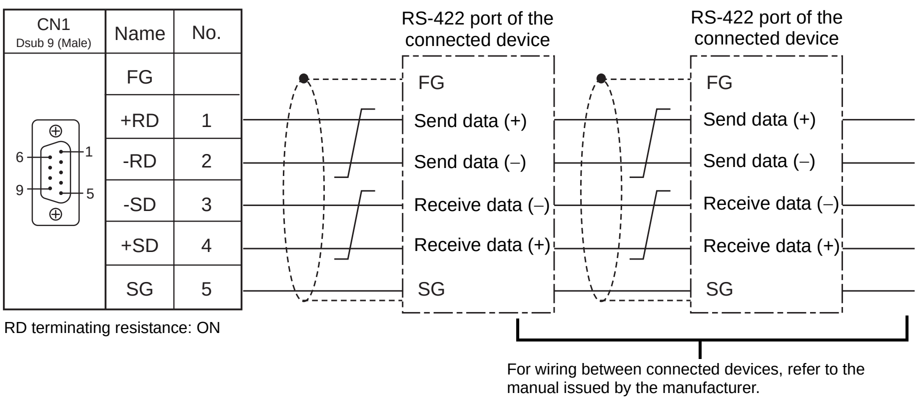
  - RS-485 (2-wire system)



Multi-drop connection (1 : n)

In the case of multi-drop connection, wiring between a V8 and a connected device is the same as that for 1 : 1 communication. Meanwhile, for description of wiring between connected devices, refer to the manual issued by the manufacturer.

- Connection example

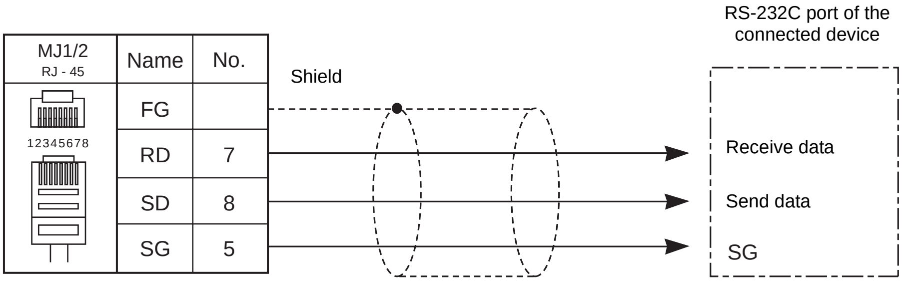


1.4.2 MJ1/MJ2

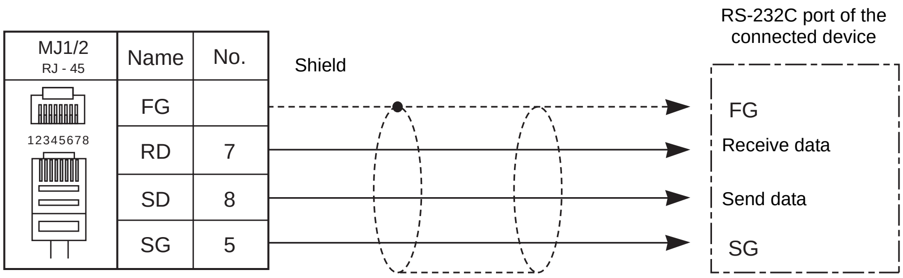
⚠CAUTION	• Be sure to turn off the power before connecting cables. Otherwise, electrical shock or damage may occur. • Pins No. 3 and 4 are provided for external power supply. To prevent damage to the device due to wrong connection, check the pin numbers and connect wires correctly.

RS-232C Connection

- Use Hakko Electronics' cable "V6-TMP" (3, 5, 10 m) as a communication cable.
- Connect a shielded cable to either the V8 series or the connected device. Connect the cable to the FG terminal on the backside of MONITOUCH.



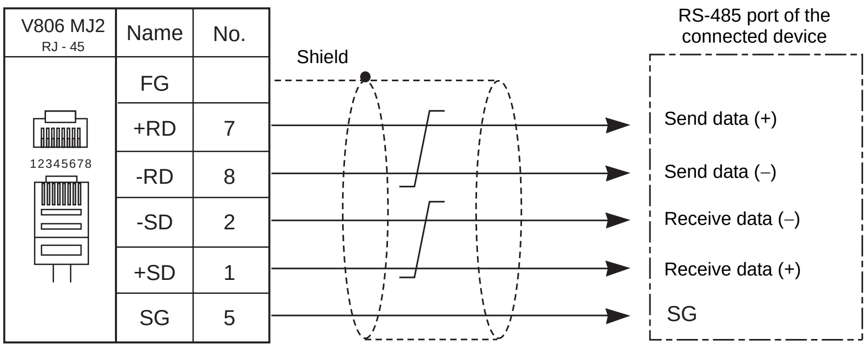
- If noise disturbs communications, connect a shielded cable to both the V8 series and the connected device.



RS-485 Connection

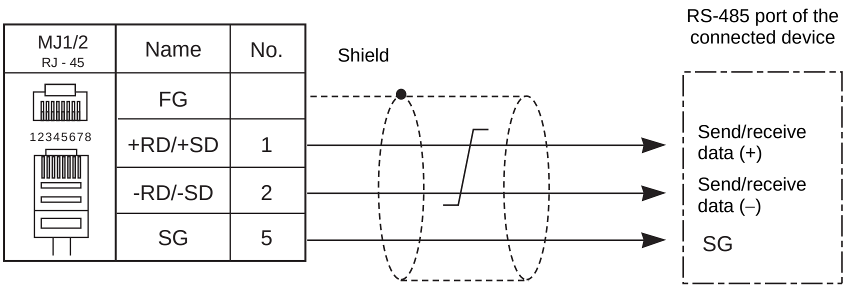
MJ2 on the V806 series can be used for connection via RS-422 (4-wire system). For the other models, MJ1 and MJ2 cannot be used for connection via RS-422 (4-wire system). Use the CN1 port instead or a RS-232C-to-RS-422 converter commercially available.

- Use Hakko Electronics' cable "V6-TMP" (3, 5, 10 m) as a communication cable.
- If the PLC has the terminal for signal ground (SG), connect a wire.
- The DIP switch on the back of the V8 unit is used to set the terminating resistance. For more information, refer to the description of the DIP switch setting in the relevant Hardware Specifications manual.
- Connect a shielded cable to either the V8 series or the connected device. Connect the cable to the FG terminal on the backside of MONITOUCH.
  - RS-422 (4-wire system)

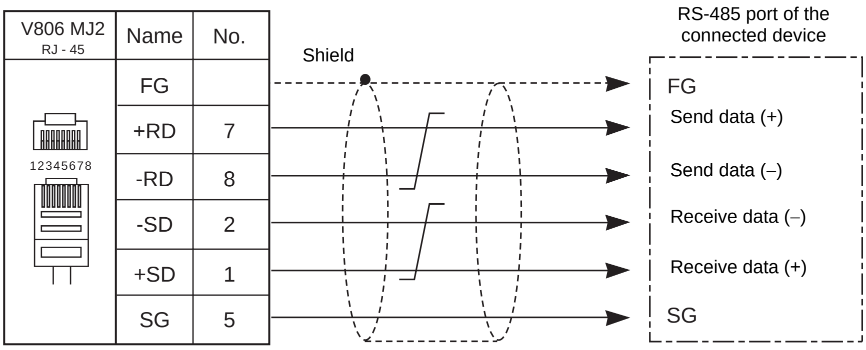


* Slide switch on V806: RS-422 (lower)

  - RS-485 (2-wire system)

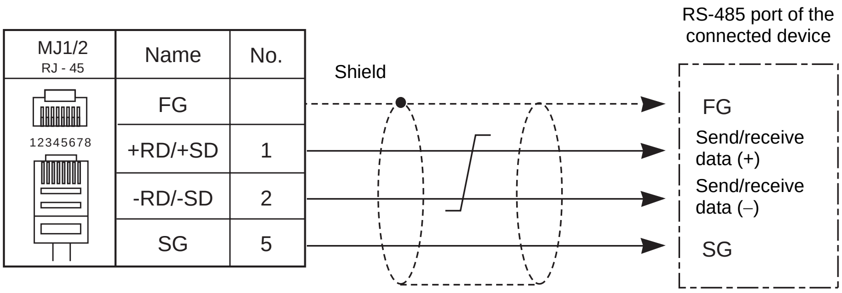


- If noise disturbs communications, connect a shielded cable to both the V8 series and the connected device.
  - RS-422 (4-wire system)



* Slide switch on V806: RS-422 (lower)

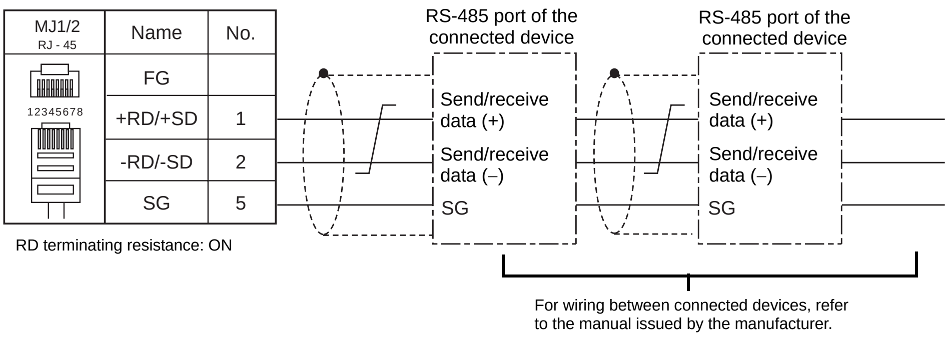
  - RS-485 (2-wire system)



Multi-drop connection (1 : n)

In the case of multi-drop connection, wiring between a V8 and a connected device is the same as that for 1 : 1 communication. Meanwhile, for description of wiring between connected devices, refer to the manual issued by the manufacturer.

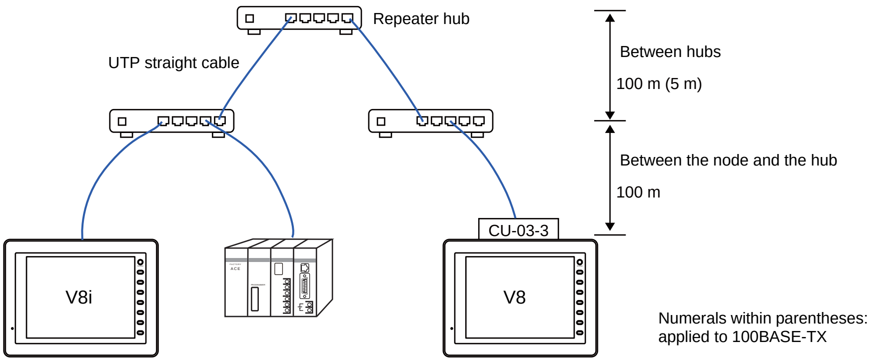
- Connection example



1.4.3 LAN

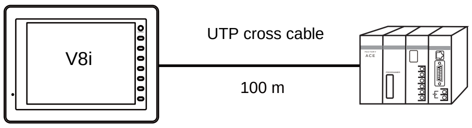
Connection Example

With hub



* Cascading connection via repeater hubs: 4 stages (2 stages) maximum

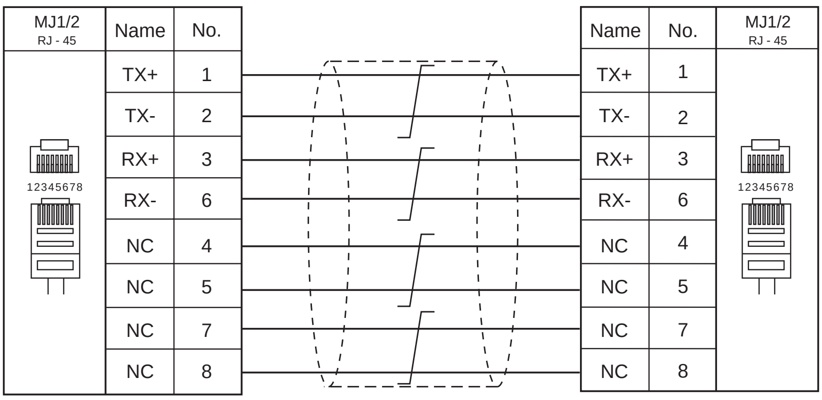
Without hub



Wiring Diagrams

- 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.

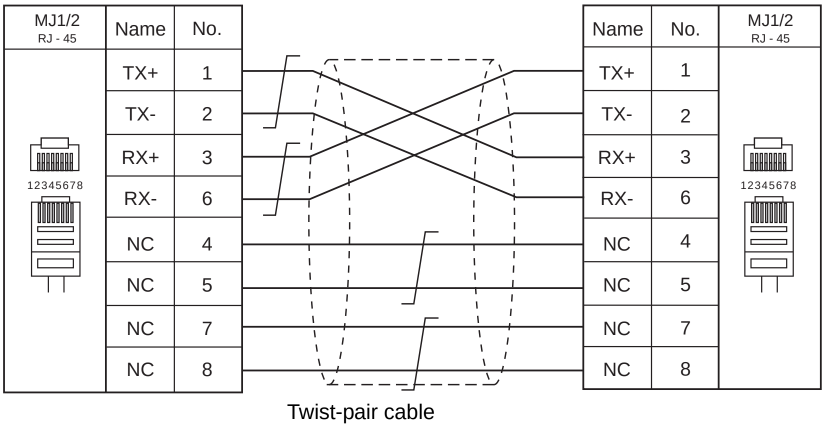
- Straight cable



MJ1/2 RJ - 45	Name	No.	Name	No.	MJ1/2 RJ - 45
	TX+	1	TX+	1	
	TX-	2	TX-	2	
	RX+	3	RX+	3	
	RX-	6	RX-	6	
	NC	4	NC	4	
	NC	5	NC	5	
	NC	7	NC	7	
	NC	8	NC	8	

Twist-pair cable

- Cross cable

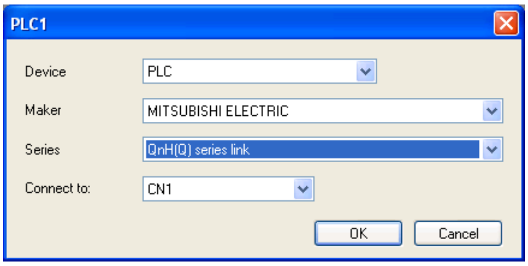

MJ1/2
RJ - 45
Name
No.
TX+ 1
TX- 2
RX+ 3
RX- 6
NC 4
NC 5
NC 7
NC 8
12345678
Name
No.
MJ1/2
RJ - 45
TX+ 1
TX- 2
RX+ 3
RX- 6
NC 4
NC 5
NC 7
NC 8
12345678
Twist-pair cable

1.5 Settings for the Connected Device

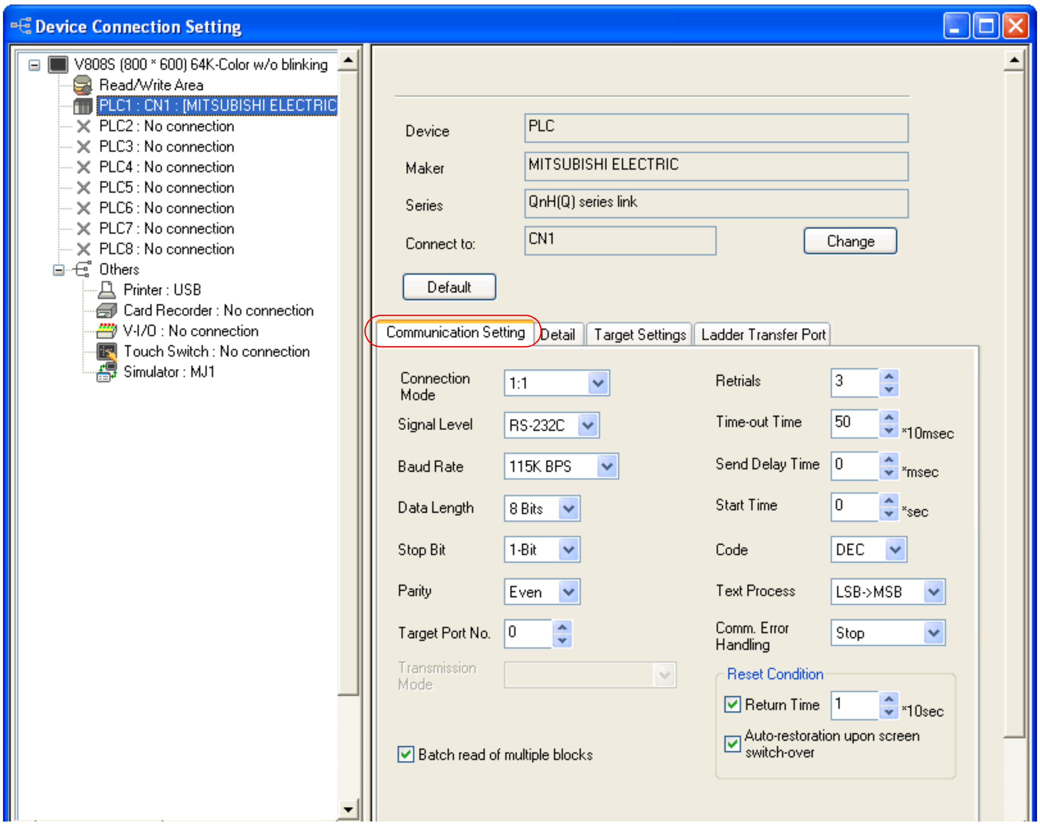
1.5.1 PLC1 to PLC8

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 V8 Main Menu screen.
For the Main Menu screen, refer to the separate V8 Series Hardware Specifications manual.

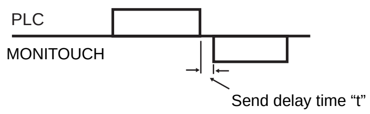
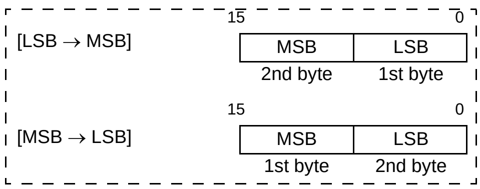
Selecting a Device to be Connected



Communication Setting

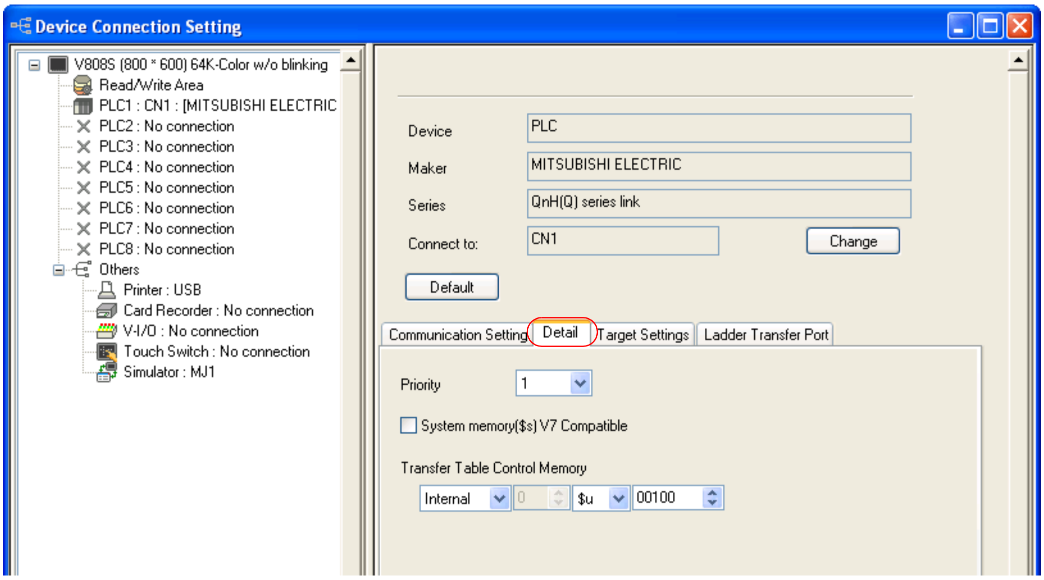


Connection Mode	Select a connection mode. 1 : 1 / 1 : n / Multi-link / Multi-link2 Available options vary, depending on which device is connected. See the list at the end of this manual.
Signal Level*1	Select a signal level. RS-232C / RS-422/485
Baud Rate*1	Select a baud rate. 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K BPS
Data Length*1	Select a data length. 7-Bit / 8-Bit
Stop Bit*1	Select a stop bit. 1-Bit / 2-Bit
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)

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.
Time-out Time	Specify a period of time allowed for V8 to monitor a response from its connected device. If V8 receives no response within the specified time, it retries to communicate with it. 0 to 999 (× 10 msec)
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
Send Delay Time	Specify a delay time that elapses before V8 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 V8 starts to send commands upon power-up. If V8 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 msec)
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 to retry the reestablishment of communication. • [Continue] The communication error message will be displayed in the top-left 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. However, communication with the device, in which a timeout was detected, will be disconnected.
Reset Condition	This setting is valid when [Disconnect] is selected for [Comm. Error Handling]. • [□ Return Time] 1 to 255 sec (× 10 sec) When the specified time has elapsed, V8 checks the restoration of the device which discontinued communicating. • [□ Auto-restoration upon screen switch-over] When the screen is switched, V8 checks the restoration of the device which discontinued communicating.
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 

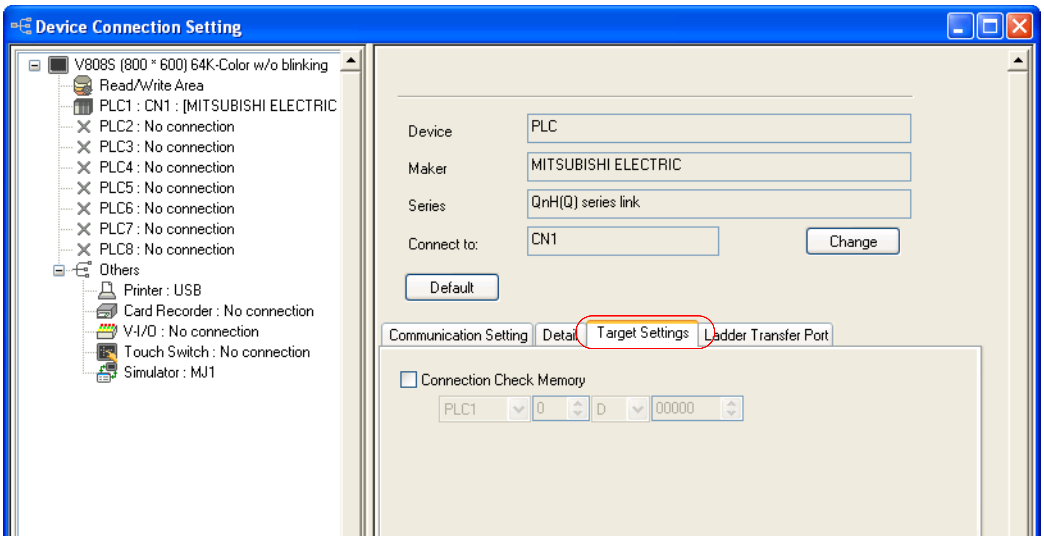
*1 Be sure to match the settings to those made on the connected device.

Detail



Priority	[1] (higher priority) - [8] (lower priority) Specify a 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 memory ($s) V7 Compatible (PLC1)	This box is checked if the V7-series screen data has been converted to the data for the V8 series. The system information relevant to 8-way communication will be stored in memory $P1 and $s. For more information, see “System Memory” (page App3-1).
☐ System memory ($s) V7 Compatible (PLC2)	This box is checked if the V7-series screen data (including temperature control network/PLC2Way settings) has been converted to the data for the V8 series. • Unchecked $P2:493/494/495 is used as the transfer table control memory. • Checked $s762/763/764 is used as the transfer table control memory. For more information, see “System Memory” (page App3-1).
Transfer Table Control Memory	Specify the transfer table control memory for PLC1 - PLC8. The memory specified here is the same as [Control Memory] in the [Device Memory Map Setting] dialog ([System Setting] → [Device Memory Map] → [Device Memory Map Edit] window → [Device Memory Map Setting] dialog). For more information, see “Control Memory” (page App1-11).

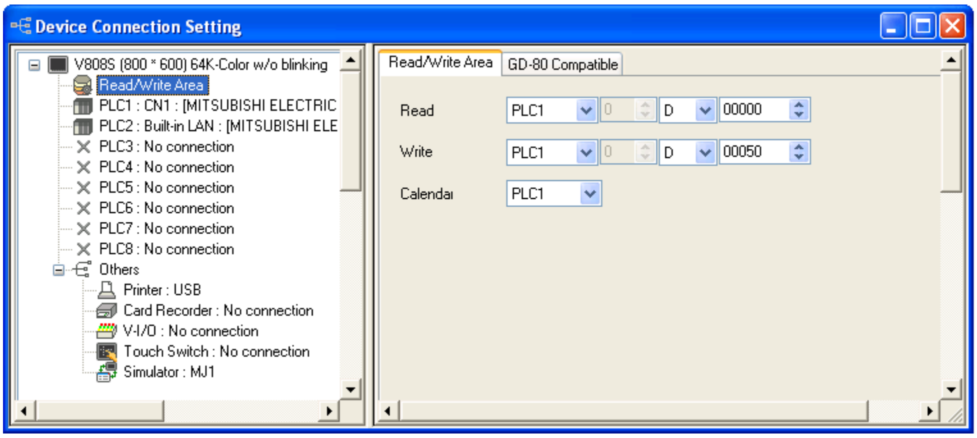
Target Settings



☐ Connection Check Memory	Specify a desired memory address used for connection confirmation when communication starts. This memory address will be used mainly during Modbus communication.
Connect To	Set these items for Ethernet communication. See “Appendix 2 Ethernet”.
PLC Table	

1.5.2 Read/Write Area

Read/Write Area

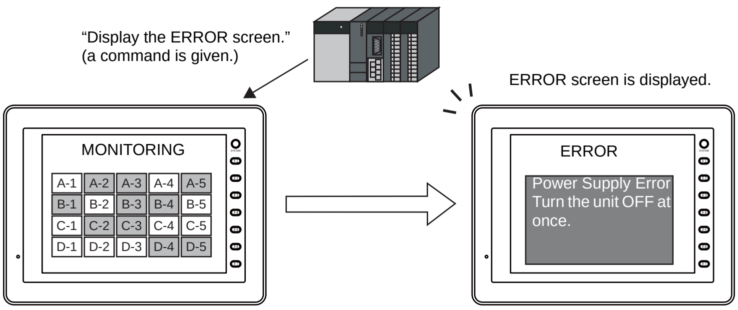


Read Area	Specify a memory address used to give commands for display or operation from the PLC to MONITOUCH. Three words (at the minimum)*1 of consecutive memory addresses are secured. For more information, see "Read area" (page 1-27).
Write area	This is the area, to which the screen numbers or overlaps displayed on MONITOUCH or a buzzer state will be written. Three words of consecutive memory addresses are secured. For more information, see "Write area" (page 1-31).
Calendar	This setting is valid when the V8's internal clock*2 is not used. The setting allows the calendar data to be read from the device via the selected port at PLC1 - PLC8. The calendar data will be updated when: • The power is turned on. • STOP → RUN • The date changes. • Bit 11 in the read area "n" is set (ON) (0 → 1 leading edge)

*1 More words are required if the sampling function is used:
sampling control memory (three words maximum), sampling data memory (variable depending on the setting)
*2 For more information on the internal clock, refer to the V8 Series Reference Manual.

Read area

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



Memory addresses are allocated as shown below.

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

* Data in these memory addresses is saved at $s460 to 462 of the V series internal memory. For more information on the internal memory ($s), refer to the V8 Series Reference Manual.

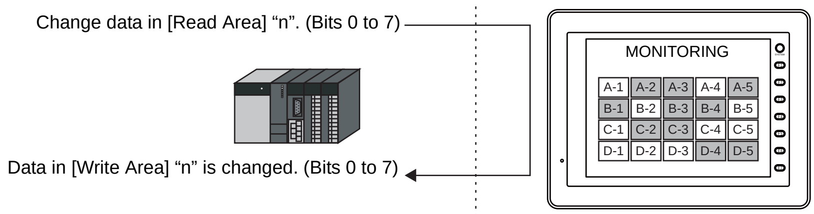
Read area “n” (sub command/data)

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

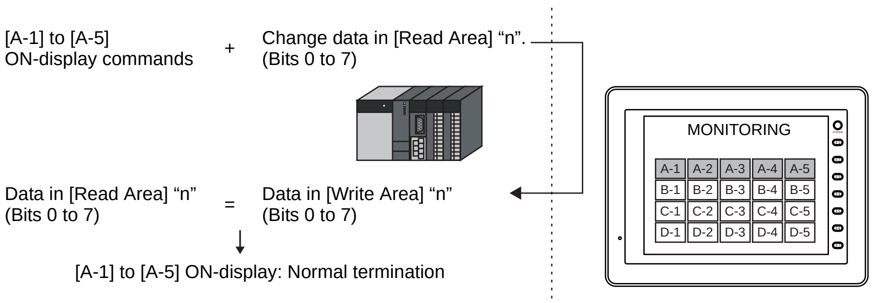
(1) Free
(2) BZ0 [0 → 1] (leading edge)
(3) BZ1 [0 → 1] (leading edge)
(4) BZ2 [1] (level)
(5) Calendar setting ([0 → 1] (leading edge)
(6) System reserved

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

*1 Watchdog
When the PLC is communicating with MONITOUCH, there is no means for the PLC to know whether or not MONITOUCH 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 V series 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. Change data in bits 0 to 7 in [Read Area] “n” when giving a graphic change command and check that the same data is saved in bits 0 to 7 in [Write Area] “n”. This can prove that the graphic change command is received and executed correctly.



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

Read area “n + 1” (screen status command)

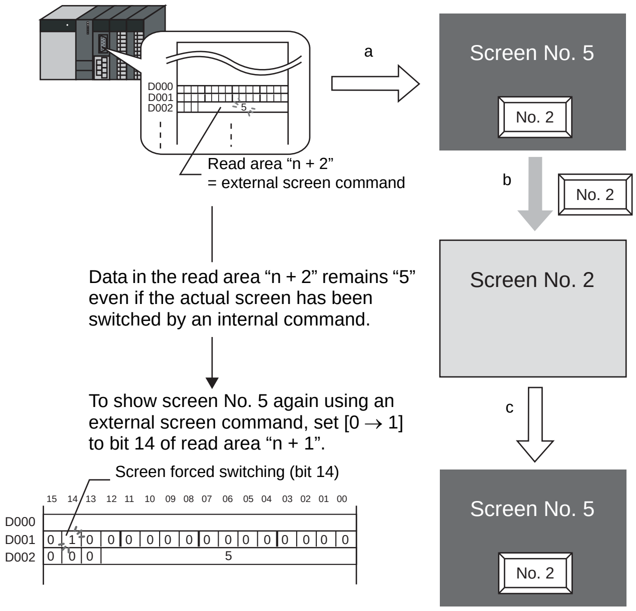
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
								0	0	0	0	0			

(1) Overlap 0
(2) Overlap 1
(3) Overlap 2
(4) System reserved
(5) Global macro execution [0 → 1] (leading edge)
(6) Data sheet output [0 → 1] (leading edge)
(7) Screen hard copy [0 → 1] (leading edge)
(8) Backlight (level)
(9) Analog RGB input (level)
(10) Screen internal switching (level)
(11) Screen forced switching [0 → 1] (leading edge)
(12) Data read refresh [0 →] (leading edge)

(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.
(4) System reserved	This bit is reserved by the system. This bit must be “0”.
(5) Global macro execution	The macro set for [Macro Block] is executed once at [0 → 1] (leading edge). The macro block number should be specified for [Global Macro Memory] in the dialog that is displayed by selecting [System Setting] → [Macro Setting]. For more information, refer to the Macro Reference manual provided separately.
(6) 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.
(7) Screen hard copy	The V series 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].
(8) 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
(9) Analog RGB input	These bits are used for controlling show/hide operations of the analog RGB input screen. [0] (level): RGB input screen not displayed (RUN screen displayed) [1] (level): RGB input screen displayed
(10) Screen internal switching	This bit controls screen switching by internal switches. [0]: Screen switching by internal switches is enabled. [1]: Screen switching by internal switches is disabled. * An “internal switch” means a switch you can create for internal processing within MONITOUCH by selecting [Screen] or [Return] for [Function:] of the switch.
(11) 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
(12) 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 V8 Series Reference Manual provided separately.
*2 As an exception, a multi-overlap may appear/disappear at the edge. For more information, refer to the V8 Series Reference Manual 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.

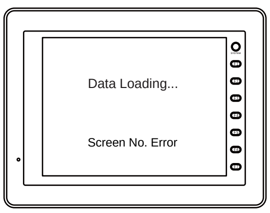


Read area “n + 2” (screen number command)															
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0													

(1) Screen number
(2) System reserved

(1) Screen number command *1	0 to 1023 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.
(2) System reserved	This bit is reserved by the system. This bit must be “0”.

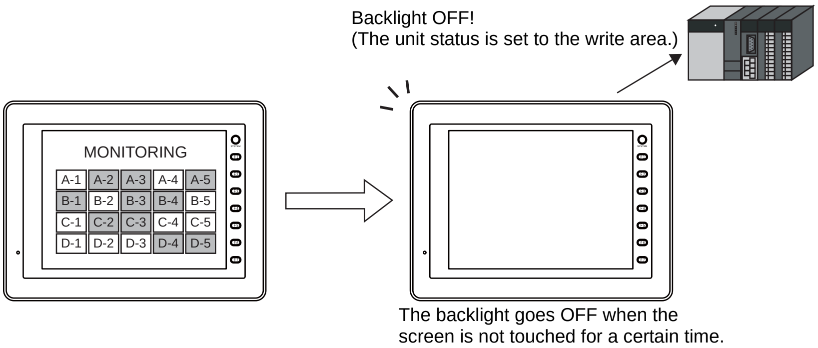
*1 Screen No. Error
When MONITOUCH has started communications with the PLC, the screen of the screen number specified in read area “n + 2” is displayed. If the screen number specified in read area “n + 2” does not exist in the screen data, “Screen No. Error” is displayed on MONITOUCH.



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

Write area

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



Memory addresses are allocated as shown below.

	Address	Contents	Operation
Write area =	n	Same as data in read area “n”	V series → PLC
	n + 1	Screen status	
	n + 2	Displayed screen number	

* Data in these memory addresses is saved at $s464 to 466 of the V series internal memory. For more information on the internal memory ($s), refer to the V8 Series Reference Manual.

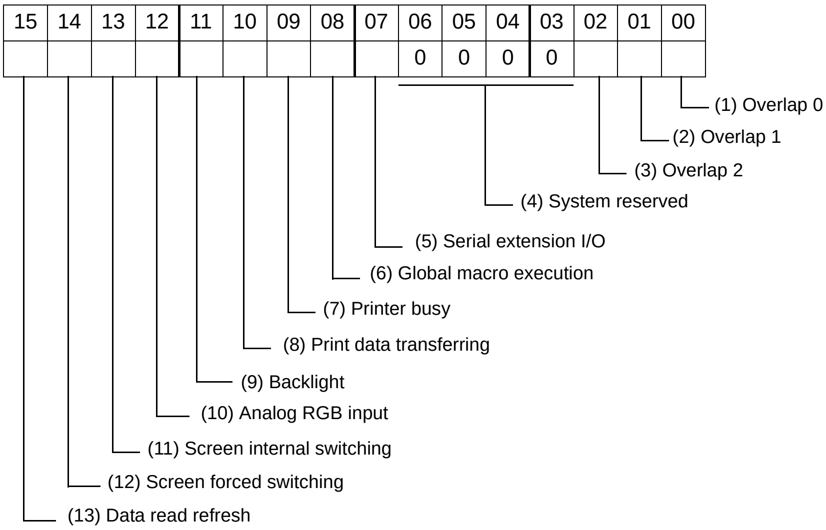
Write Area “n” (output of read area “n”)

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

(1) Free (bits 07–00)
(2) BZ0 (bit 08)
(3) BZ1 (bit 09)
(4) BZ2 (bit 10)
(5) Calendar setting (bit 11)
(6) System reserved (bits 15–12)

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

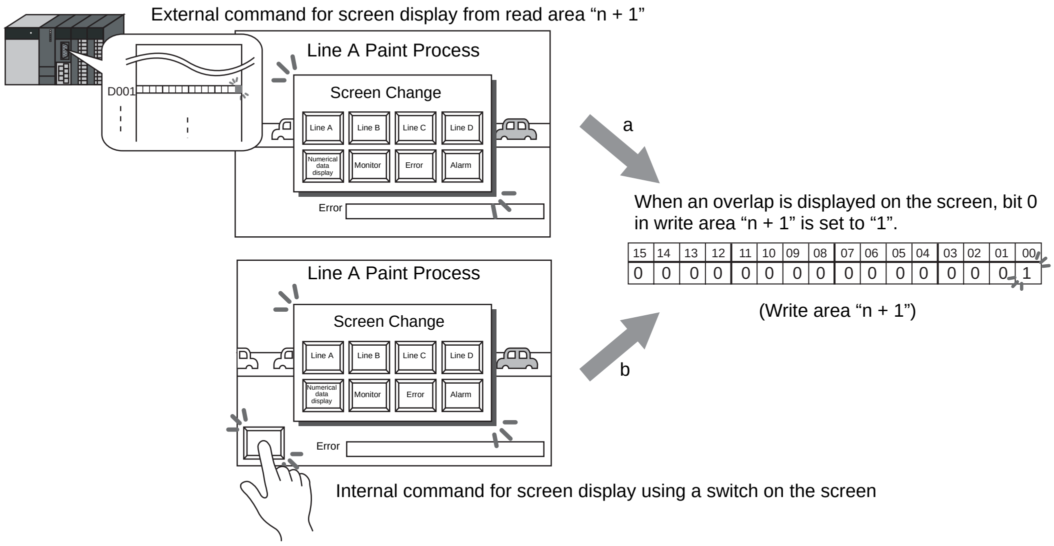
Write area “n + 1” (screen status)



(1) Overlap 0 (2) Overlap 1 (3) Overlap 2	Overlap status *1 [0]: Hide [1]: Show
(4) System reserved	Always “0”
(5) Serial extension I/O	Serial extension I/O (V-I/O) status [0]: Normal [1]: Error
(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) Analog RGB input	Analog RGB input screen status [0]: RGB input screen not displayed (RUN screen displayed) [1]: RGB input screen displayed
(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 memory address $s16. For more information on the internal memory ($s), refer to the V8 Series Reference Manual.
*3 Data of bit 11 is output to internal memory address $s17. For more information on the internal memory ($s), refer to the V8 Series Reference Manual.

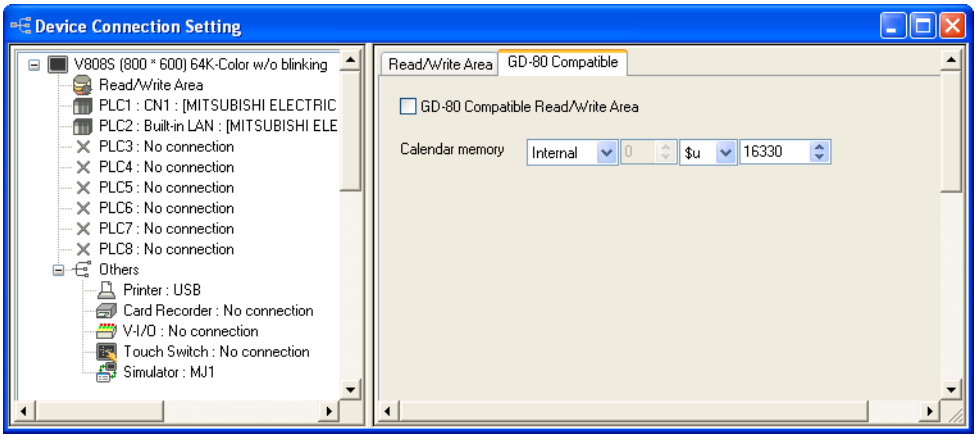
Write area "n + 2" (displayed screen number)

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

Bits 15–13: (2) System reserved
Bits 12–00: (1) Screen number

(1) Screen number	0 to 1023 Screen number currently displayed
(2) System reserved	Always "0"

GD-80 Compatible



☐ GD-80 Compatible Read/Write Area	When converting screen data files created on the MONITOUCH GD-80/81S series into those of the V8 series, this option is automatically checked. • Unchecked: The memory addresses allocated to the V series are applied to the read and write areas. (See page 1-27.) • Checked: The memory addresses allocated to the GD-80/81S series are applied to the read and write areas. For more information on [Read Area] and [Write Area] of the GD-80/81S series, refer to the GD-80 User's Manual provided separately.
Calendar	Use this memory area when the connected device is not equipped with the calendar function and the V8 series built-in clock * is not used.

Calendar memory

Follow the steps below to set the calendar memory.

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

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

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

*1 Calendar data is cleared when the power is turned off. When the power is turned on, set calendar data according to the procedure mentioned above.
*2 When using the calendar memory, automatic reading of calendar data at the time of PLC connection as well as once-a-day automatic correction is not performed. Consequently, some errors may be introduced. Perform the procedure described above at regular intervals.

2. ALLEN BRADLEY

2.1 PLC Connection

Serial Connection

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2">Unit/Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Ladder Transfer *3</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td rowspan="2">Control Logix /
Compact Logix</td><td>1756 Control Logix</td><td>Logix 5550</td><td rowspan="2">RS-232C</td><td rowspan="3">Wiring diagram 1 - C2 *1</td><td rowspan="3">Wiring diagram 1 - M2</td><td rowspan="3"></td><td rowspan="7">×</td></tr>
<tr><td>1769 Compact Logix</td><td>Channel 0</td></tr>
<tr><td rowspan="3">SLC500</td><td rowspan="3">SLC5/03 and later</td><td>Channel 0</td><td>RS-232C</td></tr>
<tr><td rowspan="2">1747-KE DF1</td><td>RS-232C</td><td>Wiring diagram 2 - C2</td><td>Wiring diagram 2 - M2</td><td></td></tr>
<tr><td>RS-422</td><td>Wiring diagram 1 - C4</td><td>×</td><td>Wiring diagram 1 - M4</td></tr>
<tr><td rowspan="2">MicroLogix</td><td>MicroLogix 1000</td><td rowspan="2">Channel 0</td><td rowspan="2">RS-232C</td><td rowspan="2">AB's
"1761-CBL-PM02"
+
Gender changer *2</td><td rowspan="2">AB's
"1761-CBL-PM02"
+
Wiring diagram 3 - M2</td><td rowspan="2"></td></tr>
<tr><td>MicroLogix 1100</td></tr>
</table>

*1 Can be connected using the AB's "1756-CP3" cable + D-sub gender changer (9-pin, female-to-male) commercially available.

*2 Use a D-sub gender changer (9-pin, female-to-male) commercially available.

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

*3 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

Ethernet Connection

<table>
<tr><th>PLC Selection on the Editor</th><th>CPU</th><th>Unit</th><th>TCP/IP</th><th>UDP/IP</th><th>Port No.</th><th>Ladder Transfer *1</th></tr>
<tr><td rowspan="2">Control Logix (Ethernet)</td><td>Logix 5550</td><td>1756-ENBT/A</td><td rowspan="4">○</td><td rowspan="4">×</td><td rowspan="4">44818 fixed</td><td rowspan="4">×</td></tr>
<tr><td>1769-L32E
1769-L35E</td><td>-</td></tr>
<tr><td>SLC500 (Ethernet TCP/IP)</td><td>SLC 5/05</td><td>1747-L551
1747-L552
1747-L553</td></tr>
<tr><td>MicroLogix (Ethernet TCP/IP)</td><td>MicroLogix 1100</td><td>-</td></tr>
</table>

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

2.1.1 Control Logix / Compact Logix

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

Communication Setting

Editor

Communication setting

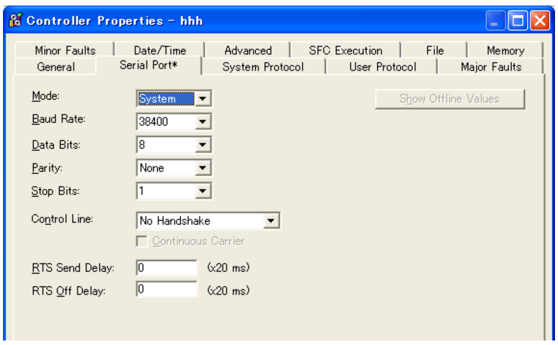
(Underlined setting: default)

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

PLC

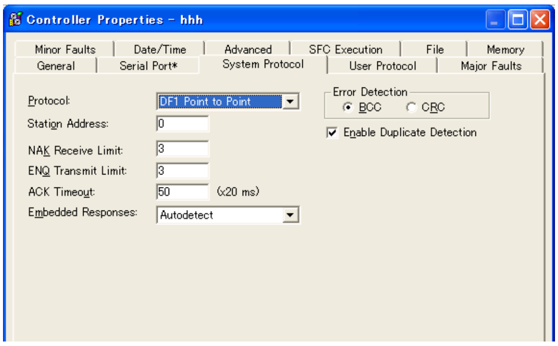
Control Logix

Serial port



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

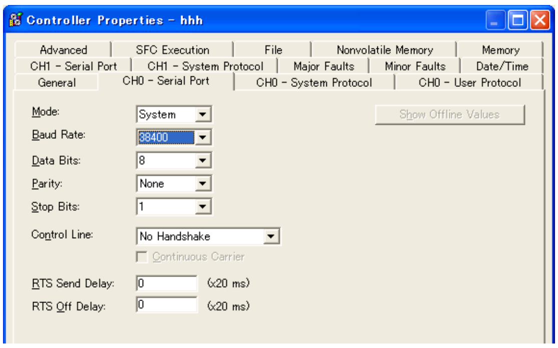
System protocol



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

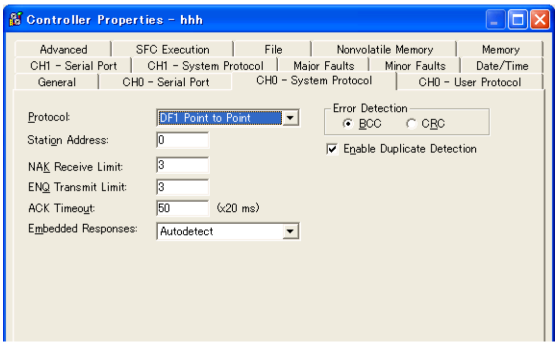
Compact Logix

CH0 - serial port



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

CH0 - system protocol



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

Available Memory

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

2.1.2 Control Logix (Ethernet)

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

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

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

- BOOTP utility
- RSLinx software
- RSLogix 5000 software

Available Memory

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

2.1.3 SLC500

Communication Setting

Editor

Communication setting

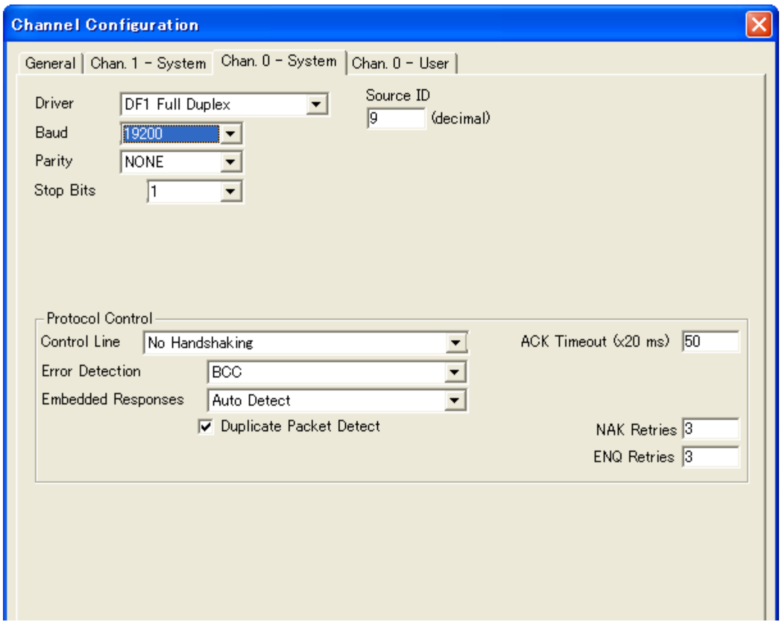
(Underlined setting: default)

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

PLC

Channel 0

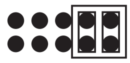
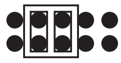
Channel Configuration (chan. 0 - system)



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

1747-KE

Jumper JW2

Item	Setting	Remarks
RS-232		
RS-422		

DF1 port setup menu

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

DF1 full-duplex setup menu

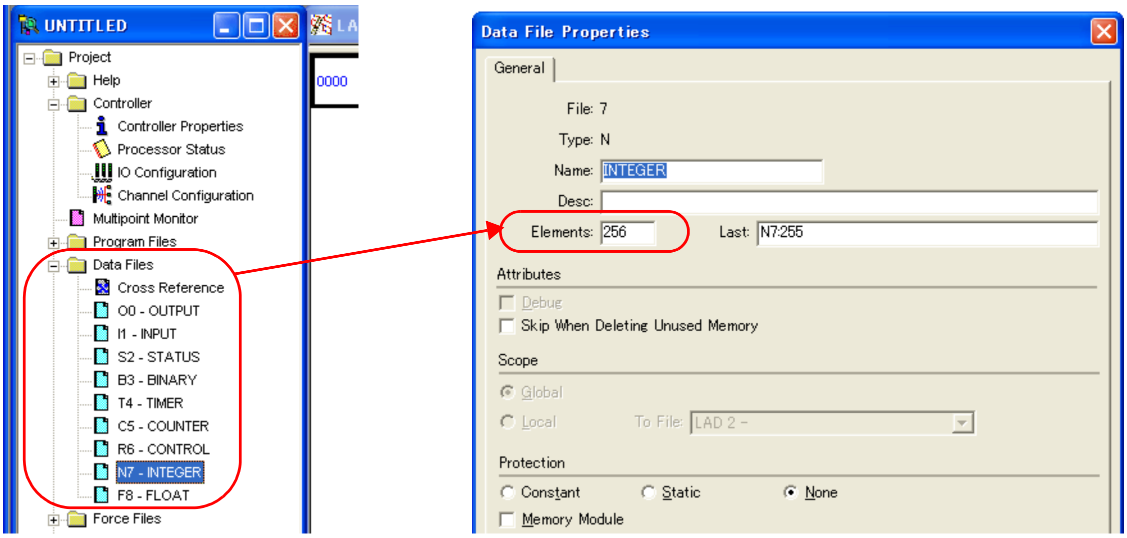
Item	Setting	Remarks
Duplicate Packet Detection	Enabled	
Checksum	BCC	
Constant Carrier Detect	Disabled	
Message Timeout	400	
Hardware Handshaking	Disabled	
Embedded Response Detect	Auto Detect	
ACK Timeout (× 5 ms)	90	
ENQuiry Retries	3	
NAK Received Retries	3	

Available Memory

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

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

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



2.1.4 SLC500 (Ethernet TCP/IP)

Communication Setting

Editor

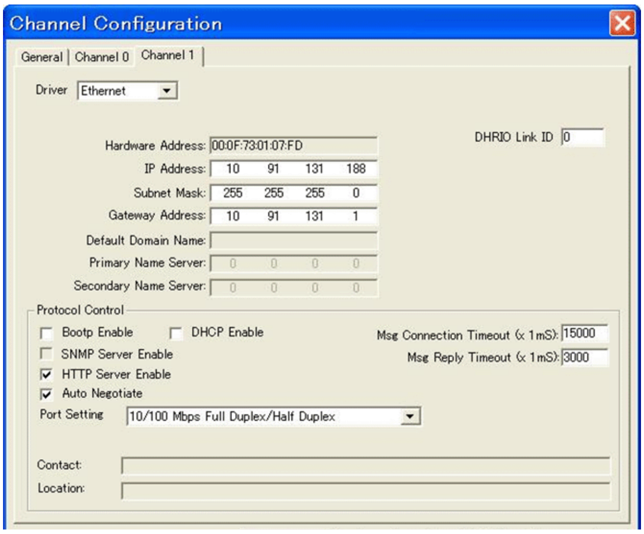
Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

Channel 1

Channel Configuration (Channel 1)



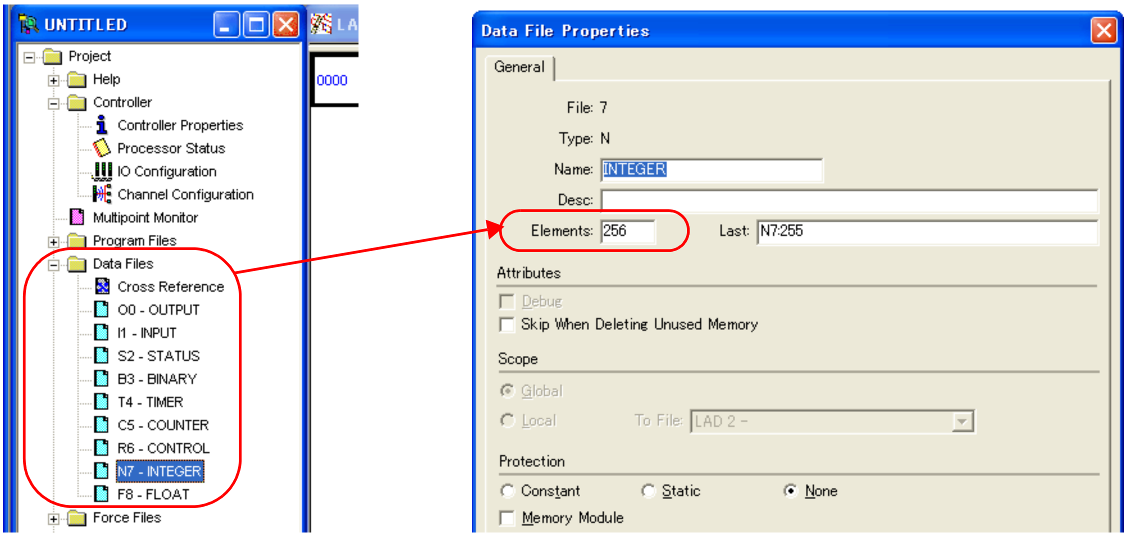
Item	Setting	Remarks
Driver	**Ethernet**	
IP Address	PLC's IP address	
Subnet Mask	PLC's subnet mask	
Gateway Address	Make settings in accordance with the network environment.	

Available Memory

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

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

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



2.1.5 Micro Logix

Communication Setting

Editor

Communication setting

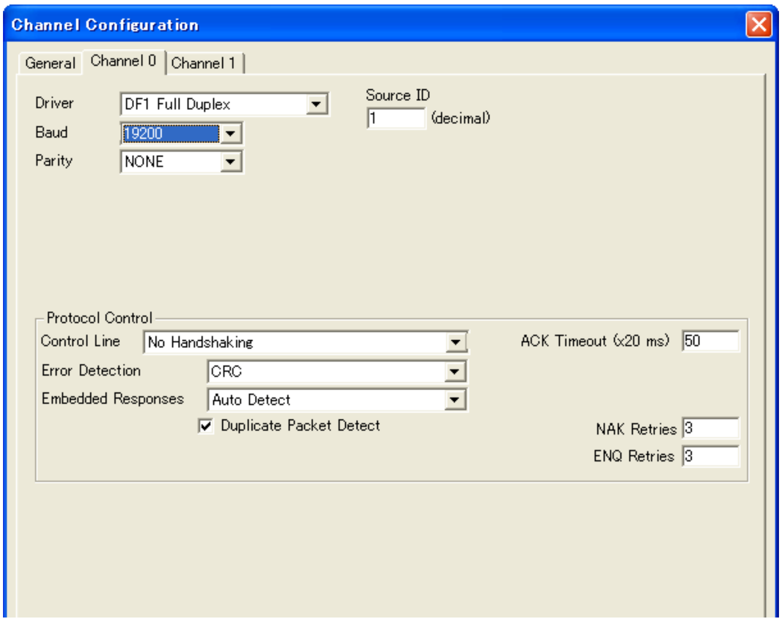
(Underlined setting: default)

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

PLC

Channel Configuration

Channel 0 - system



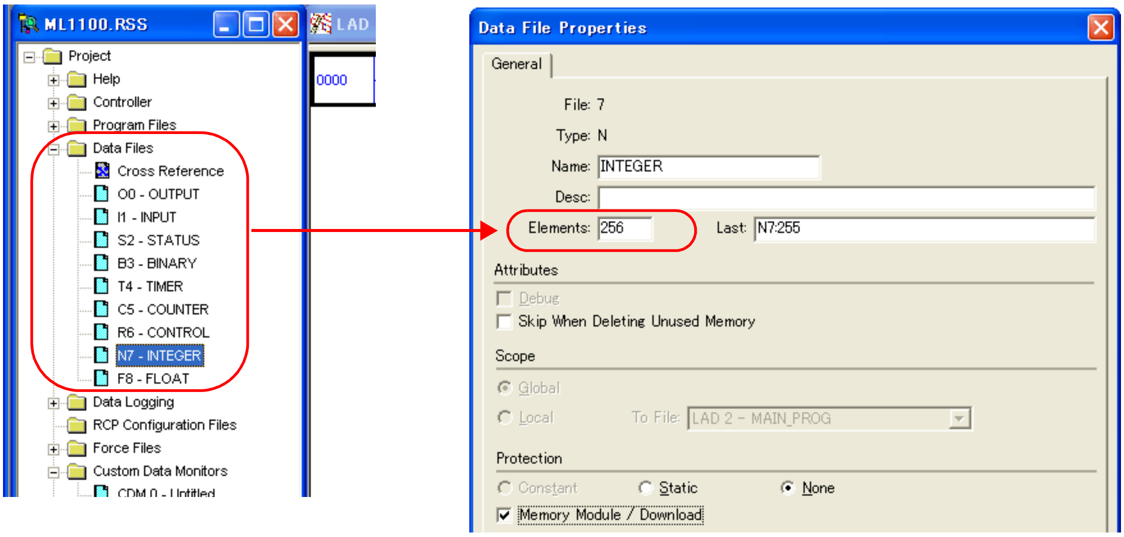
Item	Setting	Remarks
Driver	DF1 Full Duplex	
Baud	4800 / 9600 / 19200 / 38.4K	
Parity	None / Even	
Control Line	No Handshaking	
Error Detection	CRC / BCC	
Embedded Responses	Auto Detect	

Available Memory

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

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

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



2.1.6 Micro Logix (Ethernet TCP/IP)

Communication Setting

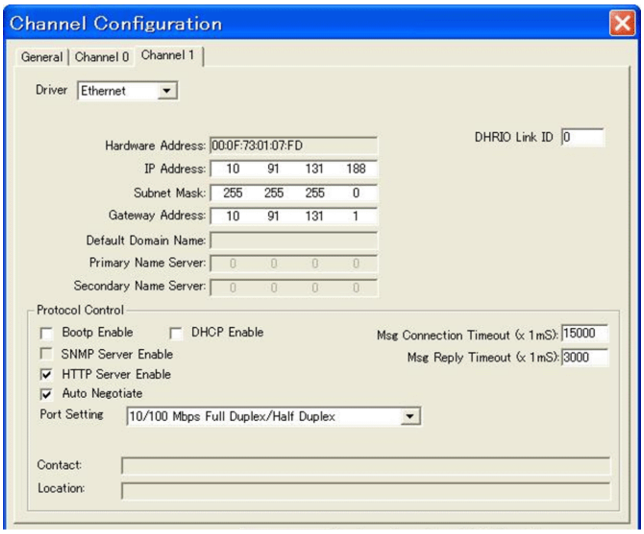
Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.
- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

Channel 1

Channel Configuration (Channel 1)



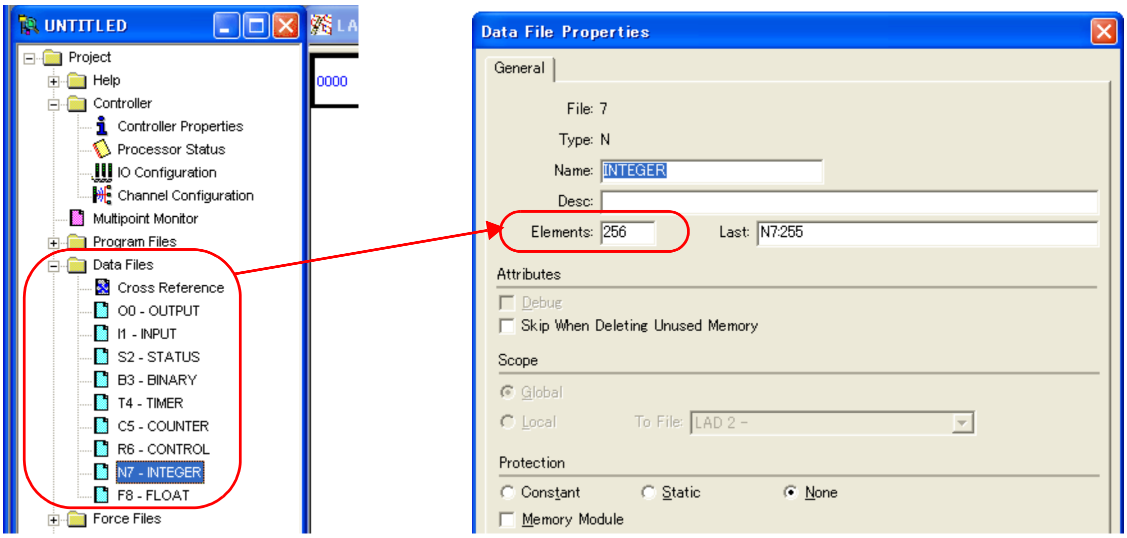
Item	Setting	Remarks
Driver	**Ethernet**	
IP Address	PLC's IP address	
Subnet Mask	PLC's subnet mask	
Gateway Address	Make settings in accordance with the network environment.	

Available Memory

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

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

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

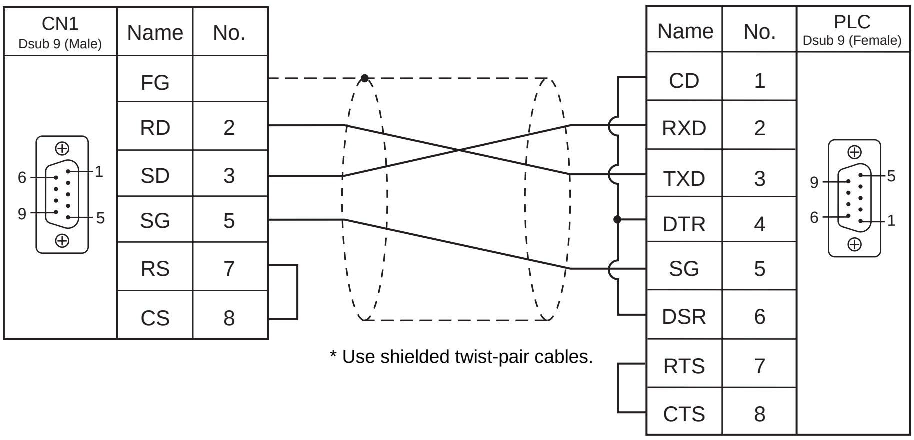


2.1.7 Wiring Diagrams

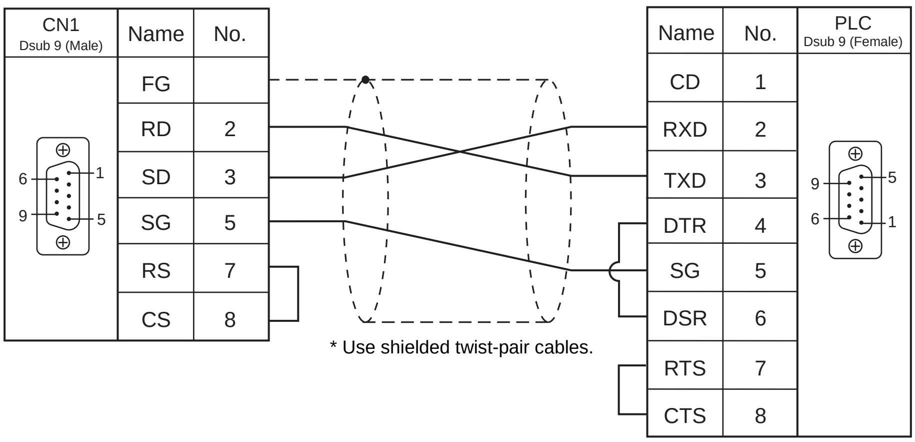
When Connected at CN1:

RS-232C

Wiring diagram 1 - C2

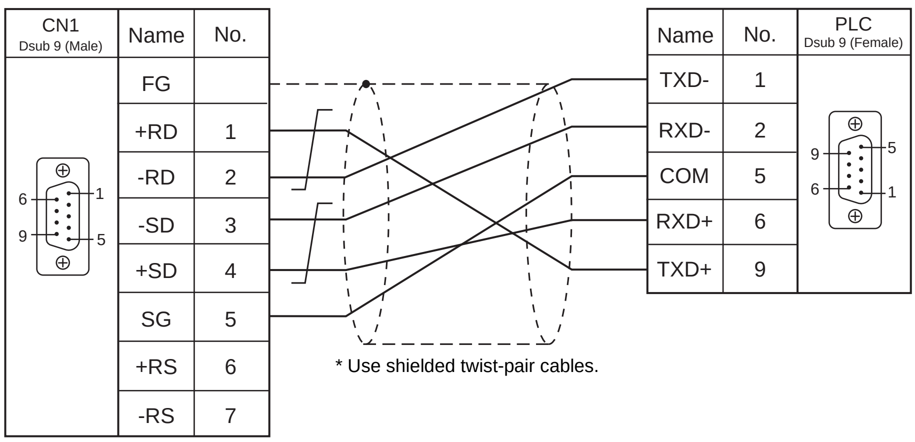


Wiring diagram 2 - C2



RS-422/RS-485

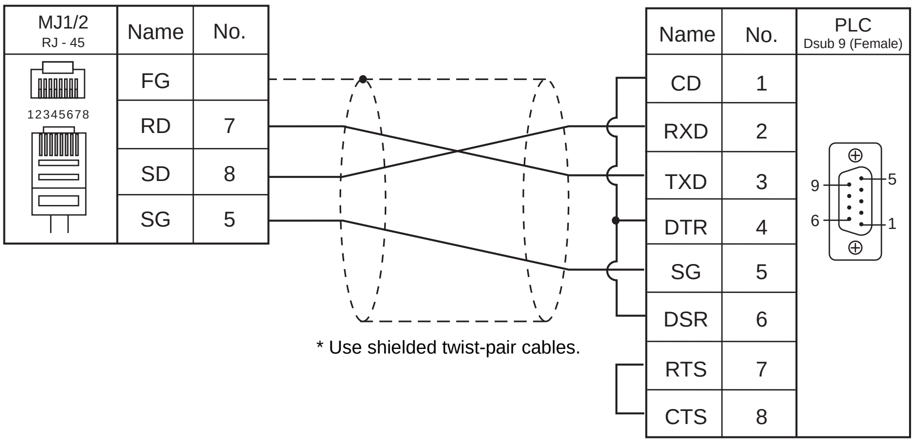
Wiring diagram 1 - C4



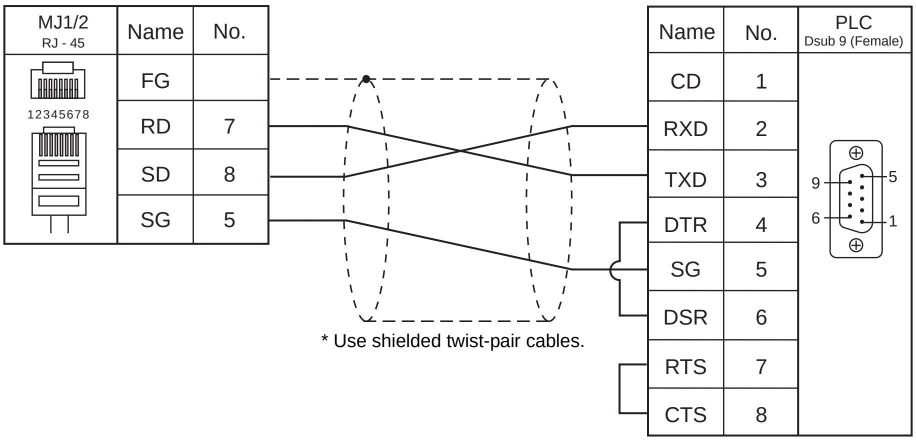
When Connected at MJ1/MJ2:

RS-232C

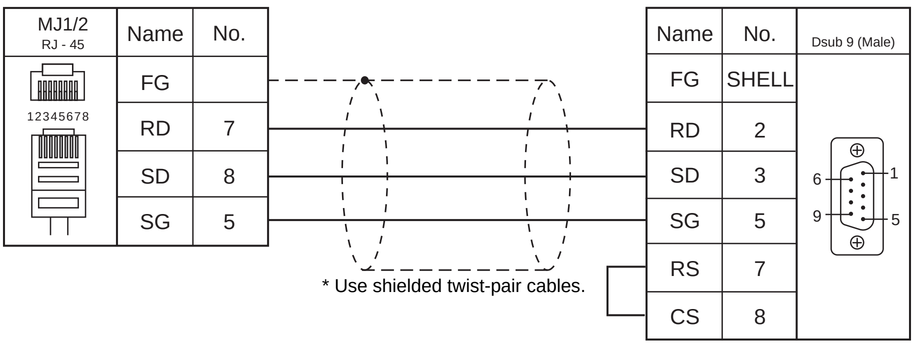
Wiring diagram 1 - M2



Wiring diagram 2 - M2

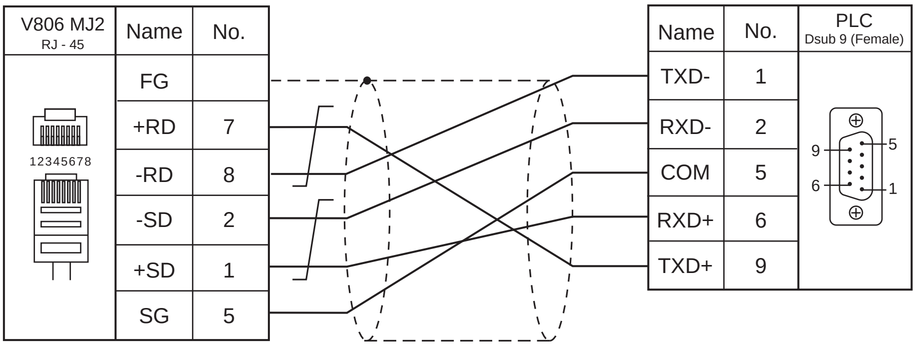


Wiring diagram 3 - M2



RS-422/RS-485

Wiring diagram 1 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

MEMO

Please use this page freely.

3. Automation Direct

3.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	Connection			Ladder Transfer *1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
Direct LOGIC (K-Sequence)	D4-430 D4-440	Port 0	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
		Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	D4-450	Port 0	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		Port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	D2-230	PORT1	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	D2-240 DL05	PORT1					
		PORT2					
	D2-250-1 D2-260 DL06	PORT1					
		PORT2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
Direct LOGIC (MODBUS RTU)	D4-450	Port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	D2-250-1 D2-260	PORT2	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

3.1.1 Direct LOGIC (K-Sequence)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

D4-450

PORT0

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

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

PORT1

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

Parameter setting register

Register	Setting	Setting Example
R772	0 0 E 0 Communication protocol 80: K-Sequence E0: Automatic recognition (Modbus, CCM, K-Sequence) Communication timeout 0: 800 ms Response delay time 0: 0 ms	00E0H K-Sequence

Register	Setting	Setting Example
R773	8 7 0 1 → Station number 01 to 1F (HEX) → Baud rate 4: 4800 bps 5: 9600 bps 6: 19200 bps 7: 38400 bps → Parity stop bit 0: Without parity, stop bit 1 2: Without parity, stop bit 2 8: Odd parity, stop bit 1 A: Odd parity, stop bit 2 C: Even parity, stop bit 1 E: Even parity, stop bit 2	8701H 38400 bps Odd parity Stop bit 1 Station number 01

PORT2

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

Parameter setting register

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

PORT3

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

Parameter setting register

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

D2-240/D2-250-1

PORT1 / PORT2

No particular setting is necessary on the PLC. The PLC performs communication functions using the following parameters. Set the following parameters on the [Communication Setting] tab window of V8.

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 Memory

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

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

3.1.2 Direct LOGIC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

D4-450

PORT1

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

Parameter setting register

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

PORT3

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

Parameter setting register

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

D2-250-1

PORT2

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

Parameter setting register

Register	Setting	Setting Example
R7655	0 0 2 0 Communication protocol 20: MODBUS RTU Communication timeout 0: Specified time Response delay time 0: 0 ms	0020H
R7656	8 7 0 1 Station number 01 to 7A (HEX) Baud rate 4: 4800 bps 5: 9600 bps 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

Available Memory

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

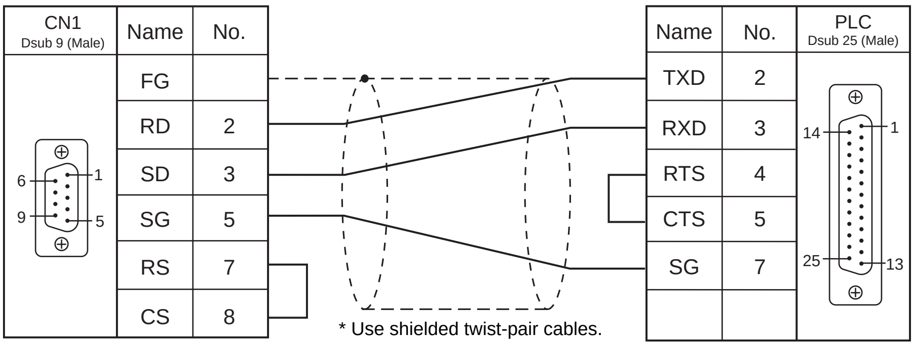
Memory		TYPE	Remarks
V	(data register)	00H	
X	(input)	01H	
Y	(output)	02H	
C	(internal relay)	03H	
S	(stage)	04H	
GX	(transmission relay for all stations)	05H	
GY	(transmission relay for specified station)	06H	
T	(timer/contact)	07H	
CT	(counter/contact)	08H	

3.1.3 Wiring Diagrams

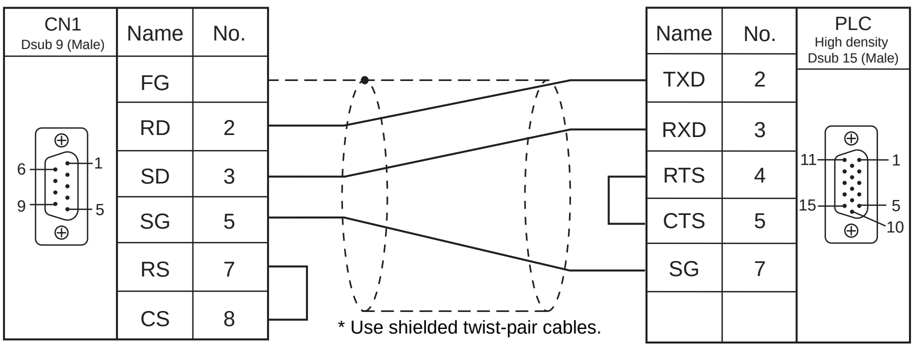
When Connected at CN1:

RS-232C

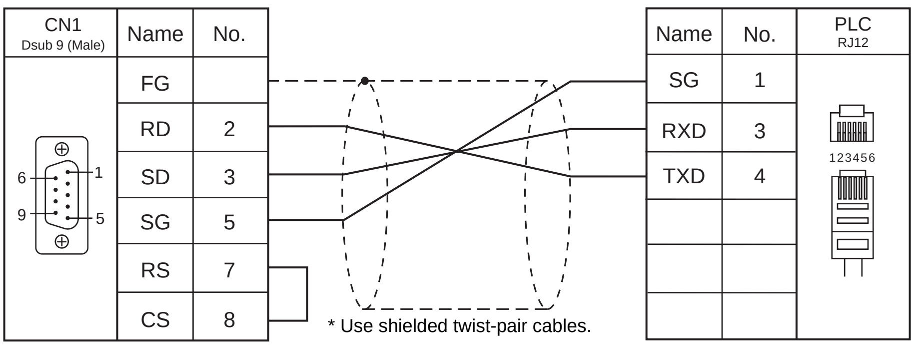
Wiring diagram 1 - C2



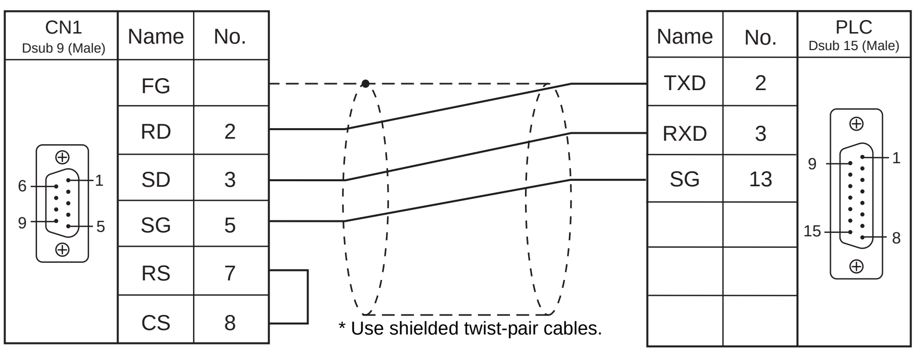
Wiring diagram 2 - C2



Wiring diagram 3 - C2

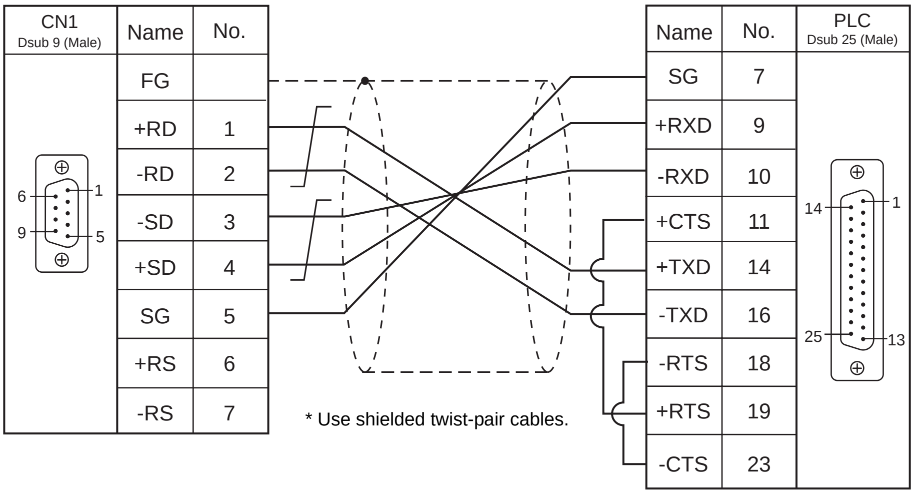


Wiring diagram 4 - C2



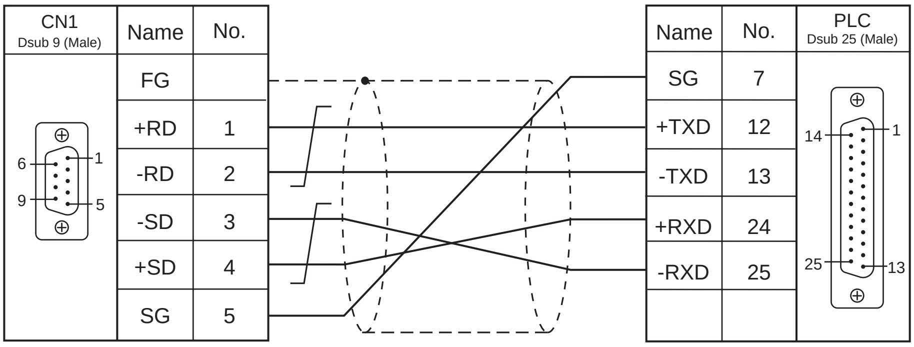
RS-422/RS-485

Wiring diagram 1 - C4



* Use shielded twist-pair cables.

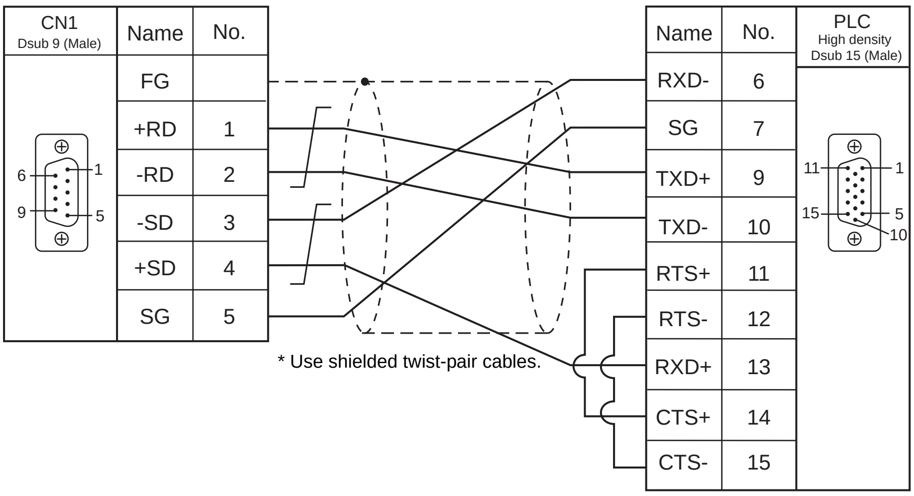
Wiring diagram 2 - C4



* Use shielded twist-pair cables.

* SU-6M: Terminal block connectable

Wiring diagram 3 - C4

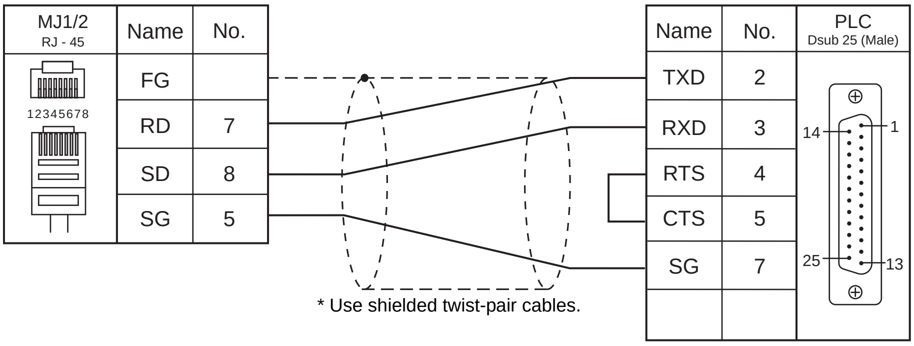


* Use shielded twist-pair cables.

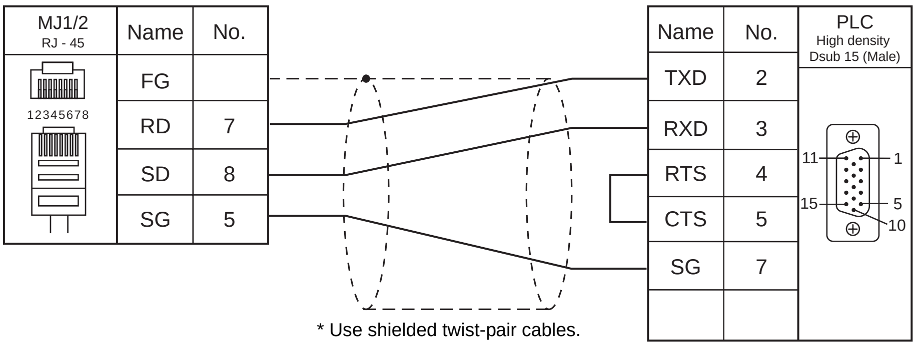
When Connected at MJ1/MJ2:

RS-232C

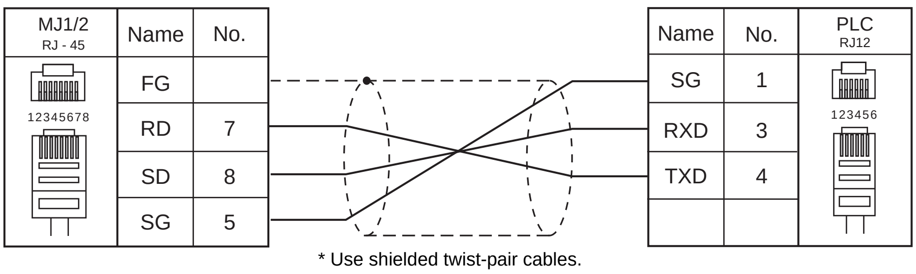
Wiring diagram 1 - M2



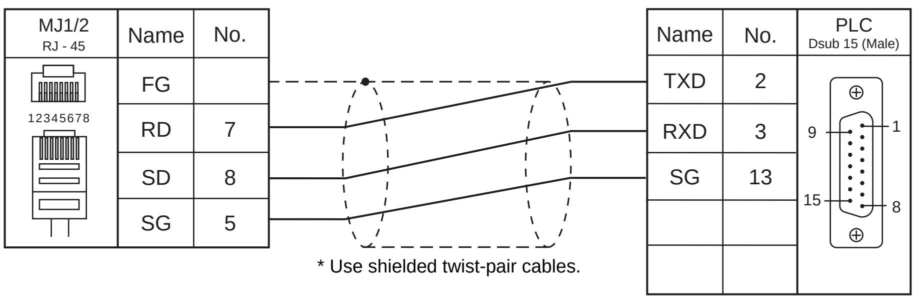
Wiring diagram 2 - M2



Wiring diagram 3 - M2

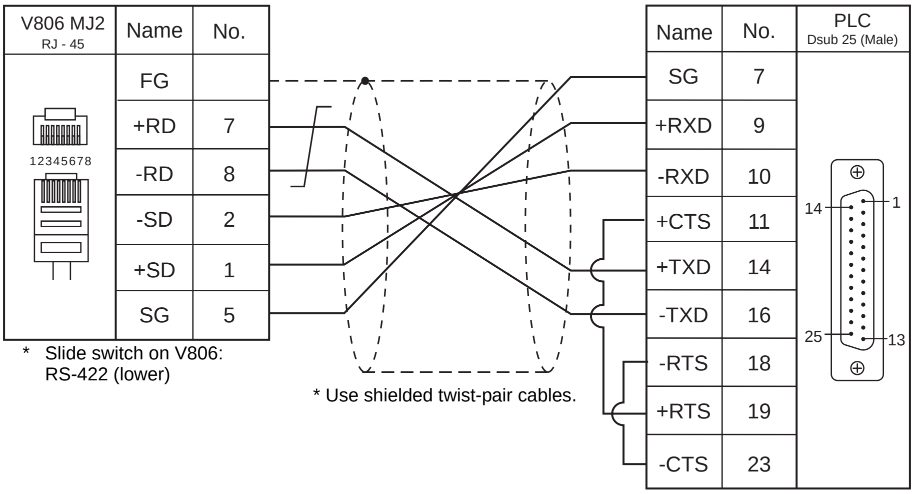


Wiring diagram 4 - M2



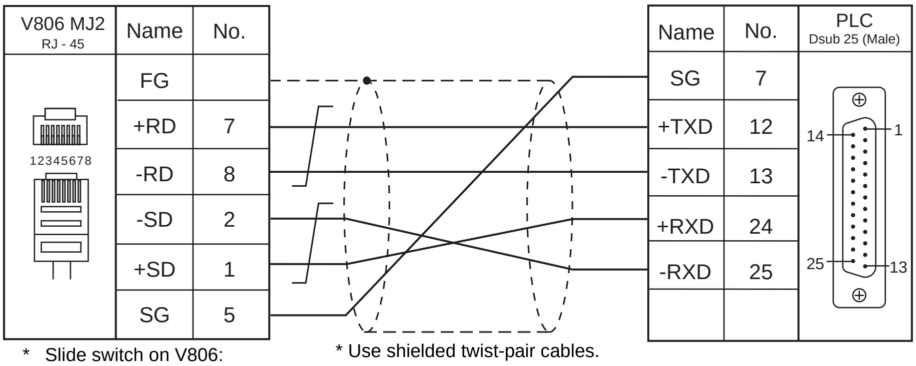
RS-422/RS-485

Wiring diagram 1 - M4



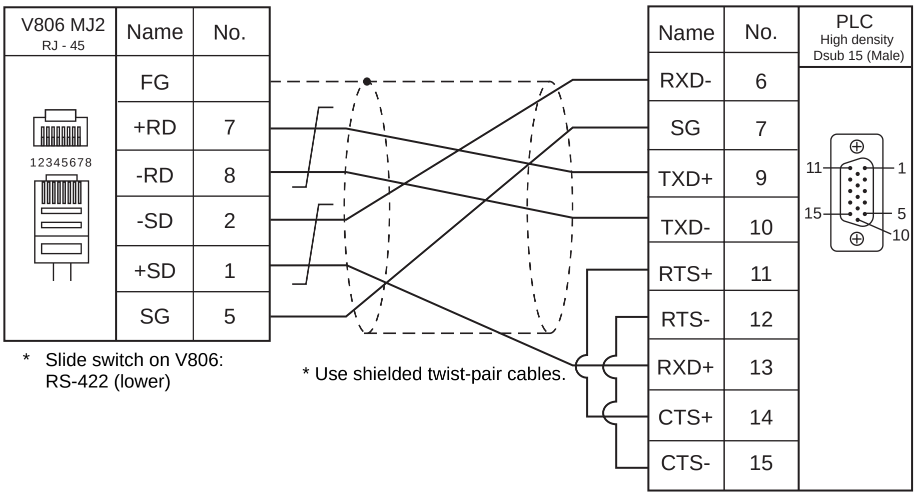
* Slide switch on V806:
RS-422 (lower)

Wiring diagram 2 - M4



* Slide switch on V806:
RS-422 (lower)

Wiring diagram 3 - M4



* Slide switch on V806:
RS-422 (lower)

4. Fuji Electric

4.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

MICREX-F Series

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection: CN1	Connection: MJ1/MJ2	Connection: MJ2 (4-wire) V806	Ladder Transfer *1
MICREX-F series	NV1P-x (F55)	NV1L-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
	NC1P-E (F70) NC1P-S (F70S)	NC1L-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		NC1L-RS4	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
	FPU080H (F80H) FPU120H (F120H) FPU120S (F120S) FPU140S (F140S) FPU15xS (F15xS)	FFU120B	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		FFK120A	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

SPB (N Mode), FLEX-PC

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection: CN1	Connection: MJ1/MJ2	Connection: MJ2 (4-wire) V806	Ladder Transfer *1
SPB (N mode) & FLEX-PC series	NS-CPU-xx	NS-RS1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NJ-CPU-xx	NJ-RS2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		NJ-RS4	RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NBxx	NB-RS1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		NW0LA-RS4	RS-485 (4-wire)	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
			RS-485 (2-wire)	Wiring diagram 2 - C4	Wiring diagram 1 - M4		
SPB (N Mode) & FLEX-PC CPU	NS-CPU-xx NJ-CPU-xx NBxx NW0Pxx (SPB)	CPU port	RS-485	Hakko Electronics' cable “D9-FU-SPBCPU” *2	×	Hakko Electronics' cable “MJ2-FU-SPBCPU” *2	○
	NJ-CPU-B16	RS-232C port	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.
*2 Cable length: XXX-FU-SPBCPU-□M (□= 2, 3, 5 m)

MICREX-SX, SPB (IEC Mode)

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection CN1	Connection MJ1/MJ2	Connection MJ2 (4-wire) V806	Ladder Transfer [*1]
MICREX-SX SPH/SPB series	NP1Px-xx (SPH)	NP1L-RS1	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
			RS-485	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
		NP1L-RS2, NP1L-RS3	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		NP1L-RS4	RS-485	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
		NP1L-RS5	RS-485	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4	
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		NW0LA-RS4	RS-485	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
MICREX-SX SPH/SPB CPU	NP1Px-xx (SPH)	CPU port	RS-485	Hakko Electronics' cable "D9-FU-SPHCPU" [*2]	×	Hakko Electronics' cable "MJ2-FU-SPHCPU" [*2]	○
	NW0Pxx (SPB)	CPU port	RS-485	Hakko Electronics' cable "D9-FU-SPBCPU" [*2]	×	Hakko Electronics' cable "MJ2-FU-SPBCPU" [*2]	

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".
*2 Cable length: XXX-FU-SPHCPU-☐M, XXX-FU-SPBCPU-☐M (☐= 2, 3, 5 m)

Ethernet Connection

MICREX-SX Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer
MICREX-SX (Ethernet)	NP1PH-xx (SPH200) NP1PS-xx (SPH300) NP1PM-xx (SPH2000)	NP1L-ET1	○	×	Self port standard No. + 251	×
	NP1PM-xx (SPH2000)	CPU with built-in Ethernet				

Network Connection

T-Link

PLC Selection on the Editor	CPU	Unit on PLC	Unit on V8	Ladder Transfer
MICREX-F (T-Link)	NV1P-x (F55)	NV1L-TL1	CU-01	×
	NC1P-E (F70)	Standard T-Link		
	NC1P-S (F70S)	Standard T-Link NC1H-TL1		
	FPU080H (F80H) FPU120H (F120H) FPU120S (F120S) FPU140S (F140S) FPU15xS (F15xS)	Standard T-Link FPC120T		
MICREX-SX (T-Link)	NP1Px-xx (SPH)	NP1L-TL1		

For more information on T-Link connection, refer to the Specifications for Communication Unit T-LINK manual.

OPCN1

PLC Selection on the Editor	CPU	Unit on PLC	Unit on V8	Ladder Transfer
FLEX-PC (OPCN-1)	NJ-CPU-xx	NJ-JPCN-1	CU-00	×
MICREX-SX (OPCN-1)	NP1Px-xx (SPH)	NP1L-JP1		

For more information on OPCN-1 connection, refer to the Specifications for Communication Unit OPCN-1 manual.

SX BUS

PLC Selection on the Editor	CPU	Unit on PLC	Unit on V8	Ladder Transfer
MICREX-SX (SX BUS)	NP1Px-xx (SPH)	–	CU-06	×

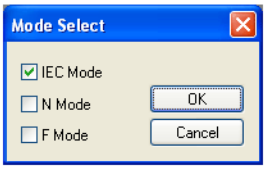
MICREX-SX Model Selection

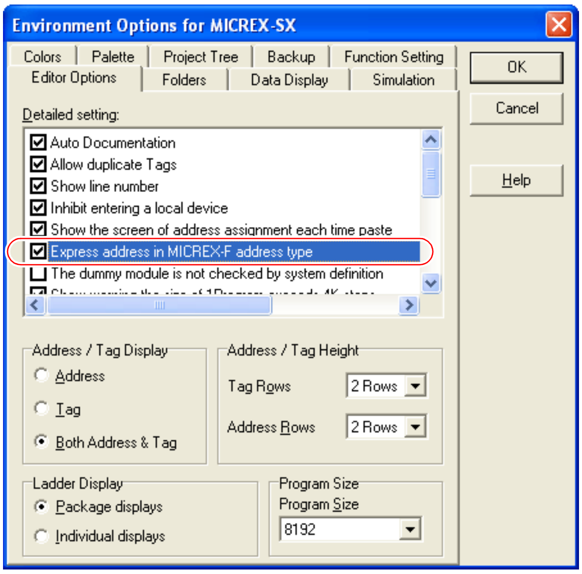
When the MICREX-SX SPH or SPB series is connected, a mode selection may be required on the V8 editor depending on the programming tool used on the PLC or the setting on the programming tool.

PLC	PLC Programming Tool			Setting on the V8 Editor	
		Environment Options for MICREX-SX		PLC Selection	Mode Selection *2
SPH series	SX-Programmer Expert (D300win)			MICREX-SX SPH / SPB series MICREX-SX SPH / SPB CPU MICREX-SX T-Link MICREX-SX OPCN-1 MICREX-SX Ethernet	IEC Mode
	SX-Programmer Standard		Unchecked *1		N Mode
			Checked *1		F Mode
SPF Series	SX-Programmer Expert (D300win)			MICREX-SX SPH / SPB series MICREX-SX SPH / SPB CPU	IEC Mode
	SX-Programmer Standard	SX-MODE	Unchecked *1		N Mode
			Checked *1		F Mode
		N-MODE	-	SPB (N mode) & FLEX-PC series SPB (N mode) & FLEX-PC CPU	-
	FLEX-PC Programmer	-			-

*1 Check or uncheck the box for [Express address in MICREX-F address type] on the [Editor Options] tab window in the [Environment Options for MICREX-SX] dialog ([Options] → [MICREX-SX Environment]) on the SX-Programmer Standard tool.

*2





4.1.1 MICREX-F Series

Communication Setting

Editor

Communication setting

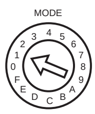
(Underlined setting: default)

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

PLC

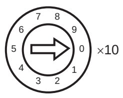
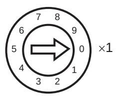
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

Mode setting

MODE	Setting	Contents	
	1	RS-232C	Command-defined asynchronous communication (non-procedure)
	3	RS-485	Command-defined asynchronous communication (non-procedure)

* The mode setting switch is common to NV1L-RS2, NC1L-RS2, NC1L-RS4, FFU120B and FFK120A.

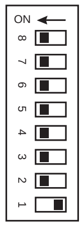
Station number setting

ADDRESS	Setting	Contents
	0 to 31	Station number ×10: the tens place ×1: the ones place

* The station number setting switch is common to NC1L-RS4, FFU120B and FFK120A.
It is not provided on NV1L-RS2 nor NC1L-RS2.

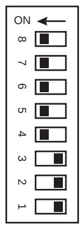
Transmission setting

NV1L-RS2, NC1L-RS2, NC1L-RS4, FFU120B

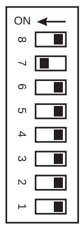
Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	1 bit	2 bits	
	Baud rate	19200	9600	
3		ON	ON	
2		ON	OFF	
1		OFF	ON	

FFK120A

- Character switches

Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	2 bits	1 bit	
3	Not used	-	OFF	
2		-	OFF	
1		-	OFF	

- Baud rate setting switches
  Set a switch to the ON position.

Switch	Contents	Example: 19,200 bps
8	Not used	
7	19,200 bps	
6	9,600 bps	
5	4,800 bps	
4	2,400 bps	
3	1,200 bps	
2	600 bps	
1	300 bps	

Available Memory

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

Memory		TYPE	Remarks
M	(auxiliary relay)	00H	WM as word device
K	(keep relay)	01H	WK as word device
B	(input/output relay)	02H	WB as word device
L	(link relay)	09H	WL as word device
F	(special relay)	0AH	WF as word device
TS	(timer/set value)	0BH	*1
TR	(timer/current value)	0CH	*1
W9	(0.1-sec timer/current value)	0DH	*1
CS	(counter/set value)	0EH	*1
CR	(counter/current value)	0FH	*1
BD	(data memory)	10H	*1
WS	(step relay)	11H	*2
Wn	(file memory)	12H	*3, *4

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

*2 Byte device such as step relay is processed as described below.
For input: Upper 8 bits are “0”.
For output: Lower 8 bits are written.

*3 To set up the file memory on the editor, enter “file number” + “: (colon)” + “address” in order.

Example: W30 : 00002
Address
Colon
File number

*4 Define the file area as “**<u>SI”.</u>**

4.1.2 SPB (N Mode) & FLEX-PC Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

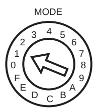
Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / 1 : n / Multi-link2	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 31	

PLC

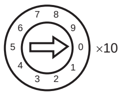
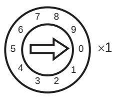
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

NS-RS1, NJ-RS2, NJ-RS4, NB-RS1

Mode setting

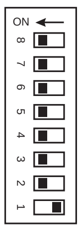
MODE	Setting	Contents	
	1	RS-232C	Command-defined asynchronous communication (non-procedure)
	3	RS-485	Command-defined asynchronous communication (non-procedure)

Station number setting

ADDRESS	Setting	Contents
 	0 to 31	Station number ×10: the tens place ×1: the ones place

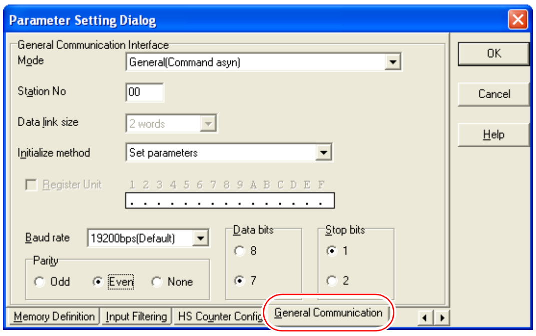
* The station number setting switch is not provided on NJ-RS2.

Transmission setting

Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	1 bit	2 bits	
	Baud rate	19200	9600	
3		ON	ON	
2		ON	OFF	
1		OFF	ON	

NW0LA-RS2, NW0LA-RS4 (Parameter Setting)

On the PLC loader, set parameters for general communications.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.



Item	Setting	Remarks
Mode	General (Command asyn)	These settings can also be specified for the parameter area. For more information, refer to the MICREX-SX SPB Series User's Manual <Communication Adapter> (FEH405).
Station No.	RS-232C: 0, RS-485: 0 to 31	
Initialize method	Set parameters	
Baud rate	4800 / 9600 / 19200 / 38400	
Parity	Odd / Even / None	
Data bits	8 / 7	
Stop bits	1 / 2	

Notes on use of 2-wire connection with NW0LA-RS4
The settings show above are not enough to establish a 2-wire connection with NW0LA-RS4.
To establish a connection, select [Initial file transfer] for [Initial Setting Mode] on the PLC loader, and select 2-wire connection for [485 mode] in the initial setting file.
For more information, refer to the MICREX-SX SPB Series User's Manual <Communication Adapter> (FEH405).

Available Memory

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

Standard Memory		TYPE	Remarks
D	(data register)	00H	
W	(link register)	01H	
M	(internal relay)	02H	WM as word device
L	(latch relay)	03H	WL as word device
X	(input relay)	04H	WX as word device
Y	(output relay)	05H	WY as word device
R	(file register)	06H	
TN	(timer/current value)	07H	
CN	(counter/current value)	08H	
T	(timer/contact)	09H	
C	(counter/contact)	0AH	
WS	(step relay)	0BH	

4.1.3 SPB (N Mode) & FLEX-PC CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	When connecting MONITOUCH to the RS-232C port on NJ-CPU-B16, select [RS-232C]. In other cases, select [RS-422/485].
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	
Target Port No.	0	

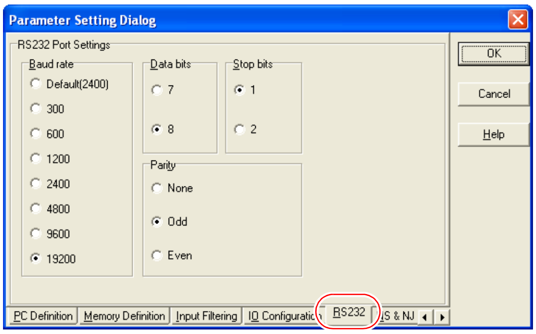
PLC

SPB, FLEX-PC CPU Port

No particular setting is necessary on the PLC.

Built-in RS-232C Port on NJ-CPU-B16

On the PLC loader, set parameters for the built-in RS-232C port.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.



Available Memory

The available memory is the same as the one described in “4.1.2 SPB (N Mode) & FLEX-PC Series”.

4.1.4 MICREX-SX SPH/SPB Series (IEC Mode)

Communication Setting

Editor

Communication setting

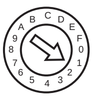
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / Multi-link2	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / <u>38400</u> bps	For the SPH series: Do not change the default setting.
Data Length	8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 31	

PLC

NP1L-RS1 , NP1L-RS2 , NP1L-RS3 , NP1L-RS4 , NP1L-RS5

Mode setting

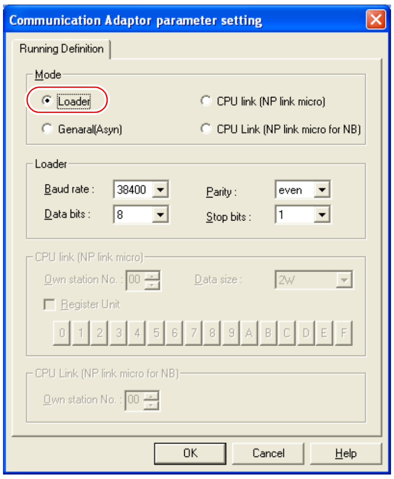
MODE	Setting	RS1, 2, 4	RS-232C Port	RS-485 Port	Remarks
		RS3, 5	CH1	CH2	
	0		General equipment	General equipment	
	1		Loader	General equipment	
	2		General equipment	Loader	
	3		Loader	Loader	
	4		General equipment	General equipment	RS3 and 5 are not used.
	5		Not used		
	6		Modem loader 19200 bps	General equipment	
	7		Self-diagnosis mode 1		
	8		Self-diagnosis mode 2		
MODE 	9		Modem loader 19200 bps	Loader	
	A		Modem loader 9600 bps	General equipment	
	B		Modem loader 9600 bps	Loader	
	C		Modem loader 38400 bps	General equipment	
	D		Modem loader 38400 bps	Loader	
	E		Modem loader 76800 bps	General equipment	
	F		Modem loader 115200 bps	Modem loader 115200 bps	

* Set the port (or CH No.) where the V8 is connected to “loader”.
Communication parameters are fixed to 38400 bps (baud rate), 8 bits (data length), 1 bit (stop bit), and even (parity).

* When the PLC is connected with the V8, the station number setting switch for RS-485 is not used.

NW0LA-RS2, NW0LA-RS4 (Parameter Setting)

On the PLC loader, set parameters for general communications.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.



Item	Setting	Remarks
Mode	Loader	
Baud rate	4800 / 9600 / 19200 / 38400	
Parity	Odd / Even / None	
Data bits	8	
Stop bits	1 / 2	

Available Memory

Variable name cooperation function
The variable name cooperation function can be used only for PLC1. For memory assignment, basically use the variable name cooperation function. **We recommend you to define the area (variable) that is used for communications with the V8 as "AT".**

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

Memory		TYPE	Remarks
I	(input memory) *1	-	%IX as bit device, %IW as word device, %ID as double-word device
Q	(output memory) *1	-	%QX as bit device, %QW as word device, %QD as double-word device
M	(standard memory)	02H	%MX1. as bit device, %MW1. as word device, %MD1. as double-word device
RM	(retain memory)	04H	%MX3. as bit device, %MW3. as word device, %%MD3. as double-word device
SM	(system memory)	08H	%MX10. as bit device, %MW10. as word device, %MD10. as double-word device

*1 For the input/output memory, the variable name cooperation function of the PLC1 must be used. Indirect designation is not available with the input/output memory.

Indirect Memory Designation

Specify the CPU number in the expansion code.

4.1.5 MICREX-SX SPH/SPB Series (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in “4.1.4 MICREX-SX SPH/SPB Series (IEC Mode)”.

Available Memory

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

Memory		TYPE	Remarks
X	(input memory) *1	-	X as bit device, WX as word device, DX as double-word device
Y	(output memory) *1	-	Y as bit device, WY as word device, DY as double-word device
M	(standard memory)	02H	M as bit device, WM as word device, DM as double-word device
L	(retain memory)	04H	L as bit device, WL as word device, DL as double-word device
SM	(system memory)	08H	SM as bit device, WSM as word device, DSM as double-word device

1 Input/output memory does not operate normally unless you import the “.ini” file created using [Export Device Information] in the PLC programming tool. Indirect designation is not available with the input/output memory.

Indirect Memory Designation

Specify the CPU number in the expansion code.

4.1.6 MICREX-SX SPH/SPB CPU (IEC Mode)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / Multi-link2	
Signal Level	RS-422/485	Do not change the setting from default.
Baud Rate	38400 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	<u>0</u> to 31	

PLC

No particular setting is necessary on the PLC.
Communication parameters are fixed to 38400 bps (baud rate), RS-422 (signal level), 8 bits (data length), 1 bit (stop bit), and even (parity).

Available Memory

The available memory is the same as the one described in “4.1.4 MICREX-SX SPH/SPB Series (IEC Mode)”.

4.1.7 MICREX-SX SPH/SPB CPU (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in “4.1.6 MICREX-SX SPH/SPB CPU (IEC Mode)”.

Available Memory

The available memory is the same as the one described in “4.1.5 MICREX-SX SPH/SPB Series (N Mode / F Mode)”.

4.1.8 MICREX-SX Ethernet

Communication Setting

Editor

Make the following settings on the editor. For more information, see "Appendix 2 Ethernet".

- IP address for the V8 unit
- V8 unit's port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC's IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
  The PLC port number is "Self port standard No." plus 251 set on the PLC.

PLC (Ethernet Parameter Setting)

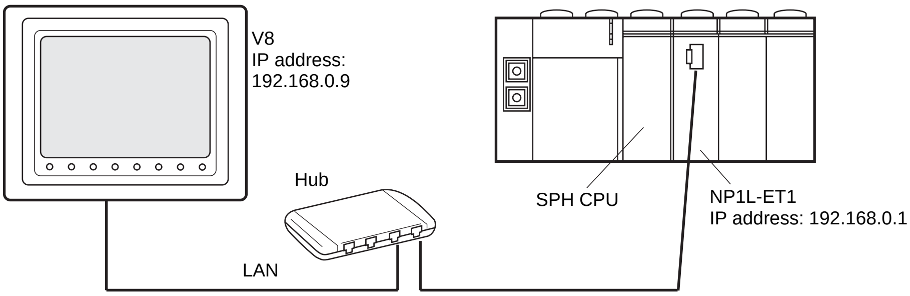
The table below shows settings required for communication with the V8. (Underlined setting: default)

Item	Setting	Remarks
IP Address	192.168.0.1	
Subnet Mask	255.255.255.0	
Self-port Standard No.	256	

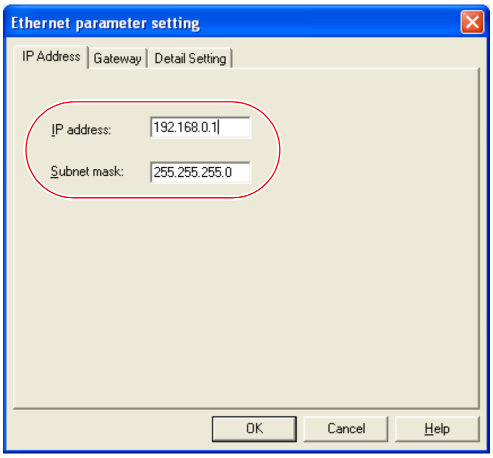
For more information on other setting items, refer to the PLC manual issued by the manufacturer.

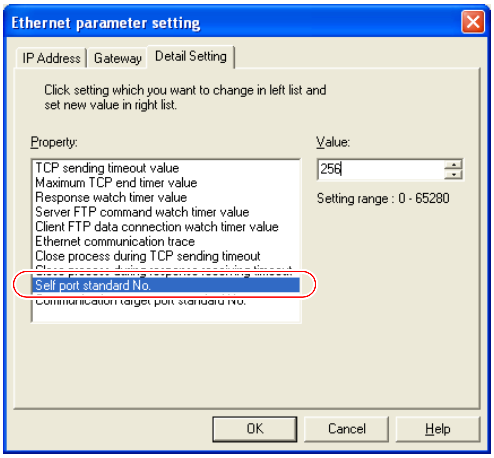
Setting Example

The following example shows the setting for communication between MICREX-SX ET1 module and the V8 unit via Ethernet.



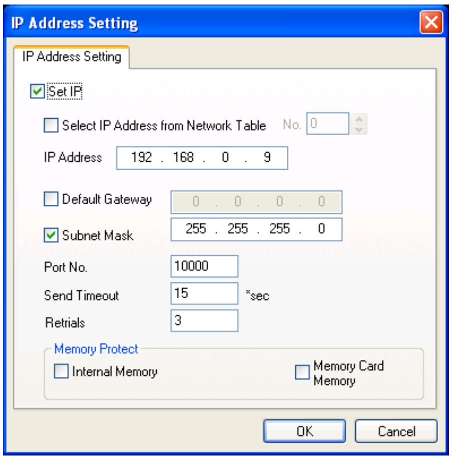
Setting on the PLC loader



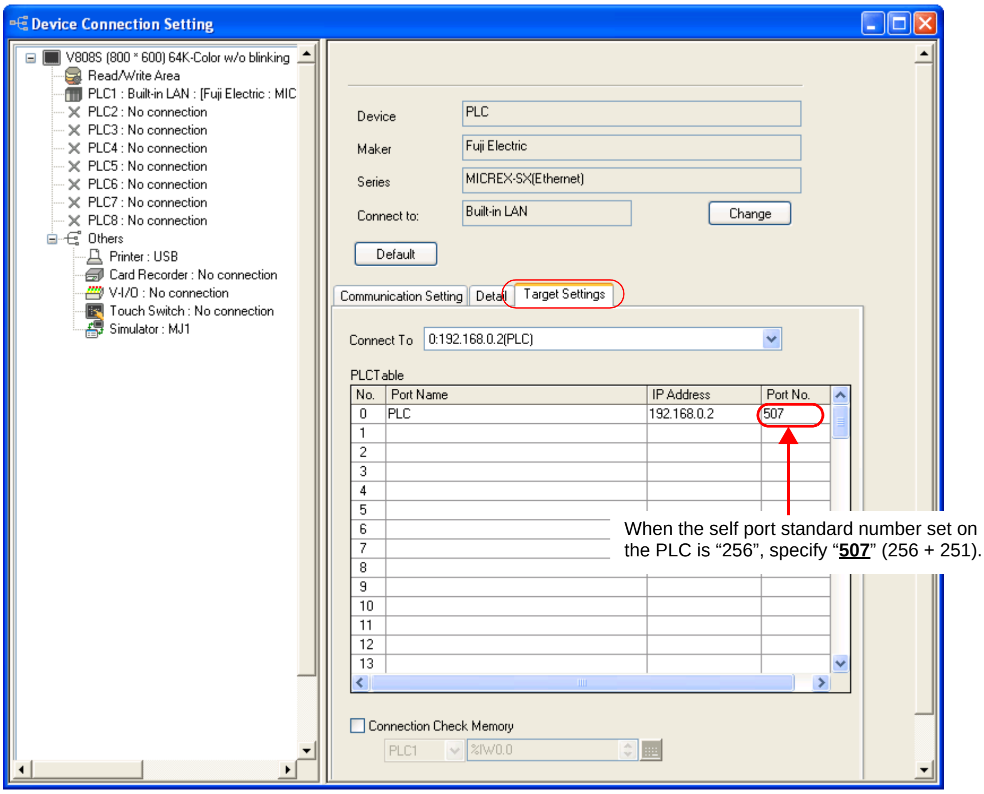


Setting on the editor

- IP address setting for the V8 unit (on the editor)
  [System Setting] → [Ethernet Communication] → [Local Port IP Address]



- PLC table
  [System Setting] → [Device Connection Setting] → [Target Settings] → [PLC Table]

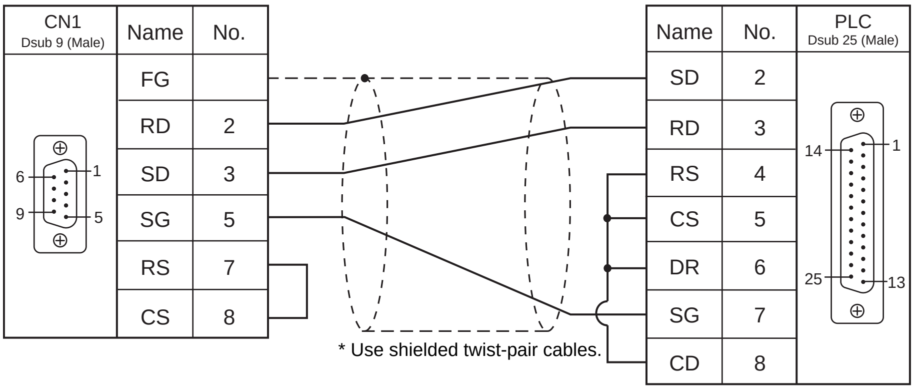


4.1.9 Wiring Diagrams

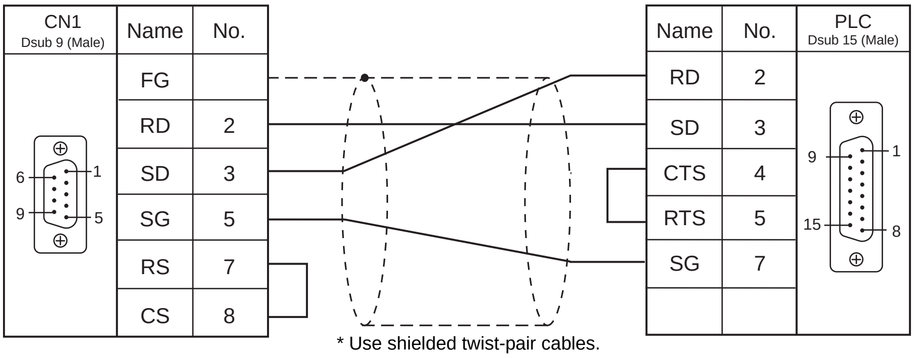
When Connected at CN1:

RS-232C

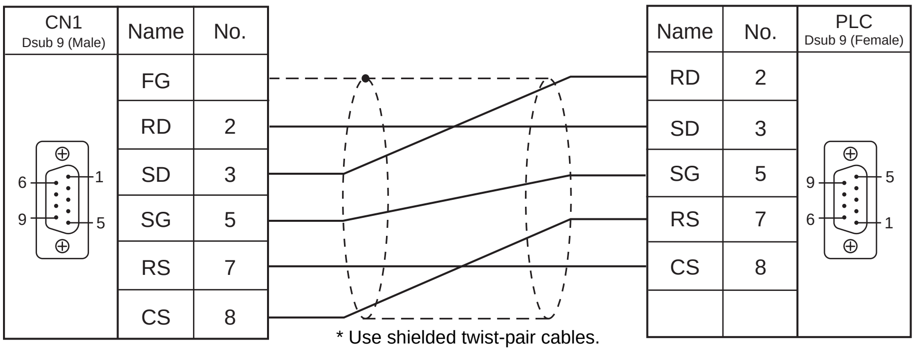
Wiring diagram 1 - C2



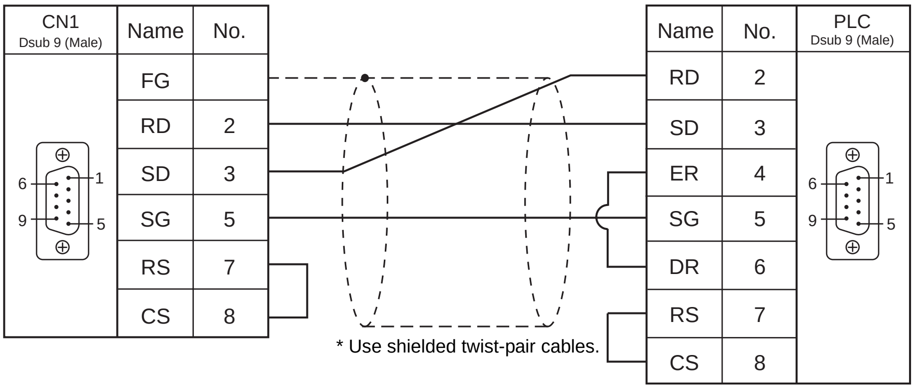
Wiring diagram 2 - C2



Wiring diagram 3 - C2

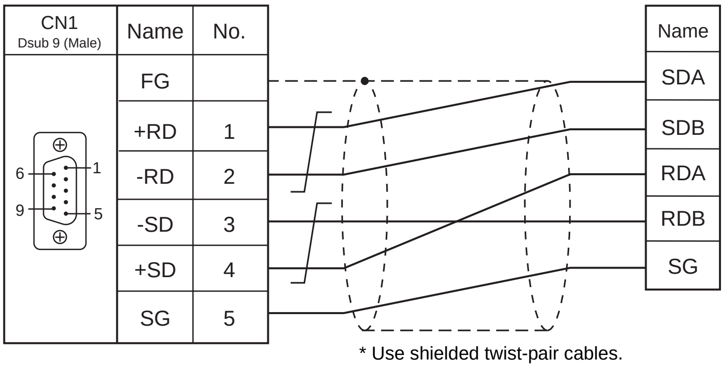


Wiring diagram 4 - C2

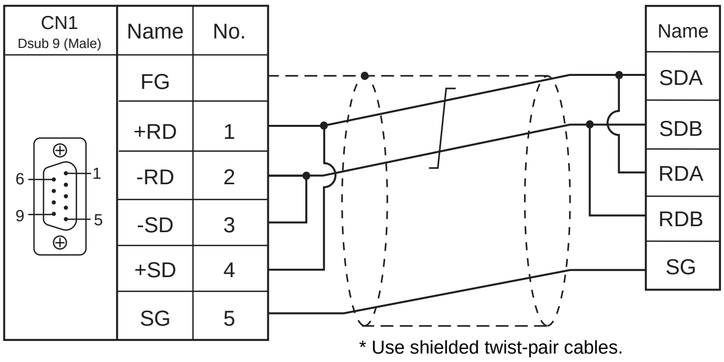


RS-422/RS-485

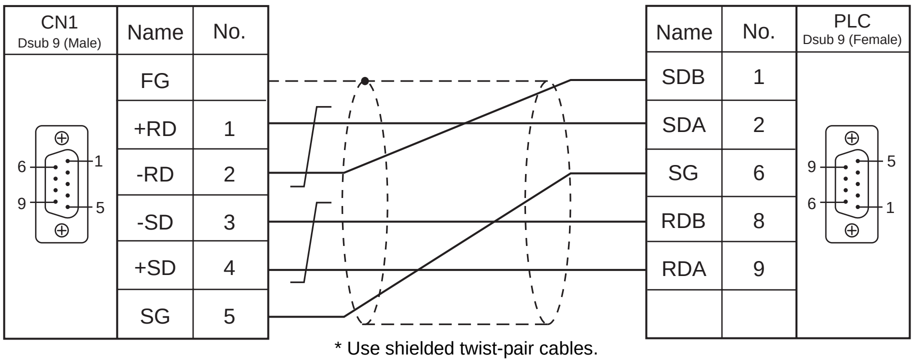
Wiring diagram 1 - C4



Wiring diagram 2 - C4



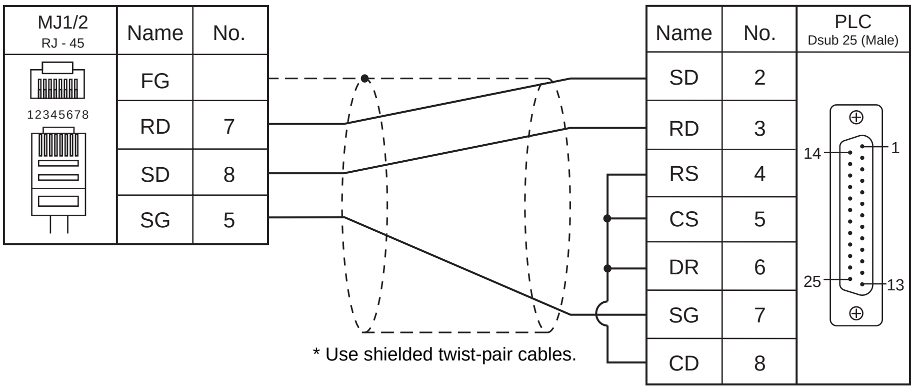
Wiring diagram 3 - C4



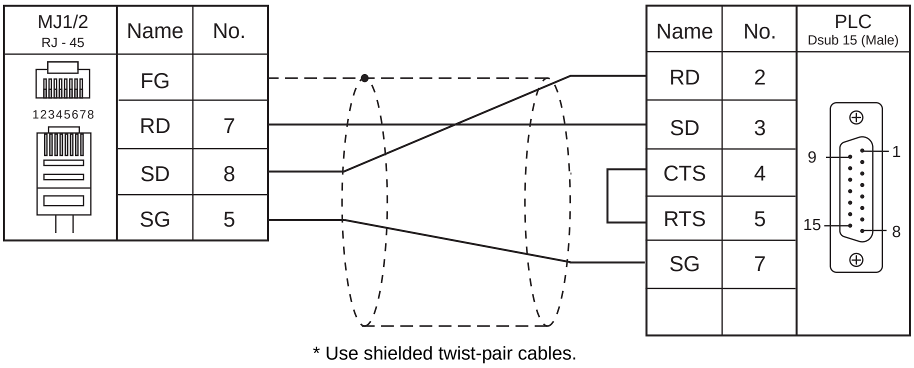
When Connected at MJ1/MJ2:

RS-232C

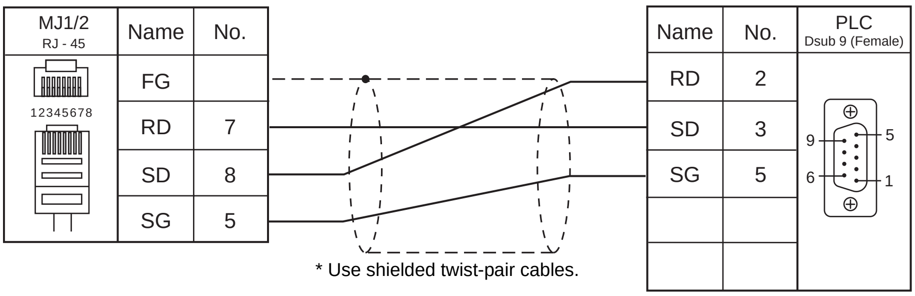
Wiring diagram 1 - M2



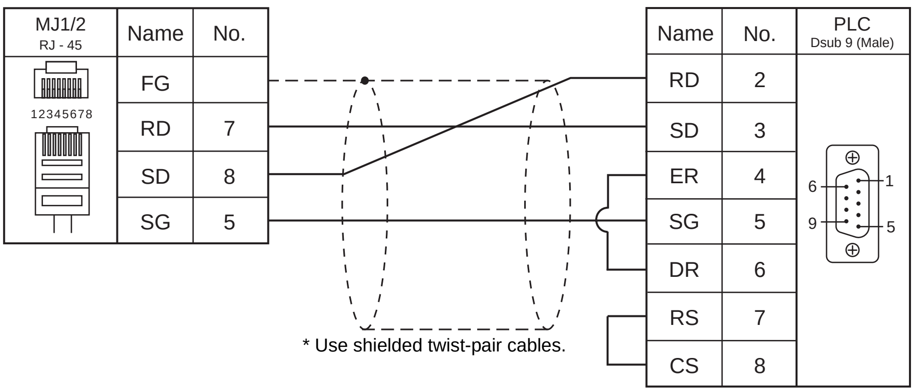
Wiring diagram 2 - M2



Wiring diagram 3 - M2

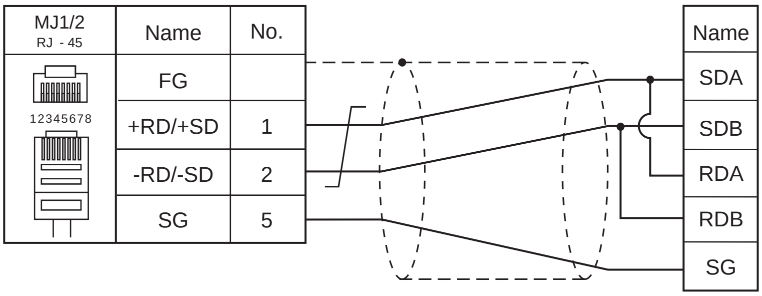


Wiring diagram 4 - M2



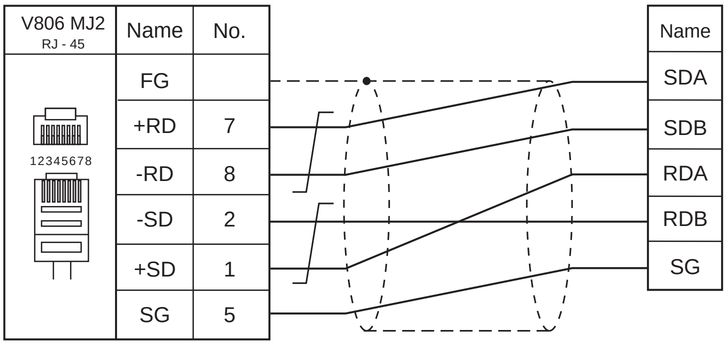
RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

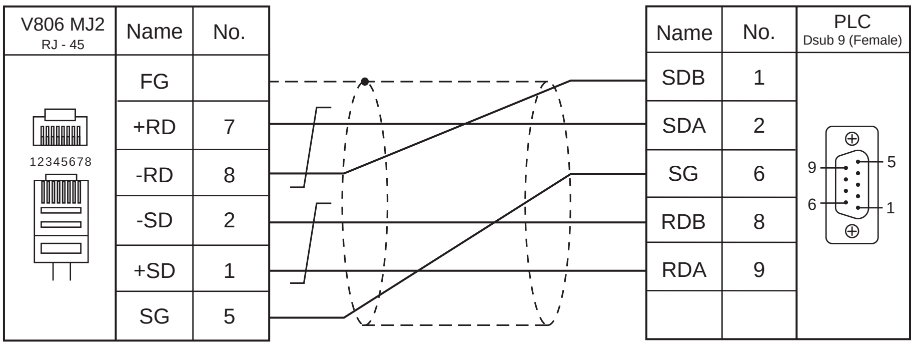
Wiring diagram 2 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 3 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

4.2 Temperature Controller/Servo/Inverter Connection

The controllers shown below can be connected.

Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
PYX (MODBUS RTU)	PYX4xx PYX5xx *1 PYX9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		PYX.Lst
PXR (MODBUS RTU)	PXR3xx PXR4xx PXR5xx *1 PXR7xx PXR9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		PXR.Lst
PXG (MODBUS RTU)	PXG4xx PXG5xx *1 PXG9xx	Terminal block	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		F_PXG.Lst
PXH (MODBUS RTU)	PXH9xx *1	Terminal block	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PXH.Lst
PUM (MODBUS RTU)	PUMxx	Terminal block (base)	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PUMA_B.Lst F_PUME.Lst

*1 Select a model on which Modbus communication is available.

Power Monitor Unit

PLC Selection on the Editor	Series Name	Model	Port	Signal Level	Connection			Lst File
					CN1	MJ1/MJ2	MJ2 (4-wire) V806	
F-MPC04P (loader)	F-MPC04P	UM02-AR2 UM02-AR3 UM02-AR4	RS-485 connector	RS-485	Wiring diagram 3 - C4	Wiring diagram 3 - M4		F-MPC04P.Lst
F-MPC series / FePSU	F-MPC04	UM01-ARxx	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM01_ARA4.Lst
	F-MPC04P	UM02-AR2	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM02_AR2.Lst
		UM02-AR3						UM02_AR3.Lst
		UM02-AR4						UM02_AR4.Lst
	F-MPC04S	UM03-AR3x	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM03_ARA3G.Lst
	F-MPC30	UM5ACxx *1	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM5A.Lst
		UM45xx *1						
	F-MPC50	UM50xx *1	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM50.Lst
	F-MPC55	UM55V	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM55V.Lst
	F-MPC60B	UM4Bxx *1	Terminal block	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4		UM4_UM42_UM43.Lst
		UM42Cxx *1						
		UM42Fxx *1						
		UM43FDxx *1						
		UM43FGxx *1						
		UM44Bxx *1						UM44.Lst
		UM44CDxx *1						
		UM44FGxx *1						
	FePSU	EAxx EGxx SAXX SGxx	Terminal block	RS-485	Wiring diagram 5 - C4	Wiring diagram 5 - M4		FePSU.Lst

*1 Select a model on which RS-485 communication is available.

Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
FVR-E11S (MODBUS RTU)	FVRxxE11S-x	Touch panel connector	RS-485	Wiring diagram 6 - C4	Wiring diagram 6 - M4		FVR-E11S(Modbus).Lst
FVR-C11S (MODBUS RTU)	FVRxxC11S-x	OPC-C11S-RSx	RS-485	Wiring diagram 7 - C4	Wiring diagram 7 - M4		FVR-C11S(Modbus).Lst
FRENIC5000G11S / P11S (MODBUS RTU)	FRNxxG11S-x FRNxxP11S-x	Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		FRENIC5000G11S_P11S(Modbus).Lst
FRENIC5000VG7 (MODBUS RTU)	FRNxxVG7S-x	RS-485 connector	RS-485	Wiring diagram 9 - C4	Wiring diagram 9 - M4	Wiring diagram 16 - M4	FRENIC5000VG7S(Modbus).Lst
		OPC-VG7-RS (communication board)		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-Mini (MODBUS RTU)	FRNxxC1S-x	OPC-C1-RS (communication board)	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Mini.Lst
FRENIC-Eco (MODBUS RTU)	FRNxxF1S-x	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Eco(Modbus).Lst
		OPC-F1-RS (communication board)		Wiring diagram 8 - C4	Wiring diagram 8 - M4		
FRENIC-Multi (MODBUS RTU)	FRNxxE1S-x	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		F-Multi.Lst
		OPC-E1-RS (communication board)		Wiring diagram 10 - C4	Wiring diagram 10 - M4		
FRENIC-MEGA (MODBUS RTU)	FRNxxxG1x-xx	Touch panel connector	RS-485	Wiring diagram 10 - C4	Wiring diagram 10 - M4		FRENIC-MEGA(Modbus).Lst
		Terminal block on control circuit		Wiring diagram 8 - C4	Wiring diagram 8 - M4		

IH Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
HFR-C9K	HFR030C9Kxx HFR050C9Kxx	HFR-OPC01 (communication board)	RS-485	Wiring diagram 13 - C4	Wiring diagram 13 - M4		F_HFR.Lst
HFR-C11K	HFR3.0C11Kxx HFR5.0C11Kxx HFR7.0C11Kxx	Terminal block	RS-485	Wiring diagram 8 - C4	Wiring diagram 8 - M4		HFR-C11K.Lst

AC Power Monitor

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
PPMC (MODBUS RTU)	PPMCxx *1	Terminal block	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		F-PPMC.Lst
			RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		

*1 Select a model on which RS-485 or RS-232C communication is available.

Servo Amplifier

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
FALDIC-α series	RYSxx *1	CN3	RS-485	Wiring diagram 12 - C4	Wiring diagram 12 - M4	Wiring diagram 17 - M4	F_FAL-A.Lst
ALPHA5 (MODBUS RTU)	RYTxxxx5-VVx	CN3A	RS-485	Wiring diagram 14 - C4	Wiring diagram 14 - M4		ALPHA5.Lst

*1 Select a model on which host interface: universal communication (RS-485) is available.

Recorder

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
PHR (MODBUS RTU)	PHRxx	Terminal block	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		F_PHR.Lst

Digital Panel Meter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
WA5000	WA5xx *1	Modular Jack	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		WA5000.Lst
			RS-485	Wiring diagram 11 - C4	Wiring diagram 11 - M4		

*1 Select a model on which RS-485 or RS-232C communication is available.

AC Power Regulator

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
APR-N (MODBUS RTU)	RPNExxxx-xx-ZAM-xx/xx	RPN003-AM (communication board)	RS-485	Wiring diagram 4 - C4	Wiring diagram 4 - M4	Wiring diagram 18 - M4	F_APR-N.Lst

Electronic Multimeter

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
WE1MA (MODBUS RTU)	WE1MA-AFxxx-Mxx WE1MA-AGxxx-Mxx	Terminal block	RS-485	Wiring diagram 15 - C4	Wiring diagram 15 - M4		F_WE1MA.Lst
	WE1MA-A1xxx-Mxx WE1MA-A5xxx-Mxx						F_WE1MA_1P.Lst *1
	WE1MA-A2xxx-Mxx WE1MA-A6xxx-Mxx						F_WE1MA_1P3L.Lst *1
	WE1MA-A3xxx-Mxx WE1MA-A7xxx-Mxx						F_WE1MA_3P3L.Lst *1
	WE1MA-A4xxx-Mxx						F_WE1MA_3P4L.Lst *1

*1 The file of "F_WE1MA.Lst" can be browsed by pressing the [Refer] button by default. It is possible to set the memory with this list file.

4.2.1 PYX (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u> / Multi-link2	
Signal Level	<u>RS-422/485</u>	Do not change the default settings because these settings on the temperature controller cannot be changed.
Baud Rate	<u>9600</u> bps	
Data Length	<u>8</u> bits	
Stop Bit	<u>1</u> bit	
Parity	<u>Odd</u>	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter	Item	Setting	Example
	Digital transmission function (station number)	<u>1</u> to 31	1

* The communication function of the temperature controller can be selected from Fuji protocol or Modbus protocol at the time of purchase. For communication with a V8, select a model on which the Modbus protocol is available.
* Digital transmission settings other than the station number are fixed as shown below.
  Transmission signal: RS-485
  Baud rate: 9600 bps
  Data length: 8 bits
  Parity: odd parity
  Stop bit: 1 bit

Available Memory

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

Memory	TYPE	Remarks
0	00H	
1	01H	Read only
4	02H	
3	03H	Read only

4.2.2 PXR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u> / Multi-link2	
Signal Level	<u>RS-422/485</u>	Do not change the default settings because these settings on the temperature controller cannot be changed.
Baud Rate	<u>9600</u> bps	
Data Length	<u>8</u> bits	
Stop Bit	<u>1</u> bit	
Parity	None / Even / <u>Odd</u>	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter	Display		Item	Setting	Example
Third block parameter		STno	Station number	<u>1</u> - 31	1
		CoM	Parity	<u>0: Odd</u> 1: Even 2: None	0
		PCoL	Communication protocol	**1: Modbus**[*1] 2: Z-ASCII	1

*1 The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.

Available Memory

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

Memory	TYPE	Remarks
0	00H	
1	01H	Read only
4	02H	
3	03H	Read only

4.2.3 PXG (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Channel	Parameter Display		Item	Setting	Example
"CoM Ch9" Communication (Ch9)	"STno"	STno	Station number	1 to 31	1
	"CoM"	CoM	Parity	96od (9600 bps / odd parity) 96Ev (9600 bps / even parity) 96no (9600 bps / without parity) 19od (19200 bps / odd parity) 19Ev (19200 bps / even parity) 196no (19200 bps / without parity)	96od
	"SCC"	SCC	Communication authority	r (Read only) rW (Read/write allowed)	rW

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.

Available Memory

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

Memory		TYPE	Remarks
1	(input relay)	01H	
4	(holding register)	02H	
3	(input register)	03H	

4.2.4 PXH (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Temperature Controller

The communication parameter can be set using keys attached to the front of the temperature controller.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Channel	Parameter Display		Item	Setting	Example
 Communication (Ch B)		STn4	RS-485 station No.	1 to 31	1
		SPd4	RS-485 baud rate	96: 9600 bps 192: 19200 bps 384: 38400 bps	384
		biT4	RS-485 bit format	8n: Data length 8 bits, without parity 8o: Data length 8 bits, odd parity 8E: Data length 8 bits, even parity	8o

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.

Available Memory

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

Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

4.2.5 PUM (MODBUS RTU)

Communication Setting

Editor

Communication setting

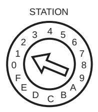
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 / 115200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Even / Odd	
Target Port No.	1 to 15 [DEC]	

Temperature Controller

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Station number setting

STATION	Setting	Example
	0 to F [HEX]	0: Station number 1 F: Station number 16

Communication setting

On the temperature controller loader, set communication parameters.

Item	Setting	Example	Remarks
RS-485 parity setting	0: None 1: Odd 2: Even	0	
RS-485 baud rate setting	0: 9600 1: 19200 2: 38400 4: 115200 kbps	1	
RS-485 communication authority setting	0: Read only 1: Read/write allowed	1	
RS-485 response interval setting	0 to 25 (default: 1)	1	Response interval = setting value × 20 ms
Extensional communication module (PUMC) connection	0: Without PUMC (RS-485 valid) 1: With PUMC (RS-485 invalid)	0	When using RS-485 communication, set “0”.

Available Memory

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

Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

Note on Setting the Memory

In accordance with the connected PUM model, set the “List” file name to be browsed by pressing the [Refer] button.

<table>
<tr><th colspan="2">Model</th><th>List File Name</th></tr>
<tr><td>PUMAxx</td><td>Control module (4 ch)</td><td rowspan="2">F_PUMA_B.Lst</td></tr>
<tr><td>PUMBxx</td><td>Control module (2 ch)</td></tr>
<tr><td>PUMExx</td><td>Event input/output module</td><td>F_PUME.Lst</td></tr>
</table>

“F_PUMA_B.Lst” is set as default.

4.2.6 F-MPC04P (Loader)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

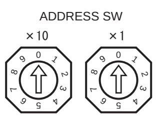
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 bit	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / Odd / Even	
Target Port No.	1 to 99 *1	

*1 To use port No. 32 to 99, use the station number table.

Power Monitor Unit

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Station number setting

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 0)	1	

Communication setting

The communication parameter can be set using keys attached to the front of the power monitor unit.

Circuit No.	Setting Code	Item	Setting	Example
C	L1-□□	Baud rate	00: 4800 bps 01: 9600 bps 02: 19200 bps	02
	L2-□□	Parity	00: None 01: Even 02: Odd	02
	L3-□□	Data length	00: 7 bits 01: 8 bits	00

Available Memory

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

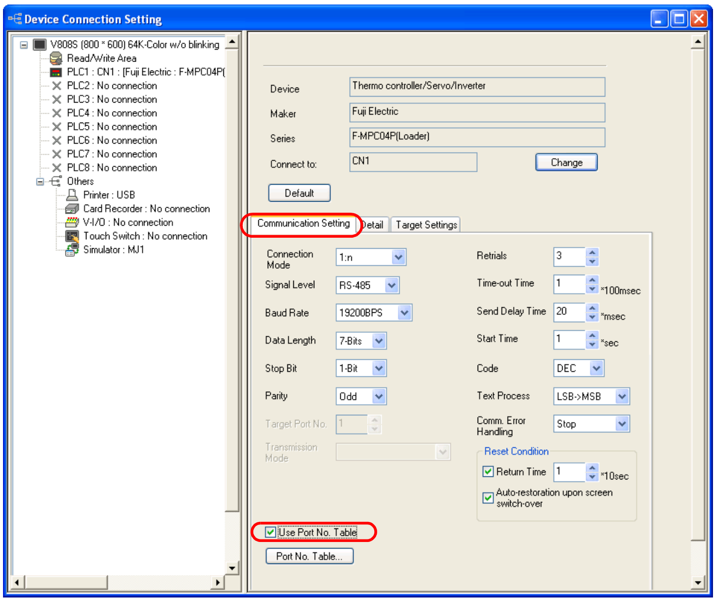
Memory	TYPE	Remarks
---	00H	Double-word

Station Number Table

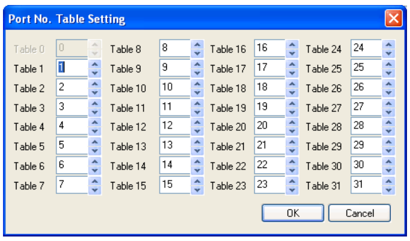
- A maximum of 31 units can be connected via serial communication. Port numbers from 0 to 31 can be set on the [Memory Setting] dialog of the editor; however, depending on the controller, port numbers exceeding 32 may be available. In such a case, use the station number table to enable communications with devices of port No. 32 or greater.
- It is easier to specify port numbers for each network in the field by making the screen for setting the port number when creating screen data. In this case, it is not necessary to transfer screen data again.

Setting the Station Number Table

1. Click [System Setting] → [Device Connection Setting]. On the [Communication Setting] tab window, check [☐ Use Port No. Table].



2. Click the [Port No. Table] button. The [Port No. Table Setting] dialog is displayed.
3. Specify port numbers of the temperature controllers for "Table 0" to "31".



Macro

To rewrite the station number table on the V series screen, use macro commands [FROM_WR] and [RESTART].

FROM_WR

FROM_WR F0 F1

- Function: Writing to FROM
  As many words as specified for F1 from the memory address set for F0 is written in the FP-ROM.
- Available memory

	Internal Memory	PLC n Memory	Memory Card	Constant
F0	◎	◎	◎	
F1				○

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Data range

	Setting	Remarks
F0	Top memory address of the source	32 words from the specified top memory address are used. Set port numbers from 0 to 31 for the memory addresses. For the station number table not used, set [–1].
F1	Number of transmission words: 32	If any other value than “32” is set, the write error ($s728 = 1) occurs.

- Notes
  - The maximum possible number of write operations to the FP-ROM is 100,000 times. This is not related to the number of words that are written.
  - Do not include the FROM_WR command in a cycle macro or an event timer macro.
  - Writing to FP-ROM takes a longer time.
  - When the station number table has been rewritten using the [FROM_WR] command, be sure to execute the [RESTART] command.
  - When the station number table is used, it is not possible to set [☐ Use Internal Flash ROM as Back-up Area] on the [General Settings] tab window that is displayed by selecting [System Setting] → [Unit Setting] → [General Settings]. Be sure to leave this box unchecked.

RESTART

When the station number table has been rewritten using the [FROM_WR] command, be sure to execute this command.

SYS (RESTART) F0

- Function: Reconnection
  This macro command reconnects the controller when the time specified for F1 has elapsed.
- Available memory

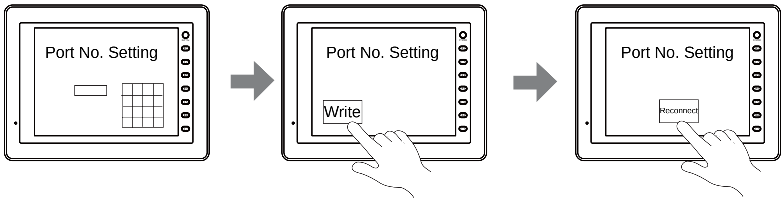
	Internal Memory	PLC n Memory	Memory Card	Constant
F1	◎			

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Data range

	Setting
F0	RESTART
F1	Time: 0 to 60 s

Example of Procedure for Rewriting the Station Number Table



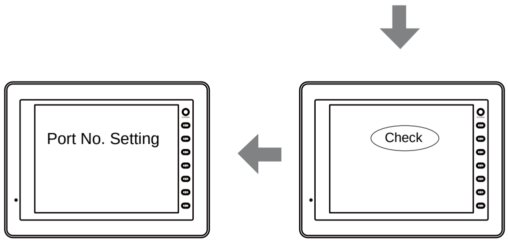
Set the port number from $u0 to 31 on the screen.
$u00000 = 00
$u00001 = 50
$u00002 = 51
:
$u00031 = 81

Write the station number table in the FP-ROM by the FRM_WR macro.

[Macro]
FROM_WR $u0000 32

Execute reconnection of the network using the [RESTART] macro.

[Macro]
$u0050 = 5
RESTART $u50



Finished

About 5 seconds ($u0050 = 5 is set).

System Memory

The result of [FROM_WR] macro execution is stored in $s728.

[0]: Normal

[1]: Error

4.2.7 F-MPC Series / FePSU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 bit	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / Odd / Even	
Target Port No.	1 to 99*1	

*1 To use port numbers 32 to 99, use the station number table. For the station number table, see “Station Number Table” (page 4-30).

F-MPC04

Communication setting

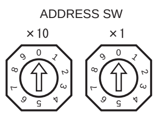
The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Circuit No.	Setting Code	Item	Setting	Example
C	4-0	RS-485 address	Loc: Communication not used 01 to 99	01
	4-1	RS-485 baud rate setting	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
	4-2	RS-485 data lenth	7: 7 bits 8: 8 bits	7
	4-3	RS-485 Pariry	00: None 01: Even 02: Odd	02

F-MPC04P

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Station number setting

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 0)	1	

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.

Circuit No.	Setting Code	Item	Setting	Example
C	L1-□□	Baud rate	00: 4800 bps 01: 9600 bps 02: 19200 bps	02
	L2-□□	Parity	00: None 01: Even 02: Odd	02
	L3-□□	Data length	00: 7 bits 01: 8 bits	00

F-MPC04S

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Setting Code	Item	Setting	Example
L-□□	Baud rate	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
L2-□□	Data length and parity	8n: Data length 8 bits, without parity 8E: Data length 8 bits, even parity 8o: Data length 8 bits, odd parity 7n: Data length 7 bits, without parity 7E: Data length 7 bits, even parity 7o: Data length 7 bits, odd parity	7o
LA-□□	Address (Transmission station number)	Loc: Station number not set 01 to 99	01
Lt-□□	Communication model mode	04: F-MPC04 mode *1 PP: PPM (B) mode	04

*1 The communication function of F-MPC04 can be selected at the time of purchase. Select a model on which "F-MPC04 mode" is available.

F-MPC30

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: Communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED □□□□□ Parity n: None E: Even o: Odd Data length 7: 7 bits 8: 8 bits Baud rate 48: 4800 bps 96: 9600 bps 192: 19200 bps * "b192E" is set as default.	1927o

F-MPC50/F-MPC55/F-MPC60B (UM4Bx, UM42xx, UM43xx)

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED Parity n: None E: Even o: Odd Data length 7: 7 bits 8: 8 bits Baud rate 48: 4800 bps 96: 9600 bps 192: 19200 bps	1927o

F-MPC60B (UM44xx)

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Setting Code	Item	Setting	Example
90	RS-485 address setting	Loc: communication not used 01 to 99	01
91	RS-485 transmission specification	7SEG LED Parity n: None E: Even o: Odd Data length 7: 7 bits 8: 8 bits Baud rate 48: 4800 bps 96: 9600 bps 192: 19200 bps	1927o

FePSU

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Type	Parameter Display	Item	Setting	Example
SEL-c	Adr.□□	Communicating station number	Loc: Communication not used 01 to 99	01
	bud□□	Baud rate	4.8: 4800 bps 9.6: 9600 bps 19.2: 19200 bps	19.2
	cbit.□□	Data length, parity	8n: Data length 8 bits, without parity 8E: Data length 8 bits, even parity 8o: Data length 8 bits, odd parity 7n: Data length 7 bits, without parity 7E: Data length 7 bits, even parity 7o: Data length 7 bits, odd parity	7o
	LtY.□□	Communication Mode	Psu: FePSU mode *1 _PP: PPM(B) mode	Psu

*1 The communication function of FePSU can be selected at the time of purchase. Select a model on which “FePSU mode” is available.

Available Memory

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

Memory		TYPE	Remarks
00	(data request of circuit No. 1 to 4) *1	00H	Double-word, read only
01	(data request of circuit No. 5 to 8) *1	01H	Double-word, read only
02	(data request of circuit No. 9, 10 or E) *1	02H	Double-word, read only
03	(Data request of the minimum/maximum voltage, power factor of circuit 1 to 10, and invalid power)*1 *2	03H	Double-word, read only
09	(model code)	09H	Read only
10	(operation status)	0AH	Read only
11	(pre-alarm value) *1	0BH	Double-word, read only
12	(current value measurement data)*1 *2	0CH	Double-word, read only
13	(integrated value data)*1 *2	0DH	Double-word, read only
14	(demand measurement data)*1 *2	0EH	Double-word, read only
15	(data of a maximum value of demand measurement)*1 *2	0FH	Double-word, read only
16	(historical data 1)*1 *2	10H	Double-word, read only
17	(historical data 2)	11H	Double-word, read only
18	(setting data)*3	12H	Double-word

*1 When a memory other than status is used, set the decimal point of the numerical display part to “3”.
*2 “0” is stored in the address for which “(Blank)” is indicated in the table below.
*3 For setting data, see “Memory: 18 (Setting Data)” described below.

Memory: 18 (Setting Data)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B
00zz	Wiring method (voltage measured)	(Blank)	CT primary rated current
01zz	Ratio of VT 1 (primary voltage) *1	(Blank)	Ratio of VT (primary voltage)
02zz	Ratio of VT 1 (secondary voltage) *1	(Blank)	Ratio of VT (secondary voltage)
03zz	Demand average time	Demand average time	Rated frequency
04zz	Frequency	(Blank)	Protective INST (current setting)*2
05zz	Number of applicable circuits	(Blank)	Protective INST (output setting)
06zz	Pulse multiplying factor	(Blank)	Protective DT (current setting)*2
07zz	Ratio of VT 2 (primary voltage) *1	(Blank)	Protective DT (operation time)*2
08zz	Ratio of VT 2 (secondary voltage) *1	(Blank)	Protective DT (output setting)*2
09zz	Number of turns for CT2 secondary line	(Blank)	Protective OC (current setting)
10zz	CT primary current *1	(Blank)	Protective OC (characteristic)
11zz	OCG sensitivity current	(Blank)	Protective OC (time magnification)*2
12zz	OCG operation time *2	(Blank)	Protective OC (output setting)
13zz	Load pre-alarm sensitivity current	(Blank)	Protective OCA overcurrent pre-alarm (current setting)
14zz	Load pre-alarm operation time	(Blank)	Protective OCA overcurrent pre-alarm (operation time)
15zz	Automatic display circuit register	(Blank)	Protective OCA overcurrent pre-alarm (output setting)
16zz	ZCT select	(Blank)	Protective OCG (51G) (current setting) *3
17zz	VT select	(Blank)	Protective OCG (51G) (characteristic)
18zz	(Blank)	(Blank)	Protective OCG (51G) (time magnification) *2
19zz	(Blank)	(Blank)	Protective OCG (51G) (output setting)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B
20zz	Phase selection	(Blank)	Protective OCG (50G) (current setting) *2
21zz	Power alarm upper limit	Power alarm upper limit	Protective OCG (50G) (operation time) *2
22zz	Integral power pulse multiplying factor *4	Pulse multiplying factor *4	Protective OCG (50G) (output setting)
23zz	Load pre-alarm operation value	Load pre-alarm operation value	Protective DG (DG/OCG) (current setting) *3
24zz	Load pre-alarm operation time	(Blank)	Protective DG (DG/OCG) (operation time) *3
25zz	Leak pre-alarm sensitivity current	Leak pre-alarm sensitivity current	Protect DG (DG/OCG) (output setting)
26zz	Leak pre-alarm operation time *2	Leak pre-alarm operation time *2	Protective DG (DG/OCG) (maximum sensitivity phase angle)
27zz	OCG sensitivity current	Leak alarm sensitivity current	Protective DG (DG/OCG) (voltage setting) *2
28zz	OCG operation time *2	Leak alarm operation time *2	Protective DG (DG/OCG) (selected from DG or OCG)
29zz	Operation type for power	Operation type for power	Protective 0 V (voltage setting)
30zz	(Blank)	Phase R input position	Protective 0 V (operation time)*2
31zz	(Blank)	History of turning breaker ON	Protective 0 V (output setting)
32zz	(Blank)	Show/hide cause of trouble	Protective UV (voltage setting)
33zz	(Blank)	Phase interruption alarm of neutral line	Protective UV (operation time)*2
34zz	(Blank)	Alarm output 1	Protective UV (output setting)
35zz	(Blank)	Alarm output 2	Protective UV2 (voltage setting)
36zz	(Blank)	Contact input 1	Protective UV2 (operation time)*2
37zz	(Blank)	Contact input 2	Protective UV2 (output setting)
38zz	(Blank)	(Blank)	Protective UV operation setting
39zz	(Blank)	Rated current (IN)	Voltage establishment VR (voltage setting)
40zz	(Blank)	Current demand time	Voltage establishment VR (operation time) *2
41zz	(Blank)	Voltage demand time	Voltage establishment VR (output setting)
42zz	(Blank)	Power demand time	Protective OVG (voltage setting)*2
43zz	(Blank)	Leak demand time	Protective OVG (operation time)
44zz	(Blank)	(Blank)	Protective OVG (output setting)
45zz	(Blank)	(Blank)	ZPD/EVT selection
46zz	(Blank)	(Blank)	Phase interruption relay
47zz	(Blank)	(Blank)	Reverse phase relay
48zz	(Blank)	(Blank)	Demand average time
49zz	(Blank)	Year setting	CB opening jam monitoring time *3
50zz	(Blank)	Month setting	CB closing jam monitoring time *3
51zz	(Blank)	Date setting	Monitoring trip coil TC disconnection, OFF expedited, function application setting
52zz	(Blank)	Hour setting	kWh pulse constant *5
53zz	(Blank)	Minute setting	kvarh pulse constant *5
54zz	(Blank)	(Blank)	Selective input 1 function setting

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B
55zz	(Blank)	(Blank)	Selective input 2 function setting
56zz	(Blank)	(Blank)	Selective input 3 function setting
57zz	(Blank)	(Blank)	Selective input 4 function setting
58zz	(Blank)	(Blank)	Selective input 5 function setting
59zz	(Blank)	(Blank)	Selective input 6 function setting
60zz	(Blank)	(Blank)	Selective input 7 function setting
61zz	(Blank)	(Blank)	Selective input 8 function setting
62zz	(Blank)	(Blank)	Device fault detection function setting
63zz	(Blank)	(Blank)	Fault pick-up output setting
64zz	(Blank)	(Blank)	Transmission component 1 output setting
65zz	(Blank)	(Blank)	Transmission component 2 output setting
66zz	(Blank)	(Blank)	Distant/direct state output setting
67zz	(Blank)	(Blank)	Transducer output current phase setting
68zz	(Blank)	(Blank)	Transducer output voltage phase setting
69zz	(Blank)	(Blank)	Residue/CT 3rd selection (zero-phase current)
70zz	(Blank)	(Blank)	Protective INST (phase N) (current setting)*2
71zz	(Blank)	(Blank)	Protective INST (phase N) (output setting)
72zz	(Blank)	(Blank)	Protective OC (phase N) (current setting)
73zz	(Blank)	(Blank)	Protective OC (phase N) (characteristic)
74zz	(Blank)	(Blank)	Protective OC (phase-N) (time magnification)*2
75zz	(Blank)	(Blank)	Protective OC (phase N) (output setting)
76zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (current setting)
77zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (operation time)
78zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (output setting)
79zz	(Blank)	(Blank)	Protective OCGA pre-alarm (current setting)
80zz	(Blank)	(Blank)	Protective OCGA pre-alarm (operation time)
81zz	(Blank)	(Blank)	Protective OCGA pre-alarm (output setting)
82zz	(Blank)	(Blank)	Protective DT2 (current setting)
83zz	(Blank)	(Blank)	Protective DT2 (operation time) *2
84zz	(Blank)	(Blank)	Protective DT2 (output setting)
85zz	(Blank)	(Blank)	Transducer output CH1 setting
86zz	(Blank)	(Blank)	Transducer output CH2 setting
87zz	(Blank)	(Blank)	Transducer output CH3 setting
88zz	(Blank)	(Blank)	Transducer output CH4 setting
89zz	(Blank)	(Blank)	Transducer output CH5 setting
90zz	(Blank)	(Blank)	Transducer output CH6 setting
91zz	(Blank)	(Blank)	External change-over function setting of transducer output
92zz	(Blank)	(Blank)	Display mode selection

*1 When using a direct value, set [DEC (with sign)] for [Display Type] on the [Num. Display] dialog.
*2 Specify “1” for [Decimal Point] on the [Num. Display] dialog.
*3 Specify “2” for [Decimal Point] on the [Num. Display] dialog.
*4 Specify the multiplying factor in the range of –3 to 2.
*5 Specify the pulse constant in the range of –2 to 4 or F.

Address denotations:

- For the memory for which the circuit number is set (00 to 02, 12 to 18):

XXYYZZ
Circuit No. (1 to 12)
Setting item (00 to 99)
Memory

* For circuit No. E, specify “11” for the circuit number.

- For the memory for which the circuit number is not set (03, 09 to 11):

XXYYYY
Setting item (00 to 99)
Memory

Note on Setting the Memory
Only the “List” file of “F-MPC04S” can be browsed by pressing the [Refer] button by default.
If any power monitor unit other than above is used, refer to each “List” file by pressing the [Refer] button and set the memory.

PLC_CTL

Content	F0	F1 (=$u n)		F2
kWh integrated value reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
Max. kW (amount of power) reset	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
Operation control *1	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	0: Turning ON the input/output 1: Turning ON the output of Power OFF 2: Turning OFF the output of power ON/OFF	
Reset all of the demand maximum values *2	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 3	
Alarm reset *2	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Time setting *2	1 - 8 (PLC1 - 8)	n	Station number *3	9
		n + 1	Command: 5	
		n + 2	0: Specific station number 1: Broadcast	
		n + 3	Year	
		n + 4	Month	
		n + 5	Day	
		n + 6	Hour	
		n + 7	Minute	
		n + 8	Second *4	

*1 Available only with F-MPC60B.
*2 Available only with FePSU.
*3 Select station No. 0 for a broadcast command.
*4 Can be set only for a broadcast command.

4.2.8 FVR-E11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.
For details on communication parameters of the inverter, contact your local distributor.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.9 FVR-C11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.
For details on communication parameters of the inverter, contact your local distributor.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.10 FRENIC5000 G11S / P11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td><table><tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td><u>0</u></td><td>O</td><td>X</td><td>X</td></tr><tr><td>1</td><td>O</td><td>O</td><td>X</td></tr><tr><td>2</td><td>O</td><td>X</td><td>O</td></tr><tr><td>3</td><td>O</td><td>O</td><td>O</td></tr></table></td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td><u>1</u> to 31</td><td>1</td></tr>
<tr><td>H34</td><td>Baud rate</td><td>0: 19200 bps
<u>1: 9600 bps</u>
2: 4800 bps</td><td>1</td></tr>
<tr><td>H35</td><td>Data length</td><td><u>0: 8 bits</u>
1: 7 bits</td><td>0</td></tr>
<tr><td>H36</td><td>Parity bit</td><td><u>0: None</u>
1: Even
2: Odd</td><td>0</td></tr>
<tr><td>H37</td><td>Stop bit</td><td><u>0: 2 bits</u>
1: 1 bit</td><td>0</td></tr>
<tr><td>U49</td><td>Communication protocol *2</td><td><u>0: FGI-bus</u>
1: Modbus RTU</td><td>1</td></tr>
</table>

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set “24 (link operation)” for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.

*2 When “FRENIC5000G11S/P11S (MODBUS RTU)” is selected for model selection on the editor, select “Modbud RTU” for the communication protocol on the inverter.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.11 FRENIC5000 VG7S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	8 bits	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits[*1]	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

*1 When no parity setting is made, set “2 bits” for stop bit.
When a parity setting (even or odd) is made, set “1 bit” for stop bit.

When Connecting to the Built-in RS-485 Port on the Inverter:

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function [*1]</td><td><table><tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>O</td><td>X</td><td>X</td></tr><tr><td>1</td><td>O</td><td>O</td><td>X</td></tr><tr><td>2</td><td>O</td><td>X</td><td>O</td></tr><tr><td>3</td><td>O</td><td>O</td><td>O</td></tr></table></td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>H34</td><td>Baud rate</td><td>0: 38400 bps
1: 19200 bps
2: 9600 bps
3: 4800 bps</td><td>0</td></tr>
<tr><td>H36</td><td>Parity bit</td><td>0: None
1: Even
2: Odd</td><td>1</td></tr>
<tr><td>H37</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When no parity setting is made, “2 bits” is set for stop bit. When a parity setting (even or odd) is made, “1 bit” is set for stop bit.</td><td>1</td></tr>
<tr><td>H40</td><td>Communication protocol[*2]</td><td>0: FGI-bus
1: SX (loader) protocol
2: Modbus RTU</td><td>2</td></tr>
</table>

When Connecting to the Terminal Block on “OPC-VG7-RS” (Optional Communication Board):

Communication setting

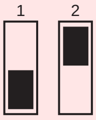
Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td>
<table>
<tr><th></th><th>Writing of Monitor/function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td><u>0</u></td><td>O</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>O</td><td>O</td><td>X</td></tr>
<tr><td>2</td><td>O</td><td>X</td><td>O</td></tr>
<tr><td>3</td><td>O</td><td>O</td><td>O</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td><u>1</u> to 31</td><td>1</td></tr>
<tr><td>o37</td><td>Communication definition setting</td><td>Baud rate
<u>0: 38400 bps</u>
1: 19200 bps
2: 9600 bps
3: 4800 bps
Parity
0: None (stop bit: 2 bits)
<u>1: Even (stop bit: 1 bit)</u>
2: Even (stop bit: 1 bit)</td><td>10</td></tr>
<tr><td>H40</td><td>Communication protocol*2</td><td>0: FGI-bus
<u>1: SX (loader) protocol</u>
2: Modbus RTU</td><td>2</td></tr>
</table>

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set “24 (link operation)” for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.
*2 When “FRENIC5000G11S/P11S (MODBUS RTU)” is selected for model selection on the editor, select “Modbud RTU” for the communication protocol on the inverter.

Notes on Using “OPC-VG7-RS” (Optional Communication Board)
Set the DIPSW2 on the optional communication board “OPC-VG7-RS” as shown below when connecting the V8 and the terminal block of the board.

The underlined settings are set as default.

<table>
<tr><th>SW2</th><th>SW2-1 Setting</th><th>SW2-2 Setting</th><th>Function</th><th>Remarks</th></tr>
<tr><td rowspan="4">1 2

OFF</td><td>OFF</td><td>OFF</td><td rowspan="2">-</td><td>-</td></tr>
<tr><td>ON</td><td>OFF</td><td>-</td></tr>
<tr><td><u>OFF</u></td><td><u>ON</u></td><td>Optional communication board enabled</td><td>Do not change the default setting when connecting with the V8.</td></tr>
<tr><td>ON</td><td>ON</td><td>-</td><td>-</td></tr>
</table>

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.12 FRENIC-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	8 bits	Do not change the default setting because the setting on the inverter cannot be changed.
Stop bit	1 / 2 bits*1	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

*1 When no parity setting is made, “2 bits” is set for stop bit.
When a parity setting (even or odd) is made, “1 bit” is set for stop bit.

Inverter

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps</td><td>3</td></tr>
<tr><td>y06</td><td>Parity bit</td><td>0: None
1: Even
2: Odd</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When no parity setting is made, “2 bits” is set for stop bit. When a parity setting (even or odd) is made, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol*1</td><td>0: Modbus RTU
1: SX (loader) protocol
2: FGI-bus</td><td>0</td></tr>
<tr><td>y99</td><td>Support link function</td><td><table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr>
<tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30</td></tr>
<tr><td>2</td><td>Function code H30</td><td>Commanded from RS-485</td></tr>
<tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr>
</table></td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td><table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
</table></td><td>3</td></tr>
</table>

*1 Select “Modbud RTU” for the communication protocol on the inverter when connecting with the V8.
*2 When “0” is specified for y99 (support link function), command from function code H30 is valid for the frequency setting and operation command.

Available Memory

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

Memory	TYPE	Remarks
---	02H	

Address denotations XXYY

Function code identification number

Function code group

Group	Code	Name
F	00H	Basic function
E	01H	Terminal function
C	02H	Control function
P	03H	Motor parameter
H	04H	High level function
S	07H	Command/function data
M	08H	Monitor data
J	0DH	Application function
y	0EH	Link function
W	0FH	Monitor 2
X	10H	Alarm 1
Z	11H	Alarm 2

4.2.13 FRENIC-Eco (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u> / Multi-link2	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 bps	
Data Length	<u>8</u> bits	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / <u>2 bits</u>	When no parity setting is made, “2 bits” is set for stop bit. When a parity setting is made, “1 bit” is set for stop bit.
Parity	<u>None</u> / Odd / Even	
Target Port No.	<u>1</u> to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th colspan="2">Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td rowspan="5">RS-485 setting (touch panel)</td><td>Station address</td><td><u>1</u> to 31</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
<u>3: 19200 bps</u>
4: 38400 bps</td><td>3</td></tr>
<tr><td>y06</td><td>Parity bit</td><td><u>0: None</u>
1: Even
2: Odd</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When no parity setting is made, “2 bits” is set for stop bit.
When a parity setting (even or odd) is made, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol*1</td><td>0: Modbus RTU
<u>1: SX (loader) protocol</u>
2: FGI-bus</td><td>0</td></tr>
<tr><td>y11</td><td rowspan="5">RS-485 setting 2 (optional board)</td><td>Station address</td><td><u>1</u> to 31</td><td>1</td></tr>
<tr><td>y14</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
<u>3: 19200 bps</u>
4: 38400 bps</td><td>3</td></tr>
<tr><td>y16</td><td>Parity bit</td><td><u>0: None</u>
1: Even
2: Odd</td><td>0</td></tr>
<tr><td>y17</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When no parity setting is made, “2 bits” is set for stop bit.
When a parity setting (even or odd) is made, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y20</td><td>Communication protocol*1</td><td><u>0: Modbus RTU</u>
2: FGI-bus</td><td>0</td></tr>
<tr><td>y98</td><td colspan="2">Bus function</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td><u>0</u></td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table></td><td>0</td></tr>
<tr><td>y99</td><td colspan="2">Support link function</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td><u>0</u></td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr><tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30, y98</td></tr><tr><td>2</td><td>Function code H30, y98</td><td>Commanded from RS-485</td></tr><tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr></table></td><td>0</td></tr>
</table>

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (optional)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (optional)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (optional)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (optional)</td></tr>
<tr><td>8</td><td>RS-485 communication (optional)</td><td>RS-485 communication (optional)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbud RTU” for the communication protocol on the inverter when connecting with the V8.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the V8.
When making the frequency and operation command settings on the V8 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the V8 connected to the optional communication board, specify “8” for function code H30.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.14 FRENIC-Multi (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	8 bits	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits	On the inverter: 2 bits when “0” is specified for y06 or y16 1 bit when “1”, “2” or “3” is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Function Code	Item		Setting	Example
y01	RS-485 setting (touch panel)	Station address	1 to 31	1
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y06		Parity bit	0: None 1: Even 2: Odd 3: None	0
y07		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When “0” is specified for y06, “2 bits” is set for stop bit. When “1”, “2”, or “3” is specified for y06, “1 bit” is set for stop bit.	-
y10		Communication protocol[*1]	0: Modbus RTU 1: SX (loader) protocol 2: FGI-bus	0
y11	RS-485 setting 2 (optional board)	Station address	1 to 31	1
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3
y16		Parity bit	0: None 1: Even 2: Odd 3: None	0
y17		Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When “0” is specified for y16, “2 bits” is set for stop bit. When “1”, “2”, or “3” is specified for y16, “1 bit” is set for stop bit.	-
y20		Communication protocol[*1]	0: Modbus RTU 2: FGI-bus	0
y98	Bus function		(see table below)	0

	Frequency	Operation Command
0	Function code H30	Function code H30
1	Commanded from the fieldbus	Function code H30
2	Function code H30	Commanded from the fieldbus
3	Commanded from the fieldbus	Commanded from the fieldbus

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td><u>0</u></td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from RS-485</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Commanded from RS-485</td></tr>
<tr><td>3</td><td>Commanded from RS-485</td><td>Commanded from RS-485</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td><u>0</u></td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (optional)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (optional)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (optional)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (optional)</td></tr>
<tr><td>8</td><td>RS-485 communication (optional)</td><td>RS-485 communication (optional)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbud RTU” for the communication protocol on the inverter when connecting with the V8.

*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the V8.
When making the frequency and operation command settings on the V8 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the V8 connected to the optional communication board, specify “8” for function code H30.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.15 FRENIC-MEGA (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	8 bits	Do not change the default setting because the setting on the inverter cannot be changed.
Stop Bit	1 / 2 bits	On the inverter: 2 bits when “0” is specified for y06 or y16 1 bit when “1”, “2” or “3” is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Inverter

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

<table>
<tr><th>Function Code</th><th colspan="2">Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td rowspan="5">RS-485 setting (touch panel)</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y06</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When “0” is specified for y06, “2 bits” is set for stop bit.
When “1”, “2”, or “3” is specified for y06, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol[*1]</td><td>0: Modbus RTU
1: SX (loader) protocol
2: FGI-bus</td><td>0</td></tr>
<tr><td>y11</td><td rowspan="5">RS-485 setting 2 (control circuit)</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>y14</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y16</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y17</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When “0” is specified for y16, “2 bits” is set for stop bit.
When “1”, “2”, or “3” is specified for y16, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y20</td><td>Communication protocol[*1]</td><td>0: Modbus RTU
2: FGI-bus</td><td>0</td></tr>
<tr><td>y98</td><td colspan="2">Bus function</td><td><table><tr><th></th><th>Frequency</th><th>Operation Command</th></tr><tr><td>0</td><td>Function code H30</td><td>Function code H30</td></tr><tr><td>1</td><td>Commanded from the fieldbus</td><td>Function code H30</td></tr><tr><td>2</td><td>Function code H30</td><td>Commanded from the fieldbus</td></tr><tr><td>3</td><td>Commanded from the fieldbus</td><td>Commanded from the fieldbus</td></tr></table></td><td>0</td></tr>
</table>

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Commanded from the loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Commanded from the loader</td></tr>
<tr><td>3</td><td>Commanded from the loader</td><td>Commanded from the loader</td></tr>
</table>
</td><td>0</td></tr>
<tr><td>H30</td><td>Link function *2</td><td>
<table>
<tr><th></th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (control circuit)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (control circuit)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (control circuit)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (control circuit)</td></tr>
<tr><td>8</td><td>RS-485 communication (control circuit)</td><td>RS-485 communication (control circuit)</td></tr>
</table>
</td><td>3</td></tr>
</table>

*1 Select “Modbud RTU” for the communication protocol on the inverter when connecting with the V8.

*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the V8.
When making the frequency and operation command settings on the V8 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the V8 connected to the terminal block on control circuit, specify “8” for function code H30.

Available Memory

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

Memory	TYPE	Remarks
4	02H	

4.2.16 HFR-C9K

Communication Setting

Editor

Communication setting

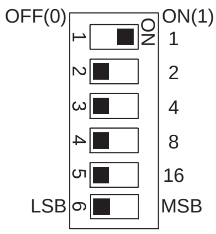
(Underlined setting: default)

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

IH Inverter

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

SW1 setting (Station address / Optional selection)

Switch	Contents		Example: Station Address: 1, Optional Selection: Selection for Communication Operation (Start from LSB)
1, 2, 3, 4, 5	Station Address*1	(see station address table below)	
6	Optional Selection	(see optional selection table below)	

Station address:

Address \ Switch	1	2	3	4	5
<u>0</u>	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
:	:	:	:	:	:
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Optional selection:

Contents	LSB	MSB
Selection for Communication Operation (Start from LSB)	<u>ON</u>	OFF
Selection for Communication Operation (Start from MSB)	OFF	ON

*1 For connection to a V8, be sure to set the station address other than 0.

Communication setting

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Function Code	Item	Setting	Example
F16	Baud rate	4: 4800 bps <u>5: 9600 bps</u> 6: 19200 bps	5
F17	Data length	0: 7 bit <u>1: 8 bits</u>	1
F18	Parity bit	0: None <u>1: Even</u> 2: Odd	1
F19	Stop bit	0: 1 bit <u>1: 2 bits</u>	1

Available Memory

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

Memory	TYPE	Remarks
---	00H	

4.2.17 HFR-C11K

Communication Setting

Editor

Communication setting

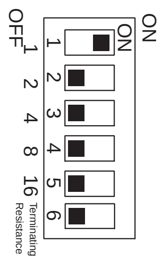
(Underlined setting: default)

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

IH Inverter

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

SW3 setting (Station address / Terminating resistance)

Switch	Contents	Example Station Address: 1 Terminating Resistance: None
1, 2, 3, 4, 5	Station Address*1	
6	Terminating Resistance	

Station Address*1:

Address \ Switch	1	2	3	4	5
0	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF
:	:	:	:	:	:
28	OFF	OFF	ON	ON	ON
29	ON	OFF	ON	ON	ON
30	OFF	ON	ON	ON	ON
31	ON	ON	ON	ON	ON

Terminating Resistance:

Contents	OFF	ON
Terminating resistance	None	Provided

*1 For connection to a V8, be sure to set the station address other than 0.

Communication setting

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Function Code	Item	Setting	Example
r 04	Baud rate	2: 4800 bps 3: 9600 bps 4: 19200 bps	3
r 05	Data length	0: 8 bit 1: 7 bits	1
r 06	Parity bit	0: None 1: Even 2: Odd	1
r 07	Stop bit	0: 2 bit 1: 1 bits	1
r 10	Communication protocol*	0: FGI-bus 1: C9K mode	0

* RS-485 communication is available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set “11 (RS485 communication selection (RS))” for function code i01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X5 can also be used. Set the function code corresponding to the digital input terminal to use.

Available Memory

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

Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	
F	(basic function)	02H	
E	(error display function)	03H	
C	(control function)	04H	
P	(optional function)	05H	
H	(high level function)	06H	
o	(output terminal function)	08H	
i	(input terminal function)	0BH	
t	(control function in the event of trip (alarm) occurrence)	0CH	
r	(RS communication function)	0DH	
Pn	(touch panel function)	0EH	

PLC_CTL

Content	F0	F1 (=$u n)		F2
Reset command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	

4.2.18 PPMC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	Do not change the default setting because the setting on the AC power monitor cannot be changed.
Parity	None / Even / Odd	
Target Port No.	1 to 31	

AC Power Monitor

The communication parameters can be set using keys attached to the front of the AC power monitor.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter		Item	Setting	Example
Setting condition 2	Item number 2	ID number	1 to 31 (default: unit number*1)	1
	Item number 3	Communication protocol selection	nor: Dedicated protocol rtu: Modbus RTU protocol *2	rtu
	Item number 7	Baud rate	9.6: 9600 bps 19.2: 19200 bps 4.8: 4800 bps	9.6
	Item number 8	Data length, parity	8n: Data length 8 bits, without parity 8o: Data length 8 bits, odd parity 8E: Data length 8 bits, even parity	8n

* The communication function of the AC power monitor can be selected at the time of purchase. Select a model on which RS-485/RS-232C communication is available.
*1 The unit number is set for the ID number upon delivery. The unit number is indicated on the instruction plate attached to the side of the case.
*2 Select "rtu (Modbus RTU)" for the communication protocol when communicating with the V8.

Available Memory

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

Memory	TYPE	Remarks
4 (holding register)	02H	
3 (input register)	03H	Read only

* Remarks on data format for the following memory:
40022 (fixed voltage), 40028 (Ip fixed power factor): 6-byte character string
40046 (calendar): 14-byte character string
Measurement data: real type (Float)
40060 (alarm clear), 40062 (amount of power clear), 40064 (cumulative value of invalid power clear): write only

4.2.19 FALDIC-α Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u> / Multi-link2	
Signal Level	<u>RS-422/485</u>	Do not change the default setting other than baud rate because the setting on the servo amplifier cannot be changed.
Baud Rate	<u>9600</u> / 19200 / 38400 bps	
Data Length	<u>8</u> bits	
Stop Bit	<u>1</u> bit	
Parity	<u>Even</u>	
Target Port No.	1 to 31	

Servo Amplifier

Set the communication parameters using the touch panel mounted on the servo amplifier.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter			Item	Setting	Example
Pn002 System parameter	PP096	(No. 96)	Station number	<u>1</u> to 31	1
	PP097	(No. 97)	Baud rate	<u>0: 9600 bps</u> 1: 19200 bps 2: 38400 bps	0

*1 The communication function of the servo amplifier can be selected at the time of purchase. Select a model on which host interface: universal communication (RS-485) is available.

Available Memory

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

Memory		TYPE	Remarks
00	(monitor data)	00H	Double-word, read only
01	(data on positioning being executed)	01H	Double-word, read only
10	(sequence mode)	02H	Read only
11	(control input/output signal)	03H	Read only
12	(alarm detection log)	04H	Read only
13	(detected alarm contents)	05H	Read only
20	(standard parameter)	06H	Double-word *1
21	(system parameter)	07H	Double-word *1
30	(positioning data)	08H	Double-word *2
40	(control command)	09H	Double-word, write only

*1 Input a parameter number by manual operation.
*2 Address denotations XXYY

Address
Positioning data number (01H - 63H)

PLC_CTL

Contents	F0	F1 (= $u n)		F2
Positioning data (immediate) setting	1 - 8 (PLC1 - 8)	n	Station number	6
		n + 1	Command: 9	
		n + 2	ABS/INC	
		n + 3	Speed selection	
		n + 4 to n + 5	Position data	
Automatic start (immediate)	1 - 8 (PLC1 - 8)	n	Station number	6
		n + 1	Command: 11	
		n + 2	ABS/INC	
		n + 3	Speed selection	
		n + 4 to n + 5	Position data	
Automatic start (positioning data number)	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 12	
		n + 2	Start number	
Override setting	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 33	
		n + 2	Data type	
		n + 3	Setting	

4.2.20 PHR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-422/485	Do not change the default settings of the signal level, data length and stop bit because these settings on the recorder cannot be changed.
Baud Rate	9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Even / Odd	
Target Port No.	1 to 31	

Recorder

The communication parameters can be set using keys attached to the front of the recorder.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter	Setting	Example	Remarks
Modbus station No.	1 to 31	1	
Modbus baud rate	9600 / 19200 bps	19200 bps	
Modbus parity	None / Even / Odd	Odd	
Front communication function	ON / OFF	ON	Be sure to set to “ON”.

* The communication function of the recorder can be selected at the time of purchase. Select a model on which RS-485 communication is available.

Available Memory

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

Memory		TYPE	Remarks
4	(holding register)	02H	
3	(input register)	03H	

4.2.21 WA5000

Communication Setting

Editor

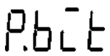
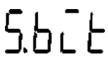
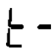
Communication setting

(Underlined setting: default)

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

Digital Panel Meter

The communication parameters can be set using keys attached to the front of the digital panel meter.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter		Item	Setting	Example	Remarks
	BAUD	Baud rate setting	4800: 4800 9600: 9600 192: 19200 384: 38400	9600	
	DATA	Data length setting	7: 7 bits 8: 8 bits	7 bits	
	P.BIT	Parity bit setting	E: Even o: Odd n: None	E: Even	
	S.BIT	Stop bit setting	2: 2 bits 1: 1 bit	2: 2 bits	
	T-	Delimiter setting	cr.LF: CR/LF cr: CR	cr.LF: CR/LF	
	ADR	Unit ID setting	01 to 31 (default: 00)	01	Specify a value when using RS-485 connection.

* The communication function of the temperature controller can be selected with the output unit specified at the time of purchase. Select a model on which RS-485/RS-232C communication is available.

Available Memory

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

Memory	TYPE	Remarks
DSP (display)	00H	
CMP (comparator)	01H	
SCL (scaling)	02H	
CAL1 (calibration 1)*1	03H	
CAL2 (calibration 2)	04H	

*1 To perform zero calibration (0000), specify a value other than 0.

PLC_CTL

Contents	F0	F1 (=$u n)		F2
Hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
		n + 2	Hold status 0: OFF, 1: ON	
Hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
		n + 2	Hold status 0: OFF, 1: ON	
Hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	Hold status 0: OFF, 1: ON	
Trigger input	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 3	
		n + 2	Display type 0: Normal display 1: Over display 2: Peak hold display 3: Valley hold display 4: Peak valley hold display	
		n + 3	Measurement value	
		n + 4	Comparison result 0: OFF 1: HI 2: GO 3: LO	
Hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Peak hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 5	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
		n + 3	Peak hold status 0: OFF, 1: ON	
Peak hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6	
		n + 2	Peak hold status 0: OFF, 1: ON	
Peak hold type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 7	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peak hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 8	
		n + 2	Peak hold remote 0: OFF, 1: ON	
Peak hold value response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	Peak hold value	
		n + 3	Valley hold value	
		n + 4	Peak valley hold value	
Peak hold value clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 10	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peal hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	

Contents	F0	F1 (=$u n)		F2
Digital zero remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 12	
		n + 2	Digital zero 0: OFF, 1: ON	
		n + 3	Displayed value	
Digital zero terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 13	
		n + 2	Digital zero 0: OFF, 1: ON	
Digital zero remote control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 14	
		n + 2	Digital zero 0: OFF, 1: ON, 2: ON when the value reaches the set value	
		n + 3	Setting value	
Digital zero remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 15	
Comparison output remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 16	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 17	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 18	
Remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 19	
		n + 2	Remote control status Bit: - | 3 | 2 | 1 | 0 0: Hold function 1: Peak hold 2: Digital zero 3: Comparison output * No remote control is performed when all bits are reset (OFF).	
Maximum / minimum / (maximum - minimum) response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 20	
		n + 2	Maximum	
		n + 3	Minimum	
		n + 4	(Maximum - minimum)	
Maximum / minimum / (maximum - minimum) clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 21	
		n + 2	Maximum /minimum /(maximum - minimum) clear 0: Maximum 1: Minimum 2: Maximum - minimum	

Contents	F0	F1 (=$u n)		F2
Range response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 22	
		n + 2	Range 0: No designation 12: J 1: Range 11 13: T 2: Range 12 14: R 3: Range 13 15: S 4: Range 14 16: B 5: Range 15 17: PA 6: Range 23 18: Pb 7: Range 24 19: JPA 8: Range 25 20: JPb 9: Range 26 21: 1V 10: KA 22: 2A 11: KB	
Range setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 23	
		n + 2	Range 1: Range 11 12: J 2: Range 12 13: T 3: Range 13 14: R 4: Range 14 15: S 5: Range 15 16: B 6: Range 23 17: PA 7: Range 24 18: Pb 8: Range 25 19: JPA 9: Range 26 20: JPb 10: KA 21: 1V 11: KB 22: 2A	
Average number of responses	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 24	
		n + 2	Average number of times 1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)	
Setting for average number of times	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 25	
		n + 2	Average number of times 1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)	
Average number of movement times	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 26	
		n + 2	Average number of movement times 0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)	
Setting for average number of movement times	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 27	
		n + 2	Average number of movement times 0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)	
Step-wide response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 28	
		n + 2	Step wide 1:1, 2:2, 5:5, 0:10 (digit)	
Step-wide setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 29	
		n + 2	Step wide 1:1, 2:2, 5:5, 0:10 (digit)	
Communication function parameter response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 30	
		n + 2	Baud rate 0: 2400, 1: 4800, 2: 9600, 3: 19200, 4: 38400	
		n + 3	Data length 0: 7 bits, 1: 8 bits	
		n + 4	Parity 0: none, 1: odd, 2: even	
		n + 5	Stop bit 0: 1 bit, 1: 2 bits	
		n + 6	Delimiter 0: CR/LF, 1: CR	

Contents	F0	F1 (=$u n)		F2
Communication function parameter setting	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 31	
		n + 2	Baud rate 0: 2400, 1: 4800, 2: 9600, 3: 19200, 4: 38400	
		n + 3	Data length 0: 7 bits, 1: 8 bits	
		n + 4	Parity 0: none, 1: odd, 2: even	
		n + 5	Stop bit 0: 1 bit, 1: 2 bits	
		n + 6	Delimiter 0: CR/LF, 1: CR	
Unit ID response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 32	
		n + 2	Unit ID 1 to 99	
Unit ID setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 33	
		n + 2	Unit ID 1 to 99	
Analog output type response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 34	
		n + 2	Analog output type 0: Not provided 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Analog output type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 35	
		n + 2	Analog output type 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Digital zero backup status response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 36	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero backup control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 37	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero data save command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 38	
Input change response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 39	
		n + 2	Input change 0: Not provided 1: Open collector 2: Logic 3: Magnetic	
Input change setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 40	
		n + 2	Input change 1: Open collector 2: Logic 3: Magnetic	

Contents	F0	F1 (=$u n)		F2
Tracking zero response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 41	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
		n + 3	Tracking zero width 0 (OFF) / 1 to 99	
Tracking zero time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 42	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
Tracking zero width setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 43	
		n + 2	Tracking zero width 0 (OFF) /1 to 99	
Sensor power response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 44	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Sensor power setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 45	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Power-on delay time response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 46	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	
Power-on delay time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 47	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	
Protection response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 48	
		n + 2	Protect 0: OFF 1: ON	
Protection setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 49	
		n + 2	Protect 0: OFF 1: ON	
Unit No. response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 50	
		n + 2	Input unit number 1 to 18	
		n + 3	Output unit number 0 to 7	
Response to prohibition of key operations	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 51	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Prohibition of key operations setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 52	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Response to linearizing function status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 53	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	

Contents	F0	F1 (=$u n)		F2
Linearizing function status setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 54	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	
Response to the number of linearization correction data	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 55	
		n + 2	Linearization correction data 0 (clear) to 16	
The number of linearization correction data setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 56	
		n + 2	Linearization correction data 1 to 16	
Response to linearization data	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 57	
		n + 2	Read start number 1 to 16	
		n + 3	The number of read data 1 to 16	
		n + 4	Linearization data input value (start number + 0)	
		n + 5	Linearization data output value (start number + 0)	
		n + 6	Linearization data input value (start number + 1)	
		n + 7	Linearization data output value (start number + 1)	
		n + 8	Linearization data input value (start number + 2)	
		n + 9	Linearization data output value (start number + 2)	
		n + 10	Linearization data input value (start number + 3)	
		n + 11	Linearization data output value (start number + 3)	
		n + 12	Linearization data input value (start number + 4)	
		n + 13	Linearization data output value (start number + 4)	
		n + 14	Linearization data input value (start number + 5)	
		n + 15	Linearization data output value (start number + 5)	
		n + 16	Linearization data input value (start number + 6)	
		n + 17	Linearization data output value (start number + 6)	
		n + 18	Linearization data input value (start number + 7)	
		n + 19	Linearization data output value (start number + 7)	
		n + 20	Linearization data input value (start number + 8)	
		n + 21	Linearization data output value (start number + 8)	
		n + 22	Linearization data input value (start number + 9)	
		n + 23	Linearization data output value (start number + 9)	
		n + 24	Linearization data input value (start number + 10)	
		n + 25	Linearization data output value (start number + 10)	
		n + 26	Linearization data input value (start number + 11)	
		n + 27	Linearization data output value (start number + 11)	
		n + 28	Linearization data input value (start number + 12)	
		n + 29	Linearization data output value (start number + 12)	
		n + 30	Linearization data input value (start number + 13)	
		n + 31	Linearization data output value (start number + 13)	
		n + 32	Linearization data input value (start number + 14)	
		n + 33	Linearization data output value (start number + 14)	4
		n + 34	Linearization data input value (start number + 15)	
		n + 35	Linearization data output value (start number + 15)	

Contents	F0	F1 (=$u n)		F2
Linearization data setting	1 - 8 (PLC1 - 8)	n	Station number	6 , 36
		n + 1	Command: 58	
		n + 2	Read start number 1 to 16	
		n + 3	The number of read data 1 to 16	
		n + 4	Linearization data input value (start number + 0)	
		n + 5	Linearization data output value (start number + 0)	
		n + 6	Linearization data input value (start number + 1)	
		n + 7	Linearization data output value (start number + 1)	
		n + 8	Linearization data input value (start number + 2)	
		n + 9	Linearization data output value (start number + 2)	
		n + 10	Linearization data input value (start number + 3)	
		n + 11	Linearization data output value (start number + 3)	
		n + 12	Linearization data input value (start number + 4)	
		n + 13	Linearization data output value (start number + 4)	
		n + 14	Linearization data input value (start number + 5)	
		n + 15	Linearization data output value (start number + 5)	
		n + 16	Linearization data input value (start number + 6)	
		n + 17	Linearization data output value (start number + 6)	
		n + 18	Linearization data input value (start number + 7)	
		n + 19	Linearization data output value (start number + 7)	
		n + 20	Linearization data input value (start number + 8)	
		n + 21	Linearization data output value (start number + 8)	
		n + 22	Linearization data input value (start number + 9)	
		n + 23	Linearization data output value (start number + 9)	
		n + 24	Linearization data input value (start number + 10)	
		n + 25	Linearization data output value (start number + 10)	
		n + 26	Linearization data input value (start number + 11)	
		n + 27	Linearization data output value (start number + 11)	
		n + 28	Linearization data input value (start number + 12)	
		n + 29	Linearization data output value (start number + 12)	
		n + 30	Linearization data input value (start number + 13)	
		n + 31	Linearization data output value (start number + 13)	
		n + 32	Linearization data input value (start number + 14)	
		n + 33	Linearization data output value (start number + 14)	
		n + 34	Linearization data input value (start number + 15)	
		n + 35	Linearization data output value (start number + 15)	

Return data: Data stored from the panel meter to the V8

4.2.22 APR-N (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

AC Power Regulator

The communication parameter can be set using keys attached to the front of the AC power regulator.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Function Code	Item	Setting	Example
6.o02	Setting device selection*	APd: Setting indicator nEt: Network device APr: APR main unit	nEt
7.n01	Communication protocol selection*	m-S: Master / slave parallel operation nEt: MODBUS RTU	nEt
7.n02	Station address	A000: 0 ⋮ A031: 31 (default: A001: 1)	A001
7.n04	Baud rate selection	4800: 4800 bps 9600: 9600 bps 1.920: 19200 bps 3.840: 38400 bps	9600
7.n05	Parity bit + Stop bit selection	P0: Without parity, Stop bit 2 bits P1: Even parity, Stop bit 1 bits P2: Odd parity, Stop bit 1 bits P3: Without parity, Stop bit 1 bits	P2

* For communication with V8, select "Network device" for the setting device selection and "MODBUS RTU" for the communication protocol selection on this regulator.

Available Memory

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

Memory	TYPE	Remarks
---	02H	Byte address

Indirect Memory Designation

- For word designation, specify the memory No. (address) in even address.
  Example: To make the memory setting of "output setting" for the function code 1.b01;
  Specify "2" in the memory No. (address).
- For bit designation, it is possible to specify the memory No. (address) in both even and odd address.
  Specify "00H" for the extensional code because the setting range for the bit address is 0 to 7.
  Example: To make the memory setting of "gradient setting selection" for the function code 1.b09;
  Specify "1" in the memory No. (address), "00H" for the extensional code, and "00" or "01" in the bit No..

4.2.23 ALPHA5 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo Amplifier

Set communication parameters.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extensional Function Setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps	0
	PA2_93	(No. 93)	Parity bit / Stop bit selection	0: Even parity, Stop bit 1 bits 1: Odd parity, Stop bit 1 bits 2: Without parity, Stop bit 1 bits 3: Even parity, Stop bit 2 bits 4: Odd parity, Stop bit 2 bits 5: Without parity, Stop bit 2 bits	0
	PA2_97	(No. 97)	Communication protocol selection*	0: PC Loader protocol 1: MODBUS RTU	1

* For communication with V8, select “MODBUS RTU” for the communication protocol selection on the servo amplifier.

Available Memory

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

Memory		TYPE	Remarks
00	(communication CONT / OUT signals)	00H	Double-word*
01	(monitor)	01H	Double-word, read only
02	(sequence monitor)	02H	Double-word, read only
03	(various commands)	03H	Double-word
04	(parameter)	04H	Double-word
05	(immediate value data)	05H	Double-word

* Communication OUT signal is read only.

PLC_CTL

Contents	F0	F1 (=$u n)		F2
Positioning data reading	1 - 8 (PLC1 - 8)	n	Station number	4
		n+1	Command: 03 (HEX)	
		n+2	Reading memory address	
		n+3	Reading positioning data count: m (1 to 9)	
		n+4	Positioning data m = 1 — Positioning status and M code Bit 15 to 8: M code Bit 7, 6: Not used Bit 5: M code output timing Bit 4: M code valid/invalid Bit 3: Not used Bit 2, 1: Step mode Bit 0: Command mode	
		n+5	Stop timer	
		n+6 to n+7	Stop position	
		n+8 to n+9	Rotation speed	
		n+10 to n+11	Acceleration time	
		n+12 to n+13	Deceleration time	
		n+14 to n+(3+10m)	Positioning data (m = 2)	
Positioning data writing	1 - 8 (PLC1 - 8)	n	Station number	4+10m
		n+1	Command: 10 (HEX)	
		n+2	Writing memory address	
		n+3	Writing positioning data count: m (1 to 9)	
		n+4	Positioning data m = 1 — Positioning status and M code Bit 15 to 8: M code Bit 7, 6: Not used Bit 5: M code output timing Bit 4: M code valid/invalid Bit 3: Not used Bit 2, 1: Step mode Bit 0: Command mode	
		n+5	Stop timer	
		n+6 to n+7	Stop position	
		n+8 to n+9	Rotation speed	
		n+10 to n+11	Acceleration time	
		n+12 to n+13	Deceleration time	
		n+14 to n+(3+10m)	Positioning data (m = 2)	

Return data: Data stored from the servo amplifier to the V8

4.2.24 WE1MA (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 / Even / Odd	
Target Port No.	1 to 31	

Electronic Multimeter

The communication parameter can be set using keys attached to the front of the electronic multimeter.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor. (Underlined setting: default)

Setting Component	Setting No.	Item	Setting	Example
Adr	231C	Station address	1 to 31	1
bPS	232C	Baud rate	4800 / 9600 / 19200 / 38400 bps	9600
PAr	233C	Parity bit	E: Even o: Odd -: None	E
StoP	234C	Stop bit	1 / 2 bits	1

Available Memory

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

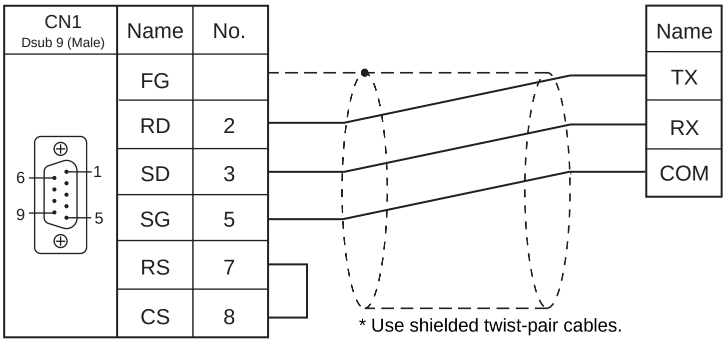
Memory		TYPE	Remarks
1	(input relay)	01H	Read only
4	(holding register)	02H	
3	(input register)	03H	Read only

4.2.25 Wiring Diagrams

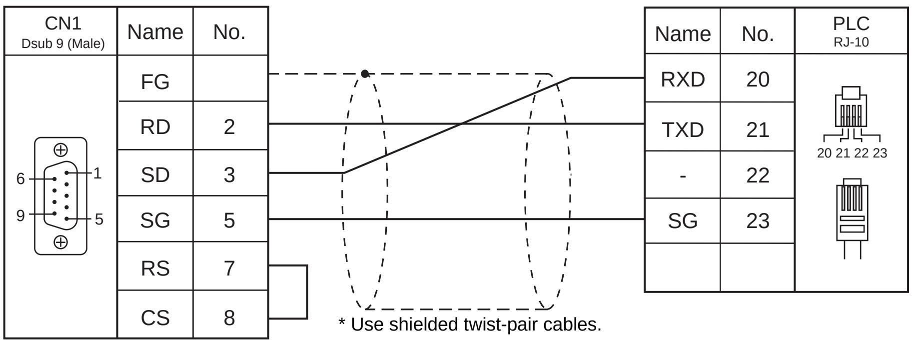
When Connected at CN1:

RS-232C

Wiring diagram 1 - C2

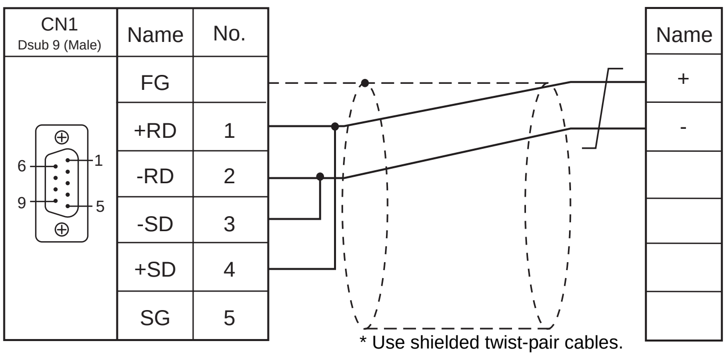


Wiring diagram 2 - C2

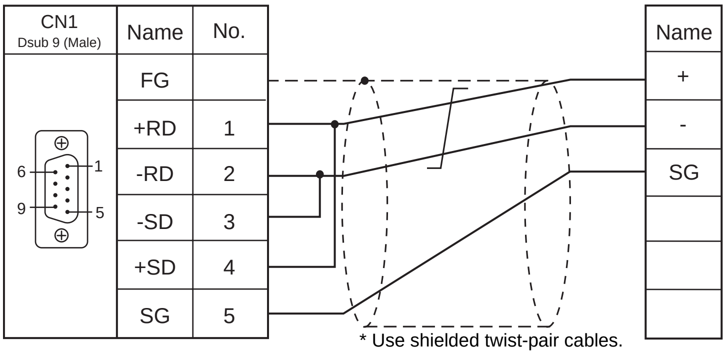


RS-422/RS-485

Wiring diagram 1 - C4

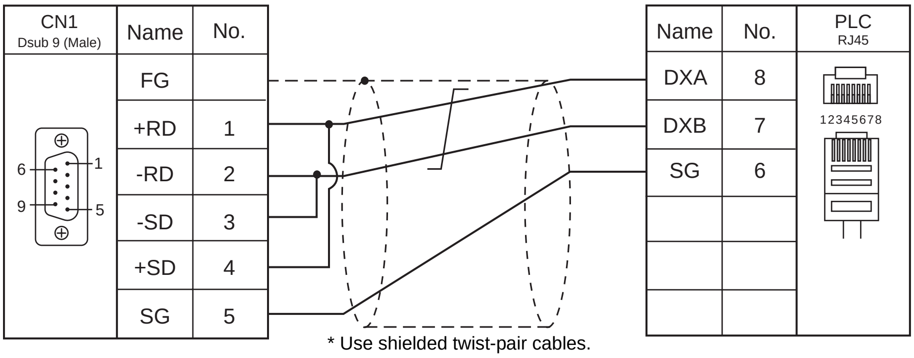


Wiring diagram 2 - C4



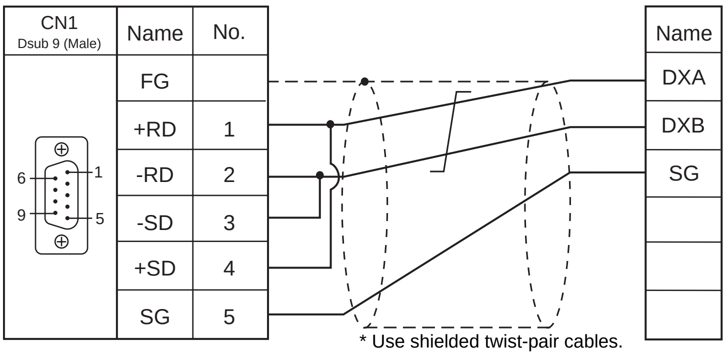
* Use shielded twist-pair cables.

Wiring diagram 3 - C4



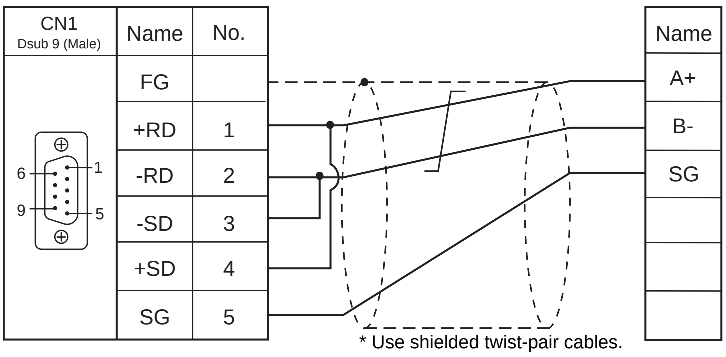
* Use shielded twist-pair cables.

Wiring diagram 4 - C4



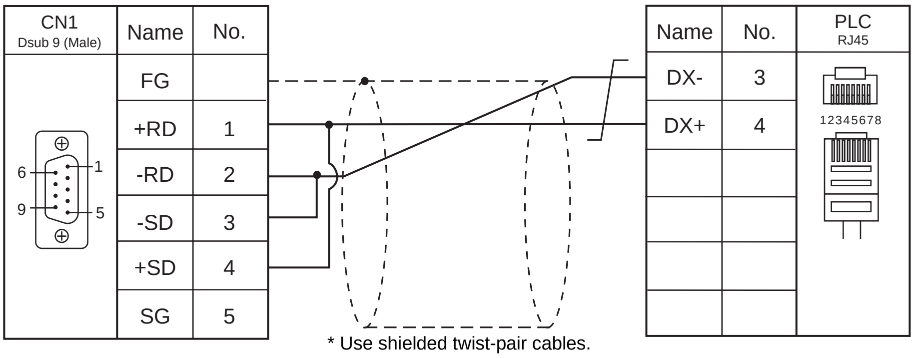
* Use shielded twist-pair cables.

Wiring diagram 5 - C4

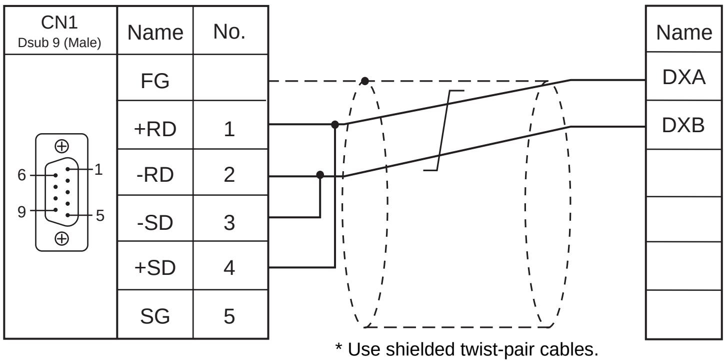


* Use shielded twist-pair cables.

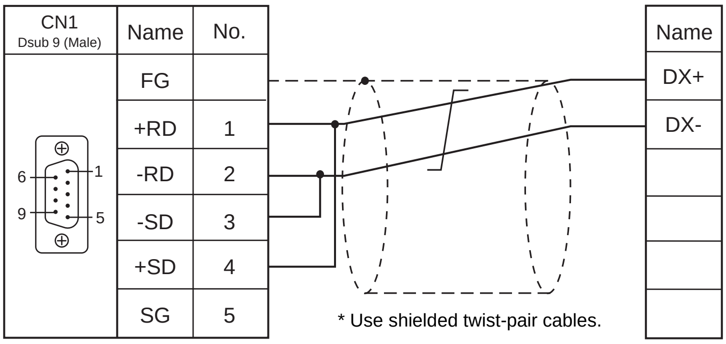
Wiring diagram 6 - C4



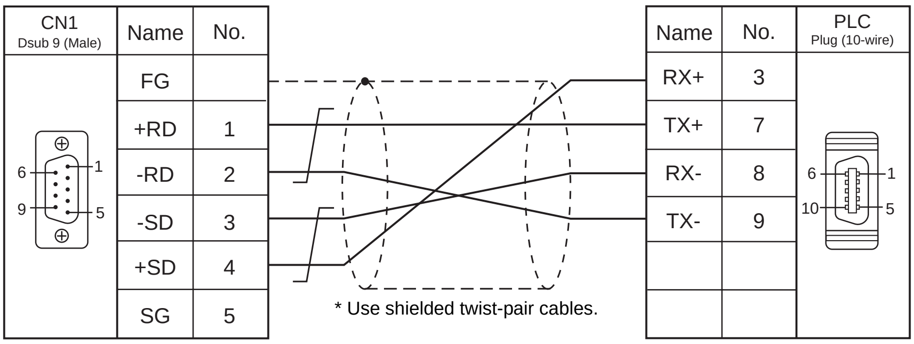
Wiring diagram 7 - C4



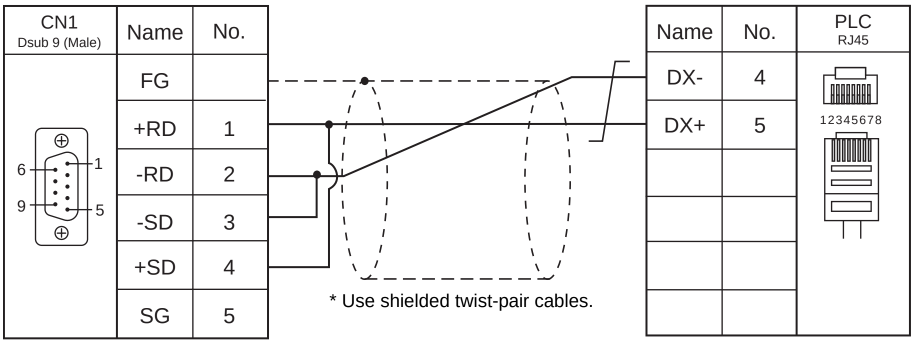
Wiring diagram 8 - C4



Wiring diagram 9 - C4

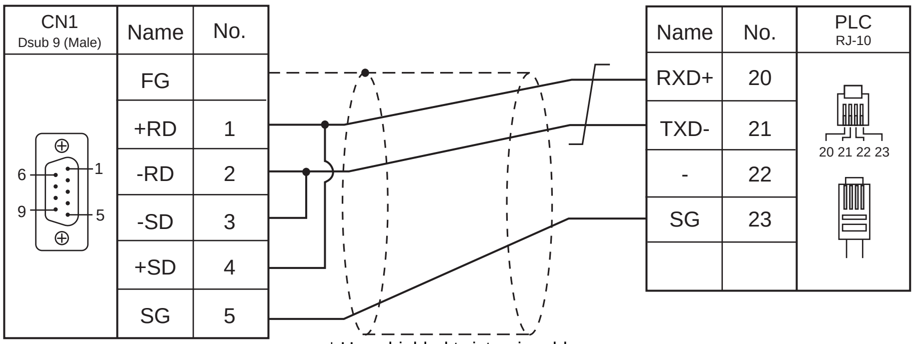


Wiring diagram 10 - C4



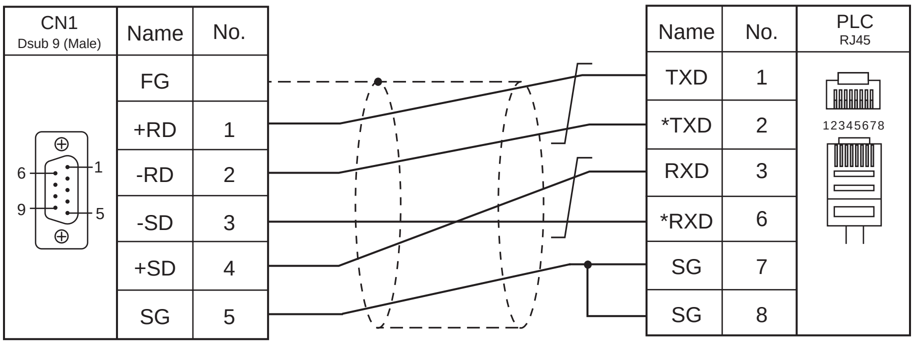
* Use shielded twist-pair cables.

Wiring diagram 11 - C4



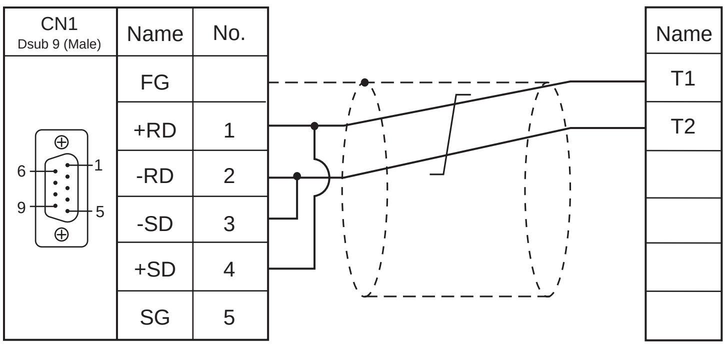
* Use shielded twist-pair cables.

Wiring diagram 12 - C4



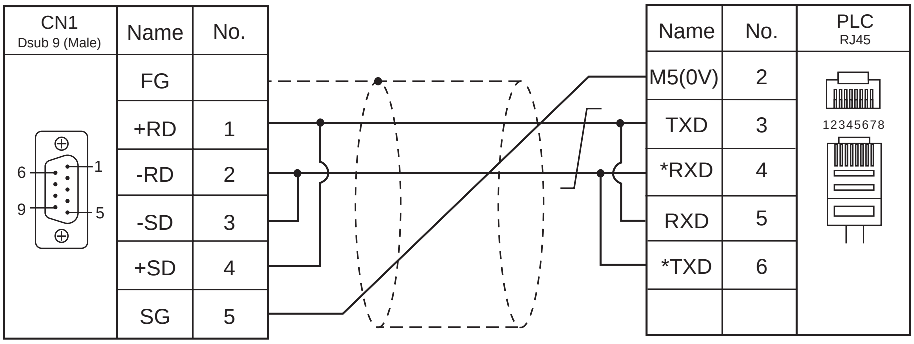
* Use shielded twist-pair cables.

Wiring diagram 13 - C4



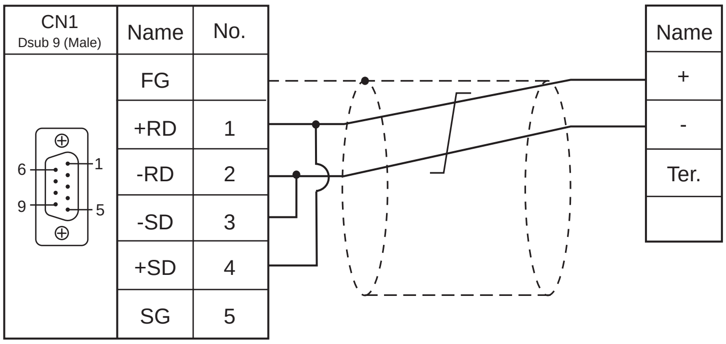
* Use shielded twist-pair cables.

Wiring diagram 14 - C4



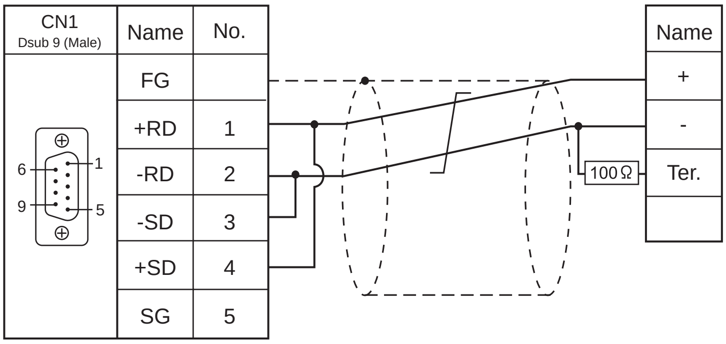
* Use shielded twist-pair cables.

Wiring diagram 15 - C4



* Use shielded twist-pair cables.

Wiring diagram when connecting V8 to the electronic multimeter located at the terminal

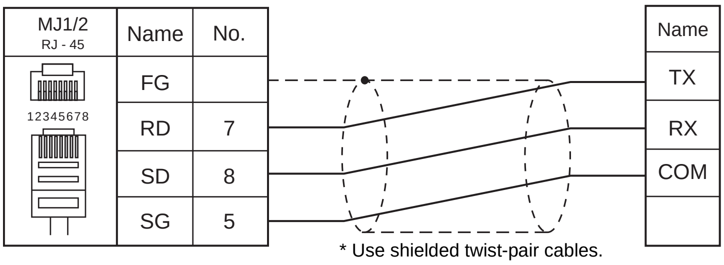


* Use shielded twist-pair cables.

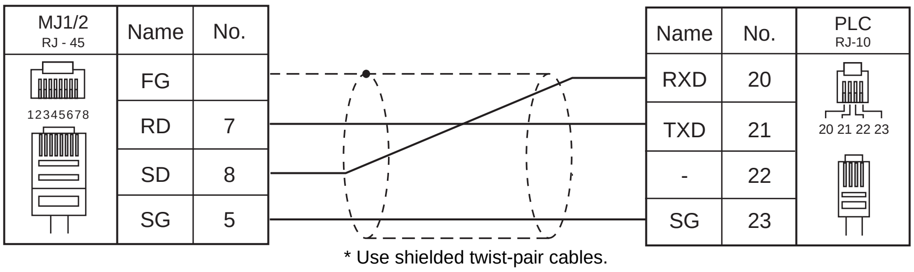
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

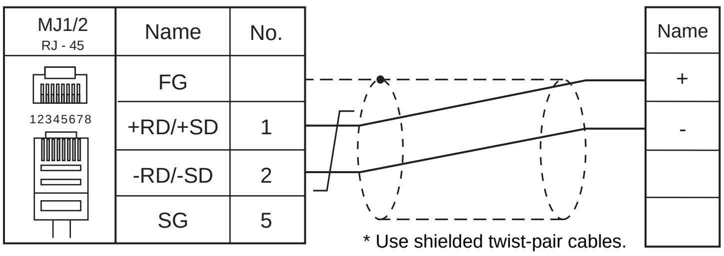


Wiring diagram 2 - M2

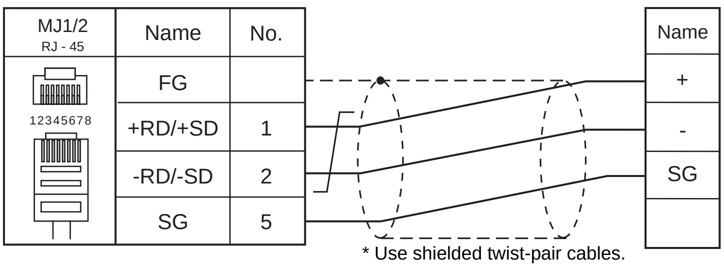


RS-422/RS-485

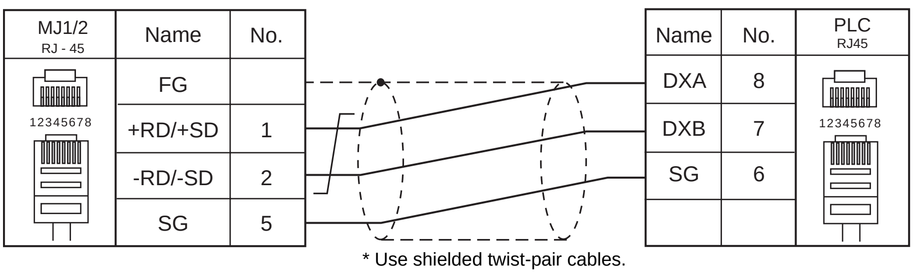
Wiring diagram 1 - M4



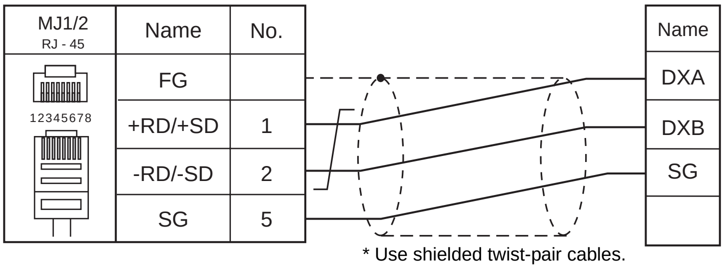
Wiring diagram 2 - M4



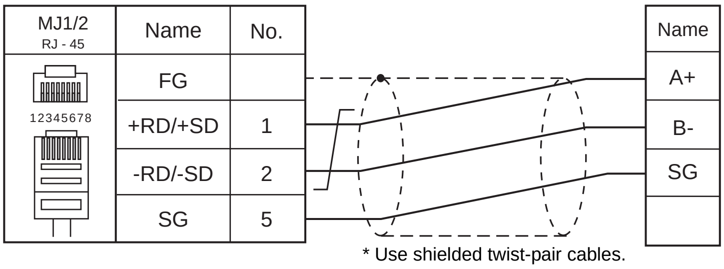
Wiring diagram 3 - M4



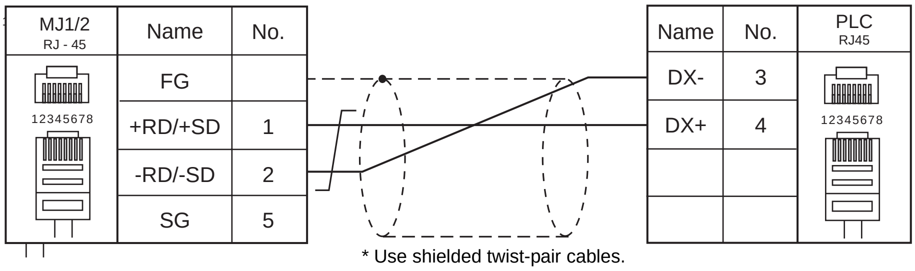
Wiring diagram 4 - M4



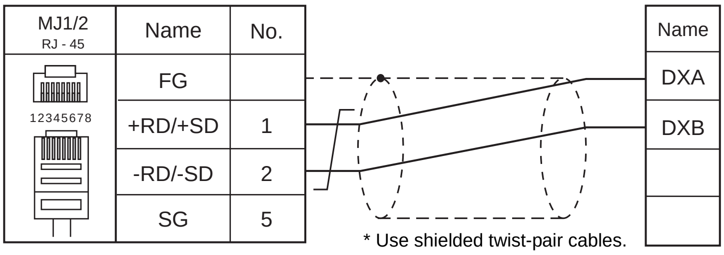
Wiring diagram 5 - M4



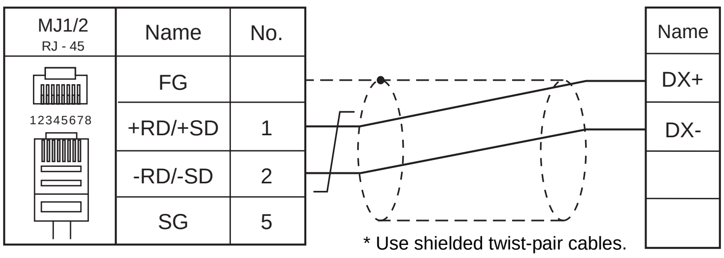
Wiring diagram 6 - M4



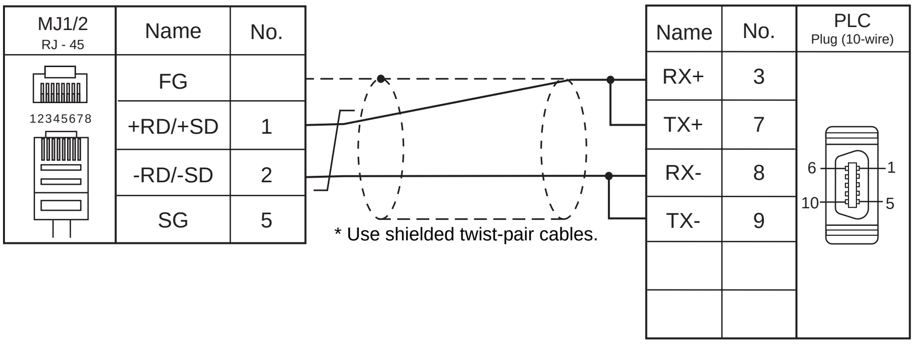
Wiring diagram 7 - M4



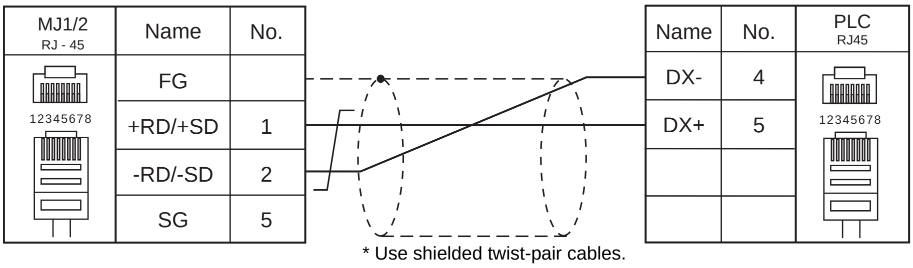
Wiring diagram 8 - M4



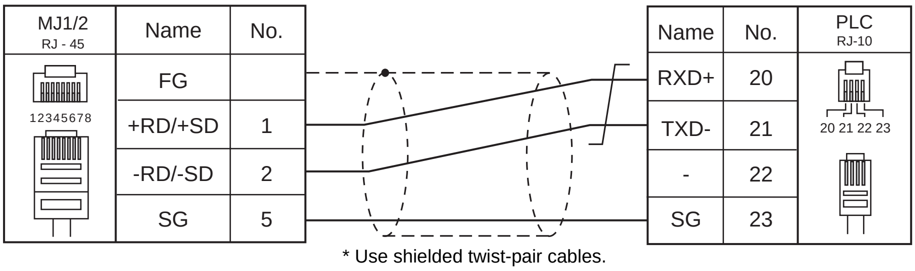
Wiring diagram 9 - M4



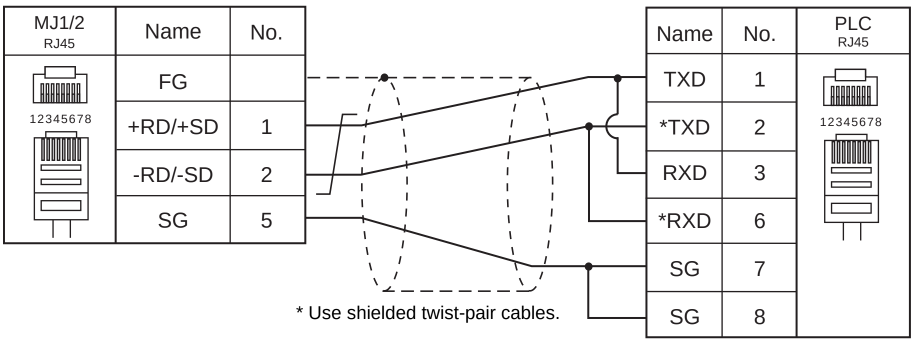
Wiring diagram 10 - M4



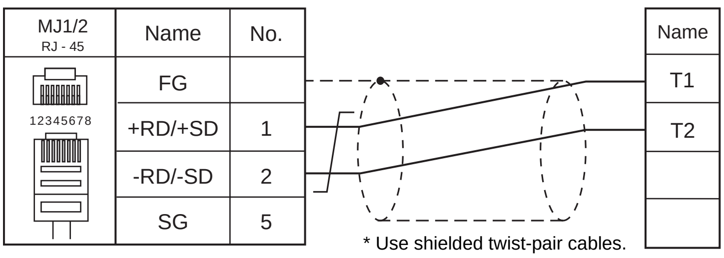
Wiring diagram 11 - M4



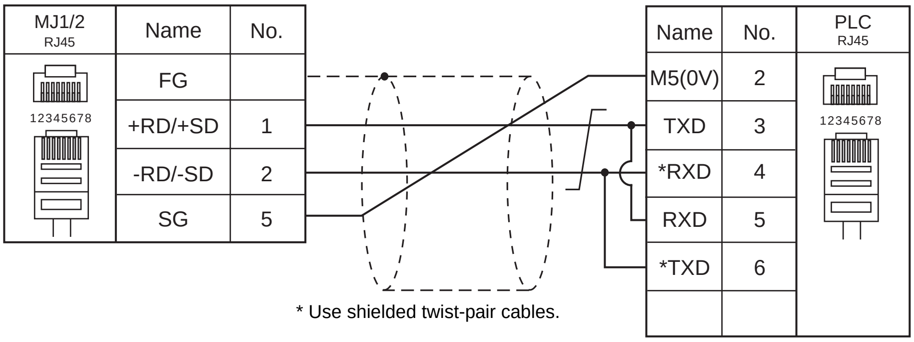
Wiring diagram 12 - M4



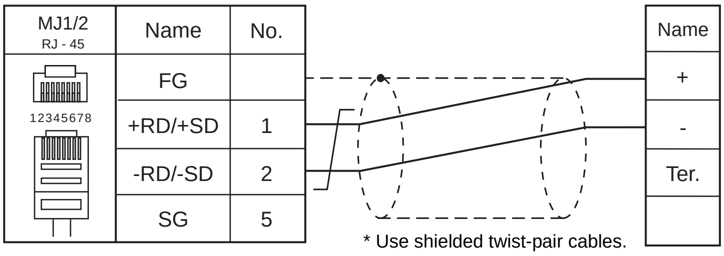
Wiring diagram 13 - M4



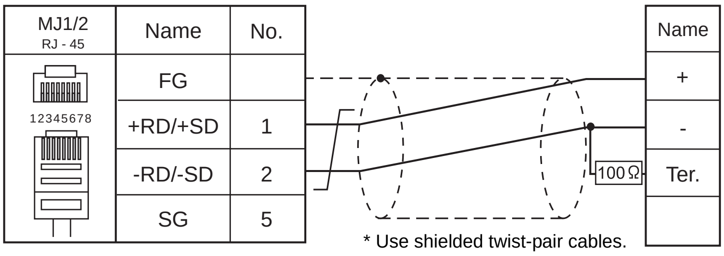
Wiring diagram 14 - M4



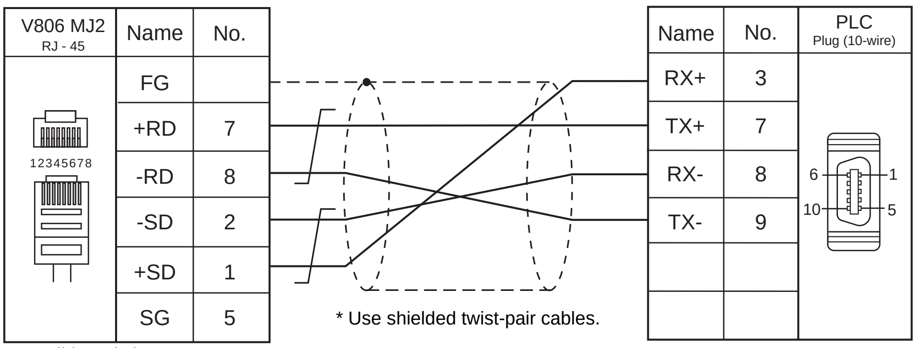
Wiring diagram 15 - M4



Wiring diagram when connecting V8 to the electronic multimeter located at the terminal

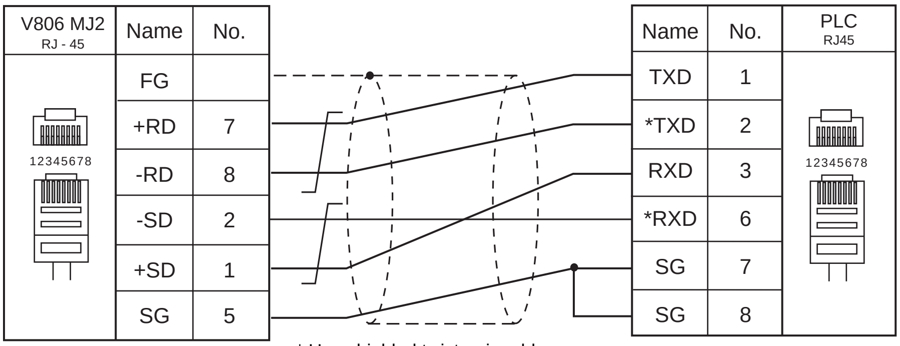


Wiring diagram 16 - M4



* Slide switch on V806:
RS-422 (lower)

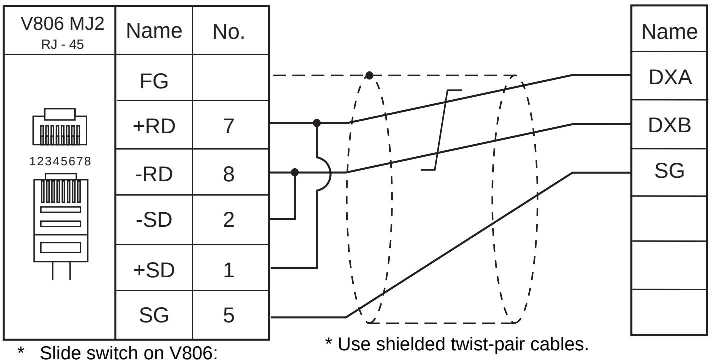
Wiring diagram 17 - M4



* Slide switch on V806:
RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 18 - M4



* Slide switch on V806:
RS-422 (lower)

* Use shielded twist-pair cables.

5. GE Fanuc

5.1 PLC Connection

Serial Connection

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2">Unit/Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Ladder Transfer *1</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td rowspan="2">90 series
(SNP-X)</td><td>IC698CPE010
IC698CPE020
IC698CRE020
IC697CPU731
IC697CPX772
IC697CPX782
IC697CPX928
IC697CPX935
IC697CPU780
IC697CGR772
IC697CGR935
IC697CPU789
IC697CPM790</td><td>IC697CMM711</td><td rowspan="2">RS-422</td><td rowspan="2">Wiring diagram 1 - C4</td><td rowspan="2">×</td><td rowspan="2">Wiring diagram 1 - M4</td><td rowspan="2">×</td></tr>
<tr><td>IC693CPU350
IC693CPU360
IC693CPU363
IC693CPU364
IC693CPU366
IC693CPU367
IC693CPU374</td><td>COM port of the CPU</td></tr>
</table>

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

5.1.1 90 series (SNP-X)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

90 series (SNP-X)

Item		Setting	Remarks
Baud Rate		19200 bps	
Parity		Odd	
Transmission code	Data Length	8 bits	
	Stop Bit	1 bit	
Function		SNP-X	

Available Memory

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

Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	

Indirect Memory Designation

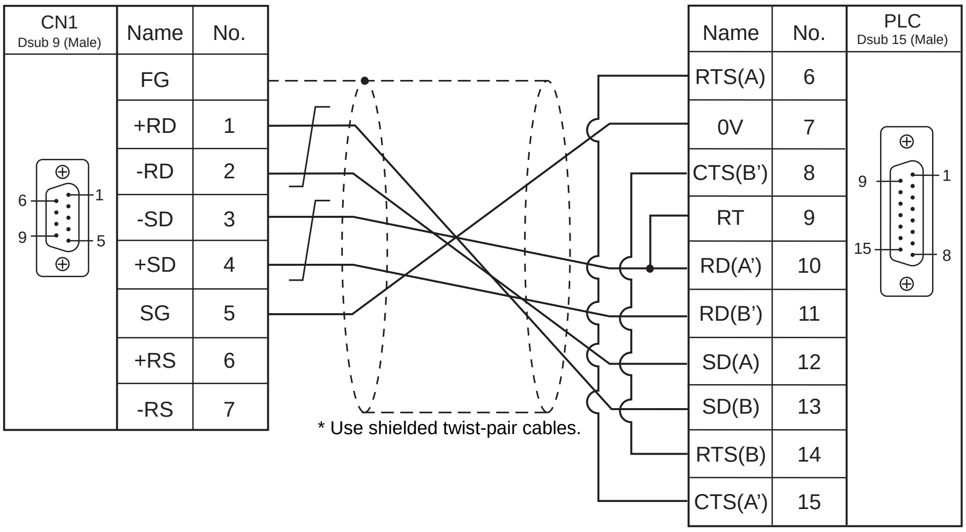
Specify the value subtracted “1” from the real memory address for the memory address No..

5.1.2 Wiring Diagrams

When Connected at CN1:

RS-422/RS-485

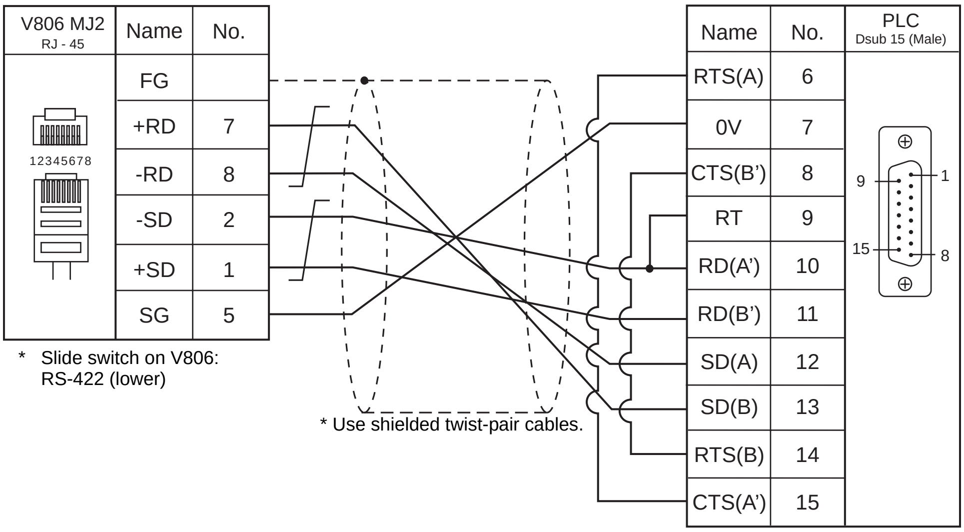
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4



* Slide switch on V806:
RS-422 (lower)

MEMO

Please use this page freely.

6. Hitachi

6.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer*4
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
HIDIC-S10/2α, S10mini	S10 2α	Interface on the CPU unit	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	×
	LQP000 LQP010 LQP011 LQP120	RS-232C connector on the CPU unit	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		LQE060 (CN1, CN2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		LQE160 (CN1, CN2)					
		LQE560 (CN1, CN2)					
		LQE165 (CN1, CN2)	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
		LQE565 (CN1, CN2)					
HIDIC-S10V	LQP510	UP LINK	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
		LQE560 (CN1, CN2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		LQE565 (CN1, CN2)	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer*1
HIDIC-S10/2α, S10mini (Ethernet)	S10mini	LQE020	○	×	4301 (max. 4 units)	×
		LQE520				
HIDIC-S10V (Ethernet)	LQP510	LQE520			4302 (max. 4 units)	
		LQP520			4302 to 4305 (1 each)	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

6.1.1 HIDIC-S10/2α, S10mini

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115k bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd
However, when the optional RS-232C/RS-422 module is used, the channel and the protocol must be set using the channel No./protocol setting switch.

Channel No./Protocol Setting Switch

A maximum of two RS-232C/RS-422 modules (four channels) can be attached to one CPU. When using multiple channels, set a unique channel number (#1 to #4) for each.

LQE060

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1

LQE160 / LQE165 / LQE560 / LQE565

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1
A		#2
E		#3

Available Memory

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

Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device

6.1.2 HIDIC-S10/2α, S10mini (Ethernet)

Editor

Make the following settings on the editor. For more information, see Appendix 2 Ethernet.

- IP address for the V8 unit
- V8 unit's port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC's IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

LQE020

Module No. setting switch

MODU NO	Contents	
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

ET. NET system

Specify the IP address and the subnet mask.

LQE520

Module No. setting switch

MODU NO	Contents	
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

S10V ET.NET system

Specify the IP address and the subnet mask.

Available Memory

Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device

6.1.3 HIDIC-S10V

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd
However, when the optional RS-232C/RS-422 module is used, the channel and the protocol must be set using the channel No./protocol setting switch.

Channel No./Protocol Setting Switch

A maximum of two RS-232C/RS-422 modules (four channels) can be attached to one CPU. When using multiple channels, set a unique channel number (#1 to #4) for each.

LQE560 / LQE565

MODU NO	Communication Mode	Channel No.
8	H-7338 protocol	#0
9		#1
A		#2
E		#3

Available Memory

Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device
LB	(work register)	15H	LBW as word device
LR	(work register 1 for ladder converter)	16H	LRW as word device
LV	(work register 2 for ladder converter)	17H	LVW as word device
LLL	(long-word work register)	18H	Double-word
LFF	(floating-point work register)	19H	
LWW	(word work register)	1AH	
LML	(long-word work register) backup area	1BH	Double-word
LGF	(floating-point work register) backup area	1CH	
LXW	(word work register) backup area	1DH	

6.1.4 HIDIC-S10V (Ethernet)

Editor

Make the following settings on the editor. For more information, see Appendix 2 Ethernet.

- IP address for the V8 unit
- V8 unit's port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC's IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

LQE520

Module No. setting switch

MODU NO	Contents	Remarks
0	Communication via 10BASE-5	
2	Communication via 10BASE-T	

S10V ET.NET

Specify the IP address and the subnet mask.

LQP520

Station No. setting switch

S/T NO	Setting	Contents
U L	0 0	Set IP address is valid.
	F F	192.192.192.1 is valid.

Standard system tool

Specify the IP address and the subnet mask.

Available Memory

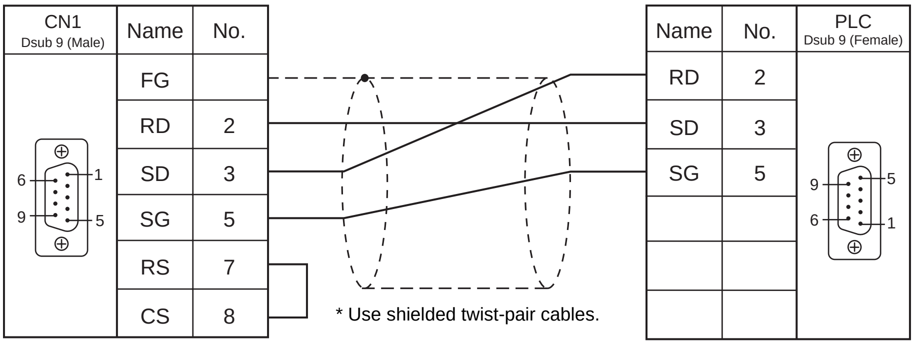
Memory		TYPE	Remarks
FW	(work register)	00H	
X	(input)	01H	XW as word device
Y	(output)	02H	YW as word device
R	(internal relay)	03H	RW as word device
G	(global link relay)	04H	GW as word device
K	(keep relay)	05H	KW as word device
T	(on-delay timer/contact)	06H	TW as word device
U	(one-shot timer/contact)	07H	UW as word device
C	(up/down counter/contact)	08H	CW as word device
TS	(on-delay timer/set value)	09H	
TC	(on-delay timer/enumerated value)	0AH	
US	(one-shot timer/set value)	0BH	
UC	(one-shot timer/enumerated value)	0CH	
CS	(up/down counter/set value)	0DH	
CC	(up/down counter/enumerated value)	0EH	
DW	(data register)	0FH	
E	(event register)	10H	EW as word device
S	(system register)	11H	SW as word device
J	(transfer register)	12H	JW as word device
Q	(receive register)	13H	QW as word device
M	(extensional internal register)	14H	MW as word device
LB	(work register)	15H	LBW as word device
LR	(work register 1 for ladder converter)	16H	LRW as word device
LV	(work register 2 for ladder converter)	17H	LVW as word device
LLL	(long-word work register)	18H	Double-word
LFF	(floating-point work register)	19H	
LWW	(word work register)	1AH	
LML	(long-word work register) backup area	1BH	Double-word
LGF	(floating-point work register) backup area	1CH	
LXW	(word work register) backup area	1DH	
A	(extensional internal register)	1EH	AW as word device
N	(nesting coil)	1FH	NW as word device
P	(process coil)	20H	PW as word device
V	(edge contact)	21H	VW as word device
Z	(Z register)	22H	ZW as word device
IW	(extensional input)	23H	
OW	(extensional output)	24H	
BD	(special internal register)	25H	

6.1.5 Wiring Diagrams

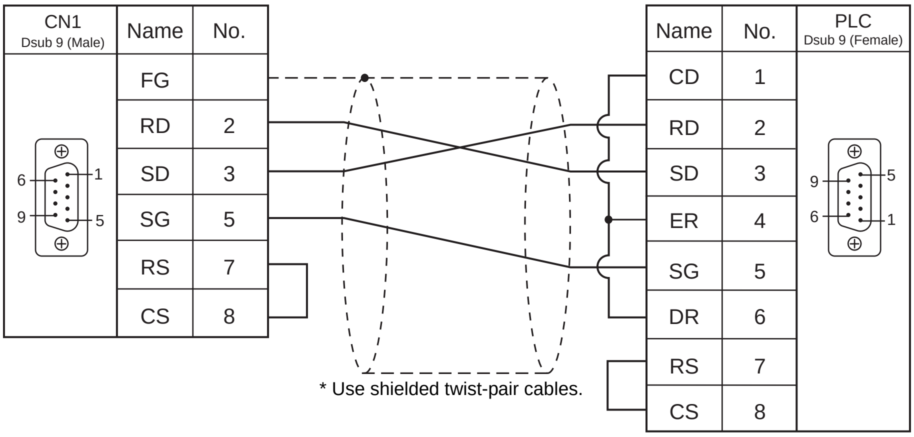
When Connected at CN1:

RS-232C

Wiring diagram 1 - C2



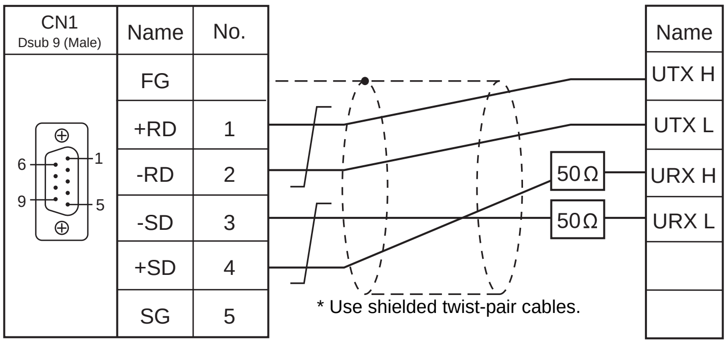
Wiring diagram 2 - C2



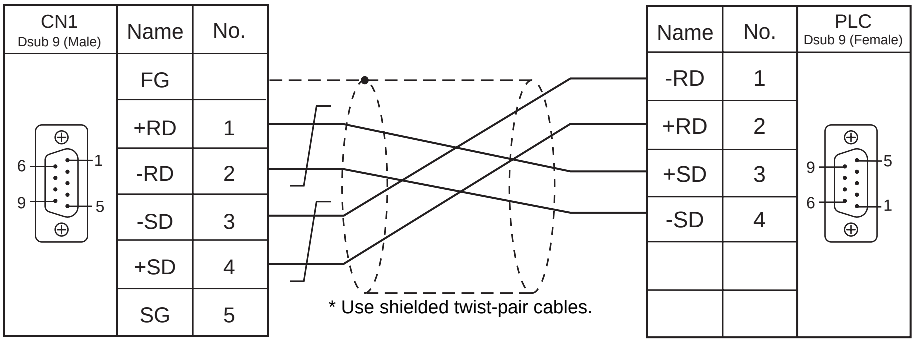
RS-422/RS-485

Wiring diagram 1 - C4

When connecting to the S10xα series, place a resistor of 50Ω (1/2 W) as shown below.



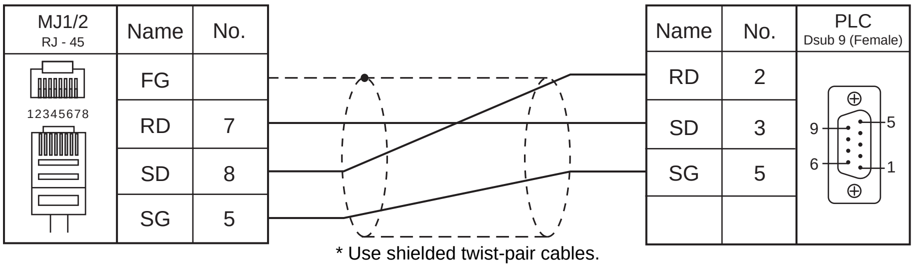
Wiring diagram 2 - C4



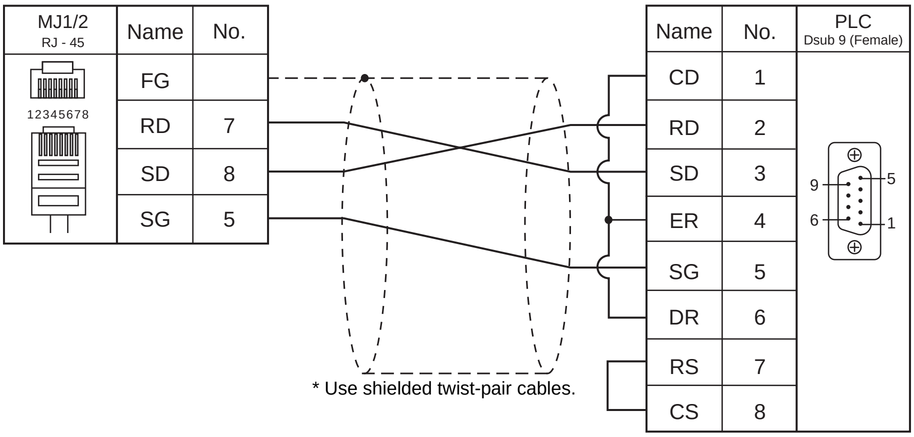
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

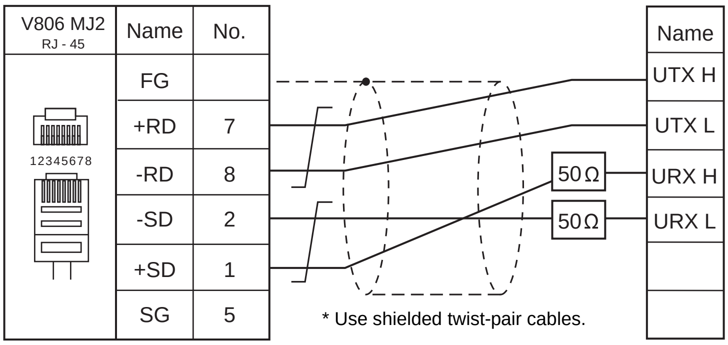


Wiring diagram 2 - M2



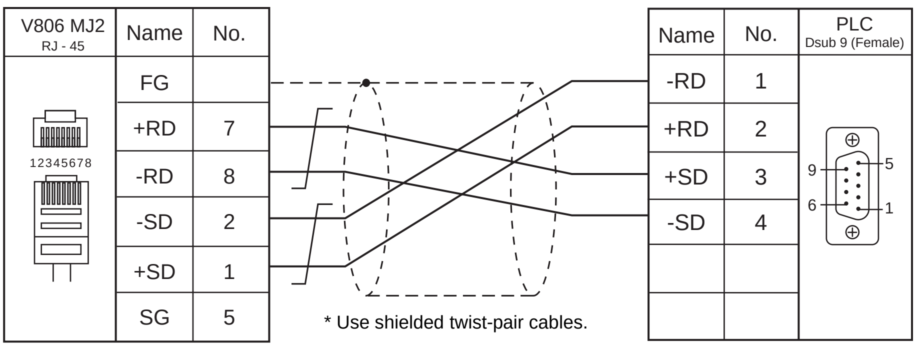
RS-422/RS-485

Wiring diagram 1 - M4



* Slide switch on V806:
RS-422 (lower)

Wiring diagram 2 - M4



* Slide switch on V806:
RS-422 (lower)

MEMO

Please use this page freely.

7. Hitachi Industrial Equipment Systems

7.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection			Ladder Transfer*4
					CN1	MJ1/MJ2	MJ2 (4-wire) V806	
HIDIC-H	H series	COMM-2H		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
				RS-422	Wiring diagram 1 - C4	×	Wiring diagram 6 - M4	
		PERIPHERAL on CPU		RS-232C	Wiring diagram 1 - C2	×		
		H252C CPU	PERIPHERAL1	RS-232C	Wiring diagram 1 - C2	×		
			PERIPHERAL2	RS-232C	Wiring diagram 1 - C2 + Hitachi's "CNCOM-05"	×		
	EH-150	On CPU	PORT1	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 2 - C4	Wiring diagram 1 - M4*3	Wiring diagram 7 - M4	
			PORT2	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2*3		
		EH-SIO*1	PORT1	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
			PORT2	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 3 - C4	Wiring diagram 2 - M4*3	Wiring diagram 8 - M4	×
	MICRO-EH	On CPU	PORT1	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
			PORT2	RS-422	Wiring diagram 4 - C4	Wiring diagram 3 - M4*3	Wiring diagram 9 - M4	
		EH-OB232		RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
		EH-OB485		RS-422	Wiring diagram 5 - C4	Wiring diagram 4 - M4*3	Wiring diagram 10 - M4	
	Web controller	EH-WD10DR	SERIAL	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		EH-WA23DR						
				RS-422	Wiring diagram 6 - C4	Wiring diagram 5 - M4*3	Wiring diagram 11 - M4	
HIDIC-EHV	EH-150 EHV	EHV-CPU128	SERIAL	RS-232C	Wiring diagram 2 - C2*2	Wiring diagram 2 - M2		
				RS-422	Wiring diagram 5 - C4	Wiring diagram 4 - M4*3	Wiring diagram 10 - M4	
		EH-SIO*1	PORT1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			PORT2					
				RS-422	Wiring diagram 3 - C4	Wiring diagram 2 - M4*3	Wiring diagram 8 - M4	

*1 For the EH-SIO unit, EH-CPU548 (version E402 or later) and EH-CPU516 (version E202 or later) can only be used.
*2 Communication is also available using the Hitachi's "EH-RS05" cable with the cable used for the wiring diagram 1-C2.
*3 Communication cannot be established when "transmission control protocol 1, without port" is set. Set "transmission control protocol 2, without port". Note that some CPUs do not support "transmission control protocol 2, without port". For more information, refer to the PLC manual issued by the manufacturer.
*4 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

Ethernet Connection

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
HIDIC-H (Ethernet)	H series	LAN-ETH2	×	○	3004 to 3005 (1 each)	×
	EH-150	EH-ETH			3004 to 3007 (1 each)	
	Web controller	ETHERNET				
HIDIC-EHV (Ethernet)	EHV-CPU128	ETHERNET				

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

7.1.1 HIDIC-H

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / 1 : n / Multi-link / Multi-link2	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115K bps	
Parity	None / Odd / <u>Even</u>	
Signal Level	RS-232C / RS-422/485	
Data Length	<u>7</u> / 8 bits	
Stop Bit	<u>1</u> / 2 bits	
Target Port No.	0 to 31 *1	
Transmission Mode	<u>Protocol 2 with port</u> Protocol 1 without port Protocol 2 without port Protocol 1 with port	Protocol 2 achieves higher communication speed, compared to protocol 1.

COMM-2H

ST No. switch

ST No.	Setting	Remarks
10^1, 10^0	0 to 31	If a value greater than 31 is set, the unit works as the station No. 31.

MODE switch

MODE	RS-232C	RS-422
1	Transmission control protocol 1 without port	-
2	Transmission control protocol 1 with port	Transmission control protocol 1 with port
7	Transmission control protocol 2 with port	-
9	Transmission control protocol 2 without port	Transmission control protocol 2 with port

* When connecting to both RS-232C and RS-422, set MODE switch to 9.

DIP switch

Switch	Setting	Contents
1	OFF	Bit length 7
2	OFF	19200 bps
3	ON	
4	ON	
5	ON	With parity
6	ON	Even
7	OFF	Stop bit 1
8	ON	With sumcheck

PERIPHERAL Port

No particular setting is necessary on the PLC. The PLC always operates using the parameter shown below. Set the following parameter on V8.

Item	Setting	Remarks
Signal Level	RS-232C	
Baud Rate	19200 bps	
Data Length	7 bits	ASCII
Stop Bit	1 bit	
Parity	Even	
Transmission Mode	Protocol 1 without port	
Sum Check	Provided	
Port Operation	Dedicated port	

EH-150 CPU

PORT1

Set the signal level and the communication protocol as shown below for PORT1 (dedicated port). Other parameters (7 bits, 1 bit, even) are fixed.

Signal Level	Communication Protocol	CPU Model
RS-232C	Transmission control protocol 1	EH-CPU104/104A/208/208A/308/308A/316/316A/448/448A/516/548
	Transmission control protocol 2	EH-CPU104A/208A/308A/316A/448/448A/516/548
RS-422	Transmission control protocol 1	EH-CPU308A/316A/448/448A/516/548
	Transmission control protocol 2	
	Transmission control protocol 1 with port	
	Transmission control protocol 2 with port	
RS-485	Transmission control protocol 1 with port	
	Transmission control protocol 2 with port	

Procedure

1. Turn the PLC off and set the “Mode setting switch” (page 7-3).
2. Turn the power on and check the value for “Special internal output: WRF037” (page 7-4).
3. When the signal level and the communication control protocol have correctly been selected, setting is completed. If they are wrong, set a correct value and turn the power off and back on again.
4. Check the value set for WRF037.

Mode setting switch

SW3	SW4	SW5	Contents
ON	ON	ON	Dedicated port, 4,800 bps
OFF	ON		Dedicated port, 9,600 bps
ON	OFF		Dedicated port, 19,200 bps
OFF	OFF		Dedicated port, 38,400 bps

Special internal output: WRF037

Memory	Setting
WRF037	(see below)

15	14	13	12	11	10	9	8	7 … 0
a	b	c	d	e	f	g	h	Station number 00 to 31 (BCD)

g, h: Communication interface setting (to be set by user)

g	h	Interface
0	0	RS-232C
0	1	RS-422
1	0	RS-485
1	1	Not to be changed

e, f: Communication interface status display (to be set by system)

e	f	Interface
0	0	RS-232C
0	1	RS-422
1	0	RS-485
1	1	-

d: Built-in terminating resistance
- 0: None
- 1: Provided

c: Station number
- 0: Without station number
- 1: With station number

b: Transmission control protocol
- 0: Transmission control protocol 1
- 1: Transmission control protocol 2

a: Bit setting 1: Set (when setting has been completed, the system sets this value to "0".)

Setting example

User Setting	After Turning the Power Back ON	Signal Level	Communication Control Protocol
H8000	H0000	RS-232C	Transmission control protocol 1
HC000	H4000		Transmission control protocol 2
H8100 (H9100)	H0500 (H1500)	RS-422	Transmission control protocol 1
HC100 (HD100)	H4500 (H5500)		Transmission control protocol 2
HA1** (HB1**)	H25** (H35**)		Transmission control protocol 1 with port
HE1** (HF1**)	H65** (H75**)		Transmission control protocol 2 with port
HA2** (HB2**)	H2A** (H3A**)	RS-485	Transmission control protocol 1 with port
HE2** (HF2**)	H6A** (H7A**)		Transmission control protocol 2 with port

Inside the parentheses ( ) shows cases where the terminating resistance is provided.

* If the setting is undefined upon power-up, the default setting (transmission control protocol 1, without port, RS-232C) is applied.

PORT2

PORT2 settings are defined as "dedicated port, RS-232C, transmission control protocol 1, 7 bits, 1 bit, even", regardless of the CPU model.

Mode setting switch, PHL switch

SW6	PHL Switch	Baud Rate	Remarks
OFF	OFF (Low)	4800 bps	PHL signal (pin 4 at PORT2) Low
ON	OFF (Low)	9600 bps	
OFF	ON (High)	19200 bps	PHL signal (pin 4 at PORT2) High
ON	ON (High)	38400 bps	

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

MICRO EH

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

CPU Model	Port	Signal Level	Communication Protocol
EH-D10 EH-D14 / EH-A14 EH-D20 / EH-A20 EH-D23 / EH-A23 EH-D28 / EH-A28 EH-D40 / EH-A40 EH-D64 / EH-A64	PORT1	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-D23 / EH-A23 EH-D28 / EH-A28	PORT2	RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
EH-x64xxx + EH-OB232	PORT2	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-x64xxx + EH-OB485		RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

PORT1

Procedure

1. Turn the PLC off and set the baud rate using the DIPSW.
2. Turn the power on and check the value set for “Special internal output: WRF01A”.
3. When the transmission control protocol has correctly been selected, setting is completed. If it is wrong, set a correct value.
4. Set the bit “R7F6” (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory. Note that the ladder tool cannot be connected when the setting has been saved using the transmission control protocol 2.

DIPSW

SW1	SW2	SW3	SW4	Baud Rate
ON	OFF	ON	OFF	38.4 kbps
ON	OFF	OFF	OFF	19.2 kbps
OFF	OFF	ON	OFF	9600 bps
OFF	OFF	OFF	OFF	4800 bps

Special internal output: WRF01A

Memory	Setting	Contents
WRF01A	H0000	Transmission control protocol 1
	H8000	Transmission control protocol 2

PORT2

Procedure

1. Check the value set for special internal output “WRF03D”.
2. When the setting, such as transmission control protocol or baud rate, has correctly been defined, the setting is completed. If it is wrong, set a correct value. See “User Setting” described in “Special internal output: WRF03D”.
3. Check that the value set for WRF03D has been changed to the one shown in the “System Setting” column.
4. Set the bit “R7F6” (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory.

Special internal output: WRF03D

Memory	Setting
WRF03D	Bit layout:

15	14	13	12 – 8	7 – 0
a	b	c	d	Station number 00 to 31 (BCD)

d: Baud rate

d	Baud Rate
00000	4800 bps
00001	9600 bps
00010	19.2 kbps
00011	38.4 kbps

c: Station number
0: Without station number
1: With station number

b: Transmission control protocol
0: Transmission control protocol 1
1: Transmission control protocol 2

a: Bit setting 1: Set (when setting completed, the system sets this value to “0”.)

Setting example

User Setting	System Setting	Interface	Baud Rate
H8300	H0300	Transmission control protocol 1	38.4 kbps
HC300	H4300	Transmission control protocol 2	
HA300	H2300	Transmission control protocol 1 with port	
HE300	H6300	Transmission control protocol 2 with port	

Web Controller

The following table shows the signal level and the communication protocol for each PLC. Other parameters (7 bits, 1 bit, even) are fixed.

PLC	Port	Signal Level	Communication Protocol
EH-WD10DR	SERIAL	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
EH-WA23DR	PORT1	RS-232C	Transmission control protocol 1
			Transmission control protocol 2
		RS-422	Transmission control protocol 1
			Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
		RS-485	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

Procedure

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (RS-232C protocol/serial protocol → passive HI protocol)

Make settings for “Interface Type”, “Transmission Control Procedure”, “Transmission Speed”.

Available Memory

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

Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

7.1.2 HIDIC-H (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see Appendix 2 Ethernet.

- IP address for the V8 unit
- V8 unit's port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC's IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

LAN-ETH2 (H Series)

The IP address setting tool can be downloaded from the Hitachi Industrial Equipment Systems website.
Connect the computer (PC) to the RS-232C port of PORT1 and specify the IP address and the task port. For more information, refer to the PLC manual issued by the manufacturer.

EH-ETH (EH-150)

Make settings using the web server function incorporated in EH-ETH. For more information, refer to the PLC manual issued by the manufacturer.

IP address information setup

Set the IP address and the subnet mask.

Task code information setup

Select [UDP/IP] for [Protocol] and specify the port number.

Web Controller

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (IP address)

Specify the IP address and the subnet mask.

System configuration (ethernet protocol → passive HI protocol)

Select [UDP/IP] for [Task code port] and specify the port number.

Available Memory

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

Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

7.1.3 HIDIC-EHV

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode		
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / <u>38400</u> / 57600 bps	
Data Length	7 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31 *1	
Transmission Mode	<u>Protocol 2 with port</u> Protocol 1 without port Protocol 2 without port Protocol 1 with port	Protocol 2 achieves higher communication speed, compared to protocol 1.

EHV-CPU

CPU communication setting on control editor

<table>
<tr><th>Item</th><th>Setting</th></tr>
<tr><td>Serial communication setting</td><td>Dedicated</td></tr>
<tr><td>Port type</td><td>RS-232C/RS-422/RS-485
The following table shows the combination of port type and communication protocols available.
<table>
<tr><th>Port Type</th><th>Communication Protocol</th></tr>
<tr><td rowspan="2">RS-232C</td><td>Transmission control protocol 1 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 2 (2 : 2)</td></tr>
<tr><td rowspan="4">RS-422</td><td>Transmission control protocol 1 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 2 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 1 (1 : n)</td></tr>
<tr><td>Transmission control protocol 2 (1 : n)</td></tr>
<tr><td rowspan="3">RS-485</td><td>Transmission control protocol 2 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 1 (1 : n)</td></tr>
<tr><td>Transmission control protocol 2 (1 : n)</td></tr>
</table></td></tr>
<tr><td>Baud rate</td><td>4800 / 9600 / 19200 / <u>38400</u> / 57600 bps</td></tr>
<tr><td>Communication protocol</td><td>See “Port Type” shown above.</td></tr>
<tr><td>Station number</td><td>0 to 31 (to be specified when “with port” is selected)</td></tr>
</table>

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 1	Version 2.0 and later
		Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

Available Memory

Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

7.1.4 HIDIC-EHV (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

Control Editor

IP address setting

Item	Contents	
IP address	Specify the IP address for the PLC.	
Subnet mask	Specify the subnet mask for the PLC.	
Default gateway		

Ethernet communication (task code) setting

Item	Contents	
Valid	Select a port to which the V8 unit is connected and make the port enabled.	
Port No.		
Protocol	UDP/IP	

Available Memory

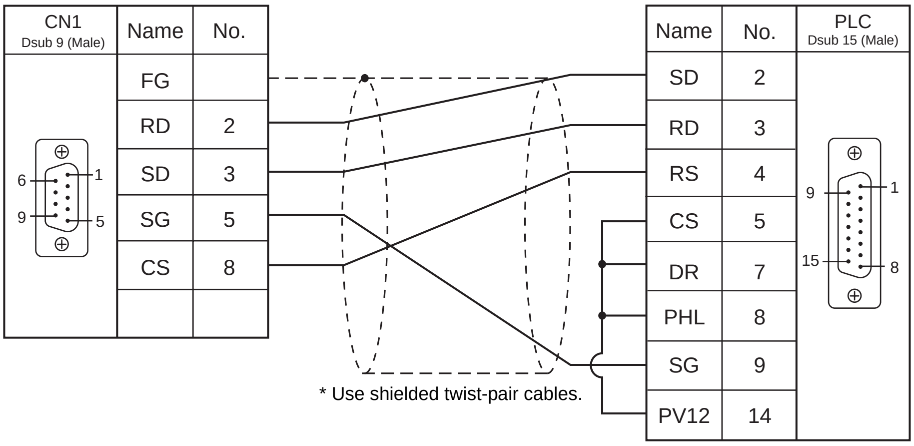
Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

7.1.5 Wiring Diagrams

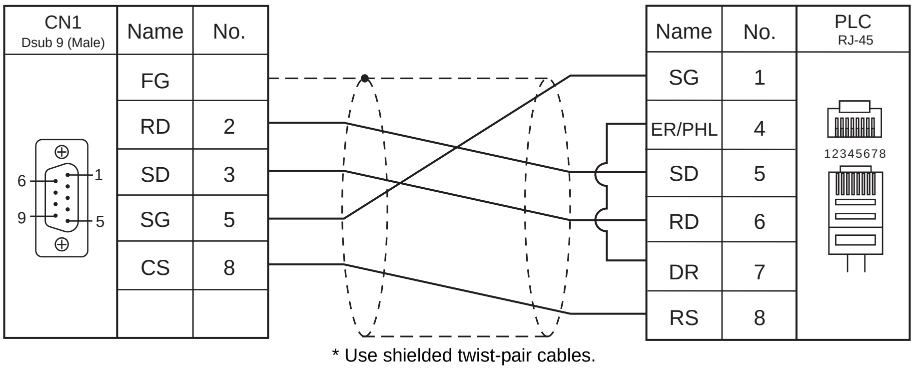
When Connected at CN1:

RS-232C

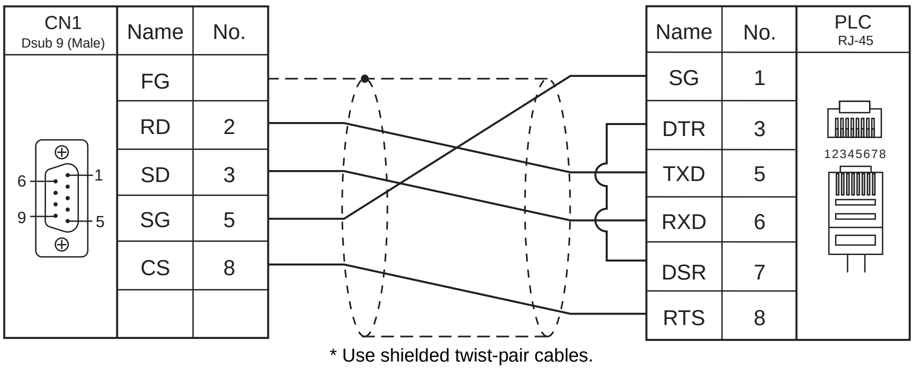
Wiring diagram 1 - C2



Wiring diagram 2 - C2

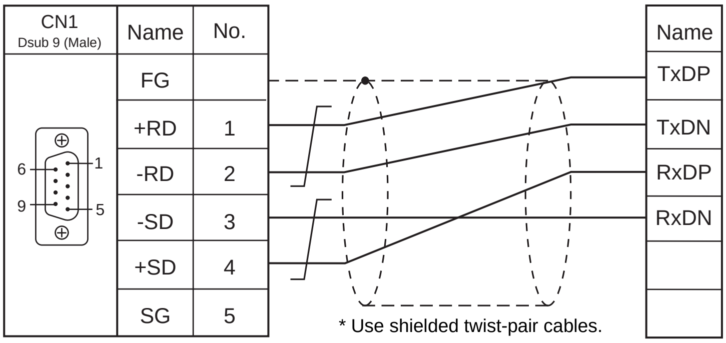


Wiring diagram 3 - C2



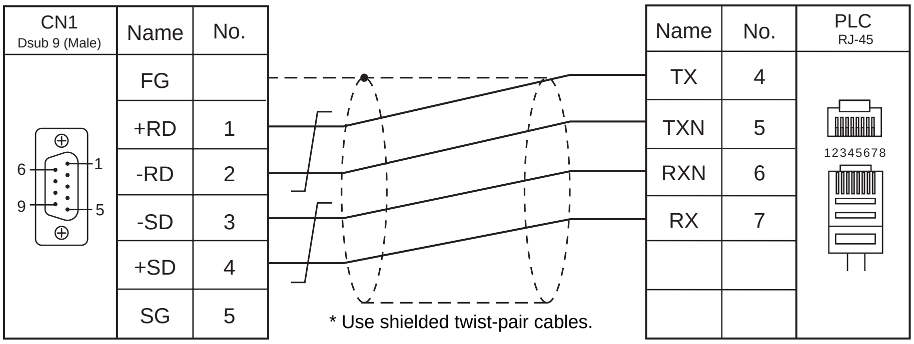
RS-422/RS-485

Wiring diagram 1 - C4



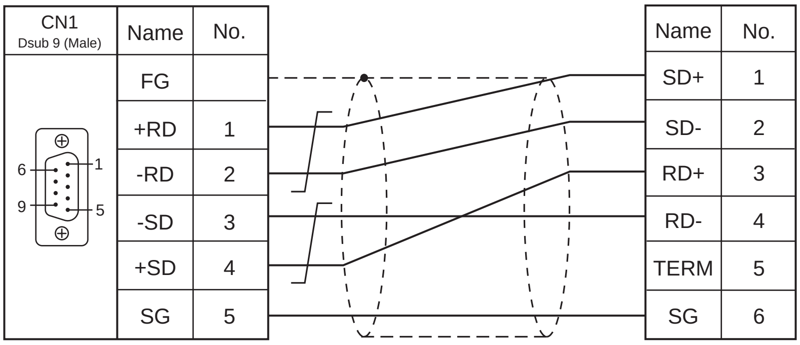
* Use shielded twist-pair cables.

Wiring diagram 2 - C4



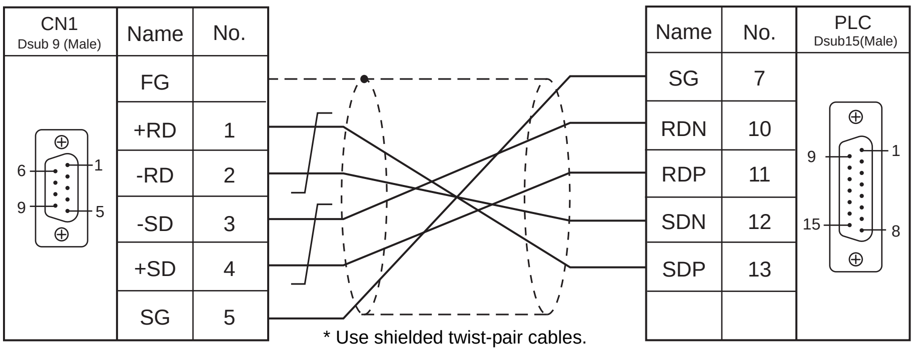
* Use shielded twist-pair cables.

Wiring diagram 3 - C4



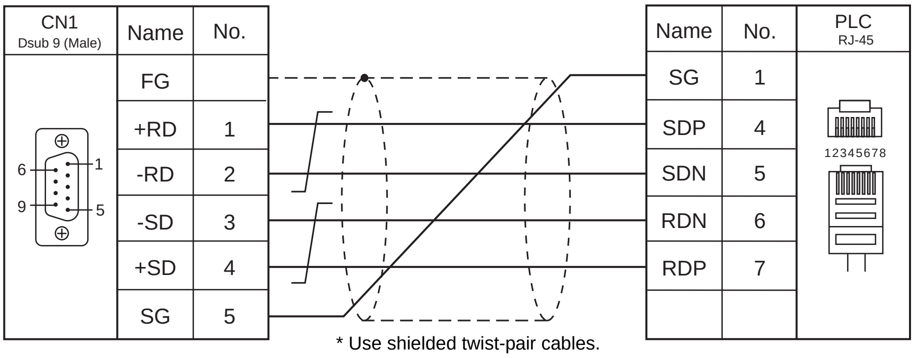
* Use shielded twist-pair cables.

Wiring diagram 4 - C4

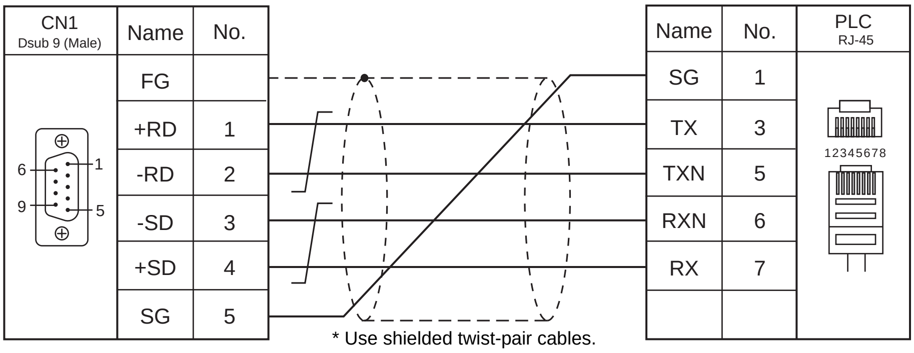


* Use shielded twist-pair cables.

Wiring diagram 5 - C4



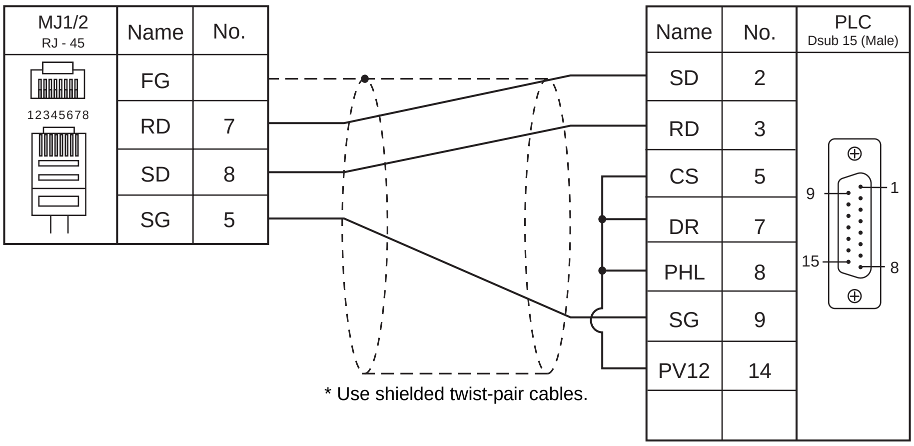
Wiring diagram 6 - C4



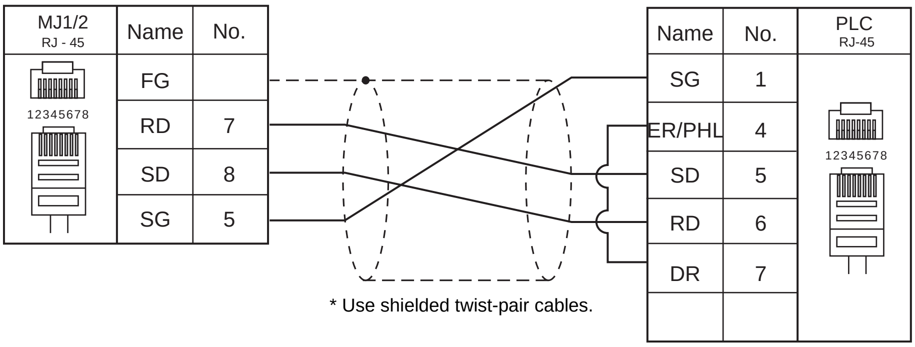
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

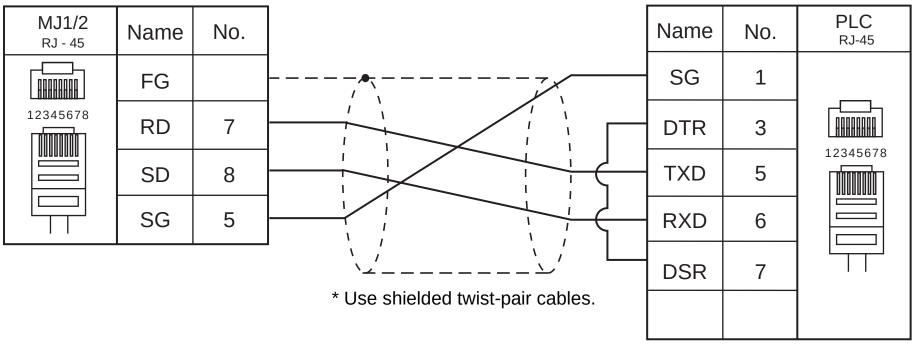


Wiring diagram 2 - M2



* Use shielded twist-pair cables.

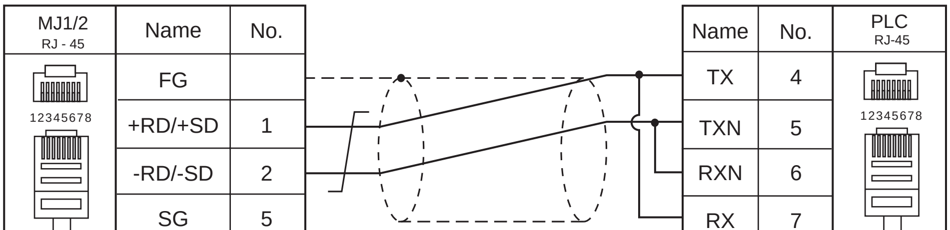
Wiring diagram 3 - M2



* Use shielded twist-pair cables.

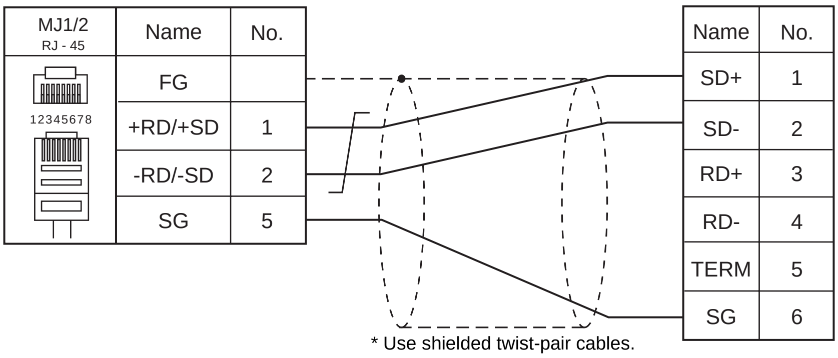
RS-422/RS-485

Wiring diagram 1 - M4



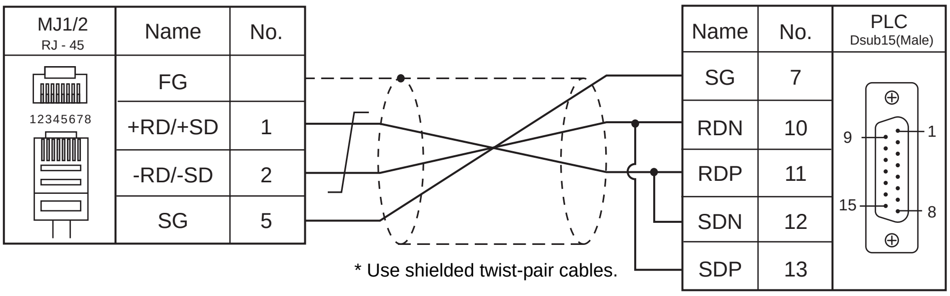
* Use shielded twist-pair cables.

Wiring diagram 2 - M4

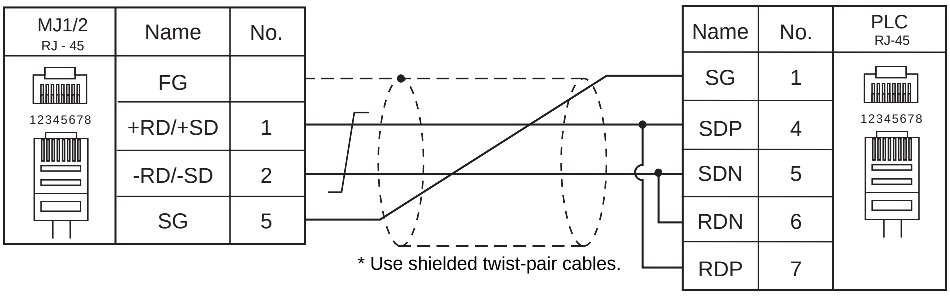


* Use shielded twist-pair cables.

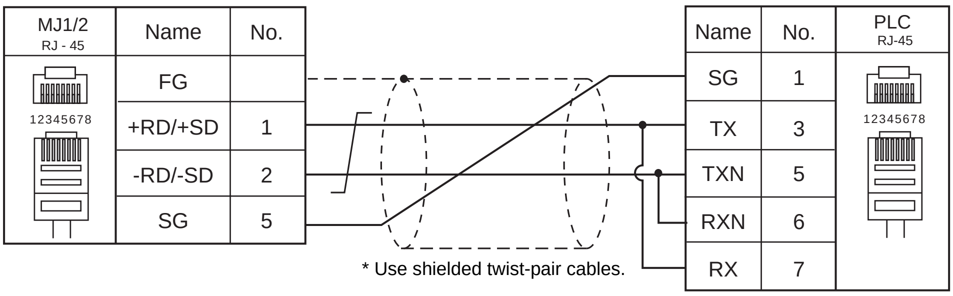
Wiring diagram 3 - M4



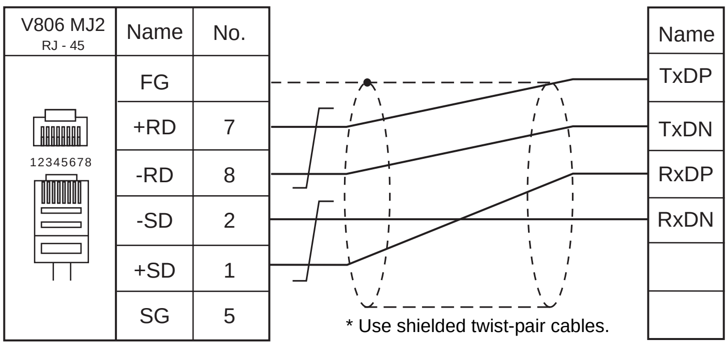
Wiring diagram 4 - M4



Wiring diagram 5 - M4

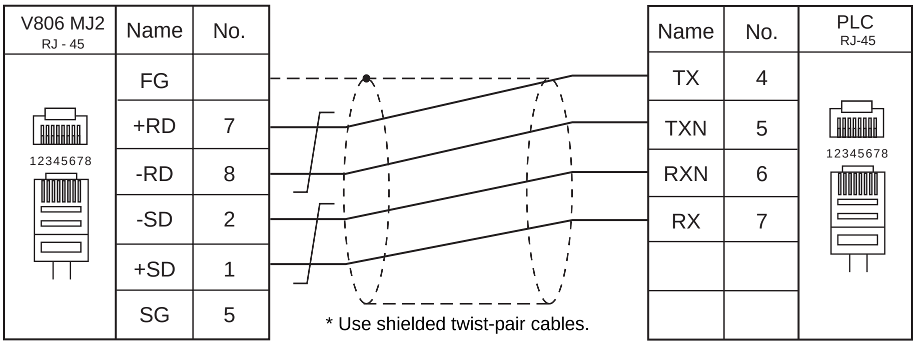


Wiring diagram 6 - M4



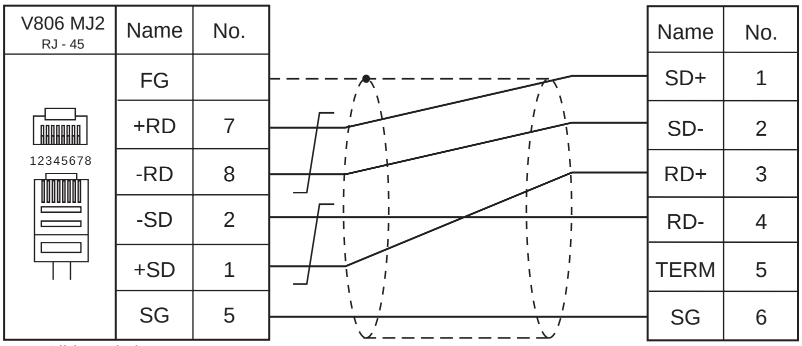
* Slide switch on V806:
RS-422 (lower)

Wiring diagram 7 - M4



* Slide switch on V806:
RS-422 (lower)

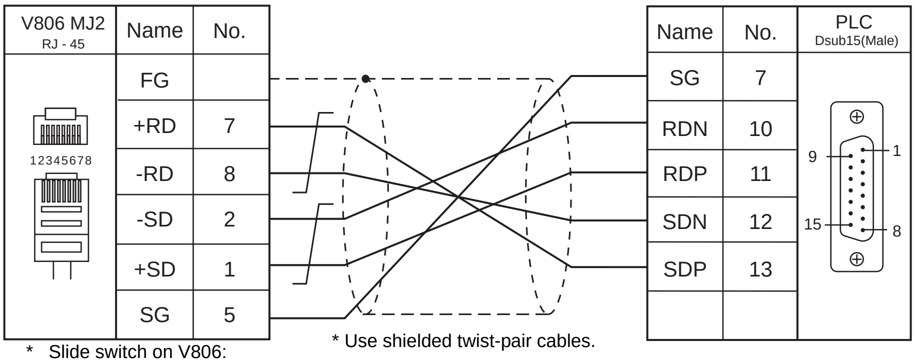
Wiring diagram 8 - M4



* Slide switch on V806:
RS-422 (lower)

* Use shielded twist-pair cables.

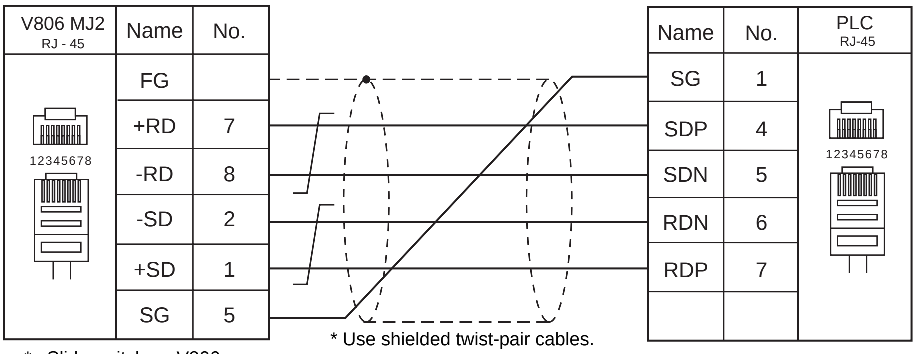
Wiring diagram 9 - M4



* Slide switch on V806:
RS-422 (lower)

* Use shielded twist-pair cables.

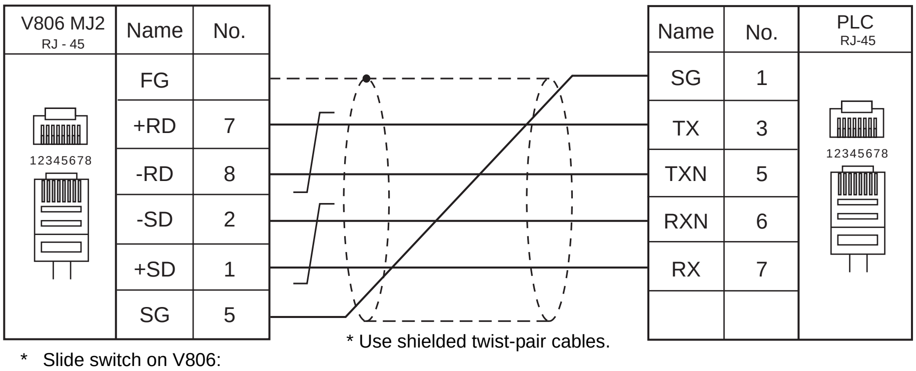
Wiring diagram 10 - M4



* Use shielded twist-pair cables.

* Slide switch on V806:
RS-422 (lower)

Wiring diagram 11 - M4



* Slide switch on V806: RS-422 (lower)

8. IAI

8.1 Temperature Controller/Servo/Inverter Connection

The controller models shown below can be connected.

Serial Connection

X-SEL Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2" colspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire) V806</th></tr>
<tr><td rowspan="4">X-SEL Controller</td><td>Orthogonal</td><td>XSEL-K
XSEL-KE
XSEL-KT/KET</td><td rowspan="2">HOST port</td><td rowspan="2">RS-232C</td><td rowspan="2">Wiring diagram 1 - C2</td><td rowspan="2">Wiring diagram 1 - M2</td><td rowspan="2"></td><td rowspan="4">IAI-XSEL.Lst</td></tr>
<tr><td>Scalar</td><td>XSEL-KX</td></tr>
<tr><td>Orthogonal</td><td>XSEL-J
XSEL-P
XSEL-Q</td><td rowspan="2">TP port</td><td rowspan="2">RS-232C</td><td rowspan="2">Wiring diagram 2 - C2</td><td rowspan="2">Wiring diagram 2 - M2</td><td rowspan="2"></td></tr>
<tr><td>Scalar</td><td>XSEL-JX
XSEL-PX
XSEL-QX</td></tr>
</table>

Robo Cylinder

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire) V806</th></tr>
<tr><td rowspan="3">PCON/ACON/SCON
(MODBUS RTU)</td><td>PCON</td><td rowspan="3">SIO</td><td rowspan="3">RS-232C</td><td rowspan="3">Wiring diagram 3 - C2</td><td rowspan="3">Wiring diagram 3 - M2</td><td rowspan="3"></td><td rowspan="3">IAI-PCON.Lst</td></tr>
<tr><td>ACON</td></tr>
<tr><td>SCON</td></tr>
</table>

8.1.1 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].

Available Memory

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

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
- Variable number 0000 to 4095
- Program number 00 to 99

*2 For 210 (string) XXYYYY
- Column number 0000 to 4095
- Program number 00 to 99

Memory: 208 (Effective Point Data Count)

Address	Name
0	Effective point data count

Memory: 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

Memory: 213 (Program Status)

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

Memory: 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

Memory: 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

Memory: 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 V series 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) Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6		
		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) Bit - 7 6 5 4 3 2 1 0 Axis 1 : Axis 6		
		n + 3	Status m = 1	Axis status	
		n + 4		Axis sensor input status	
		n + 5		Axis-related error code	
		n + 6		Encoder status	
		n + 7 to n + 8		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 Bit [- | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0] Axis 1 : Axis 6	
		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 Bit [- | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0] Axis 1 : Axis 6	
		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		

Contents	F0	F1 (= $u n)				F2
Successive writing within designated point data range	1 - 8 (PLC1 - 8)	n	Station number			4 + (4 + 2m) t = α
		n + 1	Command: 244 (HEX)			
		n + 2	Change start point data number			
		n + 3	Change point data count: t (1 to 2)			
		n + 4	Point data t = 1	Axis pattern: m (number of ON bits) Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Axis 1 : Axis 6		
		n + 5		Acceleration		
		n + 6		Deceleration		
		n + 7		Speed		
		n + 8 to n + 9		Axis pattern (m = 1)	Position data	
		n + 10 - α		Axis pattern (m = 2)	Position data	
				:		
			Point data (t = 2)		:	
		α + 1	Change start point data number			
		α + 2	Change complete point data count			
Change point data successive writing	1 - 8 (PLC1 - 8)	n	Station number			4 + (4 + 2m) t = α
		n + 1	Command: 245 (HEX)			
		n + 2	Change point data count: t (1 to 2)			
		n + 3	Point data t = 1	Change point data number		
		n + 4		Axis pattern: m (number of ON bits) Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Axis 1 : Axis 6		
		n + 5		Acceleration		
		n + 6		Deceleration		
		n + 7		Speed		
		n + 8 to n + 9		Axis pattern (m = 1)	Position data	
		n + 10 to α		Axis pattern (m = 2)	Position data	
				:		
			Point data (t = 2)			
		α + 1	Change complete point data count			
Point data clear	1 - 8 (PLC1 - 8)	n	Station number			4
		n + 1	Command: 246 (HEX)			
		n + 2	Clear start point data number			
		n + 3	Clear point data count			
Real variable change	1 - 8 (PLC1 - 8)	n	Station number			5 + 2m
		n + 1	Command: 24D (HEX)			
		n + 2	Program number			
		n + 3	Change start variable number			
		n + 4	Change variable data count: m (1 to 10)			
		n + 5 to n + 6	Variable data (m = 1)	Real variable data		
		n + 7 -	Variable data (m = 2)	Real variable data		
			:			
		n + {5 + (2*m)}	Change complete data count			
Alarm reset	1 - 8 (PLC1 - 8)	n	Station number			2
		n + 1	Command: 252 (HEX)			
Program execution	1 - 8 (PLC1 - 8)	n	Station number			3
		n + 1	Command: 253 (HEX)			
		n + 2	Program number			
Program end	1 - 8 (PLC1 - 8)	n	Station number			3
		n + 1	Command: 254 (HEX)			
		n + 2	Program number			

<table>
<tr><th>Contents</th><th>F0</th><th colspan="3">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Program pause</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: 255 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
<tr><td rowspan="3">Program one step 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: 256 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
<tr><td rowspan="3">Program execution restart</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: 257 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Program number</td></tr>
<tr><td rowspan="2">Software 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: 25B (HEX)</td></tr>
<tr><td rowspan="2">Request for drive source recovery</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: 25C (HEX)</td></tr>
<tr><td rowspan="2">Request for operation pause cancel</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: 25E (HEX)</td></tr>
<tr><td rowspan="4">Speed change

For orthogonal</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: 262 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Axis pattern
Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
Axis 1
:
Axis 6</td></tr>
<tr><td>n + 3</td><td colspan="2">Speed</td></tr>
<tr><td rowspan="11">Successive inquiry within designated range for coordinate system definition data

For scalar</td><td rowspan="11">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="11">5</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 2A0 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">Type
0: Workpiece coordinate system definition data
1: Tool coordinate system definition data</td></tr>
<tr><td>n + 3</td><td colspan="2">Inquiry target top number for coordinate system definition data</td></tr>
<tr><td>n + 4</td><td colspan="2">Inquiry record count t (1 to 32)</td></tr>
<tr><td>n + 5 to n + 6</td><td rowspan="4">Coordinate system definition data
t = 1</td><td>Coordinate offset X axis</td></tr>
<tr><td>n + 7 to n + 8</td><td>Coordinate offset Y axis</td></tr>
<tr><td>n + 9 to n + 10</td><td>Coordinate offset Z axis</td></tr>
<tr><td>n + 11 to n + 12</td><td>Coordinate offset R axis</td></tr>
<tr><td>n + 13 -</td><td colspan="2">Coordinate system definition data t = 2</td></tr>
<tr><td>:</td><td colspan="2">:</td></tr>
<tr><td rowspan="14">Scalar axis status inquiry

For scalar</td><td rowspan="14">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="14">4</td></tr>
<tr><td>n + 1</td><td colspan="2">Command: 2A1 (HEX)</td></tr>
<tr><td>n + 2</td><td colspan="2">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="2">Type
0: Base coordinate system
1: Selected workpiece coordinate system
2: System reserved
3: Coordinate system for each axis</td></tr>
<tr><td>n + 4</td><td colspan="2">Workpiece coordinate system number</td></tr>
<tr><td>n + 5</td><td colspan="2">Tool coordinate system number</td></tr>
<tr><td>n + 6</td><td colspan="2">Axis common status</td></tr>
<tr><td>n + 7</td><td rowspan="5">Axis pattern

m = 1</td><td>Axis status</td></tr>
<tr><td>n + 8</td><td>Axis sensor input status</td></tr>
<tr><td>n + 9</td><td>Axis-related error code</td></tr>
<tr><td>n + 10</td><td>Encoder status</td></tr>
<tr><td>n + 11 to n + 12</td><td>Current position</td></tr>
<tr><td>n + 13 -</td><td colspan="2">Axis pattern (m = 2)</td></tr>
<tr><td>:</td><td colspan="2">:</td></tr>
</table>

Contents	F0	F1 (= $u n)			F2
Successive inquiry within designated range for interference check zone definition data For scalar	1 - 8 (PLC1 - 8)	n	Station number		4
		n + 1	Command: 2A2 (HEX)		
		n + 2	Inquiry top number for interference check zone definition data		
		n + 3	Inquiry record count t (1 to 16)		
		n + 4	Interference check zone definition data, t = 1	Effective axis pattern: m (number of ON bits) Bit | - | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Axis 1 : Axis 6	
		n + 5 to n + 6	Interference check zone definition data, t = 1	Axis pattern (m = 1) — Interference check zone definition coordinate 1	
		n + 7 -	Interference check zone definition data, t = 1	Axis pattern (m = 2) — Interference check zone definition coordinate 1	
		:	Interference check zone definition data, t = 1	: — :	
		n + (5 + 2m)	Interference check zone definition data, t = 1	Axis pattern (m = 1) — Interference check zone definition coordinate 2	
		:	Interference check zone definition data, t = 1	Axis pattern (m = 2) — Interference check zone definition coordinate 2	
		:	Interference check zone definition data, t = 1	: — :	
		n + (5 + 4m)	Interference check zone definition data, t = 1	Physical output port number at break-in or global flag number	
		n + (6 + 4m)	Interference check zone definition data, t = 1	Error type definition at break-in	
		n + (7 + 4m)	Interference check zone definition data, t = 1	System reserved	
		:	Interference check data t = 2		
		:	:		
Traverse by absolute command For scalar	1 - 8 (PLC1 - 8)	n	Station number		7 + 2m
		n + 1	Command: 2D4 (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	Positioning type		
		n + 7 to n + 8	Axis pattern (m = 1)	Absolute coordinate data	
		n + 9 to n + 10	Axis pattern (m = 2)	Absolute coordinate data	
		:	:		
Traverse by relative command For scalar	1 - 8 (PLC1 - 8)	n	Station number		7 + 2m
		n + 1	Command: 2D5 (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	Acceleration		
		n + 4	Deceleration		
		n + 5	Speed		
		n + 6	Positioning type		
		n + 7 to n + 8	Axis pattern (m = 1)	Relative coordinate data	
		n + 9 to n + 10	Axis pattern (m = 2)	Relative coordinate data	
		:	:		

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) Bit - 7 6 5 4 3 2 1 0 Axis 1 (bit 0) : Axis 6 (bit 5)	
		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 V series

8.1.2 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 31	

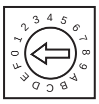
PCON / ACON / SCON

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)	

Mode select switch

Select [MANU].

Available Memory

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

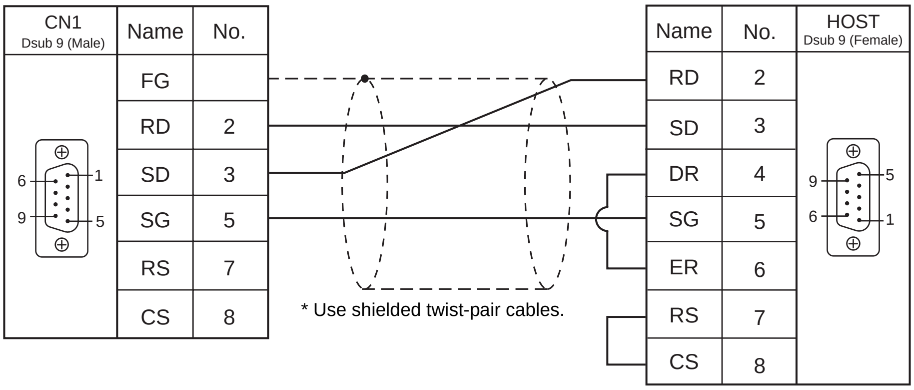
Memory		TYPE	Remarks
Coil	(coil)	00H	
Register	(holding register)	02H	

8.1.3 Wiring Diagrams

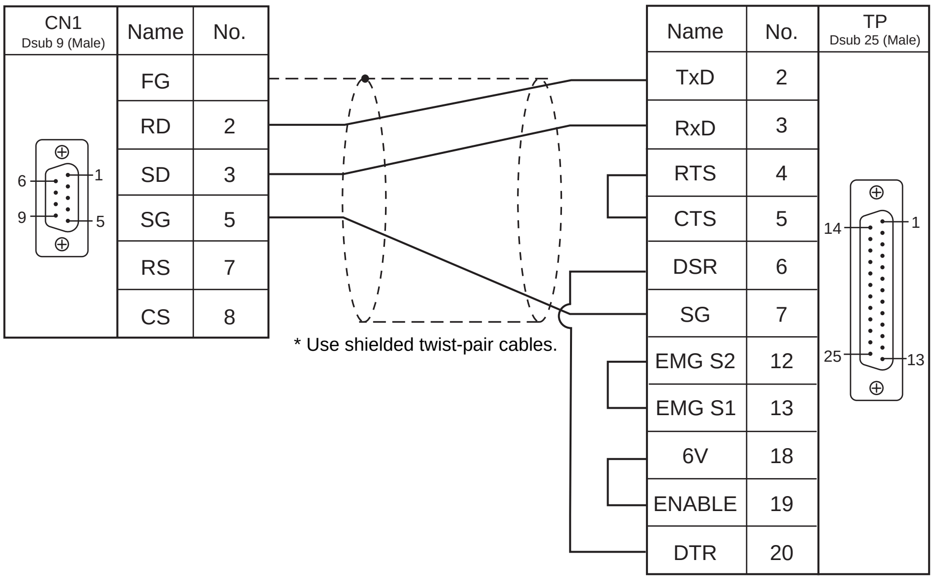
When Connected at CN1:

RS-232C

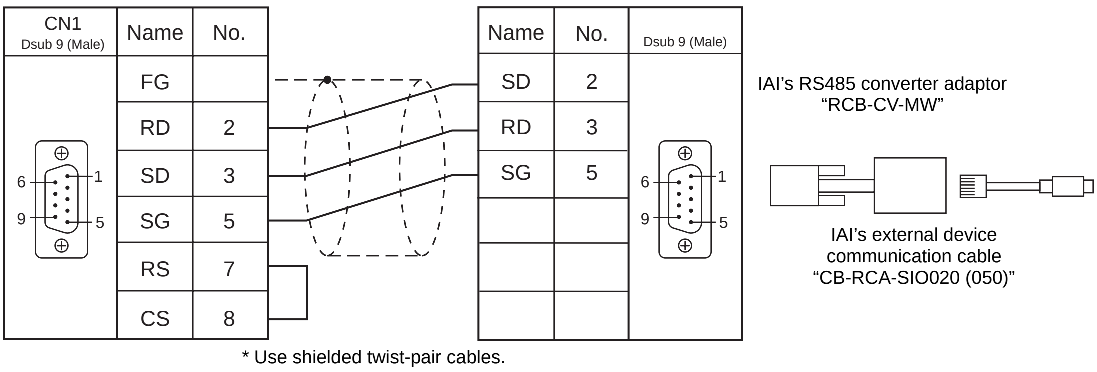
Wiring diagram 1 - C2



Wiring diagram 2 - C2



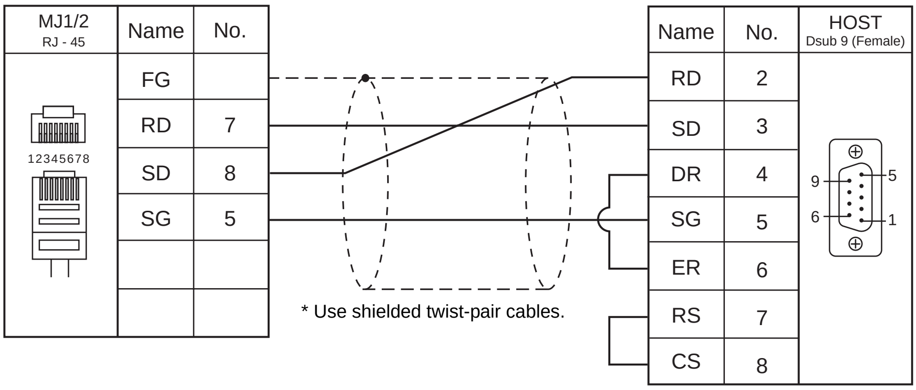
Wiring diagram 3 - C2



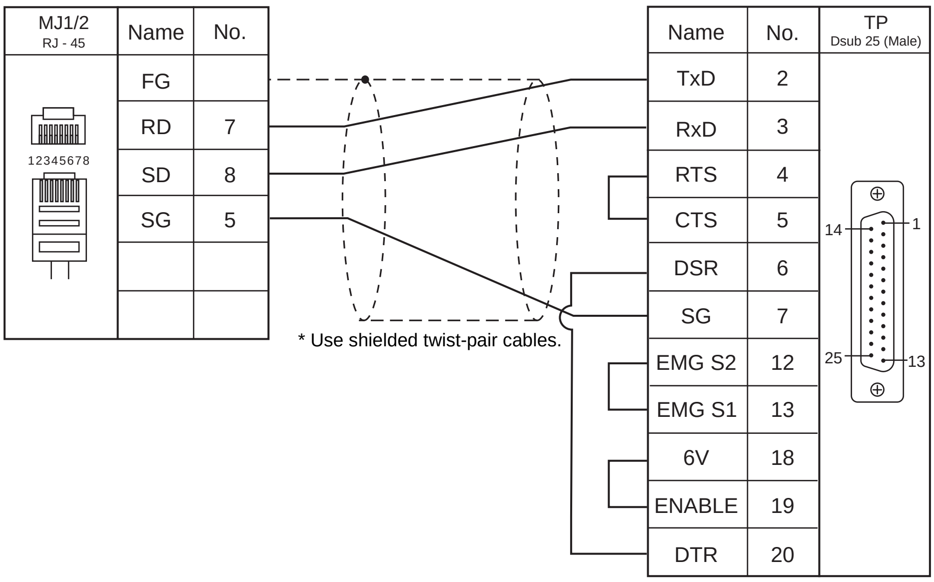
When Connected at MJ1/MJ2:

RS-232C

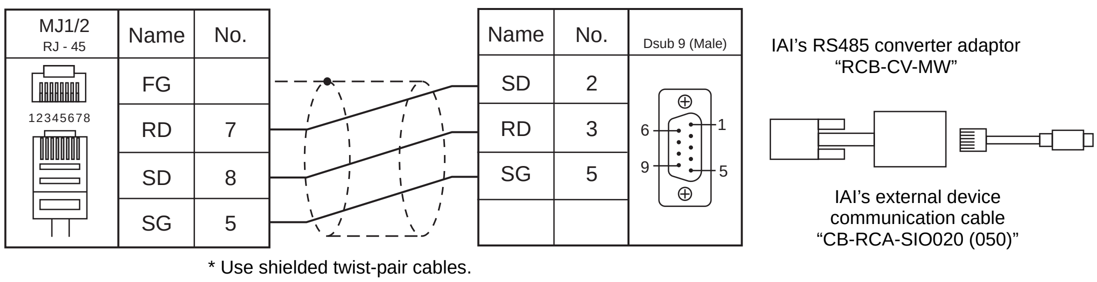
Wiring diagram 1 - M2



Wiring diagram 2 - M2



Wiring diagram 3 - M2



9. JTEKT

9.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

PLC Selection on the Editor	PLC	Unit/Port	Signal Level	Connection			Ladder Transfer *1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
TOYOPUC	PC2 L2	PC/CMP-LINK (TPU-5174)	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		×
		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)					
		Optional link (L2) (TIU-5366)					
	PC3JL	Built-in link (L1) (TIC-5783)					
		Optional link (L2) (TIC-5783)					
	PC3JD	Built-in link (L1) (TIC-5642)					

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *2
TOYOPUC (Ethernet)	PC3J PC2J *1	FL/ET-T-V2 (THU-5998)	×	○	As desired 1024 to 65534	×
		FL/ET-T-V2H (THU-6289)	×	○		
		EN-I/F-T (THU-5781)	×	○		

*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 the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

9.1.1 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

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 Memory

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

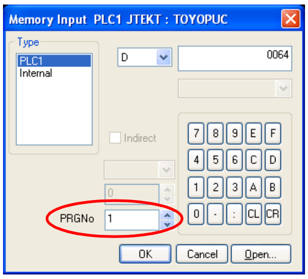
Memory		TYPE	Remarks
D	(data register)	00H	PRG No. when [Data Area Division] is selected
R	(link register)	01H	PRG No. when [Data Area Division] is selected
B	(file register)	02H	PRG No. when [Data Area Division] is selected
N	(current value register)	03H	PRG No. when [Data Area Division] is selected
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

Indirect Memory Designation

When [Data Area Division] is selected for [Transmission Mode] in the [Communication Setting] tab window, set the number from 0 to 2 at [PRG No.] for the extension program information.

Screen Editing (Memory Input)

When [Data Area Division] is selected for [Transmission Mode] in the [Communication Setting] tab window, set the number from 1 to 3 at [PRG No.] on the [Memory Input] dialog.



* The PRG No. is invalid for the memory in the common area.

9.1.2 TOYOPUC (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

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 Local Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the V8 is registered
Initialization	Initialize using the link parameter

* When multiple V8 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 for “Use”.
Other Node IP Address	Set the IP address of the V8.
Other Node Port No.	Set the port number of the V8.

Available Memory

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

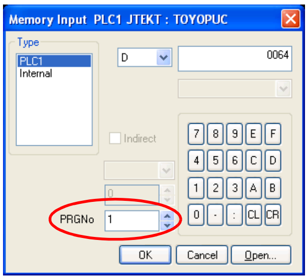
Memory		TYPE	Remarks
D	(data register)	00H	PRG No. when [Data Area Division] is selected
R	(link register)	01H	PRG No. when [Data Area Division] is selected
B	(file register)	02H	PRG No. when [Data Area Division] is selected
N	(current value register)	03H	PRG No. when [Data Area Division] is selected
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

Indirect Memory Designation

When [Data Area Division] is selected for [Transmission Mode] in the [Communication Setting] tab window, set the number from 0 to 2 at [PRG No.] for the extension program information.

Screen Editing (Memory Input)

When [Data Area Division] is selected for [Transmission Mode] in the [Communication Setting] tab window, set the number from 1 to 3 at [PRG No.] on the [Memory Input] dialog.



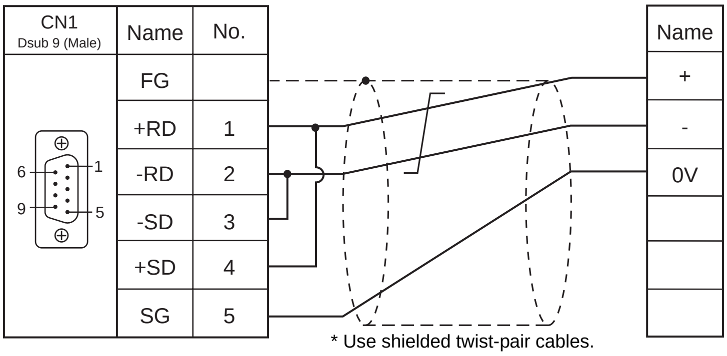
* The PRG No. is invalid for the memory in the common area.

9.1.3 Wiring Diagrams

When Connected at CN1:

RS-422/RS-485

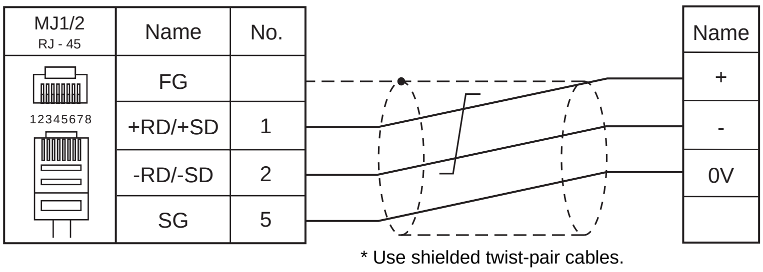
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4



MEMO

Please use this page freely.

10. KEYENCE

10.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

KV Series

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection			Ladder Transfer *2
					CN1	MJ1/MJ2	MJ2 (4-wire) V806	
KV10/24CPU	KV-10 KV-24 KV-40	CPU modular port		RS-232C	Wiring diagram 1 - C2*1	Wiring diagram 1 - M2		×
KV-700	KV-700	CPU modular port		RS-232C				
		KV-L20 KV-L20R	Port 1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			Port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
				RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
KV-1000	KV-1000	CPU modular port		RS-232C	Wiring diagram 1 - C2*1	Wiring diagram 1 - M2		
		KV-L20R	Port 1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			Port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
				RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
KV-3000/5000	KV-3000	CPU modular port		RS-232C	Wiring diagram 1 - C2*1	Wiring diagram 1 - M2		
	KV-3000 KV-5000	KV-L20V	Port 1	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			Port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
				RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	

*1 Can be connected using the Keyence's cable "OP-26487" + connector "OP-26486" + D-sub gender changer (9-pin, female-to-male) commercially available.

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

*2 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

Ethernet Connection

KV-700/1000

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
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)				

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

10.1.1 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	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.

Available Memory

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

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	

10.1.2 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	

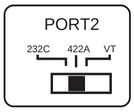
PLC

KV-700 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20

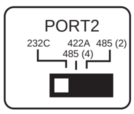
Unit editor setting

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 Memory

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

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	

10.1.3 KV-700 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

KV-LE20

Unit editor setting

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 Memory

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

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	

10.1.4 KV-1000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

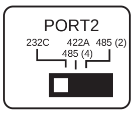
PLC

KV-1000 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20R

Unit editor setting

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

</td></tr>
</table>

* 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 Memory

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

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	

10.1.5 KV-1000 (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

The communication setting is the same as the one described in “10.1.3 KV-700 (Ethernet TCP/IP)”.

Available Memory

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

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	

10.1.6 KV-3000 / 5000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

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

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	

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

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

The communication setting is the same as the one described in “10.1.3 KV-700 (Ethernet TCP/IP)”.

Available Memory

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

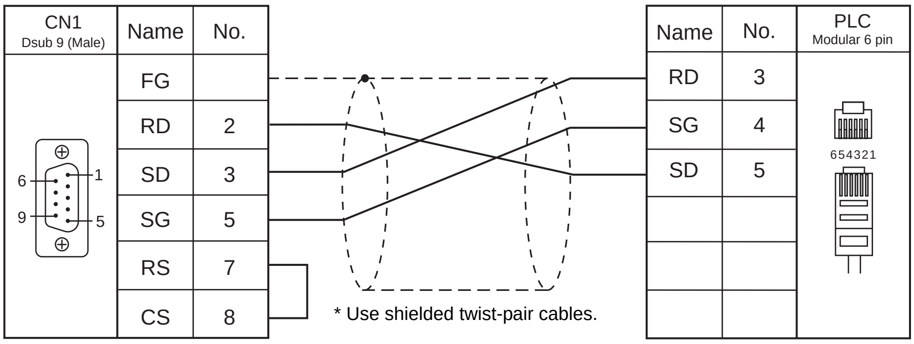
Memory		TYPE	Remarks
DM	(data memory)	00H	
R	(input/output/internal auxiliary/special relay)	01H	
TC	(timer/current value)	02H	Double-word
CC	(counter/current value)	03H	Double-word
TS	(timer/set value)	04H	Double-word
CS	(counter/set value)	05H	Double-word
T	(timer/contact)	06H	
C	(counter/contact)	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	

10.1.8 Wiring Diagrams

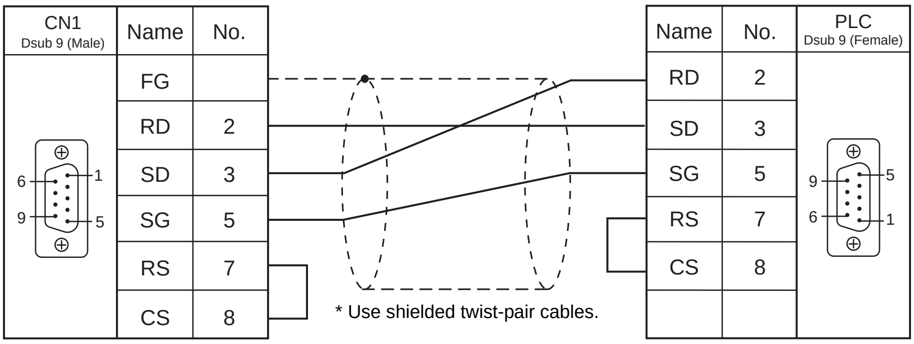
When Connected at CN1:

RS-232C

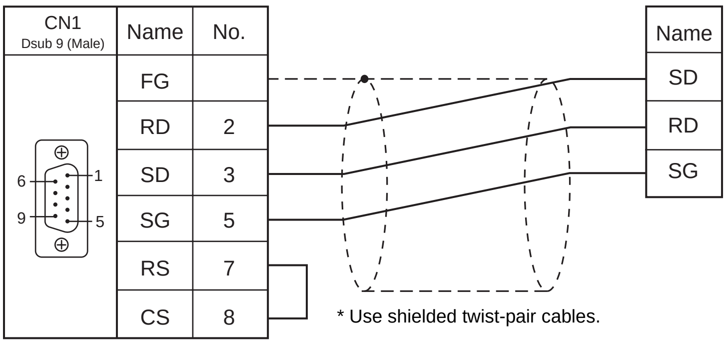
Wiring diagram 1 - C2



Wiring diagram 2 - C2

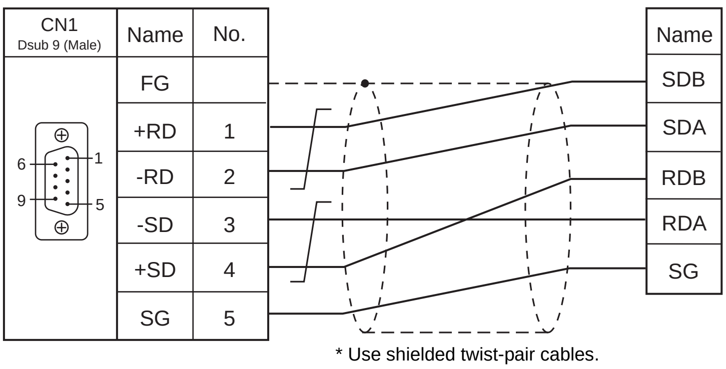


Wiring diagram 3 - C2



RS-422/RS-485

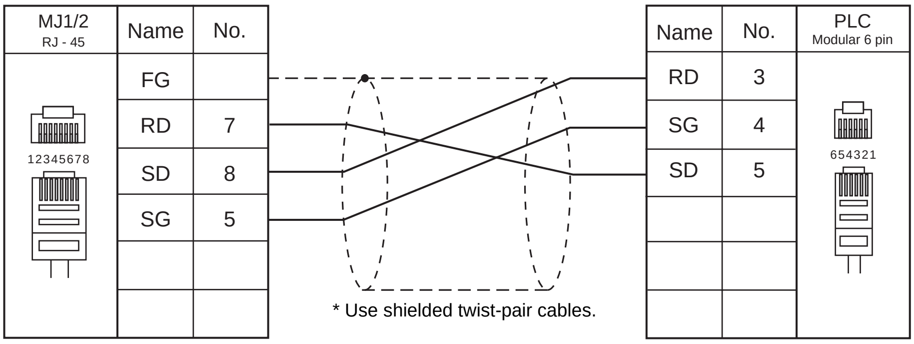
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

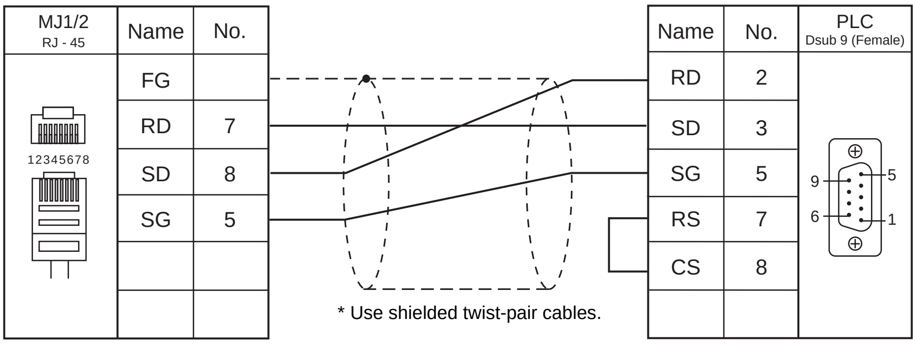
RS-232C

Wiring diagram 1 - M2



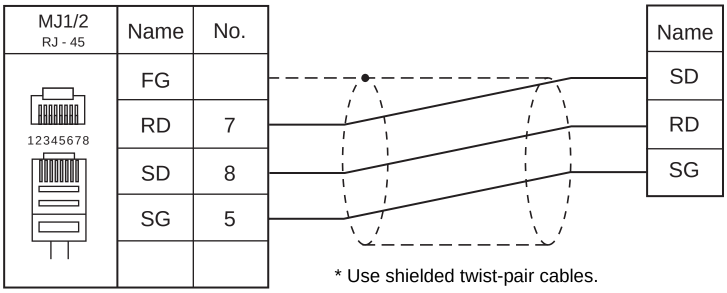
* Use shielded twist-pair cables.

Wiring diagram 2 - M2



* Use shielded twist-pair cables.

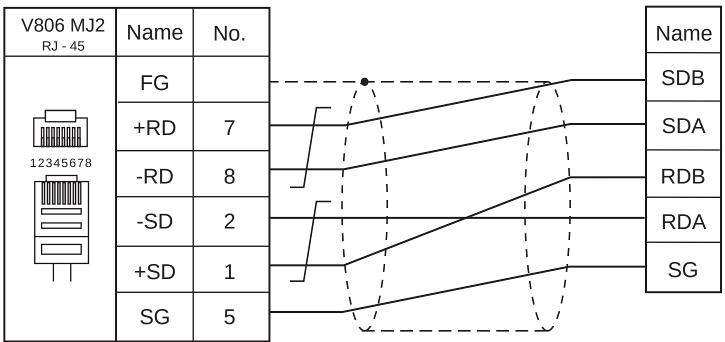
Wiring diagram 3 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

Wiring diagram 1 - M4



* Slide switch on V806:
RS-422 (lower)

* Use shielded twist-pair cables.

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11. KOYO ELECTRONICS

11.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	Connection			Ladder Transfer *1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
SU/SG (K-Sequence)	SU-5E/6B	Programmer communication port	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
		Universal communication port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	SU-5M SU-6M	Programmer communication port	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		Universal communication port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Universal communication port 2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		Universal communication port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	SZ-4	Programmer communication port (PORT1)	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		Universal communication port (PORT2)					
	SZ-4M	Programmer communication port (PORT1)					
		Universal communication port (PORT2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	
SU/SG (MODBUS RTU)	SU-5M SU-6M	Universal communication port 1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
		Universal communication port 3	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	SZ-4M	Universal communication port (PORT2)	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Wiring diagram 3 - C4	×	Wiring diagram 3 - M4	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

11.1.1 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 on the [Communication Setting] tab window 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

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

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

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

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 on the [Communication Setting] tab window of V8.

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 Memory

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

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	

11.1.2 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.	1	

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

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

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

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

Register	Setting	Setting Example
R7655	0 0 2 0 → Communication protocol 20: MODBUS RTU → Communication timeout 0: Specified time → Response delay time 0: 0 ms	0020H
R7656	8 7 0 1 → Station number 01 to 7A (HEX) → Baud rate 4: 4800 bps 5: 9600 bps 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

Available Memory

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

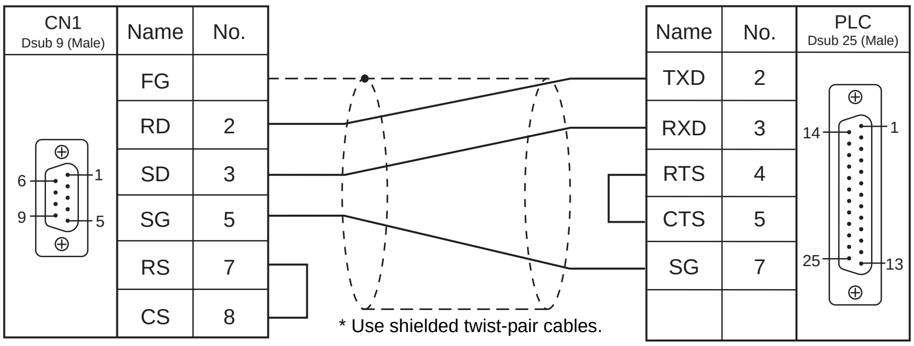
Memory		TYPE	Remarks
R	(data register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
S	(stage)	04H	
GI	(link input)	05H	
GQ	(link output)	06H	
T	(timer/contact)	07H	
C	(counter/contact)	08H	

11.1.3 Wiring Diagrams

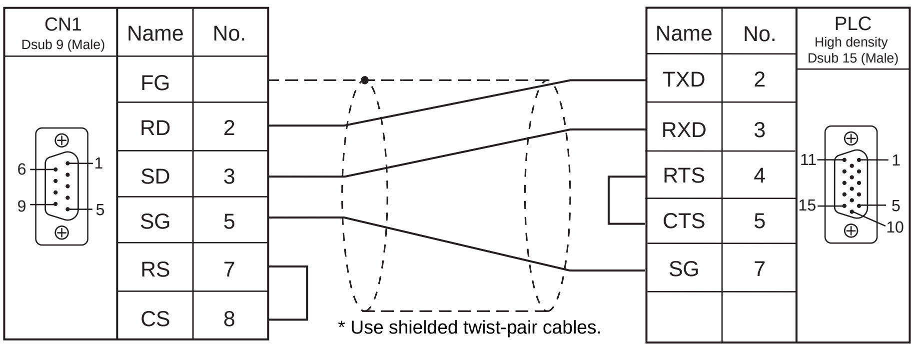
When Connected at CN1:

RS-232C

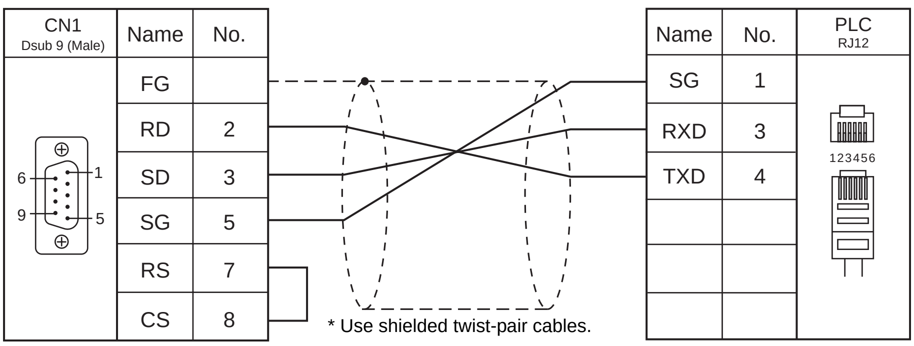
Wiring diagram 1 - C2



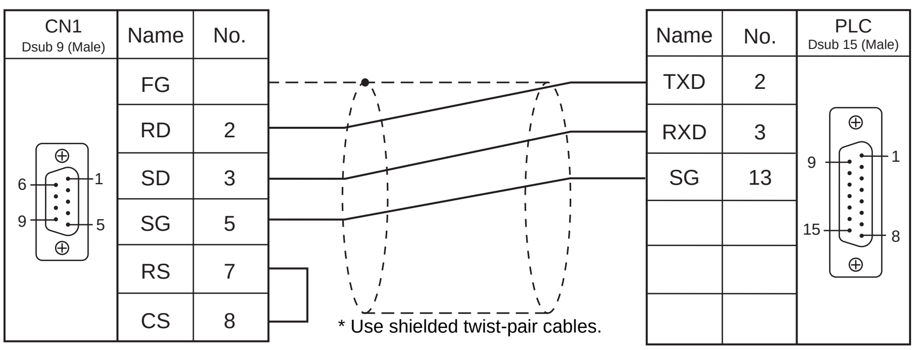
Wiring diagram 2 - C2



Wiring diagram 3 - C2

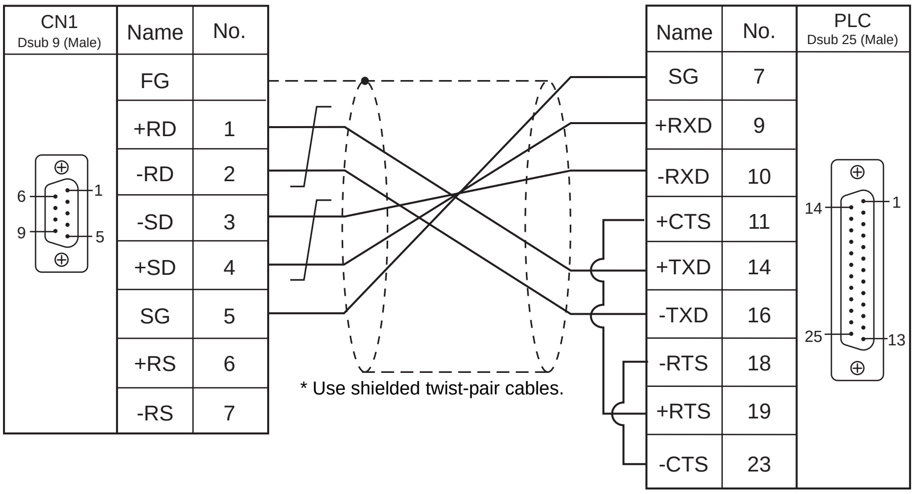


Wiring diagram 4 - C2

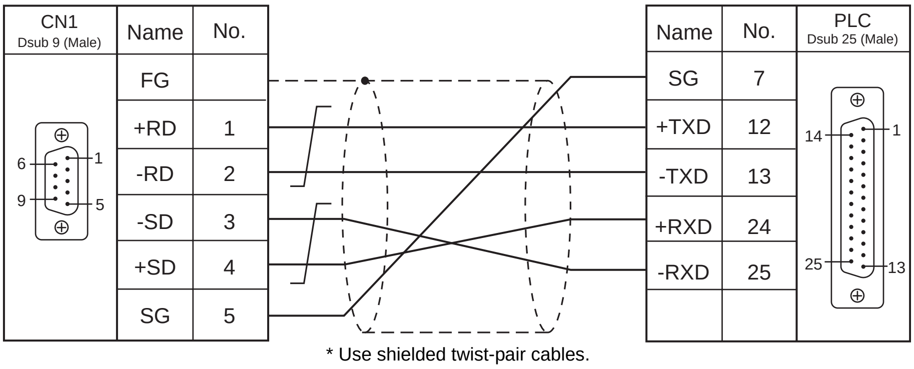


RS-422/RS-485

Wiring diagram 1 - C4

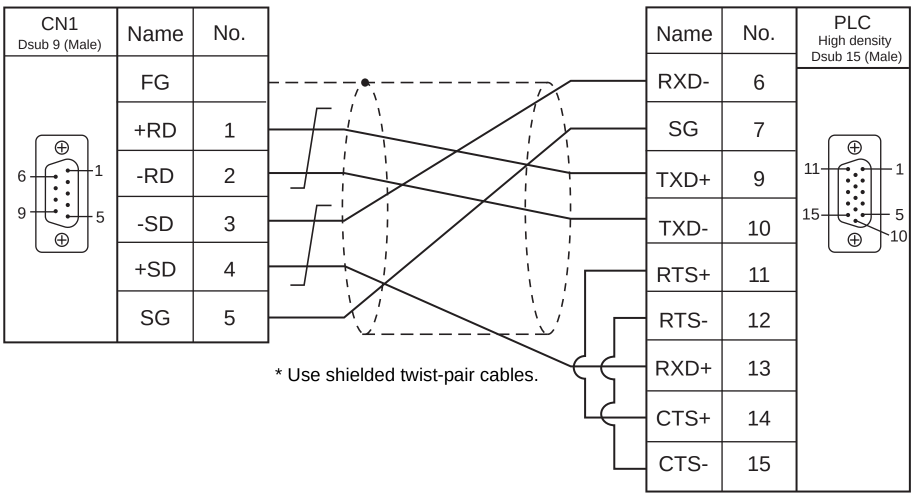


Wiring diagram 2 - C4



* SU-6M: Terminal block connectable

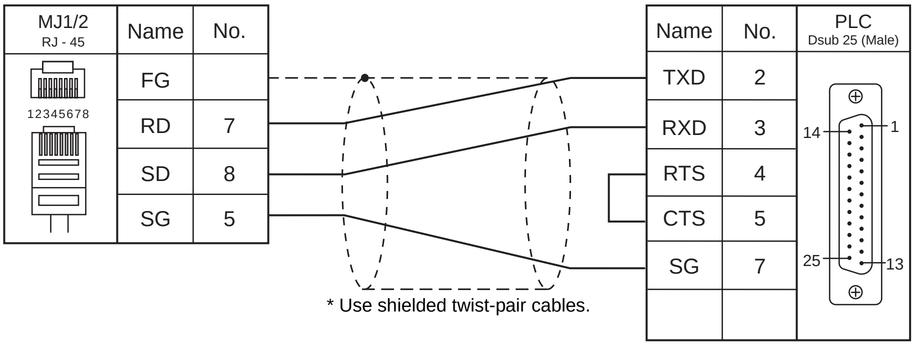
Wiring diagram 3 - C4



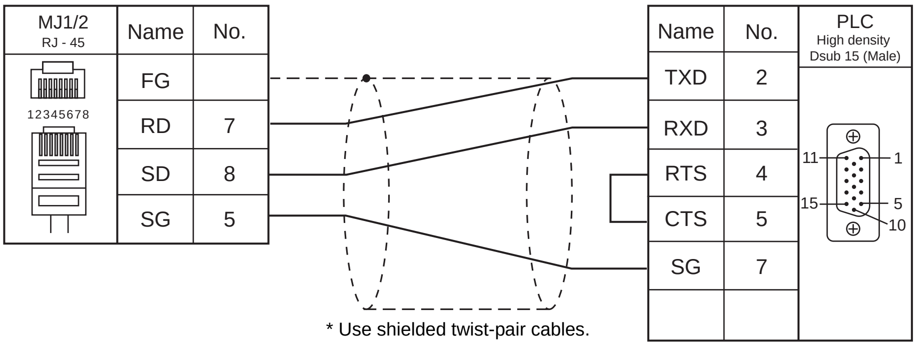
When Connected at MJ1/MJ2:

RS-232C

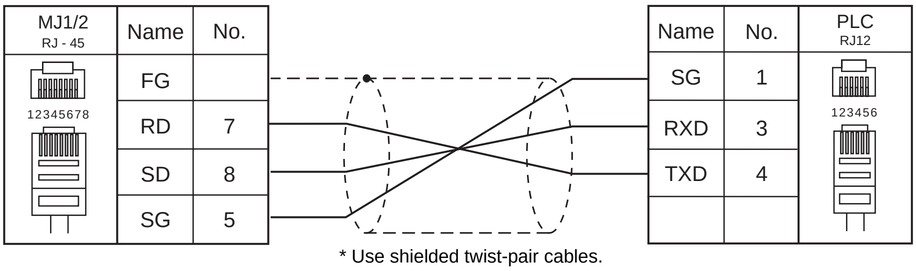
Wiring diagram 1 - M2



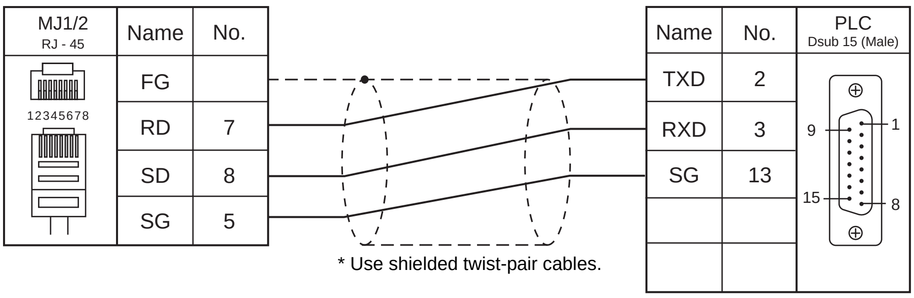
Wiring diagram 2 - M2



Wiring diagram 3 - M2

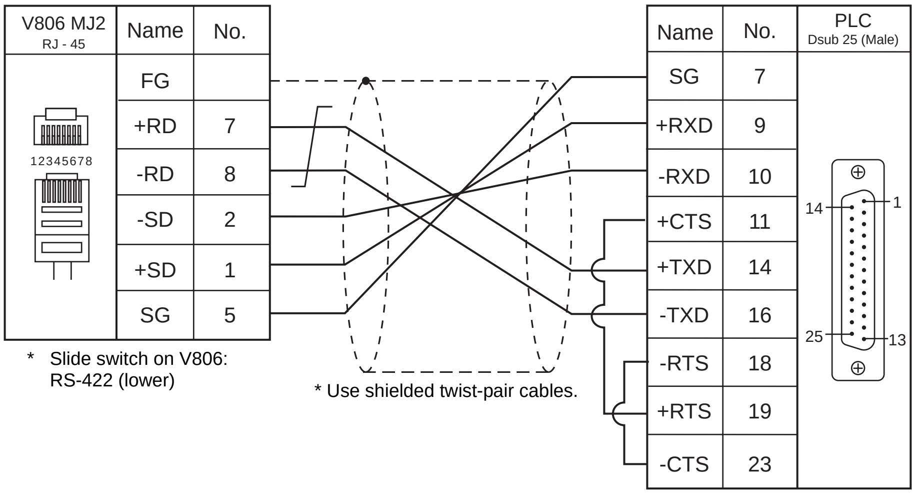


Wiring diagram 4 - M2

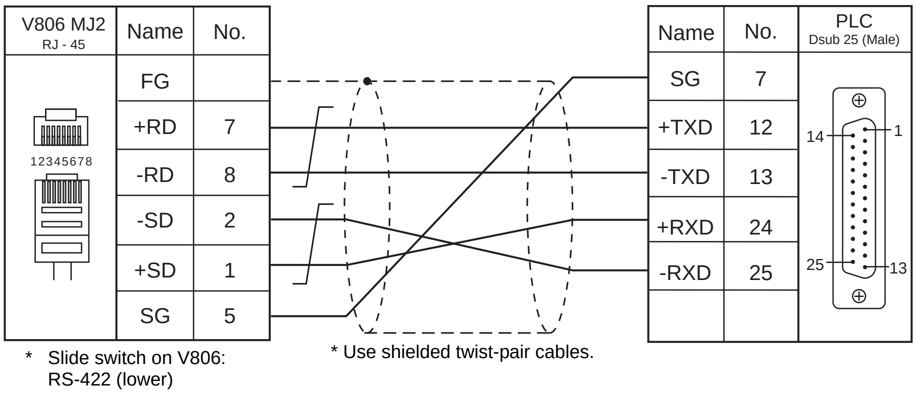


RS-422/RS-485

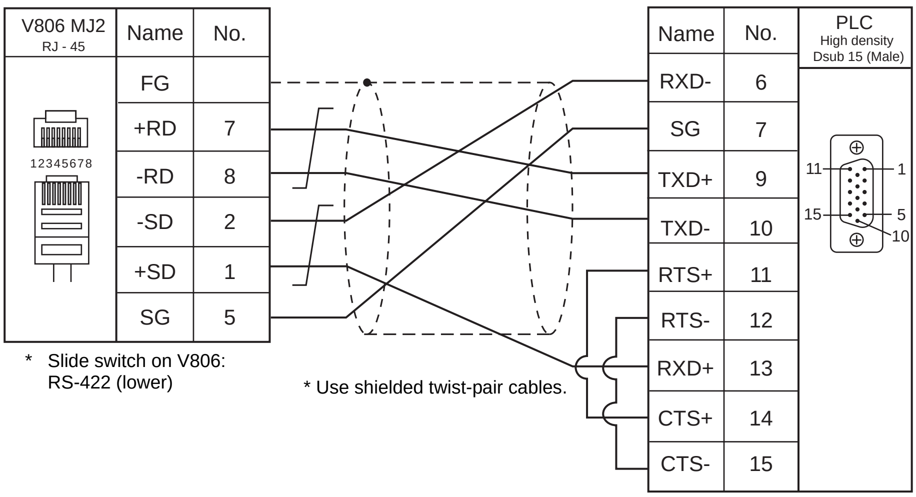
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



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12. MITSUBISHI ELECTRIC

12.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

A/QnA/QnH Series Standard Type Link Unit

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
A series link	A2A, A3A	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		×
	A2U, A3U, A4U	AJ71UC24					
	A1, A2, A3 A1N, A2N, A3N A3H, A3M, A73	AJ71C24 AJ71C24-S3 AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-422	Hakko Electronics' cable "D9-MI4-0T"	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
	A0J2, A0J2H	A0J2C214-S1		Wiring diagram 1 - C4			
	A2US	A1SJ71UC24-R2	RS-232C	Hakko Electronics' cable "D9-MI2-09"	Wiring diagram 1 - M2		
				Wiring diagram 1 - C2			
		A1SJ71UC24-R4	RS-422	Hakko Electronics' cable "D9-MI4-0T"	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			
		A1SJ71UC24-PRF	RS-232C	Hakko Electronics' cable "D9-MI2-09"	Wiring diagram 1 - M2		
	A1S, A1SJ, A2S	A1SJ71C24-R2		Wiring diagram 1 - C2			
		A1SJ71C24-R4	RS-422	Hakko Electronics' cable "D9-MI4-0T"	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			
		A1SJ71C24-PRF	RS-232C	Hakko Electronics' cable "D9-MI2-09"	Wiring diagram 1 - M2		
	A2CCPUC24	CPU with built-in link port					
	QnH (A mode)	A1SJ71UC24-R2		Wiring diagram 1 - C2			
		A1SJ71UC24-R4	RS-422	Hakko Electronics' cable "D9-MI4-0T"	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			
QnA series link	Q2A, Q3A, Q4A	AJ71QC24 AJ71QC24N	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
			RS-422	Hakko Electronics' cable "D9-MI4-0T"	×	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			
		AJ71QC24-R4 (CH1)	RS-422	Wiring diagram 2 - C4	×	Wiring diagram 3 - M4	
		AJ71QC24-R4 (CH2)	RS-422	Hakko Electronics' cable "D9-MI4-0T"	×	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			
	Q2ASx	A1SJ71QC24 A1SJ71QC24N A1SJ71QC24-R2	RS-232C	Hakko Electronics' cable "D9-MI2-09"	Wiring diagram 1 - M2		
				Wiring diagram 1 - C2			
			RS-422	Hakko Electronics' cable "D9-MI4-0T"	×	Wiring diagram 2 - M4	
				Wiring diagram 1 - C4			

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2">Unit/Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Ladder Transfer *1</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td rowspan="2">QnH (Q) series link (multi CPU)</td><td>Q02, Q02H
Q06H
Q12H
Q25H</td><td>QJ71C24
QJ71C24N
QJ71C24-R2
QJ71C24N-R2
QJ71C24N-R4</td><td rowspan="2">RS-232C</td><td>Hakko Electronics' cable “D9-MI2-09”</td><td rowspan="2">Wiring diagram 1 - M2</td><td rowspan="2"></td><td rowspan="5">×</td></tr>
<tr><td>Q00U
Q02U
Q03UD(E)
Q04UD(E)H
Q06UD(E)H
Q13UD(E)H
Q26UD(E)H</td><td>QJ71C24N
QJ71C24N-R2
QJ71C24N-R4</td><td>Wiring diagram 1 - C2</td></tr>
<tr><td rowspan="3">QnH (Q) series link</td><td>Q02, Q02H
Q06H
Q12H
Q25H</td><td rowspan="2">QJ71C24
QJ71C24N
QJ71C24-R2
QJ71C24N-R2
QJ71C24N-R4</td><td rowspan="3">RS-422</td><td rowspan="2">Hakko Electronics' cable “D9-MI4-0T”</td><td rowspan="3">×</td><td rowspan="3">Wiring diagram 2 - M4</td></tr>
<tr><td>Q00, Q01, Q00J</td></tr>
<tr><td>Q00U
Q02U
Q03UD(E)
Q04UD(E)H
Q06UD(E)H
Q13UD(E)H
Q26UD(E)H</td><td>QJ71C24N
QJ71C24N-R2
QJ71C24N-R4</td><td>Wiring diagram 1 - C4</td></tr>
</table>

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

A/QnA/QnH Series CPU

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Ladder Transfer *2</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td>A series CPU</td><td>A2A, A3A
A2U, A3U, A4U
A2US (H)
A1N, A2N, A3N
A3V, A73
A3H, A3M
A0J2H
A1S (H), A1SJ (H)
A2S (H)
A2CCPUC24
A1FX</td><td rowspan="2">Tool port *1</td><td rowspan="2">RS-422</td><td>Hakko Electronics' cable “D9-MB-CPUQ”</td><td rowspan="2">×</td><td rowspan="2">Hakko Electronics' cable “V706-ACPU” *4</td><td>○</td></tr>
<tr><td>QnA series CPU</td><td>Q2A, Q3A, Q4A
Q2AS (H)</td><td>Wiring diagram 3 - C4</td><td>×</td></tr>
<tr><td>QnH (Q) series CPU</td><td rowspan="2">Q02, Q02H
Q06H
Q12H
Q25H</td><td>Tool port</td><td rowspan="4">RS-232C</td><td rowspan="4">Hakko Electronics' cable “D9-QCPU2”</td><td rowspan="2">Hakko Electronics' cable “D9-QCPU2”
+
Wiring diagram 5 - M2</td><td rowspan="4"></td><td rowspan="4">○</td></tr>
<tr><td>QnH (Q) series CPU (multi CPU)</td><td>Tool port *3</td></tr>
<tr><td>Q00J/00/01 CPU</td><td>Q00J, Q00, Q01</td><td>Tool port</td><td>MJ-D25+QCPU2</td></tr>
<tr><td>QnU series CPU</td><td>Q00U
Q02U
Q03UD
Q04UDH
Q06UDH</td><td>Tool port</td><td>MJ2-PLC+QCPU2</td></tr>
</table>

*1 For more information of “V-MDD” (dual port interface), see page 12-28.
*2 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.
*3 Available for the CPU function version B or later.
*4 Cable length: V706-ACPU-□M (□ = 2, 3, 5, 10, 15 m)

FX Series

PLC Selection on the Editor	CPU	Port	Signal Level	Connection			Ladder Transfer *2
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
FX2N/1N series CPU	FX2N FX1N FX2NC FX1NC	Tool port *1	RS-422	Hakko Electronics' cable "D9-MI4-FX" Hakko Electronics' cable "D9-MB-CPUQ" + Mitsubishi's cable "FX-20P-CADP"	×	Hakko Electronics' cable "MJ2-MI4-FX" *4	○
FX series link (A protocol)	FX2N	FX2N-232-BD	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		×
		FX2N-485-BD	RS-485	Hakko Electronics' cable "D9-MI4-0T"*3 Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *4	
		FX2N-422-BD	RS-422	Hakko Electronics' cable "D9-MI4-FX"	×	Hakko Electronics' cable "MJ2-MI4-FX"	
	FX1N FX1S	FX1N-232-BD	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		FX1N-485-BD	RS-485	Hakko Electronics' cable "D9-MI4-0T"*3 Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
		FX1N-422-BD	RS-422	Hakko Electronics' cable "D9-MI4-FX"	×	Hakko Electronics' cable "MJ2-MI4-FX" *4	
	FX0N FX1NC FX2NC	FX0N-232ADP	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		FX2NC-232ADP		Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		FX0N-485ADP FX2NC-485ADP	RS-485	Hakko Electronics' cable "D9-MI4-0T"*3 Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
FX-3UC series CPU	FX-3U FX-3UC	Tool port *1	RS-422	Hakko Electronics' cable "D9-MI4-FX" Hakko Electronics' cable "D9-MB-CPUQ" + Mitsubishi's cable "FX-20P-CADP"	×	Hakko Electronics' cable "MJ2-MI4-FX" *4	○

*1 For more information of "V-MDD" (dual port interface), see page 12-28.
*2 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".
*3 "D9-MI4-0T" is equipped with the Y-shaped terminal at the PLC side. Modification is necessary before use.
*4 Cable length: MJ2-MI4-FX-□M (□ = 2, 3, 5 m)

Ethernet Connection

QnA/QnH Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
QnA series (Ethernet)	Q2A, Q3A, Q4A	AJ71QE71 AJ71QE71-B5	×	○	Auto-open: 5000 Open setting: As desired	×
	Q2ASx	A1SJ71QE71-B2 A1SJ71QE71-B5				
QnH (Q) series (Ethernet)	Q02, Q02H Q06H Q12H Q25H Q00J, Q00, Q01	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○		
	Q02U Q03UD Q04UDH Q06UDH Q13UDH Q26UDH	QJ71E71-B2 QJ71E71-100	×	○		
	Q03UDE Q04UDEH Q06UDEH Q13UDEH Q26UDEH	CPU with built-in Ethernet	×	○	Open setting	
QnH (Q) series (multi CPU) (Ethernet)	Q02, Q02H Q06H Q12H Q25H	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Auto-open: 5000 Open setting: As desired	
	Q02U Q03UD Q04UDH Q06UDH Q13UDH Q26UDH	QJ71E71-B2 QJ71E71-100	×	○		
	Q03UDE Q04UDEH Q06UDEH Q13UDEH Q26UDEH		×	○	Open setting	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

12.1.1 A Series Link

Communication Setting

Editor

Communication setting

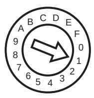
(Underlined setting: default)

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 2: With CR/LF
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

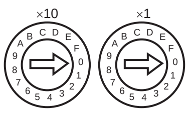
PLC

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

Mode setting

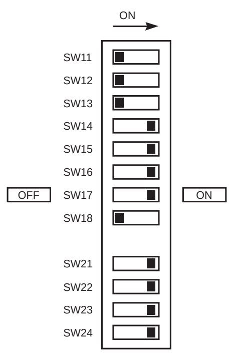
Mode	Setting	Contents	
	1	RS-232C	Dedicated protocol MODE 1
	4		Dedicated protocol MODE 4
	5	RS-422	Dedicated protocol MODE 1
	8		Dedicated protocol MODE 4

Station number setting

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

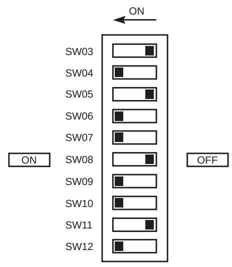
Transmission setting

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	-	-	

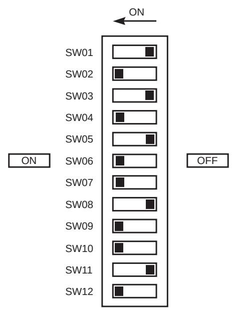
A1SJ71C24-R2, A1SJ71UC24-R2

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 Memory

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

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 memory 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.

12.1.2 A Series CPU

Communication Setting

Editor

Communication setting

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link2	
Signal Level	RS-422/485	
Baud Rate	9600 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

No particular setting is necessary on the PLC.

Available Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.3 QnA Series Link

Communication Setting

Editor

Communication setting

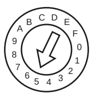
(Underlined setting: default)

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

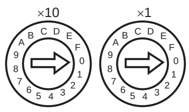
PLC

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

Mode setting

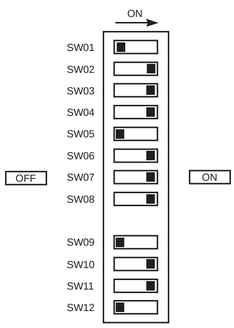
Mode	Setting	Contents
	5	Dedicated protocol binary mode Mode 5

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	

Switch	Contents	9600	19200	38400	57600	115200
SW09	Baud rate *1	ON	OFF	ON	OFF	ON
SW10		OFF	ON	ON	ON	ON
SW11		ON	ON	ON	OFF	OFF
SW12		OFF	OFF	OFF	ON	ON

*1 QJ71C24 (-R2/-R4): Max. 19200 bps
QJ71C24N (-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 Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.4 QnA Series CPU

Communication Setting

Editor

Communication setting

Item	Setting	Remarks
Connection Mode	1 : 1 / Multi-link / Multi-link2	"V-MDD" is necessary for multi-link.
Signal Level	RS-422/485	
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

No particular setting is necessary on the PLC.

Available Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.5 QnA Series (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

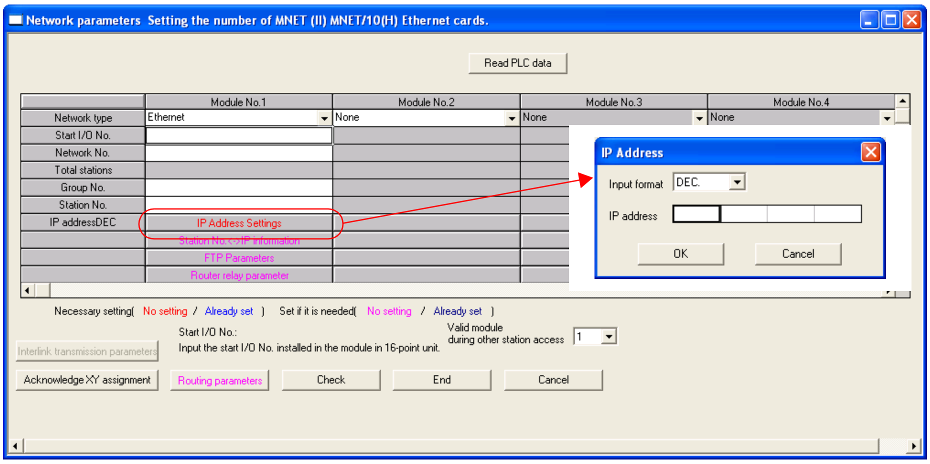
- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC (Parameter Setting)

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 Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.6 QnH (Q) Series Link

Communication Setting

Editor

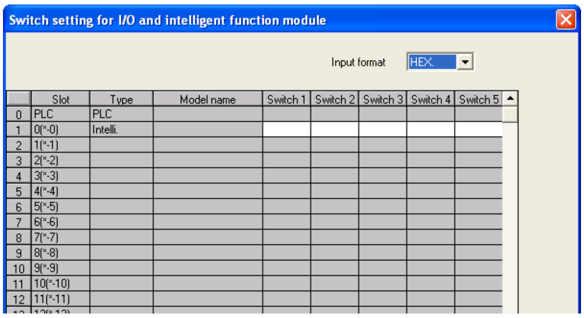
Communication setting

(Underlined setting: default)

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

PLC (PC Parameter)

Switch setting for I/O and intelligent function module



<table>
<tr><th>Switch</th><th colspan="2">Contents</th><th>Example</th></tr>
<tr><td>Switch 1</td><td colspan="2">CH1: baud rate, transmission setting

<table>
<tr><td>Bit</td><td>15 - 8</td><td>7 - 0</td></tr>
<tr><td></td><td>Baud rate</td><td>Transmission setting</td></tr>
</table>
<table>
<tr><th>bps</th><th>Setting</th></tr>
<tr><td>4800</td><td>04H</td></tr>
<tr><td>9600</td><td>05H</td></tr>
<tr><td>19200</td><td>07H</td></tr>
<tr><td>38400</td><td>09H</td></tr>
<tr><td>57600</td><td>0AH</td></tr>
<tr><td>115200</td><td>0BH</td></tr>
</table>
<table>
<tr><th>Bit</th><th>Contents</th><th>OFF</th><th>ON</th></tr>
<tr><td>0</td><td>Operation</td><td>Independent</td><td>Link</td></tr>
<tr><td>1</td><td>Data bit</td><td>7</td><td>8</td></tr>
<tr><td>2</td><td>Parity bit</td><td>Not provided</td><td>Provided</td></tr>
<tr><td>3</td><td>Parity</td><td>Odd</td><td>Even</td></tr>
<tr><td>4</td><td>Stop bit</td><td>1</td><td>2</td></tr>
<tr><td>5</td><td>Sum check</td><td>Not provided</td><td>Provided</td></tr>
<tr><td>6</td><td>Write while running</td><td>Prohibited</td><td>Allowed</td></tr>
<tr><td>7</td><td>Setting change</td><td>Prohibited</td><td>Allowed</td></tr>
</table></td><td>0BEEH

115 kbps
8 bits
1 bit
Even</td></tr>
<tr><td>Switch 2</td><td>CH1: communication protocol</td><td>MC protocol mode 5 binary code</td><td>0005H</td></tr>
<tr><td>Switch 3</td><td colspan="2">CH2: baud rate, transmission setting (the same as those for switch 1)</td><td>0BEEH</td></tr>
<tr><td>Switch 4</td><td>CH2: communication protocol</td><td>MC protocol mode 5 binary code</td><td>0005H</td></tr>
<tr><td>Switch 5</td><td>Station number setting</td><td>0 to 31</td><td>0000H</td></tr>
</table>

Available Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.7 QnH (Q) 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	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 Memory

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

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	

*1 The unit number is required in addition to the memory 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.

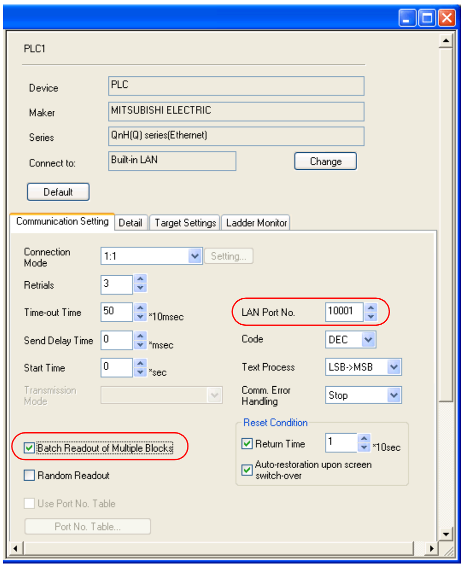
12.1.8 QnH (Q) Series (Ethernet)

Communication Setting

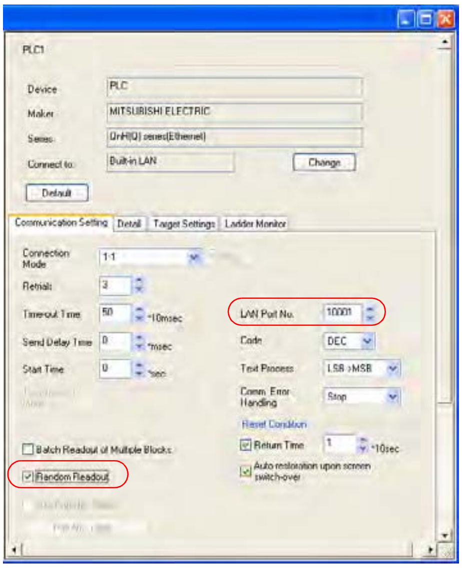
Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number and [☐ Batch Readout of Multiple Blocks] or [☐ Random Readout] in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
  When connecting the V8 to the Ethernet unit on the PLC’s base, check the [☐ Batch Readout of Multiple Blocks] check box.
  When connecting the V8 to the built-in Ethernet port on the PLC, check the [☐ Random Readout] check box.
  - When connecting to the Ethernet unit on the PLC’s base



  - When connecting to the built-in Ethernet port on the PLC



- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

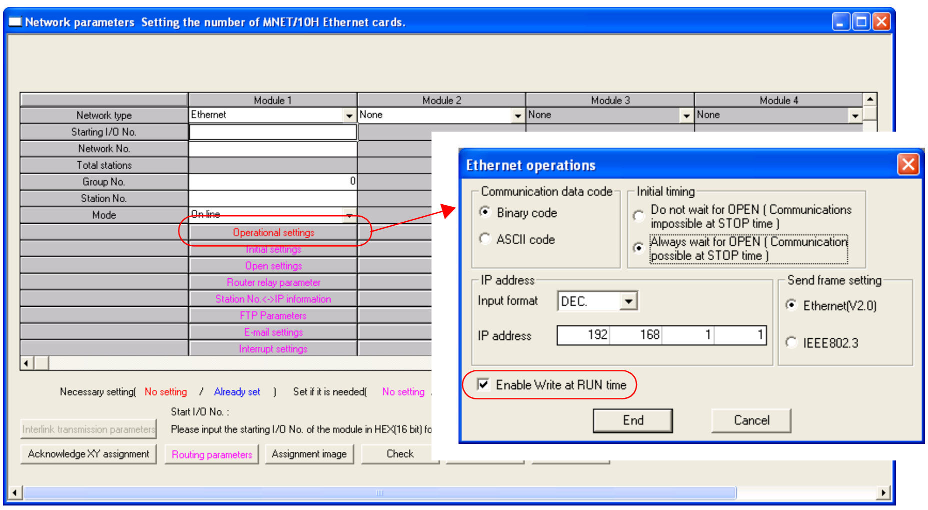
Ethernet unit

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

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.

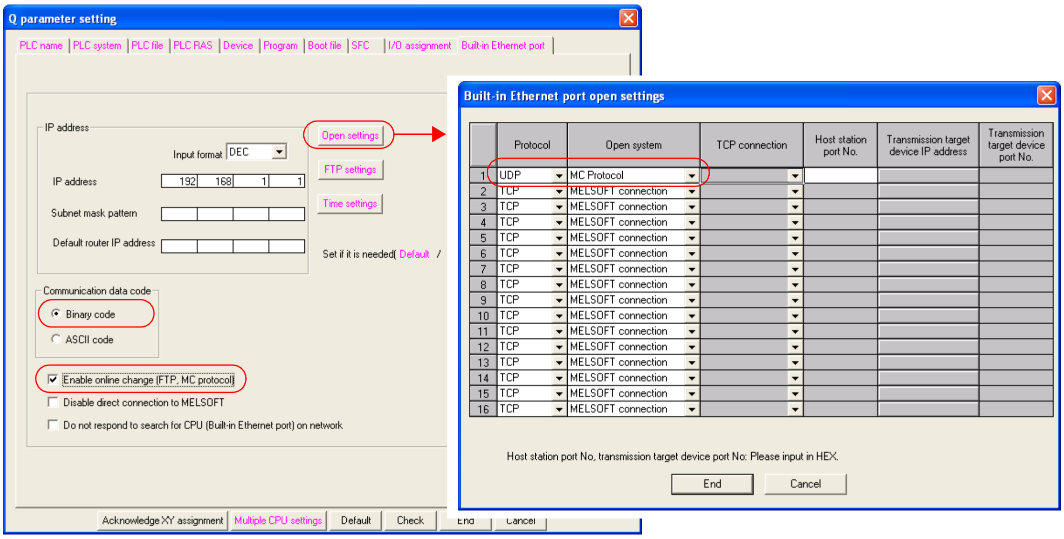
There are two types of ports: one is opened automatically by “auto-open UDP port” (default: 5000 DEC), and the other is opened by open processing. When using the open processing, make settings for [Open settings] on the [Network parameters] dialog. For more information, refer to the corresponding PLC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

Built-in Ethernet port

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

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.
Protocol	UDP	
Open system	MC Protocol	
Host station port No. (HEX)	Make settings in accordance with the network environment.	

Available Memory

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

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	

*1 The unit number is required in addition to the memory 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.

12.1.9 Q00J/00/01 CPU

The communication setting and available memory are the same as those described in “12.1.7 QnH (Q) Series CPU”.

12.1.10 QnH (Q) Series Link (Multi CPU)

The communication setting and available memory are the same as those described in “12.1.6 QnH (Q) Series Link”.

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

The communication setting and available memory are the same as those described in “12.1.8 QnH (Q) Series (Ethernet)”.

12.1.12 QnH (Q) Series CPU (Multi CPU)

The communication setting and available memory are the same as those described in “12.1.7 QnH (Q) Series CPU”.

12.1.13 QnU Series CPU

The communication setting and available memory are the same as those described in “12.1.7 QnH (Q) Series CPU”.

12.1.14 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 Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	*1
M	(auxiliary relay)	04H	
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.

12.1.15 FX Series Link (A Protocol)

Communication Setting

Editor

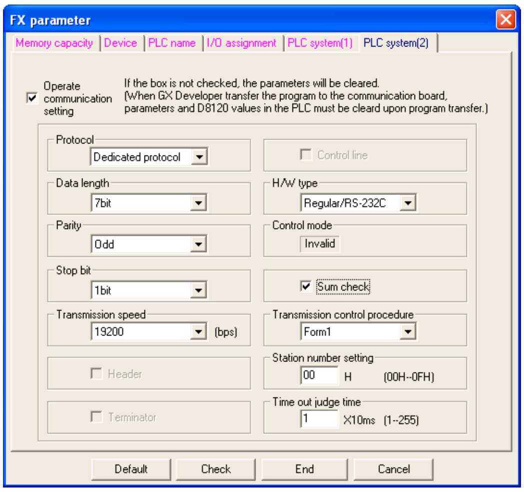
Communication setting

(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)



Item	Setting	Remarks
☐ Operate communication setting	**Checked**	
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 Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	*1
32CN	(32-bit counter/current value)	03H	*2
M	(auxiliary relay)	04H	
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.

12.1.16 FX-3UC 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 Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
TN	(timer/current value)	01H	
CN	(counter/current value)	02H	
32CN	(32-bit counter/current value)	03H	*1
M	(auxiliary relay)	04H	
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.

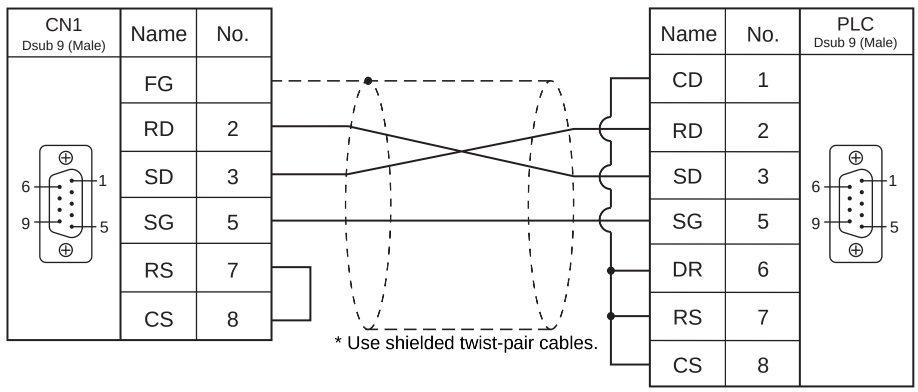
12.1.17 Wiring Diagrams

When Connected at CN1:

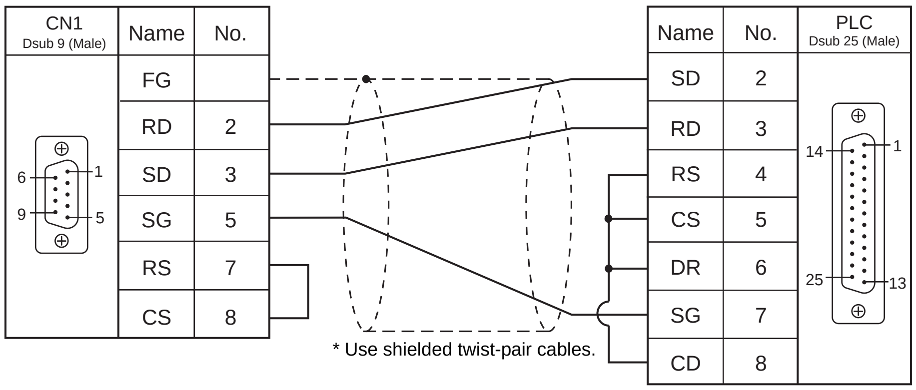
RS-232C

Wiring diagram 1 - C2

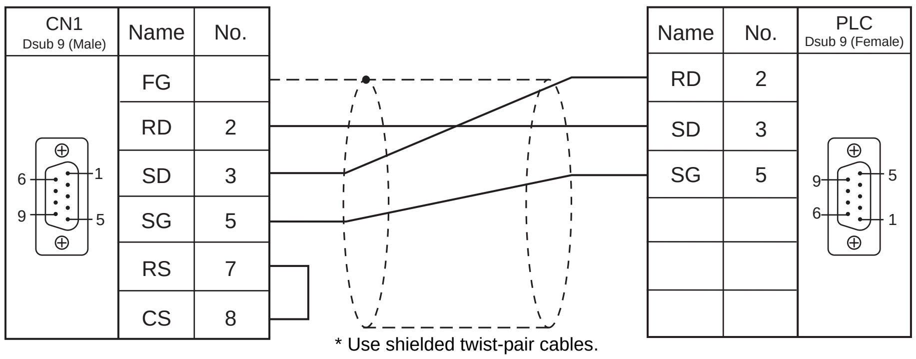
Hakko Electronics' cable "D9-MI2-09-□M" (□ = 2, 3, 5, 10, 15)



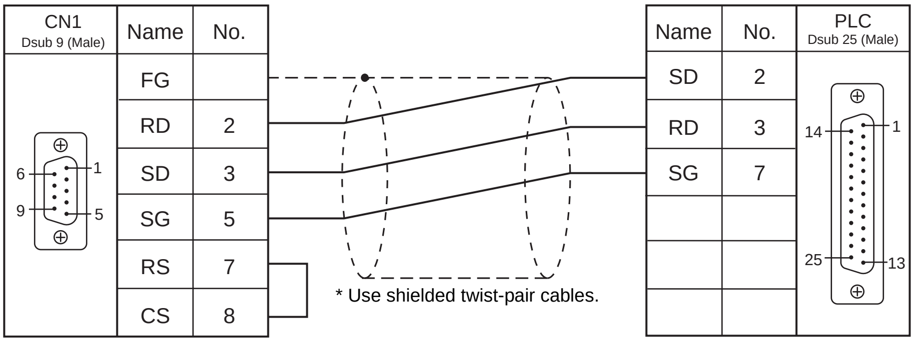
Wiring diagram 2 - C2



Wiring diagram 3 - C2



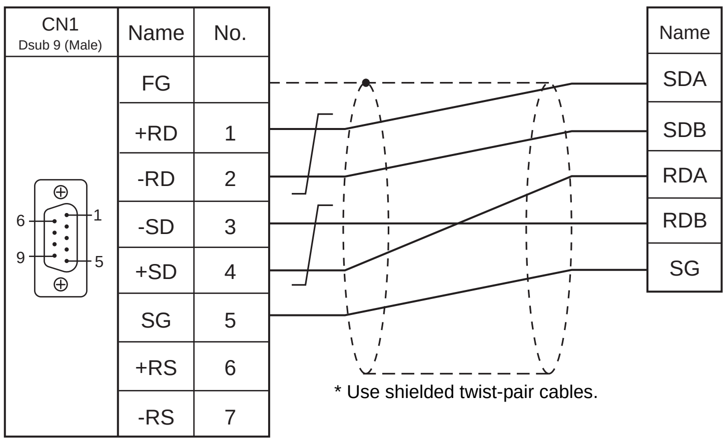
Wiring diagram 4 - C2



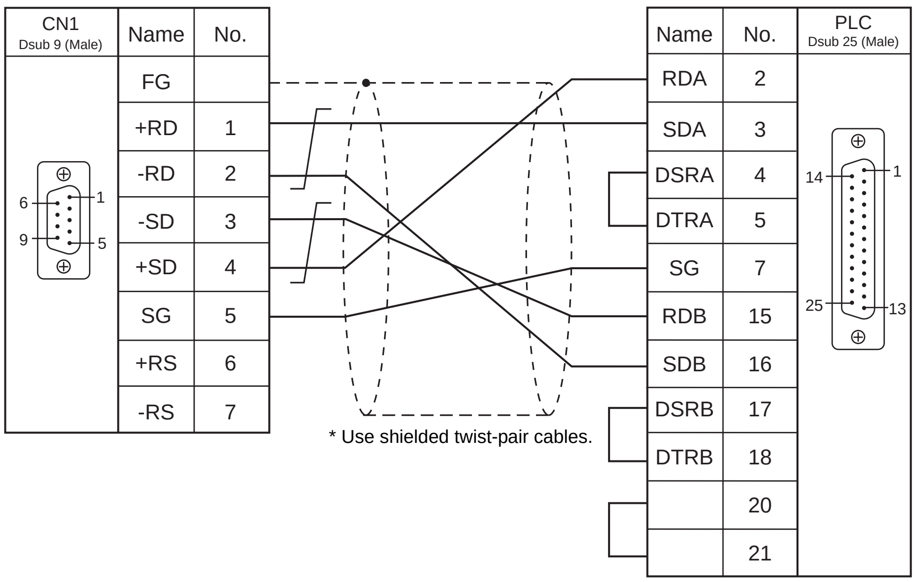
RS-422/RS-485

Wiring diagram 1 - C4

Hakko Electronics' cable "D9-MI4-0T-☐M" (☐ = 2, 3, 5, 10, 15)

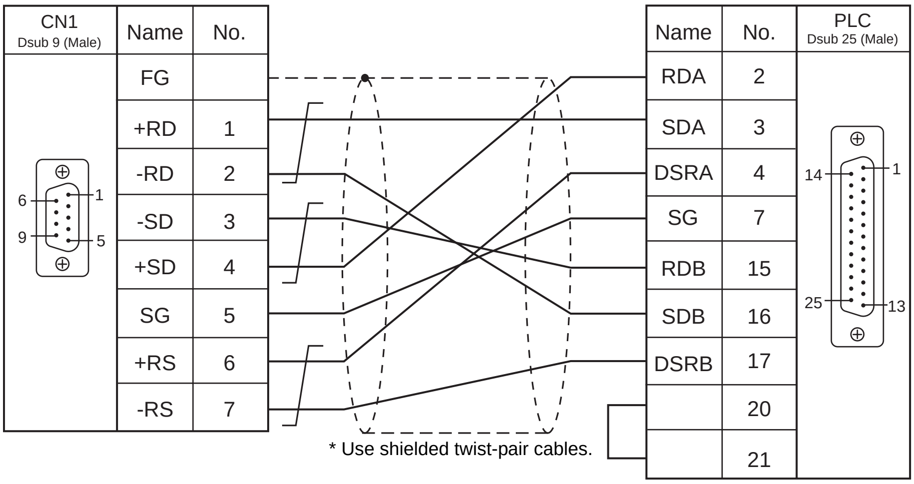


Wiring diagram 2 - C4



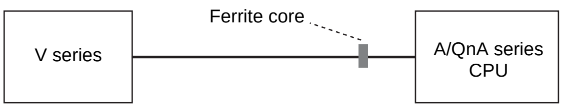
Wiring diagram 3 - C4

Hakko Electronics' cable "D9-MB-CPUQ-□M" (□ = 2, 3, 5, 10, 15)



According to our noise tests, the attachment of a ferrite core improves noise voltage by 650 to 900 V and aids in preventing communication errors.

- When connecting to the A/QnA series CPU directly, attach a ferrite core to the communication cable to avoid noise problems.

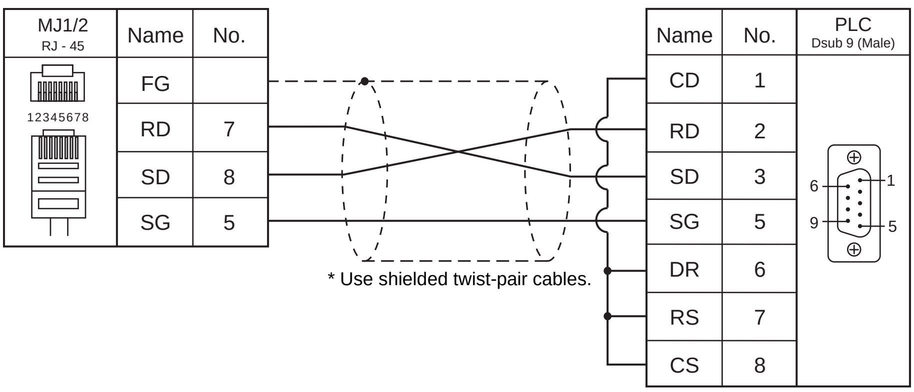


- Ferrite cores are optionally available. The model name is "GD-FC" (inner diameter: 8 mm, outer diameter: 20 mm).
- In consideration of such noise problems, it is recommended that the standard type link unit be used when the cable length of 15 m or longer is required.

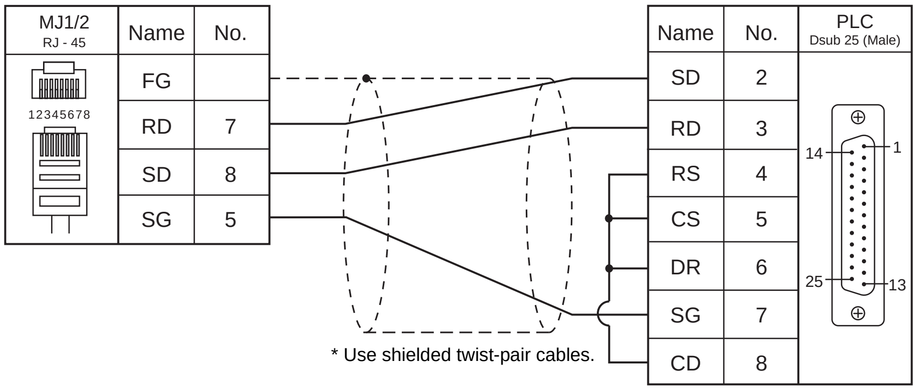
When Connected at MJ1/MJ2:

RS-232C

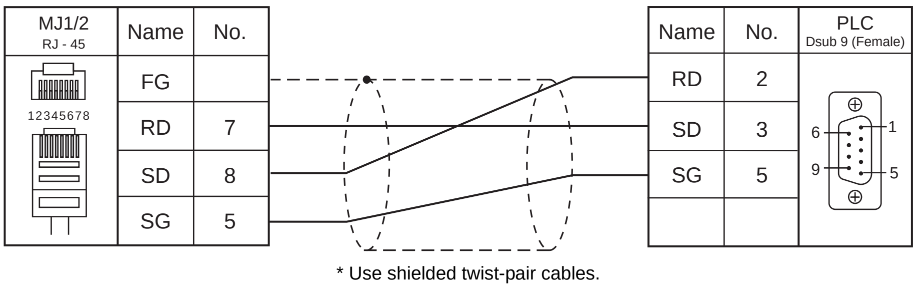
Wiring diagram 1 - M2



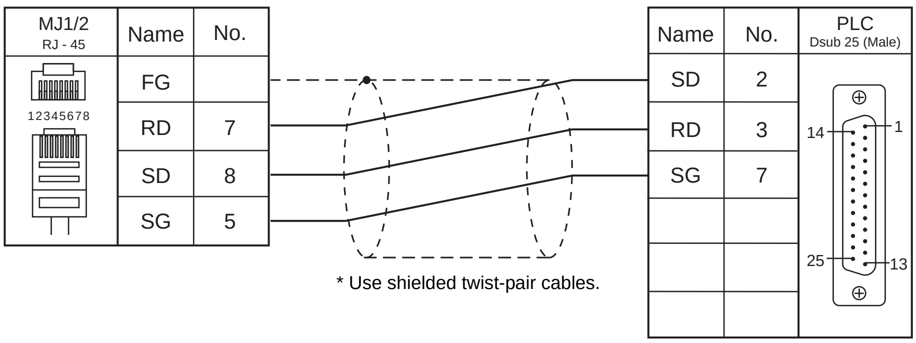
Wiring diagram 2 - M2



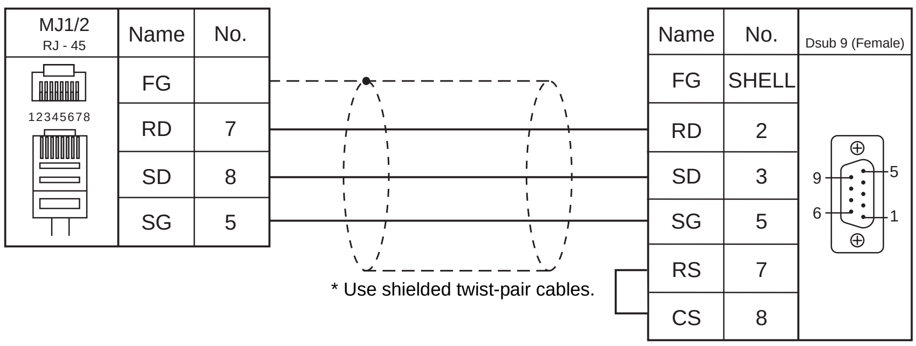
Wiring diagram 3 - M2



Wiring diagram 4 - M2

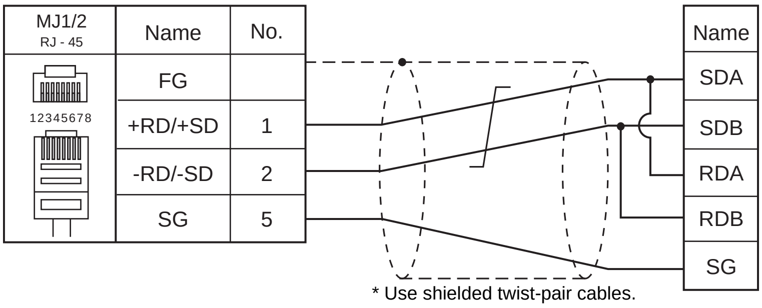


Wiring diagram 5 - M2



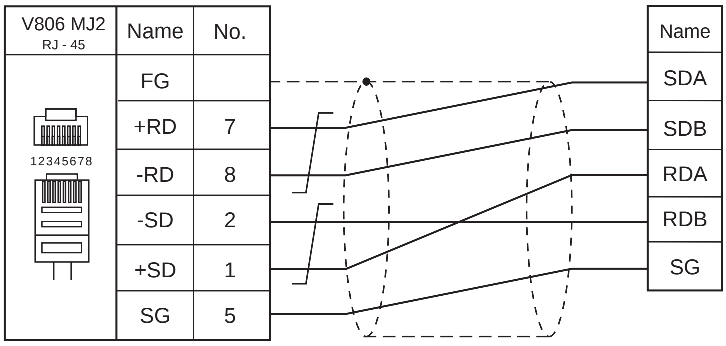
RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

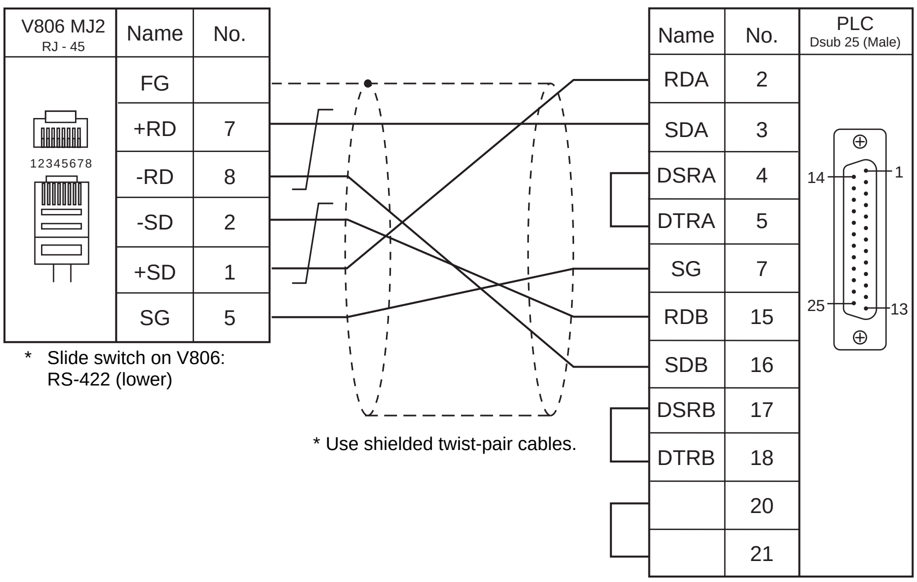
Wiring diagram 2 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

Wiring diagram 3 - M4

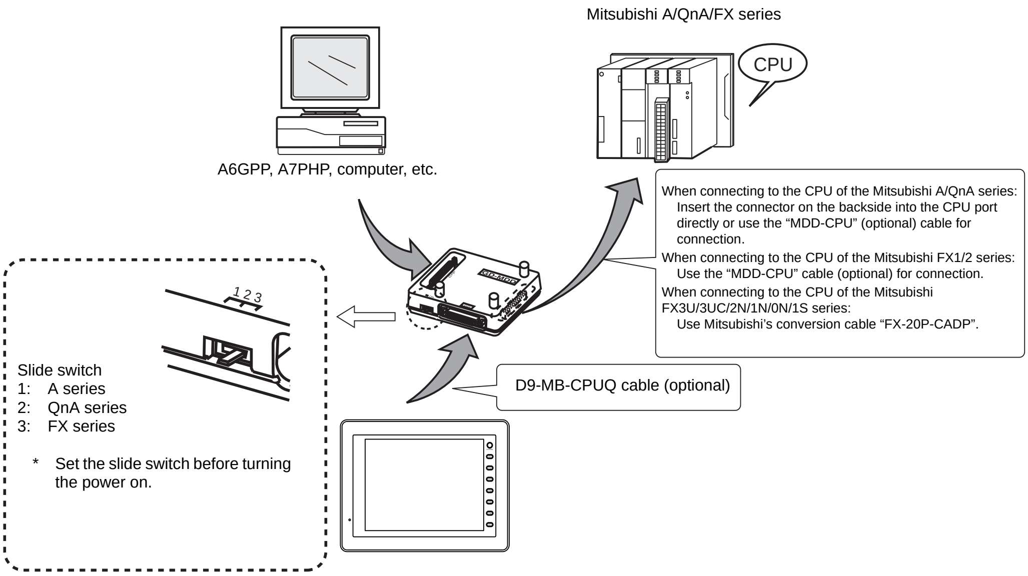


* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

V-MDD (Dual Port Interface)

"V-MDD" is the add-on connector unit with two ports, specifically designed for Mitsubishi's A series, QnA series or FX series CPU programmer.



* V-MDD cannot be used with the D9-MI4-FX cable.

- The power to V-MDD is supplied from the CPU. Check the electric capacity of 5 V at the CPU. (Current consumption: max. 350 mA)
- Keep the cable between the CPU and V-MDD as short as possible. (Max. 1 to 1.5 m)
- Be sure to consider noise problems when performing wiring.
- When using V-MDD for connection with the V8 series, set 1.5 seconds or above for the timeout time in the [Communication Setting] dialog.
- Please read the instruction manual for V-MDD before use.
- When using V-MDD, set 9600 bps for the baud rate.

12.2 Temperature Controller/Servo/Inverter Connection

The controller models shown below can be connected.

Inverter

FR-*500 / FR-V500 Series

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td rowspan="2">FR-*500</td><td>FR-A500
FR-E500
FR-F500</td><td>PU connector</td><td rowspan="3">RS-485</td><td rowspan="3">Wiring diagram 1 - C4</td><td rowspan="3">Wiring diagram 1 - M4</td><td rowspan="3">Wiring diagram 2 - M4</td><td rowspan="2">FR-E500.Lst</td></tr>
<tr><td>FR-S500</td><td>RS-485 connector</td></tr>
<tr><td>FR-V500</td><td>FR-V500</td><td>PU connector</td><td>FR-V500.Lst</td></tr>
</table>

12.2.1 FR-*500

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Parameter No.	Item	Setting	Setting Example
77	Parameter writing permission	<u>0: Writing allowed when PU operation stops</u> 1: Writing prohibited 2: Writing allowed during operation	2: Writing allowed during operation
79	Operation mode selection *2	0 / <u>1</u> / 2 / 3 / 4 / 6 / 7 / 8	1: PU operation *3 2: External operation *3
117	Communicating station number	<u>0</u> to 31	0
118	Baud rate	4800 / 9600 / <u>19200</u> bps	19200 bps
119	Data length / stop bit length	0: 8 bits / 1 bit <u>1: 8 bits / 2 bits</u> 10: 7 bits / 1 bit 11: 7 bits / 2 bits	1: 8 bits / 2 bits
120	Parity check	0: None 1: Odd <u>2: Even</u>	2: Even
121	Communication retrial times	<u>0</u> to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	Communication check intervals *1	<u>0</u> / 0.1 to 999.8 / 9999	9999: Communication check stop
123	Wait time	0 to 150 / <u>9999</u>	9999: Can be set with the communication data
124	CR/LF selection	0: CR/LF not provided <u>1: CR provided, LF not provided</u> 2: CR/LF provided	1: CR provided, LF not provided
146	Frequency setting *2	<u>0</u> / 1 / 9999	9999

*1 When the value in the range from 0.1 to 999.8 is set:
If the V8 series 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 or FR-E500, 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-F500 or FR-S500, is turned on with the settings of Pr.79=2 and n10=1, the inverter enters in the computer link operation mode.

*3 When “1” is specified for 79 (operation mode selection), the running frequency and operation command for the FR-A500 or FR-E500 can be set on the V8.
When “2” is specified for 79 (operation mode selection), the running frequency and operation command for the FR-F500 or FR-S500 can be set on the V8.
Set the sensible operation mode when you do not need to set the running frequency and operation command from the V8.

Available Memory

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

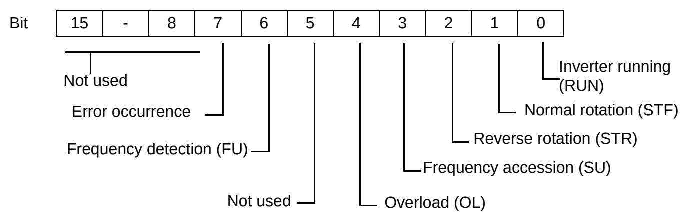
Memory		TYPE	Remarks
P	(parameter)	00H	Refer to the list file or the parameter list for the inverter.
D	(parameter)	01H	Refer to the table below.

Memory D (Parameter)

Address	Name	
D0	Operation mode	When issuing a command, such as a run command, from the V8 series, select “Communication and Run”. FR-E500 : 0002 H FR-A500 : 0002 H FR-F500 : 0002 H FR-S500 : 0000 H
D1	Output frequency (Rotation)	
D2	Output current	
D3	Output voltage	
D4	Alarm contents (last / most recent)	

Data	Contents	Data	Contents	Data	Contents	Data	Contents
H00	none	H22	OV3	H80	GF	HB2	RET
H10	OC1	H30	THT	H81	LF	HC2	P24
H11	OC2	H31	THM	H90	OHT	HF3	E.3
H12	OC3	H40	FIN	HA0	OPT	HF6	E.6
H20	OV1	H60	OLT	HB0	PE	HF7	E.7
H21	OV2	H70	BE	HB1	PUE		

Address	Name
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



Address	Name
D9	Changeover to second parameter

* These memory addresses are not available for FR-S500

Note on Setting the Memory
Only the “List” file of “FR-E500” can be browsed by pressing the [Refer] button by default.
If the inverter such as “A500”, “F500”, or “S500” is used, refer to the parameter list described in each inverter’s manual and set the memory.

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

<table>
<tr><th>Contents</th><th>F0</th><th colspan="6">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Writing running frequency (EEPROM)</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: 00EEH</td></tr>
<tr><td>n + 2</td><td colspan="5">Running frequency</td></tr>
<tr><td rowspan="3">Writing running frequency (RAM)</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: 00EDH</td></tr>
<tr><td>n + 2</td><td colspan="5">Running frequency</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>
<tr><td rowspan="3">Operation 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
0002H: Normal rotation (STF)
0004H: Reverse rotation (STR)</td></tr>
<tr><td rowspan="7">All parameter clear</td><td rowspan="7">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="7">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00FCH</td></tr>
<tr><td rowspan="5">n + 2</td><td>Pr.
Data</td><td>Communication Pr.</td><td>Calibration</td><td>Other Pr.</td><td>00ECH
00F3H
00FFH</td></tr>
<tr><td>9696H</td><td>○</td><td>×</td><td>○</td><td>○</td></tr>
<tr><td>9966H</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 rowspan="2">Inverter reset</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: 00FDH</td></tr>
</table>

12.2.2 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

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 V series does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.

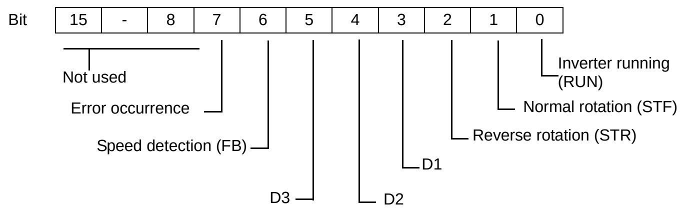
*2 When the inverter is turned on with the settings of Pr.79=0 and Pr.146=9999, the inverter enters in the PU operation mode.

Available Memory

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

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.

Memory 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 V series, select “Communication and Run”.
0002 H</td></tr>
<tr><td>D1</td><td colspan="2">Rotation speed</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)</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>
<tr><td>D10</td><td colspan="2">Special monitor</td></tr>
<tr><td>D11</td><td colspan="2">Special monitor selection No.
<table>
<tr><th>Data</th><th>Contents</th><th>Unit</th><th>Data</th><th>Contents</th><th>Unit</th></tr>
<tr><td>H01</td><td>Output frequency</td><td>0.01 Hz</td><td>H10</td><td>Output terminal status</td><td>-</td></tr>
<tr><td>H02</td><td>Output current</td><td>0.01 A</td><td>H11</td><td>Load meter</td><td>0.1%</td></tr>
<tr><td>H03</td><td>Output voltage</td><td>0.1V</td><td>H12</td><td>Motor exciting current</td><td>0.01A</td></tr>
<tr><td>H05</td><td>Speed setting</td><td>1 r/min</td><td>H13</td><td>Position pulse</td><td>-</td></tr>
<tr><td>H06</td><td>Operation speed</td><td>1 r/min</td><td>H14</td><td>Total power-on time</td><td>1h</td></tr>
<tr><td>H07</td><td>Motor torque</td><td>0.1%</td><td>H17</td><td>Operating time</td><td>1h</td></tr>
<tr><td>H08</td><td>Converter output</td><td>0.1 V</td><td>H18</td><td>Motor load ratio</td><td>0.1%</td></tr>
<tr><td>H09</td><td>Regenerative brake</td><td>0.1%</td><td>H20</td><td>Torque command</td><td>0.1%</td></tr>
<tr><td>H0A</td><td>Electric thermal load ratio</td><td>0.1%</td><td>H21</td><td>Torque current command</td><td>0.1%</td></tr>
<tr><td>H0B</td><td>Output current peak value</td><td>0.01 A</td><td>H22</td><td>Motor output</td><td>0.01 kW</td></tr>
<tr><td>H0C</td><td>Output voltage peak value of converter</td><td>0.1 V</td><td>H23</td><td>Feed back pulse</td><td>-</td></tr>
<tr><td>H0F</td><td>Input terminal status</td><td>-</td><td></td><td></td><td></td></tr>
</table>
Input terminal status
<table>
<tr><td>Bit</td><td>15</td><td>-</td><td>8</td><td>RES</td><td>CH</td><td>DI4</td><td>DI3</td><td>DI2</td><td>DI1</td><td>STR</td><td>STF</td></tr>
</table>
Output terminal status
<table>
<tr><td>Bit</td><td>15</td><td colspan="5">-</td><td>4</td><td>ABC</td><td>D03</td><td>D02</td><td>D01</td></tr>
</table>
</td></tr>
</table>

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

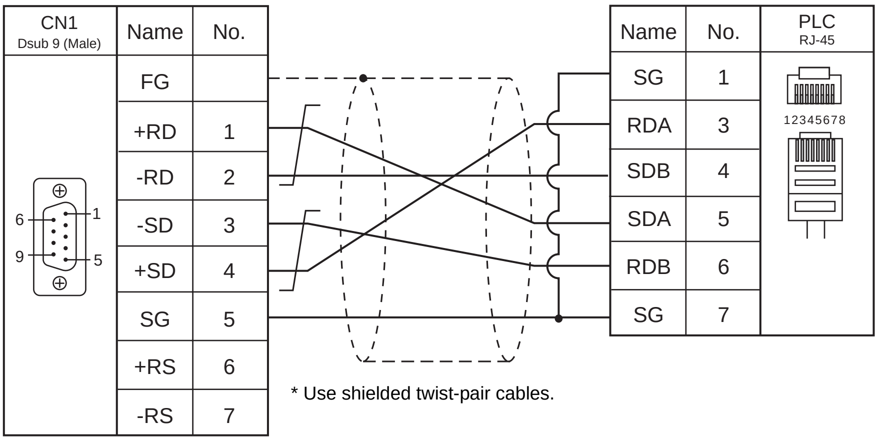
<table>
<tr><th>Contents</th><th>F0</th><th colspan="6">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Writing setting speed (EEPROM)</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00EEH</td></tr>
<tr><td>n + 2</td><td colspan="5">Running frequency</td></tr>
<tr><td rowspan="3">Writing setting speed (RAM)</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: 00EDH</td></tr>
<tr><td>n + 2</td><td colspan="5">Running frequency</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>
<tr><td rowspan="3">Operation 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
0002H: Normal rotation (STF)
0004H: Reverse rotation (STR)</td></tr>
<tr><td rowspan="7">All parameter clear</td><td rowspan="7">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="5">Station number</td><td rowspan="7">3</td></tr>
<tr><td>n + 1</td><td colspan="5">Command: 00FCH</td></tr>
<tr><td rowspan="5">n + 2</td><td>Pr.
Data</td><td>Communication Pr.</td><td>Calibration</td><td>Other Pr.</td><td>00ECH
00F3H
00FFH</td></tr>
<tr><td>9696H</td><td>○</td><td>×</td><td>○</td><td>○</td></tr>
<tr><td>9966H</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 rowspan="2">Inverter reset</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: 00FDH</td></tr>
</table>

12.2.3 Wiring Diagrams

When Connected at CN1:

RS-422/RS-485

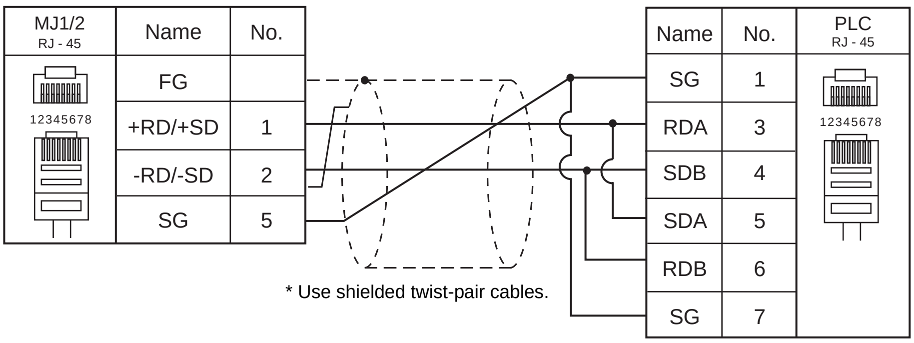
Wiring diagram 1 - C4



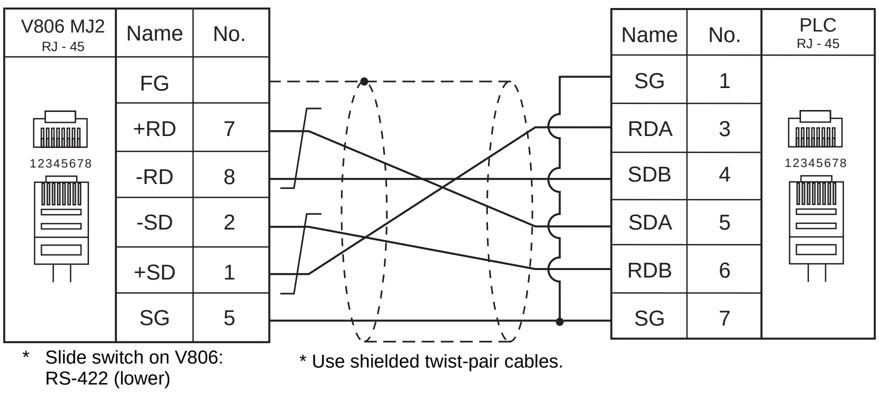
When Connected at MJ1/MJ2:

RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



* Slide switch on V806:
RS-422 (lower)

13. OMRON

13.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

SYSMAC C

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection CN1	Connection MJ1/MJ2	Connection MJ2 (4-wire) V806	Ladder Transfer *1
SYSMAC C	C20H, C28H, C40H	RS-232C port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		○
	C120, C120F C200H C500, C500F C1000H C2000, C2000H	C120-LK201-V1	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		C120-LK202-V1	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	C200H C200HS-CPU01, 03 C200HS-CPU21, 23 C200HS-CPU31, 33	C200H-LK201 C200H-LK201-V1	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
		C200H-LK202 C200H-LK202-V1	RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	C200HS-CPU21, 23 C200HS-CPU31, 33 CQM1-CPU21 CQM1-CPU41, 42, 43, 44	RS-232C port	RS-232C	Hakko Electronics' cable "D9-OM2-09" Wiring diagram 2 - C2	Wiring diagram 2 - M2		
	C500, C500F C1000H C2000, C2000H	C500-LK203	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
			RS-422	Wiring diagram 1 - C4	×		
	C200HX C200HG C200HE	RS-232C port	RS-232C	Hakko Electronics' cable "D9-OM2-09"	Wiring diagram 2 - M2		
		C200HW-COM02 C200HW-COM03 C200HW-COM04 C200HW-COM05 C200HW-COM06		Wiring diagram 2 - C2			
			RS-422	Wiring diagram 2 - C4	×	Wiring diagram 2 - M4	
	SRM1-C02	RS-232C port	RS-232C	Hakko Electronics' cable "D9-OM2-09" Wiring diagram 2 - C2	Wiring diagram 2 - M2		
	CPM1A	Peripheral port	RS-232C	Omron's "CQM1-CIF02" + Gender changer *2	Omron's "CQM1-CIF02" + Wiring diagram 4 - M2		
	CPM2A	RS-232C port	RS-232C	Hakko Electronics' cable "D9-OM2-09" Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		Peripheral port	RS-232C	Omron's "CQM1-CIF02" + Gender changer *2	Omron's "CQM1-CIF02" + Wiring diagram 4 - M2		
	CPM2C	CS1W-CN118	RS-232C	Hakko Electronics' cable "D9-OM2-09"	Wiring diagram 2 - M2		
		CPM2C-CIF01		Wiring diagram 2 - C2			
		CPM2C-CIF11	RS-422	Wiring diagram 4 - C4	×	Wiring diagram 4 - M4	

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

*2 Use a D-sub gender changer (9-pin, female-to-male) commercially available.

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

SYSMAC CS1/CJ1

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2" colspan="2">Unit/Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Ladder Transfer *1</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire) V806</th></tr>
<tr><td rowspan="9">SYSMAC CS1/CJ1</td><td rowspan="5">CS1</td><td colspan="2">RS-232C port</td><td rowspan="4">RS-232C</td><td rowspan="2">Hakko Electronics' cable "D9-OM2-09"</td><td rowspan="4">Wiring diagram 2 - M2</td><td rowspan="4"></td><td rowspan="9">○</td></tr>
<tr><td colspan="2">CS1W-SCU21</td></tr>
<tr><td colspan="2">CS1W-SCB21</td><td rowspan="2">Wiring diagram 2 - C2</td></tr>
<tr><td rowspan="2">CS1W-SCB41</td><td>Port 1</td></tr>
<tr><td>Port 2</td><td>RS-422</td><td>Wiring diagram 3 - C4</td><td>×</td><td>Wiring diagram 3 - M4</td></tr>
<tr><td rowspan="4">CJ1H
CJ1M</td><td colspan="2">RS-232C port</td><td rowspan="3">RS-232C</td><td>Hakko Electronics' cable "D9-OM2-09"</td><td rowspan="3">Wiring diagram 2 - M2</td><td rowspan="3"></td></tr>
<tr><td colspan="2">CJ1W-SCU21</td><td rowspan="2">Wiring diagram 2 - C2</td></tr>
<tr><td rowspan="2">CJ1W-SCU41</td><td>Port 2</td></tr>
<tr><td>Port 1</td><td>RS-422</td><td>Wiring diagram 3 - C4</td><td>×</td><td>Wiring diagram 3 - M4</td></tr>
</table>

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

Ethernet Connection

SYSMAC CS1/CJ1

<table>
<tr><th>PLC Selection on the Editor</th><th>CPU</th><th>Unit</th><th>TCP/IP</th><th>UDP/IP</th><th>Port No.</th><th>Ladder Transfer *1</th></tr>
<tr><td>SYSMAC CS1/CJ1 (Ethernet)</td><td>CS1</td><td>CS1W-ETN01
CS1W-ETN11
CS1W-ETN21</td><td rowspan="2">×</td><td rowspan="2">○</td><td rowspan="2">9600</td><td rowspan="2">×</td></tr>
<tr><td>SYSMAC CS1/CJ1 (Ethernet Auto)</td><td>CJ1</td><td>CJ1W-ETN11
CJ1W-ETN21</td></tr>
</table>

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

13.1.1 SYSMAC C

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

When higher 4 bits in the 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 Memory	Indication on the V Series
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 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	

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
ON  OFF	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
SW1 ON	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 Memory

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

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 memory is indicated when editing the screen as shown on the right.

xample: EM0 : 30000

Address
Colon
Bank number

13.1.2 SYSMAC CS1/CJ1

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / 1 : n / Multi-link2	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115k bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 31	
Transmission Mode	<u>Transmission Mode 1</u> / 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 memory can be displayed on MONITOUCH as data with signs.

When higher 4 bits in the 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:

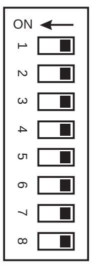
PLC Memory	Indication on the V Series
0000 to 9999	0 to 9999
F001 to F999	–1 to –999
A000 to A999	–1000 to –1999
00000000 to 99999999	0 to 99999999
F0000001 to F9999999	–1 to –9999999
A0000000 to A9999999	–10000000 to –19999999

- Setting procedure: Num. Display [Input Type: BCD]
  [Display Type: DEC] (w/ sign –, w/ sign +–)

PLC

CJ1/CS1 (CPU RS-232C Port)

DIP switch

Switch		Contents	Setting
	SW1	User memory writing	OFF: enabled
	SW2	Automatic user program transfer at power-up	OFF: not executed
	SW3	CJ1: blank CS1: message of the programming console (Japanese/English)	OFF
	SW4	Communication settings for the peripheral port	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

PLC system setting (host link 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 / 38400 / 57600 / 115200	
Parameter	7, 2, E	
Mode	Host link	
Unit No.	00	

CJ1/CS1 (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
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

Available Memory

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

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.
The assigned memory is indicated when editing the screen as shown on the right.

xample: EM0 : 30000

Address
Colon
Bank number

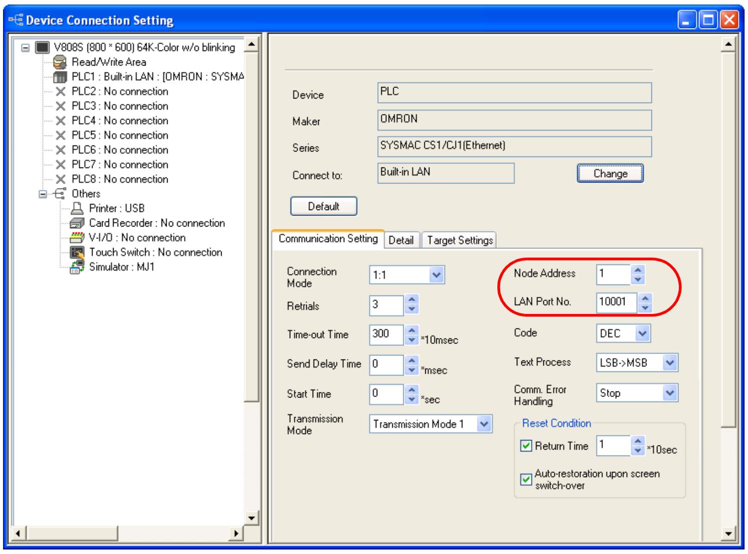
13.1.3 SYSMAC CS1/CJ1 (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number and node address in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])



- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

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

Parameter 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 V8
FINS/UDP Port	Default (9600)

Rotary switch

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 Memory

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

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.
The assigned memory is indicated when editing the screen as shown on the right.

Example: EM0 : 30000

Address
Colon
Bank number

13.1.4 SYSMAC CS1/CJ1 (Ethernet Auto)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

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

Parameter 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

NODE No.	Set the FINS node number of the Ethernet unit. Match the node number to the lower byte of the IP address.

Available Memory

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

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.
The assigned memory is indicated when editing the screen as shown on the right.

xample: EM0 : 30000

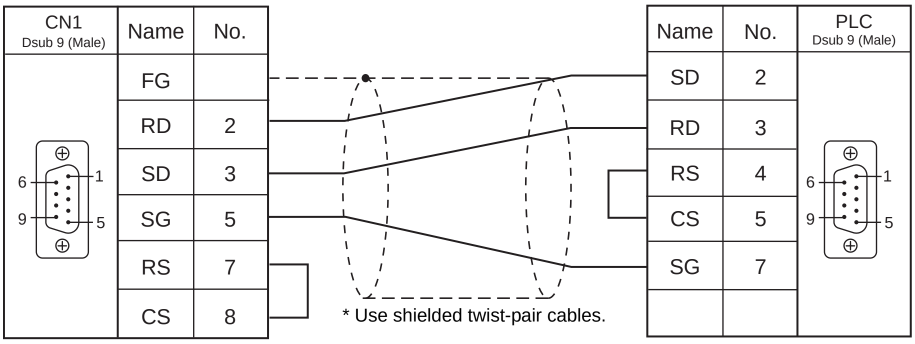
Address
Colon
Bank number

13.1.5 Wiring Diagrams

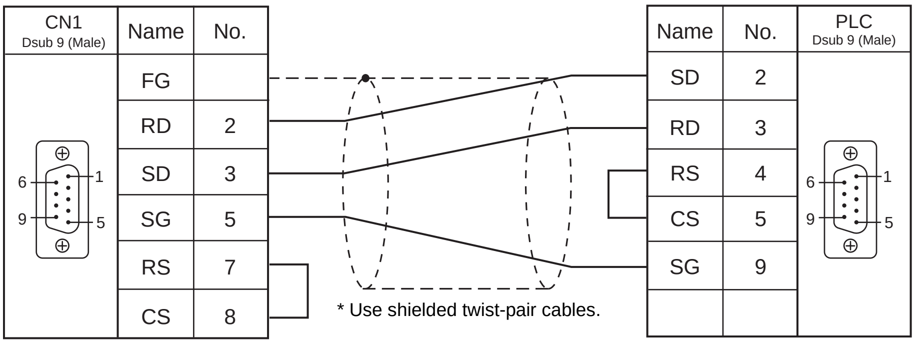
When Connected at CN1:

RS-232C

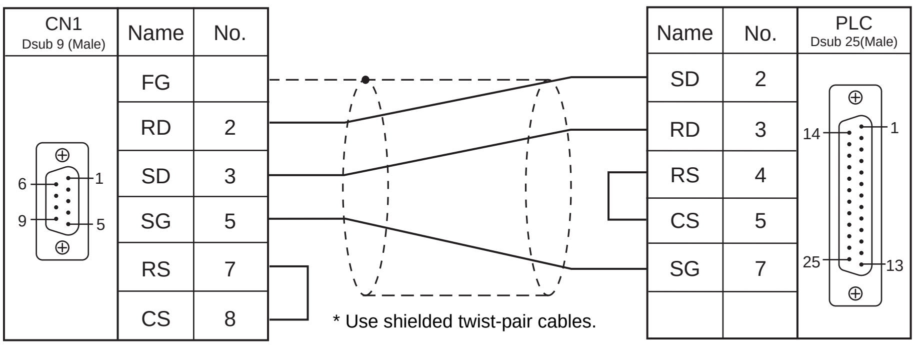
Wiring diagram 1 - C2



Wiring diagram 2 - C2
Hakko Electronics' cable "D9-OM2-09-☐M" (☐ = 2, 3, 5, 10, 15)

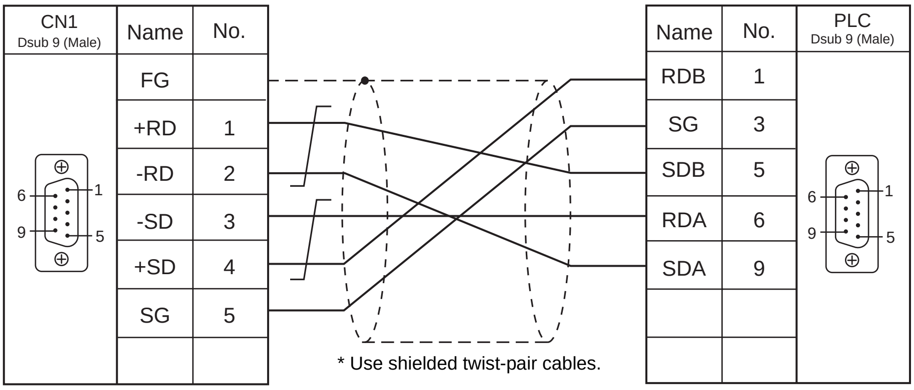


Wiring diagram 3 - C2

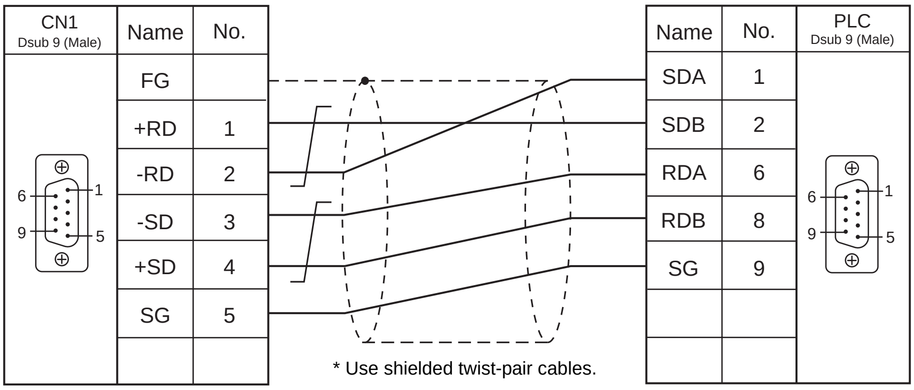


RS-422/RS-485

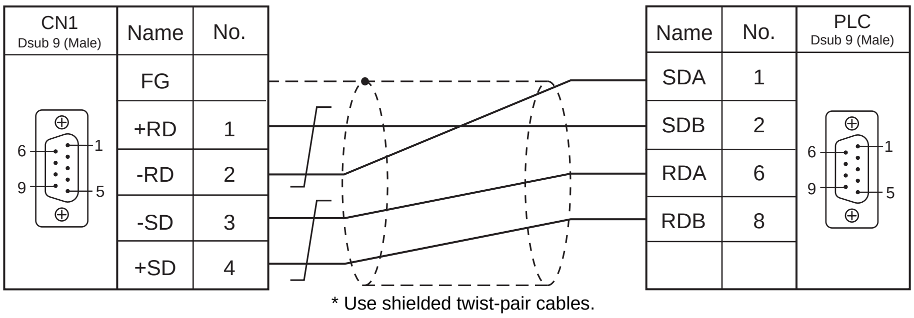
Wiring diagram 1 - C4



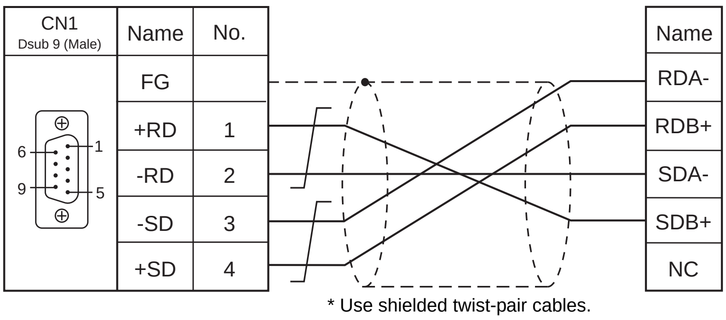
Wiring diagram 2 - C4



Wiring diagram 3 - C4



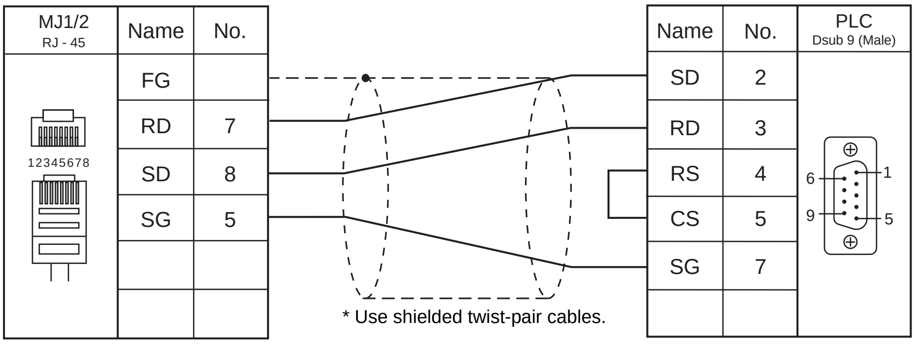
Wiring diagram 4 - C4



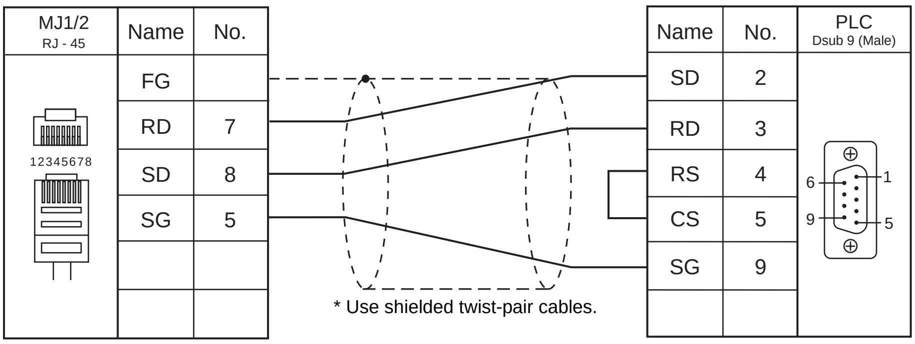
When Connected at MJ1/MJ2:

RS-232C

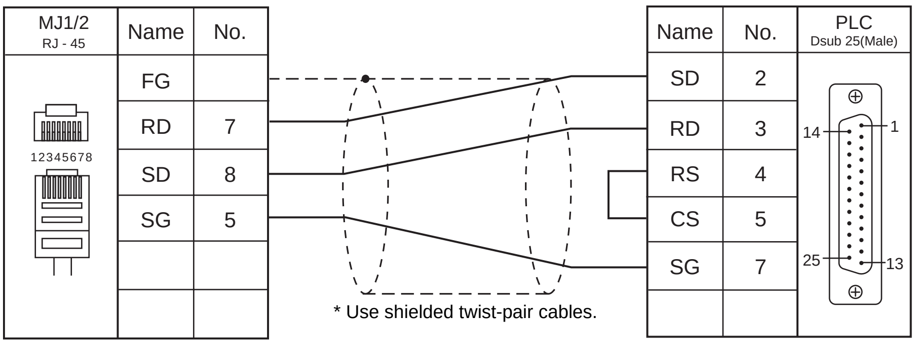
Wiring diagram 1 - M2



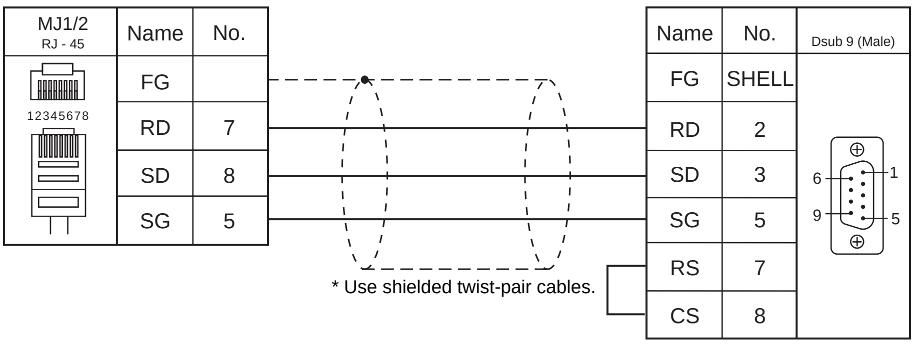
Wiring diagram 2 - M2



Wiring diagram 3 - M2

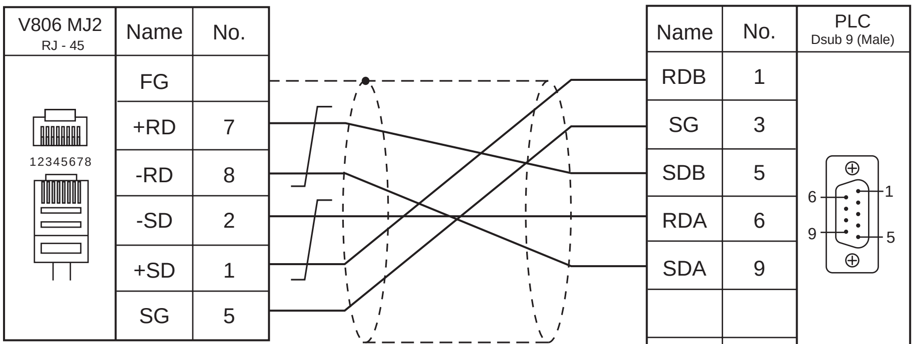


Wiring diagram 4 - M2



RS-422/RS-485

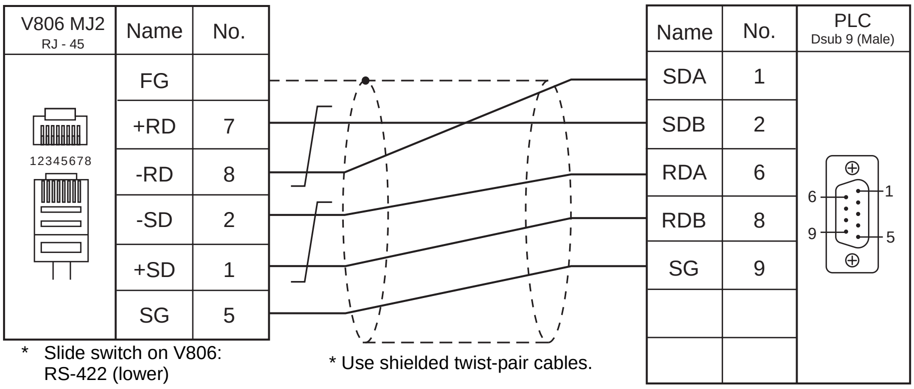
Wiring diagram 1 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

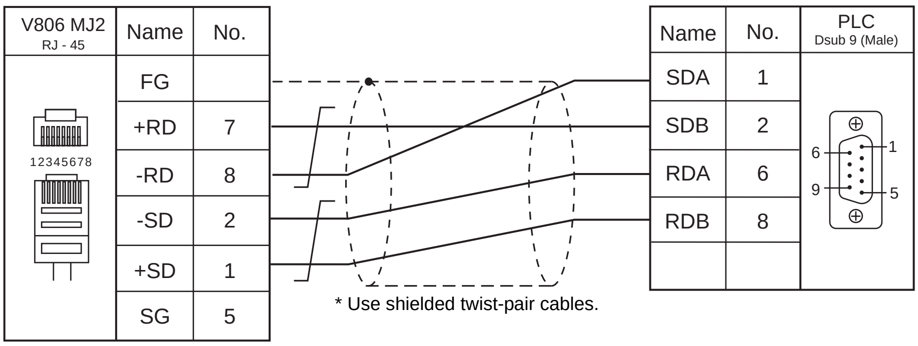
Wiring diagram 2 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

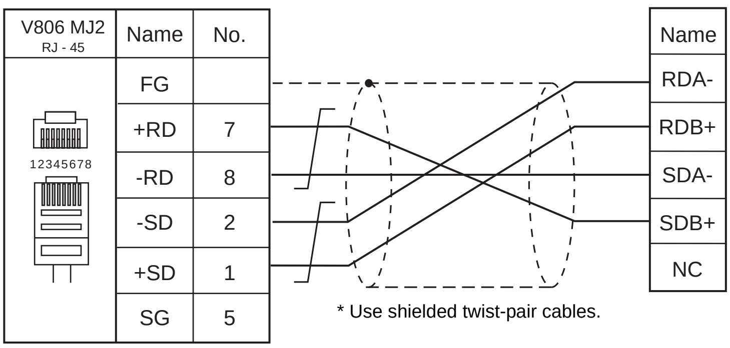
Wiring diagram 3 - M4



* Use shielded twist-pair cables.

* Slide switch on V806: RS-422 (lower)

Wiring diagram 4 - M4



* Use shielded twist-pair cables.

* Slide switch on V806: RS-422 (lower)

13.2 Temperature Controller/Servo/Inverter Connection

The controller models shown below can be connected.

Digital Temperature Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td>E5AR/E5ER</td><td>E5AR-xxxxxxxxx-FLK
E5ER-xxxxxxxxx-FLK</td><td>Terminal</td><td>RS-485</td><td>Wiring diagram 1 - C4</td><td>Wiring diagram 1 - M4</td><td>Wiring diagram 2 - M4</td><td>E5AR.Lst</td></tr>
<tr><td rowspan="2">E5AN/E5EN/E5CN
/E5GN</td><td>E5AN-xxxx01xxxxFLK
E5EN-xxxx01xxxxFLK</td><td>Terminal</td><td>RS-232C</td><td>Wiring diagram 1 - C2</td><td>Wiring diagram 1 - M2</td><td></td><td rowspan="2">E5AN.Lst</td></tr>
<tr><td>E5CN-xxxx03xxxxFLK
E5AN-xxxx03xxxxFLK
E5EN-xxxx03xxxxFLK
E5GN-xx03x-FLK</td><td>Terminal</td><td>RS-485</td><td>Wiring diagram 1 - C4</td><td>Wiring diagram 1 - M4</td><td>Wiring diagram 2 - M4</td></tr>
</table>

13.2.1 E5AR

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)

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 V8, set “ON” for the “communication writing” setting.

Available Memory

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

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 Memory Designation

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	Status	
		n + 3	Relevant information	
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 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	
			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	
			AT cancellation 0A00H: Channel 1 0A10H: Channel 2 0A20H: Channel 3 0A30H: Channel 4 09F0H: All channels	
			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	

Contents	F0	F1 (= $u n)		F2
Operation instructions	1 - 8 (PLC1 - 8)	n + 2	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	3
			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 V series

*1 8000 (HEX): broadcasting

13.2.2 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

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 V8, set “ON” for the “communication writing” setting.

E5GN

Communication level setting

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 V8, set “ON” for the “communication writing” setting.

Available Memory

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

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 Memory Designation

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="3">Read controller status</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: 0006H</td></tr>
<tr><td>n + 2</td><td>Operation status</td></tr>
<tr><td rowspan="11">Operation instructions</td><td rowspan="11">1 - 8
(PLC1 - 8)</td><td rowspan="11">n
n + 1
n + 2</td><td>Station number *1</td><td rowspan="11">3</td></tr>
<tr><td>Command: 0030H</td></tr>
<tr><td>Communication writing
0000H: Communication writing OFF (disabled)
0001H: Communication writing ON (enabled)</td></tr>
<tr><td>Control start/stop
0100H: Channel 1 Run
0101H: Channel 1 Stop</td></tr>
<tr><td>Multi-SP
0200H: Target value 1
0201H: Target value 2
0202H: Target value 3
0203H: Target value 4</td></tr>
<tr><td>AT execution/cancel
0300H: Cancel
0301H: Execute</td></tr>
<tr><td>Write mode
0400H: Backup mode
0401H: RAM write mode</td></tr>
<tr><td>0500H: Save RAM data</td></tr>
<tr><td>0600H: Software reset</td></tr>
<tr><td>0700H: Move to set area 1</td></tr>
<tr><td>0800H: Move to protect level</td></tr>
</table>

Return data: Data stored from temperature controller to V series

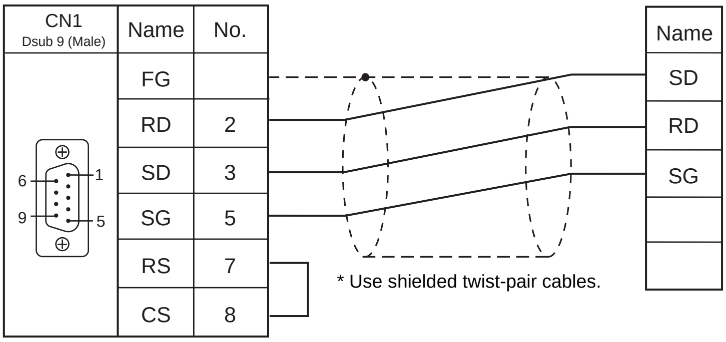
*1 8000 (HEX): broadcasting

13.2.3 Wiring Diagrams

When Connected at CN1:

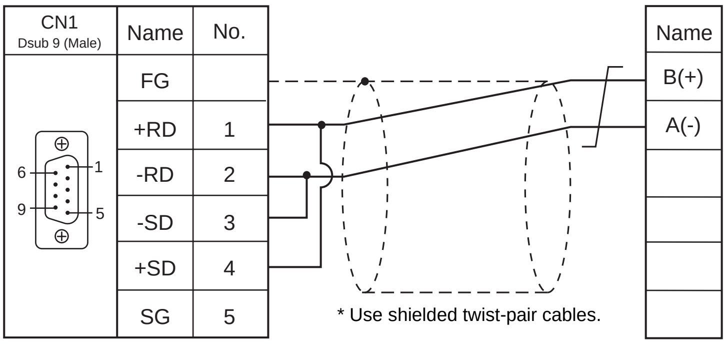
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

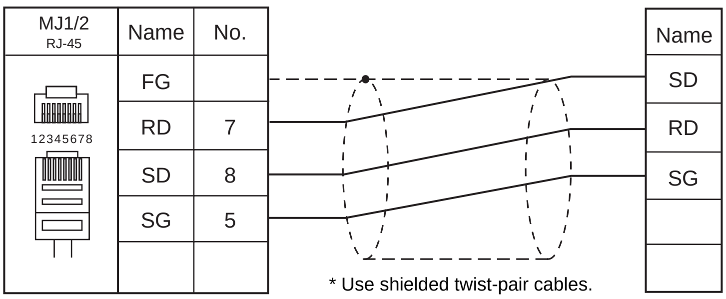
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

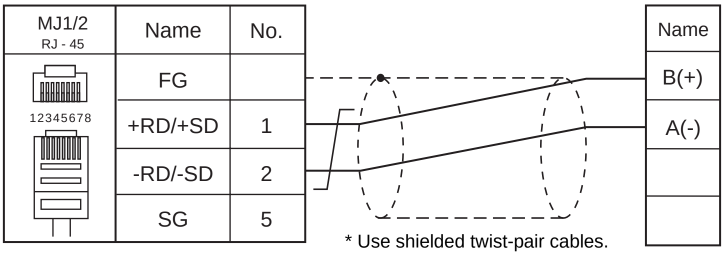
RS-232C

Wiring diagram 1 - M2

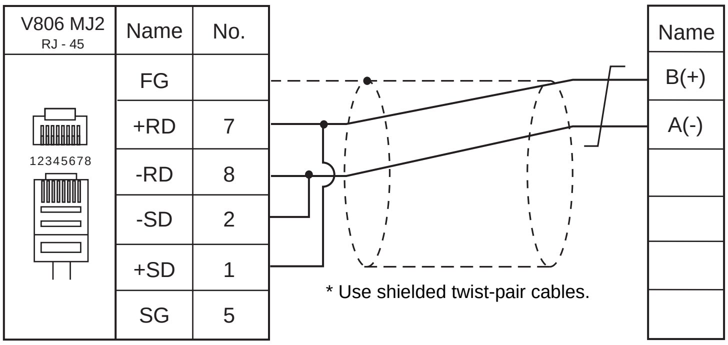


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



* Slide switch on V806:
RS-422 (lower)

14. Panasonic Electric Works

14.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection: CN1	Connection: MJ1/MJ2	Connection: MJ2 (4-wire) V806	Ladder Transfer *1
FP Series	FP1	COM port of the CPU		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
	FP3	AFP3462 (CCU)		RS-232C				
		AFP3463 (C-NET)		RS-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
	FP5	AFP5462 (CCU)		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
	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-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
	FP0	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Gender changer *2	Panasonic's "AFC8503" + Wiring diagram 6 - M2		○
		COM port of the CPU		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		×
	FP2 FP2SH	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Gender changer *2	Panasonic's "AFC8503" + Wiring diagram 6 - M2		○
		COM port of the CPU		RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		×
	FPΣ	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Gender changer *2	Panasonic's "AFC8503" + Wiring diagram 6 - M2		○
		AFPG801	COM1	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
		AFPG802	COM1, C2	RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
		AFPG803	COM1	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		
		AFPG806	COM1	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
			COM2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		
	FP-e	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Gender changer *2	Panasonic's "AFC8503" + Wiring diagram 6 - M2		○
		COM port of the CPU		RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		×
				RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		
	FP-X	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Gender changer *2	Panasonic's "AFC8503" + Wiring diagram 6 - M2		○
		AFPX-COM1	COM1	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		×
		AFPX-COM2	COM1, C2	RS-232C	Wiring diagram 5 - C2	Wiring diagram 5 - M2		
		AFPX-COM3	COM1	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		
		AFPX-COM4	COM1	RS-485				
			COM2	RS-232C	Wiring diagram 3 - C2	Wiring diagram 3 - M2		

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".
*2 Use a D-sub gender changer (9-pin, female-to-male) commercially available.

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

Ethernet Connection

FP/FP-X Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *4
FP series (Ethernet TCP/IP) *1	FP2	FP2-ET1	○	×	As desired *2	×
FP series (Ethernet UDP/IP)			×	○		
FP-X (Ethernet TCP/IP)	FP-X	AFPX-COM5	○	×	As desired *3	×

*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 V8 unit. Therefore, a maximum of eight V8 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 V8 units can be connected to an Ethernet unit.
*4 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

14.1.1 FP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

FP-X

Tool port setting

System Register *1	Contents	
410	Unit No.	<u>1</u> to 99
412	Communication Mode	**Computer link**
413	Data Length	7 / <u>8</u> bits
	Parity	None / <u>Odd</u> / Even
	Stop Bit	<u>1</u> / 2 bits
415	Baud Rate	4800 / <u>9600</u> / 19200 / 38400 /57600 / 115k bps

*1 System register setting is enabled in the RUN mode.

COM port setting

System Register *1		Contents	
COM1	COM2		
410	411	Unit No.	<u>1</u> to 99
412		Operation Mode	**Computer link**
413	414	Data Length	7 / <u>8</u> bits
		Parity	None / <u>Odd</u> / Even
		Stop Bit	<u>1</u> / 2 bits
415		Baud Rate	4800 / <u>9600</u> / 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.

P-Σ

Tool port setting

System Register *1	Contents	
410	Unit No.	<u>1</u> to 99
413	Data Length	7 / <u>8</u> bits
	Parity	None / <u>Odd</u> / Even
	Stop Bit	<u>1</u> / 2 bits
415	Baud Rate	4800 / <u>9600</u> / 19200 / 38400 /57600 / 115k bps

*1 System register setting is enabled in the RUN mode.

COM port setting

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

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

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

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

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

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)

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 Memory

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

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

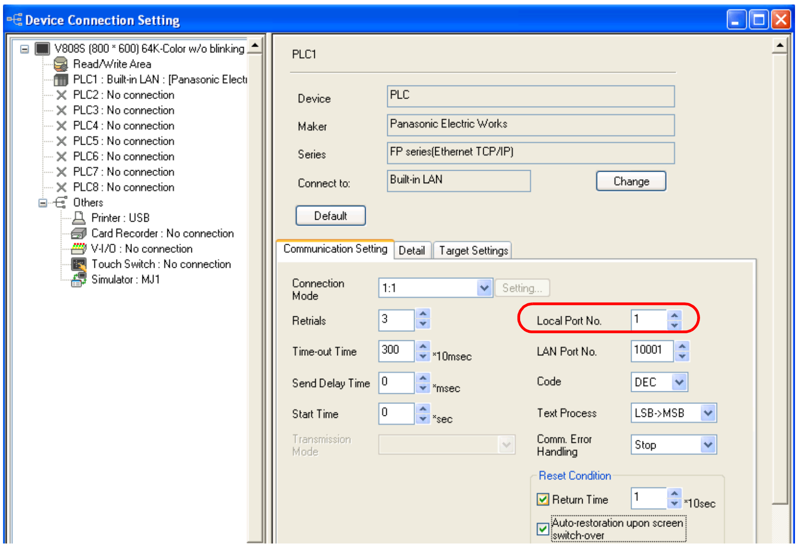
14.1.2 FP Series Ethernet (Ethernet TCP/IP)

Communication Setting

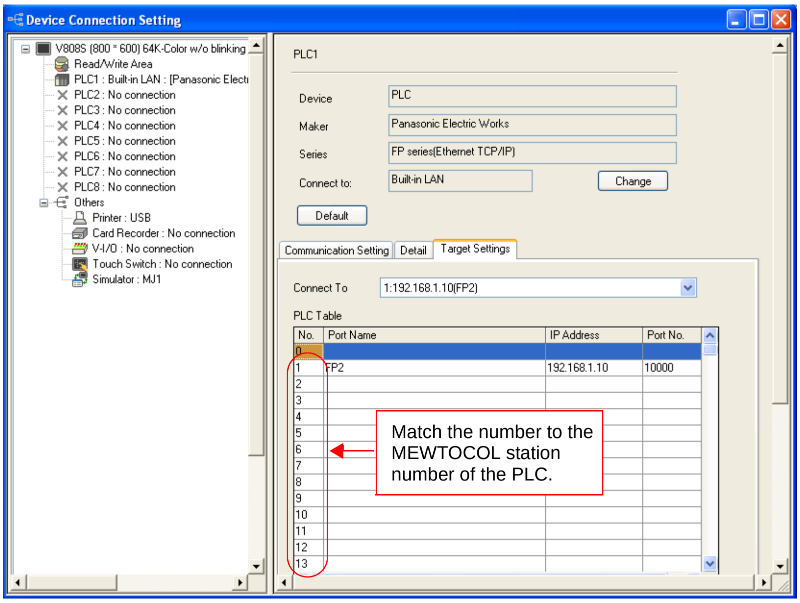
Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number and local port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
  For the local port number, set the same number (1 to 31) as the one set for “Target node MEWTOCOL station number” on the [Connection Setting] dialog of the PLC.



- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
  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 V8.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the V8 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 V8
	Target Node Port Number	Port number of the V8
	Target Node MEWTOCOL Station Number	1 to 31 * Match the number to the one set for [Local Port No.] in the [Communication Setting] tab window on the V8.
	Connection Setting	Valid

Available Memory

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

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

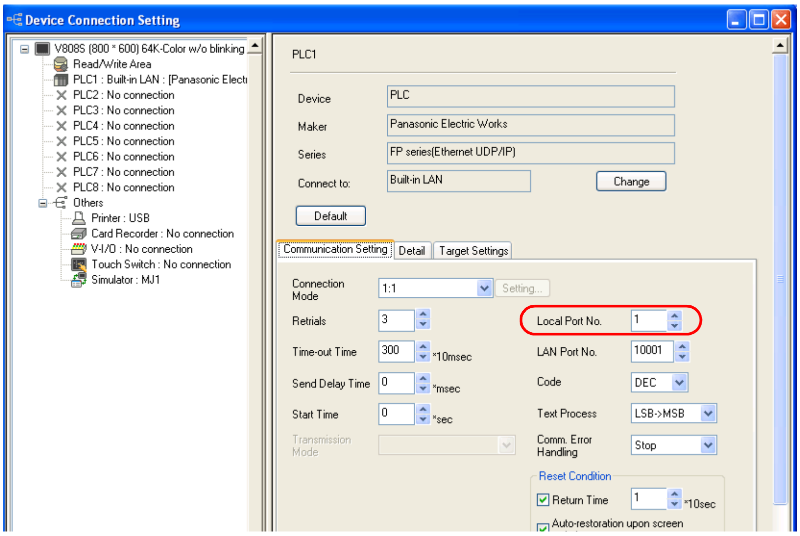
14.1.3 FP Series Ethernet (Ethernet UDP/IP)

Communication Setting

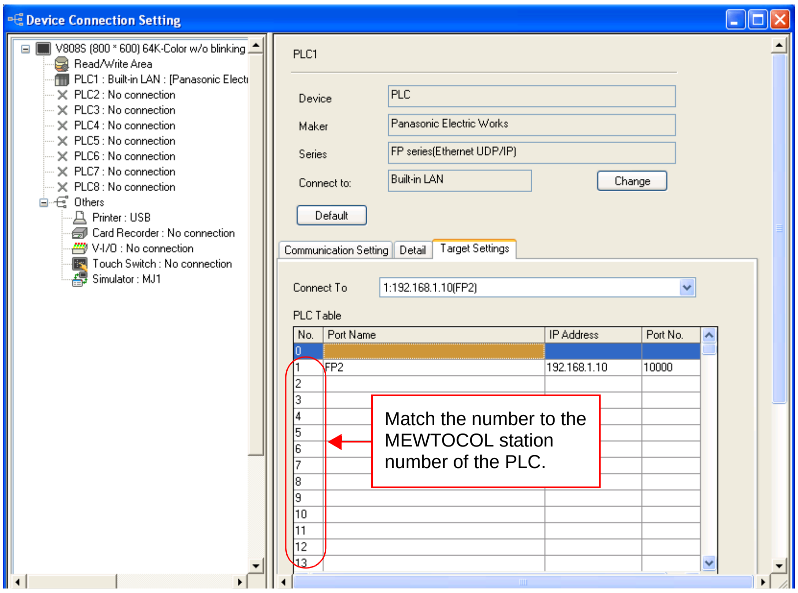
Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number and local port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
  For the local port number, set the same number (1 to 31) as the one set for “Target node MEWTOCOL station number” on the [Connection Setting] dialog of the PLC.



- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
  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

<table>
<tr><th colspan="2">Item</th><th>Setting</th></tr>
<tr><td rowspan="2">Local Node Setting</td><td>IP Address</td><td>IP address of the PLC</td></tr>
<tr><td>MEWTOCOL Station Number</td><td>1 to 31
* The same number must be specified for the PLC table number of the V8.</td></tr>
</table>

Connection setting

<table>
<tr><th colspan="2">Item</th><th>Setting</th></tr>
<tr><td rowspan="8">Connection
1 to 8
* Select a port to which the V8 is connected.</td><td>Communication Mode</td><td>UDP/IP</td></tr>
<tr><td>Open Type</td><td>Unpassive</td></tr>
<tr><td>Usage</td><td>MEWTOCOL communication</td></tr>
<tr><td>Local Node (PLC) Port Number</td><td>As desired</td></tr>
<tr><td>Target Node IP Address</td><td>IP address of the V8</td></tr>
<tr><td>Target Node Port Number</td><td>Port number of the V8</td></tr>
<tr><td>Target Node MEWTOCOL Station Number</td><td>1 to 31
* Match the number to the one set for [Local Port No.] in the [Communication Setting] tab window on the V8.</td></tr>
<tr><td>Connection Setting</td><td>Valid</td></tr>
</table>

Available Memory

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

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

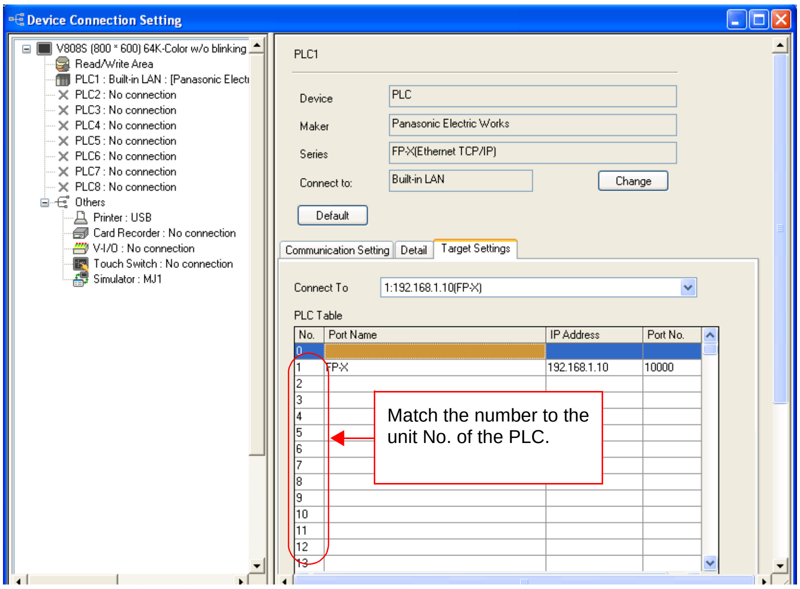
14.1.4 FP-X (Ethernet TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
  Set the same PLC table number as the one set for “No.410 Unit No.” ([Option] → [PLC Configuration] → [COM1 Port]).



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 V8.
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 Memory

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

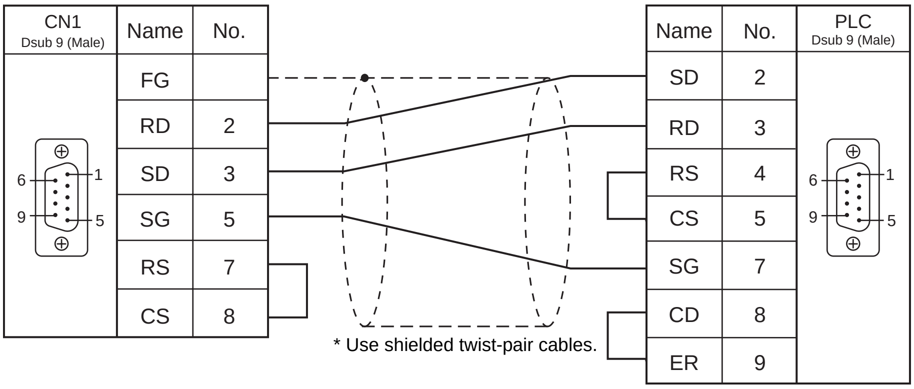
Memory		TYPE	Remarks
DT	(data register)	00H	
X	(external input)	01H	WX as word device, read only
Y	(external output)	02H	WY as word device
R	(internal relay)	03H	WR as word device, including special relays
L	(link relay)	04H	WL as word device
LD	(link register)	05H	
FL	(file register)	06H	
SV	(timer,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

14.1.5 Wiring Diagrams

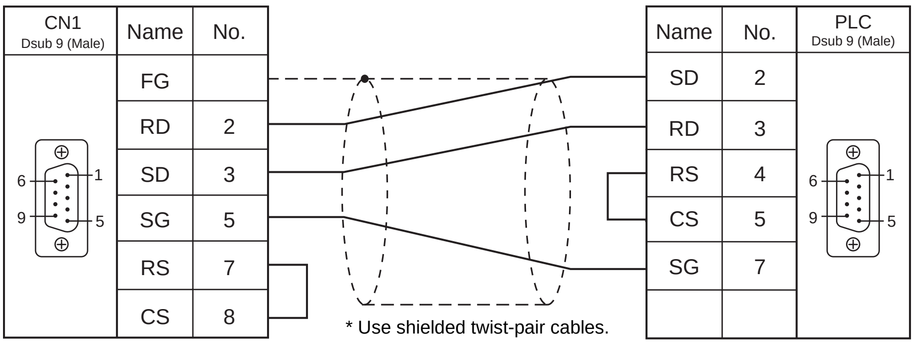
When Connected at CN1:

RS-232C

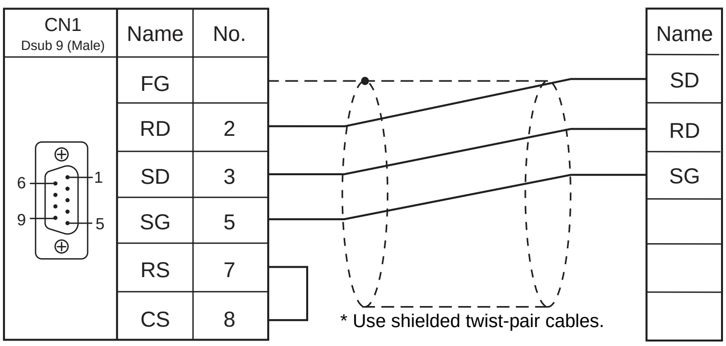
Wiring diagram 1 - C2



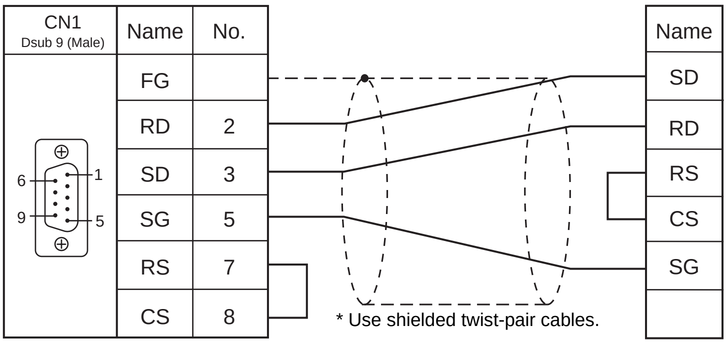
Wiring diagram 2 - C2



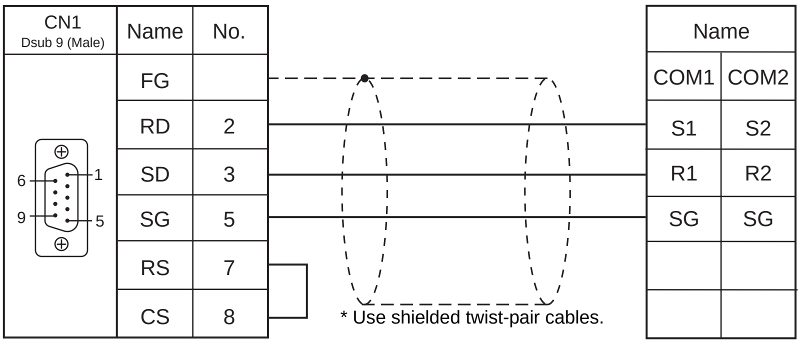
Wiring diagram 3 - C2



Wiring diagram 4 - C2

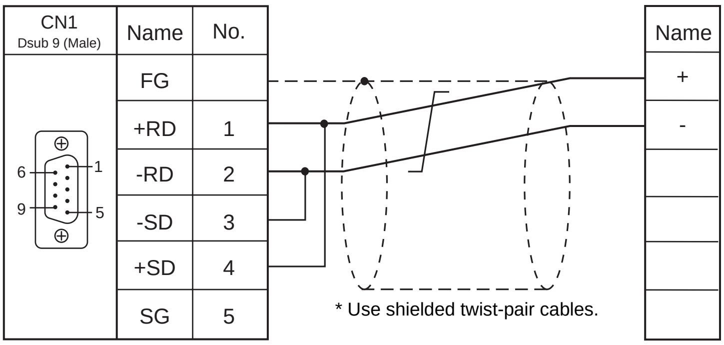


Wiring diagram 5 - C2

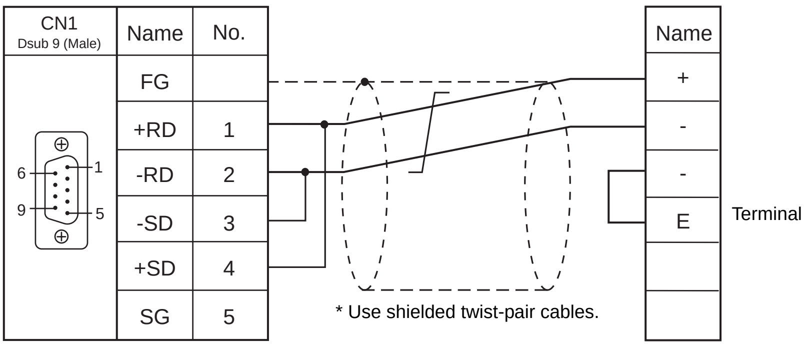


RS-422/RS-485

Wiring diagram 1 - C4



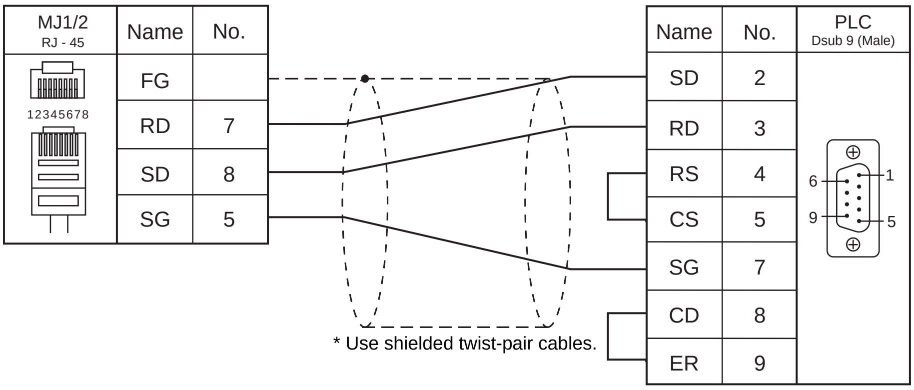
Wiring diagram 2 - C4



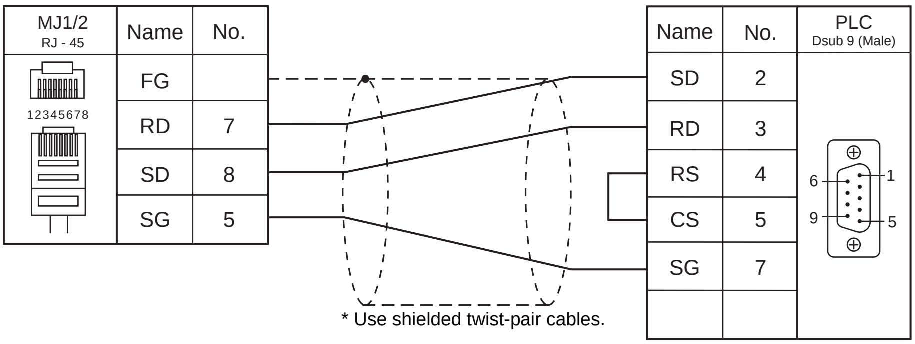
When Connected at MJ1/MJ2:

RS-232C

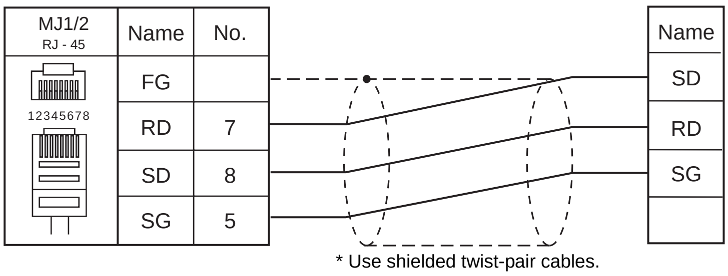
Wiring diagram 1 - M2



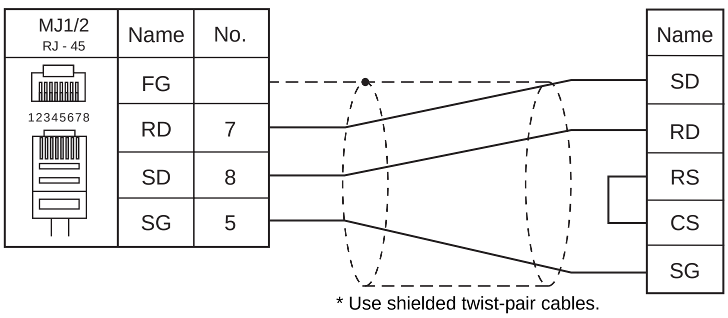
Wiring diagram 2 - M2



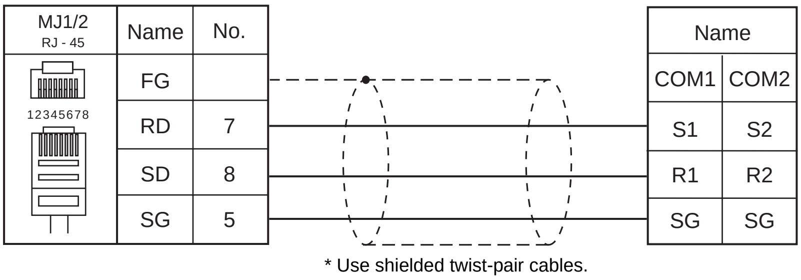
Wiring diagram 3 - M2



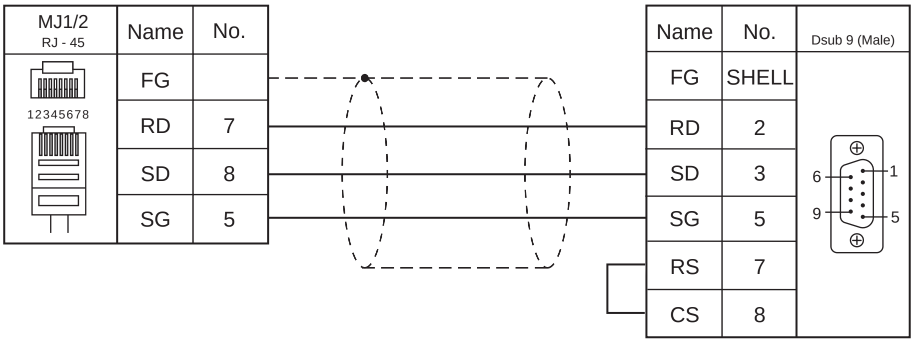
Wiring diagram 4 - M2



Wiring diagram 5 - M2

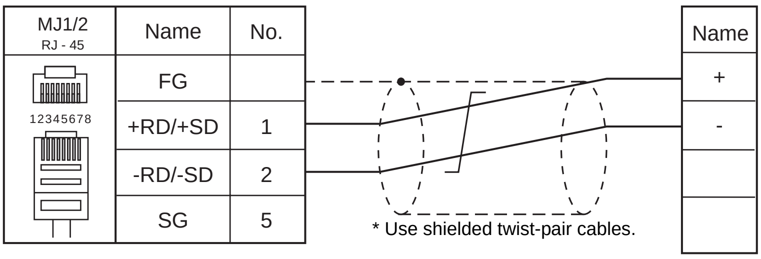


Wiring diagram 6 - M2

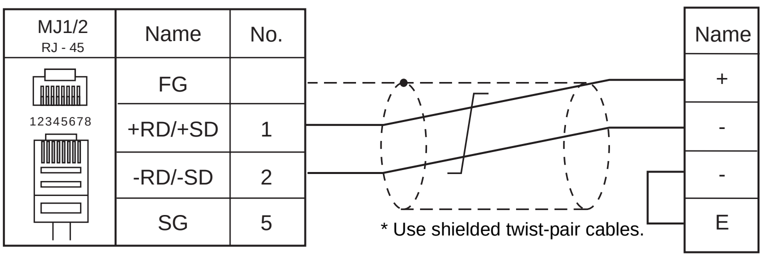


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



15. RKC

15.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Module-type Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
SR-Mini (MODBUS RTU)	H-PCP-A-x4N-4 * xx Z-1021	Modular connector 1/2	RS-422A	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 3 - M4	SR-Mini.Lst
	H-PCP-B-x4N-4 * xx Z-1021						
SR-Mini (Standard Protocol)	H-PCP-A-x4N-4 * xx	Modular connector 1/2	RS-422A	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 3 - M4	RKC_Std.Lst
	H-PCP-B-x4N-4 * xx						
SRV (MODBUS RTU)	V-TIO-A-xxxxx-xx*xxx-x x-x-6	Communication terminal	RS-485 (2-wire system)	Wiring diagram 1 - C4	Wiring diagram 1 - M4		RKC_SRV.Lst
	V-TIO-C-xxxxx-xx*xxx-x x-x-6						
SRZ (MODBUS RTU)	Z-TIO-A-x-xxxx/x2-x xxx/Y*1	Communication terminal	RS-485 (2-wire system)	Wiring diagram 1 - C4	Wiring diagram 1 - M4		RKC_SRZ_TIO.Lst
	Z-TIO-B-x-xx/xN2-xxxx/ Y*1						
	Z-DIO-A-x-xx/x-xxx2						RKC_SRZ_DIO.Lst

*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	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
CB100/CB400/ CB500/CB700/ CB900 (MODBUS RTU)	CB100xxxx-xx*xx-5x/x Z-1021	Communication terminal	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		CB100.Lst
	CB400xxxx-xx*xx-5x/x Z-1021						
	CB500xxxx-xx*xx-5x/x Z-1021						
	CB700xxxx-xx*xx-5x/x Z-1021						
	CB900xxxx-xx*xx-5x/x Z-1021						

Multi-loop Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
MA900/MA901 (MODBUS RTU)	MA900-4xxxx-xx-x*xxx-x 6/x	Communication terminal	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4		RKC_MA900.Lst
	MA901-8xxxx-xx-x*xxx-x 6/x						RKC_MA901.Lst

15.1.1 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 Memory

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

Memory	TYPE	Remarks
---	00H	

15.1.2 SRV (MODBUS RTU)

Communication Setting

Editor

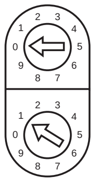
Communication setting

(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

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 Memory

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

Memory	TYPE	Remarks
---	00H	

15.1.3 SR-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

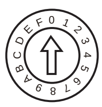
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Odd / Even	
Target Port No.	1 to 16	

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

Switch	Setting	Remarks
	0 to F (= 1 to 16)	The number that is one greater than the set value is the address.

Available Memory

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

Memory	TYPE	Remarks
---	00H	

15.1.4 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	ON	8 bits / 1 bit / without parity	OFF, ON: 7 bits, even parity ON, OFF: 7 bits, odd parity
2	ON		
3	ON	Baud rate: 9600 bps	OFF, ON: 4800 bps ON, ON: 19200 bps
4	OFF		

Unit address setting switch

Switch	Setting	Remarks
	0 to F (= 0 to 15)	

Available Memory

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

Memory	TYPE	Remarks
---	00H	

15.1.5 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	Interval time = set value × 1.666 ms

Available Memory

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

Memory	TYPE	Remarks
---	00H	

15.1.6 SRZ (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

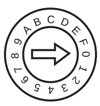
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None / Odd / Even	
Target Port No.	Z-TIO: 1 to 16 Z-DIO: 17 to 31	Default: 1

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

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 V8, the available address setting range is 0 to E (17 to 31).

Available Memory

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

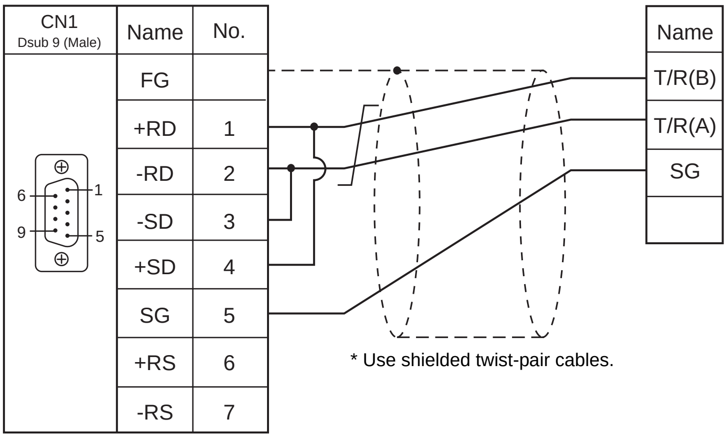
Memory	TYPE	Remarks
---	00H	

15.1.7 Wiring Diagrams

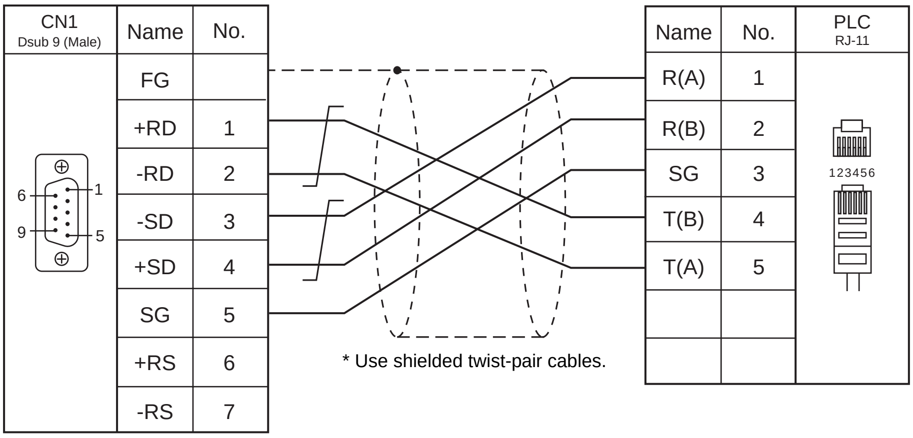
When Connected at CN1:

RS-422/RS-485

Wiring diagram 1 - C4



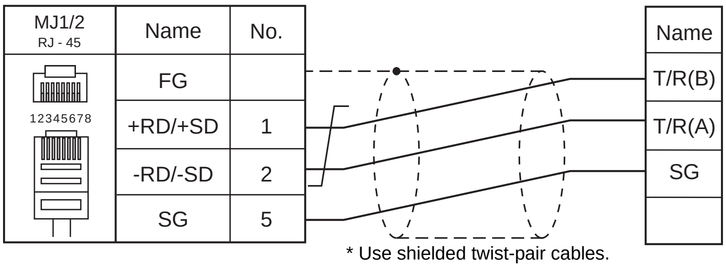
Wiring diagram 2 - C4



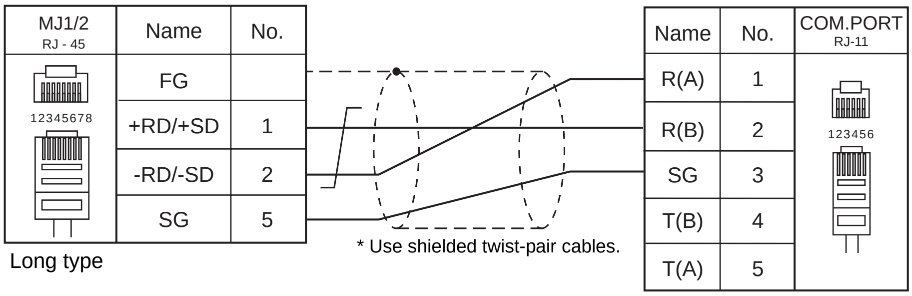
When Connected at MJ1/MJ2:

RS-422/RS-485

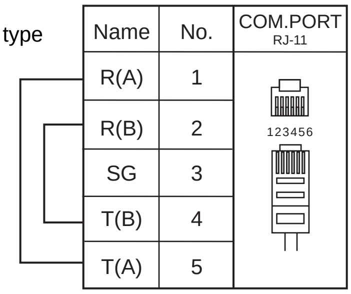
Wiring diagram 1 - M4



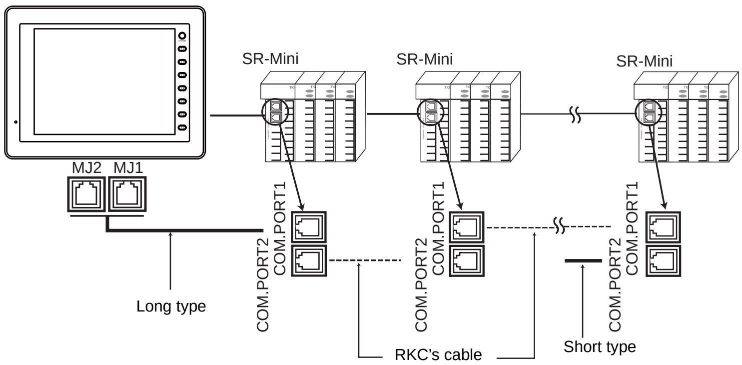
Wiring diagram 2 - M4



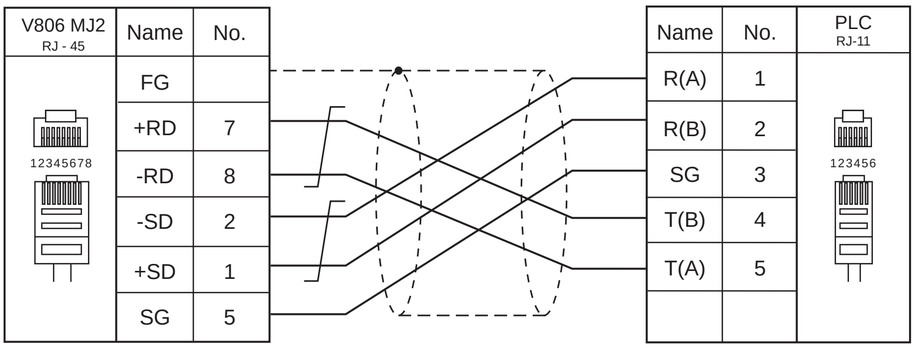
Short type



Use a long-type cable for connection between the MJ at the V8 and the controller, an RKC's cable between controllers, and short-type cable for the terminal controller.



Wiring diagram 3 - M4



MEMO

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16. SAIA

16.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
PCD	PCD1.M120 PCD1.M130 PCD2.M120 PCD2.M130 PCD2.M170 PCD2.M480	PGU port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		PCD7.F120	RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
		PCD7.F110	RS-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4		

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
PCD S-BUS (Ethernet)	PCD.M3120 PCD.M3330 PCD.M5340 PCD.M5540 PCD.M6340 PCD.M6540	CPU with built-in Ethernet	×	○	5050 fixed	×

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

16.1.1 PCD

Communication Setting

Editor

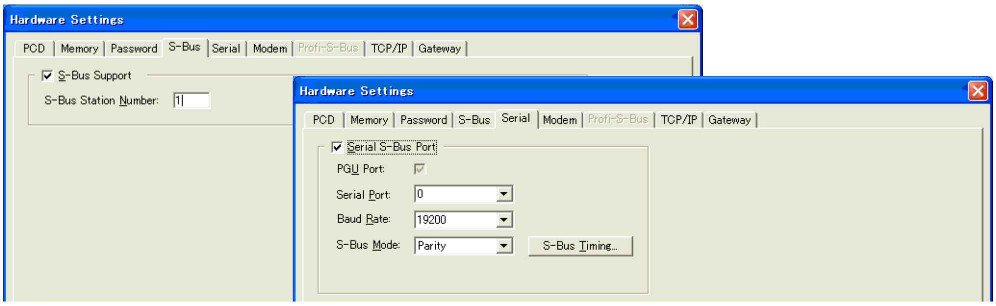
Communication setting

(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 bits	
Target Port No.	1	

PLC

PCD



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

Available Memory

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

Memory		TYPE	Remarks
R	(register)	00H	Double-word
Rfp	(register/floating point)	01H	Double-word
T	(timer)	02H	Double-word
C	(counter)	03H	Double-word
I	(input)	04H	Read only
O	(output)	05H	
F	(flag)	06H	

16.1.2 PCD S-BUS (Ethernet)

Communication Setting

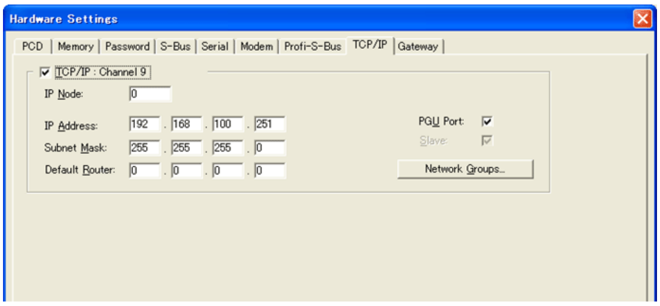
Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

PLC

PCD S-BUS (Ethernet)



Item	Setting	Remarks
IP Node	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
IP Address	PLC’s IP address	
Subnet Mask	PLC’s subnet mask	
Default Router	Make settings in accordance with the network environment.	

Available Memory

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

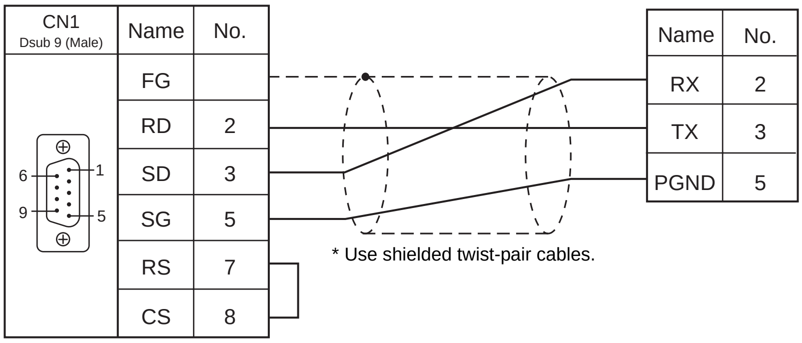
Memory		TYPE	Remarks
R	(register)	00H	Double-word
Rfp	(register/floating point)	01H	Double-word
T	(timer)	02H	Double-word
C	(counter)	03H	Double-word
I	(input)	04H	Read only
O	(output)	05H	
F	(flag)	06H	

16.1.3 Wiring Diagrams

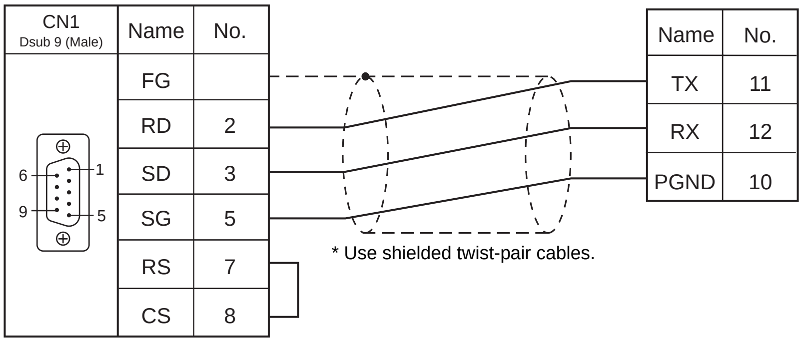
When Connected at CN1:

RS-232C

Wiring diagram 1 - C2

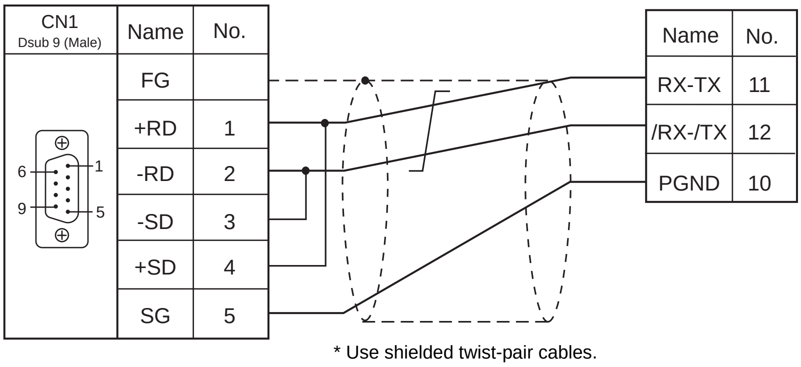


Wiring diagram 2 - C2



RS-422/RS-485

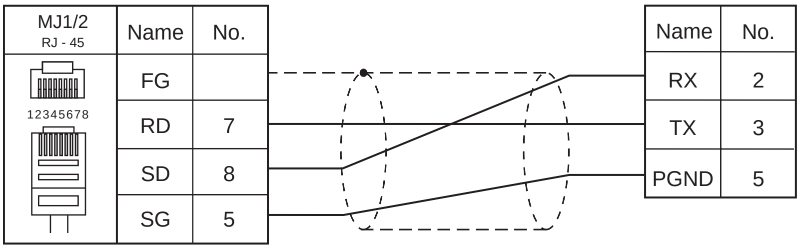
Wiring diagram 1 - C4



When Connected at MJ1/MJ2:

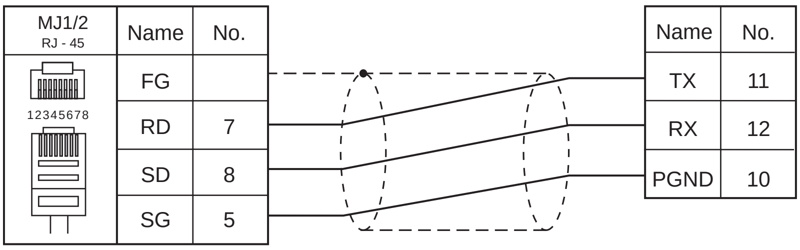
RS-232C

Wiring diagram 1 - M2



* Use shielded twist-pair cables.

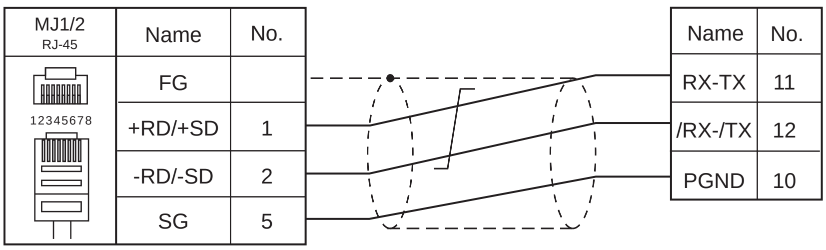
Wiring diagram 2 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

MEMO

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17. SHINKO TECHNOS

17.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Digital Indicating Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td rowspan="3">FC series</td><td>FCS-23A (C5, C)</td><td rowspan="3">Terminal block</td><td rowspan="2">RS-232C</td><td rowspan="2">Wiring diagram 1 - C2</td><td rowspan="2">Wiring diagram 1 - M2</td><td rowspan="2"></td><td rowspan="3">S-FC.Lst</td></tr>
<tr><td>FCR-13A (C5, C)
FCR-23A (C5, C)
FCR-15A (C5, C)</td></tr>
<tr><td>FCD-13A (C5, C)
FCD-15A (C5, C)</td><td>RS-485</td><td>Wiring diagram 1 - C4</td><td>Wiring diagram 1 - M4</td><td></td></tr>
</table>

* Select a model with option C5 (serial communication RS-485) or C (serial communication RS-232C).

DIN-Rail-Mounted Indicating Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire)
V806</th></tr>
<tr><td>DCL-33A</td><td>DCL-33A-x/xx, C5</td><td>RS-485</td><td>RS-485</td><td>Wiring diagram 2 - C4</td><td>Wiring diagram 2 - M4</td><td></td><td>S-DCL.Lst</td></tr>
</table>

17.1.1 FC 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 bps	
Data Length	**7 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	0 to 31	

FC Series

Auxiliary function setting mode 1

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

Item	Setting	Remarks
Communication protocol selection	**Shinko standard**	
Device number setting	0 to 31	
Baud rate selection	4800 / 9600 / 19200 bps	

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

Available Memory

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

Memory	TYPE	Remarks
---	00H	

17.1.2 DCL-33A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

DCL-33A

Auxiliary function setting mode 1

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

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

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

Available Memory

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

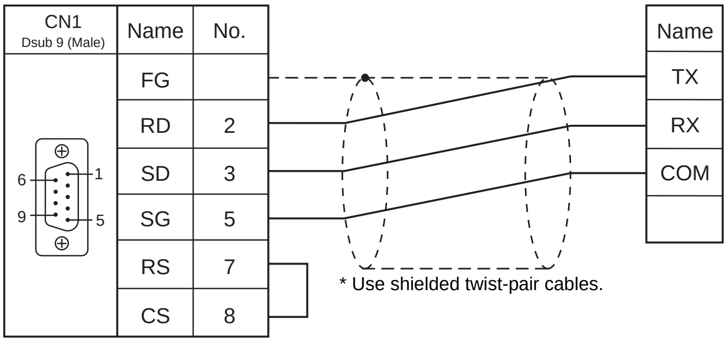
Memory	TYPE	Remarks
---	00H	

17.1.3 Wiring Diagrams

When Connected at CN1:

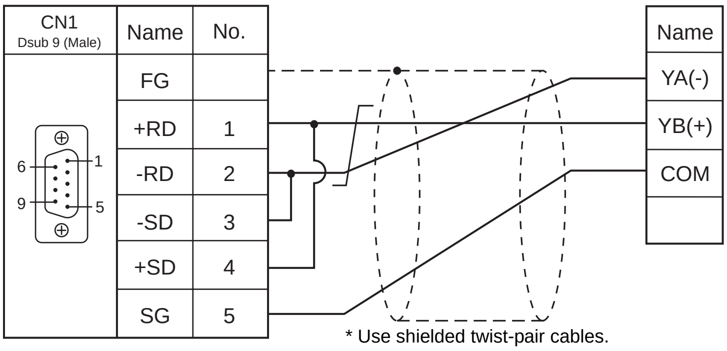
RS-232C

Wiring diagram 1 - C2

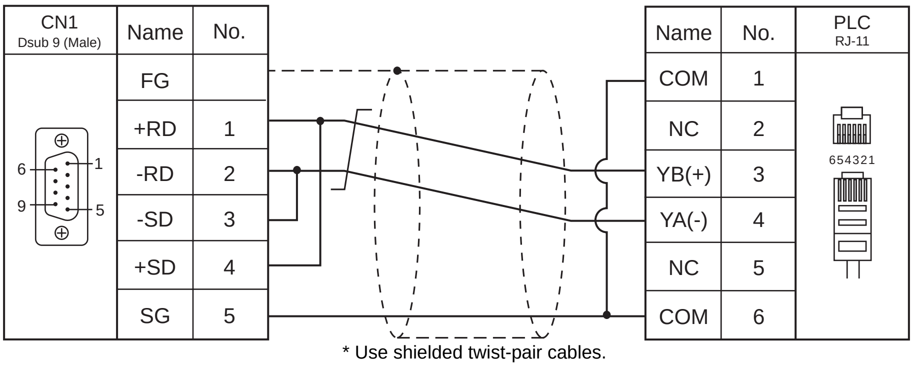


RS-422/RS-485

Wiring diagram 1 - C4



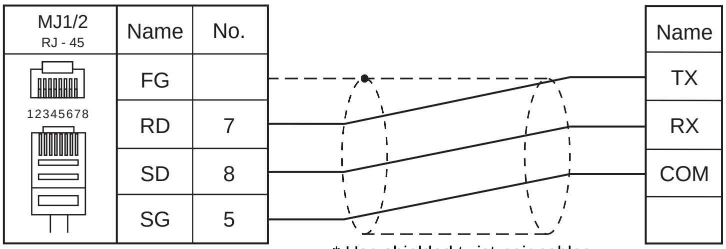
Wiring diagram 2 - C4



When Connected at MJ1/MJ2:

RS-232C

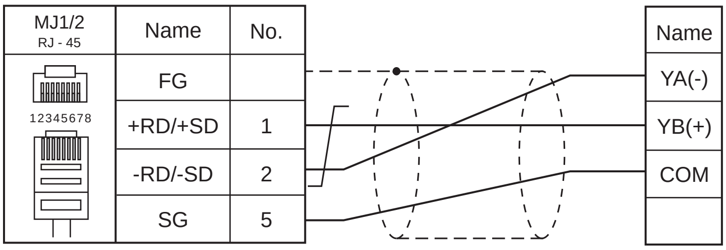
Wiring diagram 1 - M2



* Use shielded twist-pair cables.

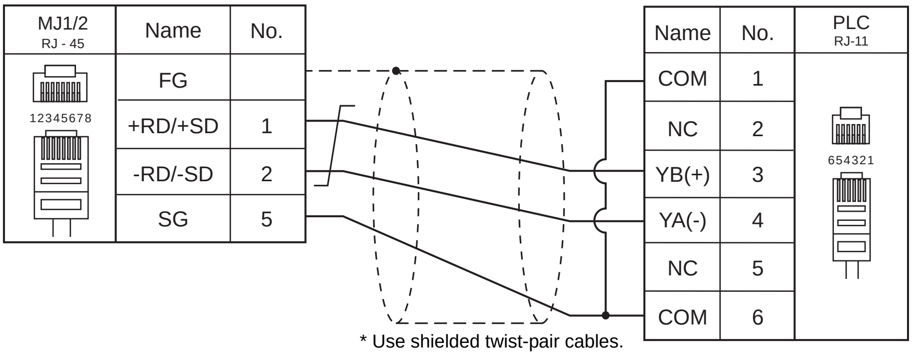
RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

Wiring diagram 2 - M4



* Use shielded twist-pair cables.

MEMO

Please use this page freely.

18. Siemens

18.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer[*1]
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
S7	S7-300	CP-341 (3964R/RK512)	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
	S7-400	CP-441 (3964R/RK512)	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			RS-422	Wiring diagram 1 - C4	×	Wiring diagram 1 - M4	
S7-200PPI	CPU 226 CPU 224 CPU 222 CPU 221 CPU 216 CPU 215 CPU 214 CPU 212	PPI	RS-485	Wiring diagram 2 - C4	Wiring diagram 2 - M4		
S7-300/400MPI	CPU 312 CPU 312C CPU 313C CPU 313C-2 DP CPU 314 CPU 314C-2 DP CPU 315-2 DP CPU 315-2 PN/DP CPU 315F-2 DP CPU 317-2 DP CPU 317-2 PN/DP CPU 317F-2 DP CPU 319-3 PN/DP CPU 412-1 CPU 412-2 CPU 414-2 CPU 414-3 CPU 416-2 CPU 416-3 CPU 417-4	MPI (MPI/DP)	RS-485				

*1 For the ladder transfer function, see Appendix 5 Ladder Transfer Function.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer[*1]
S7-300/400 (Ethernet)	CPU313C-2 DP CPU315-2 DP CPU317-2 DP	CP343-1 Lean	○	×	102 fixed	×
	CPU315-2 PN/DP CPU319-3 PN/DP	-				
	CPU412-2 CPU416-2	CP443-1				

*1 For the ladder transfer function, see Appendix 5 Ladder Transfer Function.

Network Connections

PROFIBUS-DP

To use PROFIBUS-DP communication, an optional communication interface unit “CU-04” is necessary. For more information, refer to the Specifications for Communication Unit PROFIBUS-DP.

PLC Selection on the Editor	CPU	Port	Ladder Transfer[*1]
S7 PROFIBUS-DP	S7	DP port	×

*1 For the ladder transfer function, see Appendix 5 Ladder Transfer Function

18.1.1 S7

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

S7

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

Hardware Configuration ([RK 512] tab window)

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

Hardware Configuration ([Interface] tab window)

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

Available Memory

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

Memory		TYPE	Remarks
DB	(data word)	00H	Use memory address DB1 and later.
I	(input)	01H	IW as word device
Q	(output)	02H	QW as word device
M	(marker word)	03H	MW as word device
T	(timer/current value)	04H	
C	(counter/current value)	05H	

The assigned memory is indicated when editing the screen as shown on the right.

Example: DB001 : 0000

Address
Colon
Block number

18.1.2 S7-200PPI

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 / 187.5k*1 bps	V812/V810/V808: 187.5 kbps can be specified when CN1 is selected for PLC1. V806: 187.5 kbps can be specified when MJ2 is selected for PLC1.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	1 to 31 (2)	

*1 Notes on communication at the baud rate of 187.5 kbps:
- The sound play function cannot be used.
- When performing slave communication via RS-485, set the send delay time of 5 msec or longer.
- When performing serial communication with another device at PLC2 to PLC8, if only one port is used, 115-kbps communication is available.
  When two ports are used at the same time, the maximum baud rate available is 57600 bps for each port.

S7-200

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

System block

(Underlined setting: default)

Item	Setting	Remarks
PLC Address	1 to 31 (2)	Numbers from 1 to 126 can be specified, however, communication with V8 cannot be established when a number from 32 to 126 is specified.
Highest Address	1 to 31	
Baud Rate	9.6k / 19.2k / 187.5 kbps	

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

Available Memory

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

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

18.1.3 S7-300/400MPI

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	A maximum of four MPI-capable units can be connected.
Signal Level	**RS-422/485**	
Baud Rate	19200 / 187.5k[*1] bps	V812/V810/V808: 187.5 kbps can be specified when CN1 is selected for PLC1. V806: 187.5 kbps can be specified when MJ2 is selected for PLC1.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	0 to 31 (2)	Specify the MPI station number of S7-300/400.

*1 Notes on communication at the baud rate of 187.5 kbps:
- The sound play function cannot be used.
- When performing slave communication via RS-485, set the send delay time of 5 msec or longer.
- When performing serial communication with another device at PLC2 to PLC8, if only one port is used, 115-kbps communication is available.
  When two ports are used at the same time, the maximum baud rate available is 57600 bps for each port.

MPI setting

(Underlined setting: default)

Item	Setting	Remarks
Highest MPI Address	15 / 31 / 63 / 126	Specify the highest address in the MPI network.
Local Port No.	0 to 126 (3)	Specify the port number of V8. It must be a unique number.

S7-300/400MPI

Specify the MPI address and the baud rate using “SIMATIC Manager”. For more information, refer to the PLC manual issued by the manufacturer.

Available Memory

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

Memory		TYPE	Remarks
DB	(data word)	00H	Use memory address DB1 and later.
I	(input)	01H	IW as word device
Q	(output)	02H	QW as word device
M	(marker word)	03H	MW as word device
T	(timer/current value)	04H	
C	(counter/current value)	05H	

The assigned memory is indicated when editing the screen as shown on the right.

Example: DB001 : 0000
Address
Colon
Block number

Indirect Memory Designation

- DB device

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

18.1.4 S7-300/400 (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see Appendix 2 Ethernet.

- IP address for the V8 unit
- V8 unit's port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC's IP address and port number "102" for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting] → [Target Settings])

S7-300/400

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

Hardware configuration

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

Available Memory

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

Memory		TYPE	Remarks
DB	(data word)	00H	Use memory address DB1 and later.
I	(input)	01H	IW as word device
Q	(output)	02H	QW as word device
M	(marker word)	03H	MW as word device
T	(timer/current value)	04H	
C	(counter/current value)	05H	

The assigned memory is indicated when editing the screen as shown on the right.

Example: DB001 : 0000

Address
Colon
Block number

18.1.5 Wiring Diagrams

We recommend the following cable and the connectors for cable configuration. For more information, refer to related documents issued by Siemens.

- Recommended cable

Manufacturer	Model
Siemens	6XV1 830-0EH10

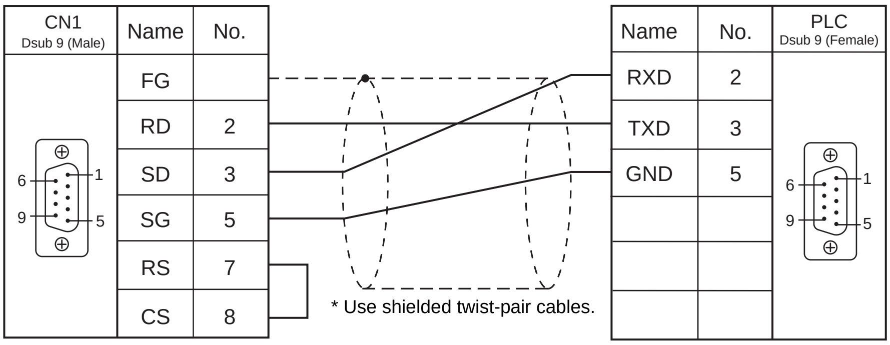
- Recommended connector

Manufacturer	Model	Remarks		
Siemens	6ES7 972-0BA50-0XA0	Fast Connect	For vertical wiring 90-degree angle of outgoing cable	Without PG I/F
	6ES7 972-0BB50-0XA0			With PG I/F
	6ES7 972-0BA60-0XA0		For vertical wiring 35-degree angle of outgoing cable	Without PG I/F
	6ES7 972-0BB60-0XA0			With PG I/F
	6GK1 500-0FC00		For horizontal wiring	-

When Connected at CN1:

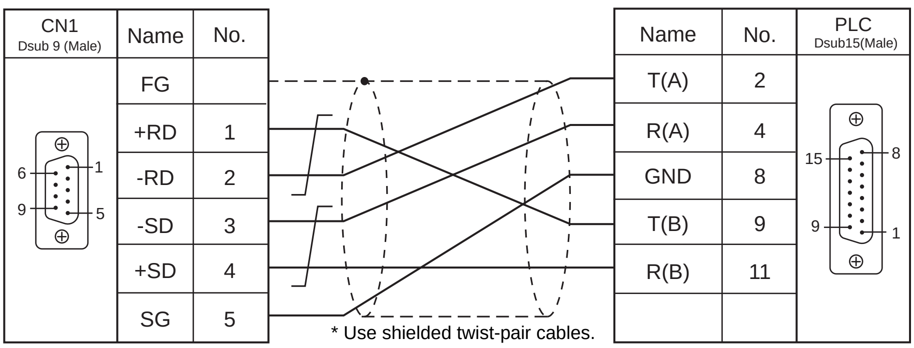
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

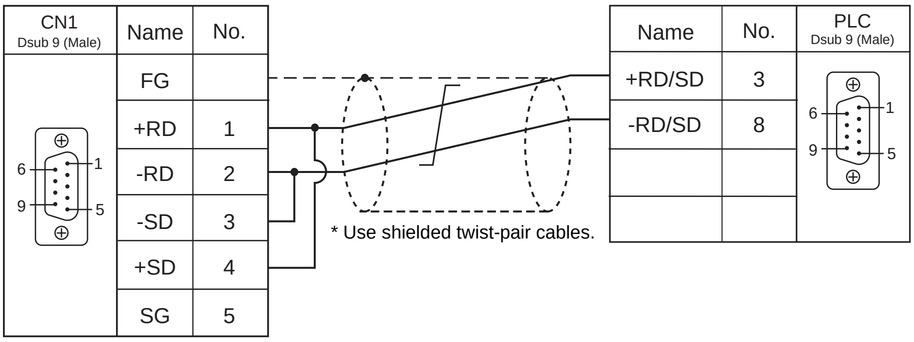
Wiring diagram 1 - C4



Wiring diagram 2 - C4

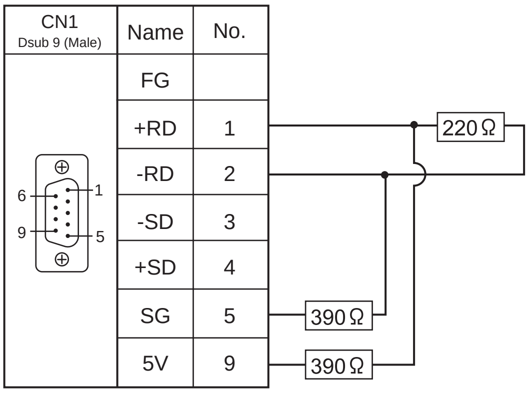
Terminating resistance
Set the DIP switch*1 of the V8 unit to the OFF position, and set the terminating resistance by referring to “Terminating resistance setting” described below.

*1 For V812/V810/V808: DIP switches 5 and 7
V806: DIP switches 1 and 2 on “DU-10”



Terminating resistance setting

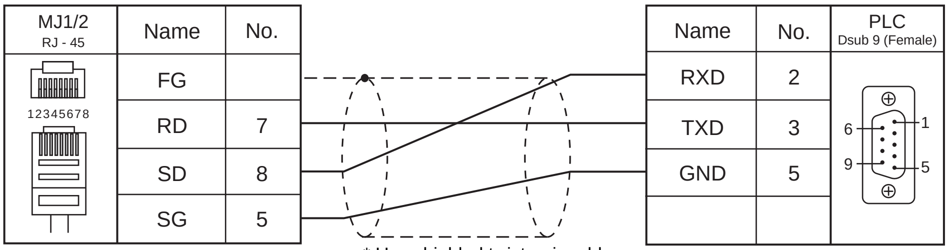
Set the DIP switch of the V8 unit to the OFF position and connect the terminating resistance to CN1 as shown below. If the terminating resistance is not connected, a communication error may occur.



When Connected at MJ1/MJ2:

RS-232C

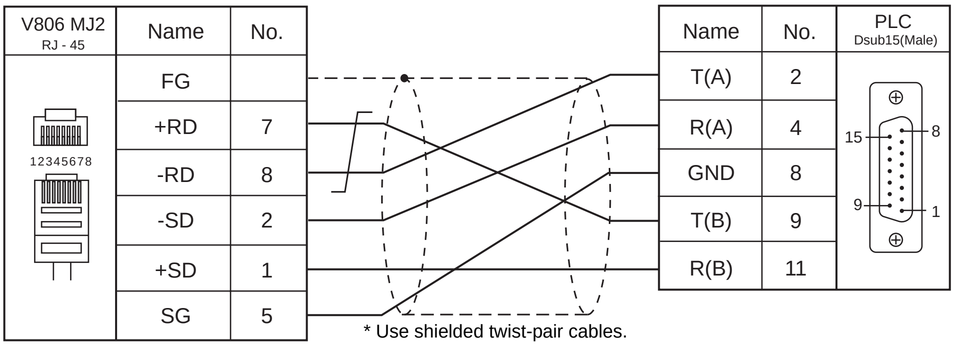
Wiring diagram 1 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

Wiring diagram 1 - M4



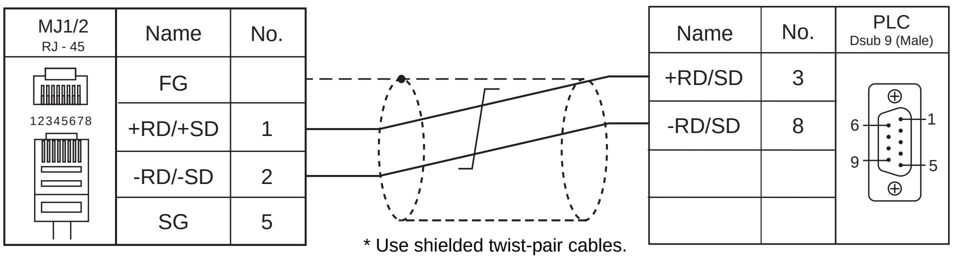
* Use shielded twist-pair cables.

* Slide switch on V806:
RS-422 (lower)

Wiring diagram 2 - M4

Terminating resistance
Set the DIP switch*1 of the V8 unit to the OFF position, and set the terminating resistance by referring to “Terminating resistance setting” described below.

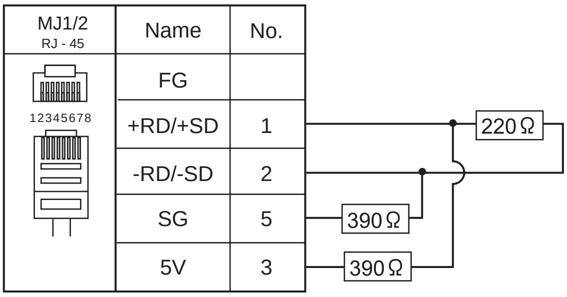
*1 For V812/V810/V808:
MJ1: DIP switch 6
MJ2: DIP switch 8
For V806
MJ1: DIP switch 1
MJ2: DIP switches 2 and 3 (slide switch on the side of the V8 unit: upper)



* Use shielded twist-pair cables.

Terminating resistance setting

Set the DIP switch of the V-series unit to the OFF position and connect the terminating resistance to MJ as shown below. If the terminating resistance is not connected, a communication error may occur.



MEMO

Please use this page freely.

19. TOSHIBA MACHINE

19.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer*1
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
TC200	TCCUH	RS-232C port	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
	TCCMW						
	TCCMO						
	TC3-01						
	TC3-02						

*1 For the ladder transfer function, see Appendix 5 Ladder Transfer Function.

19.1.1 TC200

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

TCCUH

Make the setting for communication using the ladder tool.

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

TCCMW / TCCMO

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

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

Function setting switch (MODE)

Switch	Setting		Remarks
3	ON	Link master station	When this switch is OFF, communications between V8 and PLC are not possible.
4	OFF	Link slave station	
5	OFF	Remote master station	
6	OFF	Remote slave station	

Available Memory

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

Memory		TYPE	Remarks
D	(register 1)	00H	
B	(register 2)	01H	
X	(input relay)	02H	XW as word device
Y	(output relay)	03H	YW as word device
R	(internal relay)	04H	RW as word device
G	(extension internal relay 1)	05H	GW as word device
H	(extension internal relay 2)	06H	HW as word device
L	(latch relay)	07H	LW as word device
S	(shift register)	08H	SW as word device
E	(edge relay)	09H	EW as word device
P	(timer counter register 1/current value)	0AH	
V	(timer counter register 2/current value)	0BH	
T	(timer/contact)	0CH	TW as word device
C	(counter/contact)	0DH	CW as word device
A	(special auxiliary relay)	0EH	AW as word device

* Bit 7 of word device such as D, B, V, and P is not used. Bit 3 of bit device such as X, Y, R, G, H, L, S, E, T, C, and A is also not used.

Indirect Memory Designation

- When setting bit 8 and above of word device (D, B, V, P), shift bit 8 and above to the right by 1 bit, and then specify the shifted bit number.
  Example: When word device “D” (register 1) is 0xFF7F;

  0xFF7F --> 0x7FFF
  1111 1111 0111 1111 --> 0111 1111 1111 1111

- When setting bit 4 and above of bit device (X, Y, R, G, H, L, S, E, T, C, and A), shift bit 4 and above to the right by 1 bit, and then specify the shifted bit number.
  Example: When bit device “R” (internal relay) is 0xFFF7;

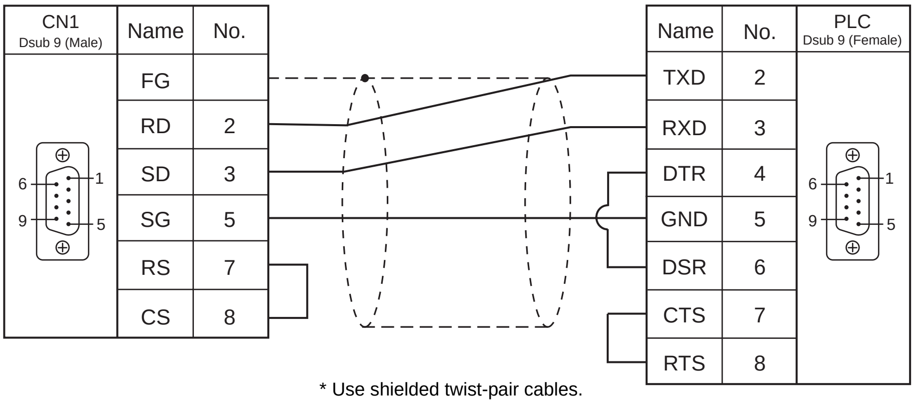
  0xFFF7 --> 0x7FFF
  1111 1111 1111 0111 --> 0111 1111 1111 1111

19.1.2 Wiring Diagrams

When Connected at CN1:

RS-232C

Wiring diagram 1 - C2

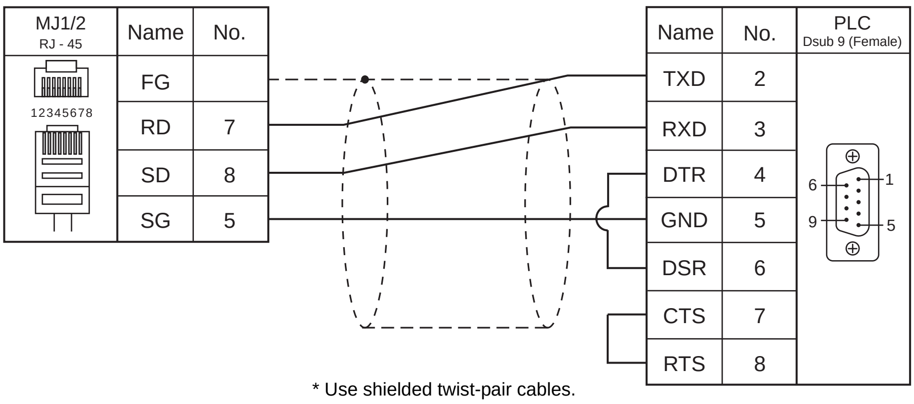


* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2



* Use shielded twist-pair cables.

20. Yamatake

20.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Digital Indicating Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire) V806</th></tr>
<tr><td rowspan="2">SDC35/36</td><td>SDC35xxxxxx2xx
SDC35xxxxxx4xx
SDC36xxxxxx2xx
SDC36xxxxxx4xx</td><td rowspan="2">Terminal on the back</td><td rowspan="2">RS-485</td><td rowspan="2">Wiring diagram 1 - C4</td><td rowspan="2">Wiring diagram 1 - M4</td><td rowspan="2"></td><td>SDC36.Lst</td></tr>
<tr><td>SDC15Txxxx03xx
SDC15Txxxx06xx
SDC25Txxxxx2xx
SDC26Txxxxx2xx</td><td>None*1</td></tr>
</table>

*1 Enter addresses manually by referring to the instruction manual for the controller.

Module-type Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="3">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>CN1</th><th>MJ1/MJ2</th><th>MJ2 (4-wire) V806</th></tr>
<tr><td>DMC10</td><td>DMC10S
DMC10D</td><td>CPL communication terminal</td><td>RS-485</td><td>Wiring diagram 1 - C4</td><td>Wiring diagram 1 - M4</td><td></td><td>DMC10.Lst</td></tr>
<tr><td rowspan="3">DMC50 (COM)</td><td rowspan="2">DMC50ME20X
DMC50MR20X</td><td>RS-485 port 1</td><td>RS-485</td><td>Wiring diagram 2 - C4</td><td>Wiring diagram 2 - M4</td><td>Wiring diagram 4 - M4</td><td rowspan="3">DMC50.Lst</td></tr>
<tr><td>Display communication port</td><td>RS-485</td><td rowspan="2">Wiring diagram 3 - C4</td><td rowspan="2">Wiring diagram 3 - M4</td><td rowspan="2"></td></tr>
<tr><td>DMC50CH40X
DMC50CH20X
DMC50CS40X
DMC50CS20X</td><td>Display communication port</td><td>RS-485</td></tr>
</table>

20.1.1 SDC35/36

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

CPL communication setting

(Underlined setting: default)

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

Available Memory

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

Memory	TYPE	Remarks
---	00H	

* Addresses 16657 to 31243 are allocated for EEPROM data addresses.
The number of times EEPROM can be reprogrammed is limited (approx. 100000 times). As such, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

20.1.2 DMC10

Communication Setting

Editor

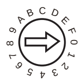
Communication setting

(Underlined setting: default)

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

Controller

Rotary switch for device address

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

CPL communication setting

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

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

Available Memory

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

Memory	TYPE	Remarks
---	00H	

* Addresses 5000 to 8999 are allocated for EEPROM data addresses.
The number of times EEPROM can be reprogrammed is limited (approx. 100000 times). As such, we recommend that you write such a parameter as to be reprogrammed frequently into RAM, where the number of reprogramming times is not limited. However, when the parameter has been written into RAM, and the power is turned off and back on, data in EEPROM is transferred.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

20.1.3 DMC50 (COM)

Communication Setting

Editor

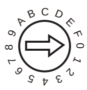
Communication setting

(Underlined setting: default)

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

Controller

Rotary address for module address

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

COM module: RS-485 port 1

Make the following settings on the PC loader.

(Underlined setting: default)

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

CTRL module: Display communication port

Make the following settings on the PC loader.

(Underlined setting: default)

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

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

Available Memory

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

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

Memory (Parameter Type ID)		TYPE	Remarks
E0A	(user-defined parameter)	3AH	Double-word
E12	(user-defined parameter)	3BH	Double-word
E13	(user-defined parameter)	3CH	Double-word
E14	(user-defined parameter)	3DH	Double-word
E15	(user-defined parameter)	3EH	Double-word
610	(user-defined parameter)	3FH	Double-word

Address denotations

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

aaabbbcc

Item ID

Group ID

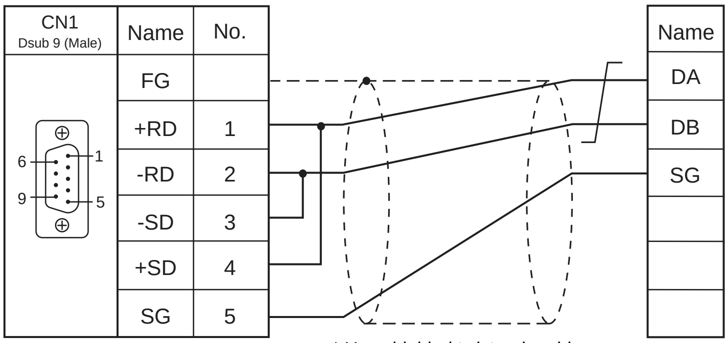
Parameter type ID

20.1.4 Wiring Diagrams

When Connected at CN1:

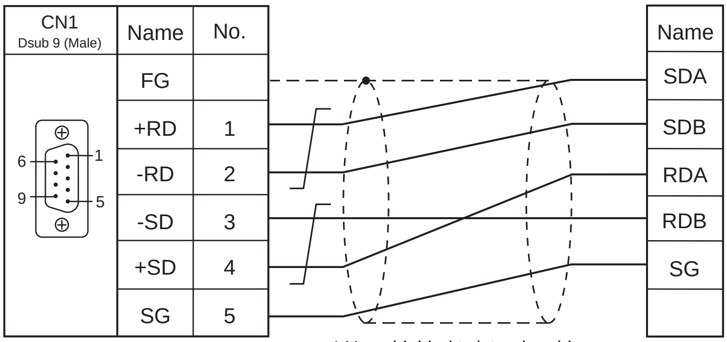
RS-422/RS-485

Wiring diagram 1 - C4



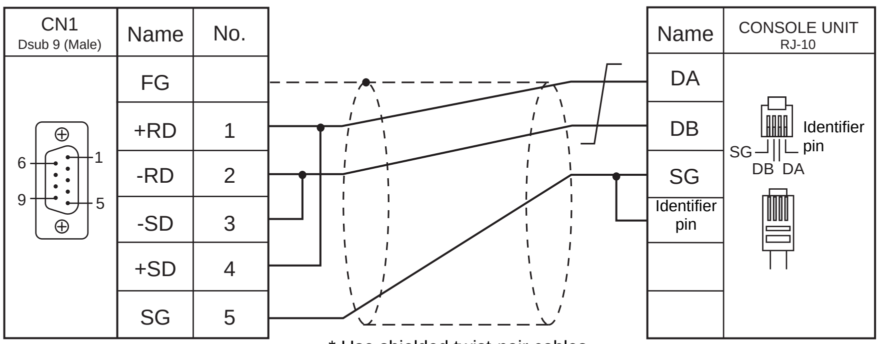
* Use shielded twist-pair cables.

Wiring diagram 2 - C4



* Use shielded twist-pair cables.

Wiring diagram 3 - C4

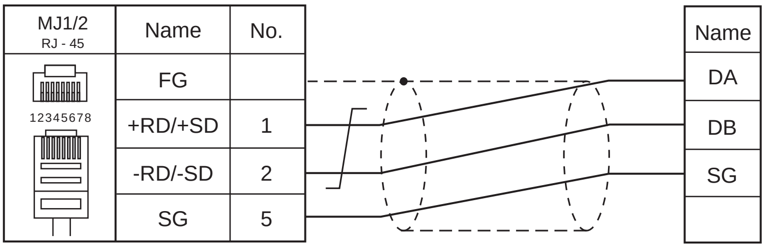


* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

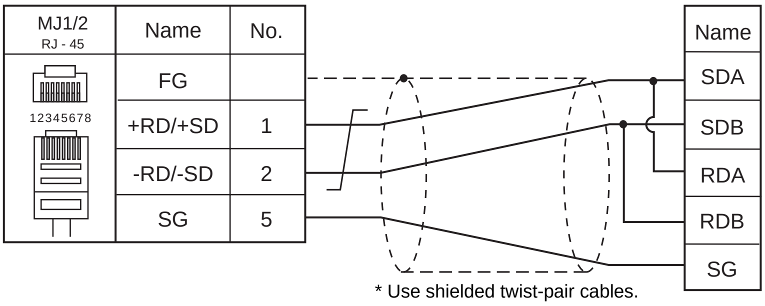
RS-422/RS-485

Wiring diagram 1 - M4

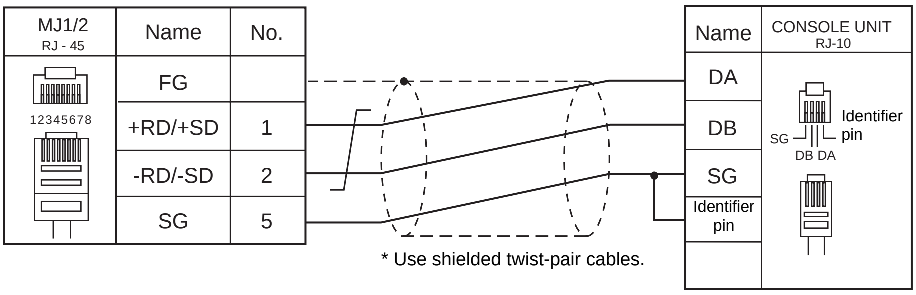


* Use shielded twist-pair cables.

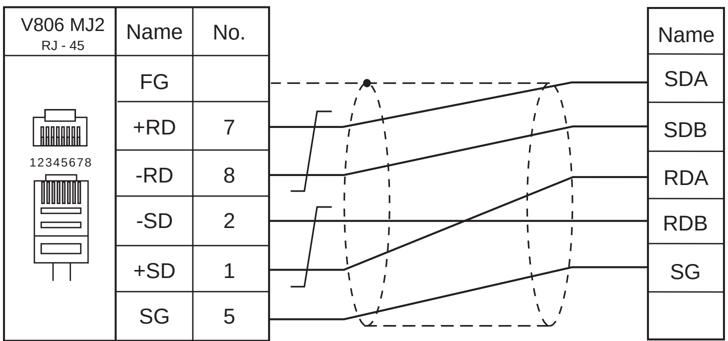
Wiring diagram 2 - M4



Wiring diagram 3 - M4



Wiring diagram 4 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

21. Yaskawa Electric

21.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection CN1	Connection MJ1/MJ2	Connection MJ2 (4-wire) V806	Ladder Transfer *1
Memobus	GL60 series	JAMSC-IF60 JAMSC-IF61 JAMSC-IF611		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		JAMSC-IF612 JAMSC-IF613		RS-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 6 - M4	
	GL120 GL130 series	Memobus port on the CPU module		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		JAMSC-120NOM 27100		RS-422	Wiring diagram 2 - C4	Wiring diagram 2 - M4	Wiring diagram 7 - M4	
	PROGIC-8	PORT2 on the CPU unit		RS-232C	Wiring diagram 2 - C2	Wiring diagram 2 - M2		
CP9200SH/ MP900	CP9200SH	CP-217IF	CN1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			CN2		Wiring diagram 3 - C2	Wiring diagram 3 - M2		
			CN3	RS-422	Wiring diagram 3 - C4	Wiring diagram 3 - M4	Wiring diagram 8 - M4	
	MP920 MP930	Memobus port on the CPU module		RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
		217IF	CN1 CN2	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		
			CN3	RS-422	Wiring diagram 4 - C4	Wiring diagram 4 - M4	Wiring diagram 9 - M4	
	MP2200 MP2300 MP2300S	217IF-01 218IF-01	PORT	RS-232C	Wiring diagram 4 - C2	Wiring diagram 4 - M2		
		217IF-01	RS422/485	RS-422	Wiring diagram 5 - C4	Wiring diagram 5 - M4	Wiring diagram 10 - M4	

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

Ethernet Connection

To speed up communications, we recommend you to select “CP/MP Expansion Memobus (UDP/IP)”.

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
MP2300 (MODBUS TCP/IP)	MP2300S MP2400	218IFA (built-in LAN port)	○	×	Set the desired number using the tool.	×
	MP2200 MP2300 MP2300S	218IF-01				
CP MP Expansion Memobus (UDP/IP)	MP2300S MP2400	218IFA (built-in LAN port)	×	○		
	MP2200 MP2300 MP2300S	218IF-01				

*1 For the ladder transfer function, see “Appendix 5 Ladder Transfer Function”.

21.1.1 Memobus

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 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	
Transmission Mode	Type 1 / Type 2	For GL60 series or PROGIC-8: Type 1: special binary code For GL120/130 series: Type 2: standard binary code

PLC

Be sure to match the settings to those made on the [Communication Settings] tab window of the editor. For more information, refer to the PLC manual issued by the manufacturer.

Item	Setting	Remarks
Signal Level	RS-232C / RS-422	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	**8 bits**	RTU mode
Stop Bit	1 bit	
Parity	Even	
Station No.	1 to 31	
Error Check	**CRC**	
Port Delay Timer	**0**	

Available Memory

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

Memory		TYPE	Remarks
4	(holding register)	00H	
3	(input register)	01H	Including constant register, read only
R	(link register)	02H	
A	(extension register)	03H	
0	(coil)	04H	
D	(link coil)	05H	
1	(input relay)	06H	Read only
7	(constant register)	07H	

21.1.2 CP9200SH/MP900

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 / 76800 bps	
Data Length	8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

PLC

CP-217IF

Be sure to match the settings to those made on the [Communication Settings] tab window of the editor.
For more information on communication settings, refer to the PLC manual issued by the manufacturer.

Memobus Port on the CPU Module (MP920, MP930) / 217IF

Module configuration

Item	Setting	Remarks
Transmission Protocol	**Memobus**	
Master/Slave	**Slave**	
Device Address	1 to 31	
Serial I/F	RS-232	
Transmission Mode	**RTU**	
Data Length	**8 bits**	
Parity Bit	Even	
Stop Bit	1 stop	
Baud Rate	19.2K	For connection via RS-422 on “217IF”, 76800 bps can also be selected. For more information, refer to the PLC manual issued by the manufacturer.

217IF-01, 218IF-01

Module configuration

Item	Setting	Remarks
Transmission Protocol	**Memobus**	
Master/Slave	**Slave**	
Device Address	1	
Serial I/F	RS-232 / RS-485	
Transmission Mode	**RTU**	
Data Length	**8 bits**	
Parity Bit	Even	
Stop Bit	1 stop	
Baud Rate	19.2K	The maximum baud rate available is 76.8 kbps.
Automatic Reception	Specified / Not Specified	To speed up communications, select [Not Specified]. When [Not Specified] is selected, the MSG-RCV function is required. For more information, refer to the PLC manual issued by the manufacturer.
Automatic Reception Setting	As desired	Make the setting when [Specified] is selected for [Automatic Reception].

Available Memory

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

Memory		TYPE	Remarks
MW	(holding register)	00H	MB as bit device
IW	(input register)	01H	IB as bit device, read only
MB	(coil)	04H	MW as word device
IB	(input relay)	06H	IW as word device, read only

When setting the MB/IB memory, set the bit numbers in the hexadecimal notation.

MBxxxx □

DEC

Bit No.: HEX

21.1.3 MP2300 (MODBUS TCP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

218IFA (Built-in LAN Port)

Module configuration

Item	Setting	Remarks
IP Address	Set the IP address of “218IFA”.	
Subnet Mask	Set the subnet mask of “218IFA”.	
Local Port	256 to 65535	Cannot set the same number as the one set for another connection number.
Target IP Address	**000.000.000.000**	Connected in the “Unpassive open” mode *
Target Port	**0000**	
Connection Type	**TCP**	
Protocol Type	**MODBUS TCP/IP**	
Code	**BIN**	
Automatic Reception	**Valid**	When “Valid” is checked, the operation equivalent to the MSG-RCV function is automatically performed.

* Gives a response to the connection request issued by the station whose address is within the range specified by the subnet mask regardless of its IP address setting.

218IF-01 (MP2200, MP2300)

Make the settings as shown below and create a program of the MSG-RCV function. For more information, refer to the PLC manual issued by the manufacturer.

Module configuration

Item	Setting	Remarks
IP Address	Set the IP address of “218IF-01”.	
Local Port	256 to 65534	Cannot set the same number as the one set for another connection number.
Target IP Address	**000.000.000.000**	Connected in the “Unpassive open” mode *
Target Port	**0000**	
Connection Type	**TCP**	
Protocol Type	**MODBUS TCP/IP**	
Code	**BIN**	

* Gives a response to the connection request issued by the station whose address is within the range specified by the subnet mask regardless of its IP address setting.

Available Memory

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

Memory		TYPE	Remarks
MW	(holding register)	00H	MB as bit device
IW	(input register)	01H	IB as bit device, read only
MB	(coil)	04H	MW as word device
IB	(input relay)	06H	IW as word device, read only

When setting the MB/IB memory, set the bit numbers in the hexadecimal notation.

MBxxxx □

DEC

Bit number: HEX

21.1.4 CP MP Expansion Memobus (UDP/IP)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.
- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

218IFA (Built-in LAN Port)

Module configuration

Item	Setting	Remarks
IP Address	Set the IP address of “218IFA”.	
Subnet Mask	Set the subnet mask of “218IFA”.	
Local Port	256 to 65535	Except 9998 and 10000. Cannot set the same number as the one set for another connection number.
Target IP Address	Set the IP address of the V series.	
Target Port	Set the port number of the V series.	
Connection Type	**UDP**	
Protocol Type	**Extension Memobus**	
Code	**BIN**	
Automatic Reception	**Valid**	When “Valid” is checked, the operation equivalent to the MSG-RCV function is automatically performed.

218IF-01

Make the settings as shown below and create a program of the MSG-RCV function. For more information, refer to the PLC manual issued by the manufacturer.

Module configuration

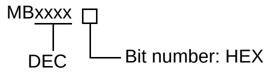
Item	Setting	Remarks
IP Address	Set the IP address of “218IF-01”.	
Local Port	255 to 65535	Cannot set the same number as the one set for another connection number.
Target IP Address	Set the IP address of the V series.	
Target Port	Set the port number of the V series.	
Connection Type	**UDP**	
Protocol Type	**Extension Memobus**	
Code	**BIN**	

Available Memory

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

Memory		TYPE	Remarks
MW	(holding register)	00H	MB as bit device
IW	(input register)	01H	IB as bit device, read only
MB	(coil)	04H	MW as word device
IB	(input relay)	06H	IW as word device, read only

When setting the MB/IB memory, set the bit numbers in the hexadecimal notation.

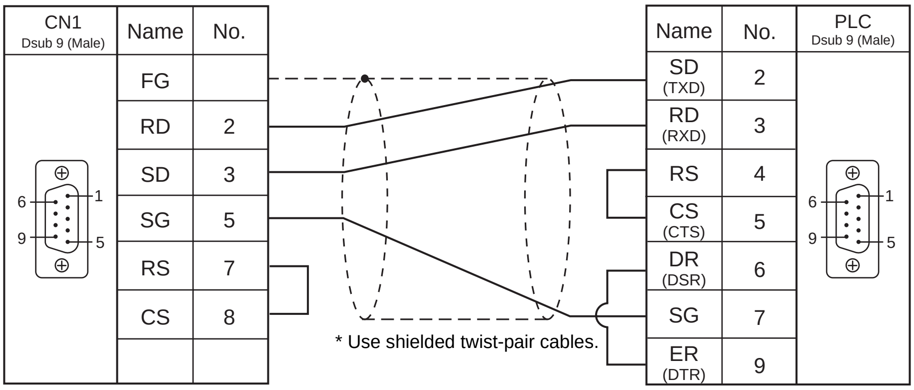


21.1.5 Wiring Diagrams

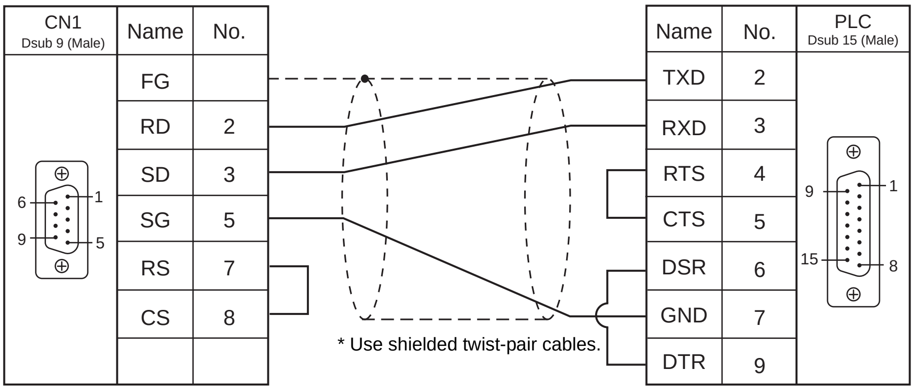
When Connected at CN1:

RS-232C

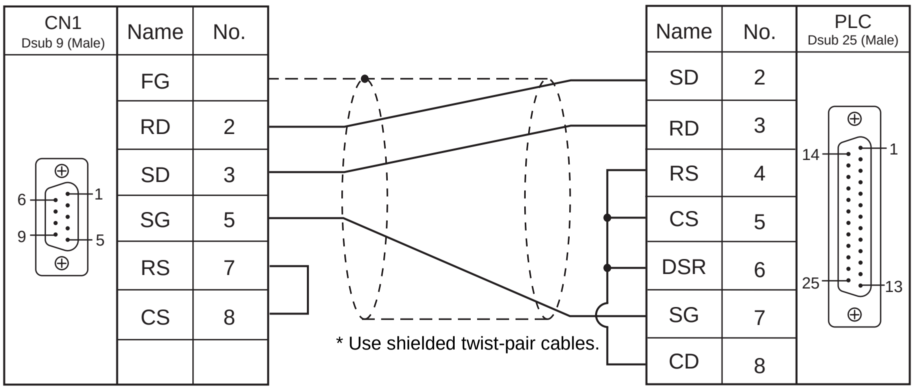
Wiring diagram 1 - C2



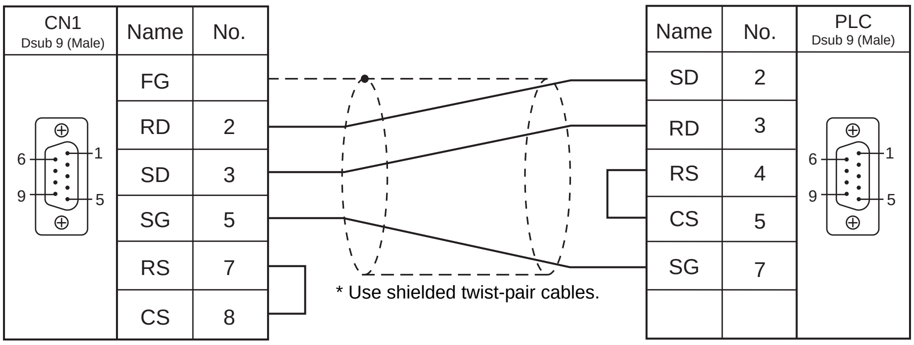
Wiring diagram 2 - C2



Wiring diagram 3 - C2

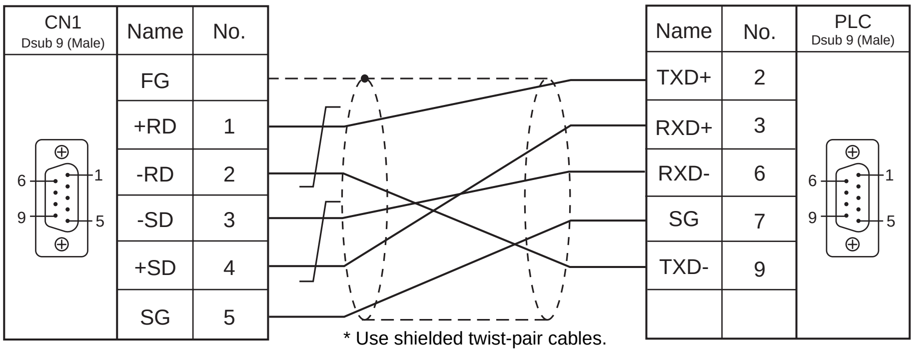


Wiring diagram 4 - C2

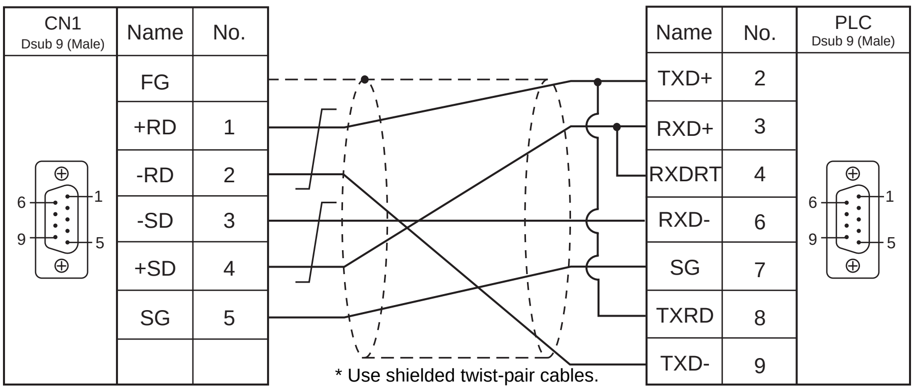


RS-422/RS-485

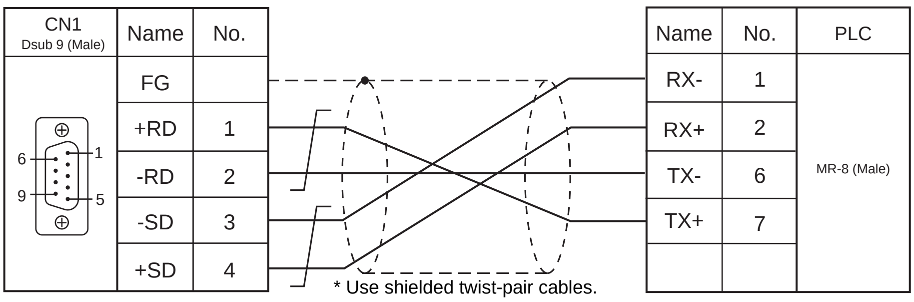
Wiring diagram 1 - C4



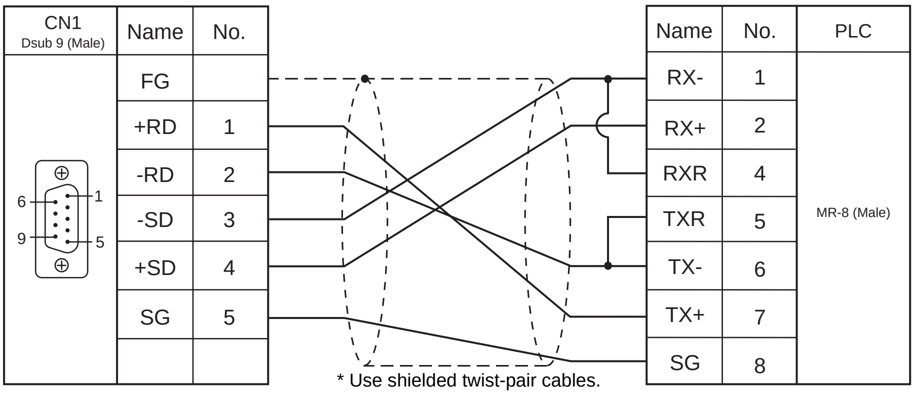
Wiring diagram 2 - C4



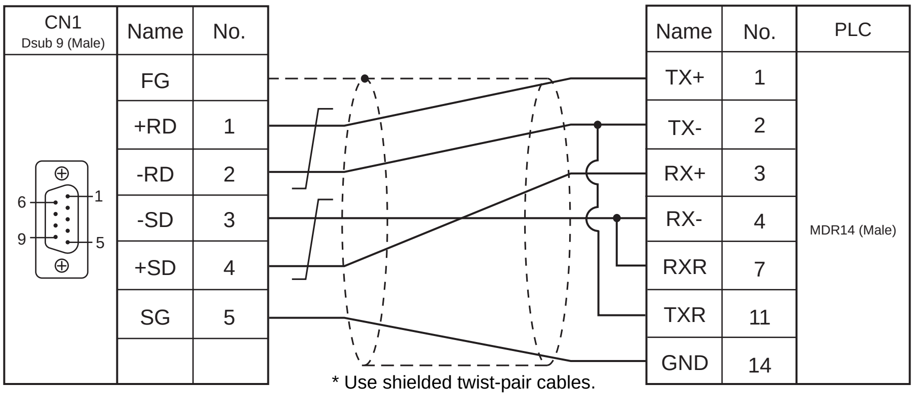
Wiring diagram 3 - C4



Wiring diagram 4 - C4



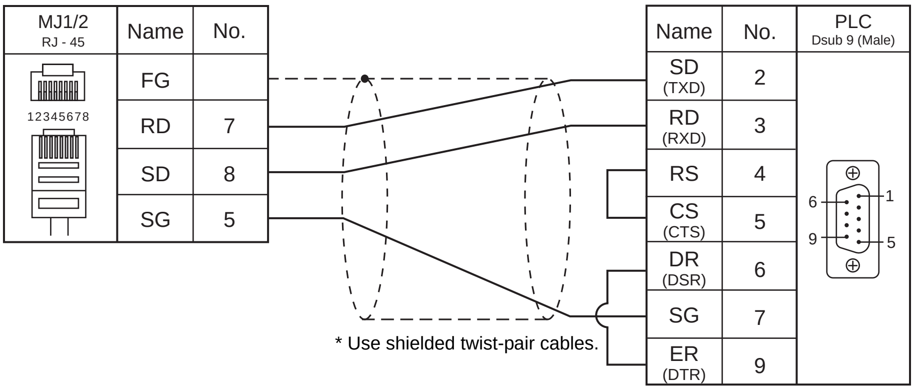
Wiring diagram 5 - C4



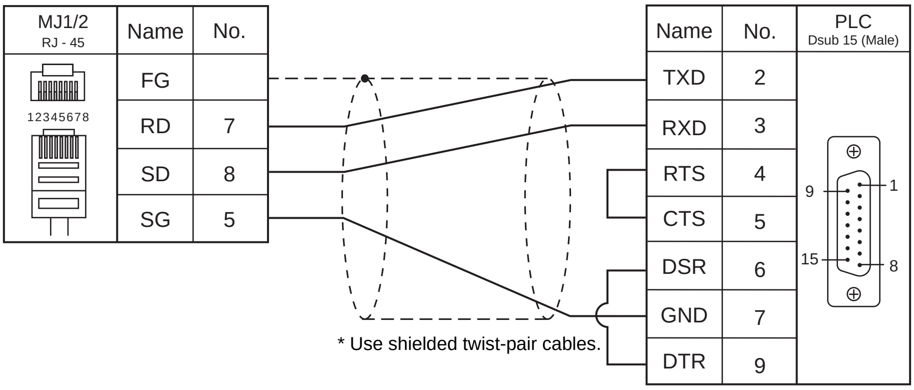
When Connected at MJ1/MJ2:

RS-232C

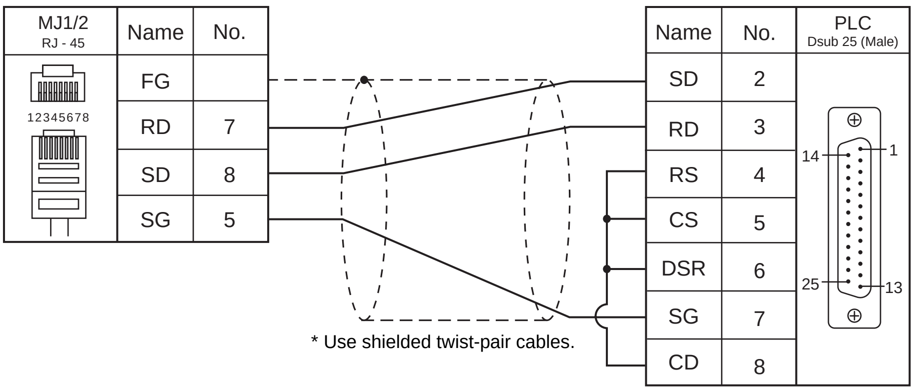
Wiring diagram 1 - M2



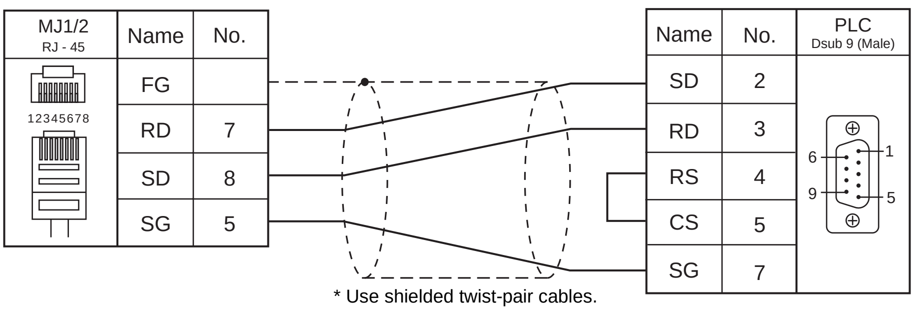
Wiring diagram 2 - M2



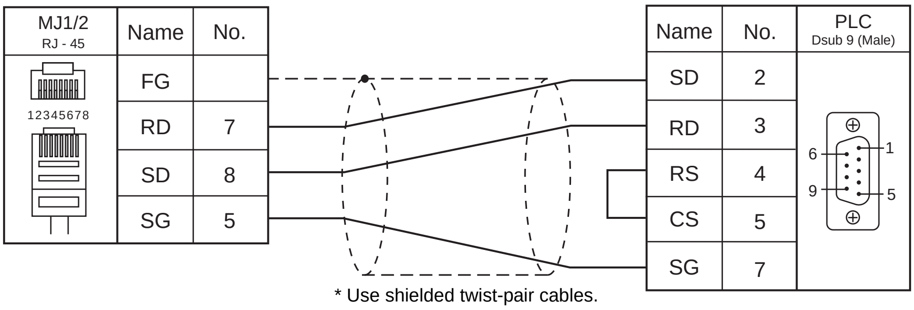
Wiring diagram 3 - M2



Wiring diagram 4 - M2

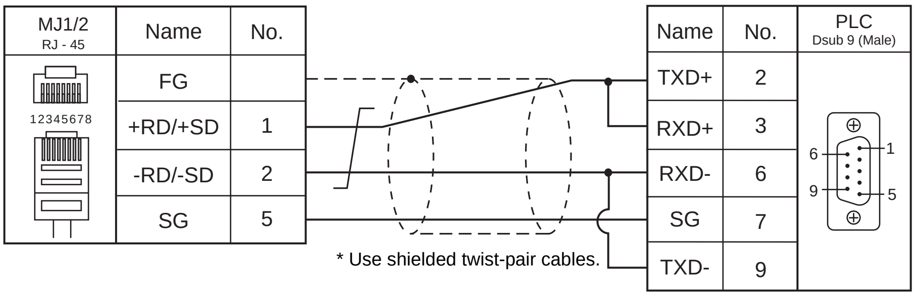


Wiring diagram 5 - M2

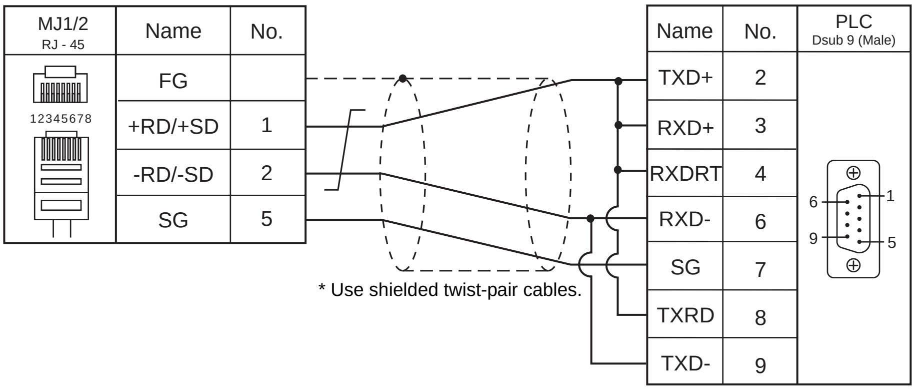


RS-422/RS-485

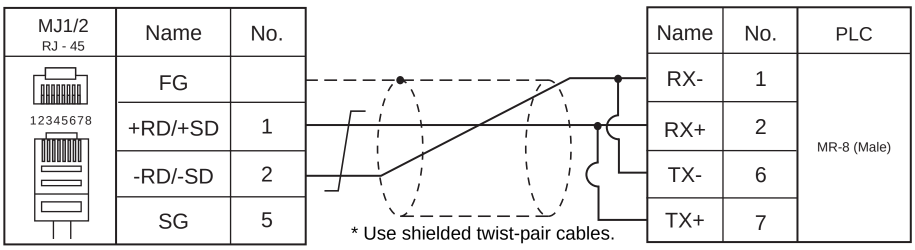
Wiring diagram 1 - M4



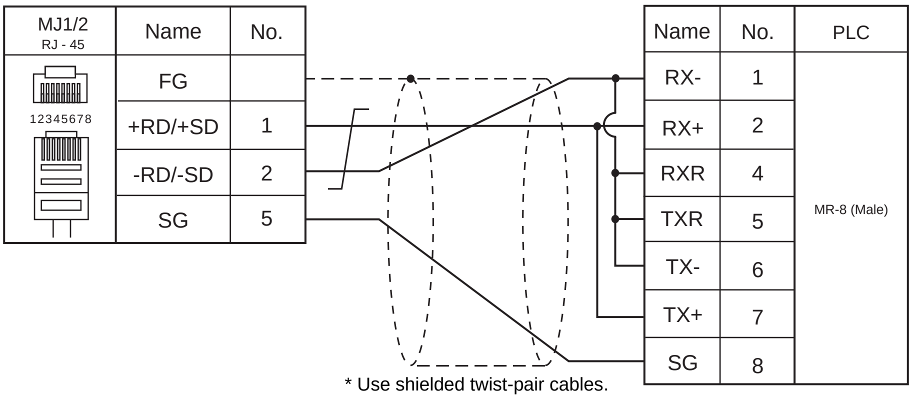
Wiring diagram 2 - M4



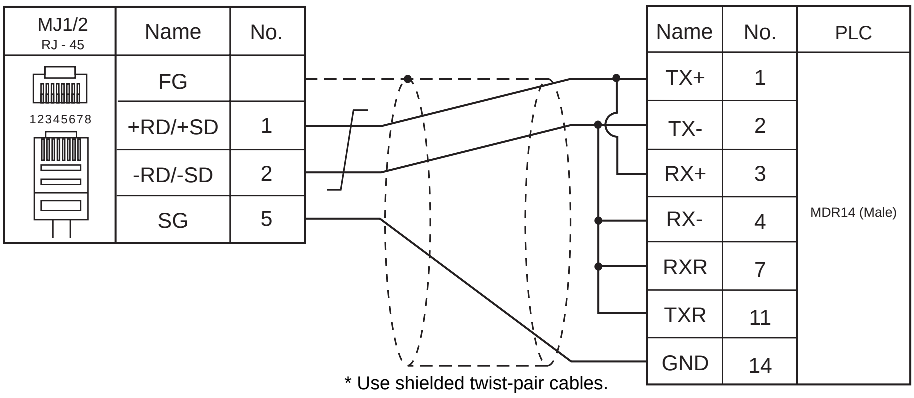
Wiring diagram 3 - M4



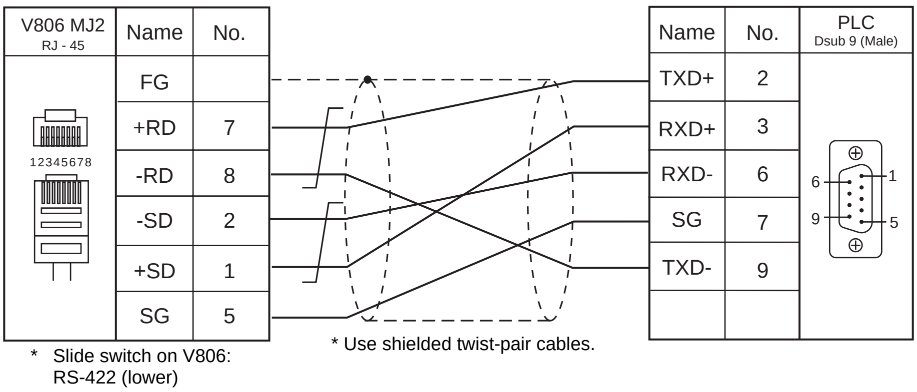
Wiring diagram 4 - M4



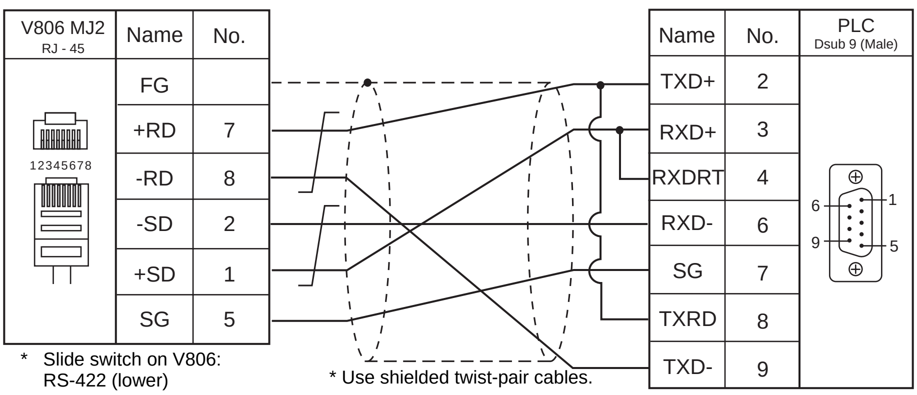
Wiring diagram 5 - M4



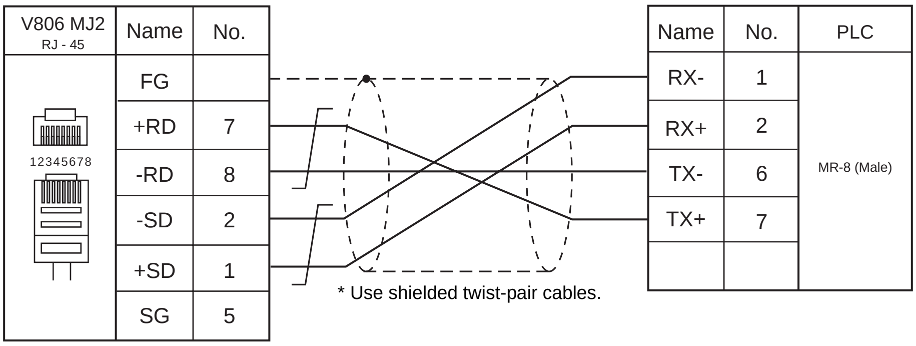
Wiring diagram 6 - M4



Wiring diagram 7 - M4

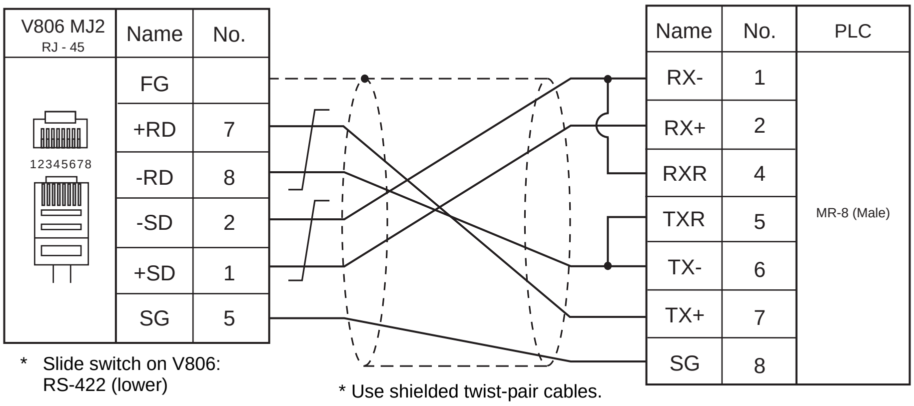


Wiring diagram 8 - M4



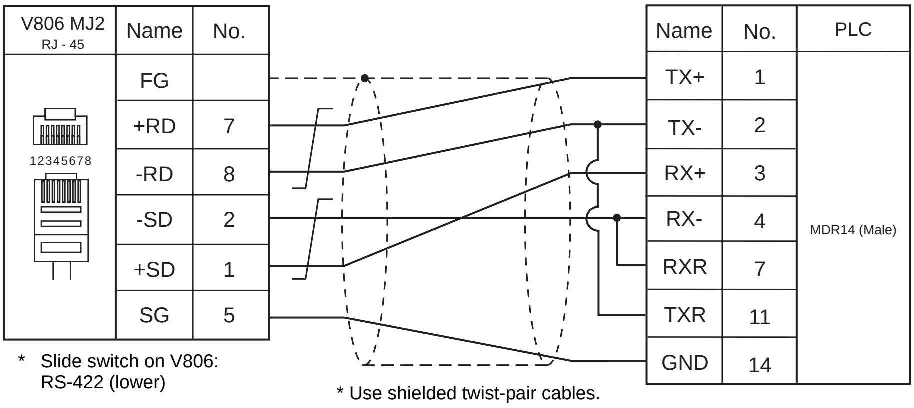
* Slide switch on V806:
RS-422 (lower)

Wiring diagram 9 - M4



* Slide switch on V806:
RS-422 (lower)

Wiring diagram 10 - M4



* Slide switch on V806:
RS-422 (lower)

MEMO

Please use this page freely.

22. Yokogawa Electric

22.1 PLC Connection

The PLC models shown below can be connected.

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			Ladder Transfer *2
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
FA-M3	F3SP21-0N F3SP25-2N F3SP35-5N	PROGRAMMER port	RS-232C	Yokogawa's "KM11-xT" + Gender changer *3	Yokogawa's "KM11-xT" + Wiring diagram 2 - M2		○
	F3SP20-0N F3SP21-0N F3SP25-2N F3SP35-5N	F3LC01-1N*1	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		F3LC11-1N					
		F3LC11-2N	RS-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
FA-M3R	F3SP28-3N/3S F3SP38-6N/6S F3SP53-4H/4S F3SP58-6H/6S F3SP59-7S	PROGRAMMER port	RS-232C	Yokogawa's "KM11-xT" + Gender changer *3	Yokogawa's "KM11-xT" + Wiring diagram 2 - M2		○
	F3SP28-3N/3S F3SP38-6N/6S F3SP53-4H/4S F3SP58-6H/6S F3SP59-7S F3SP66-4S F3SP67-4S	F3LC11-1N F3LC11-1F F3LC12-1F	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2		×
		F3LC11-2N F3LC11-2F	RS-422	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	
	F3SP66-4S F3SP67-6S	SIO port	RS-232C	Yokogawa's "KM21-2T" + Gender changer *3	Yokogawa's "KM21-2T" + Wiring diagram 2 - M2		

*1 When the link unit "F3LC01-1N" is used, the communication setting and available memory are the same as those for "FA-500". However, "B" (common register) cannot be used.
*2 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".
*3 Use a D-sub gender changer (9-pin, female-to-male) commercially available.

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

Ethernet Connection

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Ladder Transfer *1
FA-M3/FA-M3R (Ethernet UDP/IP)	FA-M3/FA-M3R	F3LE01-5T F3LE11-0T F3LE12-0T	×	○	12289	×
	F3SP66-4S F3SP67-6S	T/TX			12289 12291	
FA-M3/FA-M3R (Ethernet TCP/IP)	FA-M3/FA-M3R	F3LE01-5T F3LE11-0T F3LE12-0T	○	×	12289	×
	F3SP66-4S F3SP67-6S	T/TX			12289 12291	

*1 For the ladder transfer function, see "Appendix 5 Ladder Transfer Function".

22.1.1 FA-M3/FA-M3R

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	
Transmission Mode	With Sum Check / Without Sum Check	

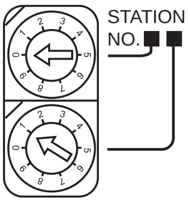
PLC

CPU Programmer Port / SIO Port

Item	Programmer port	SIO Port
Communication Mode	9600 bps, even parity 9600 bps, no parity 19200 bps, even parity 19200 bps, no parity 38400 bps, even parity 38400 bps, no parity 57600 bps, even parity 57600 bps, no parity 115200 bps, even parity 115200 bps, no parity	9600 bps, even parity 9600 bps, no parity 19200 bps, even parity 19200 bps, no parity 38400 bps, even parity 38400 bps, no parity 57600 bps, even parity 57600 bps, no parity 115200 bps, even parity 115200 bps, no parity
PC Link Function	**Use**	
Sum check	Provided / Not provided	
Terminal Character	**None**	
Protection Function	**None**	
Data Length	**8**	

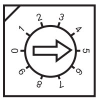
PC Link Module

Station number setting

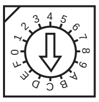
Station Number Setting	Setting	Setting Example
	01 to 32	01

Baud rate setting switch

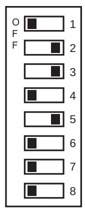
F3LC01-1N / F3LC11-1N / F3LC11-2N

Baud Rate Setting Switch	Setting	Baud Rate	Remarks
	4	4800 bps	
	5	9600 bps	
	6	19200 bps	

F3LC11-1F / F3LC12-1F / F3LC11-2F

Baud Rate Setting Switch	Setting	Baud Rate	Remarks
	4	4800 bps	
	5	9600 bps	
	6	14400 bps	
	7	19200 bps	
	8	28800 bps	
	9	38400 bps	
	A	5736 kbps	
	B	76.8 kbps	
	C	115.2 kbps	

Data format setting switch

Switch	Functions	OFF	ON	Setting Example
1	Data length	7	8	
2	Parity	Not provided	Provided	
3		Odd	Even	
4	Stop bit	1	2	
5	Sum check	Not provided	Provided	
6	Terminal character	**Not provided**	Provided	
7	Protection function	**Not provided**	Provided	
8	-	-	-	

Function setting switch

All OFF

Available Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
R	(common register)	01H	
V	(index register)	02H	
W	(link register)	03H	
Z	(special register)	04H	
TP	(count-down timer/current value)	05H	
TS	(timer/set value)	06H	Read only
CP	(count-down counter/current value)	07H	
CS	(counter/set value)	08H	
X	(input relay)	09H	
Y	(output relay)	0AH	
I	(internal relay)	0BH	
E	(common relay)	0CH	
L	(link relay)	0DH	
M	(special relay)	0EH	
B	(file register)	0FH	

* The CPU number is required in addition to the memory type and address. The assigned memory is indicated when editing the screen as shown on the right.

Example: 1 : D00001

Address
Memory type
CPU number

PLC_CTL

The user log can be read using the macro command “PLC_CTL”.

Contents	F0	F1 (=$u n)		F2
User log registration number read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	CPU No. CPU No. 1: 0 CPU No. 2: 1 CPU No. 3: 2 CPU No. 4: 3	
		n + 2	Command: -1	
		n + 3	Registration number (Stores the same number as the one stored in special register Z105.)	
Latest user log read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	CPU No. CPU No. 1: 0 CPU No. 2: 1 CPU No. 3: 2 CPU No. 4: 3	
		n + 2	Command: 0	
		n + 3	Header 0: Normal −1: Error (data not exist/communication error)	
		n + 4	Year (ASCII)	
		n + 5	Month (ASCII)	
		n + 6	Day (ASCII)	
		n + 7	Hour (ASCII)	
		n + 8	Minute (ASCII)	
		n + 9	Second (ASCII)	
		n + 10	Main code (DEC)	
		n + 11	Sub code (DEC)	
“n”th user log read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	CPU No. CPU No. 1: 0 CPU No. 2: 1 CPU No. 3: 2 CPU No. 4: 3	
		n + 2	Command: 1 to 63	
		n + 3	Header 0: Normal −1: Error (data not exist/communication error)	
		n + 4	Year (ASCII)	
		n + 5	Month (ASCII)	
		n + 6	Day (ASCII)	
		n + 7	Hour (ASCII)	
		n + 8	Minute (ASCII)	
		n + 9	Second (ASCII)	
		n + 10	Main code (DEC)	
		n + 11	Sub code (DEC)	

Return data: Data stored from temperature controller to V series

22.1.2 FA-M3/FA-M3R (Ethernet UDP/IP)

Communication Setting

Editor

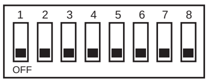
Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

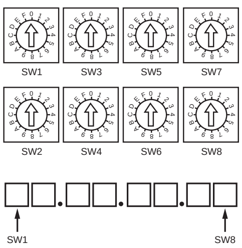
Ethernet Module

Condition setting switch

SW9	BIT	Contents	Setting
	1	Data format setting	**ON: binary** *2
	2	Write protection	OFF: not protected
	3	System reserved	OFF
	4		
	5		
	6		
	7	Line handling at TCP time-out*1	OFF: close
	8	Operation mode	OFF: normal

*1 F3LE01-5T only
*2 Port number: 12289

IP address setting switch

IP Address Setting Switch	Setting	Remarks
	0.0.0.0 to 255.255.255.255	Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210

SP66-4S / SP67-6S CPU

CPU properties

Setting	Setting Items	Setting	Remarks
NETWORK	NETWORK_SELECT	1	
ETHERNET	ETHER_MY_IPADDRESS	0.0.0.0 - 255.255.255.255	IP address
	ETHER_SUBNET_MASK	0.0.0.0 - 255.255.255.255	Subnet mask
HIGHER-LEVEL_LINK_SERVICE	HLLINK_PROTOCOL_A	**1: UDP/IP**	Port 12289
	HLLINK_DATA_FORMAT_A	**1: binary code**	
	HLLINK_PROTOCOL_B	**1: UDP/IP**	Port 12291
	HLLINK_DATA_FORMAT_B	**1: binary code**	
	HLLINK_PROTECT	0: write enabled	

Available Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
R	(common register)	01H	
V	(index register)	02H	
W	(link register)	03H	
Z	(special register)	04H	
TP	(count-down timer/current value)	05H	
TS	(timer/set value)	06H	Read only
CP	(count-down counter/current value)	07H	
CS	(counter/set value)	08H	
X	(input relay)	09H	
Y	(output relay)	0AH	
I	(internal relay)	0BH	
E	(common relay)	0CH	
L	(link relay)	0DH	
M	(special relay)	0EH	
B	(file register)	0FH	

* The CPU number is required in addition to the memory type and address. The assigned memory is indicated when editing the screen as shown on the right.

Example: 1 : D00001

Address
Memory type
CPU number

PLC_CTL

The contents of “PLC_CTL” are the same as those described in “22.1.1 FA-M3/FA-M3R”.

22.1.3 FA-M3/FA-M3R (Ethernet TCP/IP)

Communication Setting

Editor

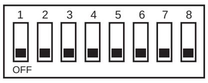
Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])

PLC

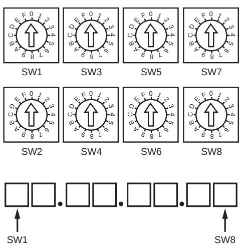
Ethernet Module

Condition setting switch

SW9	BIT	Contents	Setting
	1	Data format setting	**ON: binary** *2
	2	Write protection	OFF: not protected
	3	System reserved	OFF
	4		
	5		
	6		
	7	Line handling at TCP time-out*1	OFF: close
	8	Operation mode	OFF: normal

*1 F3LE01-5T only
*2 Port number: 12289

IP address setting switch

IP Address Setting Switch	Setting	Remarks
	<u>0.0.0.0</u> to 255.255.255.255	Set in hexadecimal notation. Example HEX C0.A8.FA.D2 ↓ DEC 192.168.250.210

SP66-4S / SP67-6S CPU

CPU properties

Setting	Setting Items	Setting	Remarks
NETWORK	NETWORK_SELECT	1	
ETHERNET	ETHER_MY_IPADDRESS	0.0.0.0 - 255.255.255.255	IP address
	ETHER_SUBNET_MASK	0.0.0.0 - 255.255.255.255	Subnet mask
HIGHER-LEVEL_LINK_SERVICE	HLLINK_PROTOCOL_A	**0: TCP/IP**	Port 12289
	HLLINK_DATA_FORMAT_A	**1: binary code**	
	HLLINK_PROTOCOL_B	**0: TCP/IP**	Port 12291
	HLLINK_DATA_FORMAT_B	**1: binary code**	
	HLLINK_PROTECT	0: write enabled	

Available Memory

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

Memory		TYPE	Remarks
D	(data register)	00H	
R	(common register)	01H	
V	(index register)	02H	
W	(link register)	03H	
Z	(special register)	04H	
TP	(count-down timer/current value)	05H	
TS	(timer/set value)	06H	Read only
CP	(count-down counter/current value)	07H	
CS	(counter/set value)	08H	
X	(input relay)	09H	
Y	(output relay)	0AH	
I	(internal relay)	0BH	
E	(common relay)	0CH	
L	(link relay)	0DH	
M	(special relay)	0EH	
B	(file register)	0FH	

* The CPU number is required in addition to the memory type and address. The assigned memory is indicated when editing the screen as shown on the right.

Example: 1 : D00001

Address
Memory type
CPU number

PLC_CTL

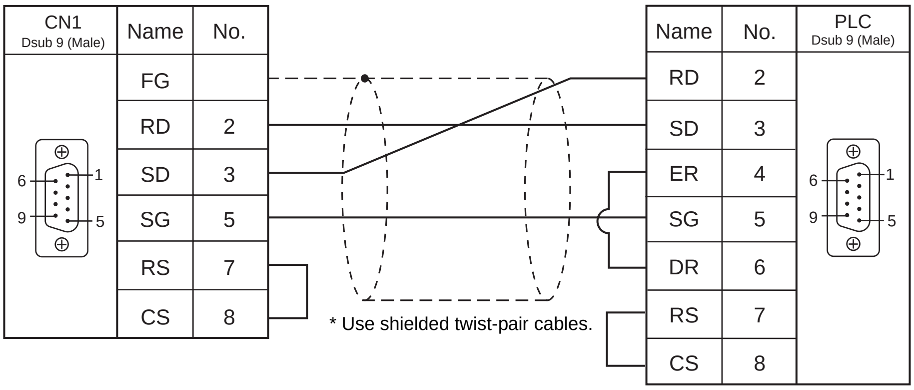
The contents of “PLC_CTL” are the same as those described in “22.1.1 FA-M3/FA-M3R”.

22.1.4 Wiring Diagrams

When Connected at CN1:

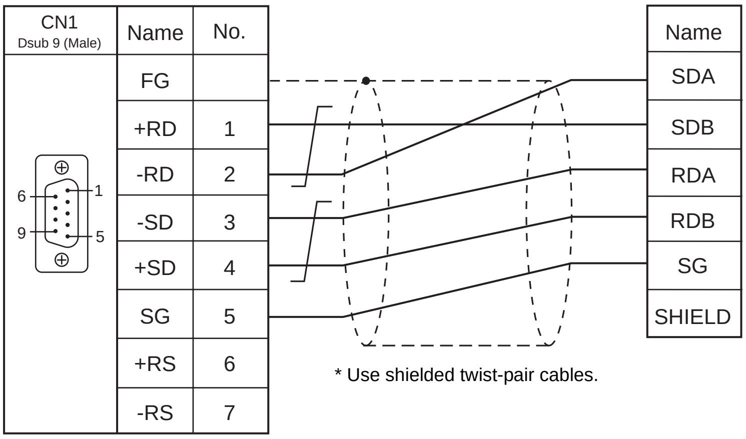
RS-232C

Wiring diagram 1 - C2



RS-422/RS-485

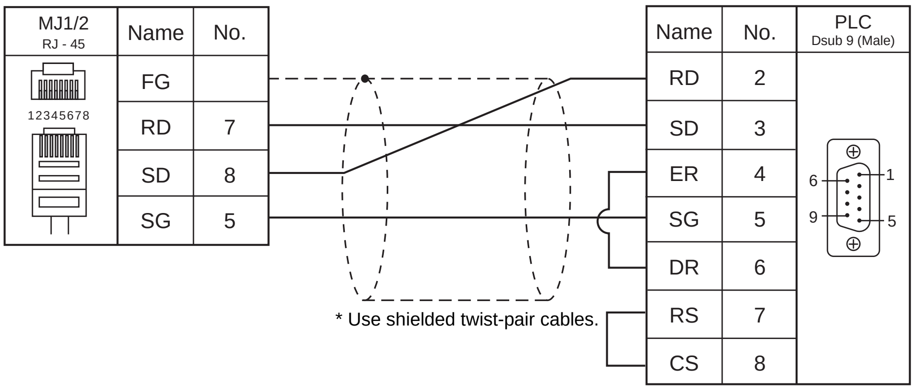
Wiring diagram 1 - C4



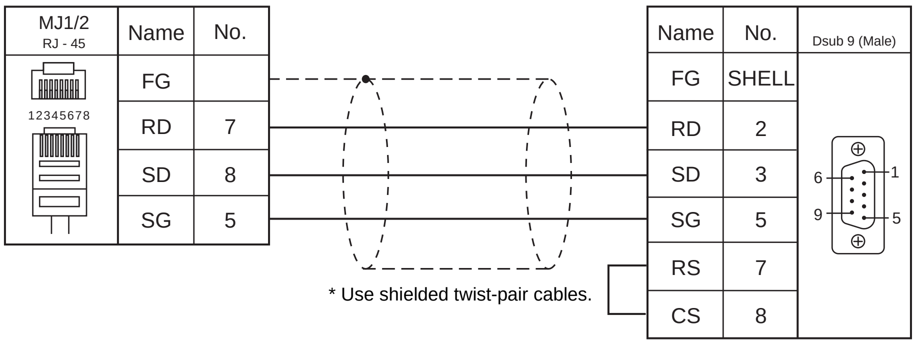
When Connected at MJ1/MJ2:

RS-232C

Wiring diagram 1 - M2

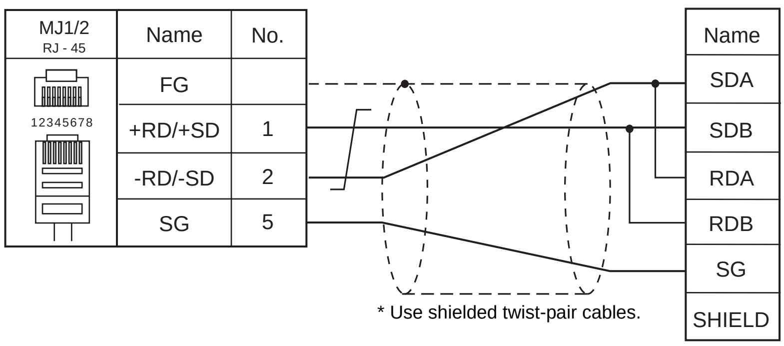


Wiring diagram 2 - M2

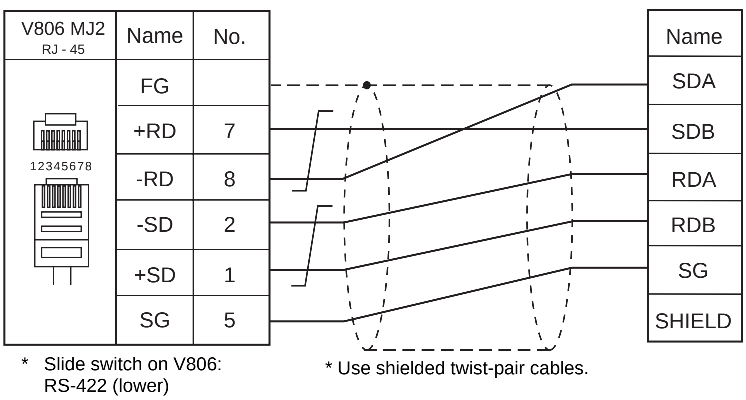


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



22.2 Temperature Controller/Servo/Inverter Connection

The controllers shown below can be connected.

Digital Indicating Controller

UT350/UT450 Series

PLC Selection on the Editor	Model	Port	Signal level	Connection			Lst File
				CN1	MJ1/MJ2	MJ2 (4-wire) V806	
UT350	UT350-01 UT350-21 UT350-31	Communication terminal	RS-485	Wiring diagram 1 - C4	Wiring diagram 1 - M4	Wiring diagram 2 - M4	UT350.Lst
UT450	UT450-01 UT450-02 UT450-11 UT450-12 UT450-21 UT450-22 UT450-31 UT450-32 UT450-41 UT450-42						UT450.Lst

22.2.1 UT350

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 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	
Transmission Mode *	With Sum Check / Without Sum Check	

* Select "Without Sum Check" for the transmission mode on the editor when "1: PC link communication (with checksum)" is specified for P.SL (Protocol selection) on the controller.

Digital Indicating Controller

The communication parameter can be set using keys attached to the front of the controller.
Be sure to match the settings to those made on the [Communication Setting] tab window of the editor.

(Underlined setting: default)

Parameter	Display	Item	Setting	Example
Communication	P.SL	Protocol selection	0: PC link communication 1: PC link communication (with checksum) 2: Ladder communication 3: Coordinated master station 4: Coordinated slave station 7: MODBUS (ASCII) 8: MODBUS (RTU) 10: Coordinated slave station (loop-1 mode) 11: Coordinated slave station (loop-2 mode)	0
	bPS	Baud rate	3: 4800 bps 4: 9600 bps	4
	Prl	Parity	0: None 1: Even 2: Odd	1
	StP	Stop bit	1 / 2 bits	1
	dLn	Data length	7 / 8 bits	8
	Adr	Address	1 to 31	1

Available Memory

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

Memory	TYPE	Remarks
D (data register)	00H	
I (input relay)	01H	

Indirect Memory Designation

Specify the value subtracted "1" from the real memory address for the memory address No..

22.2.2 UT450

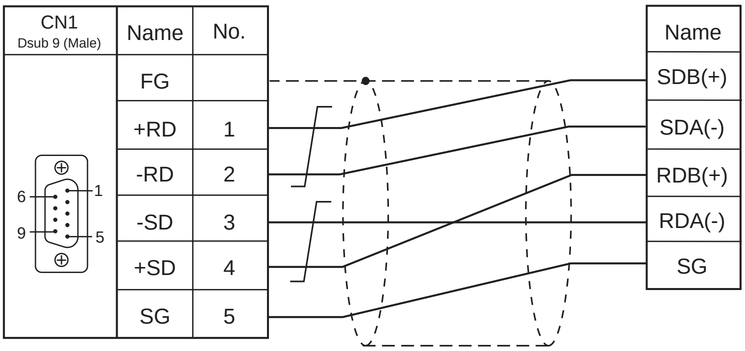
The communication setting and available memory are the same as those described in "22.2.1 UT350".

22.2.3 Wiring Diagrams

When Connected at CN1:

RS-422/RS-485

Wiring diagram 1 - C4

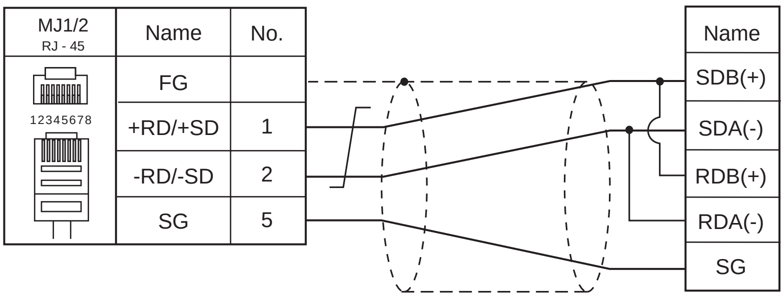


* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

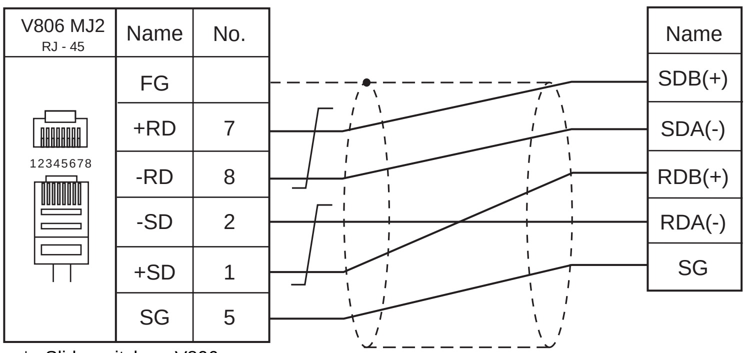
RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

Wiring diagram 2 - M4



* Slide switch on V806: RS-422 (lower)

* Use shielded twist-pair cables.

23. MODBUS

23.1 PLC Connection

Serial Connection

The V8 series works as the Modbus RTU master station. It can be connected with devices that support Modbus RTU communication.

PLC Selection on the Editor	Applicable Device	Signal Level	Connection		
			CN1	MJ1/MJ2	MJ2 (4-wire) V806
MODBUS RTU	Modbus RTU slave device	RS-232C	Wiring diagram 1 - C2	Wiring diagram 1 - M2	
		RS-422	Wiring diagram 1 - C4	×	Wiring diagram 2 - M4
		RS-485	Wiring diagram 2 - C4	Wiring diagram 1 - M4	

Ethernet Connection

The V8 series works as the Modbus TCP/IP master station. It can be connected with devices that support Modbus TCP/IP slave communication.

PLC Selection on the Editor	Applicable Device	TCP/IP	UDP/IP	Port No.
MODBUS TCP/IP	Modbus TCP/IP slave device	○	×	502*
MODBUS TCP/IP (Ethernet) Sub Station	Modbus TCP/IP slave device	○	×	502*

* Depending on the device specification, an arbitrary port number can be specified.

23.1.1 MODBUS RTU

Communication Setting

Editor

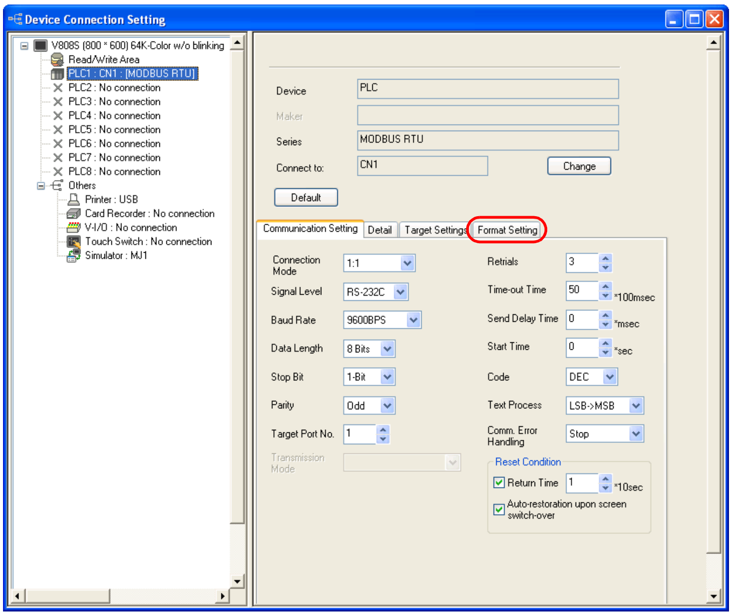
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / 1 : n / Multi-link2	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / <u>Odd</u> / Even	
Target Port No.	<u>1</u> to 255	

Format setting

Make communication format settings for each connected device.



No. 1 to 255	Port number of the connected device
Device connected	Select a connected device for each number. When creating screen data, you can set memory by referring to the list file of the device selected here.
Read Coil	Format setting Set the number of words to be read or written at one communication for each memory. The format setting also serves as the function code*1 setting used for Modbus communication. The available function codes vary depending on the device used. Refer to the instruction manual of the connected device as well as the table shown below, and set the options on the dialog correctly.
Write to Coil	
Read Input Relay	
Read Holding Register	
Write Holding Register	
Read Input Register	

*1 Format setting on V-SFT and function code for the Modbus communication

Format Setting		Modbus Communication Function Code
Reading coil		01H
Writing coil	1 bit	05H
	16 bits or more	0FH
Reading input relay		02H
Reading holding register		03H
Writing holding register	1 word	06H
	2 words or more	10H
Reading input register		04H

PLC

Make communication settings of the connected device according to the settings made for the V8 series. For more information on settings, refer to the instruction manual issued by the manufacturer.

Available Memory

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

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

Notes on Creating Screen Data

On the editor, the memory address is specified in decimal notation. Thus, when setting the address of the connected device that recognizes the memory address in hexadecimal notation, specify the value by converting the address into decimal one and add “1”.

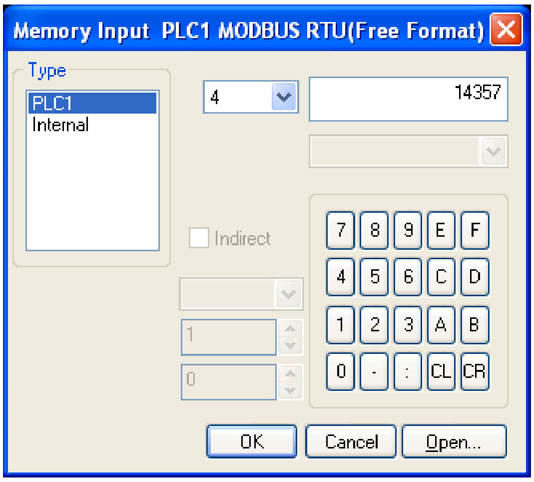
Setting example

- When specifying the PV (current value) RAM address “3814H” for Modbus RTU connection with Yamatake’s “SDC35”:

1) Convert the hexadecimal address into the decimal one.
3814HEX → 14356DEC

2) Add “1” to the decimal address.
14356 + 1 = 14357DEC

3) On the editor, specify “14357” for the holding register (4).



23.1.2 MODBUS TCP/IP (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
- [System Setting] → [Device Connection Setting] → [Format Setting]

Format setting

Make communication format settings for each connected device. (See page 23-2.)

PLC

Make communication settings of the connected device according to the settings made for the V8 series. For more information on settings, refer to the instruction manual issued by the manufacturer.

Available Memory

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

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

Notes on Creating Screen Data

On the editor, the memory address is specified in decimal notation. Thus, when setting the address of the connected device that recognizes the memory address in hexadecimal notation, specify the value by converting the address into decimal one and add “1”. (See page 23-3.)

23.1.3 MODBUS TCP/IP (Ethernet) Sub Station

Communication Setting

Editor

Make the following settings on the editor. For more information, see “Appendix 2 Ethernet”.

- IP address for the V8 unit
- V8 unit’s port number in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting])
- PLC’s IP address and port number for [PLC Table] in the [Target Settings] tab window ([System Setting] → [Device Connection Setting])
- [System Setting] → [Device Connection Setting] → [Format Setting]

Format setting

Make communication format settings for each connected device. (See page 23-2.)

PLC

Make communication settings of the connected device according to the settings made for the V8 series. For more information on settings, refer to the instruction manual issued by the manufacturer.

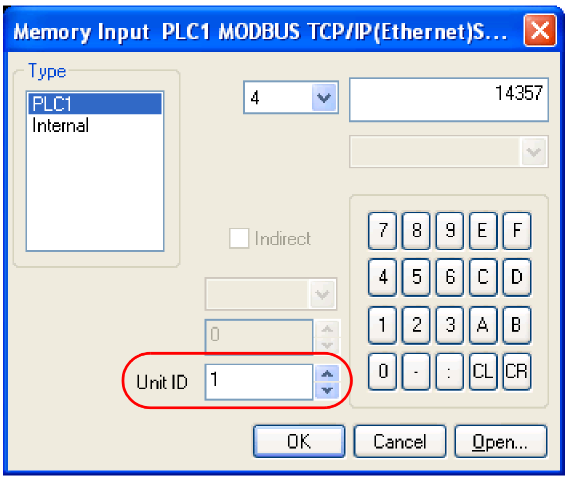
Available Memory

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

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

Notes on Creating Screen Data

- On the editor, the memory address is specified in decimal notation. Thus, when setting the address of the connected device that recognizes the memory address in hexadecimal notation, specify the value by converting the address into decimal one and add “1”. (See page 23-3.)
- When V8 series is connected to the multiple Modbus devices via the Ethernet switch as the relay station, specify “Unit ID” for each device in the [Memory Input] dialog of the editor.

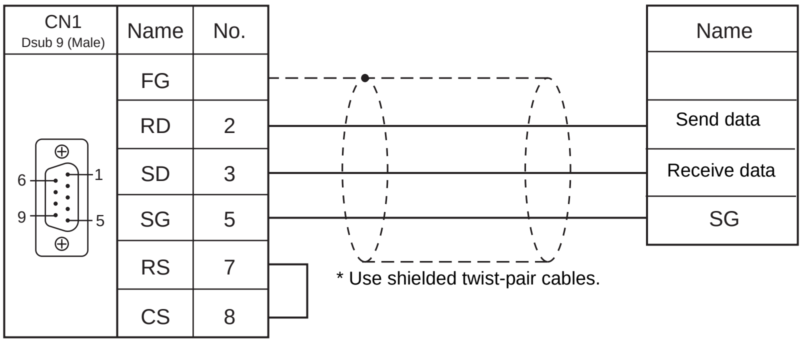


23.1.4 Wiring Diagrams

When Connected at CN1:

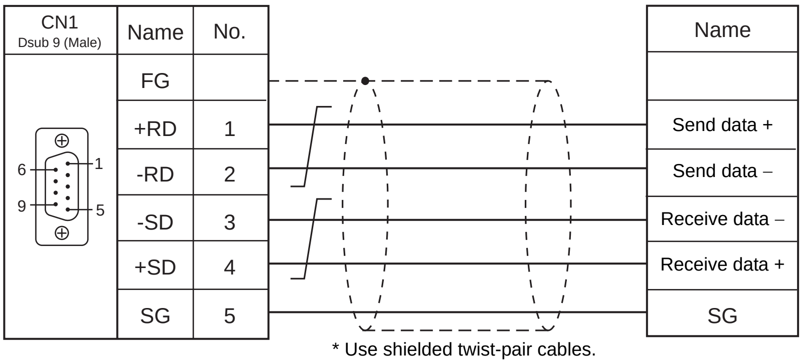
RS-232C

Wiring diagram 1 - C2

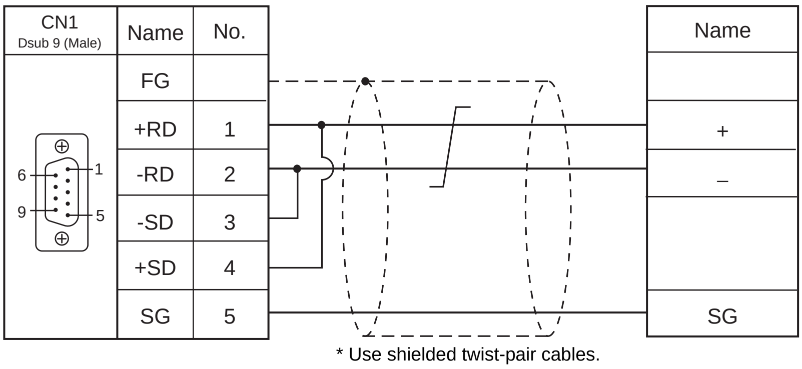


RS-422/RS-485

Wiring diagram 1 - C4



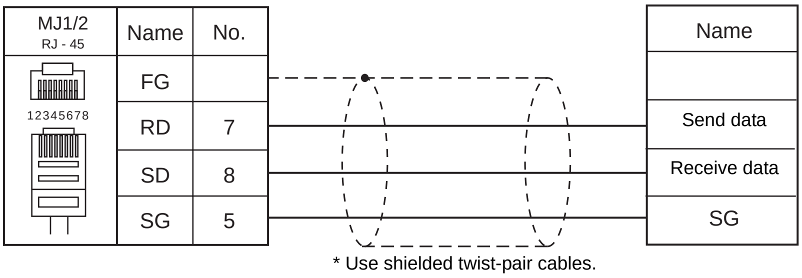
Wiring diagram 2 - C4



When Connected at MJ1/MJ2:

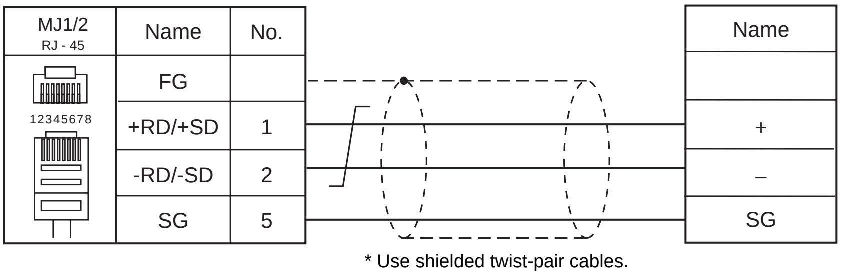
RS-232C

Wiring diagram 1 - M2

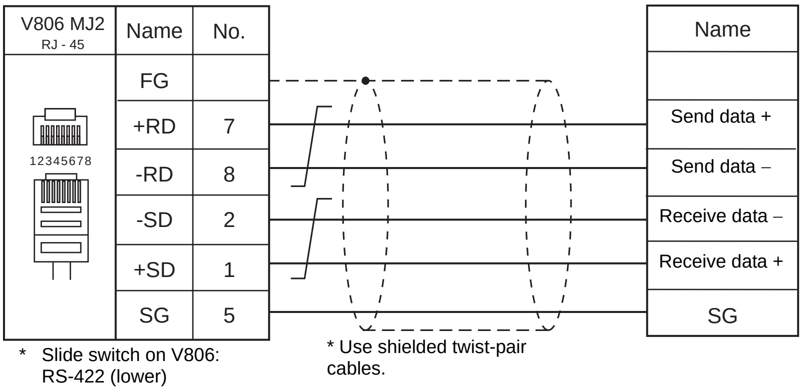


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



MEMO

Please use this page freely.

24. Barcode Reader

24.1 Barcode Reader Connection

Barcode readers can be connected to the serial port CN1/MJ1/MJ2 at the V8 series.

24.1.1 Recommended Models (Operations Verified)

Operations of the following models have been verified by Hakko Electronics.

Manufacturer	Model	Signal Level	Connection		
			CN1	MJ1/MJ2	MJ2 (4-wire) V806
Tohken	THIR-6000 THIR-3000N-RF TFIR3102 THLS-6800 TLMS-3500RV THLS6912	RS-232C	1-C2	1-M2	
Omron	V500-R521b V520-RH series				
Keyence	BL-210 series BL-600 series BL-N60 series BL-80 series				
Cognex	In-Sight 5100 In-Sight 5400				
Nichiei Intec	FFTA10ARS				
Unitech	MS210-1				
SICK	LD9000E				
OLYMPUS-symbol	LSH3502				
symbol	LS2104				
WelchAllyn	IT3800				

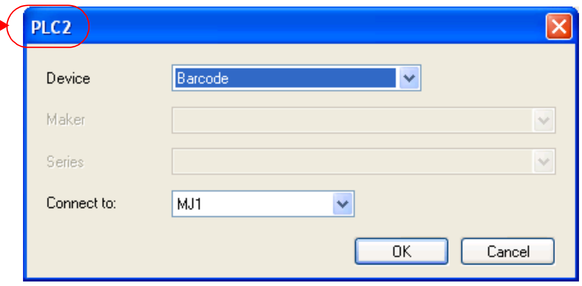
24.1.2 Communication Setting

Editor

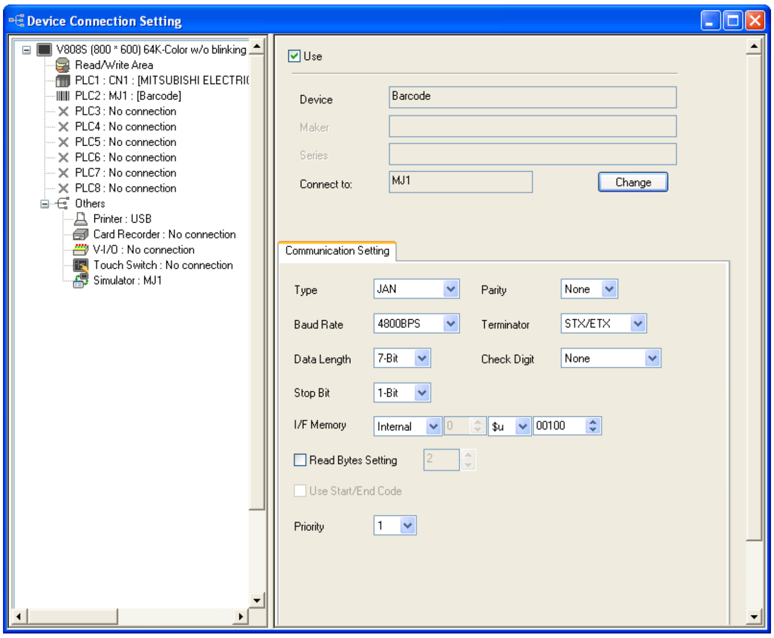
Device selection

Select [Barcode] at [Device] for the logical ports PLC2 to 8. [Barcode] cannot be selected for PLC1.

PLC2 to 8



Communication setting



(Underlined setting: default)

Item	Setting	Remarks
Type	<u>JAN</u> / ITF / CODABAR / CODE39 / ANY	
Baud Rate	<u>4800</u> / 9600 / 19200 bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Terminator	<u>STX/ETX</u> CR/LF CR	
Check Digit	<u>None</u> / Do Not Delete / Delete	
I/F Memory	See “I/F Memory” (page 24-3).	
Read Bytes Setting		
Use Start/End Code	• When checked: Data is saved with “*” attached. • When unchecked: Data is saved without “*”.	Enabled when [CODE39] is selected for [Type].

Barcode Reader

Match communication settings of the barcode reader to those made on the V8 series. For more information on settings, refer to the specifications issued by the manufacturer.

24.1.3 I/F Memory

I/F memory stores barcode information. The number of words used varies depending on the setting.

I/F Memory

Type: JAN / ITF / CORDABAR / CODE39

<table>
<tr><th>Memory</th><th>Contents</th></tr>
<tr><td>n</td><td>Flag / the number of bytes read
<table>
<tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>-</td><td>0</td></tr>
<tr><td>0</td><td></td><td>0</td><td></td><td>0</td><td>0</td><td></td><td></td><td></td></tr>
</table>
Communication error
Reading complete
The number of bytes read
(0 to 256 bytes)
* Be sure to reset the bits not in use to “0”.</td></tr>
<tr><td>n + 1</td><td rowspan="3">Data read (ASCII)
* “0” (null code) is attached to the last.</td></tr>
<tr><td>:</td></tr>
<tr><td>n + m</td></tr>
</table>

Type : ANY

<table>
<tr><th>Memory</th><th>Contents</th></tr>
<tr><td>n</td><td>Flag
<table>
<tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>-</td><td>0</td></tr>
<tr><td>0</td><td></td><td>0</td><td></td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td></tr>
</table>
Communication error
Reading complete
* Be sure to reset the bits not in use to “0”.</td></tr>
<tr><td>n + 1</td><td>The number of bytes read (0 to 2048 bytes)</td></tr>
<tr><td>n + 2</td><td rowspan="3">Data read (ASCII)
* “0” (null code) is attached to the last.</td></tr>
<tr><td>:</td></tr>
<tr><td>n + m</td></tr>
</table>

Details of flag

Communication error	When an error occurs in communication between the barcode reader and the V8 series, “1” is set. Check the communication settings and wiring.
Reading complete	When data received from the barcode reader has been written into the I/F memory, “1” is set. When this bit is set, reset it to “0” before reading the next data.
The number of bytes read	Stores the number of bytes read from the barcode reader.

Read Bytes Setting

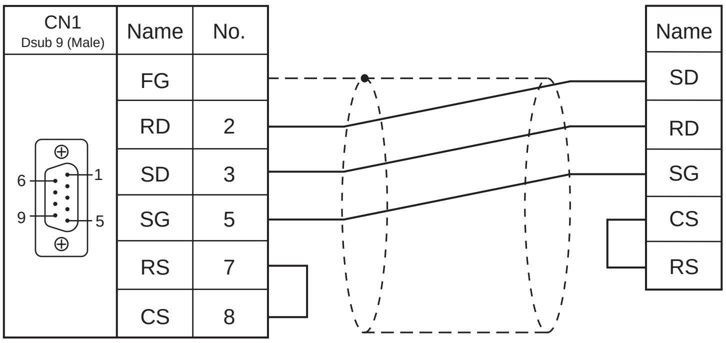
Data of the specified number of bytes is stored into the I/F memory. When this option is unchecked, the number of bytes read varies depending on the codes read.

24.1.4 Wiring Diagrams

When Connected at CN1:

RS-232C

Wiring diagram 1 - C2



* Use shielded twist-pair cables.

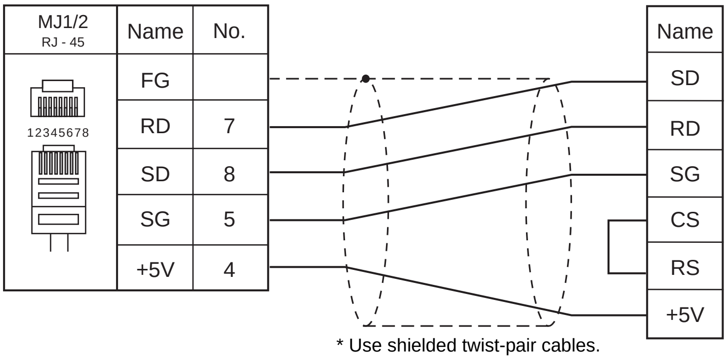
When Connected at MJ1/MJ2:

⚠CAUTION

- For barcode readers with CS/RS control, it may be necessary to install a jumper between the CS and RS to maintain proper operation.
- Allowable current for the external power supply +5V at MJ1/MJ2 is 150 mA in total. There are restrictions on the total current value when an extension unit, communication unit or USB device is used. For details, refer to the V8 Series Hardware Specifications manual.

RS-232C

Wiring diagram 1 - M2



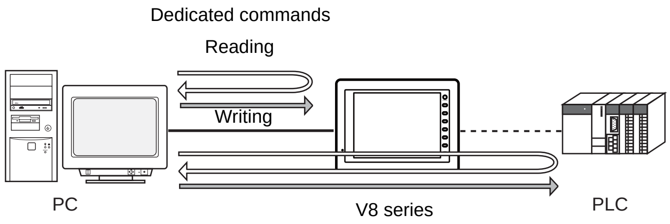
* Use shielded twist-pair cables.

25. Slave Communication Function

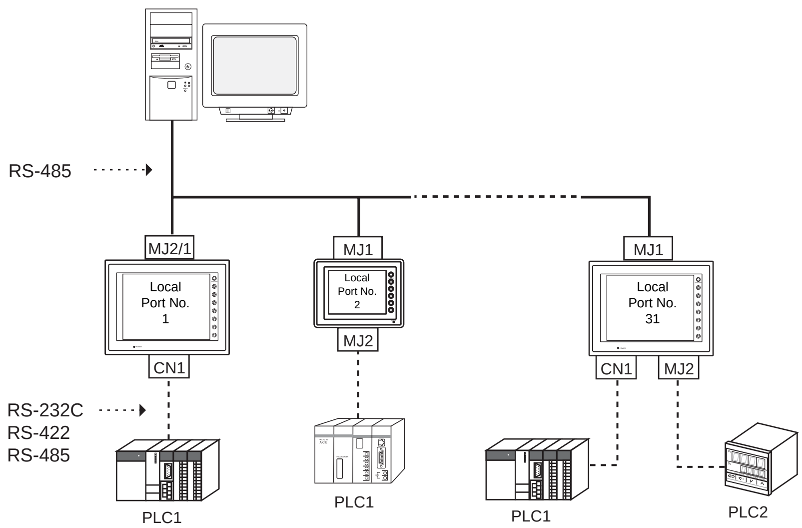
25.1 V-Link

25.1.1 Overview

- “V-Link” is the network where the computer reads from and writes to the internal memory of the V8 series, memory card, or PLC1 to 8 memory using a dedicated protocol.



- Use MJ1 or MJ2 for connection with a general-purpose computer.
- Data of the connected devices can be collected through communications with the V8 series. Data collection is available even between devices of different manufacturers.
- Either signal level RS-232C or RS-485 can be selected.
  With RS-232C, one V8 series unit can be connected; with RS-485, a maximum of 31 V8 series units can be connected.
  - RS-485 connection



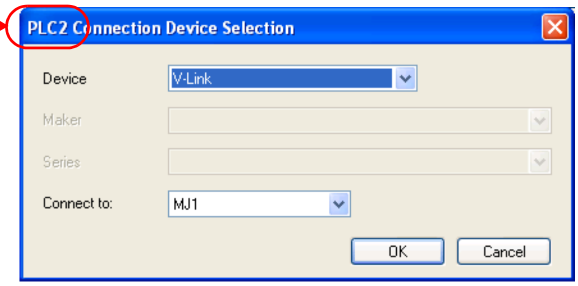
25.1.2 Communication Setting

Editor

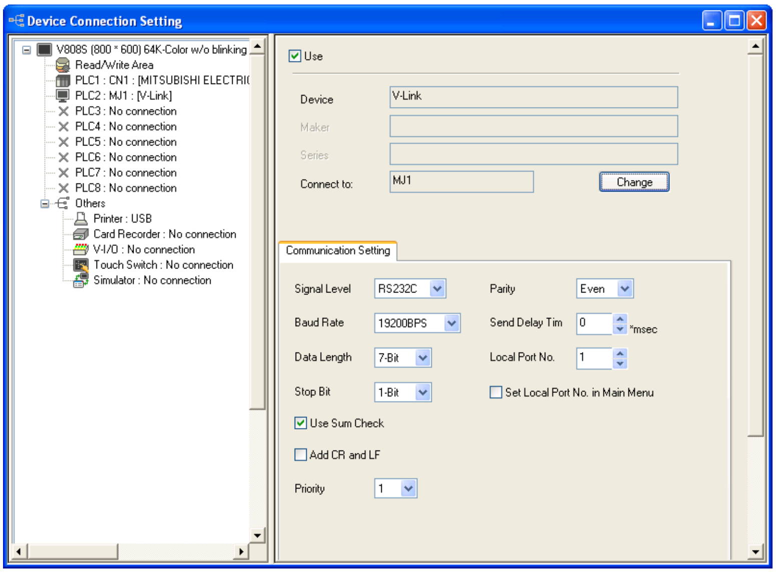
Device selection

Select [V-Link] at [Device] for the logical ports PLC2 to 8. [V-Link] cannot be selected for PLC1.

PLC2 to 8



Communication setting



(Underlined setting: default)

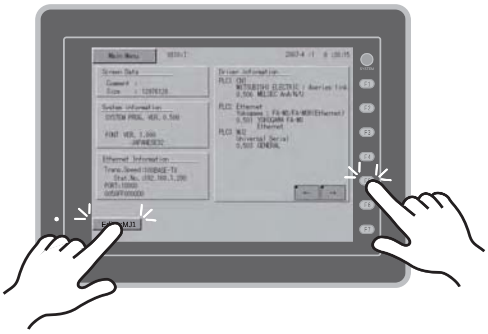
Item	Setting
Signal Level	<u>RS-232C</u> / RS-485
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115 Kbps
Data Length	<u>7</u> / 8 bits
Stop Bit	<u>1</u> / 2 bits
Parity	None / Odd / <u>Even</u>
Send Delay Time	<u>0</u> to 255 msec
Local Port No.	<u>1</u> to 31
☐ Set Local Port No. in Main Menu	• <u>Unchecked</u>: Set the local port number for screen data. • Checked: Set the local port number on MONITOUCH (see page 25-3).
☐ Use Sum Check	<u>Checked</u> / unchecked
☐ Add CR and LF	Checked / <u>unchecked</u>

MONITOUCH

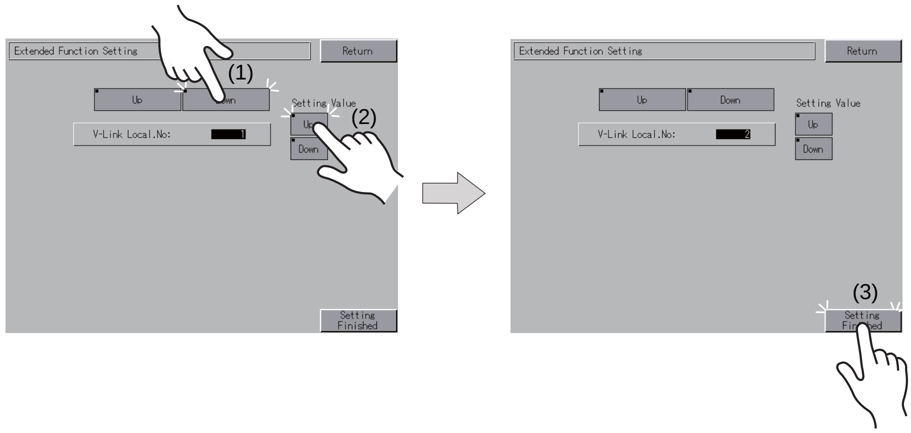
Local port number setting (Main Menu)

When [☐ Set Local Port No. in Main Menu] is checked in the [Communication Setting] tab window for V-Link, the local port number must be set on the Main Menu screen of the V8 series.

1. Transfer screen data.
2. Bring up the Main Menu screen on MONITOUCH.
3. Press the [Editor: MJ1] and the function switch [F5] at the same time.
   The Extended Function Setting screen is displayed.



4. Display the [V-Link Local No.] field using the [Up] and [Down] switches. (See (1) in the figure below.)



5. Set the local port number using the [Up] and [Down] switches. (See (2) in the figure above.)
6. Press the [Setting Finished] switch. The Main Menu screen is displayed again. (See (3) in the figure above.)

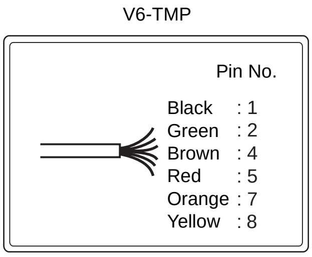
25.1.3 Connection

Cable

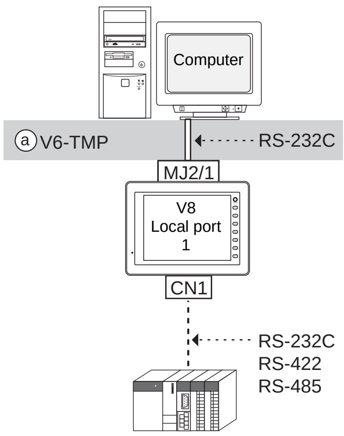
Use Hakko Electronics' cable "V6-TMP" (3, 5, or 10 m) for connection with a computer.

CAUTION

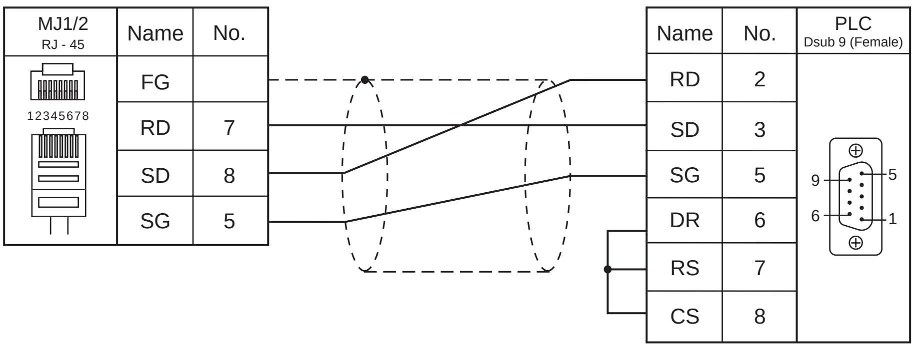
- There are six wires in the V6-TMP cable as shown on the right.
  The wires to be used are determined depending on the signal level setting. For the wires not used, be sure to properly insulate with tape, etc.
- The shielded cable of V6-TMP is connected to FG (frame ground) of MONITOUCH.



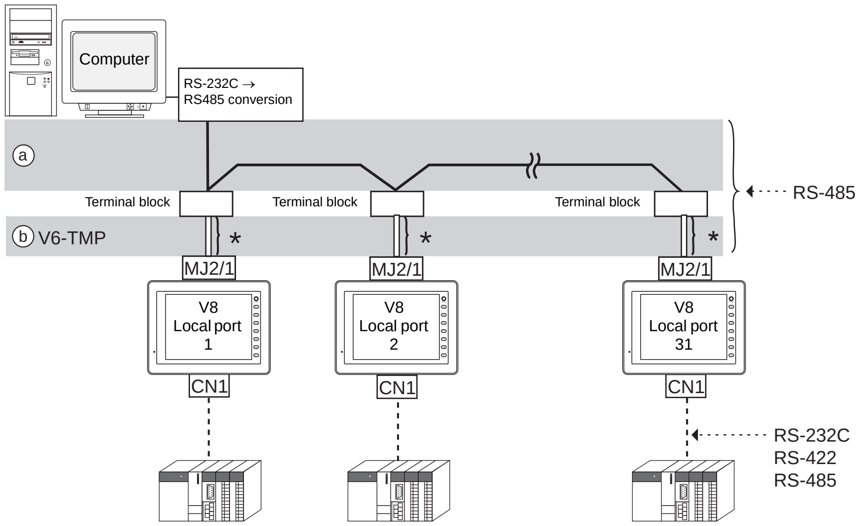
RS-232C



- Wiring example of above (a)

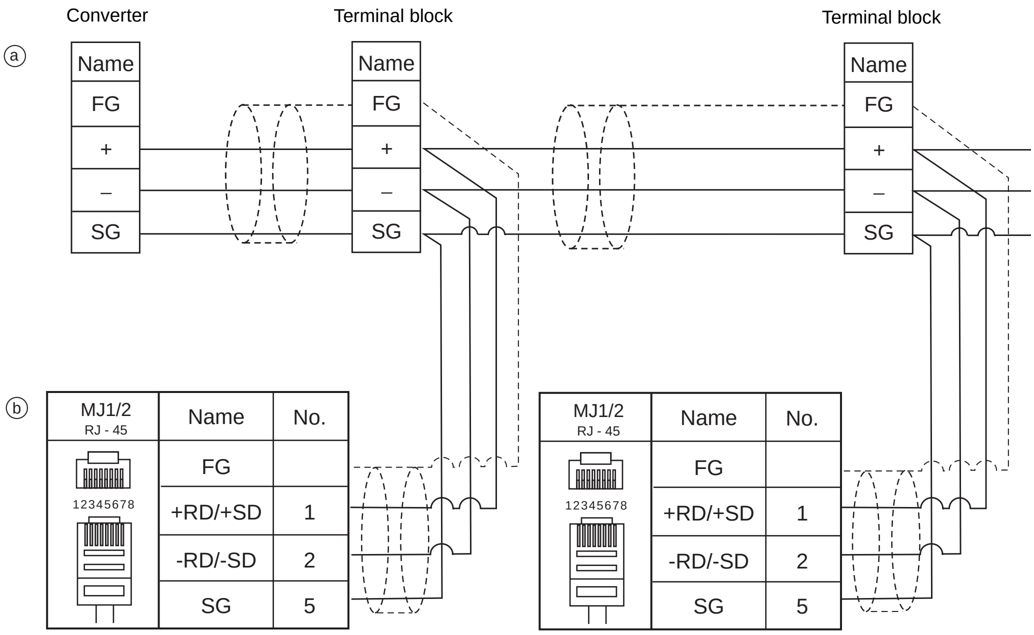


RS-485 (V8 Series: Max. 31 Units)



* 0.5 m recommended (1.0 m maximum)

- Wiring example of above (a) and (b)



25.1.4 Protocol

Read (with Sum Check and CR/LF)

Read command

Command

STX	Local port No.	Read command	Number of words to read	* Read target memory setting	ETX	SUM	CR	LF	
1	2	2	2	18	1	2	1	1	Bytes

Response

(Normal communication)

STX	Local port No.	ACK	Memory data 0	...	Memory data n	ETX	SUM	CR	LF	
1	2	2	4		4	1	2	1	1	Bytes

(When an error occurs)

STX	Local port No.	NAK	ETX	SUM	CR	LF	
1	2	2	1	2	1	1	Bytes

*** Read target memory setting**

Internal memory

Model	Type	Address	Reserved for system
2	2	4	10

PLC memory within 16 bits

Model	Type	Address	Expansion code	Reserved for system	Local port number (n:1)	Reserved for system
2	2	4	2	2	2	4

PLC memory over 16 bits

Model	Type	Address	Expansion code	Reserved for system	Local port number (n:1)
2	2	8	2	2	2

Memory card

Model	File No.	Record No.	Address	Reserved for system	
2	2	4	4	4	Bytes

e.g. Reads the 2-word data, "ABCD" starting with the address $u0020(0014H) on the V8 of the local port number 1.

Command

STX	Local port No.	Read command	Number of words to read	Model	Type	Address	Reserved for system	ETX	SUM	CR	LF
	01H	20H	02H	00H	00H	0014H	0000000000H		8FH		
02H	30H31H	32H30H	30H32H	30H30H	30H30H	30H30H31H34H	30H30H30H30H30H30H30H30H30H30H	03H	38H46H	0DH	0AH

Response

(Normal communication)

STX	Local port No.	ACK	Data				ETX	SUM	CR	LF
			B	A	D	C				
	01H	00H	42H	41H	44H	43H		60H		
02H	30H31H	30H30H	34H32H	34H31H	34H34H	34H33H	03H	36H30H	0DH	0AH

Write (with Sum Check and CR/LF)

Write command

Command

STX	Local port No.	Write command	Number of words to write	* Write target memory setting	Memory data 0	...	Memory data n	ETX	SUM	CR	LF	
1	2	2	2	18	4		4	1	2	1	1	Bytes

Response

(Normal communication)

STX	Local port No.	ACK	ETX	SUM	CR	LF	
1	2	2	1	2	1	1	Bytes

(When an error occurs)

STX	Local port No.	NAK	ETX	SUM	CR	LF	
1	2	2	1	2	1	1	Bytes

* Write target memory setting

Internal memory

Model	Type	Address	Reserved for system
2	2	4	10

PLC memory within 16 bits

Model	Type	Address	Expansion code	Reserved for system	Local port number (n:1)	Reserved for system
2	2	4	2	2	2	4

PLC memory over 16 bits

Model	Type	Address	Expansion code	Reserved for system	Local port number (n:1)
2	2	8	2	2	2

Memory card

Model	File No.	Record No.	Address	Reserved for system	
2	2	4	4	6	Bytes

e.g. Writes "AB12" to the addresses D0100 to 101(0064 to 0065H) on the PLC connected to the V8 of the local port number 1.

Command

STX	Local port No.	Write command	Number of words to write	Model	Type	Address	Reserved for system	Data B	Data A	Data 2	Data 1	ETX	SUM	CR	LF
	01H	21H	02H	01H	00H	0064H	0000000000H	42H	41H	32H	31H		2AH		
02H	30H31H	32H31H	30H32H	30H31H	30H30H	30H30H36H34H	30H30H30H30H30H30H30H30H30H30H	34H32H	34H31H	33H32H	33H31H	03H	32H41H	0DH	0AH

Response

(Normal communication)

STX	Local port No.	ACK	ETX	SUM	CR	LF
	01H	00H		C6H		
02H	30H31H	30H30H	03H	43H36H	0DH	0AH

Items for Protocols

Transmission control code: 1 byte

Signal Name	Code (Hexadecimal)	Content
STX	02H	Start of transmission block
ETX	03H	End of transmission block
CR	0DH	Carriage return
LF	0AH	Line feed

Local port number: 2 bytes

Local port numbers are used so that the host computer can identify each V8 series for access.
The data range is from 01H to 1FH (1 to 31) and is converted into the ASCII code before use.
Set the V8 series' local port number for [Local Port No.] on the editor. See page 25-2.

Command: 2 bytes

Available commands are shown below.

Name	Code (Hexadecimal)	ASCII	Content
Read	20H	32 30	Read from memory
Write	21H	32 31	Write to memory

The number of words to be read or written: 2 bytes

Set the number of words to be read or written by one command.
The data range is from 01H to FFH (1 to 255) and is converted into the ASCII code before use.

Memory address to be read or written: 18 bytes

Specify the memory address to be accessed.
Set the following code in the format as shown for "Read target memory setting" on page 25-6 and "Write target memory setting" on page 25-7.

- Model

Memory	Word Address		Double-word Address	
	Code (Hexadecimal)	ASCII	Code (Hexadecimal)	ASCII
Internal memory	00H	3030	80H	3830
PLC1 memory	11H	3131	91H	3931
PLC2 memory	12H	3132	92H	3932
PLC3 memory	13H	3133	93H	3933
PLC4 memory	14H	3134	94H	3934
PLC5 memory	15H	3135	95H	3935
PLC6 memory	16H	3136	96H	3936
PLC7 memory	17H	3137	97H	3937
PLC8 memory	18H	3138	98H	3938
Memory card	02H	3032	-	

- Type

	Type	Code (Hexadecimal)	ASCII
Internal memory	$u (user memory)	00H	3030
	$s (system memory)	01H	3031
	$L (non-volatile word memory)	02H	3032
	$LD (non-volatile double-word memory)	03H	3033
	$T (temporary user memory)	04H	3034
	$P (memory for 8-way communication)	05H	3035
PLC1-to-8 memory	Depends on the PLC to be used. Set [TYPE No.] of the memory used for each device.		

- Address
  Specify the memory address to be accessed.

- Expansion code
  When accessing to the memory shown below, set the expansion code in addition to the type and address.

$P	PLC number 1 to 8
Mitsubishi Electric PLC	Slot No. of SPU memory
Yokogawa Electric PLC	CPU No.
Omron PLC	Bank number

* If there is no need to set the expansion code, set “00” (= 3030 in the ASCII code).

- Port number
  Set the port number used for 1 : n connection (multi-drop)
  For 1 : 1 connection or n:1 connection (multi-link), the port number setting is not used. Alternatively, set “00” (= 3030 in the ASCII code).

- File number
  Specify the file number set in the [Memory Card Setting] dialog of the V-SFT editor.

- Record number
  Specify the record number set in the [Memory Card Setting] dialog of the V-SFT editor.

- System reserved
  Enter “0” (= 30 in the ASCII code) for the number of bytes.
  The number of bytes for “system reserved” varies depending on the model.
  Example:

Model	Bytes	Code (Hexadecimal)	ASCII
V8 internal memory	10	0000000000H	30303030303030303030

Sum Check Code (SUM): 2 Bytes

Data is added up (SUM), and the lower one byte (8 bits) of the sum is converted into a two-digit ASCII code (hexadecimal).
A sum check code is shown below.
Example: Transmission mode: without CR/LF, with sum check
Command: 20 (data read)
Address: 10 words from $u1000 (03E8H)
When reading, a sum check will be performed as shown below.

STX	Port No.	Command	Read words	Memory model	Memory type	Address	System reserved	ETX	SUM
	01H	20H	0AH	00H	00H	03E8H	0 0 0 0 0 0 0 0 0 0H		B9H
02H	30H31H	32H30H	30H41H	30H30H	30H30H	30H 33H 45H 38H	30H 30H 30H 30H 30H 30H 30H 30H 30H 30H	03H	42H39H

02H + 30H + 31H + 32H + 30H + 30H + 41H + 30H + 30H + 30H + 30H + 30H + 33H + 45H + 38H
+ 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 30H + 03H = 4B9H

Response Code: 2 Bytes

“ACK” code is received at normal termination, and “NAK” code at abnormal termination. The following table shows the details of each code.

Code		Contents
ACK	00H	Normal termination
NAK	02H	Overrun/Framing error An overrun or framing error is detected in the received data. Send the command again.
	03H	Parity error A parity error is detected in the received data. Send the command again.
	04H	Sum check error A sum error occurs with the received data.
	06H	Count error The memory read/write count is “0”.
	0FH	ETX error No ETX code is found.
	11H	Character error A character not used in the received data is found (other than 0 to F). Check the character and send the command again.
	12H	Command error An invalid command is given.
	13H	Memory setting error The address or device number is invalid.

25.1.5 1-byte Character Code List

Upper

Lower

<table>
<tr><th></th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th></tr>
<tr><td>0</td><td></td><td></td><td>SP</td><td>0</td><td>@</td><td>P</td><td>’</td><td>p</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td></td><td></td><td>!</td><td>1</td><td>A</td><td>Q</td><td>a</td><td>q</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td>"</td><td>2</td><td>B</td><td>R</td><td>b</td><td>r</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td>#</td><td>3</td><td>C</td><td>S</td><td>c</td><td>s</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td>$</td><td>4</td><td>D</td><td>T</td><td>d</td><td>t</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td>%</td><td>5</td><td>E</td><td>U</td><td>e</td><td>u</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td><td>&</td><td>6</td><td>F</td><td>V</td><td>f</td><td>v</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td></td><td></td><td>'</td><td>7</td><td>G</td><td>W</td><td>g</td><td>w</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>8</td><td></td><td></td><td>(</td><td>8</td><td>H</td><td>X</td><td>h</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>9</td><td></td><td></td><td>)</td><td>9</td><td>I</td><td>Y</td><td>i</td><td>y</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>A</td><td></td><td></td><td>∗</td><td>:</td><td>J</td><td>Z</td><td>j</td><td>z</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B</td><td></td><td></td><td>+</td><td>;</td><td>K</td><td>[</td><td>k</td><td>{</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>C</td><td></td><td></td><td>,</td><td><</td><td>L</td><td>¥</td><td>l</td><td>|</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>D</td><td></td><td></td><td>−</td><td>=</td><td>M</td><td>]</td><td>m</td><td>}</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>E</td><td></td><td></td><td>.</td><td>></td><td>N</td><td>^</td><td>n</td><td>~</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>F</td><td></td><td></td><td>/</td><td>?</td><td>O</td><td>_</td><td>o</td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

25.2 Modbus RTU Slave Communication

For details on Modbus RTU slave communication, refer to the Modbus Slave Communication Specifications manual provided separately.

25.3 Modbus TCP/IP Slave Communication

For details on Modbus TCP/IP slave communication, refer to the Modbus Slave Communication Specifications manual provided separately.

MEMO

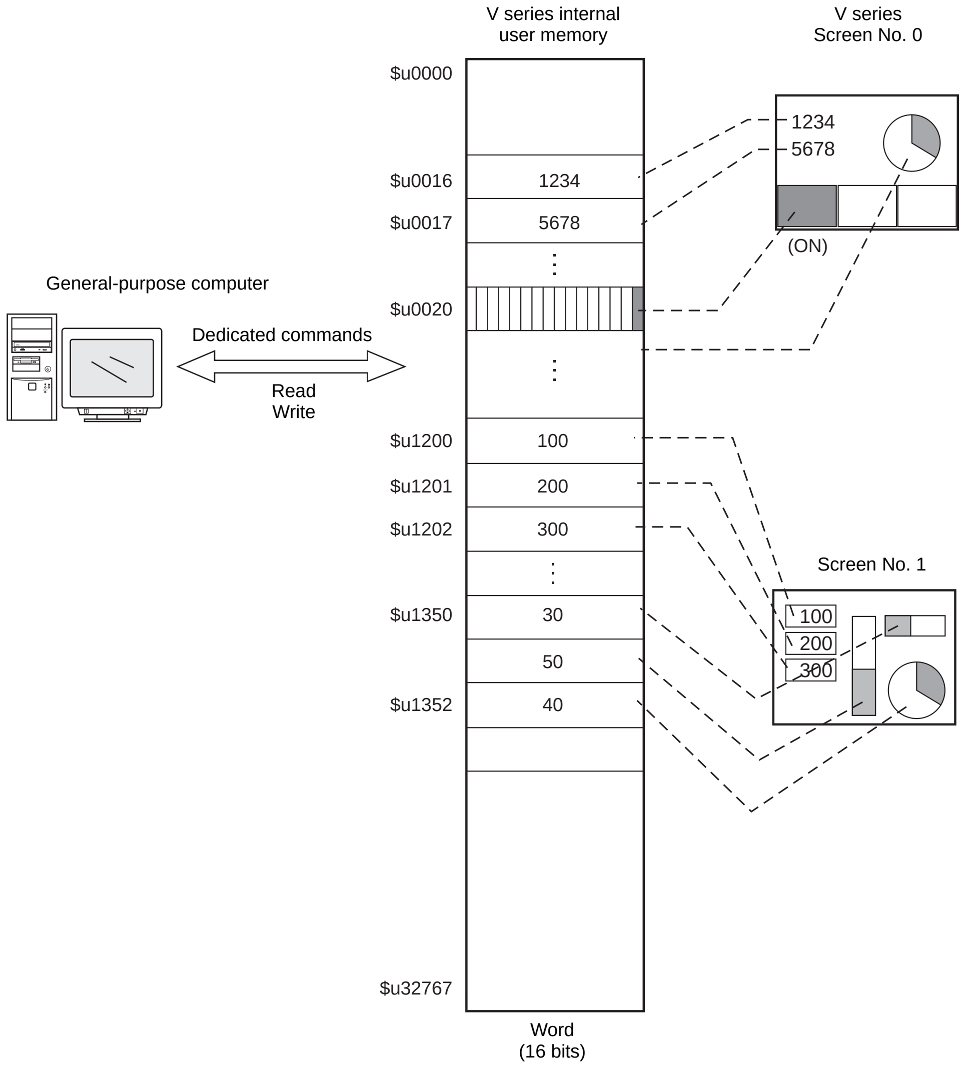
Please use this page freely.

26. Universal Serial Communication

26.1 Overview

Overview of Communication

- As shown in the diagram below, when a general-purpose computer communicates with the V series, the general-purpose computer acts as the host and the V series acts as the slave.
- Switch, lamp, data display, etc., are allocated within the internal user memory ($u0 to 32767). Assign memory addresses for system, lamp, data display, and mode within this range.
- When a screen number is specified from the host, a write action takes place to the internal memory address specified for the screen. When a screen is changed internally by a switch, etc., the changed screen number is read, and written in the internal memory address specified for the screen.



Differences between Connecting to General-purpose Computer and Connecting to PLC

- Input format (code)
  The input format used for screen number, block number, message number, etc, is fixed in [DEC].
- Write area
  When connecting to the PLC, only the three words shaded in the diagram below are used, but when connecting to a general-purpose computer, all 16 words shown below are used.

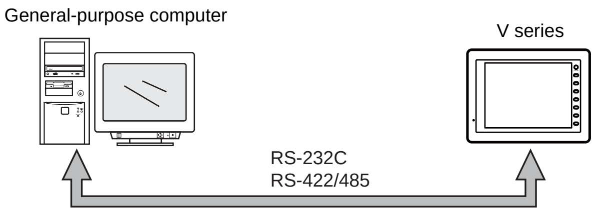
Address	Name	Contents
n + 0	CFMDAT	Sub command/data
n + 1	SCRN_COM	Screen status
n + 2	SCRN_No	Displayed screen
n + 3	SW0	No. 0 switch data
n + 4	SW1	No. 1 switch data
n + 5	ENT0	Entry information 0
n + 6	ENT1	Entry information 1
n + 7	ENT2	Entry information 2
n + 8	GREPNS	Global response
n + 9 • • n + 15		Reserved (7 words)

System Configuration

1 : 1 connection

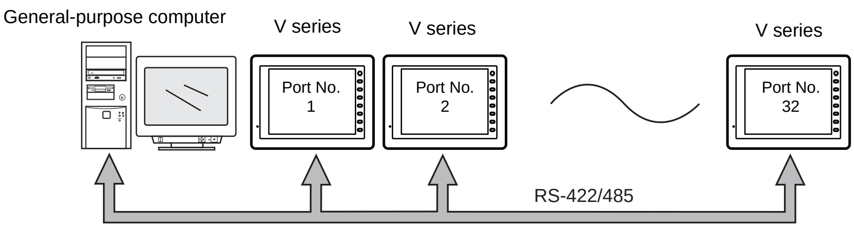
- The transmission distance available via RS-232C is 15 m and RS-422/485 is 500 m at the maximum.
- It is possible to use an interrupt* when connecting a computer to a V series in a 1 : 1 connection.

* For RS-485 (2-wire connection), interrupts cannot be used. For details on interrupts, see page 26-28.



1 : n connection

- 1 : n connection is available via RS-422/485. A maximum of 32 V series units can be connected.
- The transmission distance available is 500 m at the maximum.
- For 1 : n connection, interrupts cannot be used.

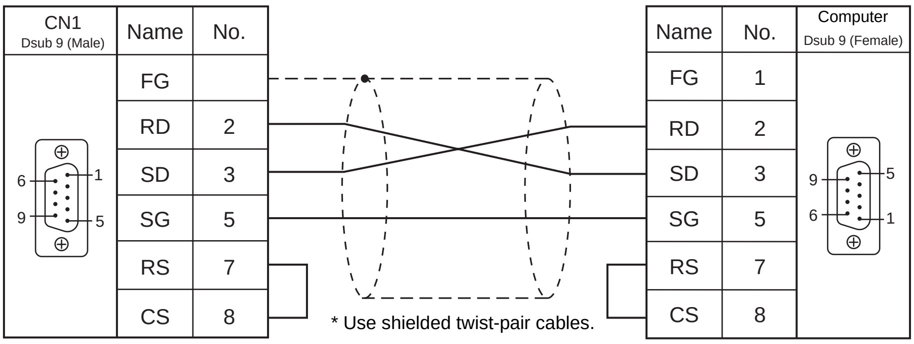


26.2 Wiring Diagrams

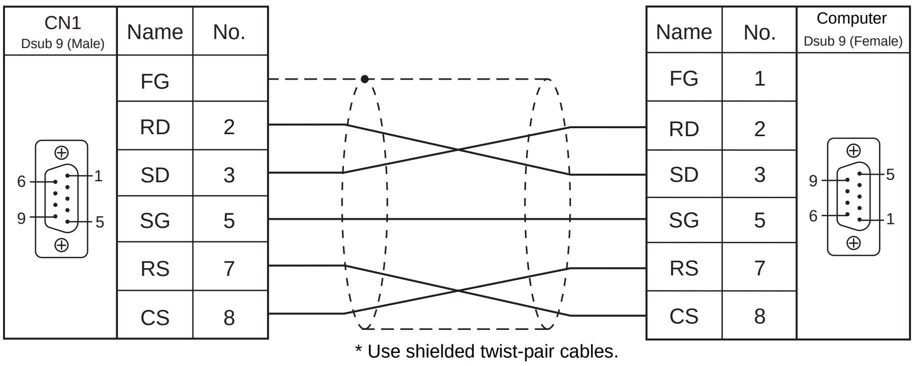
When Connected at CN1:

RS-232C

Without flow control

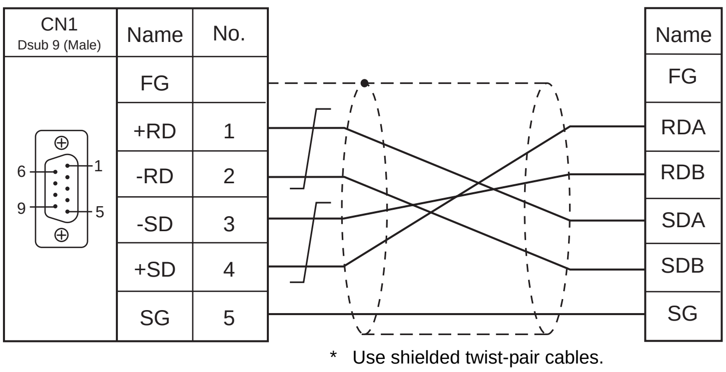


With flow control



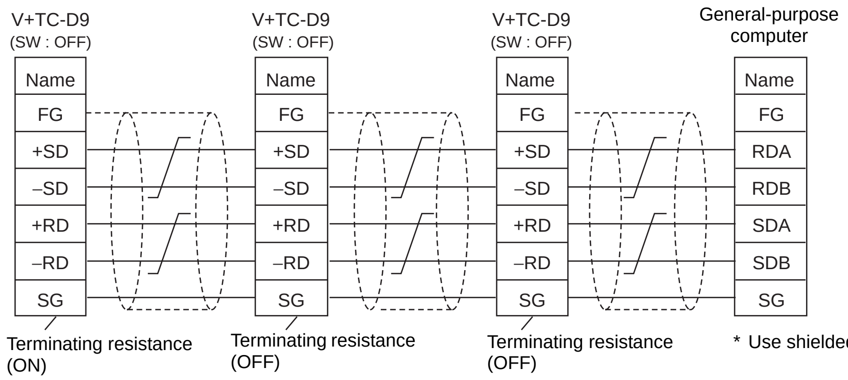
RS-422

1 : 1 connection



1 : n connection

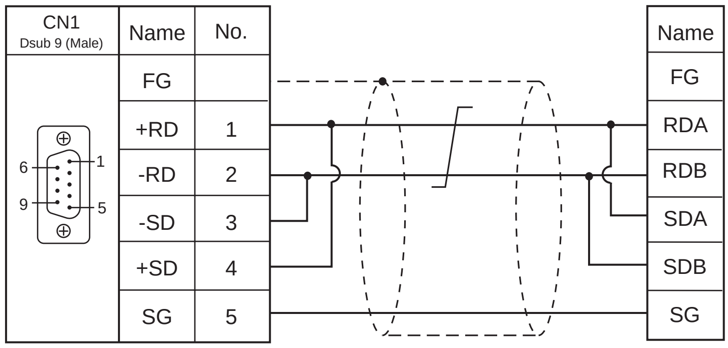
* It is convenient to use the optional terminal converter “TC-D9”.



* Use shielded twist-pair cables.

RS-485

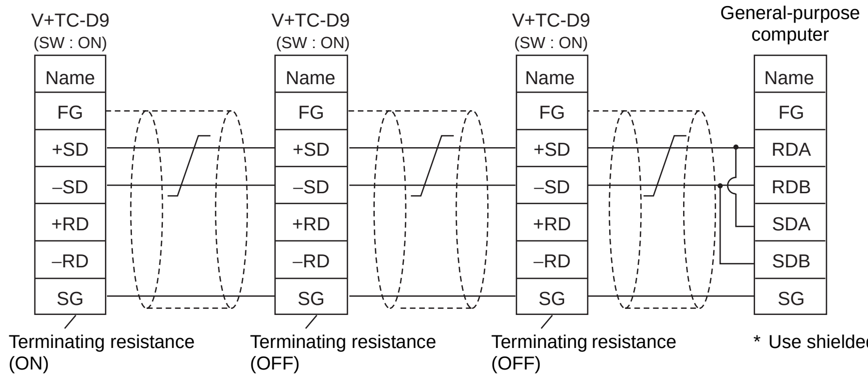
1 : 1 connection



* Use shielded twist-pair cables.

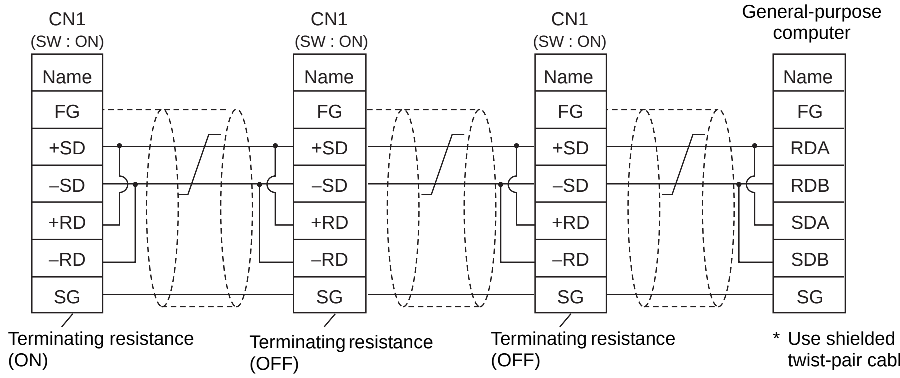
1 : n connection

- With TC-D9



* Use shielded twist-pair cables.

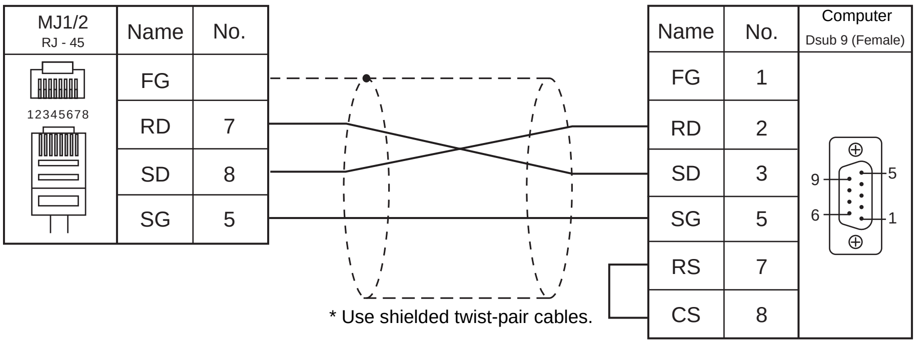
- Without TC-D9
  Install jumpers between +RD/+SD and –RD/–SD.



* Use shielded twist-pair cables.

When Connected at MJ1/MJ2:

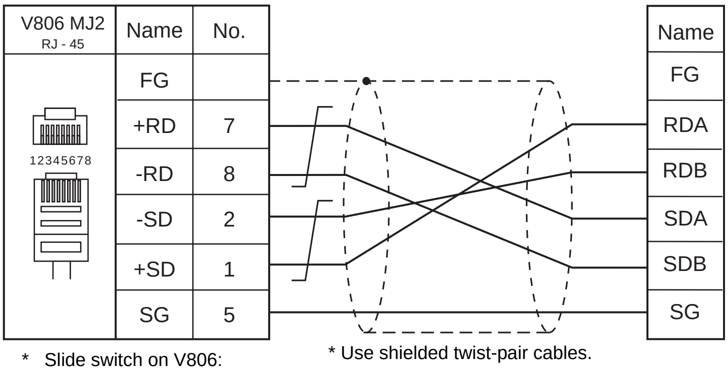
RS-232C



RS-422

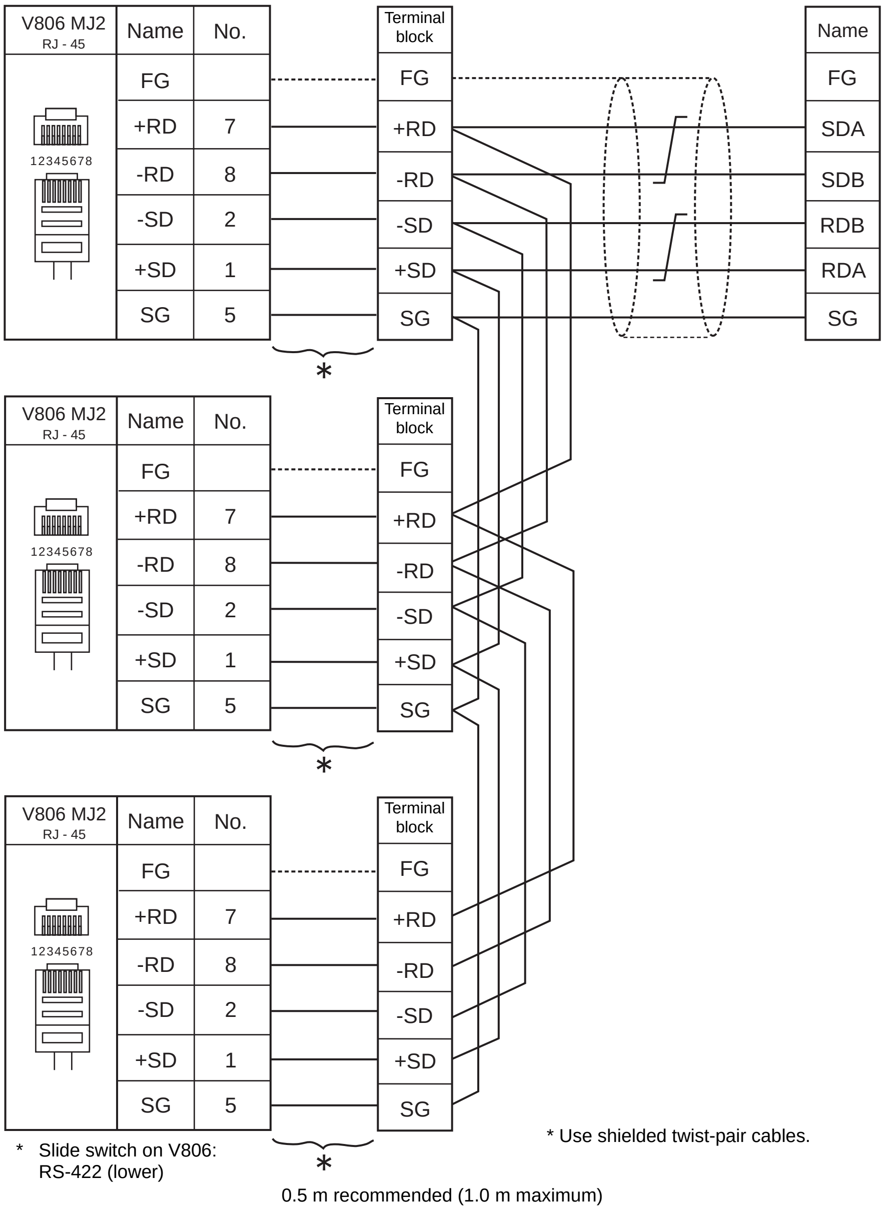
RS-422 (4-wire system) can be used on V806 (MJ2) only.

1 : 1 connection



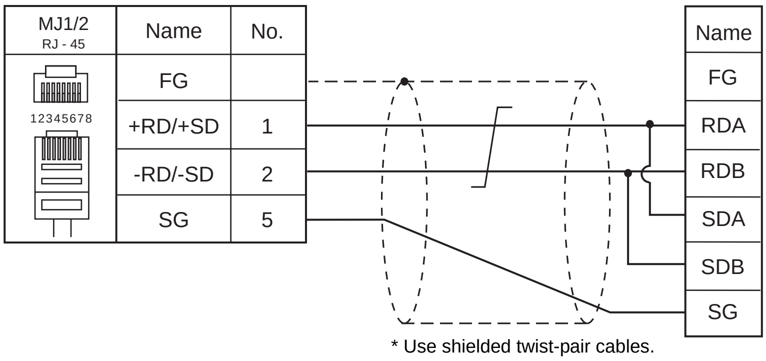
* Slide switch on V806:
RS-422 (lower)

1 : n connection

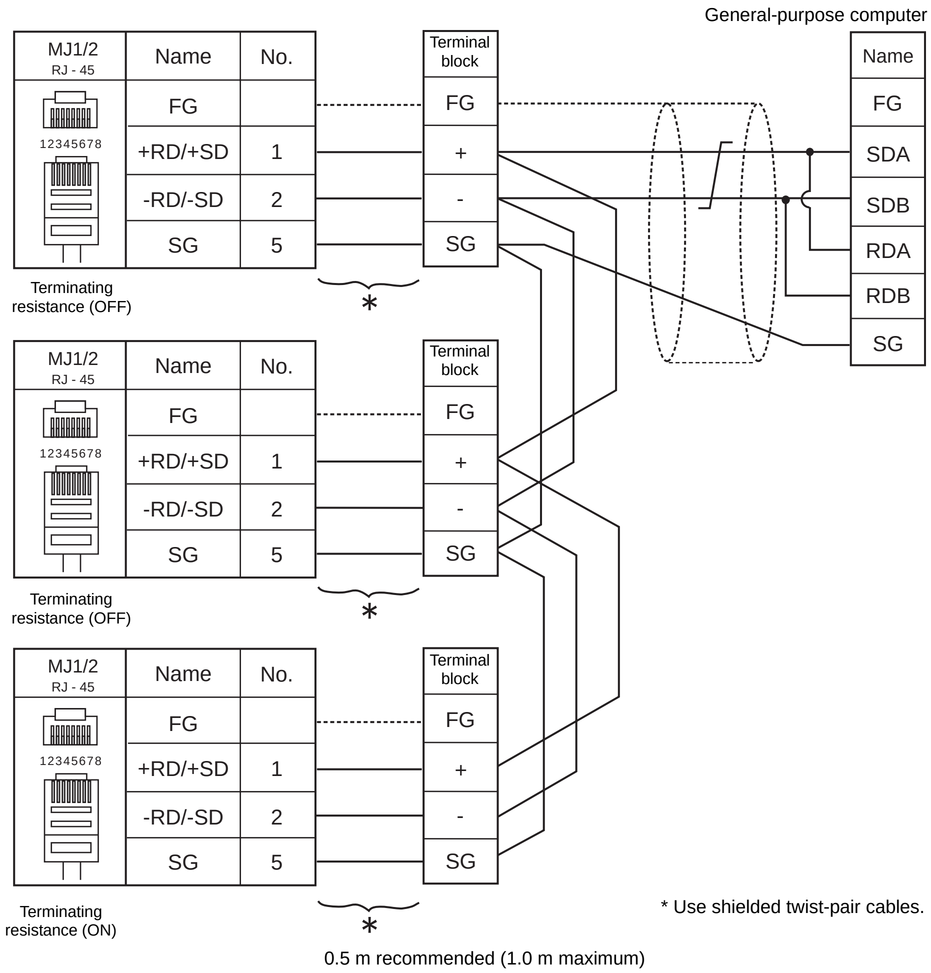


RS-485

1 : 1 connection



1 : n connection

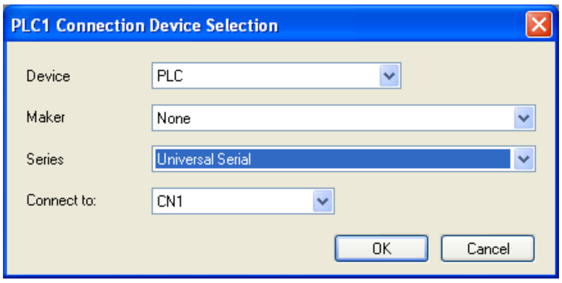


26.3 Device Connection Setting

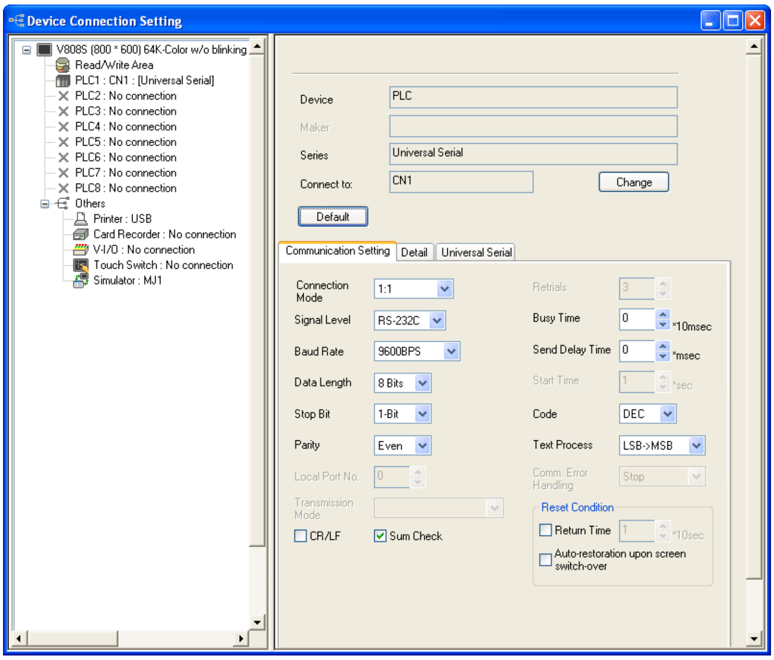
PLC1

Make settings of universal serial communication for the logical port PLC1. Universal serial communication cannot be set for any ports other than PLC1.

Device Selection



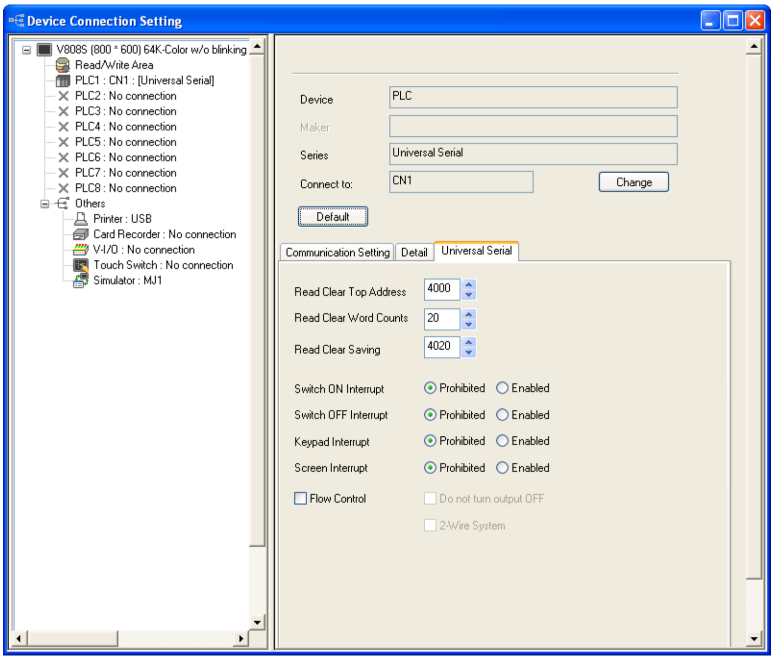
Communication Setting



Connection Mode	Set the connection method for the V series and host. 1 : 1: Select it when connecting one V series unit to one host. 1 : n: Select it when connecting multiple V series units to one host.
Signal Level	Set the signal level used for communication between the host and the V series. RS-232C / RS-422/485
Baud Rate	Set the communication speed between the host and the V series. 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps
Data Length	8 bits (fixed)
Stop Bit	Select a stop bit. 1 bit / 2 bits
Parity	Select an option for parity bit. None / Odd / Even
Target Port No.	This option is valid when 1 : n connection is used. Set the port number of the V series.
CR/LF	Set whether or not to add a CR/LF code at the end of transmission data.
Sum Check	Set whether or not to add a sum check code at the end of transmission data.
Busy Time	For details, see page 26-20.
Send Delay Time	Set the time for V series to send a response to a host after receiving a command from a host.
Code	DEC (fixed)

Text Process	When using text process, choose either [LSB → MSB] or [MSB → LSB] in order to make arrangements for the order of the first and the second bytes in one word. [LSB → MSB]: 15 | MSB | LSB | 0 — 2nd byte, 1st byte [MSB → LSB]: 15 | MSB | LSB | 0 — 1st byte, 2nd byte

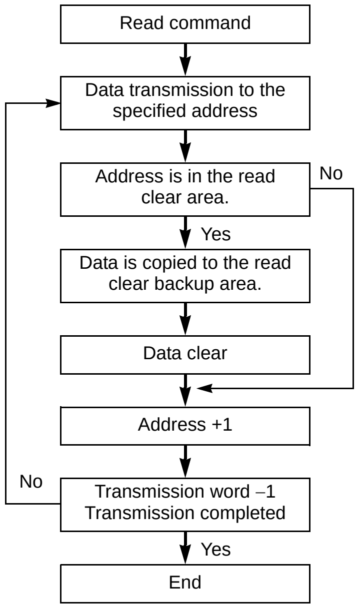
Universal Serial

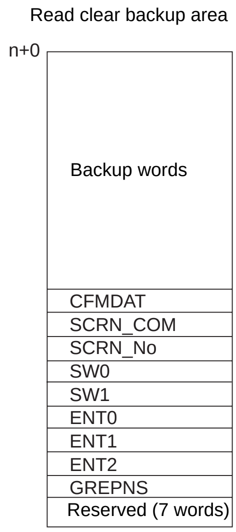


Read Clear Top Address[*2]	Set the top address number of the read clear area. The read clear area is the starting area from which the V series clears data that was previously read. Due to the fact that it is cleared to "0", once this area is read, the data remains at "0" even if you attempt to read again when a read response error occurs.
Read Clear Word Counts[*2]	Set the number of words that will be used for clearing the read area.
Read Clear Saving[*2]	Set the top address for the read clear backup area. The area size will be the same as the previously described read clear area. The number of words written in the read clear backup area are the same as the number specified for the read clear area.
Switch ON Interrupt[*1]	Select whether or not to enable or disable an interrupt when the switch changes from OFF to ON.
Switch OFF Interrupt[*1]	Select whether or not to enable or disable an interrupt when the switch changes from ON to OFF.
Keypad Interrupt[*1]	Select whether or not to enable or disable an interrupt when the switch on the keypad or the ENT switch on the keyboard is pressed and it changes from OFF to ON.
Screen Interrupt[*1]	Select whether or not to enable or disable an interrupt when the screen change switch is pressed.
☐ Flow Control	This option is valid only for 1 : 1 communication via RS-232C using CN1. Check this box when disabling an interrupt from the V series (e.g. when the host cannot receive interrupt data). When this box is checked, the action shown below takes place. • Interrupt enabled when CS (pin 8) on the V series side is ON • Interrupt disabled when CS (pin 8) on the V series side is OFF When CS is ON, interruption information stored by then is output in succession. (Interruption information for 3 times can be stored at the most.)
☐ Do not turn output OFF	This option is valid only for 1 : 1 communication via RS-422/485 using four-wire. Normally, V series uses the same cables to send or receive data. For this reason, send output remains OFF (High impedance) except for sending signals from V series. However, depending on the host specifications, send output OFF operation from the V series is not required. In this case, check [☐ Do not turn output OFF].
☐ 2-Wire System	This option is valid only for 1 : 1 communication with RS-422/485 using four-wire. When this box is checked, interrupt is disabled.

*1 Interrupt settings can be changed from the host using the [WI] command during communication.
For details on interruption, see "26.4.4 Interrupt (ENQ)".

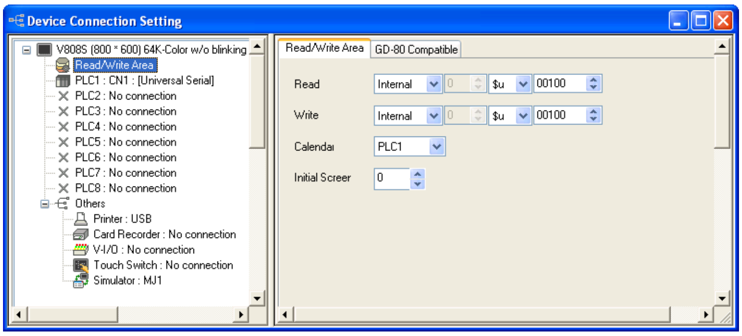
*2 Read clear and read clear backup action
The action that occurs when a read command from the host tries to access to the read clear area is shown in the following diagram.
Backup data of the system memory write area is allocated following the read clear backup area.





Read/Write Area

Read/Write Area



Read area

This memory area is necessary to change the screen display status by giving a command from the host. Be sure to set the $u memory. Address allocation is shown in the table below. For more information, see "Read/Write Area" (page 1-27).

Address	Name	Contents
n + 0	RCVDAT	Sub command/data
n + 1	SCRN_COM	Screen status command
n + 2	SCRN_No	External screen command

Write area

This memory area is used to store information regarding screen number, overlap display, and entry mode when the screen display status is changed by a command received from the host. Be sure to set the $u memory.
Address allocation is shown in the table below.

Address	Name	Contents
n + 0	CFMDAT	Sub command/data
n + 1	SCRN_COM	Screen status
n + 2	SCRN_No	Displayed screen
n + 3	SW0	No. 0 switch data
n + 4	SW1	No. 1 switch data
n + 5	ENT0	Entry information 0
n + 6	ENT1	Entry information 1
n + 7	ENT2	Entry information 2
n + 8	GREPNS	Global response
n + 9 : n + 15		Reserved (7 words)

- n + 0 to n + 2
  For details, see "Read/Write Area" (page 1-27).

- n + 3 (SW0) switch data No. 0, n + 4 (SW1) switch data No. 1
  When the switch, for which [Output Action] is set to [Momentary/Momentary W] and [Output Memory] is set in location from $s0080 to 0095, is pressed, the status and the number of the switch is stored.

  n + 3, n + 4 (SW0/SW1)

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

  Switch status
  0: OFF
  1: ON

  Switch number

  For the relationship between the switch output memory and the switch number, see page 26-32.

- n + 5 (ENT0) entry information 0, n + 6 (ENT1) entry information 1
  The same contents as n + 0 and n + 1 of the [Info. Output Memory] that is set in the entry mode are written. Write operation occurs when the key whose function is set to "Write" is pressed in the entry mode.
  When the entry selection has changed, write operation will not occur.
  When (n + 5) entry information 0 is read by the host, writing completed bit (bit 15) is reset.
  Data is written in the backup (escape) area before it is read. (See page 26-10.)

- n + 7 (ENT2) entry information 2
  The entry mode window number where a write operation was executed is written.
  The relationship between the window number and base and the window number and overlap is shown in the following table.

Window No.	Contents
0	Base entry mode
1	Overlap 0 entry mode
2	Overlap 1 entry mode
3	Overlap 2 entry mode

  - In case of using the entry mode for the table data display
    The line number and the column number will be output to the address n + 1 and the block number to the address n + 2 of the “Info. Output Memory,” when the bit No. 12 of “Command Memory” in the [Entry] dialog is ON [1]. In only this case, therefore, the window number cannot be referred because the block number is output to the address n + 7 (ENT2) of the write area.

- n + 8 (GREPNS) global response
  A response is written when a global port number is used in 1 : n communication. The contents of a response are shown in the following table. For details on the global port number, see page 26-18.

Memory Contents	Contents
0000	Global command not received
0100	ACK
Others	Identical to NAK code (see page 26-19).

- n + 9 to n + 15
  System reserved

Calendar

Select a device from which the calendar data is read without using the V8 series’ built-in clock. For more information on the built-in clock, refer to the V8 Series Reference Manual.

- PLC1 to 8
  Calendar data is read from the selected device.
  The calendar data will be updated when:
  - The power is turned on.
  - STOP → RUN
  - The date changes.
  - At the leading edge of a bit (0 → 1) in the calendar memory in the reading area

Initial screen

Set the number of the screen to be displayed when power to the V series is turned on.

GD-80 Compatible

This setting is not valid because the GD-80 series cannot be used for universal serial communication.

26.4 Standard Type Protocol

26.4.1 Standard Type Protocol

The connection mode and transmission mode are set in the [Communication Setting] tab window under [System Setting]. The mode contents are as follows.

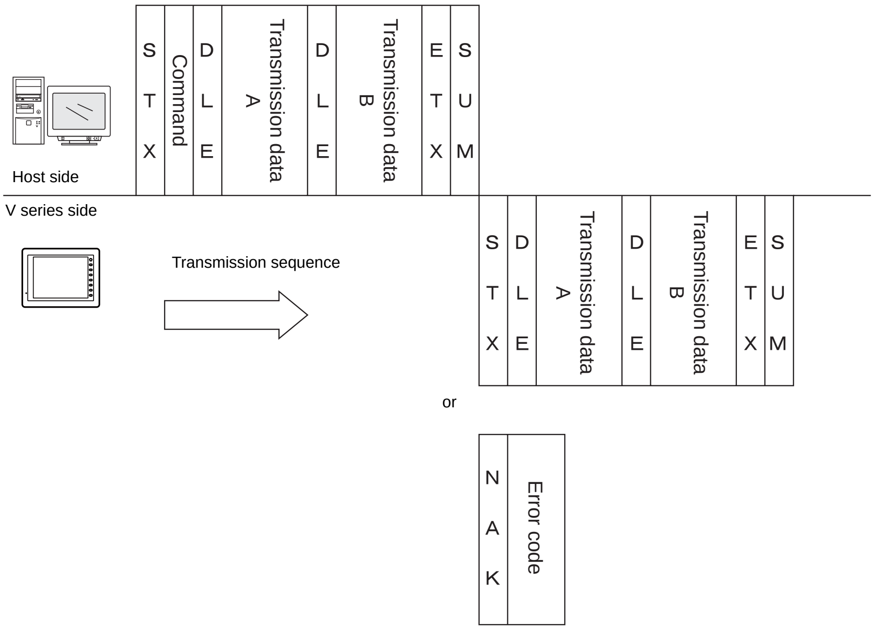
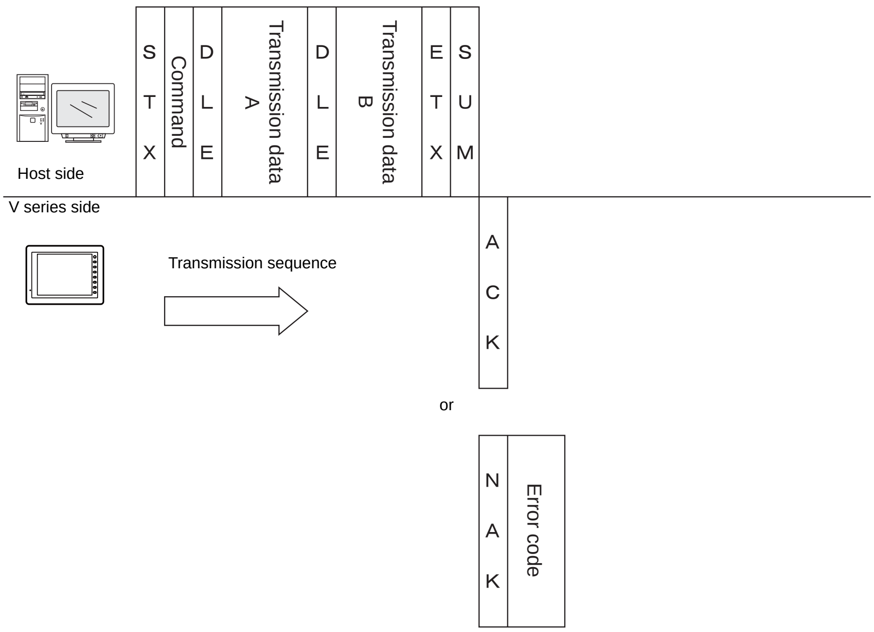
- Connection mode
  1 : 1: Select it when connecting one V series unit to one host.
  1 : n: Select it when connecting multiple V series units to one host. A maximum of 32 units can be connected. (Multi-drop specifications)

- Transmission mode
  There are four transmission modes, depending on whether or not a sum check or CR/LF code is attached to the end of transmission and received data, as shown below.

Transmission Mode	Sum Check	CR/LF
1	Not provided	Not provided
2	Provided	Not provided
3	Not provided	Provided
4	Provided	Provided

Connection (1 : 1), Transmission Mode (with Sum Check)

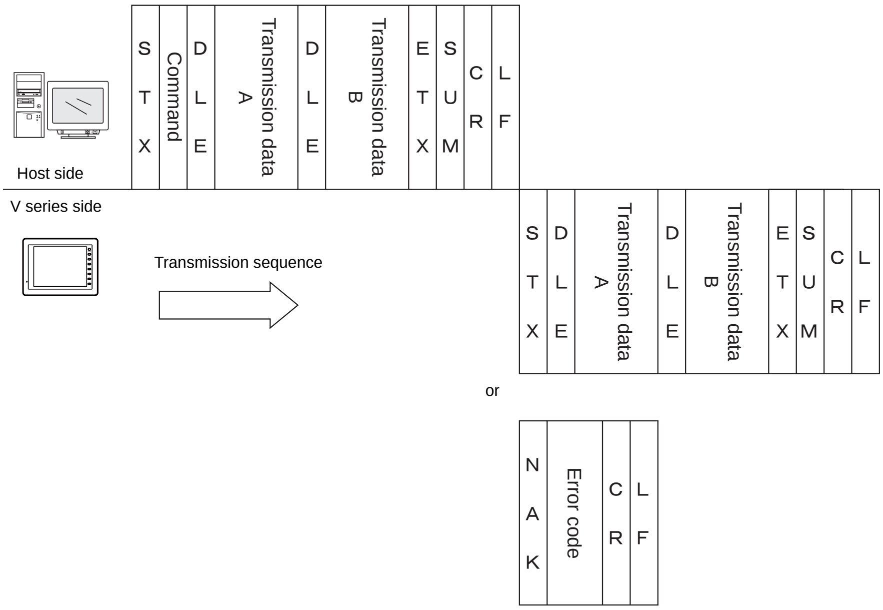
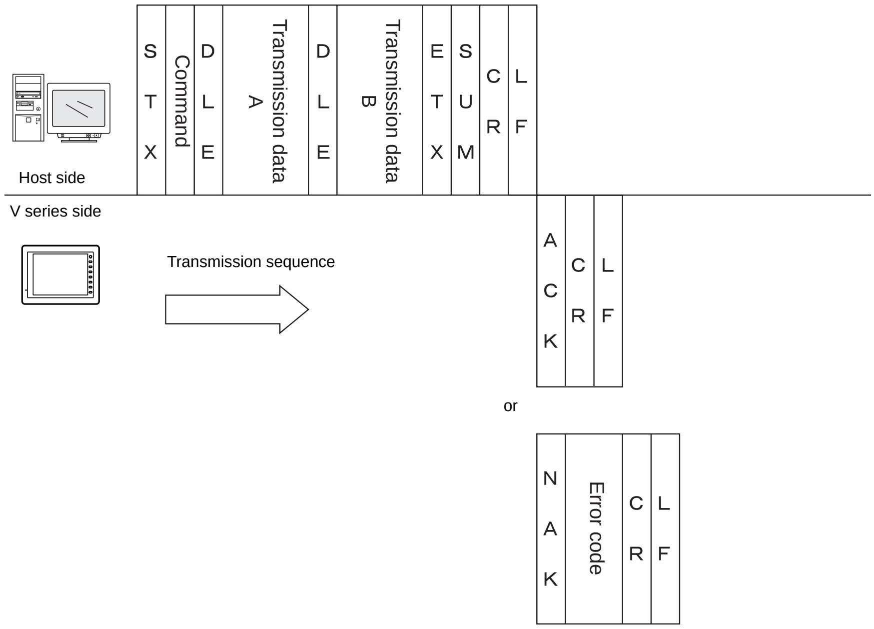
This protocol is used when one host communicates with one V series unit (1 : 1).

Contents	Protocol
Reading the V series data at the host side	
Writing data from the host to the V series	

- When 1 : 1 connection is used, an interrupt can be used. For more information, see page 26-28.

Connection (1 : 1), Transmission Mode (with Sum Check and CR/LF)

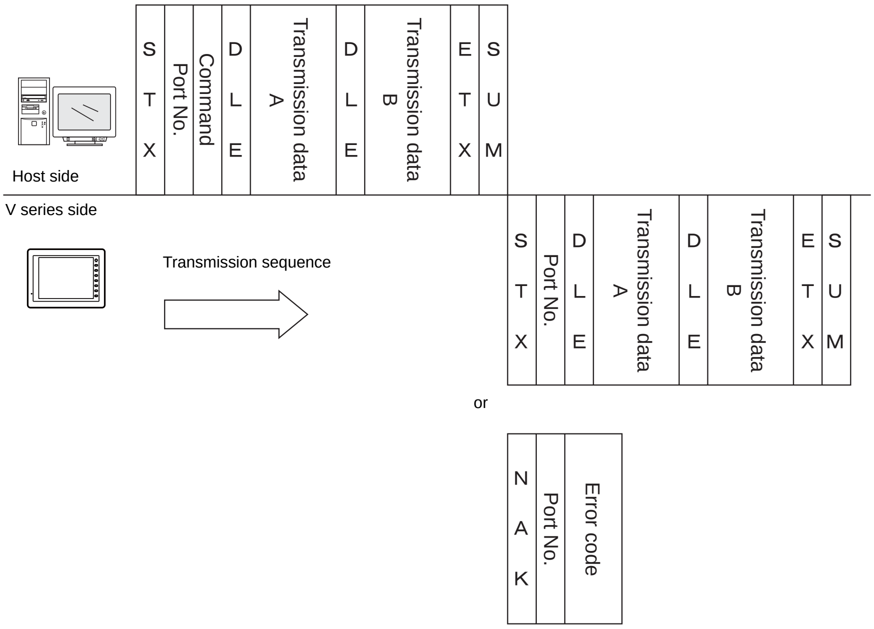
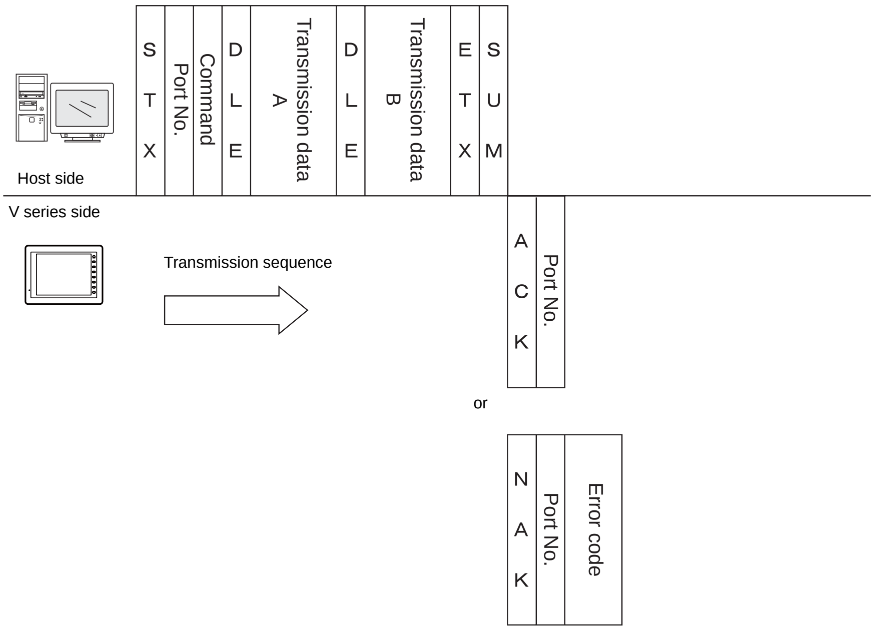
This protocol is used when one host communicates with one V series unit (1 : 1).

<table>
<tr><th>Contents</th><th>Protocol</th></tr>
<tr><td>Reading the V series data at the host side</td><td>
</td></tr>
<tr><td>Writing data from the host to the V series</td><td>
</td></tr>
</table>

- When 1 : 1 connection is used, an interrupt can be used. For more information, see page 26-28.

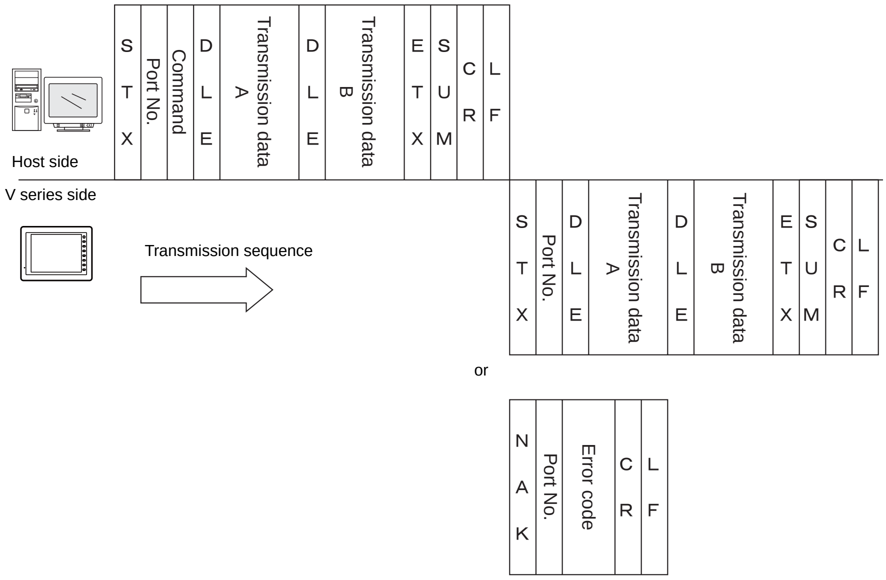
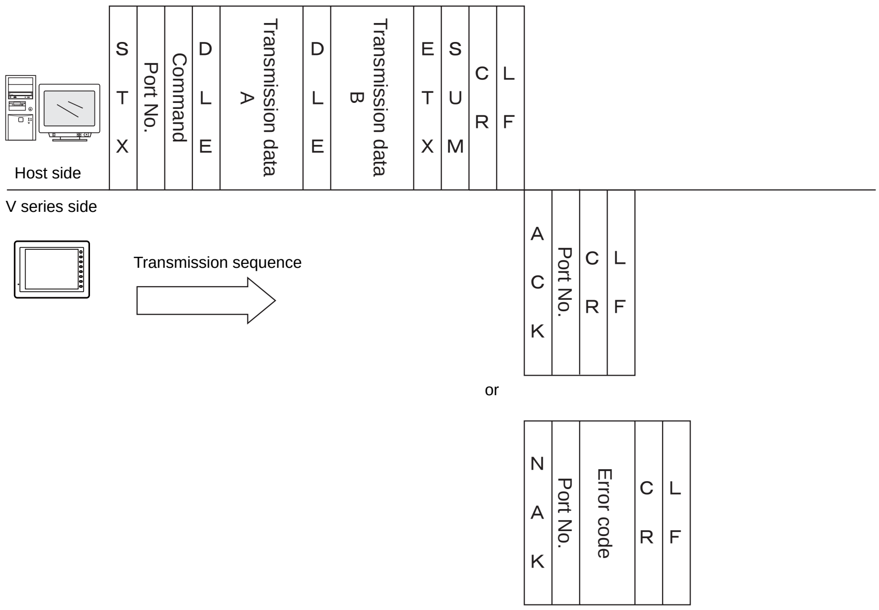
Connection (1 : n), Transmission Mode (with Sum Check)

It is possible to connect as many as 32 V series units to one host.
(For information on the global command, see page 26-21.)

<table>
<tr><th>Contents</th><th>Protocol</th></tr>
<tr><td>Reading the V series data at the host side</td><td>
</td></tr>
<tr><td>Writing data from the host to the V series</td><td>
</td></tr>
</table>

Connection (1 : n), Transmission Mode (with Sum Check and CR/LF)

It is possible to connect as many as 32 V series units to one host.
(For information on the global command, see page 26-21.)

Contents	Protocol
Reading the V series data at the host side	
Writing data from the host to the V series	

26.4.2 Protocol Contents

Transmission Control Code

The transmission control codes are shown in the table below.

Signal Name	Code (Hexadecimal)	Contents
STX	02H	Start of transmission block
ETX	03H	End of transmission block
ENQ	05H	Interrupt
ACK	06H	Positive acknowledge
CR	0DH	Carriage return
DLE	10H	Change contents within a block
NAK	15H	Negative acknowledge
LF	0AH	Line feed

Port Number

Port numbers can be set for connection mode “1 : n”.
They are used so that the host computer can identify each V series for access.
The data range is from 00H to 1FH (0 to 31) and is converted into a two-digit ASCII code (HEX) before use. Set port numbers of the V series at [Local Port No.] in the [Communication Setting] tab window.

Global port number (FFH)

When the global port number [FFH] is set, commands are send to all V series units at one time.

Commands for which global port numbers are active are shown below. If commands other than these are used, a command error will occur.

Signal Name	Name	Contents
WM	Write	Write data memory
WC	Write CHR	Write data memory as characters

Responses to global port numbers are not transmitted to the host. However, responses are written in write area n + 8.

Memory Contents	Contents
0000H	Global command not received
0100H	ACK
Others	Identical to NAK code (see page 26-19.)

Command

Available commands are shown below. The details on commands are described on pages shown at “Refer to:”.

Signal Name	Name	Contents	Refer to:
RM	Read	Read data memory	page 26-22
WM	Write	Write data memory (512 words maximum)	page 26-24
TR	Retry	Retry when NAK [01] is BUSY	page 26-25
WI	Interrupt Setting	Allow interrupt (Connection mode 1 : 1)	page 26-26
RI	Read interrupt status	Read interrupt setting status (Connection mode 1 : 1)	page 26-27
RC	Read CHR	Read data memory as characters	page 26-21
WC	Write CHR	Write data memory as characters (1024 bytes maximum)	page 26-23

Sum Check Code (SUM)

Data is added up (SUM), and the lower one byte (8 bits) of the sum is converted into a two-digit ASCII code (HEX).

Example:

Transmission mode: without CR/LF, with sum check
The sum check code is added as shown below when data “3882” (OF2AH) is transmitted to the address “$u1453” (05ADH) using the command [WM] (data writing).

STX	Command	DLE	Address	Count	Memory data	ETX	SUM
	"W" "M"		"0" "5" "A" "D"	"0" "0" "0" "1"	"0" "F" "2" "A"		"4" "D"
02H	57H 4DH	10H	30H 35H 41H 44H	30H 30H 30H 31H	30H 46H 32H 41H	03H	34H 44H

02H + 57H + 4DH + 10H + 30H + 35H + 41H + 44H + 30H + 30H + 30H + 31H
+ 30H + 46H + 32H + 41H + 03H = 34DH

* In the case of an interrupt, data from ENQ to ETX is subject to a sum check.

Error Codes

An error code is sent along with an NAK response as a two-digit ASCII code (HEX).

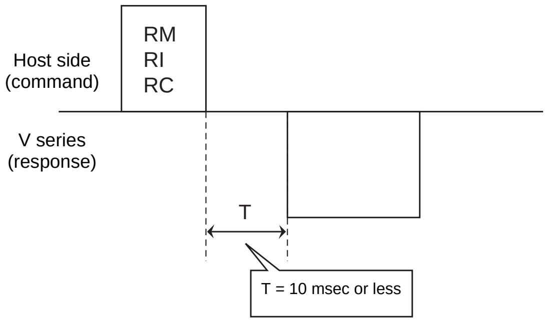
Error Codes	Contents
01H	The V series is currently engaged in display processing. The received command is on standby due to display processing. Wait a few moments and re-transmit the command.
02H	Overrun/Framing error An overrun or framing error is detected in the received data. Send the command again.
03H	Parity error A parity error is detected in the received data. Send the command again.
04H	Sum check error A sum error occurs with the received data.
05H	Address error The address specified by the memory read/write command is incorrect. Check the address or counter and re-transmit the command.
06H	Count error The memory read/write count is “0”.
07H	Screen error The data to be written in read area n + 2 (screen status command), as specified by a write command, is not registered on the screen. Check the screen number and re-transmit the data.
08H	Format error The number of DLEs is 0 or greater than 6.
09H	Received data over The number of write command data received from the host exceeded that of data shown below. • Write memory command = 512 words • Write CHR command = 1024 bytes
0BH	Retry command error When a retry command is received, there is no BUSY status (NAK [01]) command.
0FH	ETX error No ETX code is found.
10H	DLE error No DLE code is found.
11H	Character error A character not used in the received data is found (other than 0 to F). Check the character and send the command again.
12H	Command error An invalid command is given.

Response Time and BUSY

Response time varies depending on the type of command.

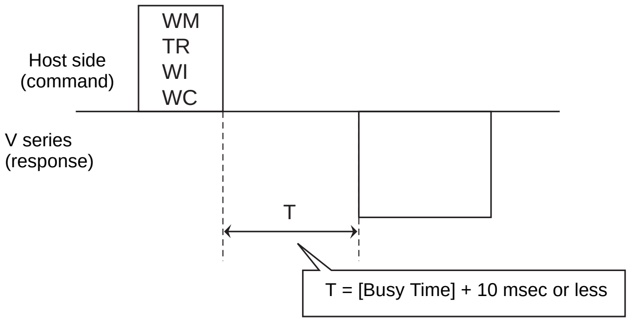
RM / RI / RC

These commands immediately send a response once receipt of data is complete.
No NAK [01] (BUSY) signal is given.



WM / TR / WI / WC

Once receipt of data is complete, these commands first check the display status. If the display status is found to be complete, a response is sent and a command is executed.
If the status is BUSY and the display is completed within the time set in [Busy Time], a response is sent.
If the display is not completed within the specified time, an NAK [01] (BUSY) signal is sent. In this case, it is necessary to retransmit the command.
When [Busy Time] is set as [0], the machine waits until the display is complete, and then a response is transmitted after a command is executed.



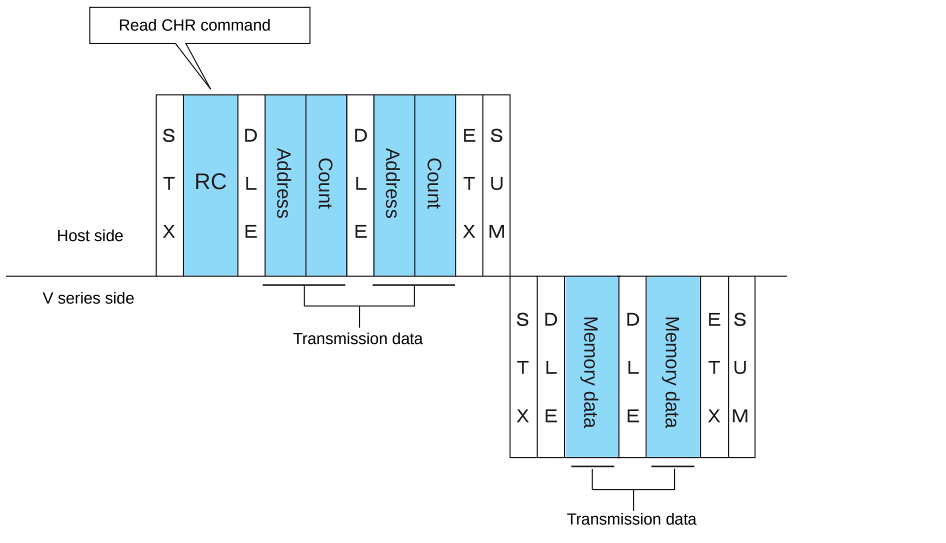
26.4.3 Command

RC: Read CHR

This command is used to read data memory as characters.

* When character data is sent, 1 character (1 byte) is converted into a two-byte ASCII code and transmitted by the read memory command. When the read CHR command is given, character data is not converted into the ASCII code before transmission, and thus, the transmission time is decreased by approximately 1/2.

Details of read CHR

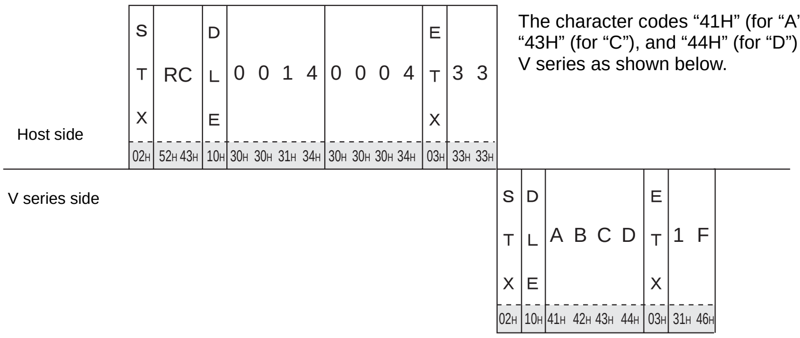


- Host side
  DLE: When the data to be read is not continuous, "DLE" is inserted as a delimiter between the breaks. There should be no more than 5 DLEs.
  Address: Top address of the data memory to be read (HEX ASCII)
  Count: Number of characters to be read (HEX ASCII)

- V series side
  Address and count are omitted and DLE and data are transmitted. The read sequence is the same as the command sequence (HEX ASCII).

Example:

Call up 4 characters that are written at the top of the address $u0020 (0014H).



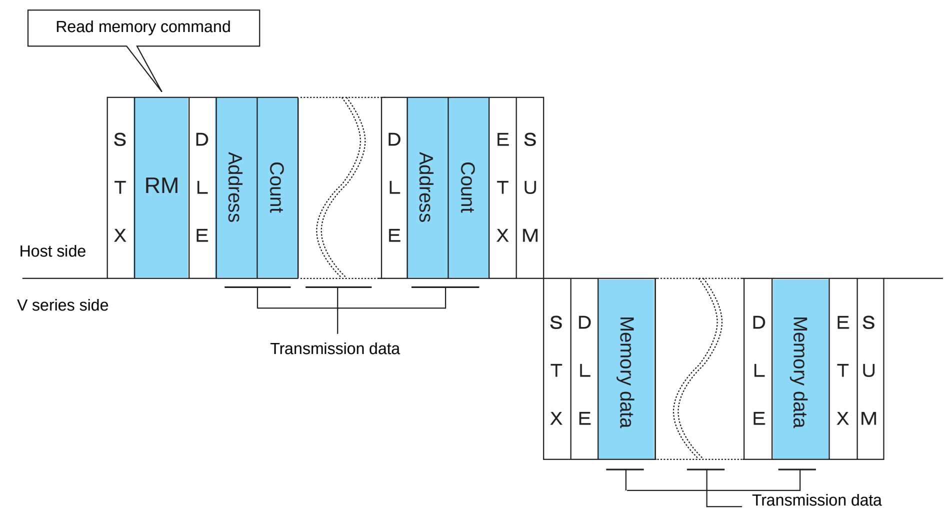
The character codes "41H" (for "A"), "42H" (for "B"), "43H" (for "C"), and "44H" (for "D") are sent from the V series as shown below.

RM: Read Memory

This command is used to read data memory.

* Communication speed is increased when you use the read CHR command to read characters.

Details of read memory

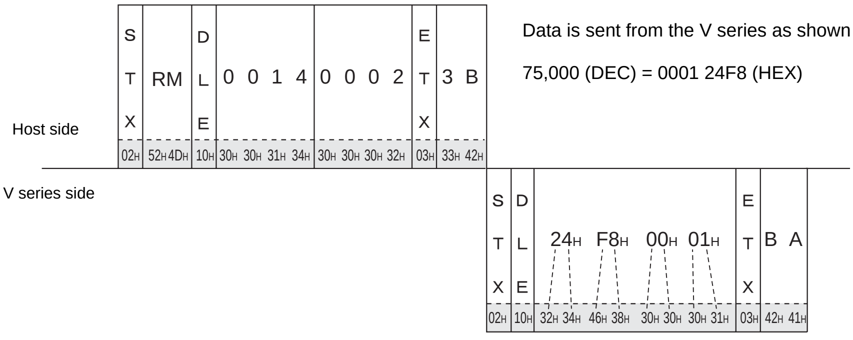


- Host side
  DLE: When the data to be read is not continuous, “DLE” is inserted as a delimiter between the breaks. There should be no more than 5 DLEs.
  Address: Top address of the data memory to be read (HEX ASCII)
  Count: Number of words to be read (HEX ASCII)

- V series side
  Address and count are omitted and DLE and data are transmitted.The read sequence is the same as the command sequence (HEX ASCII).

Example:

Read the double-word data “75,000” (DEC) contained in the address $u0020 (0014H).



Data is sent from the V series as shown below.

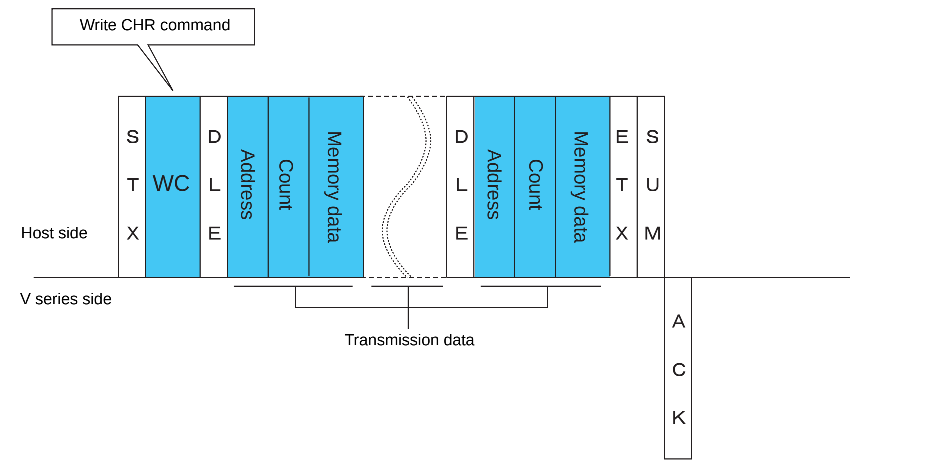
75,000 (DEC) = 0001 24F8 (HEX)

WC: Write CHR

This command is used to write data memory as characters.

* When character data is sent, 1 character (1 byte) is converted into a two-byte ASCII code and transmitted by the write memory command. When the write CHR command is given, character data is not converted into the ASCII code before transmission, and thus, the transmission time is decreased by approximately 1/2. (Character codes from 00 to 1F cannot be used.)

Details of write CHR

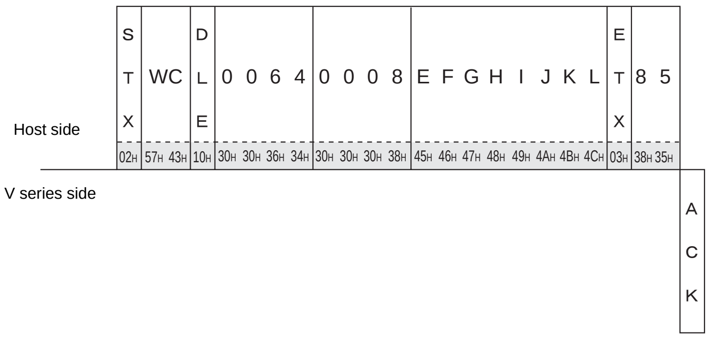


- Host side
  - DLE: When the data to be written is not continuous, "DLE" is inserted as a delimiter between the breaks. <u>There should be no more than 5 DLEs.</u>
  - Address: Top address of the memory to be written (HEX ASCII)
  - Count: Number of write characters (HEX ASCII)
  - Memory data: Data to be written

Example:

Send data to display the following characters on the V series.

$u0100 (0064H), EF
$u0101 (0065H), GH
$u0102 (0066H), IJ
$u0103 (0067H), KL

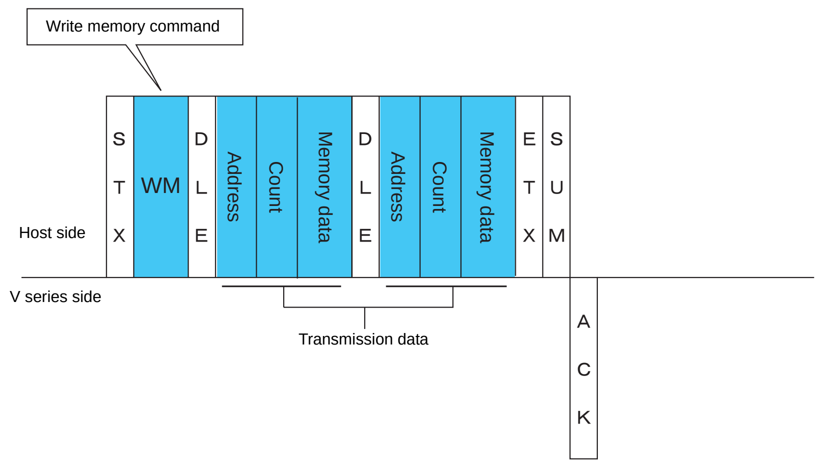


WM: Write Memory

This command is used to write data memory.

* Communication speed is increased when you use the write CHR command to write characters.

Details of write memory

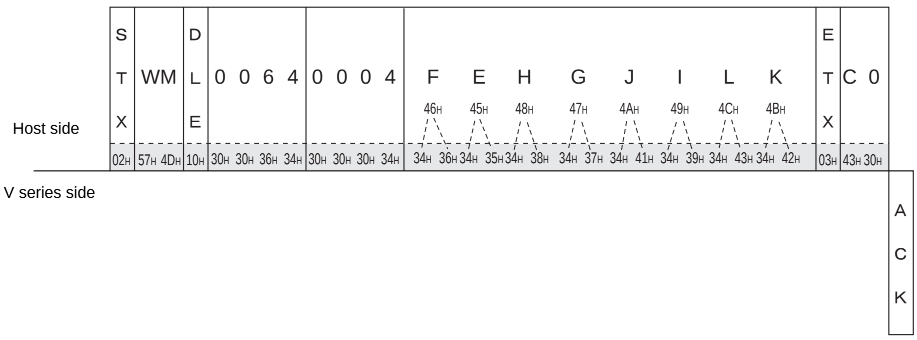


- Host side
  DLE: When the data to be written is not continuous, "DLE" is inserted as a delimiter between the breaks. There should be no more than 5 DLEs.
  Address: Top address of the memory to be written (HEX ASCII)
  Count: Number of words to be written (HEX ASCII)

Example:

Send data to display the following characters on the V series.

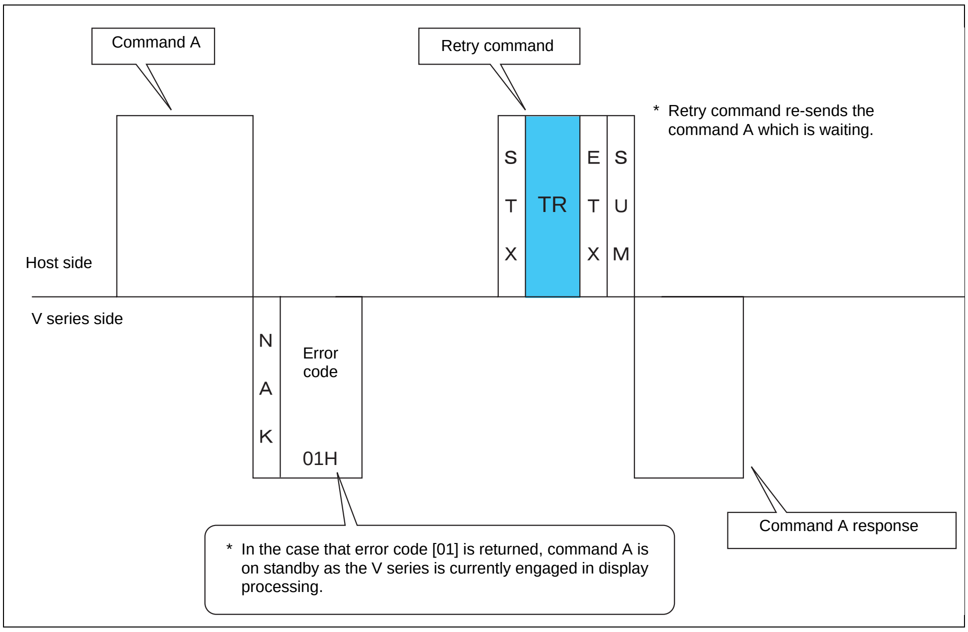
$u0100 (0064H), EF (= 4645 H)
$u0101 (0065H), GH (= 4847 H)
$u0102 (0066H), IJ (= 4A49 H)
$u0103 (0067H), KL (= 4C4B H)



TR: Retry Command

This command is used to re-send a write command/write CHR command when an NAK error code [01] is returned.

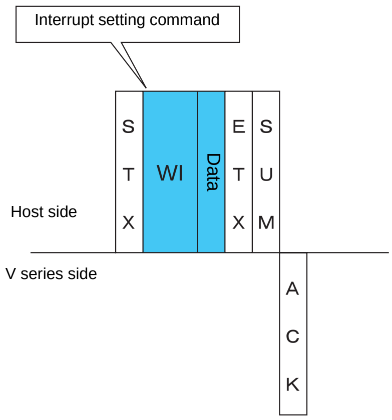
Details of retry



WI: Interrupt Setting Command

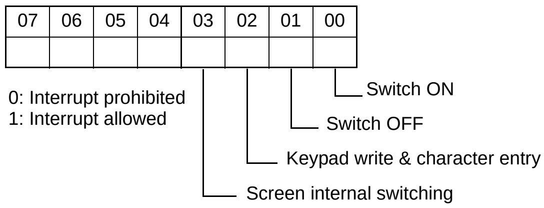
This command is used to send interrupt conditions. It can be used for 1 : 1 connection.

Details of interrupt setting command



- Host side
  Data: Interrupt conditions is specified when the interrupt data bit is set. (HEX ASCII)

  Interrupt conditions

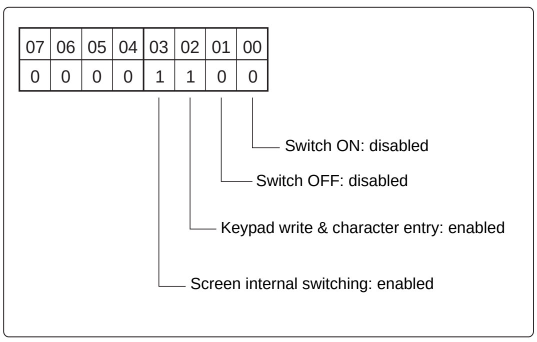


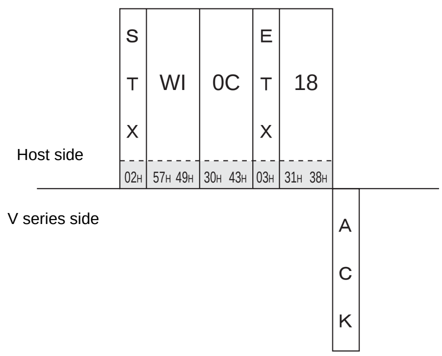
Switch ON	Interrupt when the switch changes from OFF to ON Valid only when [Action] of the switch is [Normal], [Block], [+Block], [–Block] or [Mode]
Switch OFF	Interrupt when the switch changes from ON to OFF Valid only when [Action] of the switch is [Normal], [Block], [+Block], [–Block] or [Mode]
Keypad write	Interrupt when the [ENTER] switch on the keypad is pressed
Screen internal switching	Interrupt when the screen changes based on an internal switch

* Macro (OUT_ENQ): Interrupt enabled all the time

Example:

Interrupt settings are as shown below.

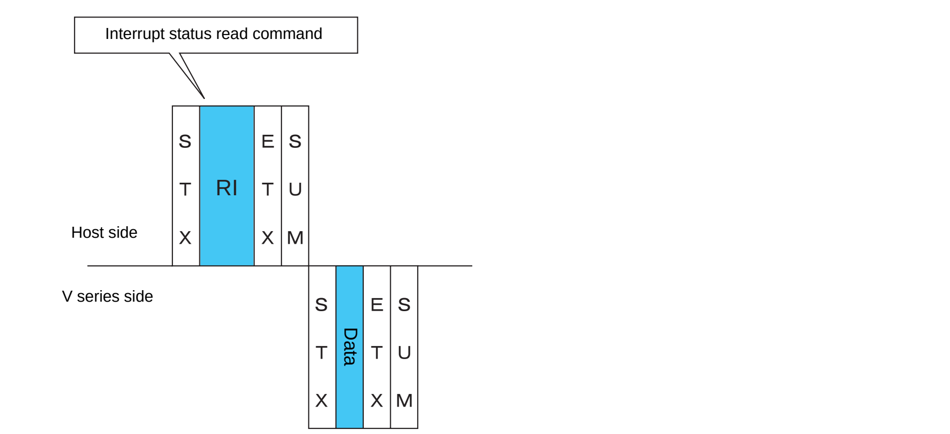




RI: Interrupt Status Read Command

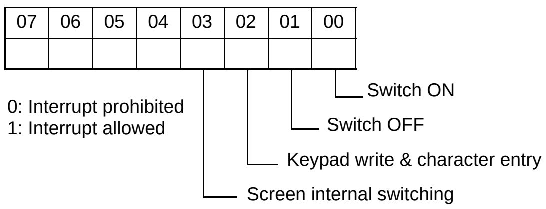
This command is used to read interrupt setting status. It can be used for 1 : 1 connection.

Details of interrupt status read command



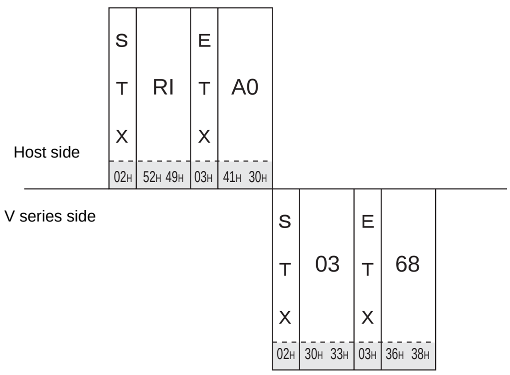
- Host side
  Interrupt status is read.(HEX ASCII)

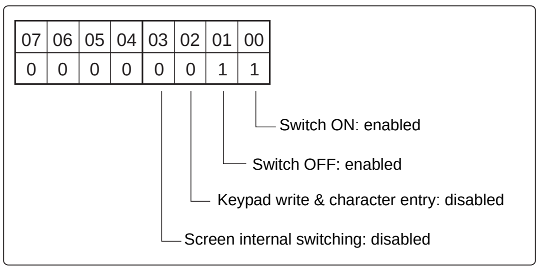
  Interrupt conditions



Example:

Interrupt status is read.





26.4.4 Interrupt (ENQ)

The interrupt command can be used for 1 : 1 connection.* Interrupt data becomes the contents of write areas n + 2 to n + 7. (See page 26-11.)

* For RS-485 (2-wire connection), interrupts cannot be used.

Interrupt codes and conditions

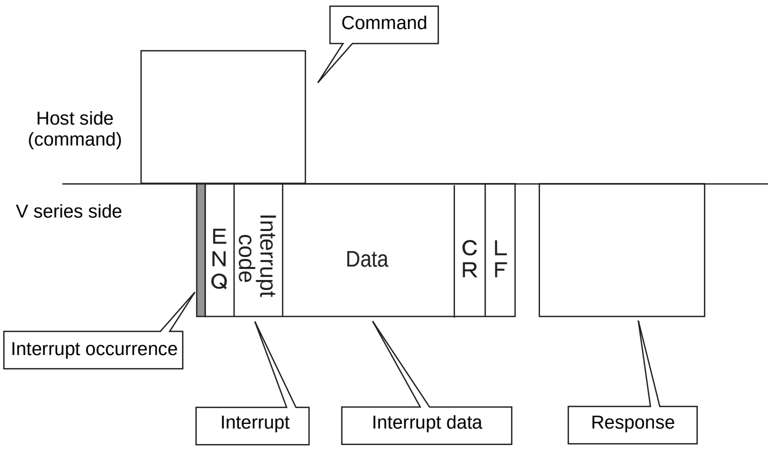
An interrupt code is sent to the host for the following actions.

Interrupt Codes	Interrupt Conditions
00H	The regular switch is changed from ON to OFF or OFF to ON when it is pressed.
01H	The “Write” switch on the keypad or on the keyboard is changed from OFF to ON when it is pressed.*
02H	The screen is switched by an internal switch.
10H • • 2FH	The macro command [OUT_ENQ] is executed (user setting).

* (If [☐ Use the Write Flag] is checked, write enable bit must be set in order to send an interrupt code.

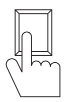
Interrupt timing

When an interrupt condition occurs while the host is transmitting a command or before the V series transmits a response, the interrupt code will be transmitted before the response is transmitted.
To use an interrupt, it is necessary to enable interrupt code detection when a response is received on the host program.



Interrupt data

- When a regular switch is pressed:



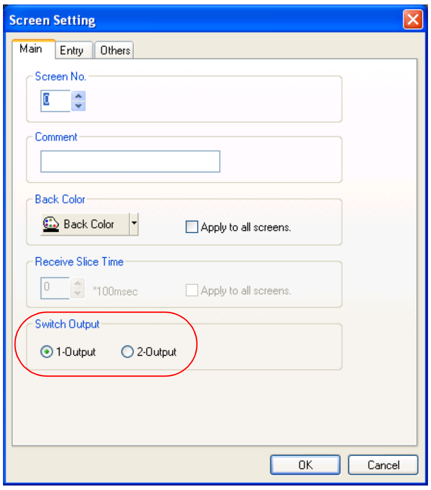
V series side

E N Q	00	Screen No. WORD	SW0 WORD	SW1 WORD	ENT0 WORD	ENT1 WORD	ENT2 WORD	E T X	S U M

A “regular switch” means a switch for which [Momentary] is selected for [Output Action] and $s0080 to 0095 is set for [Output Memory]. When this switch is pressed, the following actions take place.
Output memory is set (0 → 1) while the switch is held down, and is reset (1 → 0) when the switch is released.
At the same time, the switch number that corresponds to the output memory is written in write areas n + 3 and n + 4.
For details on the output memory and the switch number, see page 26-34.

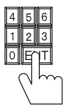
- V series analog type
  Normally, [1-Output] is set for the switch. Thus, the switch number and switch information is written in write area n + 3.
  However, when the switch as well as a function switch is pressed simultaneously (2-Output), the switch number and switch information is written in write areas n + 3 and n + 4.

- V series matrix type
  When you go from the menu bar to [Screen Setting] to [Screen Setting], you can select between [1-Output] or [2-Output]. For “1-Output”, the switch number and switch information are written in write area n + 3. For “2-Output”, the switch number and switch information are written in write areas n + 3 and n + 4.



- When the “Write” switch on the keypad is pressed:

When the [ENT] switch on the keypad is pressed

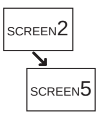


V series side

ENQ	01	Screen No.	SW0	SW1	ENT0	ENT1	ENT2	ETX	SUM
		WORD	WORD	WORD	WORD	WORD	WORD		

ENT0/1/2 is the same as system memory area (n + 5, n + 6, n + 7).

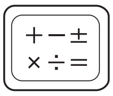
- When the screen is internally changed:



V series side

ENQ	02	Screen No.	SW0	SW1	ENT0	ENT1	ENT2	ETX	SUM
		WORD	WORD	WORD	WORD	WORD	WORD		

- When a macro command (OUT_ENQ) is executed:
  With an OUT_ENQ command, you can either convert the data into HEX code and transmit it (word transmission), or you can transmit the data just as it is without converting it (character transmission).
  For more information on “OUT_ENQ”, refer to the Macro Reference manual.



Word transmission

V series side

E N Q	XX	00	Transmission memory address WORD	Number of transmission words WORD	Word data	E T X	S U M

Transmission format: word transmission (00)
Interrupt code (10H to 2FH) (XX)

Character transmission

V series side

E N Q	XX	01	Transmission memory address WORD	Number of transmission characters WORD	Word data	E T X	S U M

Transmission format: character transmission (01)
Interrupt code (10H to 2FH) (XX)

1-byte Character Code List

Upper

Lower

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	’	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			’	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	¥	l	|								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	_	o	■								

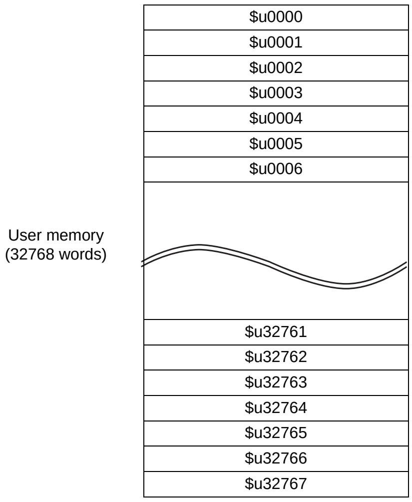
26.5 Memory Map

Memory

Inside the V series, there is internal memory necessary for screen display called “user memory ($u)”, as well as memory that the V series uses for the system called “system memory ($s)”.

User Memory ($u)

32768 words are available for user memory. This area is usable as desired for screen data. Also the host computer can write to and read from the area.
The memory map is as shown below.



System Memory ($s)

2048 words are available for system memory. System memory is memory that writes V series action status when the V Series is currently displaying something. With this written information, it is possible to check overlap status, buffer area, printer, backlight, and slave station status in multi-drop connection mode. In the table below, a small part ($s80 to 95) of system memory is extracted. For other memory addresses, refer to the Reference Manual.

* System memory cannot be read or written from the host computer.

Address $s0080 to 95

Set [Output Memory] in location ($s0080 to 95) of system memory, and select [Momentary] for [Output Action] of a switch. When the switch is pressed, output memory is set (0 → 1) and the corresponding switch number is written in system setting areas n + 3 and n + 4. (See page 26-11.)

The relationship between the output memory and the switch number is shown in the following diagram.
For details about the output of a switch, see page 26-30.

Address	Contents																
:																	
$s80	Universal serial switch output 0 Switch No. 0 to 15																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$s81	Universal serial switch output 1 Switch No. 16 to 31																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
$s82	Universal serial switch output 2 Switch No. 32 to 47																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
$s83	Universal serial switch output 3 Switch No. 48 to 63																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
$s84	Universal serial switch output 4 Switch No. 64 to 79																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
$s85	Universal serial switch output 5 Switch No. 80 to 95																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80
$s86	Universal serial switch output 6 Switch No. 96 to 111																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96
$s87	Universal serial switch output 7 Switch No. 112 to 127																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112
$s88	Universal serial switch output 8 Switch No. 128 to 143																
		MSB															LSB
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	No.	143	142	141	140	139	138	137	136	135	134	133	132	131	130	129	128

Address	Contents

$s89 — Universal serial switch output 9 Switch No. 144 to 159

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	159	158	157	156	155	154	153	152	151	150	149	148	147	146	145	144

$s90 — Universal serial switch output 10Switch No. 160 to 175

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	175	174	173	172	171	170	169	168	167	166	165	164	163	162	161	160

$s91 — Universal serial switch output 11Switch No. 176 to 191

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	191	190	189	188	187	186	185	184	183	182	181	180	179	178	177	176

$s92 — Universal serial switch output 12 Switch No. 192 to 207

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	207	206	205	204	203	202	201	200	199	198	197	196	195	194	193	192

$s93 — Universal serial switch output 13 Switch No. 208 to 223

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	223	222	221	220	219	217	218	216	215	214	213	212	211	210	209	208

$s94 — Universal serial switch output 14 Switch No. 224 to 239

MSB … LSB

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	239	238	237	236	235	234	233	232	231	230	229	228	227	226	225	224

$s95 — Universal serial switch output 15 Switch No. 240 to 255

MSB … LSB

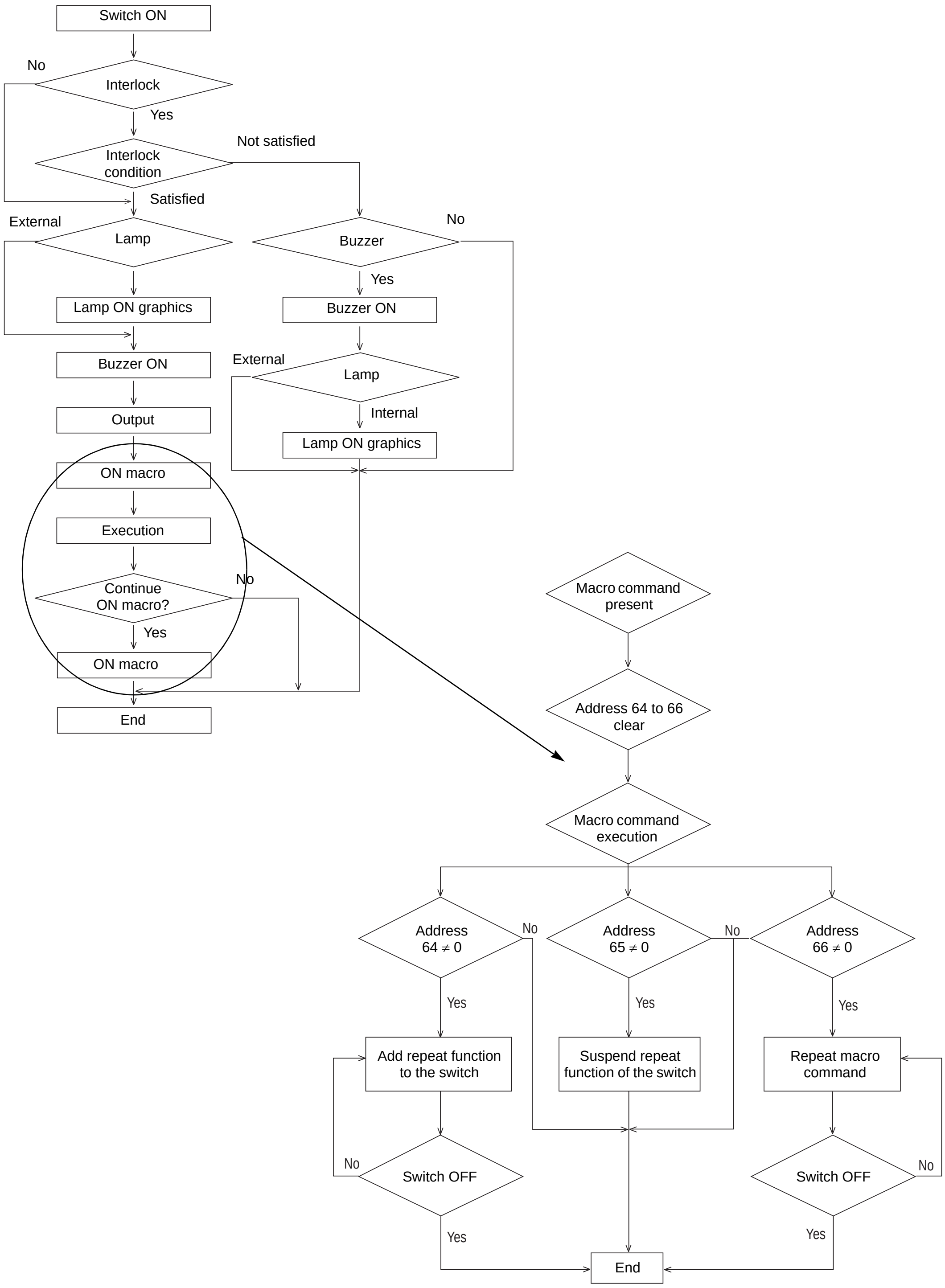
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
No.	255	254	253	252	251	250	249	248	247	246	245	244	243	242	241	240

:

Switch ON Macro Action

The macro command that controls a repeat function in the switch ON macro, as well as the processing sequence, is shown in the following diagram.

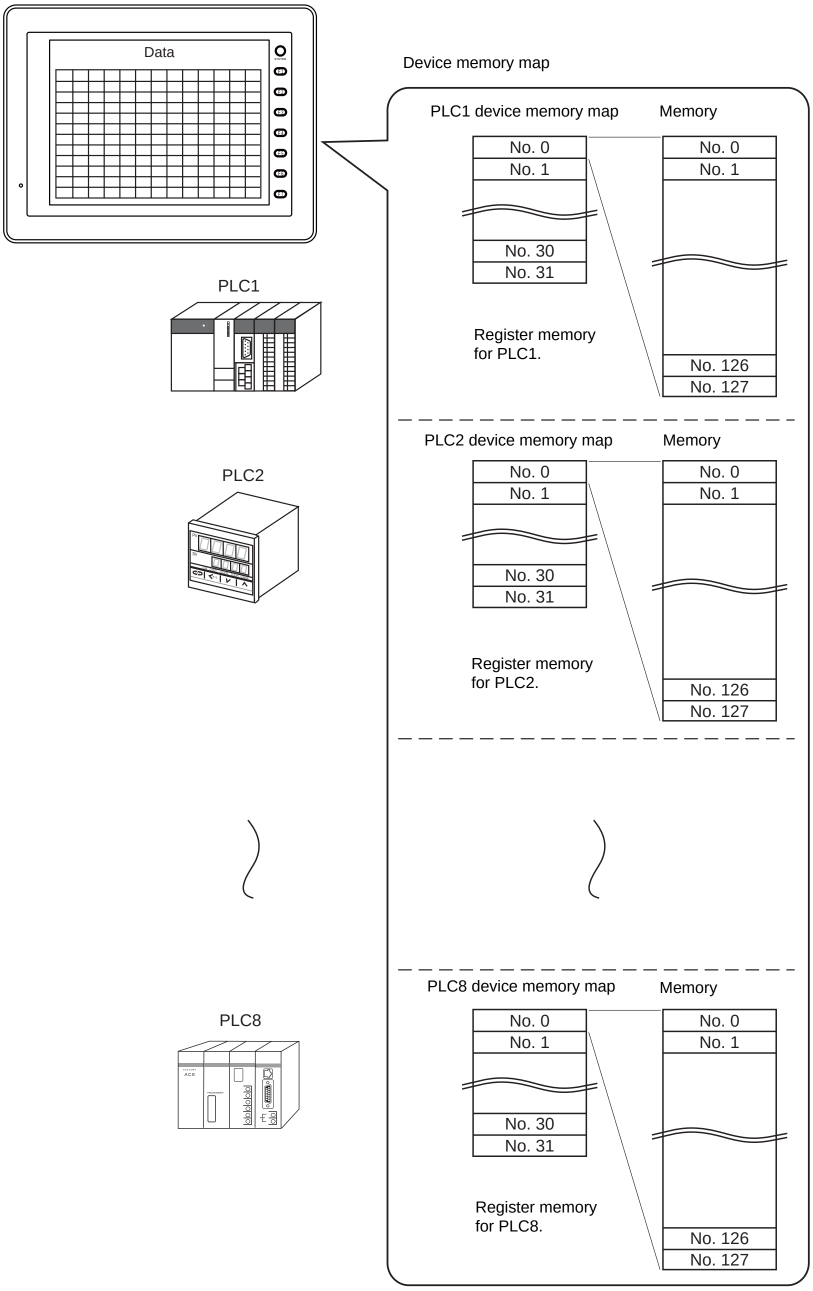
Switch action flowchart



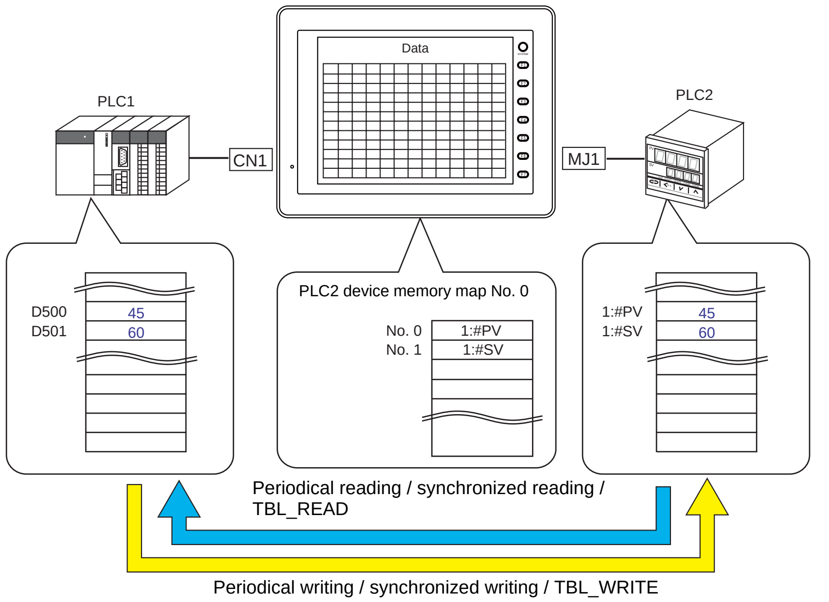
Appendix

Appendix 1   Device Memory Map

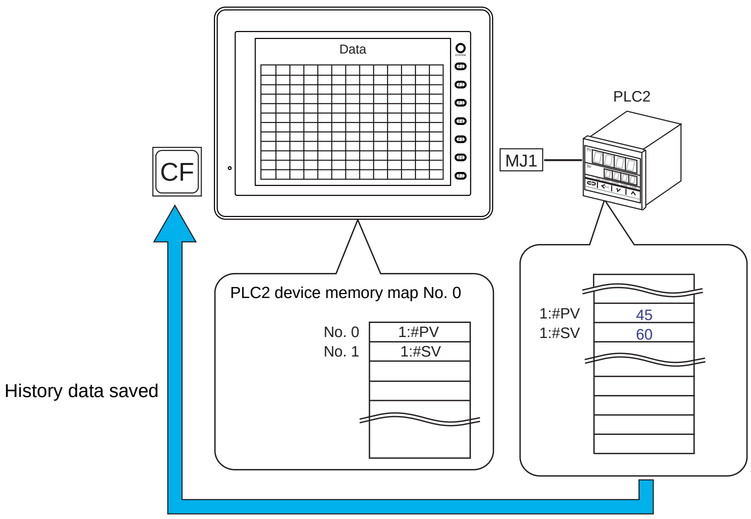
- Within the V8 series, for each logical port there are a total of 31 device memory maps from No. 0 to No. 31. 128 memory addresses can be registered in each memory map, and batch transfer of data among devices, and sampling, are possible.



- Functions that use device memory maps
  - Periodical reading
    The memory data registered in a device memory map is periodically transferred to other devices. (page App1-7)
  - Periodical writing
    The data of other devices is periodically transferred to the memories registered in a device memory map. (page App1-9)
  - Synchronized reading
    The data of each memory registered in a device memory map is transferred to another device when its bit is set (ON). (page App1-8)
  - Synchronized writing
    The data of other devices is transferred to memory addresses that are registered in the memory map and whose bits are set (ON). (page App1-10)
  - Macro (TBL_READ, TBL_WRITE)
    The data of memory addresses registered in a device memory map is transferred by using a macro command. (page App1-14)



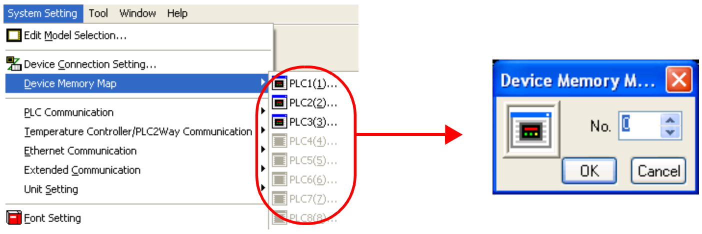
  - Sampling
    The history data of the memory addresses registered in a device memory map is saved in the V8 series internal buffer or in a CF card. (page App1-12)



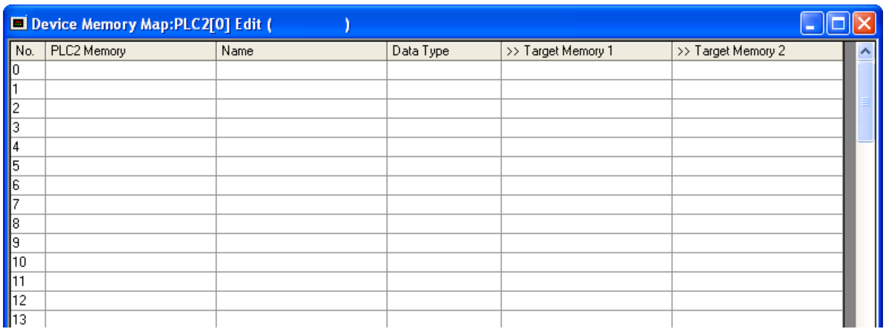
Device Memory Map Editing

Starting

1. Click [System Setting] → [Device Memory Map] → [PLCn].
   The [Device Memory Map: PLCn] dialog is displayed.



2. Select the device memory map number from 0 to 31 and click [OK].
   The [Device Memory Map Edit] window is opened.



There are a total of 32 device memory maps numbered from 0 to 31 for each logical port, and 128 memory points can be registered for each memory map.

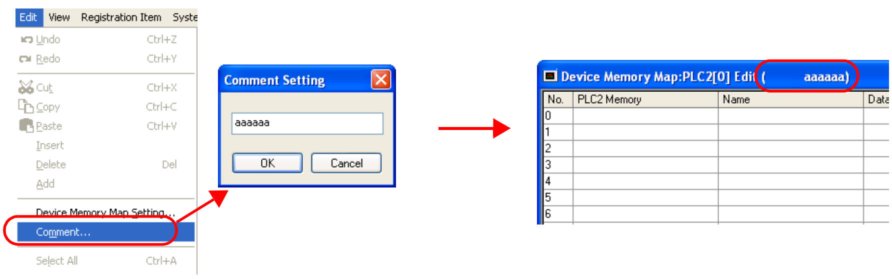
Ending

Click [Close] in the drop-down menu, or click the [Close] button at the top right corner.

Comment Setting

A comment can be set for each device memory map.

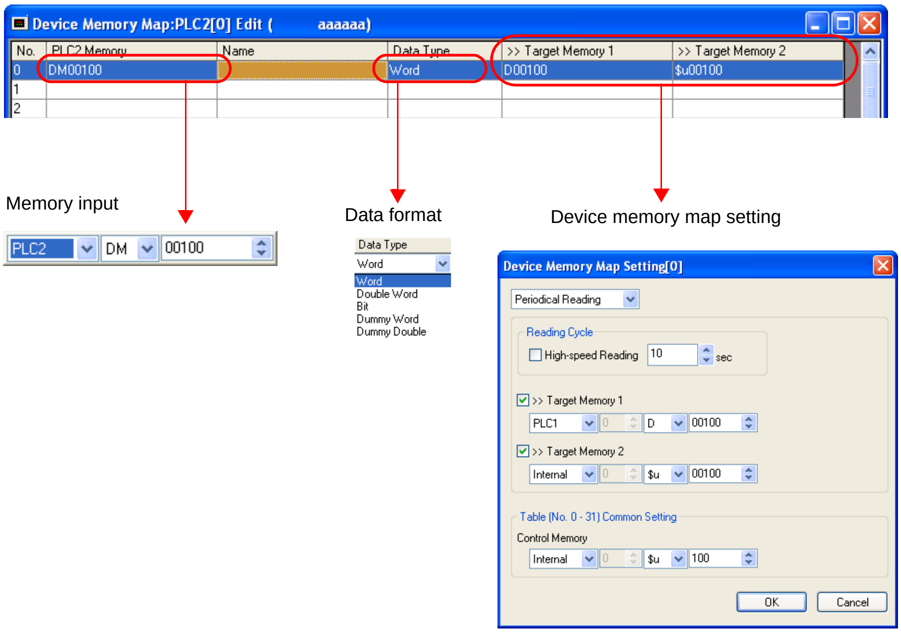
1. Click [Edit] → [Comment]. The [Comment Setting] dialog is displayed.



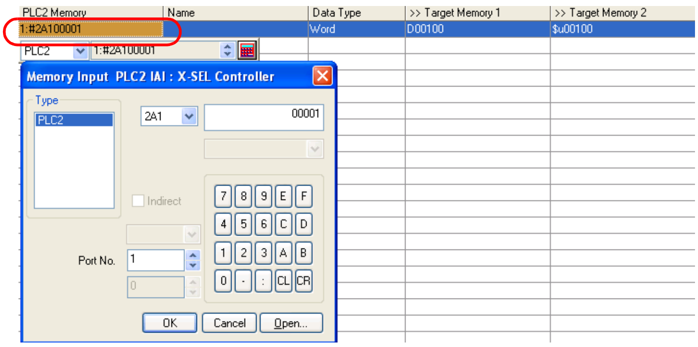
2. Enter the desired comment and click [OK]. The entered comment is displayed.

Device Memory Map Editing

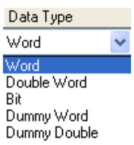
Clicking any cell displays the relevant setting menu.



1. Memory Input
   Specify the memory address whose data is to be transferred. If you have opened the PLC2 device memory map editing dialog, register the PLC2 memory.



2. Data Type



Word	Data is handled as numerical data of one word. Data is transferred based on the setting at [Code] in the [Communication Setting] tab window for each logical port.*1
Double Word	Data is handled as numerical data of two words. Data is transferred based on the setting at [Code] in the [Communication Setting] tab window for each logical port.*1
Bit	Data is handled as bit information of one word. Data is transferred without conversion.*2
Dummy Word Dummy Double	The source and target memory addresses are automatically registered with serial numbers assigned. If you would like to skip any memory address, keep the cell blank (no setting). It is regarded as a dummy word or double-word. For reading: "0" is always stored in the target memory address. The memory is not usable for any other purposes. For writing: The source memory address can be used for other purposes.

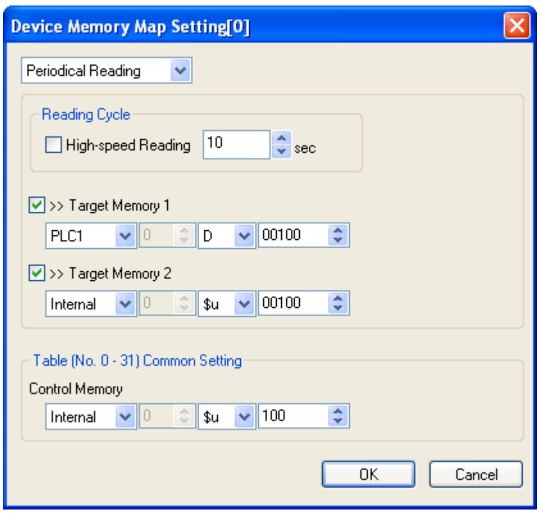
*1 When [Word] or [Double Word] is selected:
In the internal memory of the V8 series, data is normally handled as DEC with signs.

		Code	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Read	Transfer source PLCn	Communication setting BCD	MSB–LSB	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	V8 internal memory	DEC	MSB–LSB	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
	Transfer target PLCm	Communication setting DEC	MSB–LSB	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
		Communication setting BCD	MSB–LSB	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

*2 When [Bit] is selected:

		Code	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Read	Transfer source PLCn	Communication setting BCD	MSB–LSB	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	V8 internal memory	DEC																	
	Transfer target PLCm	Communication setting DEC BCD																	

3. Device memory map setting
   In this dialog, set the use of each memory map.
   - TBL_READ, TBL_WRITE
   - Periodical Reading → page App1-7
   - Synchronized Reading → page App1-8
   - Periodical Writing → page App1-9
   - Synchronized Writing → page App1-10

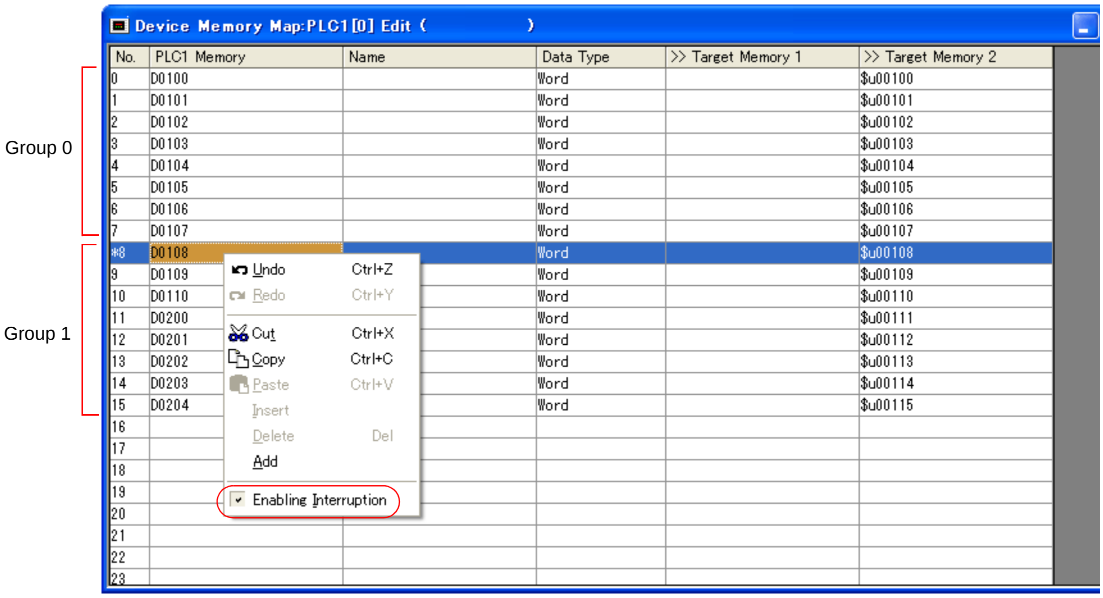


Enabling interruption

Interrupt is enabled by selecting [Enabling Interruption] in the right-click menu displayed by right-clicking on the device memory map number. The "*" mark is displayed at the selected memory.
When interruption is enabled, switch data output, cycle reading or sampling can be executed during the device memory map process.

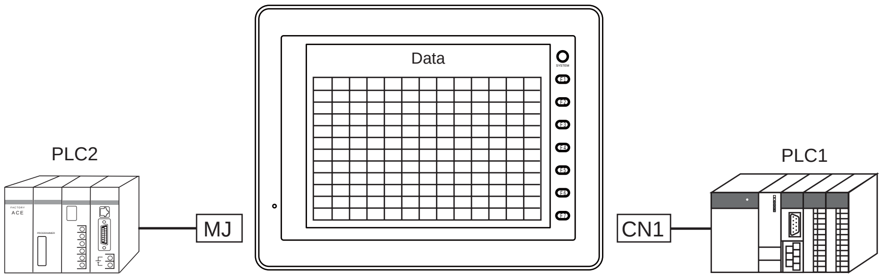
Operation in the setting shown below:

Reading group 0 (No. 0 to No. 7)
↓
Switch data output, cycle reading or sampling
↓
Reading group 1 (No. 8 to No. 15)

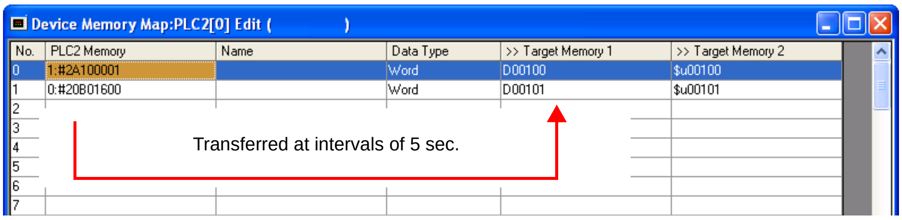


Periodical Reading

The memory data registered in a device memory map is transferred to the target memory address every cycle set at [Reading Cycle].



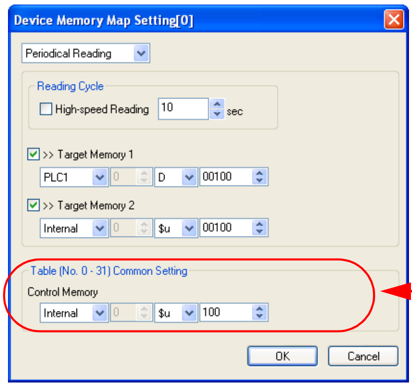
PLC2 device memory map No. 0



Setting items

Items that must be set to perform periodical reading

- "Device Memory Map Editing" (page App1-3)
- Device memory map setting

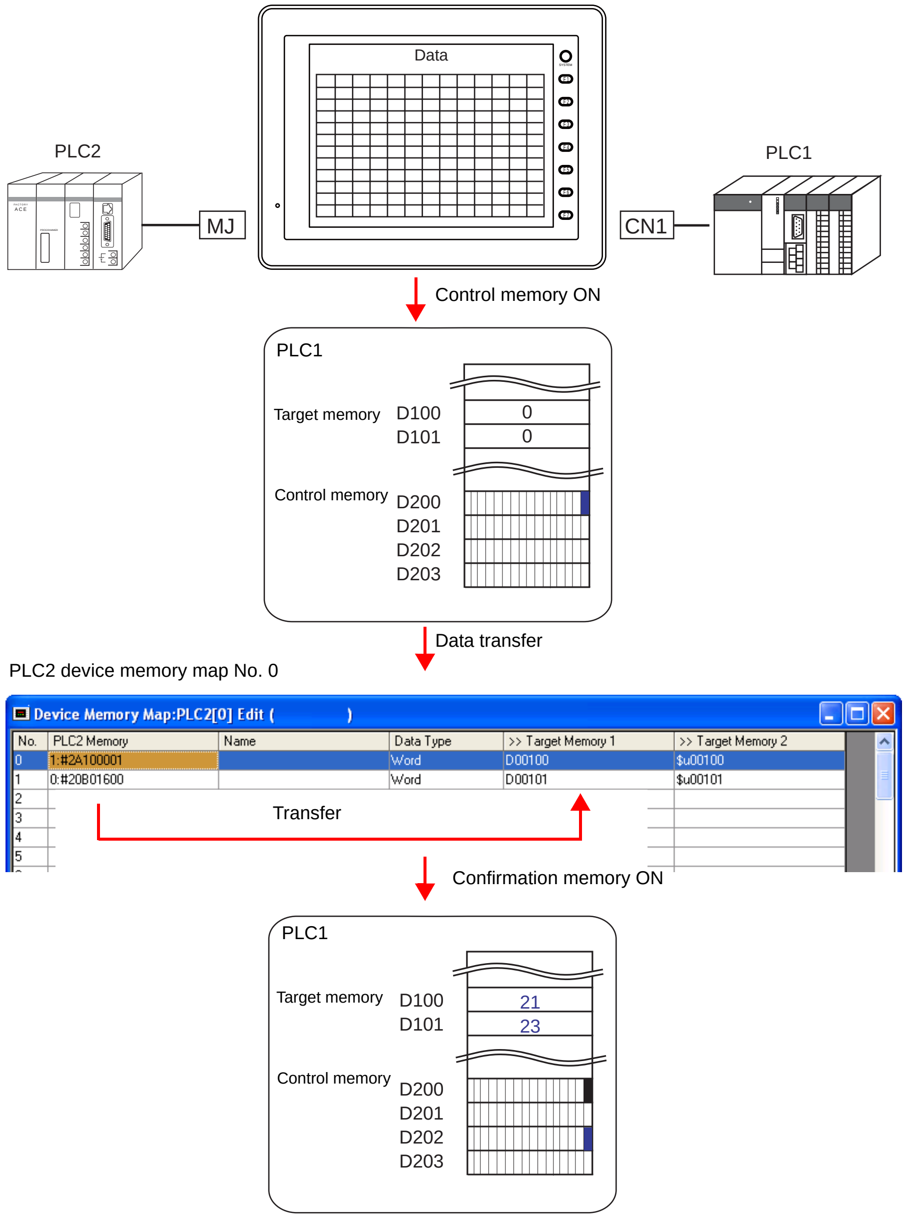


Disabled when [Periodical Reading] is selected.

<table>
<tr><td>Function</td><td>Periodical Reading</td></tr>
<tr><td>Reading Cycle</td><td>Specify the data read cycle.
<table>
<tr><td rowspan="2">☐[High-speed Reading] check box*</td><td colspan="2">Reading Cycle</td></tr>
<tr><td>Setting Range</td><td>Unit</td></tr>
<tr><td>Unchecked</td><td>1 to 3600</td><td>1s</td></tr>
<tr><td>Checked</td><td>1 to 3600</td><td>100 ms</td></tr>
</table></td></tr>
<tr><td>>> Target Memory 1
>> Target Memory 2</td><td>Set the memory address at which the read data is to be stored.</td></tr>
<tr><td>Control Memory</td><td>This option is disabled when [Periodical Reading] is selected.</td></tr>
</table>

Synchronized Reading

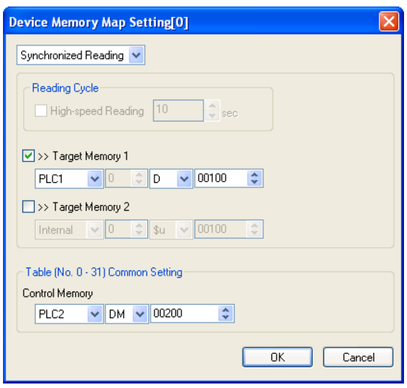
The memory data registered in a device memory map is transferred to the target memory address at the leading edge of each bit (0 → 1).



Setting items

Items that must be set to perform synchronized reading

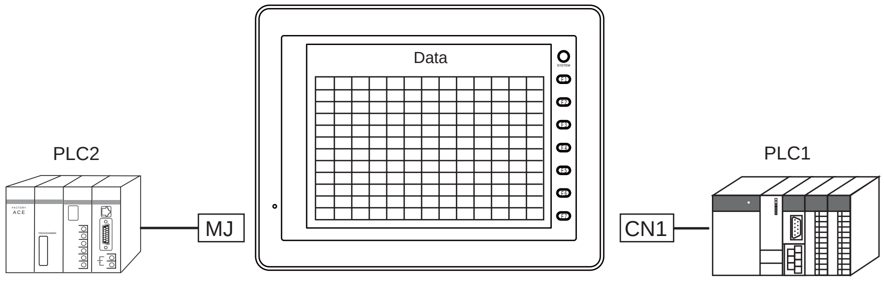
- "Device Memory Map Editing" (page App1-3)
- Device memory map setting



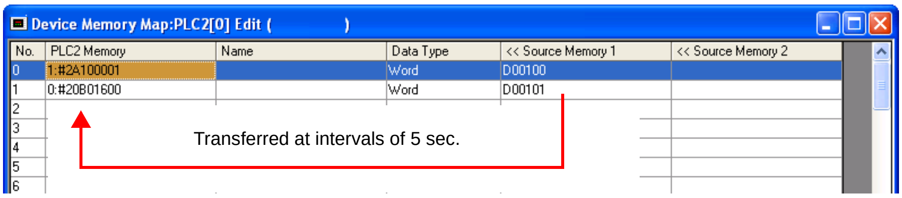
Function	Synchronized Reading
>> Target Memory 1 >> Target Memory 2	Set the memory address at which the read data is to be stored.
Control Memory	Enter a memory address as the trigger for synchronized reading. The specified memory address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see "Control Memory" (page App1-11).

Periodical Writing

The data at the source memory address is transferred to a memory registered in a device memory map in each cycle set at [Writing Cycle].



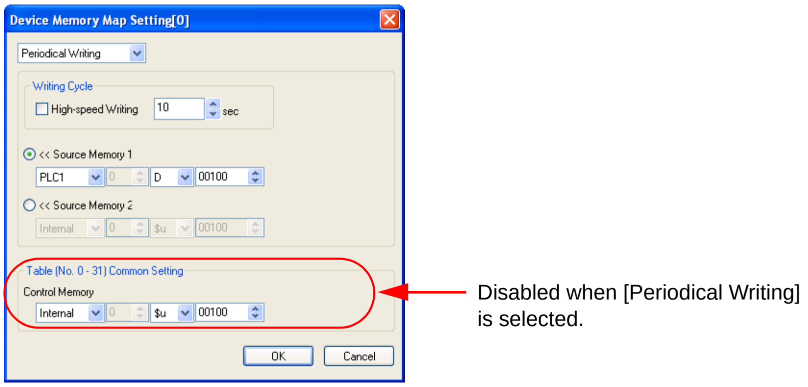
PLC2 device memory map No. 0



Setting items

Items that must be set to perform periodical writing

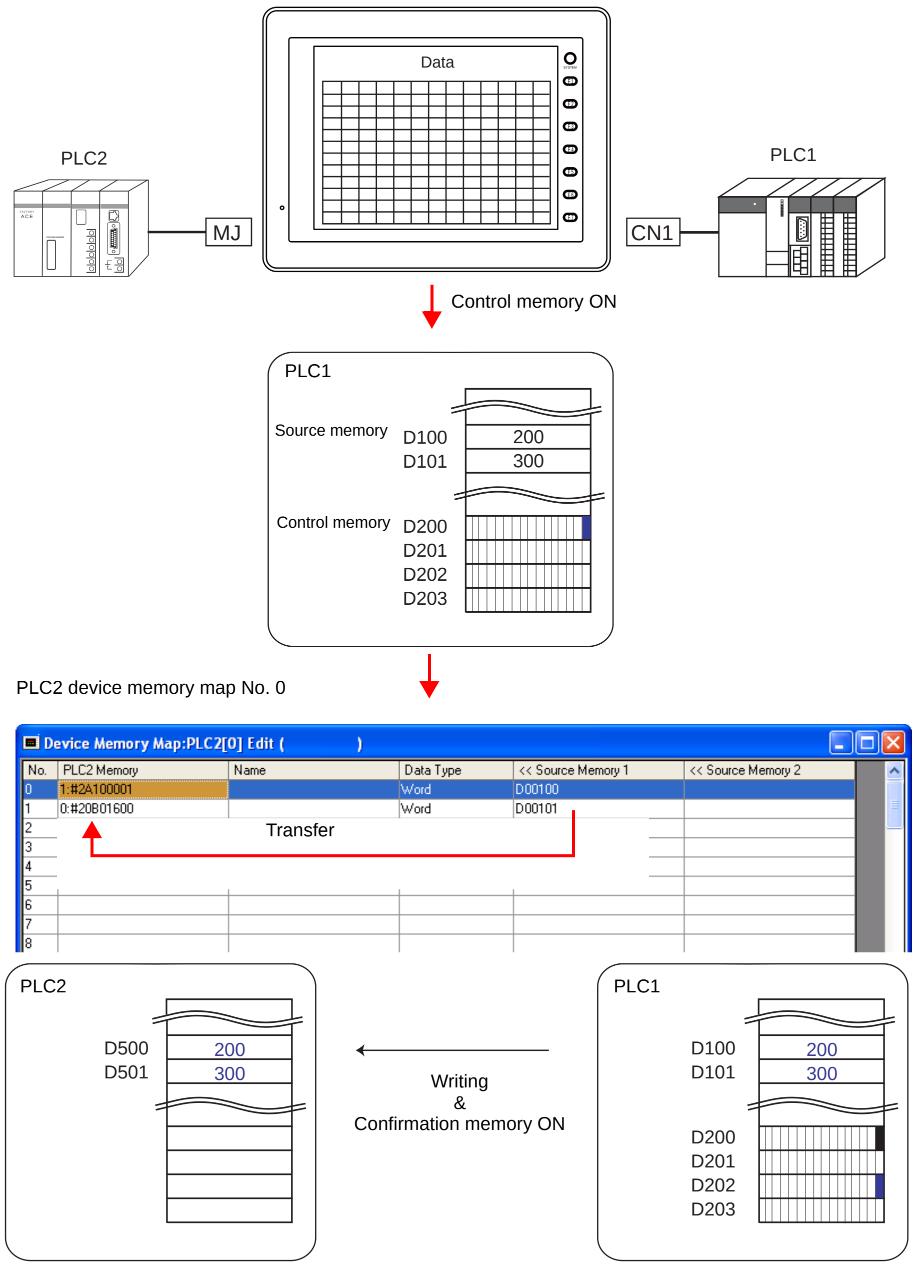
- "Device Memory Map Editing" (page App1-3)
- Device memory map setting



<table>
<tr><td>Function</td><td>Periodical Writing</td></tr>
<tr><td>Writing Cycle</td><td>Specify the data writing cycle.
<table>
<tr><td rowspan="2">☐ [High-speed Writing] check box*</td><td colspan="2">Writing Cycle</td></tr>
<tr><td>Setting Range</td><td>Unit</td></tr>
<tr><td>Unchecked</td><td>1 to 3600</td><td>1 s</td></tr>
<tr><td>Checked</td><td>1 to 3600</td><td>100 ms</td></tr>
</table></td></tr>
<tr><td><< Source Memory 1
<< Source Memory 2</td><td>Specify the memory address of the source data.</td></tr>
<tr><td>Control Memory</td><td>This option is disabled when [Periodical Writing] is selected.</td></tr>
</table>

Synchronized Writing

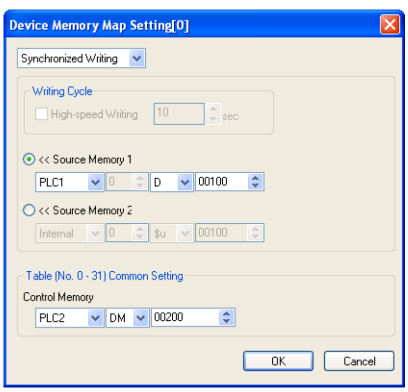
The data at the source memory address is transferred to a memory address registered in a device memory map at the leading edge of the control memory bit (0 → 1).



Setting items

Items that must be set to perform synchronized writing

- "Device Memory Map Editing" (page App1-3)
- Device memory map setting



Function	Synchronized Writing
<< Source Memory 1 << Source Memory 2	Specify the storage target memory address for the source data.
Control Memory	Enter a memory address as the trigger for synchronized reading. The specified memory address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see “Control Memory” (page App1-11).

Control Memory

Control memory is used for executing synchronized reading/synchronized writing.
Consecutive four words starting from control memory “n” are allocated.

Control Memory n	Contents	Memory Type
n	Read/Write command memory	→ V
n + 1		
n + 2	Read/Write confirmation memory	← V
n + 3		

Read/Write command memory (control memory “n” and “n + 1”)

One bit is allocated to each table.
At the leading edge of a bit (0 → 1), reading from or writing to memory set in the corresponding device memory map occurs.

n

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

Bit number

Device memory map Nos. 0 to 15

n + 1

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16

Bit number

Device memory map Nos. 16 to 31

Read/Write confirmation memory (control memory “n + 2” and “n + 3”)

One bit is allocated to each table.
When the bit of the command memory is set (0 → 1) and the resulting reading or writing is completed, the bit of the corresponding confirmation memory is set (0 → 1).
When a bit of the command memory is reset (1 → 0), the confirmation memory bit of the corresponding memory map number is reset (1 → 0).

n + 2

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

Bit number

Device memory map Nos. 0 to 15

n + 3

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16

Bit number

Device memory map Nos. 16 to 31

Sampling

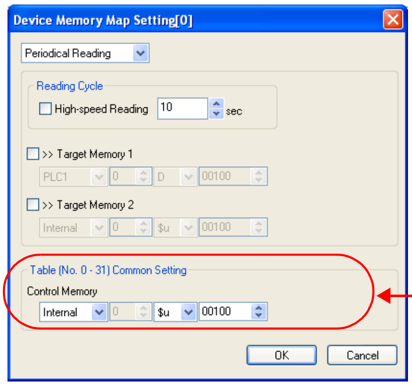
The history data of the memory addresses registered in a device memory map is saved in the V8 series internal buffer or in a CF card.

Setting items

Items that must be set to perform sampling

- "Device Memory Map Editing" (page App1-3)
- Device memory map setting
- Buffering area setting
- Trend sampling or data sampling

Device memory map setting

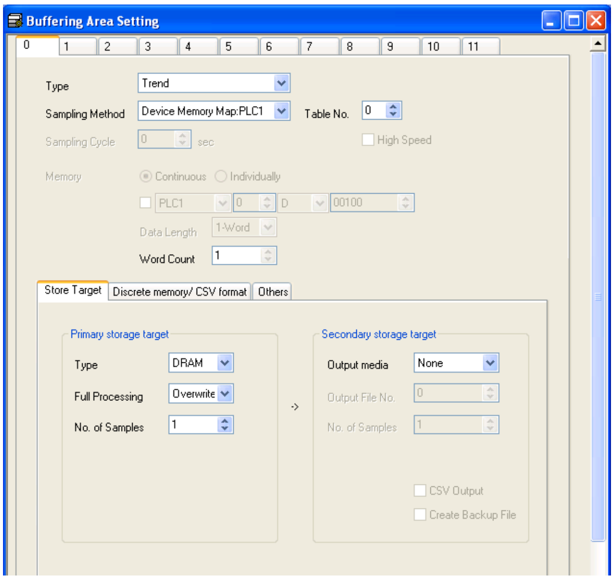


Disabled when [Periodical Reading] is selected.

<table>
<tr><td>Function</td><td>Periodical Reading</td></tr>
<tr><td>Reading Cycle</td><td>Specify the data read cycle.
<table>
<tr><td rowspan="2">☐ [High-speed Reading] check box*</td><td colspan="2">Reading Cycle</td></tr>
<tr><td>Setting Range</td><td>Unit</td></tr>
<tr><td>Unchecked</td><td>1 to 3600</td><td>1 s</td></tr>
<tr><td>Checked</td><td>1 to 3600</td><td>100 ms</td></tr>
</table>
</td></tr>
<tr><td>>> Target Memory 1
>> Target Memory 2</td><td>When unchecked:
Since sampling data is stored in the V8 internal buffer or CF card, it is not necessary to set these items.</td></tr>
<tr><td>Control Memory</td><td>This option is disabled when [Periodical Reading] is selected.</td></tr>
</table>

Buffering area setting

Click [System Setting] → [Buffering Area Setting]. The [Buffering Area Setting] dialog is opened.

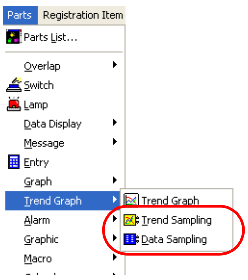


Type	Trend
Sampling Method	Device Memory Map: PLCn
Table No.	Select the device memory map number for sampling.
Word Count	The number of words is automatically set in this area based on the data in the device memory map.
Store Target	Set the desired storage target for storing sampling data.
Discrete memory / CSV format	The memory addresses of the device memory map set at [Table No.] are displayed here.

* For more information on the buffering area setting, refer to the V8 Series Reference Manual.

Trend sampling/data sampling part

To display the sampling data on the screen, place a trend sampling part or a data sampling part.
Click the [Trend Sampling] or [Data Sampling] icon and make the setting.

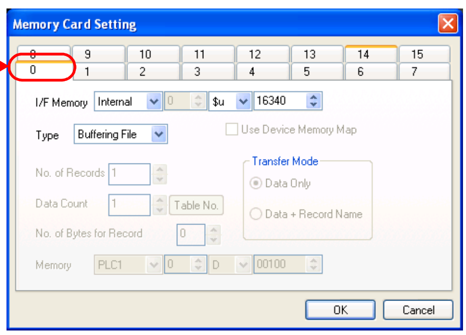


* The numbers in the [Discrete memory/ CSV format] menu of the [Buffering Area Setting] dialog are automatically set according to the data in the [Device Memory Map]. Therefore, specify the same number as that in the [Discrete memory/ CSV format] menu for the [Sampling Buffer Word No.].
For more other information, refer to the V8 Series Reference Manual provided separately.

Memory card setting

If [Memory Card] is set for [Secondary storage target] in the [Buffering Area Setting] dialog, the [Memory Card Setting] dialog is automatically set.

Match this to the setting for [Output File No.] in the [Buffering Area Setting] dialog.



TBL_READ / TBL_WRITE

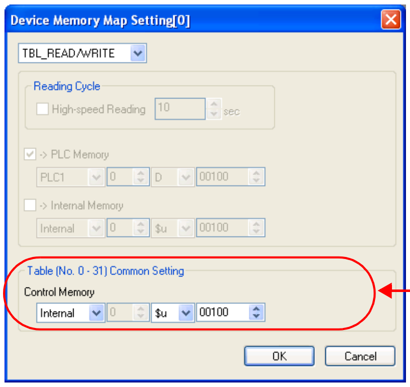
The data at the memory addresses registered in a device memory map is batch transferred using the [TBL_READ] and [TBL_WRITE] macro commands.

Setting items

Items that must be set to perform memory data transfer set in the device memory map

- “Device Memory Map Editing” (page App1-3)
- Device memory map setting
- Macro (TBL_READ / TBL_WRITE)
- Memory card setting (when a memory card is used)

Device memory map setting



Disabled when [TBL_READ/TBL_WRITE] is selected.

Function	TBL_READ/TBL_WRITE * Even device memory maps for which other functions have been selected can be transferred using these macros.
Control Memory	This option is disabled when [TBL_READ/TBL_WRITE] is selected.

Macro

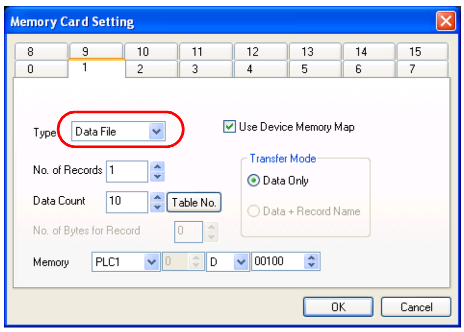
Register the following macros for switch ON macro or interval timer. For more information on macros, refer to the Macro Reference manual.

- TBL_READ
  Data at a memory address registered in a device memory map is transferred to a memory address in another device.
- TBL_WRITE
  Data at another device is transferred to a memory address registered in a device memory map.

Memory card setting

These settings are made when the target memory or source memory is a memory card memory.

1. Click [System Setting] → [Memory Card Setting]. The [Memory Card Setting] dialog is opened.
2. Select [Data File] for [Type].
   Be sure to check [Use Device Memory Map].
3. Set [No. of Records].
   By clicking [Table No.] and setting the device memory map number, the necessary number of records can be set automatically.



Appendix 2 Ethernet

Overview

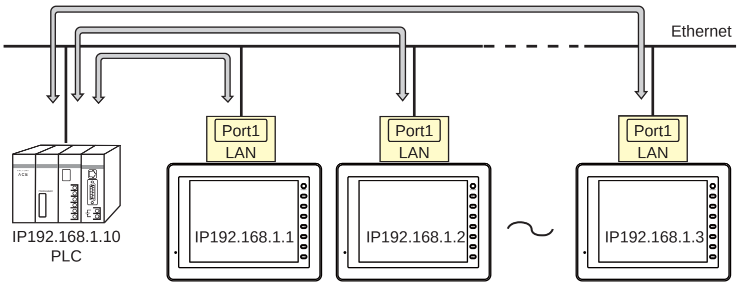
The following Ethernet functions are available with the V8 series.
When using Ethernet communications, you need to set the IP address of the V8 unit. The other settings differ according to the functions to be used.

V8 series + Option \ Function		PLC Communication TCP/IP	PLC Communication UDP/IP	Macro EREAD EWRITE SEND	HKEtn20.dll	Screen Data Transfer	Web Server E-mail
V812iS V810iS V810iT V808iS V806iT V806iC V806iM	Built-in LAN	○	○	○	○	○	○
V812S V810S V810T V808S V806T V806C V806M	CU-03-3	×	○	○	○	○	×
	CU-03-2	×	○	○	○	○	×
		↓ page App2-2		↓ page App2-4	↓ page App2-5	↓ page App2-6	↓ page App2-6

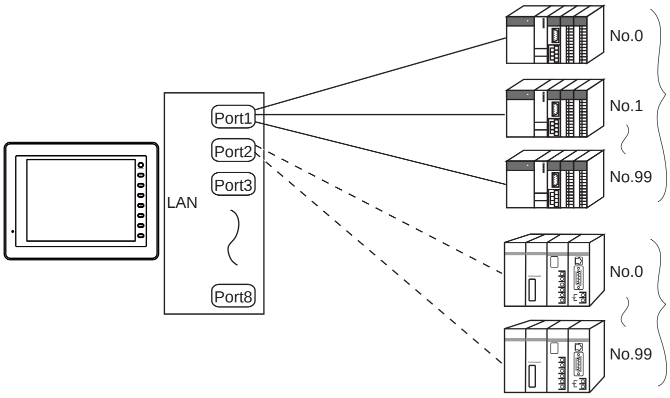
PLC Communication

Ethernet communications are possible with PLCs.

- 1 : 1 connection



- 1 : n connection
  MONITOUCH can communicate with multiple PLCs on the Ethernet.



Setting items

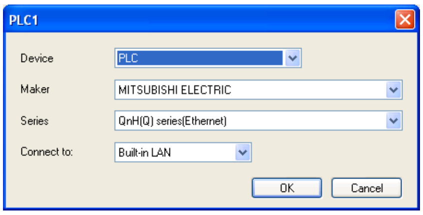
The following settings are required to communicate with PLCs via an Ethernet.

- IP address setting of the V8 series
  Make this setting in the [IP Address Setting] dialog of the V-SFT editor, or on the Main Menu screen of the V8 series.
  See page App2-7.
- Device connection setting
  - Selecting a device to be connected
  - Communication setting (connection mode, V8 port number)
  - Target settings (connection target, PLC table)

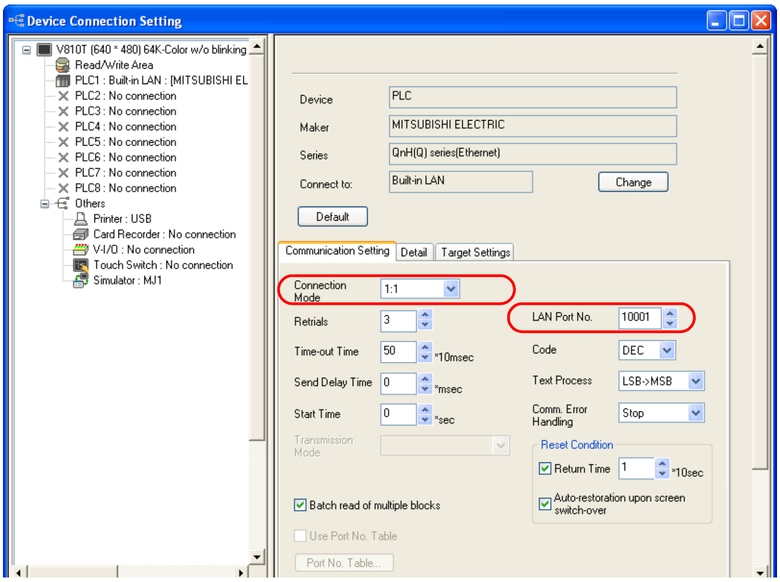
  See page App2-3.
- Setting on PLC
  Set the IP address, port number and others of PLC.
  For more information, refer to the instruction manual for the PLC issued by the manufacturer.

Device Connection Setting

1. Select models compatible with Ethernet communications under [System Setting] → [Device Connection Setting].



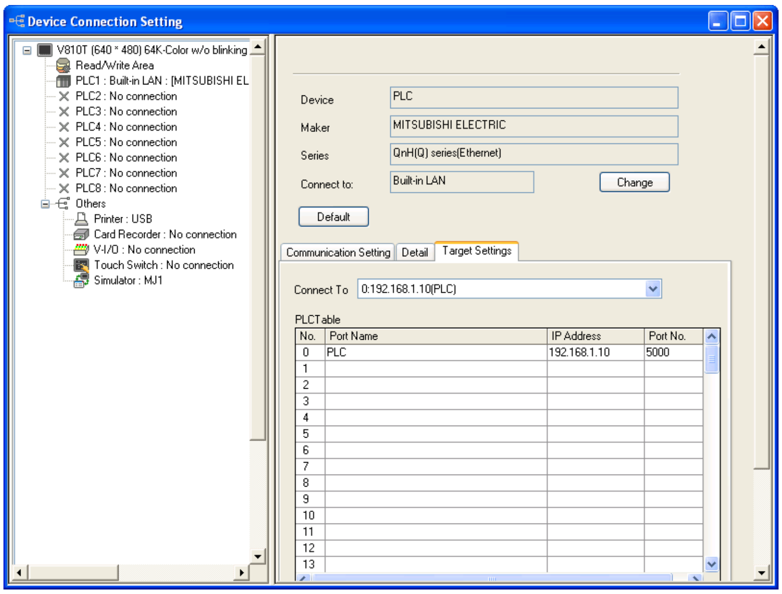
2. [System Setting] → [Device Connection Setting] → [Communication Setting]



Connection Mode	1 : 1 / 1 : n Set the number of PLCs that are to be communicated with.
LAN Port No.	Set the port number of the V8 series to be used for communications with the PLCs.

* For settings other than the above, see “1.5.1 PLC1 to PLC8” on page 1-24.

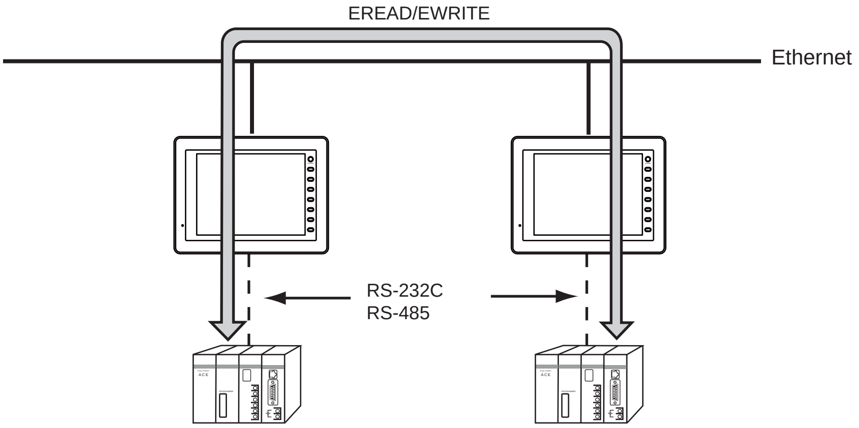
3. [System Setting] → [Device Connection Setting] → [Target Settings]



Target Settings	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 No. 0 to 99	Set the IP address, port number and others of PLC.

Macro EREAD/EWRITE

Data can be transferred among V8 units in an Ethernet network using macro commands (EREAD/EWRITE). As the data for transfer, data in the V8 internal memory or data in the memories of PLCs that communicate with the V8 series can be specified.



Setting Items

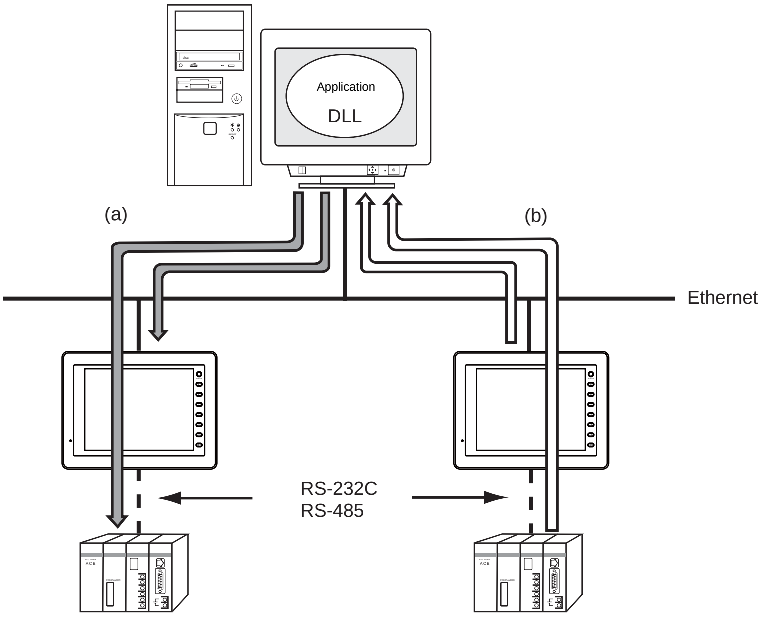
The following settings are necessary when transferring data using macro commands.

- IP address setting of the V8 series
  Make this setting in the [IP Address Setting] dialog of the V-SFT editor, or on the Main Menu screen of the V8 series.
  See page App2-7.
- Network table
  Set the IP address and port No. of the V8 series that is to be the send target for the macro command.
  See page App2-10.
- Macro command
  EREAD/EWRITE
  See page App2-12.

Connection with Computer

Communications between the computer and the V8

- "HKEtn20.dll" (for UDP/IP protocol) is provided so that the user can create an original application by using Visual C++ or Visual Basic, etc. to allow the computer to access the memory device, such as V8 internal memory, memory card or the PLC memory connected with the V8........ (a)
- The macro command (SEND) enables the V8 to access the computer........ (b)



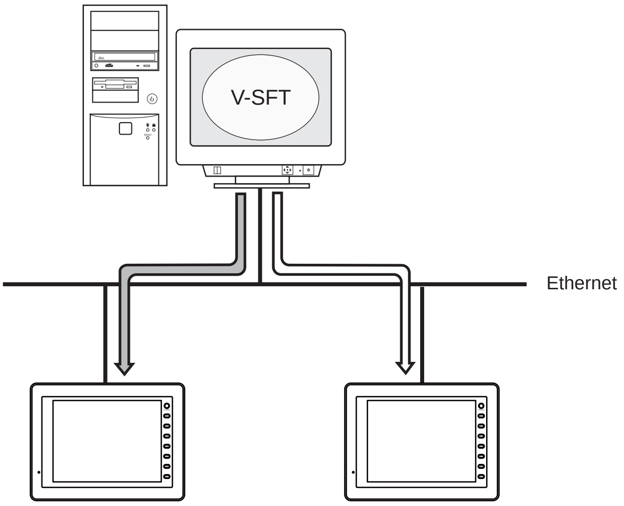
Setting Items

The following settings are required.

- IP address setting of the V8 series
  Make this setting in the [IP Address Setting] dialog of the V-SFT editor, or on the Main Menu screen of the V8 series.
  See page App2-7.
- Network table
  Set the IP address and port No. of the computer that is to be the send target for the macro command.
  This is not necessary if the SEND command is not used.
  See page App2-10.
- Macro command
  SEND
  See page App2-12.
- Applications that use HKEtn20.dll
  For details on HKEtn20.dll, refer to the separate V Series DLL Function Specifications manual.

Screen Data Transfer

Screen data can be sent from the computer to the V8 series using the editor.



Setting Items

The following settings are required to transfer screen data via an Ethernet connection.

- IP address setting of the V8 series
  Make this setting in the [IP Address Setting] dialog of the V-SFT editor, or on the Main Menu screen of the V8 series.
  See page App2-7.

For details on the transfer procedure, refer to the Operation Manual.

E-Mail

The e-mail send function can be used at the built-in LAN port.
For details on the e-mail send function, refer to the Reference Manual.

Web Server

The web server function can be used at the built-in LAN port.
For details on the web server function, refer to the Reference Manual.

IP Address Setting of the V8 Series

To use the Ethernet functions, it is necessary to set the IP addresses. Set the IP address either on the V8 unit or for screen data using the V-SFT editor.

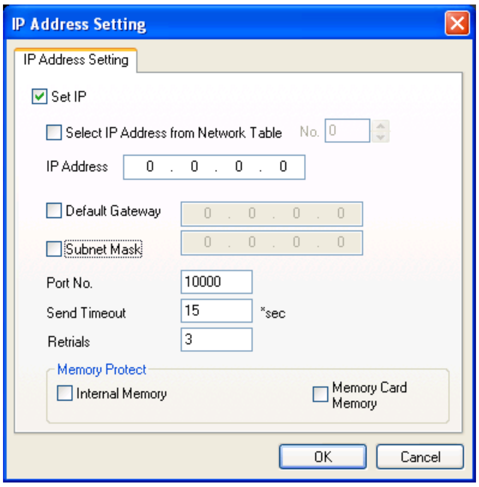
* If the IP is set in both of these ways, the IP address set by using the V-SFT editor is taken as the valid one.

1: Setting using the V-SFT Editor

Set the IP address using the V-SFT editor.

1. Select [System Setting] → [Ethernet Communication] → [Local Port IP Address]. The [IP Address Setting] dialog is displayed.

2. Check the [☐ Set IP] check box and set each item.



☐ Select IP Address from Network Table	This is valid when the IP address of the V8 has been registered in the network table. Select a network table number from 0 to 99 to set the IP address.
IP address *1	Set the IP address for the V8.
☐ Default Gateway *1	Set the default gateway.
☐ Subnet Mask *1	Set the subnet mask. When this box is not checked, the subnet mask is automatically assigned based on the byte at the extreme left of the IP address. Example: When IP address is "172.16.200.185", "255.255.0.0" is set. When IP address is "192.168.1.185", "255.255.255.0" is set.
☐ Port No. *1	Set a port number from 1024 to 65535. Other than 8001.
Send Timeout	Specify the timeout time to send the EREAD/EWRITE command.
Retrials	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Memory Protect ☐ Internal Memory ☐ Memory Card Memory	Check either check box to write-protect the memory from computers or other stations.

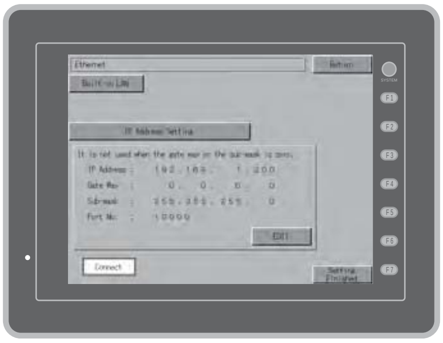
*1 For more information on each setting item, see page App2-9.

3. Click [OK].
4. Transfer the screen data to the V8 series.

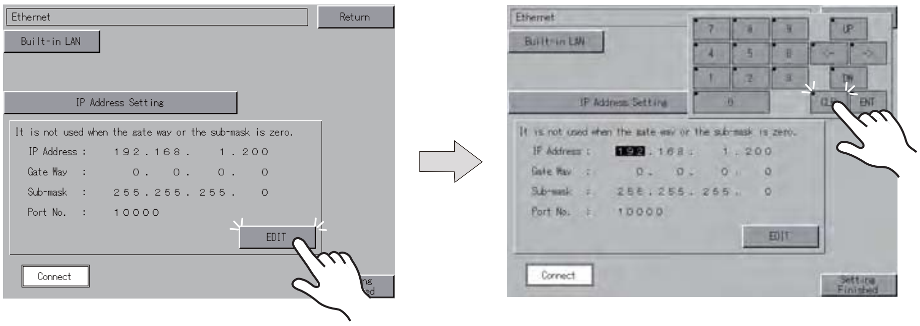
2: Setting on the Main Menu Screen of the V8 Series

Set the IP address on the Main Menu screen of the V8 series.
If IP address setting has been performed on the V-SFT editor, this setting will be taken as the valid one.

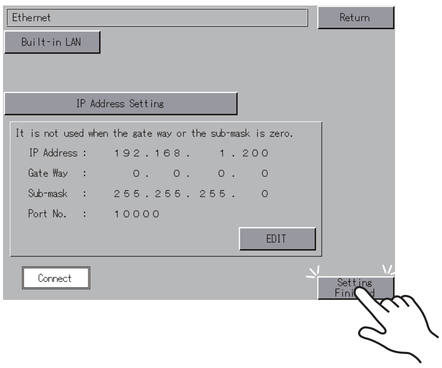
1. Press the [SYSTEM] switch at MONITOUCH to display the MODE menu.
2. With the MODE menu displayed, press the [F1] switch. The Main Menu screen is displayed.
3. Pressing the [Main Menu] switch at the top left corner brings up the drop-down window.
4. Press the [Ethernet] switch to display the Ethernet screen.



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

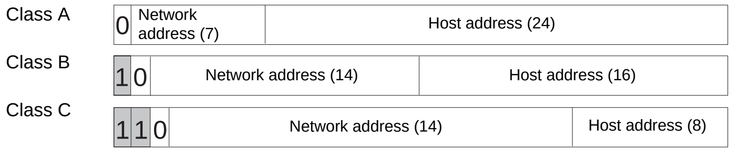


6. Press the [Setting Finished] switch to end setting. Check the IP address displayed at “Ethernet Information” on the Main Menu screen.



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 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.

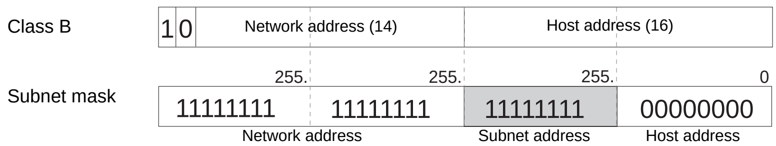
Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit data (from 0 to 65535).
The V8 series uses the port for screen data 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 network.

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.

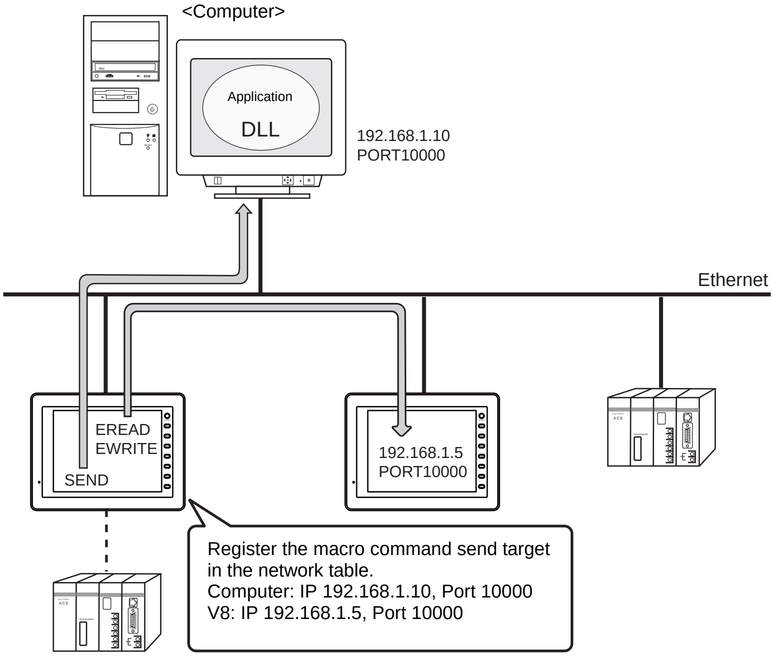


<Unusable subnet masks>

- All bits are set to “0”. → 0.0.0.0
- All bits are set to “1”. → 255.255.255.255

Network Table

- When macro commands EREAD/EWRITE/SEND are used, network table settings have to be made. Register the IP address and port number of the send target V8 series and computer in the network table of the V8 series that is the macro command send source.
  - Example

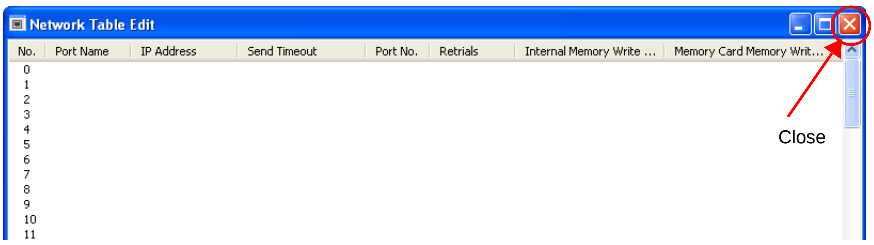


- The network table is transferred to the V8 series together with screen data.

Starting and Ending

Starting

Select [System Setting] → [Ethernet Communication] → [Network Table]. The [Network Table Edit] window is displayed.

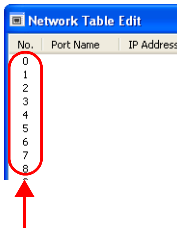


Ending

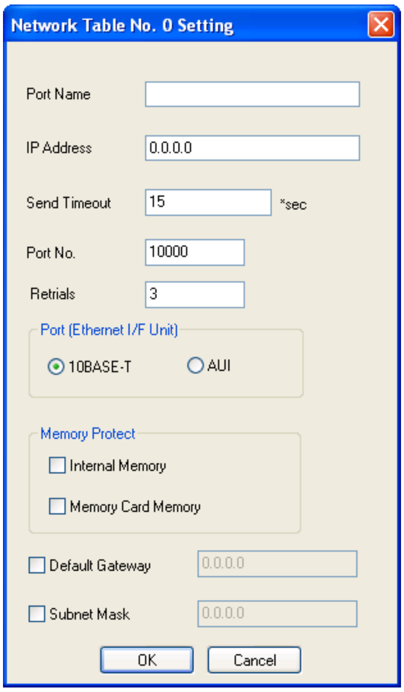
Click [File] → [Close], or click the [×] (close) button to end operation.

Network Table Setting

Double-clicking a number in the No. column displays a [Network Table Setting] dialog.



Network table number



Port Name	Set the name of the V8 or the computer.
IP Address*2	Set the IP address of the V8 or the computer.
Send Timeout*1	Specify the timeout time to send the EREAD/EWRITE command.
Port No.*2	Set the port number of the V8 or the computer.
Retrials*1	0 to 255 Set the number of retrials to be performed when a time-out occurs.
Port*1	10BASE-T: built-in LAN port, CU-03-3 AUI: CU-03-2
Memory Protect*1 ☐ Internal Memory ☐ Memory Card Memory	Check either check box to write-protect the memory from computers or other stations.
☐ Default Gateway*1 *2	Set the default gateway.
☐ Subnet Mask *1 *2	Set the subnet mask.

*1 Invalid if V8 units or PCs at other ports are registered. Only valid when set as the local port IP of the V8 unit.

*2 For more information on each setting item, see page App2-9.

Macro

This section explains the macro commands (SEND/EREAD/EWRITE) used for the Ethernet. For more information on macro commands, refer to the Macro Reference manual.

EREAD

EREAD F0 = F1 C : F2 F3

- Function: Read memory
  This macro command is used to read the data of words starting from memory address F1 of the device that communicates with the V8 series in the network table specified by F3 into memory address F0 of the device that communicates with the local port. The number of the words is specified in F2.

- Available memory

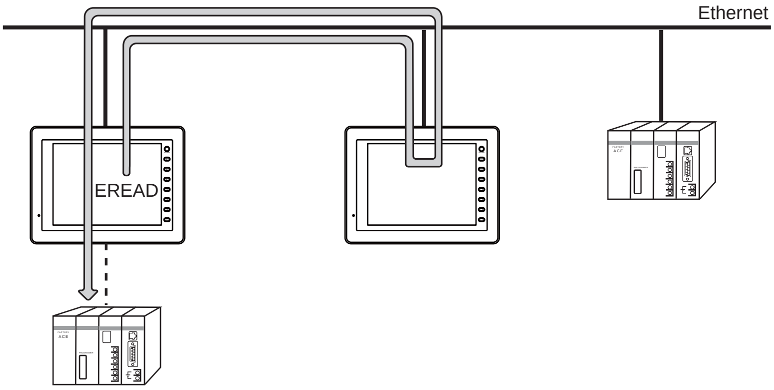
	Internal Memory	PLCn Memory	Memory Card	Constant
F0	◎	◎	◎	
F1	◎	◎	◎	
F2	◎			○
F3	◎			○

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Setting range

	Setting
F0	Top memory address of the target
F1	Top memory address of the source
F2	0 to 2000: The number of words to be transferred
F3	0 to 99: Network table number

- Example



EWRITE

EWRITE F0 F1 = F2 C: F3

- Function: Write to memory
  This macro command is used to write the data of words starting from memory address F2 of the device that communicates with the local port into memory address F0 of the device that communicates with the V8 series in the network table specified by F1. The number of the words is specified in F3.

- Available memory

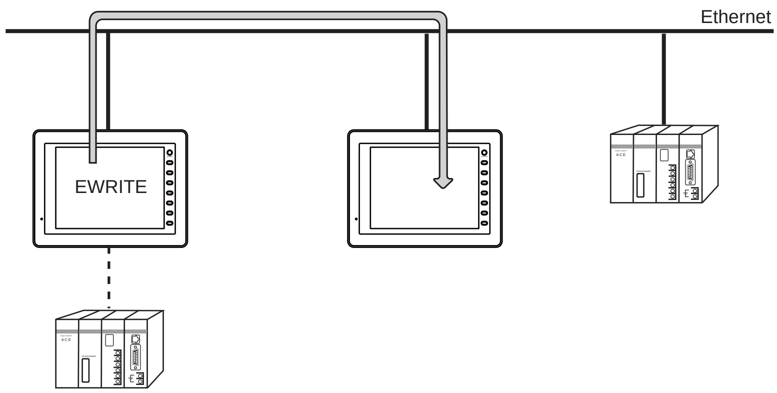
	Internal Memory	PLCn Memory	Memory Card	Constant
F0	◎	◎	◎	
F1	◎			○
F2	◎	◎	◎	
F3	◎			○

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Setting range

	Setting
F0	Top memory address of the target
F1	0 to 99: Transfer target (network table number)
F2	Top memory address of the source
F3	0 to 2000: The number of words to be transferred

- Example



SEND

SEND F0 C: F1 TO: F2

- Function: Transfer to server
  This macro command is used to transfer the data of words starting from the address specified in F0 to the server of the network table number in F2.

- Setting range

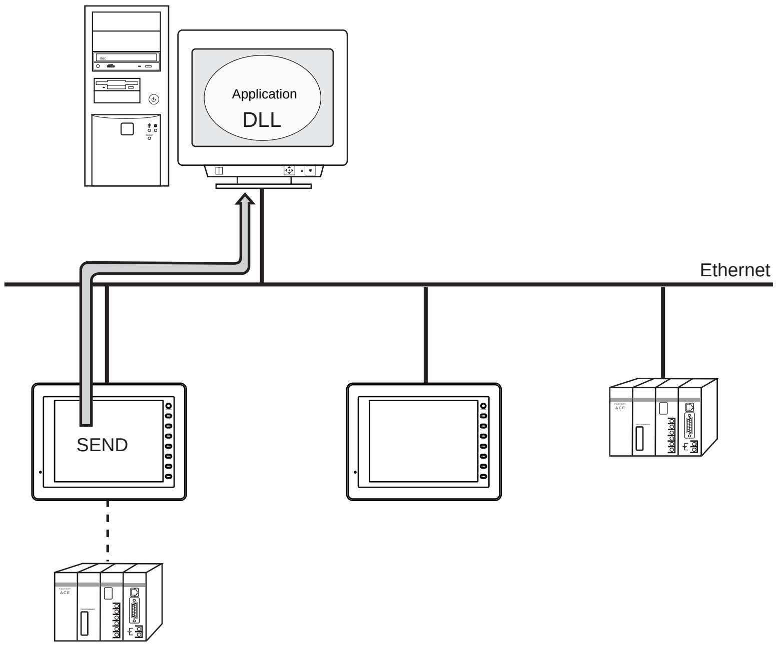
	Setting
F0	Top memory address of the target
F1	0 to 2000: The number of words to be transferred
F2	0 to 99: Transfer target (network table number)

- Available memory

	Internal Memory	PLCn Memory	Memory Card	Constant
F0	◎	◎	◎	
F1	◎			○
F2	◎			○

○: Setting enabled (indirect designation disabled)
◎: Setting enabled (indirect designation enabled)

- Example



System Memory

The Ethernet status is output to the system memory ($s) of the V8.
This section explains the memory addresses ($s514 to 619) where the Ethernet status is output.
For other memory addresses, refer to the V8 Series Reference Manual.

List

Address	Contents
⋮	⋮
$s514	Macro Wait request (0: no request, 1: request made)
515	Execution result when a macro wait request is made
516	
517	
518	Ethernet status
519	
520	Network table 0 status
521	Network table 1 status
522	Network table 2 status
523	Network table 3 status
524	Network table 4 status
525	Network table 5 status
526	Network table 6 status
527	Network table 7 status
528	Network table 8 status
529	Network table 9 status
530	Network table 10 status
531	Network table 11 status
532	Network table 12 status
533	Network table 13 status
534	Network table 14 status
535	Network table 15 status
536	Network table 16 status
537	Network table 17 status
538	Network table 18 status
539	Network table 19 status
540	Network table 20 status
541	Network table 21 status
542	Network table 22 status
543	Network table 23 status
544	Network table 24 status
545	Network table 25 status
546	Network table 26 status
547	Network table 27 status
548	Network table 28 status
549	Network table 29 status
550	Network table 30 status
551	Network table 31 status
552	Network table 32 status
553	Network table 33 status
554	Network table 34 status
555	Network table 35 status
556	Network table 36 status
557	Network table 37 status
558	Network table 38 status
559	Network table 39 status
560	Network table 40 status
561	Network table 41 status
562	Network table 42 status
563	Network table 43 status
564	Network table 44 status
565	Network table 45 status
566	Network table 46 status
567	Network table 47 status

Address	Contents
$s568	Network table 48 status
569	Network table 49 status
570	Network table 50 status
571	Network table 51 status
572	Network table 52 status
573	Network table 53 status
574	Network table 54 status
575	Network table 55 status
576	Network table 56 status
577	Network table 57 status
578	Network table 58 status
579	Network table 59 status
580	Network table 60 status
581	Network table 61 status
582	Network table 62 status
583	Network table 63 status
584	Network table 64 status
585	Network table 65 status
586	Network table 66 status
587	Network table 67 status
588	Network table 68 status
589	Network table 69 status
590	Network table 70 status
591	Network table 71 status
592	Network table 72 status
593	Network table 73 status
594	Network table 74 status
595	Network table 75 status
596	Network table 76 status
597	Network table 77 status
598	Network table 78 status
599	Network table 79 status
600	Network table 80 status
601	Network table 81 status
602	Network table 82 status
603	Network table 83 status
604	Network table 84 status
605	Network table 85 status
606	Network table 86 status
607	Network table 87 status
608	Network table 88 status
609	Network table 89 status
610	Network table 90 status
611	Network table 91 status
612	Network table 92 status
613	Network table 93 status
614	Network table 94 status
615	Network table 95 status
616	Network table 96 status
617	Network table 97 status
618	Network table 98 status
619	Network table 99 status

Addresses

$s514, 515

These addresses are related to macro commands [SEND], [EREAD] and [EWRITE].

- $s514: Set the presence or absence of a macro wait request.
  - [0]: No wait
    When a macro command is executed, there is no wait for the completion of that command before the next macro command is executed.
  - [Other than 0]: Wait imposed
    When a macro command is executed, the wait status continues until the command completes, and then the next macro command is executed.

  * If the same port is accessed for execution of commands on one macro sheet, a value other than “0” must be set to impose a wait. If “0” (no wait) is set, the macro command executed next is deleted.

- $s515: Stores the result of macro execution.

  * If the data at $s514 is “0” the information up to the command request is stored here. If the data at $s514 is other than “0” the response from the request target is stored here.

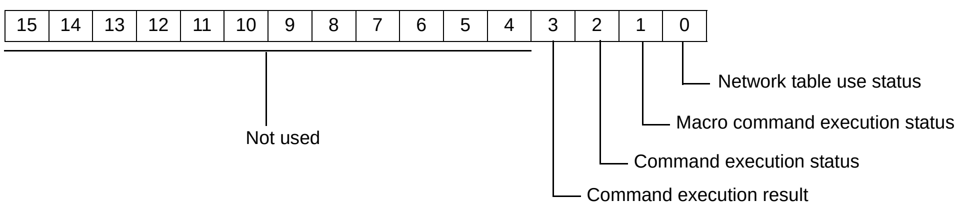
Code	Contents	Solution
0	Normal	-
200 to 2000	Communication error	See “Communication Error”.
–30	Timeout	Check if an error is occurring to the target V8.
–31	The number of words being sent exceeds the limit.	Check the number of words that can be sent in macro editing.
–32	Specified table not used	Check the setting on the network table.
–33	Cannot use the send command.	Check the macro command in macro editing.
–34	Specified table being used	Check that system memory address $s514 is set. If not, reduce the frequency of communications.
–35	Cannot process due to short memory	Check the memory space at the target station.
–36	Illegal receive packet bytes	Check the requested number of words.
–37	Memory access error	Check the setting of the requested memory.
–38	Macro setting error	Check the macro setting.
–39	Command processing not possible at send target (local mode, communication error)	After recovery of the target V8 series, execute the macro command again.

$s518

Stores the current status of the Ethernet. An error occurs if a value other than “0” is stored. For more information, see the error codes (page App2-19).

$s520 to 619

Stores the statuses of network table No. 0 to 99.



- Bit 0 (Network table use status)
  [0]: Not used [1]: Used
  For the current station, “0” (not used) is input.
- Bit 1 (Macro command execution status)
  Stores the execution status of macro command [SEND], [EREAD] or [EWRITE].
  [0]: Waiting [1]: Executing
- Bit 2 (Command execution status)
  Stores the execution status of the command from the server or other station.
  [0]: Waiting [1]: Executing (read/write command)
- Bit 3 (Macro command execution result)
  Stores the execution result of macro command [SEND], [EREAD] or [EWRITE].
  [0]: Normal [1]: Error
- Bits 4 to 15 (System reserved)
  Not used at present. Always set “0”.

Error Display

The errors displayed at the V8 series in Ethernet communications are described here. For details on other errors, refer to the Reference Manual.

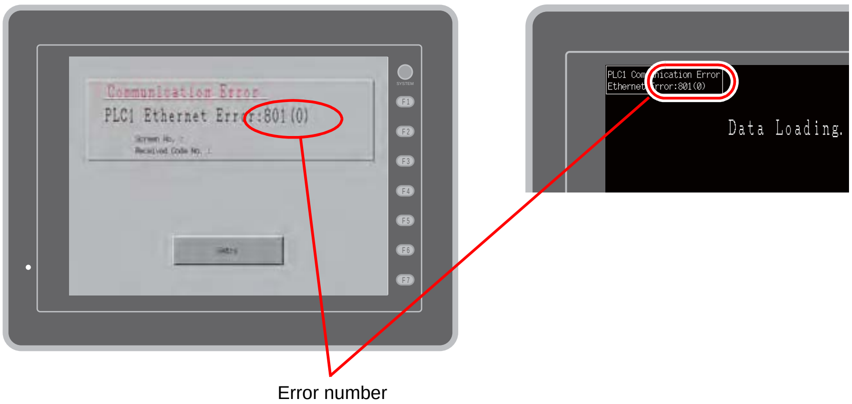
Communication Error

Ethernet error

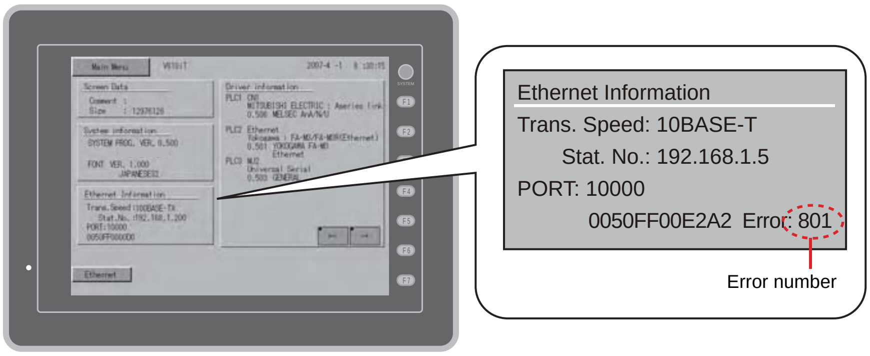
The Ethernet status is stored in system memory address $s518.
"Ethernet Error" occurs when a code other than "0" (normal) is stored in system memory address $s518.

- RUN screen

  - Communication error processing: Stopped
  - Communication error processing: Continued



- Main Menu screen



- Error number (This is the same as the value stored at system memory address $s518.)

No.	Contents	Solution
0	Normal	-
200	Failed in send request	Check cable connection and network table setting of the target station.
201	Send error	Check that the setting on the target station is consistent with the network table setting.
202	Internal port error	The communication unit is in the older version or is faulty.
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.
206	TCP connection end error	TCP communication disconnection has failed. Check that the communication partner with the V8 series is present on the line.
207	TCP send error	TCP communication has failed. Check the communication lines.
350	Send buffer full	The line is busy. Consult the network administrator of your company. The communication unit is in the older version or is faulty.
351	IC receive buffer overflow	
352	Driver receive buffer overflow	
801	Receive processing error 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.
802	Transceiver error	Check the transceiver and cable connection.
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	
902	Send socket ID error (error that may occur when V7i LAN port is used)	Turn the power off and back on again. If the problem persists, contact your local distributor.
1000	Ethernet I/F unit not mounted	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, contact your local distributor.
1001	Ethernet I/F unit not ready	
1002	Ethernet I/F unit DPRAM error	
1003	No response from Ethernet I/F unit	
1004	Ethernet receive buffer over	
1005	Ethernet send registration error	
1006	I/F unit unregistered interrupt	
1100 to 1115	Initialization error (communication unit)	
1120	Dual port access error	
1200	Undefined register	
1201	Send/receive buffer area over	
1202	MAC address error	
1203	Port error	Check whether the Ethernet I/F unit is mounted correctly, and then turn the power off and on. If the problem persists, contact your local distributor.
1301	Watch dog overflow	
1302	JAVA error LANC error	

MEMO

Please use this page freely.

Appendix 3   System Memory

The V8 series has system memories $s and $Pn.

$s

The memory addresses $s0 to 2047 (2 k words) are for system use. Data can be read from and write to these areas. For more information, refer to the V8 Series Reference Manual.

$s0000 : $s1023	1 k words (compatible with V7)
$s1024 : $s2047	1 k words (dedicated to V8)

$Pn

This is the system memory for 8-way communications, and there are 512 words 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	Memory Type
000	111 (PLC1)	V8 local port number Stores the local port number of the V8 series. (Universal serial communication, slave communication, etc.)	← V
:	-	:	
004	130 (PLC1)*2	Modbus TCP/IP Sub Station communications Relay station No. designated 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.	→ V
:	-	:	
010	128 (PLC1)	With 1 : n connection Link down information (station No. 0 - 15) 0 : Normal 1 : Down	← V
011	129 (PLC1)	With 1 : n connection Link down information (station No. 16 - 31) 0 : Normal 1 : Down	
012	114 (PLC1)	With 1 : n connection Link down information (station No. 32 - 47) 0 : Normal 1 : Down	
013	115 (PLC1)	With 1 : n connection Link down information (station No. 48 - 63) 0 : Normal 1 : Down	
014	116 (PLC1)	With 1 : n connection Link down information (station No. 64 - 79) 0 : Normal 1 : Down	
015	117 (PLC1)	With 1 : n connection Link down information (station No. 80 - 95) 0 : Normal 1 : Down	
016	118 (PLC1)	With 1 : n connection Link down information (station No. 96 - 111) 0 : Normal 1 : Down	
017	119 (PLC1)	With 1 : n connection Link down information (station No. 112 - 127) 0 : Normal 1 : Down	
018	120 (PLC1)	With 1 : n connection Link down information (station No. 128 - 143) 0 : Normal 1 : Down	
019	121 (PLC1)	With 1 : n connection Link down information (station No. 144 - 159) 0 : Normal 1 : Down	
020	122 (PLC1)	With 1 : n connection Link down information (station No. 160 - 175) 0 : Normal 1 : Down	
021	123 (PLC1)	With 1 : n connection Link down information (station No. 176 - 191) 0 : Normal 1 : Down	
022	124 (PLC1)	With 1 : n connection Link down information (station No. 192 - 207) 0 : Normal 1 : Down	
023	125 (PLC1)	With 1 : n connection Link down information (station No. 208 - 223) 0 : Normal 1 : Down	
024	126 (PLC1)	With 1 : n connection Link down information (station No. 224 - 239) 0 : Normal 1 : Down	
025	127 (PLC1)	With 1 : n connection Link down information (station No. 240 - 255) 0 : Normal 1 : Down	
:	-	:	
099	-	Error information hold (page App3-4) $Pn: Setting for the update timing of the 010 to 025 link down information 0: Always updated with the latest information Other than 0: Only updated when a communication error occurs	→ V
100	730 (PLC2)	Error status Station No. 00 status (page App3-4)	← V
101	731 (PLC2)	Error status Station No. 01 status (page App3-4)	
102	732 (PLC2)	Error status Station No. 02 status (page App3-4)	
103	733 (PLC2)	Error status Station No. 03 status (page App3-4)	
104	734 (PLC2)	Error status Station No. 04 status (page App3-4)	
105	735 (PLC2)	Error status Station No. 05 status (page App3-4)	
106	736 (PLC2)	Error status Station No. 06 status (page App3-4)	
107	737 (PLC2)	Error status Station No. 07 status (page App3-4)	
108	738 (PLC2)	Error status Station No. 08 status (page App3-4)	
109	739 (PLC2)	Error status Station No. 09 status (page App3-4)	
110	740 (PLC2)	Error status Station No. 10 status (page App3-4)	
:	:	:	
120	750 (PLC2)	Error status Station No. 20 status (page App3-4)	
:	:	:	
130	760 (PLC2)	Error status Station No. 30 status (page App3-4)	
131	761 (PLC2)	Error status Station No. 31 status (page App3-4)	
132	820 (PLC2)	Error status Station No. 32 status (page App3-4)	
133	821 (PLC2)	Error status Station No. 33 status (page App3-4)	
:	:	:	
140	828 (PLC2)	Error status Station No. 40 status (page App3-4)	

$Pn (n = 1 to 8)	$s*1	Contents	Memory Type
:	:	:	← V
150	838 (PLC2)	Error status Station No. 50 status (page App3-4)	
:	:	:	
160	848 (PLC2)	Error status Station No. 60 status (page App3-4)	
:	:	:	
170	858 (PLC2)	Error status Station No. 70 status (page App3-4)	
:	:	:	
180	868 (PLC2)	Error status Station No. 80 status (page App3-4)	
:	:	:	
190	878 (PLC2)	Error status Station No. 90 status (page App3-4)	
:	:	:	
199	887 (PLC2)	Error status Station No. 99 status (page App3-4)	
200	-	Error status Station No. 100 status (page App3-4)	
:	:	:	
350	-	Error status Station No. 250 status (page App3-4)	
:	:	:	
355	-	Error status Station No. 255 status (page App3-4)	
:	:	:	
493	762 (PLC2)*3	Device memory map reading prohibited flag (page App3-5) 0: Periodical reading/synchronized reading executed Other than 0: Periodical reading/synchronized reading stopped	→ V
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 communication down 0: The macro is not executed in relation to any of the stations. Other than 0: The macro is executed in relation to connected stations.	
495	764 (PLC2)*3	Device memory map writing prohibited flag (page App3-5) 0: Periodical writing/synchronized writing executed Other than 0: Periodical writing/synchronized writing stopped	
:	-	:	
500	800 (PLC3)	Memory for Modbus slave communications Used for reference table No. and free area 31 reference memory setting $Pn500 to 505 are exclusively for monitoring: $s800 to 805 are used for writing from the Modbus master. Refer to the Modbus Slave Communication manual.	→ V
501	801 (PLC3)		
502	802 (PLC3)		
503	803 (PLC3)		
504	804 (PLC3)		
505	805 (PLC3)		
:	:	:	
508	765 (PLC2)	Error response code (page App3-6) If “800BH” (error code received) is stored for the error status ($Pn100 to 355), it is possible to check he error code.	← V
509	766 (PLC2)		
510	767 (PLC2)		
511	768 (PLC2)		

*1 For PLC1, check the [□System memory ($s) V7 Compatible] check box in the [Detail] tab window of the [Device Connection Setting] dialog. The same information is stored in the $P1 memory and $s.

*2 If designating the relay station number using $s130, check the [□System memory ($s) V7 Compatible] check box in the [Detail] tab window of the [Device Connection Setting] dialog for PLC1. $SP1: 004 cannot be used in this case.

*3 If executing device memory map control using $s762, $s763 and $s764, check the [□System memory ($s) V7 Compatible] check box in the [Detail] tab window of the [Device Connection Setting] dialog for PLC2. Note that $P2: 493/494/495 cannot be used in this case.

Detail

$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: 11 is set (ON).

Station No. 31 | Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Station No. 18 Link down

After resetting communications

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

Station No. 31 | Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Station No. 18 Normal communication

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

Station No. 31 | Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Station No. 18 Link down

$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.

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 0 to 14 is not “0”.

Error	Detail	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 occurs on the connected device.	Refer to the instruction manual for the PLC.
Buffer full	The V8 buffer is full.	Contact your local distributor.
Parity	An error occurred in parity check.	Implement solutions 2 and 3.
Overrun	After one character is received, the next character is received before internal processing is completed.	Implement solutions 1 and 3.
Framing	Although the stop bit must be “1”, it is detected as “0”.	Implement solutions 1, 2, and 3.
Break detection	The connected device’s SD remains at the low level.	Examine the connection with the connected device’s SD/RD.

- Solution
  1) Check if the communication settings of the V8 series 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 suggestions above, contact your local distributor.

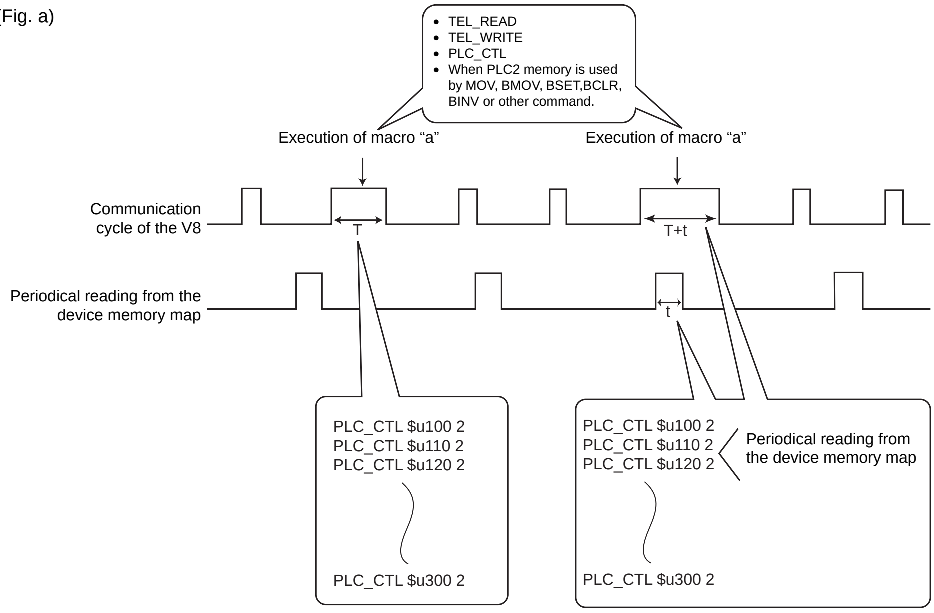
$Pn: 493, 495

Periodical or synchronized reading set in the [Device Memory Map Setting] dialog is suspended.

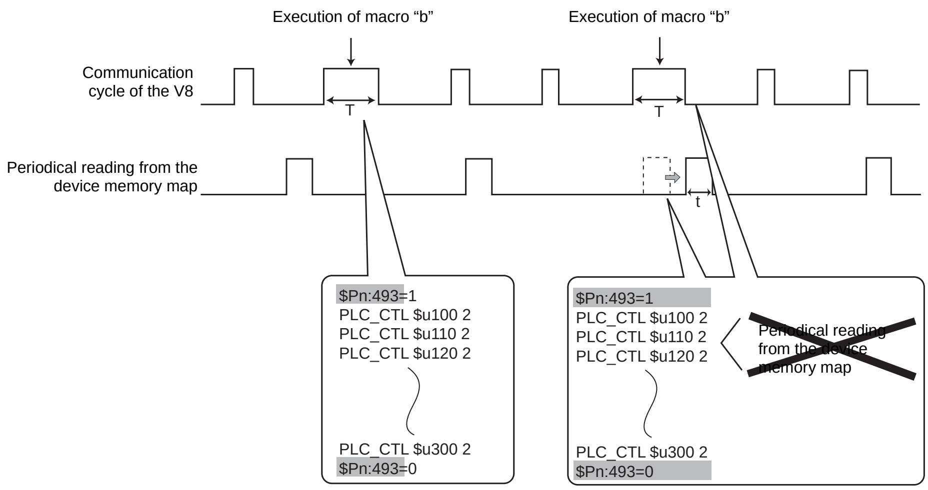
- 0: Periodical/synchronized reading is performed.
- Other than 0: Periodical/synchronized reading is suspended.

- Example: Periodical reading
  If periodical reading of the device memory map is performed while the PLC2 memory is being accessed using a macro command, the macro execution will be delayed (Fig. a). To avoid this, periodical reading can be suspended using memory address $s762 (Fig. b).

(Fig. a)



(Fig. b)



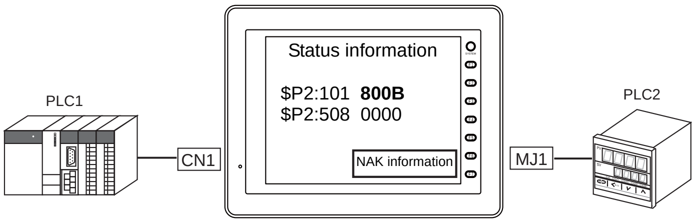
$Pn: 508 to 511

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

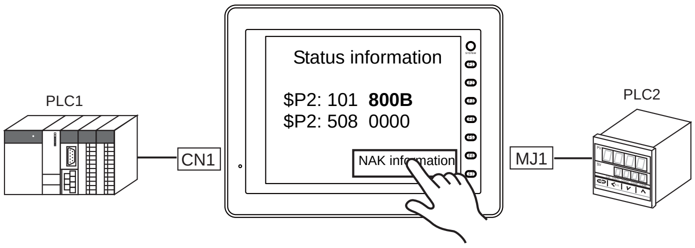
Notes on Use • Use $u/$T as the target internal memory. • Use the macro command MOV (W). MOV (D) cannot be used. • “0” is stored for devices that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

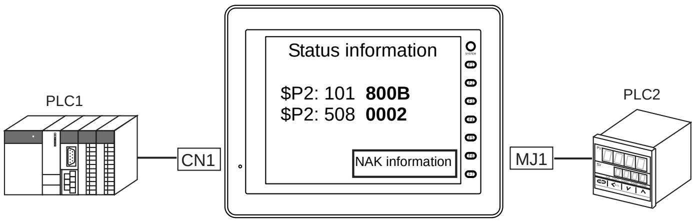
1) On receipt of an error code at station No. 1 of PLC2, “800BH” is stored in $P2: 101.



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

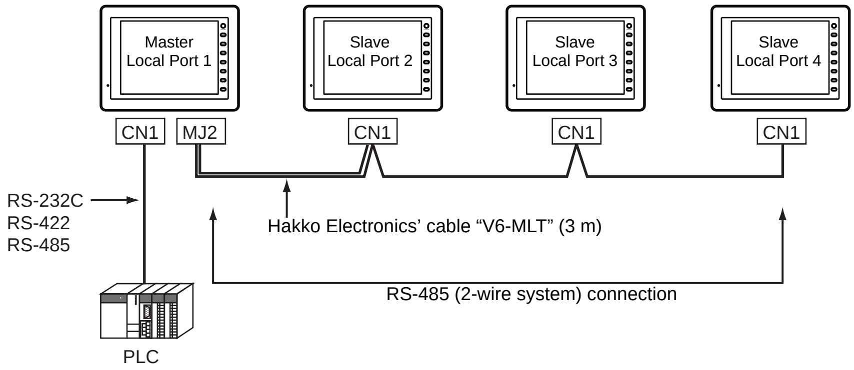


4) The PXR manual shows that code 002H means “memory address range exceeded”.
   Amend the screen data address designation.

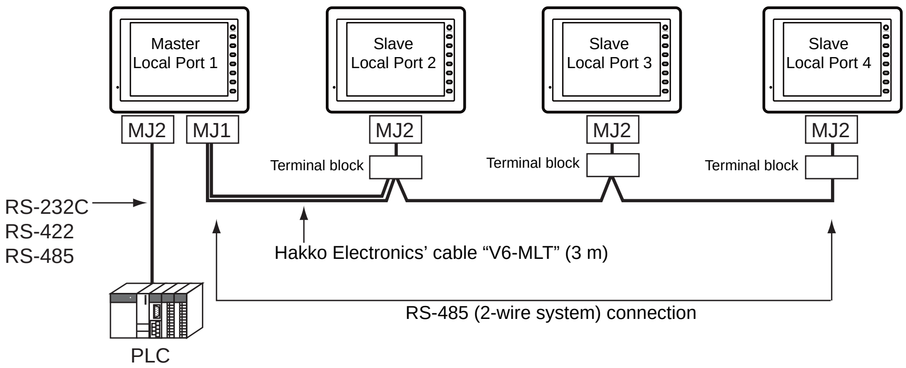
Appendix 4 n : 1 Connection

Appendix 4.1 Multi-link2

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



  - Connection example 2:

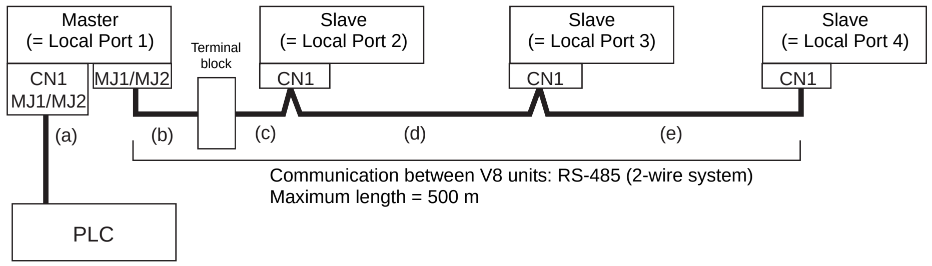


- You can make settings for multi-link2 in the [Communication Setting] tab window for PLC1. Therefore, multi-link2 connection is not possible concurrently with a network connection that uses a "CU-xx" communication interface unit.
- Multi-link2 enables PLC1 memory data to be shared among the V8 units. However, sharing data of PLC2 - PLC8 is not possible.
- The V7 and V6 series cannot be used together.
- Communication speed between the master and the PLC depend on the setting made on the PLC. The maximum communication speed between V8 units is 115 kbps, which is higher than the one available with multi-link connection described in "Appendix 4.2 Multi-link".
- 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. At this time, use Hakko Electronics' cable "V6-MLT" for multi-link2 master.

System Configuration and Wiring Diagram

Connection Method 1

Connecting the MJ1/MJ2 of the master to the CN1s of the slaves



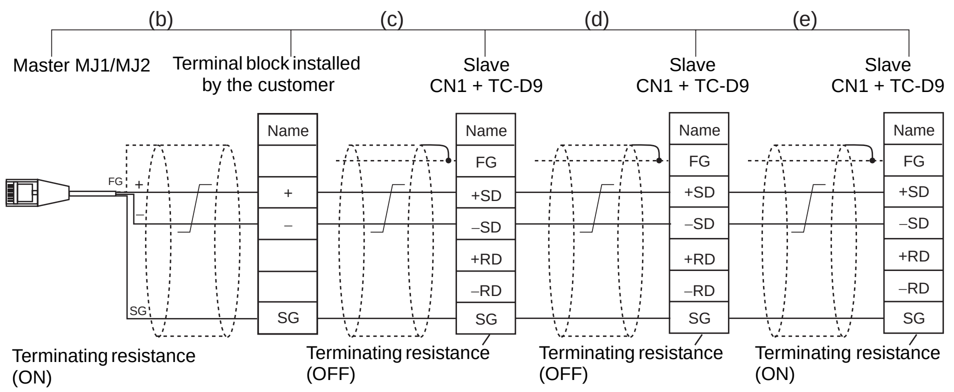
(a) Connection from master to PLC
Select the port for connection from among CN1, MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

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

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

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

Wiring diagram

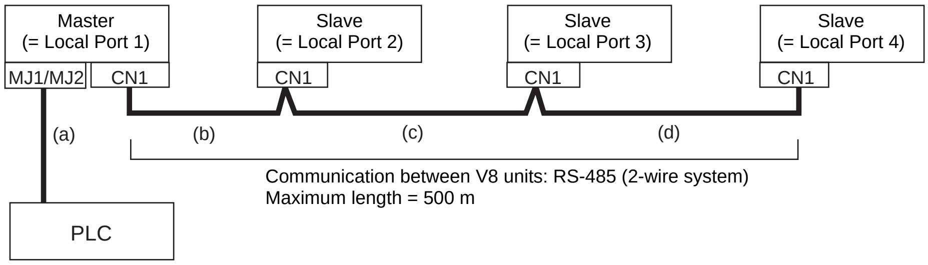


* As a measure against noise, connect the frame ground terminal of each V8 series at one side only.
The frame ground of V6-MLT must be connected to the V8 series.

* Set the slide switch of the optional unit "TC-D9" to ON (2-wire system). When the terminal converter "TC-D9" is not used, install jumpers between +RD/+SD and –RD/–SD.

Connection Method 2

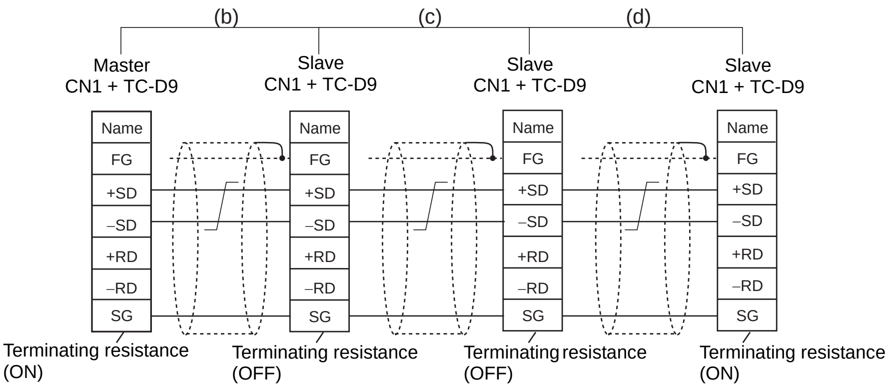
Connecting the CN1 of the master to the CN1s of the slaves



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

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

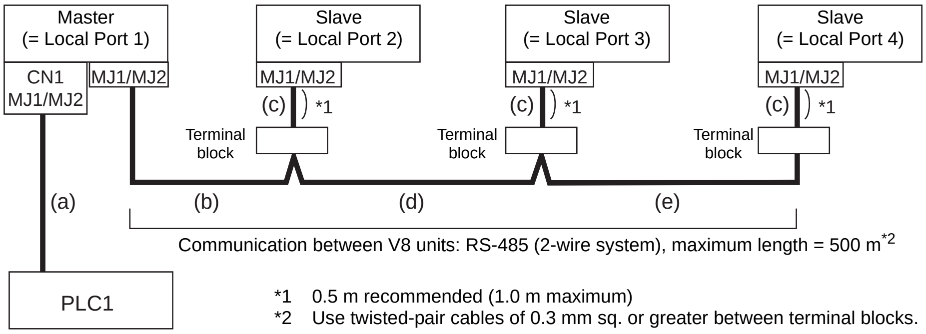
Wiring diagram



* As a measure against noise, connect the frame ground terminal of each V8 series at one side only.
* Set the slide switch of the optional unit “TC-D9” to ON (2-wire system). When the terminal converter “TC-D9” is not used, install jumpers between +RD/+SD and –RD/–SD.

Connection Method 3

Connecting the MJ1/2 of the master to the MJ1/MJ2 ports of the slaves



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

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

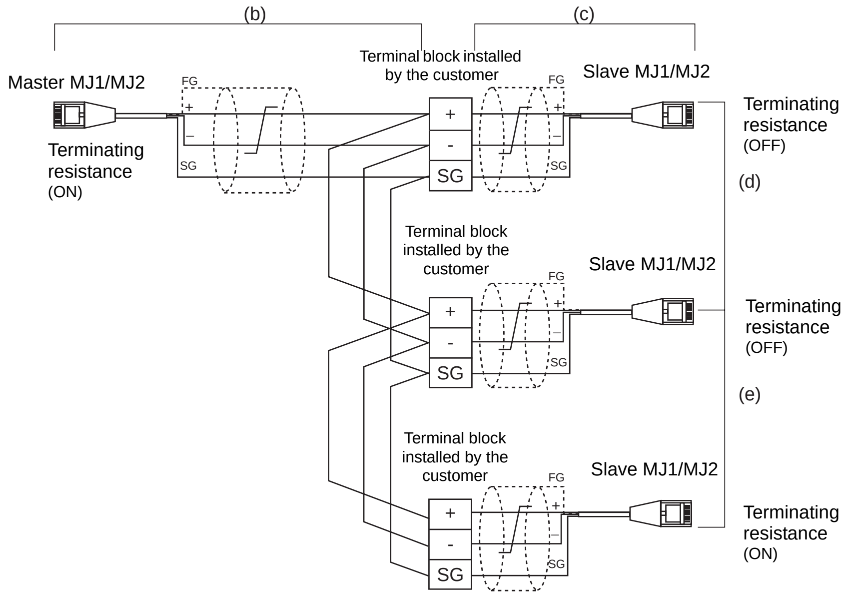
(b) Connection between master and terminal block
Choose the connecting port of the master between MJ1 and MJ2.
Use the “V6-MLT” cable (3 m). For the cable, use V6-MLT (3 m). Connect the terminals of this cable to a terminal block that you have prepared.

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

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

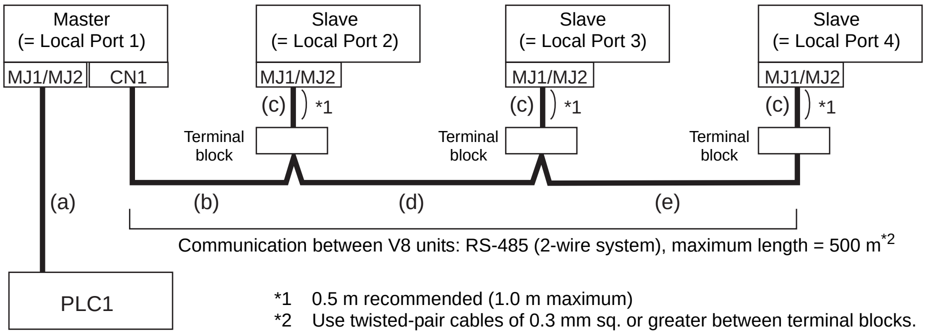
(b) (c) (d) The maximum length of the wiring among the master and slave is 500 m.

Wiring diagram



Connection Method 4

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

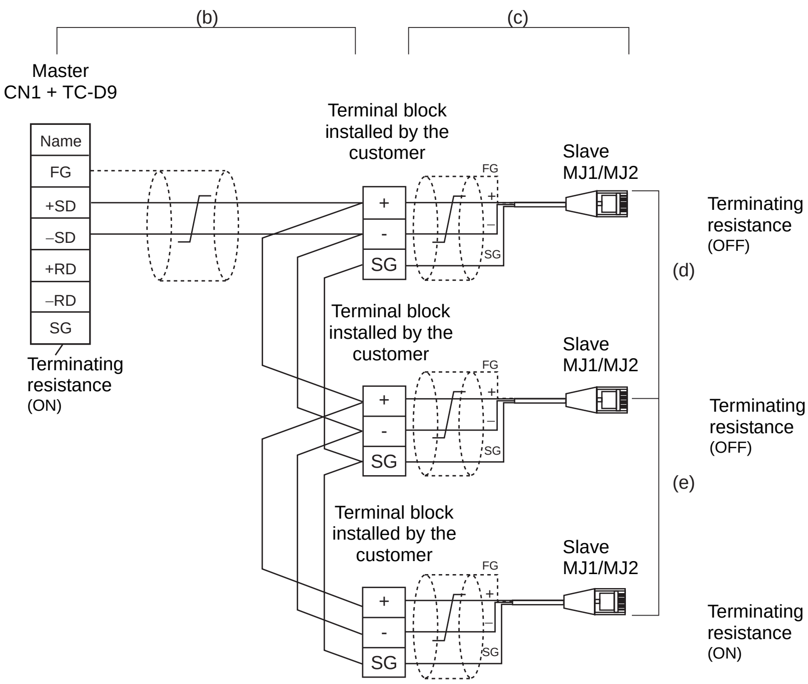


(a) Connection from master to PLC
Choose the connection port between MJ1 and MJ2.
The communication settings and connection method are the same as those for 1 : 1 connection.

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

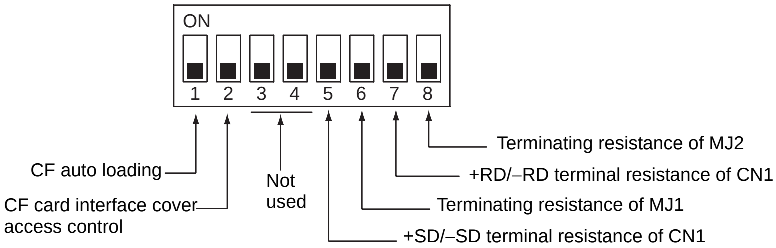
(C) Connection between terminal block and slave
The connecting port of the slave should be MJ1 or MJ2.
Use the “V6-MLT” cable (3 m).

Wiring diagram



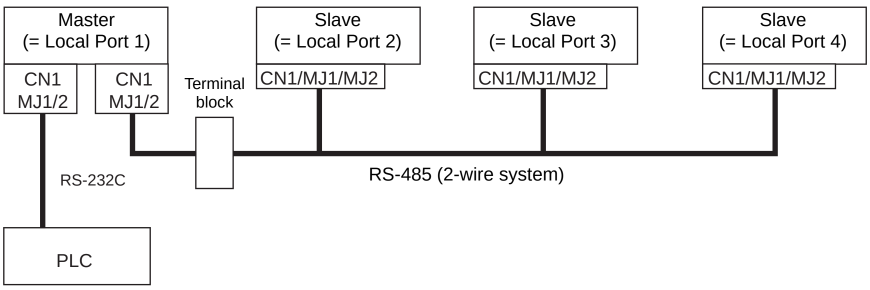
Terminating Resistance Setting

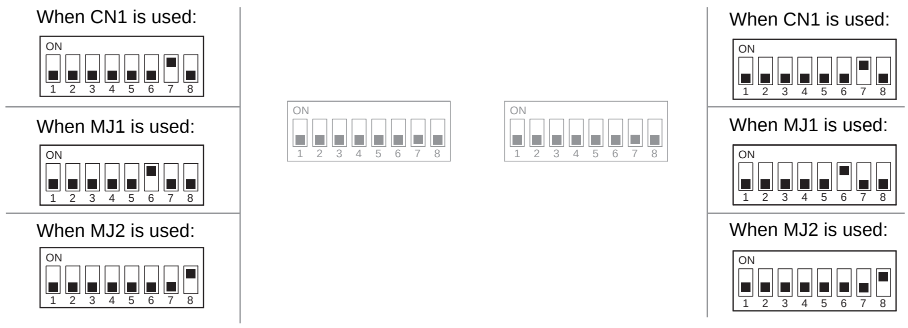
The terminating resistance should be set on the DIP switch.



When the PLC Is Connected to the Master via RS-232C:

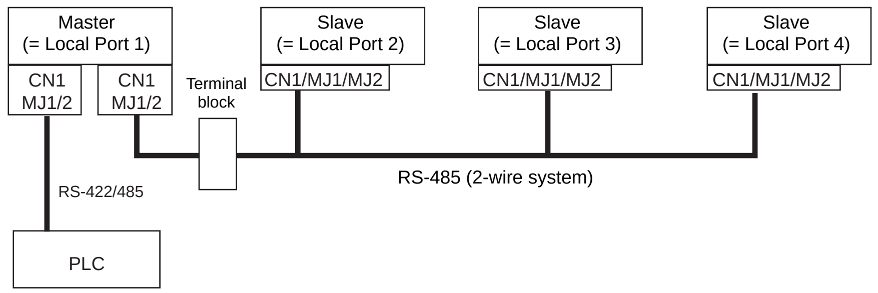
There is no terminating resistance setting for communications between the master and the PLC. Set terminating resistances for connections between V8 units.

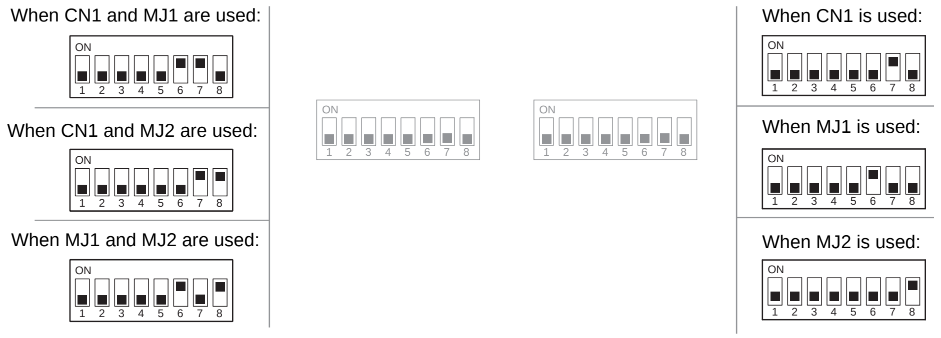




When the PLC Is Connected to the Master via RS-422/485:

Make terminating resistance settings for communications between the master and PLC, and between V8 units.



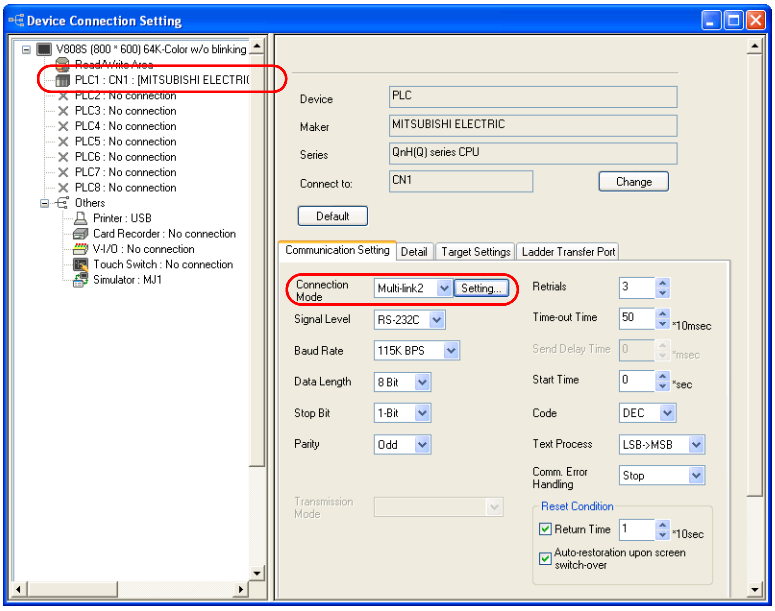


Setting on the Editor

The settings for Multi-link2 are covered below. The differences with respect to a 1 : 1 connection and the points where care is required are explained here.

Communication Setting

[System Setting] → [Device Connection Setting] → [PLC1] → [Communication Setting]

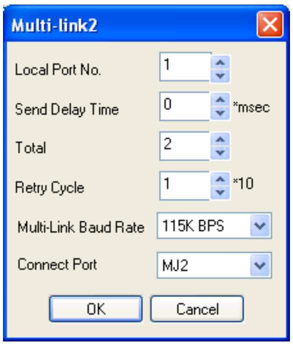


Connection Mode	Multi-link2

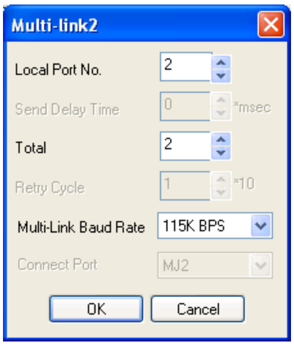
Multi-link2

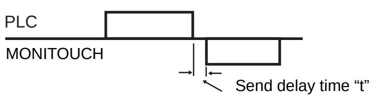
Click the [Setting] button next to [Connection Mode: Multi-link2] to display the [Multi-link2] dialog, then make the necessary settings in this dialog.
For a master, set all of the items. For a slave, set only those items marked "♦".

- Master



- Slave



Local Port No.♦	1 to 4 Specify a port number of the V8 series. 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 V8 unit, the system will not operate correctly.
Send Delay Time	Specify a delay time that elapses before V8 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 V8 units connected in the "Multi-link2" connection. The setting must be the same as other V8 series on the same communication line.

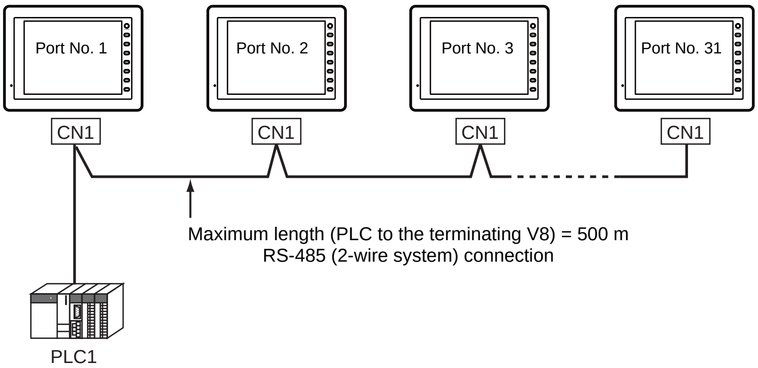
Retry Cycle	Set the number of cycles before the master sends an inquiry for restoration to the slave that has a communication problem (= system down). When a slave has a problem, it is temporarily removed from the communication targets, and the master sends an inquiry for restoration every number of 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: It will not take a long time before restoration. When the setting value is large: It will take a longer time before restoration.
Multi-Link Baud Rate♦	4800, 9600, 19200, 38400, 57600, 115 kbps Set the baud rate between V8 series units. The setting must be the same as other V8 series units on the same communication line.
Connect Port	CN1/MJ1/MJ2 Set the port to be connected to slaves.

Communication Error

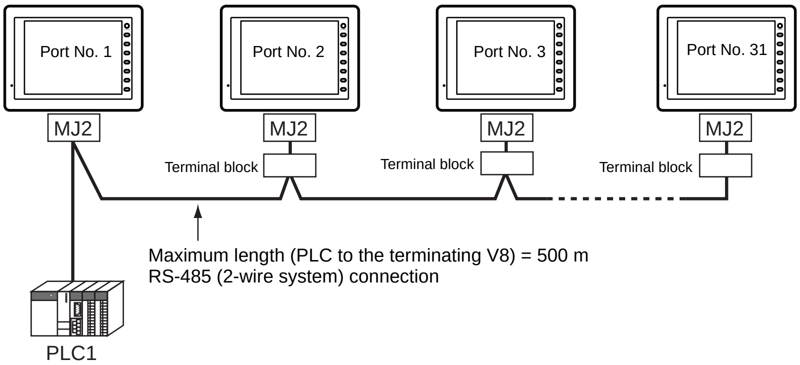
- If the master station has a communication error, the master and slave stations do not work, and as a result, "Communication Error Time-Out" is displayed.
  If a slave station becomes faulty, the communication error (check) occurs only on this station.

Appendix 4.2 Multi-link

- One PLC is connected to a maximum of 31 V8 units. The V8, V7, and V6 series can be used together.
  - Connection example 1:



  - Connection example 2:



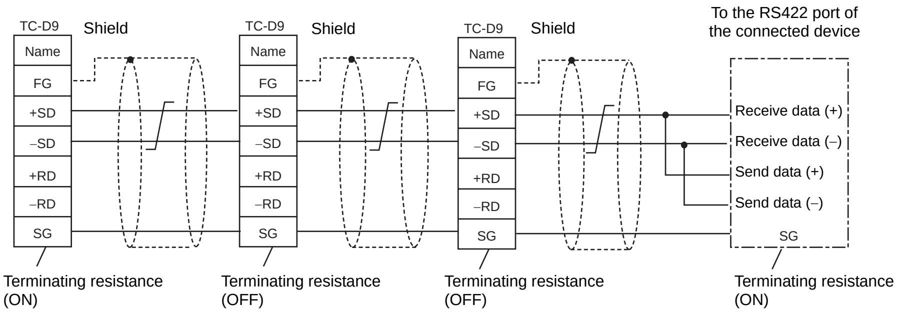
- You can make settings for multi-link at the PLC1. For the V8 series, a physical port is selectable from CN1, MJ1, and MJ2. For the V7 or V6 series, however, use CN1 only.
- Only a PLC for the signal level RS422/RS485 and with a port number is available. RS-485 (2-wire system) connection is adopted to connect a V-series 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.

Wiring Diagrams

When Connected at CN1:

The situation when the multi-link connection is made at CN1 is shown here. It is convenient to use Hakko Electronics' "TC-D9" (terminal converter) optionally available for this connection.

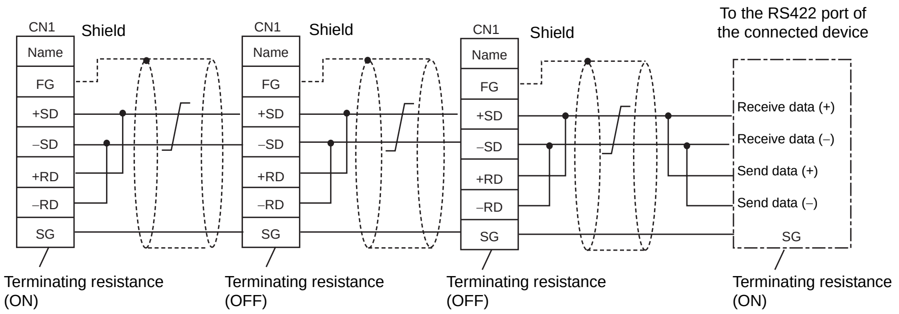
- When a TC-D9 is used:
  Set the slide switch of "TC-D9" to ON (2-wire system).



* Use shielded twist-pair cables.

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

- When no TC-D9 is used:



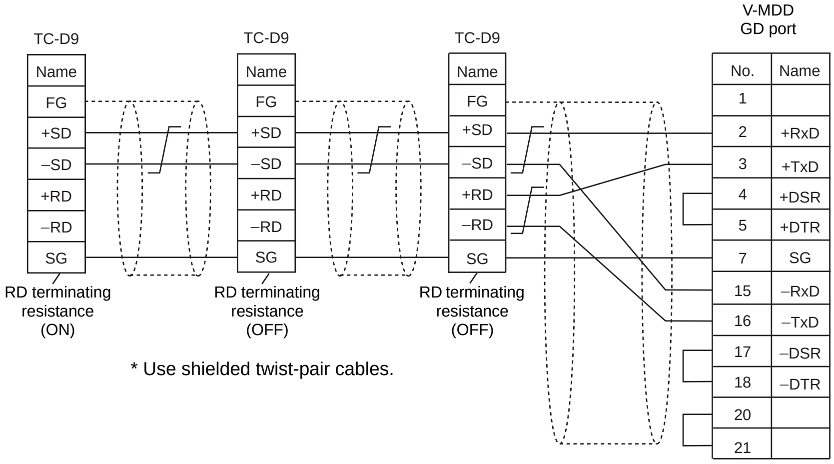
* Use shielded twist-pair cables.

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

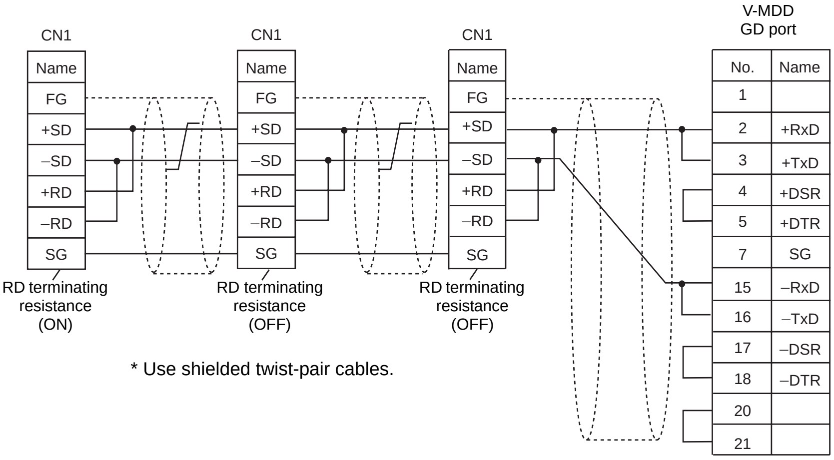
When connecting to Mitsubishi Electric's QnA CPU:

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

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

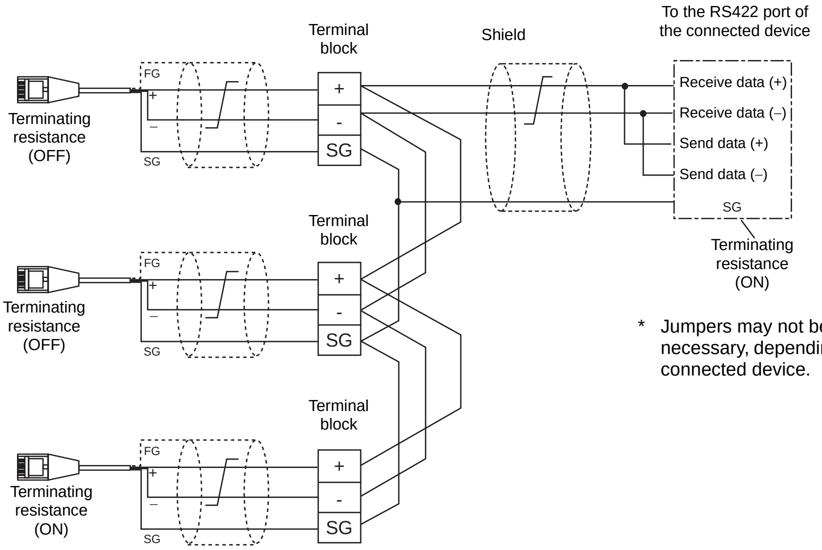


- When a TC-D9 is not used
  Install jumpers between +RD/+SD and –RD/–SD.



When Connected at MJ1/MJ2:

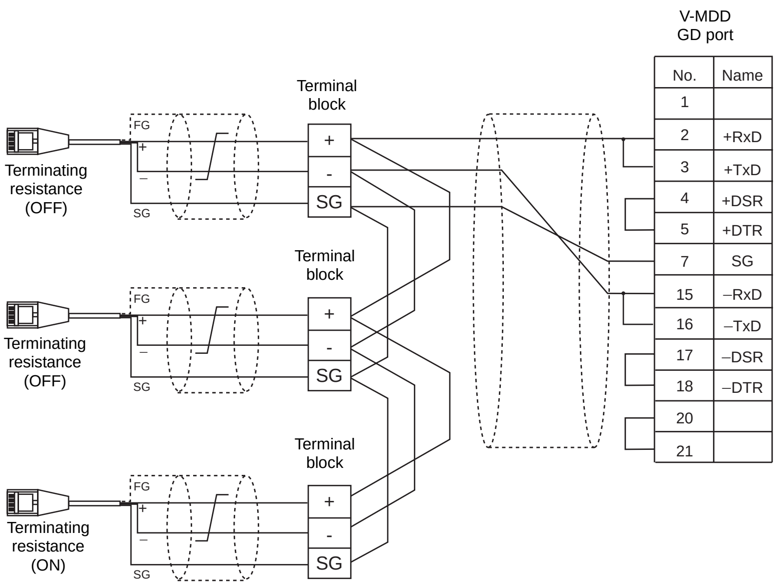
This shows the situation when a multi-link connection is made at MJ1 or MJ2.



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

When connecting to Mitsubishi Electric's QnA CPU:

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



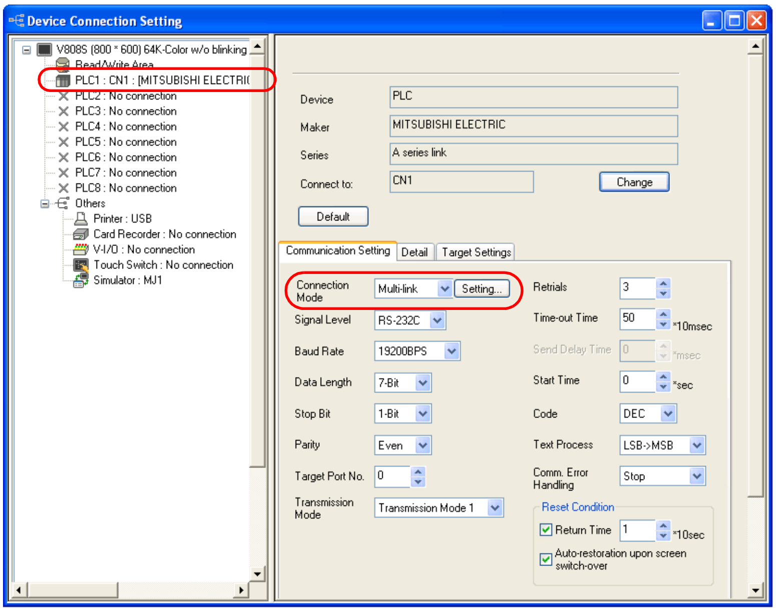
Setting on the Editor

The settings for Multi-link are covered below. The differences with respect to a 1 : 1 connection and the points where care is required are explained here.

PLC selection

Select the PLC corresponding to the multi-link connection in the [Communication Setting] tab window ([System Setting] → [Device Connection Setting] → [PLC1]).

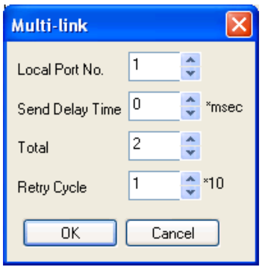
Communication Setting

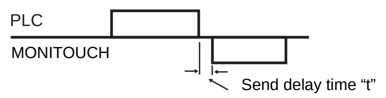


Connection Mode	Multi-link

Multi-link

Click the [Setting] button next to [Connection Mode: Multi-link] to display the [Multi-link] dialog, then make the necessary settings in this dialog.



Local Port No.	1 to 32 Specify a port number of the V8 series. Note that if the port number specified is the same as that already set for another V8 unit, the system will not operate correctly.
Send Delay Time	0 to 255 msec (Default setting: 20 msec) Specify a delay time that elapses before V8 sends the next command after receiving data from the PLC. 
Total	2 to 32 Set the total number of V series units to be connected in the multi-link connection. The setting must be the same as other V8 series on the same communication line.
Retry Cycle	1 to 100 (× 10) When the V8 series 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: It will not take a long time before restoration. When the setting value is large: It will take a longer time before restoration.

* For [Send Delay Time], [Total] and [Retry Cycle], the same values must be set on all the V8 series that are connected in the same communication line.

Appendix 5   Ladder Transfer Function

When a V8 series is connected to the CPU port of a PLC, debugging has to be carried out by disconnecting and reconnecting two cables alternately: the cable that connects the PC to the PLC and the cable that connects the V8 series and the PLC. However, using the ladder transfer function makes it possible to write the ladder program via the V8 unit and monitor the PLC without disconnecting and reconnecting the cables.

Applicable PLCs

The following PLC models support the ladder transfer function.

Manufacturer	PLC Selection on the Editor	CPU	Ladder Communication Program
Fuji Electric FA	SPB (N mode) & FLEX-PC CPU	FLEX-PC CPU Port	FlexCpu.lcma
		NJ-B16 RS-232C port	
		NW0Pxx CPU port	
	MICREX-SX SPH/SPB CPU	NP1Px-xx(SPH)	MicrexSX.lcma
		NW0Pxx(SPB)	
Mitsubishi Electric	A series CPU *1	A2A, A3A A2U, A3U, A4U A2US(H) A1N, A2N, A3N A3V, A73 A3H, A3M A0J2H A1S(H), A1SJ(H) A2S(H) A2CCPUC24 A1FX	MelACp.lcma
	QnH (Q) series CPU	Q02(H), Q06H	MelQHCpQ.lcma
	Q00J/00/01 CPU	Q00J, Q00, Q01	
	QnH (Q) series CPU (multi CPU)	Q02(H), Q06H	
	FX series CPU	FX1/2, FX0N	MelFx.lcma
	FX2N series CPU	FX2N/1N, FX2NC	
	FX1S series CPU	FX1S	
	FX-3UC series CPU	FX-3UC	
Omron	SYSMAC C	See page 12-1.	Sysmac.lcma
	SYSMAC CS1/CJ1		
Panasonic	FP Series	FP0 tool port	Mewnet.lcma
		FP2 tool port	
		FPΣ tool port	
		FP-e tool port	
		FP-X tool port	
Yokogawa Electric	FA-M3	Tool port of the CPU	Yokogawa.lcma
	FA-M3R		

1 : n communication (multi-drop), multi-link communication, and multi-link2 communication cannot be executed.

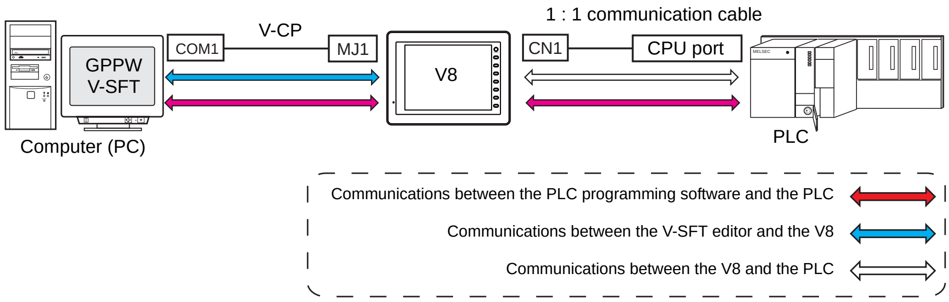
*1 Used at both MJ1 and MJ2. A dedicated cable “V6-CP-A” is required.

Connection

- Serial communications are performed between the computer and the V8 series. Use Hakko Electronics' "V-CP" cable for the connection.
  (For a Mitsubishi Electric A series CPU, use Hakko Electronics' "V6-CP-A" cable.)
- When connecting the V8 series (CN1) to the PLC, use a 1 : 1 communication cable as previously described.

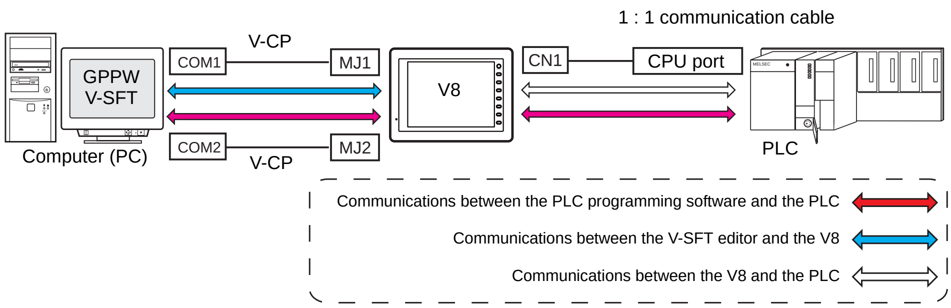
When the Computer Is Equipped with One COM Port:

It is not possible to simultaneously transfer the V-SFT editor screen data and the programming software for the PLC. Stop either transfer.
Screen data transfer from the V-SFT editor is carried out via MJ1. The use of MJ1 is recommended if executing both the ladder transfer function and screen data transfer is necessary. In this case, screen data transfer via the V-CP cable is possible through the Main Menu screen displayed on the V8 series. For more information, see page App5-4.

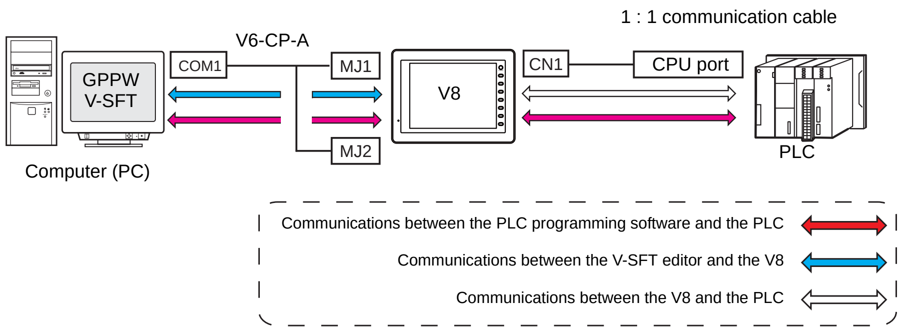


When the Computer Is Equipped with Two COM Ports and Two V-CP Cables Are Used:

Different COM ports and cables (V-CP) can be used for the V-SFT editor and the PLC programming software. However, it is not possible to transfer the editor data and PLC programming software simultaneously.



When Mitsubishi Electric's A Series CPU Is Connected:



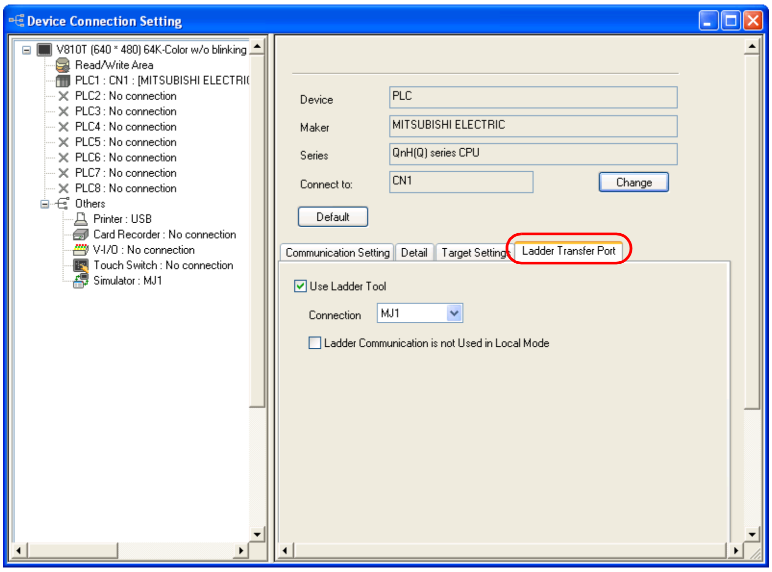
Setting

The procedure for setting the ladder transfer function is described here.

Device connection setting

Select [System Setting] → [Device Connection Setting] → [PLC1] → [Ladder Transfer Port]

* The [Ladder Transfer Port] tab window is only displayed if a model that is compatible with the ladder transfer function (see page App5-1) has been selected for PLC1.



☐ Use Ladder Tool	Checked
Connection	MJ1 / MJ2 Select the port where the ladder transfer function is to be used. * For a Mitsubishi Electric’s A series CPU, use [MJ1] or [MJ2].
☐ Ladder Communication is not Used in Local Mode	This is a setting that is valid when [MJ1] is selected and it determines the operation while the Main Menu screen is displayed. • When unchecked: Both V-SFT editor and PLC programming software communications are possible. Choose either transfer using the [F2] switch. (See page App5-4.) • When checked: Only V-SFT editor communications are possible. PLC programming software communications are not possible.

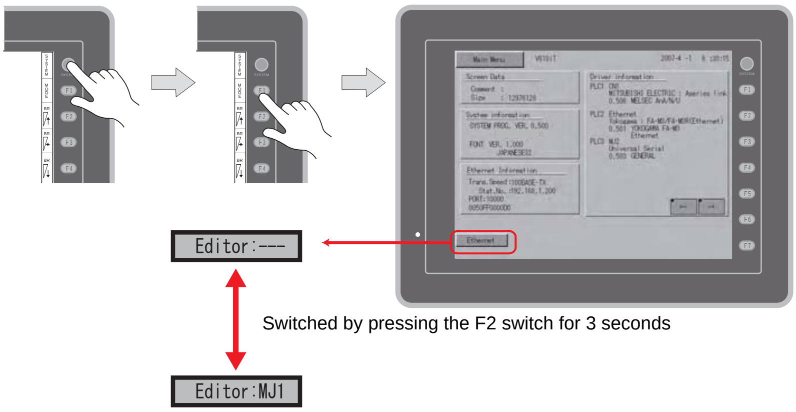
Differences in V8 Operation Depending on the Ladder Transfer Setting

The operation of the V8 series (whether communications with the computer are possible or not) differs depending on the combination of the modular jack and [Ladder Transfer Port] settings.

Editor Setting			V8 Status			
MJ1	MJ2	[☐ Ladder Communication is not Used in Local Mode] Check Box	RUN		Main Menu	
			Ladder Transfer	Screen Data Transfer MJ1	Ladder Transfer	Screen Data Transfer MJ1
Not connected	Ladder transfer	Unchecked	○	○	○	○
		Checked	○	○	×	○
Not connected or other than ladder transfer		Unchecked	○	×	○	○
		Checked	○	×	×	○
Ladder transfer	Other than ladder transfer	Unchecked	○	×	△*	△*
		Checked	○	×	×	○

* Selection on the Main Menu screen

Press the [SYSTEM] and [F1] switches. The Main Menu screen is displayed.
"Editor:---" appears, indicating the ladder transfer mode, in the lower left corner of the screen. At this time, screen data transfer via MJ1 is not possible. By pressing the [F2] switch for three seconds you can switch between "Editor:----" and "Editor: MJ1".



Indication	Ladder Transfer	Screen Data Transfer MJ1
Editor:---	○	×
Editor: MJ1	×	○

Notes

- The ladder transfer function can be used with PLC1. It cannot be used with PLC2 to PLC8.
- On-line editing between the editor and the V8 series is not possible. If attempted, communications between the PLC programming software and the PLC will not be performed correctly.
- Communicating statuses with the PLC programming software and the PLC during communications between the editor and the V8 series

Editor	PLC Programming Software
Writing to V8	Communications disconnected (normal communications on completion of writing)
Reading from V8	Normal communications
Comparing with V8	Normal communications

- Baud rate setting
  The [Baud Rate] setting in the [Communication Setting] tab window applies to the baud rate between the V8 series and the PLC. However, if communication with the PLC programming software (monitoring, etc.) starts by means of the ladder transfer function, the baud rate set on the software takes effect. The baud rate stays enabled until the V8 series is turned off and on again. Keeping this in mind, set the PLC programming software baud rate and the [Baud Rate] setting in the [Communication Setting] tab window to the same value.
- With [Use Ladder Tool] checked, it is prohibited to register the devices to be monitored for V8-PLC communication even though the PLC programming software is not started. The screen display speed will decrease somewhat accordingly.
- When the ladder program is transferred in the RUN mode of the V8 series, communications are synchronized; therefore, the performance of both the V8 series and the PLC programming software decreases.

Connection Compatibility List

May, 2009

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	n : 1 Multi-link	Network
ALLEN BRADLEY	SLC500	○	○	○		
	SLC500 (Ethernet TCP/IP)	○	○			
	Micro Logix	○		○		
	Micro Logix (Ethernet TCP/IP)	○	○			
	Control Logix / Compact Logix	○				
	Contorol Logix (Ethernet)	○				
Automation Direct	Direct LOGIC (K-Sequence)	○		○		
	Direct LOGIC (MODBUS RTU)	○	○	○		
Fuji Electric	MICREX-F series	○	○	○	○	
	MICREX-F series V4-compatible	○	○	○		
	MICREX-F T-Link					○
	MICREX-F T-Link V4-compatible					○
	SPB (N mode) & FLEX-PC series	○	○	○		
	SPB (N mode) and FLEX-PC CPU	○		○		
	MICREX-SX (T-Link)					○
	MICREX-SX (OPCN-1)					○
	MICREX-SX (SX BUS)					○
	MICREX-SX SPH/SPB series	○		○		
	MICREX-SX SPH/SPB CPU	○		○		
	MICREX-SX (Ethernet)	○	○			
	PYX (MODBUS RTU)	○	○	○		
	PXR (MODBUS RTU)	○	○	○		
	PXG (MODBUS RTU)	○	○	○		
	PXH (MODBUS RTU)	○	○	○		
	PUM (MODBUS RTU)	○	○	○		
	F-MPC04P (loader)	○	○	○		
	F-MPC series / FePSU	○	○	○		
	FVR-E11S (MODBUS RTU)	○	○	○		
	FVR-C11S (MODBUS RTU)	○	○	○		
	FRENIC5000 G11S/P11S (MODBUS RTU)	○	○	○		
	FRENIC5000 VG7S (MODBUS RTU)	○	○	○		
	FRENIC-Mini (MODBUS RTU)	○	○	○		
	FRENIC-Eco (MODBUS RTU)	○	○	○		
	FRENIC-Multi (MODBUS RTU)	○	○	○		
	FRENIC-MEGA (MODBUS RTU)	○	○	○		
	HFR-C9K	○	○	○		
	HFR-C11K	○	○	○		
	PPMC (MODBUS RTU)	○	○	○		
	FALDIC-α series	○	○	○		
	PHR (MODBUS RTU)	○	○	○		
	WA5000	○	○	○		
	APR-N (MODBUS RTU)	○	○	○		
	ALPHA5 (MODBUS RTU)	○	○	○		
	WE1MA (MODBUS RTU)	○	○	○		
GE Fanuc	90 series (SNP-X)	○		○		
Hitachi	HIDIC-S10/2α, S10mini	○		○		
	HIDIC-S10/2α, S10mini (Ethernet)	○	○			
	HIDIC-S10V	○		○		
	HIDIC-S10V (Ethernet)	○	○			
Hitachi Industrial Equipment Systems	HIDIC-H	○	○	○	○	
	HIDIC-H (Ethernet)	○	○			
	HIDIC-EHV	○	○	○	○	
	HIDIC-EHV (Ethernet)	○	○			
IAI	X-SEL controller	○	○	○		
	PCON/ACON/SCON (MODBUS RTU)	○	○	○		
JTEKT	TOYOPUC	○	○	○	○	
	TOYOPUC (Ethernet)	○	○			

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	n : 1 Multi-link	Network
KEYENCE	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)	○	○			
KOYO ELECTRONICS	SU/SG (K-Sequence)	○		○		
	SU/SG (Modbus RTU)	○	○	○		
MITSUBISHI ELECTRIC	A series link	○	○	○	○	
	A series CPU	○		○		
	QnA series link	○	○	○		
	QnA series CPU	○		○		
	QnA series (Ethernet)	○	○			
	QnH (Q) series link	○	○	○		
	QnH (Q) series CPU	○		○		
	QnH (Q) series (Ethernet)	○	○			
	Q00J/00/01 CPU	○		○		
	QnH (Q) series link (multi CPU)	○	○	○		
	QnH (Q) series (multi CPU) (Ethernet)	○	○			
	QnH (Q) series CPU (multi CPU)	○		○		
	QnU series CPU	○		○		
	FX2N/1N series CPU	○		○		
	FX series link (A protocol)	○	○	○	○	
	FX-3UC series CPU	○		○		
	FR-*500	○	○	○		
	FR-V500	○	○	○		
OMRON	SYSMAC C	○	○	○	○	
	SYSMAC CS1/CJ1	○	○	○		
	SYSMAC CS1/CJ1 (Ethernet)	○	○			
	SYSMAC CS1/CJ1 (Ethernet Auto)	○	○			
	E5AN/E5EN/E5CN/E5GN	○	○	○		
	E5AR/E5ER	○	○	○		
Panasonic	FP Series	○	○	○	○	
	FP series (Ethernet TCP/IP)	○	○			
	FP series (Ethernet UDP/IP)	○	○			
	FP-X (Ethernet TCP/IP)	○	○			
RKC	SR-Mini (MODBUS RTU)	○	○			
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)	○	○	○		
	SR-Mini (Standard Protocol)	○	○	○		
	SRV (MODBUS RTU)	○	○	○		
	MA900/MA901 (MODBUS RTU)	○	○	○		
	SRZ (MODBUS RTU)	○	○	○		
SAIA	PCD	○	○	○		
	PCD S-BUS (Ethernet)	○	○			
SHINKO TECHNOS	FC series	○	○	○		
	DCL-33A	○	○	○		
Siemens	S7	○		○		
	S7-200 PPI	○	○			
	S7-300/400 MPI	○	○			
	S7-300/400 (Ethernet)	○	○			
	S7 PROFIBUS-DP					○
TOSHIBA MACHINE	TC200	○	○	○		
Yamatake	SDC35/36	○	○	○		
	DMC10	○	○	○		
	DMC50 (COM)	○	○	○		
Yaskawa Electric	Memobus	○	○	○		
	CP9200SH/MP900	○	○	○		
	MP2300 (MODBUS TCP/IP)	○	○			
	CP MP expansion memobus (UDP/IP)	○	○			
Yokogawa Electric	FA-M3	○	○	○	○	
	FA-M3R	○	○	○	○	
	FA-M3/FA-M3R (Ethernet UDP/IP)	○	○			
	FA-M3/FA-M3R (Ethernet TCP/IP)	○	○			
	UT350	○	○	○		
	UT450	○	○	○		

Manufacturer	Models	1 : 1	1 : n Multi-drop	n : 1 Multi-link2	n : 1 Multi-link	Network
None	MODBUS RTU	○	○	○		
	MODBUS TCP/IP (Ethernet)	○	○			
	MODBUS TCP/IP (Ethernet) Sub Station	○	○			

Slave Communication

Manufacturer	Models	Setting	Remarks
None	Universal serial	○	
	V-Link	○	Ver. 5.0.1.0
	Modbus slave (RTU)	○	Ver. 5.0.1.0
	Modbus slave (TCP/IP)	○	Ver. 5.0.2.0

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