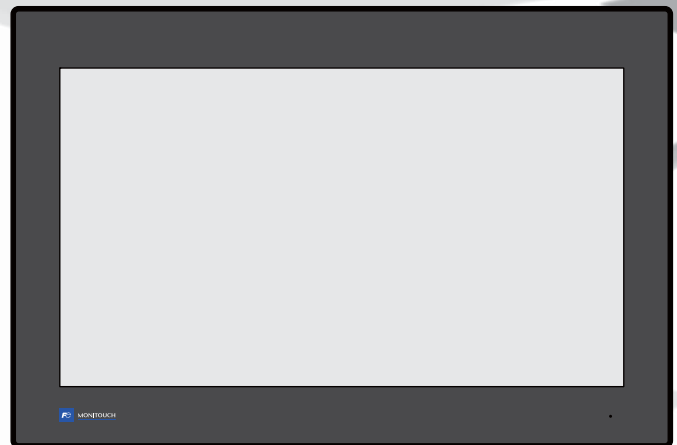


MONITOUCH

Connection Manual [2]

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X1 Series

Preface

Thank you for selecting the MONITOUCH X1 series.

This manual describes the connection and communication parameters for the X1 series and controllers.

For correct use of the X1 series, you are requested to read through this manual and understand the contents.

For details on other operating procedures for the X1 series, refer to the following related manuals.

Manual Name	Contents	Reference No.
X1 Series Reference Manual 1	Explains the functions and operation of the X1 series.	1090NE
X1 Series Reference Manual 2		1091NE
X1 Series Setup Manual	Explains the X1 series setup procedure, the installation procedure of V-SFT version 6, the creation process of basic screen programs as well as how to transfer a created screen program using V-SFT version 6.	1092NE
X1 Series Hardware Specifications	Explains precautions for handling, hardware specifications and operating procedures and provides an error list for the X1 series.	2024NE
X1 Series Connection Manual 1	Explains the connection and communication parameters for the X1 series and controllers in detail.	2217NE
X1 Series Connection Manual 2		2218NE
X1 Series Connection Manual 3		2219NE

For details about controllers (PLCs, temperature controllers, etc.), refer to the manual issued by each controller manufacturer.

Notes:

1. This manual may not, in whole or in part, be printed or reproduced without the prior written consent of Hakko Electronics Co., Ltd.
2. The information in this manual is subject to change without prior notice.
3. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries.
4. All other company names or product names are trademarks or registered trademarks of their respective holders.
5. This manual is intended to give accurate information about MONITOUCH. If you have any questions, please contact your local distributor.

Notes on Safe Usage of MONITOUCH

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




DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.

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

DANGER

- Never use the output signal of the X1 series for operations that may threaten human life or damage the system, such as signals used in case of emergency. Please design the system so that it can cope with a touch switch malfunction. A touch switch malfunction may result in machine accidents or damage.
- Turn off the power supply when you set up the unit, connect new cables, or perform maintenance or inspections. Otherwise, electrical shock or damage may occur.
- Never touch any terminals while the power is on. Otherwise, electrical shock may occur.
- The liquid crystal in the LCD panel is a hazardous substance. If the LCD panel is damaged, do not ingest the leaked liquid crystal. If leaked liquid crystal makes contact with skin or clothing, wash it away with soap and water.
- Never disassemble, recharge, deform by pressure, short-circuit, reverse the polarity of the lithium battery, nor dispose of the lithium battery in fire. Failure to follow these conditions will lead to explosion or ignition.
- Never use a lithium battery that is deformed, leaking, or shows any other signs of abnormality. Failure to follow these conditions will lead to explosion or ignition.
- Switches on the screen are operable even when the screen has become dark due to a faulty backlight or when the backlight has reached the end of its service life. If the screen is dark and hard to see, do not touch the screen. Otherwise, a malfunction may occur resulting in machine accidents or damage.
- Tighten the mounting screw on the fixtures of the X1 series to an equal torque of 7.08 lbf-in (0.8 N·m). Excessive tightening may cause deformation, breakage, or malfunction of the touch switch, which may result in damage to the machine or an accident. Loose mounting screws may cause the unit to fall down, malfunction, or short-circuit.

CAUTION

- Check the appearance of the unit when it is unpacked. Do not use the unit if any damage or deformation is found. Failure to do so may lead to fire, damage, or malfunction.
- For use in a facility or as part of a system related to nuclear energy, aerospace, medical, traffic equipment, or mobile installations, consult your local sales representative.
- Operate (or store) the X1 series under the conditions indicated in this manual and related manuals. Failure to do so could cause fire, malfunction, physical damage, or deterioration.
- Observe the following environmental restrictions on use and storage of the unit. Otherwise, fire or damage to the unit may result.
 - Avoid locations where there is a possibility that water, corrosive gas, flammable gas, solvents, grinding fluids, or cutting oil can come into contact with the unit.
 - Avoid high temperatures, high humidity, and outside weather conditions, such as wind, rain, or direct sunlight.
 - Avoid locations where excessive dust, salt, and metallic particles are present.
 - Avoid installing the unit in a location where vibrations or physical shocks may be transmitted.
- Equipment must be correctly mounted so that the main terminal of the X1 series will not be touched inadvertently. Otherwise, an accident or electric shock may occur.
- Check periodically that terminal screws on the power supply terminal block and fixtures are firmly tightened. Loosened screws or nuts may result in fire or malfunction.
- Tighten the terminal screws on the power supply terminal block of the X1 series to an equal torque of 4.43 to 5.31 lbf-in (0.5 to 0.6 N·m). Improper tightening of screws may result in fire, malfunction, or other serious trouble.
- The X1 series has a glass screen. Do not drop the unit or impart physical shocks to the unit. Otherwise, the screen may be damaged.
- Correctly connect cables to the terminals of the X1 series in accordance with the specified voltage and wattage. Overvoltage, overwattage, or incorrect cable connection could cause fire, malfunction, or damage to the unit.
- Always ground the X1 series unit. The FG terminal must be used exclusively for the X1 series unit with the level of grounding resistance being 100 Ω or less. Failure to do so may result in electric shock, fire, prevent correct touch operations or cause malfunctions.
- Prevent any conductive particles from entering into the X1 series unit. Failure to do so may lead to fire, damage, or malfunction.

CAUTION

- Do not attempt to repair, disassemble, or modify the X1 series unit yourself. Contact Hakko Electronics or the designated contractor for repairs.
- Do not repair, disassemble, or modify the X1 series. Hakko Electronics Co., Ltd. is not responsible for any damages resulting from repair, disassembly, or modification of the unit that was performed by an unauthorized person.
- Do not use sharp-pointed tools to press touch switches. Doing so may damage the display unit.
- Only experts are authorized to set up the unit, connect cables, and perform maintenance and inspection.
- Lithium batteries contain combustible material such as lithium and organic solvents. Mishandling may cause heat, explosion, or ignition resulting in fire or injury. Read the related manuals carefully and correctly handle the lithium battery as instructed.
- Take safety precautions during operations such as changing settings when the unit is running, forced output, and starting and stopping the unit. Any misoperations may cause unexpected machine movement, resulting in machine accidents or damage.
- In facilities where the failure of the X1 series could lead to accidents that threaten human life or other serious damage, be sure that such facilities are equipped with adequate safeguards.
- When disposing of the X1 series, it must be treated as industrial waste.
- Before touching the X1 series, discharge static electricity from your body by touching grounded metal. Excessive static electricity may cause malfunction or trouble.
- There is a heat sink in the back side of the unit which becomes hot during operation. Take care not to touch during operation.
- Capacitive touch switches are used. Note the following limitations.
 - Use a safety extra-low voltage (SELV) power supply for 24 VDC models. Using the X1 series with an unstable power supply may result in incorrect touch switch activation.
 - Because capacitive touch switches are susceptible to the effects of conductors, do not place conductors, such as metal, near the panel screen or use the touch switch panel when the screen is wet. Otherwise, malfunctions may occur.
 - Calibration is performed upon turning the power on. Do not touch the screen for 10 seconds immediately after turning the power on. Otherwise, malfunctions may occur.

[General Notes]

- Never bundle control cables or input/output cables with high-voltage and large-current carrying cables such as power supply cables. Keep control cables and input/output cables at least 200 mm away from high-voltage and large-current carrying cables. Otherwise, malfunction may occur due to noise.
- When using the X1 series in an environment where a source of high-frequency noise is present, it is recommended that the FG shielded cable (communication cable) be grounded at each end. However, when communication is unstable, select between grounding one or both ends, as permitted by the usage environment.
- Be sure to plug connectors and sockets of the X1 series in the correct orientation. Failure to do so may lead to damage or malfunction.
- If a LAN cable is inserted into the serial communication connector, the device on the other end may be damaged. Check the connector names on the unit and insert cables into the correct connectors.
- Do not use thinners for cleaning because it may discolor the X1 series unit surface. Use commercially available alcohol.
- Clean the display area using a soft cloth to avoid scratching the surface.
- If a data receive error occurs when the X1 series unit and a counterpart unit (PLC, temperature controller, etc.) are started at the same time, read the manual of the counterpart unit to correctly resolve the error.
- Avoid discharging static electricity on the mounting panel of the X1 series. Static charge can damage the unit and cause malfunctions. Discharging static electricity on the mounting panel may cause malfunction to occur due to noise.
- Avoid prolonged display of any fixed pattern. Due to the characteristic of liquid crystal displays, an afterimage may occur. If prolonged display of a fixed pattern is expected, use the backlight's auto OFF function.
- The X1 series is identified as a class-A product in industrial environments. In the case of use in a domestic environment, the unit is likely to cause electromagnetic interference. Preventive measures should thereby be taken appropriately.
- The signal ground (SG) and frame ground (FG) are connected inside the X1 series unit. Take care when designing systems.
- The X1 series is equipped with a battery that contains lithium metal and therefore observance of transport regulations is necessary. Hakko Electronics ships X1 series units packed in accordance with transport regulations. If there is a need to transport an X1 series unit after it is once unpacked, transport the unit in accordance with the IATA Dangerous Goods Regulations, International Maritime Dangerous Goods (IMDG) Code, and transport regulations of the countries concerned. Ask your forwarding agent for details of transport regulations.

[Notes on the LCD]

Note that the following conditions may occur under normal circumstances.

- The response time, brightness, and colors of the X1 series may be affected by the ambient temperature.
- Tiny spots (dark or luminescent) may appear on the display due to the characteristics of liquid crystal.
- Unevenness in brightness and flickering may occur depending on the screen display pattern due to the characteristics of liquid crystal.
- There are variations in brightness and color between units.
- Display colors may vary depending on the viewing angle because a converging lens is used in the backlight unit.

[Notes on the Capacitive Touch Switch]

- Touch switches may be unresponsive if touched with dry fingers. In such a case, use a capacitive stylus pen.
- Touch switches are calibrated each time the power is turned on. Do not touch the screen for 10 seconds immediately after turning the X1 series on. Otherwise, malfunctions may occur.
- When a metal object is near a touch switch for 5 minutes or longer, the touch switch is calibrated to recognize that state as the default state. Note that after the metal object is removed, the touch switch will become inoperable.
- Water droplets or conductive material can cause the sensor to make a false detection and lead to malfunctions.
- When using multi-touch operations, points must be at least 3 cm apart. Points may not be recognized if in close proximity of each other.
- In an environment with excess noise, the responsiveness of touch switches may be lowered and the point that responds may deviate by up to 1 cm. Implement measures such as adding a filter to the input power supply.
- Periodically clean the touch panel surface for optimum touch operations.

When cleaning, take note of the following points.

<When cleaning>

- The panel surface is made of glass. Be sure to clean the surface gently with a cloth or sponge. Otherwise, you may scratch or damage the glass.
- Take care not to let cleaning detergent seep into the touch panel unit.
Do not directly apply or spray cleaning detergent on the panel surface.

[Notes on the Operating System (OS) and Scope of Operation Guarantee]

- The operating system (OS) used on this product is the Windows 10 IoT Enterprise LTSC by Microsoft. Therefore, Windows Update is not applicable to this OS. Also, the apps Cortana, Microsoft Edge, Microsoft Store, and UWP are not supported.
- Custom user apps for use on Windows can be used on this product. Hakko Electronics does not guarantee the operation of apps installed by the customer. Make sure to thoroughly check the operation before actual use.
- Hakko Electronics shall not be held responsible for dealing with trouble or liable for damages stemming from Microsoft products while using this product. When trouble occurs with a Microsoft product or there is a need to check the specifications, refer to the manual of the Microsoft product or contact Microsoft. Refer to the following website to contact Microsoft.
<https://support.microsoft.com/en-us/contactus/>

[Notes on Turning Power Off]

The System Configurator built into the X1 series unit provides a write filter function. When the write filter function is enabled, the power of the X1 series unit can be turned off suddenly without damaging system files. If the write filter function is disabled, the shutdown procedure is necessary. Perform the shutdown procedure on System Configurator and after waiting for at least 15 seconds from when the screen has gone out, turn the X1 series unit power off.

[Notes on the Built-in Solid-state Drive (SSD)]

- The X1 series unit has a built-in SSD (C drive). Do not change partitions or split the drive.
- 3D NAND is used in the built-in SSD of the X1 series unit. Keep in mind the service life of the SSD.

[Notes on the Battery]

The X1 series unit has a built-in battery which is used for backing up time data and BIOS settings (retention during power outage). The battery must be replaced within three years after the unit is purchased. Note that the X1 series unit can start up in the same way as usual even if time data and BIOS settings are lost. Time data is reset to the default value in such a case. Set again as necessary.

[Notes on Wireless LAN]

For details regarding supported wireless LAN standards, radio law certifications, and countries where wireless LAN can be used, refer to the "X1 Series Notes on Wireless LAN" manual provided with the X1 series unit at delivery.

[Notes on the Startup Time]

Since a Windows OS is used, the startup time differs depending on the devices that are connected and software that is additionally installed.

Carefully consider devices and software before use.

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Connection Compatibility List

1. Overview

- 1.1 System Configuration
- 1.2 Physical Ports
- 1.3 Connection Method
- 1.4 Hardware Settings
- 1.5 System Device Memory for Communication Confirmation

1.1 System Configuration

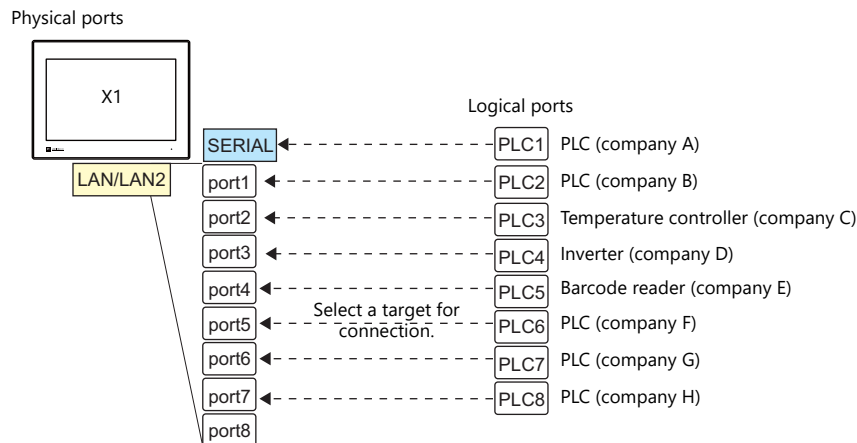
1.1.1 Overview

The X1 series is equipped with nine physical ports consisting of one serial port, two LAN ports, four USB-A ports^{*1}, one audio port, and one HDMI port. For models with wireless LAN and Bluetooth^{*2}, one WLAN port and one Bluetooth port are also provided.

The LAN port can open eight ports simultaneously. A maximum of eight different devices can be connected to the serial port and LAN ports so that the X1 series can communicate with them at the same time. This is called 8-way communication.

*1 Two ports of USB version 3.0, two ports of USB version 2.0

*2 For models with "R" in model name



Port		No. of Ports	Applicable Devices		
			8-way Communication	Other than 8-way	
Serial	SERIAL	RS-232C RS-422 (4-wire) RS-485 (2-wire)	1	PLC, temperature controller, servo, inverter, RFID controller, V-Link, slave communication (Modbus RTU, Modbus ASCII)	Sato's barcode printer (MR-400)
Ethernet	LAN	All models	8	PLC, controller, slave communication (Modbus TCP/IP)	Computer, network camera ^{*1} , network printer ^{*1}
	LAN2		8		Computer, network printer ^{*1}
	WLAN	Models with "R" in model name	1	-	Computer, tablet ^{*1} , network printer ^{*1}
USB	USB-A	All models	4	-	USB flash drive, keyboard, mouse, USB hub, printer ^{*1}
AUDIO		All models	1	-	External speaker
HDMI		All models	1	-	External monitor
Bluetooth		Models with "R" in model name	1	-	Bluetooth devices

*1 Use the function of Windows to establish connection.

- Only the logical port PLC1 can be selected for the following devices and functions. They cannot be connected at the same time.

- Devices

Without PLC connection, Mitsubishi Electric A-Link + Net10, Allen-Bradley Control Logix / Compact Logix*, Allen-Bradley Micro800 controllers*, 3S-Smart Software Solutions CODESYS V3 (Ethernet)

* Control Logix / Compact Logix Tag and Micro800 Controllers Tag can be selected at PLC1-8.

- Functions

Ladder monitor function, MICREX SX variable name cooperation function

1.1.2 System Composition

Serial Communication

- 1 : 1 connection

A serial port is used as a communication port.

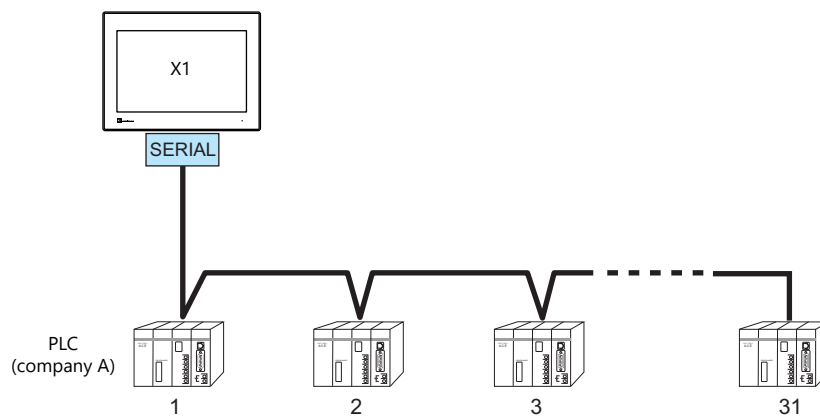
For more information, see "1 : 1 Connection" (page 1-12) in "1.3 Connection Method".



- 1 : n connection

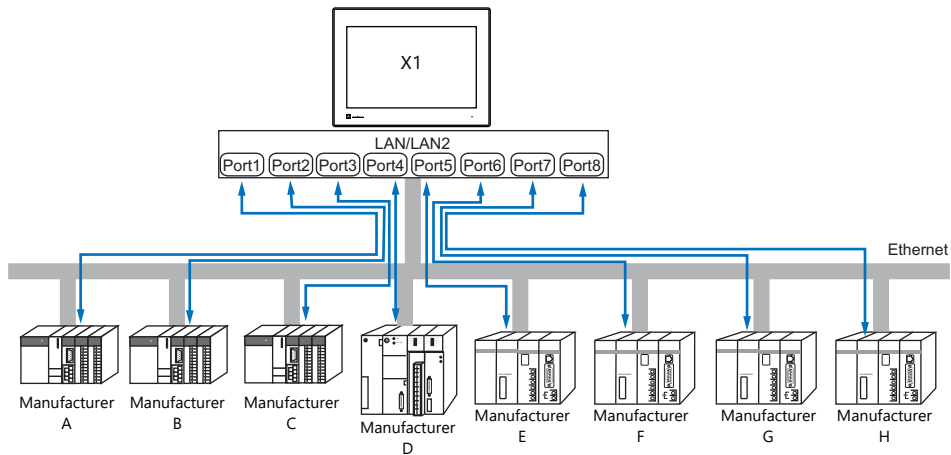
A serial port is used as a communication port. A maximum of 31 units of the same model can be connected to each port.

For more information, see "1 : n Connection (Multi-drop)" (page 1-16) in "1.3 Connection Method".

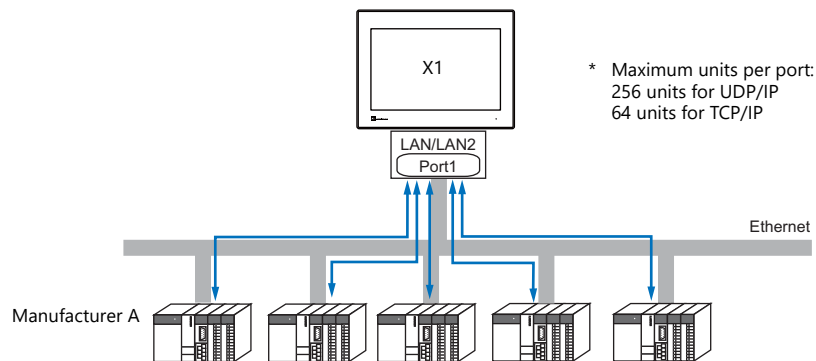


Ethernet Communication

The X1 series unit can open up to eight ports for communication, which means that the unit can simultaneously communicate with up to eight types of PLCs.



When there are two or more PLCs of the same model, the X1 series can carry out 1 : n communication via one port.



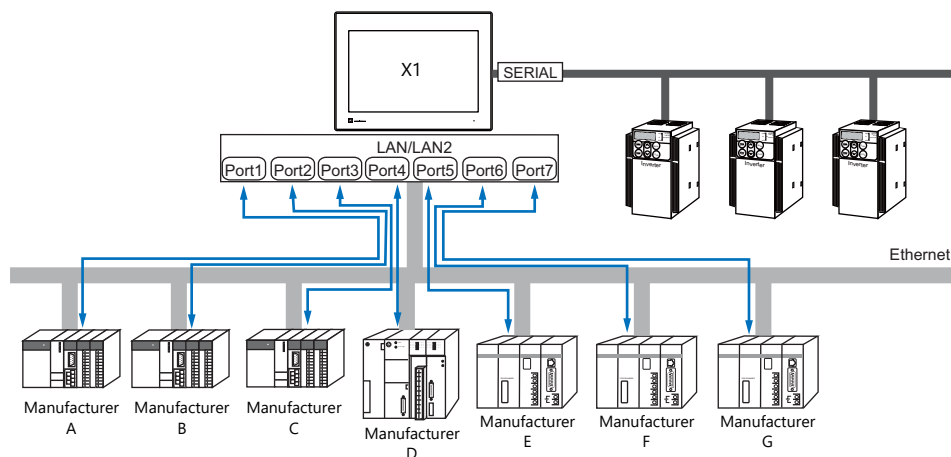
* Maximum units per port:
256 units for UDP/IP
64 units for TCP/IP

* For more information, refer to "1.3.2 Ethernet Communication" (page 1-18) in "1.3 Connection Method".

Mixed Serial-Ethernet Communication

In the case of mixed serial-Ethernet communication, the X1 series can simultaneously communicate with up to eight types of PLCs.

- Connection of 1 model for serial communication and 7 models for Ethernet communication



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

1.2 Physical Ports

1.2.1 SERIAL

The SERIAL port supports communication via RS-232C, RS-485 (2-wire connection), and RS-422 (4-wire connection).



CAUTION

The SERIAL and LAN/LAN2 connectors are RJ-45 connectors. Check the connector names on the unit and insert cables into the correct connectors.

Pin Arrangement

SERIAL RJ-45 8pin	No.	RS-232C		RS-485 (2-wire connection)		RS-422 (4-wire connection)	
		Signal	Description	Signal	Description	Signal	Description
	1	RD	Receive data	+SD/RD	Send/receive data (+)	+SD	Send data (+)
	2	-	Not used	-SD/RD	Send/receive data (-)	-SD	Send data (-)
	3			-	Not used	-	Not used
	4			-	Not used	-	Not used
	5	SG	Signal ground	SG	Signal ground	SG	Signal ground
	6						
	7	SD	Send data	-	Not used	+RD	Receive data (+)
	8	-	Not used	-	Not used	-RD	Receive data (-)

Switching between RS-232C and RS-422/485

There are two ways to select the signal level (RS-232C or RS-422/485): using the V-SFT editor or using Local mode on the X1 series unit.

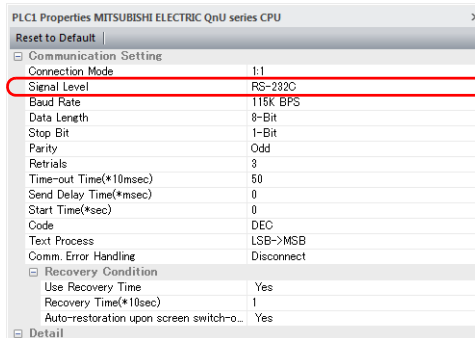


CAUTION

The setting changed on the X1 series unit takes priority. To restore the screen program settings, press the [Restore Screen Data Settings] switch on the Local mode screen.

Setting Using the V-SFT Editor

[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



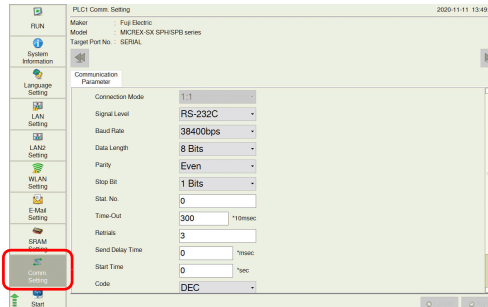
Item	Description
Connection Mode	Configure according to the connected device.
Signal Level	RS-232C / RS-422/485
Baud Rate	Configure according to the connected device.
Data Length	
Stop Bit	
Parity	
Target Port No.	
Transmission Mode	

For settings other than the above, see "1.4 Hardware Settings" (page 1-29).

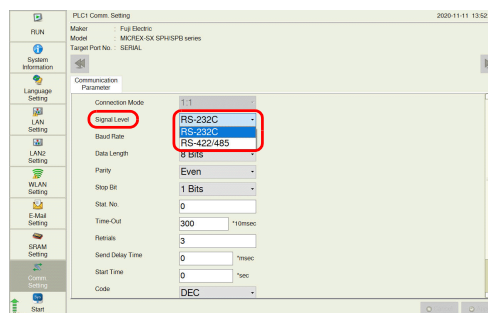
Setting Using Local Mode on the Unit

Set the signal level in Local mode on the X1 series unit.

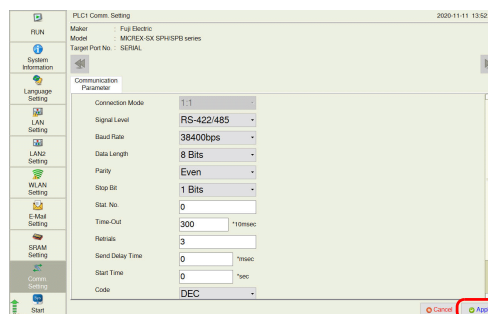
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press the [Comm. Setting] icon to display the Communication Setting screen.



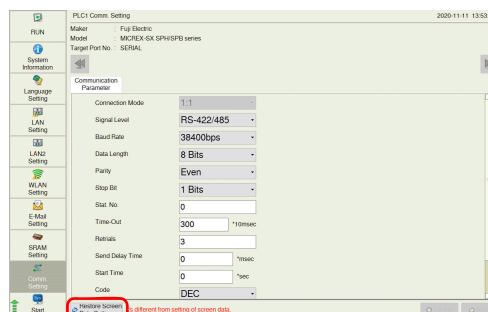
4. Select [RS-232C] or [RS-422/485] at [Signal Level].



5. Press the [Apply] switch to confirm the setting.



- * Press the [Restore Screen Data Settings] switch to restore the screen program settings.



Switching between RS-485 (2-wire Connection) and RS-422 (4-wire Connection)

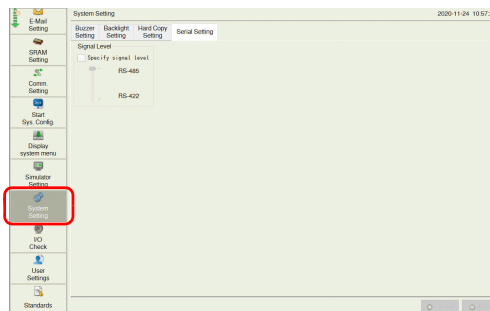
Set the signal level (RS-485/RS-422) in the [Serial Setting] tab window in Local mode of the X1 series unit. This setting is necessary when all of the following three conditions apply.

- The [Target Port No.] setting is set to [SERIAL] for PLCx in the [Hardware Setting] window of a screen program.
- The [Signal Level] setting is set to [RS-422/485] at either of the following locations:
[Hardware Setting] → [PLCx Properties] in the screen program
[Comm. Setting] → [Communication Parameter] in Local mode
- A connected device supports both RS-485 (2-wire connection) and RS-422 (4-wire connection) and RS-422 is used for connection.

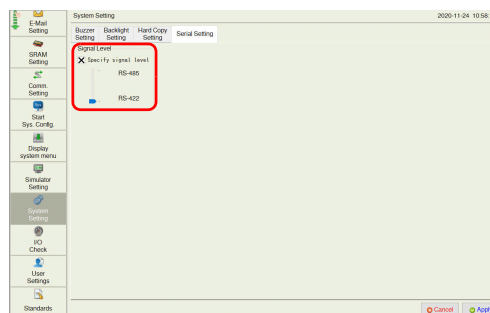
CAUTION

- Signal level: RS-232C
Communication is performed via RS-232C, irrespective of whether the [Specify signal level] checkbox is selected or not.
- Signal level: RS-422/485
 - * When the [Specify signal level] checkbox is selected, the following setting takes priority.
 - When communicating with devices that support RS-485 (2-wire connection) only or RS-422 (4-wire connection) only:
The following setting is not necessary. (The signal level is automatically recognized.)
 - When communicating with devices that support both RS-485 (2-wire connection) and RS-422 (4-wire connection):
If the [Specify signal level] checkbox is not selected, communication is performed via RS-485 (2-wire connection).
To perform communication via RS-422 (4-wire connection), the following setting is necessary.

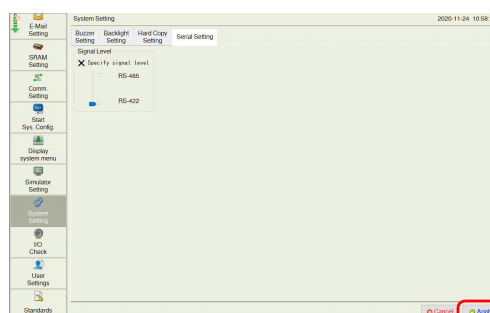
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press [System Setting] → [Serial Setting].



4. Select the [Specify signal level] checkbox and select [RS-485] (default) or [RS-422].



5. Press the [Apply] switch to confirm the setting.



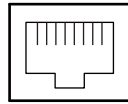
Recommended Cable

AWG 26 stranded wire, braided shield

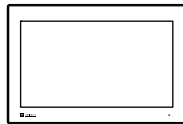
- * Check the operation in advance in the usage environment.

Notes on Configuring a Cable

Pin arrangement
on MONITOUCH



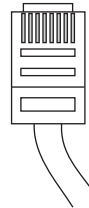
87654321



Pin arrangement on the
cable



12345678



Applicable Devices

Port	Applicable Devices
SERIAL	PLC, temperature controller, inverter, servo, RFID controller, V-Link, slave communication (Modbus RTU, Modbus ASCII), Sato's barcode printer (MR-400)

1.2.2 LAN/LAN2



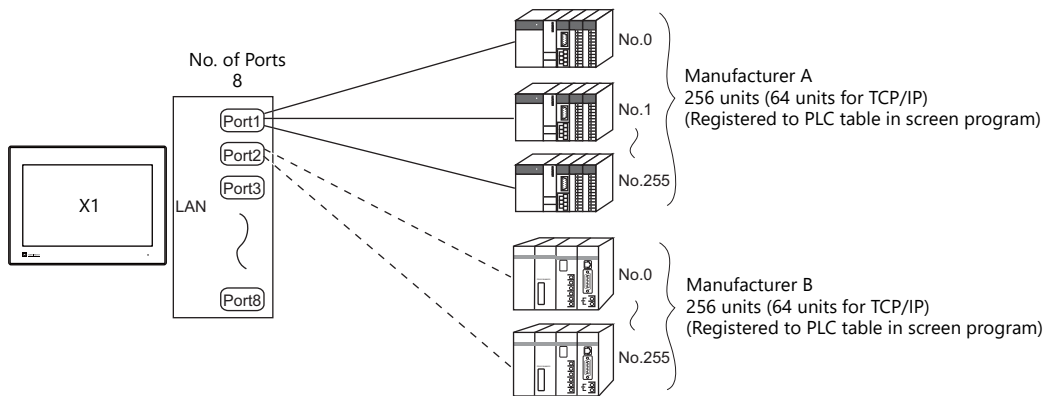
The LAN/LAN2 and SERIAL connectors are RJ-45 connectors. Check the connector names on the unit and insert cables into the correct connectors.

LAN Port Specifications

Item	Specification		
	1000BASE-T (IEEE802.3ab)	100BASE-TX (IEEE802.3u)	10BASE-T (IEEE802.3)
Baud Rate	1000 Mbps	100 Mbps	10 Mbps
Transmission Method	Base band		
Maximum Segment Length	100 m (between the node and the hub, or between hubs)		
Connecting cable	100 Ω, STP cable, category 5e or above		
Protocol	UDP/IP, TCP/IP		
Port	Auto-MDIX, Auto-Negotiation functions compatible		
Number of Concurrently Opened Ports	8 ports		
Maximum Number of Connectable Devices	UDP/IP: 256 units via each of ports PLC1 to PLC8 TCP/IP: 64 units via each of ports PLC1 to PLC8		

* Jumbo frames not supported

Maximum number of connectable devices



Pin Arrangement

LAN/LAN2 RJ-45	No.	1000BASE-T		100BASE-TX / 10BASE-T	
		Name	Description	Name	Description
	1	BI_DA+	Transmit/receive data A+	TX+	Transmit signal +
	2	BI_DA-	Transmit/receive data A-	TX-	Transmit signal -
	3	BI_DB+	Transmit/receive data B+	RX+	Receive signal +
	4	BI_DC+	Transmit/receive data C+	NC	Not used
	5	BI_DC-	Transmit/receive data C-		
	6	BI_DB-	Transmit/receive data B-	RX-	Receive signal -
	7	BI_DD+	Transmit/receive data D+	NC	Not used
	8	BI_DD-	Transmit/receive data D-		

LED

LAN/LAN2	A: Activity LED	B: Speed LED	Status
	On	Off	10BASE link established / Data is being transmitted
	On	Lit green	100BASE link established / Data is being transmitted
	On	Lit orange	1000BASE link established / Data is being transmitted

Applicable Devices

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

1.2.3 WLAN

WLAN Port Specifications

Item	Specification
Complying Antennas	Two antennas (2T2R) built into the X1 series unit
Wireless LAN Standards	IEEE802.11ac/a/b/g/n
Communication Frequency	<ul style="list-style-type: none"> • 2.4 GHz band (2.412 GHz to 2.484 Hz) • 5.0 GHz band (W52*: 5.150 GHz to 5.250 GHz, W53*: 5.250 GHz to 5.350 GHz, W56: 5.470 GHz to 5.725 GHz) * Outdoor use of the W52 and W53 bands is prohibited by radio law.
Modulation Method	<ul style="list-style-type: none"> • 11b: DSSS (DBPSK, DQPSK, CCK) • 11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) • 11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) • 11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
Max. Baud Rate	<ul style="list-style-type: none"> • 11b: 11 Mbps • 11a/g: 54 Mbps • 11n: 300 Mbps (MCS0 to 15) • 11ac: 867 MHz (MCS0 to 9)
Operation Mode	Station
Usage Environment	Indoor use only
Security	64/128-bits WEP, WPA, WPA2, 802.1x, 802.11i
Conformance Standards	<ul style="list-style-type: none"> • MIC • FCC • ISED • RED • KC • NCC

Applicable Devices

Applicable Devices
Computer (screen program transfer), tablet, network printer, etc.

Notes on Wireless LAN

- Antennas are built into the X1 series unit for wireless communication. (Wireless LAN communication is possible within 10 meters from the front face of the X1 series unit.)
Make sure to check that a stable wireless connection can be established beforehand if using the interface. Placing the access point within 10 meters is recommended for a stable connection.
- Radio waves used by wireless LAN pass through wood and glass, and therefore communication is possible even if floors and walls are made of wooden or glass material. However, radio waves cannot penetrate reinforcing rods, metal, or concrete, so if these materials are used, communication is not possible.
Signal intensity can be checked using the Received Signal Strength Indication (RSSI) as a guideline. Placing the access point in a position indicating a higher RSSI value will attain a more stable communication status.
A low RSSI value which cannot be improved by moving the access point indicates that the radio wave intensity is attenuated due to a long communication distance or physical obstructions.

Notes on radio waves

- The wireless LAN function of the X1 series corresponds to "radio equipment for radio stations (antenna power: 10 mW/MHz or less) of low-power data communication systems" defined by radio law, and therefore does not require a radio license.
- Depending on the peripheral environment or installation conditions, data transmission via wireless LAN may be unstable compared to wired connections and result in packet loss.
Be sure to check the connection before actual use.
- Do not use the wireless LAN function in the following situations.
 1. Near a person who uses a cardiac pacemaker: The function may cause electromagnetic interference in cardiac pacemakers, leading to malfunctions.
 2. Near medical devices: The function may cause electromagnetic interference in medical devices, leading to malfunctions.
 3. Near microwaves: Microwaves may cause electromagnetic interference in wireless communications of the X1 series unit.
- Notes on using wireless LAN
Models that support wireless LAN use the 2.4 GHz and 5.0 GHz frequency bands. These frequency bands are used for industrial, scientific, and medical equipment; on-site radio stations (requiring a radio license) and certain low-power radio stations (no radio license required) for identifying moving objects in production lines; and amateur radio stations (requiring a radio license).

1. Before using the wireless LAN function, check that there are no on-site radio stations and certain low-power radio stations for identifying moving objects or amateur radio stations in use nearby.
 2. If ever the X1 series unit causes wave interference to an on-site radio station for identifying moving objects, immediately stop wireless LAN communication and ensure that waves are no longer emitted. Then take necessary actions to resolve the interference (e.g. changing frequencies, relocating, installing partitions).
 3. If the X1 series unit causes wave interference to a certain low-power radio station for identifying moving objects, or if any other problem occurs, contact your distributor.
 4. Communications conforming to IEEE802.11ac, IEEE802.11n or IEEE802.11a use the 5.0 GHz frequency band. Outdoor use of the 5.2 GHz (W52) and 5.3 GHz (W53) bands is prohibited by radio law.
- The wireless LAN function conforms to the radio standards in the following countries.
Never use the X1 series unit outside of these countries.
Australia, Belgium, Canada, Czech, Denmark, Finland, France, Germany, Great Britain, Greek, Hungary, Ireland, Italy, Japan, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, United States of America

Notes on security

A wireless LAN transmits data between a computer and a wireless LAN access point without using a LAN cable. Therefore, as long as radio waves are transmitted, LAN connection can be established whenever desired.

On the other hand, within a certain range, radio waves will pass through all obstructions (such as walls) and reaches the entire area. If security settings are not made, the following problems may occur.

Transmission contents can be eavesdropped on

- A malicious third party can eavesdrop on communication contents and steal identity such as your ID, password, and credit card numbers, or eavesdrop on email contents.

Unauthorized intrusions

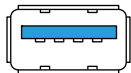
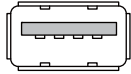
- A malicious third party may access personal or corporate networks without authorization and steal identity or confidential information (information leakage).
- An attacker can impersonate you and send out false information (impersonation).
- Communication contents can be intercepted and then manipulated before sending (manipulation).
- Data and systems can be destroyed using a computer virus (destruction).

Principally, models that support wireless LAN have security functions. If such functions are properly configured before use, any risks of sustaining the above attacks can be reduced.

We recommend configuring security functions before use at your own judgment and responsibility, and fully understand the problems that may occur if the X1 series unit is used without configuring security functions.

1.2.4 USB-A

USB Port Specifications

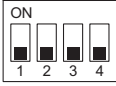
Item		Specification
USB3.0 	Applicable Standards	Compliant with USB version 3.0
	Baud Rate	Super speed: 5.0 Gbps
USB2.0 	Applicable Standards	Compliant with USB version 2.0
	Baud Rate	High speed: 480 Mbps

Applicable Devices

Applicable Devices
USB flash drive, numeric keypad, keyboard, mouse, USB hub, printer

1.2.5 DIP Switch (DIPSW) Settings

The X1 series unit is equipped with DIP switches 1 to 4. Turn off power to the unit before changing any DIP switches.

No.	Description	
Factory settings 	1	Storage automatic upload
	2	Display of touch switch test screen
	3	Terminating resistance of transmitting line for serial communication RS-422 (4-wire connection) and RS-485 (2-wire connection)
	4	Terminating resistance of receiving line for serial communication RS-422 (4-wire connection)
		The System Configurator is displayed if No. 1 and No. 2 are both set to the ON position.

DIPSW1* (Storage Automatic Upload)

Set DIP switch 1 to the ON position to automatically upload screen programs from a USB flash drive.

* This function is valid when HMI is selected as the startup mode on System Configurator.

For details, refer to the X1 Series Hardware Specifications.

* Be sure to set DIP switch 1 to the OFF position when not using automatic upload.

DIPSW2 (Display of Touch Switch Test Screen)

Set DIP switch 2 to the ON position to display the touch switch test screen.

DIPSW1, 2 (System Configurator Start)

Set DIP switches 1 and 2 to the ON position to display the System Configurator screen.

* After completing settings on System Configurator, be sure to set DIP switches 1 and 2 to the OFF position.

DIPSW3, 4 (Terminating Resistance Setting)

- When connecting a controller at SERIAL via RS-422/485 (2-wire connection), set DIP switch 3 to the ON position.
- When connecting a controller at SERIAL via RS-422/485 (4-wire connection), set DIP switches 3 and 4 to the ON position.



CAUTION

When executing communication via RS-232C at SERIAL, set DIP switches 3 and 4 to the OFF position.

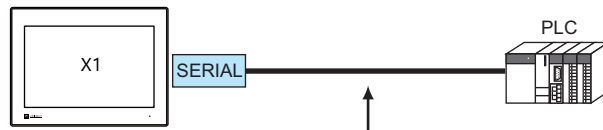
1.3 Connection Method

1.3.1 Serial Communication

1 : 1 Connection

Overview

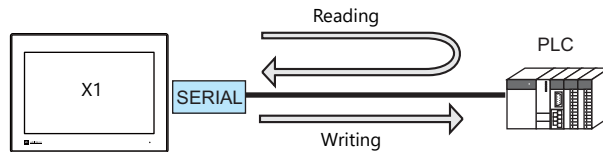
- Connect one X1 series unit with one PLC (1 : 1 connection).
- You can make settings for 1 : 1 connection in [Communication Setting] for the logical ports PLC1 to PLC8 and use SERIAL as the communication port.



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

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

- The X1 series unit (master station) communicates with a PLC (slave station) under the PLC's protocol. Therefore, there is no need to prepare a communication program for the PLC.
- The X1 series unit reads from PLC device memory for screen display. It is also possible to write switch data or numerical data entered through the keypad directly to PLC device memory.

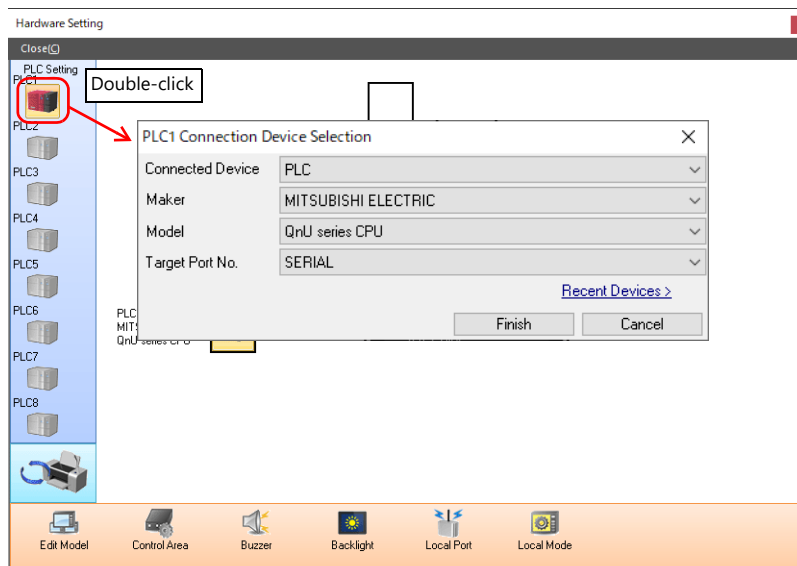


V-SFT Ver. 6 Settings

Hardware Settings

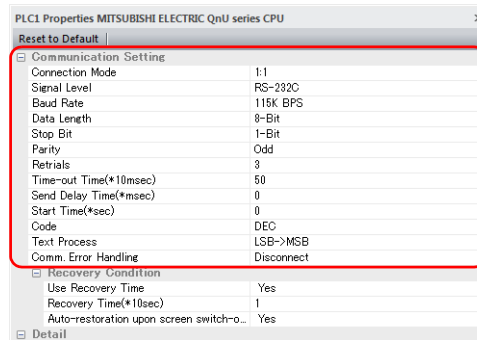
Selecting a device to be connected

Select a device to connect from [Communication Setting] → [Hardware Setting].



PLC properties

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




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

For settings other than the above, see "1.4 Hardware Settings" (page 1-29).

Settings of a Connected Device

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

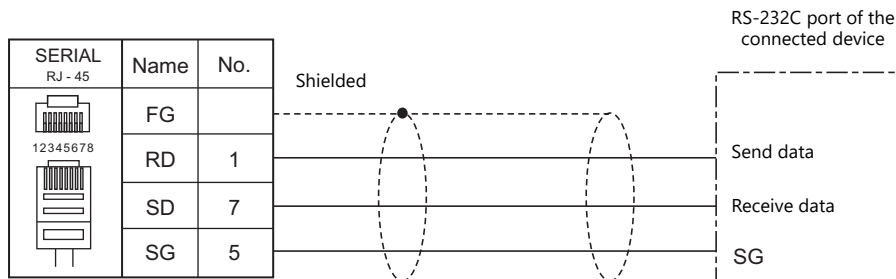
Wiring



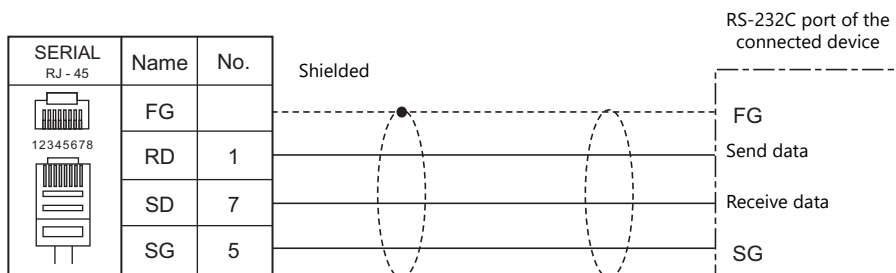
DANGER Be sure to turn off the power before connecting cables. Otherwise, you may sustain an electrical shock or equipment may be damaged.

RS-232C Connection

- The maximum length of wiring is 15 m.
 - * The maximum length varies depending on the connected device. Check the specifications for each device.
- Connect a shielded cable to either the X1 series unit or the connected device. Connect the cable to the FG terminal on the backside of the X1 series unit.
- The signal ground (SG) and frame ground (FG) are connected inside the X1 series unit. Take care when designing systems.

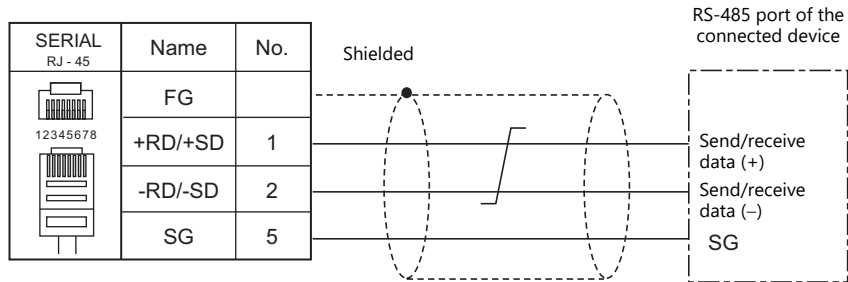


- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.

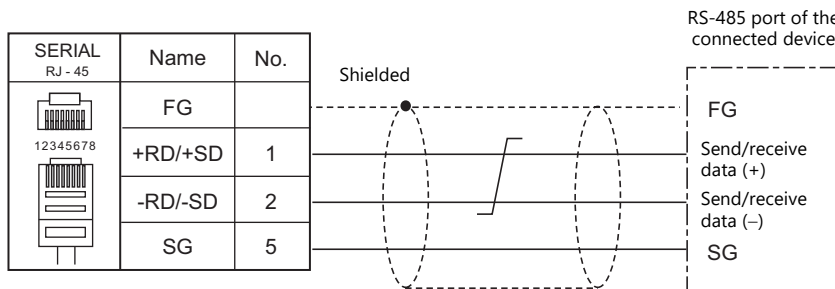


RS-485 (2-wire) Connection

- The maximum length of wiring is 500 m.
 - * The maximum length varies depending on the connected device. Check the specifications for each device.
- If the PLC has a signal ground (SG) terminal, connect it.
- DIP switch 3 on the back of the X1 series unit is used to set the terminating resistance. For more information, see "1.2.5 DIP Switch (DIPSW) Settings" (page 1-11).
- Connect a shielded cable to either the X1 series unit or the connected device. Connect the cable to the FG terminal on the backside of the X1 series unit.
- The signal ground (SG) and frame ground (FG) are connected inside the X1 series unit. Take care when designing systems.

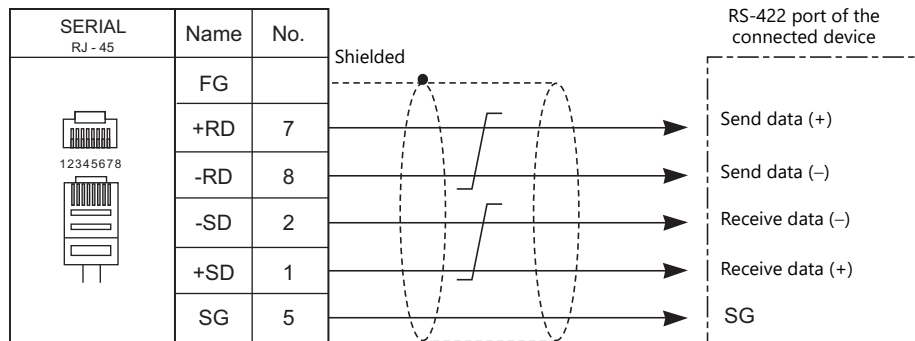


- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.

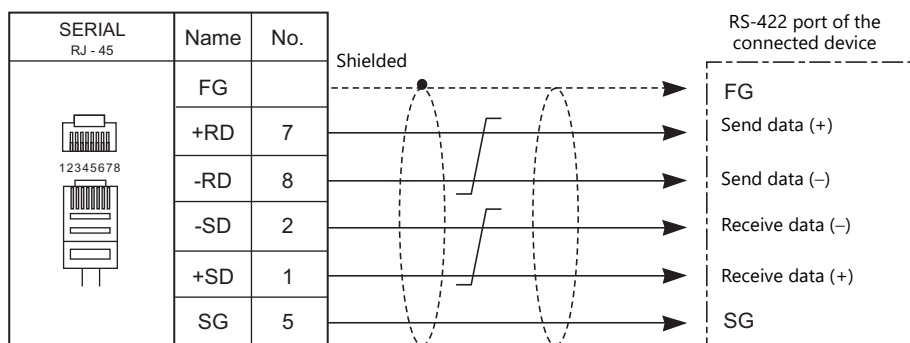


RS-422 (4-wire) Connection

- The maximum length of wiring is 500 m.
 - * The maximum length varies depending on the connected device. Check the specifications for each device.
- If the PLC has a signal ground (SG) terminal, connect it.
- DIP switches 3 and 4 on the back of the X1 series unit are used to set the terminating resistance. For more information, see "1.2.5 DIP Switch (DIPSW) Settings" (page 1-11).
- Connect a shielded cable to either the X1 series unit or the connected device. Connect the cable to the FG terminal on the backside of the X1 series unit.
- The signal ground (SG) and frame ground (FG) are connected inside the X1 series unit. Take care when designing systems.



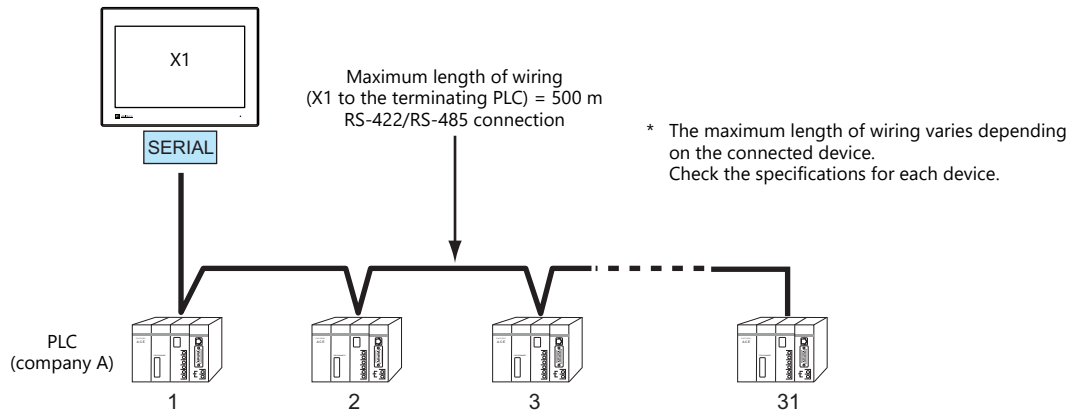
- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.



1 : n Connection (Multi-drop)

Overview

- Multi-drop connection connects one X1 series unit to multiple PLCs of the same model as a 1 : n connection. (Maximum connectable units: 31)
- You can make settings for 1 : n connection in [Communication Setting] for the logical ports PLC1 to PLC8.



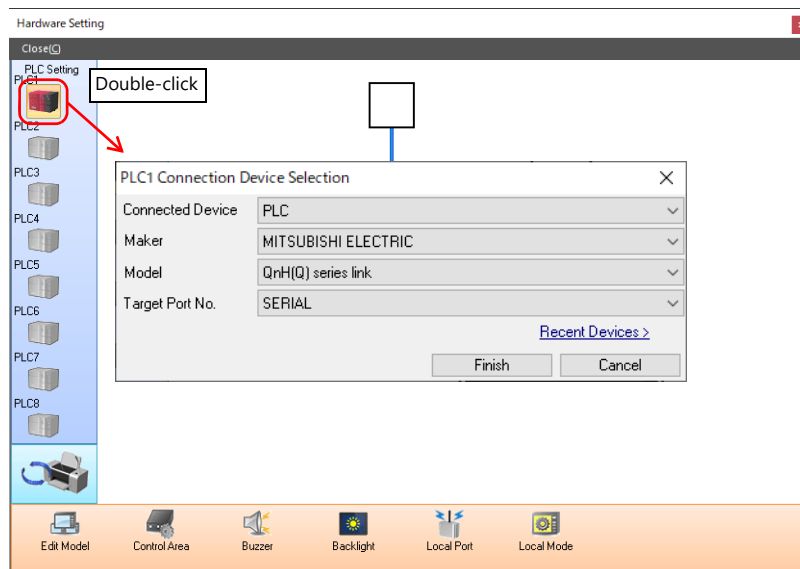
- For models that support multi-drop connection, refer to the "Connection Compatibility List" provided at the end of this manual or the chapters on individual manufacturers.

V-SFT Ver. 6 Settings

Hardware Settings

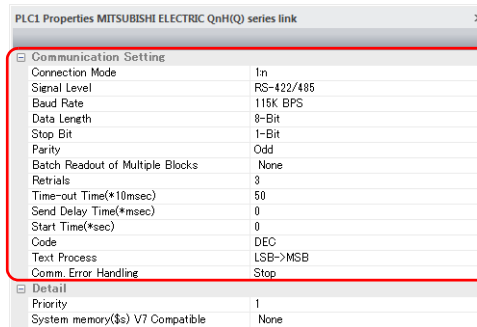
Selecting a device to be connected

Select a device to connect from [Communication Setting] → [Hardware Setting].



PLC properties

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




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

For settings other than the above, see "1.4 Hardware Settings" (page 1-29).

Settings of a Connected Device

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

Wiring

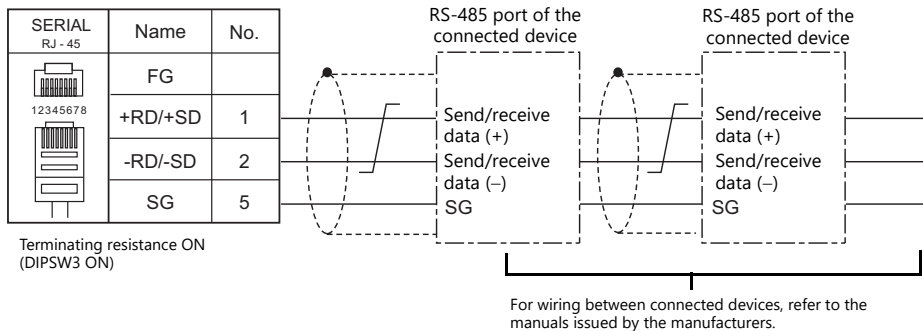


DANGER Be sure to turn off the power before connecting cables. Otherwise, you may sustain an electrical shock or equipment may be damaged.

The wiring between an X1 series unit and a connected device is the same as that for 1 : 1 communication. For descriptions of wiring between connected devices, refer to the manuals issued by the manufacturers.

RS-485 (2-wire) Connection

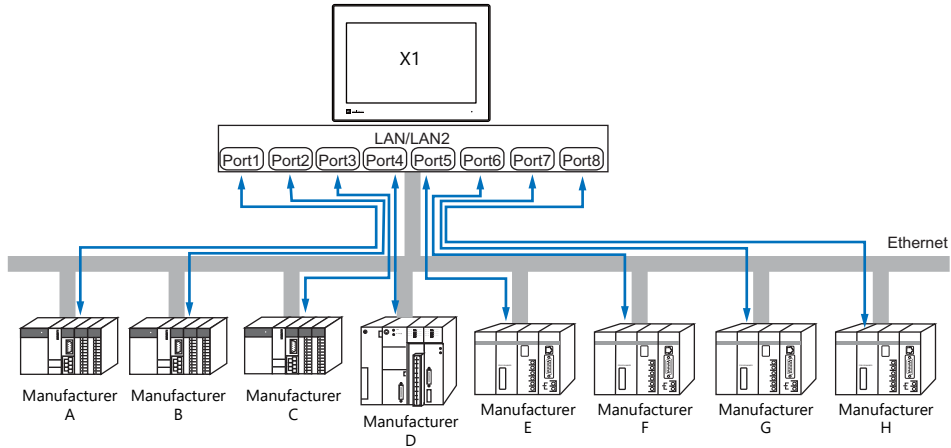
- Connection example



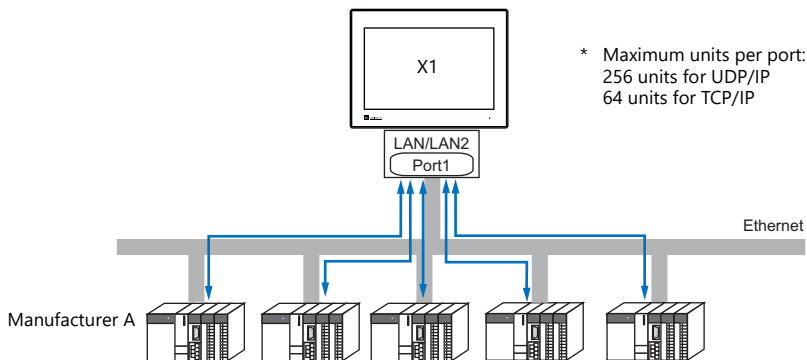
1.3.2 Ethernet Communication

Overview

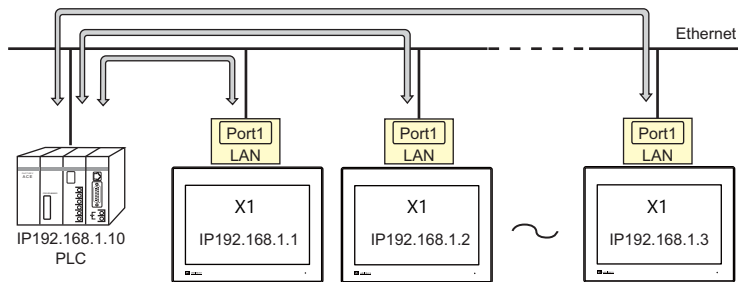
- The X1 series unit can open up to eight ports for communication, which means that the unit can simultaneously communicate with up to eight types of PLCs.



- When multiple PLCs of the same model are connected, a single port on the X1 series unit can be used to perform 1 : n communication with these PLCs.



- If multiple X1 series units are connected to one single PLC, the maximum permissible number of these units depends on the PLC specifications. Refer to the PLC manual issued by the manufacturer.



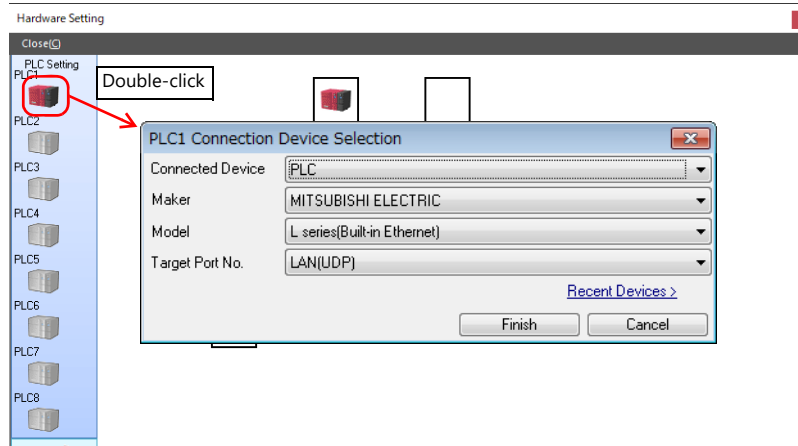
- You can make settings for Ethernet communication in [Communication Setting] for the logical ports PLC1 - PLC8.

V-SFT Ver. 6 Settings

Hardware Settings

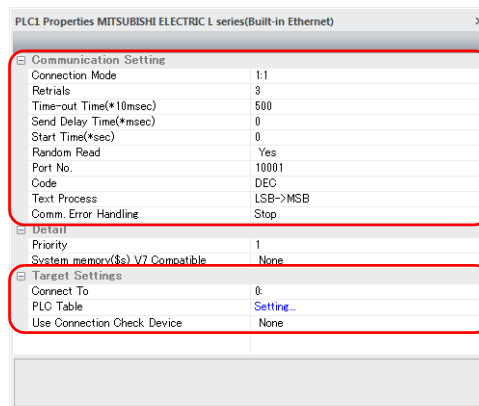
Selecting a device to be connected

Select a device to connect from [Communication Setting] → [Hardware Setting].

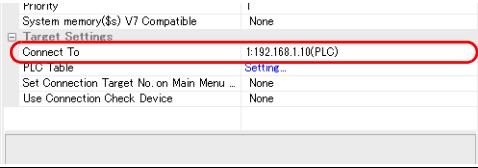
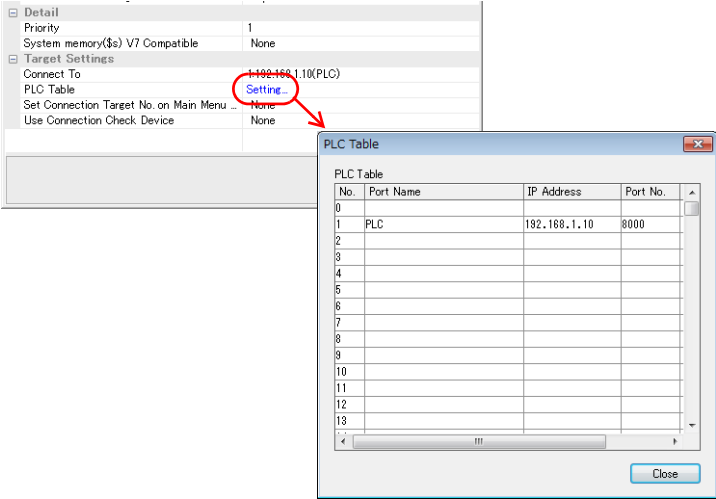


PLC properties

Configure the [PLC Properties].



Item	Description
Communication Setting	Connection Mode 1:1 / 1:n Set the number of PLCs that are to be communicated with.
	Port No. Set the port number of the X1 series unit to be used for communication with the PLCs.
	KeepAlive This setting is used when using the "KeepAlive" function. The "KeepAlive" function is used for periodically checking the connection with devices on the network. This function enables a prompt detection of a communication error, thus, significantly shortens the time to wait until a "disconnect" process takes place after an occurrence of the time-out error. * When using this function, select [Disconnect] for [Comm. Error Handling]. • [Use KeepAlive] Select [Yes] when using the "KeepAlive" function. The following settings will take effect. <ul style="list-style-type: none"> - [Retrials] Specify the number of retries. If a timeout persists even after as many retries as specified, an error handling routine will take place. 0 to 255 Default: 0 - [Time-out Time] Specify a period of time allowed for the X1 series unit to monitor a response from its connected device. If no response is given within the specified time, retry will be made. 1 to 999 (× 10 msec) Default: 30 (× 10 msec) - [Checking Cycle] Set the cycle time of "KeepAlive" communication. 1 to 999 (× 10 msec) Default: 10 (× 10 msec)

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

* For settings other than the above, see "1.4 Hardware Settings" (page 1-29).

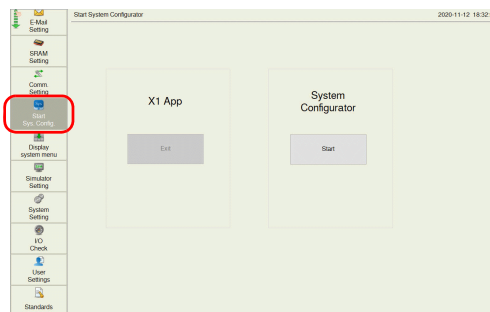
IP Address Setting of the X1 Series Unit

An IP address must be set for the X1 series unit to connect to devices via Ethernet. Set the IP address using System Configurator on the X1 series unit.

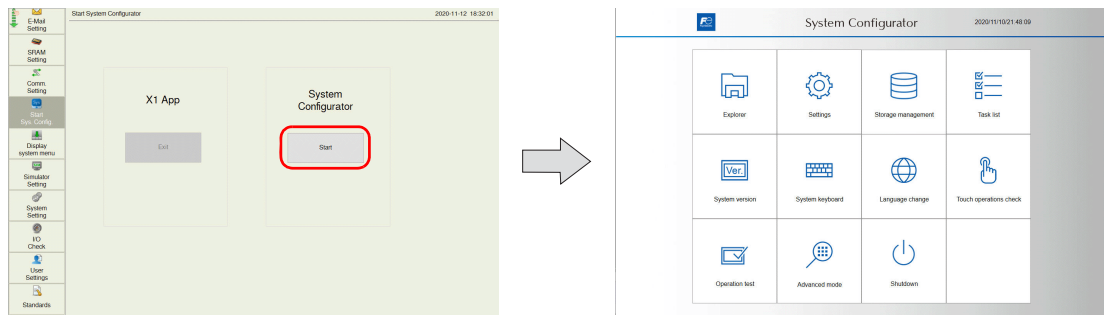
System Configurator

Set the IP address using System Configurator on the X1 series unit.

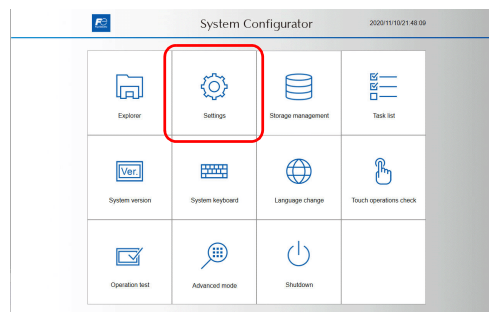
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press the [Start Sys. Config.] icon to display the System Configurator screen.



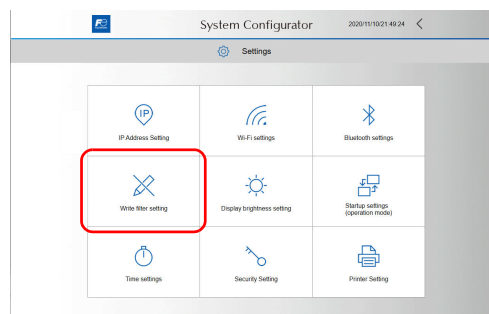
4. Press the [Start] switch. System Configurator starts.



5. Press [Settings].

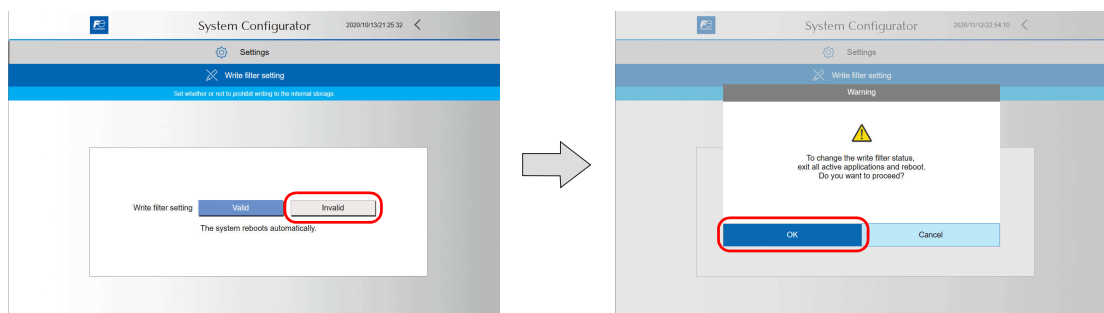


6. Press [Write filter setting].



7. If [Write filter setting] is set to [Valid], press [Invalid].
The following dialog appears. Press [OK] to reboot the X1 series unit.
After the X1 series unit reboots, perform steps 1 to 5.

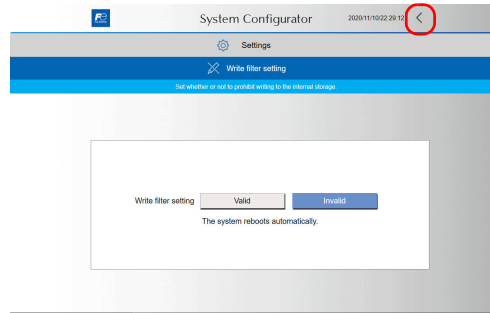
When [Write filter setting] is set to [Valid]



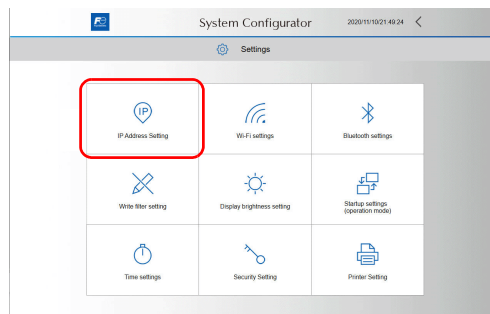
The IP address cannot be changed when [Write filter setting] is set to [Valid].
Set [Write filter setting] to [Invalid] and reboot the X1 series unit.

When [Write filter setting] is set to [Invalid], press [<] to return to the settings screen.

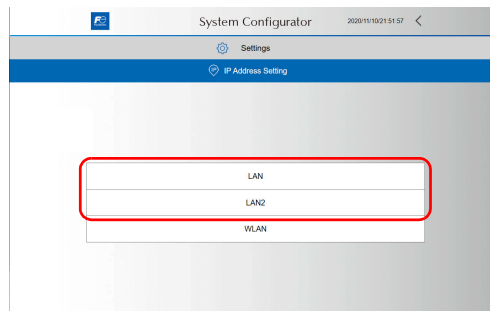
When [Write filter setting] is set to [Invalid]



8. Press [IP Address Setting].

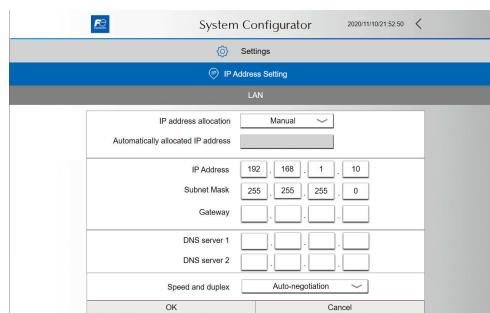


9. Press [LAN] or [LAN2].

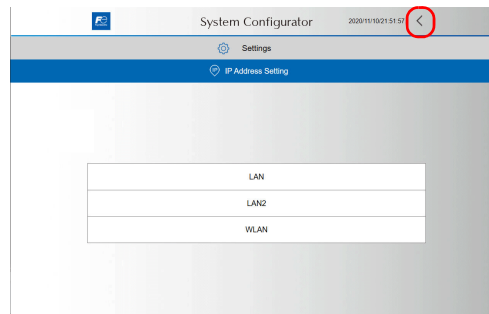


10. Configure settings and press [OK] to confirm.*

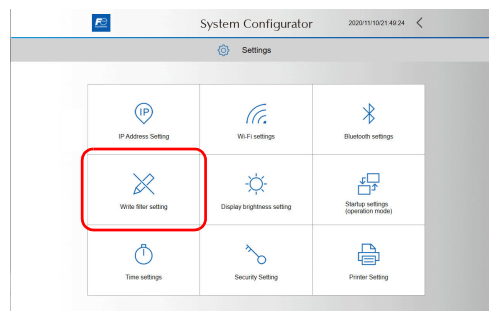
* In order to input numbers, either connect a USB keyboard or display the system keyboard on the X1 series unit. For details on the system keyboard, see "Displaying the system keyboard" (page 1-24).



11. The IP address setting screen is displayed. Press [<].

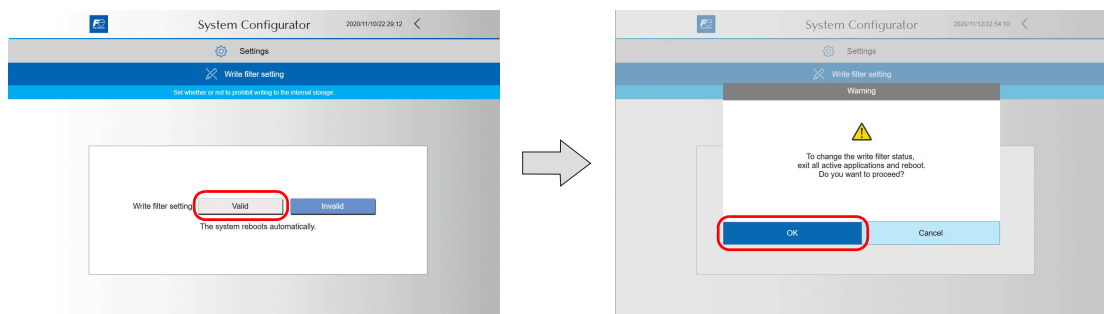


12. Press [Write filter setting].



13. Press [Valid].

The following dialog appears. Press [OK] to reboot the X1 series unit.

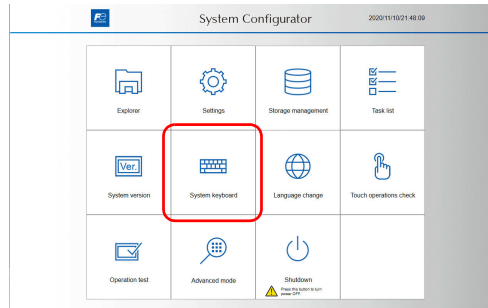


Displaying the system keyboard

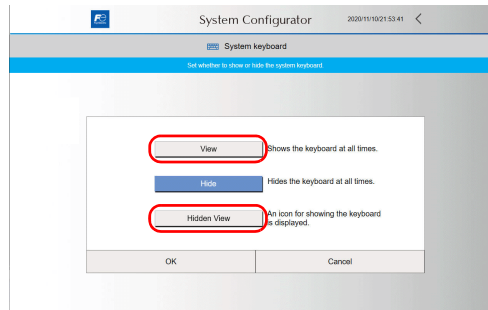
The system keyboard can be used to input characters on System Configurator.

Display the system keyboard by the following procedure. (Default: System keyboard is hidden.)

1. Start System Configurator.
For details on how to start System Configurator, see steps 1 to 4 in "System Configurator" (page 1-20).
2. Press [System keyboard].

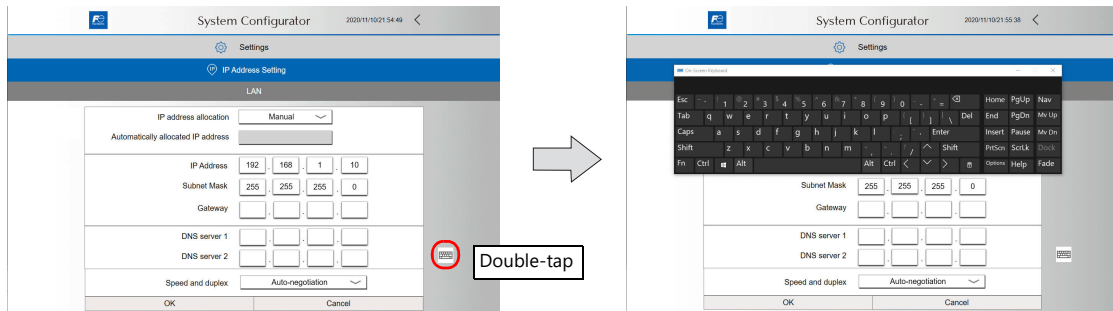


3. Press [View] or [Hidden View] and then press [OK].



<Hidden view mode>

An icon is displayed as indicated below. Double-tap the icon to display the system keyboard.
The location of the icon can be changed by dragging.



Basics of ethernet settings

IP address				
This is an address that is used for recognizing each node on the Ethernet and should be unique. The IP address is 32-bit data which consists of the network address and the host address and can be classified into classes A to C depending on the network size.				
Class A	<table border="1"> <tr> <td>0</td> <td>Network address (7)</td> <td>Host address (24)</td> </tr> </table>	0	Network address (7)	Host address (24)
0	Network address (7)	Host address (24)		
Class B	<table border="1"> <tr> <td>10</td> <td>Network address (14)</td> <td>Host address (16)</td> </tr> </table>	10	Network address (14)	Host address (16)
10	Network address (14)	Host address (16)		
Class C	<table border="1"> <tr> <td>110</td> <td>Network address (21)</td> <td>Host address (8)</td> </tr> </table>	110	Network address (21)	Host address (8)
110	Network address (21)	Host address (8)		
<p><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</p>				
<p><Unusable IP addresses></p> <ul style="list-style-type: none"> • "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 				

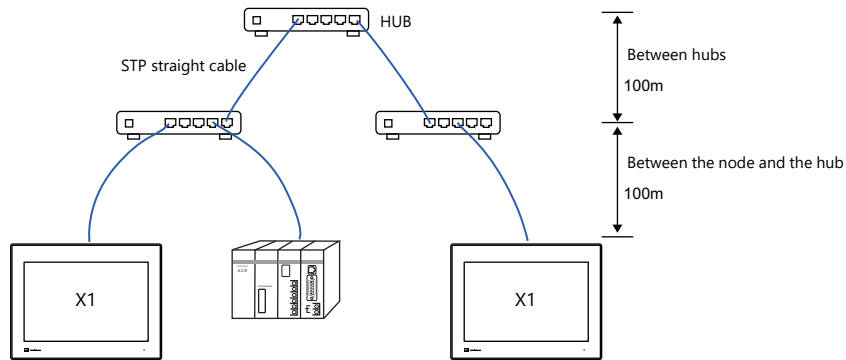
Port No.
Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit data (from 0 to 65535). The X1 series uses the port for screen program transfer (8001), PLC communication (as desired), and the simulator (8020). Set a unique number in the range of 1024 to 65535. For a PLC or a computer, set the port number in the range of 256 to 65535. It is recommended to set a greater number.

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

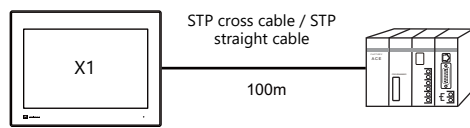
Subnet mask																			
A subnet mask is used for dividing one network address into multiple networks (subnet). The subnet is assigned by specifying a part of the host address in the IP address as a subnet address.																			
<table border="1"> <tr> <td>Class B</td> <td>10</td> <td>Network address (14)</td> <td>Host address (16)</td> </tr> <tr> <td>Subnet mask</td> <td>255</td> <td>255</td> <td>255</td> <td>0</td> </tr> <tr> <td></td> <td>11111111</td> <td>11111111</td> <td>11111111</td> <td>00000000</td> </tr> <tr> <td></td> <td>Network address</td> <td>Subnet address</td> <td>Host address</td> <td></td> </tr> </table>	Class B	10	Network address (14)	Host address (16)	Subnet mask	255	255	255	0		11111111	11111111	11111111	00000000		Network address	Subnet address	Host address	
Class B	10	Network address (14)	Host address (16)																
Subnet mask	255	255	255	0															
	11111111	11111111	11111111	00000000															
	Network address	Subnet address	Host address																
<p><Unusable subnet masks></p> <ul style="list-style-type: none"> • All bits are set to "0"..... 0.0.0.0 • All bits are set to "1"..... 255.255.255.255 																			

Connection Example

With hub



Without hub



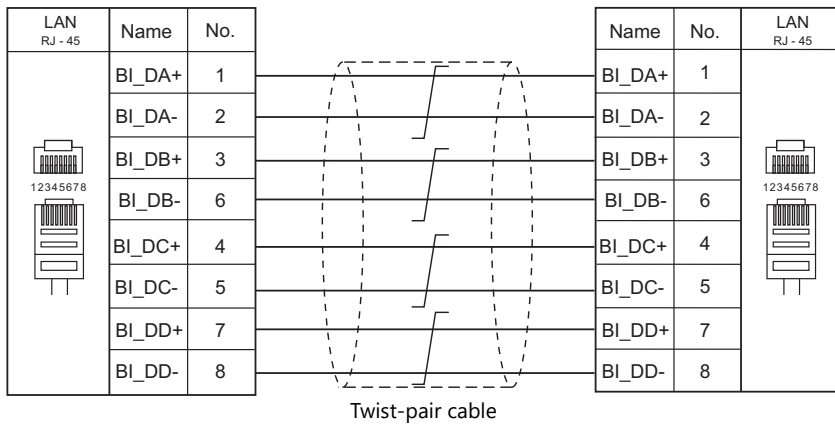
Wiring

CAUTION

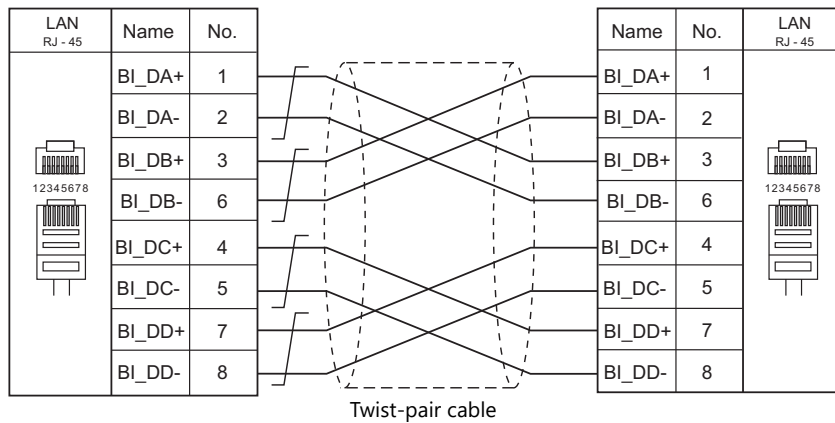
- Use a commercially available cable. Using a self-made cable may cause an error in network connection.
- If the use of a cross cable cannot stabilize communication, use a hub.

For 1000BASE-T

- Straight cable

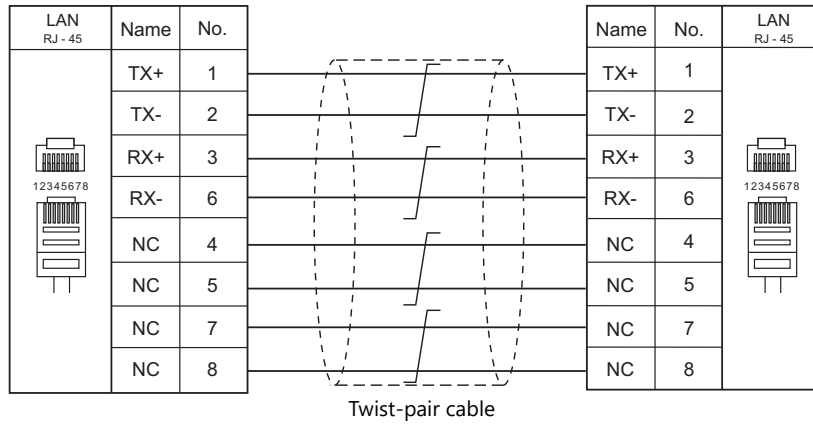


- Cross cable

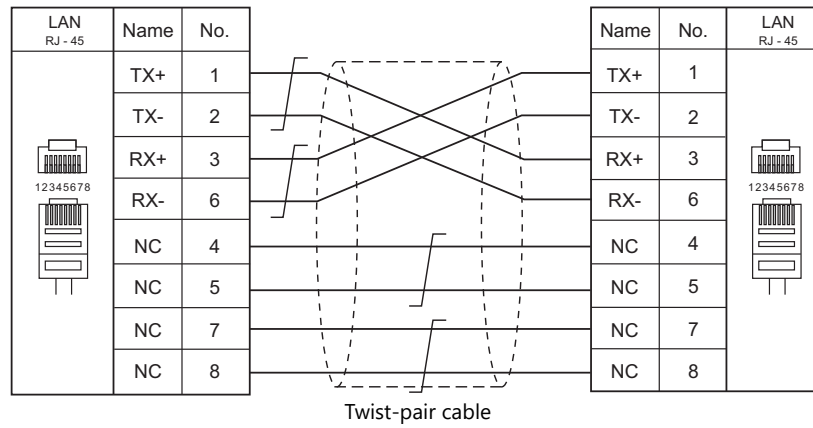


For 100BASE-TX / 10BASE-T

- Straight cable



- Cross cable

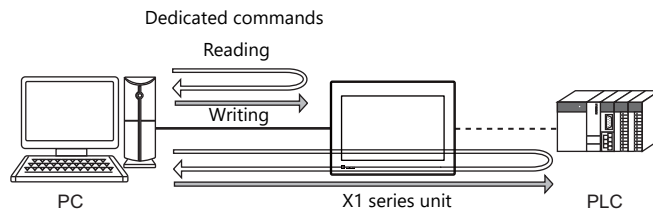


1.3.3 Slave Communication

Connecting via V-Link, Modbus RTU, Modbus ASCII, or Modbus TCP/IP is applicable to slave communication using the X1 series unit. V-Link, Modbus RTU and Modbus ASCII are used for serial communication, and Modbus TCP/IP is used for Ethernet (TCP/IP) communication.

V-Link

- "V-Link" is the network where the PC reads from and writes to the internal device memory of the X1 series unit or the device memory of PLC1 to PLC8 using a dedicated protocol.



- You can make settings for V-Link communication in [Communication Setting] for the logical ports PLC2 to PLC8.
- For more information, refer to "V-Link" in book 3 of the X1 Series Connection Manual.

MODBUS RTU

- The X1 series unit is connected to a Modbus RTU master via serial connection.
- The Modbus slave communication device memory table is prepared for the X1 series unit. The master is allowed to access the device memory table and read/write data from/into the PLC.
- For more information, refer to the Modbus Slave Communication Specifications manual separately provided.

MODBUS ASCII

- The X1 series unit is connected to a Modbus ASCII master via serial connection.
- The Modbus slave communication device memory table is prepared for the X1 series unit. The master is allowed to access the device memory table and read/write data from/into the PLC.
- For more information, refer to the Modbus Slave Communication Specifications manual separately provided.

MODBUS TCP/IP

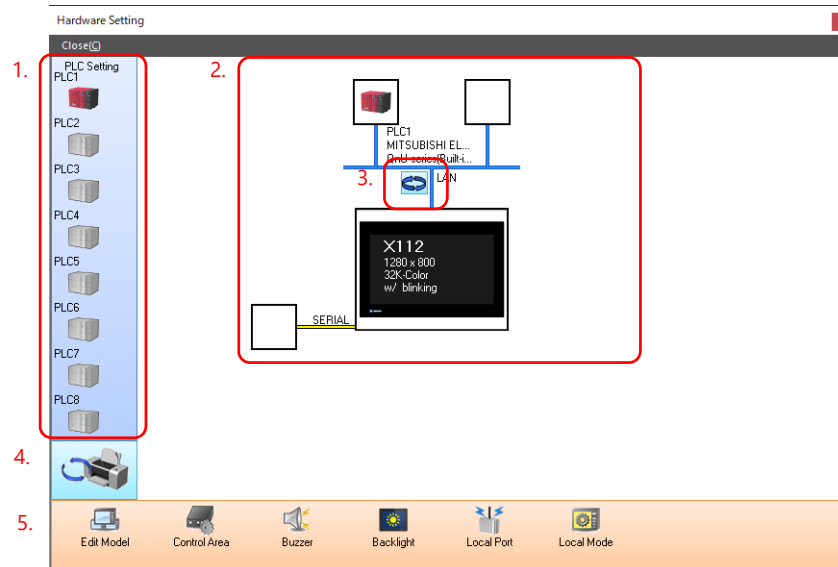
- The X1 series unit is connected to a Modbus TCP/IP master via Ethernet communication.
- The Modbus slave communication device memory table is prepared for the X1 series unit. The master is allowed to access the device memory table and read/write data from/into the PLC.
- For more information, refer to the Modbus Slave Communication Specifications manual separately provided.

1.3.4 Other Connections

The serial port (SERIAL) is used for serial printer connection and communications other than 8-way communication.

1.4 Hardware Settings

Select devices to connect to the X1 series unit and configure settings on the [Hardware Setting] screen.

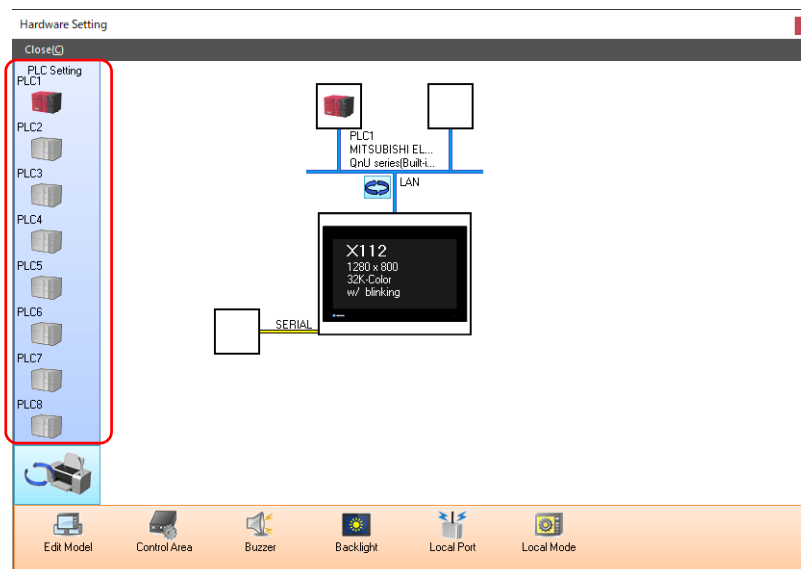


Item	Description
1.	PLC Settings Set the devices (PLC, temperature controller, servo, inverter, etc.) to connect to PLC1 to PLC8.
2.	Connection diagram Displays the devices configured for connection. Devices as well as communication settings can be changed.
3.	LAN/LAN2 Selection Select LAN or LAN2 for the Ethernet connection port of the X1 series unit. The display changes each time the button is clicked.
4.	PLC Setting / Other Settings Toggle Switch the display between PLC settings and other settings. The display changes each time the button is clicked.
5.	Unit Settings Configure the settings of the X1 series unit.

1.4.1 PLC Settings

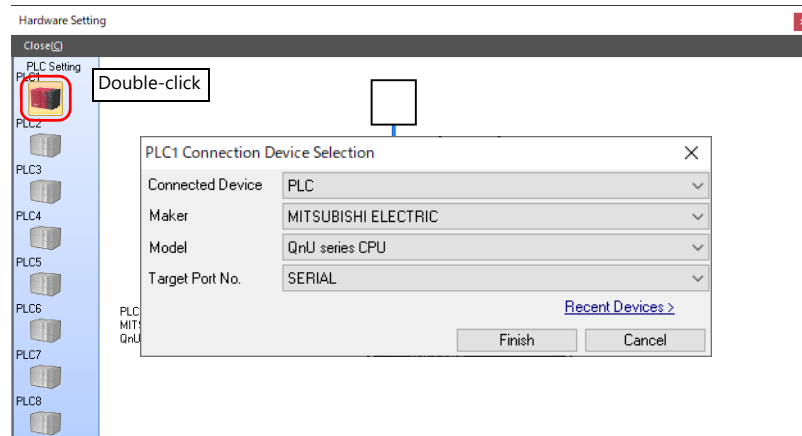
To enable communication with a PLC, a temperature controller, an inverter, etc., configure the following settings on the editor. These settings are displayed on the Local mode screen of the X1 series unit.

For details on the Local mode screen, refer to the X1 Series Hardware Specifications.



Selecting a Device to be Connected

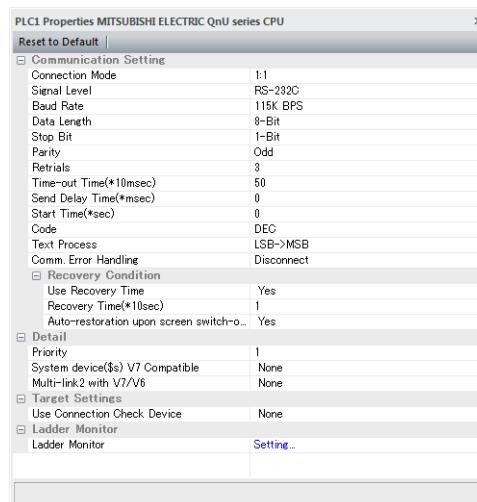
Double-click on a PLC icon in the [Hardware Setting] window to display the window shown below.



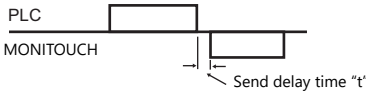
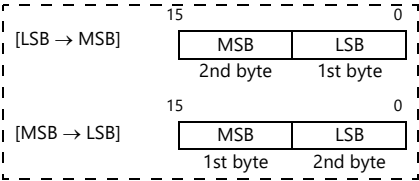
Item	Description
Applicable Devices	Select the device to connect.
Maker	Select the manufacturer of the device.
Model	Select the model of the device to connect. Refer to the respective chapter of each manufacturer and select the appropriate model.
Target Port No.	Select the port to which the device connects to on the X1 series unit.

PLC Properties

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



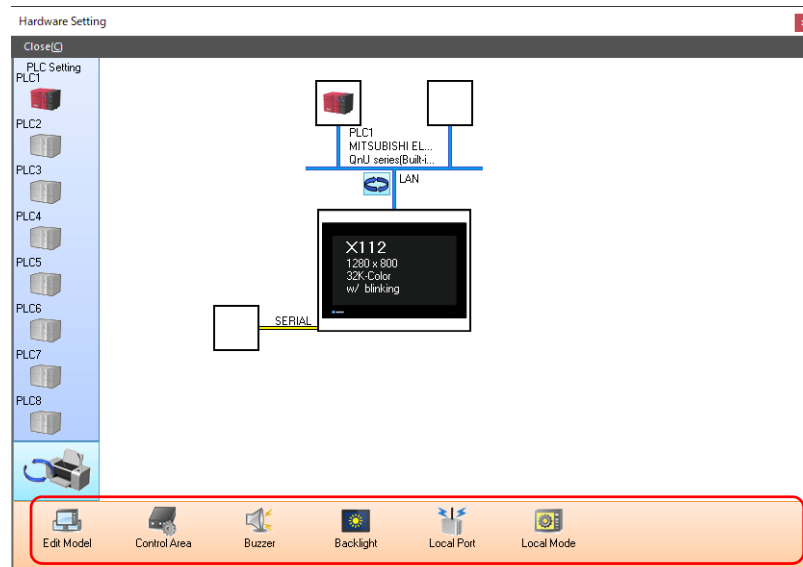
Item	Description	
Communication Setting	Connection Mode	Select a connection mode. 1:1 / 1:n Available options vary, depending on which device is connected. For details, see "Connection Compatibility List" provided at the end of this manual.
	Signal Level *1	Select a signal level. RS-232C / RS-422/485
	Baud Rate *1	Select a baud rate. 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps
	Data Length *1	Set the number of bits for data. 7 / 8 bits
	Stop Bit *1	Set the number of stop bits. 1 / 2 bits
	Parity *1	Select an option for parity bit. None / Odd / Even
	Target Port No. *1	Specify a port number of the connected device. 0 to 31 (Modbus RTU/Modbus ASCII: 1 to 255)

Item		Description	
Communication Setting	Transmission Mode *1	Select a transmission mode for the connected device. This setting is required if a device of Mitsubishi, Omron, Hitachi Industrial Equipment Systems, Yokogawa, JTEKT, or Yaskawa is used.	
	Retrials	Specify the number of retrials to be allowed in the event of a timeout during communication. If a timeout persists even after as many retrials as specified, an error handling routine will take place. 1 to 255	
	Time-out Time	Specify a period of time allowed for the X1 series unit to monitor a response from its connected device. If no response is given within the specified time, retrial will be made. PLC: 0 to 999 (× 10 msec) Temperature controller, servo, inverter: 1 to 255 (× 100 msec)	
	Send Delay Time	Specify a delay time that elapses before the X1 series unit sends the next command after receiving a response from its connected device. Normally use the default setting. 0 to 255 (× 1 msec) 	
	Start Time	Specify a delay time that elapses before the X1 series unit starts to send commands upon power-up. If the X1 series unit and its connected device are turned on at the same time and the device is slower to start up, set [Start Time]. 0 to 255 (× 1 sec)	
	Code	Select a code for the connected device. The selected option is reflected through the data displayed on graphs or trending sampling parts. DEC/BCD	
	Text Process	Specify a byte order in text data. This setting is valid for macro commands that handle text. LSB → MSB / MSB → LSB 	
	Comm. Error Handling	Select an action to be taken in the event of a communication error. <ul style="list-style-type: none"> • [Stop] Communication will be stopped entirely and the communication error screen will be displayed. The [RETRY] switch is available for attempting reestablishment of communication. • [Continue] A communication error message will be displayed at the center of the screen. The same communication will continue until restoration, and screen operation is not allowed for that duration. When communication has been returned to a normal state, the message disappears and screen operation is allowed. • [Disconnect] No error message will appear and communication will proceed to the next one.* However, communication with the device, in which a timeout was detected, will be disconnected. When a timeout is detected, ⚠ will be displayed for the part that is monitoring the address of the timeout device. <p>* The communication status is displayed on the status bar. For details, refer to the X1 Series Hardware Specifications.</p>	
	Recovery Condition	Use Return Time	This setting is valid when [Disconnect] is selected for [Comm. Error Handling].
		Recovery Time	[Recovery Time]: 1 to 255 (×10 sec) When the specified time has elapsed, the X1 series unit sends a recovery check command to the device which discontinued communication.
Auto-restoration upon screen switch-over		When the screen is switched, the X1 series unit checks the recovery of the device which discontinued communication.	

Item		Description
Detail	Priority	[1] (higher priority) - [8] (lower priority) Specify the priority taken during 8-way communication. If interruptions from two or more devices occur at the same time, communication with these devices will take place in order of priority.
	System device (\$) V7 Compatible (PLC1)	This is set to [Yes] when a V7 series screen program (including temperature control network/PLC2Way settings) is converted to an X1 series screen program. System information relevant to 8-way communication will be stored in device memory addresses \$P1 and \$s. * For more information, see "1.5.1 \$Pn (For 8-way Communication)" (page 1-37).
	System device (\$) V7 Compatible (PLC2)	This is set to [Yes] when a V7 series screen program (including temperature control network/PLC2Way settings) is converted to an X1 series screen program. <ul style="list-style-type: none"> [None] \$P2:493/494/495 is used for controlling the device memory map. [Yes] \$s762/763/764 is used for controlling the device memory map. * For more information, see "1.5.1 \$Pn (For 8-way Communication)" (page 1-37).
	Device Memory for Device Memory Map Control	Specify the device memory for device memory map control of PLC1 to PLC8. The device memory specified here is the same as [Control Device] in [Device Memory Map Setting] ([System Setting] → [Device Memory Map] → [Device Memory Map Edit] window → [Device Memory Map Setting]). * For details, refer to the X1 Series Reference Manual 2.
Target Settings	Connect To	Set this for Ethernet communication. For more information, see "1.3.2 Ethernet Communication" (page 1-18).
	PLC Table	
	Use Connection Check Device	Select [Yes] for connection confirmation using a desired device memory address at the start of communication.
	Device for Confirming Connection	Specify a desired device memory address used for connection confirmation.

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

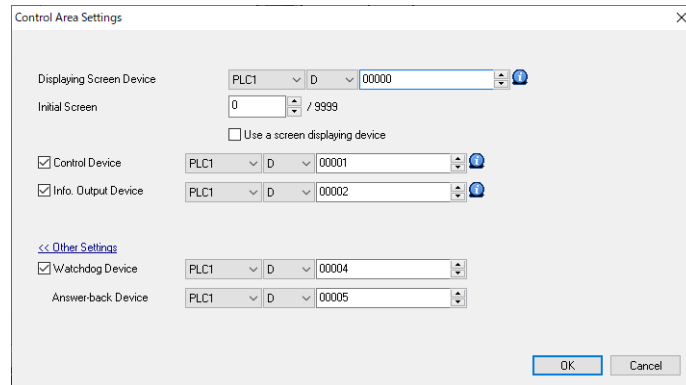
1.4.2 Unit Settings



Edit Model Selection

Select an X1 series model to edit.
For details, refer to the X1 Series Reference Manual 1.

Control Area

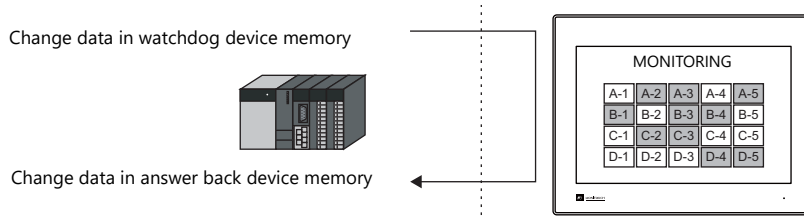


Item		Description
Screen	Displaying Screen Device	Used for switching the screen by an external command. When a screen number is specified in a device memory, the screen is displayed as specified. Also, the currently displayed screen number is stored in this device memory.
	Initial Screen	Set the screen number to display at startup. * When recovering from a communication error, the screen number which was set for the screen displaying device memory is displayed.
	Use a screen displaying device	When this checkbox is selected, the screen number which was set for the screen displaying device memory is displayed as the initial screen.
	Control Device	For details, refer to the X1 Series Reference Manual 1.
	Info. Output Device	
Other Settings	Watchdog Device	When data is saved in this area, the same data is written to the [Answer-back Device] after the screen is displayed.
	Answer-back Device	Utilizing this operation, these device memory can be used for watchdog monitoring ^{*1} or display scanning ^{*2} .

***1 Watchdog**

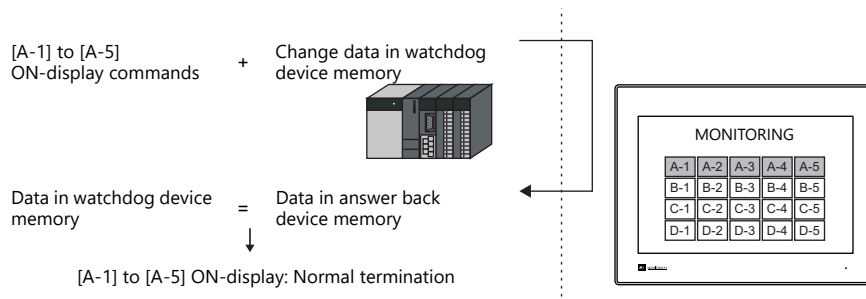
When the PLC is communicating with the X1 series unit, there is no means for the PLC to know whether or not the unit is operating correctly.

To solve this one-way communication, forcibly change data in the watchdog device memory and check that the same data is saved in the answer back device memory. This proves that the X1 series unit is correctly operating through communications with the PLC. This verification is called "watchdog".



***2 Display scanning**

This operation can be used for display scanning. Forcibly change data in the watchdog device memory when giving a graphic change command and check that the same data is saved in the answer back device memory. This proves that the graphic change command is received and executed correctly.



Buzzer

Make settings for the buzzer.
For details, refer to the X1 Series Hardware Specifications.

Backlight

Make settings for the backlight.
For details, refer to the X1 Series Hardware Specifications.

Local Port Setting

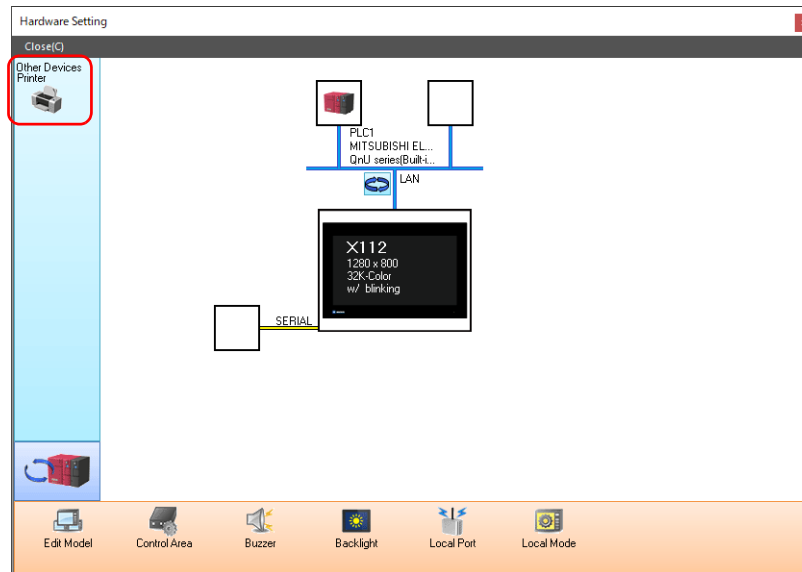
Item	Description
Port No. *1	Set a port number from 1024 to 65535. ("8001" is not available.)
Send Timeout	Specify the timeout time to send the EREAD/EWRITE/SEND/MES macro commands.
Device Protect Internal Device Memory Card Device	Select either checkbox to write-protect the corresponding device memory from computers or other stations.

*1 For more information on each setting item, see "Basics of ethernet settings" (page 1-25).

Local Mode

Make prohibition settings for Local mode.
For details, refer to the X1 Series Hardware Specifications.

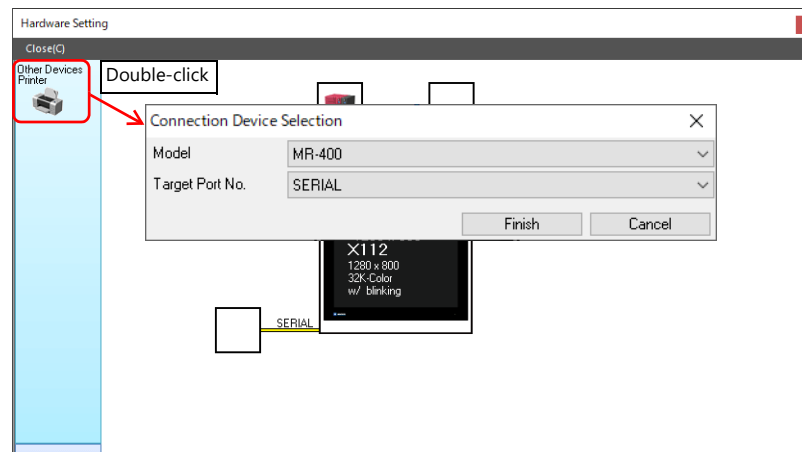
1.4.3 Other Equipment



Printer

Configure these settings when connecting a printer.

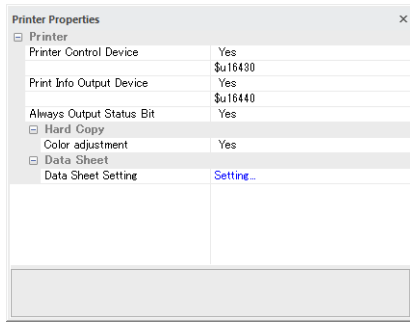
Selecting the printer model



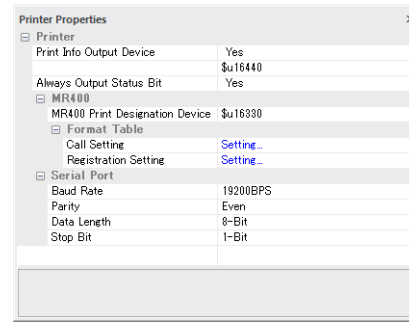
Item	Description
Model	Select the model of the printer to connect. When [None] is selected, printing can be executed by using the function of Windows. For details on configuring the printer settings, refer to the X1 Series Hardware Specifications.
Target Port No.	Select the port where the printer cable is connected.

Printer Properties

When [Model] is set to [None]



When [Model] is set to [MR-400]



Item		Description																																
Printer Control Device		<p>When this setting is enabled and the bit is set to ON (0 → 1), screen images and data sheets can be printed out.</p> <p>MSB LSB</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>09</td><td>08</td><td>07</td><td>06</td><td>05</td><td>04</td><td>03</td><td>02</td><td>01</td><td>00</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td> </tr> </table> <p style="text-align: center;">0 → 1: Screen image output └─┬─┘ 0 → 1: Data sheet output └─┬─┘</p>	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00																			
0	0	0	0	0	0	0	0	0	0	0	0	0	0																					
Printer Info Output Device (Yes/None)		<p>When using device memory for outputting printer information, the printer state is output to the specified address.</p> <p>MSB LSB</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>09</td><td>08</td><td>07</td><td>06</td><td>05</td><td>04</td><td>03</td><td>02</td><td>01</td><td>00</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td> </tr> </table> <p style="text-align: center;">0: End (standby) └─┬─┘ 1: Transferring print data └─┬─┘ 0: Not busy └─┬─┘ 1: Busy └─┬─┘</p>	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00																			
0	0	0	0	0	0	0	0	0	0	0	0	0	0																					
Always Output Status Bit (Yes/None)		<p>The X1 series unit outputs [0 → 1] when starting to transfer data upon receiving a print command, and outputs [1 → 0] upon finishing transfer. However, these signals may not be output if the print data is small. Set to [Yes] when bit output is required regardless of the data size.</p> <p>The output area is shown below.</p> <ul style="list-style-type: none"> Bit 1 of the device memory for outputting printer information Bit 0 of internal device memory \$s16 <p>\$s16</p> <p>MSB LSB</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>09</td><td>08</td><td>07</td><td>06</td><td>05</td><td>04</td><td>03</td><td>02</td><td>01</td><td>00</td> </tr> <tr> <td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td> </tr> </table> <p style="text-align: center;">0: End (standby) └─┬─┘ 1: Transferring print data └─┬─┘</p>	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00																			
	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
Hard Copy	Color adjustment (Yes/None)	<p>This setting is enabled when [Reversed] is selected on the X1 series unit. (For details, refer to the X1 Series Hardware Specifications.) Enabling color adjustment also adjusts colors other than black and white (dark → light, light → dark). Select [Yes] when TTF fonts are used.</p>																																
Data Sheet	Data Sheet Setting	<p>Make settings for data sheet printing. For more information, refer to the X1 Series Reference Manual 1.</p>																																
MR400	MR400 Print Designation Device	<p>This setting can be configured when MR400 is selected for the printer model. Set the device memory used to issue printing commands to the MR400. For details, refer to the X1 Series Reference Manual 1.</p>																																
	Format Table	<p>Register the printing format. For details, refer to the X1 Series Reference Manual 1.</p>																																
Serial port	Baud Rate	<p>Specify the baud rate. 4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K BPS</p>																																
	Parity	<p>Set the parity. None / Odd / Even</p>																																
	Data Length	<p>Set the number of bits for data. 7-Bit / 8-Bit</p>																																
	Stop Bit	<p>Set the number of stop bits. 1-Bit / 2-Bit</p>																																

* For details on printing, refer to the X1 Series Reference Manual 1.

1.5 System Device Memory for Communication Confirmation

The X1 series has addresses \$s and \$Pn as system device memory.

- \$Pn
This is the system device memory for 8-way communications, and 512 words are allocated for each logical port. For more information, see "1.5.1 \$Pn (For 8-way Communication)".
- \$s518
This is the system device memory for confirming the Ethernet status. For more information, see "1.5.2 \$s (Ethernet Status Confirmation)".

For the device memory address \$s, \$s0 to 2047 (2 K words) are assigned and data can be read from written to this area. For more information on addresses other than \$s518, refer to the X1 Series Reference Manual 1.

1.5.1 \$Pn (For 8-way Communication)

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

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

\$Pn List

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

\$Pn (n = 1 to 8)	\$. ^{*1}	Contents	Device Type
000	111 (PLC1)	X1 local port number Stores the local port number of the X1 series. (Universal serial communication, slave communication, etc.)	←X1
:	-	:	
004	130 (PLC1) ^{*2}	Modbus TCP/IP Sub Station communications Relay station No. designated device memory When a relay station number is set with a MOV macro command, the error information of the sub station number that is connected to that relay station is stored in \$Pn010 to 025.	→X1
:	-	:	
010	128 (PLC1)	Link down information (station No. 0 - 15) 0: Normal 1: Down	←X1
011	129 (PLC1)	Link down information (station No. 16 - 31) 0: Normal 1: Down	
012	114 (PLC1)	Link down information (station No. 32 - 47) 0: Normal 1: Down	
013	115 (PLC1)	Link down information (station No. 48 - 63) 0: Normal 1: Down	
014	116 (PLC1)	Link down information (station No. 64 - 79) 0: Normal 1: Down	
015	117 (PLC1)	Link down information (station No. 80 - 95) 0: Normal 1: Down	
016	118 (PLC1)	Link down information (station No. 96 - 111) 0: Normal 1: Down	
017	119 (PLC1)	Link down information (station No. 112 - 127) 0: Normal 1: Down	
018	120 (PLC1)	Link down information (station No. 128 - 143) 0: Normal 1: Down	
019	121 (PLC1)	Link down information (station No. 144 - 159) 0: Normal 1: Down	
020	122 (PLC1)	Link down information (station No. 160 - 175) 0: Normal 1: Down	
021	123 (PLC1)	Link down information (station No. 176 - 191) 0: Normal 1: Down	
022	124 (PLC1)	Link down information (station No. 192 - 207) 0: Normal 1: Down	
023	125 (PLC1)	Link down information (station No. 208 - 223) 0: Normal 1: Down	
024	126 (PLC1)	Link down information (station No. 224 - 239) 0: Normal 1: Down	
025	127 (PLC1)	Link down information (station No. 240 - 255) 0: Normal 1: Down	
:	-	:	
099	-	Error information hold (page 1-41) Setting for the update timing of the \$Pn: 010 to 025 link down information 0: Always updated with the latest information Other than 0: Only updated when a communication error occurs	→X1
100	730 (PLC2)	Error status Station No. 00 status (page 1-42)	←X1
101	731 (PLC2)	Error status Station No. 01 status (page 1-42)	
102	732 (PLC2)	Error status Station No. 02 status (page 1-42)	
103	733 (PLC2)	Error status Station No. 03 status (page 1-42)	
104	734 (PLC2)	Error status Station No. 04 status (page 1-42)	
105	735 (PLC2)	Error status Station No. 05 status (page 1-42)	
106	736 (PLC2)	Error status Station No. 06 status (page 1-42)	
107	737 (PLC2)	Error status Station No. 07 status (page 1-42)	
108	738 (PLC2)	Error status Station No. 08 status (page 1-42)	
109	739 (PLC2)	Error status Station No. 09 status (page 1-42)	

\$Pn (n = 1 to 8)	\$s*1	Contents	Device Type
110	740 (PLC2)	Error status Station No. 10 status (page 1-42)	←X1
:	:	:	
120	750 (PLC2)	Error status Station No. 20 status (page 1-42)	
:	:	:	
130	760 (PLC2)	Error status Station No. 30 status (page 1-42)	
131	761 (PLC2)	Error status Station No. 31 status (page 1-42)	
132	820 (PLC2)	Error status Station No. 32 status (page 1-42)	
133	821 (PLC2)	Error status Station No. 33 status (page 1-42)	
:	:	:	
140	828 (PLC2)	Error status Station No. 40 status (page 1-42)	
:	:	:	
150	838 (PLC2)	Error status Station No. 50 status (page 1-42)	
:	:	:	
160	848 (PLC2)	Error status Station No. 60 status (page 1-42)	
:	:	:	
170	858 (PLC2)	Error status Station No. 70 status (page 1-42)	
:	:	:	
180	868 (PLC2)	Error status Station No. 80 status (page 1-42)	
:	:	:	
190	878 (PLC2)	Error status Station No. 90 status (page 1-42)	
:	:	:	
199	887 (PLC2)	Error status Station No. 99 status (page 1-42)	
200	-	Error status Station No. 100 status (page 1-42)	
:	:	:	
350	-	Error status Station No. 250 status (page 1-42)	
:	:	:	
355	-	Error status Station No. 255 status (page 1-42)	
356	-	Device memory map 0 Status	←X1
357	-	Device memory map 0 Error code 1	
358	-	Device memory map 0 Error code 2	
359-361	-	Device memory map 1 Status, error code	
362-364	-	Device memory map 2 Status, error code	
365-367	-	Device memory map 3 Status, error code	
368-370	-	Device memory map 4 Status, error code	
371-373	-	Device memory map 5 Status, error code	
374-376	-	Device memory map 6 Status, error code	
377-379	-	Device memory map 7 Status, error code	
380-382	-	Device memory map 8 Status, error code	
383-385	-	Device memory map 9 Status, error code	
386-388	-	Device memory map 10 Status, error code	
389-391	-	Device memory map 11 Status, error code	
392-394	-	Device memory map 12 Status, error code	
395-397	-	Device memory map 13 Status, error code	
398-400	-	Device memory map 14 Status, error code	
401-403	-	Device memory map 15 Status, error code	
404-406	-	Device memory map 16 Status, error code	
407-409	-	Device memory map 17 Status, error code	
410-412	-	Device memory map 18 Status, error code	
413-415	-	Device memory map 19 Status, error code	
416-418	-	Device memory map 20 Status, error code	

\$Pn (n = 1 to 8)	\$s*1	Contents	Device Type
419-421	-	Device memory map 21 Status, error code	←X1
422-424	-	Device memory map 22 Status, error code	
425-427	-	Device memory map 23 Status, error code	
428-430	-	Device memory map 24 Status, error code	
431-433	-	Device memory map 25 Status, error code	
434-436	-	Device memory map 26 Status, error code	
437-439	-	Device memory map 27 Status, error code	
440-442	-	Device memory map 28 Status, error code	
443-445	-	Device memory map 29 Status, error code	
446-448	-	Device memory map 30 Status, error code	
449	-	Device memory map 31 Status	
450	-	Device memory map 31 Error code 1	
451	-	Device memory map 31 Error code 2	
:	:	:	
493	762 (PLC2)*3	Device memory map reading prohibited flag (refer to the X1 Series Reference Manual 2). 0: Periodical reading/synchronized reading executed Other than 0: Periodical reading/synchronized reading stopped	→X1
494	763 (PLC2)*3	Forced execution of the device memory map TRL_READ/TBL_WRITE macro Setting for macro operation when there is a station with a communication error 0: The macro is not executed in relation to any of the stations. Other than 0: The macro is executed in relation to connected stations.	
495	764 (PLC2)*3	Device memory map writing prohibited flag (refer to the X1 Series Reference Manual 2). 0: Periodical writing/synchronized writing executed Other than 0: Periodical writing/synchronized writing stopped	
:	-	:	
500	800 (PLC3)	Device memory for Modbus slave communications Used for setting the number of the reference device memory map and the device memory for referring free area 31.Used for setting the number of the reference device memory map and the device memory for referring free area 31. \$Pn500 to 505 are exclusively used for monitoring; \$s800 to 805 are used for writing from the Modbus master. Refer to the Modbus Slave Communication Specifications.	→X1
501	801 (PLC3)		
502	802 (PLC3)		
503	803 (PLC3)		
504	804 (PLC3)		
505	805 (PLC3)		
:	:	:	
508	765 (PLC2)	Error response code (page 1-45) If "800BH" (error code received) is stored for the error status (\$Pn100 to 355), it is possible to check the error code.	←X1
509	766 (PLC2)		
510	767 (PLC2)		
511	768 (PLC2)		

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

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

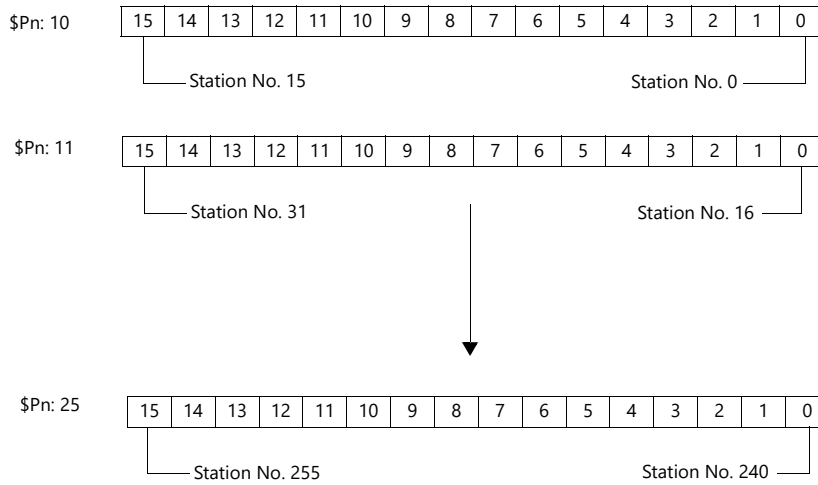
*3 If executing device memory map control using \$s762, \$s763 and \$s764, select yes for [System device (\$s) V7 Compatible] under [Detail] on the [PLC Properties] window for PLC2. Note that \$P2: 493/494/495 cannot be used in this case.

Details

\$Pn: 10 to 25

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

- 0: Normal
- 1: Down

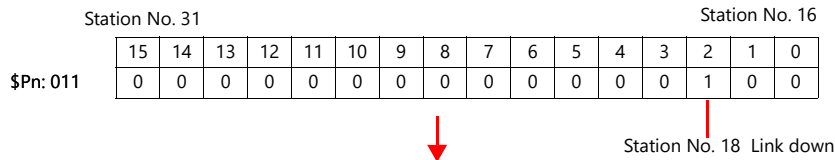


\$Pn:99

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

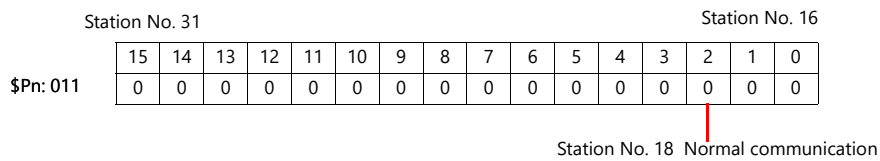
- 0: Always updated with the latest information
- Other than 0: Only updated when a communication error occurs

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

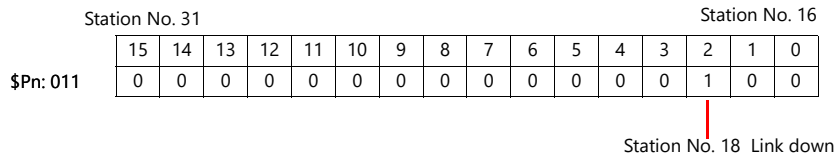


After resetting communications

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



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

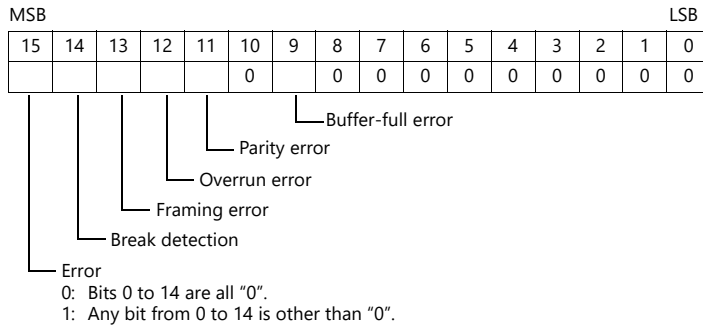


\$Pn: 100 to 355

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

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

Errors other than the above are stored as shown below.



Error	Details	Solution
Time-out	Although a request to send is given, no answer is returned within the specified time.	Implement solutions 1, 2, and 3.
Check code	The check code of the response is incorrect.	Implement solutions 1 and 3.
Data error	The code of the received data is invalid.	Implement solutions 1, 2, and 3.
Error code received	An error occurred on the connected device.	Refer to the instruction manual for the PLC.
Buffer full	The X1 buffer is full.	Contact your local distributor.
Parity	An error occurred in parity check.	Implement solutions 2 and 3.
Overrun	After receiving one character, the next character was received before internal processing was completed.	Implement solutions 1 and 3.
Framing	Although the stop bit must be "1", it was detected as "0".	Implement solutions 1, 2, and 3.
Break detection	The connected device's SD is remaining at the low level.	Examine the connection with the connected device's SD and RD.

- Solution

- 1) Check if the communication settings of the X1 series and the connected device are matched.
- 2) Check the cable connection.
- 3) Data may be disrupted because of noise. Fix noise.

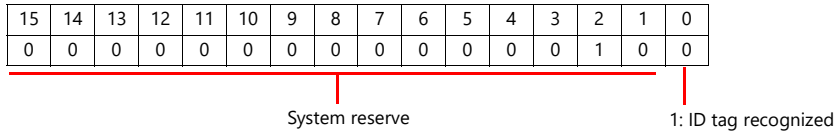
If you still cannot solve the error even after following the solutions above, contact your local distributor.

\$Pn: 356 to 451

This device memory is valid when an Omron ID controller (V600/620/680) or NITTOKU RFID reader/writer (ITS-HRW110) is connected with [Guarantee synchronism of the data] checked on the [Device Memory Map Setting] dialog.

- Status (\$Pn 356, 359, ...)

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

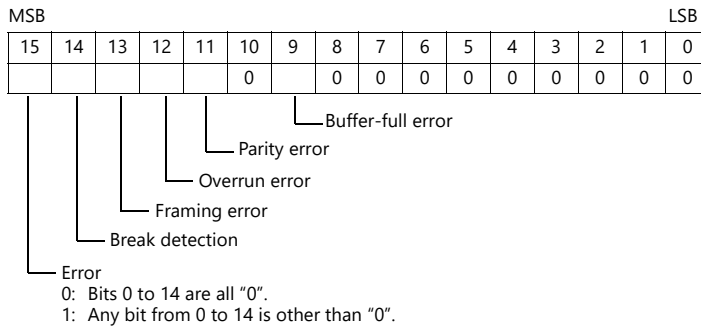


- Error code 1 (\$Pn 357, 360, ...)

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

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

Errors other than the above are stored as shown below.



- Error code 2 (\$Pn 358, 361, ...)

The exit code/main response is stored when error code 1 = 800BH.

For Omron ID Controller (V600/620/680)

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

For NITTOKU RFID Reader/Writer (ITS-HRW 110)

Main response (HEX)	Contents	
00	Command execution success	Success - normal
80		Success - RF power supply OFF/ON control is provided
81		Success - tag no response OK
01	Command execution failure	Command argument - format error
02		Command argument - parameter length error
03		Command argument - parameter error
04		FIFO size error
05		Execution failure
06		Abort (abort with error after execution)
07		Get system info - Retrieve failed (extended Read/Write command system)
08		Get system info - Data error (extended Read/Write command system)
09		Out-of-specification error
0A		System settings update: magic number mismatch
0B		System setting update: incorrect device ID
0C		System setting update: error in writing EEPROM
0D		Fatal error
E0		Protocol mismatch
E1		Mismatch the current settings
FE		Shipping processing mode: Out-of-operating mode
FF		Undefined command
Other than above		Reserved

\$Pn: 508 to 511

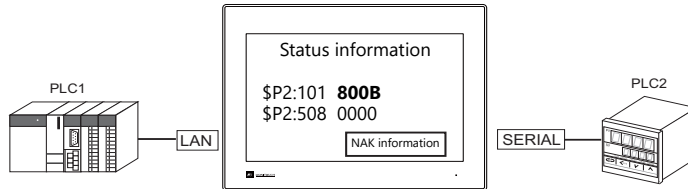
If "800BH" is stored for the error status information (\$Pn: 100 to 355), on transferring the data of that station number to any internal device memory address, the reception code will be obtained at \$Pn: 508 to 511.

Notes on use

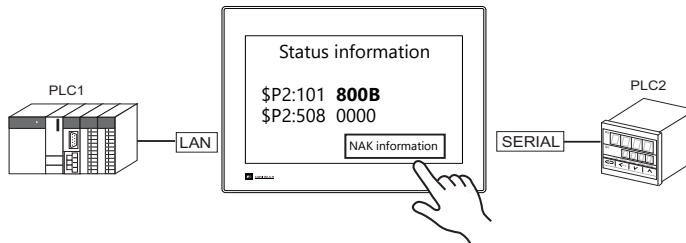
- Use \$u/\$T as the target internal device memory.
- Use the macro command MOV (W). MOV (D) cannot be used.
- "0" is stored to device memory addresses that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

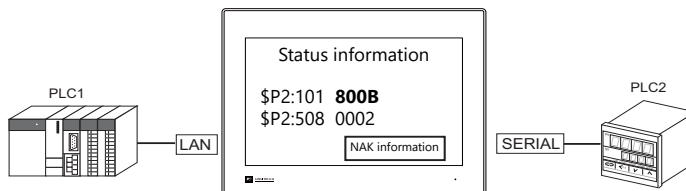
- 1) On receipt of an error code at station No. 1 of PLC2, "800BH" is stored in \$P2:101.



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



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



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

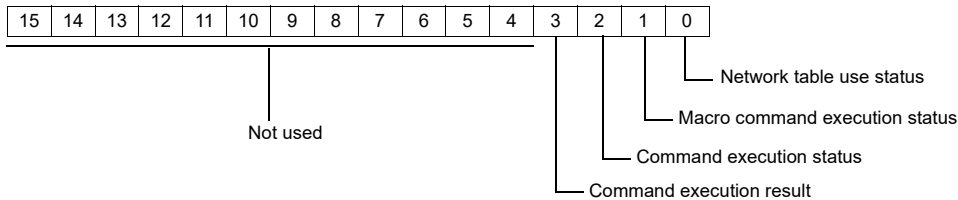
1.5.2 \$s (Ethernet Status Confirmation)

\$s List

\$s	Contents	Stored Value
518	Ethernet status (for built-in LAN port)	<ul style="list-style-type: none"> [0]: Normal [801]: Link down error Check the link confirmation LED on the HUB or communication unit. If the LED is not on, check cable connection or the port setting on the network table.
520	Network table 0 status	
521	Network table 1 status	
522	Network table 2 status	
:	:	
617	Network table 97 status	
618	Network table 98 status	
619	Network table 99 status	
:	:	
1400	Network table 100 status	
1401	Network table 101 status	
1402	Network table 102 status	
:	:	
1553	Network table 253 status	
1554	Network table 254 status	
1555	Network table 255 status	
:	:	
1657	Ethernet status (for built-in LAN2 port)	<ul style="list-style-type: none"> [0]: Normal [801]: Link down error Check the link confirmation LED on the HUB or communication unit. If the LED is not on, check cable connection or the port setting on the network table.
1658	Ethernet status (for built-in WLAN port)	
:	:	

\$s520 - 619, 1400 - 1555

Stores the statuses of network table No. 0 to 255.



- 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 MES or Ethernet macros (SEND/EREAD/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 MES or Ethernet macros (SEND/EREAD/EWRITE).
0: Normal 1: Error
- Bits 4 to 15 (System reserved)
Not used at present. Always set "0".

2. IAI

2.1 Temperature Controller/Servo/Inverter Connection

2.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

X-SEL Controller

PLC Selection on the Editor	Model		Port	Signal Level	Connection		Lst File
					RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)	
X-SEL controller	Orthogonal	XSEL-K XSEL-KE XSEL-KT/KET	HOST port	RS-232C	Wiring diagram 1 - M2	×	IAI_XSEL.Lst
	Scalar	XSEL-KX					
	Orthogonal	XSEL-J XSEL-P XSEL-Q	TP port	RS-232C	Wiring diagram 2 - M2	×	
	Scalar	XSEL-JX XSEL-PX XSEL-QX					

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Robo Cylinder

PLC Selection on the Editor	Model	Unit/Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)	
ROBO CYLINDER (RCP2/ERC)	RCP2 ERC	SIO	RS-485	Wiring diagram 1 - M4	×	IAI_ROBO.Lst
			RS-232C	Wiring diagram 3 - M2 ^{*3}	×	
				Wiring diagram 4 - M2 ^{*4}	×	
ROBO CYLINDER (RCS/E-CON)	RCS E-CON	PORT IN	RS-485	Wiring diagram 1 - M4	×	IAI_ROBO.Lst
			RS-232C	Wiring diagram 3 - M2 ^{*3}	×	
				Wiring diagram 4 - M2 ^{*4}	×	
PCON/ACON/SCON (MODBUS RTU)	PCON ACON SCON	SIO	RS-485	Wiring diagram 1 - M4	×	IAI_PCON.Lst
			RS-232C	Wiring diagram 3 - M2 ^{*3}	×	
				Wiring diagram 4 - M2 ^{*4}	×	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 Use IAI's RS-485 conversion adaptor "RCB-CV-MW" and external device communication cable "CB-RCA-SIO020 (050)".

*4 Use IAI's SIO converter "RCB-TU-SIO-A/B".

2.1.1 X-SEL Controller

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / <u>38400</u> / 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	<u>9600</u> / 19200 / 38400 bps
I/O parameter 93	Data length	8
I/O parameter 94	Stop bit	1
I/O parameter 95	Parity	None
Other parameter 46	Bit pattern	1

Mode switch

Select [AUTO].

System I/O connector

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

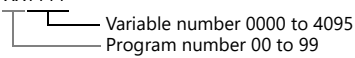
- XSEL-K/KE/KT/KET/KX/J/JX (with built-in cutout relay)**
 Set the normally-closed type emergency stop input between the EMG terminals or short-circuit these terminals. When they are open, operation is disabled due to an emergency stop.
 For the ENB terminals, set the normally-closed safety gate input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

Available Device Memory

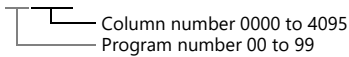
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

*1 For 20E (integer variable) XYYYYY



*2 For 210 (string) XYYYYY



208 (Effective Point Data Count)

Address	Name
0	Effective point data count

212 (Axis Status)

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

213 (Program Status)

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

215 (System Status)

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

253 (Program)

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

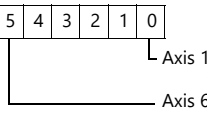
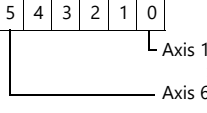
2A1 (Scalar Axis Status)

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

PLC_CTL

Real numbers used on the X1 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) <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Bit</div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15px;">-</td> <td style="width: 15px;">7</td> <td style="width: 15px;">6</td> <td style="width: 15px;">5</td> <td style="width: 15px;">4</td> <td style="width: 15px;">3</td> <td style="width: 15px;">2</td> <td style="width: 15px;">1</td> <td style="width: 15px;">0</td> </tr> </table> <div style="margin-left: 10px;"> <div style="margin-bottom: 5px;">└─ Axis 1</div> <div style="margin-bottom: 5px;">⋮</div> <div>└─ Axis 6</div> </div> </div>		-	7	6	5	4	3	2	1	0
		-	7		6	5	4	3	2	1	0		
		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) <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Bit</div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15px;">-</td> <td style="width: 15px;">7</td> <td style="width: 15px;">6</td> <td style="width: 15px;">5</td> <td style="width: 15px;">4</td> <td style="width: 15px;">3</td> <td style="width: 15px;">2</td> <td style="width: 15px;">1</td> <td style="width: 15px;">0</td> </tr> </table> <div style="margin-left: 10px;"> <div style="margin-bottom: 5px;">└─ Axis 1</div> <div style="margin-bottom: 5px;">⋮</div> <div>└─ Axis 6</div> </div> </div>		-	7	6	5	4	3	2	1	0
		-	7		6	5	4	3	2	1	0		
		n + 3 -	Status m = 1		Axis status								
					Axis sensor input status								
					Axis-related error code								
					Encoder status								
					Current position								
		n + 7 to n + 8	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										
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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> 		-	7	6	5	4	3	2	1	0
-	7	6	5	4	3	2	1	0					
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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> 		-	7	6	5	4	3	2	1	0
		-	7		6	5	4	3	2	1	0		
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										
		n + 1	Command: 234 (HEX)										
		n + 2	Axis pattern: m (number of ON bits) Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div>	-	7	6	5	4	3	2	1	0	6 + 2m
		-	7	6	5	4	3	2	1	0			
		n + 3	Acceleration										
		n + 4	Deceleration										
		n + 5	Speed										
		n + 6 to n + 7	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Axis pattern (m = 1)</td> <td>Absolute coordinate data</td> </tr> </table>	Axis pattern (m = 1)	Absolute coordinate data								
Axis pattern (m = 1)	Absolute coordinate data												
n + 8 -	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Axis pattern (m = 2)</td> <td>Absolute coordinate data</td> </tr> </table>	Axis pattern (m = 2)	Absolute coordinate data										
Axis pattern (m = 2)	Absolute coordinate data												
:													
Traverse by relative command For orthogonal	1 - 8 (PLC1 - 8)	n	Station number										
		n + 1	Command: 235 (HEX)										
		n + 2	Axis pattern: m (number of ON bits) Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div>	-	7	6	5	4	3	2	1	0	6 + 2m
		-	7	6	5	4	3	2	1	0			
		n + 3	Acceleration										
		n + 4	Deceleration										
		n + 5	Speed										
		n + 6 to n + 7	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Axis pattern (m = 1)</td> <td>Relative coordinate data</td> </tr> </table>	Axis pattern (m = 1)	Relative coordinate data								
Axis pattern (m = 1)	Relative coordinate data												
n + 8 -	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Axis pattern (m = 2)</td> <td>Relative coordinate data</td> </tr> </table>	Axis pattern (m = 2)	Relative coordinate data										
Axis pattern (m = 2)	Relative coordinate data												
:													
Jog/ inching traverse	1 - 8 (PLC1 - 8)	n	Station number										
		n + 1	Command: 236 (HEX)										
		n + 2	Axis pattern m Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div>	-	7	6	5	4	3	2	1	0	9
		-	7	6	5	4	3	2	1	0			
		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										
		n + 1	Command: 237 (HEX)										
		n + 2	Axis pattern Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div>	-	7	6	5	4	3	2	1	0	7
		-	7	6	5	4	3	2	1	0			
		n + 3	Acceleration										
		n + 4	Deceleration										
		n + 5	Speed										
n + 6	Point number												
:													
Operation stop and cancel	1 - 8 (PLC1 - 8)	n	Station number										
		n + 1	Command: 238 (HEX)										
		n + 2	Stop axis pattern Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div>	-	7	6	5	4	3	2	1	0	4
		-	7	6	5	4	3	2	1	0			
n + 3	Additional command												
:													

Contents	F0	F1 (= \$u n)		F2										
Successive writing within designated point data range	1 - 8 (PLC1 - 8)	n	Station number	$4 + (4 + 2m)t = \alpha$										
		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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> └─ Axis 1 └─ Axis 6	-	7	6	5	4	3	2	1	0
		-			7	6	5	4	3	2	1	0		
		n + 5			Acceleration									
		n + 6			Deceleration									
		n + 7			Speed									
		n + 8 to n + 9			Axis pattern (m = 1)	Position data								
					Axis pattern (m = 2)	Position data								
		n + 10 - α			:									
					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	$4 + (4 + 2m)t = \alpha$										
		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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> └─ Axis 1 └─ Axis 6	-	7	6	5	4	3	2	1	0
		-			7	6	5	4	3	2	1	0		
		n + 5			Acceleration									
		n + 6			Deceleration									
		n + 7			Speed									
		n + 8 to n + 9			Axis pattern (m = 1)	Position data								
					Axis pattern (m = 2)	Position data								
		n + 10 to α			:									
					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									
			Variable data (m = 2)		Real variable data									
		n + 7 -	:											
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)											
Program end	1 - 8 (PLC1 - 8)	n	Station number	3										
		n + 1	Command: 254 (HEX)											
		n + 2	Program number											

Contents	F0	F1 (= \$u n)		F2									
Program pause	1 - 8 (PLC1 - 8)	n	Station number	3									
		n + 1	Command: 255 (HEX)										
		n + 2	Program number										
Program one step execution	1 - 8 (PLC1 - 8)	n	Station number	3									
		n + 1	Command: 256 (HEX)										
		n + 2	Program number										
Program execution restart	1 - 8 (PLC1 - 8)	n	Station number	3									
		n + 1	Command: 257 (HEX)										
		n + 2	Program number										
Software reset	1 - 8 (PLC1 - 8)	n	Station number	2									
		n + 1	Command: 25B (HEX)										
Request for drive source recovery	1 - 8 (PLC1 - 8)	n	Station number	2									
		n + 1	Command: 25C (HEX)										
Request for operation pause cancel	1 - 8 (PLC1 - 8)	n	Station number	2									
		n + 1	Command: 25E (HEX)										
Speed change For orthogonal	1 - 8 (PLC1 - 8)	n	Station number	4									
		n + 1	Command: 262 (HEX)										
		n + 2	Axis pattern <div style="display: flex; align-items: center;"> Bit <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15px;">-</td> <td style="width: 15px;">7</td> <td style="width: 15px;">6</td> <td style="width: 15px;">5</td> <td style="width: 15px;">4</td> <td style="width: 15px;">3</td> <td style="width: 15px;">2</td> <td style="width: 15px;">1</td> <td style="width: 15px;">0</td> </tr> </table> <div style="margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div> </div>		-	7	6	5	4	3	2	1	0
-	7	6	5	4	3	2	1	0					
n + 3	Speed												
Successive inquiry within designated range for coordinate system definition data For scalar	1 - 8 (PLC1 - 8)	n	Station number	5									
		n + 1	Command: 2A0 (HEX)										
		n + 2	Type 0: Workpiece coordinate system definition data 1: Tool coordinate system definition data										
		n + 3	Inquiry target top number for coordinate system definition data										
		n + 4	Inquiry record count t (1 to 32)										
		n + 5 to n + 6	Coordinate system definition data		Coordinate offset X axis								
		n + 7 to n + 8			Coordinate offset Y axis								
		n + 9 to n + 10			Coordinate offset Z axis								
		n + 11 to n + 12			Coordinate offset R axis								
		n + 13 -	Coordinate system definition data t = 2										
:	:												
Scalar axis status inquiry For scalar	1 - 8 (PLC1 - 8)	n	Station number	4									
		n + 1	Command: 2A1 (HEX)										
		n + 2	Inquiry axis pattern: m (number of ON bits) <div style="display: flex; align-items: center;"> Bit <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15px;">-</td> <td style="width: 15px;">7</td> <td style="width: 15px;">6</td> <td style="width: 15px;">5</td> <td style="width: 15px;">4</td> <td style="width: 15px;">3</td> <td style="width: 15px;">2</td> <td style="width: 15px;">1</td> <td style="width: 15px;">0</td> </tr> </table> <div style="margin-left: 10px;"> ↙ Axis 1 : ↘ Axis 6 </div> </div>		-	7	6	5	4	3	2	1	0
		-	7		6	5	4	3	2	1	0		
		n + 3	Type 0: Base coordinate system 1: Selected workpiece coordinate system 2: System reserved 3: Coordinate system for each axis										
		n + 4	Workpiece coordinate system number										
		n + 5	Tool coordinate system number										
		n + 6	Axis common status										
		n + 7	Axis pattern		Axis status								
		n + 8			Axis sensor input status								
		n + 9			Axis-related error code								
		n + 10	m = 1		Encoder status								
		n + 11 to n + 12			Current position								
		n + 13 -	Axis pattern (m = 2)										
:	:												

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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> └─ Axis 1 └─ Axis 6	-	7	6	5	4	3	2	1	0
		-			7	6	5	4	3	2	1	0		
		n + 5 to n + 6			Axis pattern (m = 1) Interference check zone definition coordinate 1									
		n + 7 -			Axis pattern (m = 2) Interference check zone definition coordinate 1									
		:			:									
		n + (5 + 2m)			Axis pattern (m = 1) Interference check zone definition coordinate 2									
		:			Axis pattern (m = 2) Interference check zone definition coordinate 2									
		:			:									
		n + (5 + 4m)			Physical output port number at break-in or global flag number									
		n + (6 + 4m)			Error type definition at break-in									
n + (7 + 4m)	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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> └─ Axis 1 └─ Axis 6		-	7	6	5	4	3	2	1	0	
		-	7		6	5	4	3	2	1	0			
		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 <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> └─ Axis 1 └─ Axis 6		-	7	6	5	4	3	2	1	0	
		-	7		6	5	4	3	2	1	0			
		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 <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> 		-	7	6	5	4	3	2	1	0
		-	7		6	5	4	3	2	1	0		
		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 X1 series

2.1.2 ROBO CYLINDER (RCP2/ERC)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

ROBO CYLINDER

RCP2


Application software

Set parameters using the application software.

(Underlined setting: default)


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

Axis number setting switch (ADRS)

ADRS	Setting	Remarks
	0 to F (0 to 15)	

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

PORT switch (PORT)

PORT	Setting	Remarks
PORT  ON OFF	ON	

Emergency stop terminal block

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

- RCP2-C / RCP2-CF (with built-in cutout relay)**
 Connect the EMG switch between the S1 terminal and the 24-V terminal.
 When the EMG switch is not used, short-circuit them.
 Short-circuit the terminals S2 and EMG, and MPI and MPO, respectively.
- RCP2-CG (with external cutout relay)**
 Install wiring by referring to the specifications sheet of RCP2.

ERC**Application software**


Set parameters using the application software.

(Underlined setting: default)

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

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

RCB-TU-SIO-A/B**PORT switch (PORT)**

PORT	Setting	Remarks
 SW1	ON	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.

When the EMG switch is not used, short-circuit them.

Available Device Memory


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

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

PLC_CTL

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

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

 Return data: Data stored from controller to X1 series

2.1.3 ROBO CYLINDER (RCS/E-CON)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

ROBO CYLINDER

RCS


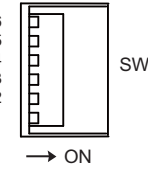
Application software

Set parameters using the application software.

(Underlined setting: default)


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

RCS axis number setting switch

SW	Axis number	Setting				Remarks
		1	2	3	4	
RCS-C: SW1 	<u>0</u>	OFF	OFF	OFF	OFF	Always turn the switches 5 and 6 of RCS-E.
	1	ON	OFF	OFF	OFF	
	2	OFF	ON	OFF	OFF	
	3	ON	ON	OFF	OFF	
	4	OFF	OFF	ON	OFF	
RCS-E: SW (switch No. 1 to 4) 	5	ON	OFF	ON	OFF	
	6	OFF	ON	ON	OFF	
	7	ON	ON	ON	OFF	
	8	OFF	OFF	OFF	ON	
	9	ON	OFF	OFF	ON	
	10	OFF	ON	OFF	ON	
	11	ON	ON	OFF	ON	
	12	OFF	OFF	ON	ON	
	13	ON	OFF	ON	ON	
	14	OFF	ON	ON	ON	
15	ON	ON	ON	ON		

When changing the switch setting, turn the power off.

PORT switch (PORT)

PORT	Setting	Remarks
	ON	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.

When the EMG switch is not used, short-circuit them.

E-CON

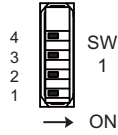
Application software

Set parameters using the application software.

(Underlined setting: default)


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

RCS axis number setting switch

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

When changing the switch setting, turn the power off.

PORT switch (PORT)

PORT	Setting	Remarks
	ON	


Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.

When the EMG switch is not used, short-circuit them.

RCB-TU-SIO-A/B

PORT switch (PORT)

PORT	Setting	Remarks
	ON	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.

When the EMG switch is not used, short-circuit them.

Available Device Memory

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

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

PLC_CTL

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

Return data: Data stored from controller to X1 series

2.1.4 PCON / ACON / SCON (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PCON / ACON / SCON


Exclusive software

Set parameters using the exclusive software.

(Underlined setting: default)

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

Axis number setting switch (ADRS)

ADRS	Setting	Remarks
	0 to F (0 to 15)	

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

Mode select switch


Select [MANU].

Emergency stop terminal block

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

- ACON-C, PCON-C/CF (with built-in cutout relay)**
 Connect the EMG switch between the S1 terminal and the 24-V terminal.
 When the EMG switch is not used, short-circuit them.
 Short-circuit the terminals S2 and EMG-, and MPI and MPO, respectively.
- ACON-CY/PL/PO/SE, PCON-CY/PL/PO/SE (with built-in cutout relay)**
 Connect the EMG switch between the EMG- terminal and the 24-V terminal.
 When the EMG switch is not used, short-circuit them.
 Short-circuit the MPI terminal and the MPO terminal.
- ACON-CG / PCON-CG (with external cutout relay)**
 Install wiring by referring to the specifications sheet of ACON/PCON.
- SCON**
 Connect the EMG switch between the S1 terminal and the EMG- terminal.
 When the EMG switch is not used, short-circuit them.
 Short-circuit the S2 terminal and the EMG+ terminal.

RCB-TU-SIO-A/B**PORT switch (PORT)**

PORT	Setting	Remarks
 SW1	ON	

Emergency stop terminal block

When the servo cannot be turned on, connect the EMG switch between the EMG1 terminal and the EMG2 terminal on the emergency stop terminal block.

When the EMG switch is not used, short-circuit them.

Available Device Memory

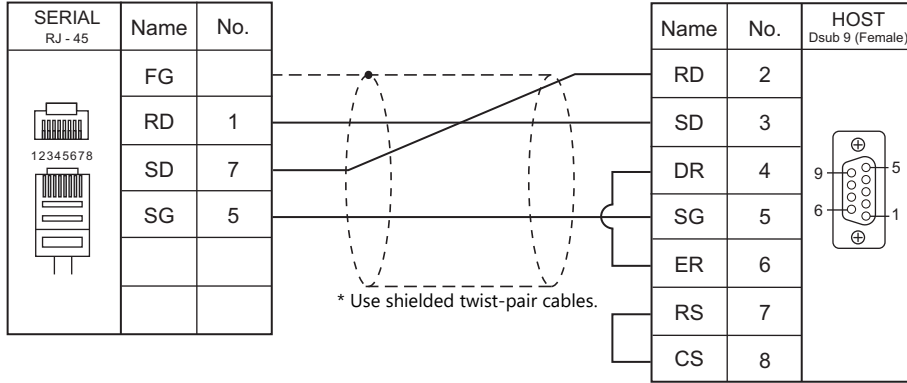
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

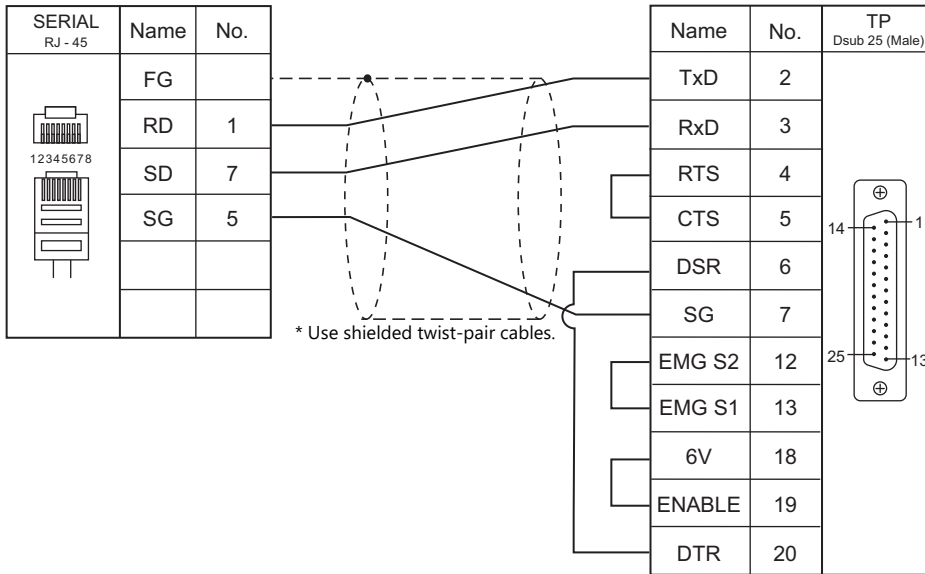
2.1.5 Wiring Diagrams

RS-232C

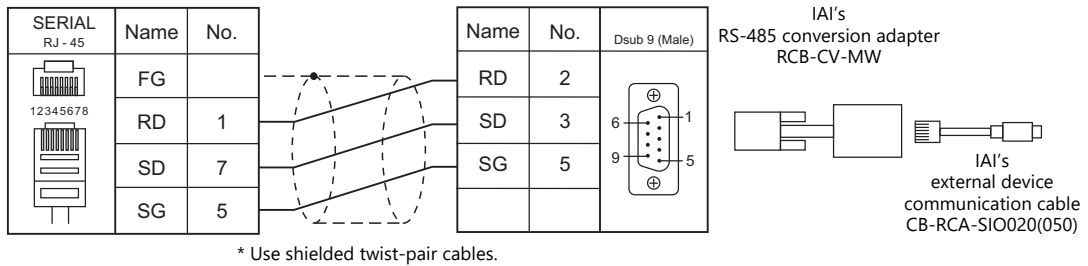
Wiring diagram 1 - M2



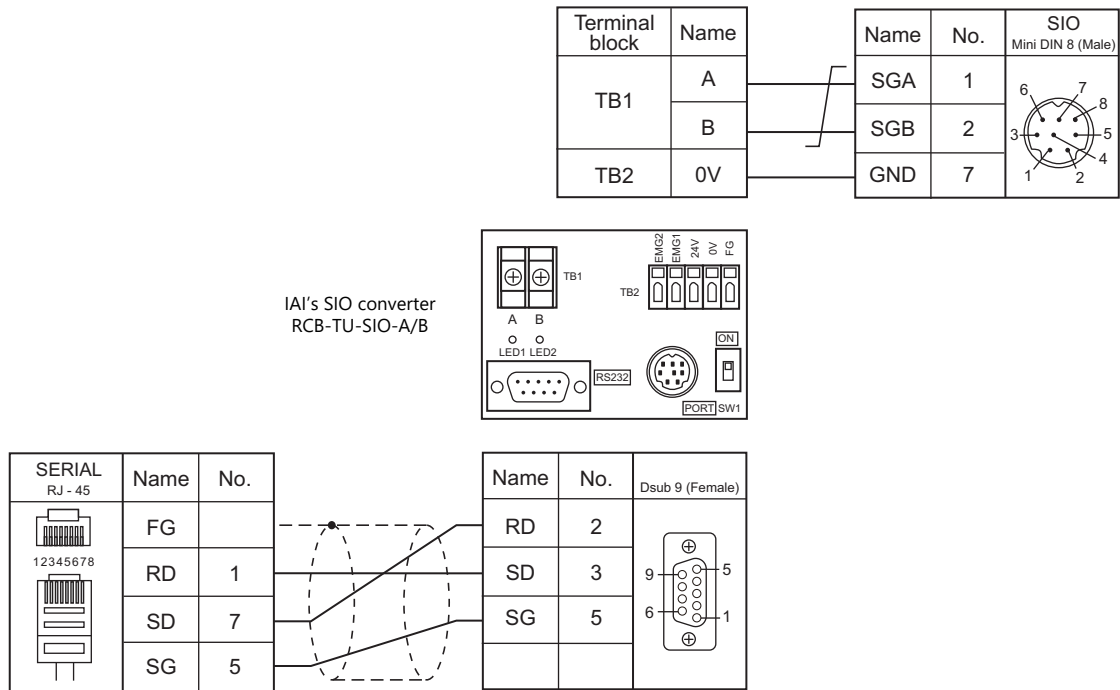
Wiring diagram 2 - M2



Wiring diagram 3 - M2

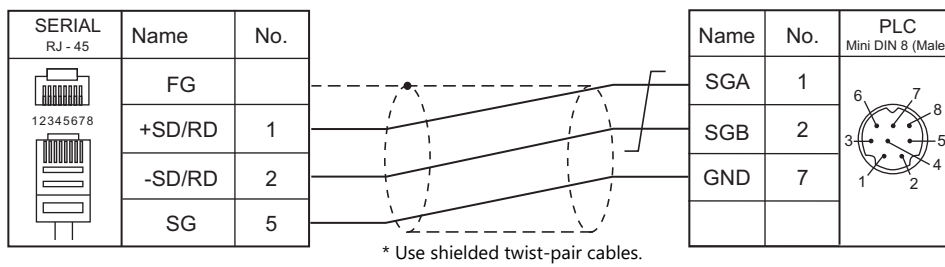


Wiring diagram 4 - M2



RS-485

Wiring diagram 1 - M4



3. IDEC

3.1 PLC Connection

3.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection	
					RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)
MICRO 3	FC2A-Cxxxx	Loader port		RS-232C	IDEC's "FC2A-KC1" +Wiring diagram 1 - M2 or IDEC's "FC2A-KC2" +Wiring diagram 2 - M2	×
		FC2A-LC1		RS-485	Wiring diagram 1 - M4	×
MICRO Smart	FC4A-Cxxxx*3 FC4A-Dxxxx*4	Port 1	CPU (built-in)	RS-232C	Wiring diagram 3 - M2 or IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
				RS-232C	Wiring diagram 6 - M2 or IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
		Port 2	FC4A-PC1 FC4A-HPC1	RS-232C	IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
				RS-485	Wiring diagram 2 - M4	×
	Port 2	FC4A-PC2 FC4A-HPC2	RS-485	Wiring diagram 2 - M4	×	
			FC4A-PC3 FC4A-HPC3	RS-485	Wiring diagram 1 - M4	×
				RS-485	Wiring diagram 1 - M4	×
FC6A-Cxxxx FC6A-Dxxxx	Port 1	CPU (built-in)	RS-232C	Wiring diagram 8 - M2	×	
			RS-485	Wiring diagram 3 - M4	×	
			RS-232C	Wiring diagram 7 - M2	×	
Port 2	FC6A-PC3 FC6A-SIF52	RS-485	Wiring diagram 1 - M4	×		
		RS-485	Wiring diagram 1 - M4	×		
MICRO Smart pentra	FC5A-Cxxxx FC5A-Dxxxx	Port 1	CPU (built-in)	RS-232C	Wiring diagram 3 - M2 or IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
				RS-232C	Wiring diagram 6 - M2 or IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
		Port 2	FC4A-PC1 FC4A-HPC1	RS-232C	IDEC's "FC4A-KC1C" +Wiring diagram 4 - M2 or IDEC's "FC4A-KC2C" +Wiring diagram 5 - M2	×
				RS-485	Wiring diagram 2 - M4	×
	Port 2	FC4A-PC2 FC4A-HPC2	RS-485	Wiring diagram 2 - M4	×	
			FC4A-PC3 FC4A-HPC3	RS-485	Wiring diagram 1 - M4	×
	Port 3 to 7	FC5A-SIF2*5		RS-232C	Wiring diagram 7 - M2	×
RS-485			Wiring diagram 1 - M4	×		

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 Only port 1 can be used for "FC4A-C10Rxx".

*4 When the communication board "FC4A-PCx" is used with "FX4A-Dxxxx", IDEC's HMI base module "FC4A-HPH1" is required.

*5 "FC5A-C10Rxx" and "FC5A0C16Rxx" cannot be used.

A maximum of 3 units of "FC5A-C24Rxx" or 5 units of "FC5A-Dxxxx" can be added.

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1
MICRO Smart (Ethernet TCP/IP)	FC6A	CPU (built-in)	○	×	As desired (Max. 8 units)	○
		FC6A-PH1				

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

3.1.1 MICRO 3

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Function setting (communication)

(Underlined setting: default)

Item	Setting	Remarks
Communication Device No. Setting	0	
Loader Port Communication Mode	Arbitrary setting mode	
Communication Condition Selection Input No.	X0000	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Bit	<u>7</u> / 8 bits	
Parity	None / Odd / <u>Even</u>	
Stop Bit	<u>1</u> / 2 bits	
Terminator Code	CR	
Receive Timeout	Make settings in accordance with the network environment.	

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
I (input)	01H	*1
Q (output)	02H	*1
M (internal relay)	03H	*1
R (shift register)	04H	
TS (timer/set value)	05H	
TN (timer/enumerated value)	06H	
T (timer/contact)	07H	Read only
CS (counter/set value)	08H	
CN (counter/enumerated value)	09H	
C (counter/contact)	0AH	Read only

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

Example: M2000

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

3.1.2 MICRO Smart

Communication Setting

Editor

Communication setting

Item	Setting	Remarks
Connection Mode	<u>1</u> :1 / 1:n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 31	
Transmission Mode	<u>Little Endian</u> / Big Endian	FC4A: Little Endian fixed

PLC

Function setting (communication)

(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
I (input)	01H	*1
Q (output)	02H	*1
M (internal relay)	03H	*1
R (shift register)	04H	
TS (timer/set value)	05H	
TN (timer/enumerated value)	06H	
T (timer/contact)	07H	Read only
CS (counter/set value)	08H	
CN (counter/enumerated value)	09H	
C (counter/contact)	0AH	Read only
P (index register)	0CH	Double-word

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

Example: M2000

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

3.1.3 MICRO Smart Pentra

Communication Setting

Editor

Communication setting

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

PLC

Function setting (communication)

(Underlined setting: default)

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

Function setting (other 2)

(Underlined setting: default)

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

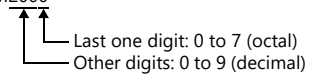
Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
I (input)	01H	*1
Q (output)	02H	*1
M (internal relay)	03H	*1
R (shift register)	04H	
TS (timer/set value)	05H	
TN (timer/enumerated value)	06H	
T (timer/contact)	07H	Read only
CS (counter/set value)	08H	
CN (counter/enumerated value)	09H	
C (counter/contact)	0AH	Read only

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

Example: M2000



3.1.4 MICRO Smart (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number of the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Transmission mode of the X1 series unit
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
Match the setting with PLC's [Device Settings] → [32-bit Data Storage Setting].
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Make the PLC setting using the programming tool "WindLDR". For more information, refer to the PLC manual issued by the manufacturer.

Function setting

	Item	Setting	Remarks
Network setting	IP Address	IP address of the PLC	For more information, refer to the manual of the PLC.
	Subnet Mask	Subnet Mask of the PLC	
	Default gateway	Make settings in accordance with the network environment.	
Connection Setting	Communication Mode	Maintenance communication server	
	Local host port	As desired	
Device setting	32-bit Data Storage Setting	From lower word: little endian From higher word: big endian	

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	D8000 to 9999: inaccessible to special data register and non-retentive area.
I (input)	01H	
Q (output)	02H	
M (internal relay)	03H	M8000 to 9997: special internal register
R (shift register)	04H	
TS (timer/set value)	05H	
TN (timer/enumerated value)	06H	
T (timer/contact)	07H	Read only
CS (counter/set value)	08H	
CN (counter/enumerated value)	09H	
C (counter/contact)	0AH	Read only
P (index register)	0CH	Double-word

Indirect Device Memory Designation

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

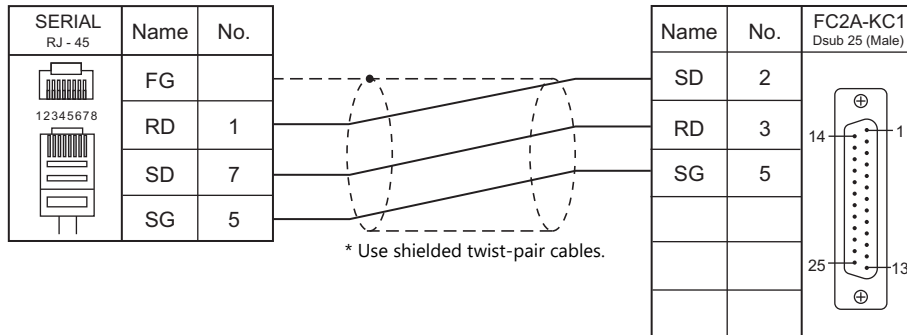
- To specify a byte address (I, Q, or M):
Set the word address to n+1 and the bit number to n+2.

Example: How to assign M8014 using indirect address designation:
(8014/10) / 2 = 400 (DEC) with a remainder of 14 (OCT)
n+1 = 400 (DEC)
n+2 = 14 (OCT) = 0C (HEX)

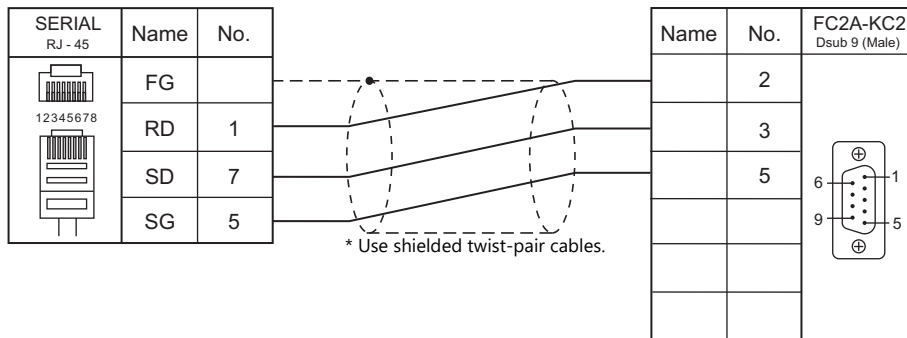
3.1.5 Wiring Diagrams

RS-232C

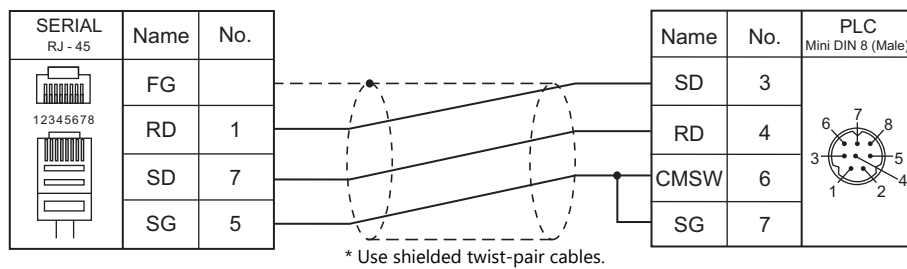
Wiring diagram 1 - M2



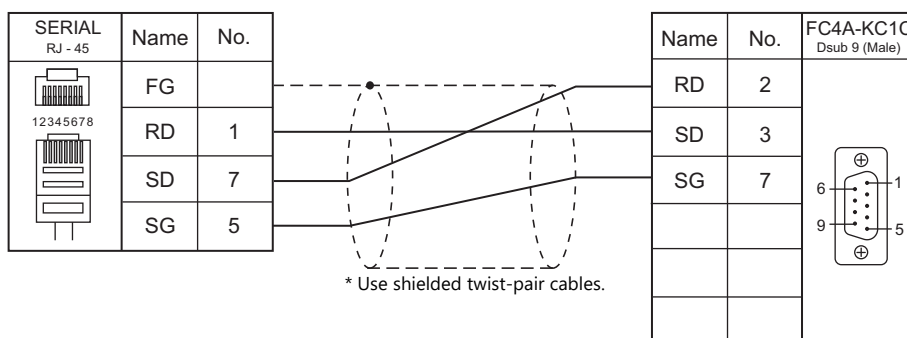
Wiring diagram 2 - M2



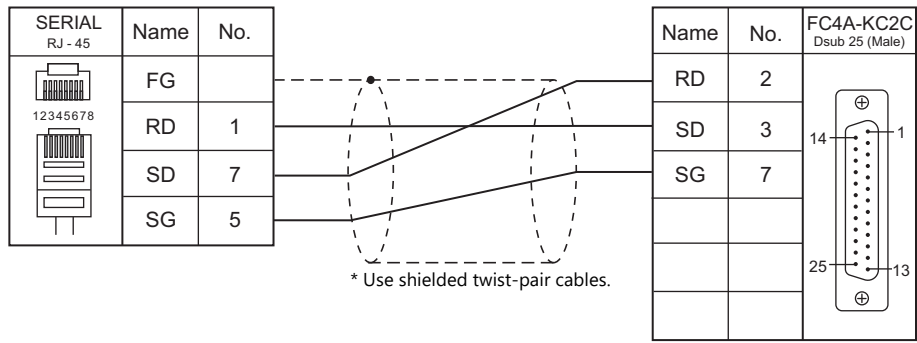
Wiring diagram 3 - M2



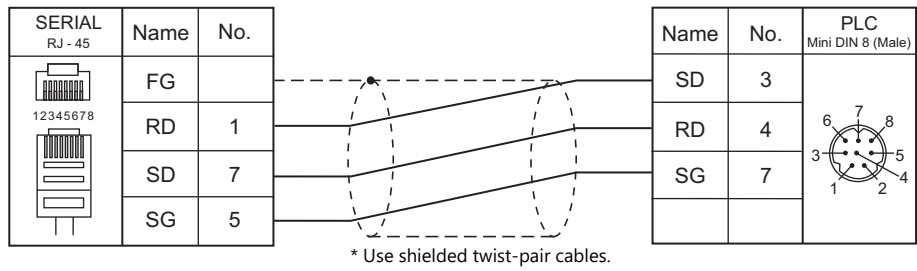
Wiring diagram 4 - M2



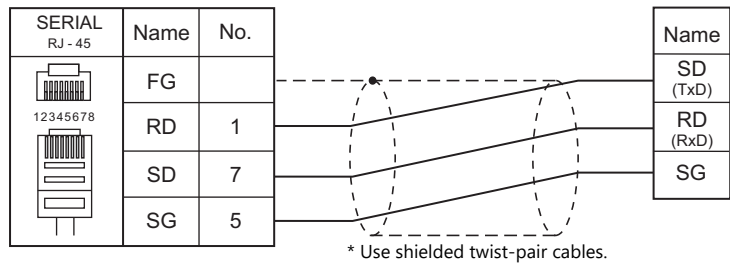
Wiring diagram 5 - M2



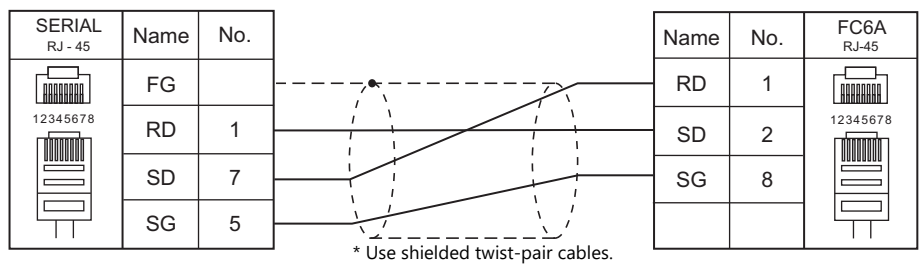
Wiring diagram 6 - M2



Wiring diagram 7 - M2

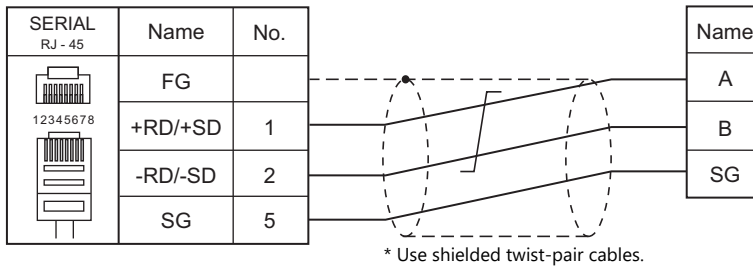


Wiring diagram 8 - M2

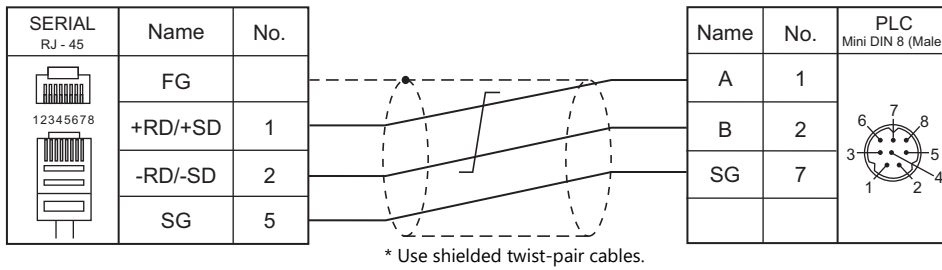


RS-422/RS-485

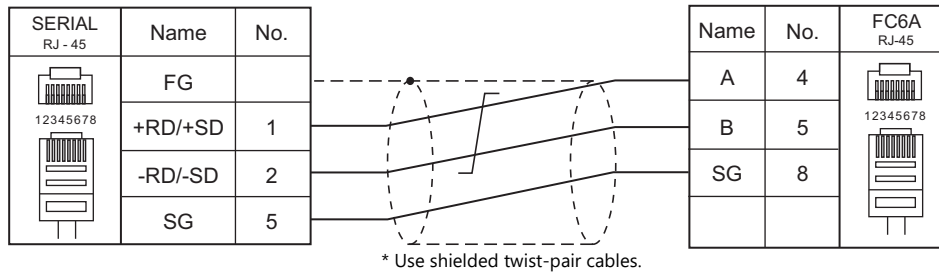
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



4. JTEKT

4.1 PLC Connection

4.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Unit/Port	Signal Level	Connection	
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)
TOYOPUC	PC2 L2	PC/CMP-LINK (TPU-5174)	RS-485	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)			
TOYOPUC-Plus	Plus CPU	Serial port built into CPU (CN6)	RS-232C	Wiring diagram 1 - M2	×
			RS-485	Wiring diagram 1 - M4	×
		Plus EX (CN2) (TCU-6741)	RS-232C	Wiring diagram 1 - M2	×
			RS-485	Wiring diagram 1 - M4	×
		Plus EX2 (CN2) (TCU-6858)	RS-232C	Wiring diagram 1 - M2	×
			RS-485	Wiring diagram 1 - M4	×
		Plus 2P-EFR (CN3) (TCU-6929)	RS-232C	Wiring diagram 1 - M2	×
			RS-485	Wiring diagram 1 - M4	×

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*2}
TOYOPUC (Ethernet)	PC3J PC2J ^{*1}	FL/ET-T-V2 (THU-5998)	×	○	As desired 1025 to 65534 (Max. 8 units)	○
		FL/ET-T-V2H (THU-6289)				
		EN-I/F-T (THU-5781)				
TOYOPUC (Ethernet PC10 mode)	PC10G (version 3.00 or later) PC10GE	Built-in Ethernet (L1/L2)	○	○	As desired 1025 to 65534 (Max. 32 units)	○
		FL/ET-T-V2 (THU-5998)				
		FL/ET-T-V2H (THU-6289)				
		EN-I/F-T (THU-5781)				
TOYOPUC-Plus (Ethernet)	Plus CPU	CN1 (CN1)	○	○	As desired 1025 to 65534 (Max. 32 units)	○
		Plus EX (CN1)				
		Plus EX2 (CN1)				
		Plus EFR (CN1)				
		Plus EFR2 (CN1)				
		Plus 2P-EFR (CN1)/(CN2)				
TOYOPUC-Nano (Ethernet)	TOYOPUC-Nano TOYOPUC-Nano 10GX	Built-in Ethernet (L1/L2)	○	○ ^{*3}	As desired 1025 to 65534 (Max. 32 units)	○
		2ET (TUU-6949) (L1/L2)	○	○	As desired 1025 to 65534 (Max. 8 units)	

*1 The PC2J CPU may not be used depending on the CPU version. For more information, refer to the PLC manual issued by the manufacturer.

*2 For KeepAlive functions, see "1.3.2 Ethernet Communication".

*3 Only TOYOPUC-Nano 10GX supported. UDP/IP is not supported by TOYOPUC-Nano.

4.1.1 TOYOPUC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> :1 / 1 : n	
Signal Level	RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115k bps	
Parity	<u>E</u> ven	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Target Port No.	<u>0</u> to 31	
Transmission Mode	<u>Data Area Single</u> / 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	<u>7</u> / 8 bits	ASCII
Stop Bit	1 / <u>2</u> bits	
Baud Rate	4800 / 9600 / <u>19200</u> / 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
SW2	0	Set the number from 00 to 37 in octal notation. SW1 denotes the higher-order digit, and SW2 denotes the lower-order digit.
SW3	1	Baud rate 1: 19200, 2: 9600, 3: 4800

Short bar

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

THU-2755 / THU-5139 / THU-2927**Rotary switch**

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

DIP switch

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

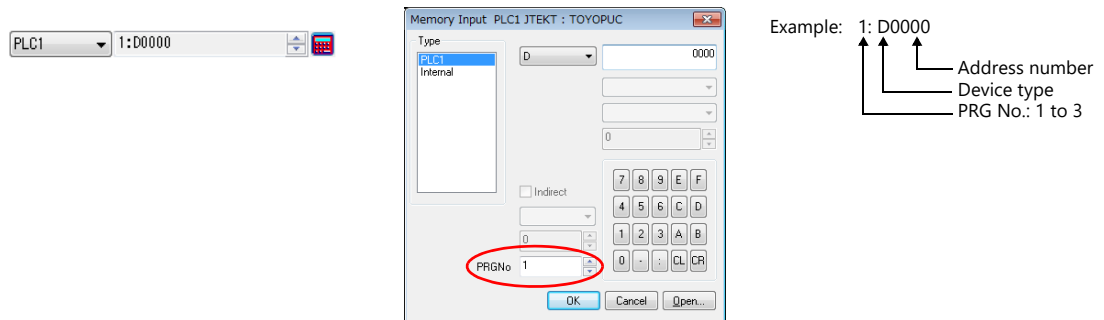
Available Device Memory

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

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

PRG No. setting

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



Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

* If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.

Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.

PRG No. 1: 0

PRG No. 2: 1

PRG No. 3: 2

4.1.2 TOYOPUC (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Hellowin

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

I/O module setting

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

Link parameter setting

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

Ethernet setting

Item	Setting
Local Node IP Address	Set the IP address of the PLC.
Connection 1 - 8 *	Protocol: UDP Own Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the X1 is registered
Initialization	Initialization based on Link Parameter

* When multiple X1 units are connected, make the settings for each unit. A maximum of eight units can be connected at one time.

Other node table setting

Item	Setting
Table 1 to 16	Check each box under "Used".
Other Node IP Address	Set the IP address of the X1.
Other Node Port No.	Set the port number of the X1.

Available Device Memory

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

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

PRG No. setting

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

Example: 1: D0000

- Address number: 0000
- Device type: D
- PRG No.: 1 to 3

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

* If [Transmission Mode: Data Area Division] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.

Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.

- PRG No. 1: 0
- PRG No. 2: 1
- PRG No. 3: 2

4.1.3 TOYOPUC (Ethernet PC10 Mode)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

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

Communication Setting Switches L1 and L2 (When connecting to the built-in Ethernet port)

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

PCwin

Link parameter setting

Item	Setting
Rack No.	For built-in Ethernet: Built-in For Ethernet unit: As desired
Slot No.	For built-in Ethernet: L1 / L2 For Ethernet unit: As desired
Link Module Name	Ethernet (32 ports)

Ethernet setting

Item	Setting
Local Node IP Address	Set the IP address of the PLC.
Setting 1/Setting 2/ Setting 3/Setting 4/	Setting 1: Connection 1 to 8 Setting 2: Connection 9 to 16 Setting 3: Connection 17 to 24 Setting 4: Connection 25 to 32
Connection 1 - 32 *	Protocol: UDP or TCP Destination Non-Specified Passive Open Local Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the X1 is registered (for protocol: UDP)
Initialization	Initialize using the link parameter

* When multiple X1 units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting (for protocol: UDP)

Item	Setting
Setting 1/Setting 2	Setting 1: Table 1 to 16 Setting 2: Table 17 to 32
Table 1 to 32	Check each box for "Use".
Other Node IP Address	Set the IP address of the X1.
Other Node Port No.	Set the port number of the X1.

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

- PC10G: PC10 mode
- PC10GE: PC10 extended mode

PCwin settings

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

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

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

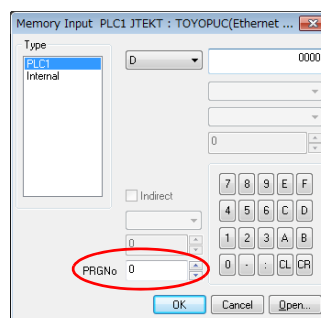
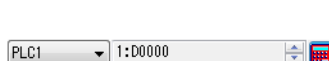
Available Device Memory

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

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

PRG No. setting

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



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

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

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

- PRG No. 1: 0
- PRG No. 2: 1
- PRG No. 3: 2

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2																						
Write to FR register flash memory *	1 to 8 (PLC1 to 8)	n	Station number																						
		n+1	Command: 0																						
		n+2	ExNo. (HEX) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>ExNo.</th> <th>Address</th> </tr> </thead> <tbody> <tr> <td>40H</td> <td>FR000000 to FR007FFF</td> </tr> <tr> <td>41H</td> <td>FR008000 to FR00FFFF</td> </tr> <tr> <td>42H</td> <td>FR010000 to FR017FFF</td> </tr> <tr> <td>43H</td> <td>FR018000 to FR01FFFF</td> </tr> <tr> <td>:</td> <td>:</td> </tr> <tr> <td>:</td> <td>:</td> </tr> <tr> <td>7EH</td> <td>FR1F0000 to FR1F7FFF</td> </tr> <tr> <td>7FH</td> <td>FR1F8000 to FR1FFFFF</td> </tr> </tbody> </table>	ExNo.	Address	40H	FR000000 to FR007FFF	41H	FR008000 to FR00FFFF	42H	FR010000 to FR017FFF	43H	FR018000 to FR01FFFF	:	:	:	:	7EH	FR1F0000 to FR1F7FFF	7FH	FR1F8000 to FR1FFFFF				
ExNo.	Address																								
40H	FR000000 to FR007FFF																								
41H	FR008000 to FR00FFFF																								
42H	FR010000 to FR017FFF																								
43H	FR018000 to FR01FFFF																								
:	:																								
:	:																								
7EH	FR1F0000 to FR1F7FFF																								
7FH	FR1F8000 to FR1FFFFF																								
n+3	Execution result 0: Successful 1: Error 2: Writing																								
CPU status readout	1 to 8 (PLC1 to 8)	n	Station number																						
		n+1	Command: 1																						
		n+2	Data 1 <table border="1" style="margin-left: 20px;"> <tr> <td>15</td><td>~</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td colspan="2">Fixed to 0</td> <td rowspan="2">Running</td> <td rowspan="2">Stopped</td> <td rowspan="2">Stop request continued</td> <td rowspan="2">Pseudo stop</td> <td rowspan="2">Debug mode</td> <td rowspan="2">I/O monitor user mode</td> <td rowspan="2">PC3 mode</td> <td rowspan="2">PC10 mode</td> <td rowspan="2">Test mode</td> </tr> <tr> <td colspan="2"></td> </tr> </table>	15	~	8	7	6	5	4	3	2	1	0	Fixed to 0		Running	Stopped	Stop request continued	Pseudo stop	Debug mode	I/O monitor user mode	PC3 mode	PC10 mode	Test mode
15	~	8	7	6	5	4	3	2	1	0															
Fixed to 0		Running	Stopped	Stop request continued	Pseudo stop	Debug mode	I/O monitor user mode	PC3 mode	PC10 mode	Test mode															
n+3	Data 2 <table border="1" style="margin-left: 20px;"> <tr> <td>15</td><td>~</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> <tr> <td colspan="2">Fixed to 0</td> <td rowspan="2">Severe failure</td> <td rowspan="2">Minor failure</td> <td rowspan="2">Alarm</td> <td rowspan="2">I/O assignment parameter changed</td> <td rowspan="2">With memory card</td> <td rowspan="2">Test mode</td> <td colspan="3"></td> </tr> <tr> <td colspan="2"></td> </tr> </table>	15	~	8	7	6	5	4	3	2	1	0	Fixed to 0		Severe failure	Minor failure	Alarm	I/O assignment parameter changed	With memory card	Test mode					
15	~	8	7	6	5	4	3	2	1	0															
Fixed to 0		Severe failure	Minor failure	Alarm	I/O assignment parameter changed	With memory card	Test mode																		

Contents	F0	F1 (= \$u n)	F2
CPU status readout	1 to 8 (PLC1 to 8)	<p>n+4</p> <p>Data 3</p>	2
		<p>n+5</p> <p>Data 4</p>	
		<p>n+6</p> <p>Data 5</p>	
		<p>n+7</p> <p>Data 6</p>	
		<p>n+8</p> <p>Data 7</p>	
		<p>n+9</p> <p>Data 8</p>	

Return data: Data stored to X1 series from PC10G

* Writing to the FR register flash memory is performed in units of 64 kB. When writing to addresses in memory, specify an "Ex No." corresponding to the desired addresses for 64 kB of data.
Communication between the X1 series and PC10G pauses during writing.

4.1.4 TOYOPUC-Plus

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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


PLC

Link parameters

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

* The parity setting is fixed to even.

RS-232C/RS-422 selector switch

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

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

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.

Use [TYPE] when assigning indirect device memory for macro programs.

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

PRG No. setting

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

Example: 1: D0000

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

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater

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

* If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.

Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.

PRG No. 1: 0

PRG No. 2: 1

PRG No. 3: 2

4.1.5 TOYOPUC-Plus (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

PCwin

I/O module setting

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

Link parameter setting

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

Ethernet setting

Item	Setting
Own Node IP Address	Set the IP address of the PLC.
Connection 1 - 32 *	Protocol: UDP / TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open Own Node Port No.: Port number of the PLC Other Node Table No.: Table number for which the X1 is registered
Initialize	Initialization based on Link Parameter

* When multiple X1 units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting

Item	Setting
Table 1 to 32	Check each box under "Used".
Other Node IP Address	Set the IP address of the X1 series unit.
Other Node Port No.	Set the port number of the X1.

Available Device Memory

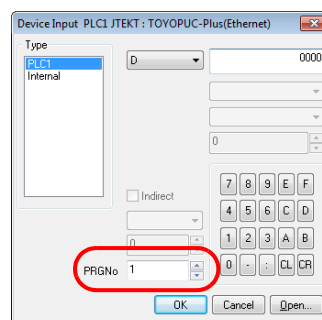
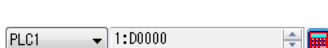
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.

Use [TYPE] when assigning indirect device memory for macro programs.

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

PRG No. setting

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



Example: 1: D0000

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

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater

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

* If [Transmission Mode: Expanded mode] is set under [Communication Setting], specify a program number ([PRG No.]) for the expansion code.

Specify the number obtained by subtracting "1" from the actual program number ([PRG No.]) as defined below.

PRG No. 1: 0

PRG No. 2: 1

PRG No. 3: 2

4.1.6 TOYOPUC-Nano (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Built-in Ethernet (L1/L2)

Link parameter setting

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

Ethernet setting

Item	Setting	Remarks	
Local Node IP Address	Set the IP address of the PLC.		
Connection 1 to 32 *	Open Protocol	TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open / UDP	Only TOYOPUC-Nano 10GX supports UDP/IP.
	Own Node Port No.	PLC port number	
	Other Node Table No.	Table number for which the X1 is registered	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Initialize	Initialization based on Link Parameter		

* When multiple X1 units are connected, make the settings for each unit. A maximum of 32 units can be connected at one time.

Other node table setting

Item	Setting	Remarks
Table 1 to 32	Check each box under "Used".	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Other Node IP Address	Set the IP address of the X1 series unit.	
Other Node Port No.	Set the port number of the X1.	

2ET (L1/L2)**I/O module setting**

Item	Setting
Module Type	Special / Communication
Module Name	2ET

Link parameter setting

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

Ethernet setting

Item	Setting	Remarks
Local Node IP Address	Set the IP address of the PLC.	
Connection 1 to 8 *	Open Protocol	TCP Destination Specified Passive Open / TCP Destination Non-Specified Passive Open / UDP
	Own Node Port No.	PLC port number
	Other Node Table No.	Table number for which the X1 is registered
Initialize	Initialization based on Link Parameter	

* When multiple X1 units are connected, make the settings for each unit. A maximum of 8 units can be connected at one time. Connections 9 to 32 cannot be used.

Other node table setting

Item	Setting	Remarks
Table 1 to 16	Check each box under "Used".	Setting not necessary when "Destination Non-Specified Passive Open" is selected for "Open Protocol".
Other Node IP Address	Set the IP address of the X1 series unit.	
Other Node Port No.	Set the port number of the X1.	

* Tables 17 to 32 cannot be used.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used.

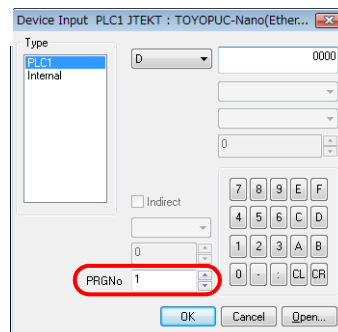
Use [TYPE] when assigning indirect device memory for macro programs.

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

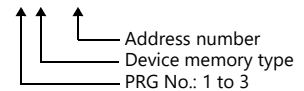
PRG No. setting

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

PLC1 1:D0000



Example: 1: D0000



Indirect Device Memory Designation

- Address No. 0 to 65535

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

- For the address number of 65536 or greater

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

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

PRG No. 1: 0

PRG No. 2: 1

PRG No. 3: 2

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

Contents	F0	F1 (= \$u n)	F2
CPU status readout	1 to 8 (PLC1 to 8)	Data 5 	2
		Data 6 	
		Data 7 	
		Data 8: Fixed to "0"	

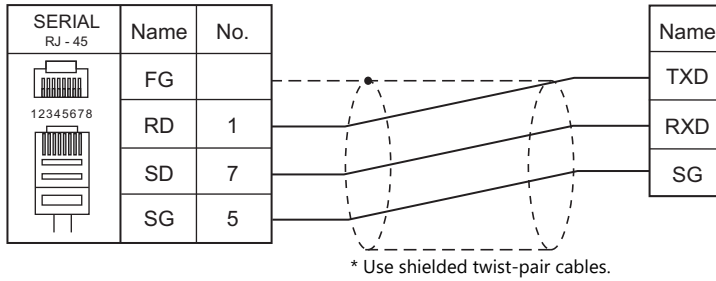
Return data: Data stored from TOYOPUC-Nano to X1 series

* Writing to the FR register flash memory is performed in units of 64 kB. When writing to addresses in memory, specify an "Ex No." corresponding to the desired addresses for 64 kB of data. Communication between the X1 series and TOYOPUC-Nano pauses during writing.

4.1.7 Wiring Diagrams

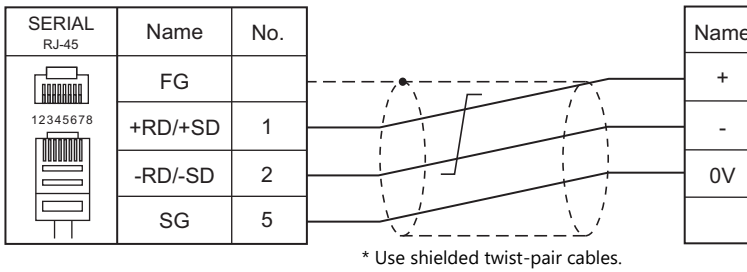
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



5. KEYENCE

5.1 PLC Connection

5.2 Temperature Controller/Servo/Inverter Connection

5.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection	
					RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}
KZ series link	KZ-300 KZ-350	KZ-L2	Port 1	RS-232C	Wiring diagram 5 - M2	×
			Port 2	RS-232C	Wiring diagram 4 - M2	×
					RS-422	×
KZ/KV series CPU	KZ-10 KZ-16 KZ-24 KZ-40 KZ-80 KZ-300 KZ-350 KV series	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
KZ24/300 CPU	KZ-24 KZ-300					
KV10/24 CPU	KV-10 KV-24 KV-40					
KV-700	KV-700	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
		KV-L20 KV-L20R	Port 1	RS-232C	Wiring diagram 3 - M2	×
			Port 2	RS-232C	Wiring diagram 4 - M2	×
					RS-422	×
KV-1000	KV-1000	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
		KV-L20R	Port 1	RS-232C	Wiring diagram 3 - M2	×
			Port 2	RS-232C	Wiring diagram 4 - M2	×
					RS-422	×
KV-3000/5000	KV-3000	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
		KV-L20V	Port 1	RS-232C	Wiring diagram 3 - M2	×
	KV-5000		KV-L20V	Port 2	RS-232C	Wiring diagram 4 - M2
					RS-422	×
KV Nano	KV-N14 KV-N24 KV-N40 KV-N60	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
		KV-N10L		RS-232C	Wiring diagram 3 - M2	×
		KV-N11L		RS-422	Wiring diagram 2 - M4	Wiring diagram 1 - M4 ^{*3}
	KV-NC32T	CPU modular port		RS-232C	Wiring diagram 2 - M2	×
		KV-NC10L	Port1	RS-232C	Wiring diagram 3 - M2	×
			KV-NC20L	Port1	RS-232C	Wiring diagram 3 - M2
					Port2	RS-232C
			RS-422	Wiring diagram 2 - M4	Wiring diagram 1 - M4 ^{*3}	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*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)				
KV-7000/8000 (Ethernet TCP/IP)	KV-7300 KV-7500	KV-LE20V	○	×	8500 (Max. 8 units)	
		KV-LE21V				
		KV-EP21V				
	KV-7500	CPU (built-in)				
	KV-8000	CPU (built-in)				
KV-XLE02						
KV Nano(Ethernet TCP/IP)	KV-N24 KV-N40 KV-N60	KV-NC1EP ^{*2}	○	×	8500 (Max. 8 units)	
		KV-NC32T				KV-NC1EP

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

*2 Keyence's connection conversion unit "KV-N1" is required.

5.1.1 KZ Series Link

Communication Setting

Editor

Communication setting


(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> :1 / 1:n	
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	1 / <u>2</u> bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 9	


PLC

Port 1

Operation mode setting switch (SET A)

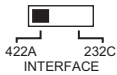
SET A	Item	Setting	Remarks
	A1	OFF	Link mode
	A2	ON	

Communication parameter setting switch (SET B)


SET B	Item	Setting	Remarks																				
	B1	<table border="1"> <thead> <tr> <th>B1</th> <th>B2</th> <th>B3</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>4800 bps</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>9600 bps</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>19200 bps</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>38400 bps</td> </tr> </tbody> </table>	B1	B2	B3	Baud Rate	OFF	ON	OFF	4800 bps	ON	ON	OFF	9600 bps	OFF	OFF	ON	19200 bps	OFF	ON	ON	38400 bps	Common to Port 1 and 2
	B1		B2	B3	Baud Rate																		
	OFF		ON	OFF	4800 bps																		
	ON		ON	OFF	9600 bps																		
	OFF	OFF	ON	19200 bps																			
	OFF	ON	ON	38400 bps																			
	B2	Baud rate																					
	B3	Baud rate																					
B4	Bit length	OFF: 7 bit ON: 8 bit																					
B5	Parity check	<table border="1"> <thead> <tr> <th>B5</th> <th>B6</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>None</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Odd</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Even</td> </tr> </tbody> </table>	B5	B6	Parity	OFF	OFF	None	ON	OFF	Odd	ON	ON	Even									
B5			B6	Parity																			
OFF	OFF		None																				
ON	OFF	Odd																					
ON	ON	Even																					
B6																							
B7	Stop bit	OFF: 1 bit ON: 2 bit																					
B8	System reserve	Fixed to OFF																					

Port 2


Port select switch (INTERFACE)

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


Operation mode setting switch (SET A)

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


Terminator select switch (TERMINATOR)

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

Station number setting switch (STATION No.)

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

Communication parameter setting switch (SET B)

SET B	Item	Setting	Remarks																				
	B1	<table border="1"> <thead> <tr> <th>B1</th> <th>B2</th> <th>B3</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>4800 bps</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>9600 bps</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>19200 bps</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>38400 bps</td> </tr> </tbody> </table>	B1	B2	B3	Baud Rate	OFF	ON	OFF	4800 bps	ON	ON	OFF	9600 bps	OFF	OFF	ON	19200 bps	OFF	ON	ON	38400 bps	Common to Port 1 and 2
	B1		B2	B3	Baud Rate																		
	OFF		ON	OFF	4800 bps																		
	ON		ON	OFF	9600 bps																		
	OFF	OFF	ON	19200 bps																			
	OFF	ON	ON	38400 bps																			
	B2	Baud rate																					
	B3																						
B4	OFF: 7 bits ON: 8 bits																						
B5	<table border="1"> <thead> <tr> <th>B5</th> <th>B6</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>None</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Odd</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Even</td> </tr> </tbody> </table>		B5	B6	Parity	OFF	OFF	None	ON	OFF	Odd	ON	ON	Even									
B5		B6	Parity																				
OFF	OFF	None																					
ON	OFF	Odd																					
ON	ON	Even																					
B6	Parity check																						
B7	Stop bit	OFF: 1 bit ON: 2 bits																					
B8	System reserve	Fixed to OFF																					

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	

5.1.2 KZ/KV Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u>	
Baud Rate	<u>9600 bps</u>	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>Even</u>	
Target Port No.	<u>0</u>	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

5.1.3 KZ24/300 CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

5.1.4 KV10/24 CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

5.1.5 KV-700

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / <u>57600</u> bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	<u>0</u> to 9	

PLC

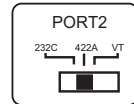
KV-700 (CPU Modular Port)

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	Change the setting using the PORT 2 selector switch attached to the side.
	Interface	RS-232C / RS-422A	
	Station No.	0 to 9	

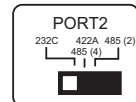


* These settings can be checked on the access window of the CPU. For more information, refer to the PLC manual issued by the manufacturer.

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	PORT 2 selector switch attached to the side
	Interface	RS-232C/RS-422A/485 (4-wire system)	



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

Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
R (input/output/internal auxiliary/special relay)	01H	
TC (timer/current value)	02H	
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	

5.1.6 KV-700 (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

KV-LE20

Unit editor setting

(Underlined setting: default)

Item	Setting	Remarks
Baud Rate	<u>100/10 Mbps Auto</u> / 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)	<u>8500</u>	TCP/IP

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

Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
R (input/output/internal auxiliary/special relay)	01H	
TC (timer/current value)	02H	
CC (counter/current value)	03H	
TS (timer/set value)	04H	
CS (counter/set value)	05H	
T (timer/contact)	06H	
C (counter/contact)	07H	
TM (temporary data memory)	08H	
CTH (high-speed counter/current value)	09H	
CTC (high-speed counter comparator/set value)	0AH	
CT (high-speed counter comparator/contact)	0BH	
CR (control relay)	0CH	
CM (control memory)	0DH	

5.1.7 KV-1000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	<u>Q</u> to 9	

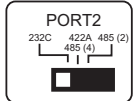
PLC

KV-1000 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20R

Unit editor setting

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

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

Available Device Memory

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

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

5.1.8 KV-1000 (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

The communication setting is the same as the one described in "5.1.6 KV-700 (Ethernet TCP/IP)".

Available Device Memory

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

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

5.1.9 KV-3000 / 5000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	<u>0</u> to 9	

PLC

KV-3000 (CPU Modular Port)

No particular setting is necessary on the PLC.

KV-L20V

Unit editor setting

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

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

Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
R (input/output/internal auxiliary/special relay)	01H	
TC (timer/current value)	02H	Double-word
CC (counter/current value)	03H	Double-word
TS (timer/set value)	04H	Double-word
CS (counter/set value)	05H	Double-word
T (timer/contact)	06H	
C (counter/contact)	07H	
TM (temporary data memory)	08H	
CTH (high-speed counter/current value)	09H	Double-word
CTC (high-speed counter comparator/set value)	0AH	Double-word
CT (high-speed counter comparator/contact)	0BH	
CR (control relay)	0CH	
CM (control memory)	0DH	
MR (internal auxiliary relay)	0EH	
LR (latch relay)	0FH	
EM (extended data memory 1)	10H	
FM (extended data memory 2)	11H	
Z (index register)	12H	Double-word
B (link relay)	13H	
VB (work relay)	14H	
ZF (file register)	15H	
W (link register)	16H	
VM (work memory)	17H	
UG (expansion unit buffer memory)	18H	*1

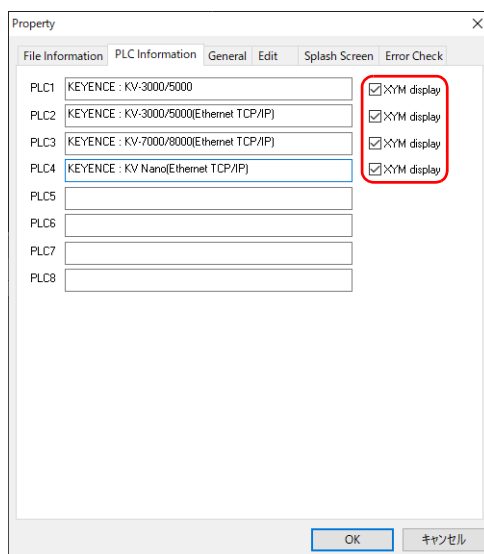
*1 The unit number is required in addition to the device memory type and address. The assigned device memory is expressed as shown on the right when editing the screen program.

Example: UGxyyyyy

Address number
Unit No.: 0 to 48

XYM display of device memory

The PLC device memory can be displayed in XYM format by selecting [XYM display] in the [File] → [Property] → [PLC Information] tab window.



Normal Display		XYM Display	
Device Memory	Address Range	Device Memory	Address Range
R	00000 to 199915	X (input)	0000 to 1999F
		Y (output)	0000 to 1999F
		R	0000 to 199915
MR	000000 to 399915	M	00000 to 63999
LR	00000 to 99915	L	00000 to 15999
DM	00000 to 65534	D	00000 to 65534
EM	00000 to 65534	E	00000 to 65534
FM	00000 to 32767	F	00000 to 32767

Indirect Device Memory Designation

- UG (extension unit buffer memory)

	15	8 7	0
n+0	Models (11 to 18)		18
n+1	Address No.		
n+2	Unit No.		
n+3	Expansion code	Bit designation	
n+4	00	Target Port No.	

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

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

The communication setting is the same as the one described in "5.1.6 KV-700 (Ethernet TCP/IP)".

Available Device Memory

The communication setting is the same as the one described in "5.1.9 KV-3000 / 5000".

5.1.11 KV-7000/8000 (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Make settings by using the software "KV STUDIO". Configure settings for each unit used. The communication setting is the same as the one described in "5.1.6 KV-700 (Ethernet TCP/IP)".

- * When the baud rate is set to "1000/100/10 Mbps Auto" (default) for KV-XLE02, communication can be performed at 1000 Mbps.

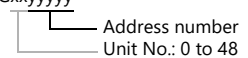
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
R (input/output/internal auxiliary/special relay)	01H	
TC (timer/current value)	02H	Double-word
CC (counter/current value)	03H	Double-word
TS (timer/set value)	04H	Double-word
CS (counter/set value)	05H	Double-word
T (timer/contact)	06H	
C (counter/contact)	07H	
TM (temporary data memory)	08H	
CR (control relay)	0CH	
CM (control memory)	0DH	
MR (internal auxiliary relay)	0EH	
LR (latch relay)	0FH	
EM (extended data memory 1)	10H	
FM (extended data memory 2)	11H	
Z (index register)	12H	Double-word
B (link relay)	13H	
VB (work relay)	14H	
ZF (file register)	15H	
W (link register)	16H	
VM (work memory)	17H	
UG (expansion unit buffer memory)	18H	*1

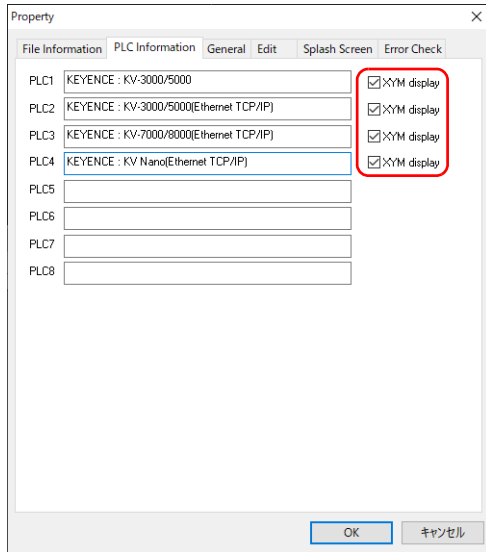
- *1 The unit number is required in addition to the device memory type and address. The assigned device memory is expressed as shown on the right when editing the screen program.

Example: UGxxxxxxx



XYM display of device memory

The PLC device memory can be displayed in XYM format by selecting [XYM display] in the [File] → [Property] → [PLC Information] tab window.



Normal Display		XYM Display	
Device Memory	Address Range	Device Memory	Address Range
R	00000 to 199915	X (input)	0000 to 1999F
		Y (output)	0000 to 1999F
		R	0000 to 199915
MR	000000 to 399915	M	00000 to 63999
LR	00000 to 99915	L	00000 to 15999
DM	00000 to 65534	D	00000 to 65534
EM	00000 to 65534	E	00000 to 65534
FM	00000 to 32767	F	00000 to 32767

Indirect Device Memory Designation

- UG (extension unit buffer memory)

	15	8	7	0
n+0	Models (11 to 18)		18	
n+1	Address No.			
n+2	Unit No.			
n+3	Expansion code		Bit designation	
n+4	00		Target Port No.	

5.1.12 KV Nano

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
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	1 bit	
Parity	Even	
Target Port No.	<u>Q</u> to 9	

PLC

KV Nano (CPU Modular Port)

Unit editor setting

Port	Item	Setting	Remarks
Built-in serial (Port 0)	Operation mode	KV STUDIO mode	

KV-N10L-KV-N11L

Unit editor setting

Port	Item	Setting	Remarks
Extension cassette (Port 1, Port 2)	Extension cassette	KV-N10L (RS-232C) / KV-N11L (RS-422A/485)	
	Operation mode	KV STUDIO mode	
	Interface	RS-232C / RS-422A/485 (4-wire) / RS-485 (2-wire)	
	RS/CS flow control	Disable	When RS-232C is selected
	KV mode Station No.	0 to 9	When RS-422 (4-wire type) is selected

* 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-NC10L-KV-NC20L

Unit editor setting

Port	Item	Setting	Remarks
Select extension adapter	Extension adapter	KV-NC10L (RS-232C) / KV-NC20L (RS-232C + RS-232C/422A/485)	
Extension adapter (Port 1)	Operation mode	KV STUDIO mode	
Extension adapter (Port 2)	Operation mode	KV STUDIO mode	
	Interface	RS-232C / RS-422A/485 (4-wire) / RS-485 (2-wire)	
	RS/CS flow control	Disable	When RS-232C is selected
	KV mode Station No.	0 to 9	When RS-422 (4-wire type) is selected

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

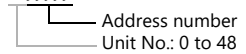
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
R (input/output/internal auxiliary/special relay)	01H	
TC (timer/current value)	02H	Double-word
CC (counter/current value)	03H	Double-word
TS (timer/set value)	04H	Double-word
CS (counter/set value)	05H	Double-word
T (timer/contact)	06H	
C (counter/contact)	07H	
TM (temporary data memory)	08H	
CTH (high-speed counter/current value)	09H	Double-word
CTC (high-speed counter comparator/set value)	0AH	Double-word
CT (high-speed counter comparator/contact)	0BH	
CR (control relay)	0CH	Partially read only
CM (control memory)	0DH	Partially read only
MR (internal auxiliary relay)	0EH	
LR (latch relay)	0FH	
Z (index register)	12H	Double-word
B (link relay)	13H	
VB (work relay)	14H	
W (link register)	16H	
VM (work memory)	17H	
UG (expansion unit buffer memory)	18H	*1

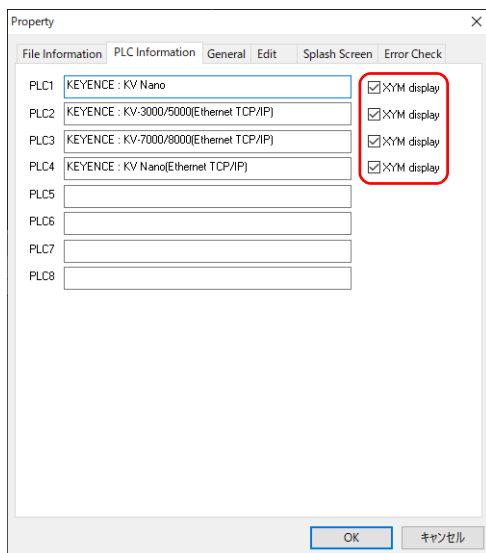
*1 The unit number is required in addition to the device memory type and address. The assigned device memory is expressed as shown on the right when editing the screen program.

Example: UGxyyyyy



XYM display of device memory

The PLC device memory can be displayed in XYM format by selecting [XYM display] in the [File] → [Property] → [PLC Information] tab window.



Normal Display		XYM Display	
Device Memory	Address Range	Device Memory	Address Range
R	00000 to 199915	X (input)	0000 to 1999F
		Y (output)	0000 to 1999F
MR	000000 to 399915	R	0000 to 199915
LR	00000 to 99915	M	00000 to 63999
DM	00000 to 65534	L	00000 to 15999
EM	00000 to 65534	D	00000 to 65534
FM	00000 to 32767	E	00000 to 65534
		F	00000 to 32767

Indirect Device Memory Designation

- UG (extension unit buffer memory)

	15	8 7	0
n+0	Models (11 to 18)		18
n+1	Address No.		
n+2	Unit No.		
n+3	Expansion code	Bit designation	
n+4	00	Target Port No.	

5.1.13 KV Nano (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

The communication setting is the same as the one described in "5.1.6 KV-700 (Ethernet TCP/IP)".

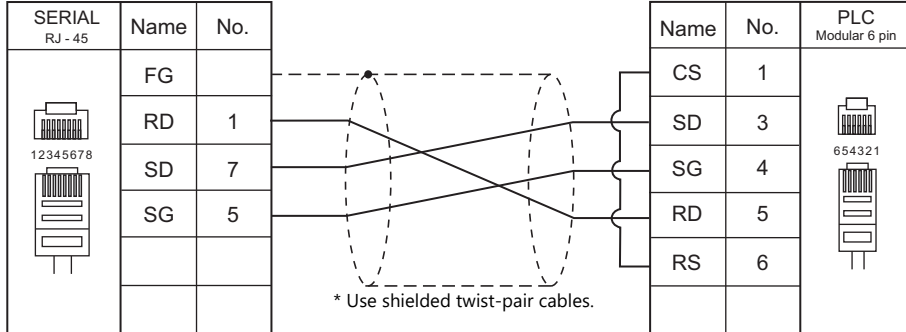
Available Device Memory

The communication setting is the same as the one described in "5.1.12 KV Nano".

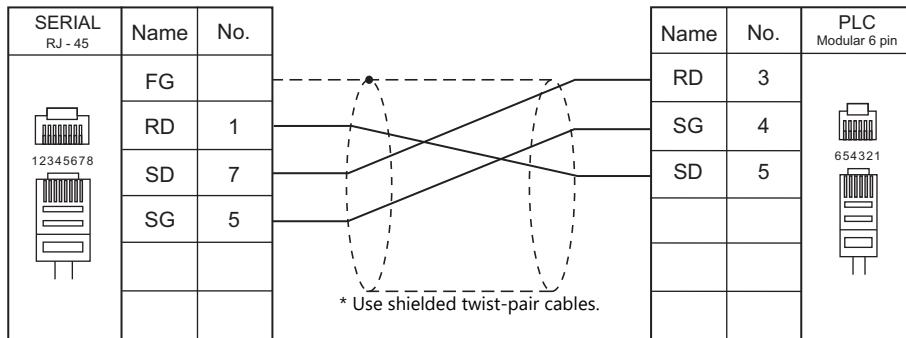
5.1.14 Wiring Diagrams

RS-232C

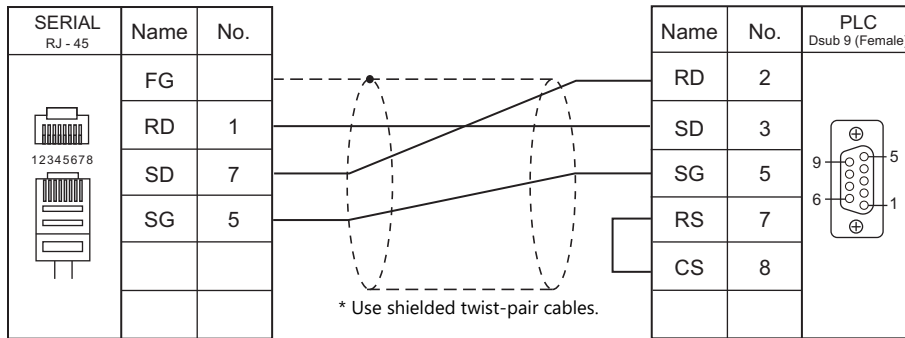
Wiring diagram 1 - M2



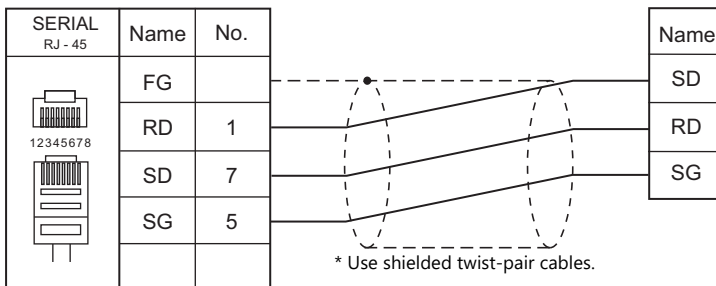
Wiring diagram 2 - M2



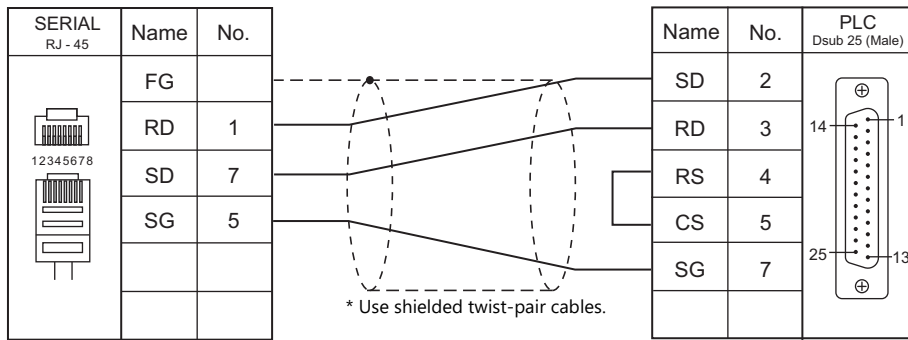
Wiring diagram 3 - M2



Wiring diagram 4 - M2

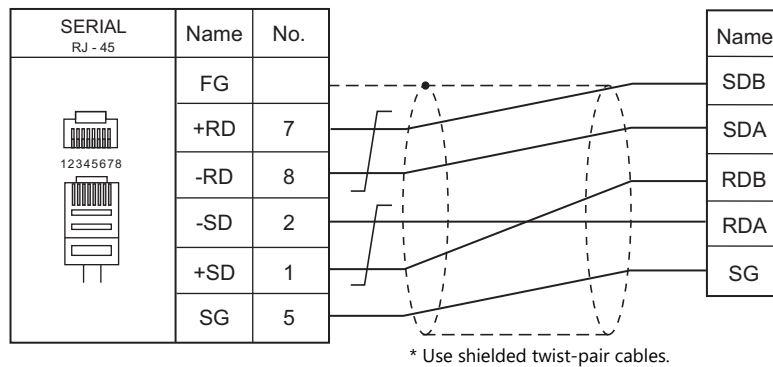


Wiring diagram 5 - M2

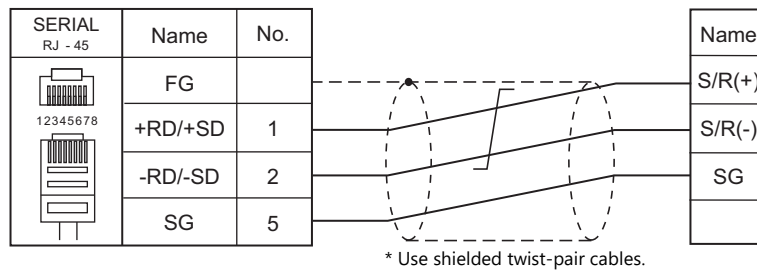


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



5.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Electrostatic Sensor Amplifier

PLC Selection on the Editor	Model		Port	Signal Level	Connection		Lst File
	Communication Unit	Sensor Amplifier			RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)	
DL-RS1A (SK-1000)	DL-RS1A	SK-1000 (master) SK-1050 (slave)	Terminal block	RS-232C	Wiring diagram 1 - M2	×	DLRS1A_SK.Lst

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

5.2.1 DL-RS1A (SK-1000)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

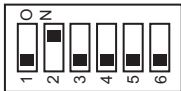
Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C (fixed)	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	1 bit (fixed)	
Parity	<u>None</u> / Odd / Even	

Electrostatic Sensor Amplifier

DL-RS1A (RS-232C communication interface unit)


Communication setting switch

(Underlined setting: default)

Communication setting switch	Setting Item	Setting																				
	SW1 SW2 SW3	<table border="1"> <thead> <tr> <th></th> <th>4800 bps</th> <th><u>9600 bps</u></th> <th>19200 bps</th> <th>38400 bps</th> </tr> </thead> <tbody> <tr> <td>SW1</td> <td>ON</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>SW2</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>SW3</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> </tbody> </table>		4800 bps	<u>9600 bps</u>	19200 bps	38400 bps	SW1	ON	OFF	ON	OFF	SW2	OFF	ON	ON	OFF	SW3	OFF	OFF	OFF	ON
		4800 bps	<u>9600 bps</u>	19200 bps	38400 bps																	
	SW1	ON	OFF	ON	OFF																	
SW2	OFF	ON	ON	OFF																		
SW3	OFF	OFF	OFF	ON																		
SW4	Data bit Length	OFF: 8 bits ON: 7 bits																				
SW5 SW6	Parity check	<table border="1"> <thead> <tr> <th></th> <th><u>None</u></th> <th>Even</th> <th>Odd</th> <th>None</th> </tr> </thead> <tbody> <tr> <td>SW5</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>SW6</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>		<u>None</u>	Even	Odd	None	SW5	OFF	ON	OFF	ON	SW6	OFF	OFF	ON	ON					
	<u>None</u>	Even	Odd	None																		
SW5	OFF	ON	OFF	ON																		
SW6	OFF	OFF	ON	ON																		

Read/write setting switch

(Underlined setting: default)

Read/write setting switch	Setting	Remarks
	RW: Readable data from and writable setting to the sensor amplifier. <u>R: Read-only from the sensor amplifier.</u>	Set to "RW" when writing setting values from the X1.

SK-1000/SK-1050 (Sensor Amplifier)

ID number

ID number	Sensor Amplifier	Remarks
0	SK-1000 (Main)	
1 to 7	SK-1050 (Expansion)	The ID number (0 through 7) is automatically assigned.

Available Device Memory

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

Device Memory	TYPE	Remarks
-	00H	Double-word

Address (Data No.)

Data No.	Name	Remarks
001	Zero shift execution request	
002	Zero shift reset execution request	
003	Reset request	
005	Initial reset request	
006	System parameter set request	
033	Sensor amplifier error	Read only
036	Judgment output/Alarm output	Read only
037	Judgment value (P.V. value)	Real number, read only
038	Internal measurement value (R.V. value)	Real number, read only
039	Peak hold value during hold period	Real number, read only
040	Bottom hold value during hold period	Real number, read only
043	Bank status	Read only
044	Timing status	Read only
045	Temperature	Real number, read only
046	Humidity	Real number, read only
051	Abnormal setting	Read only
052	External input status	Read only
053	EEPROM write result	Read only
054	Zero shift/Zero shift reset result	Read only
055	Reset request result	Read only
056	Current system parameters	Read only
065	HI setting value (BANK 0)	Real number
066	LO setting value (BANK 0)	Real number
070	HI setting value (BANK 1)	Real number
071	LO setting value (BANK 1)	Real number
075	HI setting value (BANK 2)	Real number
076	LO setting value (BANK 2)	Real number
080	HI setting value (BANK 3)	Real number
081	LO setting value (BANK 3)	Real number
097	Key lock function	
098	Bank function	
099	Timing input	
104	Sub display's screen	
105	System parameter settings	
130	Range setting	
133	Averaging	
134	Output mode	
136	Hold function setting	
138	Timing input setting	
141	Hysteresis	Real number
142	Analog output scaling	
143	Analog output upper limit	Real number
144	Analog output lower limit	Real number
145	External input	
146	External input 1	
147	External input 2	
148	External input 3	
149	External input 4	
150	Bank switching method	
152	Zero shift value memory function	
154	Display columns	
161	Distance correction method	
162	Near-side distance correction amount	

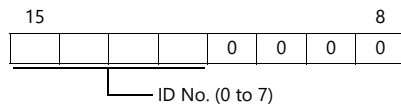
Data No.	Name	Remarks
163	Far-side distance correction amount	
164	Area scaling	Real number
193	Product code	Read only
195	Connected sensor head	Read only

* Set the ID number (0 through 7) when specifying a device.
The ID number is automatically assigned to the sensor amplifier which is connected to the DL-RS1A (RS-232C communication unit).

Indirect Device Memory Designation

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

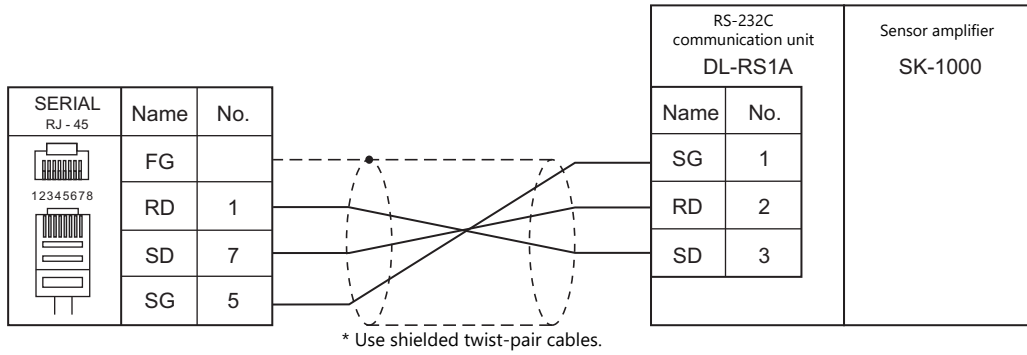
* Specify the ID number (0 through 7) to the upper 4 bits of the extension code.



5.2.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



6. Koatsu Gas Kogyo

6.1 Temperature Controller/Servo/Inverter Connection

6.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

IC Card Reader

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)	
R-BLT	R-BLT	Terminal block	RS-232C	Wiring diagram 1 - M2	×	R_BLT.List

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

6.1.1 R-BLT

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

R-BLT

Be sure to match the settings to those made under [Communication Setting] of the editor.
For more information, refer to the R-BLT manual issued by the manufacturer.

Item	Setting	Remarks
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Length	8 bits	
Stop Bit	2 bits	
Parity	None	

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.

Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
(buffer)	00H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

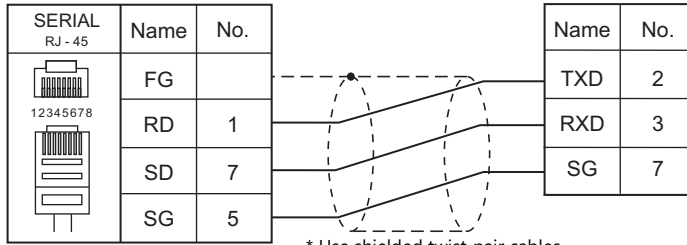
Contents	F0	F1 (= \$u n)		F2
Page specification	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	3
		n + 1	Command: 50H	
		n + 2	Page No.: 0 to 255	
Card reading	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	2
		n + 1	Command: 02H	
Card writing	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	2
		n + 1	Command: 06H	
Card formatting	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	3
		n + 1	Command: 49H	
		n + 2	Card capacity (unit: 256 bytes)	
Card type reference	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	2
		n + 1	Command: 4BH	
		n + 2	Type classification	
		n + 3	Card capacity (unit: 256 bytes)	
Status reading	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	2
		n + 1	Command: 03H	
		n + 2	Status	

Return data: Data stored from IC card reader to X1 series

6.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



7. KOGANEI

7.1 Temperature Controller / Servo / Inverter Connection

7.1 Temperature Controller / Servo / Inverter Connection

Serial Connection

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire) ^{*1}	RS-422 (4-wire)	
IBFL-TC	IBFL-TC	Connector a / b	RS-485	Wiring diagram 1 - M4	×	IBFL-TC.Lst

*1 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

7.1.1 IBFL-TC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-422/485	
Baud Rate	115200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	
Target Port No.	0 to 15	

Takt Time Controller

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

Available Device Memory

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

Device Memory	TYPE	Remarks
P (parameter)	00H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

Contents	F0	F1 (= \$u n)		F2
Acquire IBFL-TC status *5	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6	
		n + 2	IBFL-TC status 	
Version data acquisition	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 7	
		n + 2 - n + 9	Version (16 characters) IBFL-TC Ver.x.xx	

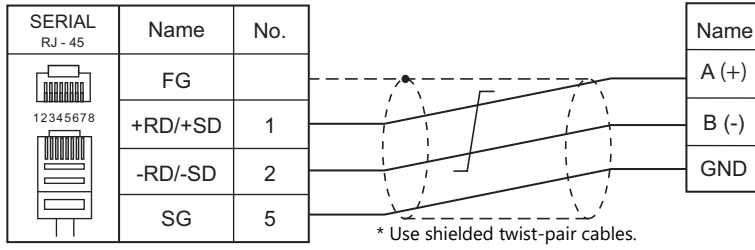
Return data: Data stored from PLC to X1 series

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

7.1.2 Wiring Diagrams

RS-422/RS-485

Wiring diagram 1 - M4



8. KOYO ELECTRONICS

8.1 PLC Connection

8.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	Connection	
				RS-232C* ¹ / RS-485 (2-wire)* ²	RS-422 (4-wire)* ²
SU/SG series	SU-5	U-01DM	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 5 - M4
	SU-5E SU-6B SU-6H	Universal communication port	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 2 - M4
		U-01DM	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 5 - M4
	SU-5M SU-6M	Universal communication port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 2 - M4
		Universal communication port 2	RS-232C	Wiring diagram 3 - M2	×
		Universal communication port 3	RS-422	×	Wiring diagram 3 - M4
		U-01DM	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 5 - M4
	SZ-4	Universal communication port (PORT2)	RS-232C	Wiring diagram 3 - M2	×
	SZ-4M	Universal communication port (PORT2)	RS-232C	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 4 - M4
	SG-8	Universal communication port	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 2 - M4
		G-01DM (CN2)	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 5 - M4
		G-01DM (CN1)	RS-422	×	Wiring diagram 6 - M4
G-01DM (CN2)					
PZ3	Universal communication port	RS-232C	Wiring diagram 2 - M2	×	
		RS-422	×	Wiring diagram 4 - M4	
SR-T (K protocol)	SR-1T	Universal communication port	RS-485	Wiring diagram 1 - M4	×
SU/SG (K-Sequence)	SU-5E SU-6B	Programmer communication port	RS-232C	Wiring diagram 4 - M2	×
		Universal communication port	RS-232C	Wiring diagram 1 - M2	×
	SU-5M SU-6M	Programmer communication port	RS-232C	Wiring diagram 4 - M2	×
			RS-422	×	Wiring diagram 2 - M4
		Universal communication port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 2 - M4
	Universal communication port 2	RS-232C	Wiring diagram 3 - M2	×	
		RS-422	×	Wiring diagram 3 - M4	
	SZ-4	Programmer communication port (PORT1)	RS-232C	Wiring diagram 3 - M2	×
		Universal communication port (PORT2)			
SZ-4M	Programmer communication port (PORT1)	RS-232C	Wiring diagram 2 - M2	×	
	Universal communication port (PORT2)				
	Universal communication port (PORT2)	RS-232C	Wiring diagram 2 - M2	×	
		RS-422	×	Wiring diagram 4 - M4	
SU/SG (MODBUS RTU)	SU-5M SU-6M	Universal communication port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 2 - M4
	Universal communication port 3	RS-422	×	Wiring diagram 3 - M4	
		RS-232C	Wiring diagram 2 - M2	×	
	SZ-4M	Universal communication port (PORT2)	RS-422	×	Wiring diagram 4 - M4

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

8.1.1 SU/SG

Communication Setting

Editor

Communication setting


(Underlined setting: default)

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

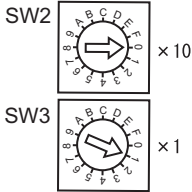
SU-5

Host Link Module (U-01DM)

Online/offline selector switch (SW1)

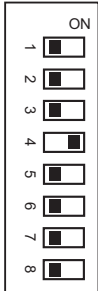
SW1	Setting
 <p>Online Offline</p>	Online

Rotary switch (SW2, SW3)

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

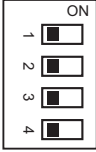
DIP switch (SW4)

(Underlined setting: default)

SW4	Item	Setting	Remarks																				
	No. 1 No. 2 No. 3	Baud rate	<table border="1"> <thead> <tr> <th></th> <th>No. 1</th> <th>No. 2</th> <th>No. 3</th> </tr> </thead> <tbody> <tr> <td>4800 bps</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>9600 bps</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>19200 bps</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> <tr> <td><u>38400 bps</u></td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>		No. 1	No. 2	No. 3	4800 bps	ON	OFF	ON	9600 bps	OFF	ON	ON	19200 bps	ON	ON	ON	<u>38400 bps</u>	OFF	OFF	OFF
		No. 1	No. 2	No. 3																			
	4800 bps	ON	OFF	ON																			
	9600 bps	OFF	ON	ON																			
19200 bps	ON	ON	ON																				
<u>38400 bps</u>	OFF	OFF	OFF																				
No. 4	Parity	OFF: <u>No parity</u> ON: <u>Odd parity</u>																					
No. 5	Self diagnosis	OFF: Not provided																					
No. 6 No. 7 No. 8	Response delay time	OFF: 0 ms																					

DIP switch (SW5)

(Underlined setting: default)

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

SU-5E/6B**Universal Communication Port****System parameter setting**

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

(Underlined setting: default)


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

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

DIP switch

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

(Underlined setting: default)

Switch	Item	Setting	Remarks										
	No. 1	Battery mode OFF: <u>Without battery</u> ON: With battery											
	No. 2	Station number setting OFF: <u>According to the system parameter setting</u> ON: Fixed to 01											
	No. 3	Baud rate	<table border="1"> <thead> <tr> <th>Baud Rate</th> <th>SW3</th> <th>SW4</th> </tr> </thead> <tbody> <tr> <td>9600 bps</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>19200 bps</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>	Baud Rate	SW3	SW4	9600 bps	ON	OFF	19200 bps	ON	ON	
	Baud Rate		SW3	SW4									
9600 bps	ON	OFF											
19200 bps	ON	ON											
No. 4													

Host Link Module (U-01DM)

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

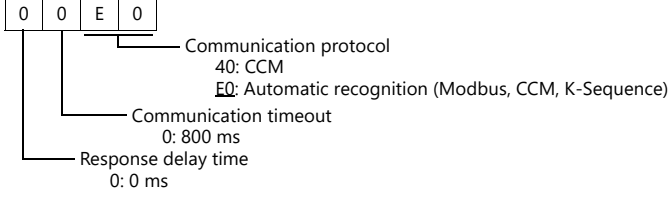
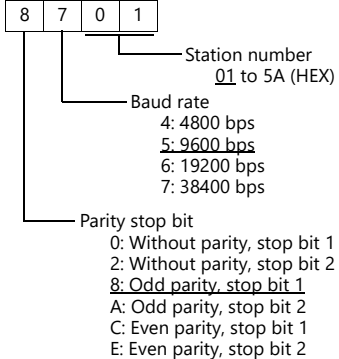
SU-5M/6M

Universal Communication Port 1

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

Parameter setting register

(Underlined setting: default)

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

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

Universal Communication Port 2

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

Parameter setting register

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

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

Universal Communication Port 3

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

Parameter setting register

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

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

Host Link Module (U-01DM)

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

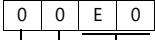
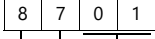
SU-6H

Universal Communication Port

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

Parameter setting register

(Underlined setting: default)


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

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

DIP switch

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

(Underlined setting: default)

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

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

Host Link Module (U-01DM)

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

SZ-4

Universal Communication Port (PORT2)

System parameter setting

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

(Underlined setting: default)

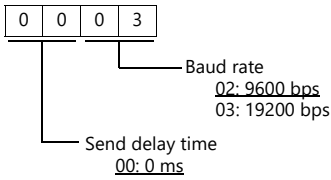
Item	Setting	Remarks
Parity	<u>Odd</u> / None	
Station number	<u>1</u> to 90	
Data type	HEX	

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

Parameter setting register

Set the baud rate at special register "R7632".

(Underlined setting: default)

Register	Setting	Setting Example
R7632		<p>0003H</p> <p>19200 bps</p>

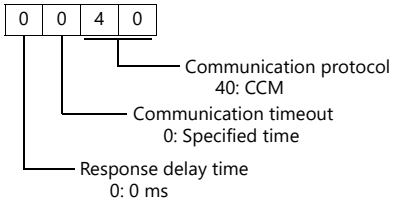
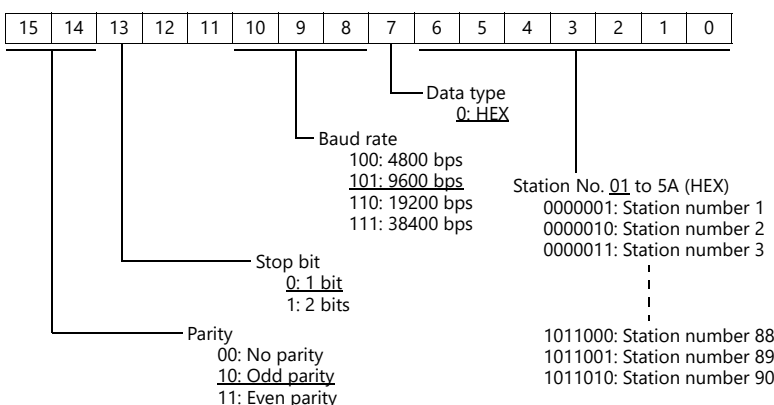
SZ-4M

Universal Communication Port (PORT2)

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

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R7655		<p>0040H</p> <p>CCM</p>
R7656		<p>8701H</p> <p>38400 bps</p> <p>Odd parity</p> <p>Stop bit 1</p> <p>Station number 01 HEX denotation</p> <p>Station No. 01 to 5A (HEX)</p> <p>0000001: Station number 1</p> <p>0000010: Station number 2</p> <p>0000011: Station number 3</p> <p>...</p> <p>1011000: Station number 88</p> <p>1011001: Station number 89</p> <p>1011010: Station number 90</p>

SG-8

Universal Communication Port

System parameter setting

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

(Underlined setting: default)

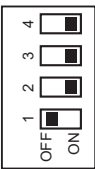
Item	Setting	Remarks
Station number	<u>1</u> to 90	Valid only when DIP switch No. 2 is set to OFF
Data type	HEX	

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

DIP switch


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

(Underlined setting: default)

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

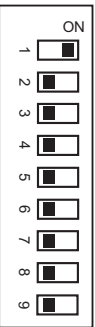
Host Link Module (G-01DM)

Online/offline selector switch

Selector Switch	Setting
	Online

DIP switch (SW1)

(Underlined setting: default)

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

DIP switch (SW2)

(Underlined setting: default)

SW2	Item	Setting	Remarks																	
	No. 1 No. 2 No. 3	Baud rate	<table border="1"> <thead> <tr> <th></th> <th>SW1</th> <th>SW2</th> <th>SW3</th> </tr> </thead> <tbody> <tr> <td>4800 bps</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>9600 bps</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>19200 bps</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>		SW1	SW2	SW3	4800 bps	ON	OFF	ON	9600 bps	OFF	ON	ON	19200 bps	ON	ON	ON	
		SW1	SW2	SW3																
	4800 bps	ON	OFF	ON																
	9600 bps	OFF	ON	ON																
	19200 bps	ON	ON	ON																
	No. 4	Parity	<u>OFF: No parity</u> ON: Odd parity																	
	No. 5	Self diagnosis	<u>OFF: Not provided</u>																	
	No. 6	Turnaround delay	<u>OFF: Not provided</u>																	
	No. 7 No. 8	Response delay time	<u>OFF: 0 ms</u>																	
No. 9	ASCII/HEX selection	<u>OFF: HEX</u>																		

Short plug 1

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

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

Short plug 2

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

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

PZ3**Universal Communication Port**

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

Available Device Memory

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

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

8.1.2 SR-T (K Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-422/485</u>	
Baud Rate	<u>19200</u>	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>Odd</u>	
Target Port No.	0 to 31	

PLC

Universal Communication Port

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

Item	Setting	
Baud rate	<u>19200 bps</u>	
Parity	<u>Odd</u>	
Data length	<u>8 bits</u>	
Stop bit	<u>1 bit</u>	
Data type	<u>HEX</u>	

Available Device Memory

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

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

8.1.3 SU/SG (K-Sequence)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

SU-5M/6M

Programmer Communication Port

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

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

Universal Communication Port 1

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

Parameter setting register

(Underlined setting: default)

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

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

Universal Communication Port 2

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

Parameter setting register

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

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

Universal Communication Port 3

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

Parameter setting register

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

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

SZ-4/SZ-4M**Programmer Communication Port (PORT1) / Universal Communication Port (PORT2)**

No particular setting is necessary on the PLC. The PLC performs communication functions using the following parameters. Set the following parameters under [Communication Setting] of X1.

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

Available Device Memory

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

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

8.1.4 SU/SG (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

SU-5M/6M

Universal Communication Port 1

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

Parameter setting register

(Underlined setting: default)

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

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

Universal Communication Port 3

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

Parameter setting register

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

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

SZ-4M

Universal Communication Port (PORT2)

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

Parameter setting register

(Underlined setting: default)

Register	Setting	Setting Example
R7655	<p>0 0 2 0</p> <p>Communication protocol 20: MODBUS RTU</p> <p>Communication timeout 0: Specified time</p> <p>Response delay time 0: 0 ms</p>	0020H
R7656	<p>Bit 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0</p> <p>Data type 0: <u>HEX</u></p> <p>Baud rate 100: 4800 bps <u>101: 9600 bps</u> 110: 19200 bps 111: 38400 bps</p> <p>Station No. 01 to 5A (HEX) 0000001: Station number 1 0000010: Station number 2 0000011: Station number 3 ⋮ 1011000: Station number 88 1011001: Station number 89 1011010: Station number 90</p> <p>Stop bit 0: 1 bit 1: 2 bits</p> <p>Parity 00: No parity <u>10: Odd parity</u> 11: Even parity</p>	<p>8701H</p> <p>38400 bps Odd parity Stop bit 1 Station number 01 HEX denotation</p>

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

Available Device Memory

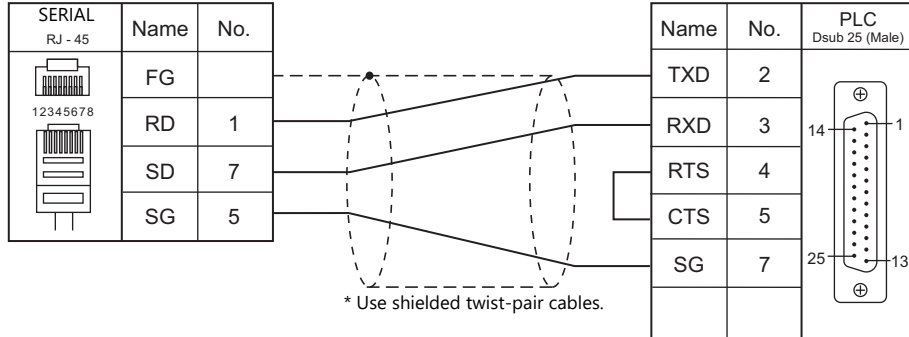
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

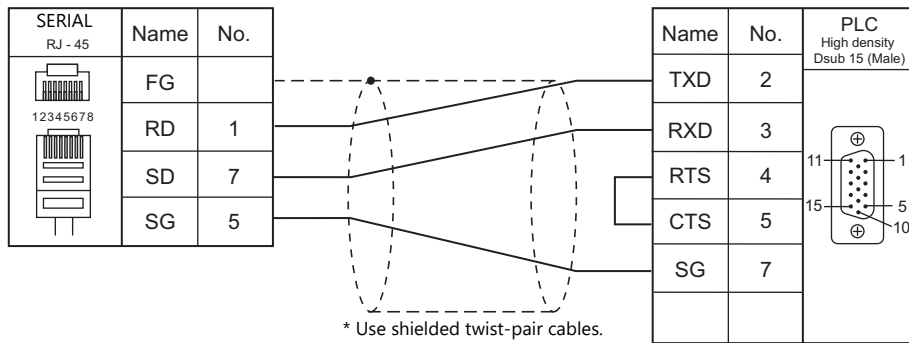
8.1.5 Wiring Diagrams

RS-232C

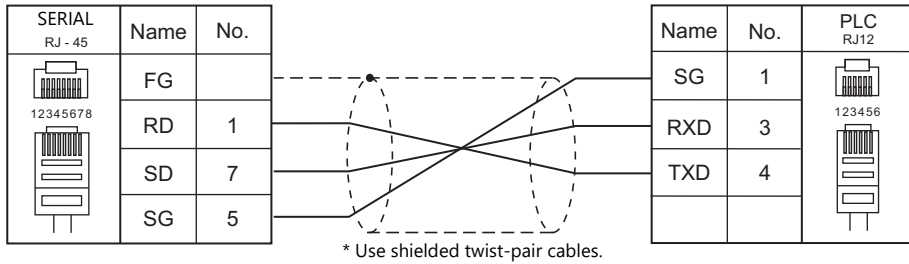
Wiring diagram 1 - M2



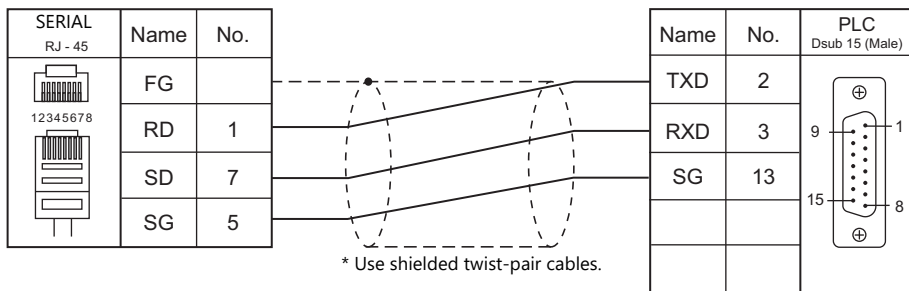
Wiring diagram 2 - M2



Wiring diagram 3 - M2

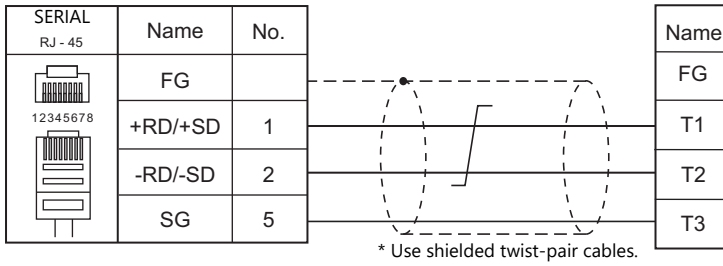


Wiring diagram 4 - M2

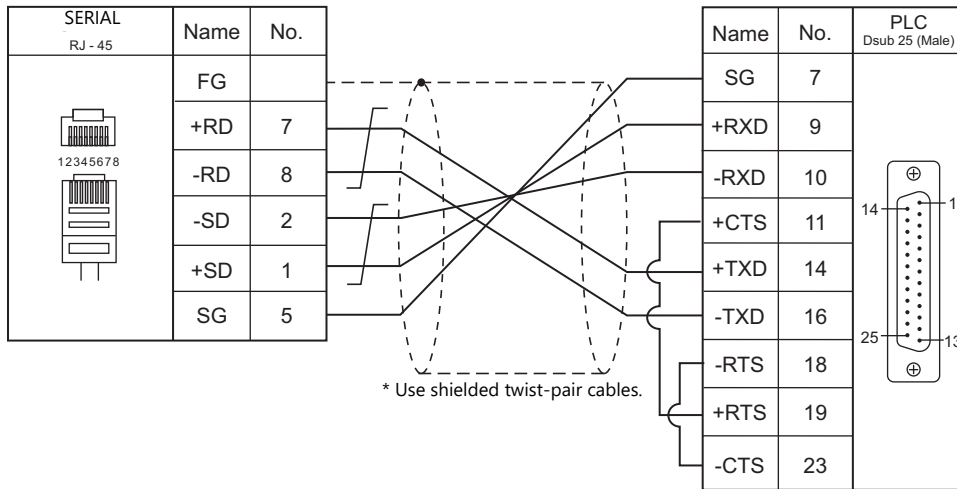


RS-422/RS-485

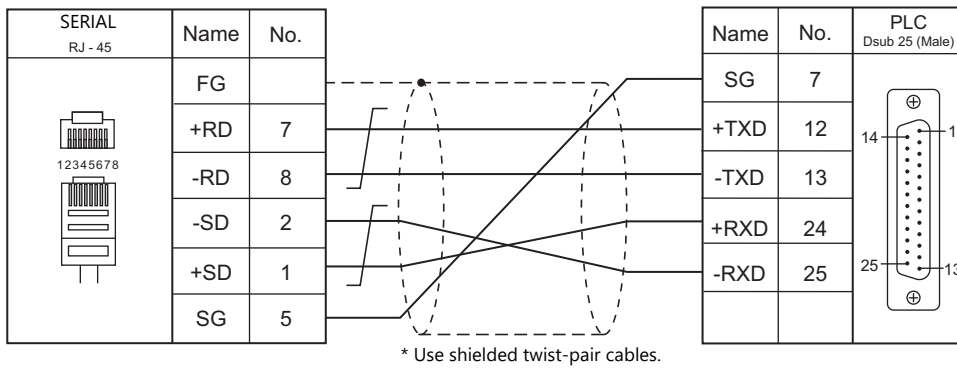
Wiring diagram 1 - M4



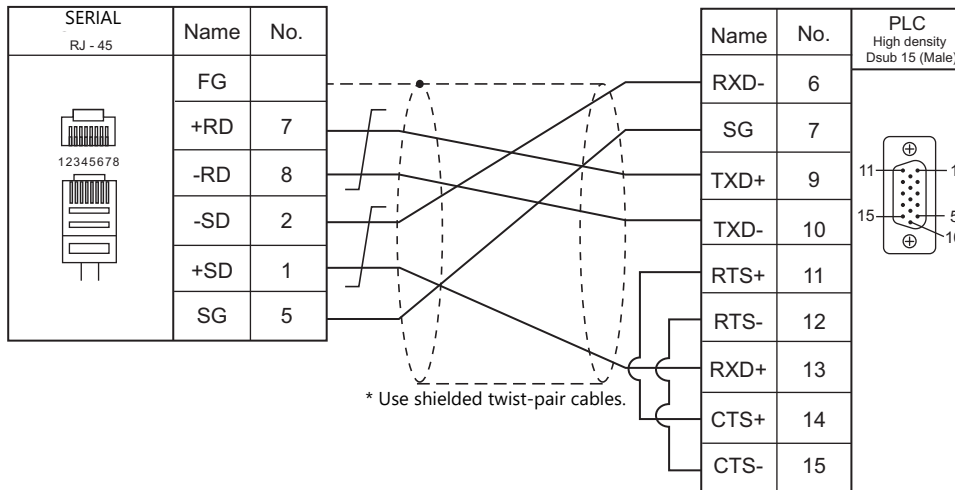
Wiring diagram 2 - M4



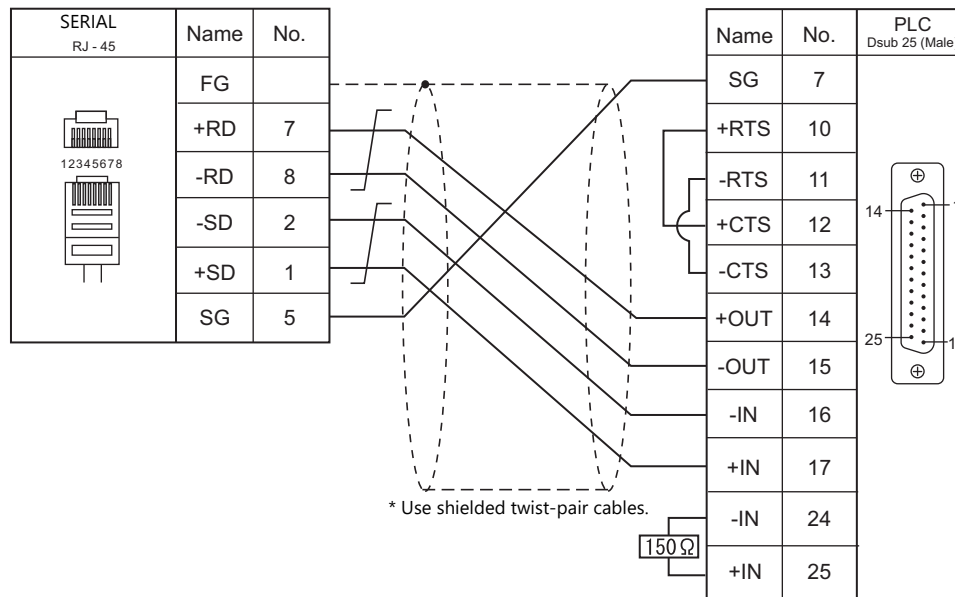
Wiring diagram 3 - M4



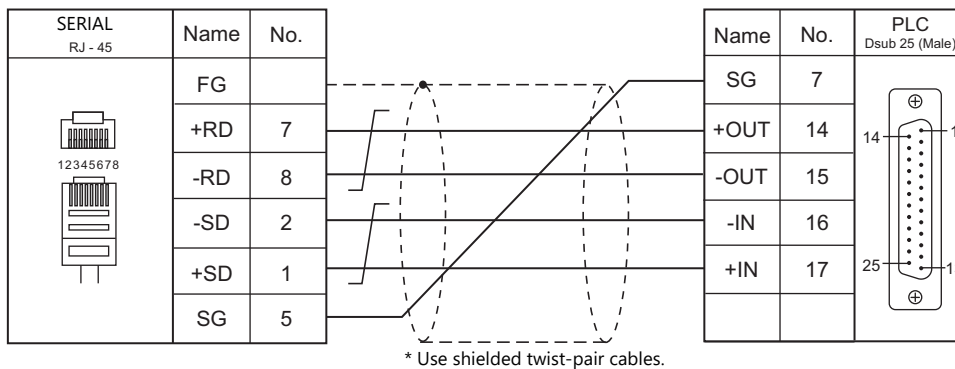
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



9. Lenze

9.1 Temperature Controller/Servo/Inverter Connection

9.1 Temperature Controller/Servo/Inverter Connection

Ethernet Connection

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

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

9.1.1 ServoDrive (Ethernet TCP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 9410) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

ServoDrive

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

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

Available Device Memory

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

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

Specification of codes and sub codes

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

PLC1 0:#0:8SI00100

Device Input PLC1 Lenze : Servo Drive 9400(Ethe... x

Type: 8SI 00100

Indirect:

Port No. 0

Sub Code 0

OK Cancel Open...

Example: 0 : #0 : 8SI 00100

- ↑ Code
- ↑ Device memory type
- ↑ Sub code
- ↑ Target Port No.

Indirect Device Memory Designation

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

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

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

Return data: Data stored from servo to X1 series

10. LS

10.1 PLC Connection

10.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	Connection					
					RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}				
MASTER-KxxxS	K200S	K3P-07AS	RS-232C port on the CPU unit	RS-232C	Wiring diagram 1 - M2	×				
		K3P-07CS								
	K300S	K4P-15AS								
	K1000S	K7P-30AS								
MASTER-KxxxS CNET	K200S	K3P-07AS	K3F-CU2A	RS-232C	Wiring diagram 2 - M2	×				
		K3P-07BS	K3F-CU4A	RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
	K300S	K4P-15AS	K4F-CUEA	RS-232C	Wiring diagram 2 - M2	×				
				RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
	K1000S	K7P-30AS	K7F-CUEA	RS-232C	Wiring diagram 2 - M2	×				
				RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
GLOFA CNET	GM6	GM6-CPUA GM6-CPUB GM6-CPUC	G6L-CUEB	RS-232C	Wiring diagram 2 - M2	×				
			G6L-CUEC	RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
	GM4	GM4-CPUA	G4L-CUEA	RS-232C	Wiring diagram 2 - M2	×				
				RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
	GM3	GM3-CPUA	G3L-CUEA	RS-232C	Wiring diagram 2 - M2	×				
				RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
GLOFA GM7 CNET	GM7	G7M-DR G7M-DT	G7L-CUEB	RS-232C	Wiring diagram 1 - M2	×				
			G7L-CUEC	RS-422/485	Wiring diagram 1 - M4	Wiring diagram 3 - M4 ^{*3}				
GLOFA GM series CPU	GM6	GM6-CPUA GM6-CPUB GM6-CPUC	RS-232C port on the CPU unit	RS-232C	Wiring diagram 1 - M2	×				
							GM4	GM4-CPUA		
	GM3	GM3-CPUA								
							GM7	G7M-DR G7M-DT		
XGT/XGK series CNET	XGK-CPUH XGK-CPUA XGK-CPUS XGK-CPUE	XGL-C22A	XGL-CH2A	RS-232C	Wiring diagram 1 - M2	×				
				RS-232C	Wiring diagram 2 - M4	Wiring diagram 4 - M4 ^{*3}				
				RS-422						
XGT/XGK series CPU	XGK-CPUH XGK-CPUA XGK-CPUS XGK-CPUE	RS-232C port on the CPU unit	XGL-C42A	RS-422						
				XGT/XGI series CNET	XGI-CPUH XGI-CPUU XGI-CPUS	XGL-C22A	XGL-CH2A	RS-232C	Wiring diagram 1 - M2	×
								RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 ^{*3}
XGT/XGI series CPU	XGI-CPUH XGI-CPUU XGI-CPUS	RS-232C port on the CPU unit	XGL-C42A	RS-422						

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

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

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

10.1.1 MASTER-KxxxS

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

10.1.2 MASTER-KxxxS CNET

Communication Setting

Editor

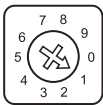
Communication setting

(Underlined setting: default)

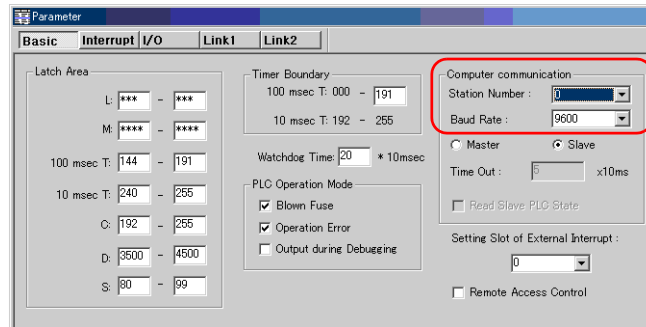
Item	Setting	Remarks
Connection Mode	<u>1</u> : <u>1</u> / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	9600 / 19200 / <u>38400</u> / 57600 / 76800 / 115200 bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Target Port No.	<u>0</u> to 31	

PLC

MODE switch

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

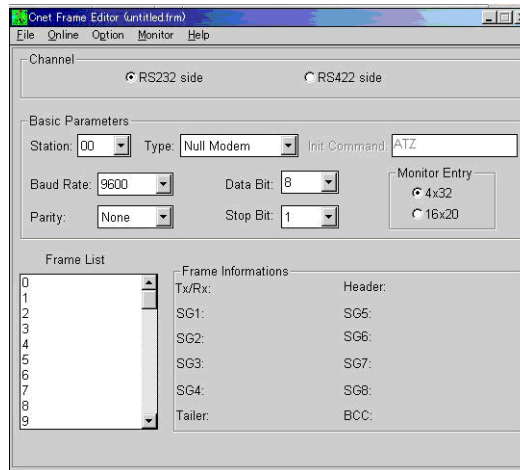
KGL_WIN for Windows



(Underlined setting: default)

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

Cnet Frame Editor



(Underlined setting: default)

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

Available Device Memory

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

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

10.1.3 MASTER-K Series (Ethernet)

Communication Setting

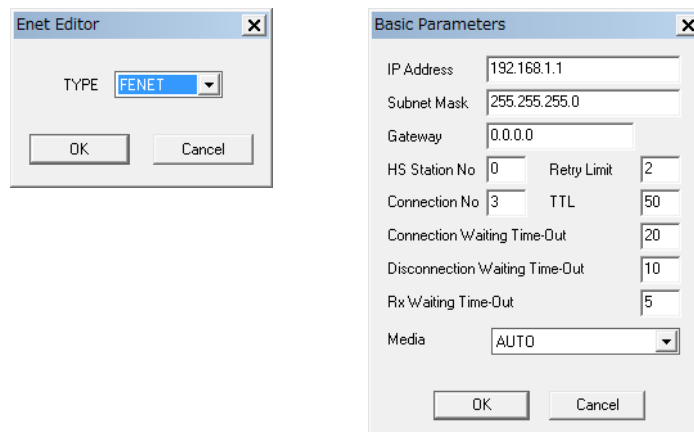
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

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



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

Available Device Memory

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

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

10.1.4 GLOFA CNET

Communication Setting

Editor

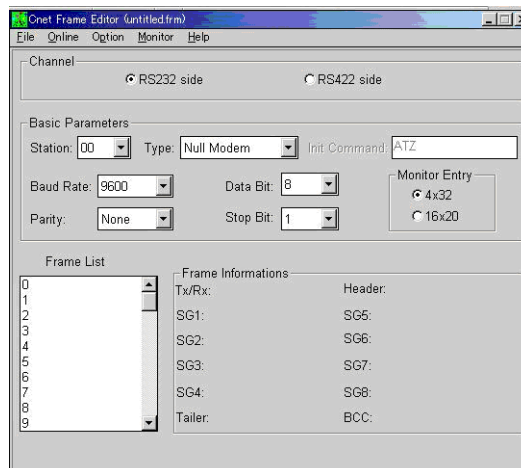
Communication setting

(Underlined setting: default)

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

PLC

Cnet frame editor



(Underlined setting: default)

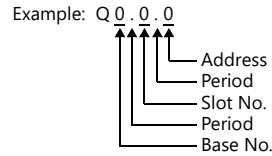
Item	Setting	Remarks
Channel	<u>RS232C</u> / RS422	
Baud Rate	9600 / 19200 / <u>38400</u> / 76800 bps	76800: Valid only when [Channel: RS422 side] is selected
Data Bit	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Station	<u>0</u> to 31	
Type	<u>RS422</u> / RS485	To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

Available Device Memory

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

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

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

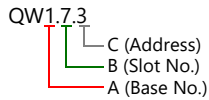


Indirect Device Memory Designation

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

- Using Q or I device memory

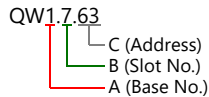
- Word access



$$\text{Address number} = A \times 32 + B \times 4 + C = 1 \times 32 + 7 \times 4 + 3 = 63$$

Specify "63" (DEC) for the address number.

- Bit access



$$\begin{aligned} \text{Address number} &= A \times 32 + B \times 4 + (\text{quotient of } C \text{ divided by } 16) \\ &= 1 \times 32 + 7 \times 4 + (63 \div 16) = 63 \end{aligned}$$

$$\text{Bit designation} = \text{remainder when } C \text{ is divided by } 16 = (63 \div 16) = 15$$

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

10.1.5 GLOFA GM7 CNET

Communication Setting

Editor


Communication setting

(Underlined setting: default)

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

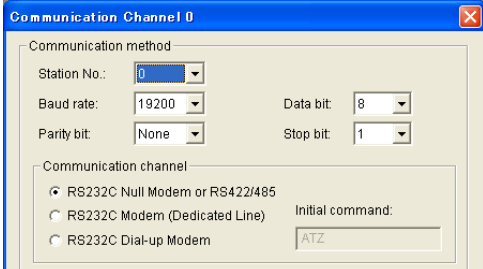
PLC

Mode switches

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

* G7L-CUEC is not provided with mode switches.

Communication Channel 0



(Underlined setting: default)

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

Available Device Memory

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

10.1.6 GLOFA GM Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

The following settings are fixed; baud rate: 38400 bps, data length: 8 bits, without parity, and stop bit: 1 bit.

Available Device Memory

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

10.1.7 GLOFA GM Series (Ethernet UDP/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2005) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Set the IP address using "Enet Editor".

The port number is fixed to "2005".

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

Available Device Memory

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

10.1.8 XGT/XGK Series CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

Communication setting

(Underlined setting: default)

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

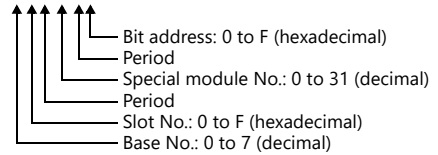
Available Device Memory

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

Device Memory	TYPE	Remarks
P (input/output relay)	00H	PW as word device, input relay: read only
M (auxiliary relay)	01H	MW as word device
L (link relay)	02H	LW as word device
K (keep relay)	03H	KW as word device
F (special relay)	04H	FW as word device; FW0 to FW1023: read only
T (timer/current value)	05H	
C (counter/current value)	06H	
D (data register)	07H	
TC (timer/contact)	09H	
CC (counter/contact)	0AH	
N (communication data register)	0BH	
R (file register)	0CH	RW as word device
ZR (file register)	0DH	
U (analog data register)	0EH	UW as word device *1

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

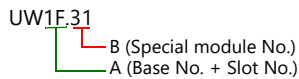
Example: U 3 1 . 31 . F



Indirect Device Memory Designation

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

Example: Indirect device memory designation of "UW1F.31"



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

Specify "1023" (DEC) for the address number.

10.1.9 XGT/XGK Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

The following settings are fixed; baud rate: 115200 bps, data length: 8 bits, without parity, and stop bit: 1 bit.

Available Device Memory

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

10.1.10 XGT / XGK Series (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Go to [Standard Settings] in XG-PD and set the IP address.

The port numbers are 2004 for TCP/IP and 2005 for UDP/IP (both fixed).

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

Available Device Memory

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

10.1.11 XGT / XGI Series CNET

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

Communication settings

(Underlined setting: default)

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

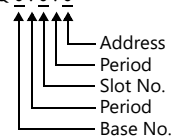
Available Device Memory

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

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

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

Example: Q 0 . 0 . 0



Indirect Device Memory Designation

- For the address number of 0 to 65535:

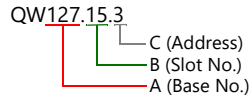
	15	8	7	0
n + 0	Model		Device type	
n + 1	Address No.			
n + 2	Expansion code		Bit designation	
n + 3	00		Station number	

- For the address number of 65536 or greater:

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

- Using Q or I device memory

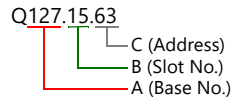
- Word access



$$\text{Address number} = A \times 64 + B \times 4 + C = 127 \times 64 + 15 \times 4 + 3 = 8191$$

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

- Bit access



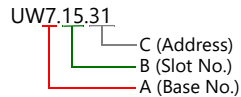
$$\begin{aligned} \text{Address number} &= A \times 64 + B \times 4 + (\text{quotient of } C \text{ divided by } 16) \\ &= 127 \times 64 + 15 \times 4 + (63 \div 16) = 8191 \end{aligned}$$

$$\text{Bit designation} = \text{remainder when } C \text{ is divided by } 16 = (63 \div 16) = 15$$

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

- Using U device memory

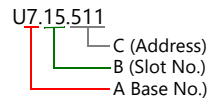
- Word access



$$\text{Address number} = A \times 512 + B \times 32 + C = 7 \times 512 + 15 \times 32 + 31 = 4095$$

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

- Bit access



$$\begin{aligned} \text{Address number} &= A \times 512 + B \times 32 + (\text{quotient of } C \text{ divided by } 16) \\ &= 7 \times 512 + 15 \times 32 + (511 \div 16) = 4095 \end{aligned}$$

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

10.1.12 XGT / XGI Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Baud rate: 115200 bps, data length: 8 bits, without parity, stop bit: 1 bit (fixed)

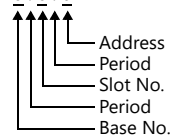
Available Device Memory

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

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

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

Example: QW 0 . 0 . 0

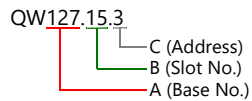


Indirect Device Memory Designation

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

- Using Q or I device memory

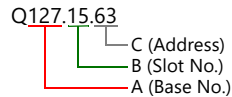
- Word access



$$\text{Address number} = A \times 64 + B \times 4 + C = 127 \times 64 + 15 \times 4 + 3 = 8191$$

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

- Bit access



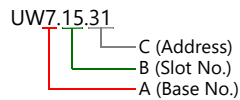
$$\begin{aligned} \text{Address number} &= A \times 64 + B \times 4 + (\text{quotient of } C \text{ divided by } 16) \\ &= 127 \times 64 + 15 \times 4 + 63 \div 16 = 8191 \end{aligned}$$

$$\text{Bit designation} = \text{remainder when } C \text{ is divided by } 16 = (63 \div 16) = 15$$

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

- Using U device memory

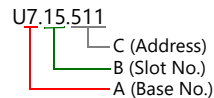
- Word access



$$\text{Address number} = A \times 512 + B \times 32 + C = 7 \times 512 + 15 \times 32 + 31 = 4095$$

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

- Bit access



$$\begin{aligned} \text{Address number} &= A \times 512 + B \times 32 + (\text{quotient of } C \text{ divided by } 16) \\ &= 7 \times 512 + 15 \times 32 + (511 \div 16) = 4095 \end{aligned}$$

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

10.1.13 XGT / XGI Series (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 2004 for TCP/IP or No. 2005 for UDP/IP) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Go to [Standard Settings] in XG-PD and set the IP address.

The port numbers are 2004 for TCP/IP and 2005 for UDP/IP (both fixed).

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

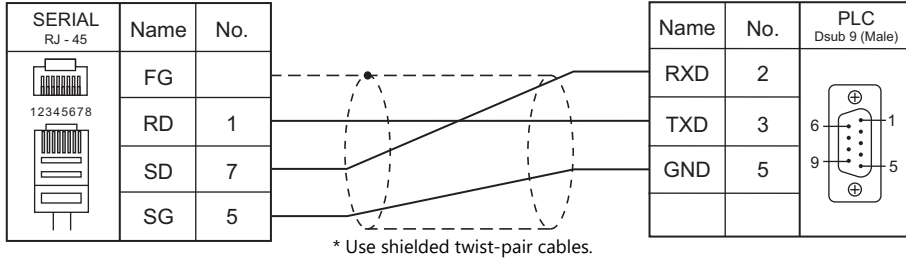
Available Device Memory

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

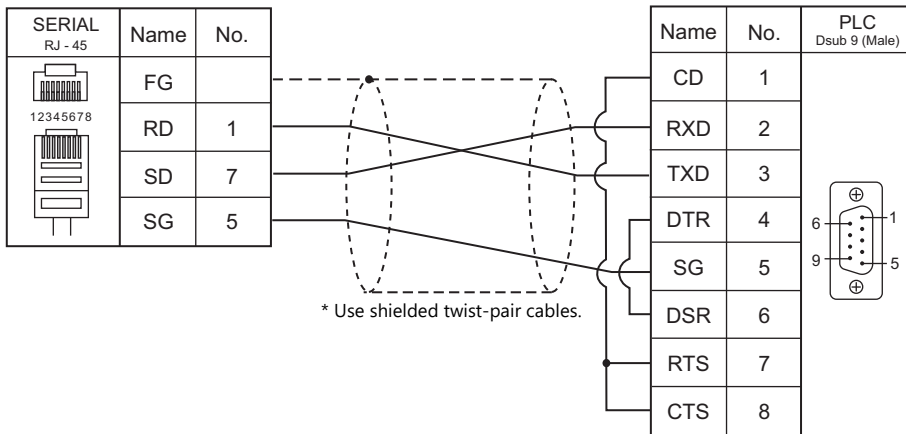
10.1.14 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2

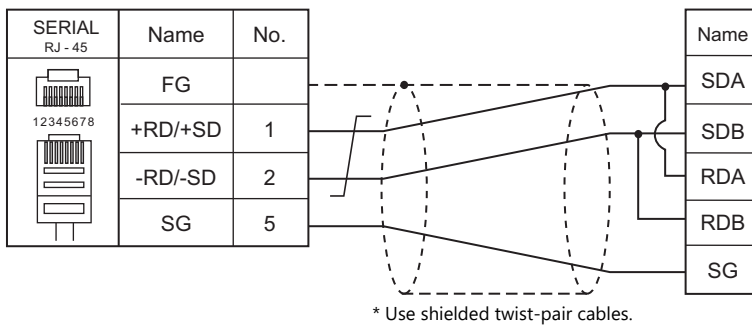


Wiring diagram 2 - M2

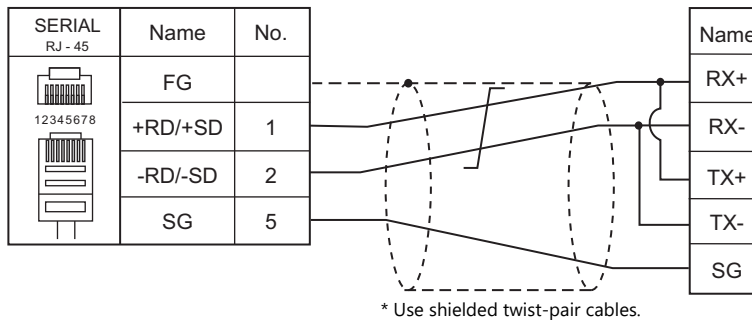


RS-422/485

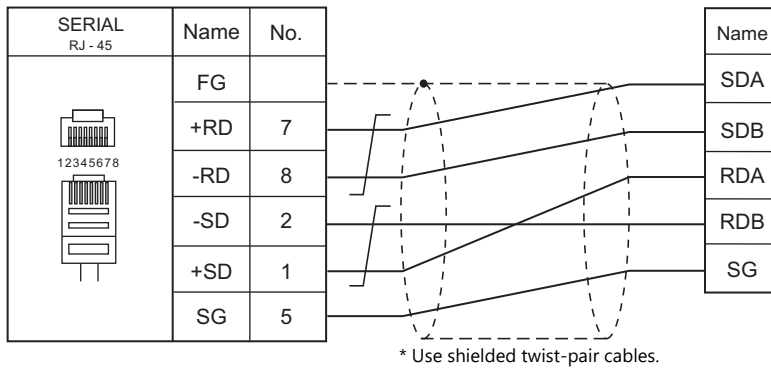
Wiring diagram 1 - M4



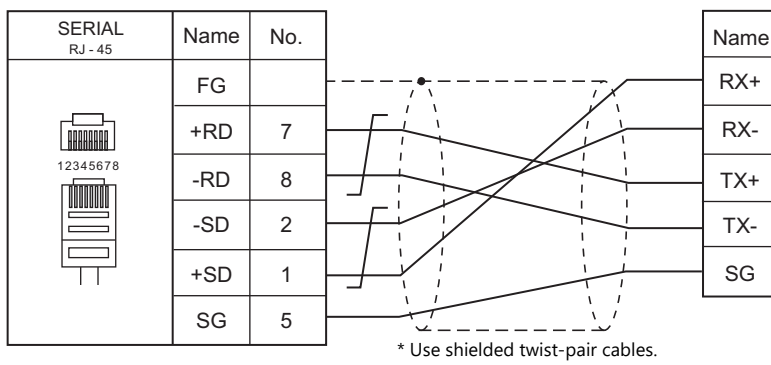
Wiring diagram 2 - M4



Wiring diagram 3 - M4



Wiring diagram 4 - M4



11. MITSUBISHI ELECTRIC

11.1 PLC Connection

11.2 Temperature Controller/Servo/Inverter Connection

11.1 PLC Connection

Serial Connection

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

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2
A series link A-link + Net10	A2A, A3A	AJ71C24-S6 AJ71C24-S8 AJ71UC24	RS-232C	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	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *3
	A0J2, A0J2H	A0J2C214-S1			
	A2US	A1SJ71UC24-R2 A1SJ71UC24-R4 A1SJ71UC24-PRF	RS-232C	Wiring diagram 1 - M2	×
			RS-422	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *3
			RS-232C	Wiring diagram 1 - M2	×
	A1S, A1SJ, A2S	A1SJ71C24-R2 A1SJ71C24-R4 A1SJ71C24-PRF	RS-422	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *3
	A2CCPUC24	Link port built into CPU	RS-232C	Wiring diagram 1 - M2	×
QnH (A mode)	A1SJ71UC24-R2 A1SJ71UC24-R4	RS-232C	Wiring diagram 1 - M2	×	
		RS-422	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *3	
QnA series link	Q2A, Q3A, Q4A	AJ71QC24 AJ71QC24N	RS-232C	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 2 - M4
		AJ71QC24-R4(CH1)	RS-422	×	Wiring diagram 3 - M4
		AJ71QC24-R4(CH2)	RS-422	×	Wiring diagram 2 - M4
	Q2ASx	A1SJ71QC24 A1SJ71QC24N A1SJ71QC24-R2	RS-232C	Wiring diagram 1 - M2	×
RS-422			×	Wiring diagram 2 - M4	
QnH (Q) series link	Q00, Q01, Q00J Q02, Q02H Q06H, Q12H Q25H	QJ71C24 QJ71C24N QJ71C24-R2 QJ71C24N-R2 QJ71C24N-R4	RS-232C	Wiring diagram 1 - M2	×
	Q00UJ, Q00U Q01U, Q02U Q03UD(E), Q04UD(E)H Q06UD(E)H, Q10UD(E)H Q13UD(E)H, Q20UD(E)H Q26UD(E)H, Q50UDEH Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71C24N QJ71C24N-R2 QJ71C24N-R4	RS-422	×	Wiring diagram 2 - M4
QnH (Q) series link (Multi CPU)	Q02, Q02H Q06H Q12H Q25H	QJ71C24 QJ71C24N QJ71C24-R2 QJ71C24N-R2 QJ71C24N-R4	RS-232C	Wiring diagram 1 - M2	×
	Q00UJ, Q00U Q01U, Q02U Q03UD(E), Q04UD(E)H Q06UD(E)H, Q10UD(E)H Q13UD(E)H, Q20UD(E)H Q26UD(E)H, Q50UDEH Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71C24N QJ71C24N-R2 QJ71C24N-R4	RS-422	×	Wiring diagram 2 - M4
L series link	L02CPU L26CPU-BT	LJ71C24 LJ71C24-R2	RS-232C RS-422	Wiring diagram 1 - M2 ×	×

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

QnH/QnU/Q170M/L Series CPU

PLC Selection on the Editor	CPU	Port	Signal Level	Connection	
				RS-232C* ¹ / RS-485 (2-wire)	RS-422 (4-wire)
QnH (Q) series CPU	Q02, Q02H Q06H Q12H Q25H	Tool port	RS-232C	Wiring diagram 5 - M2	×
QnH (Q) series CPU (Multi CPU)		Tool port * ²			
Q00J/00/01 CPU		Tool port			
QnU series CPU	Tool port				
Q170MCP (Multi CPU)	Q170M Q170MSCPU-S1	Tool port			
L series CPU	L02SCPU L02SCPU-P	Tool port			

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Available for the CPU function version B or later.

FX Series

PLC Selection on the Editor	CPU	Port	Signal Level	Connection	
				RS-232C* ¹ / RS-485 (2-wire)* ²	RS-422 (4-wire)* ²
FX series CPU	FX0N	Tool port	RS-422	×	Wiring diagram 4 - M4
FX2N/1N series CPU	FX2N FX1N FX2NC FX1NC	Tool port	RS-422	×	Wiring diagram 4 - M4
FX1S series CPU	FX1S	Tool port	RS-422	×	Wiring diagram 4 - M4
FX series link (A protocol)	FX2N	FX2N-232-BD	RS-232C	Wiring diagram 3 - M2	×
		FX2N-485-BD	RS-485	Wiring diagram 1 - M4	Wiring diagram 2 - M4 * ³
		FX2N-422-BD	RS-422	×	Wiring diagram 4 - M4
	FX1N FX1S	FX1N-232-BD	RS-232C	Wiring diagram 3 - M2	×
		FX1N-485-BD	RS-485	Wiring diagram 1 - M4	Wiring diagram 2 - M4 * ³
		FX1N-422-BD	RS-422	×	Wiring diagram 4 - M4
	FX0N FX1NC FX2NC	FX0N-232ADP FX2NC-232ADP	RS-232C	Wiring diagram 4 - M2	×
				Wiring diagram 3 - M2	
FX0N-485ADP FX2NC-485ADP		RS-485	Wiring diagram 1 - M4	Wiring diagram 2 - M4 * ³	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

iQ-R / iQ-F Series

PLC Selection on the Editor	CPU	Port	Signal Level	Connection	
				RS-232C* ¹ / RS-485 (2-wire)	RS-422 (4-wire)* ²
iQ-R series link	R04 R08 R16 R32 R120	RJ71C24	RS-232C	Wiring diagram 1 - M2	×
		RJ71C24-R2	RS-422	×	Wiring diagram 2 - M4
		RJ71C24-R4	RS-422	×	Wiring diagram 2 - M4
FX5U/5UC series	FX5U FX5UJ	Built-in RS-485 terminal block	RS-422	×	Wiring diagram 2 - M4
		FX5-485-BD			
		FX5-485ADP			
	FX5UC	Built-in RS-485 terminal block	RS-232C	Wiring diagram 3 - M2	×
		FX5-232-BD			
		FX5-232ADP			
FX5UC	Built-in RS-485 terminal block	RS-422	×	Wiring diagram 2 - M4	
	FX5-485ADP				
	FX5-232ADP				

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

QnA/QnH/Q170/L Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive* ¹
QnA series (Ethernet)	Q2A, Q3A, Q4A	AJ71QE71 AJ71QE71-B5	×	○	Auto-open 5000	○
	Q2ASx	A1SJ71QE71-B2 A1SJ71QE71-B5			Open setting: As desired (max. 16 units)	
QnH (Q) series (Ethernet)	Q02, Q02H Q06H, Q12H, Q25H Q00J, Q00, Q01	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Auto-open 5000	○
	Q02U, Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	CPU with built-in Ethernet	×	○	Open setting: As desired (max. 16 units)	
QnH (Q) series (Ethernet ASCII)	Q02, Q02H Q06H, Q12H, Q25H Q00J, Q00, Q01	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	○
	Q02U, Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71E71-B2 QJ71E71-100	×	○		
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	CPU with built-in Ethernet	×	○		

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*1}
QnH (Q) series (Multi CPU) (Ethernet)	Q02, Q02H Q06H, Q12H, Q25H	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Auto-open 5000	○
	Q02U, Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV		×	○	Open setting: As desired (max. 16 units)	
QnH (Q) series (Multi CPU) (Ethernet ASCII)	Q02, Q02H Q06H, Q12H, Q25H	QJ71E71 QJ71E71-B2 QJ71E71-100	×	○	Open setting: As desired (max. 16 units)	○
	Q02U, Q03UD Q04UDH, Q06UDH Q10UDH, Q13UDH Q20UDH, Q26UDH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	QJ71E71-B2 QJ71E71-100	×	○		
	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV		×	○		
QnU series (Built-in Ethernet)	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
QnU series (Multi CPU) (Built-in Ethernet)	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
QnU series (Built-in Ethernet ASCII)	Q03UDE Q04UDEH, Q06UDEH Q10UDEH, Q13UDEH Q20UDEH, Q26UDEH Q50UDEH, Q100UDEH Q03UDV, Q04UDV Q06UDV, Q13UDV Q26UDV	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
L series (Built-in Ethernet)	L02CPU L26CPU-BT	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
Q170 series (Multi CPU) (Built-in Ethernet)	Q170M Q170MSCPU-S1 Q172DCPU-S1 Q173DCPU-S1	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
Q170 series (Multi CPU) (Ethernet)	Q172CPUN ^{*2} Q173CPUN ^{*2}	QJ71E71 ^{*3} QJ71E71-B2 ^{*3} QJ71E71-B5 ^{*3} QJ71E71-100 ^{*3}	×	○	Auto-open: 5000 Open setting: As desired (max. 16 units)	○

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

*2 It is configurable with the motion CPU to be used, and is used in conjunction with the sequencer CPU that supports multi CPU.

*3 Ethernet unit function version D or later

FX Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*5}
FX3U/3GE series (Ethernet)	FX3U (Version 2.21 and later)	FX3U-ENET-L	×	○	Open setting: As desired (max. 2 units)	○
		FX3U-ENET			Open setting: As desired (max. 4 units)	
	FX3UC ^{*1} (Version 2.21 and later)	FX3U-ENET-L	×	○	Open setting: As desired (max. 2 units)	
	FX3GE	CPU with built-in Ethernet	×	○	Open setting: As desired (max. 4 units)	
	FX3S ^{*2} (Version V1.00 or greater) FX3G ^{*3} , FX3GC (Version V2.00 or greater) FX3U ^{*4} , FX3UC ^{*4} (Version V3.10 or greater)	FX3U-ENET-ADP	×	○	Open setting: As desired (max. 4 units)	

*1 FX2NC-CNV-IF or FX3UC-1PS-5V (Mitsubishi Electric) is required.

*2 Mitsubishi's adapter "FX3S-CNV-ADP" is required. Supported by FX3U-ENET-ADP Version 1.20 or greater.

*3 Mitsubishi's adapter "FX3G-CNV-ADP" is required.

*4 For FX3U / FX3UC-32MT-LT(-2), Mitsubishi's "FX3U-CNV-BD" is required when the communication function expansion board or adapter is not used.

*5 For KeepAlive functions, see "1.3.2 Ethernet Communication".

iQ-R / iQ-F Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*1}
iQ-R series (Built-in Ethernet)	R04 R08 R16 R32 R120	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 16 units)	○
iQ-R series (Ethernet)	R04 R08 R16 R32 R120	RJ71E71	○	○	Open setting: As desired (max. 16 units)	○
FX-5U/5UC series (Ethernet)	FX5U FX5UC FX5UJ	CPU with built-in Ethernet	○	○	Open setting: As desired (max. 8 units)	○

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

11.1.1 A Series Link

Communication Setting

Editor

Communication setting


(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> bps	
Transmission Mode	<u>Transmission Mode 1</u> / Transmission Mode 4	Transmission Mode 1: Without CR/LF Transmission Mode 4: With CR/LF
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	

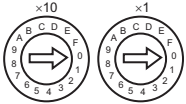
PLC

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

Mode setting

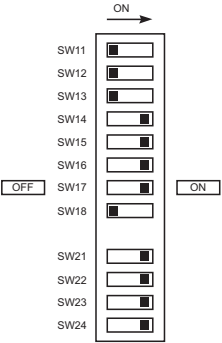
Mode	Setting	Contents	
	1	RS-232C	Dedicated protocol MODE 1
	4		Dedicated protocol MODE 4
	5	RS-422	Dedicated protocol MODE 1
	8		Dedicated protocol MODE 4

Station number setting

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

Transmission setting

AJ71UC24

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

A1SJ71C24-R2, A1SJ71UC24-R2

Switch	Contents	ON	OFF	Example: RS-232C, 19200 bps
SW03	Not used	-	-	
SW04	Write while running	Enabled	Disabled	
		9600	19200	
SW05	Baud rate	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	
		9600	19200	
SW05	Baud rate	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	

11.1.2 QnA Series Link

Communication Setting

Editor

Communication setting


(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
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	

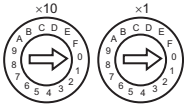
PLC

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

Mode setting

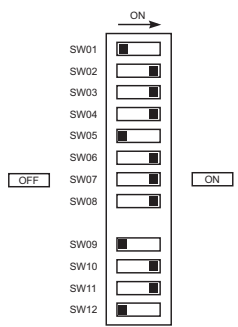
Mode	Setting	Contents
	5	Dedicated protocol binary mode Mode 5

Station number setting

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

Transmission setting

AJ71QC24, AJ71QC24N, A1SJ71QC24

Switch	Contents	OFF	ON	Example: 19200 bps			
SW01	Operation	Independent	Link				
SW02	Data bit	7	8				
SW03	Parity bit	Not provided	Provided				
SW04	Parity	Odd	Even				
SW05	Stop bit	1	2				
SW06	Sum check	Not provided	Provided				
SW07	Write while running	Disabled	Enabled				
SW08	Setting change	Disabled	Enabled				
SW09	Baud rate *1	9600	19200	38400		57600	115200
SW10		ON	OFF	ON		OFF	ON
SW11		OFF	ON	ON		ON	ON
SW12		ON	ON	ON		OFF	OFF
		OFF	OFF	OFF	ON	ON	

*1 AJ71C24 (-R2/-R4): Max. 19200 bps

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

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

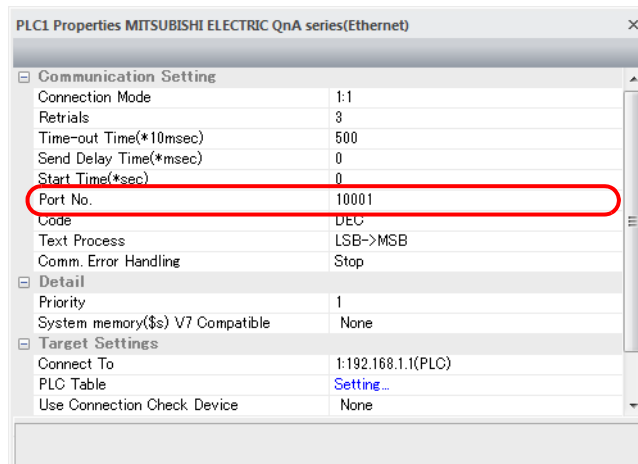
11.1.3 QnA Series (Ethernet)

Communication Setting

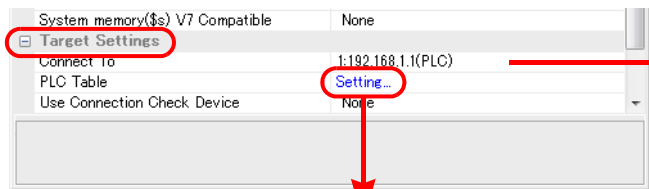
Editor

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

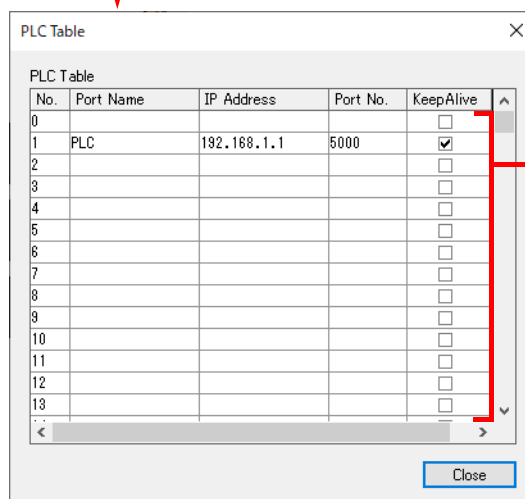
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



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



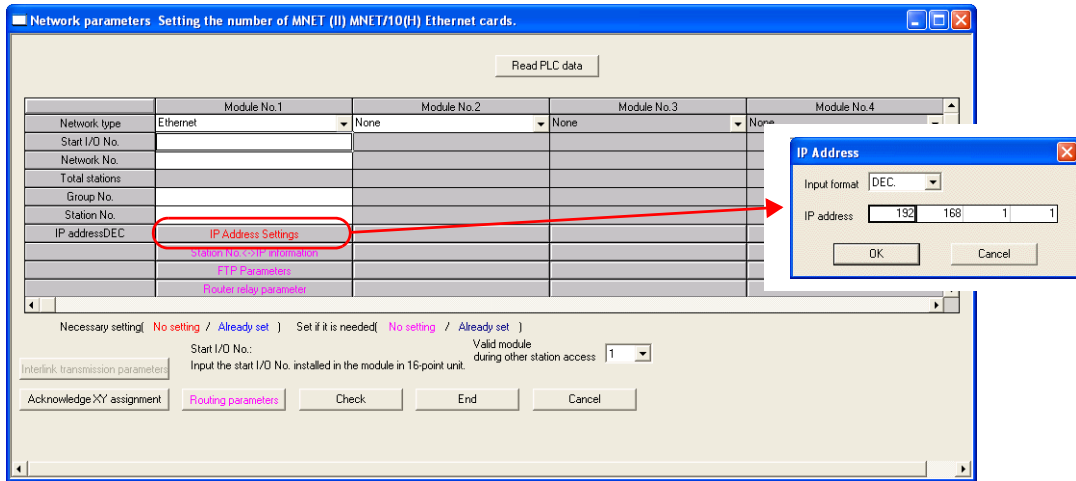
Set the IP address, port number and whether or not to use the KeepAlive function of the PLC.

PLC

PC parameter

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

Network parameter (Ethernet)



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

Port No.

There are two types of ports: one is opened automatically by "auto-open UDP port" (default: 5000 DEC), and the other is opened by open processing.

For more information, refer to the corresponding PLC manual.

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

11.1.4 QnH (Q) Series Link

Communication Setting

Editor

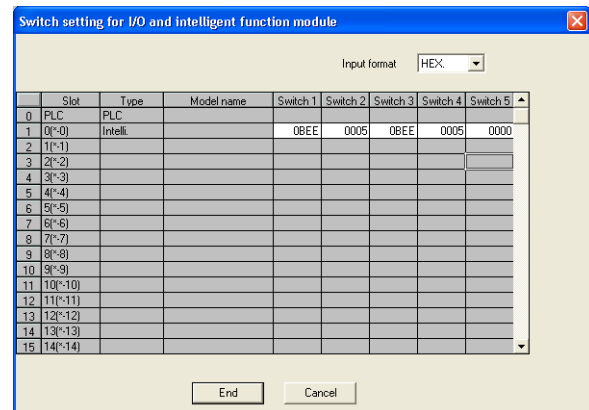
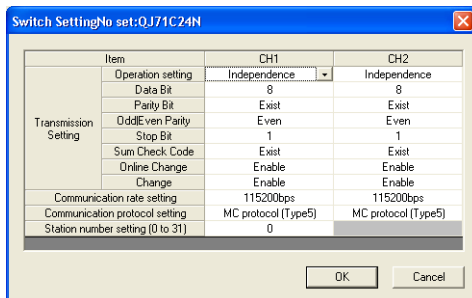
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : <u>1</u> / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	<u>8 bits</u>	
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



Switch	Contents	Example																																																		
Switch 1	<p>CH1: baud rate, transmission setting</p> <p>Bit 15 - 8 7 - 0</p> <p style="text-align: center;">Baud rate Transmission setting</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>bps</th> <th>Setting</th> </tr> </thead> <tbody> <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> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Bit</th> <th>Contents</th> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <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> </tbody> </table>	bps	Setting	4800	04H	9600	05H	19200	07H	38400	09H	57600	0AH	115200	0BH	Bit	Contents	OFF	ON	0	Operation	Independent	Link	1	Data bit	7	8	2	Parity bit	Not provided	Provided	3	Parity	Odd	Even	4	Stop bit	1	2	5	Sum check	Not provided	Provided	6	Write while running	Prohibited	Allowed	7	Setting change	Prohibited	Allowed	<p>0BEEH</p> <p>115 kbps 8 bits 1 bit Even</p>
bps	Setting																																																			
4800	04H																																																			
9600	05H																																																			
19200	07H																																																			
38400	09H																																																			
57600	0AH																																																			
115200	0BH																																																			
Bit	Contents	OFF	ON																																																	
0	Operation	Independent	Link																																																	
1	Data bit	7	8																																																	
2	Parity bit	Not provided	Provided																																																	
3	Parity	Odd	Even																																																	
4	Stop bit	1	2																																																	
5	Sum check	Not provided	Provided																																																	
6	Write while running	Prohibited	Allowed																																																	
7	Setting change	Prohibited	Allowed																																																	
Switch 2	CH1: communication protocol	MC protocol mode 5 binary code																																																		
Switch 3	CH2: baud rate, transmission setting (the same as those for switch 1)	0BEEH																																																		
Switch 4	CH2: communication protocol	MC protocol mode 5 binary code																																																		
Switch 5	Station number setting	0 to 31																																																		

Available Device Memory

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

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

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

Example:

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

The screenshot shows two overlapping windows from the 'Q parameter setting' software. The background window is 'I/O Assignment' and the foreground window is 'Acknowledge XY Assignment'.

I/O Assignment Window:

Slot	PLC	Type	Model name	Points	StartXY
0	0(-0)	Intelli.	QJ71C24N	32points	0080
2	1(-1)	Input	Q64AD	16points	00A0
3	2(-2)	Output	Q64DAN	16points	00B0
4	3(-3)				
5	4(-4)				
6	5(-5)				
7	6(-6)				

Acknowledge XY Assignment Window:

XY No.	Type	Slot	Module type	Points	Model name	Duplication
0060	Network					
0070	I/O Assign					
0080	I/O assignment	0(-0)	Intelli.	32	QJ71C24N	
0090	I/O assignment	0(-0)	Intelli.	32	QJ71C24N	
00A0	I/O assignment	1(-1)	Input	16	Q64AD	
00B0	I/O assignment	2(-2)	Output	16	Q64DAN	
00C0						
00D0						
00E0						
00F0						
0100						
0110						
0120						
0130						

A red box highlights the 'XY No.' column in the 'Acknowledge XY Assignment' window, with a red arrow pointing to the '0080' value. A text box next to it says: "Decimal number of 'XXX' of the station I/O No. of 'xxx0 H' = Unit No.".

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

With the use of buffer memory of the input unit: Unit No. = "10" (DEC)

With the use of buffer memory of the output unit: Unit No. = "11" (DEC)

11.1.5 QnH (Q) Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection mode	1 : 1	
Signal level	RS-232C	
Baud rate	9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data length	8 bits	
Stop bit	1 bit	
Parity	Odd	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

11.1.6 QnH (Q) Series (Ethernet)

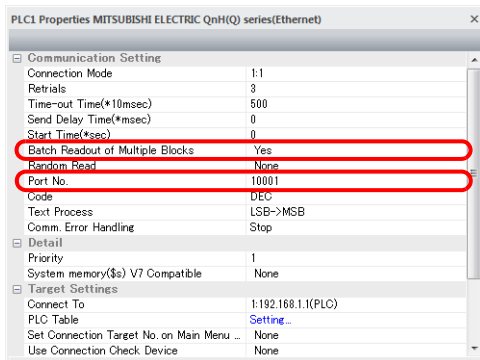
Communication Setting

Editor

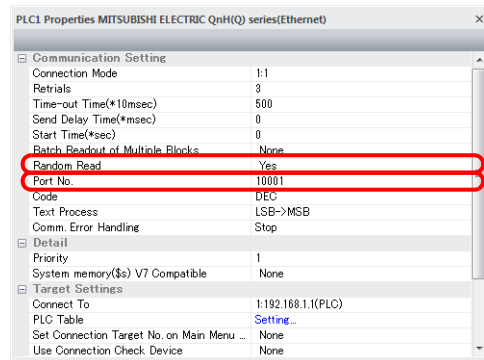
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
 - When connecting to the Ethernet unit, select [Yes] for the [Batch Readout of Multiple Blocks] setting.
 - When connecting to the built-in Ethernet port on the QnU series, select [Yes] for the [Random Read] setting.

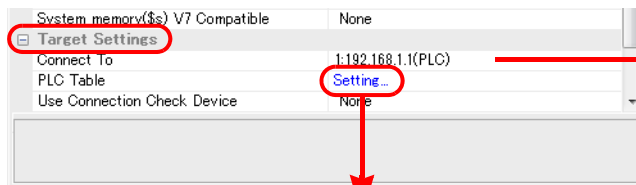
When connecting to the Ethernet unit



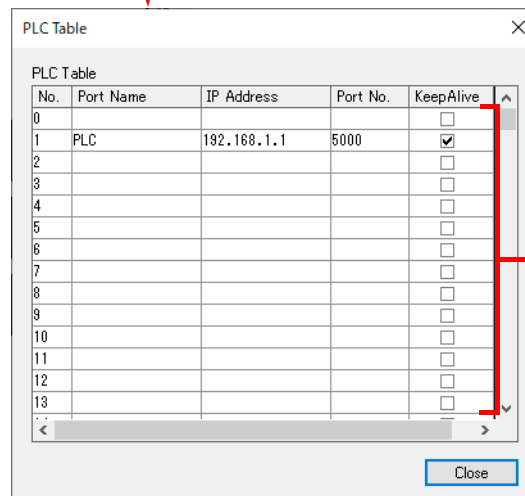
When connecting to the built-in Ethernet port on the QnU series



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



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



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

PLC

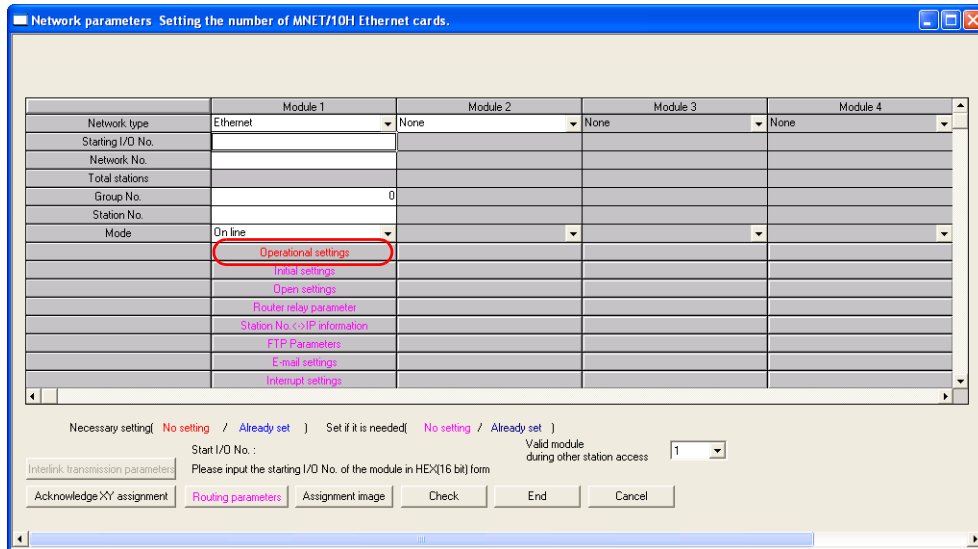
Make the PLC setting using the programming tool "GX-Developer". For more information, refer to the PLC manual issued by the manufacturer.

Ethernet unit

PC parameter

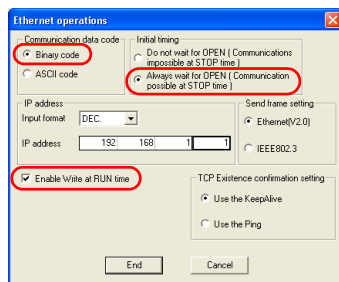
Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



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

Ethernet operations

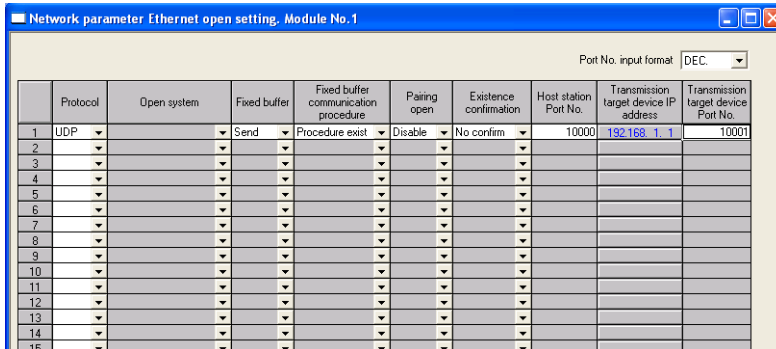


Item	Setting	Remarks
Communication data code	Binary code	
Initial timing	Always wait for OPEN (Communication possible at STOP time)	
IP address (DEC)	Make settings in accordance with the network environment.	
Enable Write at RUN time	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.

Port No.

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

- Open setting

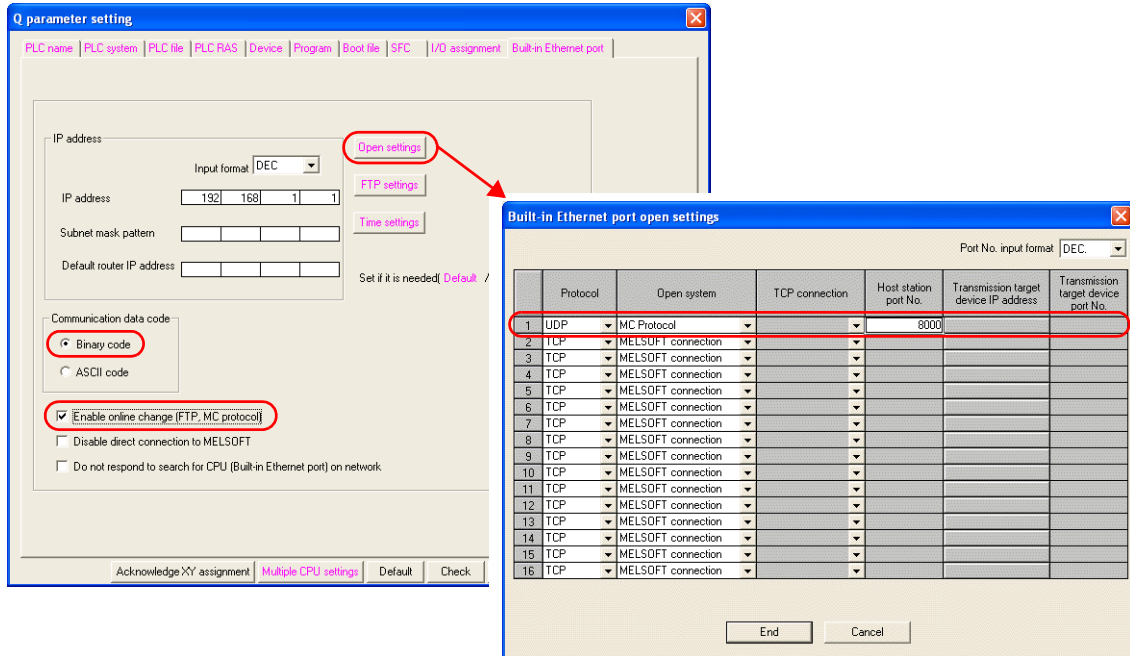


Item	Setting	Remarks
Protocol	UDP	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5002.
Transmission target device IP address (DEC)	IP address of X1	
Transmission target device Port No. (DEC)	Port No. of X1	

Built-in Ethernet port

PC parameter

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



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	Binary code	
Enable online change (FTP, MC protocol)	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	UDP	
Open system	MC Protocol	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

11.1.7 QnU Series CPU

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

11.1.8 Q00J/00/01 CPU

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

11.1.9 QnH (Q) Series Link (Multi CPU)

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

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

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

11.1.11 QnH (Q) Series CPU (Multi CPU)

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

11.1.12 QnH (Q) Series (Ethernet ASCII)

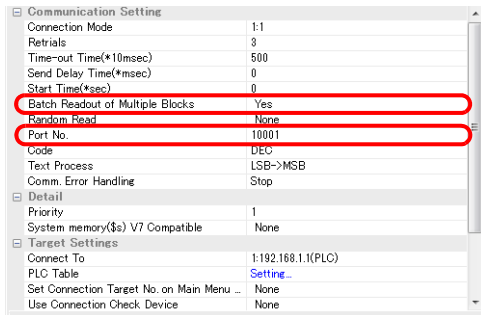
Communication Setting

Editor

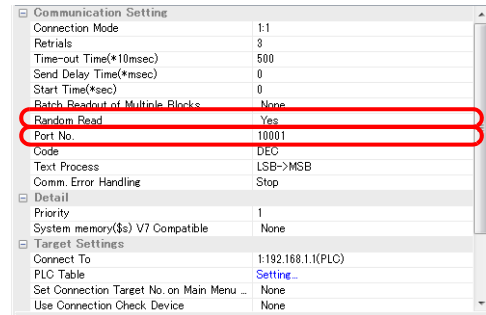
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
 - When connecting to the Ethernet unit, select [Yes] for the [Batch Readout of Multiple Blocks] setting.
 - When connecting to the built-in Ethernet port on the QnU series, select [Yes] for the [Random Read] setting.

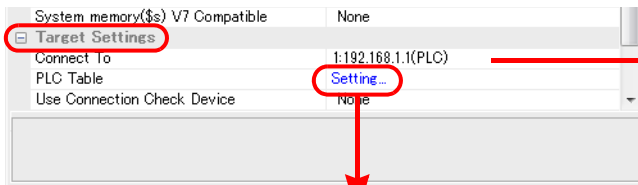
When connecting to the Ethernet unit



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



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



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

No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	5000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>

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

PLC

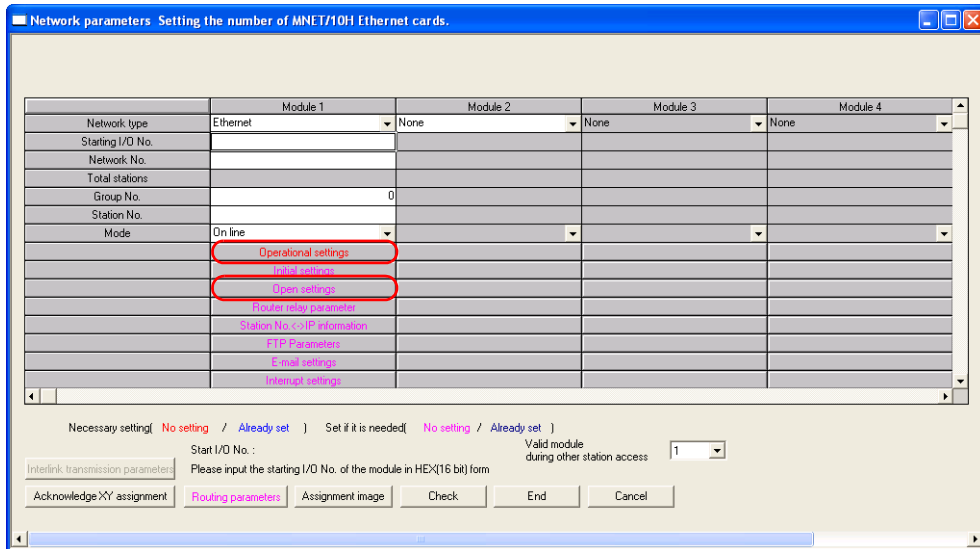
Make the PLC setting using the programming tool "GX-Developer". For more information, refer to the PLC manual issued by the manufacturer.

Ethernet unit

PC parameter

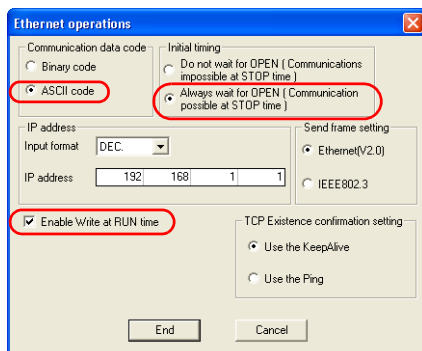
Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



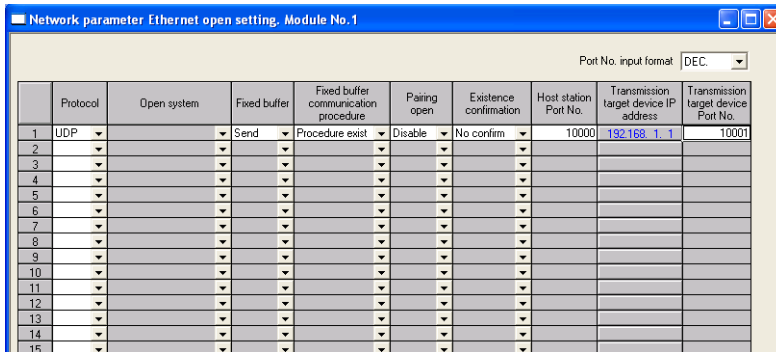
Item	Setting	Remarks
Network type	Ethernet	For more information, refer to the manual of the PLC.
Station I/O No.		
Network No.	Make settings in accordance with the network environment.	
Group No.		
Station No.		

Ethernet operations



Item	Setting	Remarks
Communication data code	ASCII code	
Initial timing	Always wait for OPEN (Communication possible at STOP time)	
IP address (DEC)	Make settings in accordance with the network environment.	
Enable Write at RUN time	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.

Open setting

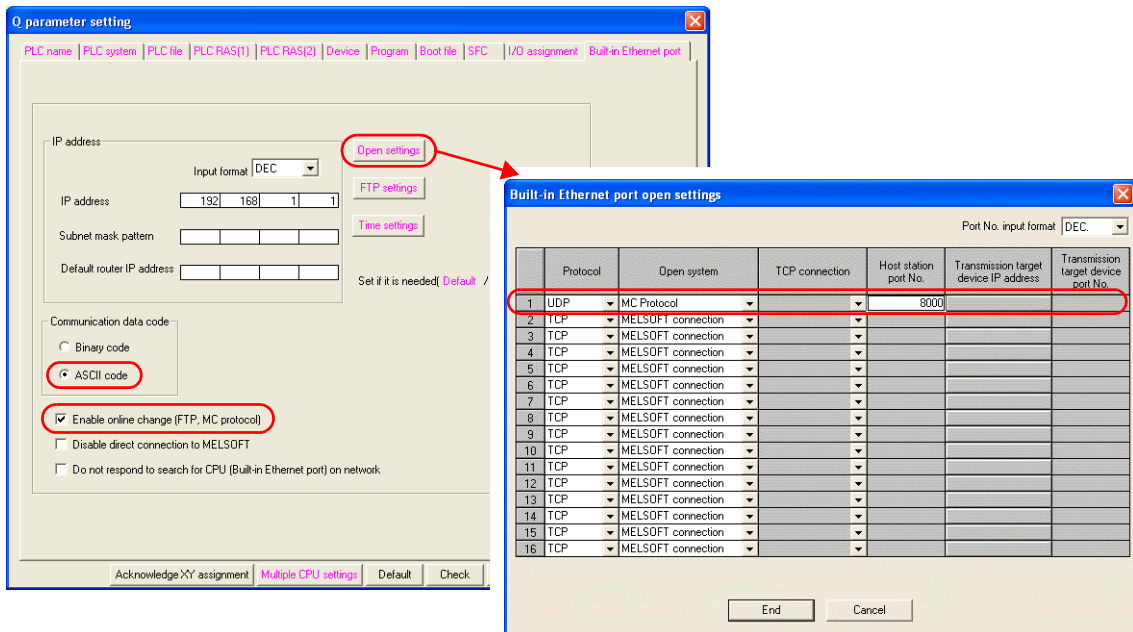


Item	Setting	Remarks
Protocol	UDP	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5002.
Transmission target device IP address (DEC)	IP address of X1	
Transmission target device Port No. (DEC)	Port No. of X1	

Built-in Ethernet port

PC parameter

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



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	ASCII code	
Enable online change (FTP, MC protocol)	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	UDP	
Open system	MC Protocol	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. Convert byte address into word address when entering the data on the editor if the memory device of the link unit is byte address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

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

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

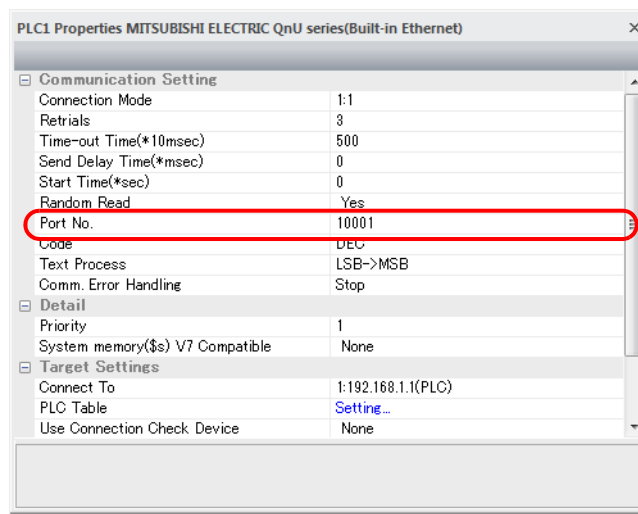
11.1.14 QnU Series (Built-in Ethernet)

Communication Setting

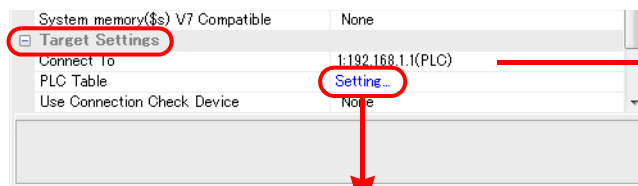
Editor

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

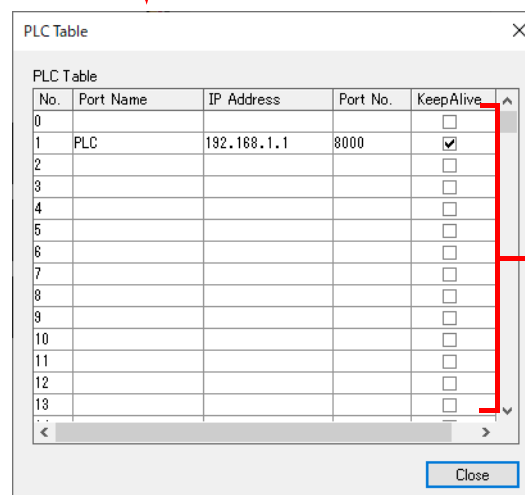
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Random Read
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting] → [Random Read]
 - When reading out at random, select [Yes]. (default)
 - When not reading out at random, select [No].
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



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



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

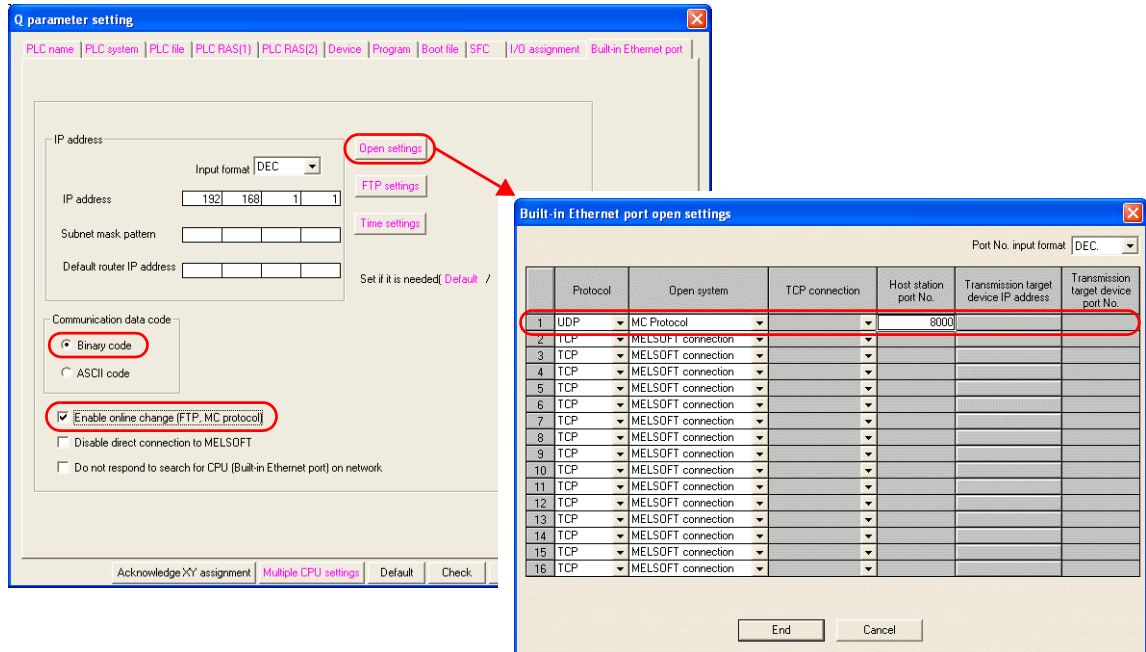
PLC

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

QnU Series Built-in Ethernet

PC parameter

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



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	Binary code	
Enable online change (FTP, MC protocol)	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	MC Protocol	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

Available Device Memory

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

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

11.1.15 QnU Series (Multi-CPU) (Built-in Ethernet)

The communication setting and available device memory are the same as those described in "11.1.14 QnU Series (Built-in Ethernet)".

11.1.16 QnU Series (Built-in Ethernet ASCII)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Random Read
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting] → [Random Read]
 - When reading out at random, select [Yes]. (default)
 - When not reading out at random, select [No].
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

Communication Setting	
Connection Mode	1:1
Retrials	3
Time-out Time(*10msec)	500
Send Delay Time(*msec)	0
Start Time(*sec)	0
Random Read	Yes
Port No.	10001
Code	DEC
Text Process	LSB→MSB
Comm. Error Handling	Stop
Detail	
Priority	1
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

System memory(\$s) V7 Compatible	
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	8000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>
...				<input type="checkbox"/>

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

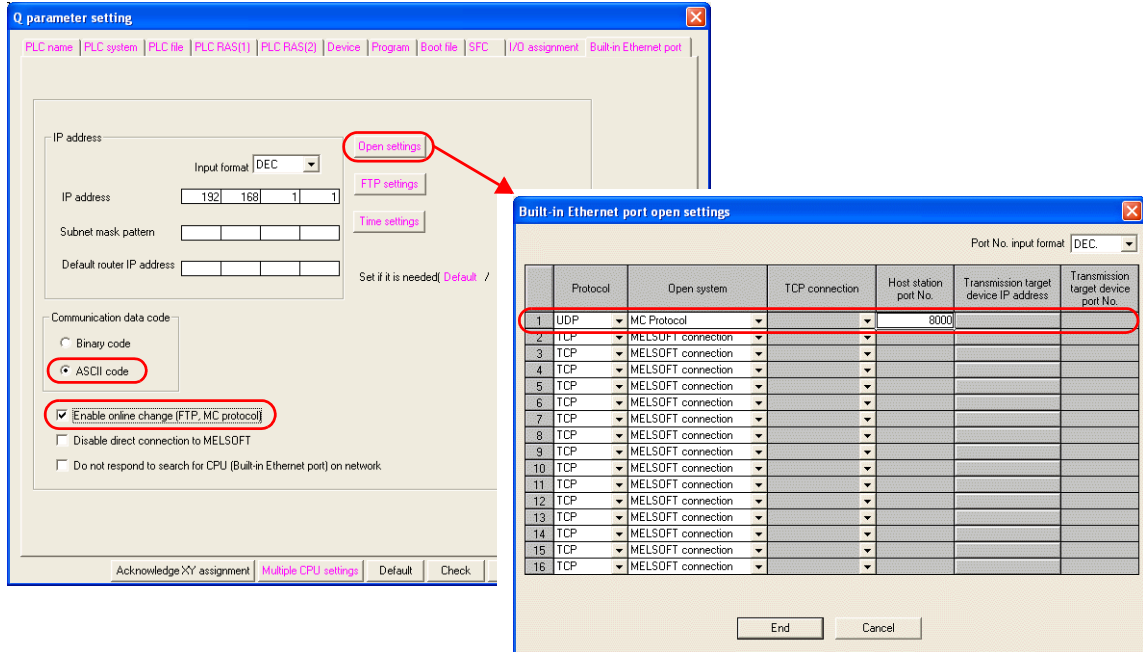
PLC

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

QnU Series Built-in Ethernet

PC parameter

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



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	ASCII code	
Enable online change (FTP, MC protocol)	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	MC Protocol	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5009.

Available Device Memory

Settings are the same as those described in "11.1.14 QnU Series (Built-in Ethernet)".

11.1.17L Series Link

Communication Setting

Editor

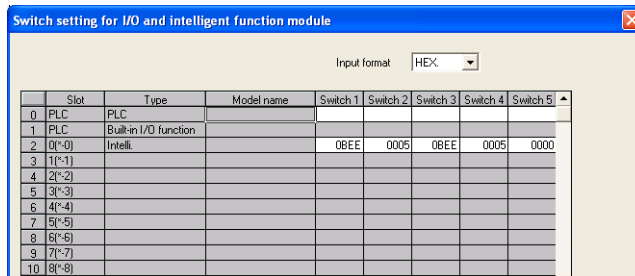
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	<u>8 bits</u>	
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



Switch	Contents	Example																																																		
Switch 1	<p>CH1: baud rate, transmission setting</p> <p>Bit 15 - 8 7 - 0</p> <p style="text-align: center;">Baud rate Transmission setting</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>bps</th> <th>Setting</th> </tr> </thead> <tbody> <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> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Bit</th> <th>Contents</th> <th>OFF</th> <th>ON</th> </tr> </thead> <tbody> <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> </tbody> </table>	bps	Setting	4800	04H	9600	05H	19200	07H	38400	09H	57600	0AH	115200	0BH	Bit	Contents	OFF	ON	0	Operation	Independent	Link	1	Data bit	7	8	2	Parity bit	Not provided	Provided	3	Parity	Odd	Even	4	Stop bit	1	2	5	Sum check	Not provided	Provided	6	Write while running	Prohibited	Allowed	7	Setting change	Prohibited	Allowed	<p>OBEEH</p> <p>115 kbps 8 bits 1 bit Even</p>
bps	Setting																																																			
4800	04H																																																			
9600	05H																																																			
19200	07H																																																			
38400	09H																																																			
57600	0AH																																																			
115200	0BH																																																			
Bit	Contents	OFF	ON																																																	
0	Operation	Independent	Link																																																	
1	Data bit	7	8																																																	
2	Parity bit	Not provided	Provided																																																	
3	Parity	Odd	Even																																																	
4	Stop bit	1	2																																																	
5	Sum check	Not provided	Provided																																																	
6	Write while running	Prohibited	Allowed																																																	
7	Setting change	Prohibited	Allowed																																																	
Switch 2	CH1: communication protocol	MC protocol mode 5 binary code																																																		
Switch 3	CH2: baud rate, transmission setting (the same as those for switch 1)	OBEEH																																																		
Switch 4	CH2: communication protocol	MC protocol mode 5 binary code																																																		
Switch 5	Station number setting	0 to 31																																																		

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-14.

11.1.18L Series (Built-in Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port numbers 1024 to 65000 for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

Communication Setting

Connection Mode	1:1
Retrials	3
Time-out Time(*10msec)	500
Send Delay Time(*msec)	0
Start Time(*sec)	0
Random Read	Yes
Port No.	10001
Code	DEC
Text Process	LSB->MSB
Comm. Error Handling	Stop

Detail

Priority	1
System memory(\$s) V7 Compatible	None

Target Settings

Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

Setting range: 1024 to 65000
In addition to the specified port number, the port number of "the specified port number +20" is secured by the system.
Example: When specifying port number 10001, the port number 10021 is also used.
Take care not to use the same port numbers with other settings.

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

System memory(\$s) V7 Compatible: None

Target Settings

Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

PLC Table

No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	8000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>

Close

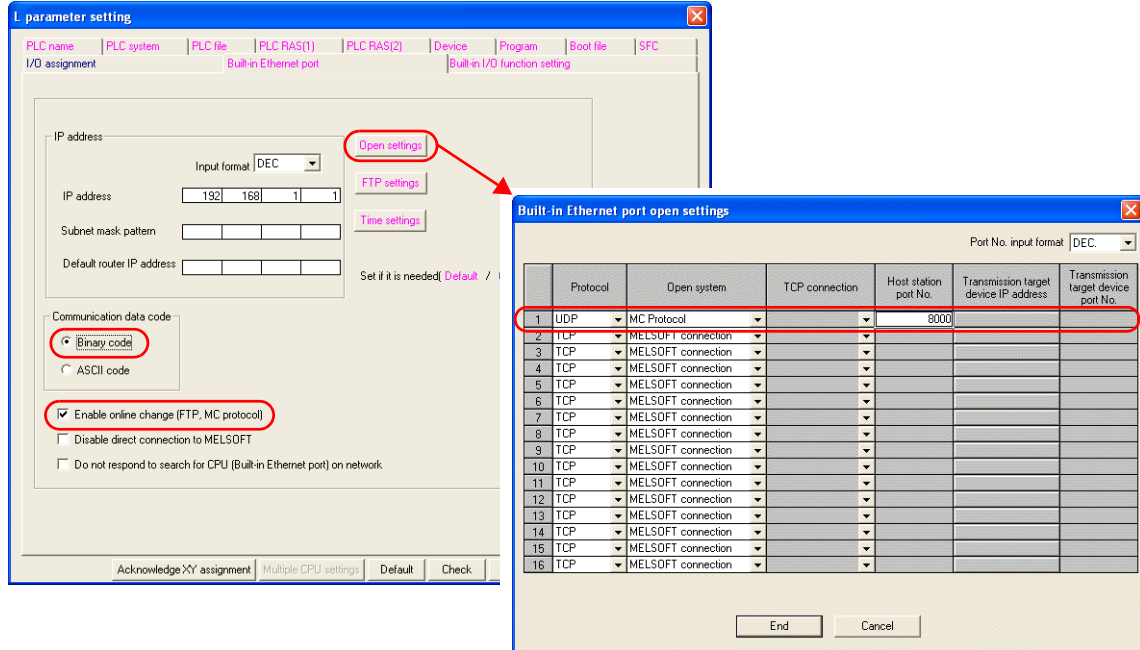
Set the IP address, port number and whether or not to use the KeepAlive function of the PLC.

PLC

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

L Series Built-in Ethernet

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



Item	Setting	Remarks
IP address (DEC)	Make settings in accordance with the network environment.	For more information, refer to the manual of the PLC.
Communication data code	Binary code	
Enable online change (FTP, MC protocol)	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open system	MC Protocol	
Host station port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No.5000 to 5009.

Available Device Memory

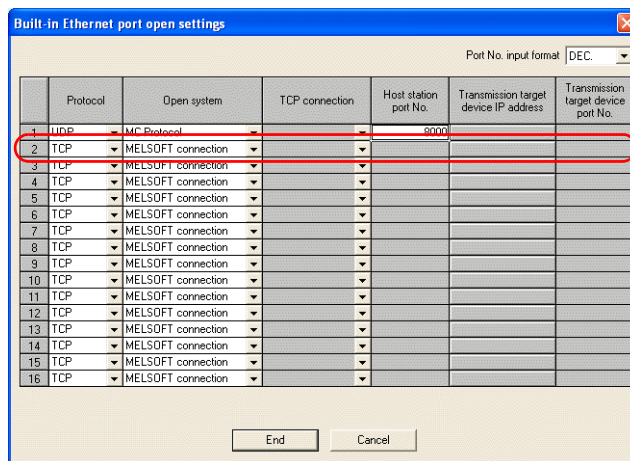
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-14.

Accessing the SPU device memory from the X1 series

Add [Open system: MELSOFT connection] on the [Built-in Ethernet port open settings] dialog. Add one port per one X1 series unit. (maximum 8 ports can be registered)



Item	Setting	Remarks
Protocol	TCP	
Open system	MELSOFT connection	

11.1.19 L Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.
For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, refer to page 11-14.

11.1.20 FX Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	D0 to 999, D8000 or later (special register)
TN (timer/current value)	01H	
CN (counter/current value)	02H	
32CN (32-bit counter/current value)	03H	Double word ^{*1} FX0N : C235 to 254, read only
M (auxiliary relay)	04H	FX1 : M0 to 1023, M8000 or later (special relay) FX2 : M0 to 1535, M8000 or later (special relay)
S (state)	05H	
X (input relay)	06H	Read only
Y (output relay)	07H	
TS (timer/contact)	08H	
CS (counter/contact)	09H	
DX (file register)	0AH	Use DX for D1000 to 2999.

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

11.1.21 FX2N/1N Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

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

11.1.22 FX1S Series CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

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

11.1.23 FX Series Link (A Protocol)

Communication Setting

Editor

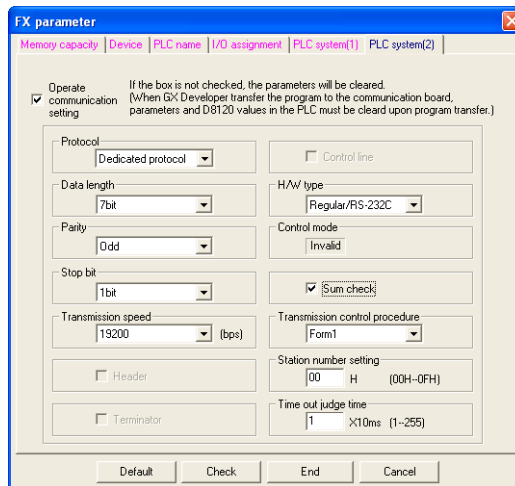
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> bps	
Transmission Mode	<u>Transmission Mode 1</u> / Transmission Mode 4	
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 (PC Parameter)

PLC system (2)



(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	D8000 and later: special register
TN (timer/current value)	01H	
CN (counter/current value)	02H	*1
32CN (32-bit counter/current value)	03H	*2
M (auxiliary relay)	04H	M8000 and later: special relay
S (state)	05H	
X (input relay)	06H	Read only
Y (output relay)	07H	
TS (timer/contact)	08H	
CS (counter/contact)	09H	

*1 CN200 to CN255 equals 32CN (32-bit counter).

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

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

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

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

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

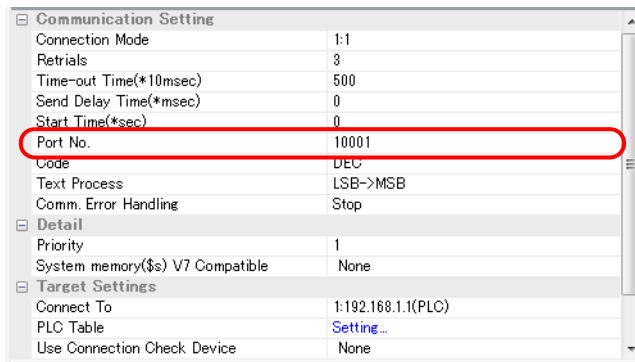
11.1.25 FX-3U/3GE Series (Ethernet)

Communication Setting

Editor

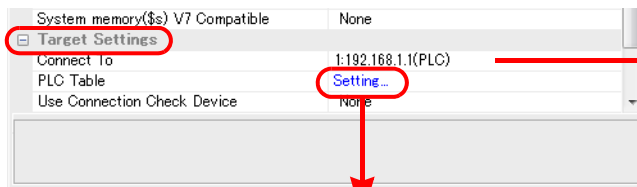
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



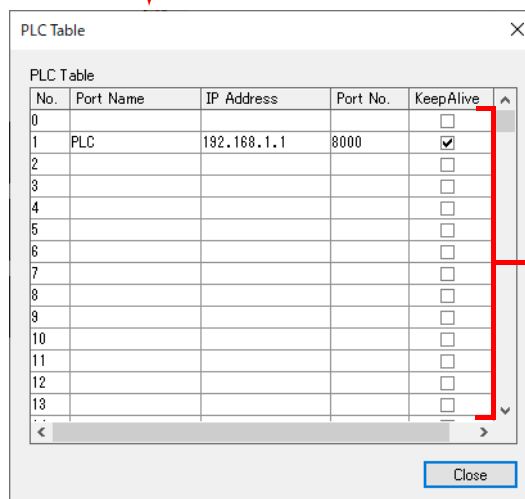
Communication Setting	
Connection Mode	1:1
Retrials	3
Time-out Time(*10msec)	500
Send Delay Time(*msec)	0
Start Time(*sec)	0
Port No.	10001
Code	DEC
Text Process	LSB->MSB
Comm. Error Handling	Stop
Detail	
Priority	1
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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



System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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



No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	8000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>

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

PLC

FX3U-ENET-L

Make PLC settings using the configuration tool "FX3U-ENET-L".

Ethernet operational settings

Item	Setting	Remarks
Communication data code	Binary code	
Initial timing	Always wait for OPEN (Communication possible at STOP time)	
IP address (DEC)	Specify according to the environment.	

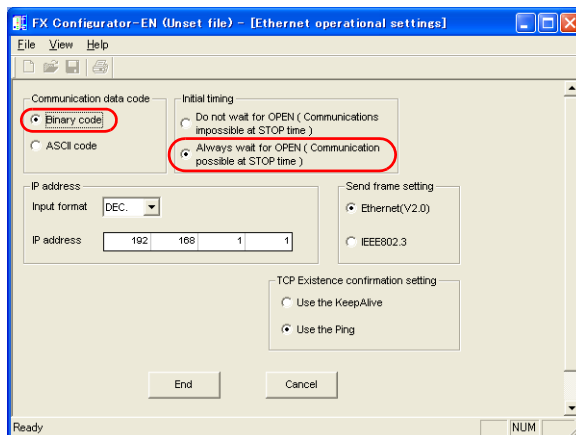
Ethernet open settings

Use row No. 3 or No. 4 for setting.

Item	Setting	Remarks
Protocol	UDP	
Open system	MC protocol	
Existence confirmation	No confirm	
Host station Port No. (DEC)	As desired	1025 to 5548, 5552 to 65534
Transmission target device IP address	IP address of the X1	
Transmission target device Port No. (DEC)	Port number of the X1	

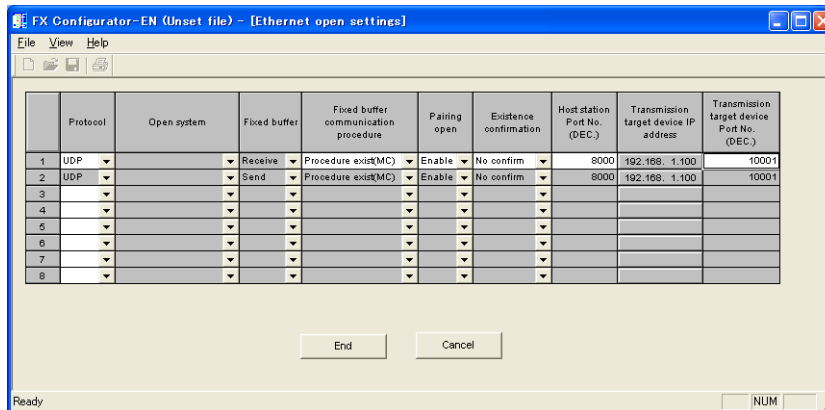
FX3U-ENET

Make the PLC setting using the programming tool "FX-Configurator-EN". For more information, refer to the PLC manual issued by the manufacturer.

Ethernet operational settings

Item	Setting	Remarks
Communication data code	Binary code	
Initial timing	Always wait for OPEN (Communication possible at STOP time)	
IP address (DEC)	Make settings in accordance with the network environment.	

Open setting



Item	Setting	Remarks
Protocol	UDP	
Fixed buffer	Receive, Send	
Fixed buffer communication procedure	Procedure exist (MC)	
Pairing open	Enable	
Existence confirmation	No confirm	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	1025 to 5548, 5552 to 65534
Transmission target device IP address (DEC)	IP address of X1	
Transmission target device Port No. (DEC)	Port No. of X1	

FX3GE Built-in Ethernet Port, FX3U-ENET-ADP

Make PLC settings using the programming tool "GX Works2".

PC parameter

Specify the IP address and open settings on the Ethernet port setting dialog.

Item	Setting	Remarks
Used CH	CH1 / CH2	When using FX3U-ENET-ADP, select the CH to which FX3U-ENET-ADP is connected.
IP address (DEC)	Specify according to the environment.	For more information, refer to the manual of the PLC.
Communication data code	Binary code	
Protocol	UDP	
Open system	MC Protocol	
Host station port No. (DEC)	Specify according to the environment.	When using FX3U-ENET-ADP, 5549 to 5559 cannot be used.
Transmission target device IP address (DEC)	Set the IP address of the V9 series unit.	
Transmission target device port No. (DEC)	Set the port number of the V9 series unit to be used for PLC communication.	

Available Device Memory

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

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

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

11.1.26 FX 3U/3UC/3G Series Link (A Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> bps	
Transmission Mode	<u>Transmission Mode 1</u> / Transmission Mode 4	
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 (PC Parameter)

PLC system (2)

(Underlined setting: default)

Item	Setting	Remarks
Operate communication setting	Checked	
Protocol	Dedicated protocol	<ul style="list-style-type: none"> RS-232C When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, sum check and form 1: D8120 (D8420) = 6896H RS-422 When you set Dedicated protocol, 7bits, Even, 1bit, 19200bps, smacked and form 1: D8120 (D8420) = 6096H
Data length	<u>7</u> bits / 8 bits	
Parity	None / <u>Odd</u> / Even	
Stop bit	<u>1</u> bit / 2 bits	
Transmission speed	4800 / <u>9600</u> / 19200 bps	
H/W type	<u>RS-232C</u> / RS-485	
Sum check	Checked	
Transmission control protocol	<u>Form 1</u> / Form 4	
Station number setting	<u>00</u> to 0FH	* CH1 : D8120, CH2 : D8420

Available Device Memory

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

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

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

11.1.27 FX5U/5UC series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

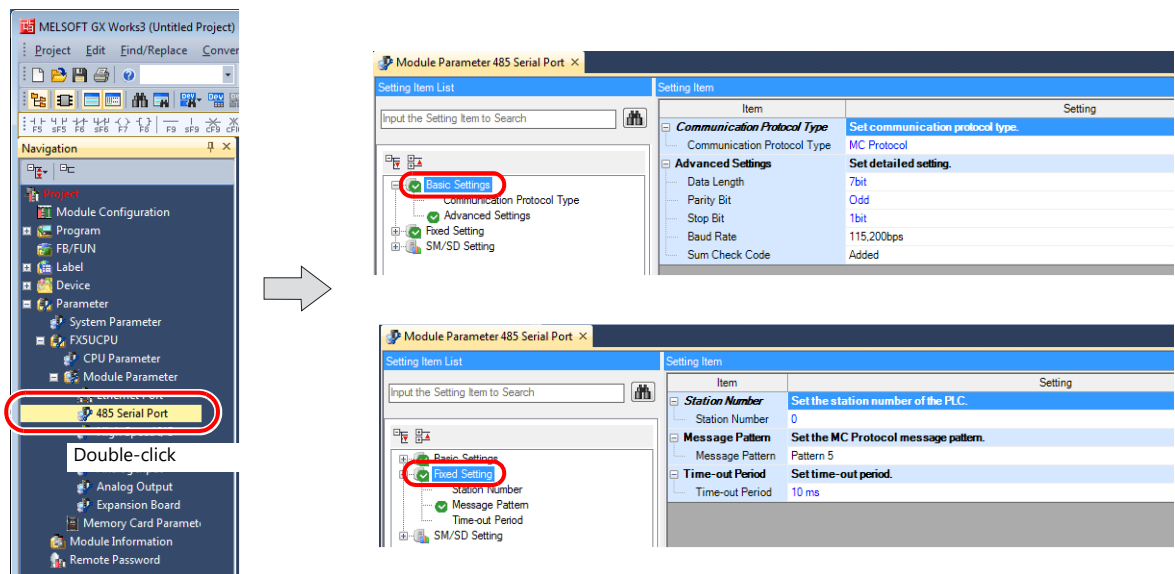
Item	Setting	Remarks
Connection Mode	1: <u>1</u> / 1 : n	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / <u>Odd</u> / Even	
Target Port No.	<u>0</u> to 31	

PLC

Make PLC settings using the programming tool "GX Works3".

Built-in RS-485 Port

[Module Parameter] → [485 Serial Port]

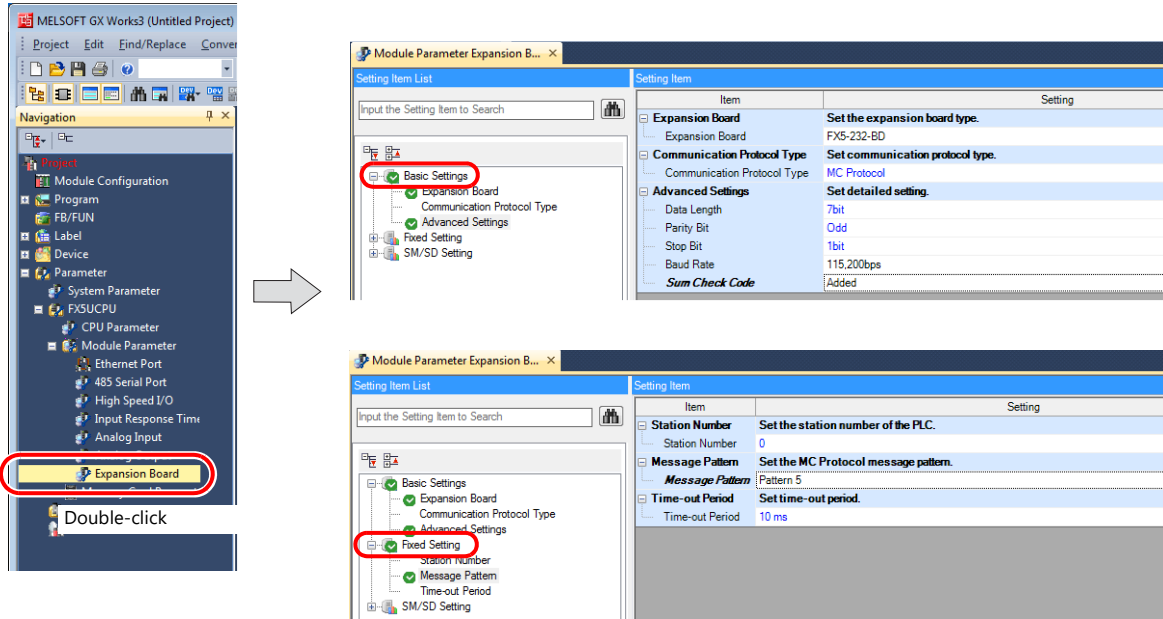


(Underlined setting: default)

	Item	Setting	Remarks
Basic Settings	Communication Protocol Type	MC Protocol	
	Data Length	8 bits	
	Parity Bit	None / <u>Odd</u> / Even	
	Stop bit	<u>1</u> bit / 2bit	
	Baud Rate	4,800 / <u>9,600</u> / 19,200 / 38,400 / 57,600/ 115,200 bps	
	Sum Check Code	Added	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	Pattern 5	

FX5-232-BD/FX5-485-BD

[Module Parameter] → [Expansion Board]

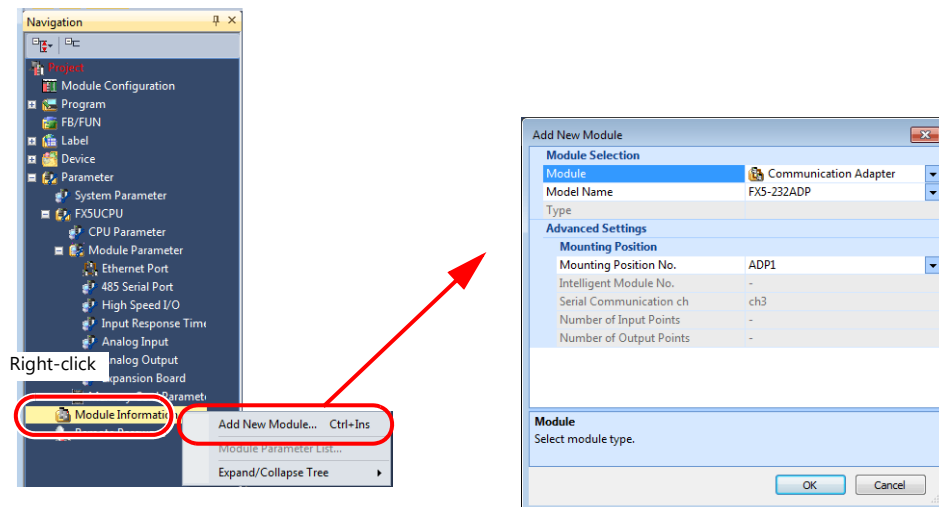


(Underlined setting: default)

	Item	Setting	Remarks
Basic Settings	Expansion Board	FX5-232-BD / FX5-485-BD	
	Communication Protocol Type	MC Protocol	
	Data Length	8 bits	
	Parity Bit	None / <u>Odd</u> / Even	
	Stop Bit	<u>1bit</u> / 2bit	
	Baud Rate	4,800 / <u>9,600</u> / 19,200 / 38,400 / 57,600 / 115,200 bps	
	Sum Check Code	Added	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	Pattern 5	

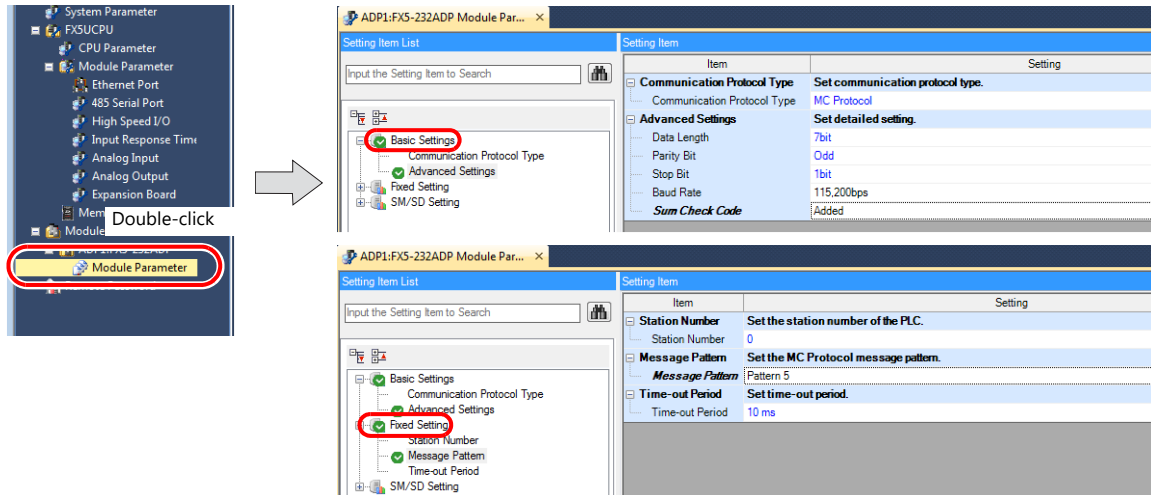
FX5-232ADP/FX5-485ADP

[Module Information] → [Add New Module]



	Item	Setting	Remarks
Module Selection	Module	Communication Adapter	
	Model Name	FX5-232ADP / FX5-485ADP	
Advanced Settings	Mounting Position No.	Specify according to the environment.	

[Module Parameter]



(Underlined setting: default)

	Item	Setting	Remarks
Basic Settings	Communication Protocol Type	MC Protocol	
	Data Length	8 bits	
	Parity Bit	None / <u>Odd</u> / Even	
	Stop Bit	<u>1bit</u> / 2bit	
	Baud Rate	4,800 / <u>9,600</u> / 19,200 / 38,400 / 57,600/ 115,200 bps	
	Sum Check Code	Added	
Fixed Setting	Station Number	0 to 31	
	Message Pattern	Pattern 5	

Available Device Memory

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

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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

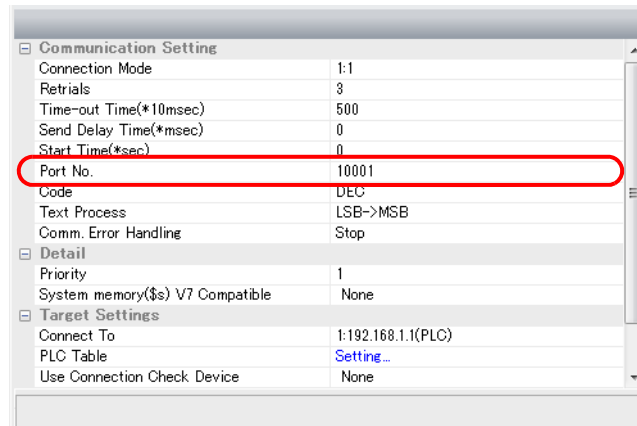
11.1.28 FX-5U/5UC Series (Ethernet)

Communication Setting

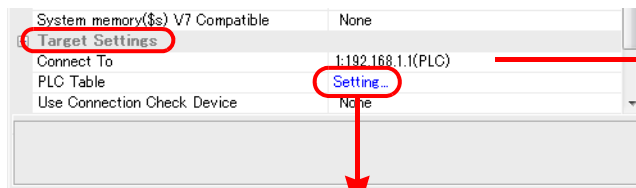
Editor

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

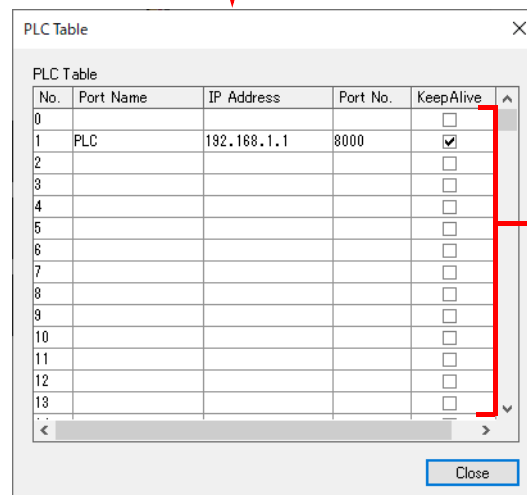
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



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



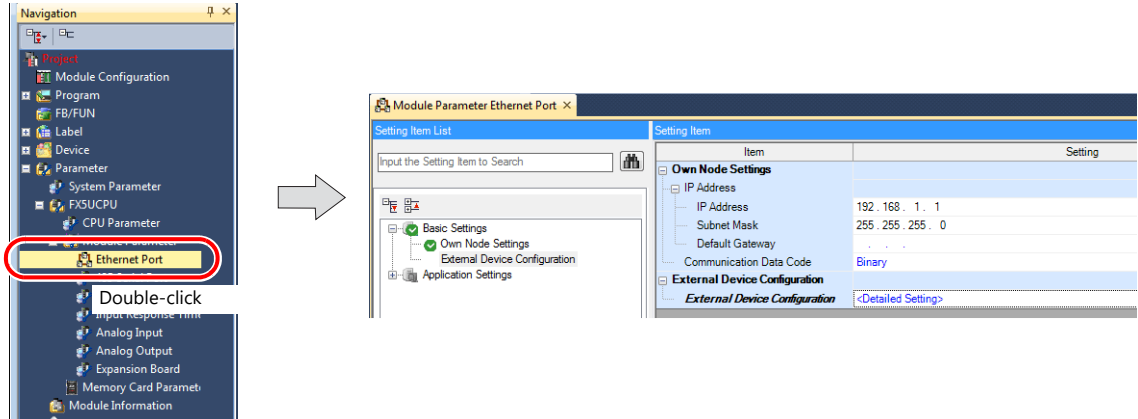
Set the IP address, port number and whether or not to use the KeepAlive function for the PLC.

PLC

Make PLC settings using the programming tool "GX Works3".

Built-in Ethernet Port

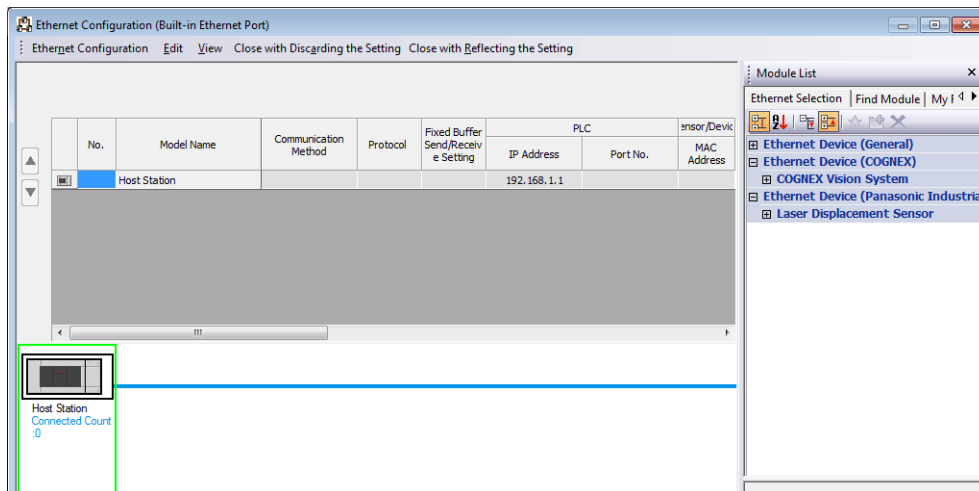
[Module Parameter] → [Ethernet Port]



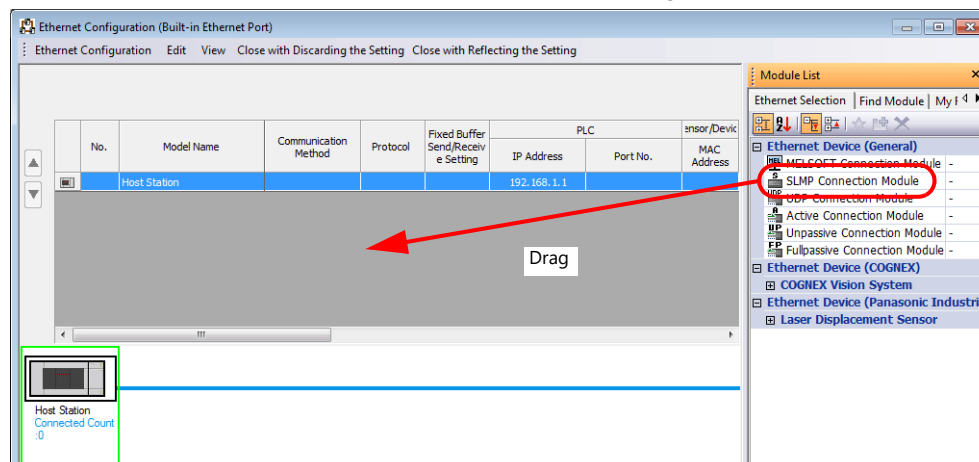
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Communication Data Code	Binary	
External Device Configuration	Specify the X1 series as a SLMP connection module.	

Setting procedure for [External Device Configuration]

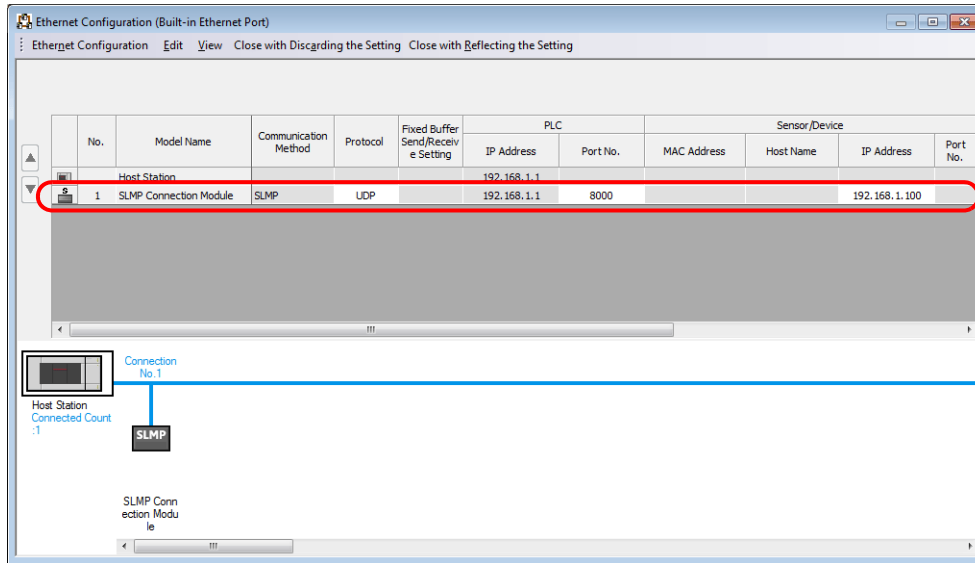
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item	Setting	Remarks
Protocol	UDP / TCP	
PLC	Port No.	Set the port number of the host station (PLC). 1025 to 4999, 5010 to 65534
Sensor/Device	IP Address	Set the IP address of the X1 series unit. Only for protocol UDP

Available Device Memory

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

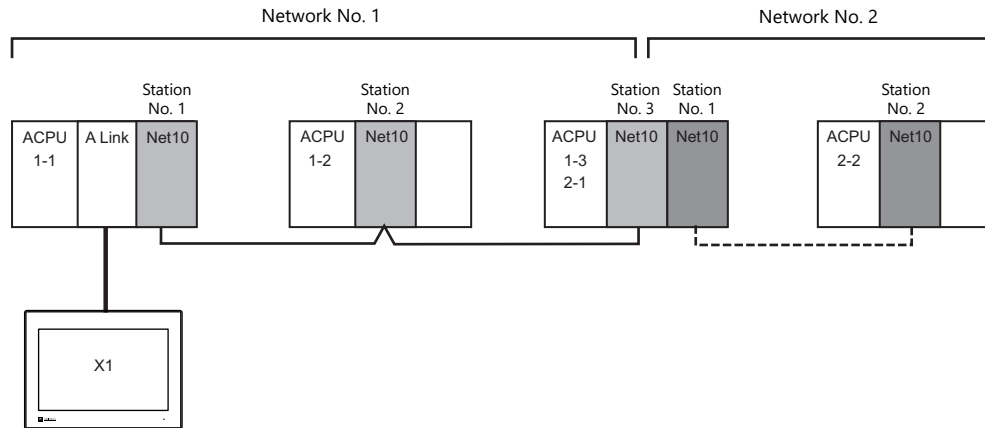
Device Memory	TYPE	Remarks
D (data register)	00H	
W (link register)	01H	
R (file register)	02H	
TN (timer/current value)	03H	
CN (counter/current value)	04H	
Un\G (special unit buffer memory)	05H	*1
M (internal relay)	06H	
L (latch relay)	07H	
B (link relay)	08H	
X (input)	09H	
Y (output)	0AH	
TS (timer/contact)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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

11.1.29 A-Link + Net10

The A-link + Net10 can only be selected by the logical port PLC1.

The X1 series can communicate with an A series on the network (Net10) via the standard type link unit.



- When the X1 series is connected to a standard type link unit that is mounted on a CPU connected to a data-link system and network system, the X1 series can access other CPUs on NET II (/B) and NET/10. In such a case, select "A-Link + Net10" for the V-SFT PLC type.
- Accessing other CPUs on NET II (/B) and NET/10 with the X1 series
 - On NET II (/B), only CPUs on the same network as the CPU installed with the standard type link unit for connection with the X1 series (No.1 in above figure) can be accessed.
(Available station numbers: 0 to 64)
 - On NET/10, CPUs on networks other than the network with the CPU installed with the standard type link unit for connection with the X1 series (No.1 in above figure) can be accessed as well (No.2 in above figure).
(Available station numbers: 1 to 64)
- Reading and writing device memory for the CPU installed with the standard type link unit for connection with the X1 series (1-1 in above figure)
Set station number 31 for device memory settings on the V-SFT.
The response time becomes the same level as with connection between the X1 series and PLC (1 : 1).
 - * **Note that the response time is slow when writing and reading CPU device memory with station numbers other than "31" since transient transmission is used.**
 - * **Do not use station number "31" for PLCs on a network.**
- For details on NET II (/B) data link and NET/10 network systems, refer to instruction manuals issued by Mitsubishi.

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> bps	
Transmission Mode	<u>Transmission Mode 1</u> / Transmission Mode 4	Transmission Mode 1: Without CR/LF Transmission Mode 4: With CR/LF
Data Length	<u>7</u> / 8 bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / Odd / <u>Even</u>	

PLC

For details on settings for NET II (/B) data link and NET/10 network systems, refer to instruction manuals issued by Mitsubishi.

Standard type link unit

Other than the station number, settings are the same as for "11.1.1 A Series Link".
Specify "0" for the station number.

Available Device Memory

The contents of "Available Device Memory" are the same as those described in "11.1.1 A Series Link".

When setting the device memory on the V-SFT, specify the station number as well. Specify the network number using a macro. For more information, refer to the following.

Network Specification Macro

When accessing a PLC on a network number other than that directly connected via NET/10, execute "SYS (OUT_ENQ) F1" with the screen open macro, and specify the network number to connect to.

Station numbers on multiple networks cannot be accessed from the same screen.

Macro command "SYS (OUT_ENQ) F1"

Contents	F0	F1 (=\$u n)	
Network specification	OUT_ENQ	n	0 (fixed)
		n+1	2 (fixed)
		n+2	System code 1: NET/10 2: NET II (/B)
		n+3	Network No. (fixed to 0 when n+2=2)

Use this macro with the screen open macro. If used at any other time, a communication error will result since a network change takes place immediately.

For more information on macros, refer to the separate V9 series Macro Reference manual. Also refer to "network registration" in the "Standard Link / Multi-drop Link Unit" manual from Mitsubishi.

11.1.30 Q170MCPU (Multi CPU)

Editor

Communication setting

(Underlined setting: default)

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

PLC

When using the PLC for the first time, the operating system must be installed. For more information, refer to the PLC manual issued by the manufacturer.

No communication setting is required.

Available Device Memory

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

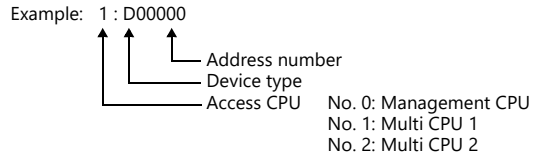
Device Memory	TYPE	Remarks
D (data register)	00H	
W (link register)	01H	
R (file register)	02H	Available only for the sequencer CPU
TN (timer/current value)	03H	Available only for the sequencer CPU
CN (counter/current value)	04H	Available only for the sequencer CPU
SPU (special unit buffer memory)	05H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

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address.

For the unit number, set the decimal number of "XXX" included in the station I/O number "xxx0 H" of the link unit. For more information, see page 11-14.

Specifying the access CPU

In addition to the device type and address, an access CPU must be specified. The assigned device memory is expressed as shown below when editing the screen.



* Q170MCPU is equipped with the sequencer CPU and motion CPU in one unit.

The multi CPU unit No. is fixed as shown below:

Management CPU: Sequencer CPU
Multi CPU 1: Sequencer CPU
Multi CPU 2: Motion CPU

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

- * For the SPU device memory, specify the unit number in the expansion code.
For any other devices memory, specify the access CPU number in the expansion code.
Management CPU: 0 Multi CPU: 1 or 2

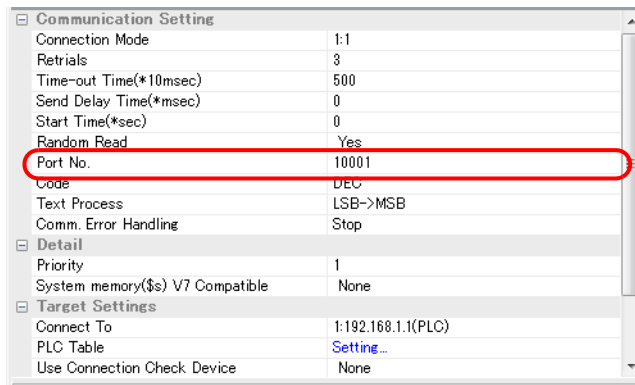
11.1.31 Q170 Series (Multi CPU) (Built-in Ethernet)

Communication Setting

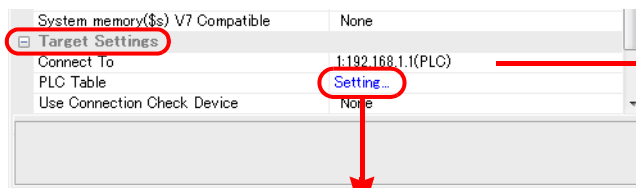
Editor

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

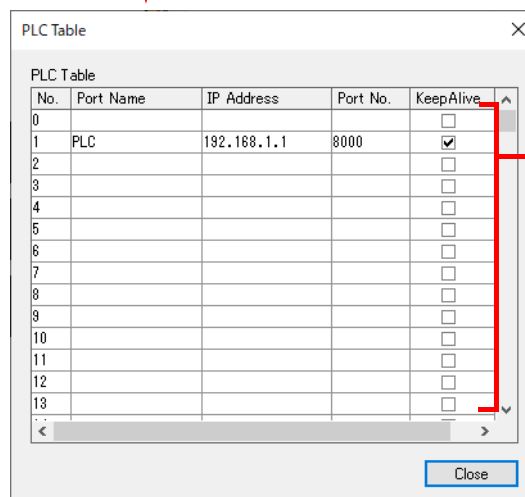
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



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



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

On the MT Developer 2, the port number is specified in hexadecimal notation. When specifying the port number on the editor, convert it into a decimal number.

PLC

When using the PLC for the first time, the operating system must be installed.

Make communication settings using the programming tool "MT-Developer2". For more information, refer to the PLC manual issued by the manufacturer.

Built-in Ethernet port setting

Specify the IP address and open method on the built-in Ethernet port setting dialog.

Item	Setting	Remarks
IP address (DEC)	Specify according to the environment.	For more information, refer to the manual of the PLC.
Communication data code	Binary code	
Enable writing during running	Checked	Data can be written from X1 to PLC only when this box is checked. If writing of data is attempted while the box is unchecked, the error "Error code received Receive code 0055" will occur.
Protocol	UDP/TCP	Set the same protocol as the one set on the editor.
Open type	MC protocol	
Local port No. (HEX)	Specify according to the environment.	1388H to 1391H cannot be specified because they are occupied by the system. When making a setting on the editor, convert the number specified here into a decimal number.

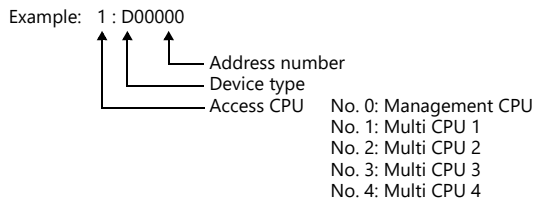
Available Device Memory

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

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

Specifying the access CPU

In addition to the device type and address, an access CPU must be specified. The assigned device memory is expressed as shown below when editing the screen.



* The multi CPU unit numbers are assigned as shown below:

- For Q170MCPU

Management CPU: Motion CPU
Multi CPU 1: Sequencer CPU
Multi CPU 2: Motion CPU

- For Q172DCPU-S1/Q173DCPU-S1

Management CPU: Motion CPU
Multi CPU 1 to 4: Determined according to the slot position of the CPU (sequencer CPU or motion CPU)

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

* Specify the access CPU number in the expansion code.
 Management CPU: 0 Multi CPU: 1 or 4

11.1.32 Q170 Series (Multi CPU) (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

Communication Setting	
Connection Mode	1:1
Retrials	3
Time-out Time(*10msec)	500
Send Delay Time(*msec)	0
Start Time(*sec)	0
Random Read	Yes
Port No.	10001
Code	DEC
Text Process	LSB->MSB
Comm. Error Handling	Stop
Detail	
Priority	1
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

System memory(\$s) V7 Compatible	
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

PLC Table				
No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	8000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>
...				<input type="checkbox"/>

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

PLC

When using the PLC for the first time, the operating system must be installed.

Make multi CPU settings using the programming tool "MT-Developer2". For more information, refer to the PLC manual issued by the manufacturer.

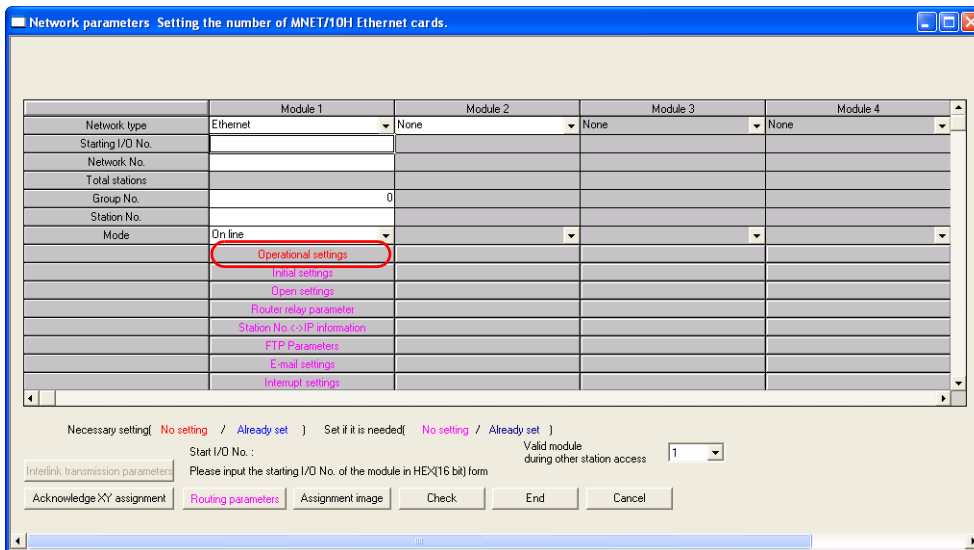
Ethernet unit

Make PLC communication settings using the programming tool "GX-Developer".

PC parameter

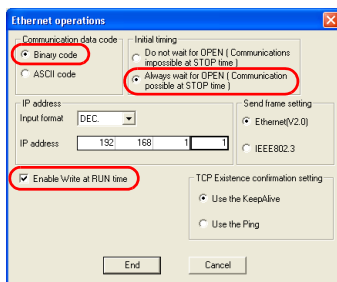
Make the I/O assignment setting for the Ethernet unit.

Network parameter (Ethernet)



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

Ethernet operations

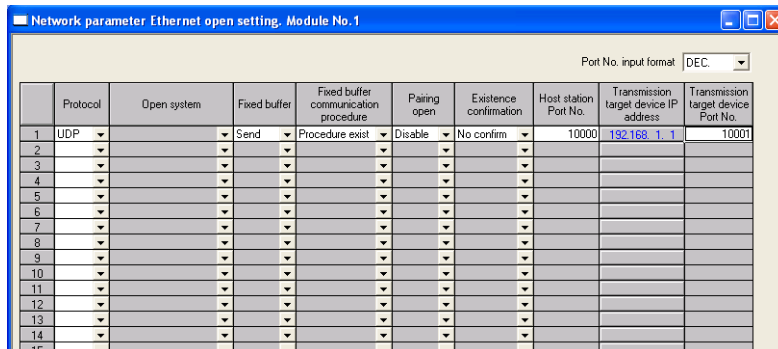


Item	Setting	Remarks
Communication data code	Binary code	
Initial timing	Always wait for OPEN (Communication possible at STOP time)	
IP address (DEC)	Make settings in accordance with the network environment.	
Enable Write at RUN time	Checked	It is not possible to write value from X1 to PLC when unchecked. If so, "error code received 0055" occurs.

Port No.

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

- Open setting



Item	Setting	Remarks
Protocol	UDP	
Host station Port No. (DEC)	Make settings in accordance with the network environment.	It is not possible to set it from No. 5000 to 5002.
Transmission target device IP address (DEC)	IP address of X1	
Transmission target device Port No. (DEC)	Port No. of X1	

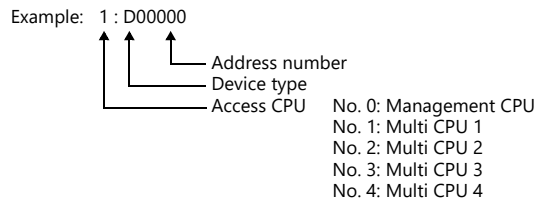
Available Device Memory

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

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

Specifying the access CPU

In addition to the device type and address, an access CPU must be specified. The assigned device memory is expressed as shown below when editing the screen.



* The multi CPU unit numbers are assigned as shown below:
 Do not set the motion CPU as the management CPU. If the motion CPU is set as the management CPU, the motion CPU cannot be accessed.

Management CPU: Sequencer CPU
Multi CPU 1: Sequencer CPU
Multi CPU 2 to 4: Determined according to the slot position of the CPU (sequencer CPU or motion CPU)

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

* Specify the access CPU number in the expansion code.
 Management CPU: 0 Multi CPU: 1 or 4

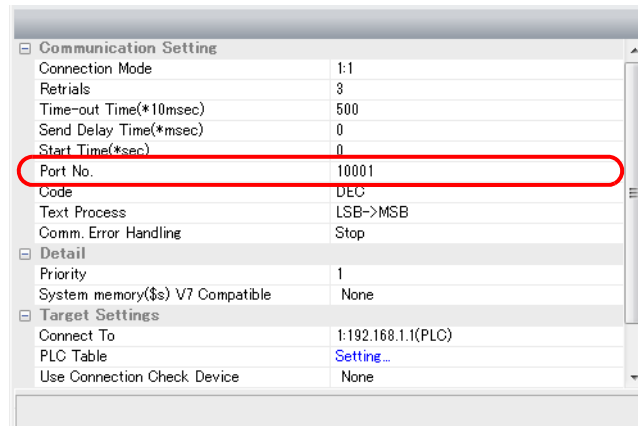
11.1.33 iQ-R Series (Built-in Ethernet)

Communication Setting

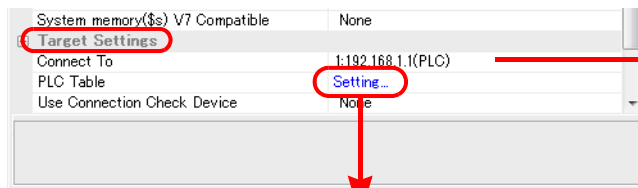
Editor

Make the following settings on the editor. For more information, see 1.3.2 Ethernet Communication.

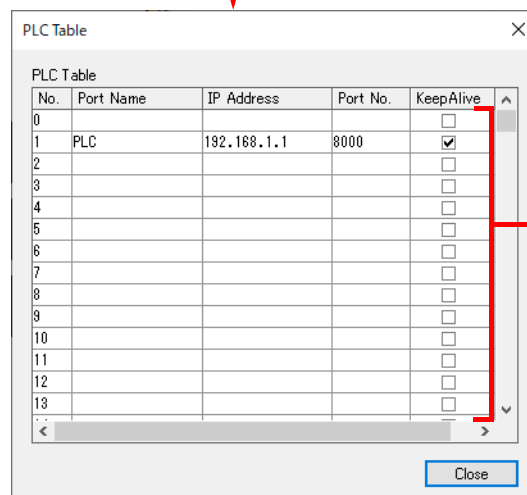
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



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

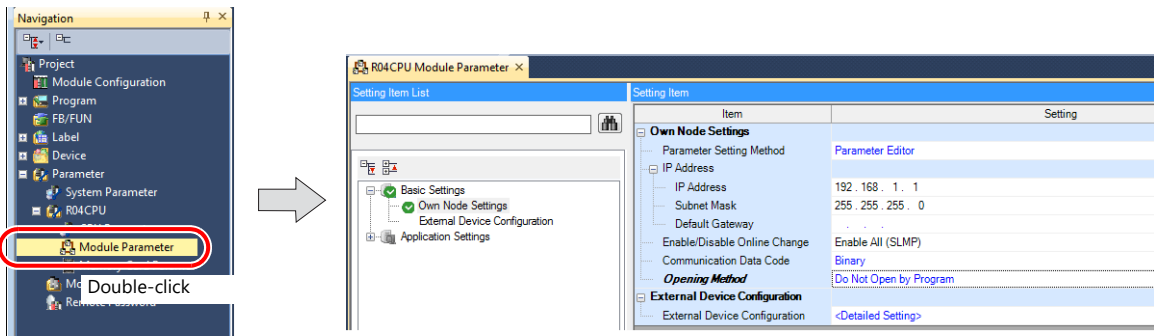


Set the IP address, port number and whether or not to use the KeepAlive function for the PLC.

PLC

Make PLC settings using the programming tool "GX Works3".

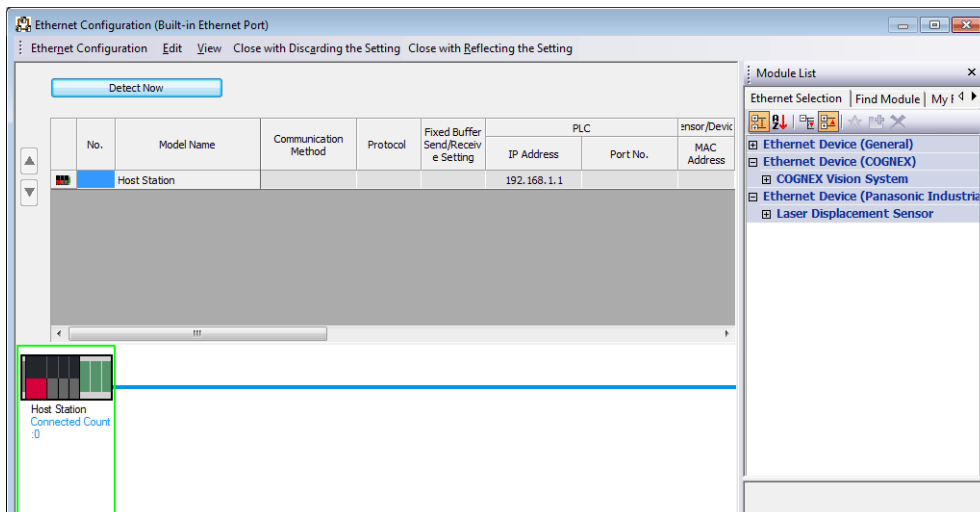
[Module Parameter]



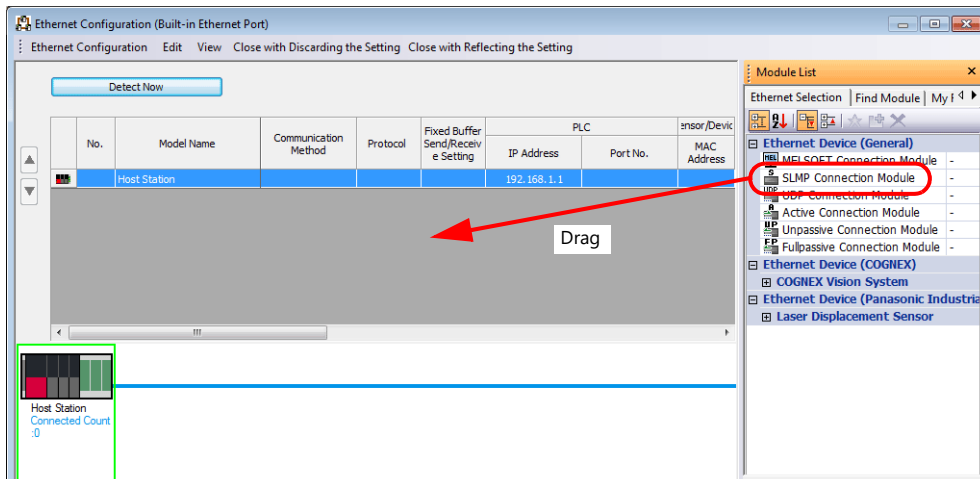
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Enable/Disable Online Change	Enable All (SLMP)	
Communication Data Code	Binary	
Opening Method	Do Not Open by Program	
External Device Configuration	Specify the X1 series as a SLMP connection module.	

Setting procedure for [External Device Configuration]

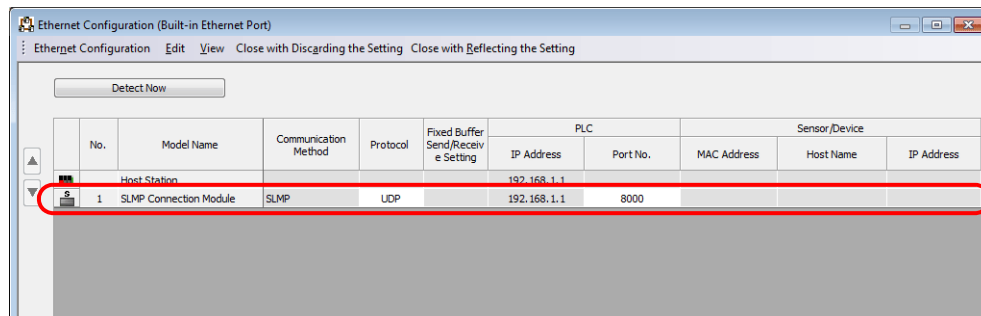
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item	Setting	Remarks
Protocol	UDP / TCP	
PLC	Port No.	Set the port number of the host station (PLC). 1025 to 4999, 5010 to 65534

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
W (link register)	01H	
R (file register)	02H	
TN (timer/current value)	03H	
CN (counter/current value)	04H	
Un\G (unit access device memory)	05H	*1
M (internal relay)	06H	
L (latch relay)	07H	
B (link relay)	08H	
X (input)	09H	
Y (output)	0AH	
TS (timer/contact)	0BH	
TC (timer/coil)	0CH	
CS (counter/contact)	0DH	
CC (counter/coil)	0EH	
SD (special register)	10H	
SM (special relay)	11H	
SB (special link relay)	12H	
SW (special link register)	13H	
ZR (file register (for continuous access))	14H	
F (annunciator)	15H	
SS (totalizing timer/contact)	16H	
SC (totalizing timer/coil)	17H	
SN (totalizing timer/current value)	18H	
Z (index register)	19H	
LTN (long timer/current value)	24H	Double-word
LSTN (long totalizing timer/current value)	27H	Double-word
LCN (long counter/current value)	2AH	Double-word
LZ (long index register/current value)	2BH	Double-word
RD (refreshing data register)	2CH	
U3En\G (CPU buffer memory access device memory)	2DH	*2
U3En\HG (CPU buffer memory access device memory (periodical area))	2EH	*2

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

Example: U00\G000000000

↑ Address number (DEC)
↑ Unit number (HEX)

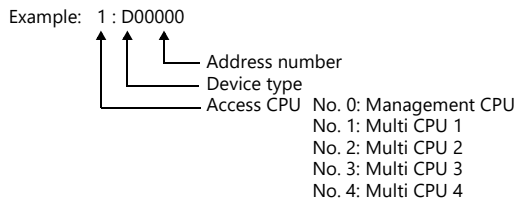
*2 Specify the CPU number.

Example: U3E0\G000000000

↑ Address number (DEC)
↑ CPU number: 0 to 3

Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.



Indirect Device Memory Designation

- For the address number of 0 to 65535:

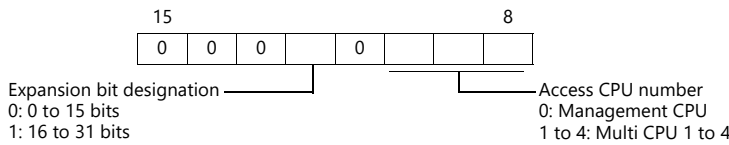
	15	8 7	0
n + 0	Model		Device type
n + 1	Address No.		
n + 2	Expansion code *		Bit designation
n + 3	00		Station number

- For the address number of 65536 or greater

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

* Specify an expansion code for the following device memory.

- Un\G
Specify the unit number in the expansion code.
- U3En\G, U3En\HG
Specify the CPU number in the expansion code.
- LTN, LSTN, LCN, LZ
For bit designation, specify whether to access the upper or lower word (expansion bit designation). Also specify the access CPU number when connecting multiple CPUs.



- Other than Un\G, U3En\G, U3En\HG
When connecting multiple CPUs, specify the access CPU number in the expansion code.
Management CPU: 0 Multi CPU: 1 to 4

11.1.34iQ-R Series link

Communication Setting

Editor

Communication setting

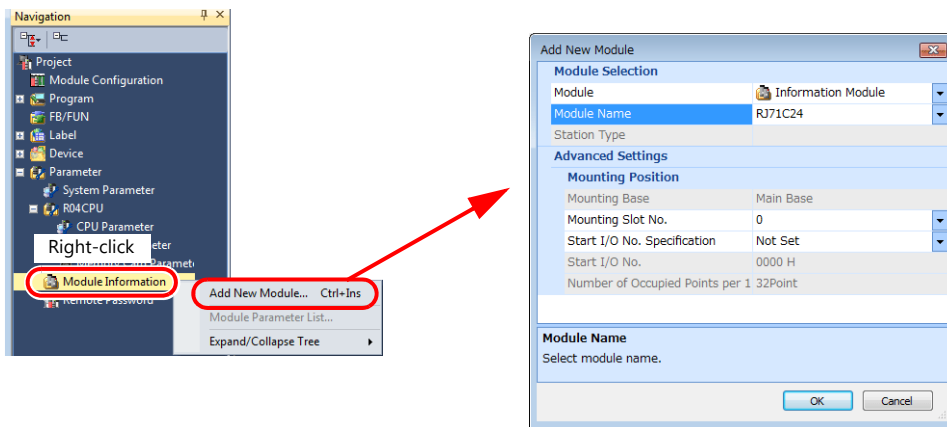
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : <u>1</u> / 1 : n	
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	<u>None</u> / Odd / Even	
Target Port No.	<u>0</u> to 31	

PLC

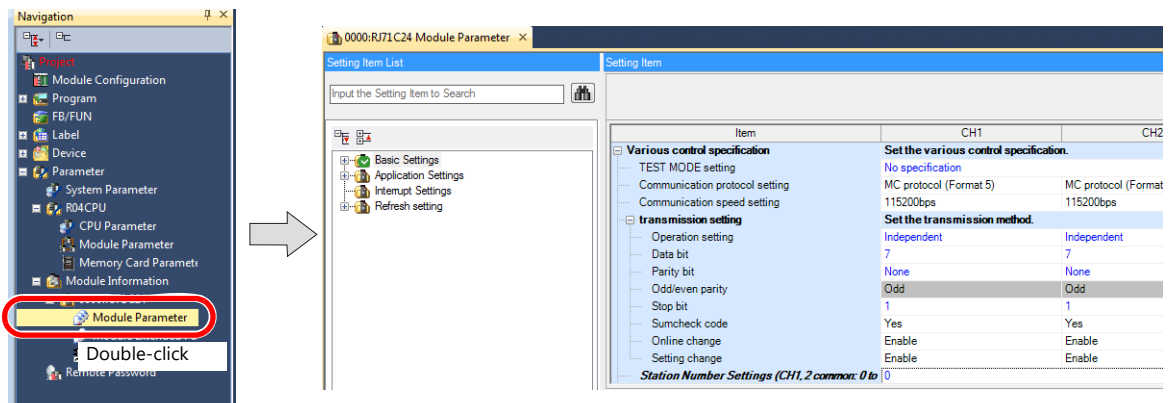
Make PLC settings using the programming tool "GX Works3".

[Module Information] → [Add New Module]



Item	Setting	Remarks
Module Selection	Module Module Name	Information Module RJ71C24 / RJ71C24-R2 / RJ71C24-R4
Mounting Position		Specify according to the environment.

[Module Parameter]



(Underlined setting: default)

Item		Setting	Remarks
Basic Settings	Communication protocol setting	MC protocol (Format 5)	
	Communication speed setting	4800 / 9600 / 19200 / 38400 / 57600 / <u>115200</u> bps	
	Operation setting	Independent	
	Data bit	8	
	Parity bit	<u>None</u> / Yes	
	Odd/even parity	<u>Odd</u> / Even	
	Stop Bit	<u>1</u> / 2	
	Sumcheck code	Yes	
	Online change	Enable	
	Setting change	Enable	
Station Number Settings		<u>0</u> to 31	

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
W (link register)	01H	
R (file register)	02H	
TN (timer/current value)	03H	
CN (counter/current value)	04H	
Un\G (unit access device memory)	05H	*1
M (internal relay)	06H	
L (latch relay)	07H	
B (link relay)	08H	
X (input)	09H	
Y (output)	0AH	
TS (timer/contact)	0BH	
TC (timer/coil)	0CH	
CS (counter/contact)	0DH	
CC (counter/coil)	0EH	
H (link unit buffer device memory)	0FH	
SD (special register)	10H	
SM (special relay)	11H	
SB (special link relay)	12H	
SW (special link register)	13H	
ZR (file register (for continuous access))	14H	
F (annunciator)	15H	
SS (totalizing timer/contact)	16H	
SC (totalizing timer/coil)	17H	
SN (totalizing timer/current value)	18H	
Z (index register)	19H	
LTN (long timer/current value)	24H	Double-word
LSTN (long totalizing timer/current value)	27H	Double-word
LCN (long counter/current value)	2AH	Double-word
LZ (long index register/current value)	2BH	Double-word
RD (refreshing data register)	2CH	
U3En\G (CPU buffer memory access device memory)	2DH	*2
U3En\HG (CPU buffer memory access device memory (periodical area))	2EH	*2

*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

*2 Specify the CPU number.

Example: U00\G000000000

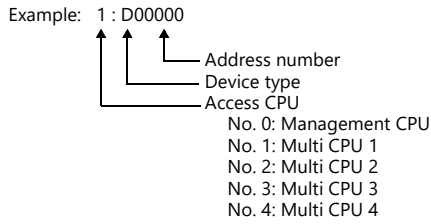
↑ Address number (DEC)
↑ Unit number (HEX)

Example: U3E0\G000000000

↑ Address number (DEC)
↑ CPU number: 0 to 3

Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.



Indirect Device Memory Designation

- For the address number of 0 to 65535:

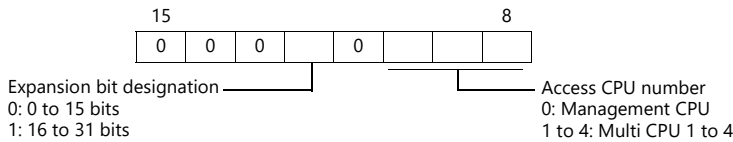
	15	8 7	0
n + 0	Model		Device type
n + 1	Address No.		
n + 2	Expansion code *		Bit designation
n + 3	00		Station number

- For the address number of 65536 or greater

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

* Specify an expansion code for the following device memory.

- Un\G
Specify the unit number in the expansion code.
- U3En\G, U3En\HG
Specify the CPU number in the expansion code.
- LTN, LSTN, LCN, LZ
For bit designation, specify whether to access the upper or lower word (expansion bit designation). Also specify the access CPU number when connecting multiple CPUs.



- Other than Un\G, U3En\G, U3En\HG
When connecting multiple CPUs, specify the access CPU number in the expansion code.
Management CPU: 0 Multi CPU: 1 to 4

11.1.35 iQ-R Series (Ethernet)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

Communication Setting	
Connection Mode	1:1
Retrials	3
Time-out Time(*10msec)	500
Send Delay Time(*msec)	0
Start Time(*sec)	0
Port No.	10001
Code	DEC
Text Process	LSB->MSB
Comm. Error Handling	Stop
Detail	
Priority	1
System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

System memory(\$s) V7 Compatible	None
Target Settings	
Connect To	1:192.168.1.1(PLC)
PLC Table	Setting...
Use Connection Check Device	None

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

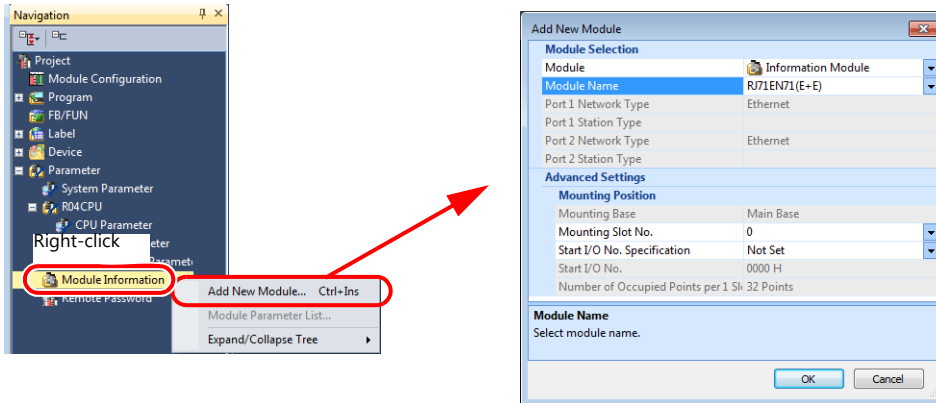
No.	Port Name	IP Address	Port No.	KeepAlive
0				<input type="checkbox"/>
1	PLC	192.168.1.1	8000	<input checked="" type="checkbox"/>
2				<input type="checkbox"/>
3				<input type="checkbox"/>
4				<input type="checkbox"/>
5				<input type="checkbox"/>
6				<input type="checkbox"/>
7				<input type="checkbox"/>
8				<input type="checkbox"/>
9				<input type="checkbox"/>
10				<input type="checkbox"/>
11				<input type="checkbox"/>
12				<input type="checkbox"/>
13				<input type="checkbox"/>
...				<input type="checkbox"/>

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

PLC

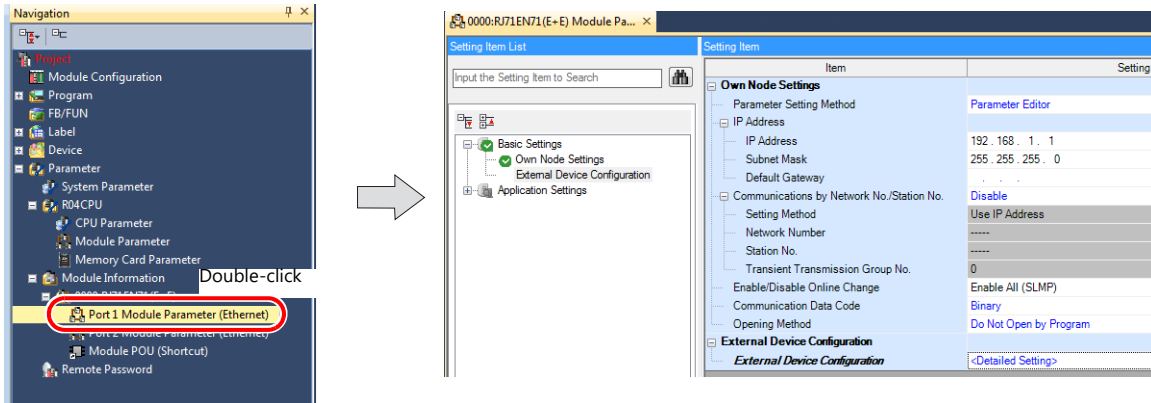
Make PLC settings using the programming tool "GX Works3".

[Module Information] → [Add New Module]



Item		Setting	Remarks
Module Selection	Module	Information Module	
	Module Name	RJ71EN71 (E+CCIEC): Ethernet connection available with port 1 only RJ71EN71 (E+CCIEF): Ethernet connection available with port 1 only RJ71EN71 (E+E): Ethernet connection available with both port 1 and 2	
Mounting Position		Specify according to the environment.	

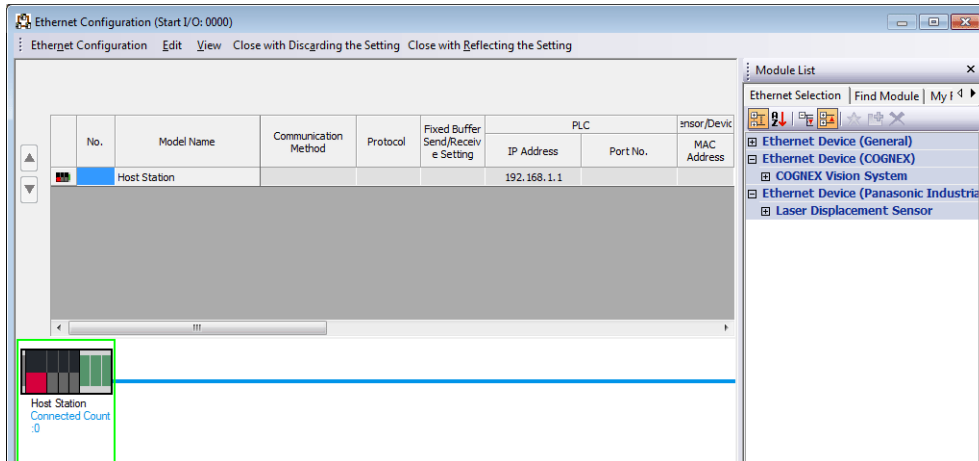
[Module Parameter]



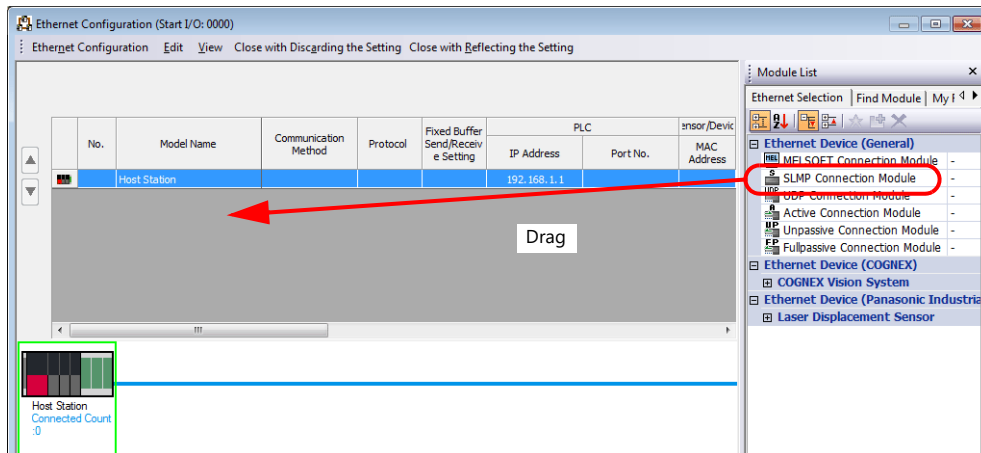
Item	Setting	Remarks
IP Address	Set the IP address of the host station (PLC).	
Subnet Mask	Specify according to the environment.	
Default Gateway	Specify according to the environment.	
Enable/Disable Online Change	Enable All (SLMP)	
Communication Data Code	Binary	
Opening Method	Do Not Open by Program	
External Device Configuration	Specify the X1 series as a SLMP connection module.	

Setting procedure for [External Device Configuration]

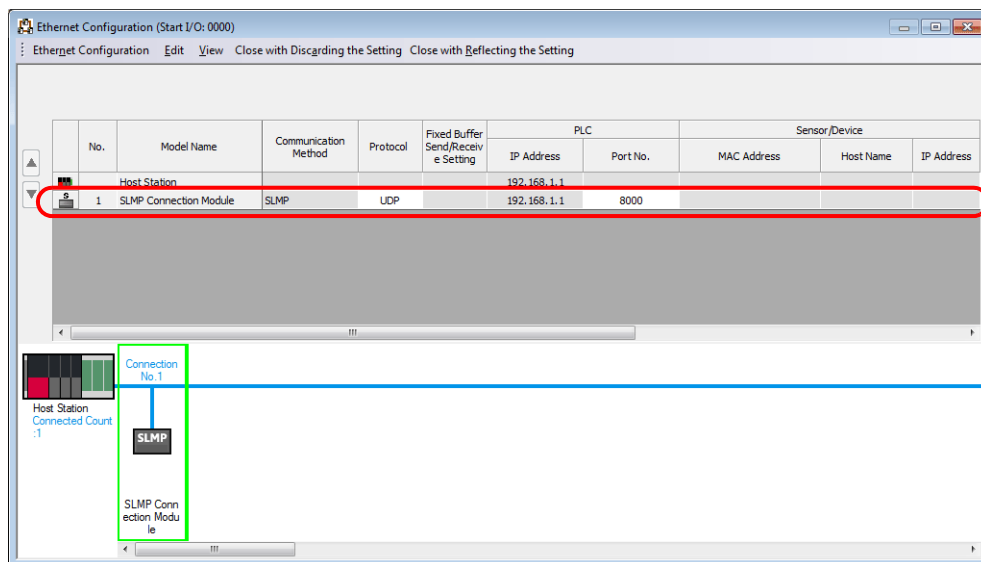
1. Double-click on [Detailed Setting] at [External Device Configuration] to display the [Ethernet Configuration] window.



2. Select [SLMP Connection Module] on the [Module List] pane, and drag it on to the area below the host station row.



3. Configure settings for the added SLMP connection module.



Item	Setting	Remarks
Protocol	UDP / TCP	
PLC Port No.	Set the port number of the host station (PLC).	1025 to 4999, 5010 to 65534

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data register)	00H	
W (link register)	01H	
R (file register)	02H	
TN (timer/current value)	03H	
CN (counter/current value)	04H	
Un\G (unit access device memory)	05H	*1
M (internal relay)	06H	
L (latch relay)	07H	
B (link relay)	08H	
X (input)	09H	
Y (output)	0AH	
TS (timer/contact)	0BH	
TC (timer/coil)	0CH	
CS (counter/contact)	0DH	
CC (counter/coil)	0EH	
H (link unit buffer device memory)	0FH	
SD (special register)	10H	
SM (special relay)	11H	
SB (special link relay)	12H	
SW (special link register)	13H	
ZR (file register (for continuous access))	14H	
F (annunciator)	15H	
SS (totalizing timer/contact)	16H	
SC (totalizing timer/coil)	17H	
SN (totalizing timer/current value)	18H	
Z (index register)	19H	
LTN (long timer/current value)	24H	Double-word
LSTN (long totalizing timer/current value)	27H	Double-word
LCN (long counter/current value)	2AH	Double-word
LZ (long index register/current value)	2BH	Double-word
RD (refreshing data register)	2CH	
U3En\G (CPU buffer memory access device memory)	2DH	*2
U3En\HG (CPU buffer memory access device memory (periodical area))	2EH	*2

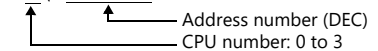
*1 The unit number is required in addition to the device type and address. To set the device memory address on the editor for the link unit which has byte-addressable memory, convert the address into word address. Set the unit number in hexadecimal notation.

Example: U00\G000000000



*2 Specify the CPU number.

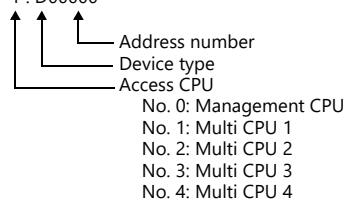
Example: U3E0\G000000000



Specifying the access CPU when connection multiple CPUs

When multiple CPUs are connected, an access CPU must be specified in addition to the device memory type and address. The assigned device memory is expressed as shown below when editing the screen.

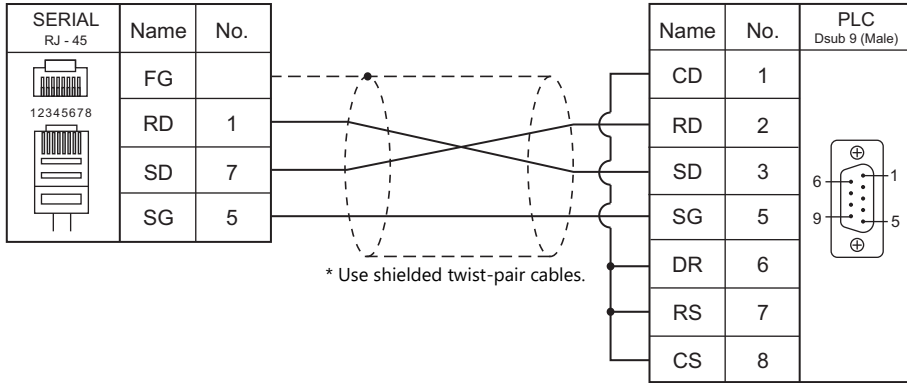
Example: 1 : D00000



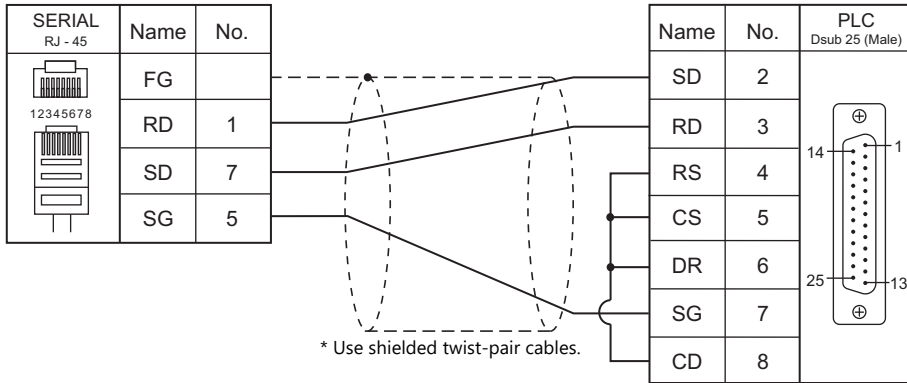
11.1.36 Wiring Diagrams

RS-232C

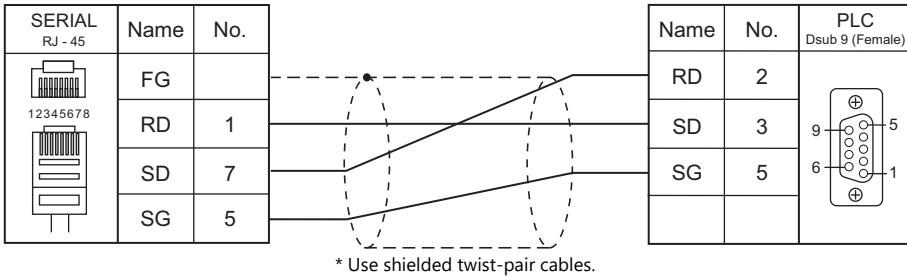
Wiring diagram 1 - M2



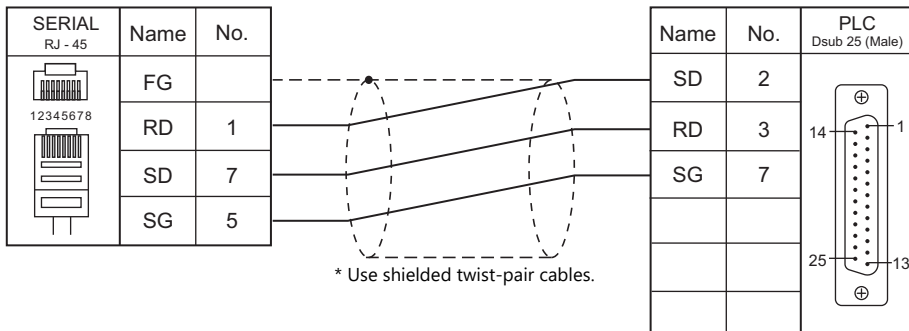
Wiring diagram 2 - M2



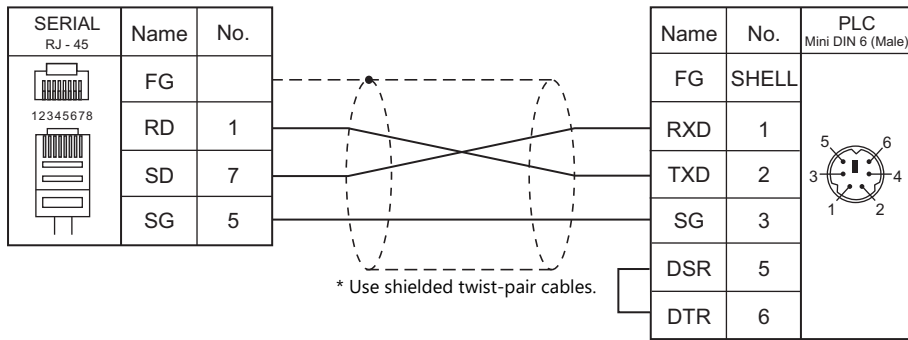
Wiring diagram 3 - M2



Wiring diagram 4 - M2

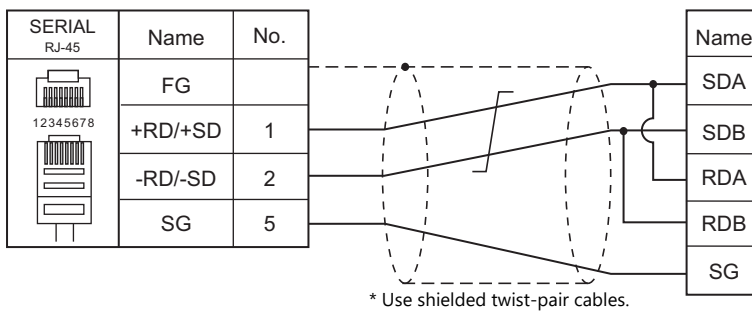


Wiring diagram 5 - M2

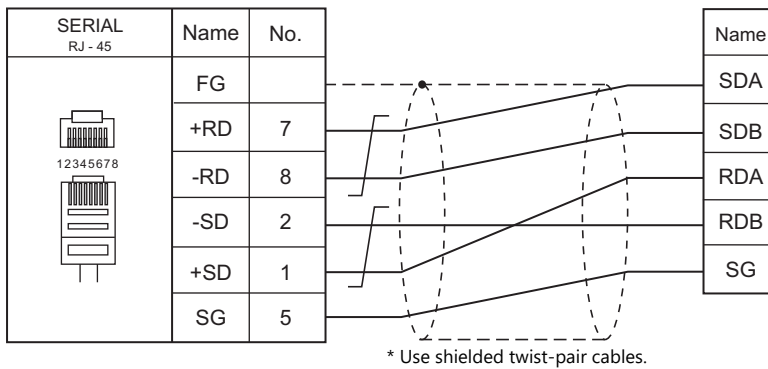


RS-422/RS-485

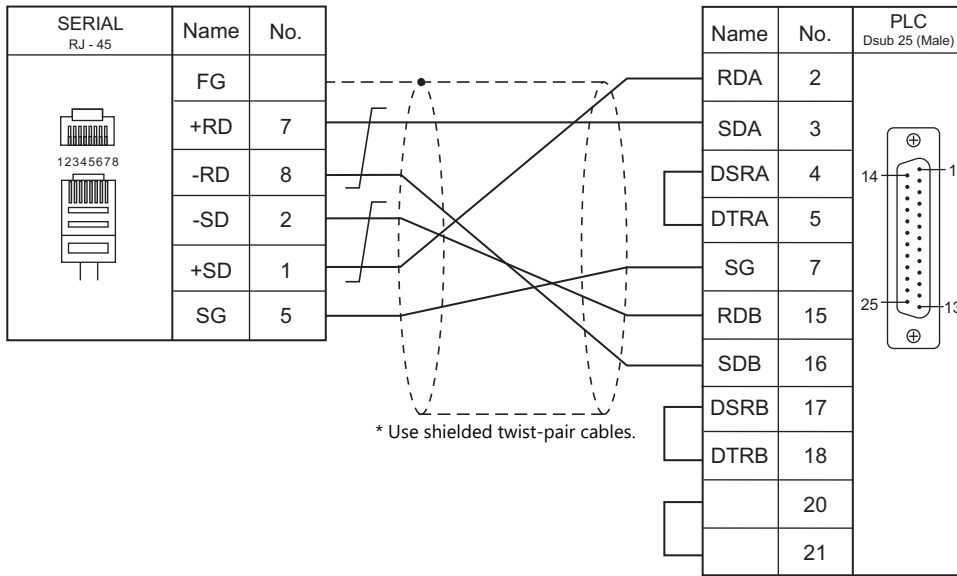
Wiring diagram 1 - M4



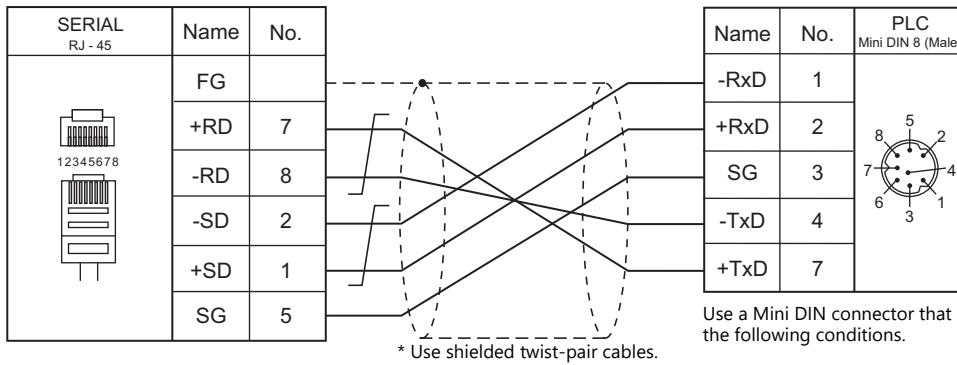
Wiring diagram 2 - M4



Wiring diagram 3 - M4

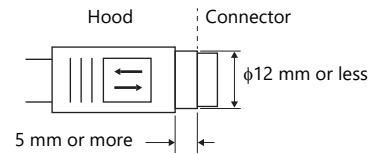


Wiring diagram 4 - M4

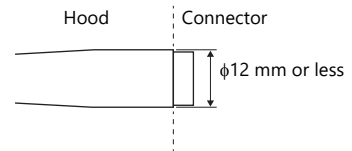


Use a Mini DIN connector that satisfies the following conditions.

<With hood (2-layered structure)>



<Without hood>



11.2 Temperature Controller/Servo/Inverter Connection

Inverter

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire) ^{*1}	RS-422 (4-wire) ^{*1}	
FR-*500	FR-A500 FR-E500 FR-F500	PU connector	RS-485	Wiring diagram 1 - M4	Wiring diagram 2 - M4 ^{*2}	FR-E500.Lst
	FR-S500	RS-485 connector				FR-V500.Lst
FR-V500	FR-V500	PU connector				FR-E700.Lst
FR-E700	FR-E700	PU connector				

*1 Select RS-422/485 by using the editor or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Servo

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}	
MR-J2S-*A	MR-J2S-*A	CN3	RS-232C	Wiring diagram 1 - M2	×	M_J2S_A.Lst
			RS-485	×	Wiring diagram 3 - M4	
MR-J2S-*CL	MR-J2S-*CL	CN3	RS-232C	Wiring diagram 1 - M2	×	M_J2S_C.Lst
			RS-485	×	Wiring diagram 3 - M4	
MR-J3-*A	MR-J3-*A	CN3	RS-485	×	Wiring diagram 2 - M4	MRJ3.Lst
MR-J3-*T	MR-J3-*T	CN3	RS-485			MRJ3_T.Lst
MR-J4-*A	MR-J4-*A	CN3	RS-485			MRJ4_A.Lst

*1 Select RS-232C by using the editor or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 by using the editor or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

11.2.1 FR-*500

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
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

(Underlined setting: default)

Parameter No.		Item	Setting	Setting Example
A500 E500 F500	S500 F500J			
77	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	79	Operation mode selection *2	0 / 1 / 2 / 3 / 4 / 6 / 7 / 8	1: PU operation *3 2: External operation *3
117	n1	Communicating station number	<u>0</u> to 31	0
118	n2	Baud rate	4800 / 9600 / <u>19200</u> bps	19200 bps
119	n3	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	n4	Parity check	0: None 1: Odd <u>2: Even</u>	2: Even
121	n5	Communication retrial times	<u>0</u> to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	n6	Communication check intervals *1	<u>0</u> / 0.1 to 999.8 / 9999	9999: Communication check stop
123	n7	Wait time	0 to 150 / <u>9999</u>	9999: Can be set with the communication data
-	n8	Operation command write	<u>0: Computer</u> 1: External	0: Computer
-	n9	Speed command write	<u>0: Computer</u> 1: External	0: Computer
-	n10	Link start mode selection *2	<u>0</u> 1: Computer link operation mode	1: Computer link operation mode
124	n11	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 X1 does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.

*2 When the inverter, FR-A500, FR-E500 or FR-F500, is turned on with the settings of Pr.79 = 0 and Pr.146 = 9999, the inverter enters in the PU operation mode.

When the inverter, FR-S500 or FR-F500J, is turned on with the settings of Pr.79 = 2 and n10 = 1, the inverter enters in the computer link operation mode.

*3 In the case of FR-A500, FR-E500 or FR-F500, when the running frequency change and operation command specification are made on the X1, select the PU operation mode. In the case of FR-S500 or FR-F500J, when the running frequency change and operation command specification are made on the X1, select the computer link operation mode. If those settings are not made on the X1, set an appropriate value according to the purpose of usage.

Available Device Memory

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

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

D (Parameter)

Address	Name																																																								
D0	Operation mode When issuing a command, such as a run command, from the X1, 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) <table border="1"> <thead> <tr> <th>Data</th> <th>Contents</th> <th>Data</th> <th>Contents</th> <th>Data</th> <th>Contents</th> <th>Data</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>H00</td> <td>none</td> <td>H22</td> <td>OV3</td> <td>H80</td> <td>GF</td> <td>HB2</td> <td>RET</td> </tr> <tr> <td>H10</td> <td>OC1</td> <td>H30</td> <td>THT</td> <td>H81</td> <td>LF</td> <td>HC2</td> <td>P24</td> </tr> <tr> <td>H11</td> <td>OC2</td> <td>H31</td> <td>THM</td> <td>H90</td> <td>OHT</td> <td>HF3</td> <td>E.3</td> </tr> <tr> <td>H12</td> <td>OC3</td> <td>H40</td> <td>FIN</td> <td>HA0</td> <td>OPT</td> <td>HF6</td> <td>E.6</td> </tr> <tr> <td>H20</td> <td>OV1</td> <td>H60</td> <td>OLT</td> <td>HB0</td> <td>PE</td> <td>HF7</td> <td>E.7</td> </tr> <tr> <td>H21</td> <td>OV2</td> <td>H70</td> <td>BE</td> <td>HB1</td> <td>PUE</td> <td></td> <td></td> </tr> </tbody> </table>	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		
Data	Contents	Data	Contents	Data	Contents	Data	Contents																																																		
H00	none	H22	OV3	H80	GF	HB2	RET																																																		
H10	OC1	H30	THT	H81	LF	HC2	P24																																																		
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H12	OC3	H40	FIN	HA0	OPT	HF6	E.6																																																		
H20	OV1	H60	OLT	HB0	PE	HF7	E.7																																																		
H21	OV2	H70	BE	HB1	PUE																																																				
D5	Alarm contents (three times before / two times before)																																																								
D6	Alarm contents (five times before / four times before) *																																																								
D7	Alarm contents (seven times before / six times before) *																																																								
D8	Inverter status monitor 																																																								
D9	Changeover to second parameter																																																								

* These memory addresses are not available for FR-S500



CAUTION

When setting device memory:

By default, only the "List" file of "FR-E500" can be browsed by pressing the [Refer] button.

If an inverter such as "A500", "F500", or "S500" is used, refer to the parameter list described in each inverter's manual and then set the device memory.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)					F2	
Writing running frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00EEH					
		n + 2	Running frequency					
Writing running frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00EDH					
		n + 2	Running frequency					
All alarms clear	1 - 8 (PLC1 - 8)	n	Station number				2	
		n + 1	Command: 00F4H					
Operation command	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00FAH					
		n + 2	0000H: Stop 0002H: Normal rotation (STF) 0004H: Reverse rotation (STR)					
All parameter clear	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00FCH					
		n + 2	Pr.	Communication Pr.	Calibration	Other Pr.		00ECH 00F3H 00FFH
			Data					
			9696H	○	×	○		○
			9966H	○	○	○		○
5A5AH	×	×	○	○				
55AAH	×	○	○	○				
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number				2	
		n + 1	Command: 00FDH					

11.2.2 FR-V500

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
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

(Underlined setting: default)

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	<u>0</u> / 1 / 2 / 3 / 4 / 6 / 7 / 8	1: PU operation
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 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	<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 X1 does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.

*2 When the inverter is turned on with the settings of Pr.79=0 and Pr.146=9999, the inverter enters in the PU operation mode.

Available Device Memory

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

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

D (Parameter)

Address	Name																																																																														
D0	Operation mode When issuing a command, such as a run command, from the X1, select "Communication and Run". 0002 H																																																																														
D1	Rotation speed																																																																														
D2	Output current																																																																														
D3	Output voltage																																																																														
D4	Alarm contents (last / most recent)																																																																														
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D9	Changeover to second parameter																																																																														
D10	Special monitor																																																																														
D11	<p>Special monitor selection No.</p> <table border="1"> <thead> <tr> <th>Data</th> <th>Contents</th> <th>Unit</th> <th>Data</th> <th>Contents</th> <th>Unit</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>Input terminal status</p> <p>Bit: 15 - 8 RES CH DI4 DI3 DI2 DI1 STR STF</p> <p>Output terminal status</p> <p>Bit: 15 - 4 ABC D03 D02 D01</p>	Data	Contents	Unit	Data	Contents	Unit	H01	Output frequency	0.01 Hz	H10	Output terminal status	-	H02	Output current	0.01 A	H11	Load meter	0.1%	H03	Output voltage	0.1V	H12	Motor exciting current	0.01A	H05	Speed setting	1 r/min	H13	Position pulse	-	H06	Operation speed	1 r/min	H14	Total power-on time	1h	H07	Motor torque	0.1%	H17	Operating time	1h	H08	Converter output	0.1 V	H18	Motor load ratio	0.1%	H09	Regenerative brake	0.1%	H20	Torque command	0.1%	H0A	Electric thermal load ratio	0.1%	H21	Torque current command	0.1%	H0B	Output current peak value	0.01 A	H22	Motor output	0.01 kW	H0C	Output voltage peak value of converter	0.1 V	H23	Feed back pulse	-	H0F	Input terminal status	-			
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H05	Speed setting	1 r/min	H13	Position pulse	-																																																																										
H06	Operation speed	1 r/min	H14	Total power-on time	1h																																																																										
H07	Motor torque	0.1%	H17	Operating time	1h																																																																										
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H0C	Output voltage peak value of converter	0.1 V	H23	Feed back pulse	-																																																																										
H0F	Input terminal status	-																																																																													

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)					F2	
Writing setting speed (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00EEH					
		n + 2	Running frequency					
Writing setting speed (RAM)	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00EDH					
		n + 2	Running frequency					
All alarms clear	1 - 8 (PLC1 - 8)	n	Station number				2	
		n + 1	Command: 00F4H					
Operation command	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00FAH					
		n + 2	0000H: Stop 0002H: Normal rotation (STF) 0004H: Reverse rotation (STR)					
All parameter clear	1 - 8 (PLC1 - 8)	n	Station number				3	
		n + 1	Command: 00FCH					
		n + 2	Pr.	Communication Pr.	Calibration	Other Pr.		00ECH 00F3H 00FFH
			Data					
			9696H	○	×	○		○
			9966H	○	○	○		○
5A5AH	×	×	○	○				
55AAH	×	○	○	○				
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number				2	
		n+1	Command: 00FDH					

11.2.3 MR-J2S-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
15	SNO	Station number setting	<u>0</u> to 31
16	BPS	Communication function selection	<p> Baud rate 0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps Serial communication selection 0: <u>RS-232C</u> 1: RS-422 Response delay time 0: <u>Invalid</u> 1: Valid </p>
53	OP8	Function selection 8	<p> Sum check for protocol 0: Provided Station number selection for protocol 0: With station number </p>

Available Device Memory

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

Device Memory	TYPE	Remarks
F01 (status display/fraction display)	00H	Real number, read only
05 (parameter)	01H	Double-word
F05 (parameter/fraction display)	02H	Real number
12 (external I/O signals)	03H	Double-word, partially read only
33 (alarm history)	04H	Double-word, read only
02 (current alarm)	05H	Read only
F35 (status display at alarm occurrence/fraction display)	06H	Real number, read only
42 (other commands)	0DH	Double-word, read only
81 (clear status display data)	0EH	Write only
82 (clear alarm history)	0FH	Write only
8B (operation mode selection)	10H	Write only
90 (I/O device prohibition/cancel)	11H	Write only
92 (input device ON/OFF)	12H	Double-word, write only
A0 (test operation mode data)	13H	Double-word, write only

Set the target device memory on the [Device Input] dialog.

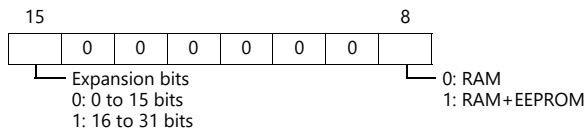
- RAM: Store to RAM.
- EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

- Address No. 0 to 65535

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

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n+3 to n+10	Software version	

Return data: Data stored from servo amplifier to X1

11.2.4 MR-J2S-*CL

Communication Setting

Editor

Communication setting

(Underlined setting: default)

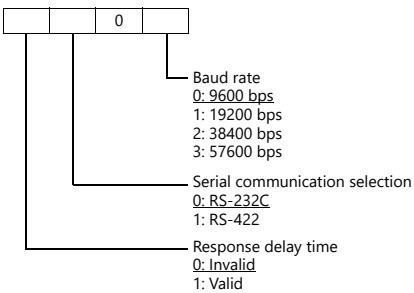
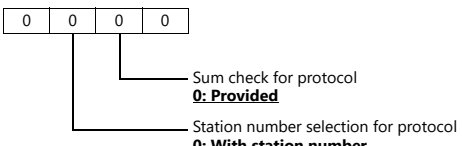
Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / <u>1</u> : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	<u>9600</u> / 19200 / 38400 / 57600 bps	
Data Length	8 bits (fixed)	
Stop Bit	1 bit (fixed)	
Parity	Even (fixed)	
Target Port No.	<u>0</u> to 31	

Servo amplifier

Extension setting parameters

To make the parameter setting valid, the power supply is turned on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
15	SNO	Station number setting	<u>0</u> to 31
16	BPS	Communication function selection	 <p>Baud rate <u>0</u>: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps</p> <p>Serial communication selection <u>0</u>: RS-232C 1: RS-422</p> <p>Response delay time <u>0</u>: Invalid 1: Valid</p>
57	OP8	Function selection 8	 <p>Sum check for protocol <u>0</u>: Provided</p> <p>Station number selection for protocol <u>0</u>: With station number</p>

Available Device Memory

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

Device Memory	TYPE	Remarks
F01 (status display/fraction display)	00H	Real number, read only
05 (parameter)	01H	Double-word
F05 (parameter/fraction display)	02H	Real number
12 (external I/O signals)	03H	Double-word, partially read only
33 (alarm history)	04H	Double-word, read only
02 (current alarm)	05H	Read only
F35 (status display at alarm occurrence/fraction display)	06H	Real number, read only
F6C (latch data of current position)	07H	Real number, read only
6D (value of general-purpose register (Rx))	08H	Double-word
F6D (value of general-purpose register (Rx))	09H	Real number
6E (value of general-purpose register (Dx))	0AH	Double-word
F6E (value of general-purpose register (Dx))	0BH	Real number
42 (other commands)	0DH	Double-word, read only
81 (status display data erasure)	0EH	Write only
82 (alarm history erasure)	0FH	Write only
8B (operation mode selection)	10H	Write only
90 (I/O device prohibition/cancel)	11H	Write only
92 (input device ON/OFF)	12H	Double-word, write only
A0 (test operation mode data)	13H	Double-word, write only

Set the target device memory on the [Device Input] dialog.

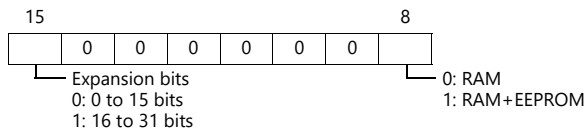
- RAM: Stored in RAM
- EEPROM: Stored in RAM + EEPROM

Indirect Device Memory Designation

- Address No. 0 to 65535

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

* Expansion code



- For the address number of 65536 or greater

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

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n+3 to n+10	Software version	

Return data: Data stored from servo amplifier to X1

11.2.5 MR-J3-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

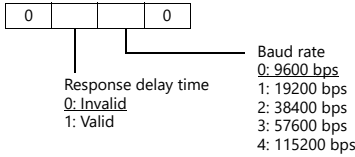
Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : <u>n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	<u>9600</u> / 19200 / 38400 / 57600 / 115K bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	<u>0</u> to 31	

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
PC20	SNO	Station number setting	<u>0</u> to 31
PC21	SOP	Communication function selection	

Available Device Memory

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

Device Memory	TYPE	Remarks
F01 (status display)	00H	Real number, read only
12 (external I/O signals)	03H	Double-word, partially read only, storage destination device invalid
33 (alarm history)	04H	Double-word, read only
02 (current alarm)	05H	Read only
F35 (status display at alarm occurrence)	06H	Real number, read only
42 (other commands)	0DH	Double-word, read only
81 (clear status display data)	0EH	Write only, storage destination device invalid
82 (clear alarm history)	0FH	Write only, storage destination device invalid
8B (operation mode selection)	10H	Storage destination device invalid
90 (I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92 (input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0 (test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01 (status display name and unit)	14H	Read only
04 (parameters)	15H	Storage destination device invalid
05A (basic setting parameters)	16H	Double-word, *1
05B (gain/filter parameters)	17H	Double-word, *1
05C (extension setting parameters)	18H	Double-word, *1
05D (I/O setting parameters)	19H	Double-word, *1
F05A (basic setting parameters)	1AH	Real number, *1
F05B (gain/filter parameters)	1BH	Real number, *1
F05C (extension setting parameters)	1CH	Real number, *1
F05D (I/O setting parameters)	1DH	Real number, *1

Device Memory	TYPE	Remarks
06A (basic setting parameters upper limit)	1EH	Double-word, read only, *1
06B (gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C (extension setting parameters upper limit)	20H	Double-word, read only, *1
06D (I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A (basic setting parameters upper limit)	22H	Real number, read only, *1
F06B (gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C (extension setting parameters upper limit)	24H	Real number, read only, *1
F06D (I/O setting parameters upper limit)	25H	Real number, read only, *1
07A (basic setting parameters lower limit)	26H	Double-word, read only, *1
07B (gain/filter parameters lower limit)	27H	Double-word, read only, *1
07C (extension setting parameters lower limit)	28H	Double-word, read only, *1
07D (I/O setting parameters lower limit)	29H	Double-word, read only, *1
F07A (basic setting parameters lower limit)	2AH	Real number, read only, *1
F07B (gain/filter parameters lower limit)	2BH	Real number, read only, *1
F07C (extension setting parameters lower limit)	2CH	Real number, read only, *1
F07D (I/O setting parameters lower limit)	2DH	Real number, read only, *1
S08A (basic setting parameters symbol)	2EH	Read only, *1
S08B (gain/filter parameters symbol)	2FH	Read only, *1
S08C (extension setting parameters symbol)	30H	Read only, *1
S08D (I/O setting parameters symbol)	31H	Read only, *1
09A (write enable/disable of basic setting parameters)	32H	Read only, *1
09B (write enable/disable of gain/filter parameters)	33H	Read only, *1
09C (write enable/disable of extension setting parameters)	34H	Read only, *1
09D (write enable/disable of I/O setting parameters)	35H	Read only, *1

*1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten.
Do not change the value for "040001" on the servo amplifier side.

- Set the target device memory on the [Device Input] dialog.
 - RAM: Store to RAM.
 - EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

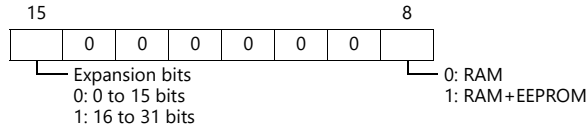
- Address No. 0 to 65535

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

- For the address number of 65536 or greater

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

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n+3 to n+10	Software version	

Return data: Data stored from servo amplifier to X1

11.2.6 MR-J3-*T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo amplifier

Extension setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting Example
PC20	SNO	Station number setting	<u>0</u> to 31
PC21	SOP	Communication function selection	<p>Response delay time 0: Invalid 1: Valid</p> <p>Baud rate 0: <u>9600</u> bps 1: 19200 bps 2: 38400 bps 3: 57600 bps 4: 115200 bps</p>

Available Device Memory

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

Device Memory	TYPE	Remarks
F01 (status display)	00H	Real number, read only
12 (external I/O signals)	03H	Double-word, partially read only, storage destination device invalid
33 (alarm history)	04H	Double-word, read only
02 (current alarm)	05H	Read only
F35 (status display at alarm occurrence)	06H	Real number, read only
42 (other commands)	0DH	Double-word, read only
81 (clear status display data)	0EH	Write only, storage destination device invalid
82 (clear alarm history)	0FH	Write only, storage destination device invalid
8B (operation mode selection)	10H	Storage destination device invalid
90 (I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92 (input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0 (test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01 (status display name and unit)	14H	Read only
04 (parameters)	15H	Storage destination device invalid
05A (basic setting parameters)	16H	Double-word, *1
05B (gain/filter parameters)	17H	Double-word, *1
05C (extension setting parameters)	18H	Double-word, *1
05D (I/O setting parameters)	19H	Double-word, *1
F05A (basic setting parameters)	1AH	Real number, *1
F05B (gain/filter parameters)	1BH	Real number, *1
F05C (extension setting parameters)	1CH	Real number, *1
F05D (I/O setting parameters)	1DH	Real number, *1
06A (basic setting parameters upper limit)	1EH	Double-word, read only, *1

Device Memory	TYPE	Remarks
06B (gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C (extension setting parameters upper limit)	20H	Double-word, read only, *1
06D (I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A (basic setting parameters upper limit)	22H	Real number, read only, *1
F06B (gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C (extension setting parameters upper limit)	24H	Real number, read only, *1
F06D (I/O setting parameters upper limit)	25H	Real number, read only, *1
07A (basic setting parameters lower limit)	26H	Double-word, read only, *1
07B (gain/filter parameters lower limit)	27H	Double-word, read only, *1
07C (extension setting parameters lower limit)	28H	Double-word, read only, *1
07D (I/O setting parameters lower limit)	29H	Double-word, read only, *1
F07A (basic setting parameters lower limit)	2AH	Real number, read only, *1
F07B (gain/filter parameters lower limit)	2BH	Real number, read only, *1
F07C (extension setting parameters lower limit)	2CH	Real number, read only, *1
F07D (I/O setting parameters lower limit)	2DH	Real number, read only, *1
S08A (basic setting parameters symbol)	2EH	Read only, *1
S08B (gain/filter parameters symbol)	2FH	Read only, *1
S08C (extension setting parameters symbol)	30H	Read only, *1
S08D (I/O setting parameters symbol)	31H	Read only, *1
09A (write enable/disable of basic setting parameters)	32H	Read only, *1
09B (write enable/disable of gain/filter parameters)	33H	Read only, *1
09C (write enable/disable of extension setting parameters)	34H	Read only, *1
09D (write enable/disable of I/O setting parameters)	35H	Read only, *1
F40 (point table: point data)	36H	Real number
50 (point table: servo motor speed)	37H	Double-word
54 (point table: acceleration time constant)	38H	Double-word
58 (point table: deceleration time constant)	39H	Double-word
60 (point table: dwell)	3AH	Double-word
64 (point table: auxiliary function)	3BH	Double-word
45 (point table: M code)	3CH	Double-word

*1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten.
Do not change the value for "040001" on the servo amplifier side.

- Set the target device memory on the [Device Input] dialog.
 - RAM: Store to RAM.
 - EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

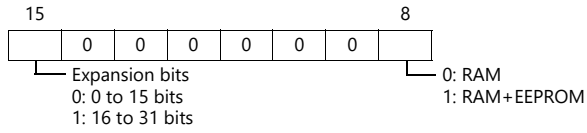
- Address No. 0 to 65535

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

- For the address number of 65536 or greater

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

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Software version	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n+3 to n+10	Software version	
Option unit parameter Read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0005H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
Option unit parameter Write	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	Command: 0084H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (low-order)	
Option unit parameter upper limit values read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0006H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter upper limit value (low-order)	
		n + 5	Parameter upper limit value (high-order)	
Option unit parameter lower limit values read	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0007H	
		n + 2	Data Type 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter lower limit value (low-order)	
		n + 5	Parameter lower limit value (high-order)	
Option unit parameter symbols read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0008H	
		n + 2	Parameter No. *1	
		n+3 to n+7	Symbols	
Option unit parameter write-enable/disable read	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0009H	
		n + 2	Parameter No. *1	
		n+3	0: Write enabled 1: Write disabled	

*1 Option unit parameter No.

Return data: Data stored from servo amplifier to X1

No.	Contents
2	MR-J3-D01 Input signal device selection 1 (CN10-21, 26)
3	MR-J3-D01 Input signal device selection 2 (CN10-27, 28)
4	MR-J3-D01 Input signal device selection 3 (CN10-29, 30)
5	MR-J3-D01 Input signal device selection 4 (CN10-31, 32)
6	MR-J3-D01 Input signal device selection 5 (CN10-33, 34)
7	MR-J3-D01 Input signal device selection 6 (CN10-35, 36)
8	MR-J3-D01 Output signal device selection 1 (CN10-46, 47)
9	MR-J3-D01 Output signal device selection 2 (CN10-48, 49)

No.	Contents
10	Function selection O-1
12	Function selection O-3
13	MR-J3-D01 Analog monitor 1 output
14	MR-J3-D01 Analog monitor 2 output
15	MR-J3-D01 Analog monitor 1 offset
16	MR-J3-D01 Analog monitor 2 offset
21	MR-J3-D01 Override offset
22	MR-J3-D01 Analog torque limit offset

11.2.7 MR-J4-*A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo amplifier

Expansion setting parameters

Parameter settings become effective when the power is turned off and on again.

(Underlined setting: default)

Parameter No.	Symbol	Item	Setting
PC20	SNO	Station number setting	0 to 31
PC21	SOP	Communication function selection	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> 0 0 </div> Baud Rate 0 : 9600 bps 1 : 19200 bps 2 : 38400 bps 3 : 57600 bps 4 : 115200 bps Response delay time 0 : Invalid 1 : Valid

Available Device Memory

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

Device Memory	TYPE	Remarks
F01 (status display)	00H	Real number, read only
12 (external I/O signals)	03H	Double-word, storage destination device invalid
33 (alarm history)	04H	Double-word, read only
02 (current alarm)	05H	Read only
F35 (status display at alarm occurrence)	06H	Real number, read only
F6C (latch data of current position)	07H	Real number, read only
6D (value of general-purpose register (Rx))	08H	Double-word
F6D (value of general-purpose register (Rx))	09H	Real number
6E (value of general-purpose register (Dx))	0AH	Double-word, storage destination device invalid
F6E (value of general-purpose register (Dx))	0BH	Real number, storage destination device invalid
42 (other commands)	0DH	Double-word, read only
81 (clear status display data)	0EH	Write only, storage destination device invalid
82 (clear alarm history)	0FH	Write only, storage destination device invalid
8B (operation mode selection)	10H	Storage destination device invalid
90 (I/O device prohibition/cancel)	11H	Write only, storage destination device invalid
92 (input device ON/OFF)	12H	Double-word, write only, storage destination device invalid
A0 (test operation mode data)	13H	Double-word, write only, storage destination device invalid
S01 (status display: names and units)	14H	Read only
04 (parameter group)	15H	Storage destination device invalid
05A (basic setting parameters)	16H	Double-word, *1

Device Memory	TYPE	Remarks
05B (gain/filter parameters)	17H	Double-word, *1
05C (extension setting parameters)	18H	Double-word, *1
05D (I/O setting parameters)	19H	Double-word, *1
F05A (basic setting parameters)	1AH	Real number, *1
F05B (gain/filter parameters)	1BH	Real number, *1
F05C (extension setting parameters)	1CH	Real number, *1
F05D (I/O setting parameters)	1DH	Real number, *1
06A (basic setting parameters upper limit)	1EH	Double-word, read only, *1
06B (gain/filter parameters upper limit)	1FH	Double-word, read only, *1
06C (extension setting parameters upper limit)	20H	Double-word, read only, *1
06D (I/O setting parameters upper limit)	21H	Double-word, read only, *1
F06A (basic setting parameters upper limit)	22H	Real number, read only, *1
F06B (gain/filter parameters upper limit)	23H	Real number, read only, *1
F06C (extension setting parameters upper limit)	24H	Real number, read only, *1
F06D (I/O setting parameters upper limit)	25H	Real number, read only, *1
07A (basic setting parameters lower limit)	26H	Double-word, read only, *1
07B (gain/filter parameters lower limit)	27H	Double-word, read only, *1
07C (extension setting parameters lower limit)	28H	Double-word, read only, *1
07D (I/O setting parameters lower limit)	29H	Double-word, read only, *1
F07A (basic setting parameters lower limit)	2AH	Real number, read only, *1
F07B (gain/filter parameters lower limit)	2BH	Real number, read only, *1
F07C (extension setting parameters lower limit)	2CH	Real number, read only, *1
F07D (I/O setting parameters lower limit)	2DH	Real number, read only, *1
S08A (basic setting parameters symbol)	2EH	Read only, *1
S08B (gain/filter parameters symbol)	2FH	Read only, *1
S08C (extension setting parameters symbol)	30H	Read only, *1
S08D (I/O setting parameters symbol)	31H	Read only, *1
09A (write enable/disable of basic setting parameters)	32H	Read only, *1
09B (write enable/disable of gain/filter parameters)	33H	Read only, *1
09C (write enable/disable of extension setting parameters)	34H	Read only, *1
09D (write enable/disable of I/O setting parameters)	35H	Read only, *1
F40 (point table: point data)	36H	Real number, *2
50 (point table: speed data)	37H	Double-word
54 (point table: acceleration time constant)	38H	Double-word
58 (point table: deceleration time constant)	39H	Double-word
60 (point table: dwell time)	3AH	Double-word
64 (point table: auxiliary function)	3BH	Double-word
45 (point table: M code)	3CH	Double-word
05E (extension setting 2 parameters)	3DH	Double-word, *1
05F (extension setting 3 parameters)	3EH	Double-word, *1
05L (linear servo/DD motor setting parameters)	3FH	Double-word, *1
05T (positioning control parameters)	40H	Double-word, *1
F05E (extension setting 2 parameters)	41H	Real number, *1
F05F (extension setting 3 parameters)	42H	Real number, *1
F05L (linear servo/DD motor parameters)	43H	Real number, *1
F05T (positioning control parameters)	44H	Real number, *1
06E (extension setting 2 parameters upper limit)	45H	Double-word, read only, *1
06F (extension setting 3 parameters upper limit)	46H	Double-word, read only, *1
06L (linear servo/DD motor parameters upper limit)	47H	Double-word, read only, *1
06T (positioning control parameters upper limit)	48H	Double-word, read only, *1
F06E (extension setting 2 parameters upper limit)	49H	Real number, read only, *1
F06F (extension setting 3 parameters upper limit)	4AH	Real number, read only, *1
F06L (linear servo/DD motor parameters upper limit)	4BH	Real number, read only, *1
F06T (positioning control parameters upper limit)	4CH	Real number, read only, *1
07E (extension setting 2 parameters lower limit)	4DH	Double-word, read only, *1
07F (extension setting 3 parameters lower limit)	4EH	Double-word, read only, *1
07L (linear servo/DD motor parameters lower limit)	4FH	Double-word, read only, *1
07T (positioning control parameters lower limit)	50H	Double-word, read only, *1
F07E (extension setting 2 parameters lower limit)	51H	Real number, read only, *1
F07F (extension setting 3 parameters lower limit)	52H	Real number, read only, *1
F07L (linear servo/DD motor parameters lower limit)	53H	Real number, read only, *1

Device Memory	TYPE	Remarks
F07T (positioning control parameters lower limit)	54H	Real number, read only, *1
S08E (extension setting 2 parameters symbol)	55H	Read only, *1
S08F (extension setting 3 parameters symbol)	56H	Read only, *1
S08L (linear servo/DD motor parameters symbol)	57H	Read only, *1
S08T (positioning control parameters symbol)	58H	Read only, *1
09E (write enable/disable of extension setting 2 parameters)	59H	Read only, *1
09F (write enable/disable of extension setting 3 parameters)	5AH	Read only, *1
09L (write enable/disable of linear servo/DD motor parameters)	5BH	Read only, *1
09T (write enable/disable of positioning control parameters)	5CH	Read only, *1
1A (latch display of current position)	5DH	Double-word, read only
F1A (latch display of current position)	5EH	Real number, read only
6F (number of general-purpose registers)	5FH	Double-word, read only
40 (other commands 2)	60H	Read only

- *1 When accessing a device memory of a parameter group differing from the previous access, the value for parameter group specification "040001" is automatically overwritten. Do not change the value for "040001" on the servo amplifier side.
- *2 The possible setting range changes according to the third digit of "05T0001" (point data unit) and the first digit of "05T0003" (feed length magnification (STM)). Write data upon checking "05T0001" and "05T0003".

- Specify the storage target device memory address on the [Device Input] dialog.
 - RAM: Store to RAM.
 - EEPROM: Store to RAM and EEPROM.

Indirect Device Memory Designation

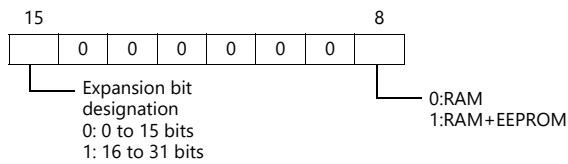
- Address No. 0 to 65535

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

- For the address number of 65536 or greater

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

* Expansion code



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Software version	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0002H	
		n + 2	Data No. 0070H	
		n + 3 to n + 10	Software version	
Option unit parameter read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0005H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
Option unit parameter write	1 to 8 (PLC1 to 8)	n	Target Port No.	7
		n + 1	Command: 0084H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter (low-order)	
		n + 5	Parameter (high-order)	
		n + 6	Write area 0: RAM 1: EEPROM	
Option unit parameter upper limit values read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0006H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter upper limit value (low-order)	
		n + 5	Parameter upper limit value (high-order)	
Option unit parameter lower limit values read	1 to 8 (PLC1 to 8)	n	Target Port No.	4
		n + 1	Command: 0007H	
		n + 2	Display format 0: Normal 1: Real number (decimal)	
		n + 3	Parameter No. *1	
		n + 4	Parameter lower limit value (low-order)	
		n + 5	Parameter lower limit value (high-order)	
Option unit parameter symbols read	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0008H	
		n + 2	Parameter No. *1	
		n + 3 to n + 7	Symbols	
Option unit parameter write-enable/disable read	1 to 8 (PLC1 to 8)	n	Target Port No.	3
		n + 1	Command: 0009H	
		n + 2	Parameter No. *1	
		n + 3	0: Write enabled 1: Write disabled	

Return data: Data stored from servo amplifier to X1

*1 Option unit parameter No.

Error numbers	Contents
2	MR-D01 Input signal device selection 1
3	MR-D01 Input signal device selection 2
4	MR-D01 Input signal device selection 3
5	MR-D01 Input signal device selection 4
6	MR-D01 Input signal device selection 5
7	MR-D01 Input signal device selection 6
8	MR-D01 Output signal device selection 1
9	MR-D01 Output signal device selection 2
10	Function selection O-1
11	Function selection O-2

Error numbers	Contents
12	Function selection O-3
13	MR-D01 Analog monitor 1 output
14	MR-D01 Analog monitor 2 output
15	MR-D01 Analog monitor 1 offset
16	MR-D01 Analog monitor 2 offset
21	MR-D01 Override offset
22	MR-D01 Analog torque limit offset
28	MR-D01 Input signal device selection 7
29	MR-D01 Input signal device selection 8

11.2.8 FR-E700

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
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

When setting run commands and set frequency commands from X1, select the Network operation mode. For more information, refer to the Instruction Manual (Applied) of inverter.

Be sure to reset the inverter after making the initial settings of the parameters. Otherwise, communication is not possible.

(Underlined setting: default)

Parameter No.	Item	Setting	Setting Example
77	Parameter writing permission	<u>0: Writing allowed when PU operation stops</u> 1: Writing prohibited 2: Writing allowed during operation	2
79	Operation mode selection *3	<u>0</u> / 1 / 2 / 3 / 4 / 6 / 7	2 : External operation mode
117	PU communication station number	<u>0</u> to 31	0
118	PU communication speed	4800 / 9600 / <u>19200</u> / 38400bps	19200 bps
119	PU communication stop bit length (data length)	0: 8 bits / 1 bit <u>1: 8 bits / 2 bits</u> 10: 7 bits / 1 bit 11: 7 bits / 2 bits	1
120	PU communication parity check	0: None 1: Odd <u>2: Even</u>	2
121	Number of PU communication retries	0 to 10 / 9999	9999: The inverter does not stop even if a communication alarm occurs.
122	PU communication check time interval	<u>0</u> *1 0.1 to 999.8 *2 9999	9999: No communication check
123	PU communication waiting time setting	0 to 150 / <u>9999</u>	9999: Can be set with the communication data
124	PU communication CR/LF selection	0: Without CR/LF <u>1: With CR</u> 2: With CR/LF	1
338	Communication operation command source	<u>0: communication</u> 1: external	0
339	Communication speed command source	<u>0: communication</u> 1: external (communication invalid) 2: external (communication valid)	0
340	Communication startup mode selection *3	<u>0: As set in Pr.79</u> 1: Network operation mode 10: Network operation mode *4	1
549	Protocol selection	<u>0: Mitsubishi inverter protocol</u> 1: Modbus-RTU protocol	0
550	NET mode operation command source selection	0: communication option 2: PU connector <u>9999: Automatic communication option recognition</u>	9999 When using a communication option set 2.
551	PU mode operation command source selection	2: PU connector 3: USB connector 4: Operation panel <u>9999: USB automatic recognition</u>	9999

- *1 RS-485 communication is possible. Note that a communication fault (E.PUE) occurs as soon as the inverter is switched to the operation mode with command source.
- *2 When the value in the range from 0.1 to 999.8 is set:
If the X1 does not start communication within the preset time, the inverter stops due to an alarm. This can be avoided by the periodical reading setting.
- *3 When the inverter is turned on with the settings of Pr.79=0/2/6 and Pr.340=1, the inverter enters in the Network operation mode.
- *4 Operation mode can be changed between the PU operation mode and Network operation mode from the operation panel.

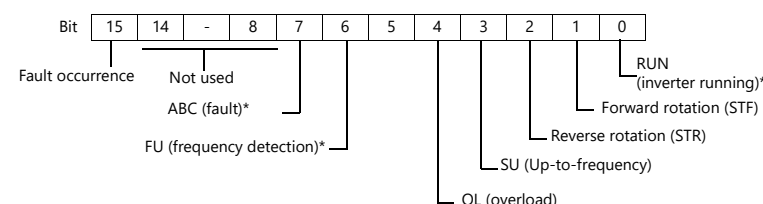
Available Device Memory

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

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

D (Parameter)

Address	Name																																																																																																											
D0	Operation mode 0000 H: Network operation 0001 H: External operation 0002 H: PU operation																																																																																																											
D1	Pr.37=0 : Frequency display, setting Pr.37≠0 : Machine speed at 60 Hz																																																																																																											
D2	Output current																																																																																																											
D3	Output voltage																																																																																																											
D4	Fault description (First fault in past / Latest fault)																																																																																																											
D5	Fault description (Third fault in past / Second fault in past)																																																																																																											
D6	Fault description (Fifth fault in past / Fourth fault in past)																																																																																																											
D7	Fault description (Seventh fault in past / Sixth fault in past)																																																																																																											
D8	<p>Inverter status monitor</p> <p>* Definitions change according to the Pr.190 to 192.</p>																																																																																																											
D9	Second parameter changing																																																																																																											
D10	Special monitor																																																																																																											
D11	<p>Special monitor selection No.</p> <table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th>Data</th> <th>Contents</th> <th>Unit</th> </tr> </thead> <tbody> <tr><td>H01</td><td>Output frequency / speed</td><td>0.01 Hz / 0.001</td></tr> <tr><td>H02</td><td>Output current</td><td>0.01 A</td></tr> <tr><td>H03</td><td>Output voltage</td><td>0.1V</td></tr> <tr><td>H05</td><td>Frequency setting / speed setting</td><td>0.01 HZ / 0.001</td></tr> <tr><td>H07</td><td>Motor torque</td><td>0.1 %</td></tr> <tr><td>H08</td><td>Converter output voltage</td><td>0.1 V</td></tr> <tr><td>H09</td><td>Regenerative brake duty</td><td>0.1 %</td></tr> <tr><td>H0A</td><td>Electric thermal relay function load factor</td><td>0.1 %</td></tr> <tr><td>H0B</td><td>Output current peak value</td><td>0.01 A</td></tr> <tr><td>H0C</td><td>Converter output voltage peak value</td><td>0.1 V</td></tr> <tr><td>H0E</td><td>Output power</td><td>0.01 kW</td></tr> <tr><td>H0F</td><td>Input terminal status^{*1}</td><td>-</td></tr> </tbody> </table> <table border="1" style="display: inline-table;"> <thead> <tr> <th>Data</th> <th>Contents</th> <th>Unit</th> </tr> </thead> <tbody> <tr><td>H10</td><td>Output terminal status^{*2}</td><td>-</td></tr> <tr><td>H14</td><td>Cumulative energization time</td><td>1 h</td></tr> <tr><td>H17</td><td>Actual operating time</td><td>1 h</td></tr> <tr><td>H18</td><td>Motor load factor</td><td>0.1%</td></tr> <tr><td>H19</td><td>Cumulative power</td><td>1 kWh</td></tr> <tr><td>H34</td><td>PID set point</td><td>0.1 %</td></tr> <tr><td>H35</td><td>PID measured value</td><td>0.1 %</td></tr> <tr><td>H36</td><td>PID deviation</td><td>0.1 %</td></tr> <tr><td>H3A</td><td>Option input terminal status1^{*3}</td><td>-</td></tr> <tr><td>H3B</td><td>Option input terminal status2^{*3}</td><td>-</td></tr> <tr><td>H3C</td><td>Option output terminal status^{*3}</td><td>-</td></tr> </tbody> </table> <p>*1 Input terminal status</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>RES</td><td>-</td><td>MRS</td><td>-</td><td>RH</td><td>RM</td><td>RL</td><td>-</td><td>-</td><td>STR</td><td>STF</td> </tr> </table> <p>*2 Output terminal status</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>ABC</td><td>FU</td><td>-</td><td>-</td><td>-</td><td>RUN</td> </tr> </table> <p>*3 Refer to the manual of the inverter.</p>	Data	Contents	Unit	H01	Output frequency / speed	0.01 Hz / 0.001	H02	Output current	0.01 A	H03	Output voltage	0.1V	H05	Frequency setting / speed setting	0.01 HZ / 0.001	H07	Motor torque	0.1 %	H08	Converter output voltage	0.1 V	H09	Regenerative brake duty	0.1 %	H0A	Electric thermal relay function load factor	0.1 %	H0B	Output current peak value	0.01 A	H0C	Converter output voltage peak value	0.1 V	H0E	Output power	0.01 kW	H0F	Input terminal status ^{*1}	-	Data	Contents	Unit	H10	Output terminal status ^{*2}	-	H14	Cumulative energization time	1 h	H17	Actual operating time	1 h	H18	Motor load factor	0.1%	H19	Cumulative power	1 kWh	H34	PID set point	0.1 %	H35	PID measured value	0.1 %	H36	PID deviation	0.1 %	H3A	Option input terminal status1 ^{*3}	-	H3B	Option input terminal status2 ^{*3}	-	H3C	Option output terminal status ^{*3}	-	-	-	-	-	-	RES	-	MRS	-	RH	RM	RL	-	-	STR	STF	-	-	-	-	-	-	-	-	-	-	ABC	FU	-	-	-	RUN
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H17	Actual operating time	1 h																																																																																																										
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H3C	Option output terminal status ^{*3}	-																																																																																																										
-	-	-	-	-	RES	-	MRS	-	RH	RM	RL	-	-	STR	STF																																																																																													
-	-	-	-	-	-	-	-	-	-	ABC	FU	-	-	-	RUN																																																																																													

Address	Name
D12	<p>Inverter status monitor (expansion)</p>  <p>* Definitions change according to the Pr.190 to 192.</p>

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)					F2	
Read set frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number					2
		n + 1	Command: 006EH					
		n + 2	0 to 65535Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001					
Read set frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number					2
		n + 1	Command: 006DH					
		n + 2	0 to 65535Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001					
Write set frequency (EEPROM)	1 - 8 (PLC1 - 8)	n	Station number					3
		n + 1	Command: 00EEH					
		n + 2	0 to 40000Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001					
Write set frequency (RAM)	1 - 8 (PLC1 - 8)	n	Station number					3
		n + 1	Command: 00EDH					
		n + 2	0 to 40000Hz Pr.37=0 Set frequency in 0.01Hz Pr.37≠0 Speed 0.001					
Inverter reset	1 - 8 (PLC1 - 8)	n	Station number					3
		n+1	Command: 00FDH					
		n + 2	9696H: Makes the inverter reset without reply after receiving command. 9966H: Returns ACK and makes the inverter reset after receiving a command.					
All parameter clear	1 - 8 (PLC1 - 8)	n	Station number					3
		n + 1	Command: 00FCH					
		n + 2	Pr.	Communication Pr.	Calibration Pr.	Other Pr.	00ECH 00F3H 00FFH	
			Data					
			9696H *1	○	×	○	○	
9966H *1	○		○	○	○			
5A5AH	×	×	○	○				
55AAH	×	○	○	○				

Contents	F0	F1 (= \$u n)	F2
Write run command (Expansion)	1 - 8 (PLC1 - 8)	n	Station number
		n + 1	Command: 00F9H
		n + 2	0000H: stop
		3	
Write run command	1 - 8 (PLC1 - 8)	n	Station number
		n + 1	Command: 00FAH
		n + 2	0000H: stop
		3	
All alarms clear	1 - 8 (PLC1 - 8)	n	Station number
		n + 1	Command: 00F4H
			2

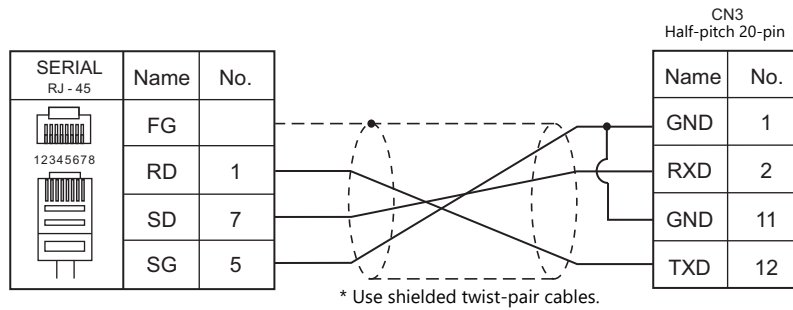
Return data: Data stored from inverter to X1

- *1 When executing this command, the setting values of communication parameter for X1 series are also returned to the initial values. Set the parameter again.
- *2 The description changes depending on the setting of Pr.180 to 184.

11.2.9 Wiring Diagrams

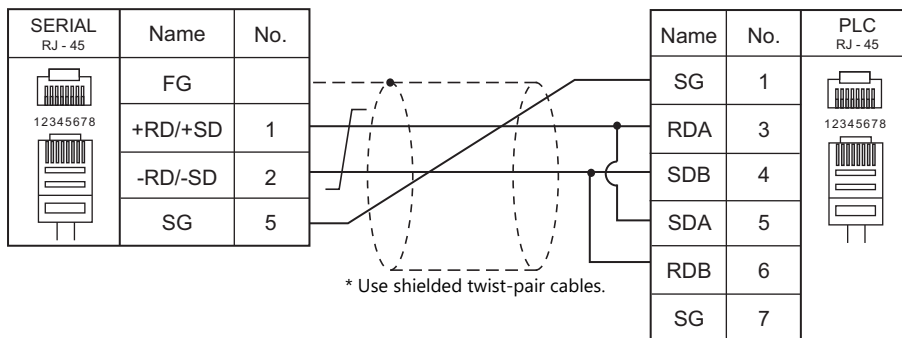
RS-232C

Wiring diagram 1 - M2

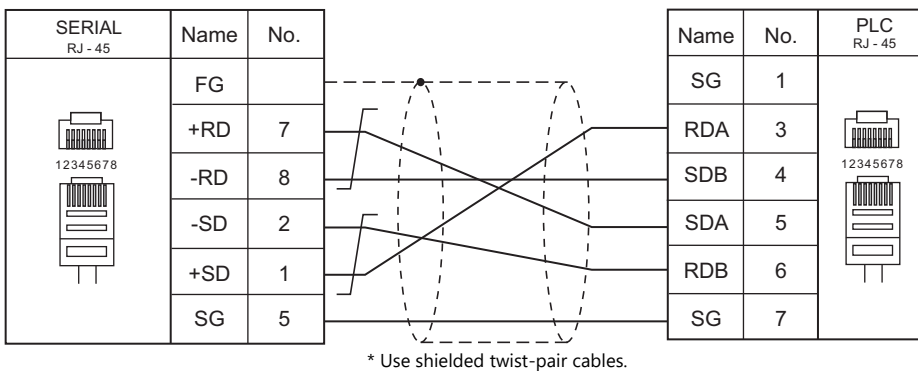


RS-422/RS-485

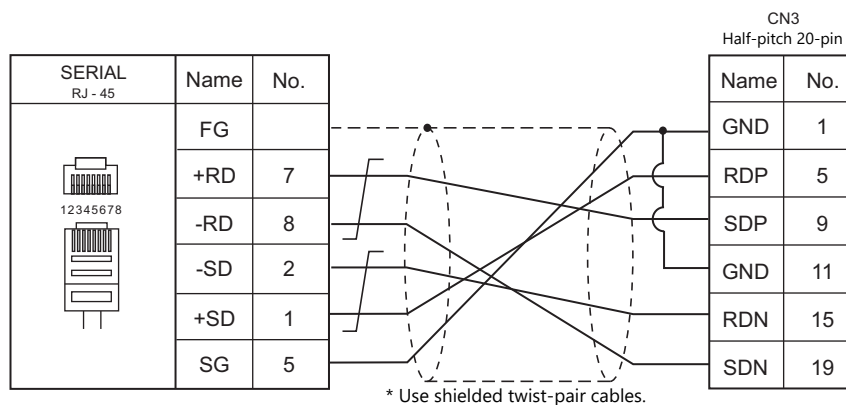
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



12. MODICON

12.1 PLC Connection

12.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	Connection	
					RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)
Modbus RTU	Quantum	140 CPU 113 02 140 CPU 113 03 140 CPU 331 10 140 CPU 434 12A 140 CPU 434 12B 140 CPU 434 12U 140 CPU 534 14U 140 CPU 651 50 140 CPU 651 60 140 CPU 671 60(HSBY)	COMM1	RS-232C	Wiring diagram 1 - M2	×

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

12.1.1 Modbus RTU

Communication Setting

Editor

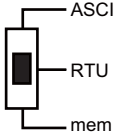
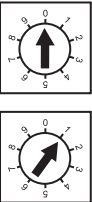
Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> :1	
Signal Level	<u>RS-232C</u>	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Length	<u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>1</u> to 247	

PLC

Communication setting

Switch	Setting	Contents	Remarks																			
	Communication setting	RTU	9600 bps, 8 bits, 1 bit, even (fixed)																			
 Example: Station No. 1	Device address	1 to 64		When the communication setting switch is set to "mem", the parameters set in the PLC programming software take effect. (Communication at 19200 bps maximum is allowed.) For more information, refer to the PLC manual issued by the manufacturer.																		
		<table border="1"> <thead> <tr> <th>Station No. (1 to 64)</th> <th>SW1 (the tens place)</th> <th>SW2 (the ones place)</th> </tr> </thead> <tbody> <tr> <td>1 to 9</td> <td>0</td> <td>1 to 9</td> </tr> <tr> <td>10 to 19</td> <td>1</td> <td rowspan="4">0 to 9</td> </tr> <tr> <td>20 to 29</td> <td>2</td> </tr> <tr> <td>30 to 39</td> <td>3</td> </tr> <tr> <td>40 to 49</td> <td>4</td> </tr> <tr> <td>50 to 59</td> <td>5</td> <td rowspan="2">0 to 4</td> </tr> <tr> <td>60 to 64</td> <td>6</td> </tr> </tbody> </table>	Station No. (1 to 64)		SW1 (the tens place)	SW2 (the ones place)	1 to 9	0	1 to 9	10 to 19	1	0 to 9	20 to 29	2	30 to 39	3	40 to 49	4	50 to 59	5	0 to 4	60 to 64
Station No. (1 to 64)	SW1 (the tens place)	SW2 (the ones place)																				
1 to 9	0	1 to 9																				
10 to 19	1	0 to 9																				
20 to 29	2																					
30 to 39	3																					
40 to 49	4																					
50 to 59	5	0 to 4																				
60 to 64	6																					

Available Device Memory

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

Device Memory	TYPE	Remarks
4 (holding register)	00H	
3 (input register)	01H	Read only
0 (output coil)	04H	
1 (input relay)	06H	Read only

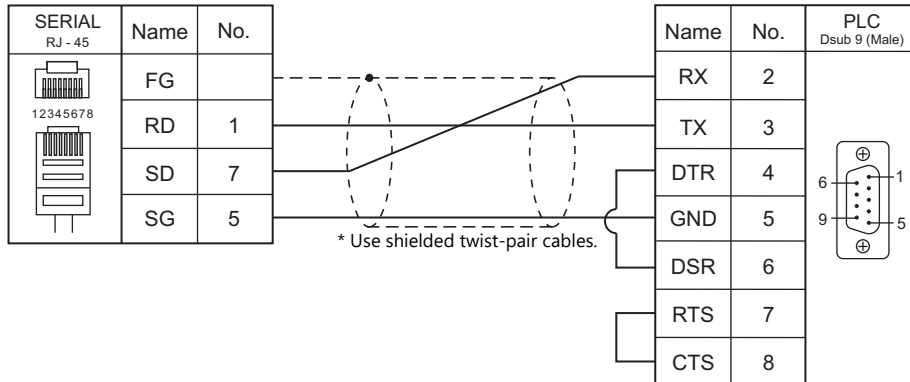
Notes on Creating Screen Programs

On the editor, the device memory address is specified in decimal notation. Thus, when the address of a connected device is expressed in hexadecimal notation, convert the address into decimal one and add "1".

12.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



13. MOELLER

13.1 PLC Connection

13.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)
PS4	PS4-141-MM1 PS4-151-MM1 PS4-201-MM1 PS4-201-MM5 PS4-271-MM1 PS4-341-MM1	PRG port	RS-232C	Wiring diagram 1 - M2 or MOELLER's "ZB4-303-KB1" + Wiring diagram 2 - M2	×

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

13.1.1 PS4

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u>	
Baud Rate	<u>9600 bps</u>	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>None</u>	

PLC

PRG port

The communication parameters are fixed; baud rate: 9600 bps, signal level: RS-232C, data length: 8 bits, stop bit: 1 bit, parity: none.

For establishing communication with the X1 series, register a device memory in the PLC software "S40". For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

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

Device Memory	TYPE	Remarks
MW (Merker)	00H	M as bit device *1

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

- Word device

Example: MW200

↑
Address number
(even number only)

- Bit device

Example: M200.0

↑ ↑
Bit number: 0 to 7
Period
Byte address number

Indirect Device Memory Designation

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

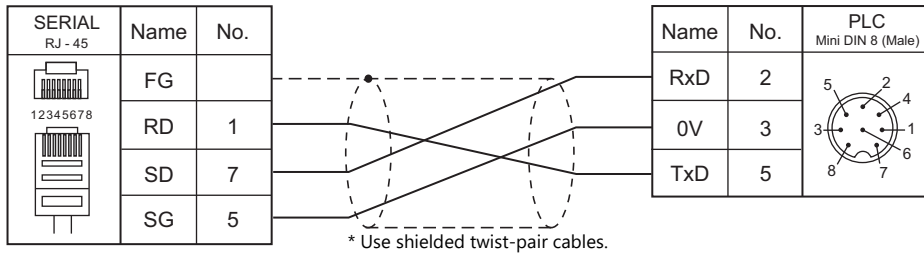
*1 Word designation
Specify an address number divided by "2".
Example: In the case of MW10, specify "5" (10 divided by 2) for the address number.

*2 Bit designation
Example: In the case of bits 0 to 7 of MW10, specify "5" for the address number and "0" to "7" for the bit designation.
Example: In the case of bits 0 to 7 of MW11, specify "5" for the address number and "8" to "15" for the bit designation.

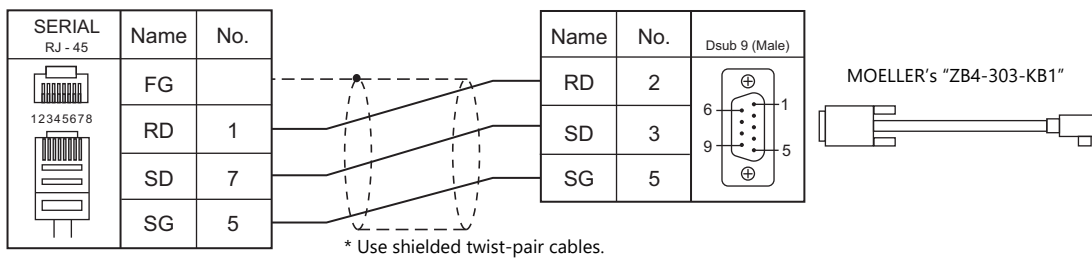
13.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



Wiring diagram 2 - M2



14. MOOG

14.1 Temperature Controller/Servo/Inverter Connection

14.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Servo Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)	RS-422 (4-wire) ^{*1}	
J124-04x series	J124-04x	CN1	RS-422	×	Wiring diagram 1 - M4	MOOG.List

*1 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

14.1.1 J124-04x Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

J124-04x

Be sure to match the settings to those made under [Communication Setting] of the editor.
For more information, refer to the instruction manual for the digital controller issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.

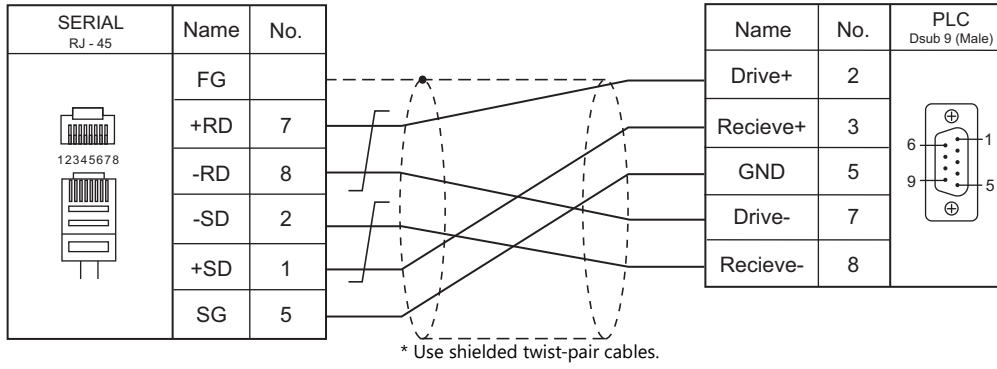
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
(parameter)	00H	Double-word

14.1.2 Wiring Diagrams

RS-422/RS-485

Wiring diagram 1 - M4



15. M-SYSTEM

15.1 Temperature Controller/Servo/Inverter Connection

15.1 Temperature Controller/Servo/Inverter Connection

Remote I/O

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)	
R1M series (MODBUS RTU)	R1M series	D-sub connector	RS-232C	Wiring diagram 1 - M2	×	MSYS_R1M.Lst
		Terminal block	RS-485	Wiring diagram 1 - M4	×	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

15.1.1 R1M Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Remote I/O

Make PLC settings by using the software "R1CON". For more information, refer to the PLC manual issued by the manufacturer.

Modbus settings (RTU)

(Underlined setting: default)

Item	Setting	Remarks
Node Address	<u>1</u> to F H (= 1 to 15)	Set by the address setting rotary switch.
Baud Rate	9600 / 19200 / <u>38400</u> bps	
Bit Length	8 bits	
Parity	NONE / <u>ODD</u> / EVEN	
Stop Bit	<u>1</u> / 2 bits	

Available Device Memory

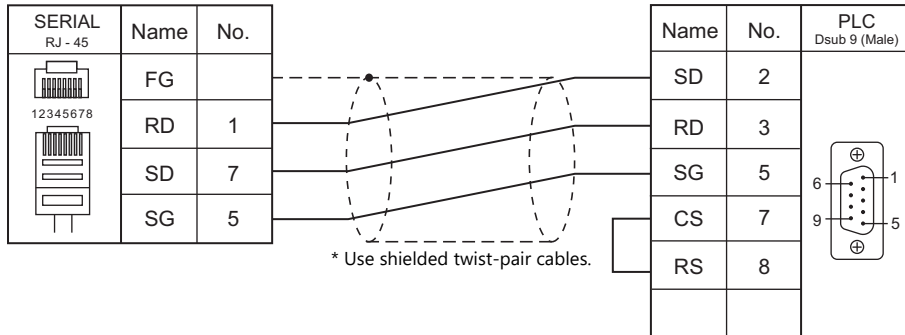
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

15.1.2 Wiring Diagrams

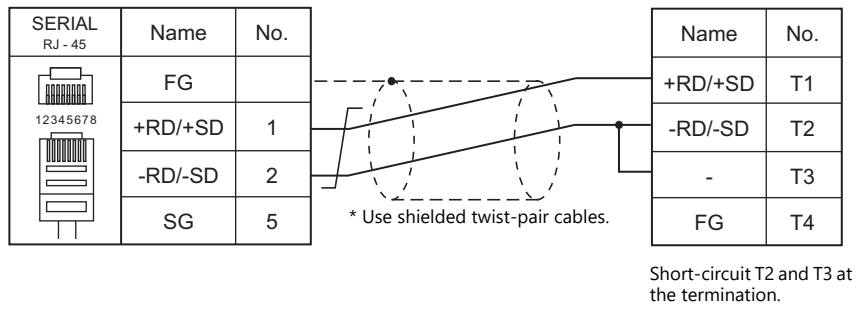
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



16. NITTOKU

16.1 Temperature Controller/Servo/Inverter Connection

16.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

RFID reader/writer

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
ITS-HRW110	ITS-HRW110	Wiring connector jack	RS-485	Wiring diagram 1 - M4	×	ITS-HRW110 .Lst

*1 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

16.1.1 ITS-HRW110

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	RS-422/485	
Baud Rate	9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bit	
Parity	<u>None</u> / Odd / Even	
Target Port No.	0 to 255	255: Only 1:1 available. Communication is possible regardless of the station number setting of the device.
Protocol Setting	0:ISO15693, low(6.62kbps), single 1/4 1:ISO15693, low(6.62kbps), single 1/256 2:ISO15693, high(26.48kbps), single 1/4 3:ISO15693, high(26.48kbps), single 1/256 4:ISO15693, low(6.67kbps), double 1/4 5:ISO15693, low(6.67kbps), double 1/256 6:ISO15693, high(26.69kbps), double 1/4 7:ISO15693, high(26.69kbps), double 1/256	
Number of bytes per block	1 to 32	*1

*1 The number of bytes per block varies depending on the tag used.

- 1) ITS-HTG21F52K, ITS-HTG61F52K, ITS-HTG81F52K, or the tag using Fujitsu MB89R118C as a tag IC
Number of bytes per block: 8
- 2) ITS-HTG12N5K or the tag using NXP I-CODE SLI SL2 ICS 20 as a tag IC
Number of bytes per block: 4

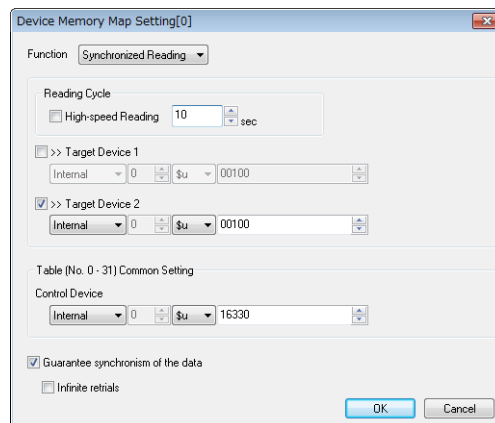
When using a tag other than 1) and 2) above, set it according to the specifications of the tag IC.

Device memory map setting

Reading or writing to/from the tag data can be performed by using the [Synchronized Reading/Synchronized Writing] function of the device memory map.

- Synchronized reading

Reading starts when the control device memory (command bit) is set (ON). Reading is performed at specified cycles until the control device memory (acknowledge bit) is set (ON).



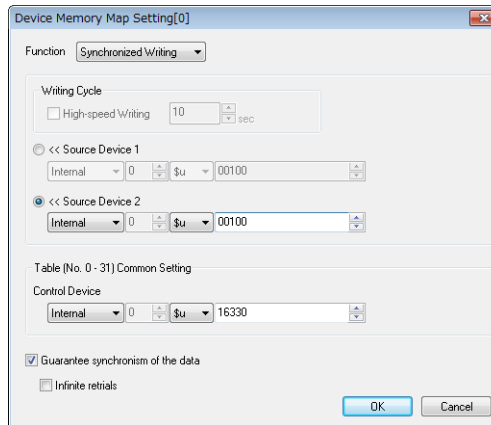
Item	Contents
Reading Cycle	The data at the device memory addresses registered in the device memory map is read when the control device memory (command bit) is set (ON). Reading of data is repeated at specified cycles until the data is read correctly. When the data has correctly been read, the control device memory (acknowledge bit) is set (ON) and reading operation finishes. *1
Control Device	Enter a device memory address as the trigger for synchronized reading. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.

Item	Contents
Guarantee synchronism of the data	When the box is checked, retry is made until the first data in the device memory map is read correctly. *2 *3 Check the status/error codes at \$Pn 356 to 451 to confirm whether or not reading of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data in the device memory map is read correctly. *3 Status/error codes are stored in \$Pn 356 to 451.

- *1 When both [Guarantee synchronism of the data] and [Infinite retrials] are not checked, the acknowledge bit is set (ON) when reading of any data at the device memory address registered in the device memory map has been completed successfully.
- *2 Set the device memory address of the same station number in the device memory map.
- *3 This setting is invalid when the macro command "TBL_READ" is executed.

• Synchronized writing

Writing starts when the control device memory (command bit) is set (ON). When writing has been finished, the control device memory (acknowledge bit) is set (ON).



Item	Contents
Writing Cycle	The data is written into the device memory addresses registered in the device memory map when the control device memory (command bit) is set (ON). When writing of data finishes, the control device memory (acknowledge bit) is set (ON) regardless of the result of the writing status.
Control Device	Enter a device memory address as the trigger for synchronized writing. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data is correctly written into the address registered in the device memory map. *1*2*3 Check the status/error codes at \$Pn 356 to 451 to confirm whether or not writing of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data is correctly written into the addresses registered in the device memory map. *2 Status/error codes are stored in \$Pn 356 to 451.

- *1 Set the device memory address of the same station number in the device memory map.
- *2 This setting is invalid when the macro command "TBL_WRITE" is executed.
- *3 Since data is read/written in blocks, data concurrency may not be guaranteed when writing, regardless of whether "Guarantee synchronism of the data" is checked or not. To ensure data concurrency at the time of writing, it is necessary to set the range from the start to the end of writing to the number of bytes per block in one table.

ITS-HRW110

Make the settings using the tool software "ITS-INIT". For more information, refer to the Intelligent R/W users manual.

(Underlined setting: default)

Item	Setting	Remarks
Change communication settings	Baud rate	9600 / 19200 / 38400 / 57600 / <u>115,200</u> bps
	Data	7 / <u>8</u> bits
	Parity	<u>none</u> / odd / even
	Stop	<u>1</u> / 2 bits
Change device ID	Device ID	<u>0</u> to 254
RF setting	Protocol	ISO15693, low, single 1/4 ISO15693, low, single 1/256 <u>ISO15693, high, single 1/4</u> ISO15693, high, single 1/256 ISO15693, low, double 1/4 ISO15693, low, double 1/256 ISO15693, high, double 1/4 ISO15693, high, double 1/256

Available Device Memory

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

Device Memory	TYPE	Remarks
D (data in tags)	00H	

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

Indirect Device Memory Designation

- For the address number of 0 to 65535:

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

- For the address number of 65536 or greater:

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

- * When specifying the byte address of device D, convert it to a word as follows.

Indirect device No. (address) = target byte address/2

Indirect bit designation = [(Target byte address % 2)x8] + bit value (% is a remainder)

e.g.) If the target byte address is D:0011.7,

Indirect device No. (address) = 11/2 = 5

Indirect Bits Specified = [(11 % 2)x8]+7 = (1x8)+7 = 15

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2	
Protocol verification	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: 1 (HEX)	
		n + 2	Primary protocol selection 1: ISO15693	
		n + 3	Sub protocol selection 0:ISO15693, low(6.62kbps), single 1/4 1:ISO15693, low(6.62kbps), single 1/256 2:ISO15693, high(26.48kbps), single 1/4 3:ISO15693, high(26.48kbps), single 1/256 4:ISO15693, low(6.67kbps), double 1/4 5:ISO15693, low(6.67kbps), double 1/256 6:ISO15693, high(26.69kbps), double 1/4 7:ISO15693, high(26.69kbps), double 1/256	
RX Input change *1	1 to 8 (PLC1 to 8)	n	Station number	4
		n + 1	Command: 4 (HEX)	
		n + 2	RX Input dynamic change 0: OFF 1: ON	
		n + 3	RX Input selection 0: RX_IN1 1: RX_IN2	
RX Input verification	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: 5 (HEX)	
		n + 2	RX Input dynamic change 0: OFF 1: ON	
		n + 3	RX Input selection 0: RX_IN1 1: RX_IN2	

Contents	F0	F1 (= \$u n)	F2										
ISO15693 Inventory (Notify both DSFID and UID)	1 to 8 (PLC1 to 8)	n	Station number	4/5 *2									
		n + 1	Command: 1F (HEX)										
		n + 2	Request flag <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>Bit</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> </table> </div> <div style="margin-left: 100px;"> Sub-Carrier flag 0: For "single" protocol setting. 1: For "double" protocol setting. Data rate flag 0: For "low" protocol setting. 1: For "high" protocol setting. Inventory flag: 1 fixed Protocol Extension flag 0: No protocol format extension 1: Protocol format is extended AFI flag 0: AFI field is not present 1: AFI field is present Nb slots flag: 1 fixed (1 slot) Option flag 0: Command option not supported 1: Command option supported 0 fixed </div>		Bit	7	6	5	4	3	2	1	0
		Bit	7		6	5	4	3	2	1	0		
		n + 3	TCMD: 1										
		n + 4	AFI *2										
		n + 5	Number of data: 1										
		n + 6	DSFID										
n + 7 to n + 10	UID (binary code)												
ISO15693 Inventory (Notify UID only)	1 to 8 (PLC1 to 8)	n	Station number	4/5 *2									
		n + 1	Command: 20 (HEX)										
		n + 2	Request flag <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>Bit</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> </table> </div> <div style="margin-left: 100px;"> Sub-Carrier flag 0: For "single" protocol setting. 1: For "double" protocol setting. Data rate flag 0: For "low" protocol setting. 1: For "high" protocol setting. Inventory flag: 1 fixed Protocol Extension flag 0: No protocol format extension 1: Protocol format is extended AFI flag 0: AFI field is not present 1: AFI field is present Nb slots flag: 1 fixed (1 slot) Option flag 0: Command option not supported 1: Command option supported 0 fixed </div>		Bit	7	6	5	4	3	2	1	0
		Bit	7		6	5	4	3	2	1	0		
		n + 3	TCMD: 1										
		n + 4	AFI *2										
n + 5	Number of data: 1												
n + 6 to n + 9	UID (binary code)												

Contents	F0	F1 (= \$u n)	F2																																																													
ISO15693 general-purpose command (pass-through)	1 to 8 (PLC1 to 8)	n	Station number	Variable																																																												
		n + 1	Command: 21 (HEX)																																																													
		n + 2	Number of requested words: number of words used from n + 3 through n + m (variable)																																																													
		n + 3	Request flag <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="padding: 2px;">7</td><td style="padding: 2px;">6</td><td style="padding: 2px;">5</td><td style="padding: 2px;">4</td><td style="padding: 2px;">3</td><td style="padding: 2px;">2</td><td style="padding: 2px;">1</td><td style="padding: 2px;">0</td> </tr> </table> </div> <div style="margin-left: 100px;"> Sub-Carrier flag 0: For "single" protocol setting. 1: For "double" protocol setting. Data rate flag 0: For "low" protocol setting. 1: For "high" protocol setting. Inventory flag: 0 fixed Protocol Extension flag 0: No protocol format extension 1: Protocol format is extended Select flag 0: Request shall be executed by any VICC according to the setting of Address flag 1: Request shall be executed only by VICC in selected state Address flag 0: UID field is not present 1: UID field is present Option flag 0: Command option not supported 1: Command option supported 0 fixed </div>		7	6	5	4	3	2	1	0																																																				
		7	6		5	4	3	2	1	0																																																						
		n + 4	TCMD ^{*4} <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e6e6fa;">Command Code (HEX)</th> <th style="background-color: #e6e6fa;">Type</th> <th style="background-color: #e6e6fa;">Function</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">01</td><td>Mandatory</td><td>Inventory</td></tr> <tr><td style="text-align: center;">02</td><td>Mandatory</td><td>Stay Quiet</td></tr> <tr><td style="text-align: center;">03 - 1F</td><td>Mandatory</td><td>RFU</td></tr> <tr><td style="text-align: center;">20</td><td>Optional</td><td>Read Single Block</td></tr> <tr><td style="text-align: center;">21</td><td>Optional</td><td>Write Single Block</td></tr> <tr><td style="text-align: center;">22</td><td>Optional</td><td>Lock Block</td></tr> <tr><td style="text-align: center;">23</td><td>Optional</td><td>Read Multiple Blocks</td></tr> <tr><td style="text-align: center;">24</td><td>Optional</td><td>Write Multiple Blocks</td></tr> <tr><td style="text-align: center;">25</td><td>Optional</td><td>Select</td></tr> <tr><td style="text-align: center;">26</td><td>Optional</td><td>Reset to Ready</td></tr> <tr><td style="text-align: center;">27</td><td>Optional</td><td>Write Address</td></tr> <tr><td style="text-align: center;">28</td><td>Optional</td><td>Lock Address</td></tr> <tr><td style="text-align: center;">29</td><td>Optional</td><td>Write DSFID</td></tr> <tr><td style="text-align: center;">2A</td><td>Optional</td><td>Lock DSFID</td></tr> <tr><td style="text-align: center;">2B</td><td>Optional</td><td>Get System Information</td></tr> <tr><td style="text-align: center;">2C</td><td>Optional</td><td>Get Multiple Block Security Status</td></tr> <tr><td style="text-align: center;">2D - 9F</td><td>Optional</td><td>RFU</td></tr> <tr><td style="text-align: center;">A0 - DF</td><td>Optional</td><td>IC Mfg dependent</td></tr> <tr><td style="text-align: center;">E0 - FF</td><td>Proprietary</td><td>IC Mfg dependent</td></tr> </tbody> </table>		Command Code (HEX)	Type	Function	01	Mandatory	Inventory	02	Mandatory	Stay Quiet	03 - 1F	Mandatory	RFU	20	Optional	Read Single Block	21	Optional	Write Single Block	22	Optional	Lock Block	23	Optional	Read Multiple Blocks	24	Optional	Write Multiple Blocks	25	Optional	Select	26	Optional	Reset to Ready	27	Optional	Write Address	28	Optional	Lock Address	29	Optional	Write DSFID	2A	Optional	Lock DSFID	2B	Optional	Get System Information	2C	Optional	Get Multiple Block Security Status	2D - 9F	Optional	RFU	A0 - DF	Optional	IC Mfg dependent	E0 - FF	Proprietary	IC Mfg dependent
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23	Optional	Read Multiple Blocks																																																														
24	Optional	Write Multiple Blocks																																																														
25	Optional	Select																																																														
26	Optional	Reset to Ready																																																														
27	Optional	Write Address																																																														
28	Optional	Lock Address																																																														
29	Optional	Write DSFID																																																														
2A	Optional	Lock DSFID																																																														
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E0 - FF	Proprietary	IC Mfg dependent																																																														
n + 5 to n + 8	UID (binary code) ^{*5}																																																															
n + 9 to n + m	<ul style="list-style-type: none"> • T5T Param (byte / word / double-word / binary code) ^{*6} • T5T Data (byte / word / double-word / binary code) ^{*6} 																																																															
n + (m + 1) and up	Data (in words)																																																															

Contents	F0	F1 (= \$u n)	F2										
ISO15693 extended command Read Large Blocks *3	1 to 8 (PLC1 to 8)	n	Station number	8/12									
		n + 1	Command: 24 (HEX)										
		n + 2	Number of bytes per block: 0 to 31 *7										
		n + 3	Number of retries between the target device and the tag: 0 to 7 (0 is recommended)										
		n + 4	Request flag <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>Bit</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> </table> </div> <ul style="list-style-type: none"> <li style="margin-left: 100px;">Sub-Carrier flag 0: For "single" protocol setting. 1: For "double" protocol setting. <li style="margin-left: 100px;">Data rate flag 0: For "low" protocol setting. 1: For "high" protocol setting. <li style="margin-left: 100px;">Inventory flag: 0 fixed <li style="margin-left: 100px;">Protocol Extension flag 0: No protocol format extension 1: Protocol format is extended <li style="margin-left: 100px;">Select flag: 0 fixed <li style="margin-left: 100px;">Address flag 0: UID field is not present 1: UID field is present <li style="margin-left: 100px;">Option flag: 0 fixed <li style="margin-left: 100px;">0 fixed 		Bit	7	6	5	4	3	2	1	0
		Bit	7		6	5	4	3	2	1	0		
		n + 5	Number of read blocks per command (0 is recommended) *8 *9										
		n + 6 to n + 9	UID (binary code) *5										
		n + 10	Starting block number										
		n + 11	Number of read blocks *8										
		n + 12 and up	Read data (in words)										
		ISO15693 Write Large Blocks *3	1 to 8 (PLC1 to 8)		n	Station number	Variable						
n + 1	Command: 25 (HEX)												
n + 2	Number of bytes per block: 0 to 31 *7												
n + 3	Number of retries between the target device and the tag: 0 to 7 (0 is recommended)												
n + 4	Request flag <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td>Bit</td> <td>7</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>1</td> <td>0</td> </tr> </table> </div> <ul style="list-style-type: none"> <li style="margin-left: 100px;">Sub-Carrier flag 0: For "single" protocol setting. 1: For "double" protocol setting. <li style="margin-left: 100px;">Data rate flag 0: For "low" protocol setting. 1: For "high" protocol setting. <li style="margin-left: 100px;">Inventory flag: 0 fixed <li style="margin-left: 100px;">Protocol Extension flag 0: No protocol format extension 1: Protocol format is extended <li style="margin-left: 100px;">Select flag: 0 fixed <li style="margin-left: 100px;">Address flag 0: UID field is not present 1: UID field is present <li style="margin-left: 100px;">Option flag 0: Command option not supported 1: Command option supported <li style="margin-left: 100px;">0 fixed 			Bit	7	6		5	4	3	2	1	0
Bit	7			6	5	4		3	2	1	0		
n + 5	Number of blocks written per command (0 is recommended) *8 *9												
n + 6 to n + 9	UID (binary code) *5												
n + 10	Starting block number												
n + 11	Number of write blocks *8												
n + 12 and up	Write data (in words) *10												
Device ID check	1 to 8 (PLC1 to 8)			n	Station number	2							
		n + 1	Command: E0 (HEX)										
		n + 2	Device ID										

Contents	F0	F1 (= \$u n)		F2
Device ID change ^{*11}	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: E1 (HEX)	
		n + 2	Device ID	
		n + 3	Device ID after the change ^{*12}	
		n + 4	Change result ^{*12} 0: Successful Other than 0: Fail	
RS-485 serial check	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: E8 (HEX)	
		n + 2	Baud rate 10H: 9600 bps 01H: 19200 bps 02H: 38400 bps 03H: 57600 bps 04H: 115200 bps	
		n + 3	Data bit 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	
RS-485 serial change ^{*11}	1 to 8 (PLC1 to 8)	n	Station number	6
		n + 1	Command: E9 (HEX)	
		n + 2	Baud rate 10H: 9600 bps 01H: 19200 bps 02H: 38400 bps 03H: 57600 bps 04H: 115200 bps	
		n + 3	Data bit 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	Baud rate after the change ^{*12} 10H: 9600 bps 01H: 19200 bps 02H: 38400 bps 03H: 57600 bps 04H: 115200 bps	
		n + 7	Data bit after the change ^{*12} 0: 7 bits 1: 8 bits	
		n + 8	Parity after the change ^{*12} 0: None 1: Odd 2: Even	
		n + 9	Stop bit after the change ^{*12} 0: 1 bit 1: 2 bits	
		n + 10	Change result ^{*12} 0: Successful Other than 0: Fail	
EEPROM parameter acquisition	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: A8 (HEX)	
		n + 2	Target ID ^{*13}	
		n + 3	Target ID to acquire	
		n + 4 to n + 5	Acquired data (variable) ^{*13}	

Contents	F0	F1 (= \$u n)		F2
EEPROM parameter change *11	1 to 8 (PLC1 to 8)	n	Station number	Variable
		n + 1	Command: A9 (HEX)	
		n + 2	Target ID *13	
		n + 3 to n + 4	Change data (variable) *13	
		n + 5	Target ID to change *12	
		n + 6 to n + 7	Data after change (variable) *12 *13	
		n + 8	Change result *12 0: Successful Other than 0: Fail	
RSSI acquisition	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: DD (HEX)	
		n + 2	RSSI report value *14	
		n + 3	RX Input state *15	
		n + 4	RSSI Main/Sub *16	
NOP (Existence check of the target device)	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: F0 (HEX)	
Processing time acquisition	1 to 8 (PLC1 to 8)	n	Station number	2
		n + 1	Command: F1 (HEX)	
		n + 2	Processing time *17	
Shipping processing	1 to 8 (PLC1 to 8)	n	Station number	Variable
		n + 1	Command: FC (HEX)	
		n + 2	Shipping processing *18 00H: Password acquisition 01H: Login 02H: Logout FFH: EEPROM default write	
		n + 3	Number of bytes of the login password *19	
		n + 4 to n + m	Login password (ASCII string): variable *19	
		n + (m + 1)	Execution processing 00H: Password acquisition 01H: Login 02H: Logout FFH: EEPROM default write	
		n + (m + 2)	Number of bytes of the acquired login password *20	
		n + (m + 3) and up	Acquired login Password (binary format): variable *20	
Firmware version verification	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: FF (HEX)	
		n + 2	Firmware information type 0: Version 1: Build management information	
		n + 3	Acquired firmware information 0: Version 1: Build management information	
		n + 4	Number of bytes of acquired information	
		n + 5 and up	Acquired information (ASCII string): variable	
Flush the receive buffer	1 to 8 (PLC1 to 8)	n	Station number	3
		n + 1	Command: 100 (HEX)	
		n + 2	Number of flush bytes: 1 to 32 *21	

Return data: Data stored from reader/writer to X1 series

- *1 The initial value of the RX Input setting after power-on is the value read from the EEPROM.
Use this command when you want to temporarily change the RX Input setting without updating the EEPROM value.
Communication with the tag is done according to the settings specified in the RX Input settings.
- *2 The presence or absence of AFI depends on the status of the 4th bit of n+2 (AFI flag of the request flag).
- *3 When reading/writing with PLC_CTL, the number of words that can be set in F1 is up to 512 words.
- *4 For Write/Lock commands, the 6th bits of n+3 (option flag of the request flag) must be ON depending on the tag.
- *5 The presence or absence of a UID is dependent on the value of the 5th bit of n+3 or n+4 (address flag of the request flag).
- *6 The number of words varies depending on the tag used. Refer to the datasheet for the target tag and set it accordingly.
The following data types, number of data points, and data must be specified when setting request data.

Data type	Number of data	Data
0: Byte	Number of output bytes	1 byte data per 1 word of F1 x number of data
1: Word	Number of output words	1 word data per 1 word of F1 x number of data
2: Double-word	Number of output double words	1 double-word data per 2 words of F1 x number of data
3: Binary code	Number of output bytes	2 bytes data per 1 word of F1 x [(number of data + 1)/2]

e.g. 1) Setting request data of 2 bytes, 10H for the 1st byte and 20H for the 2nd byte

	Data type	Number of data	Data	
F1 setting	n+m	n+(m+1)	n+(m+2)	n+(m+3)
Setting	0: Byte	2	10 H	20 H

e.g. 2) Setting request data of 2 words, 201H for the 1st word and 403H for the 2nd word

	Data type	Number of data	Data	
F1 setting	n+m	n+(m+1)	n+(m+2)	n+(m+3)
Setting	1: Word	2	201 H	403 H

e.g. 3) Setting request data of 2 double words, 4030201H for the 1st double word and 8070605H for the 2nd double word

	Data type	Number of data	Data			
F1 setting	n+m	n+(m+1)	n+(m+2)	n+(m+3)	n+(m+4)	n+(m+5)
Setting	2: Double-word	2	201 H	403 H	605 H	807 H

e.g. 4) Setting request data of 3 bytes in binary format, 30H for the 1st byte, 31H for the 2nd byte, and 32H for the 3rd byte

	Data type	Number of data	Data	
F1 setting	n+m	n+(m+1)	n+(m+2)	n+(m+3)
Setting	3: Binary code	3	3130 H	32 H

*7 Set the value deducted 1 from the actual number of bytes.

e.g.) actual byte count: 8 = set value: 7

*8 Set the value deducted 1 from the actual number of blocks.

e.g.) actual block count: 1 = set value: 0

*9 When setting to other than "0 (= 1 block)", refer to the data sheet of the tag, etc., and specify as much as possible.

*10 Calculate the number of bytes to write from the specified "Number of bytes per block" and "Number of write blocks".

Write data is set for 2 bytes per word.

*11 This changes the EEPROM of the target device. When an EEPROM write error occurs, PLC_CTL macro execution result does not become an error. Any error other than EEPROM write (Device ID, write range parameter error, etc.) will be an error in PLC_CTL macro execution result.

When normal/EEPROM write error occurs, the value actually written to the EEPROM is stored in *12 response data.

*12 Determine whether the EEPROM has been successfully changed by checking the state of the device ID/parameter after the change and whether the change result is "0: Successful".

If the result of the change is "Other than 0: Fail", review the other response data to identify which data was not changed.

*13 List of target IDs

ID	Internal parameters	Number of bytes	Byte allocation			
			DAT[0]	DAT[1]	DAT[2]	DAT[3]
00H	RS-485 response transmission - waiting time	2	WAIT_L (Lower)	WAIT_H (Higher)	-	-
01H	RS-485 response transmission - dummy byte	1	DMY	-	-	-
02H	RS-485 response transmission - idle time	3	IDLE_L (Lower)	IDLE_M (Middle)	IDLE_H (Higher)	-
03H	RS-485 command receive - flush bytes	1	FLS	-	-	-
04H	RS-485 command receive - unit timeout	3	RTD_L (Lower)	RTD_M (Middle)	RTD_H (Higher)	-
05H	RS-485 command receive - line feed timeout	3	RTN_L (Lower)	RTN_M (Middle)	RTN_H (Higher)	-
11H	Protocol setting	2	PROT	SEL	-	-
12H	RX Input setting	2	RX_AUTO	RX_SEL	-	-
18H	RX Input dynamic switching - RSSI result display	1	RPT_SEL	-	-	-
1CH	Tag communication result LED status display - holding time	2	HLD_L (Lower)	HLD_H (Higher)	-	-
20H	ISO15693 Inventory command timeout	1	T_OUT	-	-	-
21H	ISO15693 general-purpose command timeout	1	T_OUT	-	-	-
22H	ISO15693 general-purpose command single EOF wait time	1	TWAIT	-	-	-
30H	ISO15693 RF power supply - OFF time	2	VAL_L (Lower)	VAL_H (Higher)	-	-
31H	ISO15693 RF power supply - waiting time after power-on	2	VAL_L (Lower)	VAL_H (Higher)	-	-
32H	ISO14443A RF power supply - OFF time	2	VAL_L (Lower)	VAL_H (Higher)	-	-
33H	ISO14443A RF power supply - waiting time after power-on	2	VAL_L (Lower)	VAL_H (Higher)	-	-

*14 The RX Input setting changes the return data.

When RX Input Dynamic Switching is OFF: Always the value of RSSI_MAIN

When dynamic switching of RX Input is ON: Follow the setting of "RSSI result display in RX Input dynamic switching" parameter (EP_ID=18H) of EEPROM.

*15 When dynamic switching of RX Input is OFF: The same value as RX_SEL set by RX Input command is stored.

When dynamic switching of RX Input is ON: The value of RX Input when communication with the tag is successful is stored.

*16 It indicates the value obtained from the RSSI Levels and Oscillator Status Register (0x0F) of the TRF7970A during the previous command execution.

-
- *17 The processing time measured by the RTC of the microcomputer (16 bit values) is stored. Processing time of this command itself cannot be obtained.
Make sure to execute this command before the RSSI acquisition command when acquiring an RSSI.
 - *18 When executing this command, use it in the order of password acquisition -> login -> logout or EEPROM default write.
If you execute a command to acquire a password or to write EEPROM default after login is completed, you will be logged out.
 - *19 It is required only at login. Specify the number of bytes and password acquired by password acquisition.
 - *20 The data is stored only when the password acquisition is executed.
 - *21 Runs the NOP command (existence check of the target device) after sending the specified number of bytes of "M".

System Device Memory

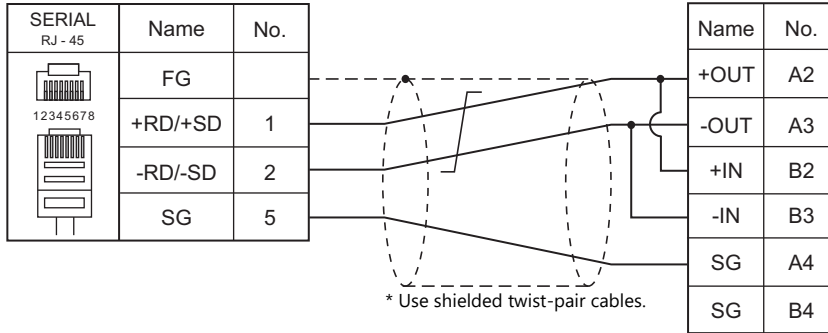
\$Pn: 356 to 451

When [Guarantee synchronism of the data] is checked in the [Device Memory Map Setting] dialog, a status/error code of each device memory map is stored here. For more information, see "1.5 System Device Memory for Communication Confirmation" (page 1-37).

16.1.2 Wiring Diagrams

RS-422/485

Wiring diagram 1 - M4



17. OMRON

17.1 PLC Connection

17.2 Temperature Controller/Servo/Inverter Connection

17.1 PLC Connection

Serial Connection

SYSMAC C/CV

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire) ^{*2}
SYSMAC C	C20H,C28H,C40H	RS-232C port	RS-232C	Wiring diagram 1 - M2	×
	C120, C120F C200H C500, C500F C1000H C2000, C2000H	C120-LK201-V1	RS-232C	Wiring diagram 3 - M2	×
		C120-LK202-V1	RS-422	×	Wiring diagram 2 - M4
	C200H C200HS-CPU01, 03 C200HS-CPU21, 23 C200HS-CPU31, 33	C200H-LK201 C200H-LK201-V1	RS-232C	Wiring diagram 3 - M2	×
		C200H-LK202 C200H-LK202-V1	RS-422	×	Wiring diagram 2 - M4
	C200HS-CPU21, 23 C200HS-CPU31, 33 CQM1-CPU21 CQM1-CPU41, 42, 43, 44	RS-232C port	RS-232C	Wiring diagram 2 - M2	×
	C500, C500F C1000H C2000, C2000H	C500-LK203	RS-232C	Wiring diagram 3 - M2	×
			RS-422	×	Wiring diagram 2 - M4
	C200HX C200HG C200HE	RS-232C port	RS-232C	Wiring diagram 2 - M2	×
		C200HW-COM02 C200HW-COM03 C200HW-COM04 C200HW-COM05 C200HW-COM06	RS-422	×	Wiring diagram 3 - M4
	SRM1-C02	RS-232C port	RS-232C	Wiring diagram 2 - M2	×
	CPM1A	Peripheral port	RS-232C	OMRON's [CQM1-CIF02] + Wiring diagram 4 - M2	×
	CPM2A	RS-232C port	RS-232C	Wiring diagram 2 - M2	×
Peripheral port		RS-232C	OMRON's [CQM1-CIF02] + Wiring diagram 4 - M2	×	
CPM2C	CS1W-CN118	RS-232C	Wiring diagram 2 - M2	×	
	CPM2C-CIF01		×	Wiring diagram 5 - M4	
	CPM2C-CIF11	RS-422	×	Wiring diagram 5 - M4	
SYSMAC CV	CV500 CV1000 CV2000 CVM1	Host link port built into CPU	RS-232C	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 6 - M4
		CV500-LK201	RS-232C PORT1	Wiring diagram 3 - M2	×
			RS-232C PORT2	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 3 - M4

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

SYSMAC CS1/CJ1/CJ2

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection			
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2		
SYSMAC CS1/CJ1/CJ2 SYSMAC CS1/CJ1/CJ2 DNA	CS1	RS-232C port	RS-232C	Wiring diagram 2 - M2	×		
		CS1W-SCU21 CS1W-SCU21-V1					
		CS1W-SCU31-V1	RS-422	×	Wiring diagram 4 - M4		
		CS1W-SCB21 CS1W-SCB21-V1	RS-232C	Wiring diagram 2 - M2	×		
		CS1W-SCB41 CS1W-SCB41-V1					
		Port 1	RS-422	×	Wiring diagram 4 - M4		
		Port 2					
	CJ1H CJ1M		RS-232C port	RS-232C	Wiring diagram 2 - M2	×	
			CJ1W-SCU21 CJ1W-SCU21-V1 CJ1W-SCU22				
			CJ1W-SCU31-V1	RS-422	×	Wiring diagram 4 - M4	
			CJ1W-SCU32	RS-422	×	Wiring diagram 5 - M4	
			CJ1W-SCU41 CJ1W-SCU41-V1	Port 1	RS-422	×	Wiring diagram 4 - M4
				Port 2	RS-232C	Wiring diagram 2 - M2	×
			CJ1W-SCU42	Port 1	RS-422	×	Wiring diagram 5 - M4
				Port 2	RS-232C	Wiring diagram 2 - M2	×
		CJ2H CJ2M		RS-232C port*3	RS-232C	Wiring diagram 2 - M2	×
				CP1W-CIF01*4			
			CP1W-CIF11*4 CP1W-CIF12*4	RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *7	
			CJ1W-SCU21 CJ1W-SCU21-V1 CJ1W-SCU22	RS-232C	Wiring diagram 2 - M2	×	
			CJ1W-SCU31-V1	RS-422	×	Wiring diagram 4 - M4	
			CJ1W-SCU32	RS-422	×	Wiring diagram 5 - M4	
			CJ1W-SCU41 CJ1W-SCU41-V1	Port 1	RS-422	×	Wiring diagram 4 - M4
				Port 2	RS-232C	Wiring diagram 2 - M2	×
			CJ1W-SCU42	Port 1	RS-422	×	Wiring diagram 5 - M4
				Port 2	RS-232C	Wiring diagram 2 - M2	×
	CP1E (N/NA)*5 CP1H CP1L		RS-232C port*6	RS-232C	Wiring diagram 2 - M2	×	
			CP1W-CIF01				
			CP1W-CIF11 CP1W-CIF12	RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *7	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 CJ2M-3x is not equipped with a built-in serial communication port.

*4 Can be used only with CJ2M-3x.

*5 CP1E (E type) cannot be connected because it is not equipped with a built-in serial communication port and installation of an optional board is not possible.

*6 Only CP1E (N/NA type) is equipped with a built-in serial communication port.

*7 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

SYSMAC CS1/CJ1/CJ2

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*1}
SYSMAC CS1/CJ1/CJ2/CP series (Ethernet) SYSMAC CS1/CJ1/CJ2/CP series (Ethernet Auto) SYSMAC CS1/CJ1/CJ2/CP series DNA (Ethernet)	CS1	CS1W-ETN01 CS1W-ETN11 CS1W-ETN21	×	○	9600	○
	CJ1	CJ1W-ETN11 CJ1W-ETN21				
	CJ2	Built-in EtherNet/IP port				
		CJ1W-ETN21 CJ1W-EIP21				
	CP1L-EL CP1L-EM	Built-in Ethernet port				
	CP1H CP1L-L CP1L-M	CP1W-CIF41				
CP2E	Built-in Ethernet port					

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

NX/NJ Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*1}
NJ series (EtherNet/IP)	NX701	Built-in EtherNet/IP port	○	×	Fixed to 44818 Max. 32 units connectable	○
	NJ101 NJ301 NJ501	Built-in EtherNet/IP port				
		CJ1W-EIP21				

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

17.1.1 SYSMAC C

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	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 device memory can be displayed on MONITOUCH as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.

[F]: Regards higher 4 bits as [-0].

[A]: Regards higher 4 bits as [-1].

- Displayable range 1 word: -1999 to +9999
2 words: -19999999 to +99999999

Example:

PLC Device Memory	Indication on the X1 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 device memory. For more information, refer to the PLC manual issued by the manufacturer.
Data Length	7 bits	
Parity	Even	
Stop Bit	2 bits	
Baud Rate	9600 bps	

C120-LK201-V1 / C120-LK202-V1**Switch setting**

Switch	No.	Setting	Contents
SW1	1 to 5	OFF	Unit No. 0
	6 to 7	OFF	Not used
	8	ON	Starts operation at power-up
SW2	1	OFF	19200 bps
	2	OFF	
	3	ON	
	4	OFF	
	5	OFF	Not used
	6	OFF	1 : n protocol
	7	ON	Disables command levels 1, 2, and 3
	8	ON	
SW3	1	ON	CTS switch: always ON
	2	OFF	
	3	ON	LK201-V1: internal synchronization LK202-V1: terminating resistance provided
	4	OFF	
	5	ON	
	6	OFF	
	7 to 8	OFF	Not used

The communication parameter setting is fixed to 7 bits for data length, 2 bits for stop bit, and even for parity.

C200H-LK201-V1 / C200H-LK202-V1**Front switch setting**

Switch	Setting	Contents
SW1	0	Higher-order digit of the unit No. (×10)
SW2	0	Lower-order digit of the unit No. (×1)
SW3	6	19200 bps
SW4	2	Disables command levels 1, 2 and 3 / 7 / 2 / even

Back switch setting

Unit	Switch	Setting	Contents
LK201	SW1	OFF	Not used
	SW2	OFF	
	SW3	ON	1 : n protocol
	SW4	OFF	5-V power not supplied
	CTS switch	0	0 V (always ON)
LK202	Terminating resistance	ON	Provided
	Protocol	OFF	1 : n protocol

C500H-LK203**Back switch setting**

Switch		Setting	Contents
5-V power supply		OFF	
I/O port		-	RS-232C/RS422
Synchronization		Internal	
Terminating resistance		Provided	Applicable for RS-422
CTS		0V	0 V
SW1	1 to 5	OFF	Unit No. 0
	6	OFF	7 / 2 / even
	7	OFF	
	8	ON	Monitor
SW2	1	OFF	19200 bps
	2	OFF	
	3	ON	
	4	OFF	
	5	ON	System No. 0
	6	OFF	1 : n protocol
	7	ON	Disables levels 1, 2, and 3
8	ON		

C200HX / C200HG / C200HE**DIP switch**

Item	Setting		Remarks
SW5	ON	Standard setting	7, 2, E, 9600 bps, Unit No. 0
	OFF	PC system setting	<p>Communication settings are made by setting DM6645 to 6648. For more information, refer to the PLC manual issued by the manufacturer.</p> <p>Setting example</p> <p>DM6645: "0001H" Communication is performed according to the setting for DM6646.</p> <p>DM6646: "0304H" 7, 2, E, 19200 bps</p> <p>DM6648: "0000H" Unit No. 0</p>

C200HW-COM02 - 06**DIP switch**


For the port A of C200HW-CCM03/06 (RS-422), the DIP switch setting is available.

DIP Switch	Contents	Setting
SW1	Change-over of 2-wire or 4-wire system	4 (4-wire system)
SW2	Terminator	ON

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

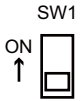
CPM2A**Communication condition setting switch**

Communication Condition Setting Switch	Setting	Contents
	OFF	The peripheral port and RS-232C port are operated according to the communication protocol and communication format set on the PLC system setting.

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

CPM1A/CPM2C**Communication port function setting switch (only for CPM2C)**

Communication Port Function Setting Switch	Setting	Contents
	OFF	The RS-232C port is operated according to the communication protocol and communication format set on the PLC system setting.

PLC system setting (peripheral port)

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200	
Parameter	1, 7, 2, E	
Mode	Host link	
Unit No.	00	

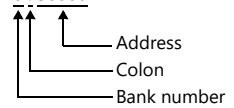
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
HR (holding relay)	02H	
LR (link relay)	03H	
AR (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 7. The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 7 in the expansion code.

17.1.2 SYSMAC CV

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	<u>RS-232C</u> / RS-422	
Baud Rate	4800 / 9600 / <u>19200</u> 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 device memory can be displayed on MONITOUCH as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.

[F]: Regards higher 4 bits as [-0].

[A]: Regards higher 4 bits as [-1].

- Displayable range 1 word: -1999 to +9999
2 words: -19999999 to +99999999

Example:


PLC Device Memory	Indication on the X1 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

CPU Unit

Communication selector switch

Communication Selector Switch	Setting
	Upper: RS-232C Lower: RS-422

Basic setting DIP switch


DIP Switch	Setting	Remarks	
	No. 3	OFF: Host link communication	
	No. 4	OFF: The host communication port is operated according to the communication condition set on the PLC system setting.	ON: Fixed to 9600 bps for baud rate, 0 for station number, 7 bits for data length, 2 bits for stop bit and even parity
	No. 6	ON: With terminating resistance	Invalid during RS-232C communication

PLC system setting (host link port)

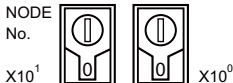
Item	Setting	Remarks	
Port Setting	Default Setting	Unchecked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
	Baud Rate	4800 / 9600 / 19200	
	Parameter	7, 2, E	
Unit No.	00		

Host Link Unit

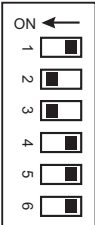
Communication selector switch

Communication Selector Switch	Setting
	Communication port 2 Upper: RS-232C Lower: RS-422

Unit No. selector switch

Unit No. Selector Switch	Setting
	Communication port 2 Unit No.: 00 to 31 (DEC)

Basic setting DIP switch

DIP Switch	Setting	Remarks	
	No. 1	OFF: The link unit is operated according to the communication condition set on the CPU advanced unit system setting.	ON: Fixed to 9600 bps for baud rate, 0 for station number, 7 bits for data length, 2 bits for stop bit and even parity CPU fixed
	No. 2	ON: Switching CTS for communication port 1	
	No. 3	ON: Switching CTS for communication port 2	Invalid during RS-422 communication
	No. 4	OFF: Not used	
	No. 5	OFF: Normal operation	

CPU advanced unit system setting

Set parameters for communication port 1 or 2.

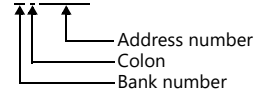
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
AR (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 7. The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 7 in the expansion code.

17.1.3 SYSMAC CS1/CJ1/CJ2

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
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 device memory can be displayed on MONITOUCH as data with signs.

When higher 4 bits in the device memory indicates [F] or [A], it is treated as negative.

[F]: Regards higher 4 bits as [-0].

[A]: Regards higher 4 bits as [-1].

- Displayable range 1 word: -1999 to +9999
2 words: -19999999 to +99999999

Example:

PLC Device Memory	Indication on the X1 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/CJ2 (Built-in RS-232C Port / CP1W-CIFxx)

DIP switch

Switch	Contents	Setting
	SW1	User memory writing
	SW2	Automatic user program transfer at power-up
	SW3	CJ1/CJ2: Blank CS1: message of the programming console (Japanese/English)
	SW4	CJ2: Blank CS1/CJ1: peripheral port communication condition
	SW5	RS-232C communication setting
	SW6	User-specified switch
	SW7	Simple-backup type specification
	SW8	Fixed to OFF
		OFF: enabled OFF: not executed OFF OFF: CX-Programmer connection OFF: According to the setting made on the PLC system setting OFF OFF OFF

PC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Parameter	7, 2, E	
Mode	Host link	
Unit No.	00	

CP1W-CIF11/12 DIP switch

Make the operation setting for the RS-422/485 optional board (CP1W-CIF11/12) by using the DIP switch provided on the backside.

Switch	Contents	Setting
	SW1	Terminating resistance ON: Provided
	SW2	2-wire / 4-wire selection ON: 2-wire system OFF: 4-wire system
	SW3	2-wire / 4-wire selection ON: 2-wire system OFF: 4-wire system
	SW4	Not used OFF
	SW5	RS control for RD OFF: Without control
	SW6	RS control for SD ON: With control (when 2-wire system is selected) OFF: Without control (when 4-wire system is selected)

CJ1/CS1/CJ2 (Serial Communication Board/Unit)

Advanced unit setting

Item	Setting	Remarks
Random Setting	Provided	
Serial Communication Mode	Default (host link) / Host link	When "Default (host link)" is selected, the unit operates as the unit No. 0.
Data Length	7 bits / 8 bits	
Stop Bit	2 bits / 1 bit	
Parity	Even, odd, none	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Send Delay Time	Default: 0 ms	
Send Delay Time Random Setting	0	
CTS control	None	
Host link unit No.	00	

DM area setting

$m = D30000 + 100 \times \text{unit No. (CH)}$

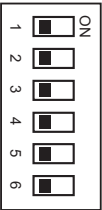
DM Area				Bit	Contents	Setting
Board		Unit				
Port 1	Port 2	Port 1	Port 2			
D32000	D32010	m	m + 10	15	Port setting	1: Random setting
				14 to 12	Reserved	-
				11 to 08	Host link	0 or 5
				07 to 05	Reserved	-
				04	Start bit	0: 1 bit
				03	Data length	0: 7 bits 1: 8 bits
				02	Stop bit	0: 2 bits 1: 1 bit
				01	Parity	0: Provided 1: None
00	Parity	0: Even 1: Odd				

DM Area				Bit	Contents	Setting
Board		Unit				
Port 1	Port 2	Port 1	Port 2			
D32001	D32011	m + 1	m + 11	15 to 04	Reserved	-
				03 to 00	Baud rate	0: 9600 5: 4800 6: 9600 7: 19200 8: 38400 9: 57600 A: 115200
D32002	D32012	m + 2	m + 12	15	Send delay time	0: 0 ms 1: Random setting
				14 to 00	Send delay time random setting	0 to 7530H Unit: 10 ms
D32003	D32013	m + 3	m + 13	15	CTS control	0: None 1: Provided
				14	1 : n/1 : 1 protocol setting	1: 1 : 1 protocol 0: 1 : n protocol
				13 to 11	Reserved	-
				10 to 08	Host link-compatible model mode	
				07 to 00	Unit No.	00 to 1FH

CP1 (Built-in RS-232C Port / CP1W-CIFxx)

CPU DIP switch

Set the communication conditions for the CP1H/CP1L optional board slot by using the CPU DIP switch.


Switch	Contents	Setting
	SW4	Optional slot 1 communication condition
	SW5	Optional slot 2 communication condition
		OFF: According to the setting made on the PLC system setting
		OFF: According to the setting made on the PLC system setting

PLC system setting

Item	Setting	Remarks
User Setting	Checked	The system setting can be made by specifying a value for the address using a programming console. For more information, refer to the PLC manual issued by the manufacturer.
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200	
Parameter	7, 2, E	
Mode	Host link	
Unit No.	00 to 31	

CP1W-CIF11/12 DIP switch

Make the operation setting for the RS-422/485 optional board (CP1W-CIF11/12) by using the DIP switch provided on the backside.

Switch	Contents	Setting
	SW1	Terminating resistance
	SW2	2-wire / 4-wire selection
	SW3	2-wire / 4-wire selection
	SW4	Not used
	SW5	RS control for RD
	SW6	RS control for SD
		ON: Provided
		ON: 2-wire system OFF: 4-wire system
		ON: 2-wire system OFF: 4-wire system
		OFF
		OFF: Without control
		ON: With control (when 2-wire system is selected) OFF: Without control (when 4-wire system is selected)

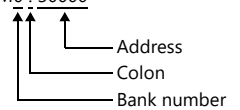
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
H (holding relay)	02H	
A (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1, not available on the CP1 series
W (internal relay)	08H	
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 18 (HEX).
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000

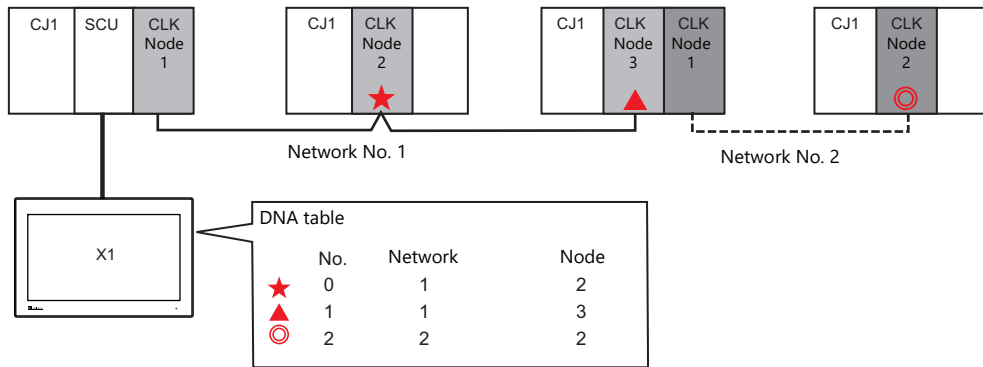


Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 18 (HEX) in the expansion code.

17.1.4 SYSMAC CS1/CJ1/CJ2 (DNA)

The X1 series can communicate with CS1/CJ1/CJ2 on the network (Controller Link) via the serial unit.



Communication Setting

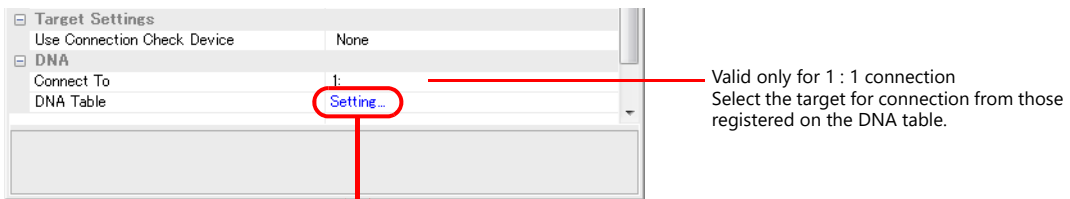
Editor

Communication settings

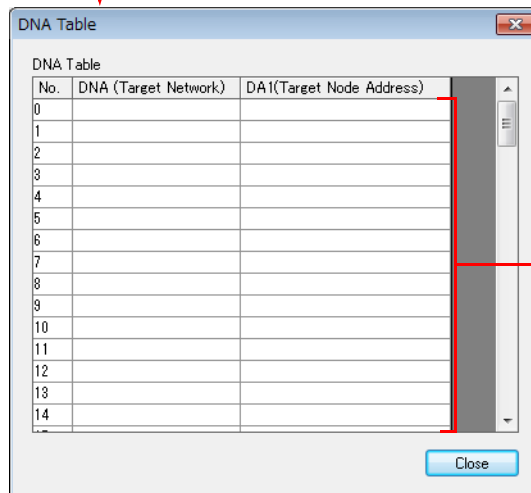
The communication setting is the same as the one described in "17.1.3 SYSMAC CS1/CJ1/CJ2".

DNA

[System Setting] → [Hardware Setting] → [PLC Properties] → [DNA]



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



Set the network number and node number of the PLC.

Item	Setting
DNA	Set the network number of the communication target.
DA1	Set the node address of the communication target.

PLC

Communication setting

The communication setting is the same as the one described in "17.1.3 SYSMAC CS1/CJ1/CJ2".

CX-Integrator

Set the PLC routing table on "CX-Integrator". Two types of routing tables are available: local network table and relay network table.

An error will occur unless these settings are made correctly. For more information, refer to the PLC manual issued by the manufacturer.

- Local network table
Set the unit number and network number of the communication unit.
- Relay network table
Set the network number of the access target (final network No.) and the first relay point (relay network No., relay node No.).

Rotary switch

Switch	Setting
NODE No.	Set the node number of the Controller Link unit.

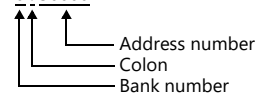
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
H (holding relay)	02H	
A: (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1, not available on the CP1 series
W (internal relay)	08H	
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 18 (HEX).
The assigned device memory is expressed as shown on the right when editing the screen.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 18 (HEX) in the expansion code.

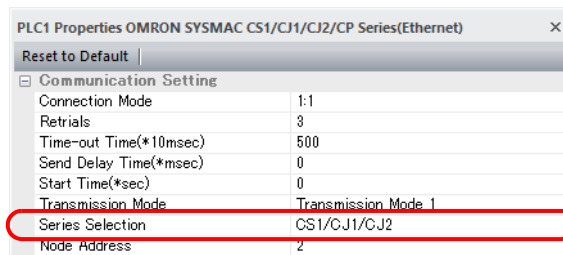
17.1.5 SYSMAC CS1/CJ1/CJ2/CP Series (Ethernet)

Communication Setting

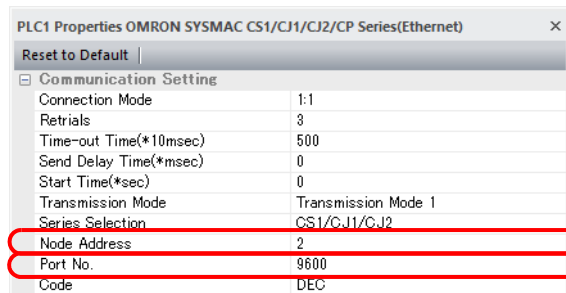
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- PLC model selection
[System Setting] → [Hardware Setting] → [PLC Properties] → [Series Selection]
 - [CS1/CJ1/CJ2] (default)
Select this option when connecting with the CS1/CJ1/CJ2 series.
 - [CP]
Select this option when connecting with the CP series.



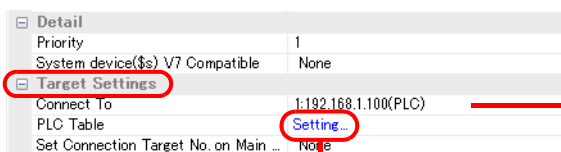
- Port number for the X1 series unit (for communication with PLC) and node address
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



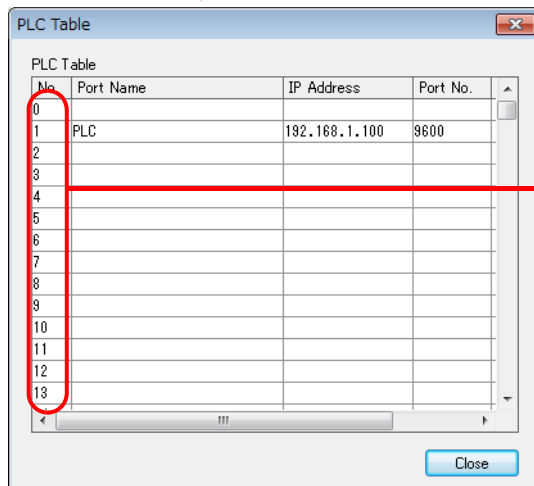
Set the node number of the X1 series unit (1 to 126).

Set the same number as the one specified for [FINS/UDP Port] on the PLC.

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



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



PLC table No. = PLC node No.

Set the IP address, port number and whether or not to use the KeepAlive function at the PLC table number which is the same as the PLC node number.

PLC

CS1/CJ1/CJ2

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

Parameter settings (example: CJ2 with built-in Ethernet port)

Item		Setting	Remarks
TCP/IP	IP Address	IP address of the PLC	
	Subnet Mask	Subnet mask of the PLC	
FINS/UDP	FINS/UDP port	Default (9600)	
	IP Address Conversion	IP address table	Connection is possible even when an automatic generation method is selected. In this case, the least significant byte of the PLC and X1 series unit is set as the node number.*
	Dynamic assignment of target IP address	Enable dynamic assignment of target IP addresses	

* The node number of the X1 series unit is limited to 1 to 126.

Rotary switch

Switch	Setting
NODE No.	Set the FINS node number of the CPU/Ethernet unit. Set the number, which is not used as the X1 series node number, in hexadecimal notation.

CP1 (CP1W-CIF41)

Access the Ethernet option board from a web browser and make the following settings. For details, refer to the PLC manual issued by the manufacturer.

Setting format

Item	Setting	Remarks
IP Address	IP address of the PLC	
Subnet Mask	Subnet mask of the PLC	
FINS Node Address	FINS node number of the PLC	
FINS/UDP port	Default (9600)	
IP Address Conversion	IP address table	Connection is possible even when an automatic generation method is selected. In this case, the least significant byte of the PLC and X1 series unit is set as the node number.*
Dynamic assignment of target IP address	Enable dynamic assignment	

* The node number of the X1 series unit is limited to 1 to 126.

CP1L-E/CP2E

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

PLC system settings

Item		Setting	Remarks
Address Setting	IP Address	IP address of the PLC	
	Subnet Mask	Subnet mask of the PLC	
FINS Node No.	Node No.	Set the FINS node number of the PLC.	
FINS/UDP Settings	FINS/UDP port	Default (9600)	
	IP Address Conversion	IP address table	Connection is possible even when an automatic generation method is selected. In this case, the least significant byte of the PLC and X1 series unit is set as the node number.*
	Dynamic assignment of target IP address	Enable dynamic assignment of target IP addresses	

* The node number of the X1 series unit is limited to 1 to 126.

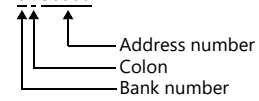
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
H (holding relay)	02H	
A (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1
W (internal relay)	08H	
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 18 (HEX).
The assigned device memory is expressed as shown on the right when editing the screen program.

Example: EM0 : 30000



Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 18 (HEX) in the expansion code.

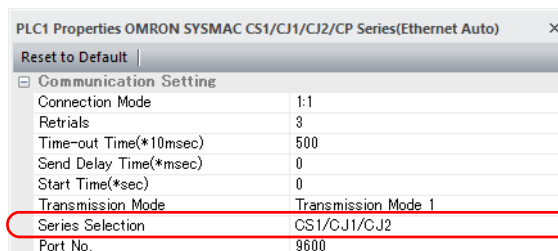
17.1.6 SYSMAC CS1/CJ1/CJ2/CP Series (Ethernet Auto)

Communication Setting

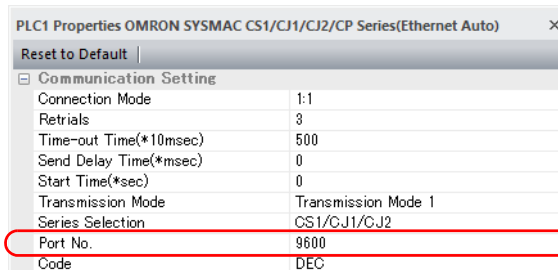
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- PLC model selection
[System Setting] → [Hardware Setting] → [PLC Properties] → [Series Selection]
 - [CS1/CJ1/CJ2] (default)
Select this option when connecting with the CS1/CJ1/CJ2 series.
 - [CP]
Select this option when connecting with the CP series.

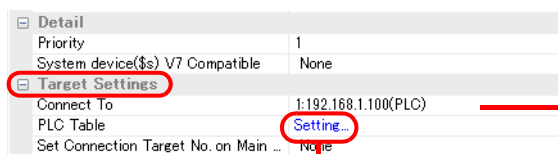


- Port number of the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]

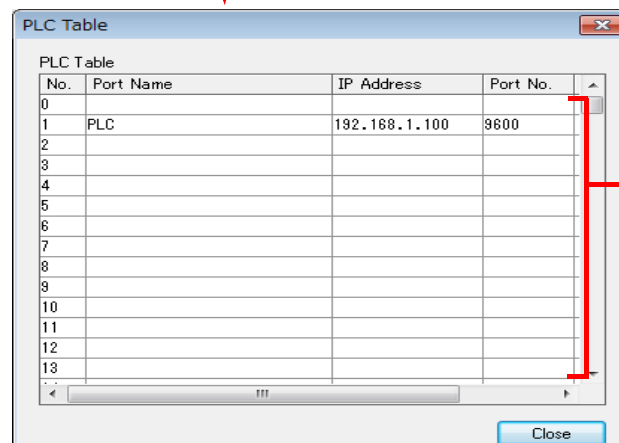


Set the same number as the one specified for [FINS/UDP Port] on the PLC.

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



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



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

PLC

CS1/CJ1/CJ2

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

Parameter settings (example: CJ2 with built-in Ethernet port)

Item	Setting
IP Address (FINS node address)	IP address of the PLC The least significant byte of this IP address is regarded as the FINS node address. Set the same number as the one set with the rotary switch.
Subnet Mask	Subnet mask of the PLC
IP Address Conversion	Automatic generation (dynamic)
FINS/UDP port	Default (9600)

Rotary switch

Switch	Setting
NODE No.	Set the FINS node number of the CPU/Ethernet unit. Set the least significant byte of the PLC's IP address in hexadecimal notation.

CP1 (CP1W-CIF41)

Access the Ethernet option board from a web browser and make the following settings. For details, refer to the PLC manual issued by the manufacturer.

Setting format

Item	Setting
IP Address	IP address of the PLC
Subnet Mask	Subnet mask of the PLC
FINS Node Address	FINS node number of the PLC Set the least significant byte of the PLC IP address.
FINS/UDP port	Default (9600)
IP Address Conversion	Automatic generation (dynamic)

CP1L-E/CP2E

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

PLC system settings

Item		Setting
Address Setting	IP Address	IP address of the PLC
	Subnet Mask	Subnet mask of the PLC
FINS Node No.	Node No.	Set the FINS node number of the PLC. Set the least significant byte of the PLC IP address.
FINS/UDP Settings	FINS/UDP port	Default (9600)
	IP Address Conversion	Automatic generation (dynamic)

* The node number of the X1 series unit is limited to 1 to 126.

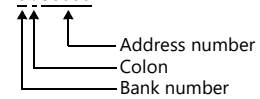
Available Device Memory

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

Device Memory	TYPE	Remarks
DM (data memory)	00H	
CH (input/output/internal auxiliary relay)	01H	
H (holding relay)	02H	
A (auxiliary memory relay)	04H	
T (timer/current value)	05H	
C (counter/current value)	06H	
EMn (extended data memory)	07H	*1
W (internal relay)	08H	
TU (timer/contact)	09H	Read only
CU (counter/contact)	0AH	Read only

*1 When using EMn (extended data memory), specify the bank number 0 to 18 (HEX).
The assigned device memory is expressed as shown on the right when editing the screen program.

Example: EM0 : 30000

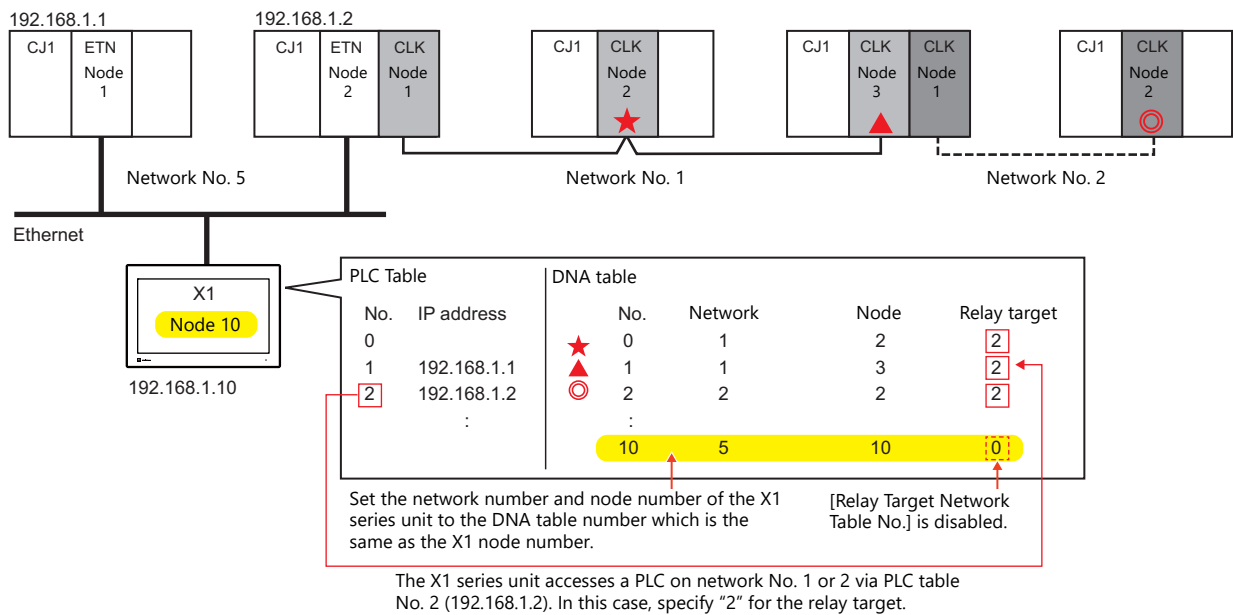


Indirect Device Memory Designation

- EMn (extended data memory)
Specify the bank number 0 to 18 (HEX) in the expansion code.

17.1.7 SYSMAC CS1/CJ1/CJ2/CP Series DNA (Ethernet)

The X1 series unit can communicate with CS1/CJ1/CJ2/CP on the network (Controller Link) via the Ethernet unit.

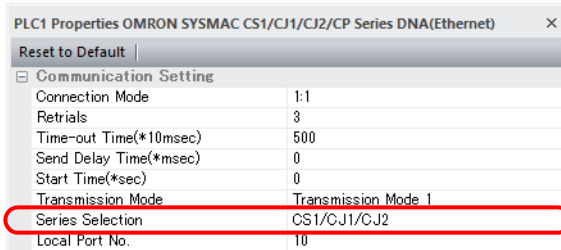


Communication Setting

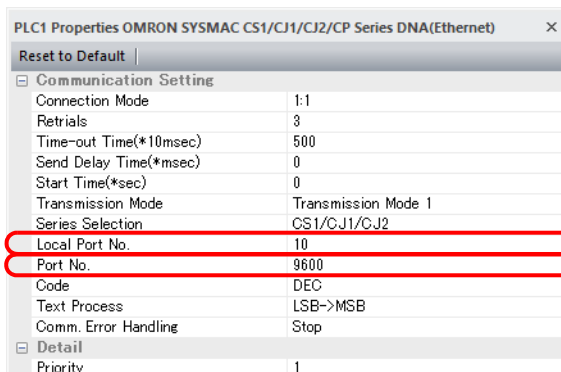
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- PLC model selection
[System Setting] → [Hardware Setting] → [PLC Properties] → [Series Selection]
 - [CS1/CJ1/CJ2] (default)
Select this option when connecting with the CS1/CJ1/CJ2 series.
 - [CP]
Select this option when connecting with the CP series.



- Port number (for communication with PLC) and local port number (node number) of the X1 series unit
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



Set the node number of the X1 series unit.

Set the same number as the one specified for [FINS/UDP Port] on the PLC.

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

No.	Port Name	IP Address	Port No.
0			
1	PLC1	192.168.1.1	9600
2	PLC2	192.168.1.2	9600
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

PLC table No. = PLC node No.

Set the IP address, port number and whether or not to use the KeepAlive function at the PLC table number which is the same as the PLC node number.

- Network number and node number of the PLC, PLC table number of the relay PLC
Network number and node number of the X1 series unit
[System Setting] → [Hardware Setting] → [PLC Properties] → [DNA]

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

No.	DNA (Target Network)	DA1(Target Node Address)	Relay Target
0	1	2	2
1	1	3	2
2	2	2	2
3			
4			
5			
6			
7			
8			
9			
10	5	10	0
11			
12			
13			

Set the network number and node number of the PLC, and the PLC table number of the relay PLC.

Set the network number and node number of the X1 series unit to the DNA table number which is the same as the X1 node number.
[Relay Target Network Table No.] is disabled.

PLC

CS1/CJ1/CJ2

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

Parameter settings (example: CJ2 with built-in Ethernet port)

Item		Setting
TCP/IP	IP Address	IP address of the PLC
	Subnet Mask	Subnet mask of the PLC
FINS/UDP	FINS/UDP port	Default (9600)
	IP Address Conversion	IP address table
	IP Address Table	IP address and node number of the PLC IP address and node number of the X1 series unit

Rotary switch

Switch	Setting
NODE No.	Set the node number of the CPU/Ethernet unit or Controller Link unit. Set the node number registered in the IP address table of the PLC in hexadecimal notation.

CX-Integrator

Set the PLC routing table on "CX-Integrator". Two types of routing tables are available: local network table and relay network table.

An error will occur if these settings are incorrect. For details, refer to the PLC manual issued by the manufacturer.

- Local network table
Set the unit number and network number of the communication unit.
- Relay network table
Set the network number of the access target (final network number) and the first relay point (relay network number, relay node number).

CP1 (CP1W-CIF41)

Access the Ethernet option board from a web browser and make the following settings. For details, refer to the PLC manual issued by the manufacturer.

Setting format

Item	Setting
IP Address	IP address of the PLC
Subnet Mask	Subnet mask of the PLC
FINS Node Address	FINS node number of the PLC Set the node number registered in the "IP address table" shown below.
FINS/UDP port	Default (9600)
IP Address Conversion	IP address table

IP address table

Item	Setting
FINS Node Address	IP address and node number of the PLC IP address and node number of the X1 series unit
IP Address	

CX-Integrator

The contents are the same as those described in "CS1/CJ1/CJ2".

CP1L-E/CP2E

Make the following settings on CX Programmer. For details, refer to the PLC manual issued by the manufacturer.

PLC system settings

Item		Setting
Address Setting	IP Address	IP address of the PLC
	Subnet Mask	Subnet mask of the PLC
FINS Node No.	Node No.	Set the FINS node number of the PLC. Set the node number registered in the IP address table of the PLC.
FINS/UDP Settings	FINS/UDP port	Default (9600)
	IP Address Conversion	IP address table
	IP Address Table	IP address and node number of the PLC IP address and node number of the X1 series unit

* The node number of the X1 series unit is limited to 1 to 126.

CX-Integrator

The contents are the same as those described in "CS1/CJ1/CJ2".

Available Device Memory

The contents are the same as those described in "17.1.5 SYSMAC CS1/CJ1/CJ2/CP Series (Ethernet)".

17.1.8 NJ Series (EtherNet/IP)

Communication Setting

Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

Valid only for 1 : 1 connection

IP address and port number (No. 44818) of the PLC

No.	Port Name	IP Address	Port No.
0	PLC	192.168.250.1	44818
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

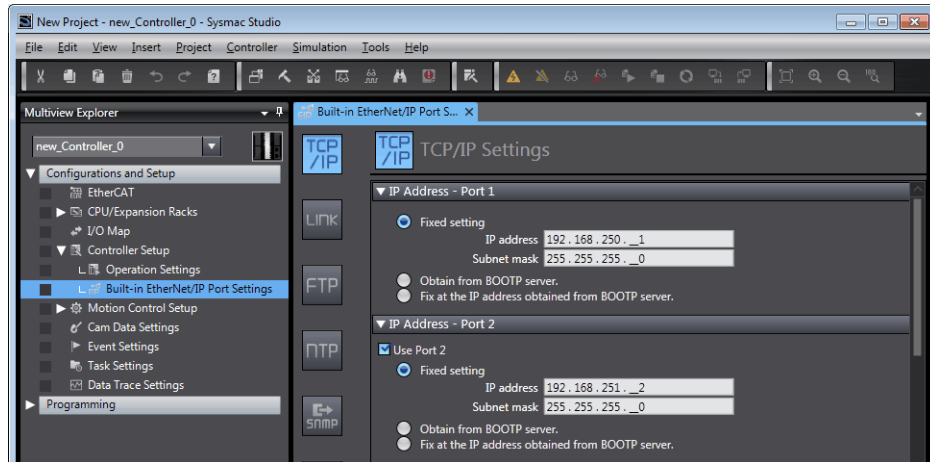
PLC

Set the IP address using the Sysmac Studio ladder tool. For more information, refer to the PLC manual issued by the manufacturer.

Built-in EtherNet/IP port

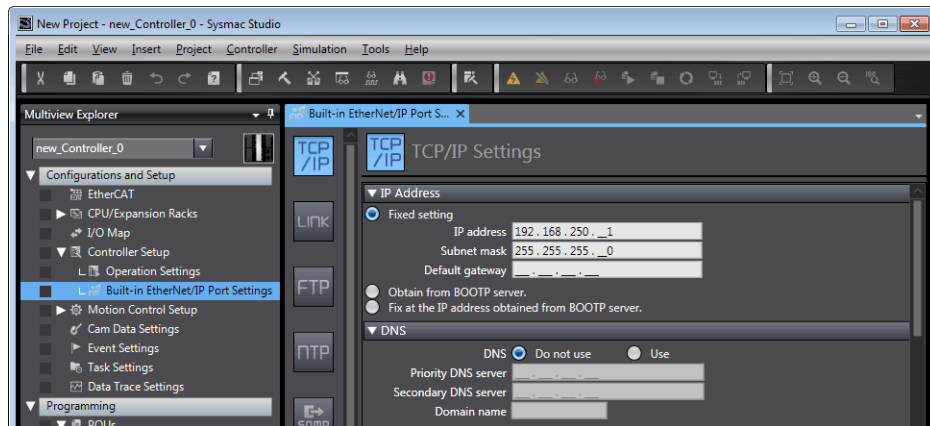
Select [Configurations and Setup] → [Controller Setup] → [Built-in EtherNet/IP Port Settings] on the [Multiview Explorer] pane and configure settings.

NX701



Item				
TCP/IP Settings	IP Address - Port 1	Fixed setting	IP address	Specify the IP address for port 1 of the PLC.
			Subnet mask	Specify the subnet mask for port 1 of the PLC.
	IP Address - Port 2	Fixed setting	IP address	Specify the IP address for port 2 of the PLC.
			Subnet mask	Specify the subnet mask for port 2 of the PLC.

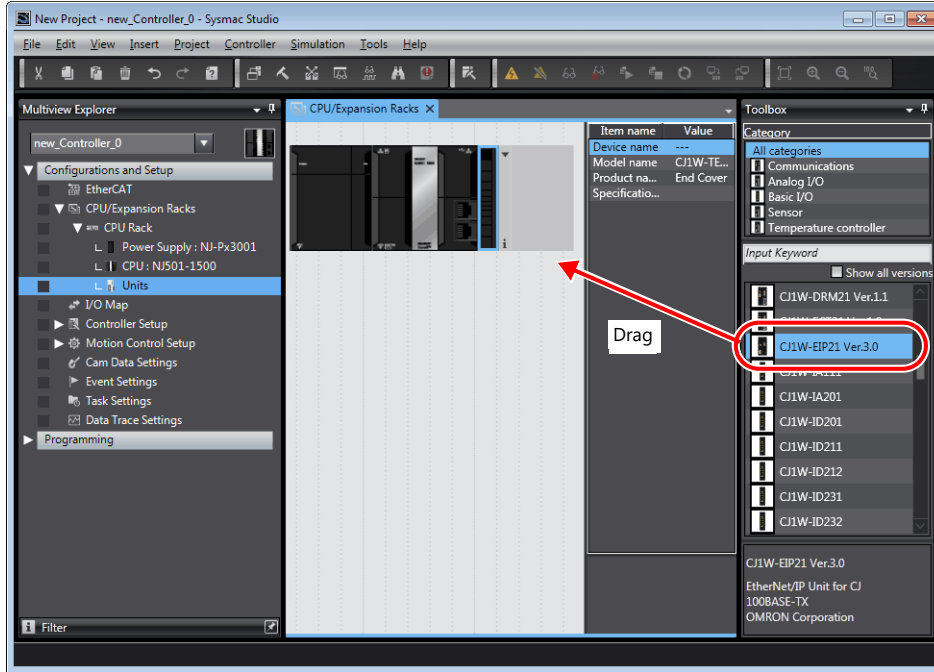
NJ101/NJ301/NJ501



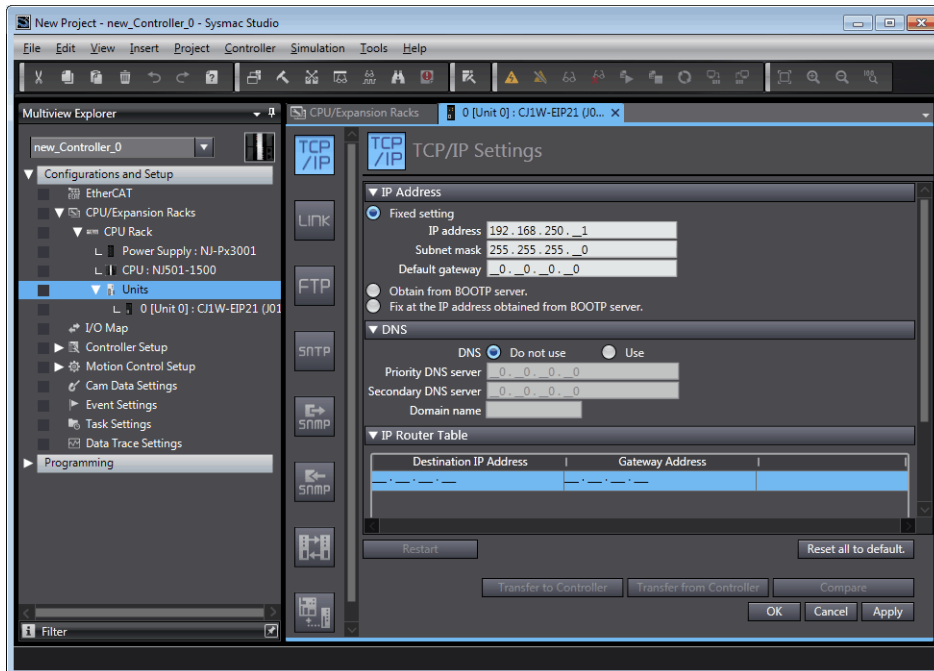
Item				
TCP/IP Settings	IP address	Fixed setting	IP address	Specify the IP address for the PLC.
			Subnet mask	Specify the subnet mask for the PLC.
			Default gateway	Specify according to the environment.

CJ1W-EIP21

- Unit registration
 Display the [CPU/Expansion Racks] tab window by double-clicking [CPU/Expansion Racks] under [Configurations and Setup] on the [Multiview Explorer] pane. Then register the unit by dragging "CJ1W-EIP21" from the [Toolbox] pane onto the tab window.



- IP address registration
 Select the newly registered "CJ1W-EIP21" unit on the [Multiview Explorer] pane and configure settings.



Item				
TCP/IP Settings	IP address	Fixed setting	IP address	Specify the IP address for the PLC.
			Subnet mask	Specify the subnet mask for the PLC.
			Default gateway	Specify according to the environment.

Available Device Memory

Set the PLC device memory by importing variables (tags) created using the PLC ladder tool into V-SFT.
For details on importing tags, refer to the "OMRON NX/NJ Series Connection" manual.

Data type		Range of Number of Elements for Arrays ^{*1}			Remarks
		Index1	Index2	Index3	
BOOL	(1-bit integer)	0 to 65535	0 to 32767	0 to 16383	*2, *3
SINT	(1-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
INT	(2-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	
DINT	(4-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383	
REAL	(4-byte floating-point)	0 to 65535	0 to 32767	0 to 16383	
STRING	(character string)	0 to 255	-	-	*5
USINT	(1-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
UINT	(2-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	
UDINT	(4-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383	
BYTE	(1-byte integer)	0 to 65535	0 to 32767	0 to 16383	*2, *3, *4
WORD	(2-byte integer)	0 to 65535	0 to 32767	0 to 16383	
DWORD	(4-byte integer)	0 to 65535	0 to 32767	0 to 16383	

*1 The ranges given are based on when a maximum value is specified. The maximum setting is 65535, which is the total number of elements (Index1 × Index2 × Index3).
Ranges differ according to the created tag.

*2 With multi-dimensional arrays, PLC device memory is allocated from lower bits.
For access in units of words, such as for numerical data display parts, access is done in accordance with the allocation of PLC device memory.

- BOOL type
When the variable (tag) registration on the PLC is "FLAG[4] [8]"

FLAG (32 bits)																															
3				2				1				0																			
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

When "FLAG [0] [0]" is specified for a numerical data display part (1 word) on V-SFT, the 16 bits from "FLAG [0] [0]" to "FLAG [1] [7]" are read.

- SINT type
When the variable (tag) registration on the PLC is "DATA[2] [4]"

DATA (8 bytes)							
1				0			
3	2	1	0	3	2	1	0

When "DATA[0][0]" is specified for a numerical data display part (1 word) on V-SFT, the 2 bytes from "DATA[0] [0]" to "DATA[0] [1]" are read.

*3 Only existing data is accessed if the size of the accessed tag is smaller than 2 bytes (1 word) for access in units of words such as for numerical data display parts.

- Example: SINT type
When the variable (tag) registration on the PLC is "DATA [3] [3]"

DATA (9 bytes)											
2			1			0					
-	-	-	2	1	0	2	1	0	2	1	0

When "DATA [2] [2]" is specified for a numerical data display part (1 word) on V-SFT, only the single byte of "DATA [2] [2]" is accessed.

*4 For access in units of words, bits 8 to 15 correspond to the next byte device memory.

- *5 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

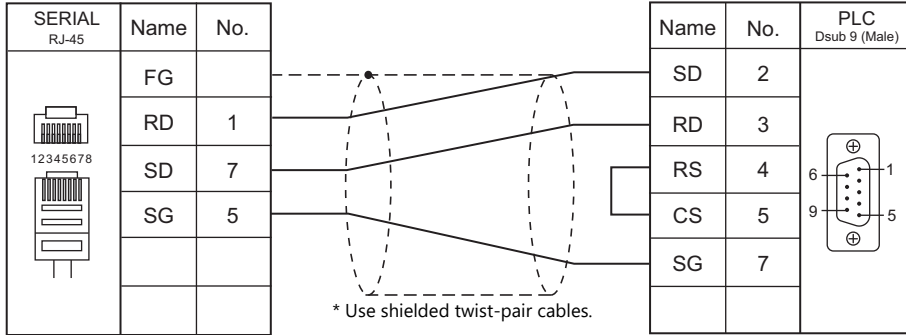
Indirect Device Memory Designation

Not available

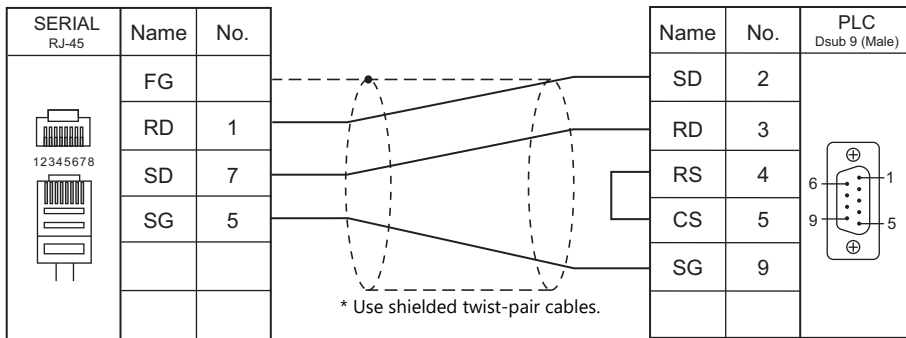
17.1.9 Wiring Diagrams

RS-232C

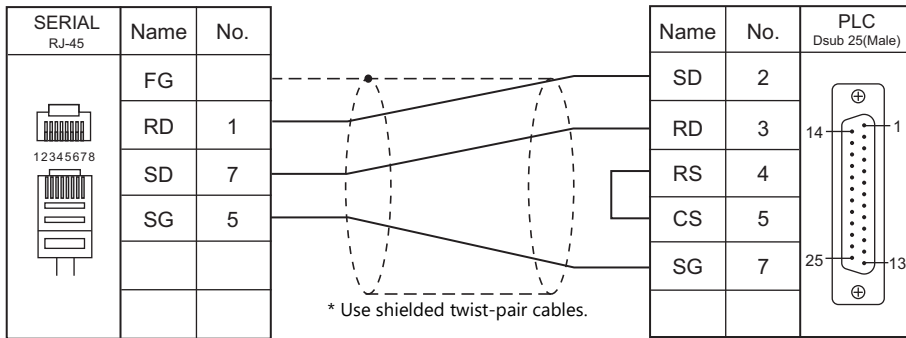
Wiring diagram 1 - M2



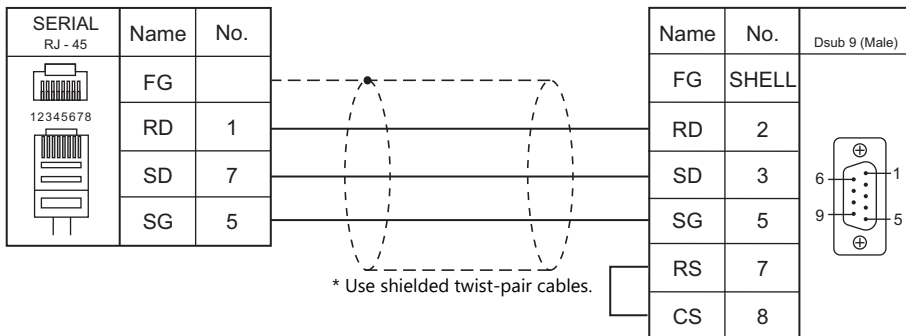
Wiring diagram 2 - M2



Wiring diagram 3 - M2

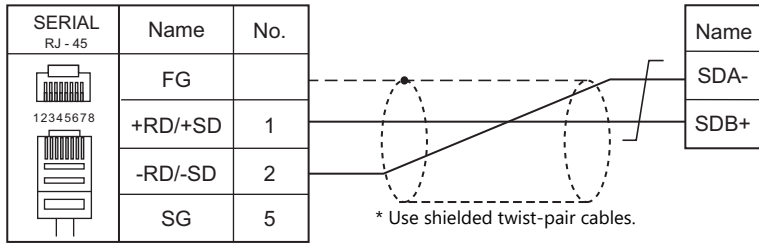


Wiring diagram 4 - M2

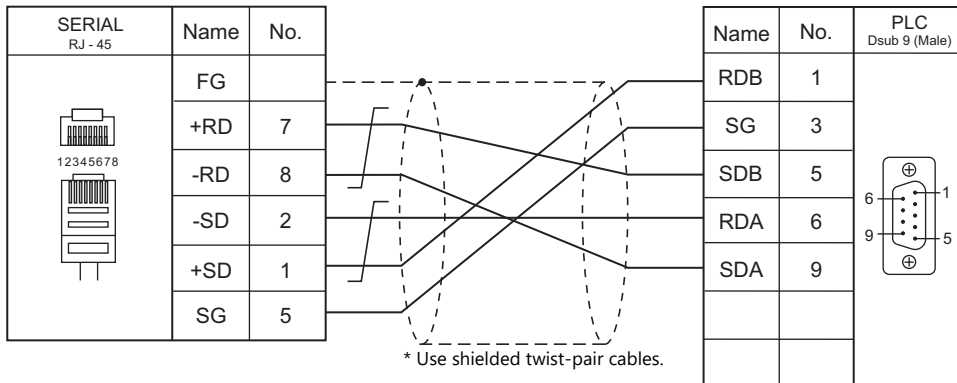


RS-422/RS-485

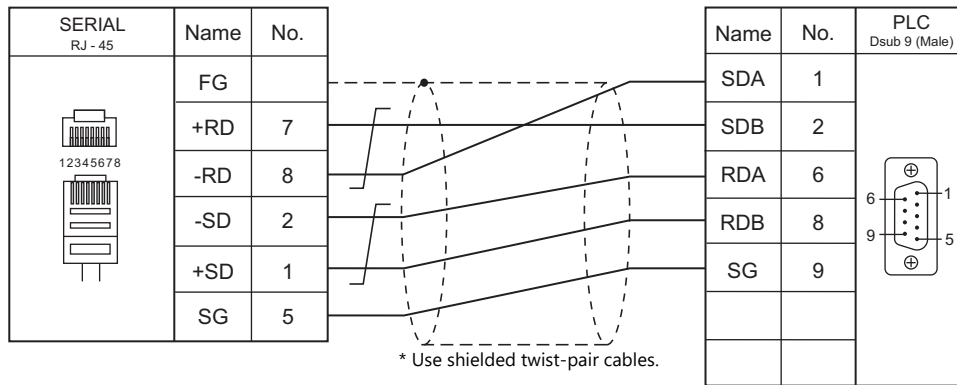
Wiring diagram 1 - M4



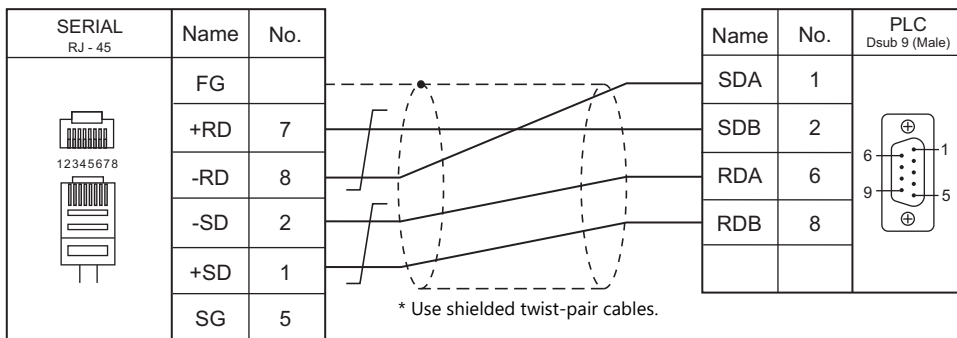
Wiring diagram 2 - M4



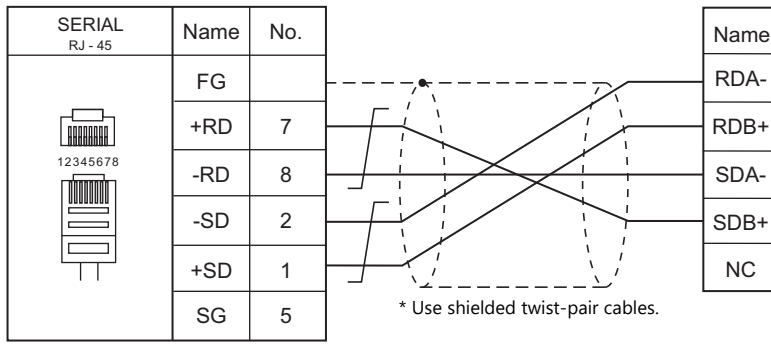
Wiring diagram 3 - M4



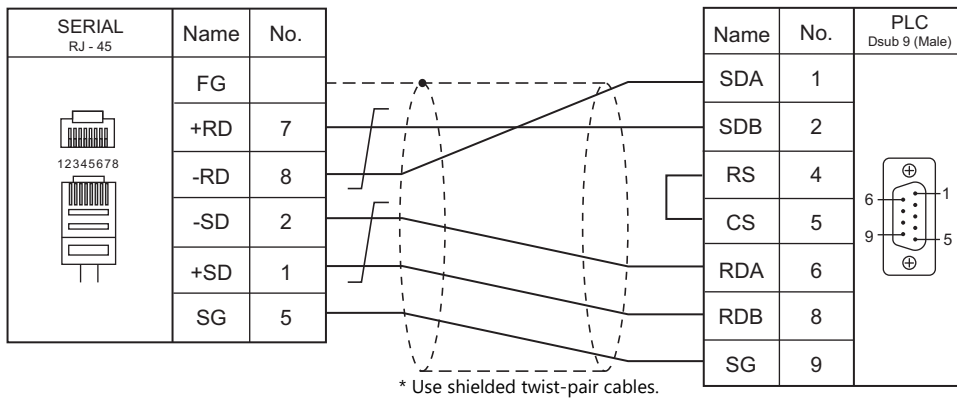
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



17.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File	
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}		
E5AK	E5AK-xxx01xx	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5AK.Lst	
	E5AK-xxx02xx	Terminal	RS-422	×	Wiring diagram 6 - M4		
	E5AK-xxx03xx	Terminal	RS-485	Wiring diagram 2 - M4	×		
E5AK-T	E5AK-Txx01xx	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5AKT.Lst	
	E5AK-Txx02xx	Terminal	RS-422	×	Wiring diagram 6 - M4		
	E5AK-Txx03xx	Terminal	RS-485	Wiring diagram 2 - M4	×		
E5AN/E5EN/ E5CN/E5GN	E5AN-xxxx01xxxxFLK E5EN-xxxx01xxxxFLK	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5AN.Lst	
	E5CN-xxxx03xxxxFLK E5AN-xxxx03xxxxFLK E5EN-xxxx03xxxxFLK E5GN-xx03x-FLK	Terminal	RS-485	Wiring diagram 1 - M4	×		
	E5AR-xxxxxxx-FLK E5ER-xxxxxxx-FLK	Terminal	RS-485	Wiring diagram 1 - M4	×		E5AR.Lst
	E5CC-xxxx-002 E5CC-xxxx-003 E5CC-xxxx-004 E5EC-xxxx-004 E5EC-xxxx-008 E5EC-xxxx-009 E5EC-xxxx-012 E5EC-xxxx-014 E5AC-xxxx-004 E5AC-xxxx-008 E5AC-xxxx-009 E5AC-xxxx-012 E5AC-xxxx-014 E5DC-xxxx-002 E5DC-xxxx-015 E5GC-xxxx-015	Terminal	RS-485	Wiring diagram 1 - M4	×		
E5CK	E5CK-xxx01	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5CK.Lst	
	E5CK-xxx03	Terminal	RS-485	Wiring diagram 1 - M4	×		
E5CK-T	E5CK-Txx01	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5CKT.Lst	
	E5CK-Txx03	Terminal	RS-485	Wiring diagram 1 - M4	×		
E5CN-HT	E5CN-HTxxxx01xx-x-FLK E5AN-HTxxxx01Bxx-x-FLK E5EN-HTxxxx01Bxx-x-FLK	Terminal	RS-232C	Wiring diagram 1 - M2	×	E5CN-HT.Lst	
	E5AN-HTxxxx02Bxx-x-FLK E5EN-HTxxxx02Bxx-x-FLK	Terminal	RS-422	×	Wiring diagram 6 - M4		
	E5CN-HTxxxx03xx-x-FLK E5AN-HTxxxx03Bxx-x-FLK E5EN-HTxxxx03Bxx-x-FLK	Terminal	RS-485	Wiring diagram 1 - M4	×		
	E5EK-xxx01xx	Terminal	RS-232C	Wiring diagram 1 - M2	×		E5EK.Lst
E5EK-xxx02xx	Terminal	RS-422	×	Wiring diagram 6 - M4			
E5EK-xxx03xx	Terminal	RS-485	Wiring diagram 2 - M4	×			
E5ZD	E5ZD-4xx01xx E5ZD-6xx01xx	CN4	RS-232C	Wiring diagram 2 - M2	×	E5ZD.Lst	
	E5ZD-8xx01xx	CN501					
	E5ZD-4xx02xx E5ZD-6xx02xx	CN6	RS-422	×	Wiring diagram 7 - M4		
	E5ZD-8xx02xx	CN502 TB302					Wiring diagram 6 - M4
	E5ZD-4xx03xx E5ZD-6xx03xx	CN6	RS-485	Wiring diagram 3 - M4	×		
	E5ZD-8xx03xx	CN502 TB302					Wiring diagram 1 - M4
E5ZE	E5ZE-8xx01xx	-	RS-232C	Wiring diagram 2 - M2	×	E5ZE.Lst	
	E5ZE-8xxx04xx	Terminal	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 6 - M4 ^{*3}		
E5ZN	E5ZN	Terminal	RS-485	Wiring diagram 1 - M4	×	E5ZN.Lst	

PLC Selection on the Editor	Model		Port	Signal Level	Connection		Lst File
					RS-232C* ¹ / RS-485 (2-wire)* ²	RS-422 (4-wire)* ²	
EJ1	EJ1N-TCxx-xxxx	EJ1C-EDUx-NFLK	Port A (Terminal) Port B	RS-485	Wiring diagram 1 - M4	×	EJ1.Lst

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

ID Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C* ¹ / RS-485 (2-wire)* ²	RS-422 (4-wire)* ²	
V600/620/680	V600-CA1A-V	Dsub25	RS-232C	Wiring diagram 2 - M2	×	OM_V600.Lst
	V600-CA2A-V	Dsub9	RS-422	Wiring diagram 5 - M4	Wiring diagram 6 - M4* ³	
	V600-CD1D	Dsub9	RS-232C	Wiring diagram 3 - M2	×	
	V680-CA5D01-V2	Dsub9	RS-232C	Wiring diagram 2 - M4	Wiring diagram 6 - M4* ³	
	V680-CA5D02-V2	Terminal	RS-485	Wiring diagram 2 - M4	Wiring diagram 6 - M4* ³	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Power Meter

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C* ¹ / RS-485 (2-wire)* ²	RS-422 (4-wire)	
KM20	KM20-B40-FLK	Terminal	RS-485	Wiring diagram 1 - M4	×	OM_KM20.Lst
		K3SC terminal	RS-232C	Wiring diagram 4 - M2	×	
KM100	KM100-Tx-FLK	Terminal	RS-485	Wiring diagram 1 - M4	×	OM_KM100.Lst
		K3SC terminal	RS-232C	Wiring diagram 4 - M2	×	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

ID Controller

PLC Selection on the Editor	Model	TCP/IP	UDP/IP	Port No.	Lst File
V680S (Ethernet TCP/IP)	V680S-HMD63-ETN V680S-HMD64-ETN V680S-HMD66-ETN	○	×	502	OM_V680S_Eth.Lst

17.2.1 E5AK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 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	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / <u>2</u> bits
	LEn	Data length	<u>7</u> / 8 bits
	Ppty	Parity	None / Odd / <u>Even</u>
	bPS	Baud rate	4800 / <u>9600</u> / 19200 bps
	U-no	Communication unit No.	<u>0</u> to 31

Available Device Memory

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

Device Memory	TYPE	Remarks
D (parameter)	00H	
S (special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
		S14 Read only, expansion code 0: group A / 1: group B

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

When monitoring special command S14 (status), specify the group number in the expansion code.

00H: Group A

01H: Group B

17.2.2 E5AK-T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 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 99	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / <u>2</u> bits
	LEn	Data length	<u>7</u> / 8 bits
	Prty	Parity	None / Odd / <u>Even</u>
	bPS	Baud rate	4800 / <u>9600</u> / 19200 bps
	U-no	Communication unit No.	<u>0</u> to 99

Available Device Memory

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

Device Memory	TYPE	Remarks
D (parameter)	00H	
S (special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
		S14 Read only, expansion code 0: group A / 1: group B
P (program parameter)	02H	

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

When monitoring special command S14 (status), specify the group number in the expansion code.

00H: Group A

01H: Group B

17.2.3 E5AN/E5EN/E5CN/E5GN

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

E5CN/E5SAN/E5EN

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	PSEL	Protocol selection	CompoWay/F
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 bps
	LEn	Data length	<u>7</u> / 8 bits
	Sbit	Communication stop bit	1 / <u>2</u> bits
	Prty	Parity	None / Odd / <u>Even</u>
Adjustment level	CMWT	Communication writing ^{*1}	OFF / ON

*1 When writing setting data from the X1, set "ON" for the "communication writing" setting.

E5GN

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / 9600 / 19200 bps
	LEn	Data length	<u>7</u> / 8 bits
	Sbit	Communication stop bit	1 / <u>2</u> bits
	Prty	Parity	None / Odd / <u>Even</u>
Adjustment level	CMWT	Communication writing ^{*1}	OFF / ON

*1 When writing setting data from the X1, set "ON" for the "communication writing" setting.

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 (setting area 0)	00H	Double-word, read only
C1 (setting area 0)	01H	Double-word
C3 (setting area 1)	03H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No.		
n + 2	Expansion code	Bit designation	
n + 3	00	Station number	

For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2									
Read controller status	1 - 8 (PLC1 - 8)	n	Station number									
		n + 1	Command: 0006H									
		n + 2	Operation status (higher byte) 00: Control in execution (Operation in progress while the setting area is "0" with no error occurring) 01: Control not in execution (Other than above) Related information (lower byte) Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table> Input error _____ Beyond the display range _____ _____ Heater overcurrent (CT1) _____ Heater current hold (CT1) _____ A/D converter error _____ Heater overcurrent (CT2) _____ Heater current hold (CT2)	-	7	6	5	4	3	2	1	0
-	7	6	5	4	3	2	1	0				
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1									
		n + 1	Command: 0030H									
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)									
			Control start/stop 0100H: Channel 1 Run 0101H: Channel 1 Stop									
			Multi-SP 0200H: Target value 1 0201H: Target value 2 0202H: Target value 3 0203H: Target value 4									
			AT execution/cancel 0300H: Cancel 0301H: Execute									
			Write mode 0400H: Backup mode 0401H: RAM write mode									
			0500H: Save RAM data									
			0600H: Software reset									
			0700H: Move to set area 1									
0800H: Move to protect level												

*1 8000 (HEX): broadcasting

Return data: Data stored from temperature controller to X1 series

17.2.4 E5AR/E5ER

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-422/485	
Baud Rate	<u>9600</u> / 19200 / 38400 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	

Temperature Controller

Communication level setting (LS)

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level (L.S)	PSEL	Protocol selection	CompoWay/F
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	<u>9600</u> / 19200 / 38400 bps
	LEn	Communication data length	<u>7</u> / 8 bits
	Sbit	Communication stop bit	1 / <u>2</u> bits
	Prtly	Communication parity	None / Odd / <u>Even</u>
Adjustment level (L.Adj)	CMWT	Communication writing ^{*1}	OFF / ON

*1 When writing setting data from the X1, set "ON" for the "communication writing" setting.

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 (communication monitor)	00H	Double-word
C1 (communication monitor)	01H	Double-word
C4 (communication monitor)	03H	Double-word
C5 (protection level)	04H	Double-word
C6 (run level)	05H	Double-word
C7 (adjustment level)	06H	Double-word
C8 (adjustment 2 level)	07H	Double-word
C9 (bank setting level)	08H	Double-word
CA (PID setting level)	09H	Double-word
CB (approximation setting level)	0AH	Double-word
CC (default setting level for input)	0BH	Double-word
CD (default setting level for control)	0CH	Double-word
CE (default setting level 2 for control)	0DH	Double-word
CF (warning setting level)	0EH	Double-word
D0 (display adjustment level)	0FH	Double-word
D1 (communication level)	10H	Double-word
D2 (high-performance setting level)	11H	Double-word
D3 (extended control setting level)	12H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

For bit designation, an expansion code setting is required.
 00H: when designating bit 0 to 15
 01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2																																																																								
Read controller status	1 - 8 (PLC1 - 8)	n	Station number																																																																								
		n + 1	Command: 0006H																																																																								
		n + 2	Status Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> <tr><td colspan="2"></td><td colspan="2">ch4</td><td colspan="2">ch3</td><td colspan="2">ch2</td><td>ch1</td></tr> </table>	-	7	6	5	4	3	2	1	0			ch4		ch3		ch2		ch1																																																						
		-	7	6	5	4	3	2	1	0																																																																	
		ch4		ch3		ch2		ch1																																																																			
		n + 3	<table border="1" style="width: 100%; text-align: center;"> <tr><td>Bit</td><td colspan="8">Operation status</td></tr> <tr><td>00</td><td colspan="8">Control in progress</td></tr> <tr><td>01</td><td colspan="8">Error occurring (outputting manipulated variables at an occurrence of error)</td></tr> <tr><td>10</td><td colspan="8">Resetting (including setting area 1)</td></tr> <tr><td>11</td><td colspan="8">Manual mode</td></tr> </table>	Bit	Operation status								00	Control in progress								01	Error occurring (outputting manipulated variables at an occurrence of error)								10	Resetting (including setting area 1)								11	Manual mode																																		
Bit	Operation status																																																																										
00	Control in progress																																																																										
01	Error occurring (outputting manipulated variables at an occurrence of error)																																																																										
10	Resetting (including setting area 1)																																																																										
11	Manual mode																																																																										
		n + 3	Relevant information Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr> <tr><td>Blank</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Blank</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	-	7	6	5	4	3	2	1	0	Blank								Blank																																																						
-	7	6	5	4	3	2	1	0																																																																			
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Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1																																																																								
		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																																																																								

Contents	F0	F1 (= \$u n)	F2	
Operation instructions	1 - 8 (PLC1 - 8)	n + 2	AT cancellation 0A00H: Channel 1 0A10H: Channel 2 0A20H: Channel 3 0A30H: Channel 4 09F0H: All channels	3
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Move to set area 1	
			0800H: Move to protect level	
			Auto/manual 0900H: Channel 1 Auto mode 0901H: Channel 1 Manual mode 0910H: Channel 2 Auto mode 0911H: Channel 2 Manual mode 0920H: Channel 3 Auto mode 0921H: Channel 3 Manual mode 0930H: Channel 4 Auto mode 0931H: Channel 4 Manual mode 09F0H: All channels Auto mode 09F1H: All channels Manual mode	
			0B00H: Initialize	
			Unlatch 0C00H: Channel 1 Warning unlatch 0C10H: Channel 2 Warning unlatch 0C20H: Channel 3 Warning unlatch 0C30H: Channel 4 Warning unlatch 0CF0H: All channels Warning unlatch	
			SP mode 0D00H: Channel 1 Local SP 0D01H: Channel 1 Remote SP 0D10H: Channel 2 Local SP (Cascade open) 0D11H: Channel 2 Remote SP (Cascade close)	

Return data: Data stored from temperature controller to X1 series

*1 8000 (HEX): broadcasting

17.2.5 E5CC/E5EC/E5AC/E5DC/E5GC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	<u>9600</u> / 19200 / 38400 / 57600 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 99	

Temperature Controller

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	PSEL	Protocol selection	CompoWay/F
	U-no	Communication unit No.	0 to 99
	bps	Baud rate	<u>9600</u> / 19200 / 38400 / 57600 bps
	LEn	Communication data length	<u>7</u> / 8 bits
	Sbit	Communication stop bit	1 / <u>2</u> bits
	Prty	Communication parity	None / Odd / <u>Even</u>
Adjustment level	CMWT	Communication writing ^{*1}	OFF / ON

*1 When writing setting data from the X1, set "ON" for the "communication writing" setting.

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 (setting area 0)	00H	Double-word, read only
C1 (setting area 0)	01H	Double-word
C3 (setting area 1)	02H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No.		
n + 2	Expansion code	Bit designation	
n + 3	00	Station number	

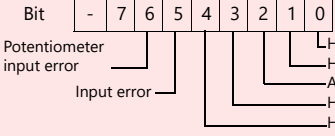
For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2
Read controller status	1 - 8 (PLC1 - 8)	n	Station number
		n + 1	Command: 0006H
		n + 2	Operation status (higher byte) 00: Control in execution (Operation in progress while the setting area is "0" with no error occurring) 01: Control not in execution (Other than above) Related information (lower byte) 
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1
		n + 1	Command: 0030H
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)
			Control start/stop 0100H: Channel 1 Run 0101H: Channel 1 Stop
			Multi-SP 0200H: Target value 0 0201H: Target value 1 0202H: Target value 2 0203H: Target value 3 0204H: Target value 4 0205H: Target value 5 0206H: Target value 6 0207H: Target value 7
			AT execution/cancel 0300H: Cancel 0301H: AT execution at 100% 0302H: AT execution at 40%
			Write mode 0400H: Backup mode 0401H: RAM write mode
			0500H: Save RAM data
			0600H: Software reset
			0700H: Move to set area 1
			0800H: Move to protect level
			Auto/manual 0900H: Channel 1 Auto mode 0901H: Channel 1 Manual mode
			0B00H: Initialize
			Unlatch 0C00H: Channel 1 Warning unlatch 0C01H: Channel 2 Warning unlatch 0C02H: Channel 3 Warning unlatch 0C03H: Heater disconnection latch cancel 0C04H: SSR failure latch cancel 0C05H: Heater overcurrent latch cancel 0C0FH: All latch cancel
			SP mode 0D00H: Local SP mode 0D01H: Remote SP mode
Invert direct/reverse operation 0E00H: Not invert 0E01H: Invert			
Program start 1100H: Reset 1101H: Start			
Readout of main unit's attribute	1 - 8 (PLC1 - 8)	n	Station number
		n + 1	Command: 0005H
		n + 2 - n + 6	Type: 10-byte ASCII
		n + 7	Buffer size (HEX)

*1 8000 (HEX): broadcasting

Return data: Data stored from temperature controller to X1 series

17.2.6 E5CK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 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	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / <u>2</u> bits
	LEn	Data length	<u>7</u> / 8 bits
	PrtY	Parity	None / Odd / <u>Even</u>
	bPS	Baud rate	4800 / <u>9600</u> / 19200 bps
	U-no	Communication unit No.	<u>0</u> to 31

Available Device Memory

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

Device Memory	TYPE	Remarks
D (parameter)	00H	
S (special command)	01H	Write only, expansion code: fixed to 0

17.2.7 E5CK-T

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Parity	None / Odd / <u>Even</u>	
Station number	<u>0</u> to 99	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / <u>2</u> bits
	LEn	Data length	<u>7</u> / 8 bits
	Prty	Parity	None / Odd / <u>Even</u>
	bPS	Baud Rate	4800 / <u>9600</u> / 19200 bps
	U-no	Communication unit No.	<u>0</u> to 99

Available Device Memory

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

Device Memory	TYPE	Remarks
D (parameter)	00H	
S (special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
		S14 Read only, expansion code 0: group A / 1: group B
P (program parameter)	02H	

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No.		
n + 2	Expansion code	Bit designation	
n + 3	00	Station number	

When monitoring special command S14 (status), specify the group number in the expansion code.

00H: Group A

01H: Group B

17.2.8 E5CN-HT

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

E5CN-HT/E5AN-HT/E5EN-HT

Communication level setting

(Underlined setting: default)

Level	Displayed Character	Setting Data	Setting
Communication level	PSEL	Communication protocol	CompoWay/F
	U-no	Communication unit No.	0 to 31
	bps	Baud rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 bps
	LEn	Data length	<u>7</u> / 8 bits
	Sbit	Stop bit	1 / <u>2</u> bits
	Prty	Parity	None / Odd / <u>Even</u>
Adjustment level	CMWT	Communication writing *1	OFF / ON

*1 When writing the setting data from the X1, set "ON" for the "communication writing" setting.

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 (setting area 0)	00H	Double-word, read only
C1 (setting area 0)	01H	Double-word
C3 (setting area 1)	02H	Double-word
C4 (setting area 0)	03H	Double-word
C5 (setting area 0)	04H	Double-word
DA (setting area 0)	05H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No.		
n + 2	Expansion code	Bit designation	
n + 3	00	Station number	

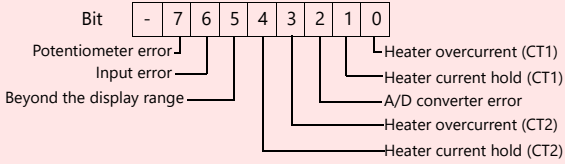
For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Read controller status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0006H	
		n + 2	<p>Operation status (higher byte) 00: Control not in execution (Setting area 1, outputting manipulated variables for manual operation, resetting operation or alarm occurrence) 01: Control in execution (Other than above)</p> <p>Related information (lower byte)</p> 	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 0030H	
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)	
			Control start/stop 0100H: Channel 1 RUN 0101H: Channel 1 STOP	
			AT execution/cancel 0300H: AT cancel 0301H: AT execution at 100% 0302H: AT execution at 40%	
			Write mode 0400H: Backup mode 0401H: RAM write mode	
			0500H: Save RAM data	
			0600H: Software reset	
			0700H: Shift to set area 1	
			0800H: Protection level shift	
			Auto/manual 0900H: Auto mode 0901H: Manual mode	
			0B00H: Initialize	
			Alarm latch cancel 0C00H: Alarm latch 1 cancel 0C01H: Alarm latch 2 cancel 0C02H: Alarm latch 3 cancel 0C03H: Heater disconnection latch cancel 0C04H: SSR failure latch cancel 0C05H: Heater overcurrent latch cancel 0C0FH: All latch cancel	
			SP mode 0D00H: Program SP mode 0D01H: Remote SP mode 0D02H: Constant value control SP mode	
			Invert direct/reverse operation 0E00H: Not invert 0E01H: Invert	
			Infrared communication 1200H: OFF 1201H: ON	
			Hold 1300H: Hold cancel 1301H: Hold	
1400H: Advance				
Readout of main unit's attribute	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0005H	
		n + 2 - n + 6	Type (CHAR) * Data following 11th byte or later is discarded.	
		n + 7	Buffer size (HEX)	

*1 8000 (HEX): broadcasting

Response code: Data stored from temperature controller to X1 series

17.2.9 E5EK

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 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	

Temperature Controller

(Underlined setting: default)

Mode	Displayed Character	Setting Data	Setting
Option mode	Sbit	Stop bit	1 / <u>2</u> bits
	LEn	Data length	<u>7</u> / 8 bits
	PrtY	Parity	None / Odd / <u>Even</u>
	bPS	Baud rate	4800 / <u>9600</u> / 19200 bps
	U-no	Communication unit No.	<u>0</u> to 31

Available Device Memory

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

Device Memory	TYPE	Remarks
D (parameter)	00H	
S (special command)	01H	S00 to 11 Write only, expansion code: fixed to 0
		S14 Read only, expansion code 0: group A / 1: group B

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

When monitoring special command S14 (status), specify the group number in the expansion code.

00H: Group A

01H: Group B

17.2.10 E5ZD

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> bps	
Data Length	<u>7</u> bits	
Stop Bit	<u>2</u> bits	
Parity	<u>Even</u>	
Target Port No.	<u>0</u> to 15	

Temperature Controller

(Underlined setting: default)

Switch	Setting Data	Setting
SW2	Unit No.	<u>0</u> to F (= 0 to 15)
SW3	Baud rate	5: 4800 bps 6: 9600 bps

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

Available Device Memory

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

Device Memory	TYPE	Remarks
0000 Control temperature	00H	
0001 Measurement temperature		Bank No. 0
0002 Operation status		Bank No. 0
0003 Output value		Bank No. 0
0004 Output value on the cooling side		Bank No. 0
0005 Proportional band		
0006 Integral time		
0007 Derivative time		
0008 Control cycle		
0009 Control cycle on the cooling side		
000A Output operation		Bank No. 0
000B Heater disconnection effective channel		Bank No. 0
000C Alarm status		Bank No. 0
000D Warning mode: warning 1		Bank No. 0
000E Warning mode: warning 2		Bank No. 0
000F Temperature at which an alarm occurs: warning 1		
0010 Temperature at which an alarm occurs: warning 2		
0011 Execution memory bank No.		Bank No. 0
0012 Adjustment sensitivity		
0013 Adjustment sensitivity on the cooling side		
0015 Input offset value		
001D Heater disconnection detection level		
001F Heater current value	Bank No. 0	
0021 Deadband / overlap band	Bank No. 0	
0022 Cooling coefficient		

Device Memory		TYPE	Remarks
-	.0023 Fuzzy strength	00H	
	.0024 Fuzzy scale 1		
	.0025 Fuzzy scale 2		

Address denotations: Example: xx : yyyyzz

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No. (lower)	CH No.	
n + 2	00	Address No. (higher)	
n + 3	Bank No.	Bit designation	
n + 4	00	Station number	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Auto tuning	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0 - 7: AT start channel No. 12: Cancel	
Setting data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 3	
		n + 2	0: Save 1: Initialize	
Operation control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	0: Control start 1: Control stop	
		n + 3	Channel No.	

17.2.11 E5ZE

Communication Setting

Editor

Communication setting


(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Length	<u>7</u> bits	
Stop Bit	<u>2</u> bits	
Parity	<u>Even</u>	
Target Port No.	<u>0</u> to 15	

Temperature Controller

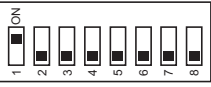
Unit No.

(Underlined setting: default)

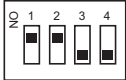
UNIT	Setting Items	Setting
	Unit No.	<u>0</u> to F (= 0 to 15)

Function

(Underlined setting: default)

FUNCTION	Setting Items	Setting												
 SW1 SW2	Baud rate	<table border="1"> <thead> <tr> <th></th> <th>4800</th> <th><u>9600</u></th> <th>19200</th> </tr> </thead> <tbody> <tr> <td>SW1</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>SW2</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>		4800	<u>9600</u>	19200	SW1	OFF	ON	OFF	SW2	ON	OFF	OFF
	4800	<u>9600</u>	19200											
SW1	OFF	ON	OFF											
SW2	ON	OFF	OFF											

Specification setting (RS-422/485)

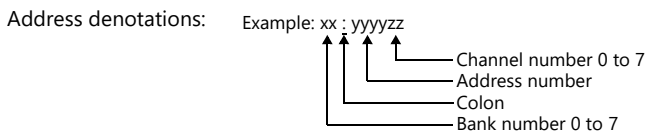
FUNCTION	Setting Items	Setting												
 SW1 SW2	Interface	<table border="1"> <thead> <tr> <th></th> <th>RS-422</th> <th>RS-485</th> </tr> </thead> <tbody> <tr> <td>SW1</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>SW2</td> <td>OFF</td> <td>ON</td> </tr> </tbody> </table>		RS-422	RS-485	SW1	OFF	ON	SW2	OFF	ON			
		RS-422	RS-485											
SW1	OFF	ON												
SW2	OFF	ON												
SW3 SW4	Terminating resistance	<table border="1"> <thead> <tr> <th></th> <th>Provided (RS-422)</th> <th>Provided (RS-485)</th> <th>None</th> </tr> </thead> <tbody> <tr> <td>SW3</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>SW4</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>		Provided (RS-422)	Provided (RS-485)	None	SW3	ON	ON	OFF	SW4	ON	OFF	OFF
	Provided (RS-422)	Provided (RS-485)	None											
SW3	ON	ON	OFF											
SW4	ON	OFF	OFF											

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

Available Device Memory

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

Device Memory	TYPE	Remarks
0000 Control temperature	00H	
0001 Measurement temperature		Bank No. 0
0002 Operation status		Bank No. 0
0003 Output value		Bank No. 0
0004 Output value on the cooling side		Bank No. 0
0005 Proportional band		
0006 Integral time		
0007 Derivative time		
0008 Control cycle		
0009 Control cycle on the cooling side		
000A Output operation		Bank No. 0
000B HB warning/HS warning effective channel		Bank No. 0
000C Alarm status		Bank No. 0
000D Warning mode: warning 1		Bank No. 0
000E Warning mode: warning 2		Bank No. 0
000F Temperature at which an alarm occurs: warning 1		
0010 Temperature at which an alarm occurs: warning 2		
0011 Execution memory bank No.		Bank No. 0
0012 Adjustment sensitivity		
0013 Adjustment sensitivity on the cooling side		
0014 Setting unit		Bank No. 0
0015 Input offset value		
0016 Manual reset value		
0017 Current control temperature		
0018 Output lower limit value		Bank No. 0
0019 Output upper limit value		
001A Output lower limit value on the cooling side		
001B Output upper limit value on the cooling side		
001C Limit of output change rate		
001D Heater disconnection detection (HB warning)		
001E SSR failure detection (HS warning)	Bank No. 0	
001F Heater current value	Bank No. 0	
0020 SSR leakage current value	Bank No. 0	
0021 Deadband / overlap band	Bank No. 0	
0022 Cooling coefficient		
0023 Fuzzy strength		
0024 Fuzzy scale 1		
0025 Fuzzy scale 2		



Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)	Device type	
n + 1	Address No. (lower)	CH No.	
n + 2	00	Address No. (higher)	
n + 3	Bank No.	Bit designation	
n + 4	00	Station number	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Auto tuning	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0 - 7: AT start channel No. 10: Collective start at all channels 11: Sequential start at all channels 12: Cancel	
Lamp value setting	1 - 8 (PLC1 - 8)	n	Station number	5
		n + 1	Command: 1	
		n + 2	Bank No. / channel No.	
		n + 3	Lamp value	
Lamp value read out	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	Bank No. / channel No.	
		n + 3	Lamp value	
Setting data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 3	
		n + 2	0: Save 1: Initialize	
Operation control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	0: Control start 1: Control stop	
		n + 3	Channel No.	
Manual operation	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 5	
		n + 2	Channel No.	

Return data: Data stored from temperature controller to X1 series

17.2.12 E5ZN

Communication Setting

Editor



Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 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 15	

Temperature Controller

(Underlined setting: default)

Item	Setting Data	Setting	
UNIT		Unit No. 0 to F (= 0 to 15)	
BPS		Baud rate 0: 4800 <u>1: 9600</u> 2: 19200 3: 38400	
Communication level	LEn	Data length	<u>7</u> / 8 bits
	Sbit	Stop bit	1 / <u>2</u> bits
	Prty	Parity	None / <u>Even</u> / Odd
Adjustment level	CMWT	Communication writing ^{*1}	OFF / ON

*1 When writing the setting data from the X1, set "ON" for the "communication writing" setting.

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 Setting area 0	00H	Double-word, read only
C1 Setting area 0	01H	Double-word
C3 Setting area 1	02H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2									
Controller status read out	1 - 8 (PLC1 - 8)	n	Station number	2									
		n + 1	Command: 06H										
		n + 2	Operation status (higher byte) 00: Control in execution for all channels (Operation in progress while the setting area is "0" with no error occurring.) 01: Control stopping at any of the channels (Other than above)										
			Related information (lower byte)										
			Bit <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>-</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td> </tr> </table>	-	7	6	5	4	3	2	1	0	
-	7	6	5	4	3	2	1	0					
			Blank Blank Overcurrent Input error Current hold										
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3									
		n + 1	Command: 0030H										
		n + 2	Communication writing 0000H: Communication writing OFF (disabled) 0001H: Communication writing ON (enabled)										
			Control start/stop 0100H: Channel 1 run 0101H: Channel 1 stop 0110H: Channel 2 run 0111H: Channel 2 stop 01F0H: All-channel run *2 01F1H: All-channel stop *2										
			Multi-SP 0200H: Channel 1 target value 0 0201H: Channel 1 target value 1 0210H: Channel 2 target value 0 0211H: Channel 2 target value 1 02F0H: All-channel target value 0 *2 02F1H: All-channel target value 1 *2										
			AT execution 0300H: Channel 1 AT cancel 0301H: Channel 1 AT execute 0310H: Channel 2 AT cancel 0311H: Channel 2 AT execute 03F0H: All-channel AT cancel *2 03F1H: All-channel AT execute *2										
			Write mode 0400H: Backup mode 0401H: RAM write mode										
			0500H: Save RAM data										
			0600H: Software reset										
			0700H: Move to set area 1										
			0800H: Move to protection level										
			Auto/manual 0900H: PV hold										
			0B00H: Initialize										
Unlatch 0C00H: Channel 1 warning 1 unlatch *2 0C01H: Channel 1 warning 2 unlatch *2 0C031H: Channel 1 warning 3 unlatch *2 0C0FH: Channel 1 all warnings unlatch *2 0C10H: Channel 2 warning 1 unlatch *2 0C11H: Channel 2 warning 2 unlatch *2 0C13H: Channel 2 warning 3 unlatch *2 0C1FH: Channel 2 all warnings unlatch *2 0CF0H: All channels warning 1 unlatch *2 0CF1H: All channels warning 2 unlatch *2 0CF2H: All channels warning 3 unlatch *2 0CFFH: All channels all warnings unlatch *2													

Return data: Data stored from temperature controller to X1 series

*1 8000 (HEX): broadcasting
*2 Valid only for the product of pulse output type or analog output type

17.2.13 V600/620/680

Communication Setting

Editor

Communication setting

(Underlined setting: default)

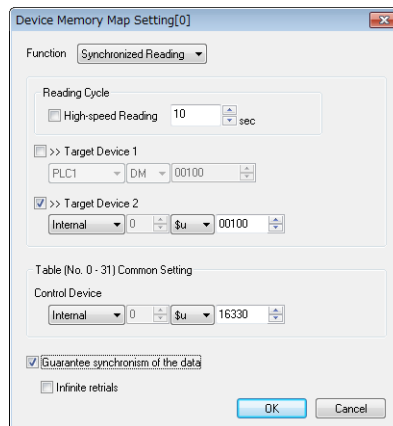
Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 115K bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 31	
Transmission Mode	1 : 1 procedure / <u>1:N procedure</u>	The transmission mode is set according to the connection mode. 1 : 1 → 1 : 1 procedure 1 : n → 1 : N procedure

Device memory map setting

Reading or writing to/from the tag can be performed by using the [Synchronized Reading/Synchronized Writing] function of the device memory map.

- Synchronized reading

Reading starts when the control device memory (command bit) is set (ON). Reading is performed at specified cycles until the control device memory (acknowledge bit) is set (ON).



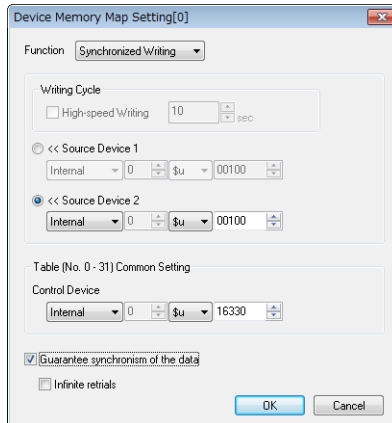
Item	Contents
Reading Cycle	The data at the device memory addresses registered in the device memory map is read when the control device memory (command bit) is set (ON). Reading of data is repeated at specified cycles until the data is read correctly. When the data has correctly been read, the control device memory (acknowledge bit) is set (ON) and reading operation finishes. ^{*1}
Control Device	Enter a device memory address as the trigger for synchronized reading. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data in the device memory map is read correctly. ^{*2 *3} Check the status/error codes at \$Pn 356 to 451 to confirm whether or not reading of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data in the device memory map is read correctly. ^{*3} Status/error codes are stored in \$Pn 356 to 451.

^{*1} When both [Guarantee synchronism of the data] and [Infinite retrials] are not checked, the acknowledge bit is set (ON) when reading of any data at the device memory address registered in the device memory map has been completed successfully.

^{*2} Set the device memory address of the same station number and channel in the device memory map.

^{*3} This setting is invalid when the macro command "TBL_READ" is executed.

- Synchronized writing
Writing starts when the control device memory (command bit) is set (ON). When writing has been finished, the control device memory (acknowledge bit) is set (ON).



Item	Contents
Writing Cycle	The data is written into the device memory addresses registered in the device memory map when the control device memory (command bit) is set (ON). When writing of data finishes, the control device memory (acknowledge bit) is set (ON) regardless of the result of the writing status.
Control Device	Enter a device memory address as the trigger for synchronized writing. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data is correctly written into the address registered in the device memory map. *1*2 Check the status/error codes at \$Pn 356 to 451 to confirm whether or not writing of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data is correctly written into the addresses registered in the device memory map. *2 Status/error codes are stored in \$Pn 356 to 451.

*1 Set the device memory address of the same station number and channel in the device memory map.
*2 This setting is invalid when the macro command "TBL_WRITE" is executed.

ID Controller

V600-CA1A/V600-CA2A

(Default: OFF (all))

DIP Switch		Setting																																								
<p>DIP switch 1</p>	SW1 SW2 SW3	Baud rate setting <table border="1"> <thead> <tr> <th>SW1</th> <th>SW2</th> <th>SW3</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>OFF</td> <td>ON</td> <td>4800</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>9600</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>ON</td> <td>19200</td> </tr> </tbody> </table>	SW1	SW2	SW3	Baud Rate	ON	OFF	ON	4800	ON	ON	OFF	9600	ON	ON	ON	19200																								
	SW1	SW2	SW3	Baud Rate																																						
	ON	OFF	ON	4800																																						
ON	ON	OFF	9600																																							
ON	ON	ON	19200																																							
SW4 SW5 SW6	Communication format <table border="1"> <thead> <tr> <th>SW4</th> <th>SW5</th> <th>SW6</th> <th>Data Length</th> <th>Stop Bit</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td rowspan="3">7</td> <td rowspan="2">2</td> <td>Even</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>Odd</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>OFF</td> <td rowspan="3">8</td> <td>1</td> <td>Even</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>Odd</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>OFF</td> <td rowspan="3">8</td> <td>2</td> <td>None</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>ON</td> <td rowspan="2">1</td> <td>Even</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>Odd</td> </tr> </tbody> </table>	SW4	SW5	SW6	Data Length	Stop Bit	Parity	OFF	OFF	OFF	7	2	Even	OFF	OFF	ON	Odd	OFF	ON	OFF	8	1	Even	OFF	ON	ON	Odd	ON	OFF	OFF	8	2	None	ON	OFF	ON	1	Even	ON	ON	OFF	Odd
SW4	SW5	SW6	Data Length	Stop Bit	Parity																																					
OFF	OFF	OFF	7	2	Even																																					
OFF	OFF	ON			Odd																																					
OFF	ON	OFF		8	1	Even																																				
OFF	ON	ON	Odd																																							
ON	OFF	OFF	8		2	None																																				
ON	OFF	ON		1	Even																																					
ON	ON	OFF			Odd																																					
SW7 SW8	Always OFF																																									

DIP Switch		Setting																																																																																											
<p>DIP switch 2</p>	SW2 SW3 SW4 SW5	Unit No. (Valid only when "1 : N" is selected by SW6. When "1 : 1" is selected, set all switches to the OFF positions.)																																																																																											
		<table border="1"> <thead> <tr> <th>SW2</th> <th>SW3</th> <th>SW4</th> <th>SW5</th> <th>No.</th> </tr> </thead> <tbody> <tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>0</td></tr> <tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>1</td></tr> <tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>2</td></tr> <tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>3</td></tr> <tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>4</td></tr> <tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>5</td></tr> <tr><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>6</td></tr> <tr><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>7</td></tr> </tbody> </table>	SW2	SW3	SW4	SW5	No.	OFF	OFF	OFF	OFF	0	OFF	OFF	OFF	ON	1	OFF	OFF	ON	OFF	2	OFF	OFF	ON	ON	3	OFF	ON	OFF	OFF	4	OFF	ON	OFF	ON	5	OFF	ON	ON	OFF	6	OFF	ON	ON	ON	7	<table border="1"> <thead> <tr> <th>SW2</th> <th>SW3</th> <th>SW4</th> <th>SW5</th> <th>No.</th> </tr> </thead> <tbody> <tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>8</td></tr> <tr><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>9</td></tr> <tr><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>10</td></tr> <tr><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>11</td></tr> <tr><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>12</td></tr> <tr><td>ON</td><td>ON</td><td>OFF</td><td>ON</td><td>13</td></tr> <tr><td>ON</td><td>ON</td><td>ON</td><td>OFF</td><td>14</td></tr> <tr><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>15</td></tr> </tbody> </table>	SW2	SW3	SW4	SW5	No.	ON	OFF	OFF	OFF	8	ON	OFF	OFF	ON	9	ON	OFF	ON	OFF	10	ON	OFF	ON	ON	11	ON	ON	OFF	OFF	12	ON	ON	OFF	ON	13	ON	ON	ON	OFF	14	ON	ON	ON	ON	15
	SW2	SW3	SW4	SW5	No.																																																																																								
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ON	ON	ON	ON	15																																																																																									
SW6	Communication protocol OFF: 1 : 1 ON: 1 : N																																																																																												
SW7	Terminating resistance at sending side (valid only for RS-422) OFF: Not provided ON: Provided																																																																																												
SW8	Terminating resistance at receiving side (valid only for RS-422) OFF: Not provided ON: Provided																																																																																												



V600-CD1D

(Default: OFF (all))

DIP Switch		Setting																																														
<p>DIP switch 1</p>	SW2 SW3	Baud rate setting																																														
		<table border="1"> <thead> <tr> <th>SW2</th> <th>SW3</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr><td>OFF</td><td>ON</td><td>4800</td></tr> <tr><td>ON</td><td>OFF</td><td>9600</td></tr> <tr><td>ON</td><td>ON</td><td>19200</td></tr> </tbody> </table>	SW2	SW3	Baud Rate	OFF	ON	4800	ON	OFF	9600	ON	ON	19200																																		
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ON	ON	19200																																														
SW4 SW5 SW6	Communication format																																															
	<table border="1"> <thead> <tr> <th>SW4</th> <th>SW5</th> <th>SW6</th> <th>Data Length</th> <th>Stop Bit</th> <th>Parity</th> </tr> </thead> <tbody> <tr><td>OFF</td><td>OFF</td><td>OFF</td><td rowspan="3">7</td><td rowspan="2">2</td><td>Even</td></tr> <tr><td>OFF</td><td>OFF</td><td>ON</td><td>Odd</td></tr> <tr><td>OFF</td><td>ON</td><td>OFF</td><td rowspan="3">8</td><td rowspan="2">1</td><td>Even</td></tr> <tr><td>OFF</td><td>ON</td><td>ON</td><td>Odd</td></tr> <tr><td>ON</td><td>OFF</td><td>OFF</td><td rowspan="3">8</td><td rowspan="2">2</td><td>None</td></tr> <tr><td>ON</td><td>OFF</td><td>ON</td><td rowspan="2">1</td><td>Even</td></tr> <tr><td>ON</td><td>ON</td><td>OFF</td><td>Odd</td></tr> <tr><td>ON</td><td>ON</td><td>ON</td><td></td><td></td><td></td></tr> </tbody> </table>	SW4	SW5	SW6	Data Length	Stop Bit	Parity	OFF	OFF	OFF	7	2	Even	OFF	OFF	ON	Odd	OFF	ON	OFF	8	1	Even	OFF	ON	ON	Odd	ON	OFF	OFF	8	2	None	ON	OFF	ON	1	Even	ON	ON	OFF	Odd	ON	ON	ON			
SW4	SW5	SW6	Data Length	Stop Bit	Parity																																											
OFF	OFF	OFF	7	2	Even																																											
OFF	OFF	ON			Odd																																											
OFF	ON	OFF		8	1	Even																																										
OFF	ON	ON	Odd																																													
ON	OFF	OFF	8		2	None																																										
ON	OFF	ON		1		Even																																										
ON	ON	OFF			Odd																																											
ON	ON	ON																																														
SW8	Always OFF																																															
<p>DIP switch 2</p>	SW3 SW4 SW5	Unit No. (Valid only when "1 : N" is selected by SW6. When "1 : 1" is selected, set all switches to the OFF positions.)																																														
		<table border="1"> <thead> <tr> <th>SW3</th> <th>SW4</th> <th>SW5</th> <th>Unit No.</th> </tr> </thead> <tbody> <tr><td>OFF</td><td>OFF</td><td>OFF</td><td>0</td></tr> <tr><td>OFF</td><td>OFF</td><td>ON</td><td>1</td></tr> <tr><td>OFF</td><td>ON</td><td>OFF</td><td>2</td></tr> <tr><td>OFF</td><td>ON</td><td>ON</td><td>3</td></tr> <tr><td>ON</td><td>OFF</td><td>OFF</td><td>4</td></tr> <tr><td>ON</td><td>OFF</td><td>ON</td><td>5</td></tr> <tr><td>ON</td><td>ON</td><td>OFF</td><td>6</td></tr> <tr><td>ON</td><td>ON</td><td>ON</td><td>7</td></tr> </tbody> </table>	SW3	SW4	SW5	Unit No.	OFF	OFF	OFF	0	OFF	OFF	ON	1	OFF	ON	OFF	2	OFF	ON	ON	3	ON	OFF	OFF	4	ON	OFF	ON	5	ON	ON	OFF	6	ON	ON	ON	7										
	SW3	SW4	SW5	Unit No.																																												
	OFF	OFF	OFF	0																																												
OFF	OFF	ON	1																																													
OFF	ON	OFF	2																																													
OFF	ON	ON	3																																													
ON	OFF	OFF	4																																													
ON	OFF	ON	5																																													
ON	ON	OFF	6																																													
ON	ON	ON	7																																													
SW6	Communication protocol OFF: 1 : 1 ON: 1 : N																																															
SW7 SW8	Always OFF																																															

V680

(Default: OFF (all))

Switch Setting		Setting															
SW1 SW2	Controller No. setting	0 to 31 (32 to 99: not available)  Higher-order digit: 0 to 3  Lower-order digit: 0 to 9															
SW3-1	Switch selection	OFF: DIP switch enabled															
SW3-3 SW3-4	Baud rate setting	<table border="1"> <thead> <tr> <th>SW3-3</th> <th>SW3-4</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>9600</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>19200</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>38400</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>115200</td> </tr> </tbody> </table>	SW3-3	SW3-4	Baud Rate	OFF	OFF	9600	OFF	ON	19200	ON	OFF	38400	ON	ON	115200
SW3-3	SW3-4	Baud Rate															
OFF	OFF	9600															
OFF	ON	19200															
ON	OFF	38400															
ON	ON	115200															
SW3-5	Data length setting	OFF: 7 bits ON: 8 bits															
SW3-6 SW3-7	Parity	<table border="1"> <thead> <tr> <th>SW3-6</th> <th>SW3-7</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>Even</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>None</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Odd</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Even</td> </tr> </tbody> </table>	SW3-6	SW3-7	Parity	OFF	OFF	Even	OFF	ON	None	ON	OFF	Odd	ON	ON	Even
SW3-6	SW3-7	Parity															
OFF	OFF	Even															
OFF	ON	None															
ON	OFF	Odd															
ON	ON	Even															
SW3-8	Stop bit	OFF: 2 bits ON: 1 bit															
SW3-9	Communication protocol	OFF: 1 : 1 ON: 1 : N															
SW3-10	Command system	ON: V600 command format															

Available Device Memory

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

Device Memory		TYPE	Remarks
--	Setting area 0	00H	

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Channel No.		Bit designation
n + 3	00		Station number

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

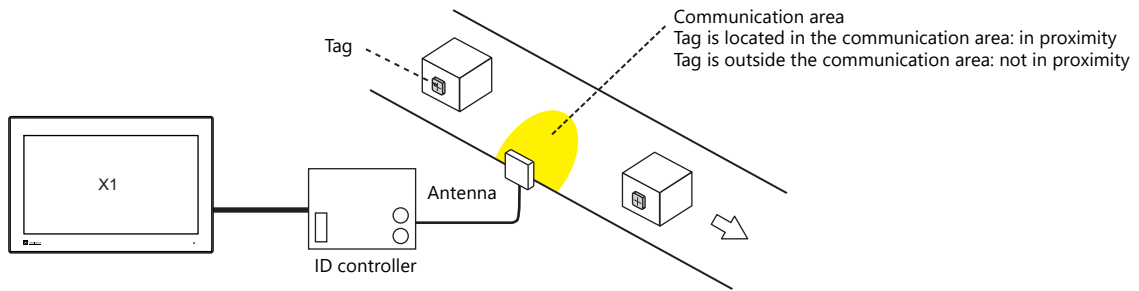
Contents	F0	F1 (= \$u n)		F2
Read (specified with ASCII code) Channel 1	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 0	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Read data	
Write (specified with ASCII code) Channel 1	1 - 8 (PLC1 - 8)	n	Station number	4 + m
		n + 1	Command: 1	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Write data	
Command process abort	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 2	
Data management Channel 1 Data check command: compare	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 3	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 1 Data check command: calculation	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 4	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 1 Writing count management command: subtraction	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 5	
		n + 2	Top address	
		n + 3	Number of updates	
Data management Channel 1 Writing count management command: addition	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 6	
		n + 2	Top address	
		n + 3	Number of updates	
Repeated writing	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 7	
Controller control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 8	
		n + 2	OUT1 operation 0: No operation 1: ON 2: OFF	
		n + 3	OUT2 operation 0: No operation 1: ON 2: OFF	
		n + 4	Current input status (IN1) 0: OFF 1: ON	
		n + 5	Current input status (IN2) 0: OFF 1: ON	
		n + 6	Output status after execution of operation (OUT1) 0: OFF 1: ON	
		n + 7	Output status after execution of operation (OUT2) 0: OFF 1: ON	
Error information read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2 to n + 4	Latest error log information (new)	
		n + 5 to n + 91	Latest error log information (old), max. 29 logs	
Abort (reset)	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 10	
Exit code acquisition Channel 1	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 12	
		n + 2	Exit code *1	

Contents	F0	F1 (= \$u n)		F2
Read (specified with ASCII code) Channel 2	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 100	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Read data	
Write (specified with ASCII code) Channel 2	1 - 8 (PLC1 - 8)	n	Station number	4 + m
		n + 1	Command: 101	
		n + 2	Top address	
		n + 3	Word count: m	
		n + 4 to n + (3 + m)	Write data	
Data management Channel 2 Data check command: compare	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 103	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 2 Data check command: calculation	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 104	
		n + 2	Top address	
		n + 3	Bytes	
Data management Channel 2 Writing count management command: subtraction	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 105	
		n + 2	Top address	
		n + 3	Number of updates	
Data management Channel 2 Writing count management command: addition	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 106	
		n + 2	Top address	
		n + 3	Number of updates	
Exit code acquisition Channel 2	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 112	
		n + 2	Exit code *1	

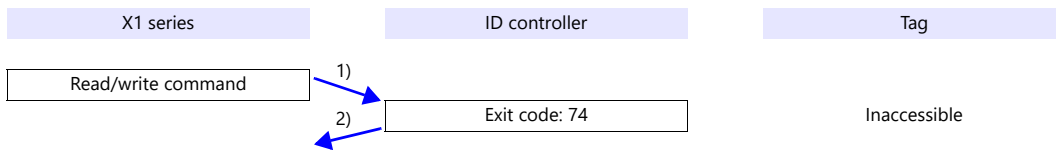
*1 Return data: Data stored from temperature controller to X1 series

*1 The exit code will not be stored if it cannot be acquired due to timeout or other reasons.

Operation

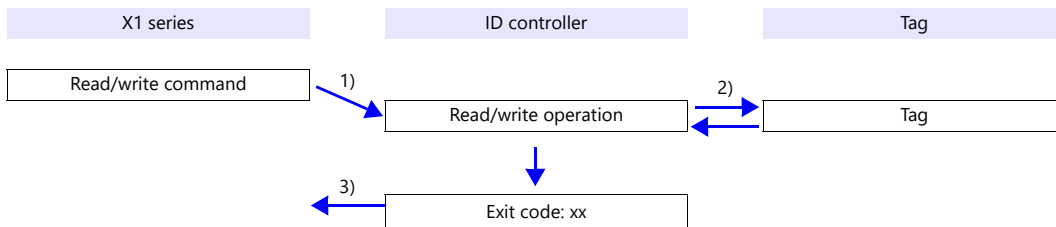


When a tag is located in proximity:



- 1) The X1 series sends the read/write command.
- 2) Since the tag is not located in an accessible position, the X1 series receives exit code 74 from the ID controller.
- 3) When [Synchronized Reading] is selected in the [Device Memory Map Setting] dialog and the control device memory (command bit) is set (ON):
 - 1) is executed at cycles specified for [Reading Cycle].

When a tag is not located in proximity (reading/writing possible):



- 1) The X1 series sends the read/write command.
- 2) The ID controller executes reading/writing from/into the tag.
- 3) The X1 series receives the exit code from the ID controller.
 - Exit code (00, 74): Finish
 - Exit code (other than 00 or 74): Steps 1) to 3) are repeated the set number of retrial times.

System Device Memory

\$Pn: 356 to 451

When [Guarantee synchronism of the data] is checked in the [Device Memory Map Setting] dialog, a status/error code of each device memory map is stored here. For more information, see "1.5 System Device Memory for Communication Confirmation" (page 1-37).

17.2.14 V680S (Ethernet TCP/IP)

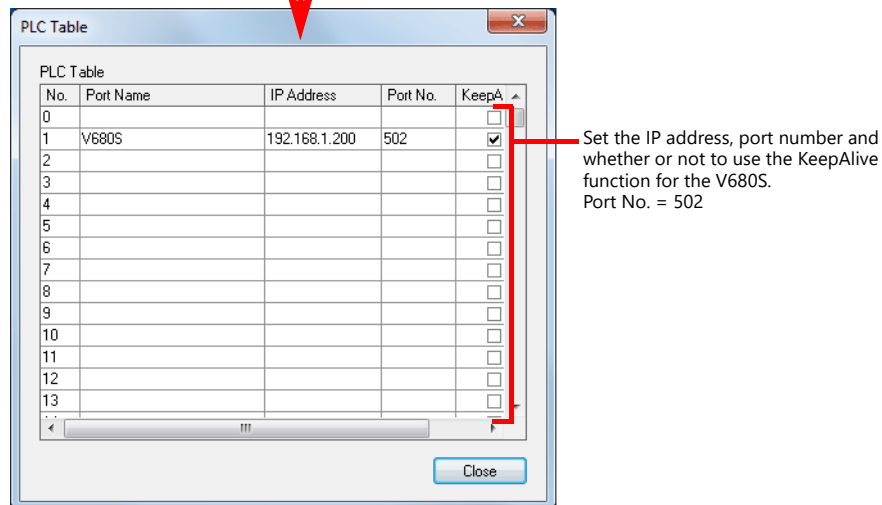
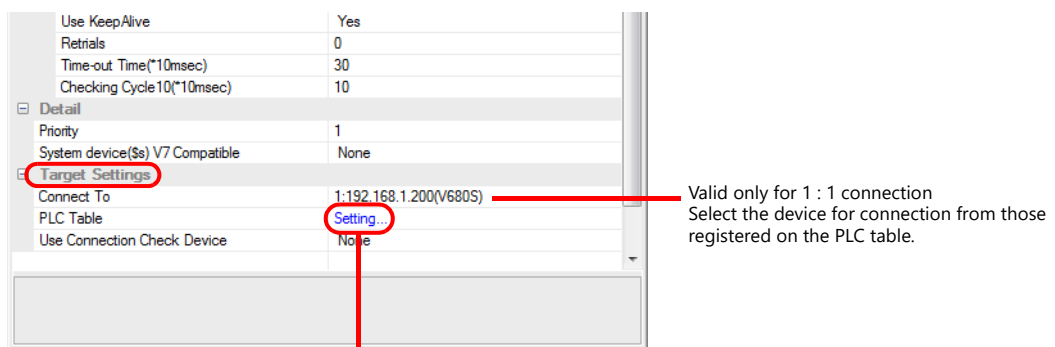
Communication Setting

Editor

Communication setting

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number of the X1 series unit (for communication with an external device)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number of V680S
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



Device memory map settings

Reading or writing to/from the tag can be performed by using the [Synchronized Reading/Synchronized Writing] function of the device memory map.

- Synchronized reading

Reading starts when the control device memory (command bit) is set (ON). Reading is performed at specified cycles until the control device memory (acknowledge bit) is set (ON).

Item	Contents
Reading Cycle	The data at the device memory addresses registered in the device memory map is read when the control device memory (command bit) is set (ON). Reading of data is repeated at specified cycles until the data is read correctly. When the data has correctly been read, the control device memory (acknowledge bit) is set (ON) and reading operation finishes. *1
Control Device	Enter a device memory address as the trigger for synchronized reading. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.
Guarantee synchronism of the data	When the box is checked, retry is made until the first data in the device memory map is read correctly. *2 *3 Check the status/error codes at \$Pn 356 to 451 to confirm whether or not reading of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data in the device memory map is read correctly. *3 Status/error codes are stored in \$Pn 356 to 451.

*1 When both [Guarantee synchronism of the data] and [Infinite retrials] are not checked, the acknowledge bit is set (ON) when reading of any data at the device memory address registered in the device memory map has been completed successfully.

*2 Set the device memory address of the same station number and channel in the device memory map.

*3 This setting is invalid when the macro command "TBL_READ" is executed.

- Synchronized writing

Writing starts when the control device memory (command bit) is set (ON). When writing has been finished, the control device memory (acknowledge bit) is set (ON).

Item	Contents
Writing Cycle	The data is written into the device memory addresses registered in the device memory map when the control device memory (command bit) is set (ON). When writing of data finishes, the control device memory (acknowledge bit) is set (ON) regardless of the result of the writing status.
Control Device	Enter a device memory address as the trigger for synchronized writing. The specified address is used for the device memory map Nos. 0 to 31. Four words are occupied. For more information, see the X1 Series Reference Manual 2.

Guarantee synchronism of the data	When the box is checked, retry is made until the first data is correctly written into the address registered in the device memory map. *1*2 Check the status/error codes at \$Pn 356 to 451 to confirm whether or not writing of subsequent data has been completed successfully.
Infinite retrials	When the box is checked, retry is made until all data is correctly written into the addresses registered in the device memory map. *2 Status/error codes are stored in \$Pn 356 to 451.

*1 Set the device memory address of the same station number and channel in the device memory map.

*2 This setting is invalid when the macro command "TBL_WRITE" is executed.

ID Controller

Configure settings using a web browser by starting the V680S in Safe Mode and establishing an Ethernet connection with the host computer.

For information on starting in Safe Mode, refer to the V680S instruction manual.

After making necessary settings, restart the V680S by pressing the [Reboot] button on the web browser.

Network settings

Item	Setting	Remarks
IP Address	Specify according to the environment.	Default: 192.168.1.200
Subnet Mask	Specify according to the environment.	
Gateway address	Specify according to the environment.	

RF tag communication settings

Item	Setting	Remarks
RF tag communications option	Once / FIFO Repeat	[Repeat] cannot be set.

Available Device Memory

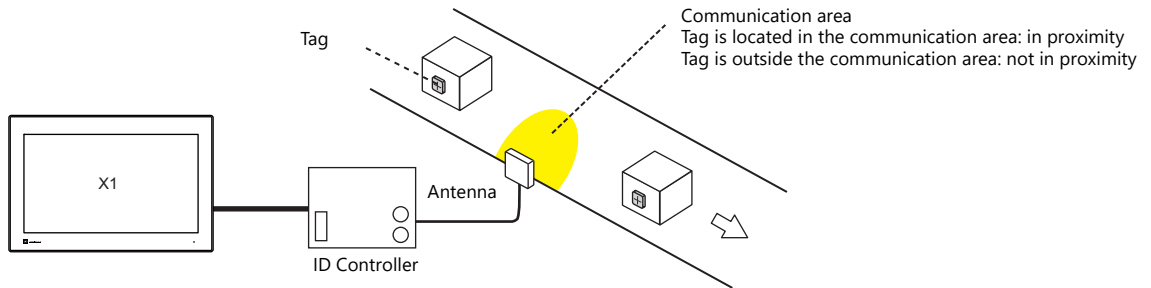
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
DATA	Data	00H	
ID	ID	01H	Read only
CMOP	Communications option	02H	
CMCD	Communication conditions	03H	
TCPCD	TCP/IP communication conditions	04H	Double-word
TYPN	Type name	05H	Specify within 64 bytes *1
WEBCD	Web communication conditions	06H	
WEBPS	Web password	07H	Specify within 16 bytes *2
NOIS	Noise	08H	Read only
FRMINF	Format information	09H	Read only
FWV	Firmware version	0AH	Read only
MACA	MAC address	0BH	Read only
RWST	Reader/writer status	0CH	Read only
OPEH	Operation time	0DH	Double-word, read only
ERQ	Query information of latest error communication	0EH	Double-word, read only
CERH	Communication error history	0FH	Double-word, read only
SERH	System error history	10H	Double-word, read only
RSTR	Restoration information	11H	Double-word, read only

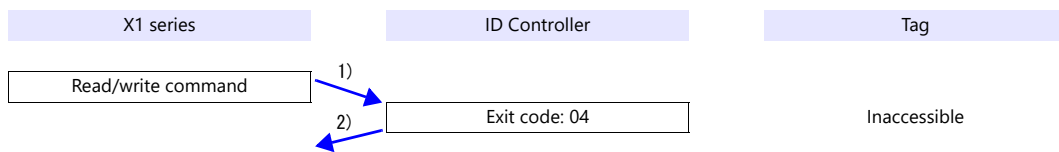
*1 A maximum of 63 bytes can be used for the actual specification. The 64th byte is for the null terminator. If the type name is shorter than 63 bytes, designate null for the rest of the bytes.

*2 A maximum of 15 bytes can be used for the actual specification. The 16th byte is for the null terminator. If the password is shorter than 15 bytes, designate null for the rest of the bytes.

Operation

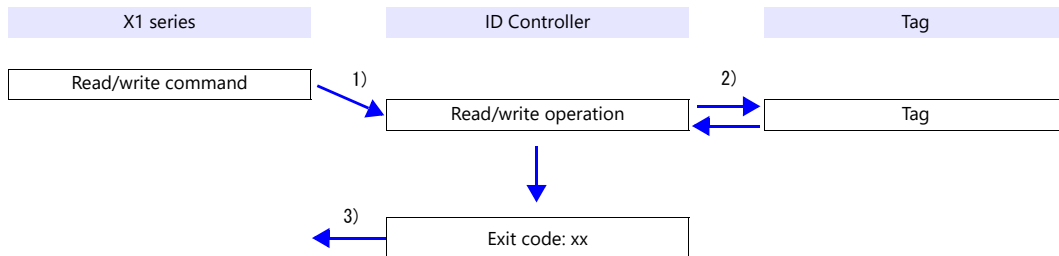


When a tag is not located in proximity (reading/writing possible):



- 1) The X1 series sends the read/write command.
- 2) Since the tag is not located in an accessible position, the X1 series receives exit code 04 from the ID controller.
- 3) When [Synchronized Reading] is selected in the [Device Memory Map Setting] dialog and the control device memory (command bit) is set (ON):
 - 1) is executed at cycles specified for [Reading Cycle].

When a tag is not located in proximity (reading/writing possible):



- 1) The X1 series sends the read/write command.
- 2) The ID controller executes reading/writing from/into the tag.
- 3) The X1 series receives the exit code from the ID controller.
 - Exit code 00: Exit
 - Exit code (other than 00): Steps 1) to 3) are repeated for the set number of retrieval times.

System Device Memory

\$Pn: 356 to 451

When [Guarantee synchronism of the data] is checked in the [Device Memory Map Setting] dialog, a status/error code of each device memory map is stored here. For more information, see "1.5 System Device Memory for Communication Confirmation" (page 1-37).

17.2.15 KM20

Communication Setting

Editor

Communication setting

(Underlined setting: default)

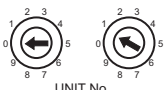
Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Parity	None / Odd / <u>Even</u>	
Target Port No.	<u>0</u> to 99	

Temperature Controller

Communication setting switch

COMMUNICATION SETTING SW		Setting Data	Remarks																				
SW1 SW2 SW3	Baud rate	<table border="1"> <thead> <tr> <th>SW1</th> <th>SW2</th> <th>SW3</th> <th>Baud Rate</th> </tr> </thead> <tbody> <tr> <td>ON</td> <td>ON</td> <td>OFF</td> <td>4800</td> </tr> <tr> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>9600</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>ON</td> <td>19200</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>ON</td> <td>38400</td> </tr> </tbody> </table>	SW1	SW2	SW3	Baud Rate	ON	ON	OFF	4800	OFF	OFF	OFF	9600	ON	OFF	ON	19200	OFF	ON	ON	38400	
SW1	SW2	SW3	Baud Rate																				
ON	ON	OFF	4800																				
OFF	OFF	OFF	9600																				
ON	OFF	ON	19200																				
OFF	ON	ON	38400																				
SW4	Data bits	OFF: 7 bits ON: 8 bits																					
SW5	Stop bit	OFF: 2 bits ON: 1 bit																					
SW6 SW7	Parity	<table border="1"> <thead> <tr> <th>SW6</th> <th>SW7</th> <th>Parity</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>Even</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Odd</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>None</td> </tr> </tbody> </table>	SW6	SW7	Parity	OFF	OFF	Even	ON	OFF	Odd	OFF	ON	None									
SW6	SW7	Parity																					
OFF	OFF	Even																					
ON	OFF	Odd																					
OFF	ON	None																					
SW8	Priority setting	OFF: DIP switch setting ON: RS-485 communication setting	CT/5ACT setting																				
SW9 SW10	Circuit setting	<table border="1"> <thead> <tr> <th>SW6</th> <th>SW7</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>Three-phase three-wire</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Single-phase two-wire</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Single-phase three-wire</td> </tr> </tbody> </table>	SW6	SW7	Circuit	OFF	OFF	Three-phase three-wire	ON	OFF	Single-phase two-wire	OFF	ON	Single-phase three-wire	Set this switch correctly according to the measurement environment. Otherwise, measurement cannot be performed correctly.								
SW6	SW7	Circuit																					
OFF	OFF	Three-phase three-wire																					
ON	OFF	Single-phase two-wire																					
OFF	ON	Single-phase three-wire																					

Unit No. setting switch

UNIT No.	Setting Data	Remarks
	00 to 99	

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 Variable area (instantaneous value)	00H	Double-word, read only
C2 Variable area (maximum value)	02H	Double-word, read only
C3 Variable area (minimum value)	03H	Double-word, read only
C000 Parameter area	04H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Status read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 06H	
		n + 2	Operation status	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number ^{*1}	3
		n + 1	Command: 30H	
		n + 2	0300H: Integral power consumption zero reset 1200H: Maximum of each measurement value reset 1300H: Minimum of each measurement value reset 9900H: Software reset	

 Return data: Data stored from temperature controller to X1 series

*1 8000 (HEX): broadcasting

17.2.16 KM100

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 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 99	

Temperature Controller

Communication level

Move to the communication setting level by using the key on the operation panel and make the required settings.

When the [LEVEL] key is held down for three seconds or longer in the run level, the setting level is selected.

When the [LEVEL] key is pressed in the setting level, the communication setting level is selected.

When the [LEVEL] key is held down for one second or longer, the run level is selected again.

(Underlined setting: default)

Item	Setting	Remarks
Communication unit No.	U-no 00 to 99	
Baud rate	bPS 4800 / <u>9600</u> / 19200 / 38400	
Data length	LEn <u>7</u> / 8	
Stop bit	Sbit 1 / <u>2</u>	
Parity	Prty None / <u>Even</u> / Odd	

Available Device Memory

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

Device Memory	TYPE	Remarks
C0 Variable area (instantaneous value)	00H	Double-word, read only
C1 Variable area (average value)	01H	Double-word, read only
C2 Variable area (maximum value)	02H	Double-word, read only
C000 Parameter area	04H	Double-word

Indirect Device Memory Designation

	15	8 7	0
n + 0	Model (91 to 98)		Device type
n + 1	Address No.		
n + 2	Expansion code		Bit designation
n + 3	00		Station number

For bit designation, an expansion code setting is required.

00H: when designating bit 0 to 15

01H: when designating bit 16 to 31

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)		F2
Status read out	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 06H	
		n + 2	Operation status	
Operation instructions	1 - 8 (PLC1 - 8)	n	Station number *1	3
		n + 1	Command: 30H	
		n + 2	0000H: Start calculation of arbitrary integral power consumption	
			0100H: Stop calculation of arbitrary integral power consumption	
			0200H: Arbitrary integral power consumption zero reset	
			0300H: Integral power consumption zero reset	
			0700H: Move to setting level	
			Log data read out	
			1000H: Moving the read pointer to the top of the stored data	
			1001H: Reading the log data at the read pointer (The pointer advances.)	
1002H: Reading the log data at the read pointer and delete the read data and earlier data from the memory (The pointer advances.)				
1100H: Delete all log data				
9900H: Software reset				

Return data: Data stored from temperature controller to X1 series

*1 8000 (HEX): broadcasting

17.2.17 EJ1

Communication Setting

Editor

Communication setting


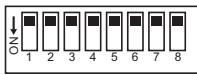
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-422/485	
Baud Rate	<u>9600</u> / 19200 / 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.	0 to 63	

Temperature Controller

TC4/2 (Basic Units)

(Underlined setting: default)

SW1	SW2	Setting Item	Setting
		1 2	Unit No.
		3	Communication Protocol
-			<u>OFF</u>: CompoWay/F (Supported in the version 1.2 of the EJ1.)

SW2		SW1															
1	2	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
<u>OFF</u>	<u>OFF</u>	00	<u>01</u>	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ON	OFF	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
OFF	ON	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
ON	ON	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63

EDU (End Unit)

The End Unit has two communications ports: port A and port B. Write Mode is valid for port B.

If settings are changed from port A, they are always written to nonvolatile memory. When using port A, be sure to consider the write life of the nonvolatile memory.

Port A (Terminal) Communication setting

Communication parameters are fixed to 38400 bps (baud rate), 7 bits (data length), 2 bit (stop bit), and even (parity).

- * To communicate using port A (terminal), disconnect the dedicated USB-serial conversion cable (E58-C1FQ1) from port A (connector). If communication is performed through port A (terminal) without disconnecting the conversion cable, communication through port A (terminal) may not be performed correctly.

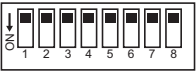
Port B Communication setting

Set the temperature controller using the dip switch of TC4/2 (basic unit) and the "CX-Thermo" support software.

For more information, refer to the manual of the temperature controller.

- TC4/2 (Basic Units) DIPSW

(Underlined setting: default)

SW2	Setting Item	Setting															
	Baud Rate	<table border="1"> <thead> <tr> <th>SW2 *1</th> <th>Follow the setting values in the parameter "Port B communication speed" *2 (9600 by default)</th> <th>19200 bps</th> <th>38400 bps</th> <th>115K bps</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>5</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>	SW2 *1	Follow the setting values in the parameter "Port B communication speed" *2 (9600 by default)	19200 bps	38400 bps	115K bps	4	OFF	ON	OFF	ON	5	OFF	OFF	ON	ON
		SW2 *1	Follow the setting values in the parameter "Port B communication speed" *2 (9600 by default)	19200 bps	38400 bps	115K bps											
		4	OFF	ON	OFF	ON											
5	OFF	OFF	ON	ON													

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2																														
Readout of main unit's attribute	1 - 8 (PLC1 - 8)	n	Station number	2																													
		n+1	Command: 0005H																														
		n+2	Type: 10-byte ASCII																														
		:																															
		n+6																															
n+7	Send and receive buffer sizes (HEX) ^{*1}																																
Read controller status	1 - 8 (PLC1 - 8)	n	Station number	2																													
		n+1	Command: 0006H																														
		n+2	Operation status (higher byte) • TC4/2 (Basic Units)																														
			<table border="1" style="margin-left: 20px;"> <tr> <td>Bit</td> <td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>-</td> </tr> <tr> <td></td> <td colspan="2">ch4</td><td colspan="2">ch3</td><td colspan="2">ch2</td><td colspan="2">ch1</td><td></td> </tr> </table> <table border="1" style="margin-left: 20px; margin-top: 5px;"> <tr> <th>Bit</th> <th>Operating Status</th> </tr> <tr> <td>00</td> <td>Operating</td> </tr> <tr> <td>01</td> <td>Error output</td> </tr> <tr> <td>10</td> <td>Stopped</td> </tr> <tr> <td>11</td> <td>In manual operation</td> </tr> </table>		Bit	15	14	13	12	11	10	9	8	-		ch4		ch3		ch2		ch1			Bit	Operating Status	00	Operating	01	Error output	10	Stopped	11
		Bit	15		14	13	12	11	10	9	8	-																					
			ch4		ch3		ch2		ch1																								
		Bit	Operating Status																														
		00	Operating																														
		01	Error output																														
		10	Stopped																														
11	In manual operation																																
• HFU (Advanced Unit): 00 fixed																																	
Related information (lower byte)																																	
<table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Code</th> <th>HFU (Advanced Unit)</th> <th>TC4/2 (Basic Units)</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>Startup processing</td> <td>Startup processing</td> </tr> <tr> <td>01</td> <td>-</td> <td>-</td> </tr> <tr> <td>02</td> <td>Device error</td> <td>Device error</td> </tr> <tr> <td>03</td> <td>Configuration confirmation</td> <td>Configuration confirmation</td> </tr> <tr> <td>04</td> <td>Configuration error</td> <td>Configuration error</td> </tr> <tr> <td>05</td> <td>Normal</td> <td>-</td> </tr> <tr> <td>06</td> <td>-</td> <td>Normal</td> </tr> </tbody> </table>	Code	HFU (Advanced Unit)	TC4/2 (Basic Units)	00	Startup processing	Startup processing	01	-	-	02	Device error	Device error	03	Configuration confirmation	Configuration confirmation	04	Configuration error	Configuration error	05	Normal	-	06	-	Normal									
Code	HFU (Advanced Unit)	TC4/2 (Basic Units)																															
00	Startup processing	Startup processing																															
01	-	-																															
02	Device error	Device error																															
03	Configuration confirmation	Configuration confirmation																															
04	Configuration error	Configuration error																															
05	Normal	-																															
06	-	Normal																															
n+2																																	
Operation commands	1 - 8 (PLC1 - 8)	n	Station number ^{*2}	3																													
		n+1	Command: 0030H																														
		n+2	Write mode 0400H: Backup mode 0401H: RAM write mode 0600H: Software reset																														
			RUN 0A00H: channel 1 0A01H: channel 2 0A02H: channel 3 0A03H: channel 4 0AFFH: All channels																														
			STOP 0B00H: channel 1 0B01H: channel 2 0B02H: channel 3 0B03H: channel 4 0BFFH: All channels																														
			Manual 0C00H: channel 1 0C01H: channel 2 0C02H: channel 3 0C03H: channel 4 0CFFH: All channels																														
			Auto 0D00H: channel 1 0D01H: channel 2 0D02H: channel 3 0D03H: channel 4 0DFFH: All channels																														
			AT execution at 40% 0E00H: channel 1 0E01H: channel 2 0E02H: channel 3 0E03H: channel 4 0EFFH: All channels																														

Contents	F0	F1 (= \$u n)	F2	
Operation commands	1 - 8 (PLC1 - 8)	n+2	AT execution at 100% 0F00H: channel 1 0F01H: channel 2 0F02H: channel 3 0F03H: channel 4 0FFFH: All channels	3
			AT cancel 1000H: channel 1 1001H: channel 2 1002H: channel 3 1003H: channel 4 10FFH: All channels	
			Bank 0 Change 1E00H: channel 1 1E01H: channel 2 1E02H: channel 3 1E03H: channel 4 1EFFH: All channels	
			Bank 1 Change 1F00H: channel 1 1F01H: channel 2 1F02H: channel 3 1F03H: channel 4 1FFFH: All channels	
			Bank 2 Change 2000H: channel 1 2001H: channel 2 2002H: channel 3 2003H: channel 4 20FFH: All channels	
			Bank 3 Change 2100H: channel 1 2101H: channel 2 2102H: channel 3 2103H: channel 4 21FFH: All channels	
			Local SP Change 2200H: channel 1 2201H: channel 2 2202H: channel 3 2203H: channel 4 22FFH: All channels	
			Remote SP Change 2300H: channel 1 2301H: channel 2 2302H: channel 3 2303H: channel 4 23FFH: All channels	
			2D00H: Reset Error	
			Alarm 1 Latch Cancel 3200H: channel 1 3201H: channel 2 3202H: channel 3 3203H: channel 4 32FFH: All channels	
			Alarm 2 Latch Cancel 3300H: channel 1 3301H: channel 2 3302H: channel 3 3303H: channel 4 33FFH: All channels	
			Alarm 3 Latch Cancel 3400H: channel 1 3401H: channel 2 3402H: channel 3 3403H: channel 4 34FFH: All channels	
			All Alarm Latch Cancel 3500H: channel 1 3501H: channel 2 3502H: channel 3 3503H: channel 4 35FFH: All channels	
			37FFH: Save RAM data *3	
			3800H: Initialize	
	39FFH: Save RAM data 2 *4			
	Register Unit Configuration 3B00H: Reset 3B01H: Register	3		

*1 Stores the smaller of the send and receive buffer sizes.

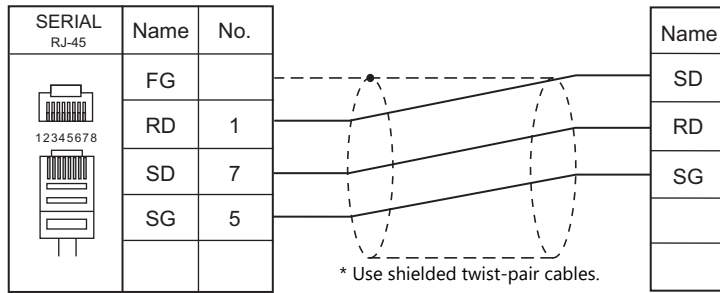
Return data: Data stored from temperature controller to X1 series

- *2 8000 (HEX): broadcasting
- *3 The set value(s) which can be changed during operation are saved in the nonvolatile memory area.
- *4 All the set values are saved in the nonvolatile memory area.

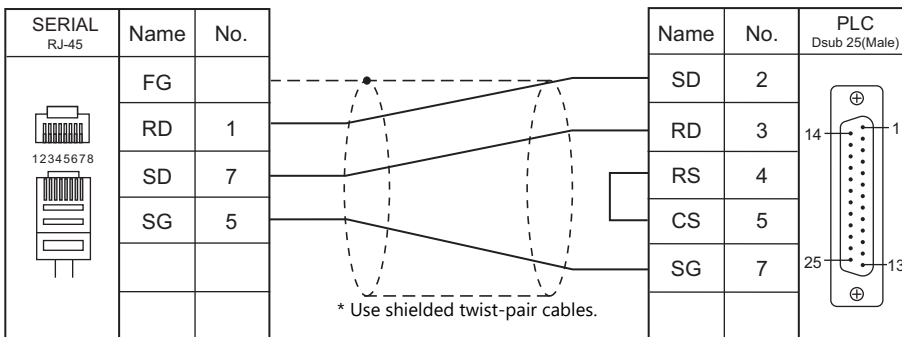
17.2.18 Wiring Diagrams

RS-232C

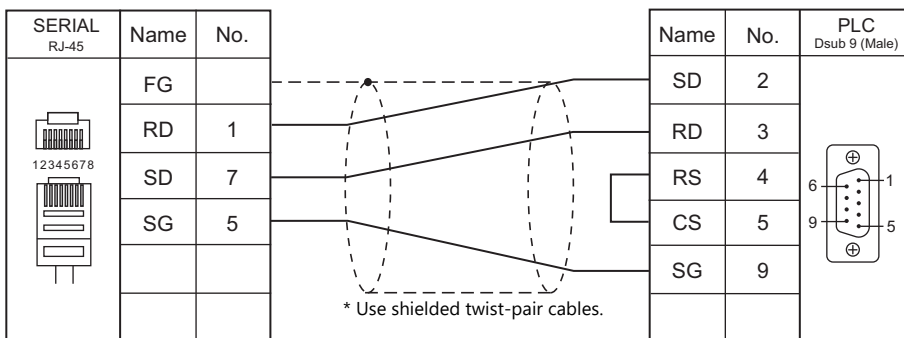
Wiring diagram 1 - M2



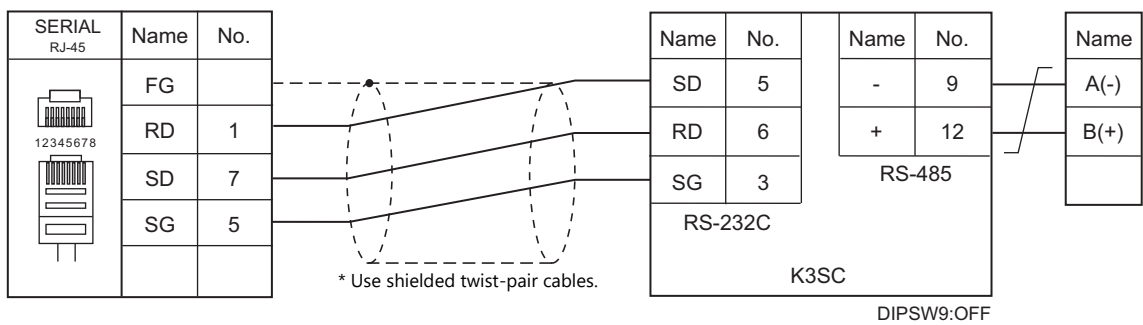
Wiring diagram 2 - M2



Wiring diagram 3 - M2

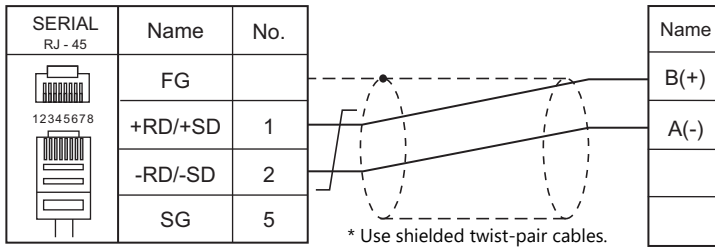


Wiring diagram 4 - M2

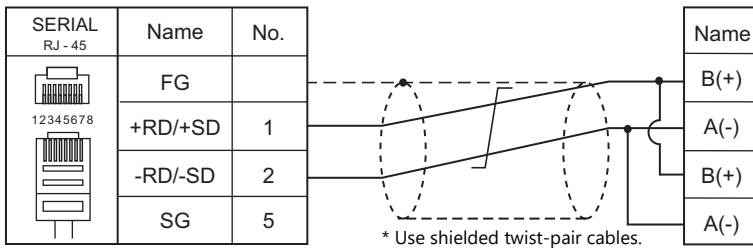


RS-422/RS-485

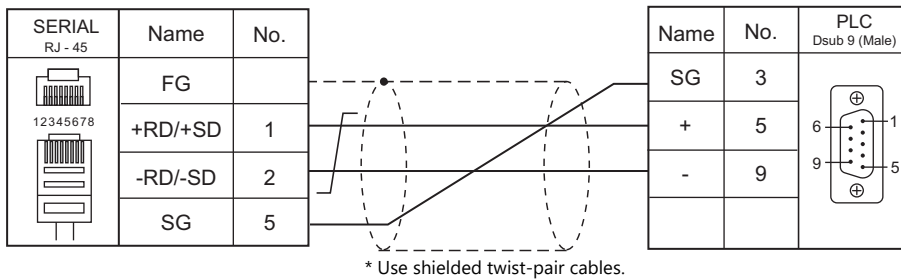
Wiring diagram 1 - M4



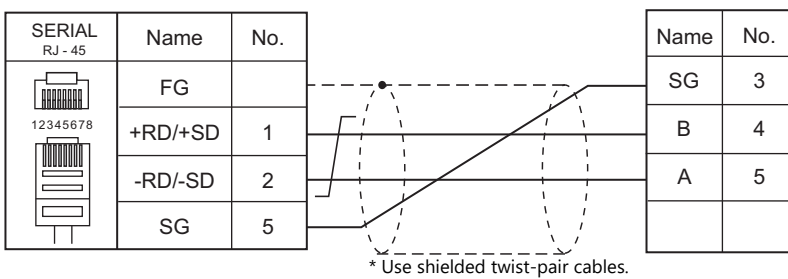
Wiring diagram 2 - M4



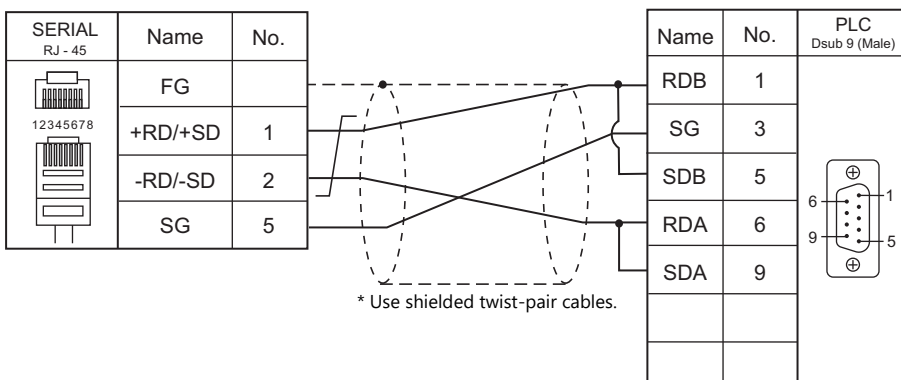
Wiring diagram 3 - M4



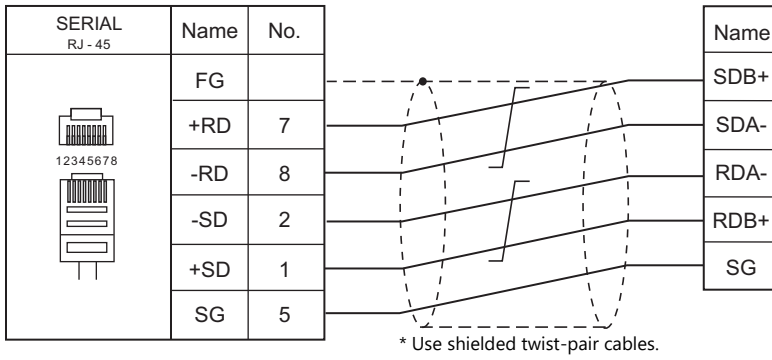
Wiring diagram 4 - M4



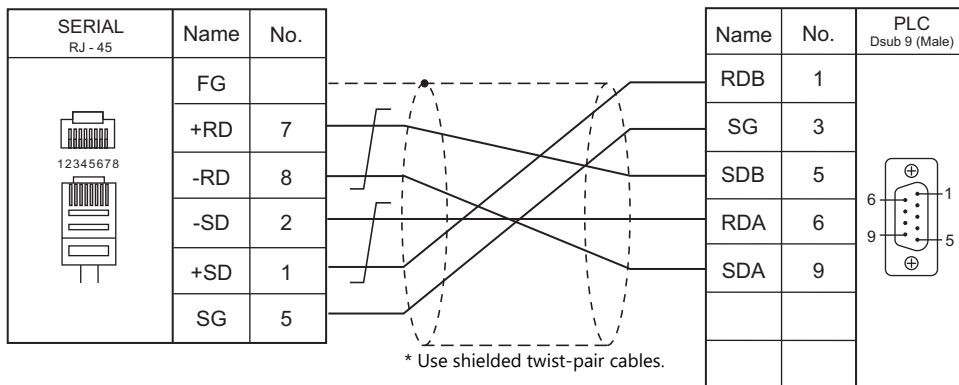
Wiring diagram 5 - M4



Wiring diagram 6 - M4



Wiring diagram 7 - M4



18. Oriental Motor

18.1 Temperature Controller/Servo/Inverter Connection

18.1 Temperature Controller/Servo/Inverter Connection

Stepping Motor

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire) ^{*1}	RS-422 (4-wire)	
Highly-efficient AR series (MODBUS RTU)	ARD-KD ARD-AD ARD-CD	CN6 CN7	RS-485	Wiring diagram 1 - M4	×	OM_AR (MODBUS RTU).Lst
CRK series (MODBUS RTU)	CRD503-KD CRD507-KD CRD507H-KD CRD514-KD	CN6 CN7	RS-485	Wiring diagram 1 - M4	×	OM_CRK (MODBUS RTU).Lst

*1 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

18.1.1 High-efficiency AR Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Stepping Motor

ARD-AD/ARD-CD


MEXE02 (application software)

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.


(Underlined setting: default)

Item	Setting	Remarks
Communication timeout	<u>0</u> to 10000 ms	0: No check * If the X1 series performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.
Parity	None / <u>Even</u> / Odd	
Stop bit	<u>1</u> / 2 bits	


Baud rate setting switch (SW2)

SW2	Setting Item	Setting	Remarks
	Baud rate	0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps 4: 115200 bps	5 to F disabled


Function setting switches (SW4)

SW4	No.	Setting Item	Setting	Remarks
	1	Device number setting	OFF: 1 to 15 ON: 16 to 31	Use this switch together with the device number setting switch (ID).
	2	Protocol setting	ON: MODBUS protocol	

Device number setting switch (ID)

ID	Setting Item	Setting			Remarks
	Device number	Device No.	Device Number Setting Switch (ID)	Function Setting Switch (SW4) No. 1	Use this switch together with function setting switch (SW4) No. 1. * Do not use device No. 0.
		1 to 15	1 to F	OFF	
		16 to 31	0 to F	ON	

Terminating resistance setting switches (TERM.)

TERM.	Setting Item	Setting	Remarks
	Terminating resistance	Both ON: With terminating resistance	Be sure to set both switches to the same position (ON or OFF). Turning ON either one only may result in communication error.
		Both OFF: Without terminating resistance	


ARD-KD**MEXE02 (application software)**

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.


(Underlined setting: default)

Item	Setting	Remarks
Communication timeout*	<u>0</u> to 10000 ms	0: No check * If the X1 series performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.
Parity	None / <u>Even</u> / Odd	
Stop bit	<u>1</u> / 2 bits	

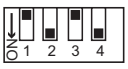
Device number setting switch (SW1)

SW1	Setting Item	Setting	Remarks									
	Device number	<table border="1"> <thead> <tr> <th>Device No.</th> <th>Device Number Setting Switch (ID)</th> <th>Function Setting Switch (SW3) No. 1</th> </tr> </thead> <tbody> <tr> <td>1 to 15</td> <td>1 to F</td> <td>OFF</td> </tr> <tr> <td>16 to 31</td> <td>0 to F</td> <td>ON</td> </tr> </tbody> </table>	Device No.	Device Number Setting Switch (ID)	Function Setting Switch (SW3) No. 1	1 to 15	1 to F	OFF	16 to 31	0 to F	ON	Use this switch together with function setting switch (SW3) No. 1. * Do not use device No. 0.
		Device No.	Device Number Setting Switch (ID)	Function Setting Switch (SW3) No. 1								
		1 to 15	1 to F	OFF								
16 to 31	0 to F	ON										

Baud rate setting switch (SW2)

SW2	Setting Item	Setting	Remarks
	Baud rate	0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps 4: 115200 bps	5 to F disabled

Function setting switches (SW3)

SW3	No.	Setting Item	Setting	Remarks
	1	Device number setting	OFF: 1 to 15 ON: 16 to 31	Use this switch together with the device number setting switch (SW1).
	2	Protocol setting	ON: MODBUS protocol	
	3	Not used	OFF	
	4	Terminating resistance	ON: With terminating resistance OFF: Without terminating resistance	

Available Device Memory

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

Device Memory	TYPE	Remarks
4 (holding register)	02H	

18.1.2 CRK Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Stepping Motor


MEXE02 (application software)

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.


(Underlined setting: default)

Item	Setting	Remarks
Communication device number	1 to 31	This setting is valid, provided that the device number setting switch (SW1) is set to "F". * Do not use device No. 0.
Communication protocol	Modbus RTU	
Parity	None / <u>Even</u> / Odd	
Stop bit	<u>1</u> / 2 bits	
Communication timeout	<u>0</u> to 10000 ms	0: No check * If the X1 series performs no communication for a set timeout period (other than "0"), an alarm occurs at the stepping motor.

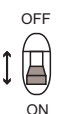
Device number setting switch (SW1)

SW1	Setting Item	Setting	Remarks
	Device number	1 to E: 1 to 14	Do not use device No. 0.
		F: Device number of the communication device number parameter in MEXE02	

Function setting switches (SW2)

SW2	No.	Setting Item	Setting	Remarks																								
	1	Baud rate	<table border="1"> <thead> <tr> <th></th> <th>No. 1</th> <th>No. 2</th> <th>No. 3</th> </tr> </thead> <tbody> <tr> <td>9600 bps</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>19200 bps</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>38400 bps</td> <td>OFF</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>57600 bps</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>115200 bps</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> </tbody> </table>		No. 1	No. 2	No. 3	9600 bps	OFF	OFF	OFF	19200 bps	ON	OFF	OFF	38400 bps	OFF	ON	OFF	57600 bps	ON	ON	OFF	115200 bps	OFF	OFF	ON	
			No. 1	No. 2	No. 3																							
	9600 bps		OFF	OFF	OFF																							
	19200 bps		ON	OFF	OFF																							
	38400 bps		OFF	ON	OFF																							
57600 bps	ON	ON	OFF																									
115200 bps	OFF	OFF	ON																									
2																												
3																												
4	Connected device	ON: Universal master device																										

Terminating resistance setting switch (SW3)

SW3	Setting Item	Setting	Remarks
	Terminating resistance	ON: With terminating resistance OFF: Without terminating resistance	

Available Device Memory

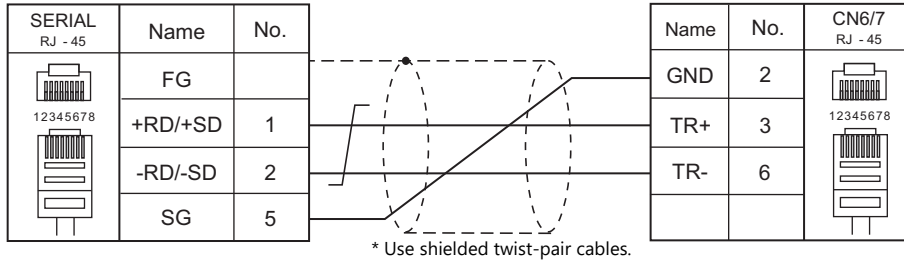
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
4 (holding register)	02H	

18.1.3 Wiring diagram

RS-485

Wiring diagram 1 - M4



19. Panasonic

19.1 PLC Connection

19.2 Temperature Controller/Servo/Inverter Connection

19.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port		Signal Level	Connection	
					RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)
FP Series (RS232C/422)	FP1	COM port of the CPU		RS-232C	Wiring diagram 1 - M2	×
	FP3	AFP3462 (CCU)		RS-232C		
		AFP3463 (C-NET)		RS-422	Wiring diagram 1 - M4	×
	FP5	AFP5462 (CCU)		RS-232C	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	Wiring diagram 1 - M4	×
		AFP3463 (C-NET)		RS-422		
	FP0	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Wiring diagram 6 - M2	×
		COM port of the CPU		RS-232C	Wiring diagram 3 - M2	×
	FP2 FP2SH	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Wiring diagram 6 - M2	×
		COM port of the CPU		RS-232C	Wiring diagram 2 - M2	×
	FPΣ	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Wiring diagram 6 - M2	×
		AFPG801	COM1	RS-232C	Wiring diagram 4 - M2	×
		AFPG802	COM1, 2	RS-232C	Wiring diagram 5 - M2	×
		AFPG803	COM1	RS-485	Wiring diagram 2 - M4	×
		AFPG806	COM1	RS-485	Wiring diagram 1 - M4	×
	COM2		RS-232C	Wiring diagram 3 - M2	×	
	FP-e	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Wiring diagram 6 - M2	×
		COM port of the CPU		RS-232C	Wiring diagram 3 - M2	×
				RS-485	Wiring diagram 2 - M4	×
	FP-X	Tool port of the CPU		RS-232C	Panasonic's "AFC8503" + Wiring diagram 6 - M2	×
		AFPX-COM1	COM1	RS-232C	Wiring diagram 4 - M2	×
		AFPX-COM2	COM1, 2	RS-232C	Wiring diagram 5 - M2	×
		AFPX-COM3	COM1	RS-485	Wiring diagram 1 - M4	×
		AFPX-COM4	COM1	RS-485		
			COM2	RS-232C	Wiring diagram 3 - M2	×
FP0H	COM port of the CPU		RS-232C	Wiring diagram 3 - M2	×	
	AFP0HCCS1	COM1	RS-232C	Wiring diagram 4 - M2	×	
	AFP0HCCS2	COM1, 2	RS-232C	Wiring diagram 5 - M2	×	
	AFP0HCCM1	COM1	RS-485	Wiring diagram 1 - M4	×	
	AFP0HCCS1M1	COM1	RS-485			
			COM2	RS-232C	Wiring diagram 3 - M2	×
FP7 Series (RS232C/422)	FP7	COM0 of the CPU		RS-232	Wiring diagram 3 - M2	×
		AFP7CCS1	CH1			
		AFP7CCS2	CH1, CH2			
		AFP7CCM1	CH1	RS-485	Wiring diagram 1 - M4	×
		AFP7CCM2	CH1, CH2			
		AFP7CCS1M1	CH1			
CH2	RS-232		Wiring diagram 3 - M2	×		

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

FP/FP-X/FP7 Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*5}
FP Series (TCP/IP) ^{*1}	FP2	FP2-ET1	○	×	As desired ^{*2}	○
	FP0H	Built-in Ethernet				
FP Series (UDP/IP)	FP2	FP2-ET1	×	○		
	FP0H	Built-in Ethernet				
FP-X (TCP/IP)	FP-X	AFPX-COM5	○	×	As desired ^{*3}	
FP7 Series (Ethernet)	FP7	Built-in Ethernet	○	○	8000 to 65535 ^{*4}	

*1 To speed up communications, we recommend you to use UDP/IP communication.

*2 The FP2-ET1 allows the user connections from 1 through 8. Up to 8 stations of the X1 can be connected.

The FP0H allows the user connections from 1 through 9. Up to 9 stations of the X1 can be connected.

*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 X1 units can be connected to an Ethernet unit.

*4 The number of connectable X1 units depends on the [No. of User Connections] setting in the PLC communication tool (up to 216 stations).

*5 For KeepAlive functions, see "1.3.2 Ethernet Communication".

19.1.1 FP Series (RS232C/422)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> :1 / 1:n	
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	
Header	% (<u>Header</u>) / < (Extension Header)	Models on which "< (Extension header)" is available: FP2, FP2SH, FPΣ, FP-X, FP0R
Monitor Registration	Unchecked / <u>Checked</u>	One X1 unit can be registered as a monitor for one PLC.

PLC

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

FP-X

Tool port setting

(Underlined setting: default)

System Register *1	Contents	
410	Unit No.	<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 *1

(Underlined setting: default)

System Register *2		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 *3

*1 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.

*2 System register setting is enabled in the RUN mode.

*3 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)

FP-Σ**Tool port setting**

(Underlined setting: default)

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

(Underlined setting: default)

System Register *1		Contents	
COM1	COM2		
410	411	Unit No.	<u>1</u> to 99*3
412		Communication 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 AFP806COM1, set the switch attached to the back of the cassette as well.
SW1 to 2: OFF 19200 bps, ON 115 kbps

*3 In addition to system register setting, the station number setting is also possible with the station number setting switch. For more information, refer to the PLC manual issued by the manufacturer.

FP1 / FP0 / FP-e**Tool port setting**

(Underlined setting: default)

System Register *1	Contents	
411	Data Length	7 / <u>8</u> bits
414	Baud Rate	<u>9600</u> / 19200
-	Parity	Odd (fixed)
-	Stop Bit	1 (fixed)

*1 System register setting is enabled in the RUN mode.

COM port setting

(Underlined setting: default)

System Register *1	Contents	
412	Communication Mode	Computer link
413	Data Length	7 / <u>8</u> bits
	Parity	None / <u>Odd</u> / Even
	Stop Bit	<u>1</u> / 2 bits
414	Baud Rate	4800 / <u>9600</u> / 19200
415	Unit No.	<u>1</u> to 99

*1 System register setting is enabled in the RUN mode.

FP2**Tool port setting**

(Underlined setting: default)

System Register *1	Contents	
411	Data Length	7 / <u>8</u> bits
414	Baud Rate *2	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115200 bps
-	Parity	Odd (fixed)
-	Stop Bit	1 (fixed)

*1 System register setting is enabled in the RUN mode.

*2 Enabled when the DIP switch 1 on the back of the CPU unit is set to the OFF position.

COM port setting

(Underlined setting: default)

System Register *1	Contents	
412	Communication Mode	Computer link
413	Data Length	7 / <u>8</u> bits
	Parity	None / <u>Odd</u> / Even
	Stop Bit	<u>1</u> / 2 bits
414	Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 / 115200 bps
415	Unit No.	<u>1</u> to 99

*1 System register setting is enabled in the RUN mode.

FP10/FP10s (COM Port)**Operation mode setting switch**

Switch	Setting	Contents
4	OFF	Baud rate: 19200 bps
5	ON	Data length: 8 bits
6	ON	With parity
7	OFF	Odd
8	OFF	Stop bit 1

Station number setting switch

(Underlined setting: default)

Switch		Setting
The tens place	The ones place	<u>01</u> to 32

FP10SH (COM Port)**Operation mode setting switch (upper)**

Switch	Setting	Contents
1	OFF	Not control with a modem
2	OFF	Beginning code STX invalid
3	OFF	Terminating code CR
4	ON	
5	ON	Stop bit 1
6	ON	Odd parity
7	ON	
8	ON	Data length: 8 bits

Operation mode setting switch (lower)

Switch	Setting	Contents
6	ON	Baud rate: 19200 bps
7	ON	
8	OFF	

Station number setting switch (lower)

(Underlined setting: default)

Switch		Setting
The tens place	The ones place	<u>01</u> 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	-

FP0H**COM port setting**

(Underlined setting: default)

System Register *1			Contents	
COM0	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

*1 System register setting is enabled in the RUN mode.

Available Device Memory

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

Device Memory	TYPE	Remarks
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

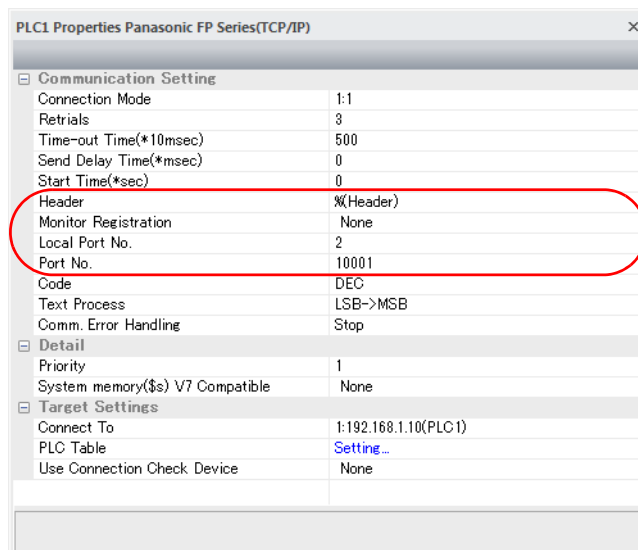
19.1.2 FP Series (TCP/IP)

Communication Setting

Editor

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

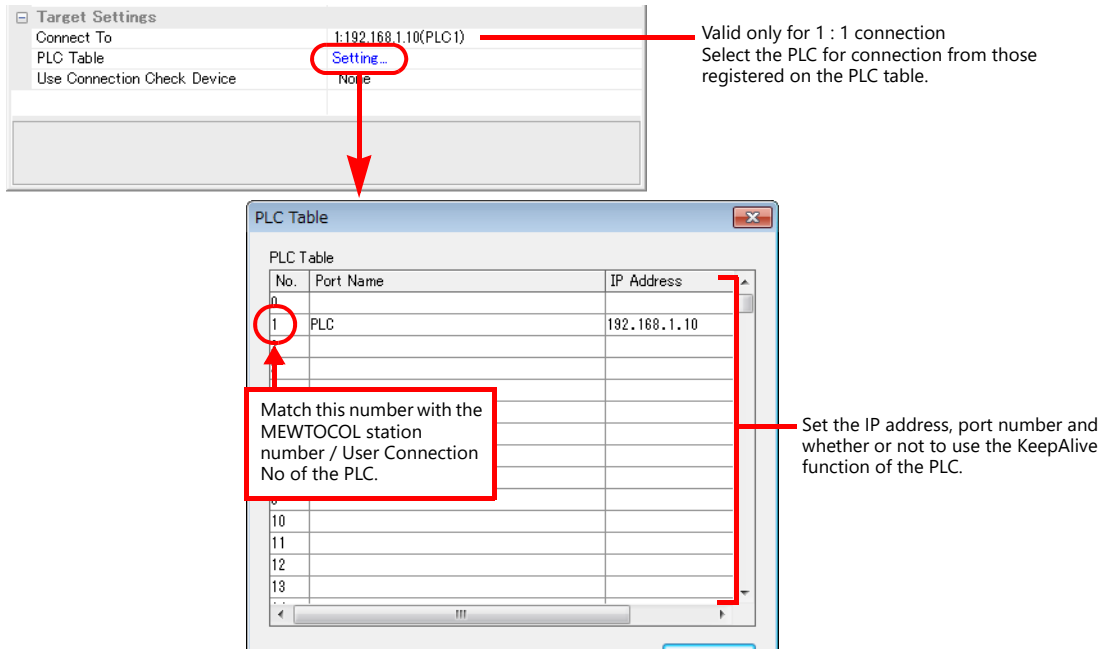
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One X1 unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple X1 units in n : 1 connection.
Local Port No.	Set the local port number of the X1 unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
 Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
 The PLC table number must be the same as the one set for "MEWTOCOL Station Number" of the FP2 or "User Connection No." of the FP0H.



PLC

FP2-ET1

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 X1.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the X1 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 X1
	Target Node Port Number	Port number of the X1
	Target Node MEWTOCOL Station Number	1 to 31 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the X1.
	Connection Setting	Valid

FPOH

Make "Ethernet Setting" using the configuration tool "FPWIN GR7". For more information, refer to the PLC manual issued by the manufacturer.

Basic information on communication

Item	Setting
Home IP address	IP address of the PLC

User connection setting

Item		Setting
Connection 1 to 9 * Select a port to which the X1 is connected.	Connection usage	Use
	Communication Mode	TCP/IP
	Open system (server/client)	Server connection (target station as desired)
	Open system (automatic/manual)	Open automatically
	Operation mode	MEWTOCOL-COM
	MEWTOCOL communications type	Connect with FP2 ET-LAN
	Local port No.	Connection1: 60001 Connection2: 60002 Connection3: 60003 Connection4: 60004 Connection5: 60005 Connection6: 60006 Connection7: 60007 Connection8: 60008 Connection9: 60009

Available Device Memory

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

Device Memory	TYPE	Remarks
DT (data register)	00H	
X (external input)	01H	WX as word device, read only
Y (external output)	02H	WY as word device
R (internal relay)	03H	WR as word device, including special relays
L (link relay)	04H	WL as word device
LD (link register)	05H	
FL (file register)	06H	FP2, 3, 5, 10 only
SV (timer, counter/set value)	07H	
EV (timer, counter/elapsed time)	08H	
T (timer/contact)	09H	Read only
C (counter/contact)	0AH	Read only

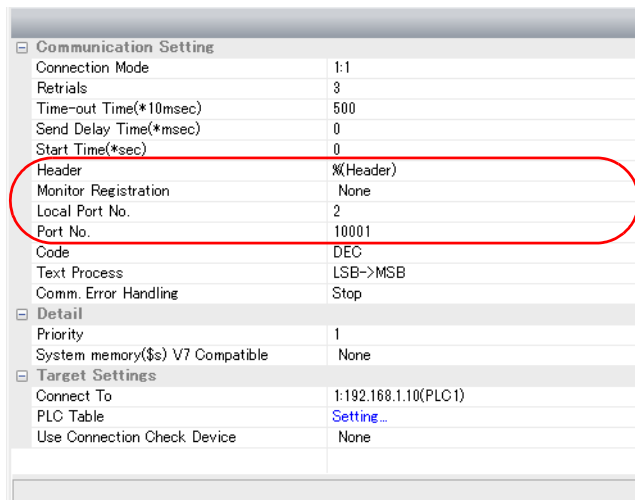
19.1.3 FP Series (UDP/IP)

Communication Setting

Editor

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

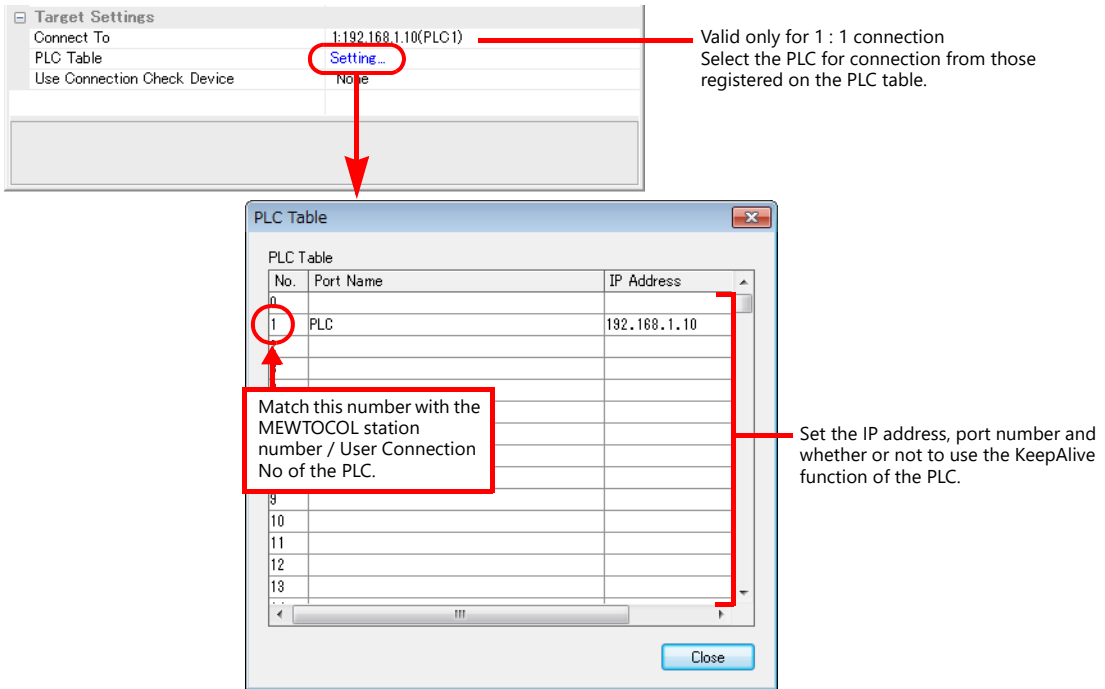
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One X1 unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple X1 units in n : 1 connection.
Local Port No.	Set the local port number of the X1 unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
 Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
 The PLC table number must be the same as the one set for "MEWTOCOL Station Number" of the FP2 or "User Connection No." of the FP0H.



PLC

FP2-ET1

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 X1.

Connection setting

Item		Setting
Connection 1 to 8 * Select a port to which the X1 is connected.	Communication Mode	UDP/IP
	Open Type	Unpassive
	Usage	MEWTOCOL communication
	Local Node (PLC) Port Number	As desired
	Target Node IP Address	IP address of the X1
	Target Node Port Number	Port number of the X1
	Target Node MEWTOCOL Station Number	1 to 31 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the X1.
	Connection Setting	Valid

FP0H

Make "Ethernet Setting" using the configuration tool "FPWIN GR7". For more information, refer to the PLC manual issued by the manufacturer.

Basic information on communication

Item	Setting
Home IP address	IP address of the PLC

User connection setting

Item		Setting
Connection 1 to 9 * Select a port to which the X1 is connected.	Connection usage	Use
	Communication Mode	UDP/IP
	Open system (server/client)	Server connection (target station as desired)
	Open system (automatic/manual)	Open automatically
	Operation mode	MEWTOCOL-COM
	MEWTOCOL communications type	Connect with FP2 ET-LAN
Local port No.	Connection1: 60001 Connection2: 60002 Connection3: 60003 Connection4: 60004 Connection5: 60005 Connection6: 60006 Connection7: 60007 Connection8: 60008 Connection9: 60009	

Available Device Memory

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

Device Memory	TYPE	Remarks
DT (data register)	00H	
X (external input)	01H	WX as word device, read only
Y (external output)	02H	WY as word device
R (internal relay)	03H	WR as word device, including special relays
L (link relay)	04H	WL as word device
LD (link register)	05H	
FL (file register)	06H	FP2, 3, 5, 10 only
SV (timer, counter/set value)	07H	
EV (timer, counter/elapsed time)	08H	
T (timer/contact)	09H	Read only
C (counter/contact)	0AH	Read only

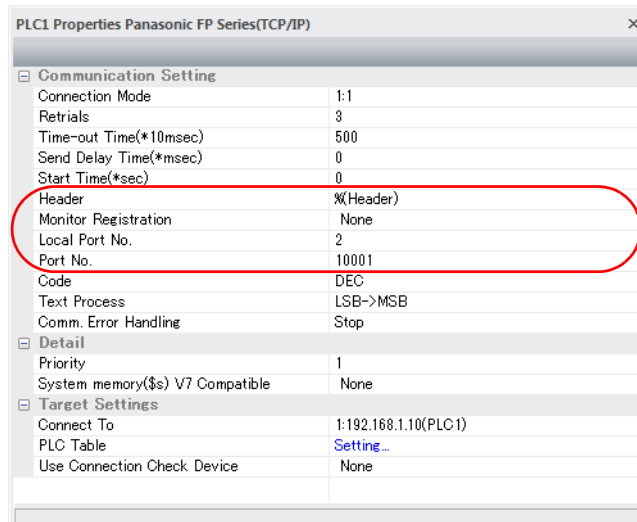
19.1.4 FP-X (TCP/IP)

Communication Setting

Editor

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

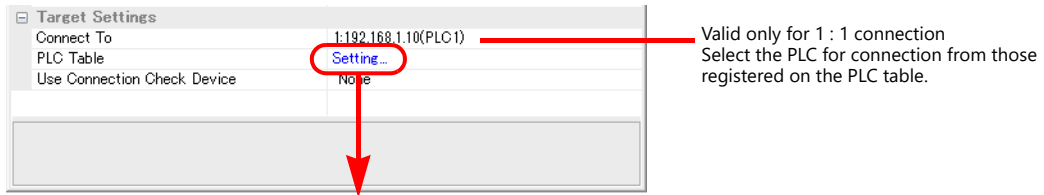
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



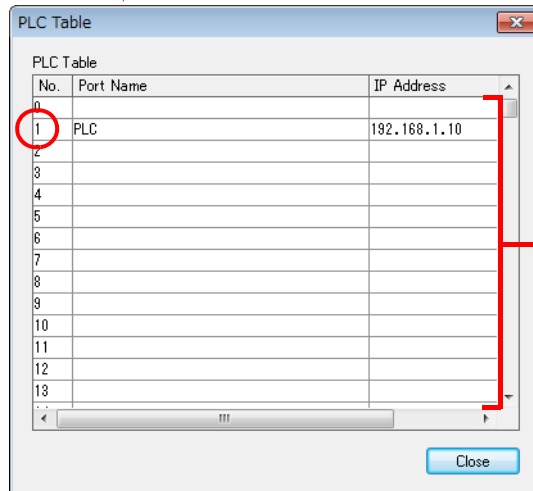
Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One X1 unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple X1 units in n : 1 connection.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
 Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
 Set the same PLC table number as the one set for "No. 410 Unit No." ([Option] → [PLC System Register Setting] → [COM1 Port Setting]).



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



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

PLC

Make the PLC setting using the 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 X1.	
No. 412	Communication Mode	Computer link	
No. 413	Communication Format	Data Length	8 bits
		Parity	Odd
		Stop Bit	1 bit
No. 415	Baud rate	9600 / 115200 bps * Match the baud rate to the one set for "Baud rate of COM1 Port" in the [Control unit - Communication cassette Setting] of the [Communication Setting] dialog on the communication tool "Configurator WD".	

Available Device Memory

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

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

19.1.5 FP7 Series (RS232C/422)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : <u>1</u> / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / <u>Odd</u> / Even	
Target Port No.	0 to 255	

PLC

FP7 configuration

Make PLC settings using the programming tool "FPWIN GR7".


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

(Underlined setting: default)

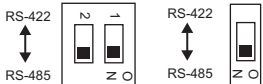

Setting Items		Descriptions	
Built-in SCU	COM0 setting COM1 setting *1 COM 2 setting *1	Communication mode	MEWTocol-7
		Target port No.	1 to 255
		Baud rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps
		Data length	7 / <u>8</u> bits
		Parity	None / <u>Odd</u> / Even
		Stop bit	<u>1</u> / 2 bits
		CS/RS	Invalid
		Transmission latency setting	For RS-232C, RS-422 communication: 0 For RS-485 communication: Change depending on environment
		Beginning code STX	Invalid
		Terminating resistance	CR
Modem initialization	No initialization		

*1 When using communication cassettes, configure CH1 and CH2 as COM1 and COM2 respectively.
CH1 = COM1
CH2 = COM2


AFP7CCS2

Setting Items	Contents	Remarks
	Signal line change 3W	Set all switches to 3W.

AFP7CCM1/AFP7CCM2

Setting Item	Contents	Remarks
	Signal level change RS-485	Turn on all three switches of the CH for connection.
	Terminating resistance setting ON at termination	

AFP7CCS1M1


Setting Item	Contents	Remarks
 ON OFF	RS-485 Terminating resistance setting	ON at termination

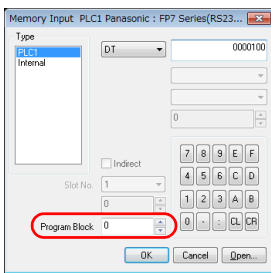
Available Device Memory

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

Device Memory	TYPE	Remarks
DT (data register)	00H	*1
X (external input)	01H	WX as word device; X0 to X1F and X70 to X9F: read only *1
Y (external output)	02H	WY as word device; Y0 to Y9, Y13, Y15 to Y1F, Y70 to Y9F: read only *1
R (internal relay)	03H	WR as word device, including special relays *1
L (link relay)	04H	WL as word device *1
LD (link register)	05H	*1
T (timer/contact)	09H	Read only *1
C (counter/contact)	0AH	Read only *1
P (pulse relay)	0BH	Read only *1
E (error report relay)	0CH	Read only
SD (system data)	0DH	Read only
SR (system relay)	0EH	WS as word device, read only
IN (direct input)	0FH	WI as word device, read only *2
OT (direct output)	10H	WO as word device *2
UM (unit memory)	11H	*2
TS (timer/set value)	12H	Double-word *1
TE (timer/elapsed value)	13H	Double-word *1
CS (counter/set value)	14H	Double-word *1
CE (counter/elapsed value)	15H	Double-word *1
I (index register)	16H	Double-word

*1 Specify the program block number. Indications on the screen configuration software are as follows.




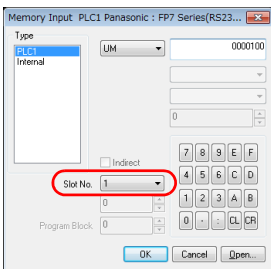


Example: 1: DT000100

- ↑ Address number
- ↑ Device type
- ↑ Program block number
- 0: Global device
- 1 to 999: Local device

*2 Specify the slot number. Indications on the screen configuration software are as follows.





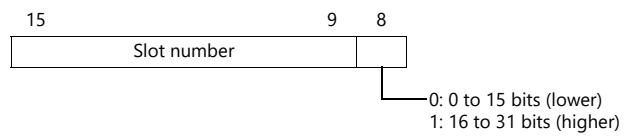
Example: 1: UM000100

- ↑ Address number
- ↑ Device type
- ↑ Slot number: 1 to 99

Indirect device memory designation

	15	8	7	5	4	0
n + 0	Model			Device type		
n + 1	Lower address No.					
n + 2	Program block number			Higher address No.		
n + 3	Expansion code *			Bit designation		
n + 4	00			Station number		

* Specify the expansion code as follows.



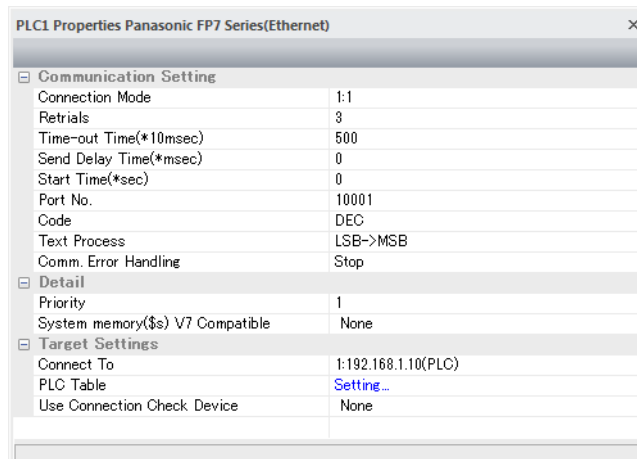
19.1.6 FP7 Series (Ethernet)

Communication Setting

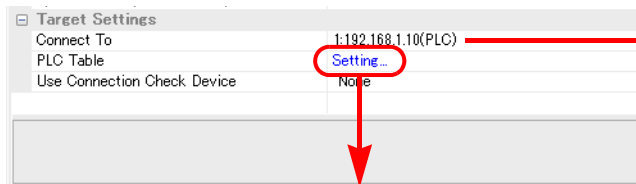
Editor

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

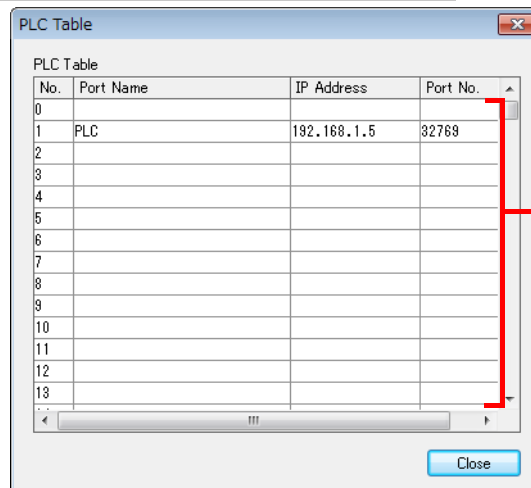
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



- IP address and port number (No. 8000 to 65535) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



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



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

PLC

Make PLC settings using the programming tool "FPWIN GR7".
For more information, refer to the PLC manual issued by the manufacturer.

FP7 configuration

Setting Item		Setting	
Built-in ET-LAN	Basic information on communication	Local IP address	Set the IP address of the PLC.
		Subnet mask	Set the subnet mask of the PLC.
		Default gateway	Set the default gateway of the PLC.
	User connection information settings	Operation mode	MEWTOCOL-7
		Connection usage	Use
		Open system (server/client)	Server connection (target station as desired) / server connection (target station specified)
		Open system (automatic/manual)	Open automatically
		Communication mode	UDP/IP / TCP/IP
		Local port No.	Set the port number of the PLC (8000 to 65535).
		Target port No.	Port number of the X1 (communication mode: TCP/IP, open system (server/client): Not required for server connection (target station as desired))
		Unused connection time	0
		Target port setting method	Specify the IP address (IPv4).
		Target IP address	IP address of the X1 (communication mode: TCP/IP, open system (server/client): Not required for server connection (target station as desired))

Available Device Memory

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

Device Memory	TYPE	Remarks
DT (data register)	00H	*1
X (external input)	01H	WX as word device; X0 to X1F and X70 to X9F: read only *1
Y (external output)	02H	WY as word device; Y0 to Y9, Y13, Y15 to Y1F, Y70 to Y9F: read only *1
R (internal relay)	03H	WR as word device, including special relays *1
L (link relay)	04H	WL as word device *1
LD (link register)	05H	*1
T (timer/contact)	09H	Read only *1
C (counter/contact)	0AH	Read only *1
P (pulse relay)	0BH	Read only *1
E (error report relay)	0CH	Read only
SD (system data)	0DH	Read only
SR (system relay)	0EH	WS as word device, read only
IN (direct input)	0FH	WI as word device, read only *2
OT (direct output)	10H	WO as word device *2
UM (unit memory)	11H	*2
TS (timer/set value)	12H	Double-word *1
TE (timer/elapsed value)	13H	Double-word *1
CS (counter/set value)	14H	Double-word *1
CE (counter/elapsed value)	15H	Double-word *1
I (index register)	16H	Double-word

*1 Specify the program block number. Indications on the screen configuration software are as follows.

PLC1 0:DT0000100

Memory Input - PLC1 Panasonic : FP7 Series(Ethernet)

Type: DT 0000100

Slot No: 1

Program Block: 0

OK Cancel Open...

Example: 1: DT000100

↑ ↑ ↑

Address number
Device type
Program block number
0: Global device
1 to 999: Local device

*2 Specify the slot number. Indications on the screen configuration software are as follows.

PLC1 1:UM000100

Memory Input - PLC1 Panasonic : FP7 Series(Ethernet)

Type: UM 0000100

Slot No: 1

Program Block: 0

OK Cancel Open...

Example: 1: UM000100

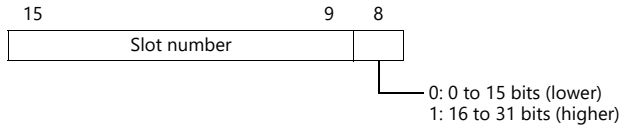
↑ ↑ ↑

Address number
Device type
Slot number: 1 to 99

Indirect device memory designation

	15	8	7	5	4	0
n + 0	Model			Device type		
n + 1	Lower address No.					
n + 2	Program block number			Higher address No.		
n + 3	Expansion code *			Bit designation		
n + 4	00			Station number		

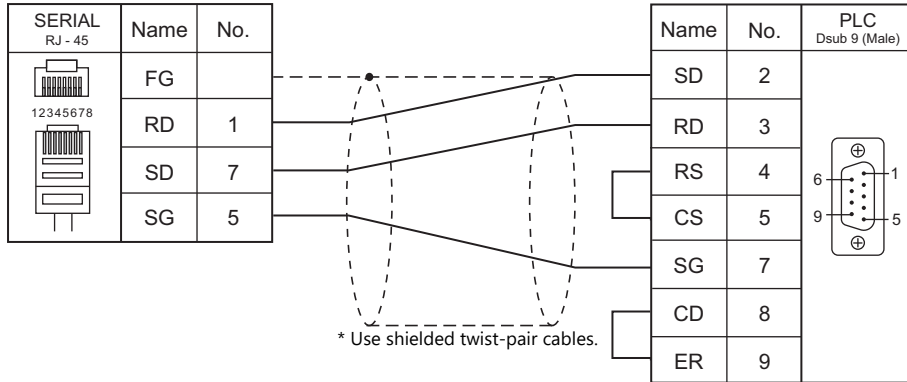
* Specify the expansion code as follows.



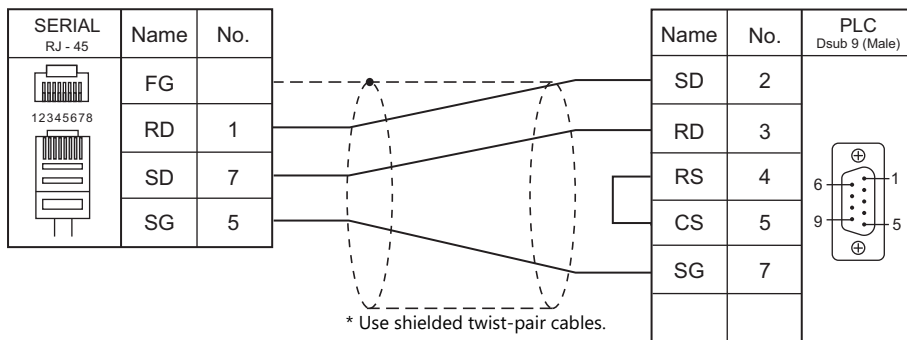
19.1.7 Wiring Diagrams

RS-232C

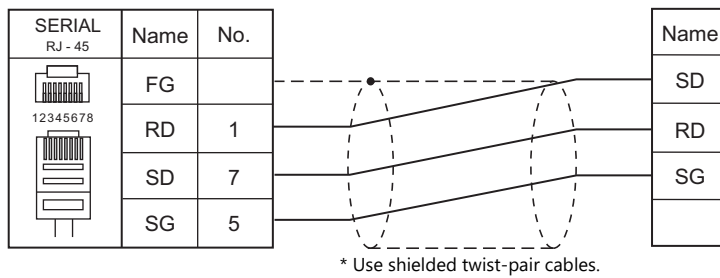
Wiring diagram 1 - M2



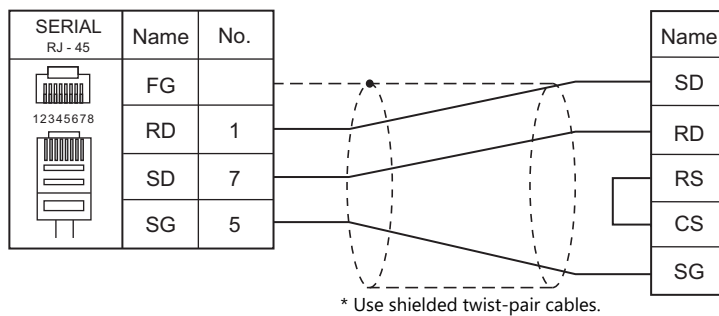
Wiring diagram 2 - M2



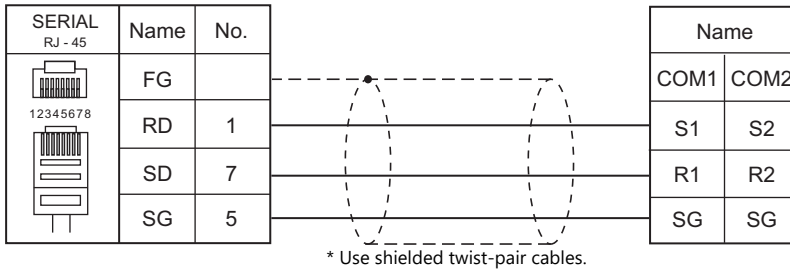
Wiring diagram 3 - M2



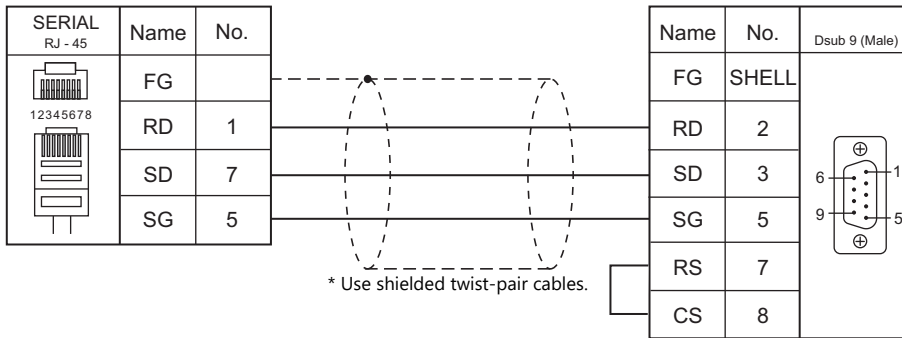
Wiring diagram 4 - M2



Wiring diagram 5 - M2

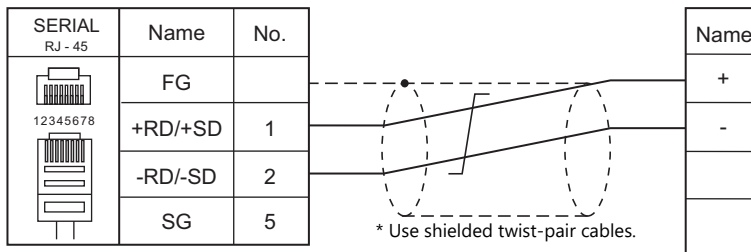


Wiring diagram 6 - M2

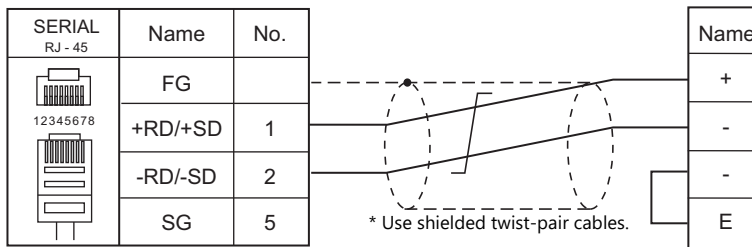


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



19.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Laser Marker

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire)	RS-422 (4-wire)	
LP-400	LP-410U, LP-410TU, LP-411U, LP-411TU, LP-420S9U, LP-420S9TU, LP-421S9U, LP-421S9TU, LP-425S9U, LP-425S9TU, LP-430U, LP-430TU, LP-431U, LP-431TU, LP-435U, LP-435TU	COM2	RS-232C	Wiring diagram 1 - M2	×	LP-400. Lst
LP-RF series	LP-GS051, LP-GS051-E, LP-GS051-F, LP-GS051-FE, LP-GS051-FN, LP-GS051-L, LP-GS051-LE, LP-GS051-LF, LP-GS051-LFE, LP-GS051-LFN, LP-GS052, LP-GS052-E, LP-GS052-F, LP-GS052-FE, LP-GS052-FN, LP-RC350S, LP-RF200P, LP-RV200P	RS-232C port	RS-232C	Wiring diagram 4 - M2	×	LP-RF.Lst

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Eco-POWER METER

PLC Selection on the Editor	Model		Port	Signal Level	Connection		Lst File
					RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)	
KW Series	KW1M	AKW1110 AKW1111	Terminal	RS-485	Wiring diagram 1 - M4	×	Pana_KW1M. Lst
	KW1M-H	AKW1121	Terminal	RS-485	Wiring diagram 1 - M4	×	
	KW1M-R	AKW1000 AKW1000K	Terminal	RS-232C	Wiring diagram 2 - M2	×	
			Terminal	RS-485	Wiring diagram 1 - M4	×	
	KW2G	AKW2010G	Terminal	RS-485	Wiring diagram 1 - M4	×	Pana_KW2G. Lst
	KW2G-H	AKW2020G	Terminal	RS-485	Wiring diagram 1 - M4	×	
	KW4M	AKW5111 AKW5211	Terminal	RS-485	Wiring diagram 1 - M4	×	Pana_KW4M. Lst
	KW7M	AKW7111	Terminal	RS-485	Wiring diagram 1 - M4	×	Pana_KW7M. Lst
KW8M	AKW8111 AKW8111H AKW8115	Terminal	RS-485	Wiring diagram 1 - M4	×	Pana_KW8M. Lst	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Servo Amplifier

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)	
MINAS A4 series	MADDTxxxx MBDDTxxxx MCDDTxxxx MDDDTxxxx MEDDTxxxx MFDDTxxxx MGDDTxxxx	CN X4	RS-232C	Wiring diagram 3 - M2	×	PanaA4. Lst
			RS-485	Wiring diagram 2 - M4	×	

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

Laser Marker

PLC Selection on the Editor	Model	Port	TCP/IP	UDP/IP	Port No.	Keep Alive ^{*1}	Lst File
LP-RF series (Ethernet)	LP-GS051, LP-GS051-E, LP-GS051-F, LP-GS051-FE, LP-GS051-FN, LP-GS051-L, LP-GS051-LE, LP-GS051-LF, LP-GS051-LFE, LP-GS051-LFN, LP-GS052, LP-GS052-E, LP-GS052-F, LP-GS052-FE, LP-GS052-FN, LP-RC350S, LP-RF200P, LP-RV200P	Ethernet port	○	×	9094 (Max. 8 units)	○	LP-RF.Lst

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

19.2.1 LP-400

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u>	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Sum Check	Provided / <u>Not provided</u>	
CR/LF	<u>CR</u> / CR/LF	

Laser Marker

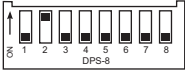
Parameter

Set communication parameters using the console. For more information, refer to the instruction manual for the laser marker issued by the manufacturer.

(Underlined setting: default)

Mode	Sub Menu	Item	Setting	Remarks
Environment setting	Communication I/O	Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
		Data Length	<u>8 bit</u>	
		Parity	<u>None</u> / Odd / Even	
		Stop Bits	<u>1</u> / 2 bit	
		Delimit	<u>CR</u> / CR+LF	
		Check Sum	<u>None</u> / Provided	

DIP switch

DPS-8	SW No.	Contents	Setting	Remarks												
	1	System reserve	OFF: System reserved													
	2	External control method	ON: RS-232C control													
	3	Buzzer at an occurrence of error	ON: Not sound OFF: Sound													
	4	Password lock	ON: Password lock invalid OFF: Password lock valid													
	5	Method to switch to remote mode	<table border="1"> <thead> <tr> <th>SW5</th> <th>SW6</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>Pressing the remote button on the front of the controller</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Inputting "REMOTE IN" on the terminal block</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Turning the key switch ON</td> </tr> </tbody> </table>	SW5	SW6	Operation	OFF	OFF	Pressing the remote button on the front of the controller	ON	OFF	Inputting "REMOTE IN" on the terminal block	OFF	ON	Turning the key switch ON	
	SW5		SW6	Operation												
	OFF		OFF	Pressing the remote button on the front of the controller												
	ON	OFF	Inputting "REMOTE IN" on the terminal block													
OFF	ON	Turning the key switch ON														
6																
7	System reserve	OFF: System reserved														
8	System reserve	OFF: System reserved														

* Keep the power off when changing the DIP switch setting.

* For communications with the X1 series, be sure to switch to the remote mode.

Wiring on the terminal block

If printing cannot be performed correctly, check the wiring status on the terminal block.

- Short-circuit A11 "LASER STOP-" and A12 "LASER STOP+". When they are opened, the auto shutter is closed and printing is disabled.
- For B11 "EMER. -" and B12 "EMER. +", connect the normally-closed type emergency stop switch or short-circuit them. When they are opened, the laser power is turned off and printing is disabled.
- Connect the power supply (internal or external) to A2 "IN COM." and B2 "OUT COM.". Otherwise, the laser marker will not be activated.
When using an internal power supply, short-circuit A1 "+12V OUT" and A2 "IN COM." as well as B1 "0V OUT" and B2 "OUT COM.". When using an external power supply, remove short bars from between A1 "+12V OUT" and A2 "IN COM." as well as B1 "0V OUT" and B2 "OUT COM.".

Available Device Memory

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

Device Memory	TYPE	Remarks
FNM (file name)	00H	
FNO (file number change)	01H	
STR (text to print)	02H	
MCS (text to print (1-byte character))	03H	
LMT (limit date and time)	04H	
CNT (counter)	05H	Double-word
LTC (lot condition)	06H	
CDF (logo file)	07H	
ALC (global condition)	08H	Double-word
CDC (logo condition)	09H	Double-word
FST (file setting)	0AH	Double-word
WDC (print line width correction)	0BH	
WTC (print quality adjustment)	0CH	
TRG (trigger condition)	0DH	
DLY (delay)	0EH	
YMD (year, month, day, time)	0FH	
ERA (year of Japanese era)	10H	
ENV (input/output environment)	11H	
PST (print setting)	12H	
STS (status request)	13H	Read only
RKC (rank condition)	14H	
RKS (rank text)	15H	
OFC (offset condition)	16H	
OFS (offset)	17H	Double-word

FNM (file name)

Address	Name	Setting Range
0000	File name	File name (CHAR 20 bytes)

FNO (file number)

Address	Name	Setting Range
0000	File number	0 to 1023, 9999 * * 9999: New

STR (text to print)

Address	Name	Setting Range
0000 to 0029	Text to print in line number 01	Text to print (CHAR 60 bytes)
0030 to 0059	Text to print in line number 02	
:	:	
1770 to 1799	Text to print in line number 60	

MCS (text to print (1-byte character))

Address	Name	Setting Range
0000 to 0014	Text to print in line number 01 (1-byte character)	Text to print (CHAR 30 bytes)
0015 to 0029	Text to print in line number 02 (1-byte character)	
:	:	
0885 to 0899	Text to print in line number 60 (1-byte character)	

LMT (limit date and time)

Address	Name	Setting Range
0101	Limit	-999 to 999
0102	Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0103	Start day	0: Not including today 1: Including today
0201	Limit	-999 to 999
0202	Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0203	Start day	0: Not including today 1: Including today
:	:	:
0801	Limit	-999 to 999
0802	Unit	0: year, 1: month, 2: day, 3: hour, 4: minute, 5: before year, 6: month, 7: day, 8: hour, 9: minute
0803	Start day	0: Not including today 1: Including today

CNT (counter)

Address	Name	Setting Range
0000	Current value	0 to 999999
0001	Initial value	0 to 999999
0002	End value	0 to 999999
0003	Step	0 to 999999
0004	Count source	0 to 7: Counter 0 to 7 8: Trigger input
0005	Flag	0: Not reset when the date changes 1: Reset when the date changes
0100	Current value	0 to 999999
0101	Initial value	0 to 999999
0102	End value	0 to 999999
0103	Step	0 to 999999
0104	Count source	0 to 7: Counter 0 to 7 8: Trigger input
0105	Flag	0: Not reset when the date changes 1: Reset when the date changes
:	:	:
0700	Current value	0 to 999999
0701	Initial value	0 to 999999
0702	End value	0 to 999999
0703	Step	0 to 999999
0704	Count source	0 to 7: Counter 0 to 7 8: Trigger input
0705	Flag	0: Not reset when the date changes 1: Reset when the date changes

LTC (lot condition)

Address	Name		Setting Range
0000	Lot function number 0	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0001		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute
0100	Lot function number 1	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0101		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute
:	:	:	:
0700	Lot function number 7	Lot condition	00: Current 01 to 08: Limit 1 to 8 10 to 17: Counter 0 to 7
0701		Limit condition	0: Year or counter 1: Month 2: Day 3: Year and month 4: Month and day 5: Day of the week 6: Hour 7: Week 8: Minute

CDF (logo file)

Address	Name	Setting Range
0000 to 0127	Name of logo file number 00	Logo file name (CHAR 256 bytes)
0128 to 0255	Name of logo file number 01	
:	:	
1920 to 2047	Name of logo file number 15	

ALC (global condition)

Address	Name	Setting Range
0000	X offset	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm
0001	Y offset	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
0002	Rotation offset	-18000 to +18000: -180.00° to +180.00°
0003	Number of overprint times	1 to 99
0004	Time to stop overprint	0 to 10: 0 to 1.0 sec.
0005	Flip horizontal	0: Not flip 1: Flip
0006	Flip vertical	0: Not flip 1: Flip

CDC (logo condition)

Address	Name	Setting Range
0000	Area number	0 to F (HEX)
0001	X magnification	10000 to 1000000: 10.000 to 1000.000%
0002	Y magnification	10000 to 1000000: 10.000 to 1000.000%
0003	X position	-300000 to +300000: -300.000 to +300.000 mm
0004	Y position	-300000 to +300000: -300.000 to +300.000 mm
0005	Rotation angle	-18000 to +18000: -180.00° to +180.00°
0006	Laser power offset	0 to 200%
0007	Scan speed correction	5 to 500%
0100	Area number	0 to F (HEX)
0101	X magnification	10000 to 1000000: 10.000 to 1000.000%
0102	Y magnification	10000 to 1000000: 10.000 to 1000.000%
0103	X position	-300000 to +300000: -300.000 to +300.000 mm
0104	Y position	-300000 to +300000: -300.000 to +300.000 mm
0105	Rotation angle	-18000 to +18000: -180.00° to +180.00°
0106	Laser power offset	0 to 200%
0107	Scan speed correction	5 to 500%
:	:	:
1500	Area number	0 to F (HEX)
1501	X magnification	10000 to 1000000: 10.000 to 1000.000%
1502	Y magnification	10000 to 1000000: 10.000 to 1000.000%
1503	X position	-300000 to +300000: -300.000 to +300.000 mm
1504	Y position	-300000 to +300000: -300.000 to +300.000 mm
1505	Rotation angle	-18000 to +18000: -180.00° to +180.00°
1506	Laser power offset	0 to 200%
1507	Scan speed correction	5 to 500%

FST (file setting)

Address	Name	Setting Range
0000	Laser power (LPW)	0005 to 1000: 000.5 to 100.0 (0.5 increments)
0001	Scan speed (SSP)	LP-430U/430TU/435U/435TU/420S9U/420S9TU/425S9U/425S9TU/410U/410TU 00001 to 12000 mm/s LP-431U/431TU/421S9U/421S9TU/411U/411TU 00001 to 06000 mm/s
0002	Frequency (MPL)	0: 5 kHz 1: 10 kHz 2: 20 kHz
0003	Print interval (INT)	00000 to 30000: 0000.0 to 3000.0 mm
0004	Line speed (LSP)	LP-430U/430TU/420S9U/420S9TU/425S9U/425S9TU/435U/435TU 60 to 240000: 000.060 to 240.000 m/min LP-431U/431TU/421S9U/421S9TU 60 to 120000: 000.060 to 120.000 m/min LP-410U/410TU 60 to 170000: 000.060 to 170.000 m/min LP-411U/411TU 60 to 85000: 000.060 to 085.000 m/min
0005	Encoder pulse (ENC)	00500 to 60000: 005.00 to 600.00 pulse/mm

WDC (print line width correction)

Address	Name	Setting Range
0000	Print line width correction	0010 to 2000: 0.010 to 2.000 mm
0001	Filling interval	0010 to 2000: 0.010 to 2.000 mm

WTC (print quality adjustment)

Address	Name	Setting Range
0000	Laser start point adjustment	-100 to +100
0001	Laser end point adjustment	-100 to +100
0002	Edge adjustment	000 to 100
0003	Curve adjustment	000 to 100
0004	Weight adjustment	000 to 100
0005	Spare scanning time	0000 to 1000: 00.00 to 10.00 msec.

TRG (trigger condition)

Address	Name	Setting Range
0000	Direction of movement	0: Standstill 1: Left 2: Right 3: Forward 4: Backward
0001	Encoder	0: None 1: Provided
0002	Trigger type	0: Trigger 1: Printing at equal intervals

DLY (delay)

Address	Name	Setting Range
0000	When "standstill" is specified for movement direction in trigger condition (TRG0000 = 0): Delay distance When any direction other than "standstill" is specified for movement direction in trigger condition (TRG0000 ≠ 0): Delay time	Delay distance 00000 to 50000: 000.00 to 500.00 mm Delay time 000000 to 005000 msec.

YMD (year, month, day, time)

Address	Name	Setting Range
0000	Year of the Christian era	1980 to 2099
0001	Month	1 to 12
0002	Day	1 to 31
0003	Hour	0 to 23
0004	Minute	0 to 59
0005	Second	0 to 59

ERA (year of Japanese era)

Address	Name	Setting Range
0000	Year of Japanese era	01 to 99

ENV (input/output environment)

Address	Name	Setting Range
0000	One-shot time	002 to 510 msec.
0001	Double trigger detection	0: Without output 1: With output

PST (print setting)

Address	Name	Setting Range
0001	Print mode (MKM)	0: Printing suspend 1: Printing restart
0002	Laser control (LSR)	0: OFF 1: ON

STS (status request)

Address	Name	Setting Range
0000	Error status	0: No error 1: Error occurring
0001	Laser excitation status	0: Excitation OFF 1: During excitation 2: Excitation finish
0002	Standby status	0: Standby 1: During printing
0003	Print ready status	0: Busy 1: Ready
0004	Trigger status	0: Trigger OFF 1: Trigger ON

RKC (rank condition)

Address	Name	Setting Range
0000	Parallel input condition	1: 4 bits × 4 2: 8 bits × 2

RKS (rank text)

Address	Name	Setting Range
0000 to 0008	Set text in rank number 1	Set text (CHAR 18 bytes)
0009 to 0017	Set text in rank number 2	
:	:	
4599 to 4607	Set text in rank number 511	

OFC (offset condition)

Address	Name	Setting Range
00000	Parallel input condition	0: No offset 1: Lower 4 bits 2: Lower 8 bits

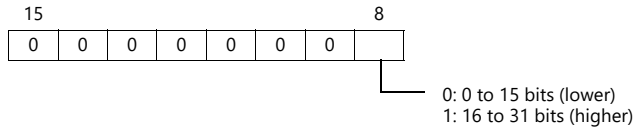
OFS (offset)

Address		Name	Setting Range
00000	Offset number 0	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
00001		Offset Y	
00002		Offset θ	
00100	Offset number 1	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
00101		Offset Y	
00102		Offset θ	
:		:	:
25500	Offset number 255	Offset X	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
25501		Offset Y	
25502		Offset θ	

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents		F0	F1 (= \$u n)		F2	
File overwrite		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	2	
			n + 1	Command: A1H		
File registration		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: A2H		
			n + 2	File number LP-430U/430TU/431U/431TU 0 to 1023 LP-435U/435TU/425S9U/425S9TU/ 420S9U/420S9TU/410U/410TU/ 421S9U/421S9TU/411U/411TU 0 to 2047		
Reading of lot text		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	4	
			n + 1	Command: 23H		
			n + 2	Lot number: 0 to 7		
			n + 3	Period number		
			n + 4 to n + 5	Start of period *1		
			n + 6 to n + 7	End of period *1		
			n + 8 to n + 16	Set text		
Lot text setting		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	8 + number of words of set text (max. 9 words)	
			n + 1	Command: A3H		
			n + 2	Lot number: 0 to 7		
			n + 3	Period number		
			n + 4 to n + 5	Start of period *2		
			n + 6 to n + 7	End of period *2		
			n + 8 to n + 16	Set text		
Reading of step & repeat setting	Setting delete	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 0 (setting delete)		
	Single fine-adjustment		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3
				n + 1	Command: 24H	
				n + 2	List line: 00 to 99	
				n + 3	Fine-adjustment type: 1 (single adjustment)	
				n + 4	Target line: 001 to 100	
				n + 5	Target column: 001 to 100	
	n + 6 to n + 7	X-axis adjustment LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU				
	n + 8 to n + 9	Y-axis adjustment -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
Print OFF		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 2 (print OFF)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		

*1 When "-1" is set for both start of period and end of period, the reading period is set as undefined.

*2 When writing is executed while "-1" is set for both start of period and end of period, the setting is deleted.

Contents		F0	F1 (= \$u n)		F2	
Reading of step & repeat setting	All columns fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 3 (all columns adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU	
	n + 7 to n + 8	Y-axis adjustment	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm			
	All lines fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 4 (all lines adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU	
	n + 7 to n + 8	Y-axis adjustment	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm			
	Column fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 24H		
n + 2			List line: 00 to 99			
n + 3			Fine-adjustment type: 5 (column adjustment)			
n + 4			Target column: 001 to 100			
n + 5 to n + 6			X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU		
n + 7 to n + 8	Y-axis adjustment	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
Line fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3	
		n + 1	Command: 24H			
		n + 2	List line: 00 to 99			
		n + 3	Fine-adjustment type: 6 (line adjustment)			
		n + 4	Target line: 001 to 100			
		n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU		
n + 7 to n + 8	Y-axis adjustment	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				

Contents		F0	F1 (= \$u n)		F2	
Writing of step & repeat setting	Setting delete	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		4
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 0 (setting delete)		
	Single fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		10
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 1 (single adjustment)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		
			n + 6 to n + 7	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n + 8 to n + 9	Y-axis adjustment	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
	Print OFF	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		6
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 2 (print OFF)		
			n + 4	Target line: 001 to 100		
			n + 5	Target column: 001 to 100		
	All columns fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 3 (all columns adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
n + 7 to n + 8			Y-axis adjustment	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
All lines fine-adjustment			1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	
	n + 1	Command: A4H				
	n + 2	List line: 00 to 99				
	n + 3	Fine-adjustment type: 4 (all lines adjustment)				
	n + 4	Target line: 001 to 100				
	n + 5 to n + 6	X-axis adjustment		LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm		
	n + 7 to n + 8	Y-axis adjustment		LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		

Contents		F0	F1 (= \$u n)		F2	
Writing of step & repeat setting	Column fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 5 (column adjustment)		
			n + 4	Target column: 001 to 100		
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n + 7 to n + 8	Y-axis adjustment	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 5 to n + 6	X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
	n + 7 to n + 8	Y-axis adjustment	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm			
	Line fine-adjustment	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		9
			n + 1	Command: A4H		
			n + 2	List line: 00 to 99		
			n + 3	Fine-adjustment type: 6 (line adjustment)		
			n + 4	Target line: 001 to 100		
n + 5 to n + 6			X-axis adjustment	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm		
n + 7 to n + 8	Y-axis adjustment	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				

Contents		F0	F1 (= \$u n)	F2		
Reading of text condition	Straight/ Proportional/ Monospace	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: 25H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 0: Straight 1: Proportional 2: Monospace		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 200 to 110000: 000,200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 200 to 55000: 000,200 to 055.000 mm
			n + 10 to n + 11	Character width		LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000,200 to 160.000 mm
			n + 12 to n + 13	X position		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027,500 to +027,500 mm
			n + 14 to n + 15	Y position		LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
			n + 16 to n + 17	Spaces between characters/ Entire width		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000,000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000,000 to 055.000 mm
			n + 18 to n + 19	Spaces between lines		LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000,000 to 160.000 mm
			n + 20	Tilting angle -18000 to +18000: -180.00° to +180.00°		
			n + 21	Font designation 1: Character font 1 2: Character font 2		
			n + 22	Line width of bold character		LP-430U/430TU/435U/435TU/420S9U/ 420S9TU/425S9U/425S9TU/410U/ 410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 4000: 0.000 to 4.000 mm
			n + 23	Laser power offset: 000 to 200%		
			n + 24	Scan speed correction: 005 to 500%		

Contents		F0	F1 (= \$u n)		F2		
Reading of text condition	Arc-shaped printing	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3	
			n + 1	Command: 25H			
			n + 2	Condition number: 01 to 60			
			n + 3	Area number: 0 to F (HEX)			
			n + 4	Start line: 01 to 60			
			n + 5	End line: 01 to 60			
			n + 6	Standard character arrangement 3: Printing out of the arc (clockwise) 4: Printing inside the arc (counterclockwise)			
			n + 7	Text origin 0: Left end 1: Center 2: Right end			
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm		
			n + 10 to n + 11	Character width	LP-430U/430TU/420S9U/420S9TU/410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm		
			n + 12 to n + 13	Center position X -300000 to +300000: -300.000 to +300.000 mm			
			n + 14 to n + 15	Center position Y -300000 to +300000: -300.000 to +300.000 mm			
			n + 16 to n + 17	Radius 0 to +300000: 000.000 to +300.000 mm			
			n + 18 to n + 19	Radius of spaces between lines	LP-430U/430TU/420S9U/420S9TU/410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm		
			n + 20	Start angle -18000 to +18000: -180.00 to +180.00°			
			n + 21	Angle of spaces between characters -18000 to +18000: -180.00 to +180.00°			
			n + 22	Font designation 1: Character font 1 2: Character font 2			
			n + 23	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/420S9TU/425S9U/425S9TU/410U/410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 0 to 4000: 0.000 to 4.000 mm		
			n + 24	Laser power offset: 000 to 200%			
			n + 25	Scan speed correction: 005 to 500%			

Contents		F0	F1 (= \$u n)	F2		
Writing of text condition	Straight/ Proportional/ Monospace	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	25	
			n + 1	Command: A5H		
			n + 2	Condition number: 01 to 60		
			n + 3	Area number: 0 to F (HEX)		
			n + 4	Start line: 01 to 60		
			n + 5	End line: 01 to 60		
			n + 6	Standard character arrangement 0: Straight 1: Proportional 2: Monospace		
			n + 7	Text origin 0: Left end 1: Center 2: Right end		
			n + 8 to n + 9	Character height		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 200 to 55000: 000.200 to 055.000 mm
			n + 10 to n + 11	Character width		LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm
			n + 12 to n + 13	X position		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm
			n + 14 to n + 15	Y position		LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm
			n + 16 to n + 17	Spaces between characters/ Entire width		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm
			n + 18 to n + 19	Spaces between lines		LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm
			n + 20	Tilting angle -18000 to +18000: -180.00° to +180.00°		
			n + 21	Font designation 1: Character font 1 2: Character font 2		
			n + 22	Line width of bold character		LP-430U/430TU/435U/435TU/420S9U/ 420S9TU/425S9U/425S9TU/410U/ 410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 4000: 0.000 to 4.000 mm
n + 23	Laser power offset: 000 to 200%					
n + 24	Scan speed correction: 005 to 500%					

Contents		F0	F1 (= \$u n)		F2		
Writing of text condition	Arc-shaped printing	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		26	
			n + 1	Command: A5H			
			n + 2	Condition number: 01 to 60			
			n + 3	Area number: 0 to F (HEX)			
			n + 4	Start line: 01 to 60			
			n + 5	End line: 01 to 60			
			n + 6	Standard character arrangement 3: Printing out of the arc (clockwise) 4: Printing inside the arc (counterclockwise)			
			n + 7	Text origin 0: Left end 1: Center 2: Right end			
			n + 8 to n + 9	Character height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 200 to 110000: 000.200 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU		
			n + 10 to n + 11	Character width	200 to 55000: 000.200 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 200 to 160000: 000.200 to 160.000 mm		
			n + 12 to n + 13	Center position X -300000 to +300000: -300.000 to +300.000 mm			
			n + 14 to n + 15	Center position Y -300000 to +300000: -300.000 to +300.000 mm			
			n + 16 to n + 17	Radius 0 to +300000: 000.000 to +300.000 mm			
			n + 18 to n + 19	Radius of spaces between lines	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm		
			n + 20	Start angle -18000 to +18000: -180.00 to +180.00°			
			n + 21	Angle of spaces between characters -18000 to +18000: -180.00 to +180.00°			
			n + 22	Font designation 1: Character font 1 2: Character font 2			
			n + 23	Line width of bold character	LP-430U/430TU/435U/435TU/420S9U/ 420S9TU/425S9U/425S9TU/410U/ 410TU 0 to 6000: 0.000 to 6.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 4000: 0.000 to 4.000 mm		
			n + 24	Laser power offset: 000 to 200%			
			n + 25	Scan speed correction: 005 to 500%			

Contents		F0	F1 (= \$u n)		F2	
Counter reset		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	10	
			n + 1	Command: A6H		
			n + 2	Counter 0 0: Not reset 1: Reset		
			n + 3	Counter 1 0: Not reset 1: Reset		
			n + 4	Counter 2 0: Not reset 1: Reset		
			n + 5	Counter 3 0: Not reset 1: Reset		
			n + 6	Counter 4 0: Not reset 1: Reset		
			n + 7	Counter 5 0: Not reset 1: Reset		
			n + 8	Counter 6 0: Not reset 1: Reset		
			n + 9	Counter 7 0: Not reset 1: Reset		
Shutter		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: A7H		
			n + 2	Shutter status 0: Shutter close 1: Shutter open		
Print trigger		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: A8H		
			n + 2	Print command 0: Stop 1: Start		
One-point laser irradiation		1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	3	
			n + 1	Command: A9H		
			n + 2	0: Stop 1: Start 2: Suspend		
Step & repeat condition	Reading of condition	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)	2	
			n + 1	Command: 2AH		
			n + 2	Step & repeat 0: None 1: Provided		
			n + 3	Number of lines: 001 to 100		
			n + 4	Number of columns: 001 to 100		
			n + 5 to n + 6	Line step		LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm
			n + 7 to n + 8	Column step		LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm
			n + 9	Counter motion 0000H: Same for all steps 001xH: Unallocated number 002xH: Serial number 00x0H: From top left toward right 00x1H: From top left toward bottom 00x2H: From top right toward left 00x3H: From top right toward bottom		

Contents		F0	F1 (= \$u n)		F2	
Step & repeat condition	Writing of condition	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		10
			n + 1	Command: AAH		
			n + 2	Step & repeat 0: None 1: Provided		
			n + 3	Number of lines: 001 to 100		
			n + 4	Number of columns: 001 to 100		
			n + 5 to n + 6	Line step	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 0 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 0 to 55000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000 to 160000: 000.000 to 160.000 mm	
			n + 7 to n + 8	Column step		
n + 9	Counter motion 0000H: Same for all steps 001xH: Unallocated number 002xH: Serial number 00x0H: From top left toward right 00x1H: From top left toward bottom 00x2H: From top right toward left 00x3H: From top right toward bottom					
Text condition (abbreviated form)	Reading of text condition (abbreviated form)	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		3
			n + 1	Command: 2BH		
			n + 2	Condition number (01 to 60)		
			n + 3 to n + 4	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n + 5 to n + 6	Y position		
	n + 6 to n + 7	Laser power offset: 000 to 200%				
	Writing of text condition (abbreviated form)	1 - 8 (PLC1 - 8)	n	Station number: 0 (fixed)		8
n + 1			Command: ABH			
n + 2			Condition number (01 to 60)			
n + 3 to n + 4			X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
n + 5 to n + 6			Y position			
n + 6 to n + 7			Laser power offset: 000 to 200%			

Contents		F0	F1 (= \$u n)		F2				
Reading of barcode print condition	QR code	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3			
			n+1	Command: 2CH					
			n+2	Barcode number: 0 to 7					
			n+3	Area number: 0 to FH					
			n+4	Type 10: Model 1 11: Model 2 12: Micro QR					
			n+5	Version Model 1: 0 to 14 Model 2: 0 to 22 Micro QR: 0 to 4					
			n+6	Data input mode 0: Numerals 1: Alphanumerics 2: Binary 3: Kanji characters					
			n+7	Error correction level 1: Standard 2: High reliability 3: Ultra-high reliability					
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU				
			n+10 to n+11	Y position	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg					
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm					
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm					
			Data matrix code (ECC200)	1 to 8 (PLC1 to 8)	n		Station number: 0 (fixed)		3
					n+1		Command: 2CH		
	n+2	Barcode number: 0 to 7							
	n+3	Area number: 0 to FH							
	n+4	Type 20: Data matrix							
	n+5	Data input mode 0: 1-byte 1: Kanji characters							
	n+6	Number of rows							
n+7	Number of columns								
n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU							
n+10 to n+11	Y position	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm							
n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg								
n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm								
n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm								

Contents		F0	F1 (= \$u n)		F2				
Reading of barcode print condition	CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3			
			n+1	Command: 2CH					
			n+2	Barcode number: 0 to 7					
			n+3	Area number: 0 to FH					
			n+4	Type 00: CODE39 01: ITF 03: NW-7					
			n+5	Inversion 0: Invalid 1: Valid					
			n+6	Check character CODE39, ITF 0: No 1: Yes NW-7 A to D: Without check character a to d: With check character					
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm				
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm					
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU				
			n+12 to n+13	Y position	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg					
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0					
			n+17	Ratio wide element width/narrow element width 18 to 34: 1.8 to 3.4					
			n+18	Laser power correction: 0 to 200%					
			n+19	Scan speed correction: 5 to 500%					
			CODE128 JAN	1 to 8 (PLC1 to 8)	n		Station number: 0 (fixed)		3
					n+1		Command: 2CH		
					n+2		Barcode number: 0 to 7		
	n+3	Area number: 0 to FH							
n+4	Type 02: CODE128 04: JAN/UPC 08: JAN/UPC with human-readable string 09: CODE128 with human-readable string								
n+5	Inversion 0: Invalid 1: Valid								
n+6	Check character 0: No 1: Yes								

Contents		F0	F1 (= \$u n)		F2	
Reading of barcode print condition	CODE128 JAN	1 to 8 (PLC1 to 8)	n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	3
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Ratio double width/narrow element width 14 to 26: 1.4 to 2.6		
			n+18	Ratio triple width/narrow element width 21 to 39: 2.1 to 3.9		
			n+19	Ratio quadruple width/narrow element width 28 to 52: 2.8 to 5.2		
			n+20	Laser power correction: 0 to 200%		
			n+21	Scan speed correction: 5 to 500%		
			RSS-14 Standard & Truncated RSS Limited RSS Expanded	1 to 8 (PLC1 to 8)	n	
	n+1	Command: 2CH				
	n+2	Barcode number: 0 to 7				
	n+3	Area number: 0 to FH				
	n+4	Type 30: RSS-14 Standard & Truncated 33: RSS Limited 34: RSS Expanded 40: RSS-14 Standard & Truncated CC-A 43: RSS Limited CC-A 44: RSS Expanded CC-A 50: RSS-14 Standard & Truncated CC-B 53: RSS Limited CC-B 54: RSS Expanded CC-B				
	n+5	Human-readable string 0: Without human-readable string 2: With human-readable string				
	n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)				
	n+7 to n+8	Height			LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
	n+9	Standard module width 0050 to 1000: 0.050 to 1.000 mm				

Contents		F0	F1 (= \$u n)			F2
Reading of barcode print condition	RSS-14 Standard & Truncated	1 to 8 (PLC1 to 8)	n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm	3
	RSS Limited		n+12 to n+13	Y position	LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
	RSS Expanded		n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Laser power correction: 0 to 200%		
			n+17	Scan speed correction: 5 to 500%		
			n	Station number: 0 (fixed)		
		n+1	Command: 2CH		3	
		n+2	Barcode number: 0 to 7			
		n+3	Area number: 0 to FH			
		n+4	Type 31: RSS-14 Stacked 32: RSS-14 Stacked Omnidirectional 41: RSS-14 Stacked CC-A 42: RSS-14 Stacked Omnidirectional CC-A 51: RSS-14 Stacked CC-B 52: RSS-14 Stacked Omnidirectional CC-B			
		n+5	Human-readable string 0: Without human-readable string 2: With human-readable string			
		n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)			
		n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm		
		n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm			
		n+10	Standard module width 0050 to 1000: 0.050 to 1.000 mm			
		n+11 to n+12	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm		
		n+13 to n+14	Y position	LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
		n+15 to n+16	Tilting angle -18000 to +18000: -180.00 to +180.00 deg			
		n+17	Laser power correction: 0 to 200%			
		n+18	Scan speed correction: 5 to 500%			

Contents		F0	F1 (= \$u n)		F2	
Reading of barcode print condition	RSS-14 Expanded Stacked	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 35: RSS Expanded Stacked 45: RSS Expanded Stacked CC-A 55: RSS Expanded Stacked CC-B		
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string		
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)		
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm		
			n+10	Number of horizontal symbol characters: 2 to 20 (even)		
			n+11	Standard module width 0050 to 1000: 0.050 to 1.000 mm		
			n+12 to n+13	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+14 to n+15	Y position	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
	n+16 to n+17	Tilting angle -18000 to +18000: -180.00 to +180.00 deg				
	n+18	Laser power correction: 0 to 200%				
	n+19	Scan speed correction: 5 to 500%				
	Composite	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 2CH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
n+4			Type CC-A composite 46: JAN/UPC 47: UCC/EAN128 48: JAN/UPC with 1D human-readable string 49: UCC/EAN128 with 1D human-readable string CC-B composite 56: JAN/UPC 57: UCC/EAN128 58: JAN/UPC with 1D human-readable string 59: UCC/EAN128 with 1D human-readable string CC-C composite 67: UCC/EAN128 69: UCC/EAN128 with 1D human-readable string			
n+5			Human-readable string 0: Without human-readable string 2: With human-readable string			
n+6			Inversion 0: Invalid 1: Valid			

Contents		F0	F1 (= \$u n)			F2
Reading of barcode print condition	Composite	1 to 8 (PLC1 to 8)	n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	3
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm		
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position		
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0		
			n+17	Laser power correction: 0 to 200%		
			n+18	Scan speed correction: 5 to 500%		
Writing of barcode print condition	QR code	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		16
			n+1	Command: ACH		
			n+2	Barcode number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4	Type 10: Model 1 11: Model 2 12: Micro QR		
			n+5	Version Model 1: 0 to 14 Model 2: 0 to 22 Micro QR: 0 to 4		
			n+6	Data input mode 0: Numerals 1: Alphanumerics 2: Binary 3: Kanji characters		
			n+7	Error correction level 0: High density 1: Standard 2: High reliability 3: Ultra-high reliability		
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+10 to n+11	Y position		
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm					
n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm					

Contents		F0	F1 (= \$u n)		F2				
Writing of barcode print condition	Data matrix code (ECC200)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		16			
			n+1	Command: ACH					
			n+2	Barcode number: 0 to 7					
			n+3	Area number: 0 to FH					
			n+4	Type 20: Data matrix					
			n+5	Data input mode 0: 1-byte 1: Kanji characters					
			n+6	Number of rows					
			n+7	Number of columns					
			n+8 to n+9	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm				
			n+10 to n+11	Y position	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
			n+12 to n+13	Rotation angle -18000 to +18000: -180.00 to +180.00 deg					
			n+14	Module pitch: vertical 0050 to 1000: 0.050 to 1.000 mm					
			n+15	Module pitch: horizontal 0050 to 1000: 0.050 to 1.000 mm					
			CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n		Station number: 0 (fixed)		20
					n+1		Command: ACH		
	n+2	Barcode number: 0 to 7							
	n+3	Area number: 0 to FH							
	n+4	Type 00: CODE39 01: ITF 03: NW-7							
	n+5	Inversion 0: Invalid 1: Valid							
	n+6	Check character CODE39, ITF 0: No 1: Yes NW-7 A to D: Without check character a to d: With check character							
n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm							
n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm								
n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU							
n+12 to n+13	Y position	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm							

Contents		F0	F1 (= \$u n)		F2		
Writing of barcode print condition	CODE39 ITF NW-7	1 to 8 (PLC1 to 8)	n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg		20	
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0			
			n+17	Ratio wide element width/narrow element width 18 to 34: 1.8 to 3.4			
			n+18	Laser power correction: 0 to 200%			
			n+19	Scan speed correction: 5 to 500%			
	CODE128 JAN	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		22	
			n+1	Command: ACH			
			n+2	Barcode number: 0 to 7			
			n+3	Area number: 0 to FH			
			n+4	Type 02: CODE128 04: JAN 08: JAN/UPC with human-readable string 09: CODE128 with human-readable string			
			n+5	Inversion 0: Invalid 1: Valid			
			n+6	Check character 0: No 1: Yes			
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm		
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm			
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
			n+12 to n+13	Y position			
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg			
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0			
			n+17	Ratio double width/narrow element width 14 to 26: 1.4 to 2.6			
			n+18	Ratio triple width/narrow element width 21 to 39: 2.1 to 3.9			
			n+19	Ratio quadruple width/narrow element width 28 to 52: 2.8 to 5.2			
n+20	Laser power correction: 0 to 200%						
n+21	Scan speed correction: 5 to 500%						

Contents		F0	F1 (= \$u n)		F2				
Writing of barcode print condition	RSS-14 Standard & Truncated RSS Limited RSS Expanded	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		18			
			n+1	Command: ACH					
			n+2	Barcode number: 0 to 7					
			n+3	Area number: 0 to FH					
			n+4	Type 30: RSS-14 Standard & Truncated 33: RSS Limited 34: RSS Expanded 40: RSS-14 Standard & Truncated CC-A 43: RSS Limited CC-A 44: RSS Expanded CC-A 50: RSS-14 Standard & Truncated CC-B 53: RSS Limited CC-B 54: RSS Expanded CC-B					
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string					
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)					
			n+7 to n+8	Height	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm				
			n+9	Standard module width 0050 to 1000: 0.050 to 1.000 mm					
			n+10 to n+11	X position	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU				
			n+12 to n+13	Y position	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg					
			n+16	Laser power correction: 0 to 200%					
			n+17	Scan speed correction: 5 to 500%					
			RSS-14 Stacked RSS-14 Stacked Omnidirectional	1 to 8 (PLC1 to 8)	n		Station number: 0 (fixed)		19
					n+1		Command: ACH		
					n+2		Barcode number: 0 to 7		
	n+3	Area number: 0 to FH							
	n+4	Type 31: RSS-14 Stacked 32: RSS-14 Stacked Omnidirectional 41: RSS-14 Stacked CC-A 42: RSS-14 Stacked Omnidirectional CC-A 51: RSS-14 Stacked CC-B 52: RSS-14 Stacked Omnidirectional CC-B							
	n+5	Human-readable string 0: Without human-readable string 2: With human-readable string							
n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)								

Contents		F0	F1 (= \$u n)			F2	
Writing of barcode print condition	RSS-14 Stacked RSS-14 Stacked Omnidirectional		n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	19	
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm			
			n+10	Standard module width 0050 to 1000: 0.050 to 1.000 mm			
			n+11 to n+12	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
			n+13 to n+14	Y position			
			n+15 to n+16	Tilting angle -18000 to +18000: -180.00 to +180.00 deg			
			n+17	Laser power correction: 0 to 200%			
			n+18	Scan speed correction: 5 to 500%			
	RSS-14 Expanded Stacked	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)			20
			n+1	Command: ACH			
			n+2	Barcode number: 0 to 7			
			n+3	Area number: 0 to FH			
			n+4	Type 35: RSS Expanded Stacked 45: RSS Expanded Stacked CC-A 55: RSS Expanded Stacked CC-B			
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string			
			n+6	Inversion 0: Invalid 1: Valid 2: Valid (with guard pattern)			
			n+7 to n+8	Barcode 1-stack height	LP-430U/430TU/420S9U/420S9TU/410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm		
			n+9	Separator height (W) ratio 000 to 100: 00.0 to 10.0 mm			
			n+10	Number of horizontal symbol characters: 2 to 20 (even)			
n+11	Standard module width 0050 to 1000: 0.050 to 1.000 mm						
n+12 to n+13	X position	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm					
n+14 to n+15	Y position						

Contents		F0	F1 (= \$u n)		F2
Writing of barcode print condition	RSS-14 Expanded Stacked	1 to 8 (PLC1 to 8)	n+16 to n+17	Tilting angle -18000 to +18000: -180.00 to +180.00 deg	20
			n+18	Laser power correction: 0 to 200%	
			n+19	Scan speed correction: 5 to 500%	
	Composite	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	19
			n+1	Command: ACH	
			n+2	Barcode number: 0 to 7	
			n+3	Area number: 0 to FH	
			n+4	Type CC-A composite 46: JAN/UPC 47: UCC/EAN128 48: JAN/UPC with 1D human-readable string 49: UCC/EAN128 with 1D human-readable string CC-B composite 56: JAN/UPC 57: UCC/EAN128 58: JAN/UPC with 1D human-readable string 59: UCC/EAN128 with 1D human-readable string CC-C composite 67: UCC/EAN128 69: UCC/EAN128 with 1D human-readable string	
			n+5	Human-readable string 0: Without human-readable string 2: With human-readable string	
			n+6	Inversion 0: Invalid 1: Valid	
			n+7 to n+8	Barcode 1-stack height LP-430U/430TU/420S9U/420S9TU/ 410U/410TU 001000 to 110000: 001.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU 001000 to 055000: 001.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 001000 to 160000: 001.000 to 160.000 mm	
			n+9	Narrow element width 0050 to 1000: 0.050 to 1.000 mm	
			n+10 to n+11	X position LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+12 to n+13	Y position LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -27500 to +27500: -027.500 to +027.500 mm LP-431U/431TU/421S9U/421S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+14 to n+15	Tilting angle -18000 to +18000: -180.00 to +180.00 deg	
			n+16	Ratio quiet zone/narrow element 000 to 200: 00.0 to 20.0	
			n+17	Laser power correction: 0 to 200%	
			n+18	Scan speed correction: 5 to 500%	
Barcode print data (2-byte characters)	Reading of barcode print data	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	4
			n+1	Command: 2DH	
			n+2	Barcode number: 0 to 7	
			n+3	Set row number (2-D code): 1 to 9	
	Writing of barcode print data	1 to 8 (PLC1 to 8)	n+4 to n+33	Print data	4 + print data word count (30 words maximum)
			n	Station number: 0 (fixed)	
			n+1	Command: ADH	
			n+2	Barcode number: 0 to 7	
			n+3	Set row number (2-D code): 1 to 9	
			n+4 to n+33	Print data	

Contents		F0	F1 (= \$u n)		F2	
2-D code pattern	Reading of 2-D code pattern	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4
			n+1	Command: 2EH		
			n+2	Barcode number: 0 to 7		
			n+3	Pattern number For QR code 0: Quite zone/margin 1: Black module 2: White module 3: Alignment 4: Finder For data matrix code 0: Quite zone/margin 1: Mark module 2: Space module		
			n+4	Character code (DEC) 0000, 2230 to 2239, 8121 to 8152		
			n+5	Laser power correction: 0 to 200%		
			n+6	Scan speed correction: 5 to 500%		
	Writing of 2-D code pattern	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		7
			n+1	Command: AEH		
			n+2	Barcode number: 0 to 7		
			n+3	Pattern number For QR code 0: Quite zone/margin 1: Black module 2: White module 3: Alignment 4: Finder For data matrix code 0: Quite zone/margin 1: Mark module 2: Space module		
			n+4	Character code (DEC) 0000, 2230 to 2239, 8121 to 8152		
			n+5	Laser power correction: 0 to 200%		
			n+6	Scan speed correction: 5 to 500%		
Serial data input		1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3 + data word count (128 words maximum)
			n+1	Command: AFH		
			n+2	Serial data number: 0 to 15		
			n+3 to n+130	Data		
Processing condition setting	Reading of processing condition	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		3
			n+1	Command: 30H		
			n+2	Processing condition number: 0 to 7		
			n+3	Area number: 0 to FH		
			n+4 to n+5	X offset	LP-430U/430TU/420S9U/420S9TU/ 410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/ 411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+6 to n+7	Y offset	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+8	Rotation angle -18000 to +18000: -180.00 to +180.00 deg		
			n+9	Laser power correction: 0 to 200%		
			n+10	Scan speed correction: 5 to 500%		

Contents		F0	F1 (= \$u n)		F2
Processing condition setting	Writing of processing condition	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	12
			n+1	Command: B0H	
			n+2	Processing condition number: 0 to 7	
			n+3	Area number: 0 to FH	
			n+4 to n+5	X offset LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+6 to n+7	Y offset LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+8 to n+9	Rotation angle -18000 to +18000: -180.00 to +180.00 deg	
			n+10	Laser power correction: 0 to 200%	
n+11	Scan speed correction: 5 to 500%				
Processing element setting	Reading of processing element setting (straight)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	4
			n+1	Command: 31H	
			n+2	Processing condition number: 0 to 7	
			n+3	Processing element number: 0 to 31	
			n+4	Element type 0: Straight	
			n+5 to n+6	Start point X coordinate LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+7 to n+8	Start point Y coordinate LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+9 to n+10	End point X coordinate LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
n+11 to n+12	End point Y coordinate LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
n+13 to n+14	Dashed line: dash length LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm				
n+15 to n+16	Dashed line: space length LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm				

Contents		F0	F1 (= \$u n)		F2		
Processing element setting	Reading of processing element setting (circle)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4	
			n+1	Command: 31H			
			n+2	Processing condition number: 0 to 7			
			n+3	Processing element number: 0 to 31			
			n+4	Element type 1: Circle			
			n+5 to n+6	Center X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU		
			n+7 to n+8	Center Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
			n+9 to n+10	Radius	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU		
	n+11 to n+12	Dashed line: dash length	000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm				
	n+13 to n+14	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm				
	Reading of processing element setting (arc)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		4	
			n+1	Command: 31H			
			n+2	Processing condition number: 0 to 7			
			n+3	Processing element number: 0 to 31			
			n+4	Element type 2: Arc			
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU		
n+7 to n+8			Start point Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm			
n+9 to n+10			End point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU			
n+11 to n+12	End point Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm					
n+13 to n+14	Radius	000010 to 300000: 000.010 to 300.000 mm					
n+15	Drawing direction	0: Counterclockwise 1: Clockwise					
n+16	Center angle	0: Less than 180 deg 1: 180 deg or more					

Contents		F0	F1 (= \$u n)			F2
	Reading of processing element setting (arc)	1 to 8 (PLC1 to 8)	n+17 to n+18	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	4
			n+19 to n+20	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
Processing element setting	Writing of processing element setting (straight)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		17
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 0: Straight		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+7 to n+8	Start point Y coordinate	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+9 to n+10	End point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU -27500 to +27500: -027.500 to +027.500 mm	
			n+11 to n+12	End point Y coordinate	LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+13 to n+14	Dashed line: dash length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	
n+15 to n+16	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm				

Contents		F0	F1 (= \$u n)		F2	
Processing element setting	Writing of processing element setting (circle)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		15
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 1: Circle		
			n+5 to n+6	Center X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU	
			n+7 to n+8	Center Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm	
			n+9 to n+10	Radius	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU	
	n+11 to n+12	Dashed line: dash length	000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm			
	n+13 to n+14	Dashed line: space length	LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm			
	Writing of processing element setting (arc)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)		21
			n+1	Command: B1H		
			n+2	Processing condition number: 0 to 7		
			n+3	Processing element number: 0 to 31		
			n+4	Element type 2: Arc		
			n+5 to n+6	Start point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU	
n+7 to n+8			Start point Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm		
n+9 to n+10			End point X coordinate	LP-430U/430TU/420S9U/420S9TU/410U/410TU -55000 to +55000: -055.000 to +055.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU		
n+11 to n+12	End point Y coordinate	-27500 to +27500: -027.500 to +027.500 mm LP-435U/435TU/425S9U/425S9TU -80000 to +80000: -080.000 to +080.000 mm				
n+13 to n+14	Radius	000010 to 300000: 000.010 to 300.000 mm				
n+15	Drawing direction	0: Counterclockwise 1: Clockwise				
n+16	Center angle	0: Less than 180 deg 1: 180 deg or more				

Contents		F0	F1 (= \$u n)		F2
Processing element setting	Writing of processing element setting (arc)	1 to 8 (PLC1 to 8)	n+17 to n+18	Dashed line: dash length LP-430U/430TU/420S9U/420S9TU/410U/410TU 000010 to 110000: 000.010 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000010 to 550000: 000.010 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000010 to 160000: 000.010 to 160.000 mm	21
			n+19 to n+20	Dashed line: space length LP-430U/430TU/420S9U/420S9TU/410U/410TU 000000 to 110000: 000.000 to 110.000 mm LP-431U/431TU/421S9U/421S9TU/411U/411TU 000000 to 550000: 000.000 to 055.000 mm LP-435U/435TU/425S9U/425S9TU 000000 to 160000: 000.000 to 160.000 mm	
Guide LD display		1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	3
			n+1	Command: B2H	
			n+2	Display 0: Display stop 1: Center + print area 2: Print image 3: Dual pointer	
Week setting	Reading of week setting	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	2
			n+1	Command: 33H	
			n+2	Update day of the week 0: Sunday (updated at 0:00 midnight) 1: Monday (updated at 0:00 midnight)	
	Writing of week setting	1 to 8 (PLC1 to 8)	n+3	The first week 0: The week including and after January 1 1: The week including the first Thursday of January	4
			n	Station number: 0 (fixed)	
n+1	Command: B3H				
n+2	Update day of the week 0: Sunday (updated at 0:00 midnight) 1: Monday (updated at 0:00 midnight)				
n+3	The first week 0: The week including and after January 1 1: The week including the first Thursday of January				

Contents		F0	F1 (= \$u n)		F2
Barcode print data (1-/2-byte characters)	Reading of barcode print data (1-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6
			n+1	Command: 35H	
			n+2	Printing character 0: 1-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
		n+6 to n+20	Barcode data		
	Reading of barcode print data (2-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6
			n+1	Command: 35H	
			n+2	Printing character 1: 2-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
		n+6 to n+35	Barcode data		
	Writing of barcode print data (1-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6 + barcode data word count (15 words maximum)
			n+1	Command: B5H	
			n+2	Printing character 0: 1-byte character	
			n+3	Setting section 0: Composite 1D section, except for composite components 1: Composite 2D section	
			n+4	Barcode number: 0 to 7	
			n+5	Set row number (2-D code): 1 to 9	
		n+6 to n+20	Barcode data		
	Writing of barcode print data (2-byte characters)	1 to 8 (PLC1 to 8)	n	Station number: 0 (fixed)	6 + barcode data word count (30 words maximum)
			n+1	Command: B5H	
			n+2	Printing character 1: 2-byte character	
n+3			Setting section 0: Composite 1D section, except for composite 1: Composite 2D section		
n+4			Barcode number: 0 to 7		
n+5			Set row number (2-D code): 1 to 9		
	n+6 to n+35	Barcode data			

Return data: Data stored from controller to X1 series

19.2.2 LP-RF Series

Editor

Communication setting

(Underlined setting: default)

Item	Setting Value	Remarks
Connection Mode	1 : 1	
Signal Level	<u>RS-232C</u>	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Sum Check Code	Yes / <u>None</u>	
CR/LF	<u>CR</u> / CR/LF	

Laser Marker

Make the following settings using "Laser Marker NAVI smart". For more information, refer to the instruction manual of the laser marker issued by the manufacturer.

System settings

(Underlined setting: default)

Tab	Item	Setting Value	Remarks
Operation/information	Operation	Remote mode at power-on	ON
		Laser pumping control	Communication command
		Shutter control	Communication command
		Guide laser display control	Communication command
Communication	RS-232C	RS-232C	Communication commands
		Baud rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115200 bit/s
		Data length	<u>8 bit</u>
		Parity	<u>None</u> / Even / Odd
		Stop bits	<u>1</u> / 2 bit
		Check sum	<u>OFF</u> / ON
		Delimiter	<u>CR</u> / CR+LF
	Command format (standard mode)	Start code	STX
		Include command in response	ON
		Positive response code	A
	Negative response code	E	
	Read request response code	A	

Available Device Memory

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

Device Memory	TYPE	Remarks
MKM (command reception permission)	00H	
LSR (laser pumping)	01H	
SHT (shutter open/close)	02H	
DLY (trigger delay)	03H	
GID (guide laser)	04H	
FNO (file selection by number)	05H	
FNM (filename)	06H	
SIN (character entry per trigger)	07H	
SST (reference character)	08H	
CNT (counter settings)	09H	Double-word
LMT (expiry date/time settings)	0AH	
LTC (lot settings)	0BH	
RKC (registered character settings)	0CH	
ALC (file settings)	0DH	Double-word
OFC (external offset settings)	0FH	
FLY (motion settings for all files)	10H	Double-word
FLF (motion settings for current file)	11H	Double-word
ENO (error code)	13H	Read only
YMD (system clock)	14H	

MKM (command reception permission)

Address	Name	Setting Range
00000	Command reception permission	0: Command reception permission ON 1: Command reception permission OFF

LSR (laser pumping)

Address	Name	Setting Range
00000	Laser pumping control	0: Laser pumping OFF 1: Laser pumping ON

SHT (shutter open/close)

Address	Name	Setting Range
00000	Shutter status	0: Shutter close 1: Shutter open

DLY (trigger delay)

Address	Name	Setting Range
00000	Delay time	0000 to 9999 ms

GID (guide laser)

Address	Name	Setting Range
00000	Guide laser display	0: Stop display 1: Marking field 2: Marking image 3: Masked objects 4: Work distance
00001	Guide laser scan speed	LP-GS051 00001 to 03000 mm/s LP-GS051-L 00001 to 02000 mm/s LP-RC350S/LP-RF200P/LP-RV200P 00001 to 06000 mm/s
00002	Guide laser Z-movement	LP-GS051 -003.000 to +003.000 mm LP-GS051-L/LP-RC350S/LP-RF200P/LP-RV200P +000.000 mm or omit

FNO (file selection by number)

Address	Name	Setting Range
00000	File number	0000 to 9999

FNM (filename)

Address	Name	Setting Range
00000	Filename	Filename (CHAR 254 bytes)

SIN (character entry per trigger)

Address	Name	Setting Range
00000 to 00099	Marking character of string number 00	Marking character (CHAR 198 bytes)
00100 to 00199	Marking character of string number 01	
:	:	
01500 to 01599	Marking character of string number 15	

SST (reference character)

Address	Name	Setting Range
00000 to 00099	Reference character of string number 001	Reference character (CHAR 198 bytes)
00100 to 00199	Reference character of string number 002	
:	:	
19900 to 19999	Reference character of string number 200	

CNT (counter settings)

Address	Name	Setting Range	
00000	Counter No. 00	Current value	
00001		Initial value	
00002		End value	
00003		Step value	
00004	Counter No. 00	Count timing	00 to 31: When counter 0 to 31 has reached the end value 32: When marking trigger is input
00100	Counter No. 01	Current value	000000000 to 999999999
00101		Initial value	
00102		End value	
00103		Step value	
00104	Counter No. 01	Count timing	00 to 31: When counter 0 to 31 has reached the end value 32: When marking trigger is input
:	:	:	:
03100	Counter No. 31	Current value	000000000 to 999999999
03101		Initial value	
03102		End value	
03103		Step value	
03104	Counter No. 31	Count timing	00 to 31: When counter 0 to 31 has reached the end value 32: When marking trigger is input

LMT (expiry date/time settings)

Address	Name	Setting Range	
00000	Expiry time No. 01	Periods	-999 to +999
00001		Expiry time unit	0: Year 1: Month 2: Day 3: Hour 4: Minute
00002		Today included	0: Today not included 1: Today included
00100		Periods	-999 to +999
00101	Expiry time No. 02	Expiry time unit	0: Year 1: Month 2: Day 3: Hour 4: Minute
00102		Today included	0: Today not included 1: Today included

Address	Name	Setting Range
:	:	:
03100	Periods	-999 to +999
03101	Expiry time No. 32	Expiry time unit 0: Year 1: Month 2: Day 3: Hour 4: Minute
03102	Today included	0: Today not included 1: Today included

LTC (lot settings)

Address	Name	Setting Range
00000	Lot No. 00	Lot unit 00: Year 01: Month 02: Day 03: Year and month 04: Month and day 05: Day of the week 06: Hour 07: Week 08: Minute 09: Hour and minute 10: Counter 11: Year (week-based)
00001	Lot type	When the lot unit is 00 to 09 and 11: 00: Current date/time 01 to 32: Expiry time No. When the lot unit is 10: 00 to 31: Counter No.
00100	Lot No. 01	Lot unit 00: Year 01: Month 02: Day 03: Year and month 04: Month and day 05: Day of the week 06: Hour 07: Week 08: Minute 09: Hour and minute 10: Counter 11: Year (week-based)
00101	Lot type	When the lot unit is 00 to 09 and 11: 00: Current date/time 01 to 32: Expiry time No. When the lot unit is 10: 00 to 31: Counter No.
:	:	:
03100	Lot No. 31	Lot unit 00: Year 01: Month 02: Day 03: Year and month 04: Month and day 05: Day of the week 06: Hour 07: Week 08: Minute 09: Hour and minute 10: Counter 11: Year (week-based)
03101	Lot type	When the lot unit is 00 to 09 and 11: 00: Current date/time 01 to 32: Expiry time No. When the lot unit is 10: 00 to 31: Counter No.

RKC (registered character settings)

Address	Name	Setting Range
00000	I/O input format	0: 4-bit × 4 1: 8-bit × 2

ALC (file settings)

Address	Name	Setting Range
00000	X-movement	-999.999 to +999.999 mm
00001	Y-movement	
00002	Z-movement	LP-GS051 -003.000 to +003.000 mm LP-GS052 -001.500 to -001.500 mm LP-GS051-L/LP-RC350S/LP-RF200P/LP-RV200P +000.000 mm or omit
00003	Rotation movement	-180.000 to +180.000°
00004	Y-axis mirroring	0: Do not invert 1: Invert
00005	X-axis mirroring	0: Do not invert 1: Invert

OFC (external offset settings)

Address	Name	Setting Range
00000	Input method	0: OFF 1: Lower 4-bit 2: Lower 8-bit 3: Lower 10-bit 4: Using SEO command

FLY (motion settings for all files)

Address	Name	Setting Range
00000	On-the-fly marking ON/OFF	0: OFF 1: ON
00001	Moving direction	0: +X to -X 1: -X to +X 2: +Y to -Y 3: -Y to +Y
00002	Trigger mode	0: Single trigger 1: Marking at regular intervals 2: Multiple triggers
00003	Trigger detecting position	0000.000 to 1000.000 mm
00004	Line speed control	0: Fixed speed 1: Input from encoder 2: Input from two sensors
00005	Encoder resolution	005.000 to 600.000 pulse/mm
00006	Distance between line speed sensors	001.000 to 999.999 mm
00007	Input timeout from line speed sensors	00: No timeout setting 01 to 10 sec.

FLF (motion settings for current file)

Address	Name	Setting Range
00000	Line speed	000.060 to 240.000 m/min
00001	Workpiece reference boundary	-2000.000 to +2000.000 mm
00002	Spacing	0000.000 to 4000.000 mm
00003	Laser irradiation start boundary	LP-RC350S -042.500 to +042.500 mm LP-RF200P/LP-RV200P -045.000 to +045.000 mm
00004	Overrun correction	-100 to +100

ENO (error code)

Address	Name	Setting Range
00000	Error code	000: No error 001 to 999: Error code

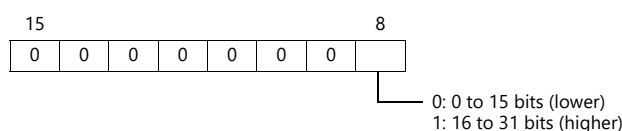
YMD (system clock)

Address	Name	Setting Range
00000	Year	1980 to 2099
00001	Month	01 to 12
00002	Day	01 to 31
00003	Hour	00 to 23
00004	Minute	00 to 59
00005	Second	00 to 59

Indirect Device Memory Designation

	15	8 7	0
n+0	Models (11 to 18)		Device memory type
n+1	Address No.		
n+2	Expansion code *		Bit designation
n+3	00		Target Port No.

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.



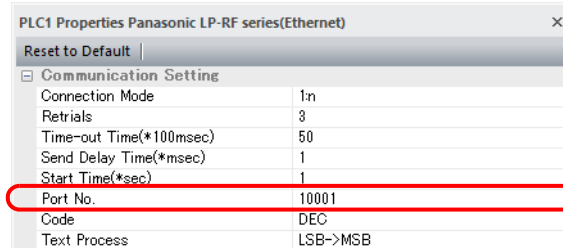
19.2.3 LP-RF Series (Ethernet)

Communication Setting

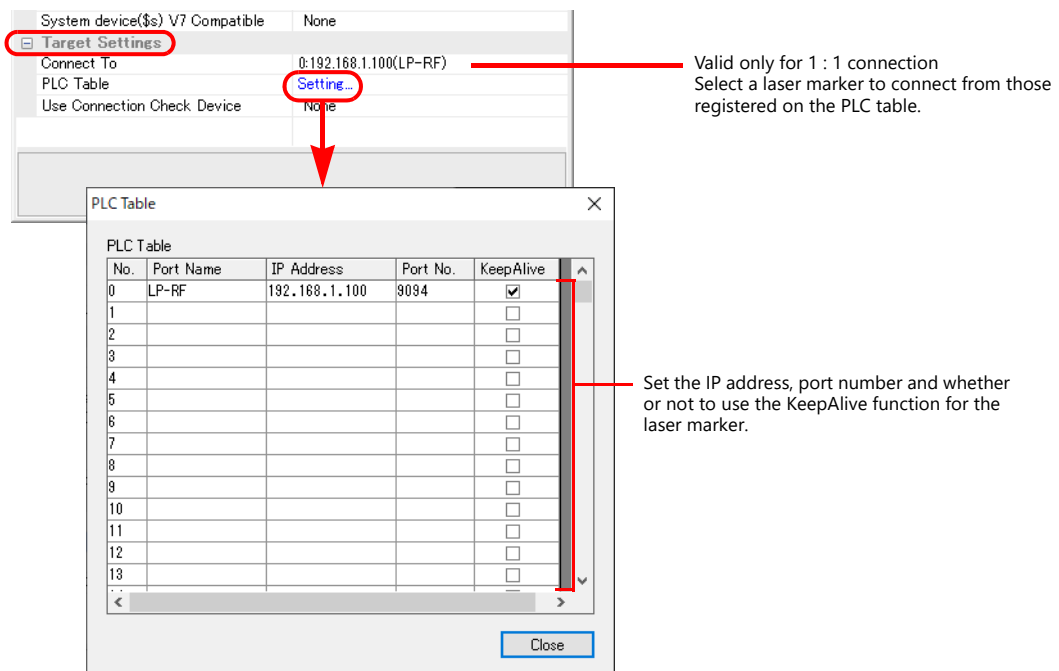
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number of the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



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



Laser Marker

Make the following settings using "Laser Marker NAVI smart". For more information, refer to the instruction manual of the laser marker issued by the manufacturer.

System settings

(Underlined setting: default)

Tab	Item	Setting Value	Remarks	
Operation/information	Operation	Remote mode at power-on	ON	
		Laser pumping control	Communication command	
		Shutter control	Communication command	
		Guide laser display control	Communication command	Other than LP-GS052
Communication	Ethernet	IP Address	IP address of the laser marker	
		Subnet Mask	Specify according to the environment.	
		Default Gateway	Specify according to the environment.	
		Port for communication commands	Set the port number to be connected with the X1 series unit.	
	Command format (standard mode)	Start code	<u>STX</u>	
		Include command in response	<u>ON</u>	
		Positive response code	<u>A</u>	
		Negative response code	<u>E</u>	
	Read request response code	<u>A</u>		

Available Device Memory

Settings are the same as those described in "19.2.2 LP-RF Series".

19.2.4 KW Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / <u>Odd</u> / Even	
Target Port No.	<u>1</u> to 99	
Header	<u>% (Header)</u> / < (Extension Header)	Model on which "< (Extension Header)" is available: KW1M-R

Eco-POWER METER

Communication parameters can be set by operating the keys on the Eco-POWER METER. For more information, refer to the manual for Eco-POWER METER.

KW1M/KW1M-H/KW8M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	<u>MEWT: MEWTOCOL</u>
	NO.	Station number setting mode	<u>1</u> to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

KW1M-R(AKW1000/AKW1000K)

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	<u>MEWT: MEWTOCOL</u>
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity
	PORT	Communication port setting mode	<u>232: RS-232C port</u> 485: RS-485 port

Stop bit: 1 (fixed)

AKW1000 and AKW1000K are not provided with the measuring function. Use each device along with a slave device AKW1131 or AKW1131K.

For establishing connection between master and slave devices, refer to the manual for Eco-POWER METER.

KW1M-R(AKW1131/AKW1131K)

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	FORM	Wired/wireless setting mode	WIRED
	PROT	Protocol setting mode	MEWT: MEWTOCOL
	NO.	Station number setting mode	<u>1</u> to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

* Use system program version 2.2 or later.

KW2G/KW2G-H

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	PROT	Protocol setting mode	MEWT: MEWTOCOL
	NO	Station number setting mode	<u>1</u> to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity
	STOP	Stop bit setting mode	<u>1: 1 bit</u> 2: 2 bits


KW4M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 3	NO.	Station setting mode	<u>1</u> to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Protocol: MEWTOCOL, stop bit: 1 (fixed)

Terminal station setting

Slide Switch	Item	Setting
	Terminal station setting	General: General station Terminal: Terminal station

KW7M

(Underlined setting: default)

Mode	Display	Item	Setting
MODE 2	PROT	Protocol setting mode	<u>MEWT: MEWTOCOL</u>
	NO.	Station number setting mode	<u>1</u> to 99
	SPD	Baud rate setting mode	4800: 4800 bps 9600: 9600 bps <u>19200: 19200 bps</u> 38400: 38400 bps
	FMT	Communication format setting mode	<u>8bit-o: data length 8 bits, odd parity</u> 7bit-n: data length 7 bits, without parity 7bit-E: data length 7 bits, even parity 7bit-o: data length 7 bits, odd parity 8bit-n: data length 8 bits, without parity 8bit-E: data length 8 bits, even parity

Stop bit: 1 (fixed)

Available Device Memory


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

Device Memory	TYPE	Remarks
DT (data register)	00H	

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= \$u n)	F2	
Status read	1 to 8 (PLC1 to 8)	n	Station number: 1 to 99	2
		n+1	Command: 0000H	
		n+2	Model code 1	
		n+3	Model code 2	
		n+4	Version	
		n+5	Operation mode 0: Stopped 1: Running	
		n+6	Error flag 0: Normal 1: Error	
		n+7	Self-diagnosis error number	

 Return data: Data stored from Eco-POWER METER to X1 series

19.2.5 MINAS A4 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)


Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1:n</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>None</u>	
Target Port No.	0 to 15	

Servo Amplifier

Communication parameters can be set by operating the rotary switch and the keys on the front panel. For more information, refer to the servo amplifier manual.

Setting changes will take effect after turning the power off and back on. If changes are made to any settings, turn the power off and on again.

Rotary switch (ID)

ID	Item	Setting
	Axis number setting	RS-232C connection: 0 to F RS-485 connection: 1 to F

Parameters

(Underlined setting: default)


Mode	Item	Setting
0C	RS-232C communication baud rate setting	1: 4800 bps <u>2: 9600 bps</u> 3: 19200 bps 4: 38400 bps 5: 57600 bps
0D	RS-485 communication baud rate setting	1: 4800 bps <u>2: 9600 bps</u> 3: 19200 bps 4: 38400 bps 5: 57600 bps

Data length: 8, stop bit: 1, parity: none (fixed)

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

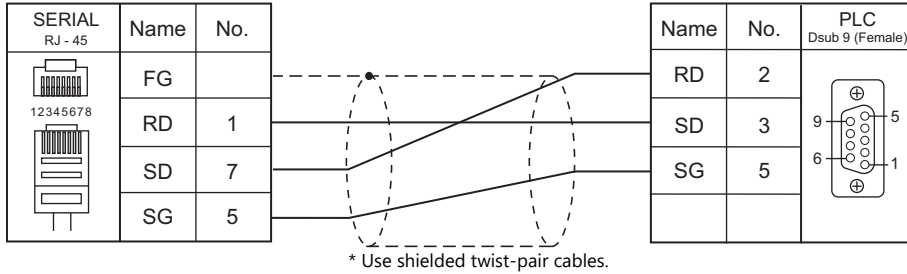
Contents	F0	F1 (= \$u n)		F2
Software version information readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0000H	
		n+2	Software version	
Amplifier model readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0001H	
		n+2	Model code 1st and 2nd characters	
		n+3	Model code 3rd and 4th characters	
		n+4	Model code 5th and 6th characters	
		n+5	Model code 7th and 8th characters	
		n+6	Model code 9th and 10th characters	
n+7	Model code 11th and 12th characters			
Motor model readout	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0002H	
		n+2	Model code 1st and 2nd characters	
		n+3	Model code 3rd and 4th characters	
		n+4	Model code 5th and 6th characters	
		n+5	Model code 7th and 8th characters	
		n+6	Model code 9th and 10th characters	
n+7	Model code 11th and 12th characters			
RS-232 protocol parameter setting	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	5
		n+1	Command: 0003H	
		n+2	Timeout period between characters 1 to 255 (unit: 0.1 sec.)	
		n+3	Protocol timeout period 1 to 255 (unit: 1 sec.)	
n+4	Retry limit (unit: 1 time)			
RS-485 protocol parameter setting	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	5
		n+1	Command: 0004H	
		n+2	Timeout period between characters 1 to 255 (unit: 0.1 sec.)	
		n+3	Protocol timeout period 1 to 255 (unit: 1 sec.)	
n+4	Retry limit (unit: 1 time)			
Execute privilege acquisition/release	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	3
		n+1	Command: 0005H	
		n+2	0: Request for execute privilege release 1: Request for execute privilege acquisition	
Parameter write to EEPROM	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0006H	
Alarm history clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0007H	
Alarm clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0008H	
Absolute clear	1 to 8 (PLC1 to 8)	n	Station number: 0 to 15	2
		n+1	Command: 0009H	

 Return data: Data stored from servo amplifier to X1 series

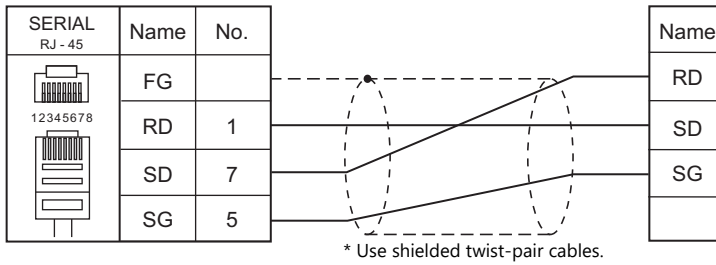
19.2.6 Wiring Diagrams

RS-232C

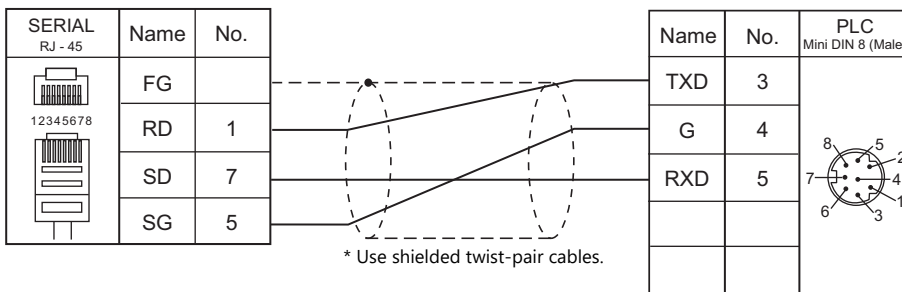
Wiring diagram 1 - M2



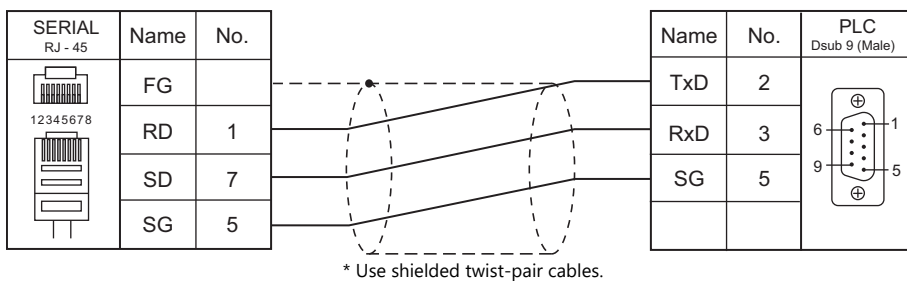
Wiring diagram 2 - M2



Wiring diagram 3 - M2

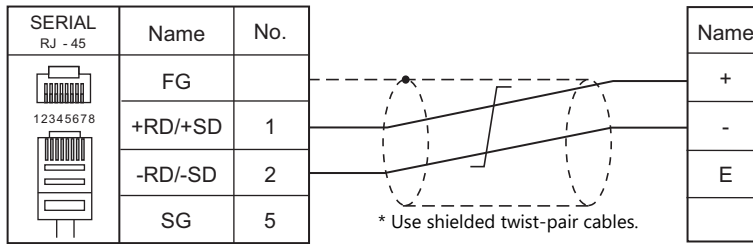


Wiring diagram 4 - M2

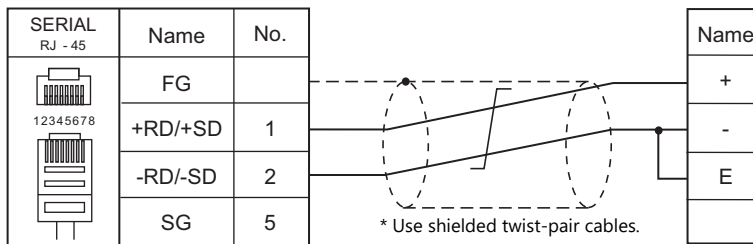


RS-485

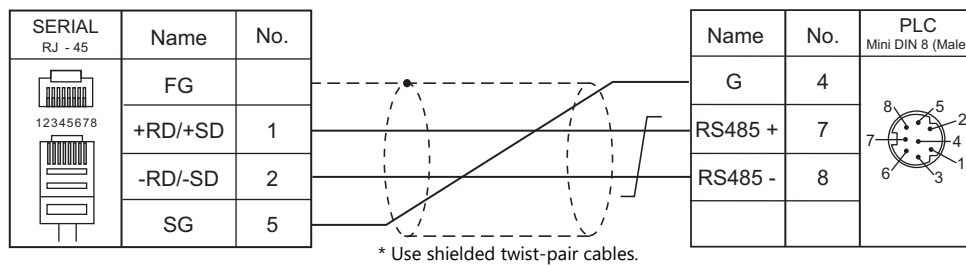
Wiring diagram 1 - M4



Eco-POWER METER connected at the terminal (except for KW4M)



Wiring diagram 2 - M4



20. RKC

20.1 Temperature Controller/Servo/Inverter Connection

20.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Module-type Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}	
SR-Mini (MODBUS RTU)	H-PCP-A-x4N-4 * xx Z-1021	Modular connector 1/2	RS-422A	Wiring diagram 2 - M4	Wiring diagram 4 - M4 ^{*3}	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 - M4	Wiring diagram 4 - M4 ^{*3}	RKC_Std.Lst
	H-PCP-B-x4N-4 * xx					
SRV (MODBUS RTU)	V-TIO-A-xxxx-xx*xxx-xx-x-6	Communication terminal	RS-485 (2-wire)	Wiring diagram 1 - M4	×	RKC_SRV.Lst
	V-TIO-C-xxxx-xx*xxx-xx-x-6					
SRZ (MODBUS RTU)	Z-TIO-A-x-xxxx/x2-x xxx/Y ^{*4}	Communication terminal	RS-485 (2-wire)	Wiring diagram 1 - M4	×	RKC_SRZ_TIO.Lst
	Z-TIO-B-x-xx/xN2-xxxx/Y ^{*4}					RKC_SRZ_DIO.Lst
	Z-DIO-A-x-xx/x-xxx2					

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

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

"2: Modbus" can be selected as the communication protocol 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
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}	
CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)	CB100xxx-xx*xx-5x/x Z-1021	Communication terminal	RS-485	Wiring diagram 1 - M4	×	CB100.Lst
	CB400xxx-xx*xx-5x/x Z-1021					
	CB500xxx-xx*xx-5x/x Z-1021					
	CB700xxx-xx*xx-5x/x Z-1021					
	CB900xxx-xx*xx-5x/x Z-1021					
REX-F400/F700/F900 (Standard Protocol)	F400xxx-xx*xx-xxx-1x F700xxx-xx*xx-xxx-1x F900xxx-xx*xx-xxx-1x	Communication terminal	RS-232C	Wiring diagram 1 - M2	×	RKC_F400.Lst
	F400xxx-xx*xx-xxx-4x F700xxx-xx*xx-xxx-4x F900xxx-xx*xx-xxx-4x	Communication terminal	RS-422A	Wiring diagram 3 - M4	Wiring diagram 5 - M4 ^{*3}	
	F400xxx-xx*xx-xxx-5x F700xxx-xx*xx-xxx-5x F900xxx-xx*xx-xxx-5x	Communication terminal	RS-485	Wiring diagram 1 - M4	×	
REX-F9000 (Standard Protocol)	F9000-xxx-x*xx/x	Communication terminal	RS-485	Wiring diagram 1 - M4	×	RKC_F9000.Lst
FB100/FB400/FB900 (MODBUS RTU)	FB400-xx-x*xxx1/xx-xxxx FB400-xx-x*xxxW/xx-xxxx FB900-xx-x*xxx1/xx-xxxx FB900-xx-x*xxxW/xx-xxxx	Communication terminal	RS-232C	Wiring diagram 1 - M2	×	RKC_FB.Lst
	FB400-xx-x*xxx4/xx-xxxx FB900-xx-x*xxx4/xx-xxxx	Communication terminal	RS-422A	Wiring diagram 3 - M4	Wiring diagram 5 - M4 ^{*3}	
	FB100-xx-x*E/xx-xxxx FB100-xx-x*F/xx-xxxx FB100-xx-x*G/xx-xxxx FB100-xx-x*H/xx-xxxx FB100-xx-x*I/xx-xxxx	Communication terminal	RS-485	Wiring diagram 1 - M4	×	
	FB400-xx-x*xxx5/xx-xxxx FB400-xx-x*xxxW/xx-xxxx FB400-xx-x*xxxX/xx-xxxx FB400-xx-x*xxxY/xx-xxxx					
	FB900-xx-x*xxx5/xx-xxxx FB900-xx-x*xxxW/xx-xxxx FB900-xx-x*xxxX/xx-xxxx FB900-xx-x*xxxY/xx-xxxx					

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

*3 The signal level must be selected on the Serial Setting screen in Local mode of the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

Multi-loop Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
MA900/MA901 (MODBUS RTU)	MA900-4xxx-xx-x*xxx-x6/x	Communication terminal	RS-485	Wiring diagram 1 - M4	×	RKC_MA900.Lst
	MA901-8xxx-xx-x*xxx-x6/x					RKC_MA901.Lst

*1 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

20.1.1 CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1: 1 / <u>1:n</u>	
Signal Level	<u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Parity	<u>None</u> / 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 <u>2: 9600 bps</u> 3: 19200 bps	
bIT	Data configuration	<u>0: 8 bits / 1 bit / none</u> 6: 8 bits / 1 bit / even 7: 8 bits / 1 bit / odd	
InT	Interval time setting	0 to 150	Interval time = set value × 1.666 ms

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

20.1.2 SRV (MODBUS RTU)

Communication Setting

Editor

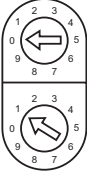
Communication setting

(Underlined setting: default)

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

SRV

Address setting switch

Switch	Setting	Remarks
	<u>00</u> to 30	<p>Higher-order digit setting (× 10) Lower-order digit setting (× 1)</p> <p>The number that is one greater than the set value is the address.</p>

DIP switch setting

Switch	Setting	Contents	Remarks
1	ON	Baud rate: 38400 bps	ON, OFF: 9600 bps OFF, ON: 19200 bps
2	ON		
3	ON	Data bit configuration 8 bits / 1 bit / without parity	ON, OFF, ON: 8 bits / 1 bit / even ON, ON, ON: 8 bits / 1 bit / odd
4	OFF		
5	OFF		
6	ON	Protocol: Modbus	
7	OFF	-	
8	OFF	-	

* Communication time settings (send changeover time/data interval delay time) can be made using the switches 4, 5, and 6. For more information, refer to the communication instruction manual for SRV.

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

20.1.3 SR-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)


Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	<u>9600</u> / 19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	<u>None</u> / 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
	<u>0</u> to F (= 1 to 16)	The number that is one greater than the set value is the address.

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

20.1.4 SR-Mini (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	<u>9600</u> / 19200 bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Target Port No.	0 to 15	


SR-Mini

DIP switch

Switch	Setting	Contents	Remarks
1	OFF	8 bits / 1 bit / without parity	OFF, ON: 7 bits, even parity ON, OFF: 7 bits, odd parity
2	OFF		
3	ON	Baud rate: 9600 bps	OFF, ON: 4800 bps ON, ON: 19200 bps
4	OFF		

Unit address setting switch

(Underlined setting: default)

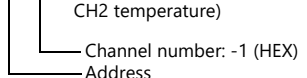
Switch	Setting	Remarks
	<u>0</u> to F (= 0 to 15)	

Available Device Memory

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

Device Memory	TYPE	Remarks
GRP0 (normal: R)	00H	Read only
GRP1 (normal: RW)	01H	
GRP2 (initial: R)	02H	Read only
GRP3 (initial: RW)	03H	

* On the signal name reference list, every channel number is designated as "00". Manually enter the value obtained by the following procedure: subtract "1" from the channel to access, and set the hexadecimal number of the obtained value.
The assigned device memory is expressed as shown on the right when editing the screen.

Example: GRP0000001 (measurement value for CH2 temperature)


Indirect Device Memory Designation

	15	8 7	0
n + 0	Model		Device type
n + 1	Address (lower)		CH No.
n + 2	00		Address (higher)
n + 3	Expansion code		Bit designation
n + 4	00		Station number

20.1.5 REX-F400/F700/F900 (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

REX-F400/F700/F900

Parameter group (PG) 24

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

(Underlined setting: default)

Indication	Item	Setting	Remarks
bIT	Communication data bit configuration	0: 8 bits / 1 bit / none 1: 8 bits / 2 bits / none 2: 8 bits / 1 bit / even 3: 8 bits / 2 bits / even 4: 8 bits / 1 bit / odd 5: 8 bits / 2 bits / odd 6: 7 bits / 1 bit / none 7: 7 bits / 2 bits / none 8: 7 bits / 1 bits / even 9: 7 bits / 2 bits / even 10: 7 bits / 1 bit / odd 11: <u>7 bits / 2 bits / odd</u>	
Add	Device address	<u>0</u> to 31	
bPS	Baud rate	2: 4800 bps 3: <u>9600</u> bps 4: 19200 bps	
InT	Interval time setting	<u>0</u> to 250 msec	

- * The "COMP" mode must be selected for communication with the X1 series.
Press the [MODE] key to display "Computer Mode Change", and change the mode from [LOC] to [COMP] by pressing the [√] key.

Available Device Memory

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

Device Memory	TYPE	Remarks
GRP0	00H	Read only
GRP1	01H	

20.1.6 REX-F9000 (Standard Protocol)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

REX-F9000

Mode transfer

Indication	Item	Setting	Remarks
LCK	Setting of set data lock function	Select whether to validate or invalidate the set data lock function (PG40: LCK). ULCK: Invalid (unlocked) LCK: Valid (locked)	

Parameter group

(Underlined setting: default)

PG	Indication	Item	Setting	Remarks																																				
PG24	Add	Device Address	<u>0</u> to 31																																					
	bPS	Baud rate	2: 4800 bps <u>3: 9600 bps</u> 4: 19200 bps																																					
	bit	Communication data bit configuration	<u>0: 8 bits / 1 bit / none</u> 1: 8 bits / 2 bits / none 2: 8 bits / 1 bit / even 3: 8 bits / 2 bits / even 4: 8 bits / 1 bit / odd 5: 8 bits / 2 bits / odd 6: 7 bits / 1 bit / none 7: 7 bits / 2 bit / none 8: 7 bits / 1 bit / even 9: 7 bits / 2 bits / even 10: 7 bits / 1 bit / odd 11: 7 bits / 2 bits / odd																																					
	InT	Interval time setting	0 to <u>250</u> msec																																					
	CMPS	Protocol selection	0: RKC standard communication																																					
PG40	LCK	Set data lock level selection	<u>0: Set values (SV) and all parameters cannot be changed.</u> 1: Only set values (SV) can be changed. 2: Only parameter groups (PG) cannot be changed.	Valid when the set data lock function is set to "LCK" by mode transfer																																				
	MLCK	Mode lock level selection	Apply the following mode transfer settings. (○: transfer allowed, ×: transfer not allowed)																																					
			<table border="1"> <thead> <tr> <th>Setting</th> <th>PID/Autotuning</th> <th>Auto/Manual</th> <th>Control RUN/STOP</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>1</td> <td>○</td> <td>×</td> <td>○</td> </tr> <tr> <td>2</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td>3</td> <td>×</td> <td>×</td> <td>○</td> </tr> <tr> <td>4</td> <td>○</td> <td>○</td> <td>×</td> </tr> <tr> <td>5</td> <td>○</td> <td>×</td> <td>×</td> </tr> <tr> <td>6</td> <td>×</td> <td>○</td> <td>×</td> </tr> <tr> <td>7</td> <td>×</td> <td>×</td> <td>×</td> </tr> </tbody> </table>	Setting	PID/Autotuning	Auto/Manual	Control RUN/STOP	0	○	○	○	1	○	×	○	2	×	○	○	3	×	×	○	4	○	○	×	5	○	×	×	6	×	○	×	7	×	×	×	
			Setting	PID/Autotuning	Auto/Manual	Control RUN/STOP																																		
			0	○	○	○																																		
			1	○	×	○																																		
			2	×	○	○																																		
			3	×	×	○																																		
4	○	○	×																																					
5	○	×	×																																					
6	×	○	×																																					
7	×	×	×																																					

Available Device Memory

The available setting range of device memory varies depending on the controller model. Be sure to set within the range available with the controller to be used.

Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
GRP0	00H	Read only
GRP1	01H	

20.1.7 MA900 / MA901 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>None</u> / 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 <u>2: 9600 bps</u> 3: 19200 bps	
blT	Data configuration	<u>0: 8 bits / 1 bit / none</u> 2: 8 bits / 1 bit / even 4: 8 bits / 1 bit / odd	
InT	Interval time setting	0 to 250 msec	

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

20.1.8 SRZ (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	<u>None</u> / Odd / Even	
Target Port No.	Z-TIO: 1 to 16 Z-DIO: 17 to 31	Default: 1


SRZ

DIP switch

Switch	Setting	Contents	Remarks
1	OFF	Baud rate: 19200 bps	OFF, OFF: 4800 bps ON, OFF: 9600 bps OFF, ON: 19200 bps ON, ON: 38400 bps
2	ON		
3	OFF	Data bit configuration 8 bits / without parity / 1 bit	OFF, ON, ON: 8 bits / even / 1 bit ON, ON, ON: 8 bits / odd / 1 bit
4	OFF		
5	ON		
6	ON	Protocol: Modbus	
7	OFF	-	
8	OFF	-	

Slave address setting switch

(Underlined setting: default)

Switch	Setting	Remarks
	<u>Q</u> 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 ¹)

* For connection to X1, the available address setting range is 0 to E (17 to 31).

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

20.1.9 FB100/FB400/FB900 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

FB100/FB400/FB900

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

Communication protocol (engineering mode F60)

Indication	Item	Setting	Remarks
CMP1	Communication 1 protocol	1: MODBUS	
CMP2	Communication 2 protocol	1: MODBUS	

* The temperature controller must be set to "STOP" (control stop) before making settings.

Communication parameter (setup setting mode)

(Underlined setting: default)

Port	Indication	Item	Setting	Remarks
Communication 1	Add1	Device address 1	1 to 31	Communication is not performed when "0" is set.
	bPS1	Baud rate 1	4.8: 4800 bps 9.6: 9600 bps <u>19.2: 19200 bps</u> 38.4: 38400 bps	
	bIT1	Data bit configuration 1	<u>8n1: 8 bits / none / 1 bit</u> 8n2: 8 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	
	InT1	Interval time 1	0 to 250 msec	
Communication 2	Add2	Device address 2	1 to 31	Communication is not performed when "0" is set.
	bPS2	Baud rate 2	4.8: 4800 bps 9.6: 9600 bps <u>19.2: 19200 bps</u> 38.4: 38400 bps	
	bIT2	Data bit configuration 2	<u>8n1: 8 bits / none / 1 bit</u> 8n2: 8 bits / none / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	
	InT2	Interval time 2	0 to 250 msec	

Parameter changes will take effect when the temperature controller is turned off and on again or is switched from "STOP" to "RUN".

Available Device Memory

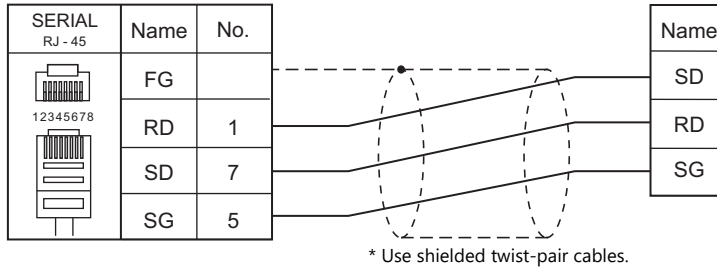
The available setting range of device memory varies depending on the controller model. Be sure to set within the range available for the controller to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	00H	0000 to 0017: Read only

20.1.10 Wiring Diagrams

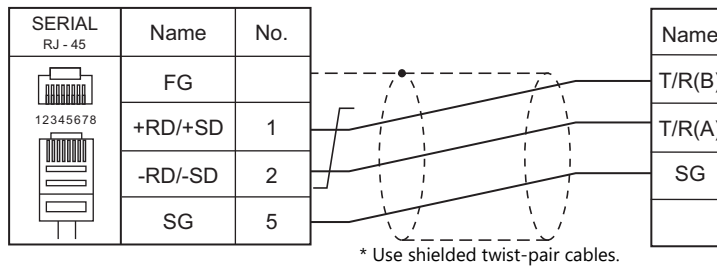
RS-232C

Wiring diagram 1 - M2

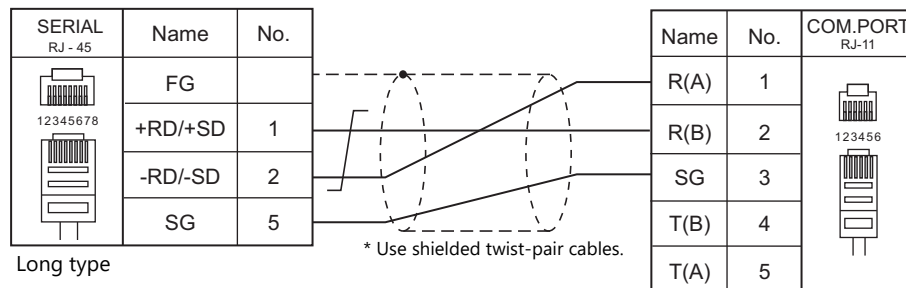


RS-422/RS-485

Wiring diagram 1 - M4

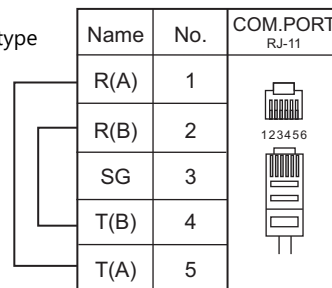


Wiring diagram 2 - M4

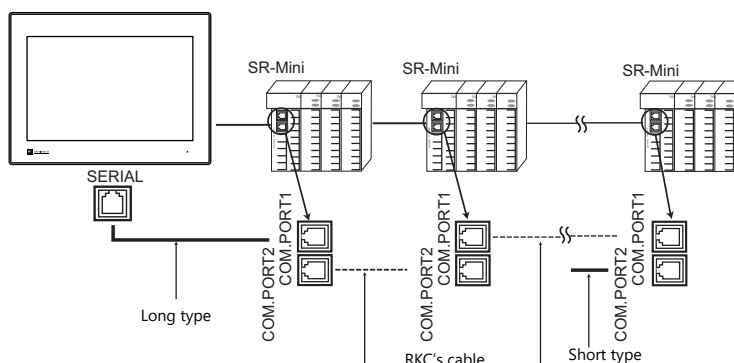


Long type

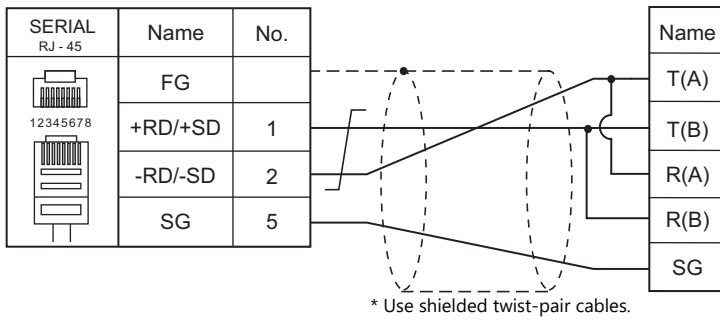
Short type



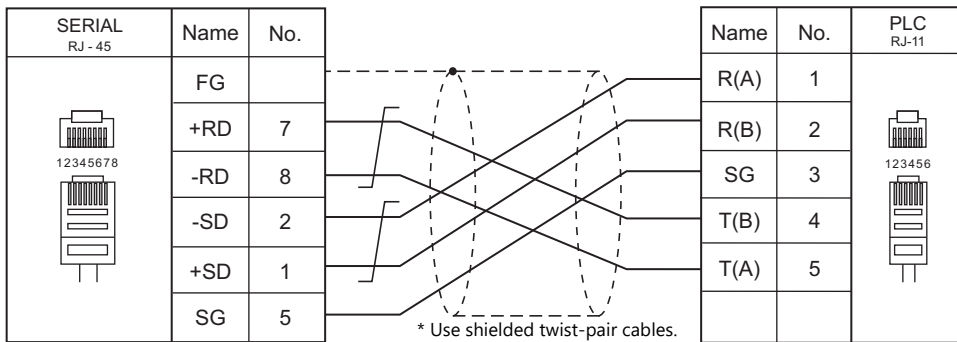
Use a long-type cable for connection between the MJ at the X1 series unit and the controller, an RKC cable between controllers, and a short-type cable for the terminal controller.



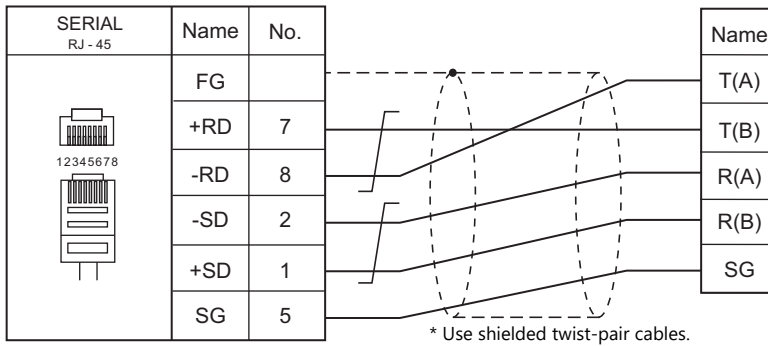
Wiring diagram 3 - M4



Wiring diagram 4 - M4



Wiring diagram 5 - M4



21. RS Automation

21.1 PLC Connection

21.2 Temperature Controller/Servo/Inverter Connection

21.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port	Signal Level	Connection		
					RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire) ^{*2}	
NX7/NX Plus Series (70P/700P/CCU+)	NX70 plus	NX70-CPU70p 1	COM port NX70-CCU+ (CCU)	RS-232C	Wiring diagram 1 - M2	×	
		NX70-CPU70p 2	COM1/COM2 NX70-CCU+ (CCU)				
	NX700 plus	NX-CPU700p	COM1/COM2 NX-CCU+ (CCU)	RS-485	Wiring diagram 1 - M4	×	
			COM1 NX7R-xxADx				RS-232C
	NX7	NX7-xxxDx NX7R-xxADx	COM1	RS-485	Wiring diagram 2 - M4	×	
				RS-232C	Wiring diagram 3 - M2	×	
			COM2	RS-485	Wiring diagram 3 - M4	×	
				RS-232C	Wiring diagram 1 - M2	×	
		NX7S-xxxDx	COM1	RS-232C	Wiring diagram 1 - M2	×	
			COM2	RS-485	Wiring diagram 3 - M4	×	
	N7/NX Series (70/700/750/CCU)	N70	CPL9211A	COM port	RS-232C	Wiring diagram 4 - M2	×
				RS-422	×	Wiring diagram 5 - M4	
				CPL9462 (CCU)	RS-232C	Wiring diagram 5 - M2	×
		N70α	CPL9210A	COM port	RS-232C	Wiring diagram 6 - M2	×
CPL9462 (CCU)				RS-232C	Wiring diagram 5 - M2	×	
N700		CPL7210A CPL7211A	COM port	RS-232C	Wiring diagram 4 - M2	×	
			RS-422	×	Wiring diagram 5 - M4		
			CPL7462 (CCU)	RS-232C	Wiring diagram 5 - M2	×	
N700α		CPL6210A CPL6210B	TOOL port	RS-232C	Wiring diagram 5 - M2	×	
			COM port	RS-232C	Wiring diagram 7 - M2	×	
			CPL7462 (CCU)	RS-232C	Wiring diagram 5 - M2	×	
N7000		CPL5221B CPL5231	COM port	RS-232C	Wiring diagram 4 - M2	×	
			RS-422	×	Wiring diagram 5 - M4		
			CPL5462 (CCU)	RS-232C	Wiring diagram 5 - M2	×	
N7000α		CPL4210 CPL4211	COM1	RS-422	×	Wiring diagram 5 - M4	
			COM2	RS-232C	Wiring diagram 7 - M2	×	
			CPL5462 (CCU)	RS-232C	Wiring diagram 5 - M2	×	
NX70		NX70-CPU70	TOOL port	RS-232C	Wiring diagram 1 - M2	×	
			NX70-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×	
		NX70-CPU750	TOOL port	RS-232C	Wiring diagram 1 - M2	×	
			COM port	RS-232C	Wiring diagram 8 - M2	×	
			NX70-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×	
			NX70-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×	
		NX700	NX-CPU750A NX-CPU750B NX-CPU750C NX-CPU750D	TOOL port	RS-232C	Wiring diagram 1 - M2	×
				COM port	RS-232C	Wiring diagram 8 - M2	×
NX-CPU700			NX-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×	
			TOOL port	RS-232C	Wiring diagram 1 - M2	×	
NX-CPU700		NX-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×		
	NX-CCU (CCU)	RS-232C	Wiring diagram 8 - M2	×			
X8 Series	X8-M16DDR X8-M14DDT X8-M32DDT	COM0/COM1	RS-232C	Wiring diagram 9 - M2	×		
			RS-485	Wiring diagram 4 - M4	×		

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

Ethernet Connection

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1
NX700 Series (Ethernet)	NX-CPU750A NX-CPU750B NX-CPU750C NX-CPU750D	NX-Ethernet	○	○	As desired *2	○
X8 Series (Ethernet)	X8-M16DDR X8-M14DDT X8-M32DDT	CPU with built-in Ethernet	○	×	50000 (fixed) (Max. 16 units)	

*1 For KeepAlive functions, see "1.3.2 Ethernet Communication".

*2 Eight connection settings are provided on the PLC; each for one X1 unit. Therefore, a maximum of eight X1 units can be connected to an Ethernet unit.

21.1.1 NX7/NX Plus Series (70P/700P/CCU+)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1:1</u> / 1:n	
Signal Level	<u>RS-232C</u> / RS-422/485	For RS-485 connection, set the transmission delay time to 3 msec or longer.
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 115K bps	57600 bps and 115K bps supported by NX7R only
Data Length	8 bits	
Stop Bit	1 bit	
Parity	None	
Target Port No.	<u>0</u> to 223, 255	

PLC

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


System Information

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

Setting Item	Setting	Remarks
CPU ID	0 to 223, 255	

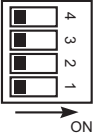
NX70-CPU70p1 (COM Port)

DIP switches

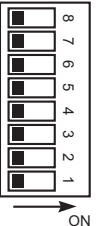
DIPSW		Contents	Setting		
	SW1	Terminating resistance (for RS-485 connection)	SW1	SW2	Terminating Resistance
	SW2		OFF	OFF	Invalid
			ON	ON	Valid
	SW3	Program write target	ON: EEPROM OFF: RAM		
	SW4	RS-232C / RS-485 selection	ON: RS-485 OFF: RS-232C		
	SW5	Baud rate selection	SW5	SW6	Baud rate
	OFF	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

NX70-CPU70p2 (COM Port) / NX-CPU700p (COM Port)

DIP switches 1

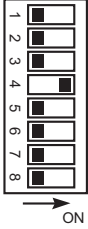
DIPSW1		Contents	Setting		
	SW1	COM1 terminating resistance (for RS-485 connection)	SW1	SW2	Terminating Resistance
	SW2		OFF	OFF	Invalid
			ON	ON	Valid
	SW3	COM2 terminating resistance (for RS-485 connection)	SW3	SW4	Terminating Resistance
SW4	OFF		OFF	Invalid	
		ON	ON	Valid	

DIP switches 2

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


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

DIP switches

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

NX7-xxxDx/NX7R-xxADx/NX7S-xxxDx

DIP switches

DIPSW	Contents		Setting
	SW1	RS-232C / RS-485 selection	ON: RS-485 OFF: RS-232C
	SW2	Terminating resistance (with RS-485 selected)	ON: Valid OFF: Invalid

Baud rate setting

The baud rate depends on the value specified for device memory SR509 or SR510.

COM	Baud Rate	Setting	Remarks
COM1 = SR509 COM2 = SR510	Auto setting:	0000 H	
	4800 bps	8003 H	
	9600 bps	8000 H	
	19200 bps	8001 H	
	38400 bps	8002 H	
	57600 bps	8004 H	Supported by NX7R only
	115K bps	8005 H	Supported by NX7R only

Available Device Memory

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

Device Memory	TYPE	Remarks
R (input/output)	00H	
L (link relay)	01H	
M (internal relay)	02H	
K (keep relay)	03H	
F (special relay)	04H	
W (word register)	05H	
TC (timer, counter)	06H	
SV (timer/set value)	07H	
PV (timer/current value)	08H	
SR (special register)	09H	
D (word register)	0AH	

21.1.2 N7/NX Series (70/700/750/CCU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> :1 / 1:n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Parity	None / <u>Odd</u> / Even	
Target Port No.	0 to 31	Only port No. 31 is valid, depending on the CPU model. For connection with a CCU module, select port No. 1.
Header	% (<u>Header</u>) / < (Extension Header)	Models on which "< (Expansion Header)" is available: NX-CPU750A / NX-CPU750B / NX-CPU750C / NX-CPU750D / NX70-CPU750
Monitor Registration	Unchecked / <u>Checked</u>	One X1 unit can be registered as a monitor for one PLC.

PLC

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

Available Device Memory

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

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

21.1.3 X8 Series

Communication Setting

Editor

Communication setting

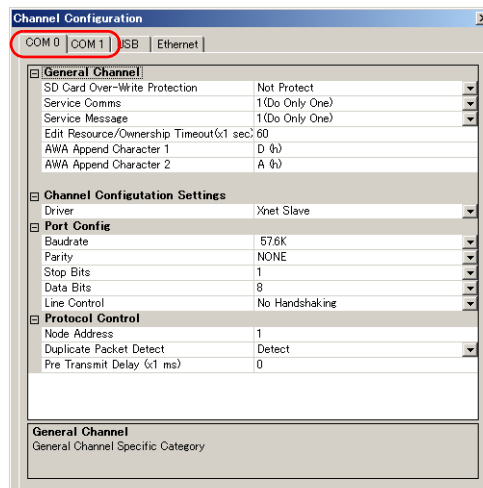
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1</u> : 1 / 1 : n	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / <u>115K</u> bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Even	
Target Port No.	0 to 249	

PLC

Make communication settings using the PLC software "XGPC" (version 1.0 or greater). For more information, refer to the PLC manual issued by the manufacturer.

Channel Configuration



Setting Item	Setting	Remarks
Driver	Xnet Slave	
Baudrate	4.8K / 9.6K / 19.2K / 38.4K / 57.6K / 115.2K	
Parity	NONE / EVEN	
Stop bits	1 / 2	
Data bits	8	
Line Control	No Handshaking / No Handshaking (RS485 Network)	RS-232C connection: No Handshaking RS-485 connection: No Handshaking (RS485 Network)
Node Address	0 to 249	

Available Device Memory

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

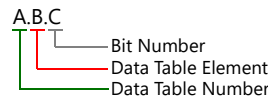
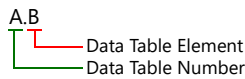
Device Memory	TYPE	Remarks
N (Integer)	00H	
X (Input)	01H	
Y (Output)	02H	
SR (System Registers)	03H	
B (Binary)	04H	
F (Floating Point)	05H	Real number. Bit designation is not possible.
L (Long)	06H	Double-word
A (ASCII)	07H	
ST (String)	08H	STRING type, *1
TM (Timer)	09H	
CT (Counter)	0AH	
CR (Control)	0BH	

*1 Set to use STRING type.
 e.g.: [Character Display] part
 Check the [Use STRING Type] checkbox in the [Detail] menu.

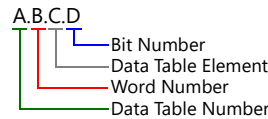
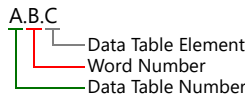
Address denotations

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

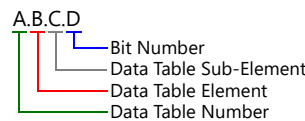
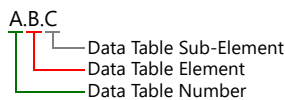
- Integer, System Registers, Binary, Floating Point, Long, ASCII, or String addresses
 Word designation Bit designation



- Input, Output addresses
 Word designation Bit designation



- Timer, Counter, or Control addresses
 Word designation Bit designation



Mnemonics can be used to specify Timer, Counter, or Control addresses.

The following shows the representation using mnemonics:

On PLC	On V-SFT
TimeBase0	TB0
TimeBase1	TB1
Done	DN
TimerTiming	TT
Enable	EN
Underflow	UF
Overflow	OF
CountDown	CD
CountUp	CU
Found	FD
Inhibit	IH

On PLC	On V-SFT
Unload	UL
Error	ER
Empty	EM
EnableUnload	EU
Preset(Low)	PRE(L)
Preset(High)	PRE(H)
Accumulator(Low)	ACC(L)
Accumulator(High)	ACC(H)
Length	LEN
Position	POS

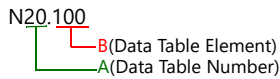
- Mnemonics can be used for bit designation on condition that Data Table Sub-Element = 0.
 Example: TM9.0.0.8 → TM9.0.0.TB0
- Mnemonics can be used for device memory address designation on condition that Data Table Sub-Element = 1 to 4.
 Example: TM9.0.1 → TM9.0.PRE(L)

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

Indirect Device Memory Designation

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

- Device memory other than Timer, Counter, and Control
 Example: Indirect device memory designation of "N20.100"



Converting A to binary
 20(DEC) = 10100(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	1	0	1	0	0

X is indicated under bits 04-07, Y is indicated under bits 02-03.

Converting B to binary
 100(DEC) = 1100100(BIN)

11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	1	1	0	0	1	0	0

Z is indicated under bits 05-07.

Arranging the values X, Y and Z in the following order

n + 1 (lower address number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	1	0	1	0	0	0	0	0	1	1	0	0	1	0	0

Y is indicated under bits 02-03, Z is indicated under bits 05-07.

n + 2 (higher address number)

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

0 fixed is indicated under bits 00-07, X is indicated under bits 08-11.

0000100100000010 (BIN) = 4064 (HEX): Lower address number
 0000000000000001 (BIN) = 1 (HEX): Higher address number

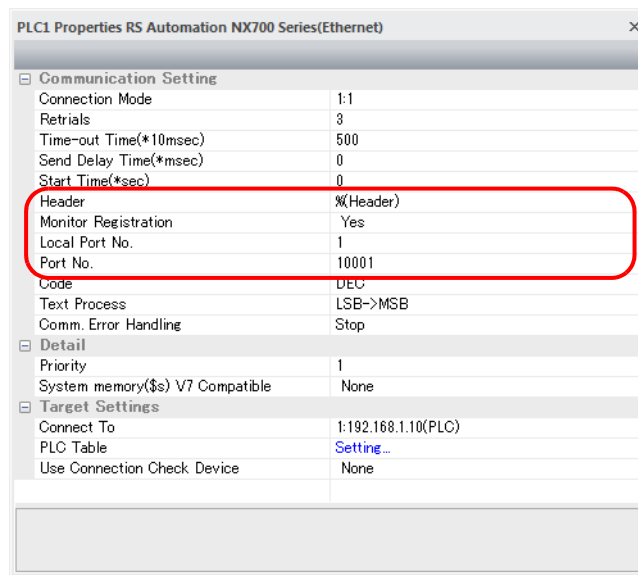
21.1.4 NX700 Series (Ethernet)

Communication Setting

Editor

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

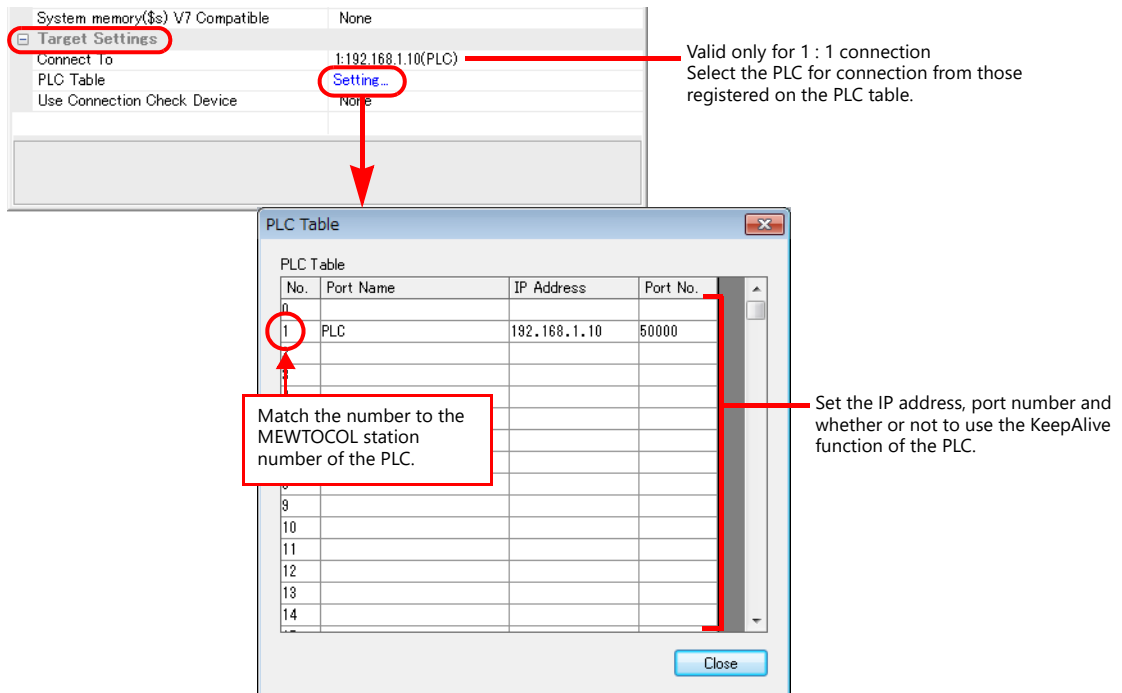
- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- Others
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



Item	Contents
Header	Select a format of communication with the PLC. % (Header) / < (Extension Header)
Monitor Registration	Select [Yes] in the case where a monitor registration command is used for communication with the PLC. * One X1 unit can be registered as a monitor for one PLC. Do not select [Yes] for multiple X1 units in n : 1 connection.
Local Port No.	Set the local port number of the X1 unit (1 to 31). Set the same number as the one set for "Target node MEWTOCOL station number" on the [Connection Setting] dialog of the PLC.

* For settings other than the above, see "1.4 Hardware Settings".

- IP address and port number of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].
Set the same PLC table number as the one set for "MEWTOCOL Station Number" ([Initial Information Setting] → [Local Node Setting]).



PLC

Make mode settings using the Ethernet unit "NX-Ethernet".

Mode setting switch

Switch	Setting	Contents	Remarks
2	ON	Auto connection function	

Make the PLC setting using the configuration tool "Configurator ET". For more information, refer to the PLC manual issued by the manufacturer.

Initial information setting

Item	Setting	
Local Node Setting	IP Address	Set the IP address of the PLC.
	MEWTOCOL Station Number	1 to 64 * The same number must be specified for the PLC table number of the X1.

Connection setting

Item	Setting	
Connection 1 to 8 * Select a port to which the X1 is connected.	Communication Mode	TCP/IP, UDP/IP
	Open Type	Unpassive
	Usage	MEWTOCOL communication
	Local Node (PLC) Port Number	As desired
	Target Node IP Address	IP address of the X1
	Target Node Port Number	Port number of the X1
	Target Node MEWTOCOL Station Number	1 to 64 * Match the number to the one set for [Local Port No.] under [Communication Setting] on the X1.
	Connection Setting	Valid

Available Device Memory

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

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

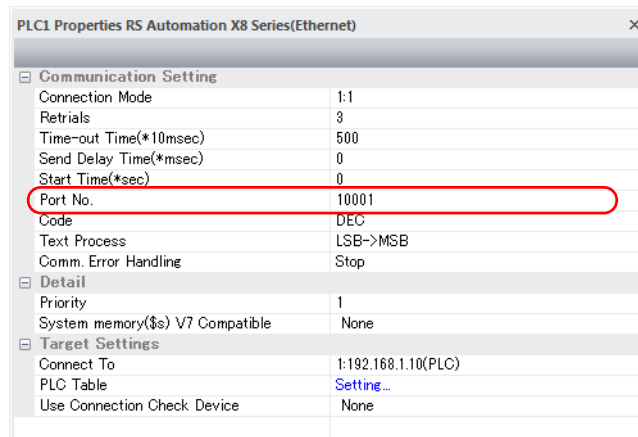
21.1.5 X8 Series (Ethernet)

Communication Setting

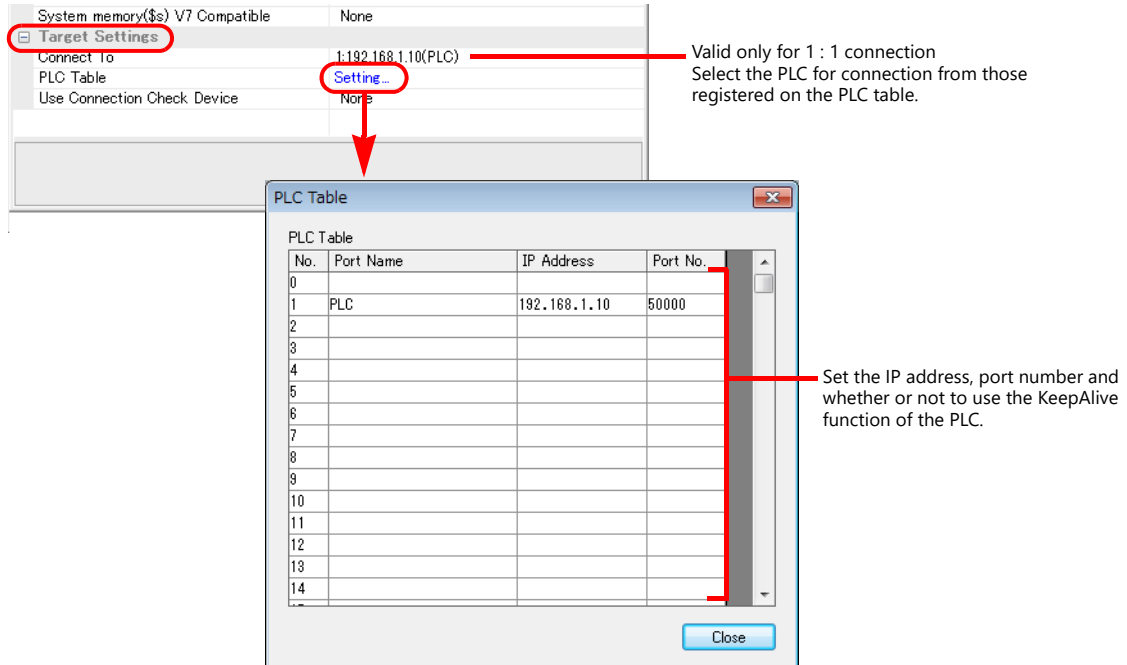
Editor

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

- IP address for the X1 series unit
Set the IP address using System Configurator. For details, see "IP Address Setting of the X1 Series Unit".
- Port number for the X1 series unit (for communication with PLC)
[System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]



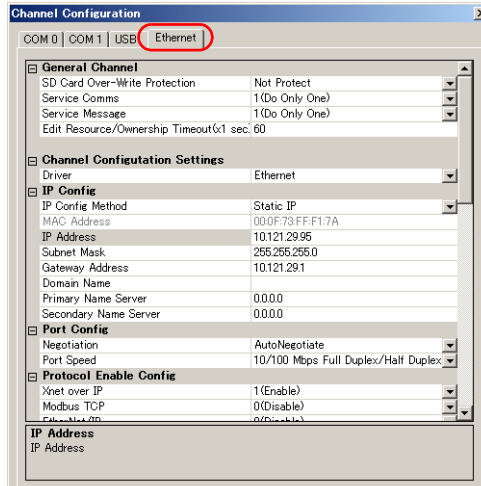
- IP address and port number (No. 50000) of the PLC
Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

Set a station number for the PLC using the PLC software "XGPC" (version 1.0 or greater). For more information, refer to the PLC manual issued by the manufacturer.

Channel Configuration



Setting Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway Address	Set according to the environment.	

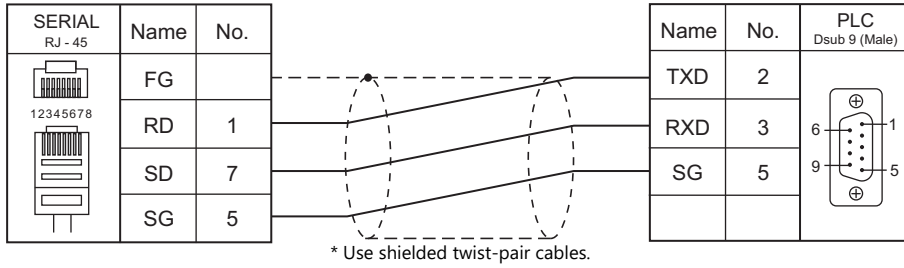
Available Device Memory

The contents of "Available Device Memory" are the same as those described in "21.1.3 X8 Series".

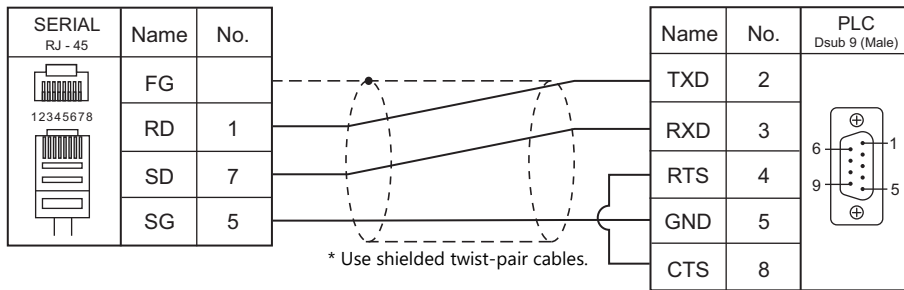
21.1.6 Wiring Diagrams

RS-232C

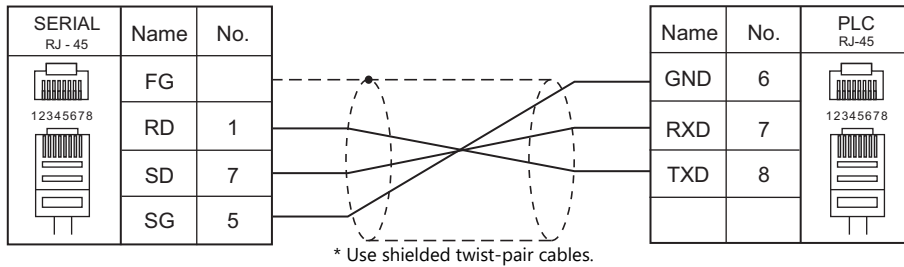
Wiring diagram 1 - M2



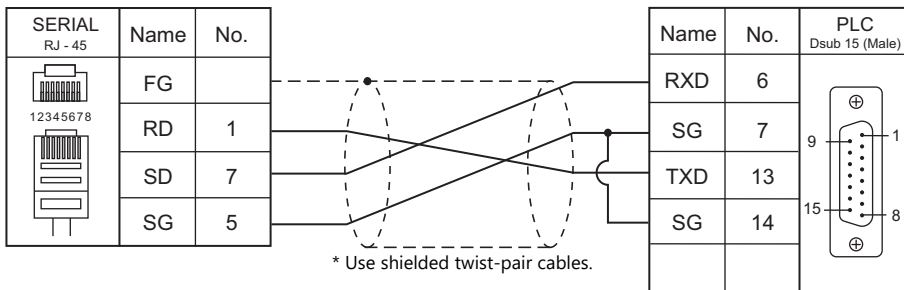
Wiring diagram 2 - M2



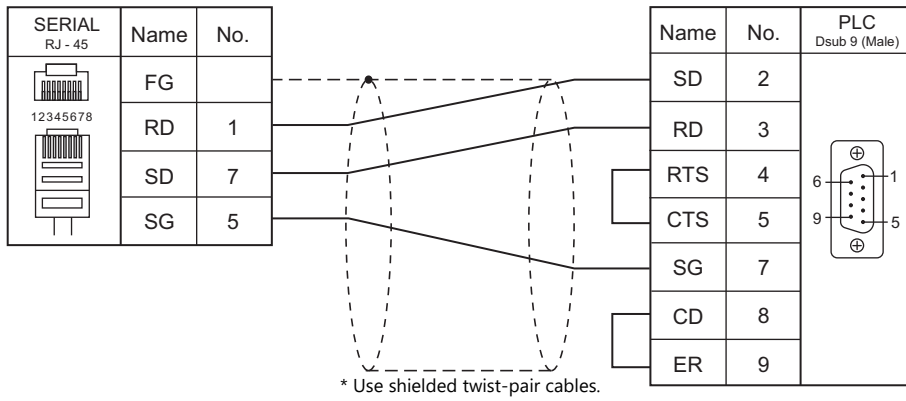
Wiring diagram 3 - M2



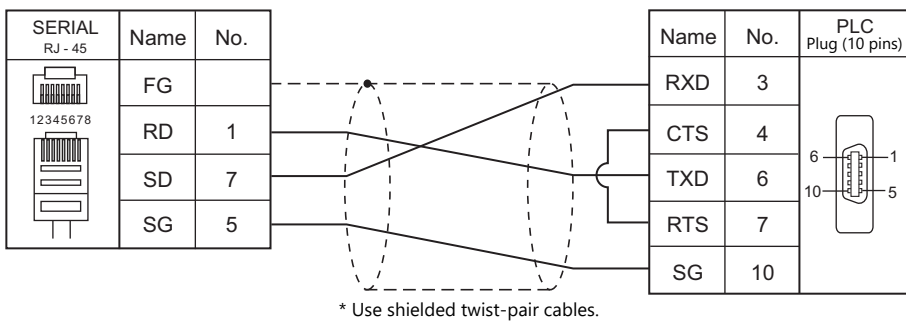
Wiring diagram 4 - M2



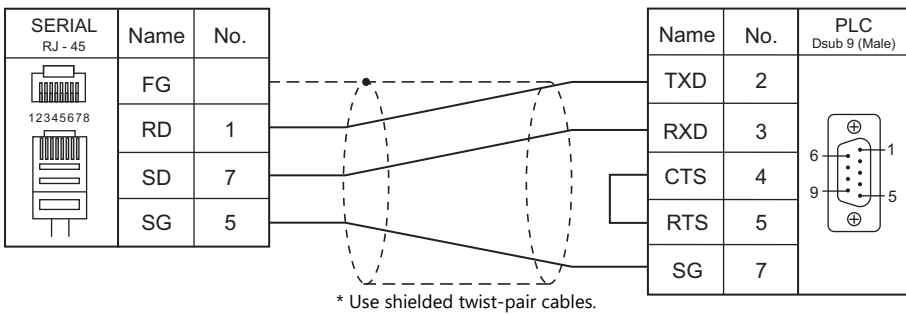
Wiring diagram 5 - M2



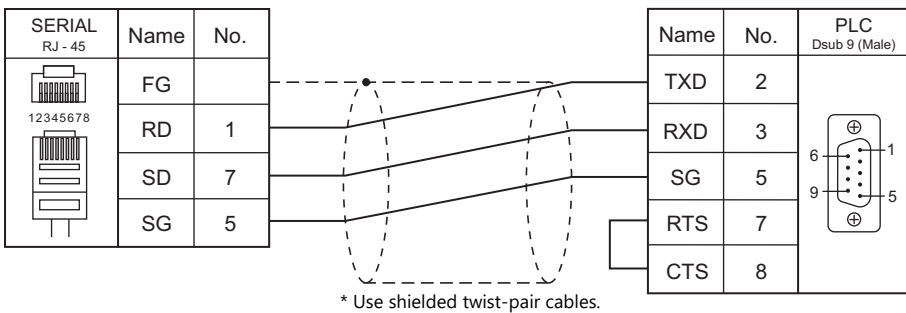
Wiring diagram 6 - M2



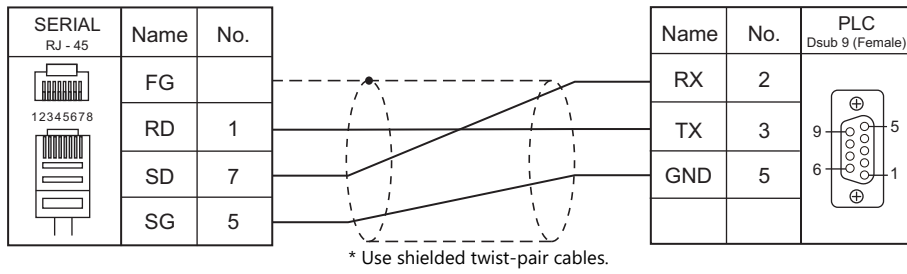
Wiring diagram 7 - M2



Wiring diagram 8 - M2

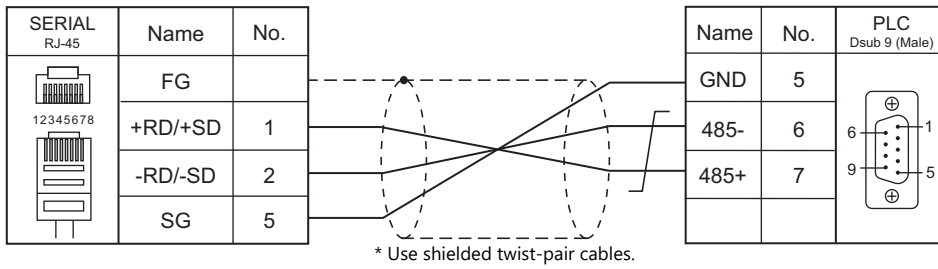


Wiring diagram 9 - M2

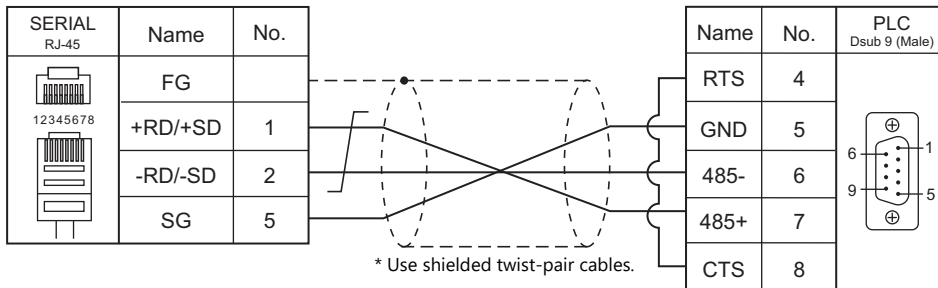


RS-422/RS-485

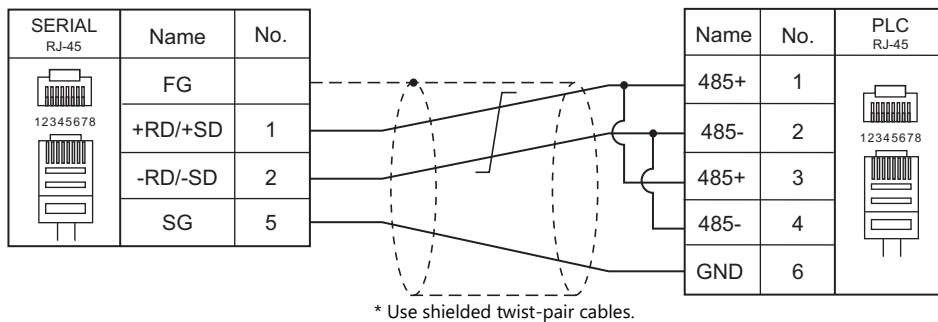
Wiring diagram 1 - M4



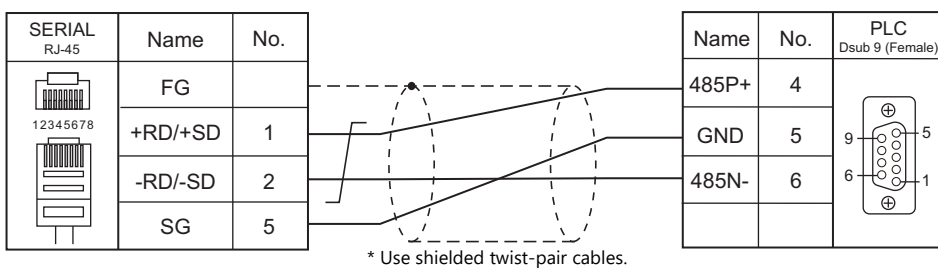
Wiring diagram 2 - M4



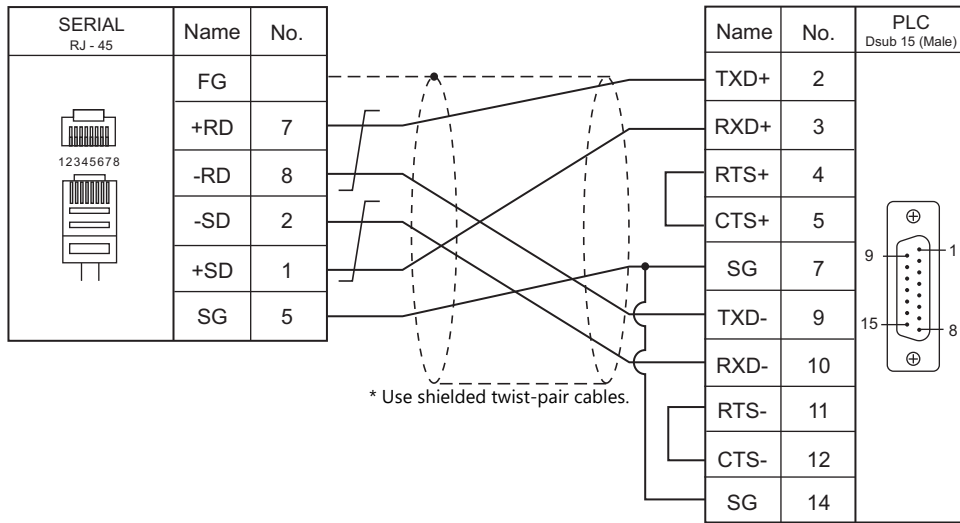
Wiring diagram 3 - M4



Wiring diagram 4 - M4



Wiring diagram 5 - M4



21.2 Temperature Controller/Servo/Inverter Connection

Servo

PLC Selection on the Editor	Model	Unit/Port	Signal Level	Connection		Lst File
				RS-232C ^{*1} / RS-485 (2-wire) ^{*2}	RS-422 (4-wire)	
CSD5 (MODBUS RTU)	CSD5_A5BX1 CSD5_01BX1 CSD5_02BX1 CSD5_04BX1	Communication Port	RS-232C	Wiring diagram 1 - M2	×	RSA_CSD5.lst
			RS-485	Wiring diagram 1 - M4	×	
Moscon-F50 (MODBUS RTU)	SI-20P2F50 SI-20P4F50 SI-20P7F50 SI-21P5F50 SI-22P2F50 SI-23P7F50 SI-B0P4F50 SI-B0P7F50 SI-B1P5F50 SI-B2P2F50 SI-40P4F50 SI-40P7F50 SI-41P5F50 SI-42P2F50 SI-43P7F50	Communication Port	RS-485	Wiring diagram 2 - M4	×	RSA_Moscon-F50.lst

*1 Select RS-232C in the screen program or in Local mode on the X1 series unit. For details, see "1.2.1 SERIAL" (page 1-4).

*2 Select RS-422/485 in the screen program or in Local mode on the X1 series unit. For details, refer to "1.2.1 SERIAL" (page 1-4).

21.2.1 CSD5 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1: 1 / <u>1:n</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	9600 / 19200 / 38400 / <u>57600</u> bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1</u> / 2 bits	
Parity	<u>None</u> / Odd / Even	
Target Port No.	<u>1</u> to 247	0: Broadcast

Servo

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

(Underlined setting: default)

Parameter	Indication	Setting	Remarks
Station number	Ft-0.07	1 to 247	
Baud rate	Ft-0.09	0: 9600 2: 19200 3: 38400 <u>5: 57600</u>	Set with right-most digit of parameter.
Data length / Parity / Stop bit	Ft-0.09	<u>0: data length 8 bits, without parity, stop bit 1</u> 1: data length 8 bits, even parity, stop bit 1 2: data length 8 bits, odd parity, stop bit 1 3: data length 8 bits, without parity, stop bit 2 4: data length 8 bits, even parity, stop bit 2 5: data length 8 bits, odd parity, stop bit 2	Set with 2nd digit from right of parameter.
Protocol	Ft-0.09	<u>0: RSA-ASCII</u> 1: MODBUS-RTU	Set with 3rd digit from right of parameter. Always set to 1: Modbus-RTU.
Signal level	Ft-0.09	<u>0: RS232</u> 1: RS485	Set with 4th digit from right of parameter.

Available Device Memory

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

Device Memory	TYPE	Remarks
4 (holding register)	02H	9999: write only
3 (input register)	03H	Read only

21.2.2 Moscon-F50 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	<u>RS-422/485</u>	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
Data Length	<u>8 bits</u>	
Stop Bit	<u>1 bit</u>	
Parity	<u>Unselected</u>	
Target Port No.	<u>1</u> to 247	0: Broadcast

AC Drive

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

(Underlined setting: default)

Parameter	Indication	Setting	Remarks
Station number	b0.08	1 to 247	
Baud rate	b0.09	1: 4800 <u>2: 9600</u> 3: 19200 4: 38400	

The following settings are fixed; signal level: RS-422/485, data length: 8 bits, stop bit: 1 bit, and parity: none.

Available Device Memory

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

Device Memory	TYPE	Remarks
U (U-variable (Monitoring))	00H	
B (B-variable (Basic Setup))	01H	
F (F-variable (Frequency Control))	02H	
S (S-variable (System Adjustment))	03H	
C (C-variable (H/W Functionality))	04H	
H (H-variable (I/O Control))	05H	
P (P-variable (Protective Function))	06H	
HE (error status (hardware))	07H	Read only
SE (error status (software))	08H	Read only
DS (operation status)	09H	

Indirect Device Memory Designation

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

* When specifying device types 00H to 06H, input the address number without decimal points.
Example: For an address of U1.01, enter "101" in n + 1.

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

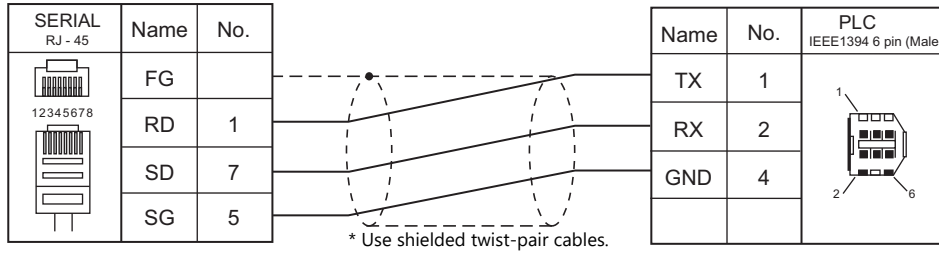
Contents	F0	F1 (= \$u n)		F2
Frequency command	1 to 8 (PLC1 to 8)	n	Station number: 0000 to 00F7 (H) *1	3
		n + 1	Command: 0000 (H)	
		n + 2	Frequency	
Reset command	1 to 8 (PLC1 to 8)	n	Station number: 0000 to 00F7 (H) *1	2
		n + 1	Command: 0001 (H)	

*1 Select station No. 0 for broadcast commands.

21.2.3 Wiring Diagrams

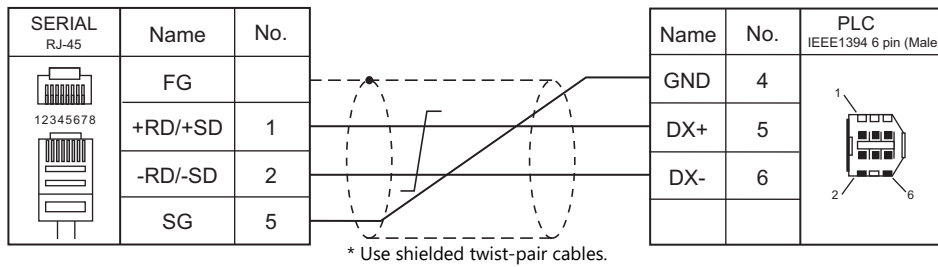
RS-232C

Wiring diagram 1 - M2

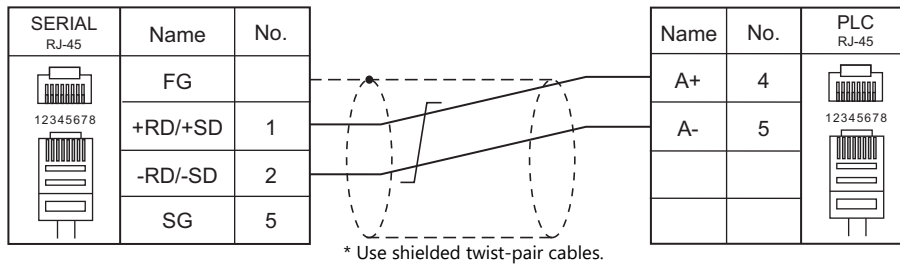


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



Connection Compatibility List

June, 2022

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
A&D	AD4402 (MODBUS RTU)	○	○
	AD4404 (MODBUS RTU)	○	○
Agilent	4263 series	○	
Allen-Bradley	PLC-5	○	○
	PLC-5 (Ethernet)	○	○
	Control Logix / Compact Logix	○	
	Control Logix / Compact Logix Tag	○	
	Control Logix / Compact Logix (Ethernet)	○	○
	Control Logix / Compact Logix Tag (Ethernet TCP/IP)	○	○
	SLC500	○	○
	SLC500 (Ethernet TCP/IP)	○	○
	NET-ENI (SLC500 Ethernet TCP/IP)	○	○
	NET-ENI (MicroLogix Ethernet TCP/IP)	○	○
	Micro Logix	○	○
	Micro Logix (Ethernet TCP/IP)	○	○
	Micro800 Controllers	○	
	Micro800 Controllers Tag	○	
Micro800 Controllers (Ethernet TCP/IP)	○	○	
Micro800 Controllers Tag (Ethernet TCP/IP)	○	○	
Automationdirect	Direct LOGIC (K-Sequence)	○	
	Direct LOGIC (Ethernet UDP/IP)	○	○
	Direct LOGIC (MODBUS RTU)	○	○
Azbil	MX series	○	○
	SDC10	○	○
	SDC15	○	○
	SDC20	○	○
	SDC21	○	○
	SDC25/26	○	○
	SDC30/31	○	○
	SDC35/36	○	○
	SDC45/46	○	○
	SDC40A	○	○
	SDC40G	○	○
	DMC10	○	○
	DMC50(COM)	○	○
	AHC2001	○	○
	AHC2001+DCP31/32	○	○
	DCP31/32	○	○
	NX(CPL)	○	○
NX(CPL) (Ethernet TCP/IP)	○	○	
NX(MODBUS RTU)	○	○	
NX(MODBUS TCP/IP)	○	○	
Banner	PresencePLUS (Ethernet/IP (TCP/IP))	○	○
Baumuller	BMx-x-PLC	○	
BECKHOFF	ADS protocol (Ethernet)	○	○
	Tag ADS protocol (Ethernet)	○	○
Bosch Rexroth	IndraDrive		○
CHINO	LT400 Series (MODBUS RTU)	○	○
	DP1000	○	○
	DB100B (MODBUS RTU)	○	○
	KR2000 (MODBUS RTU)	○	○
	LT230 (MODBUS RTU)	○	○
	LT300 (MODBUS RTU)	○	○
LT830 (MODBUS RTU)	○	○	
CIMON	BP series	○	
	CP series	○	
	XP series	○	
	S series	○	○
	S series (Ethernet)	○	○
	CP3E	○	

Manufacturer	Models	Applicable Connection Mode		
		1 : 1	1 : n Multi-drop	
DELTA	DVP series	○	○	
	DVP-SE (MODBUS ASCII)	○	○	
	DVP-SE (MODBUS TCP/IP)	○	○	
DELTA TAU DATA SYSTEMS	PMAC	○		
	PMAC(Ethernet TCP/IP)	○	○	
EATON Cutler-Hammer	ELC	○	○	
EMERSON	EC10/20/20H (MODBUS RTU)	○	○	
FANUC	Power Mate	○		
FATEK AUTOMATION	FACON FB Series	○	○	
	FACON FBs Series (Ethernet)	○	○	
FESTO	FEC	○		
FUFENG	APC Series Controller	○	○	
Fuji Electric	MICREX-F series	○	○	
	MICREX-F series V4-compatible	○	○	
	SPB (N mode) & FLEX-PC series	○	○	
	SPB (N mode) & FLEX-PC CPU	○		
	MICREX-SX SPH/SPB/SPM/SPE/SPF series	○		
	MICREX-SX SPH/SPB/SPM/SPE/SPF CPU	○		
	MICREX-SX (Ethernet)	○	○	
	PYX (MODBUS RTU)	○	○	
	PXR (MODBUS RTU)	○	○	
	PXF (MODBUS RTU)	○	○	
	PXH (MODBUS RTU)	○	○	
	PXH (MODBUS RTU)	○	○	
	PUM (MODBUS RTU)	○	○	
	F-MPC04P (loader)	○	○	
	F-MPC series / FePSU	○	○	
	FVR-E11S	○	○	
	FVR-E11S (MODBUS RTU)	○	○	
	FVR-C11S (MODBUS RTU)	○	○	
	FRENIC5000 G11S/P11S	○	○	
	FRENIC5000 G11S/P11S (MODBUS RTU)	○	○	
	FRENIC5000 VG7S (MODBUS RTU)	○	○	
	FRENIC-Ace (MODBUS RTU)	○	○	
	FRENIC-HVAC/AQUA (MODBUS RTU)	○	○	
	FRENIC-Mini (MODBUS RTU)	○	○	
	FRENIC-Eco (MODBUS RTU)	○	○	
	FRENIC-Multi (MODBUS RTU)	○	○	
	FRENIC-MEGA (MODBUS RTU)	○	○	
	FRENIC-MEGA SERVO(MODBUS RTU)	○	○	
	FRENIC-VG1(MODBUS RTU)	○	○	
	FRENIC series (loader)	○	○	
	HFR-C9K	○	○	
	HFR-C11K	○	○	
	HFR-K1K	○	○	
	PPMC (MODBUS RTU)	○	○	
	FALDIC-α series	○	○	
	FALDIC-W series	○	○	
	PH series	○	○	
	PHR (MODBUS RTU)	○	○	
	WA5000	○	○	
	APR-N (MODBUS RTU)	○	○	
	ALPHA5 (MODBUS RTU)	○	○	
	ALPHA5 Smart (MODBUS RTU)	○	○	
	ALPHA7 (MODBUS RTU)	○	○	
	WE1MA (Ver. A)(MODBUS RTU)	○	○	
	WE1MA (Ver. B)(MODBUS RTU)	○	○	
	WSZ series	○	○	
	WSZ series (Ethernet)	○	○	
	Gammaflux	TTC2100	○	○
		G24 (Ethernet TCP/IP)	○	○
	GE Fanuc	90 series	○	○
		90 series (SNP-X)	○	
		90 series (SNP)	○	○
		90 series (Ethernet TCP/IP)	○	○
		RX3i (Ethernet TCP/IP)	○	○

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
High-Pressure Gas Industry	R-BLT	○	
Hitachi	HIDIC-S10/2α, S10mini	○	
	HIDIC-S10/2α, S10mini (Ethernet)	○	○
	HIDIC-S10/4α	○	
	HIDIC-S10/ABS	○	○
	HIDIC-S10V	○	
	HIDIC-S10V (Ethernet)	○	○
Hitachi Industrial Equipment Systems	HIDIC-H	○	○
	HIDIC-H (Ethernet)	○	○
	HIDIC-EHV	○	○
	HIDIC-EHV (Ethernet)	○	○
	SJ300 series	○	○
	SJ700 series	○	○
	SJ series P1 (MODBUS RTU)	○	○
HYUNDAI	Hi5 Robot (MODBUS RTU)	○	○
	Hi4 Robot (MODBUS RTU)	○	○
IAI	X-SEL controller	○	○
	ROBO CYLINDER (RCP2/ERC)	○	○
	ROBO CYLINDER (RCS/E-CON)	○	○
	PCON/ACON/SCON (MODBUS RTU)	○	○
IDEC	MICRO 3	○	○
	MICRO Smart	○	○
	MICRO Smart pentra	○	○
	MICRO Smart (Ethernet TCP/IP)	○	○
JTEKT	TOYOPUC	○	○
	TOYOPUC (Ethernet)	○	○
	TOYOPUC (Ethernet PC10 mode)	○	○
	TOYOPUC-Plus	○	○
	TOYOPUC-Plus (Ethernet)	○	○
	TOYOPUC-Nano (Ethernet)	○	○
KEYENCE	KZ Series Link	○	○
	KZ/KV series CPU	○	
	KZ24/300 CPU	○	
	KV10/24 CPU	○	
	KV-700	○	
	KV-700 (Ethernet TCP/IP)	○	○
	KV-1000	○	
	KV-1000 (Ethernet TCP/IP)	○	○
	KV-3000/5000	○	
	KV-3000/5000 (Ethernet TCP/IP)	○	○
	KV-7000/8000 (Ethernet TCP/IP)	○	○
	KV Nano	○	
	KV Nano (Ethernet TCP/IP)	○	○
DL-RS1A (SK-1000)	○		
KOGANEI	IBFL-TC	○	○
KOYO ELECTRONICS	SU/SG	○	○
	SR-T (K protocol)	○	
	SU/SG (K-Sequence)	○	
	SU/SG (Modbus RTU)	○	○
Lenze	ServoDrive9400 (Ethernet TCP/IP)	○	○
LS	MASTER-KxxxS	○	
	MASTER-KxxxS CNET	○	○
	MASTER-K series (Ethernet)	○	○
	GLOFA CNET	○	○
	GLOFA GM7 CNET	○	○
	GLOFA GM series CPU	○	
	GLOFA GM series (Ethernet UDP/IP)	○	○
	XGT/XGK series CNET	○	○
	XGT/XGK series CPU	○	
	XGT/XGK series (Ethernet)	○	○
	XGT/XGI series CNET	○	○
	XGT/XGI series CPU	○	
	XGT/XGI series (Ethernet)	○	○

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
MITSUBISHI ELECTRIC	A series link	○	○
	QnA series link	○	○
	QnA series (Ethernet)	○	○
	QnH (Q) series link	○	○
	QnH (Q) series CPU	○	
	QnU series CPU	○	
	Q00J/00/01CPU	○	
	QnH (Q) series (Ethernet)	○	○
	QnH (Q) series link (Multi CPU)	○	○
	QnH (Q) series (Multi CPU) (Ethernet)	○	○
	QnH (Q) series CPU (Multi CPU)	○	
	QnH (Q) series (Ethernet ASCII)	○	○
	QnH (Q) series (Multi CPU) (Ethernet ASCII)	○	○
	QnU series (Built-in Ethernet)	○	○
	QnU series (Multi CPU) (Built-in Ethernet)	○	○
	QnU series (Built-in Ethernet ASCII)	○	○
	L series link	○	○
	L series (Built-in Ethernet)	○	○
	L series CPU	○	
	FX series CPU	○	
	FX2N/1N series CPU	○	
	FX1S series CPU	○	
	FX series link (A protocol)	○	○
	FX-3U/3UC/3G series CPU	○	
	FX-3U/3GE series (Ethernet)	○	○
	FX3U/3UC/3UG series link(A protocol)	○	○
	FX-5U/5UC series	○	○
	FX-5U/5UC series (Ethernet)	○	○
	A-Link + Net10		○
	Q170MCP (Multi CPU)	○	
	Q170 series (Multi CPU) (Built-in Ethernet)	○	○
	Q170 series (Multi CPU) (Ethernet)	○	○
	iQ-R series (Built-in Ethernet)	○	○
	iQ-R series link	○	○
	iQ-R series (Ethernet)	○	○
	FR-*500	○	○
	FR-V500	○	○
	MR-J2S-*A	○	○
	MR-J2S-*CL	○	○
	MR-J3-*A	○	○
	MR-J3-*T	○	○
	MR-J4-*A	○	○
FR-E700	○	○	
MODICON	Modbus RTU	○	
MOELLER	PS4	○	
MOOG	J124-04x	○	○
M-SYSTEM	R1M series (MODBUS RTU)	○	○
NITTOKU	ITS-HRW110	○	○
OMRON	SYSMAC C	○	○
	SYSMAC CV	○	○
	SYSMAC CS1/CJ1/CJ2	○	○
	SYSMAC CS1/CJ1/CJ2 DNA	○	○
	SYSMAC CS1/CJ1/CJ2/CP series (Ethernet)	○	○
	SYSMAC CS1/CJ1/CJ2/CP series (Ethernet Auto)	○	○
	SYSMAC CS1/CJ1/CJ2/CP series DNA (Ethernet)	○	○
	NJ Series (EtherNet/IP)	○	○
	E5AK	○	○
	E5AK-T	○	○
	E5AN/E5EN/E5CN/E5GN	○	○
	E5AR/E5ER	○	○
	E5CC/E5EC/E5AC/E5DC/E5GC	○	○
	E5CK	○	○
	E5CK-T	○	○
	E5CN-HT	○	○
	E5EK	○	○
	E5ZD	○	○

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
OMRON	E5ZE	○	○
	E5ZN	○	○
	V600/620/680	○	○
	KM20	○	○
	KM100	○	○
	V680S (Ethernet TCP/IP)	○	○
	EJ1	○	○
Oriental Motor	High-efficiency AR series (MODBUS RTU)	○	○
	CRK series (MODBUS RTU)	○	○
Panasonic	FP Series (RS232C/422)	○	○
	FP Series (TCP/IP)	○	○
	FP Series (UDP/IP)	○	○
	FP-X (TCP/IP)	○	○
	FP7 Series (RS232C/422)	○	○
	FP7 Series (Ethernet)	○	○
	LP-400	○	○
	KW Series	○	○
	MINAS A4 series	○	○
	LP-RF series LP-RF series (Ethernet)	○	○
RKC	SR-Mini (MODBUS RTU)	○	○
	CB100/CB400/CB500/CB700/CB900 (MODBUS RTU)	○	○
	SR-Mini (Standard Protocol)	○	○
	REX-F400/F700/F900(Standard Protocol)	○	○
	REX-F9000 (Standard Protocol)	○	○
	SRV (MODBUS RTU)	○	○
	MA900/MA901 (MODBUS RTU)	○	○
	SRZ (MODBUS RTU)	○	○
RS Automation	FB100/FB400/FB900 (MODBUS RTU)	○	○
	NX7/NX Plus Series (70P/700P/CCU+)	○	○
	N7/NX Series (70/700/750/CCU)	○	○
	NX700 Series (Ethernet)	○	○
	X8 Series	○	○
	X8 Series (Ethernet)	○	○
	CSD5 (MODBUS RTU)	○	○
Moscon-F50 (MODBUS RTU)	○	○	
SAIA	PCD S-BUS (Ethernet)	○	○
SAMSUNG	SPC series	○	○
	N_plus	○	○
	SECNET	○	○
SANMEI	Cuty Axis	○	○
SanRex	DC AUTO (HKD type)	○	○
SHARP	JW series	○	○
	JW100/70H COM port	○	○
	JW20 COM port	○	○
	JW series (Ethernet)	○	○
	JW300 series	○	○
	JW311/312/321/322 series (Ethernet)	○	○
	JW331/332/341/342/352/362 series (Ethernet)	○	○
	DS-30D	○	○
DS-32D	○	○	
SHIMADEN	SHIMADEN standard protocol	○	○
SHINKO TECHNOS	C Series	○	○
	FC Series	○	○
	GC Series	○	○
	DCL-33A	○	○
	JCx-300 Series	○	○
	PC-900	○	○
	PCD-33A	○	○
	ACS-13A	○	○
	ACD/ACR Series	○	○
	WCL-13A	○	○
	PCA1 Series	○	○
	PCB1 Series	○	○
	JIR-301-M Series	○	○
BCx2 Series	○	○	

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
Siemens	S5 PG port	○	○
	S7	○	
	S7-200 (Ethernet ISOTCP)	○	○
	S7-300/400 (Ethernet ISOTCP)	○	○
	S7-300/400 (Ethernet TCP/IP PG protocol)	○	○
	S7-1200/1500 (Ethernet ISOTCP)	○	○
	S7-1200/1500 Tag (Ethernet ISOTCP)	○	○
	LOGO! (Ethernet ISOTCP)	○	○
	TI500/505	○	○
	TI500/505 V4-compatible	○	○
S120(Ethernet ISOTCP)	○	○	
SINFONIA TECHNOLOGY	SELMART	○	○
SUS	XA-A*	○	
TECO	TP-03 (MODBUS RTU)	○	○
3S-Smart Software Solutions	CODESYS V3 (Ethernet)	○	○
TOHO	TTM-000	○	○
	TTM-00BT	○	○
	TTM-200	○	○
Tokyo Chokoku Marking Products	MB3315/1010	○	
TOSHIBA	T series / V series (T compatible)	○	○
	T series / V series (T compatible) (Ethernet UDP/IP)	○	○
	EX series	○	○
	nv series (Ethernet UDP/IP)	○	○
	VF-S7	○	○
	VF-S9	○	○
	VF-S11	○	○
	VF-S15	○	○
	VF-A7	○	○
	VF-AS1	○	○
	VF-P7	○	○
	VF-PS1	○	○
	VF-FS1	○	○
	VF-MB1	○	○
	VF-nC1	○	○
VF-nC3	○	○	
TOSHIBA MACHINE	TC200	○	○
	VELCONIC series		○
TOYO DENKI	μGPCsx series	○	
	μGPCsx CPU	○	
	μGPCsx series (Ethernet)	○	○
TURCK	BL Series Distributed I/O (MODBUS TCP/IP)	○	○
Ultra Instruments	UICCPU (MODBUS RTU)	○	
ULVAC	G-TRAN series	○	○
UNIPULSE	F340A	○	○
	F371	○	○
	F800	○	○
	F805A	○	○
	F720A	○	○
UNITRONICS	M90/M91/Vision Series (ASCII)	○	○
	Vision Series (ASCII Ethernet TCP/IP)	○	○
VIGOR	M series	○	○
WAGO	750 series (MODBUS RTU)	○	○
	750 series (MODBUS ETHERNET)	○	○
XINJE	XC Series (MODBUS RTU)	○	○
YAMAHA	RCX142	○	
Yaskawa Electric	Memobus	○	○
	CP9200SH/MP900	○	○
	MP2000 series	○	○
	MP2300 (MODBUS TCP/IP)	○	○
	CP MP expansion memobus (UDP/IP)	○	○
	MP2000 series (UDP/IP)	○	○
	MP3000 Series	○	○
	MP3000 series (Ethernet UDP/IP)	○	○
	MP3000 series expansion memobus (Ethernet)	○	○
	DX200 (high-speed Ethernet)	○	○

Manufacturer	Models	Applicable Connection Mode	
		1 : 1	1 : n Multi-drop
Yokogawa Electric	FA-M3	<input type="radio"/>	<input type="radio"/>
	FA-M3R	<input type="radio"/>	<input type="radio"/>
	FA-M3/FA-M3R (Ethernet UDP/IP)	<input type="radio"/>	<input type="radio"/>
	FA-M3/FA-M3R (Ethernet UDP/IP ASCII)	<input type="radio"/>	<input type="radio"/>
	FA-M3/FA-M3R (Ethernet TCP/IP)	<input type="radio"/>	<input type="radio"/>
	FA-M3/FA-M3R (Ethernet TCP/IP ASCII)	<input type="radio"/>	<input type="radio"/>
	FA-M3V	<input type="radio"/>	<input type="radio"/>
	FA-M3V (Ethernet)	<input type="radio"/>	<input type="radio"/>
	FA-M3V(Ethernet ASCII)	<input type="radio"/>	<input type="radio"/>
	UT100	<input type="radio"/>	<input type="radio"/>
	UT750	<input type="radio"/>	<input type="radio"/>
	UT550	<input type="radio"/>	<input type="radio"/>
	UT520	<input type="radio"/>	<input type="radio"/>
	UT350	<input type="radio"/>	<input type="radio"/>
	UT320	<input type="radio"/>	<input type="radio"/>
	UT2400/2800	<input type="radio"/>	<input type="radio"/>
	UT450	<input type="radio"/>	<input type="radio"/>
	UT32A/35A (MODBUS RTU)	<input type="radio"/>	<input type="radio"/>
	UT52A/55A (MODBUS RTU)	<input type="radio"/>	<input type="radio"/>
UT75A (MODBUS RTU)	<input type="radio"/>	<input type="radio"/>	
μR10000/20000 (Ethernet TCP/IP)	<input type="radio"/>	<input type="radio"/>	
None	Universal serial	<input type="radio"/>	<input type="radio"/>
	General AE-LINK	<input type="radio"/>	<input type="radio"/>
	Without PLC Connection		
	MODBUS RTU	<input type="radio"/>	<input type="radio"/>
	MODBUS RTU EXT Format	<input type="radio"/>	<input type="radio"/>
	MODBUS TCP/IP (Ethernet)	<input type="radio"/>	<input type="radio"/>
	MODBUS TCP/IP (Ethernet) Sub Station	<input type="radio"/>	<input type="radio"/>
	MODBUS TCP/IP (Ethernet) EXT Format	<input type="radio"/>	<input type="radio"/>
	MODBUS ASCII	<input type="radio"/>	<input type="radio"/>
	RFID controller (Stepless protocol)	<input type="radio"/>	
OPC UA server TCP/IP (Ethernet)	<input type="radio"/>		

Slave Communication

Manufacturer	Models	Setting	Remarks
None	Universal serial	<input type="radio"/>	
	V-Link	<input type="radio"/>	
	Modbus slave (RTU)	<input type="radio"/>	
	Modbus slave (TCP/IP)	<input type="radio"/>	
	Modbus slave (ASCII)	<input type="radio"/>	

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