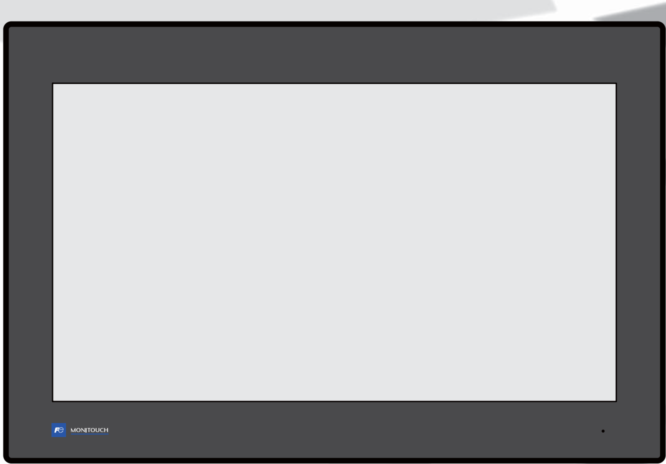
Fuji Electric

MONITOUCH

Connection Manual [1]

Contents



X1 Series

Record of Revisions

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

Printing Date	Reference No.	Revised Contents
January, 2021	2217NE0	First edition
November, 2021	2217NE1	Second edition
June, 2022	2217NE2	Third edition

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 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 Ibf-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 Ibf-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 to 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.

Contents

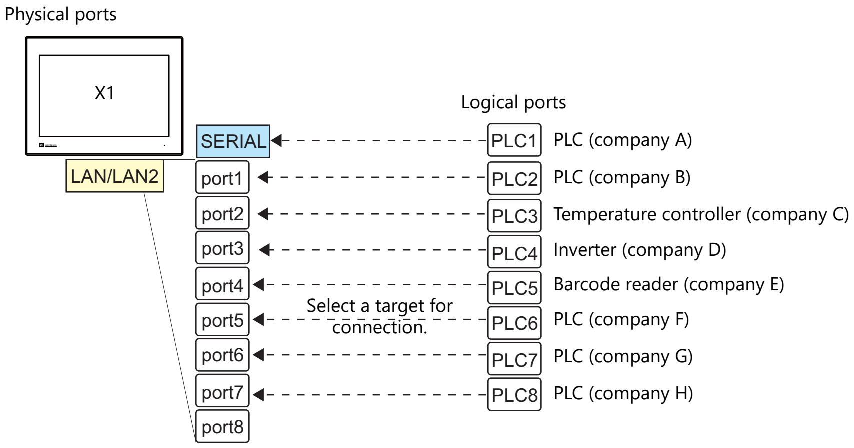
1. Overview

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.

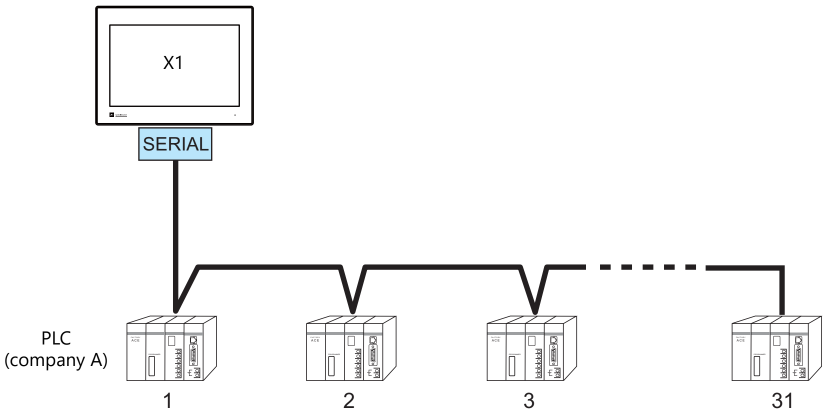
- Only the logical port PLC1 can be selected for the following devices and functions. They cannot be connected at the same time.
  - Devices
    Without PLC connection, Mitsubishi Electric A-Link + Net10, Allen-Bradley Control Logix / Compact Logix*, Allen-Bradley Micro800 controllers*, 3S-Smart Software 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

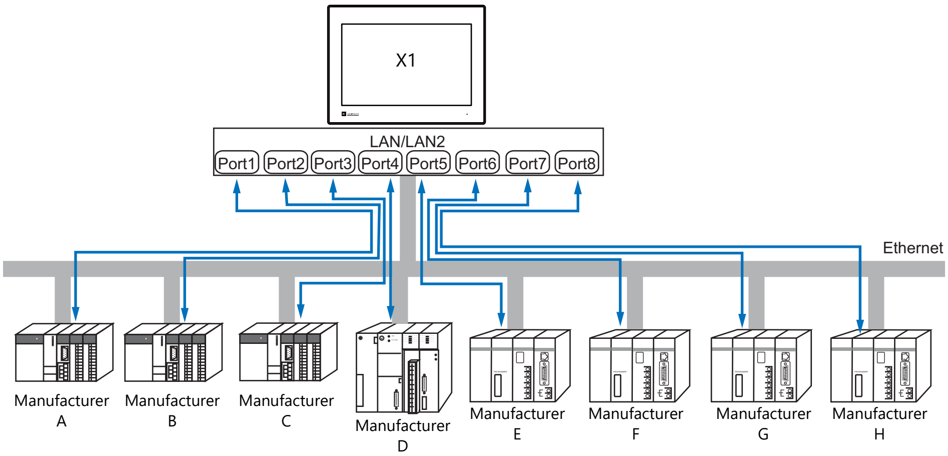
- 1 : 1 connection
  A serial port is used as a communication port.
  For more information, see “1 : 1 Connection” (page 1-12) in “1.3 Connection Method”.

- 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”.

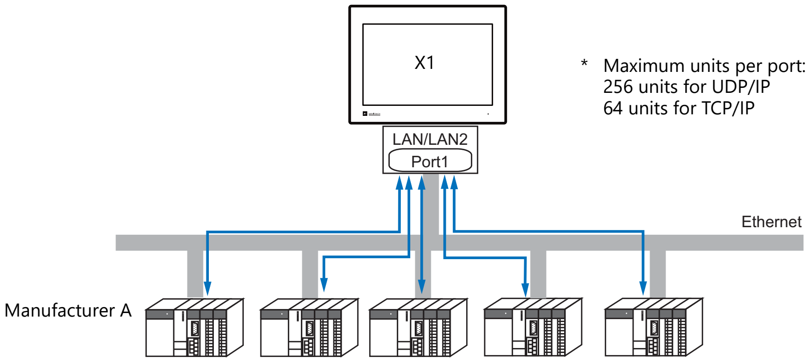


Ethernet Communication

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.

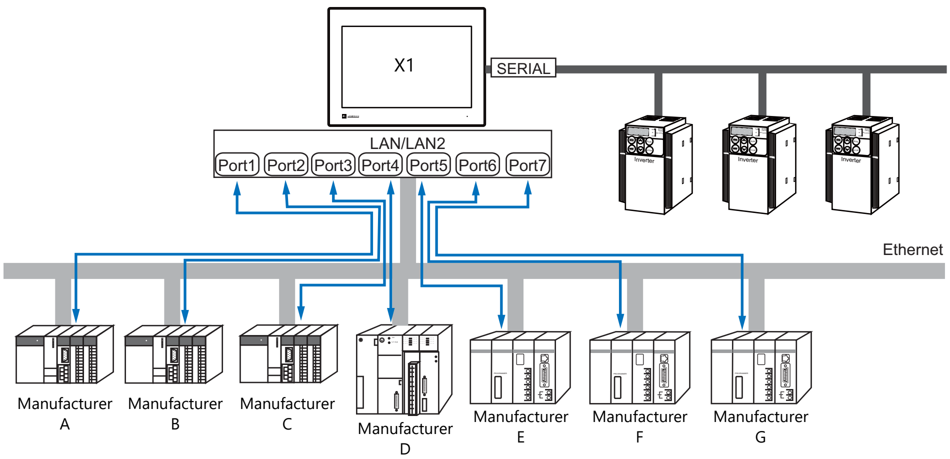


* For more information, refer to "1.3.2 Ethernet Communication" (page 1-18) in "1.3 Connection Method".

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".

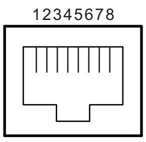
1.2 Physical Ports

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						
	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 (–)

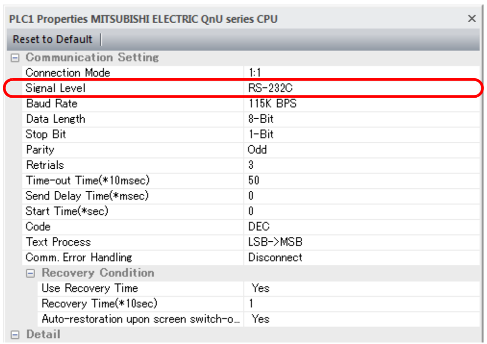
Switching between RS-232C and RS-422/485

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]



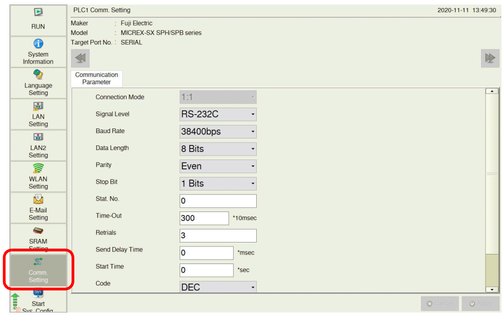
Item	Description
Connection Mode	Configure according to the connected device.
Signal Level	RS-232C / RS-422/485
Baud Rate	Configure according to the connected device.
Data Length	
Stop Bit	
Parity	
Target Port No.	
Transmission Mode	

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

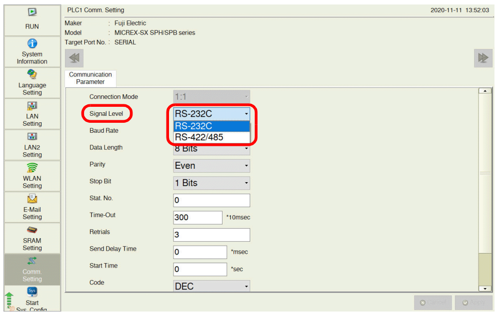
Setting Using Local Mode on the Unit

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

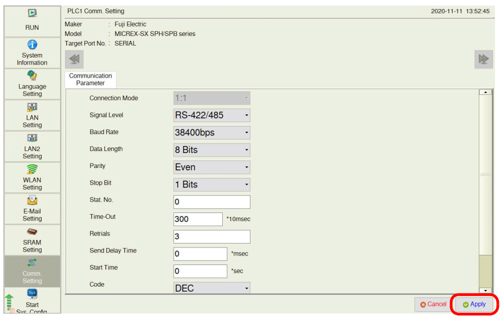
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press the [Comm. Setting] icon to display the Communication Setting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



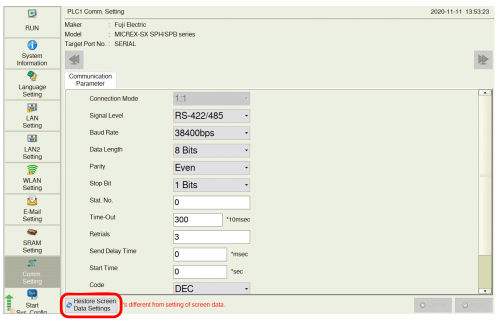
4. Select [RS-232C] or [RS-422/485] at [Signal Level].



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



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



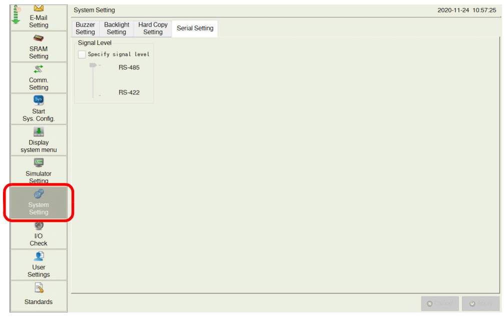
Switching between RS-485 (2-wire Connection) and RS-422 (4-wire Connection)

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.

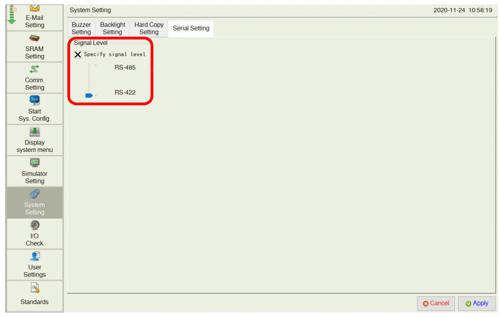
- The [Target Port No.] setting is set to [SERIAL] for PLCx in the [Hardware Setting] window of a screen program.
- The [Signal Level] setting is set to [RS-422/485] at either of the following locations:
  [Hardware Setting] → [PLCx Properties] in the screen program
  [Comm. Setting] → [Communication 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.

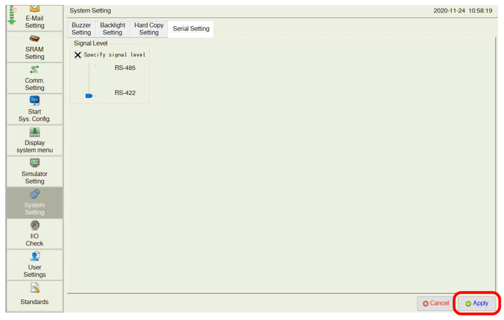
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press [System Setting] → [Serial Setting].



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



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

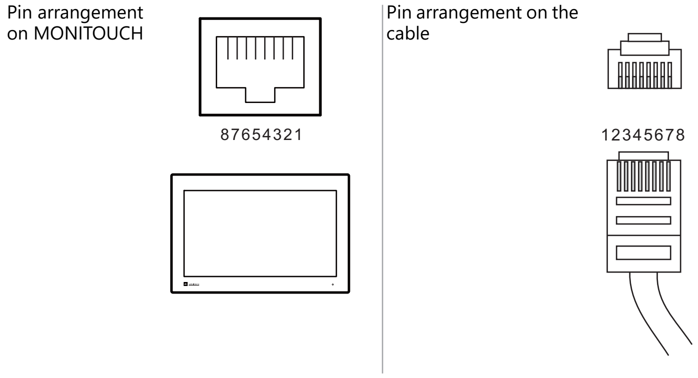


Recommended Cable

AWG 26 stranded wire, braided shield

* Check the operation in advance in the usage environment.

Notes on Configuring a Cable



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

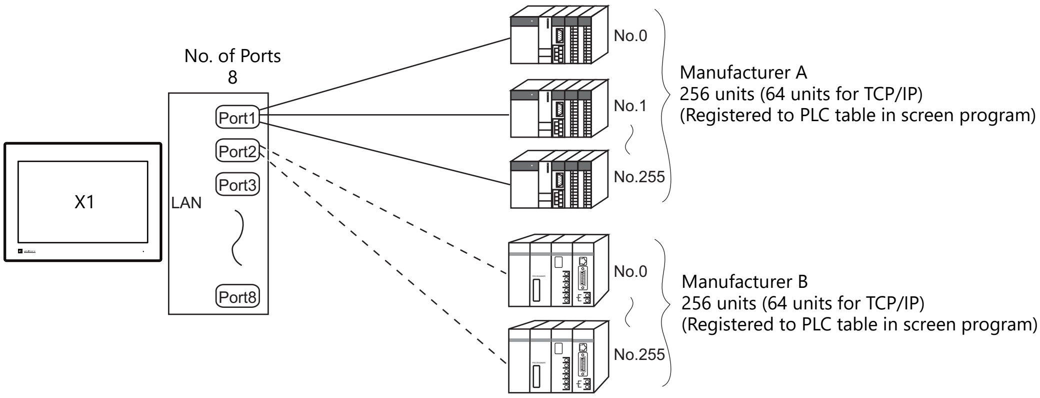
⚠ **CAUTION**	The LAN/LAN2 and SERIAL connectors are RJ-45 connectors. Check the connector names on the unit and insert cables into the correct connectors.

LAN Port Specifications

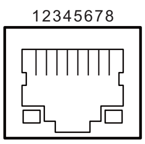
Item	Specification		
	1000BASE-T (IEEE802.3ab)	100BASE-TX (IEEE802.3u)	10BASE-T (IEEE802.3)
Baud Rate	1000 Mbps	100 Mbps	10 Mbps
Transmission Method	Base band		
Maximum Segment Length	100 m (between the node and the hub, or between hubs)		
Connecting cable	100 Ω, STP cable, category 5e or above		
Protocol	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

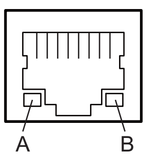
Maximum number of connectable devices



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	• 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	• 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	• 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	• 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.

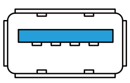
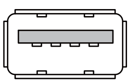
Unauthorized intrusions

- 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

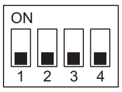
Item		Specification
USB3.0 	Applicable Standards	Compliant with USB version 3.0
	Baud Rate	Super speed: 5.0 Gbps
USB2.0 	Applicable Standards	Compliant with USB version 2.0
	Baud Rate	High speed: 480 Mbps

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	The System Configurator is displayed if No. 1 and No. 2 are both set to the ON position.
	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)	

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.

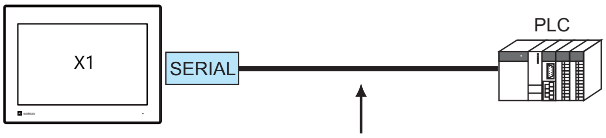
1.3 Connection Method

1.3.1 Serial Communication

1 : 1 Connection

Overview

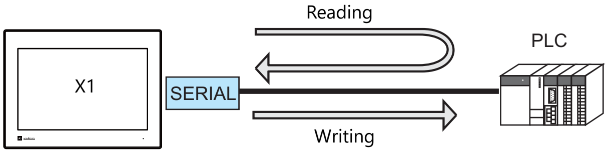
- Connect one X1 series unit with one PLC (1 : 1 connection).
- You can make settings for 1 : 1 connection in [Communication Setting] for the logical ports PLC1 to PLC8 and use SERIAL as the communication port.



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.

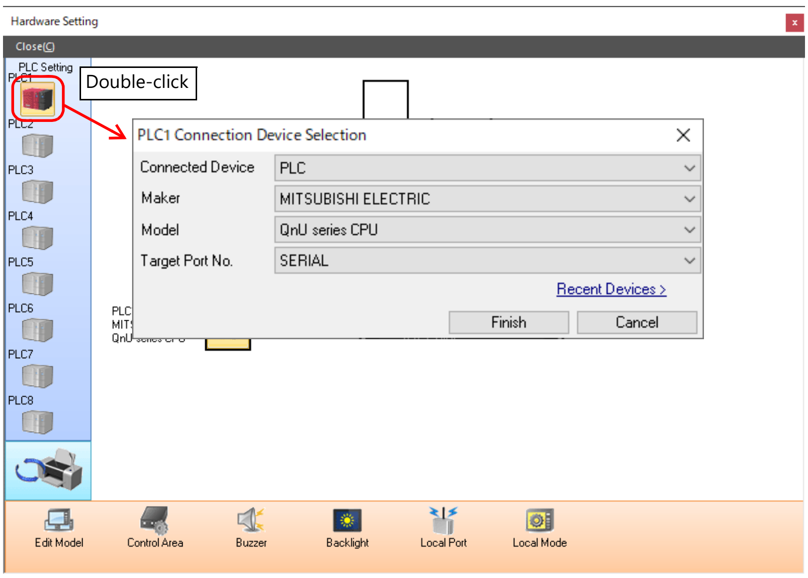


V-SFT Ver. 6 Settings

Hardware Settings

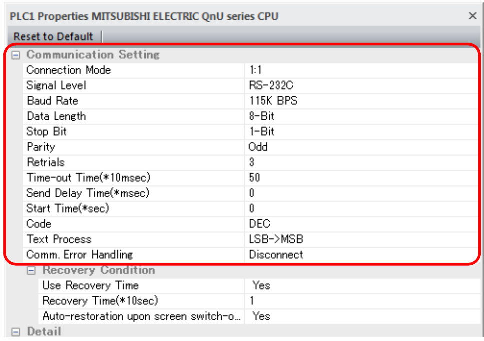
Selecting a device to be connected

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

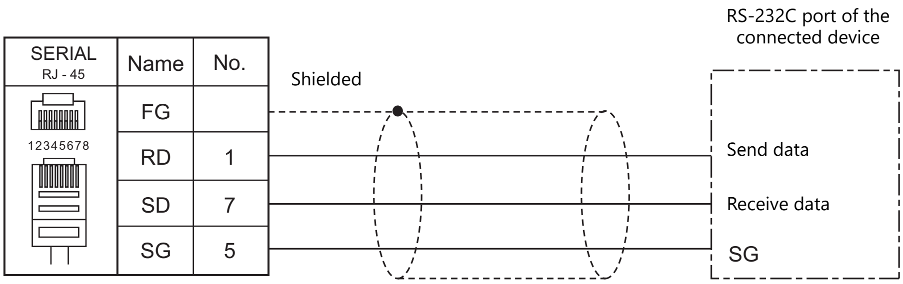
Refer to the chapter of the respective manufacturer.
For descriptions of connecting PLCs, refer to the manual for each PLC.

Wiring

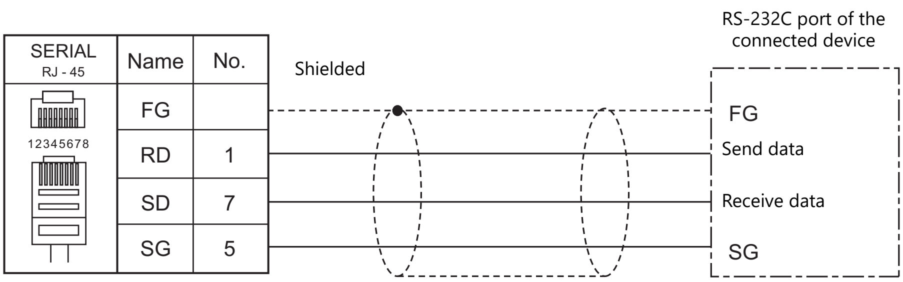
DANGER Be sure to turn off the power before connecting cables. Otherwise, you may sustain an electrical shock or equipment may be damaged.

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.

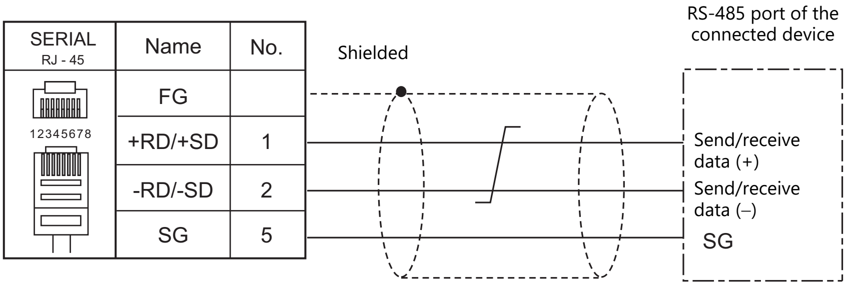


- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.

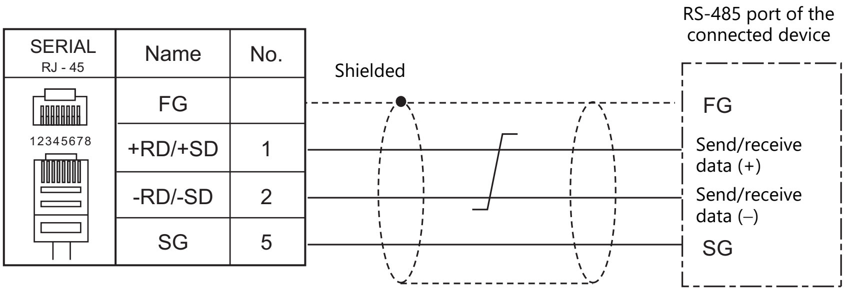


RS-485 (2-wire) Connection

- 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.

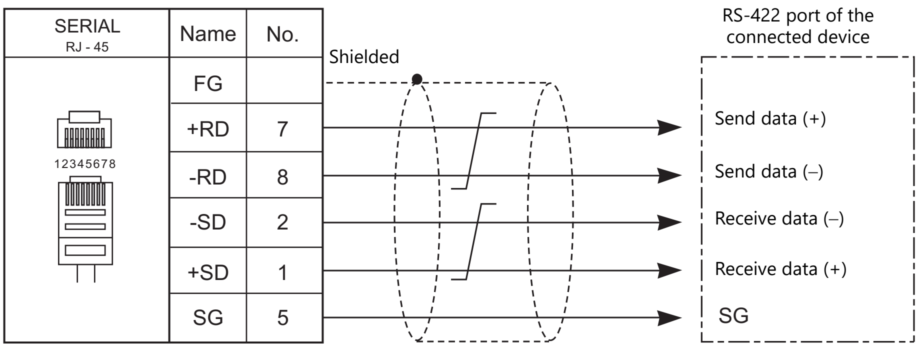


- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.

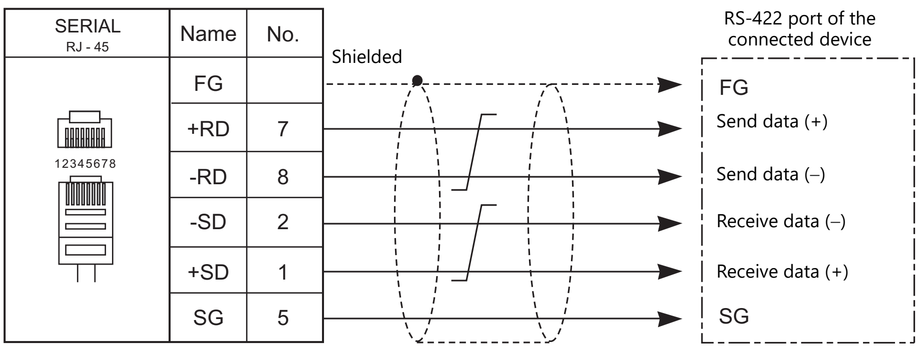


RS-422 (4-wire) Connection

- 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.



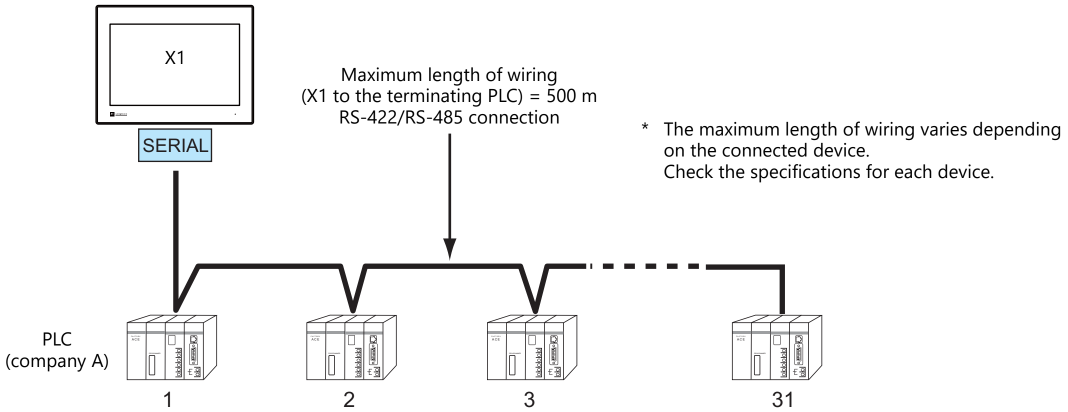
- If noise disturbs communications, connect a shielded cable to both the X1 series unit and the connected device.



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.



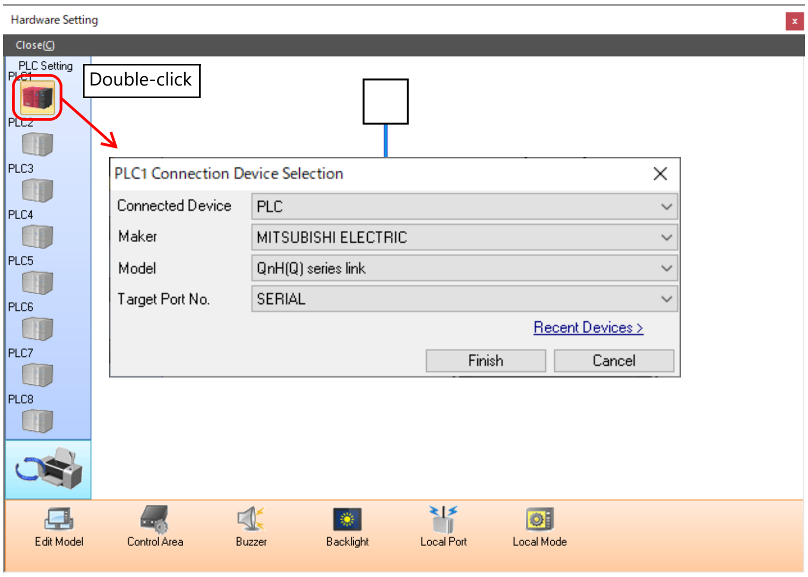
- For models that support multi-drop connection, refer to the “Connection Compatibility List” provided at the end of this manual or the chapters on individual manufacturers.

V-SFT Ver. 6 Settings

Hardware Settings

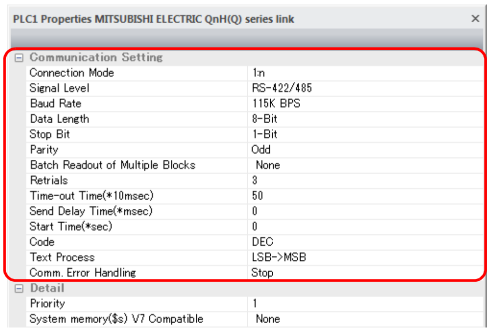
Selecting a device to be connected

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.

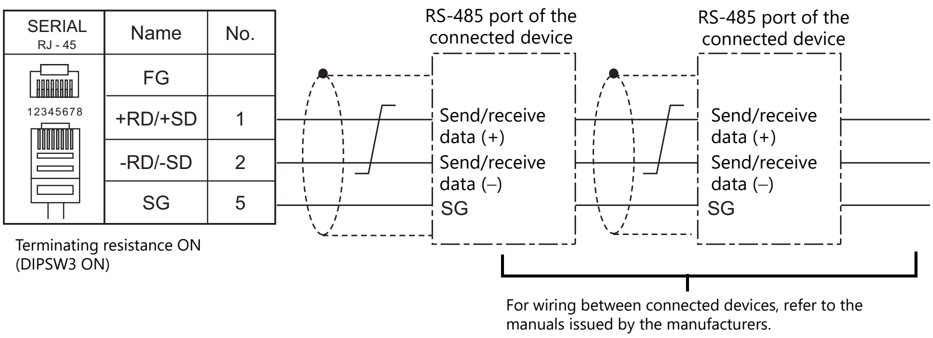
Wiring

⚠ 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

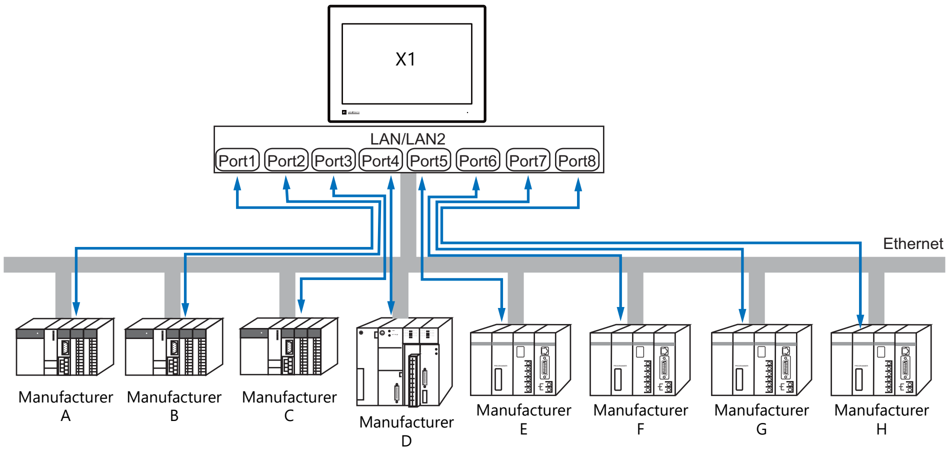
- Connection example



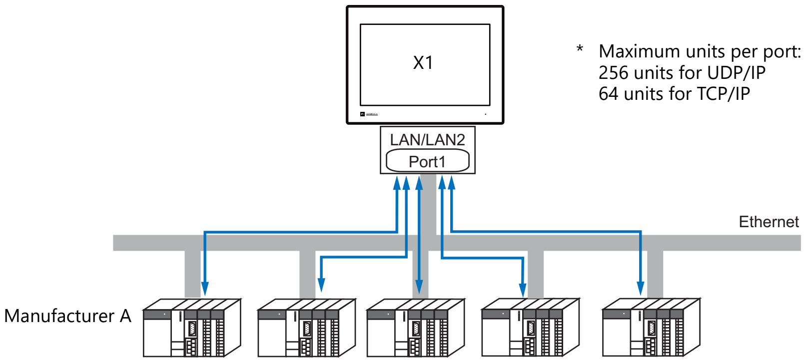
1.3.2 Ethernet Communication

Overview

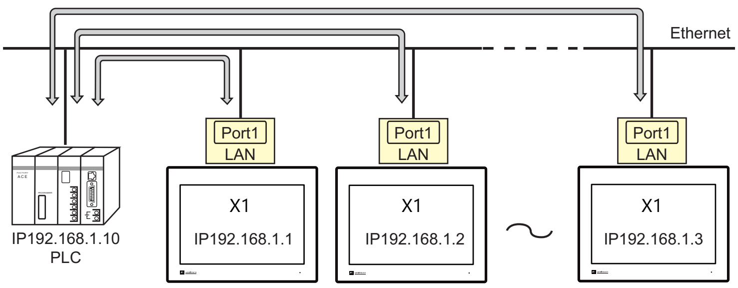
- The X1 series unit can open up to eight ports for communication, which means that the unit can simultaneously communicate with up to eight types of PLCs.



- 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.



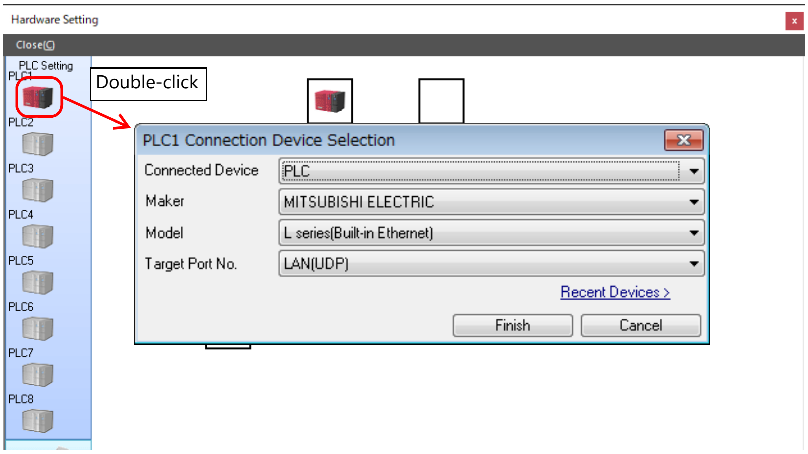
- You can make settings for Ethernet communication in [Communication Setting] for the logical ports PLC1 - PLC8.

V-SFT Ver. 6 Settings

Hardware Settings

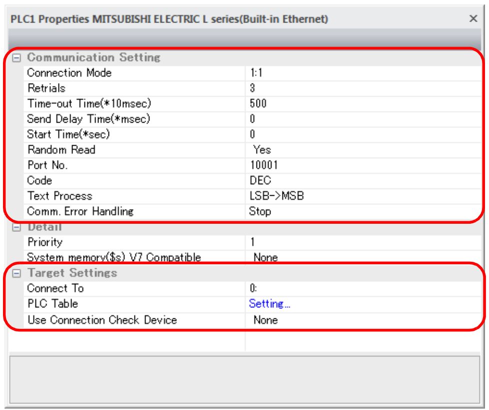
Selecting a device to be connected

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

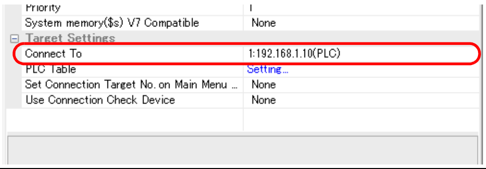
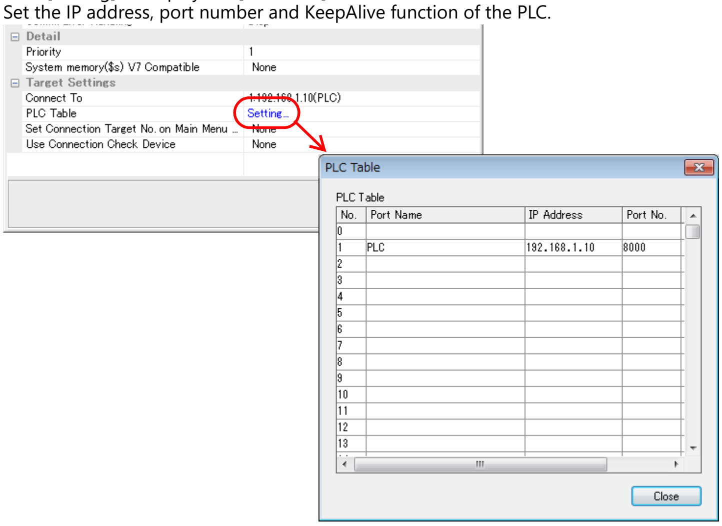


PLC properties

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. - [Retrials] Specify the number of retrials. If a timeout persists even after as many retrials as specified, an error handing 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, retrial will be made. 1 to 999 (× 10 msec) Default: 30 (× 10 msec) - [Checking Cycle] Set the cycle time of “KeepAlive” communication. 1 to 999 (× 10 msec) Default: 10 (× 10 msec)

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

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

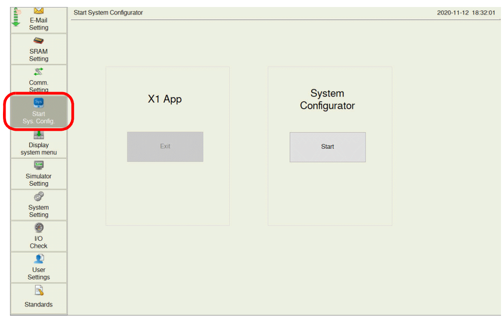
IP Address Setting of the X1 Series Unit

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.

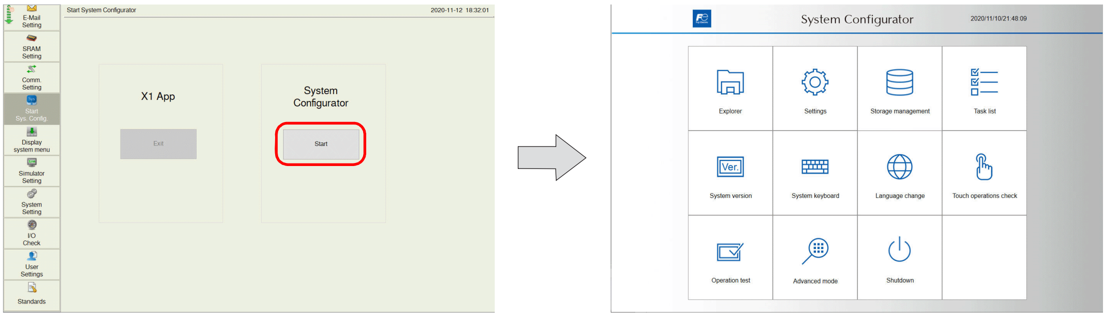
System Configurator

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

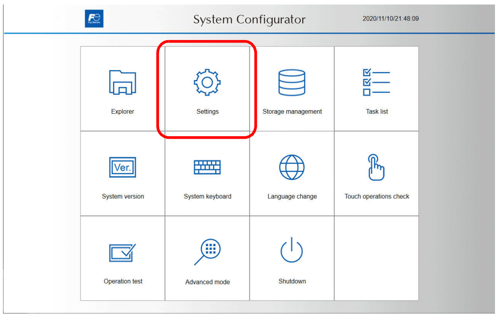
1. Press any of the four corners of the screen for more than two seconds and then press any of the remaining corners for more than two seconds to display the system menu.
2. Press the [Local] switch. The display switches to Local mode.
3. Press the [Start Sys. Config.] icon to display the System Configurator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



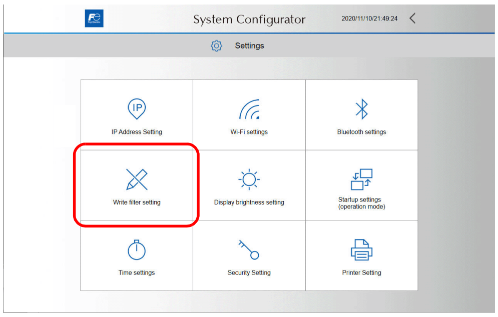
4. Press the [Start] switch. System Configurator starts.



5. Press [Settings].

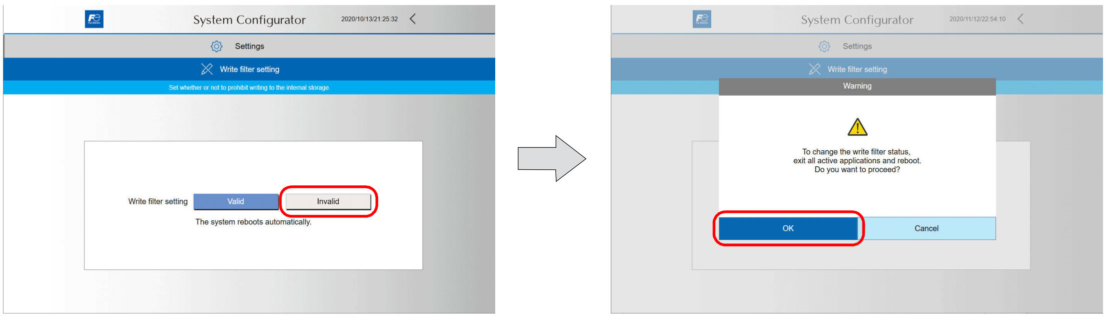


6. Press [Write filter setting].



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.

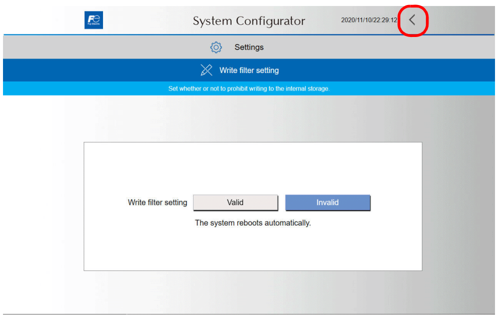
When [Write filter setting] is set to [Valid]



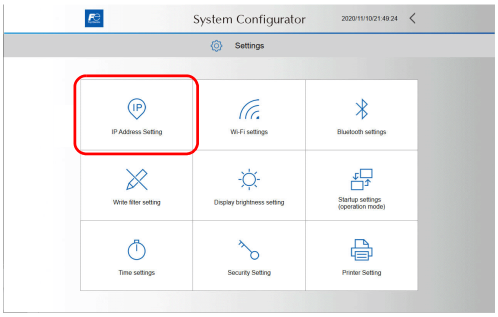
⚠ **CAUTION**	The IP address cannot be changed when [Write filter setting] is set to [Valid]. Set [Write filter setting] to [Invalid] and reboot the X1 series unit.

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

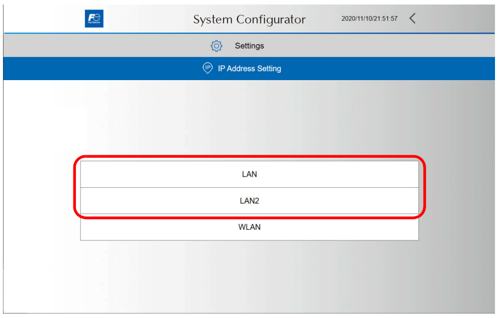
When [Write filter setting] is set to [Invalid]



8. Press [IP Address Setting].

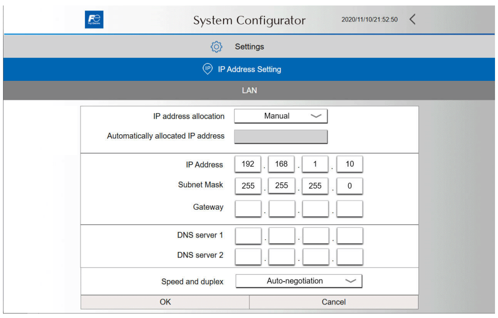


9. Press [LAN] or [LAN2].

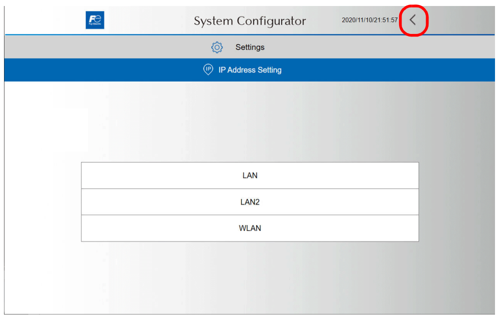


10. Configure settings and press [OK] to confirm.*

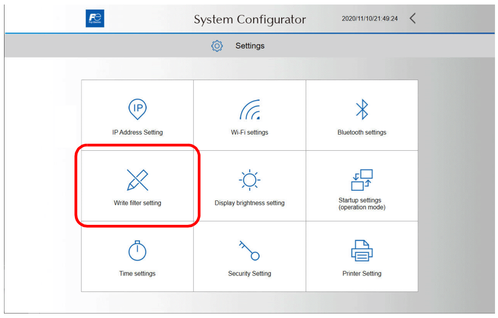
* In order to input numbers, either connect a USB keyboard or display the system keyboard on the X1 series unit. For details on the system keyboard, see “Displaying the system keyboard” (page 1-24).



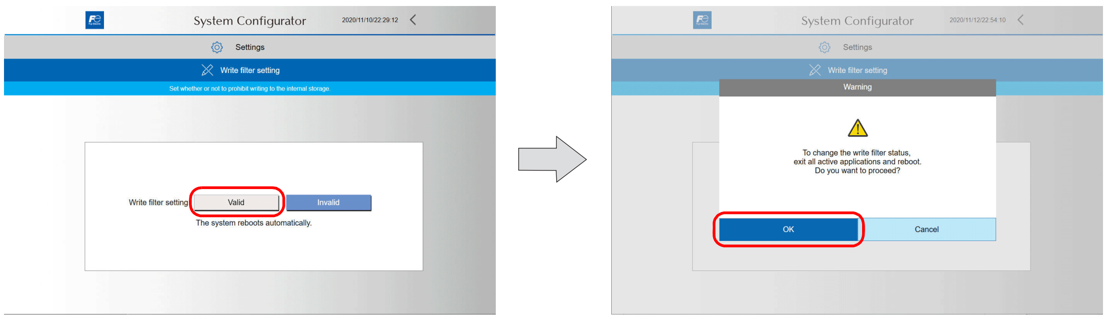
11. The IP address setting screen is displayed. Press [<].



12. Press [Write filter setting].



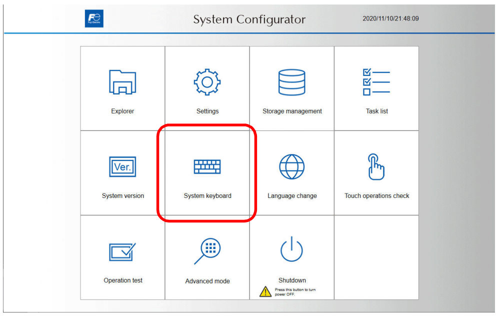
13. Press [Valid].
    The following dialog appears. Press [OK] to reboot the X1 series unit.



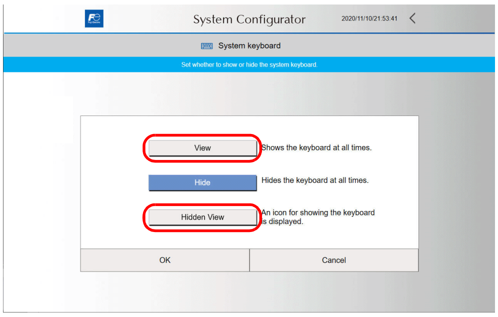
Displaying the system keyboard

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.)

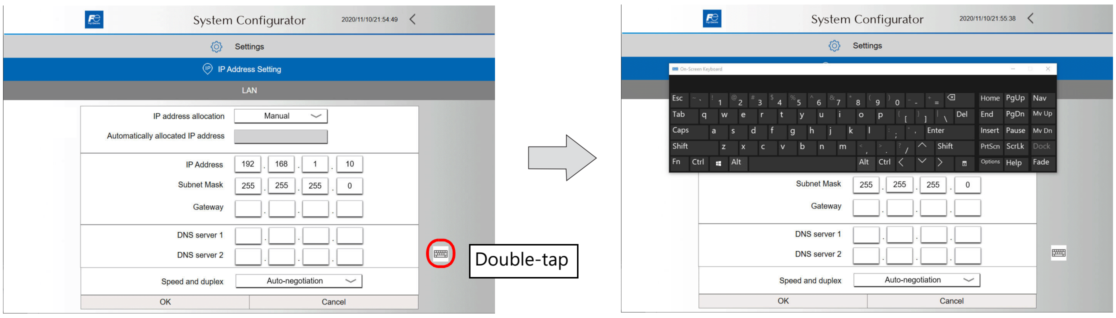
1. Start System Configurator.
   For details on how to start System Configurator, see steps 1 to 4 in "System Configurator" (page 1-20).
2. Press [System keyboard].



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



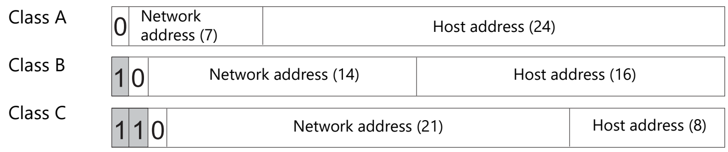
<Hidden view mode>
An icon is displayed as indicated below. Double-tap the icon to display the system keyboard.
The location of the icon can be changed by dragging.



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.



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

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

Port No.

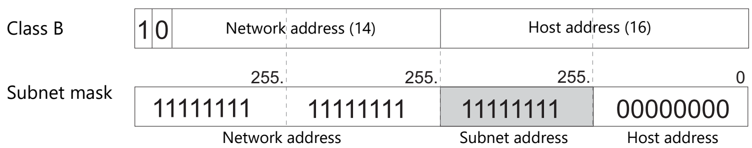
Multiple applications are running on each node, and communications are carried out for each application between the nodes. Consequently, it is necessary to have a means to identify the application that data should be transferred to. The port number works as this identifier. Each port number is 16-bit data (from 0 to 65535).
The 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

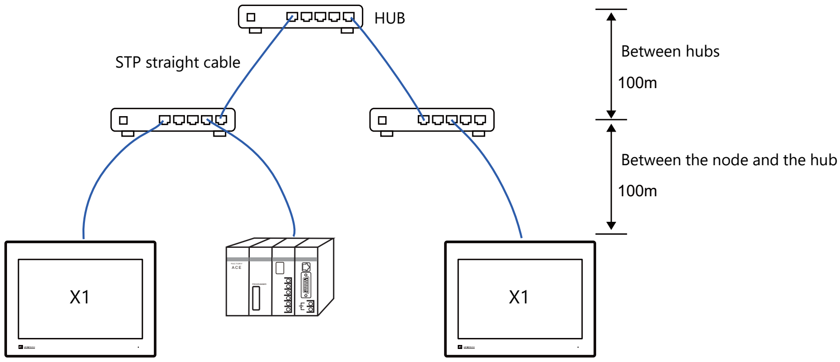
A subnet mask is used for dividing one network address into multiple networks (subnet).
The subnet is assigned by specifying a part of the host address in the IP address as a subnet address.



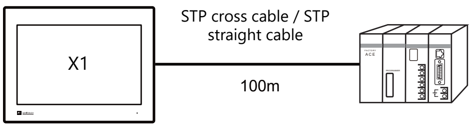
<Unusable subnet masks>
- All bits are set to "0"...... 0.0.0.0
- All bits are set to "1"...... 255.255.255.255

Connection Example

With hub



Without hub

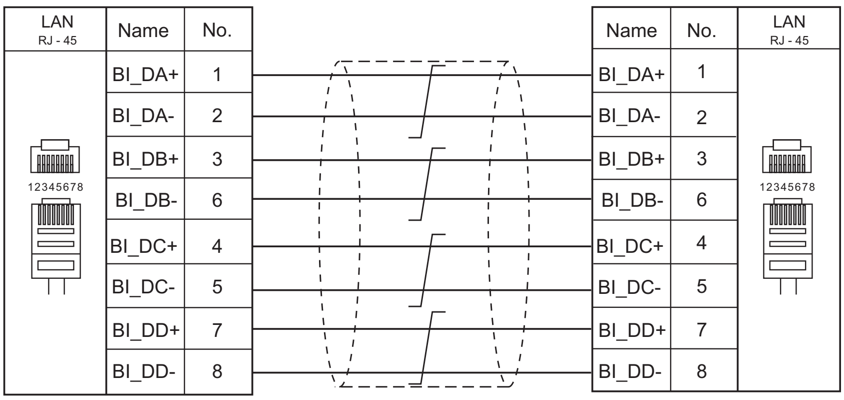


Wiring

⚠ 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.

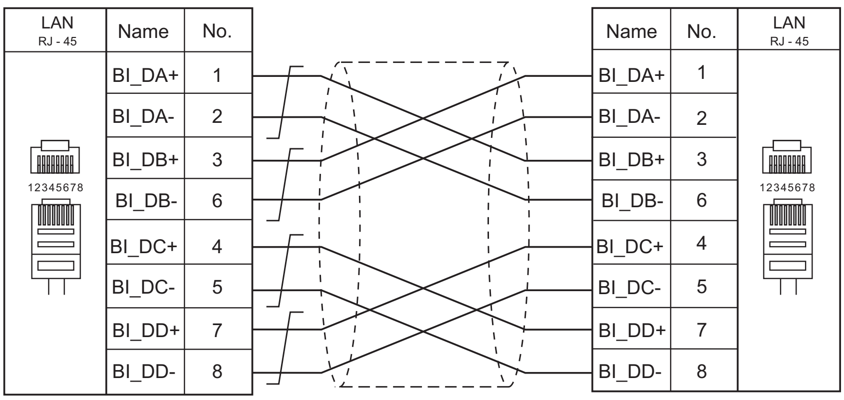
For 1000BASE-T

- Straight cable



Twist-pair cable

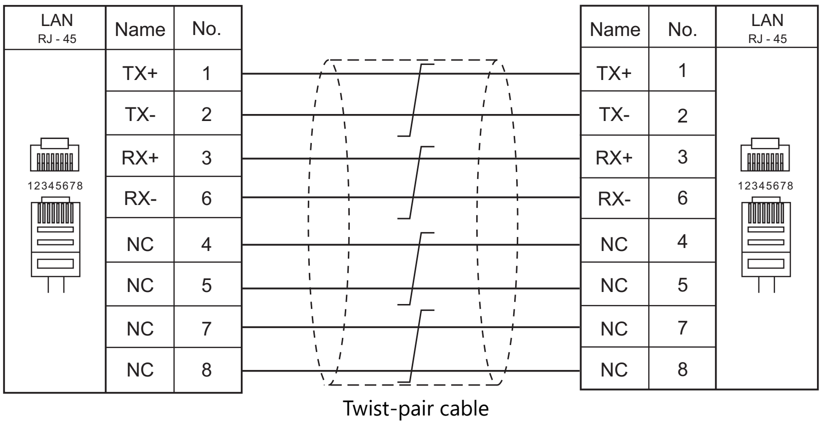
- Cross cable



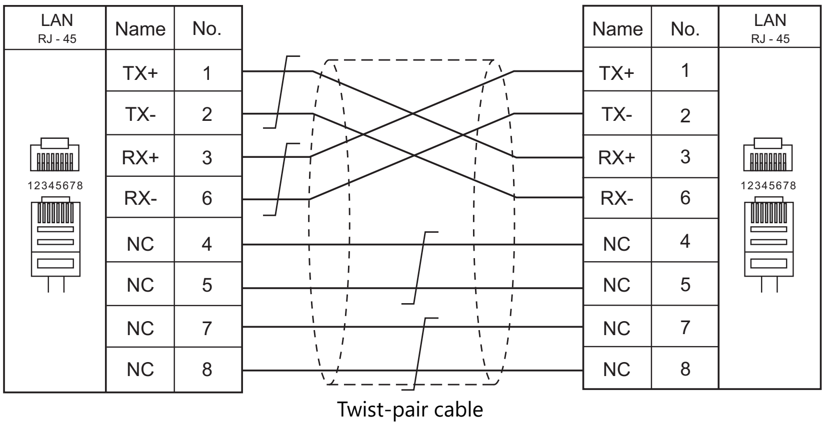
Twist-pair cable

For 100BASE-TX / 10BASE-T

- Straight cable



- Cross cable

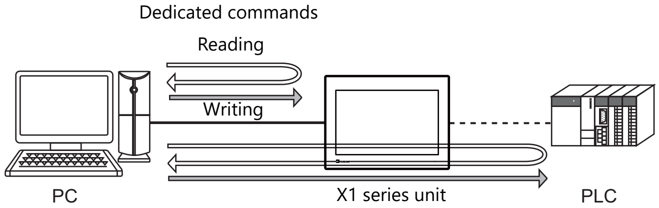


1.3.3 Slave Communication

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

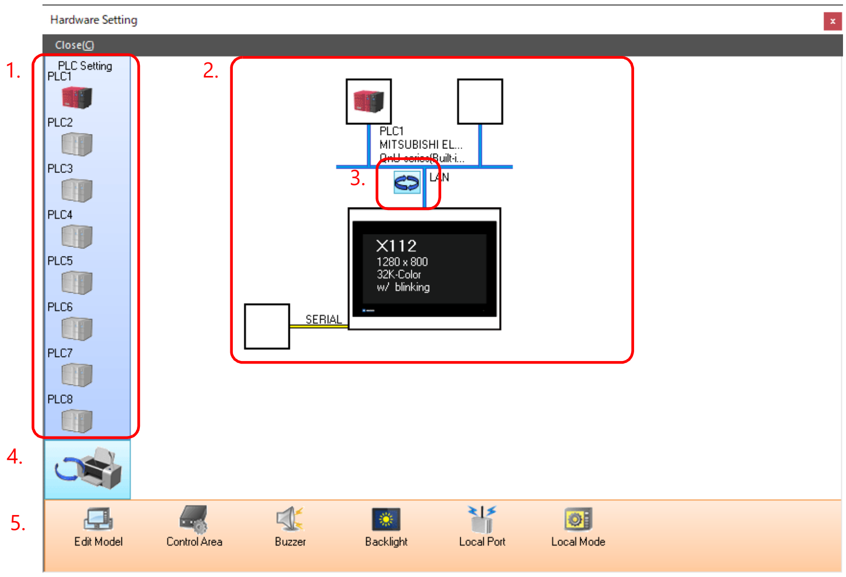
- The X1 series unit is connected to a Modbus TCP/IP master via Ethernet communication.
- The Modbus slave communication device memory table is prepared for the X1 series unit. The master is allowed to access the device memory table and read/write data from/into the PLC.
- For more information, refer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

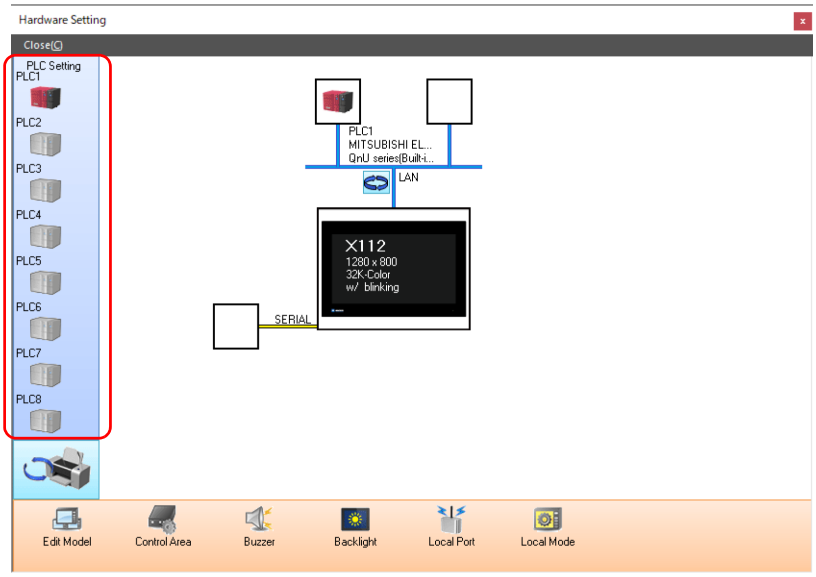
Select devices to connect to the X1 series unit and configure settings on the [Hardware Setting] screen.



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.

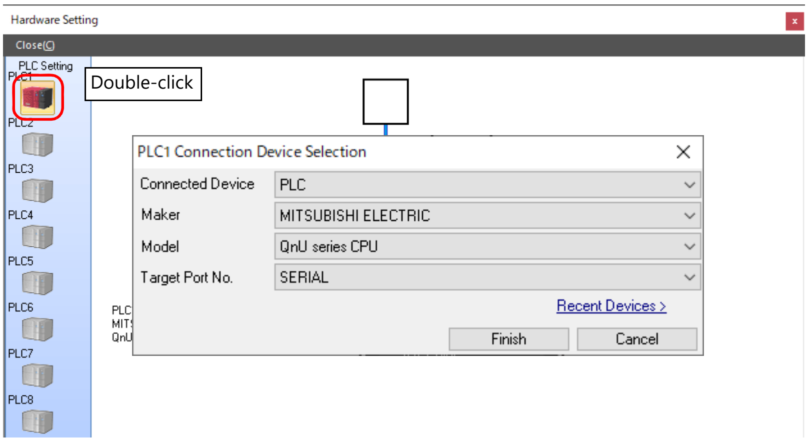
1.4.1 PLC Settings

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

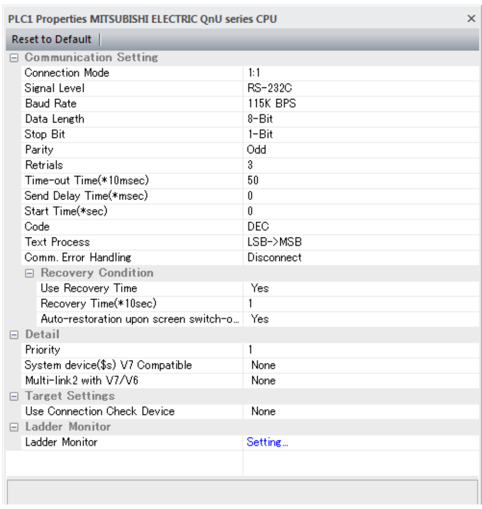
Double-click on a PLC icon in the [Hardware Setting] window to display the window shown below.



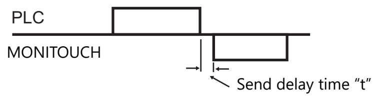
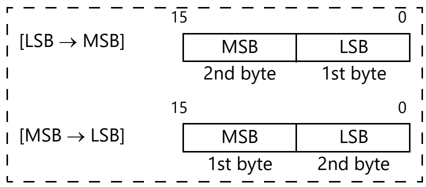
Item	Description
Applicable Devices	Select the device to connect.
Maker	Select the manufacturer of the device.
Model	Select the model of the device to connect. Refer to the respective chapter of each manufacturer and select the appropriate model.
Target Port No.	Select the port to which the device connects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

PLC Properties

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



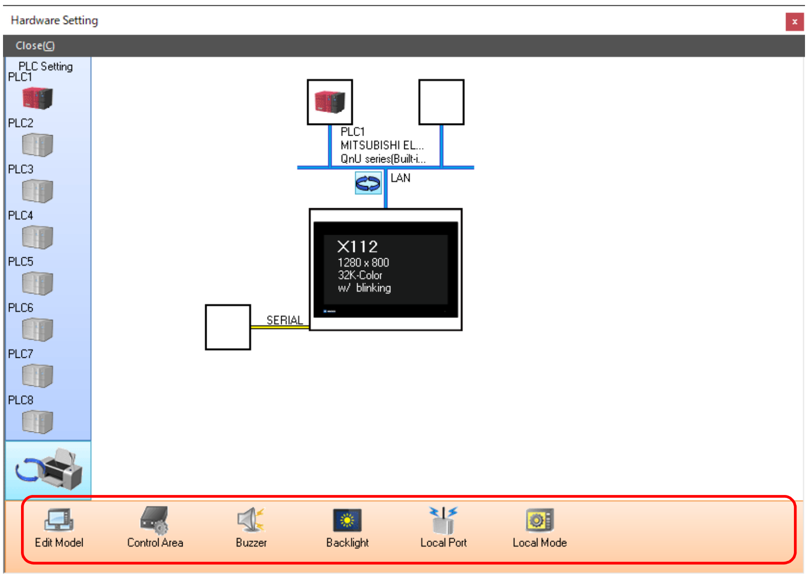
Item		Description
Communication Setting	Connection Mode	Select a connection mode. 1:1 / 1:n Available options vary, depending on which device is connected. For details, see “Connection Compatibility List” provided at the end of this manual.
	Signal Level *1	Select a signal level. RS-232C / RS-422/485
	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)

<table>
<tr><th colspan="3">Item</th><th>Description</th></tr>
<tr><td rowspan="13">Communication Setting</td><td colspan="2">Transmission Mode *1</td><td>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.</td></tr>
<tr><td colspan="2">Retrials</td><td>Specify the number of retrials to be allowed in the event of a timeout during communication. If a timeout persists even after as many retrials as specified, an error handing routine will take place.
1 to 255</td></tr>
<tr><td colspan="2">Time-out Time</td><td>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)</td></tr>
<tr><td colspan="2">Send Delay Time</td><td>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)
</td></tr>
<tr><td colspan="2">Start Time</td><td>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)</td></tr>
<tr><td colspan="2">Code</td><td>Select a code for the connected device. The selected option is reflected through the data displayed on graphs or trending sampling parts.
DEC/BCD</td></tr>
<tr><td colspan="2">Text Process</td><td>Specify a byte order in text data. This setting is valid for macro commands that handle text.
LSB → MSB / MSB → LSB
</td></tr>
<tr><td colspan="2">Comm. Error Handling</td><td>Select an action to be taken in the event of a communication error.
• [Stop]
Communication will be stopped entirely and the communication error screen will be displayed. The [RETRY] switch is available for attempting reestablishment of communication.
• [Continue]
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.
* The communication status is displayed on the status bar.
For details, refer to the X1 Series Hardware Specifications.</td></tr>
<tr><td rowspan="3">Recovery Condition</td><td>Use Return Time</td><td>This setting is valid when [Disconnect] is selected for [Comm. Error Handling].</td></tr>
<tr><td>Recovery Time</td><td>[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.</td></tr>
<tr><td>Auto-restoration upon screen switch-over</td><td>When the screen is switched, the X1 series unit checks the recovery of the device which discontinued communication.</td></tr>
</table>

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 ($s) 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 $Pn (For 8-way Communication)" (page 1-37).
	System device ($s) 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. • [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.

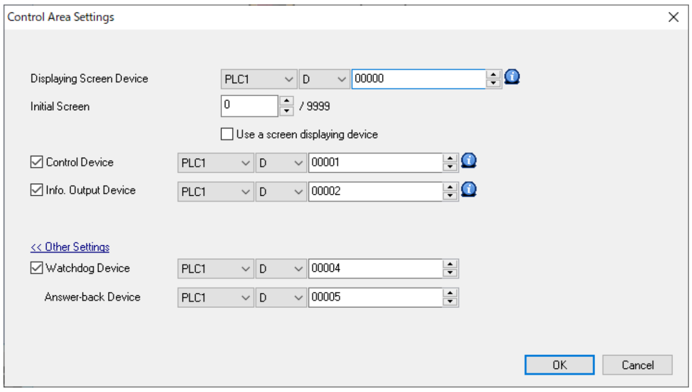
1.4.2 Unit Settings



Edit Model Selection

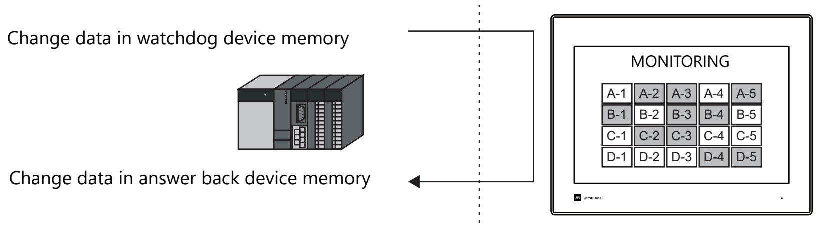
Select an X1 series model to edit.
For details, refer to the X1 Series Reference Manual 1.

Control Area

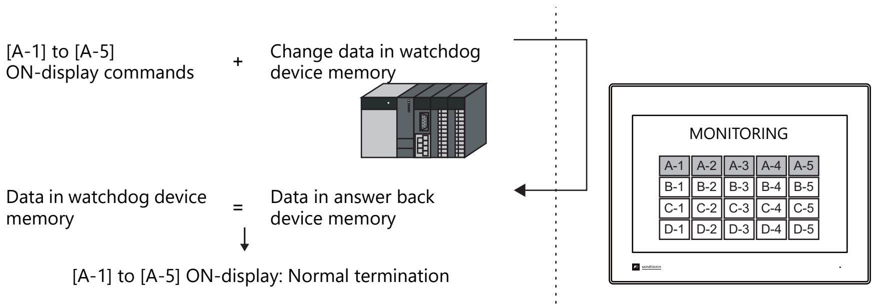


Item		Description
Screen	Displaying Screen Device	Used for switching the screen by an external command. When a screen number is specified in a device memory, the screen is displayed as specified. Also, the currently displayed screen number is stored in this device memory.
	Initial Screen	Set the screen 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. Utilizing this operation, these device memory can be used for watchdog monitoring*1 or display scanning*2.
	Answer-back Device	

*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.



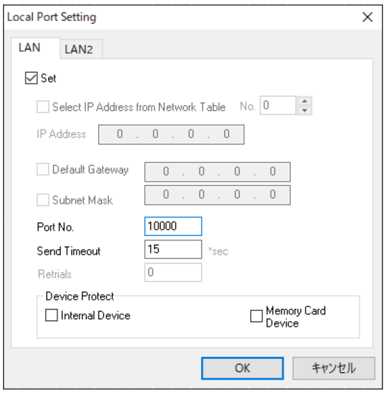
Buzzer

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



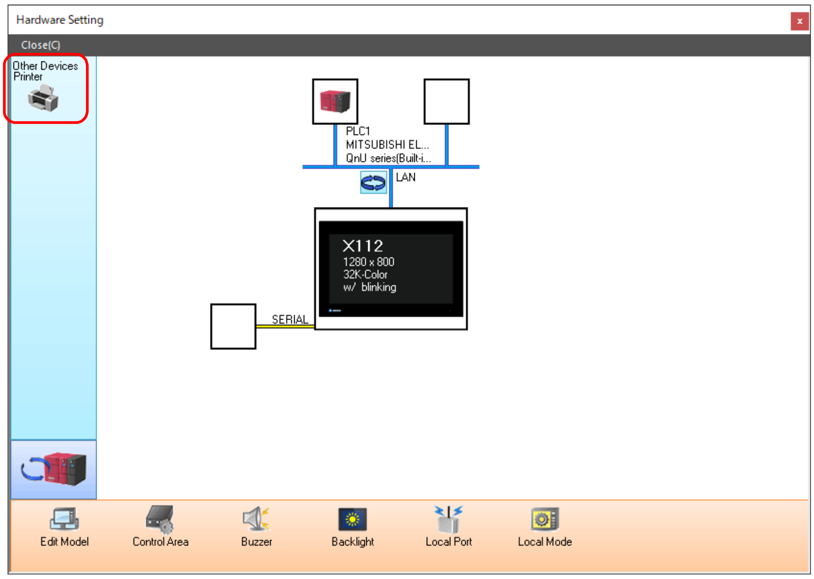
Item	Description
Port No. *1	Set a port number from 1024 to 65535. ("8001" is not available.)
Send Timeout	Specify the timeout time to send the EREAD/EWRITE/SEND/MES macro commands.
Device Protect Internal Device Memory Card Device	Select either checkbox to write-protect the corresponding device memory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

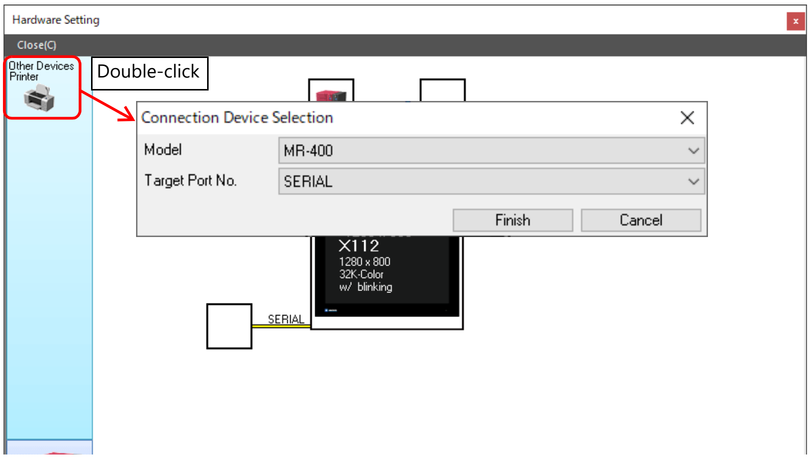
1.4.3 Other Equipment



Printer

Configure these settings when connecting a printer.

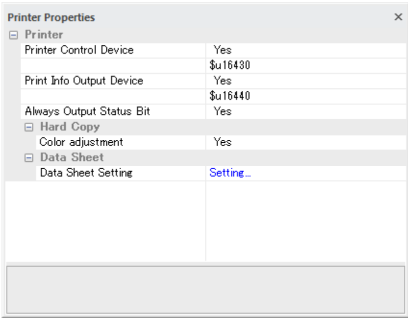
Selecting the printer model



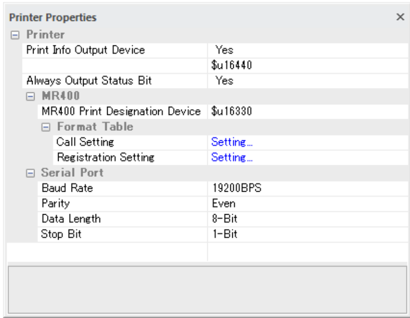
Item	Description
Model	Select the model of the printer to connect. When [None] is selected, printing can be executed by using the function of Windows. For details on configuring the printer settings, refer to the X1 Series Hardware Specifications.
Target Port No.	Select the port where the printer cable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

Printer Properties

When [Model] is set to [None]



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



<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Printer Control Device</td><td>When this setting is enabled and the bit is set to ON (0 → 1), screen images and data sheets can be printed out.
MSB LSB
<table>
<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>
0 → 1: Screen image output
0 → 1: Data sheet output</td></tr>
<tr><td colspan="2">Printer Info Output Device
(Yes/None)</td><td>When using device memory for outputting printer information, the printer state is output to the specified address.
MSB LSB
<table>
<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>
0: End (standby)
1: Transferring print data
0: Not busy
1: Busy</td></tr>
<tr><td colspan="2">Always Output Status Bit
(Yes/None)</td><td>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.
The output area is shown below.
Bit 1 of the device memory for outputting printer information
Bit 0 of internal device memory $s16
$s16
MSB LSB
<table>
<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>
0: End (standby)
1: Transferring print data</td></tr>
<tr><td>Hard Copy</td><td>Color adjustment
(Yes/None)</td><td>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.</td></tr>
<tr><td>Data Sheet</td><td>Data Sheet Setting</td><td>Make settings for data sheet printing. For more information, refer to the X1 Series Reference Manual 1.</td></tr>
<tr><td rowspan="2">MR400</td><td>MR400 Print Designation Device</td><td>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.</td></tr>
<tr><td>Format Table</td><td>Register the printing format.
For details, refer to the X1 Series Reference Manual 1.</td></tr>
<tr><td rowspan="4">Serial port</td><td>Baud Rate</td><td>Specify the baud rate.
4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K BPS</td></tr>
<tr><td>Parity</td><td>Set the parity.
None / Odd / Even</td></tr>
<tr><td>Data Length</td><td>Set the number of bits for data.
7-Bit / 8-Bit</td></tr>
<tr><td>Stop Bit</td><td>Set the number of stop bits.
1-Bit / 2-Bit</td></tr>
</table>

* 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 $s.*1

$Pn (n = 1 to 8)	$s*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	
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	←X1
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	
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.	→X1
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)		
501	801 (PLC3)	Device memory for Modbus slave communications	
502	802 (PLC3)	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: $s800 to 805 are used for writing from the Modbus master.	→X1
503	803 (PLC3)		
504	804 (PLC3)	Refer to the Modbus Slave Communication Specifications.	
505	805 (PLC3)		
:	:	:	
508	765 (PLC2)		
509	766 (PLC2)	Error response code (page 1-45) If “800BH” (error code received) is stored for the error status ($Pn100 to 355), it is possible to check the error code.	←X1
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: 10

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

Station No. 15 ... Station No. 0

$Pn: 11

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

Station No. 31 ... Station No. 16

↓

$Pn: 25

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

Station No. 255 ... Station No. 240

$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).

Station No. 31 ... Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Station No. 18 Link down

↓

After resetting communications

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

Station No. 31 ... Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Station No. 18 Normal communication

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

Station No. 31 ... Station No. 16

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
$Pn: 011	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Station No. 18 Link down

$Pn: 100 to 355

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

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

Errors other than the above are stored as shown below.

MSB … LSB

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

- Bit 9: Buffer-full error
- Bit 11: Parity error
- Bit 12: Overrun error
- Bit 13: Framing error
- Bit 14: Break detection
- Bit 15: Error
  0: Bits 0 to 14 are all "0".
  1: Any bit from 0 to 14 is other than "0".

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.

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

System reserve (bits 15 to 1)

1: ID tag recognized (bit 0)

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

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

Errors other than the above are stored as shown below.

MSB LSB

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

Buffer-full error (bit 9)
Parity error (bit 11)
Overrun error (bit 12)
Framing error (bit 13)
Break detection (bit 14)
Error (bit 15)
0: Bits 0 to 14 are all "0".
1: Any bit from 0 to 14 is other than "0".

- Error code 2 ($Pn 358, 361, ...)
  The exit code/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)

<table>
<tr><th>Main response (HEX)</th><th colspan="2">Contents</th></tr>
<tr><td>00</td><td rowspan="3">Command execution success</td><td>Success - normal</td></tr>
<tr><td>80</td><td>Success - RF power supply OFF/ON control is provided</td></tr>
<tr><td>81</td><td>Success - tag no response OK</td></tr>
<tr><td>01</td><td rowspan="18">Command execution failure</td><td>Command argument - format error</td></tr>
<tr><td>02</td><td>Command argument - parameter length error</td></tr>
<tr><td>03</td><td>Command argument - parameter error</td></tr>
<tr><td>04</td><td>FIFO size error</td></tr>
<tr><td>05</td><td>Execution failure</td></tr>
<tr><td>06</td><td>Abort (abort with error after execution)</td></tr>
<tr><td>07</td><td>Get system info - Retrieve failed (extended Read/Write command system)</td></tr>
<tr><td>08</td><td>Get system info - Data error (extended Read/Write command system)</td></tr>
<tr><td>09</td><td>Out-of-specification error</td></tr>
<tr><td>0A</td><td>System settings update: magic number mismatch</td></tr>
<tr><td>0B</td><td>System setting update: incorrect device ID</td></tr>
<tr><td>0C</td><td>System setting update: error in writing EEPROM</td></tr>
<tr><td>0D</td><td>Fatal error</td></tr>
<tr><td>E0</td><td>Protocol mismatch</td></tr>
<tr><td>E1</td><td>Mismatch the current settings</td></tr>
<tr><td>FE</td><td>Shipping processing mode: Out-of-operating mode</td></tr>
<tr><td>FF</td><td>Undefined command</td></tr>
<tr><td>Other than above</td><td>Reserved</td></tr>
</table>

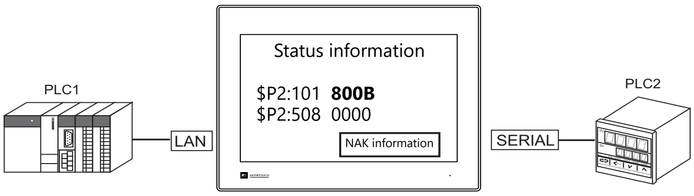
$Pn: 508 to 511

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.

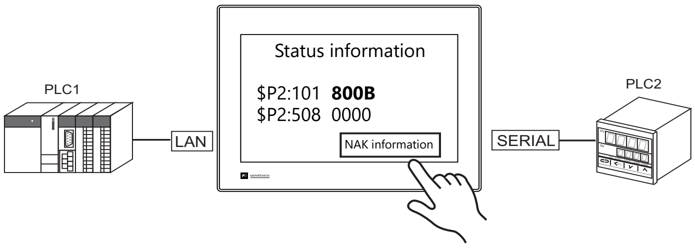
Notes on use • Use $u/$T as the target internal device memory. • Use the macro command MOV (W). MOV (D) cannot be used. • “0” is stored to device memory addresses that have no expansion error code.

- Example PLC2: Fuji Electric PXR station No. 1

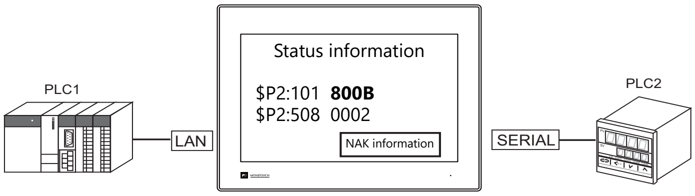
1) On receipt of an error code at station No. 1 of PLC2, “800BH” is stored in $P2:101.



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.

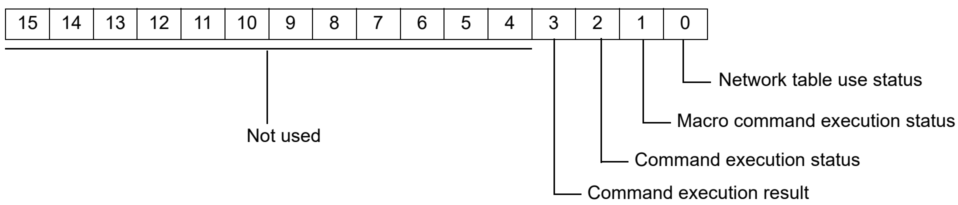
1.5.2 $s (Ethernet Status Confirmation)

$s List

$s	Contents	Stored Value
518	Ethernet status (for built-in LAN port)	• [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)	• [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. A&D

2.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Weighing Indicator

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
AD4402 (MODBUS RTU)	AD-4402 AD-4402D	Terminal block	RS-485	Wiring diagram 1 - M4	×	AD4402.List
AD4404 (MODBUS RTU)	AD-4404	Terminal block	RS-485	Wiring diagram 1 - M4	×	AD4404.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).

2.1.1 AD4402 (MODBUS RTU)

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	4800 / <u>9600</u> / 19200 bps	
Parity	<u>None</u> / Odd / Even	
Data Length	7 / <u>8</u> bits	
Stop Bit	<u>1</u> / 2 bits	
Target Port No.	1 to 99	

AD-4402

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

Available Device Memory

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

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

2.1.2 AD4404 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

AD-4404

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

Available Device Memory

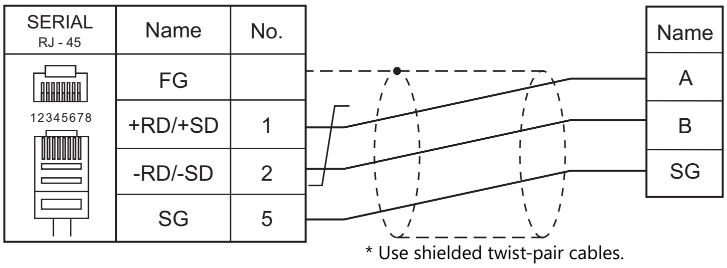
The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

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

2.1.3 Wiring Diagrams

RS-422/RS-485

Wiring diagram 1 - M4



3. Agilent

3.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection		Lst File
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2	
4263 series	4263B 4263A	GPIB-RS232C	RS-232C	Wiring diagram 1 - M2	×	None
		GPIB-RS485/422	RS-422/485	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).

3.1.1 4263 Series

Communication Setting

Editor

Communication Setting

(Underlined setting: default)

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

PLC

4263 Series

Set the GPIB address on the front panel.

Item	Setting	Remarks
GBIP Adrs	1 to 30	

GPIB-RS232C / GPIB-RS485/422

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

Select mode

Item	Setting	Remarks
Select Mode	**C Mode**	

Serial settings

(Underlined setting: default)

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

GBIP settings

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

Available Device Memory

There are no device memory.

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Return data: Data stored from 4263 series to X1 series

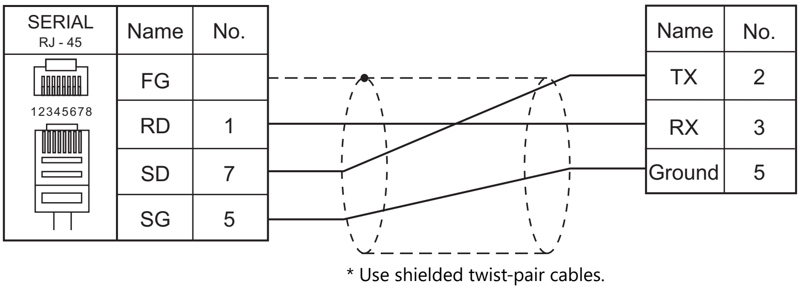
*1 "Sets the specified measurement function to ON. (command 76)" must be specified.
*2 "Sets the data buffer size. (command 37)" must be specified.
*3 Data is stored from the specified internal device memory ($u).
*4 Specify the data to feed using "Sets whether or not to feed measurement data to a data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

3.1.2 Wiring Diagrams

A GPIB serial converter is necessary to connect the X1 series with the 4263 series.
This section shows the wiring diagrams for the X1 series and the GPIB serial converter.

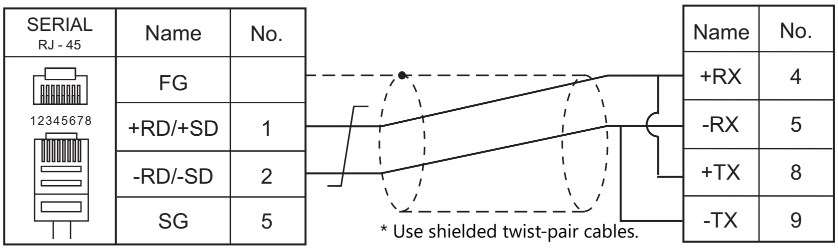
RS-232C

Wiring diagram 1 - M2

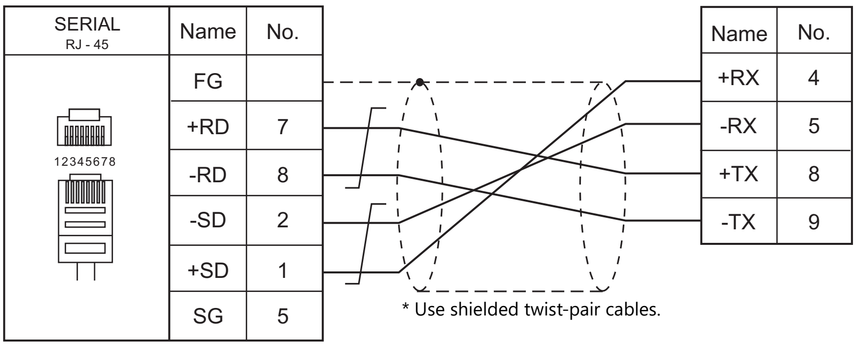


RS-422/485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



4. Allen-Bradley

4.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection: RS-232C*1 / RS-485 (2-wire)	Connection: RS-422 (4-wire)*2
PLC-5	PLC-5/10, PLC-5/12, PLC-5/15, PLC-5/25	1785-KE	RS-232C	Wiring diagram 4 - M2	×
		1770-KF2	RS-232C	Wiring diagram 5 - M2	×
			RS-422	×	Wiring diagram 2 - M4
	PLC-5/11, PLC-5/20, PLC-5/20E, PLC-5/30, PLC-5/40, PLC-5/40L, PLC-5/40E,PLC-5/60, PLC-5/60L, PLC-5/80, PLC-5/80E	Channel0	RS-232C	Wiring diagram 5 - M2	×
			RS-422	×	Wiring diagram 3 - M4
		1785-KE	RS-232C	Wiring diagram 4 - M2	×
		1770-KF2	RS-232C	Wiring diagram 5 - M2	×
			RS-422	×	Wiring diagram 2 - M4
Control Logix / Compact Logix	1756Control Logix	Logix5550	RS-232C	Wiring diagram 1 - M2	×
	1769Compact Logix	Channel0			
Control Logix / Compact Logix Tag	1756Control Logix	Logix5550	RS-232C		
	1769Compact Logix	Channel0			
SLC500	SLC5/03 and later	Channel0	RS-232C		
		1747-KE DF1	RS-232C	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 1 - M4
MicroLogix	MicroLogix 1000 MicroLogix 1100 MicroLogix 1500	Channel0	RS-232C	AB's "1761-CBL-PM02" + Wiring diagram 3 - M2	×
Micro800 Controllers	2080-LC20 2080-LC30 2080-LC50	Serial port	RS-232C	Wiring diagram 6 - M2	×
Micro800 Controllers Tag					

*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
PLC-5 (Ethernet)	PLC-5/20E PLC-5/40E PLC-5/80E	-	○	×	44818 fixed	○
Control Logix / Compact Logix (Ethernet)	Logix 5550	1756-ENBT/A	○	×	44818 fixed	○
	1769-L32E 1769-L35E 1769-L27ERM-QBFC1B *2	-				
Control Logix / Compact Logix Tag (Ethernet TCP/IP)	Logix 5550	1756-ENBT/A				
	1769-L32E 1769-L35E 1769-L27ERM-QBFC1B *2	-				
SLC500 (Ethernet TCP/IP)	SLC 5/05	1747-L551 1747-L552 1747-L553				
MicroLogix (Ethernet TCP/IP)	MicroLogix 1100	-				
NET-ENI (SLC500 Ethernet TCP/IP)	SLC 5/03 SLC 5/04 SLC 5/05	1761-NET-ENI 1761-NET-ENIW	○	×	Fixed to 44818 (Max. 6 units)	○
NET-ENI (MicroLogix Ethernet TCP/IP)	MicroLogix 1000 MicroLogix 1100 MicroLogix 1200 MicroLogix 1500	1761-NET-ENI 1761-NET-ENIW	○	×	Fixed to 44818 (Max. 6 units)	○
Micro800 Controllers (Ethernet TCP/IP)	2080-LC20 2080-LC50	-	○	×	Fixed to 44818	○
Micro800 Controllers Tag (Ethernet TCP/IP)						

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

4.1.1 PLC-5

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Series A 1785-KE

SW-1 (RS-232C link features)

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

SW-2 (for future use)

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

SW-3, SW-4 (node number)

SW	Item	Setting									Remarks
SW-3	First digit (OCT)	No.	0	1	2	3	4	5	6	7	Setting example: Station number 15 (DEC) = 17 (OCT) SW-3: ON, OFF, OFF SW-4: ON, ON, ON
		SW1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	
		SW2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	
		SW3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	
SW-4	Second digit (OCT)	No.	0	1	2	3	4	5	6	7	
		SW1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	
		SW2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	
		SW3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	

SW-5 (network link communication rate)

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

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

No.	Item	Setting		Remarks
1	RS-232C Communication Rate	<table><tr><th></th><th>4800 bps</th><th>9600 bps</th><th>19200 bps</th></tr><tr><td>SW1</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW2</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW3</td><td>ON</td><td>ON</td><td>ON</td></tr></table>		Set the same value as the one set on X1.
2				
3				
4	Diagnostic Commands	**ON**	**Execute diagnostic commands**	

Series B 1785-KE

SW-1 (RS-232C link features)

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

SW-2 (node number)

No.	Item	Setting		Remarks
1	Octal Digit 0	**0**	**SW1: ON** **SW2: ON**	
2				
3-5	Octal Digit 1	<table><tr><th>No.</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr><tr><td>SW3</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW4</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW5</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table>		Setting example: Station number 15 (DEC) = 17 (OCT) SW3-5: ON, OFF, OFF SW6-8: ON, ON, ON
6-8	Octal Digit 2	<table><tr><th>No.</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr><tr><td>SW6</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW7</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW8</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table>		

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

No.	Item	Setting		Remarks
1	Network Communication Rate	**ON**	**57600 bps**	For DH+ port
2		**ON**		
3-5	RS-232 Link Baud Rate	<table><tr><th></th><th>4800 bps</th><th>9600 bps</th><th>19200 bps</th></tr><tr><td>SW3</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>SW4</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>SW5</td><td>ON</td><td>ON</td><td>ON</td></tr></table>		Set the same value as the one set on X1.
6	Local / Remote operation	**ON**	**Local mode**	

SW-4 (for future use)

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

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

1770-KF2

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

SW-1 (asynchronous link features)

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

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

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

SW-3: ON, OFF, OFF
SW-4: ON, ON, ON</td></tr>
<tr><td>SW-4</td><td>Third Digit (OCT)</td><td colspan="2">
<table>
<tr><td>No.</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>SW6</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr>
<tr><td>SW7</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr>
<tr><td>SW8</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
</td></tr>
</table>

SW-5 (network link communication rate)

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

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

<table>
<tr><th>No.</th><th>Item</th><th colspan="2">Setting</th><th>Remarks</th></tr>
<tr><td>1, 2, 3</td><td>Asynchronous Communication Rate</td><td colspan="2">
<table>
<tr><td></td><td>4800 bps</td><td>9600 bps</td></tr>
<tr><td>SW1</td><td>ON</td><td>OFF</td></tr>
<tr><td>SW2</td><td>OFF</td><td>ON</td></tr>
<tr><td>SW3</td><td>ON</td><td>ON</td></tr>
</table>
</td><td>Set the same value as the one set on X1.</td></tr>
<tr><td>4</td><td>Diagnostic Commands</td><td>ON</td><td>Execute Received Diagnostic Commands</td><td></td></tr>
</table>

SW-7 (selecting the network link)

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

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

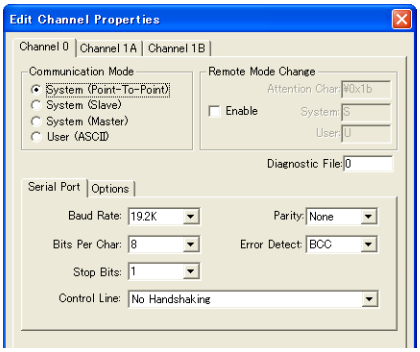
<table>
<tr><th>No.</th><th>Item</th><th>Setting</th><th>Remarks</th></tr>
<tr><td>1, 2</td><td>Selection of RS-232C / RS-422-A</td><td>
<table>
<tr><td></td><td>RS-232C</td><td>RS-422</td></tr>
<tr><td>SW1</td><td>OFF</td><td>ON</td></tr>
<tr><td>SW2</td><td>ON</td><td>OFF</td></tr>
</table>
</td><td></td></tr>
</table>

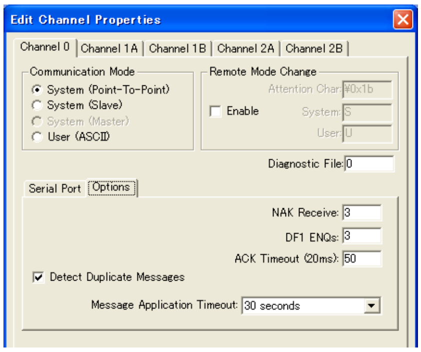
Channel 0

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

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

Channel configuration





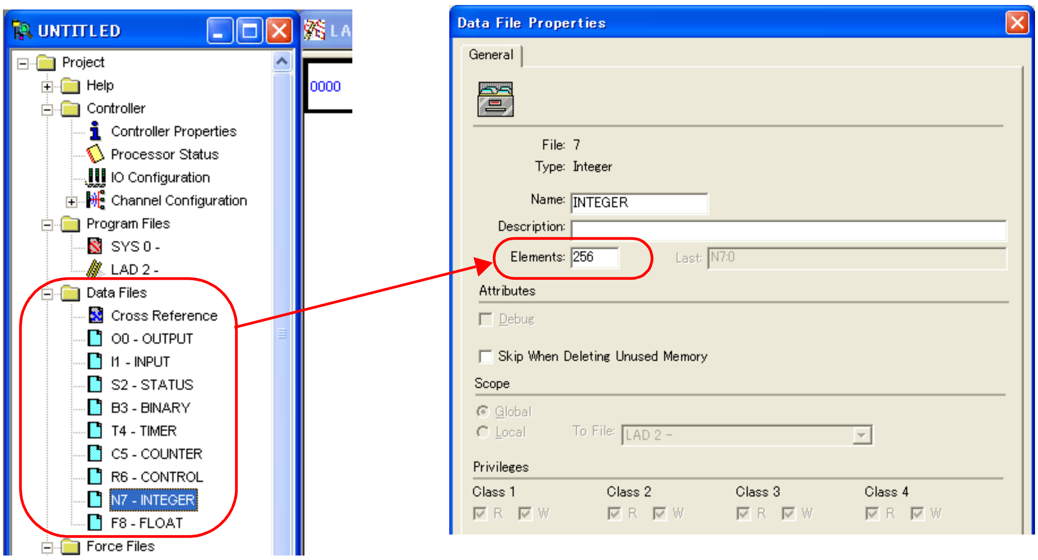
Item		Setting	Remarks
Channel 0	Communication Mode	**System (Point-To-Point)**	
	Remote Mode Change	**Unchecked**	
Serial Port	Baud Rate	4800 / 9600 / 19.2 K	
	Bits Per Char	7 / 8	
	Stop Bits	1 / 2	
	Control Line	No Handshaking	
	Parity	None / Even	
	Error Detect	**BCC**	
Options	Detect Duplicate Messages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

Available Device Memory

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

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

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



Address denotations

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

Example: For word access

Nxxx: yyy
- Element number
- File number
- Device type

For bit access

Nxxx: yyy/zz
- Bit number
- Element number
- File number
- Device type

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

Indirect Device Memory Designation

- For the file numbers 0 to 65:

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

- For the file numbers 66 to 255:

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

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

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

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

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

4.1.2 PLC-5 (Ethernet)

Communication Setting

Editor

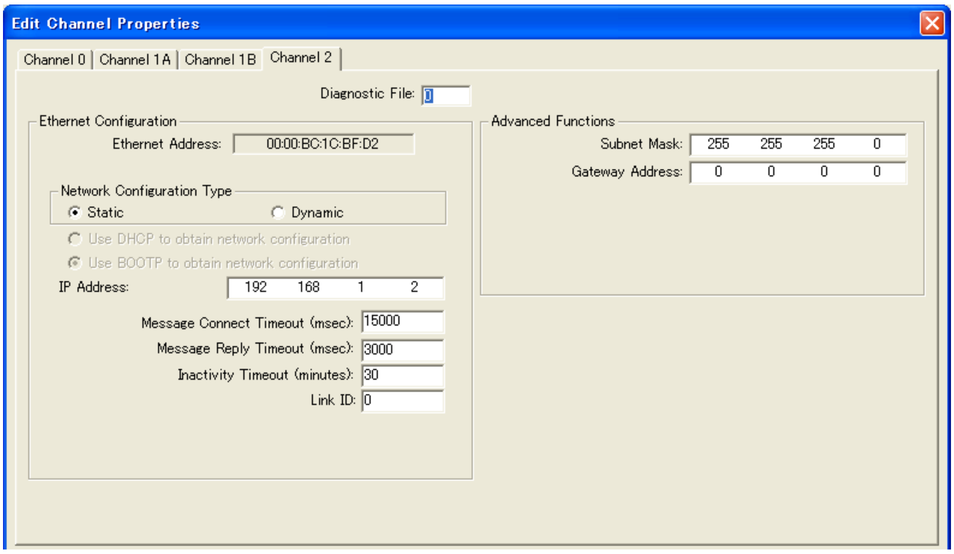
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- 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].

PLC

Channel 2

Channel configuration (channel 2)



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

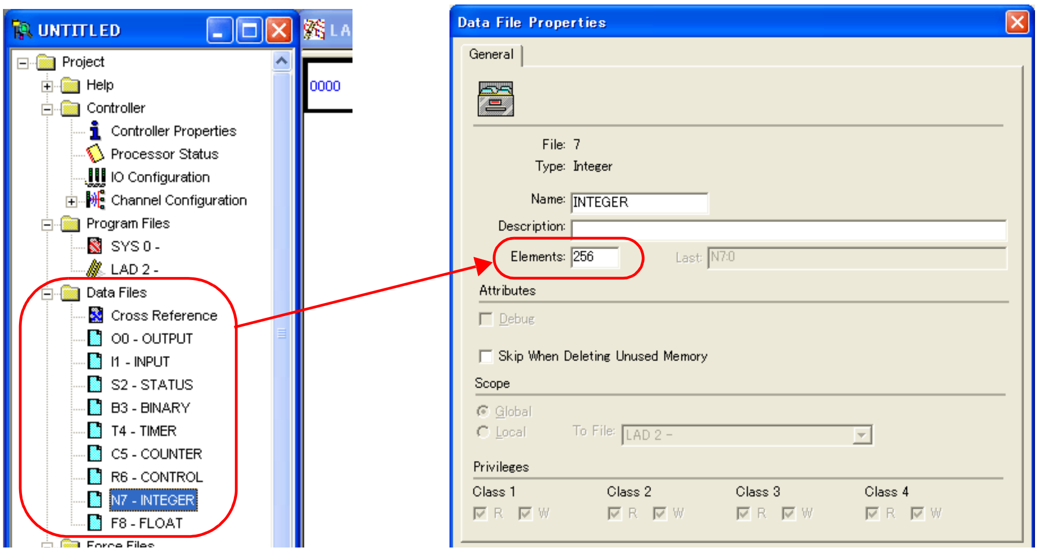
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T.ACC	(timer/current value)	02H	
T.PRE	(timer/set value)	03H	
C.ACC	(counter/current value)	04H	
C.PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R.LEN	(control/data length)	0CH	
R.POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

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



Address denotations

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

Example: For word access

Nxxx: yyy
- Element number
- File number
- Device type

For bit access

Nxxx: yyy/zz
- Bit number
- Element number
- File number
- Device type

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

Indirect Device Memory Designation

- For the file numbers 0 to 65:

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

- For the file numbers 66 to 255:

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

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

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

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

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

4.1.3 Control Logix / Compact Logix

The PLC can only be set at logical port PLC1.

Communication Setting

Editor

Communication setting

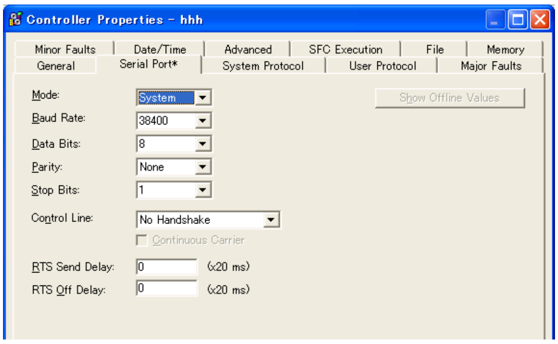
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 / 57600 115k bps	
Data Length	<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

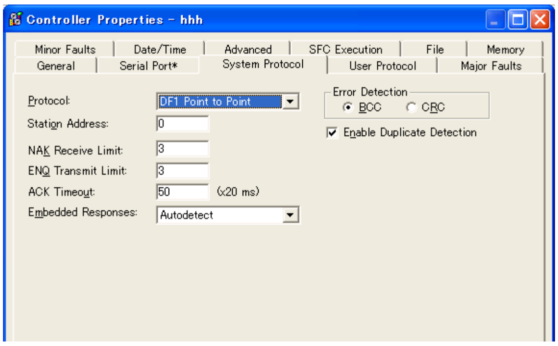
Control Logix

Serial port



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

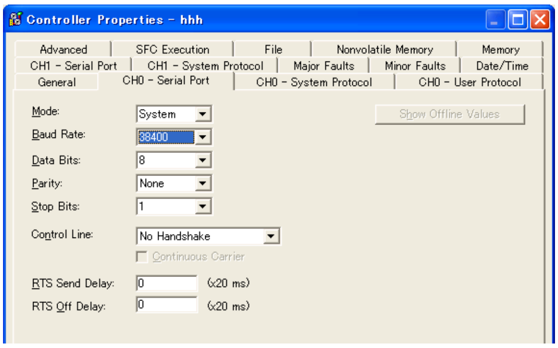
System protocol



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

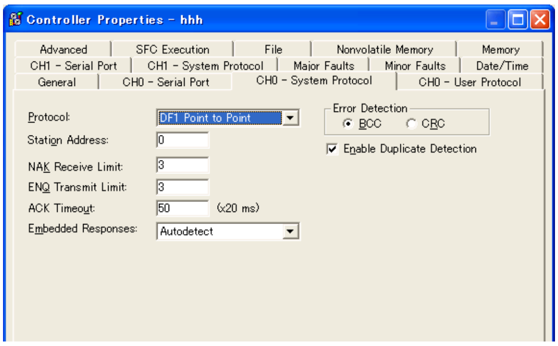
Compact Logix

CH0 - serial port



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

CH0 - system protocol



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

Available Device Memory

After creating variables (tags) on the PLC ladder tool, export the variables and import them into V-SFT. Then set PLC device memory addresses.
For details on importing tags, refer to the “Allen-Bradley PLC Connection” manual.

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

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

Dim0	Dim1	Dim2
0 to 1022	None	None
0 to 1023	0 to 1022	None
0 to 1023	0 to 1023	0 to 1022

Indirect Device Memory Designation

Not available

4.1.4 Control Logix / Compact Logix Tag

The PLC can be set at logical ports PLC1 to PLC8.

Communication Setting

The contents are the same as those described in "4.1.3 Control Logix / Compact Logix".

Available Device Memory

After creating variables (tags) on the PLC ladder tool, export the variables and import them into V-SFT. Then set PLC device memory addresses.
For details on importing tags, refer to the "Allen-Bradley PLC Connection" manual.

Data Type		Range of Number of Elements for Arrays *1			Tag Name	Remarks
		Index1	Index2	Index3		
BOOL	(1-bit integer)	0 to 65535	-	-	Up to 100 characters	*2, *3
SINT	(1-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383		*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		

*1 The ranges given are based on when a maximum value is specified. The maximum setting is 65335, which is the total number of elements (Index1 × Index2 × Index3).
Ranges differ according to the created tag.
When the Index is "1", there are no array elements.
Setting example: If the expression on the PLC is [0..9,0..19], the setting on V-SFT is Index1=10, Index2=20, and Index3=0.

*2 A BOOL type array can be created using elements in multiples of 32.

*3 When accessing bytes in units of words, such as for numerical display parts, if a variable is smaller than 2 bytes (1 word), only the byte that contains data is accessed.

Example: SINT type
When the variable 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 display part (1 word) on V-SFT, only the single byte of "DATA [2] [2]" is accessed.

*4 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.

- SINT type
  When the variable 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 display part (1 word) on V-SFT, the 2 bytes from "DATA [0] [0]" to "DATA [0] [1]" are read.

Indirect Device Memory Designation

Not available

4.1.5 Control Logix / Compact Logix (Ethernet)

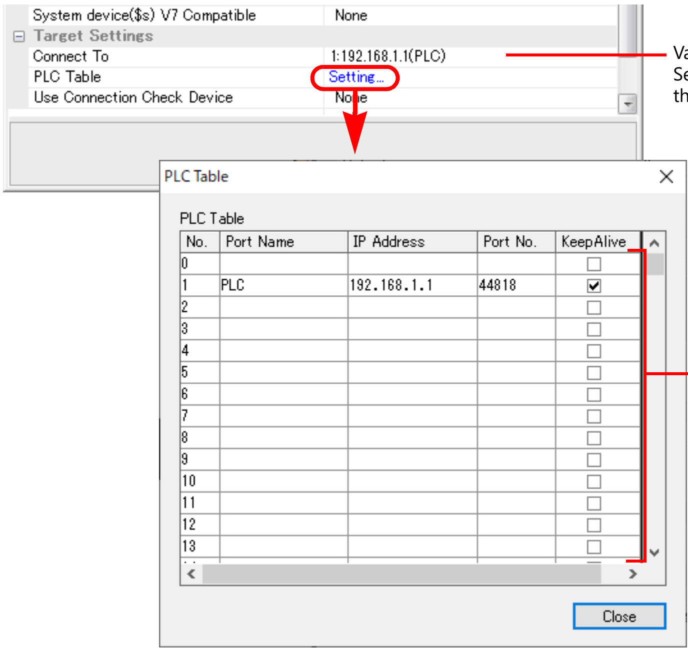
The PLC can only be set at logical port PLC1.

Communication Setting

Editor

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

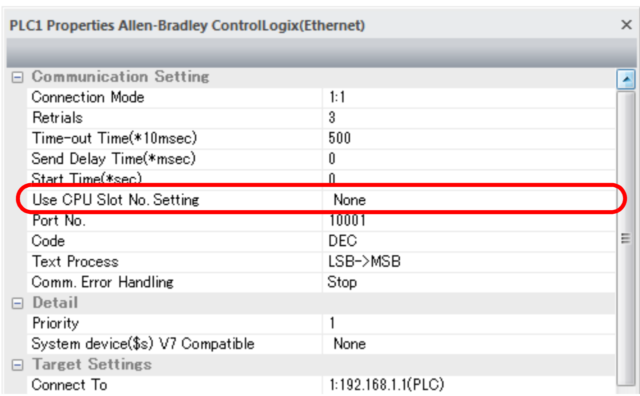
- IP address for the X1 series unit
  Set the IP address using System Configurator. For details, see “IP Address Setting of the X1 Series Unit”.
- Port number for the X1 series unit (for communication with PLC)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Communication Setting]
- IP address and port number (No. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

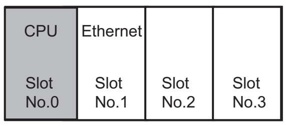


Valid only for 1 : 1 connection
Select the PLC for connection from those registered on the PLC table.

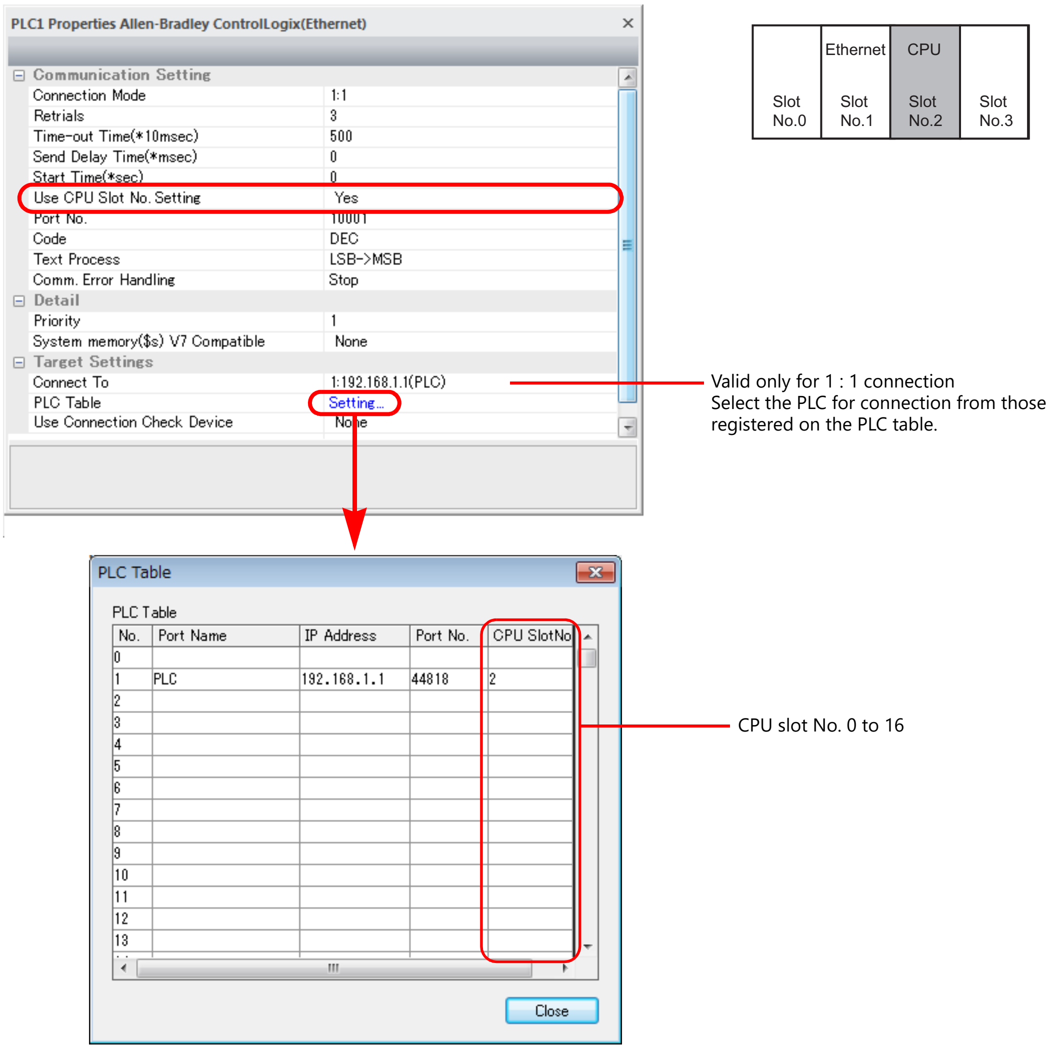
Set the IP address, port number (No. 44818) and whether or not to use the KeepAlive function of the PLC.

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





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



PLC

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

- BOOTP utility
- RSLinx software
- RSLogix 5000 software

Available Device Memory

The contents are the same as those described in “4.1.3 Control Logix / Compact Logix”.

4.1.6 Control Logix / Compact Logix Tag (Ethernet TCP/IP)

The PLC can be set at logical ports PLC1 to PLC8.

Communication Setting

The contents are the same as those described in "4.1.5 Control Logix / Compact Logix (Ethernet)".

Available Device Memory

The contents are the same as those described in "4.1.4 Control Logix / Compact Logix Tag".

4.1.7 SLC500

Communication Setting

Editor

Communication setting

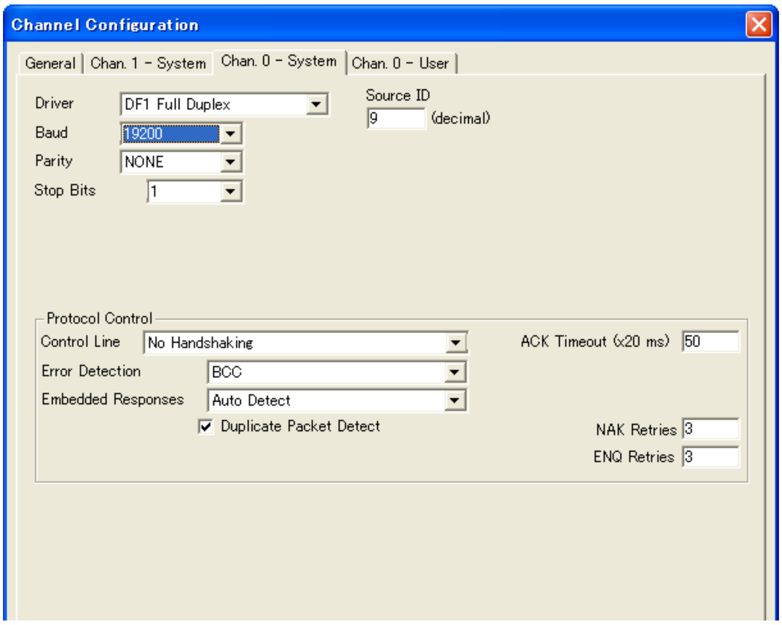
(Underlined setting: default)

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

PLC

Channel 0

Channel configuration (chan. 0 - system)

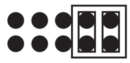
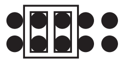


(Underlined setting: default)

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

1747-KE

Jumper JW2

Item	Setting	Remarks
RS-232		
RS-422		

DF1 port setup menu

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

DF1 full-duplex setup menu

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

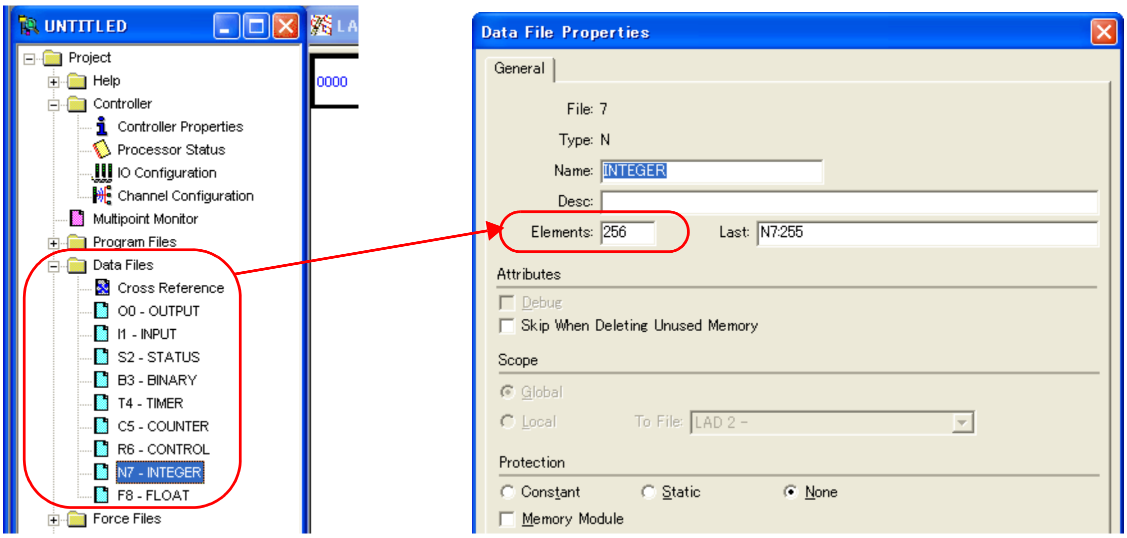
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

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



Address denotations

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

- Address other than input/output

  - For word access

    Nxxx: yyy

    Element number
    File number
    Device type

  For bit access

    Nxxx: yyy/zz

    Bit number
    Element number
    File number
    Device type

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

- Input/output address

  - For word access

    I: xxx. yyy

    Element number
    Slot No.
    Device type

  For bit access

    I: xxx. yyy/zz

    Bit number
    Element number
    Slot No.
    Device type

Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

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

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

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

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

4.1.8 SLC500 (Ethernet TCP/IP)

Communication Setting

Editor

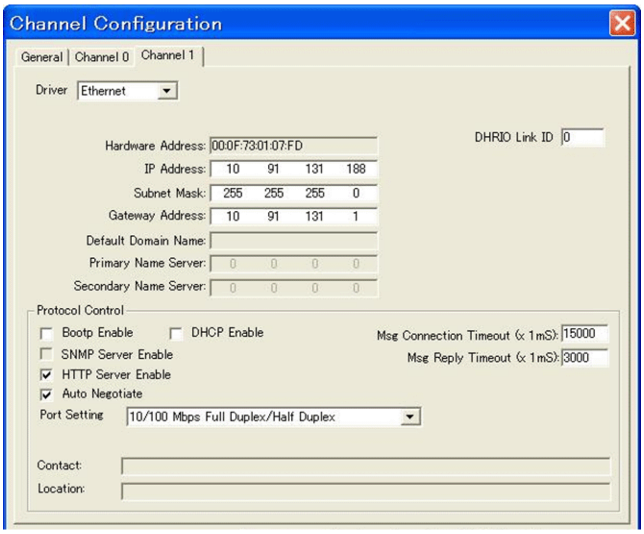
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- 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. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Channel 1

Channel configuration (channel 1)



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

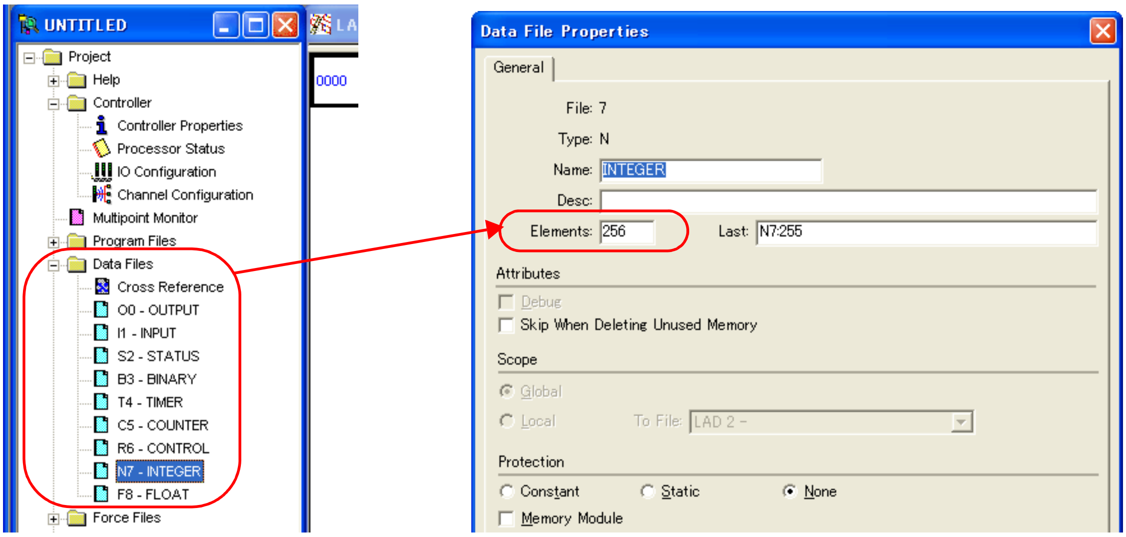
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

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



Address denotations

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

- Address other than input/output
  - For word access

    Nxxx: yyy
    - Element number
    - File number
    - Device type

  - For bit access

    Nxxx: yyy/zz
    - Bit number
    - Element number
    - File number
    - Device type

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

- Input/output address
  - For word access

    I: xxx. yyy
    - Element number
    - Slot No.
    - Device type

  - For bit access

    I: xxx. yyy/zz
    - Bit number
    - Element number
    - Slot No.
    - Device type

Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

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

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

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

4.1.9 Micro Logix

Communication Setting

Editor

Communication setting

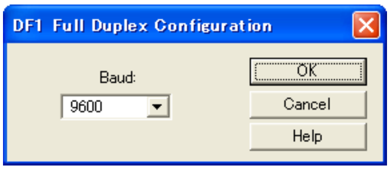
(Underlined setting: default)

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

PLC

Channel Configuration

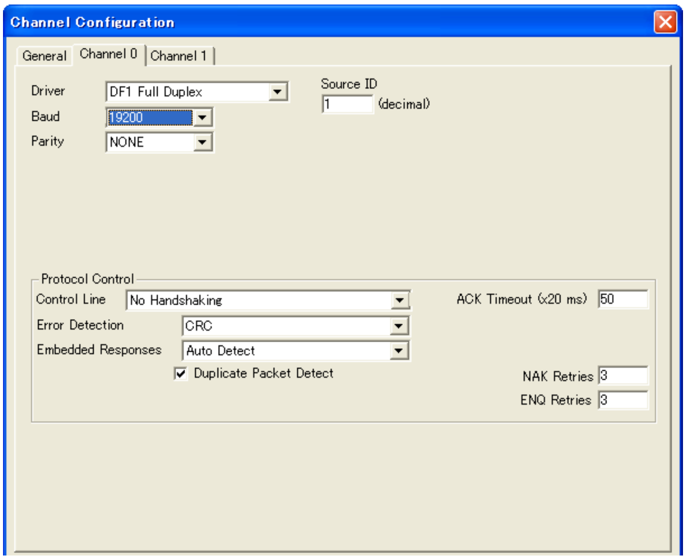
Micro Logix 1000



(Underlined setting: default)

Item	Setting	Remarks
Baud	4800 / <u>9600</u> / 19200 / 38.4K	

Micro Logix 1100, 1500



(Underlined setting: default)

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

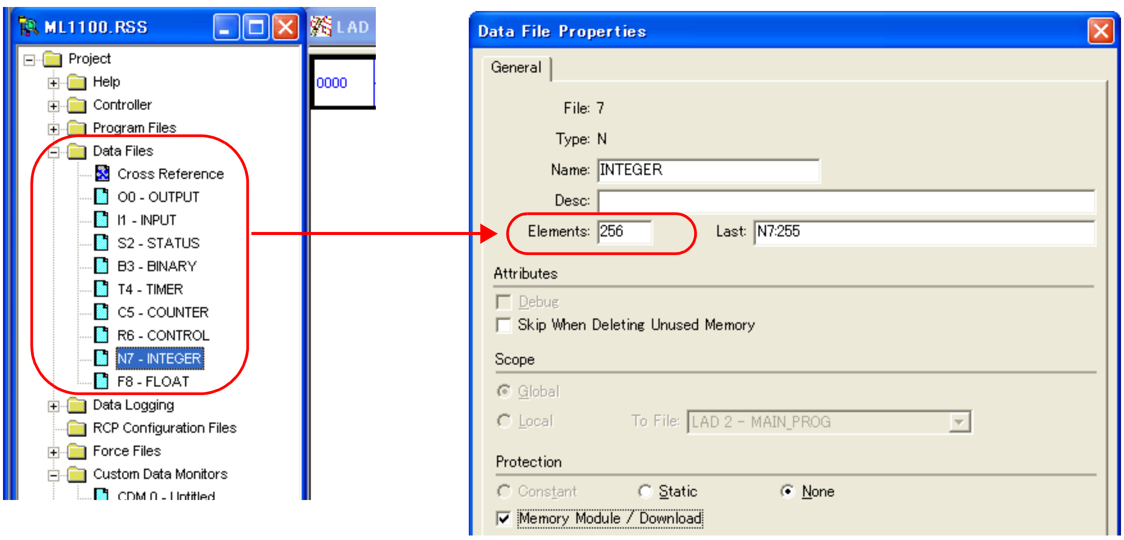
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
D	(BCD)	0EH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1
L	(LONG)	12H	Double-word

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

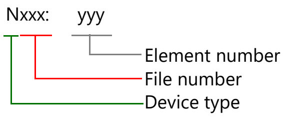
Make settings for “Data Files” using the ladder tool. Otherwise, “Error Code 10 00” is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



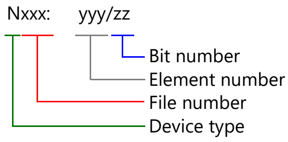
Address denotations

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

- Address other than input/output
  - For word access

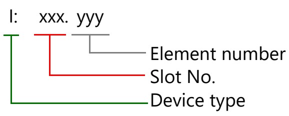


For bit access

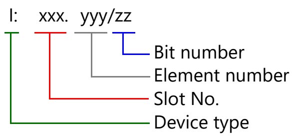


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

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

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

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

4.1.10 Micro Logix (Ethernet TCP/IP)

Communication Setting

Editor

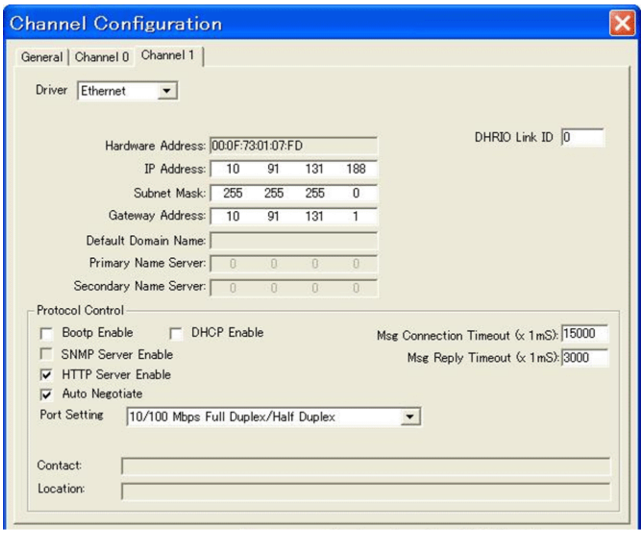
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- 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. 44818) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Channel 1

Channel configuration (channel 1)



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

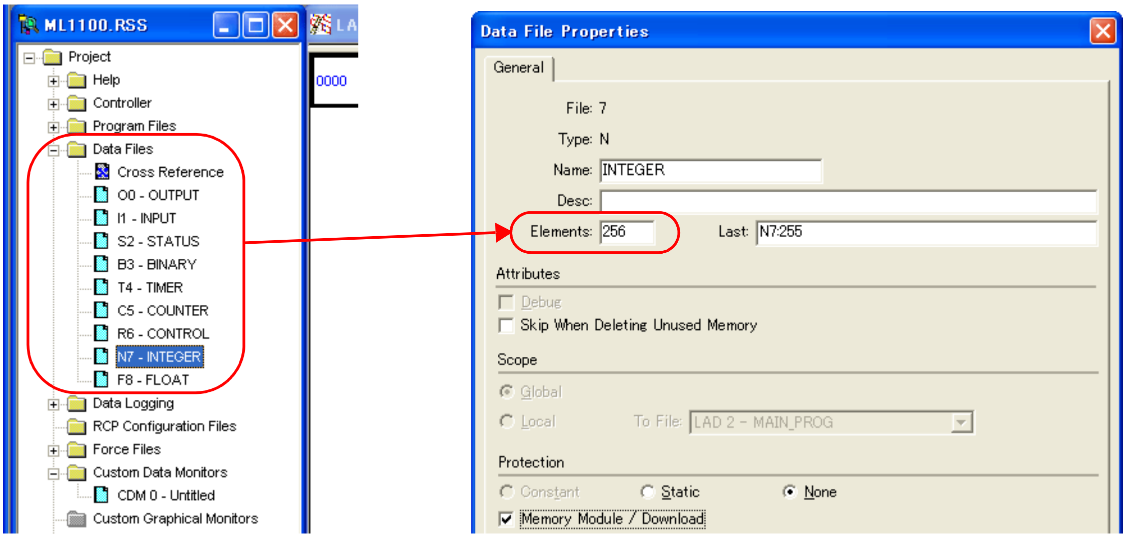
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1
L	(LONG)	12H	Double-word

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

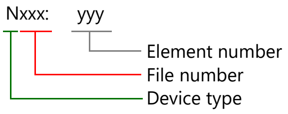
Make settings for "Data Files" using the ladder tool. Otherwise, "Error Code 10 00" is displayed on MONITOUCH.
For more information, refer to the PLC manual issued by the manufacturer.



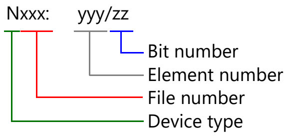
Address denotations

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

- Address other than input/output
  - For word access

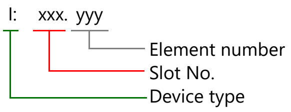


  - For bit access

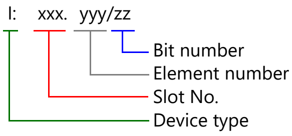


The file number will not be displayed for the input, output or status device memory.

- Input/output address
  - For word access



  - For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

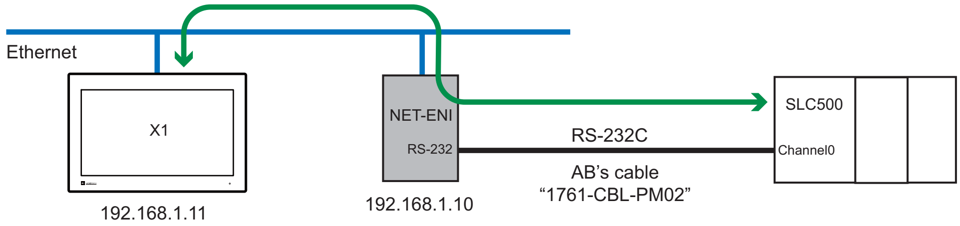
  Example: When specifying N007:123
  Specify "7123" (DEC) for the address number.

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

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

4.1.11 NET-ENI (SLC500 Ethernet TCP/IP)

The X1 series establishes communication with SLC500 via NET-ENI.



Communication Setting

Editor

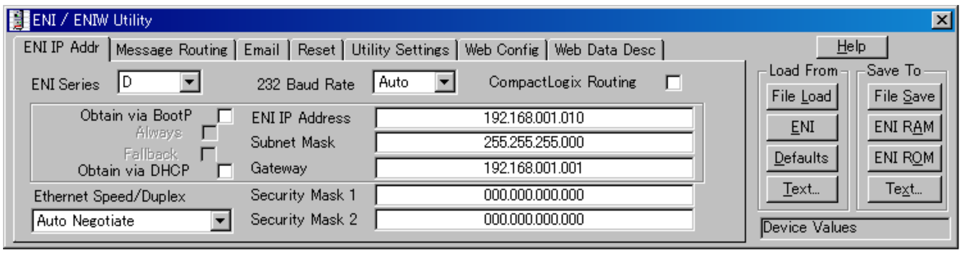
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- 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].

PLC

NET-ENI / NET-ENIW

ENI / ENIW utility

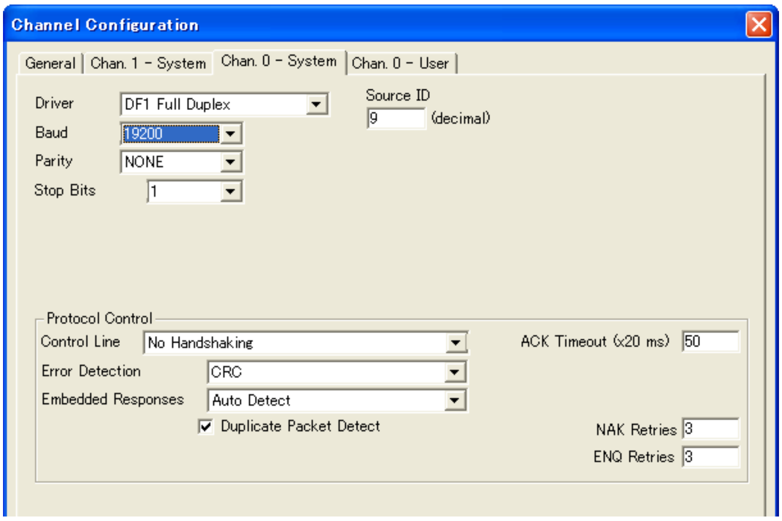


Item		Setting	Remarks
ENI IP Addr	232 Baud Rate	Auto	
	ENI IP Address	Set the IP address of NET-ENI.	
	Subnet Mask	Set the subnet mask of NET-ENI.	
	Gateway	Make settings in accordance with the network environment.	

Press [ENI ROM] to save the settings.

SLC500

Channel configuration



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

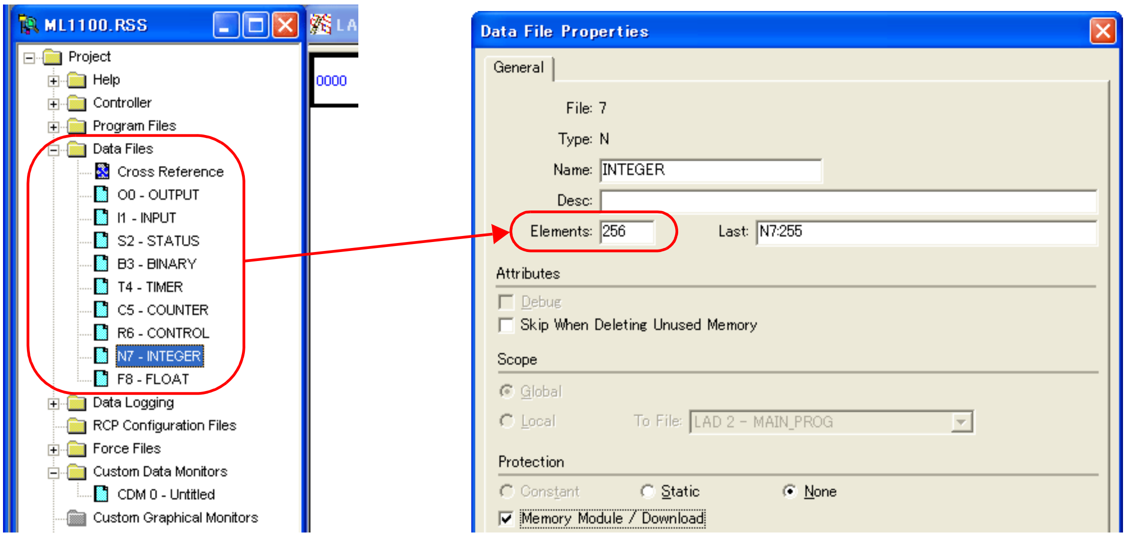
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

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

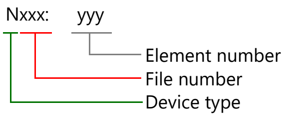


Address denotations

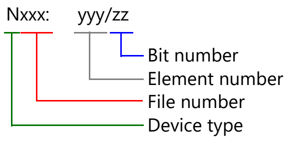
The assigned device memory is expressed as shown below when editing the screen.

- Address other than input/output

- For word access



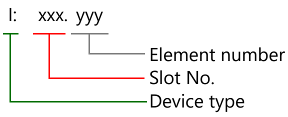
For bit access



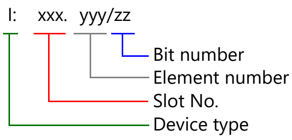
The file number will not be displayed for the input, output or status device memory.

- Input/output address

- For word access



For bit access



Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

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

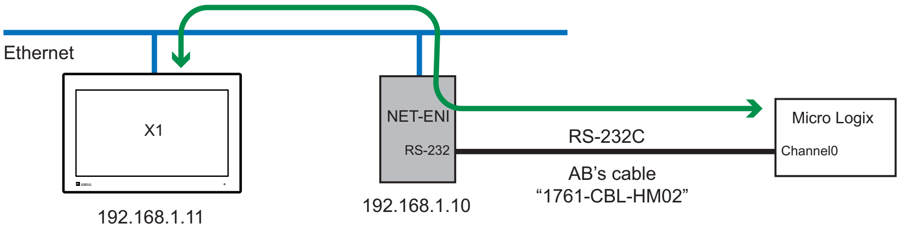
  Example: When specifying N120:123
  Specify "120123" (DEC) for the address number.
  120123 (DEC) is equivalent to 1D53B (HEX). Specify "D53B (HEX)" for the lower address number and "0001" for the upper address number.

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

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

4.1.12 NET-ENI (MicroLogix Ethernet TCP/IP)

The X1 series establishes communication with MicroLogix via NET-ENI.



Communication Setting

Editor

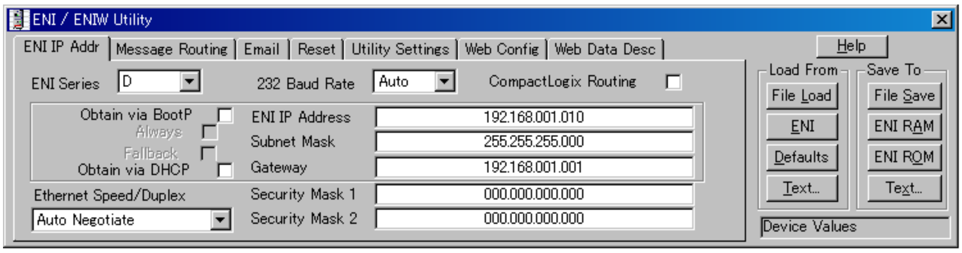
Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- 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].

PLC

NET-ENI / NET-ENIW

ENI / ENIW utility

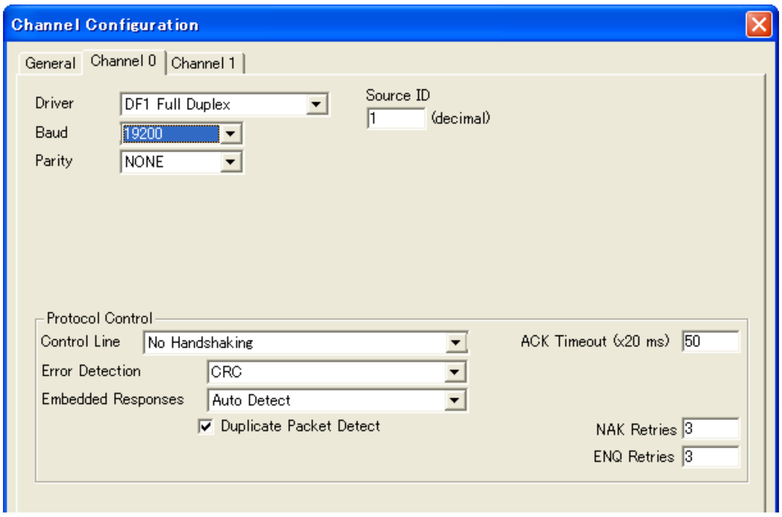


Item		Setting	Remarks
ENI IP Addr	232 Baud Rate	Auto	
	ENI IP Address	Set the IP address of NET-ENI.	
	Subnet Mask	Set the subnet mask of NET-ENI.	
	Gateway	Make settings in accordance with the network environment.	

Press [ENI ROM] to save the settings.

MicroLogix

Channel Configuration



(Underlined setting: default)

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

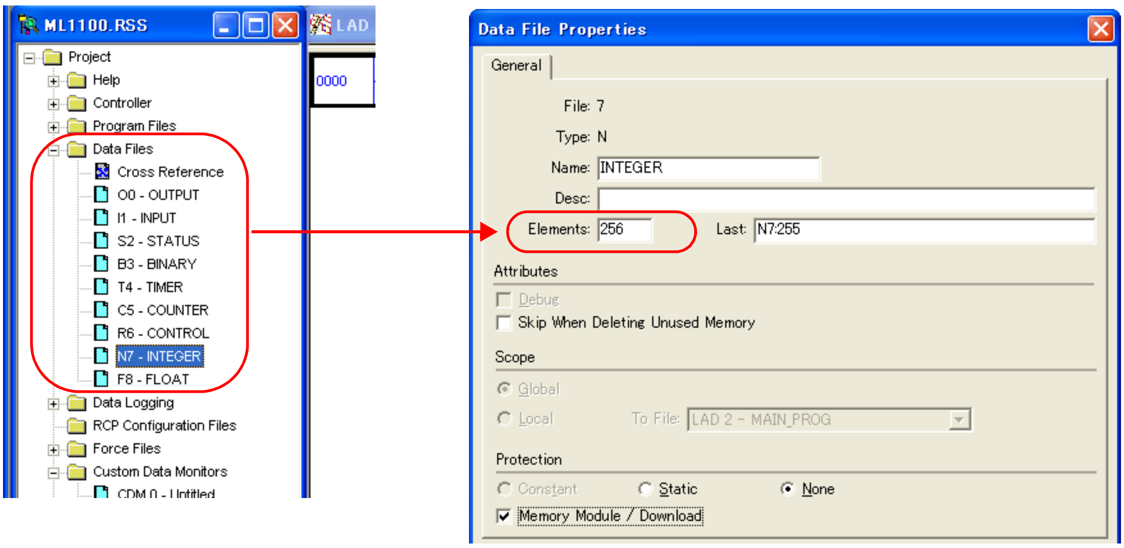
Available Device Memory

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

Device Memory		TYPE	Remarks
N	(integer)	00H	
B	(bit)	01H	
T. ACC	(timer/current value)	02H	
T. PRE	(timer/set value)	03H	
C. ACC	(counter/current value)	04H	
C. PRE	(counter/set value)	05H	
I	(input)	06H	
O	(output)	07H	
S	(status)	08H	
T	(timer/control)	09H	
C	(counter/control)	0AH	
R	(control)	0BH	
R. LEN	(control/data length)	0CH	
R. POS	(control/data position)	0DH	
A	(ASCII)	0FH	
F	(FLOAT)	10H	Real number
ST	(STRING)	11H	*1
L	(LONG)	12H	Double-word

*1 Set to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

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



Address denotations

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

- Address other than input/output

- For word access

Nxxx: yyy

Element number
File number
Device type

For bit access

Nxxx: yyy/zz

Bit number
Element number
File number
Device type

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

- Input/output address

- For word access

I: xxx. yyy

Element number
Slot No.
Device type

For bit access

I: xxx. yyy/zz

Bit number
Element number
Slot No.
Device type

Indirect Device Memory Designation

- For the file or slot numbers 0 to 65:

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

- For the file or slot numbers 66 to 255:

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

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

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

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

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

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

4.1.13 Micro800 Controllers

The PLC can only be set at logical port PLC1.

Communication Setting

Editor

Communication setting

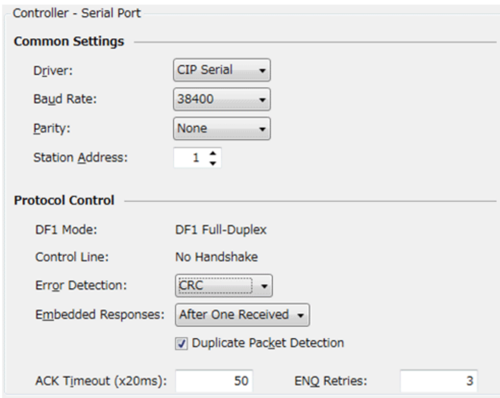
(Underlined setting: default)

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

PLC

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

Controller - Serial Port



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

Available Device Memory

After creating variables (tags) on the PLC ladder tool, export the variables and import them into V-SFT. Then set PLC device memory addresses.
For details on importing tags, refer to the “Allen-Bradley PLC Connection” manual.

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

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

Dim0	Dim1	Dim2
0 to 1022	None	None
0 to 1023	0 to 1022	None
0 to 1023	0 to 1023	0 to 1022

Indirect Device Memory Designation

Not available

4.1.14 Micro800 Controllers Tag

The PLC can be set at logical ports PLC1 to PLC8.

Communication Setting

The contents are the same as those described in “4.1.13 Micro800 Controllers”.

Available Device Memory

After creating variables (tags) on the PLC ladder tool, export the variables and import them into V-SFT. Then set PLC device memory addresses.
For details on importing tags, refer to the “Allen-Bradley PLC Connection” manual.

Data Type		Range of Number of Elements for Arrays *1			Tag Name	Remarks
		Index1	Index2	Index3		
BOOL	(1-bit integer)	0 to 65535	0 to 32767	0 to 16383	Up to 100 characters	*2, *3
SINT	(1-byte integer with a sign)	0 to 65535	0 to 32767	0 to 16383		*2, *3
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 511	0 to 255	0 to 127		*3, *4
USINT	(1-byte integer without a sign)	0 to 65535	0 to 32767	0 to 16383		*2, *3
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
WORD	(2-byte integer)	0 to 65535	0 to 32767	0 to 16383		
DWORD	(4-byte integer)	0 to 65535	0 to 32767	0 to 16383		

*1 The ranges given are based on when a maximum value is specified. The maximum setting is 65335, which is the total number of elements (Index1 × Index2 × Index3).
Ranges differ according to the created tag.
When the Index is “1”, there are no array elements.
Setting example: If the expression on the PLC is [0..9,0..19], the setting on V-SFT is Index1=10, Index2=20, and Index3=0.

*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 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 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 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 display part (1 word) on V-SFT, the 2 bytes from “DATA [0] [0]” to “DATA [0] [1]” are read.

*3 When accessing bytes in units of words, such as for numerical display parts, if a variable is smaller than 2 bytes (1 word), only the byte that contains data is accessed.
Example: SINT type
When the variable 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 display part (1 word) on V-SFT, only the single byte of “DATA [2] [2]” is accessed.

*4 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

4.1.15 Micro800 Controllers (Ethernet TCP/IP)

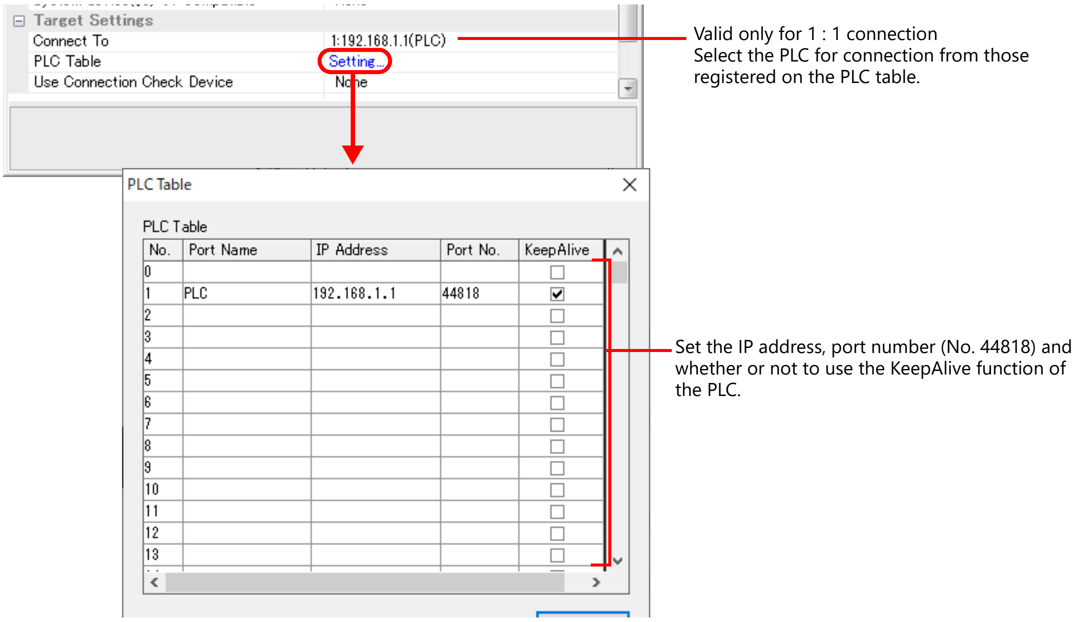
The PLC can only be set at logical port PLC1.

Communication Setting

Editor

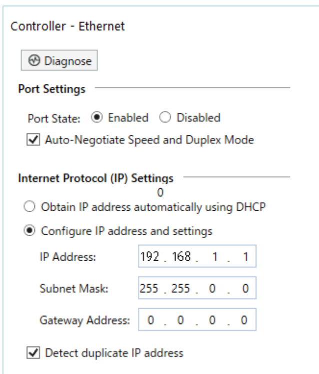
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- 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].



PLC

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



Available Device Memory

The contents are the same as those described in “4.1.13 Micro800 Controllers”.

4.1.16 Micro800 Controllers Tag (Ethernet TCP/IP)

The PLC can be set at logical ports PLC1 to PLC8.

Communication Setting

The contents are the same as those described in “4.1.15 Micro800 Controllers (Ethernet TCP/IP)”.

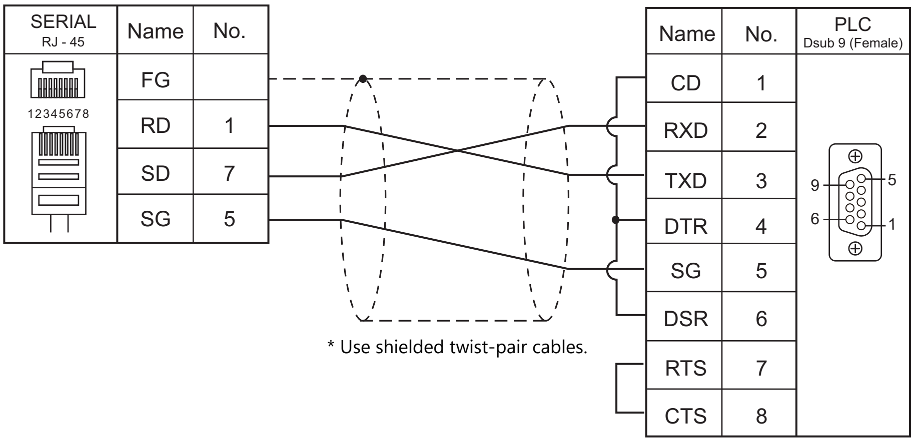
Available Device Memory

The contents are the same as those described in “4.1.14 Micro800 Controllers Tag”.

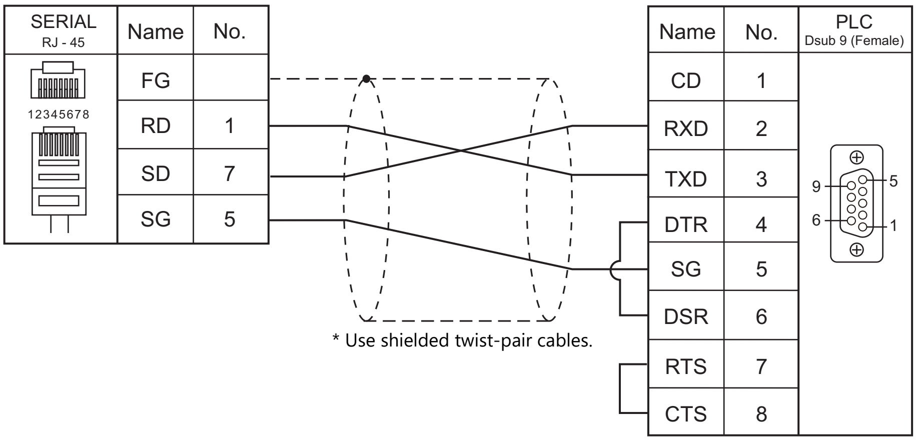
4.1.17 Wiring Diagrams

RS-232C

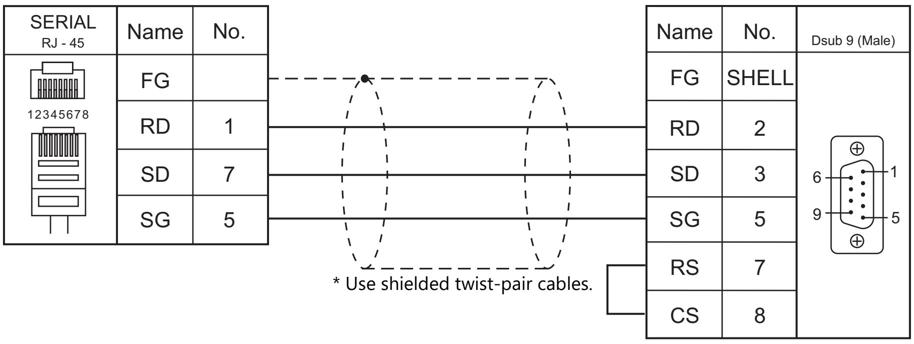
Wiring diagram 1 - M2



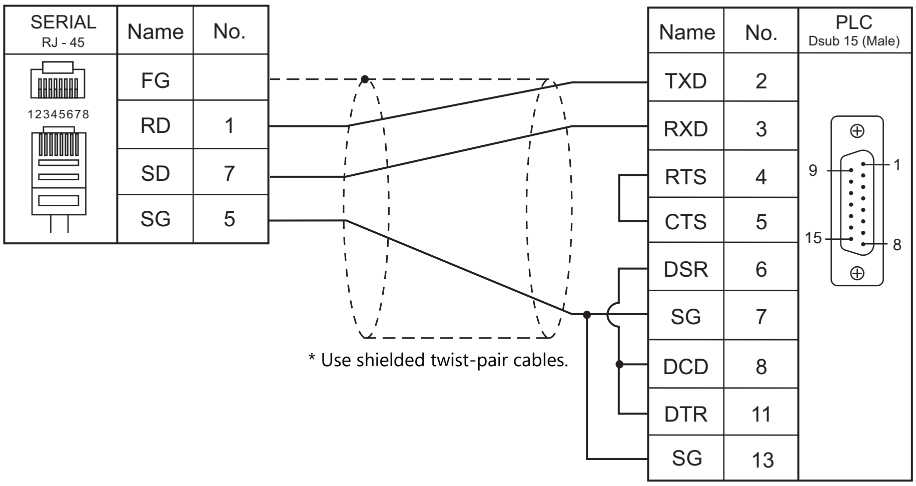
Wiring diagram 2 - M2



Wiring diagram 3 - M2

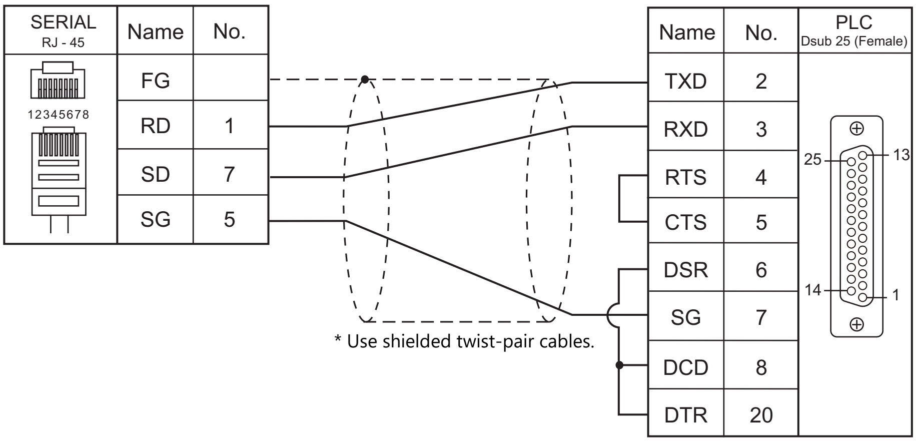


Wiring diagram 4 - M2



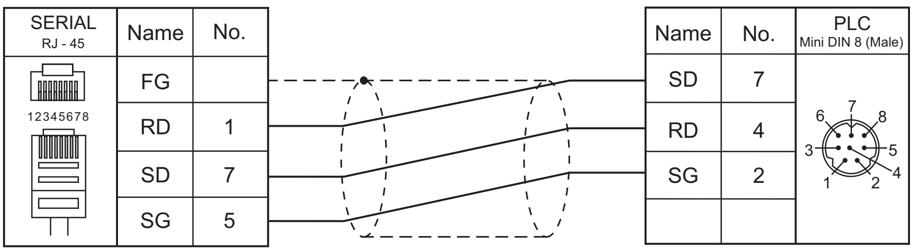
* Use shielded twist-pair cables.

Wiring diagram 5 - M2



* Use shielded twist-pair cables.

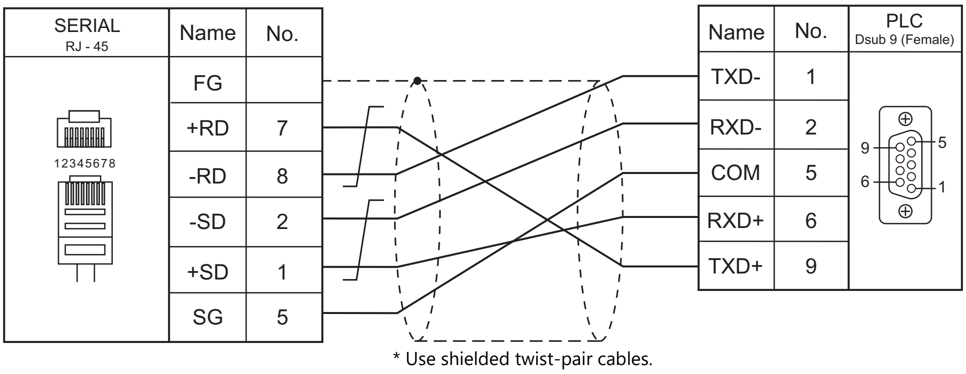
Wiring diagram 6 - M2



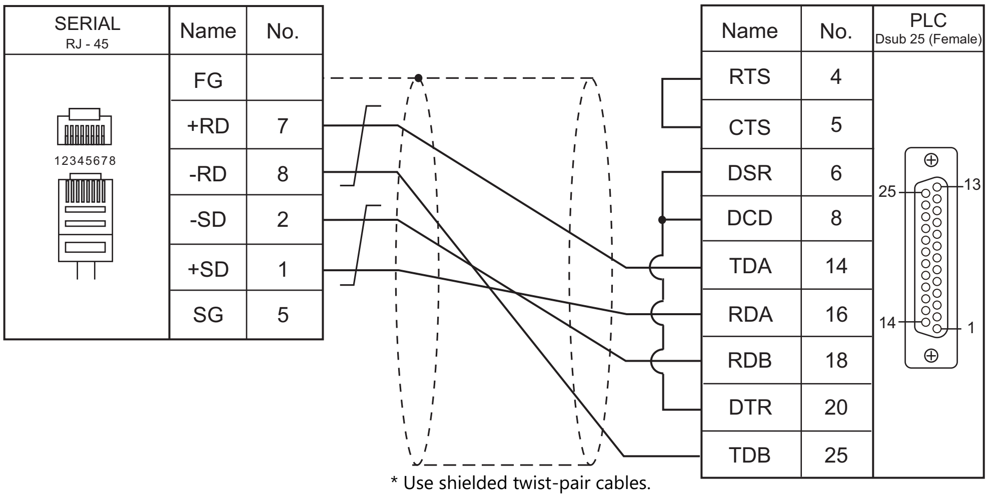
* Use shielded twist-pair cables.

RS-422/RS-485

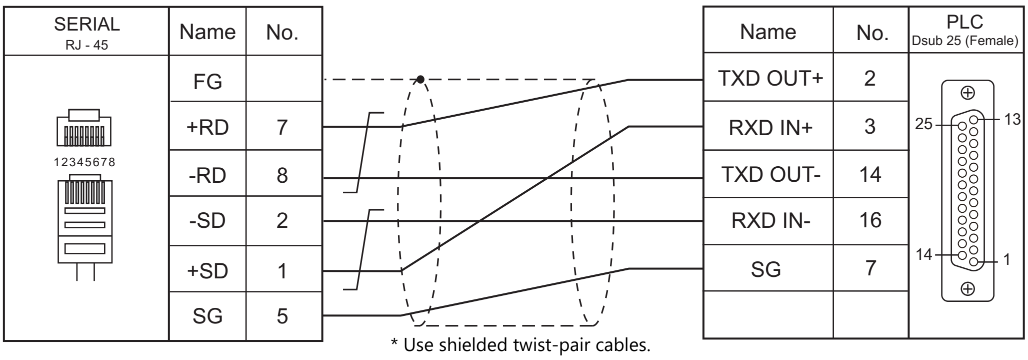
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



5. Automationdirect

5.1 PLC Connection

Serial Connection

PLC Selection on the Editor	PLC	Port	Signal Level	Connection	
				RS-232C*1 / RS-485 (2-wire)	RS-422 (4-wire)*2
Direct LOGIC (K-Sequence)	D4-430 D4-440	Port 0	RS-232C	Wiring diagram 4 - M2	×
		Port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 1 - M4
	D4-450	Port 0	RS-232C	Wiring diagram 4 - M2	×
		Port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 1 - M4
		Port 2	RS-232C	Wiring diagram 3 - M2	×
		Port 3	RS-422	×	Wiring diagram 2 - M4
	D2-230	PORT1	RS-232C	Wiring diagram 3 - M2	×
	D2-240 DL05	PORT1			
		PORT2			
	D2-250-1 D2-260 DL06	PORT1			
		PORT2	RS-232C	Wiring diagram 2 - M2	×
			RS-422	×	Wiring diagram 3 - M4
Direct LOGIC (MODBUS RTU)	D4-450	Port 1	RS-232C	Wiring diagram 1 - M2	×
			RS-422	×	Wiring diagram 1 - M4
		Port 3	RS-422	×	Wiring diagram 2 - M4
	D2-250-1 D2-260	PORT2	RS-232C	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).

Ethernet Connection

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

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

5.1.1 Direct LOGIC (K-Sequence)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

D4-450

PORT0

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

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

PORT1

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

Parameter setting register

(Underlined setting: default)

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

PORT2

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

Parameter setting register

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

PORT3

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

Parameter setting register

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

D2-240/D2-250-1

PORT1 / PORT2

No particular setting is necessary on the PLC. The PLC performs communication functions using the following parameters. Set the following parameters under [Communication Setting] of 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
V	(data register)	00H	
X	(input)	01H	
Y	(output)	02H	
C	(internal relay)	03H	
S	(stage)	04H	
GX	(transmission relay for all stations)	05H	
GY	(transmission relay for specified station)	06H	
T	(timer/contact)	07H	
CT	(counter/contact)	08H	

5.1.2 Direct LOGIC (Ethernet UDP/IP)

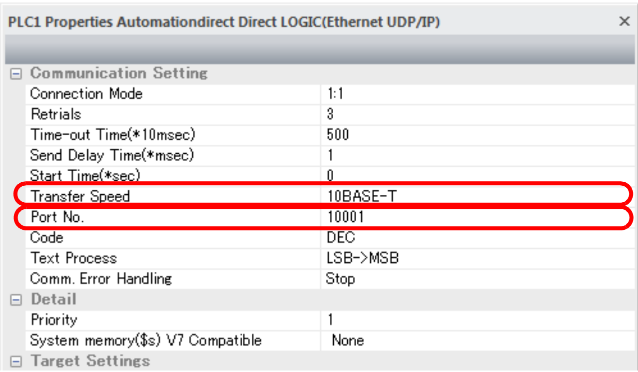
Communication Setting

Editor

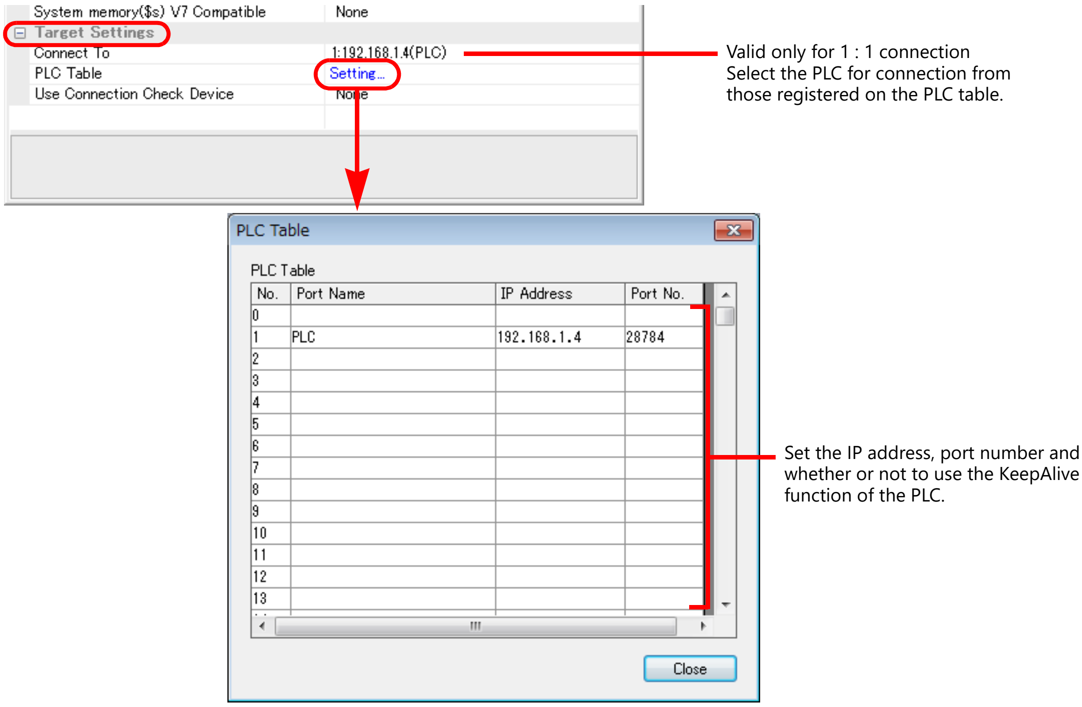
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- 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]
  - For [Transfer Speed], select the same setting as the specification of the connected communication module.*
    For Hx-ECOM: 10BASE-T
    For Hx-ECOM100: 100BASE-TX

  * If the transfer speed is not selected correctly, a check code error occurs.



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



DirectLOGIC/SU Series

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

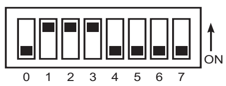
Link wizard

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

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

DIP switch

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

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

Available Device Memory

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

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

5.1.3 Direct LOGIC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

D4-450

PORT1

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

Parameter setting register

(Underlined setting: default)

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

PORT3

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

Parameter setting register

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

D2-250-1

PORT2

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

Parameter setting register

(Underlined setting: default)

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

Available Device Memory

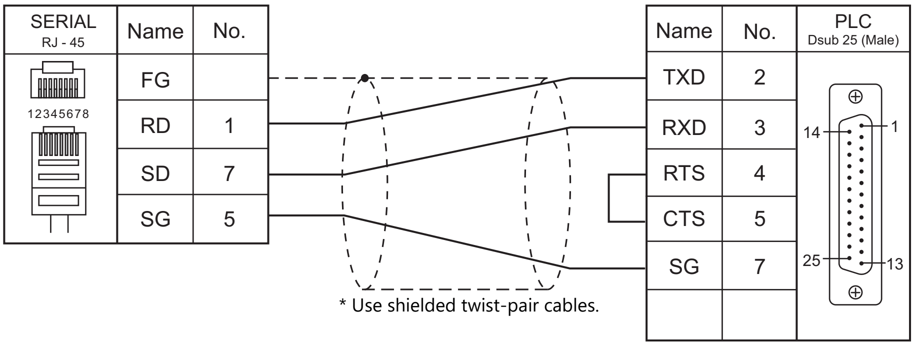
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

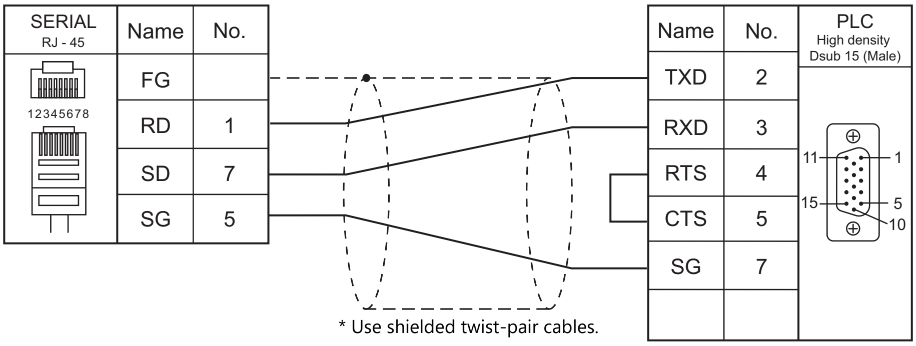
5.1.4 Wiring Diagrams

RS-232C

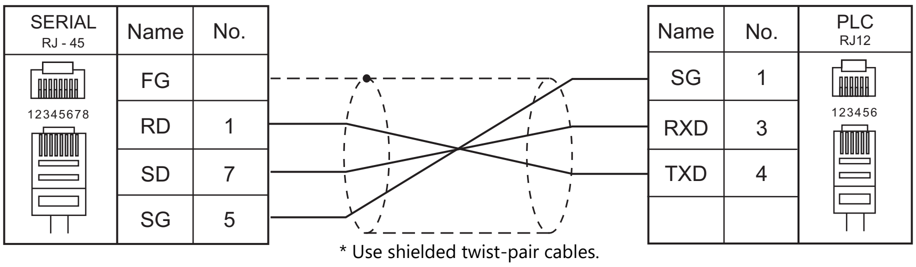
Wiring diagram 1 - M2



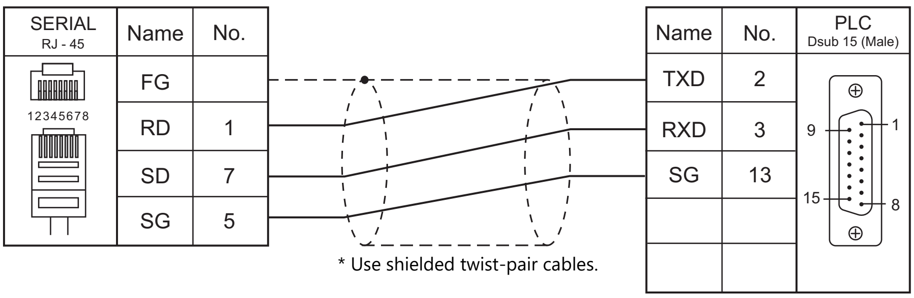
Wiring diagram 2 - M2



Wiring diagram 3 - M2

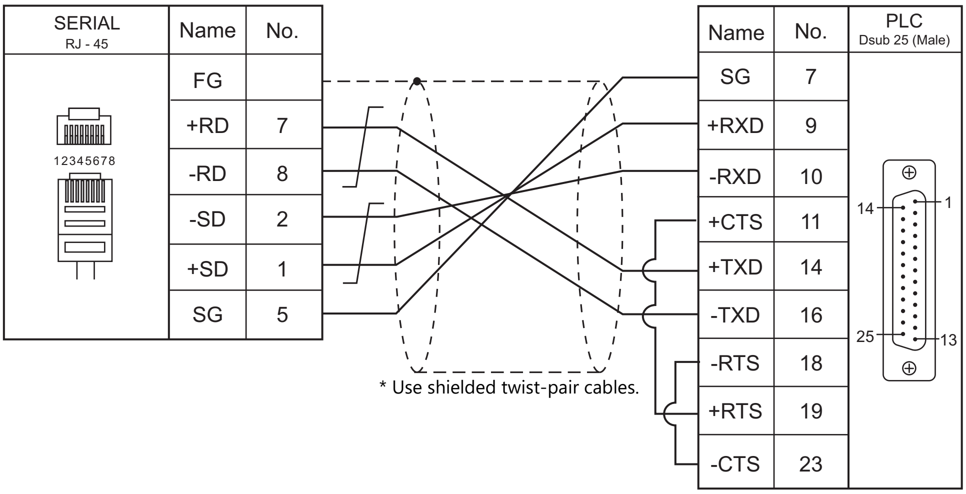


Wiring diagram 4 - M2

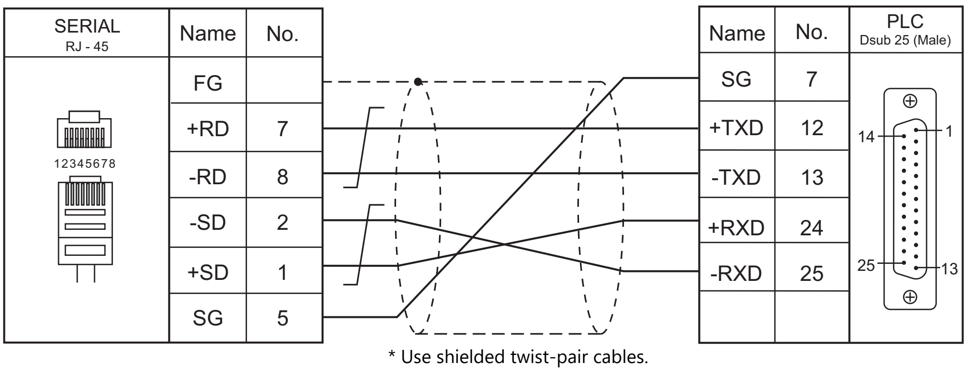


RS-422/RS-485

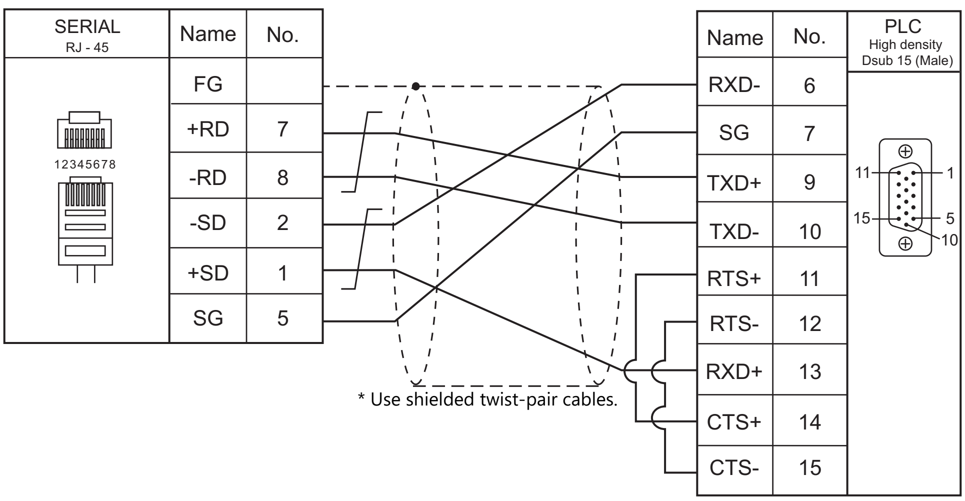
Wiring diagram 1 - M4



Wiring diagram 2 - M4



Wiring diagram 3 - M4



6. Azbil

6.1 PLC Connection

Serial Connection

PLC Selection on the Editor	Model	Port	Signal Level	Connection	
				RS-232C*1 / RS-485 (2-wire)	RS-422 (4-wire)
MX series	MX50	LOAD connector (CN7)	RS-232C	Wiring diagram 1 - M2	×
		ASCII connector (CN8)		Wiring diagram 2 - M2	×
	MX200	LOAD connector	RS-232C	Wiring diagram 2 - M2	×
		ASCII connector			

*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 MX Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

MX50

Communication setting

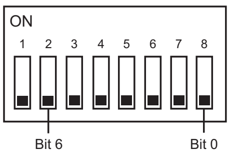
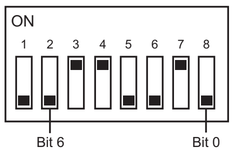
Make the following settings using the application software. For more information, refer to the PLC manual issued by the manufacturer.

(Underlined setting: default)

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

Station number

Set a station number using the DIP switches.

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

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

MX200

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

LOAD connector

(Underlined setting: default)

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

ASCII connector

(Underlined setting: default)

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

Station number

Make the following setting on the front panel.

(Underlined setting: default)

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

Available Device Memory

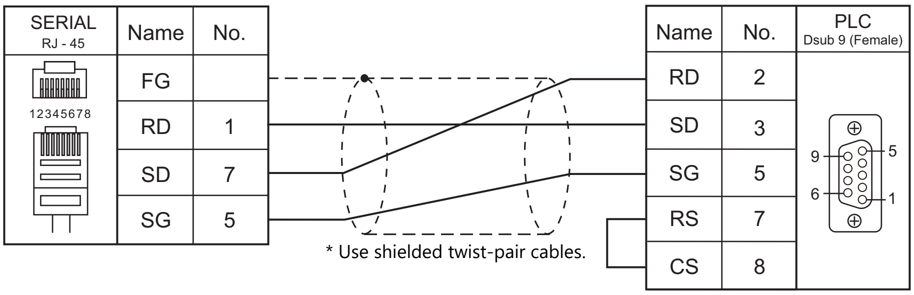
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

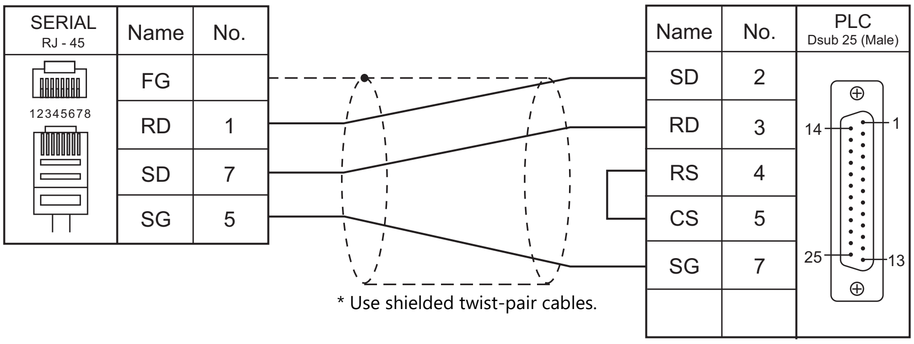
6.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



Wiring diagram 2 - M2



6.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Digital Indicating Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2	
SDC10	SDC10xxxxx05xx	Terminal on the back	RS-485	Wiring diagram 1 - M4	×	SDC10.Lst
SDC15	SDC15xxxxx03xx SDC15xxxxx06xx	Terminal on the back	RS-485	Wiring diagram 1 - M4	×	SDC15.Lst
SDC20	SDC20xxxx02xx SDC20xxxx04xx SDC20xxxx09xx	Terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	SDC20.Lst
	SDC20xxxx03xx SDC20xxxx05xx SDC20xxxx10xx	Terminal on the back	RS-232C	Wiring diagram 1 - M2	×	
SDC21	SDC21xxxx03xx SDC21xxxx06xx SDC21xxxx08xx	Terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	
	SDC21xxxx04xx SDC21xxxx07xx SDC21xxxx09xx	Terminal on the back	RS-232C	Wiring diagram 1 - M2	×	
SDC25/26	SDC25TxxUxx2xx SDC26TxxUxx2xx	Terminal on the back	RS-485	Wiring diagram 1 - M4	×	SDC25.Lst
SDC30/31	SDC30xxxx040xx SDC30xxxx041xx	Terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	SDC30.Lst
	SDC31xxxx045xx SDC31xxxx446xx SDC31xxxx546xx					
SDC35/36	SDC35xxxxxx2xx SDC35xxxxxx4xx SDC36xxxxxx2xx SDC36xxxxxx4xx	Terminal on the back	RS-485	Wiring diagram 1 - M4	×	SDC36.Lst
SDC45/46	SDC45Axxxxxxx3xx SDC45Axxxxxxx7xx SDC45Vxxxxxxx3xx SDC45Vxxxxxxx7xx SDC46Axxxxxxx3xx SDC46Axxxxxxx7xx SDC46Vxxxxxxx3xx SDC46Vxxxxxxx7xx SDC45A0x1 SDC46A0x1 SDC45RxxxxxR08xx SDC46RxxxxxRx8xx	Terminal on the back	RS-485	Wiring diagram 1 - M4	×	SDC45.Lst
SDC40A	SDC40Axxxxxxx2xx	Terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	SDC40A.Lst
	SDC40Axxxxxxx3xx		RS-232C	Wiring diagram 1 - M2	×	
SDC40G	SDC40Gxxxxx095xx	Additional terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	SDC40G.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).

Module-type 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	
DMC10	DMC10S DMC10D	CPL communication terminal	RS-485	Wiring diagram 1 - M4	×	DMC10.Lst
DMC50 (COM)	DMC50ME20X DMC50MR20X	RS-485 port 1	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	DMC50.Lst
		Display unit communication port	RS-485	Wiring diagram 3 - M4	×	
	DMC50CH40X DMC50CH20X DMC50CS40X DMC50CS20X	Display unit communication port	RS-485			

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	
AHC2001	AHC2001	CPU	RS-232C	Wiring diagram 2 - M2	×	AHC2001.Lst
		SCU	RS-232C			
			RS-485	Wiring diagram 4 - M4	Wiring diagram 6 - M4 *3	
AHC2001+ DCP31/32	AHC2001	SCU	RS-485	Wiring diagram 4 - M4	Wiring diagram 6 - M4 *3	AHC_DCP.Lst
	DCP31Axx0ASxx2xx DCP32AxxxASxx2xx	Additional terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3	
	IBS	Terminal block				

*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).

Program Controller

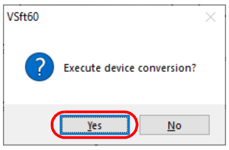
PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)*1	
DCP31/32	DCP31Axx0ASxx2xx DCP32AxxxASxx2xx	Additional terminal on the back	RS-485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *2	DCP32.Lst

*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).
*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).

Instrumentation Network Module

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
NX (CPL) *2	NX-D15 NX-D25 NX-D35	Built-in terminal	RS-485	Wiring diagram 1 - M4	×	NX_CPL.Lst
NX (MODBUS RTU) *2		NX-CB1N (terminal) NX-CB1R (terminal)				NX_Mod.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).
*2 When changing the PLC Selection from DMC10 to NX, the device memory addresses for DMC10 are automatically converted to the device memory addresses for NX by clicking [Yes] in the following dialog.

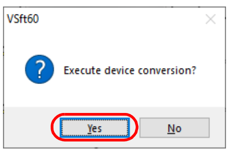


Ethernet Connection

Instrumentation Network Module

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Lst File
NX (CPL) (Ethernet TCP/IP) *2	NX-D15 NX-D25 NX-D35	NX-CB1N NX-CB1R NX-CB2N NX-CB2R	○	×	1252: Default (Max. 2 units)	○	NX_CPL_Eth.Lst
		NX-CL1 NX-CR1					
NX (MODBUS TCP/IP) *2		NX-CB1N NX-CB1R	○	×	502: Default (Max. 2 units)	○	NX_Mod_Eth.Lst
		NX-CR1					

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.
*2 When changing the PLC Selection from DMC10 to NX, the device memory addresses for DMC10 are automatically converted to the device memory addresses for NX by clicking [Yes] in the following dialog.



6.2.1 SDC10

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

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

(Underlined setting: default)

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

Available Device Memory

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

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

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

6.2.2 SDC15

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

6.2.3 SDC20

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

Make the following settings.

(Underlined setting: default)

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

Available Device Memory

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

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

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

6.2.4 SDC21

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

6.2.5 SDC25/26

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

6.2.6 SDC30/31

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

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

(Underlined setting: default)

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

Available Device Memory

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

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

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

6.2.7 SDC35/36

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

CPL communication setting

(Underlined setting: default)

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

Available Device Memory

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

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

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

6.2.8 SDC45/46

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

CPL communication setting

(Underlined setting: default)

Item (Bank)	Indication	Setting	Remarks
Communication type (RS-485 communication bank)	Com.01	**0: CPL**	When establishing a connection in "2: Modbus RTU" format, refer to "28. MODBUS" in book 3 of the X1 Series Connection Manual.
Device address (RS-485 communication bank)	Com.02	1 to 127	Communication is disabled when "0" is set.
Baud Rate (RS-485 communication bank)	Com.03	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	
Data type: data length (RS-485 communication bank)	Com.04	0: 7 bits 1: 8 bits	
Data type: parity (RS-485 communication bank)	Com.05	0: Even 1: Odd 2: None	
Data type: stop bit (RS-485 communication bank)	Com.06	0: 1 bit 1 or 2 bits	

Available Device Memory

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

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

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

6.2.9 SDC40A

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

Make the following settings.

(Underlined setting: default)

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

Available Device Memory

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

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

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

6.2.10 SDC40G

Settings are the same as those described in “6.2.9 SDC40A”.

6.2.11 DMC10

Communication Setting

Editor

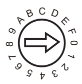
Communication setting

(Underlined setting: default)

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

Controller

Rotary switch for device address

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

CPL communication setting

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

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

Available Device Memory

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

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

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

6.2.12 DMC50 (COM)

Communication Setting

Editor

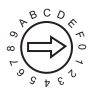
Communication setting

(Underlined setting: default)

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

Controller

Rotary address for module address

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

COM module: RS-485 port 1

Make the following settings on the PC loader.

(Underlined setting: default)

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

CTRL module: Display communication port

Make the following settings on the PC loader.

(Underlined setting: default)

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

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

Available Device Memory

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

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

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

Address denotations

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

aaabbbcc

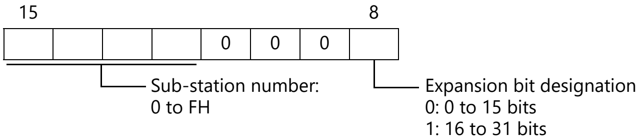
- Item ID
- Group ID
- Parameter type ID

Indirect Device Memory Designation

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

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

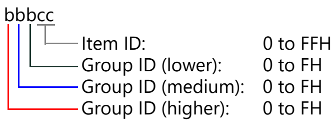
* In the expansion code, specify the sub-station number, and set which word, higher or lower, is to be read when a 2-word address is specified (expansion bit designation).

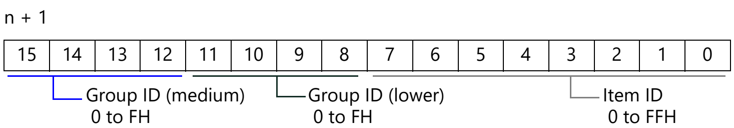


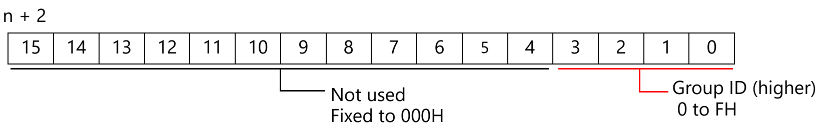
- When the address (group ID) is 100 to FFFH:

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

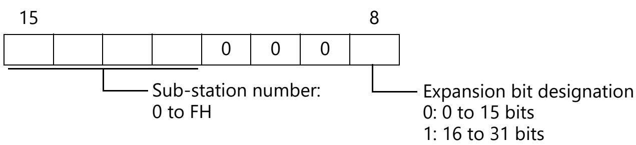
*1 Set the address (group ID + item ID) for “n + 1” and “n + 2”.







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



6.2.13 AHC2001

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

CPU unit RS-232C setting

(Underlined setting: default)

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

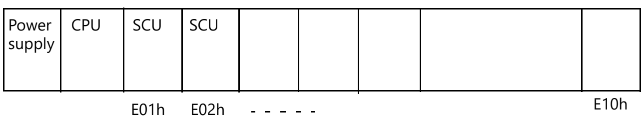
The following settings are fixed; parity: even, and stop bit: 1 bit.

SCU unit setting

(Underlined setting: default)

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

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



← Unit position E01H - E10H

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

Available Device Memory

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

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

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

Address denotations

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

aaabbbcc
- cc: Item ID
- bbb: Group ID
- aaa: Parameter type ID

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="3">ISaGRAF application
Start/stop</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 0</td></tr>
<tr><td>n + 2</td><td>0: Stop
1: Start</td></tr>
<tr><td rowspan="3">ISaGRAF application
Current status</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 1</td></tr>
<tr><td>n + 2</td><td>0: Stop
1: Run</td></tr>
<tr><td rowspan="2">Reserve for parameter backup</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
</table>

Return data: Data stored from temperature controller to X1 series

6.2.14 AHC2001+DCP31/32

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

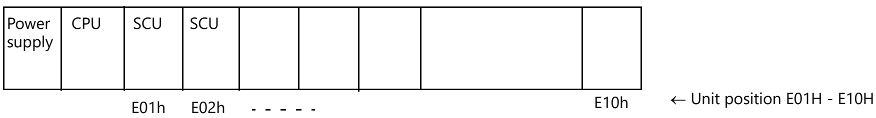
Controller

AHC2001 SCU unit setting

(Underlined setting: default)

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

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



DCP31/32

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

(Underlined setting: default)

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

IBS (air-fuel ratio controller)

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

(Underlined setting: default)

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

Available Device Memory

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

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

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

Address denotations

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

aaabbbcc
Item ID
Group ID
Parameter type ID

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

---xxxx
Address 0501 to 4600
Device type

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

Return data: Data stored from temperature controller to X1 series

6.2.15 DCP31/32

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

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

(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

6.2.16 NX (CPL)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

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

(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

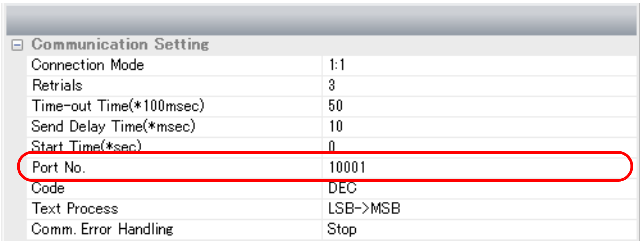
6.2.17 NX (CPL) (Ethernet TCP/IP)

Communication Setting

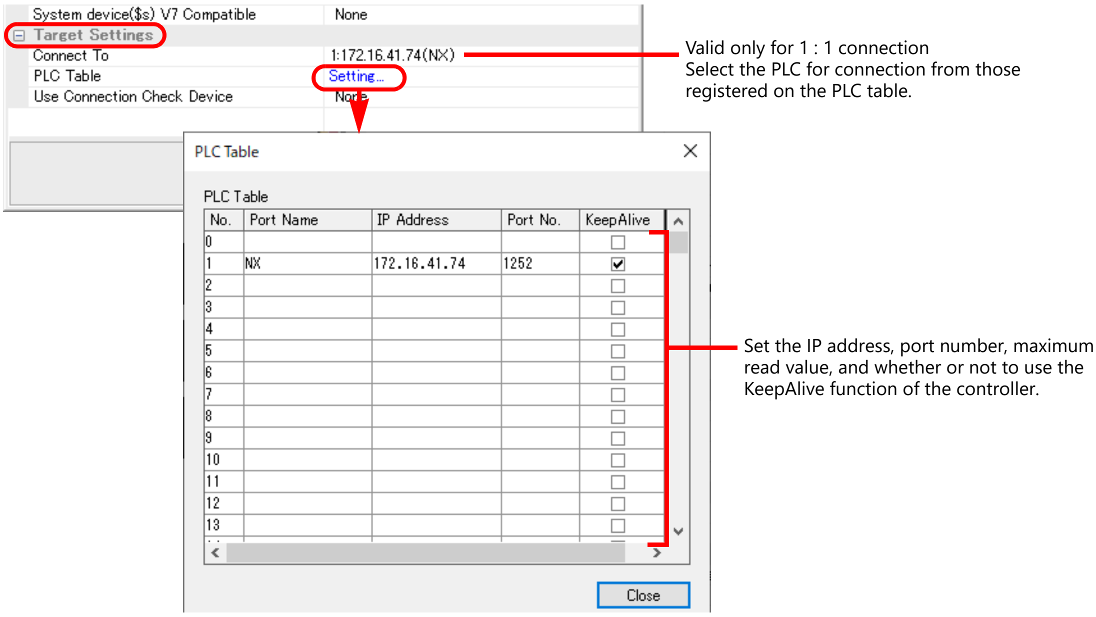
Editor

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



Controller

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

Item			Remarks
Overall	IP Setting	Net mask	
		Default gateway	
Chain	IP Address		
	Node ID		
	Port Setting	CPL/TCP port number	Default: 1252, 1024 to 49151

Available Device Memory

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

Device Memory	TYPE	Remarks
---	02H	

6.2.18 NX (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Controller

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

(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
---	02H	

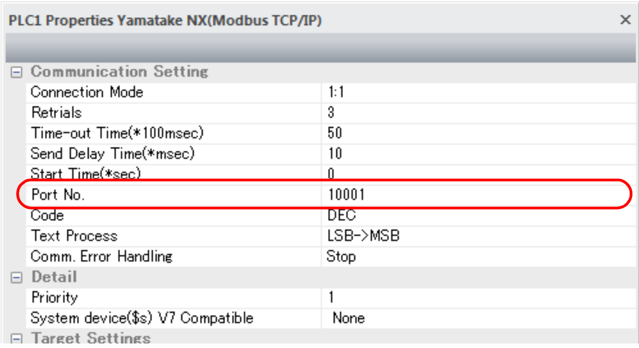
6.2.19 NX (MODBUS TCP/IP)

Communication Setting

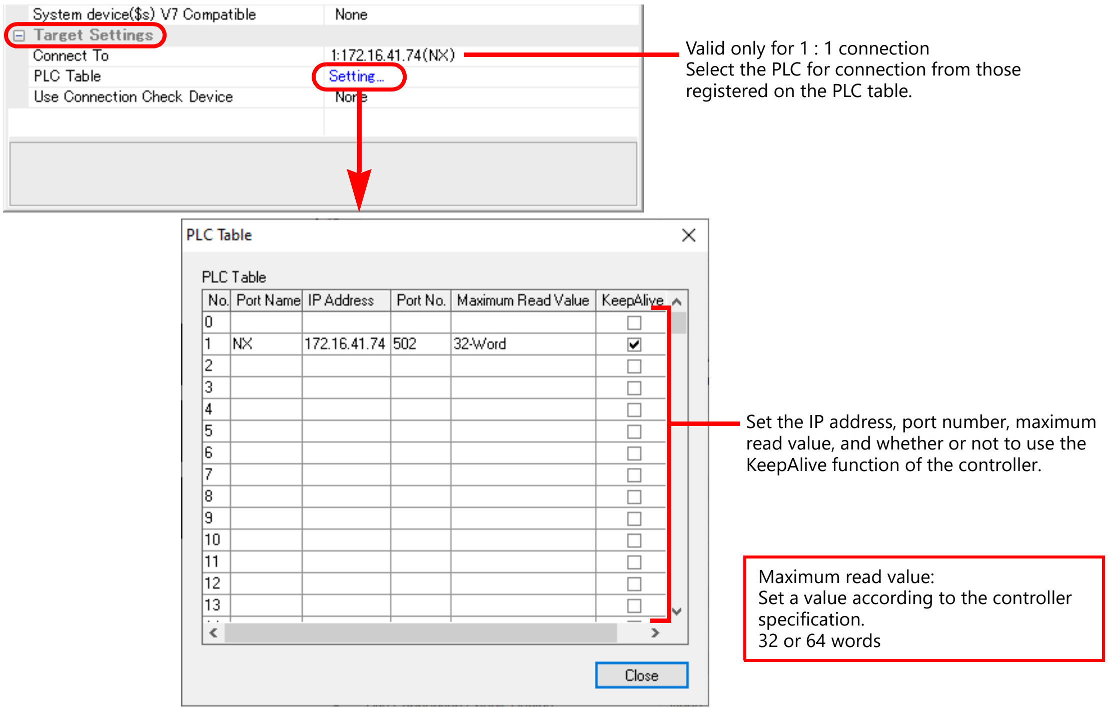
Editor

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

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



Controller

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

Item			Remarks
Overall	IP Setting	Net mask	
		Default gateway	
Chain	IP Address		
	Node ID		
	Port Setting	MODBUS/TCP port number	Default: 502

Available Device Memory

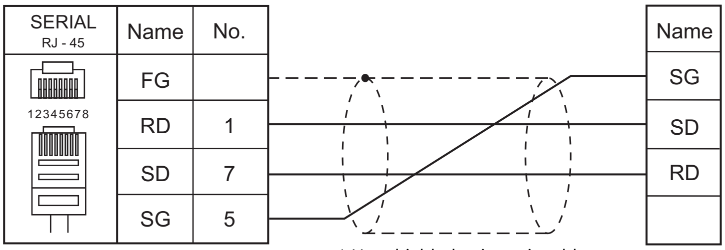
The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
---	02H	

6.2.20 Wiring Diagrams

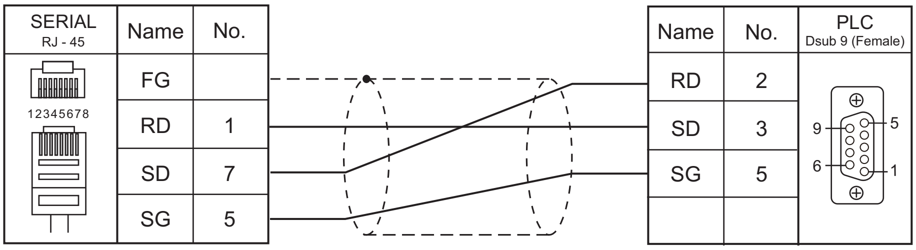
RS-232C

Wiring diagram 1 - M2



* Use shielded twist-pair cables.

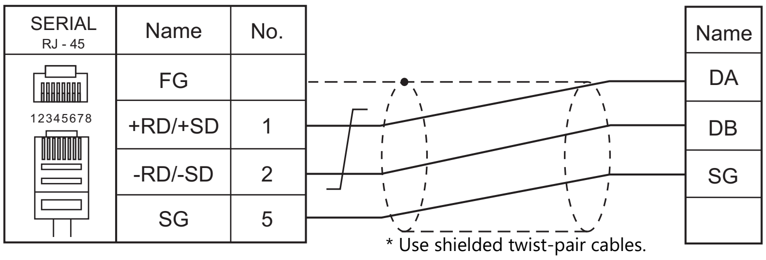
Wiring diagram 2 - M2



* Use shielded twist-pair cables.

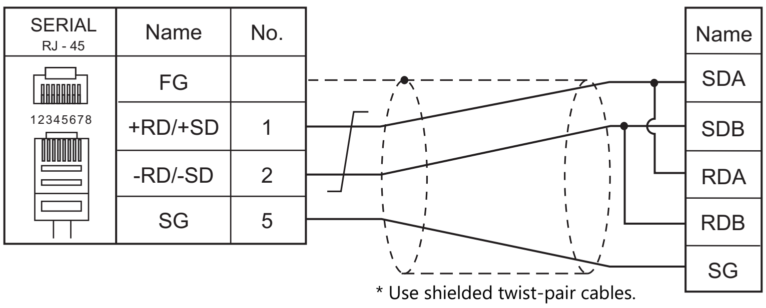
RS-422/RS-485

Wiring diagram 1 - M4



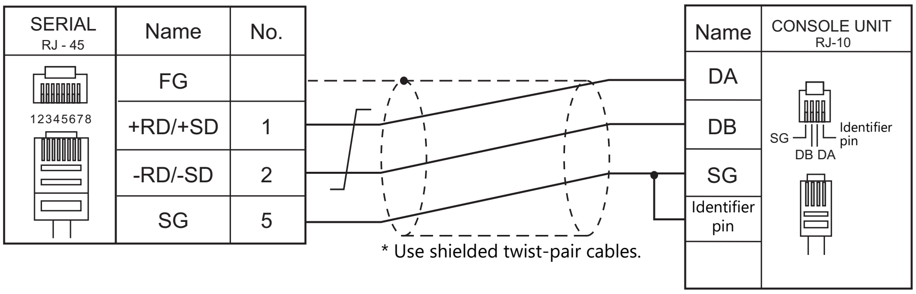
* Use shielded twist-pair cables.

Wiring diagram 2 - M4

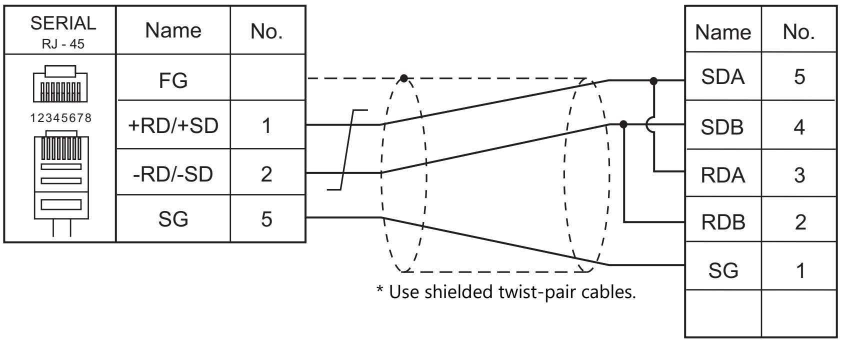


* Use shielded twist-pair cables.

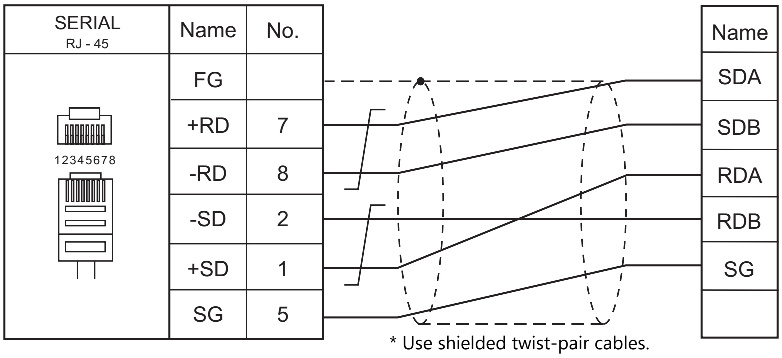
Wiring diagram 3 - M4



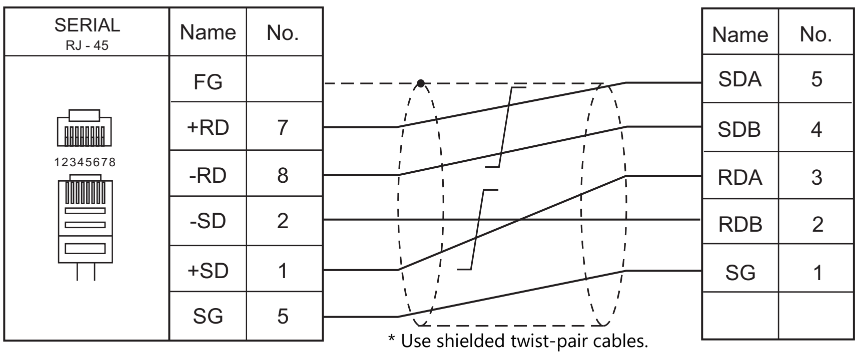
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



7. Banner

7.1 Temperature Controller/Servo/Inverter Connection

Ethernet Connection

Vision Sensor

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

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

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

Communication Setting

Editor

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

- 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].

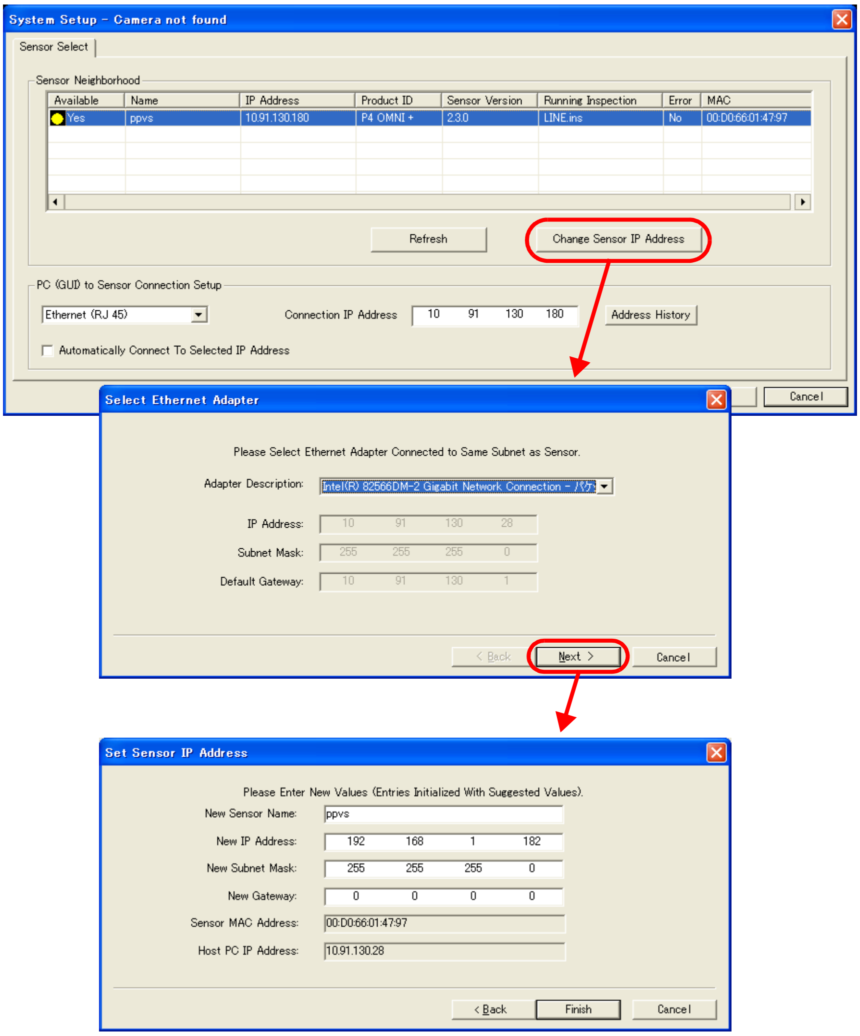
To display sensor images on the X1 series unit by using a function of Windows, the sensor’s dedicated software must be installed in the X1 series unit. For more information, refer to the instruction manual issued by BANNER.

Vision Sensor

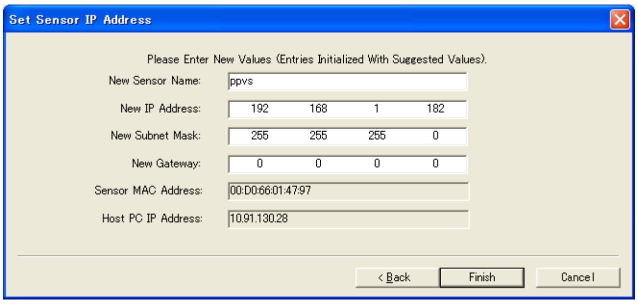
Make settings using Banner’s dedicated software “Presence PLUS”. For more information, refer to the manual of the vision sensor.

System setup

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



Sensor IP address settings



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

Available Device Memory

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

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

8. Baumuller

8.1 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)*2
BMx-x-PLC	BMx-x-PLC	RS-232C port	RS-232C	Wiring diagram 1 - M2	×
		RS-422 port	RS-422	×	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).

8.1.1 BMx-x-PLC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

No particular setting is necessary on the PLC.

Available Device Memory

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

Device Memory	TYPE	Remarks
DB (Data Block)	00H	

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

Example: DB xxx yyy

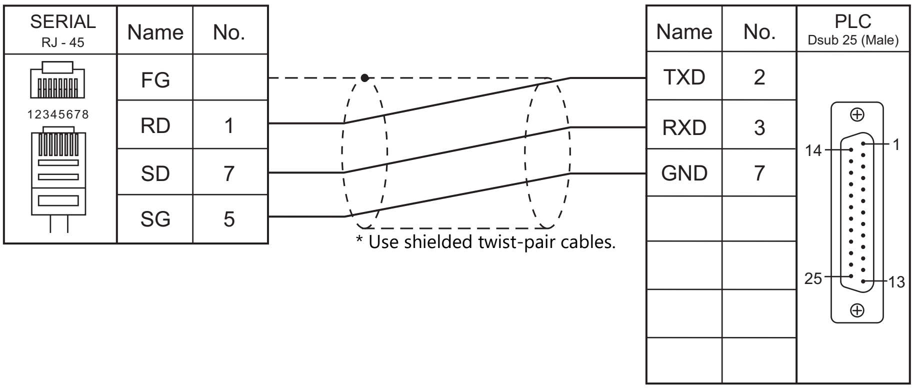
yyy: 0 to 255 (decimal)

xxx: 0 to 255 (decimal)

8.1.2 Wiring Diagrams

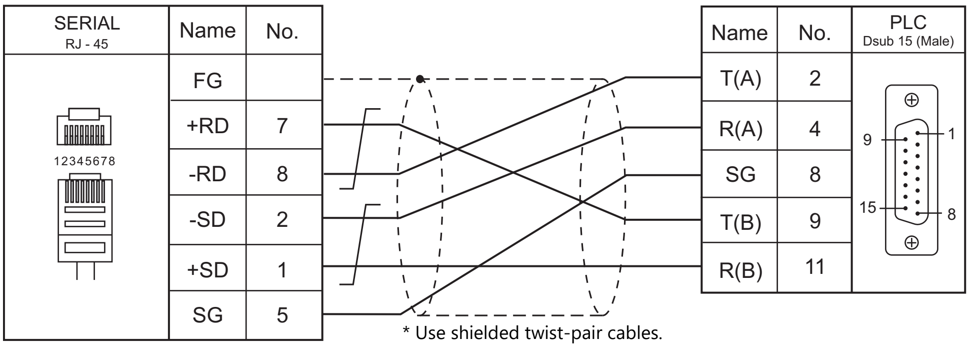
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



9. BECKHOFF

9.1 PLC Connection

Ethernet Connection

PLC Selection on the Editor	CPU/Software PLC	Unit	LAN Port	TCP/IP	UDP/IP	Port No.	Keep Alive*1
ADS protocol (Ethernet)	BC9000 BC9100 BX9000	KLxxxx *2	CPU (built-in)	○	×	Fixed to 48898	○
Tag ADS protocol (Ethernet)	TwinCAT 3 TwinCAT 2	Ethernet port		○	×	Fixed to 48898	○

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.
*2 Use the same voltage (24 V) as for the CPU.

9.1.1 ADS Protocol (Ethernet)

Communication Setting

Editor

Communication settings

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

- 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

IP address setting

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

Port No.

TCP/IP port No. 48898 (fixed)

Available Device Memory

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

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

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

Address denotations

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

Example: P800 - F00000001

Index offset
Index group
Port

Indirect Device Memory Designation

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

Example: With indirect device memory designation, “9” is assigned for “P300-I00000013”.
13 (HEX) = 19 (DEC)
$19 \div 2 = 9.5$

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

Return data: Data stored from temperature controller to X1 series

*1 Port setting values

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

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

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

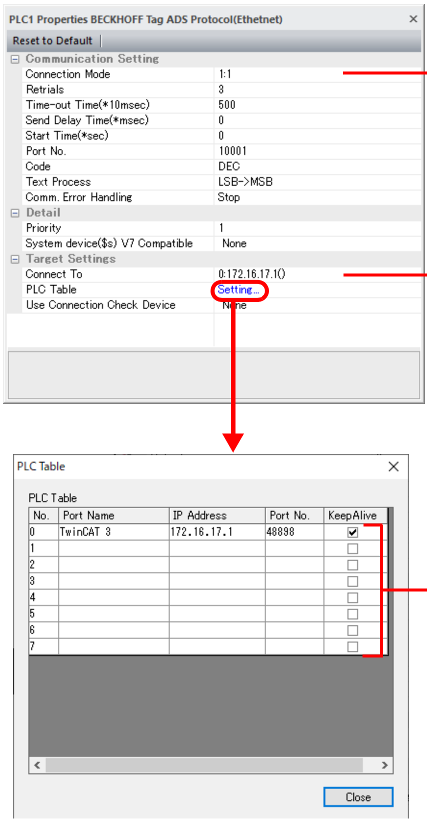
9.1.2 Tag ADS Protocol (Ethernet)

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 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].



Up to 8 units in 1 : n communication
* Up to 32 units in total for PLC1 to PLC8

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

IP address and port number (No. 48898) and whether or not to use the KeepAlive function of the PLC.

Item	Description	Remarks
Port Name	Set the port name of the device to connect.	
IP Address	Set the IP address of the device to connect.	
Port No.	Set the port number of the device to connect.	Fixed to 48898

PLC

TwinCAT 3

This section describes the settings for when connecting BECKHOFF's embedded PC "CX9020" to the X1 series unit.
For details on the settings for the device to be connected, refer to the relevant instruction manual issued by BECKHOFF.

CX9020

Check the following settings on the connected CX9020 unit.

- [Start] → [Control Panel] → [CX Configuration] → [General] tab

Item		Description	Remarks
Network Adapter	IP Address *	The IP address is displayed.	Registered at [IP Address] in the [PLC Table] of V-SFT
TwinCAT	AMS Net Id	The AMS Net ID is displayed.	Check that the ID is displayed as "IP address + .1.1".

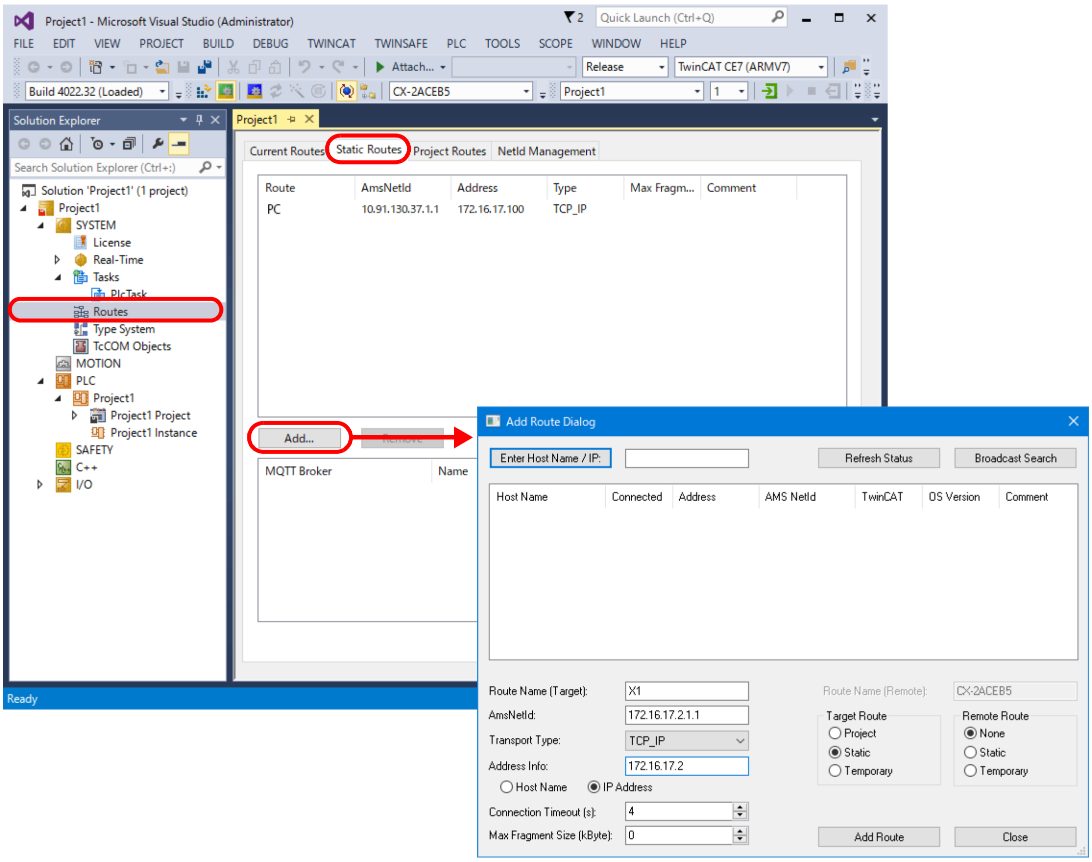
* The IP address can be changed in the [Start] → [Control Panel] → [Network and Dial-up Connections] window.
For more information, refer to the relevant instruction manual issued by BECKHOFF.

TwinCAT XAE

Connect the CX9020 unit with TwinCAT XAE, select the device to connect as the target device, and then add the X1 series unit to the route settings.

- Routes setting

  Double-click [Solution Explorer] → [Routes] to display the routes settings.
  Click the [Static Routes] tab → [Add] to open the [Add Route Dialog] window, and add the X1 series unit.



Item		Description	Remarks
Route Name (Target)		Set a port name.	
AmsNetId		Set the ID as "IP address of the X1 series unit" + ".1.1".	
Transport Type		**TCP_IP**	
Address Info		Set the IP address of the X1 series unit.	
	Host Name IP Address	Select [IP Address].	

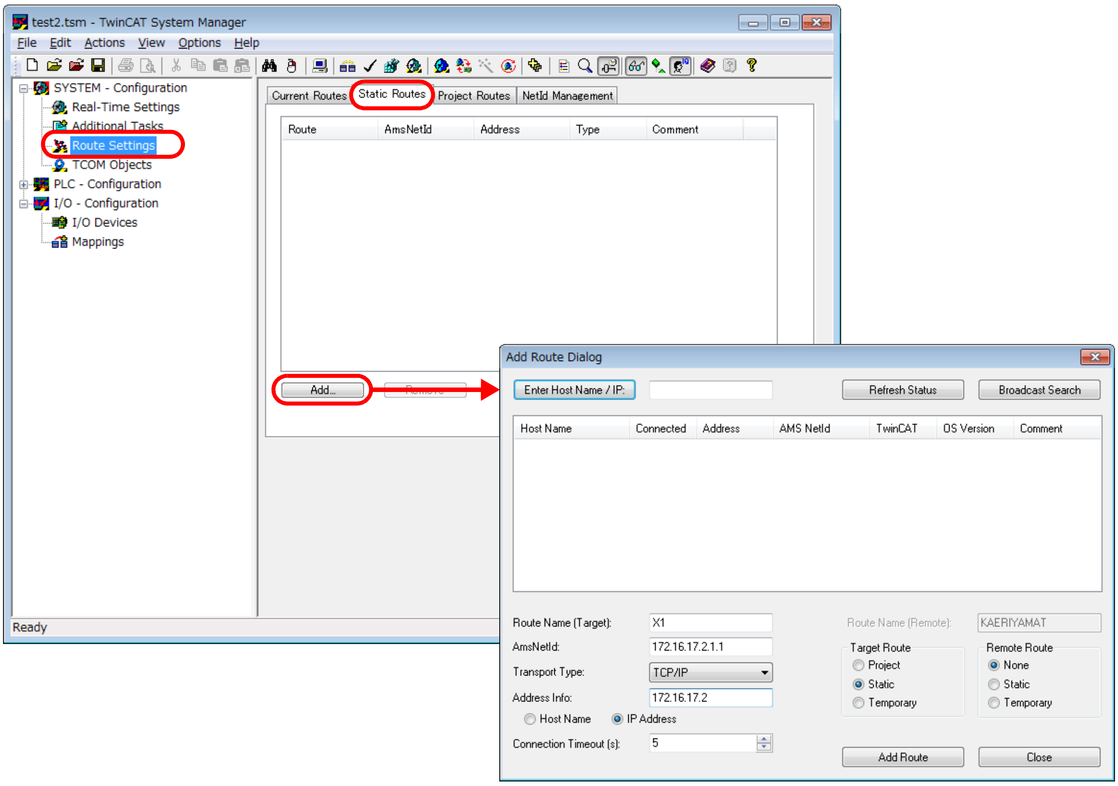
TwinCAT 2

This section describes the settings for connecting the software PLC included in the TwinCAT 2 system tool “TwinCAT System Manager”.
For details on the settings for the device to be connected, refer to the relevant instruction manual issued by BECKHOFF.

The IP address of the software PLC is the same as the IP address of the computer.
Check the IP address of the computer.

TwinCAT System Manager

- Routes setting
  Click [SYSTEM - Configuration] → [Route Settings] to display the routes settings.
  Click the [Static Routes] tab → [Add] to open the [Add Route Dialog] window, and add the X1 series unit.



Item		Description	Remarks
Route Name (Target)		Set a port name.	
AmsNetId		Set the ID as “IP address of the X1 series unit” + “.1.1”.	
Transport Type		**TCP_IP**	
Address Info		Set the IP address of the X1 series unit.	
	Host Name IP Address	Select [IP Address].	

Available Device Memory

Set PLC device memory by importing variables created using TwinCAT into V-SFT.
For details on how to import variables, refer to the instruction manual for BECKHOFF tag ADS protocol communication.

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	-	-	*3, *5, *6
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	
TIME	(TIME)	0 to 65535	0 to 32767	0 to 16383	*7
TOD	(TIME OF DAY)	0 to 65535	0 to 32767	0 to 16383	*7
DATE	(DATE)	0 to 65535	0 to 32767	0 to 16383	*8
DT	(DATE AND TIME)	0 to 65535	0 to 32767	0 to 16383	*8
BIT	(Bit)	-	-	-	TwinCAT 2 unusable

*1 The ranges given are based on when a maximum value is specified. The maximum setting is 65335, which is the total number of elements (Index1 × Index2 × Index3).
Ranges differ according to the created tag.

*2 With multi-dimensional arrays, PLC device memory is allocated from lower bits.
When accessing in units of words, such as for numerical data display parts, bits are accessed in accordance with the allocation of PLC device memory.

- BOOL type
  When the variable registered on the PLC is "FLAG[4][8]"

<table>
<tr><td colspan="32">FLAG (32 bits)</td></tr>
<tr><td colspan="8">3</td><td colspan="8">2</td><td colspan="8">1</td><td colspan="8">0</td></tr>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</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><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</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>

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 registered on the PLC is "DATA[2][4]"

<table>
<tr><td colspan="8">DATA (8 bytes)</td></tr>
<tr><td colspan="4">1</td><td colspan="4">0</td></tr>
<tr><td>3</td><td>2</td><td>1</td><td>0</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
</table>

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 variable is smaller than 2 bytes (1 word) when accessing in units of words such as for numerical data display parts.
Example: SINT type
When the variable registered on the PLC is "DATA[3][3]"

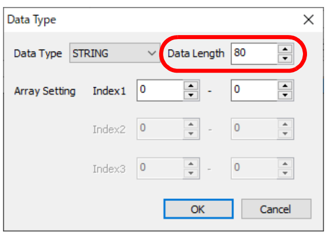
<table>
<tr><td>-</td><td colspan="9">DATA (9 bytes)</td></tr>
<tr><td>-</td><td colspan="3">2</td><td colspan="3">1</td><td colspan="3">0</td></tr>
<tr><td>-</td><td>2</td><td>1</td><td>0</td><td>2</td><td>1</td><td>0</td><td>2</td><td>1</td><td>0</td></tr>
</table>

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.

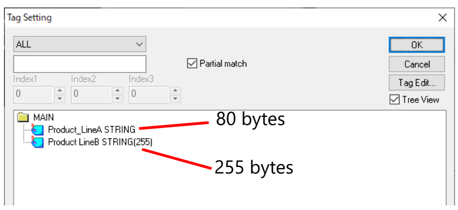
*4 When accessing in units of words, bits 8 to 15 correspond to the next byte device memory.

*5 When the STRING type is used in arrays, the top element of the address for parts, macro commands, etc. becomes "0".
Only "0" can be specified for the top element.

*6 The number of bytes per address for STRING type data can be set at [Data Length] in the data type setting window.



Setting range: 1 to 255 bytes (default: 80)
When a value other than the default value (80 bytes) is specified, the specified number of bytes is displayed after the tag name in parentheses.



Also, set the item to use STRING type.
e.g.: [Character Display] part
Check the [Use STRING Type] checkbox in the [Detail] menu.

*7 Unit: msec

*8 Unix time is used.
Conversion of Unix time and calendar data is possible by using the macro commands "CLND_TO GRE" and "GRE_TO_CLND".
For details, refer to the V9 Series Macro Reference Manual.

Address denotations

The address is expressed on the screen as shown below.

xx : xxx : ABCDEFG

- ABCDEFG: Tag name
- xxx: ADS port No.
  801/811/821/831/851 to 899
- xx: Port No. (for 1 : n connection only)

Indirect Device Memory Designation

Not available

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

<table>
<tr><th>Description</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="12">Access Info Read</td><td rowspan="12">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target port No.</td><td rowspan="12">4+m</td></tr>
<tr><td>n+1</td><td>Command: 0001H</td></tr>
<tr><td>n+2</td><td>ADS port No. [*1]</td></tr>
<tr><td>n+3</td><td>Number of bytes of tag name (max. 100 bytes): 2 × m</td></tr>
<tr><td>n+4</td><td rowspan="2">Tag name m</td></tr>
<tr><td>:</td></tr>
<tr><td>n+m+5</td><td rowspan="2">Index Group</td></tr>
<tr><td>n+m+6</td></tr>
<tr><td>n+m+7</td><td rowspan="2">Index Offset</td></tr>
<tr><td>n+m+8</td></tr>
<tr><td>n+m+9
n+m+10</td><td>Maximum number of device memory
* Non-array format: 1</td></tr>
<tr><td>n+m+11</td><td>Tag data type
0: BOOL, BIT
1: SINT
2: INT
3: DINT
4: REAL
6: STRING
7: USINT, BYTE
8: UINT, WORD
9: UDINT, DWORD, TIME, TOD, DATE, DT</td></tr>
<tr><td rowspan="14">Access Inputs</td><td rowspan="14">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target port No.</td><td rowspan="14">12</td></tr>
<tr><td>n+1</td><td>Command: 0002H</td></tr>
<tr><td>n+2</td><td>ADS port No. [*1]</td></tr>
<tr><td>n+3</td><td rowspan="2">Index Group [*2]</td></tr>
<tr><td>n+4</td></tr>
<tr><td>n+5</td><td rowspan="2">Index Offset [*2]</td></tr>
<tr><td>n+6</td></tr>
<tr><td>n+7
n+8</td><td>Maximum number of device memory [*2]
* Non-array format: 1</td></tr>
<tr><td>n+9</td><td>Tag data type [*2]
0: BOOL, BIT
1: SINT
2: INT
3: DINT
4: REAL
6: STRING
7: USINT, BYTE
8: UINT, WORD
9: UDINT, DWORD, TIME, TOD, DATE, DT</td></tr>
<tr><td>n+10</td><td>Read start offset [*3]</td></tr>
<tr><td>n+11</td><td>Number of device memory to read: m</td></tr>
<tr><td>n+12</td><td rowspan="3">Read data m</td></tr>
<tr><td>:</td></tr>
<tr><td>n+12+(m-1)</td></tr>
</table>

Description	F0	F1 (=$u n)		F2
Access Outputs	1 to 8 (PLC1 to 8)	n	Target port No.	12+m
		n+1	Command: 0003H	
		n+2	ADS port No. *1	
		n+3	Index Group *2	
		n+4		
		n+5	Index Offset *2	
		n+6		
		n+7	Maximum number of device memory *2 * Non-array format: 1	
		n+8		
		n+9	Tag data type *2 0: BOOL, BIT 1: SINT 2: INT 3: DINT 4: REAL 6: STRING 7: USINT, BYTE 8: UINT, WORD 9: UDINT, DWORD, TIME, TOD, DATE, DT	
		n+10	Write start offset *3	
		n+11	Number of device memory to write: m	
		n+12	Write data m	
		:		
		n+12+(m-1)		
Access Read By Name	1 to 8 (PLC1 to 8)	n	Target port No.	7+m
		n+1	Command: 0004H	
		n+2	ADS port No. *1	
		n+3	Number of bytes of tag name (max. 100 bytes): 2 × m	
		n+4	Tag name m	
		:		
		n+m+4	Tag data type 0: BOOL, BIT 1: SINT 2: INT 3: DINT 4: REAL 6: STRING 7: USINT, BYTE 8: UINT, WORD 9: UDINT, DWORD, TIME, TOD, DATE, DT	
		n+m+5	Read start offset *3	
		n+m+6	Number of device memory to read: l	
		n+m+7	Read data l	
		:		
		n+m+7+(l-1)		
Access Write By Name	1 to 8 (PLC1 to 8)	n	Target port No.	7+m+l
		n+1	Command: 0005H	
		n+2	ADS port No. *1	
		n+3	Number of bytes of tag name (max. 100 bytes): 2 × m	
		n+4	Tag name m	
		:		
		n+m+4	Tag data type 0: BOOL, BIT 1: SINT 2: INT 3: DINT 4: REAL 6: STRING 7: USINT, BYTE 8: UINT, WORD 9: UDINT, DWORD, TIME, TOD, DATE, DT	
		n+m+5	Write start offset *3	
		n+m+6	Number of device memory to write: l	
		n+m+7	Write data l	
		:		
		n+m+7+(l-1)		

Return data: Data stored from PLC to X1 series unit

*1 For details on how to check the ADS port number, refer to the instruction manual for BECKHOFF tag ADS protocol communication.
*2 Specify the value obtained by "Access Info Read".
*3 Set the array index you wish to access.
For an array starting with the top element of "1" or greater, offset the top value to "0".
For a non-array device memory, specify "0".

Example: To access from DATA[2][3][1] of array-defined tag DATA[1..2][1..4][1..4]
Offset = 24

<table>
<tr><td colspan="32">DATA</td></tr>
<tr><td colspan="16">2</td><td colspan="16">1</td></tr>
<tr><td colspan="4">4</td><td colspan="4">3</td><td colspan="4">2</td><td colspan="4">1</td><td colspan="4">4</td><td colspan="4">3</td><td colspan="4">2</td><td colspan="4">1</td></tr>
<tr><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>24</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>~</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td>Offset</td></tr>
</table>

10. Bosch Rexroth

10.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Servo

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2" colspan="2">Model</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="2">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>RS-232C*1 / RS-485 (2-wire)</th><th>RS-422 (4-wire)</th></tr>
<tr><td rowspan="2">IndraDrive</td><td>IndraDrive C</td><td>HCS02
HCS03
HCS02.1
HCS03.1</td><td rowspan="2">RS-232C port</td><td rowspan="2">RS-232C</td><td rowspan="2">Wiring diagram 1 - M2</td><td rowspan="2">×</td><td rowspan="2">None</td></tr>
<tr><td>IndraDrive M</td><td>HMD01
HMS01
HMS02
HMV01
HMV02</td></tr>
</table>

*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).

10.1.1 IndraDrive

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo

Item	Setting	Remarks
Parity	None / Odd / Even	

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

Available Device Memory

There are no device memory.

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="6">SIS version acquisition</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="6">2</td></tr>
<tr><td>n + 1</td><td>Command: 1H</td></tr>
<tr><td>n + 2</td><td>Execution result
0: Successful completion
Other than 0: Abnormal termination</td></tr>
<tr><td>n + 3</td><td rowspan="3">mmVnn: SIS version (character string)</td></tr>
<tr><td>:</td></tr>
<tr><td>n + 7</td></tr>
<tr><td rowspan="6">FWA number acquisition</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="6">2</td></tr>
<tr><td>n + 1</td><td>Command: 2H</td></tr>
<tr><td>n + 2</td><td>Execution result
0: Successful completion
Other than 0: Abnormal termination</td></tr>
<tr><td>n + 3</td><td rowspan="3">FWA number (character string) (Max. 20 words)</td></tr>
<tr><td>:</td></tr>
<tr><td>n + 22</td></tr>
</table>

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="6">Unit type code acquisition</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="6">2</td></tr>
<tr><td>n + 1</td><td>Command: 3H</td></tr>
<tr><td>n + 2</td><td>Execution result
0: Successful completion
Other than 0: Abnormal termination</td></tr>
<tr><td>n + 3</td><td rowspan="3">Unit type code (character string) (Max. 20 words)</td></tr>
<tr><td>:</td></tr>
<tr><td>n+22</td></tr>
<tr><td rowspan="4">Acquisition of supported baud rate</td><td rowspan="4">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="4">2</td></tr>
<tr><td>n + 1</td><td>Command: 4H</td></tr>
<tr><td>n + 2</td><td>Execution result
0: Successful completion
Other than 0: Abnormal termination</td></tr>
<tr><td>n + 3</td><td>Supported baud rate
0: 9600 bps
1: 19200 bps
2: 38400 bps
4: 57600 bps
8: 115.2 kbps</td></tr>
<tr><td rowspan="6">Shutdown</td><td rowspan="6">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="6">5</td></tr>
<tr><td>n + 1</td><td>Command: 290H</td></tr>
<tr><td>n + 2</td><td>Shutdown target
0: Firmware
1: Load routine</td></tr>
<tr><td>n + 3</td><td>Starting address (lower)</td></tr>
<tr><td>n + 4</td><td>Starting address (higher)</td></tr>
<tr><td>n + 5</td><td>Execution result
0H: Normal termination
9002H: Firmware deleted
9003H: Shutdown phase 3 not permitted
9004H: Shutdown phase 4 not permitted</td></tr>
<tr><td rowspan="5">Reboot</td><td rowspan="5">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="5">4</td></tr>
<tr><td>n + 1</td><td>Command: 291H</td></tr>
<tr><td>n + 2</td><td>Starting address (lower)</td></tr>
<tr><td>n + 3</td><td>Starting address (higher)</td></tr>
<tr><td>n + 4</td><td>Execution result
0H: Normal termination
9102H: Firmware deleted
9103H: Reboot phase 3 not permitted
9104H: Reboot phase 4 not permitted</td></tr>
<tr><td rowspan="9">Data reading</td><td rowspan="9">1 to 8
(PLC1 to 8)</td><td>n</td><td>Target Port No.</td><td rowspan="9">5</td></tr>
<tr><td>n + 1</td><td>Command: 292H</td></tr>
<tr><td>n + 2</td><td>Starting address (lower)</td></tr>
<tr><td>n + 3</td><td>Starting address (higher)</td></tr>
<tr><td>n + 4</td><td>Reading size (Max. 244 bytes)</td></tr>
<tr><td>n + 5</td><td>Execution result
0H: Normal termination
9200H: Reading range error</td></tr>
<tr><td>n + 6</td><td rowspan="3">Data to read (Max. 122 words)</td></tr>
<tr><td>:</td></tr>
<tr><td>n + 127</td></tr>
</table>

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

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

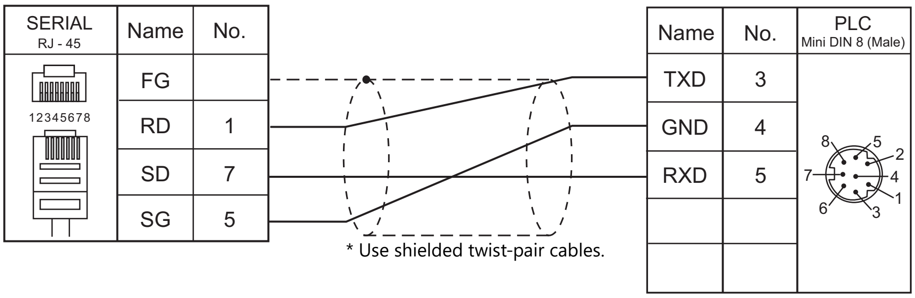
Return data: Data stored from servo to X1 series

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

10.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



11. CHINO

11.1 Temperature Controller/Servo/Inverter Connection

Digital Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection: RS-232C*1 / RS-485 (2-wire)*2	Connection: RS-422 (4-wire)*2	Lst File
DP1000	DP1xxxBRxx	Terminal block	RS-232C	Wiring diagram 1 - M2	×	DP1000.Lst
	DP1xxxBAxx	Terminal block	RS-422	×	Wiring diagram 4 - M4	
	DP10xxGRxx-xxx	Terminal block COM1	RS-232C	Wiring diagram 1 - M2	×	
	DP10xxGSxx-xxx	Terminal block COM1	RS-485	Wiring diagram 1 - M4	×	
	DP10xxGAxx-xxx	Terminal block COM1	RS-422	×	Wiring diagram 4 - M4	
	DP10xxGBxx-xxx	Terminal block COM1	RS-232C	Wiring diagram 2 - M2	×	
		COM2		Wiring diagram 3 - M2	×	
	DP10xxGCxx-xxx	Terminal block COM1	RS-485	Wiring diagram 2 - M4	×	
		COM2	RS-232C	Wiring diagram 3 - M2	×	
	DP10xxGDxx-xxx	Terminal block COM1	RS-422	×	Wiring diagram 5 - M4	
		COM2	RS-232C	Wiring diagram 3 - M2	×	
	DP10xxGExx-xxx	Terminal block COM1	RS-232C	Wiring diagram 2 - M2	×	
		COM2	RS-485	Wiring diagram 3 - M4	×	
	DP10xxGFxx-xxx	Terminal block COM1	RS-485	Wiring diagram 2 - M4	×	
		COM2		Wiring diagram 3 - M4	×	
	DP10xxGGxx-xxx	Terminal block COM1	RS-422	×	Wiring diagram 5 - M4	
		COM2	RS-485	Wiring diagram 3 - M4	×	
DB1000B (MODBUS RTU)	DB1xxxBRxx-xxx	Terminal block	RS-232C	Wiring diagram 1 - M2	×	DB1000B.Lst
	DB1xxxBAxx-xxx		RS-422	×	Wiring diagram 4 - M4	
	DB1xxxBSxx-xxx		RS-485	Wiring diagram 1 - M4	×	
LT230 (MODBUS RTU)	LT23xxxS00-xx LT23xxx200-xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	LT230.Lst
LT300 (MODBUS RTU)	LT35xxxRx0-xxx LT37xxxRx0-xxx	Terminal block	RS-232C	Wiring diagram 1 - M2	×	LT300.Lst
	LT35xxxAx0-xxx LT37xxxAx0-xxx		RS-422	×	Wiring diagram 4 - M4	
	LT35xxxSx0-xxx LT37xxxSx0-xxx		RS-485	Wiring diagram 1 - M4	×	
LT400 Series (MODBUS RTU)	LT45xxxRxx-xxx LT47xxxRxx-xxx	Terminal block	RS-232C	Wiring diagram 1 - M2	×	LT400.Lst
	LT45xxxAxx-xxx LT47xxxAxx-xxx		RS-422	×	Wiring diagram 4 - M4	
	LT45xxxSxx-xxx LT47xxxSxx-xxx		RS-485	Wiring diagram 1 - M4	×	
LT830 (MODBUS RTU)	LT830xx000-2xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	LT830.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).

Graphic Recorder

PLC Selection on the Editor	Model	Port	Signal Level	Connection: RS-232C*1 / RS-485 (2-wire)*2	Connection: RS-422 (4-wire)	Lst File
KR2000 (MODBUS RTU)	KR21xxxRxA	Terminal block	RS-232C	Wiring diagram 1 - M2	×	KR2000.Lst
			RS-485	Wiring diagram 1 - M4	×	
	KR21xxxQxA	Terminal block	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).

11.1.1 DP1000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Program Controller

DP1000

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

(Underlined setting: default)

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

* To start program operation from the X1 series, select "MASTER COM." for program start method. To select a pattern number from the X1 series, select "COM" for pattern selection method.

DP1000G

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

(Underlined setting: default)

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

* To start program operation from the X1 series, select "COM" for program start method. To select a pattern number from the X1 series, select "COM" for pattern selection method.

Notes on parameter change from the X1 series
Before changing parameters from the X1 series, function keys and the related mode in the setting menu must be locked using keys on the digital program controller.
For more information, refer to the instruction manual for the controller issued by the manufacturer.

Available Device Memory

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

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

Address denotations

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

aabbcc
Parameter 2 (BCD)
Parameter 1 (BCD) ....When using one parameter, set "01" for bb (parameter 1).
Example: For DN22 (transmission type), set "DN220100".
Address (BIN)

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

D (Data)

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

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

DN (Individual Data)

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

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

PG (Program)

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

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

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

11.1.2 DB1000B (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicating Controller

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

(Underlined setting: default)

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

Notes on parameter change from the X1 series
Before changing parameters from the X1 series, all modes on the setting screen must be locked using keys on the digital indicating controller. For more information, refer to the instruction manual for the controller issued by the manufacturer.

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

11.1.3 LT230 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicating Controller

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

(Underlined setting: default)

Mode	Indication	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 com (communication setting)	PtCL	Communication protocol	**<u>rtU: MODBUS (RTU)</u>**
	FUnC	Communication function	**<u>Com: Host communication</u>**
	AdrS	Device No.	<u>1</u> to 99
	rAtE	Baud rate	<u>9600</u> / 19200 bps
	CHAr	Character (Data length, parity, stop bit)	<u>5: 8 bits / without parity / 1 bit</u> 6: 8 bits / without parity / 2 bits 7: 8 bits / even parity / 1 bit 8: 8 bits / even parity / 2 bits 9: 8 bits / odd parity / 1 bit 10: 8 bits / odd parity / 2 bits

* When changing parameters from the X1 series, set "LoCK (key lock): 4".

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.4 LT300 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicating Controller

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

(Underlined setting: default)

Mode	Indication	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 com (communication setting)	PtCL	Communication protocol	**rtU: MODBUS (RTU)**
	FUnC	Communication function	**Com: Host communication**
	AdrS	Device No.	01 to 99
	rAtE	Baud rate	9600 / 19200 bps
	CHAr	Character (Data length, parity, stop bit)	5: 8 bits / without parity / 1 bit 6: 8 bits / without parity / 2 bits 7: 8 bits / even parity / 1 bit 8: 8 bits / even parity / 2 bits 9: 8 bits / odd parity / 1 bit 10: 8 bits / odd parity / 2 bits

* When changing parameters from the X1 series, set "LoCK (key lock): 4".

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.5 LT400 Series (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicating Controller

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

(Underlined setting: default)

Mode	Display	Item	Setting
Mode 1 eng (engineering)	LoCK	Key lock	4: All items prohibited *
Mode 7 commu (communication setting)	PrtCL	Communication protocol	**rtU: MODBUS (RTU)**
	FUnC	Communication function	**Com: Host communication**
	AdrS	Device No.	01 to 99
	rAtE	Baud rate	9600 / 19200 bps
	CHArA	Character (Data length, parity, stop bit)	8N1: 8 bits / without parity / 1 bit 8N2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8O1: 8 bits / odd parity / 1 bit 8O2: 8 bits / odd parity / 2 bits

* When changing parameters from the X1 series, set "LoCK (key lock): 4".

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.6 LT830 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Digital Indicating Controller

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

(Underlined setting: default)

Mode	Indication	Item	Setting	Remarks
Mode 5 tyPE (type)	LoCK	Lock function	3: All items prohibited *	
Mode 6 com (communication setting)	PtCL	Communication protocol	**rtU: MODBUS (RTU)**	
	FUnC	Communication function	**Com: Host communication**	
	AdrS	Device No.	1 to 99	
	rAtE	Baud rate	9600 / 19200 bps	
	CHAr	Character (Data length, parity, stop bit)	8n1: 8 bits / without parity / 1 bit 8n2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8o1: 8 bits / odd parity / 1 bit 8o2: 8 bits / odd parity / 2 bits	

* When changing parameters from the X1 series, set "LoCK (lock function): 3".

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.7 KR2000 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

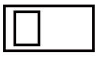
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 31	

Graphic Recorder

Selector switch

When establishing a communication with a graphic recorder, set the selector switch at the top of the unit.

(Underlined setting: default)

Selector switch	Setting	Remarks
	232C: RS-232C connection 485: RS-485 connection	Switch the signal with the power to the recorder OFF.

Communication setting

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

(Underlined setting: default)

Setting Menu	Menu	Item	Setting	Remarks
System setting	Host communication	Communication mode	**RTU: MODBUS (RTU)**	
		Device address	01 to 31	
		Bit rate	9600 / 19200 bps	
		Communication characters (Data length, parity, stop bit)	8N1: 8 bits / without parity / 1 bit 8N2: 8 bits / without parity / 2 bits 8E1: 8 bits / even parity / 1 bit 8E2: 8 bits / even parity / 2 bits 8O1: 8 bits / odd parity / 1 bit 8O2: 8 bits / odd parity / 2 bits	

Available Device Memory

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

Device Memory		TYPE	Remarks
4	(analog setting value)	00H	
3	(analog input data)	01H	Read only
0	(digital setting value)	02H	
1	(digital input data)	03H	Read only

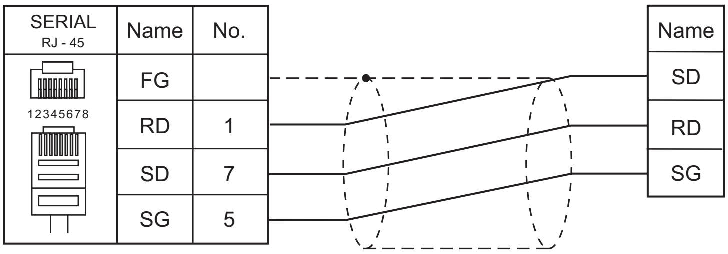
Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

11.1.8 Wiring Diagrams

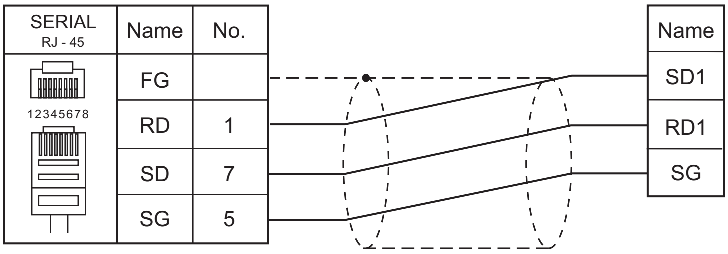
RS-232C

Wiring diagram 1 - M2



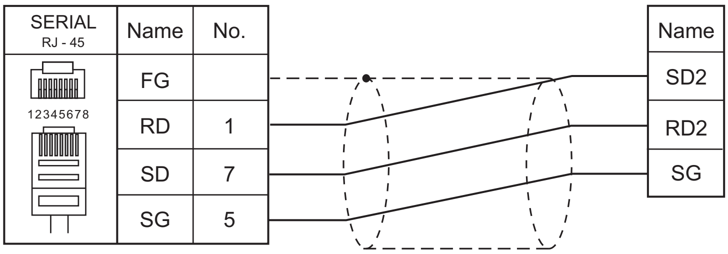
* Use shielded twist-pair cables.

Wiring diagram 2 - M2



* Use shielded twist-pair cables.

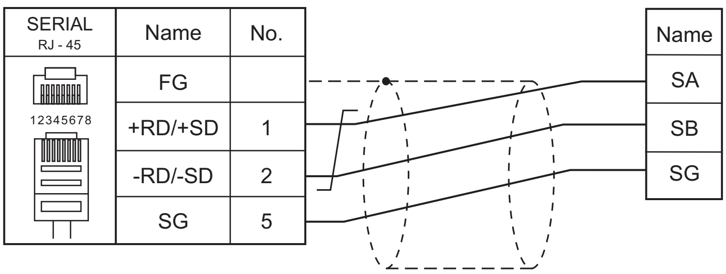
Wiring diagram 3 - M2



* Use shielded twist-pair cables.

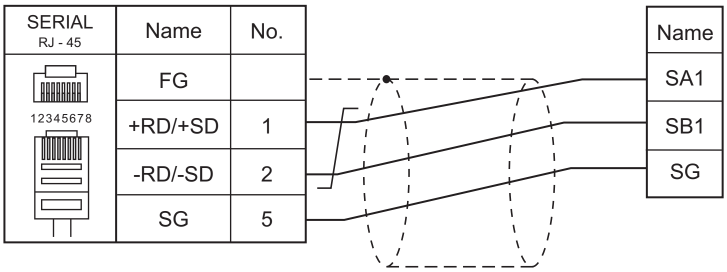
RS-422/RS-485

Wiring diagram 1 - M4



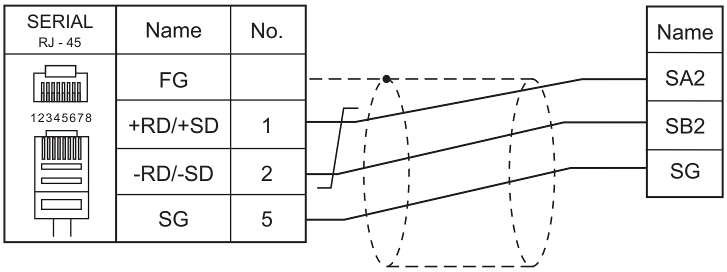
* Use shielded twist-pair cables.

Wiring diagram 2 - M4



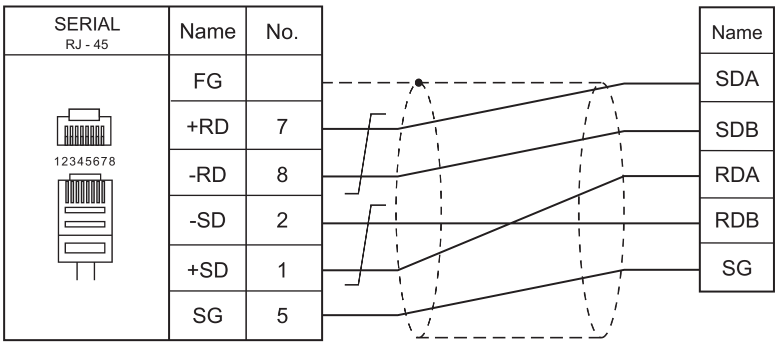
* Use shielded twist-pair cables.

Wiring diagram 3 - M4



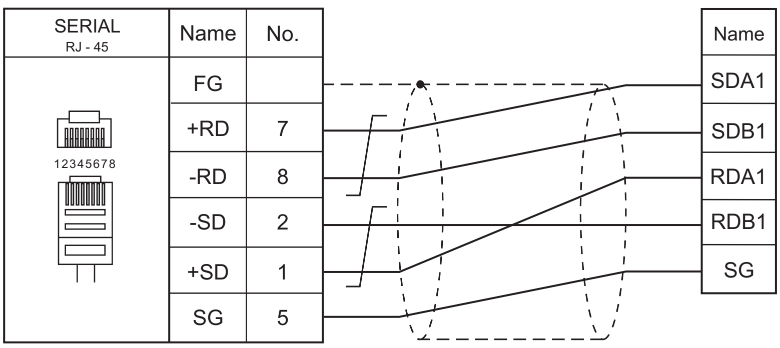
* Use shielded twist-pair cables.

Wiring diagram 4 - M4



* Use shielded twist-pair cables.

Wiring diagram 5 - M4



* Use shielded twist-pair cables.

12. CIMON

12.1 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
BP series	CM2-BPxxMDxx-R CM2-BPxxMDxx-T CM2-BPxxMDxx-S CM2-BPxxMDxx-U	LOADER port		RS-232C	Wiring diagram 1 - M2	×
	CM2-BPxxMDxx-R	Comm port		RS-232C	Wiring diagram 3 - M2	×
	CM2-BPxxMDxx-T	CH1		RS-232C	Wiring diagram 2 - M2	×
		CH2		RS-422/485	Wiring diagram 1 - M4	Wiring diagram 7 - M4 *3
	CM2-BPxxMDxx-S	Comm port		RS-422/485	Wiring diagram 2 - M4	Wiring diagram 5 - M4 *3
	CM2-BPxxMDxx-U	CH1		RS-422	×	Wiring diagram 6 - M4
		CH2		RS-422/485	Wiring diagram 1 - M4	Wiring diagram 7 - M4 *3
CP series	CM1-CPxx	LOADER port		RS-232C	Wiring diagram 1 - M2	×
	CM1-CP4C	Comm port		RS-232C	Wiring diagram 4 - M2	×
	CM1-CP4D	Comm port		RS-422/485	Wiring diagram 3 - M4	Wiring diagram 8 - M4 *3
	CM1-CPxx	CM1-SC01A	CH1	RS-232C	Wiring diagram 2 - M2	×
		CM1-SC01B	CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
		CM1-SC02A	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
XP series	CM1-XPxx	LOADER port	Modular 6 pin	RS-232C	Wiring diagram 1 - M2	×
			3 pin Terminal		Wiring diagram 6 - M2	×
		CM1-SC01A	CH1	RS-232C	Wiring diagram 2 - M2	×
		CM1-SC01B	CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
		CM1-SC02A	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
		CM1-SC02C	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-232C	Wiring diagram 2 - M2	×
S series	CM3-SP32MDT CM3-SP32MDT-SD CM3-SP32MDTV CM3-SP32MDTV-SD CM3-SP32MDTE CM3-SP32MDTE-SD CM3-SP32MDTF CM3-SP32MDTF-SD CM3-SP16MDR CM3-SP16MDRV CM3-SP16MDRE CM3-SP16MDRF	Channel1		RS-232C	Wiring diagram 5 - M2	×
		Channel2		RS-422/485	Wiring diagram 10 - M4	×
		CM3-SP02ERS CM3-SP02ERR	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-422/485	Wiring diagram 11 - M4	Wiring diagram 12 - M4 *3
CP3E	CM1-CP3E	LOADER port	3 pin Terminal	RS-232C	Wiring diagram 6 - M2	×
		CM1-SC01A	CH1	RS-232C	Wiring diagram 2 - M2	×
		CM1-SC01B	CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
		CM1-SC02A	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-422/485	Wiring diagram 4 - M4	Wiring diagram 9 - M4 *3
		CM1-SC02C	CH1	RS-232C	Wiring diagram 2 - M2	×
			CH2	RS-232C	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).
*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]
S series (Ethernet)	CM3-SP32MDTE CM3-SP32MDTE-SD CM3-SP32MDTF CM3-SP32MDTF-SD CM3-SP16MDRE CM3-SP16MDRF	LAN built into CPU	○	○	TCP/IP: 10260 (fixed)	○
		CM3-SP01EET	○	○	UDP/IP: 10262 (fixed)	

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

12.1.1 BP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

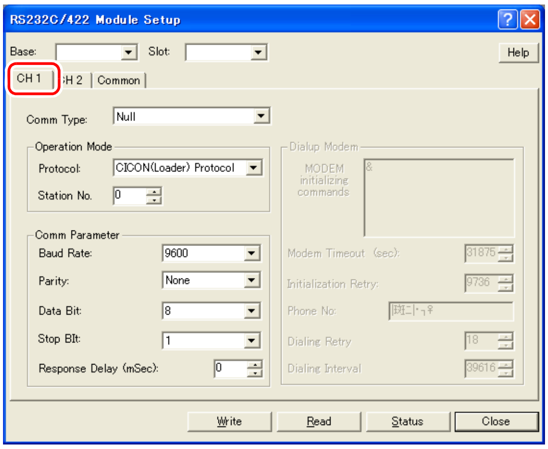
PLC

CM2-BPxxMDxx-R, T, S, U (LOADER Port)

No particular setting is necessary on the PLC.
The communication parameters are fixed; signal level: RS-232C, baud rate: 38400 bps, data length: 8 bits, stop bit: 1 bit, parity: none.

CM2-BPxxMDxx-T, U (CH1)

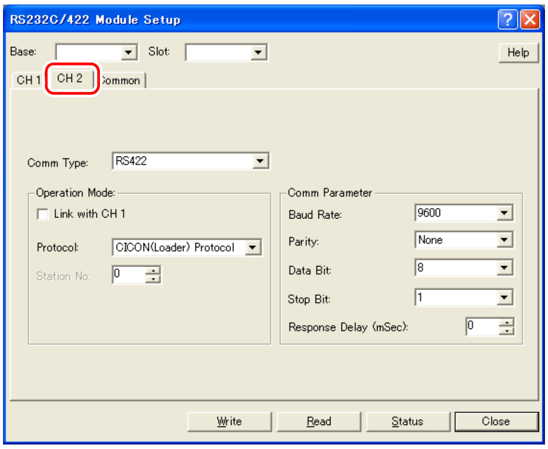
Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM2-BPxxMDxx-T, U (CH2)

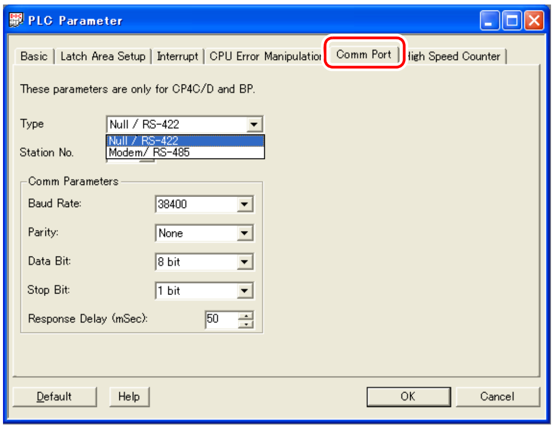
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire RS-485: 2-wire
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM2-BPxxMDxx-R, S

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Type	Null / RS-422, Modem / RS-485	RS-232C connection: Null / RS-422 RS-422 (4-wire) connection: Null / RS-422 RS-485 (2-wire) connection: Modem / RS-485
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1

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

12.1.2 CP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

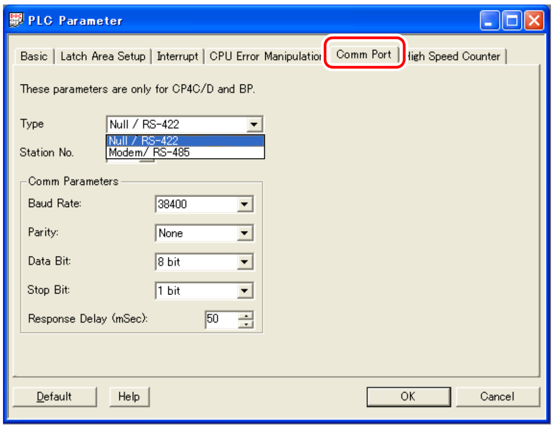
PLC

LOADER Port

No particular setting is necessary on the PLC.
The communication parameters are fixed; signal level: RS-232C, baud rate: 38400 bps, data length: 8 bits, stop bit: 1 bit, parity: none.

CM1-CP4C/CM1-CP4D

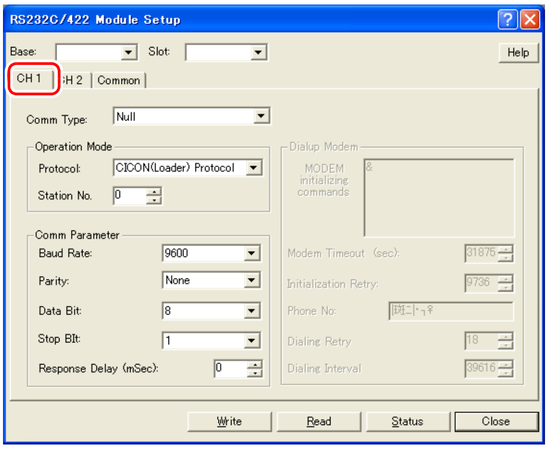
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Type	Null / RS-422, Modem / RS-485	RS-232C connection: Null / RS-422 RS-422 (4-wire) connection: Null / RS-422 RS-485 (2-wire) connection: Modem / RS-485
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01A, CM1-SC02A (CH1)

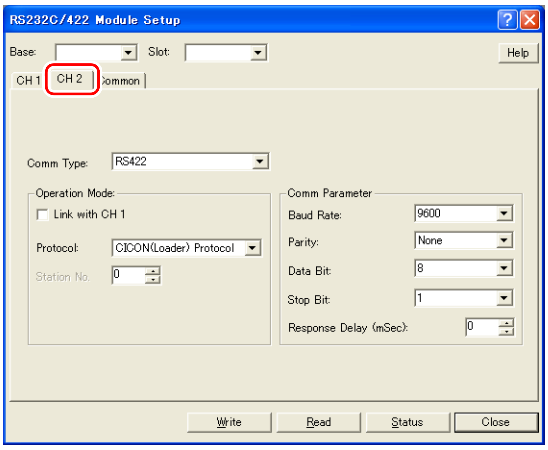
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01B, CM1-SC02A (CH2)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire RS-485: 2-wire
Protocol	**CICON(Loader) Protocol**	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1

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

12.1.3 XP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 76800 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

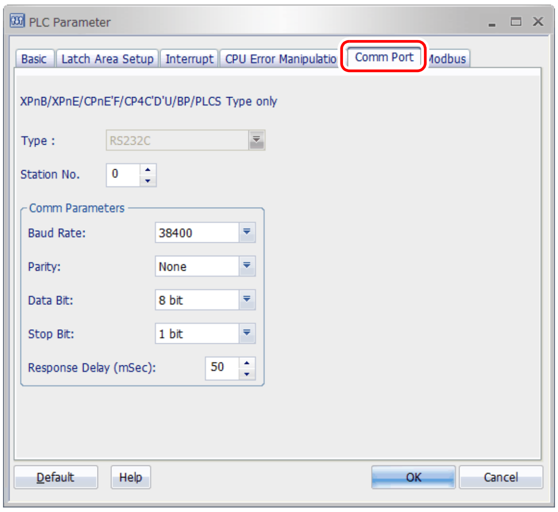
PLC

CM1-XPxA, R (LOADER Port)

No particular setting is necessary on the PLC.
The communication parameters are fixed; signal level: RS-232C, baud rate: 38400 bps, data length: 8 bits, stop bit: 1 bit, parity: none.

CM1-XPxE, F, S (LOADER Port)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.

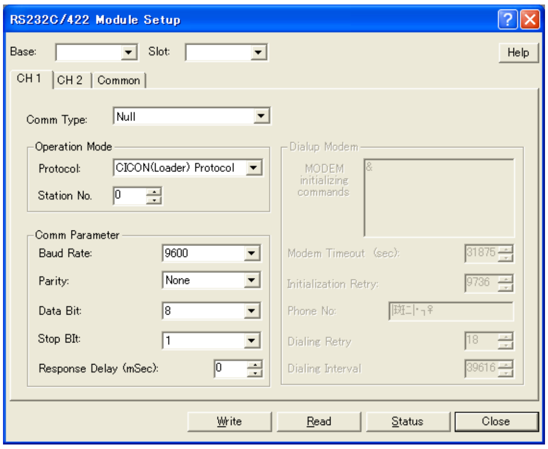


(Underlined setting: default)

Item	Setting	Remarks
Station No.	0 to 254	
Baud Rate	4800 / 9600 / 19200 / 38400 / 76800 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01A, CM1-SC02A (CH1), CM1-SC02C (CH1, CH2)

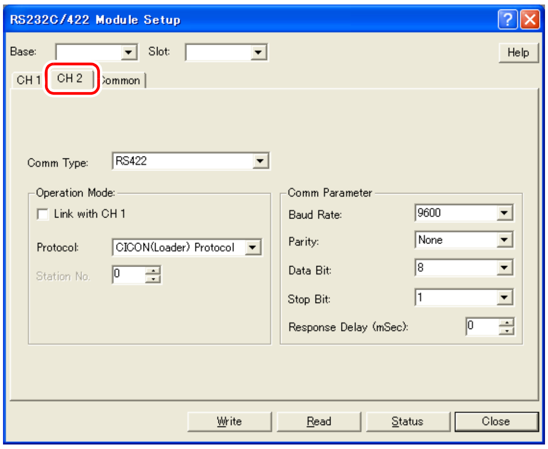
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Protocol	**CICON(Loader) Protocol**	
Station No.	0 to 31	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01B, CM1-SC02A (CH2)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire RS-485: 2-wire
Protocol	**CICON(Loader) Protocol**	
Station No.	0 to 31	
Baud Rate	9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1
Z	(Subroutine)	0EH	
R	(Index Register)	0FH	
Q	(Sequential Function Chart)	10H	

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

12.1.4 S Series

Communication Setting

Editor

Communication setting

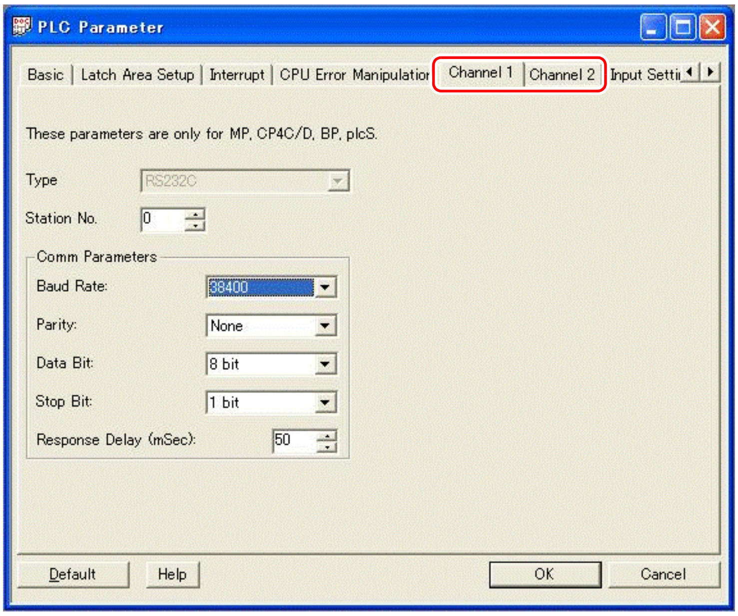
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 255	

PLC

CPU Port: Channel1 (RS-232C) / Channel2 (RS-422/485)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.

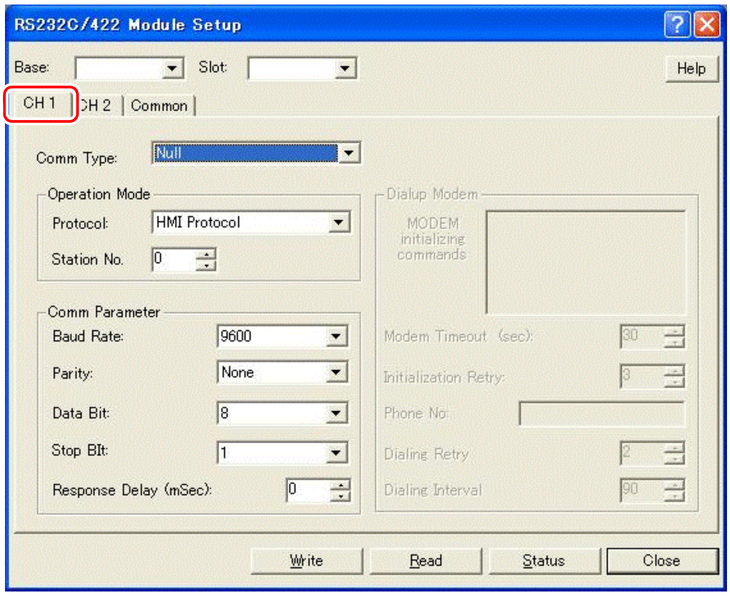


Item	Setting	Remarks
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM3-SP02ERS/CM3-SP02ERR

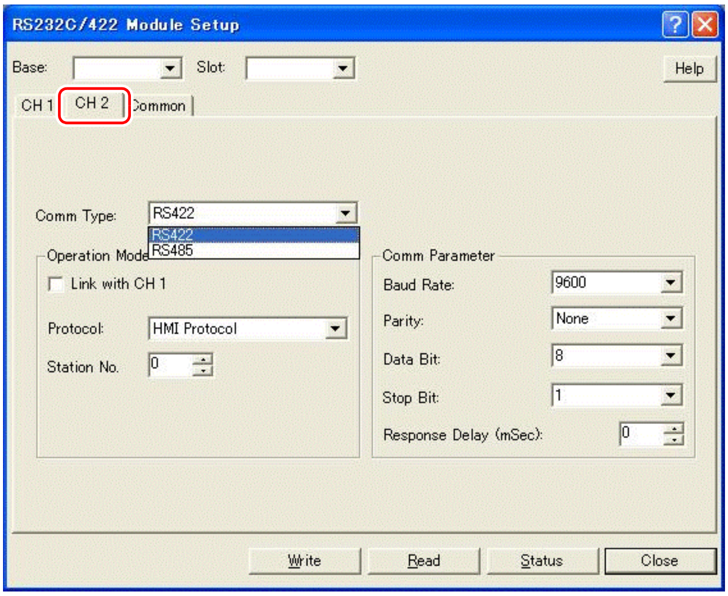
Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.

CH1



Item	Setting	Remarks
Protocol	**HMI Protocol**	
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CH2



Item	Setting	Remarks
Comm Type	RS-422, RS-485	
Protocol	**HMI Protocol**	
Station No.	0	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1
Z		0EH	

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

Indirect Device Memory Designation

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

*1 For designation of byte device memory S:
Specify an address number divided by "2" as the address number.

*2 For bit designation of byte device memory S:

- An even address number
  Specify a byte address number divided by "2" as the address number.
- An odd address number
  Specify a byte address number minus "1", divided by "2", as the address number. Specify a bit number plus "8" for the bit designation.

  Example: Indirect device memory designation of S11-07
  n + 1 = (11 - 1) / 2 = 5 (DEC)
  n + 2 = 7 + 8 = 15 (DEC)

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (=$u n)		F2
Mode change	1 to 8 (PLC1 to 8)	n	Station number	3
		n+1	Command: 0000H	
		n+2	Mode 0: Run 1: Program 2: Pause/Remote	

12.1.5 S Series (Ethernet)

Communication Setting

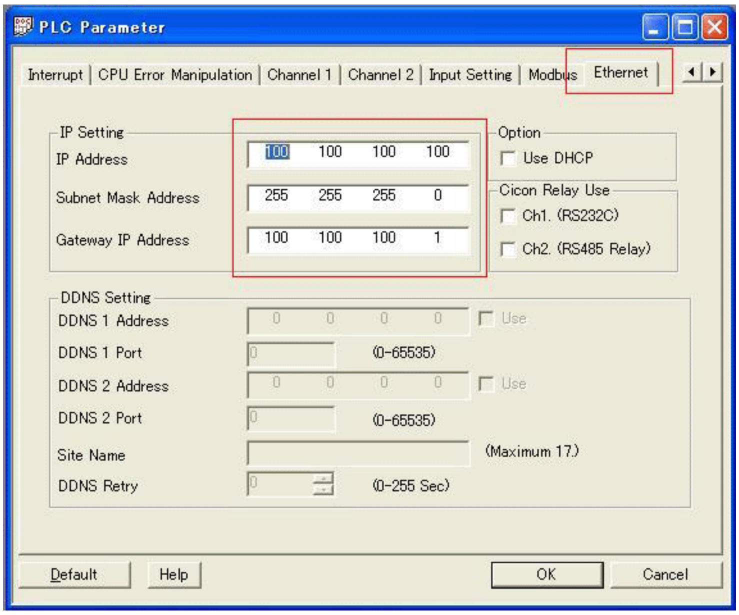
Editor

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. 10260 for TCP/IP or No. 10262 for UDP/IP) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

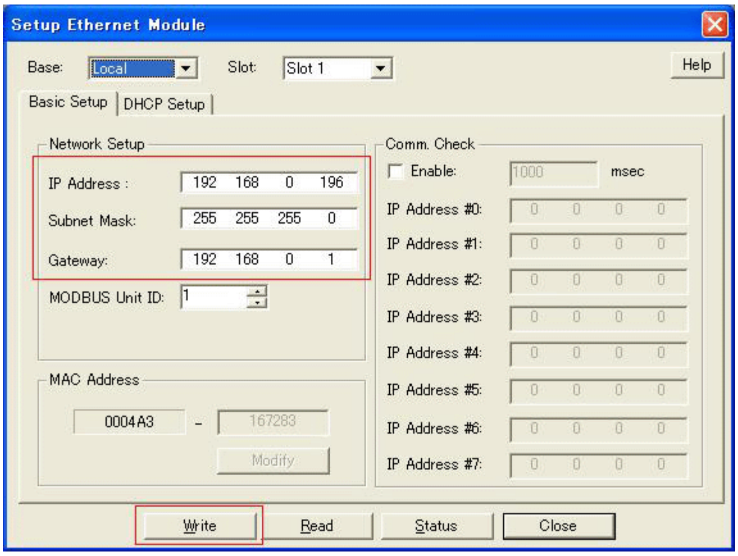
LAN port built into CPU



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	For more information, refer to the manual of the PLC.
Subnet Mask Address	Set the subnet mask of the PLC.	
Gateway IP Address	Specify according to the environment.	

* The port numbers are 10260 for TCP/IP and 10262 for UDP/IP (both fixed). For details, refer to the PLC manual issued by the manufacturer.

CM3-SP01EET



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	For more information, refer to the manual of the PLC.
Subnet Mask	Set the subnet mask of the PLC.	
Gateway	Specify according to the environment.	

* The port numbers are 10260 for TCP/IP and 10262 for UDP/IP (both fixed). For details, refer to the PLC manual issued by the manufacturer.

Available Device Memory

Settings are the same as those described in “12.1.4 S Series”.

12.1.6 CP3E

Communication Setting

Editor

Communication setting

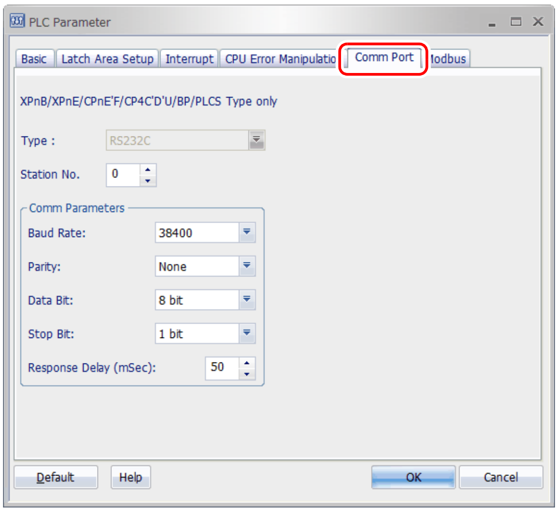
(Underlined setting: default)

Item	Setting Value	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 76800 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

PLC

CM1-CP3E (LOADER Port)

Make communication settings using the application software "CICON". For more information, refer to the instruction manual issued by CIMON.

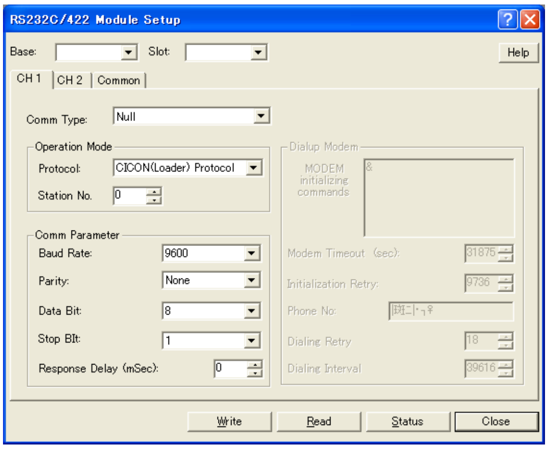


(Underlined setting: default)

Item	Setting Value	Remarks
Station No.	0 to 254	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01A, CM1-SC02A (CH1), CM1-SC02C (CH1, CH2)

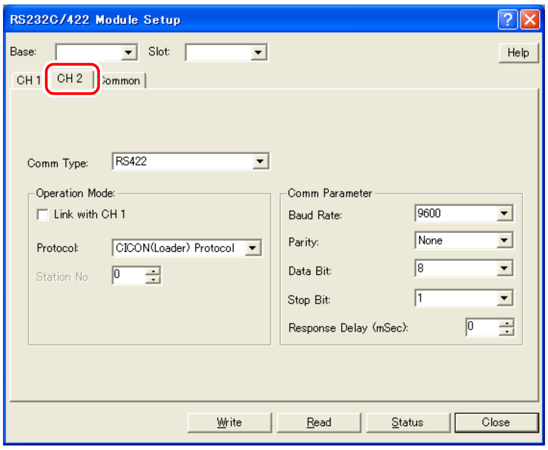
Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting Value	Remarks
Protocol	**CICON(Loader) Protocol**	
Station No.	0 to 31	
Baud Rate	4800 / 9600 / 19200 / 38400 / 76800 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

CM1-SC01B, CM1-SC02A (CH2)

Make communication settings using the application software “CICON”. For more information, refer to the instruction manual issued by CIMON.



Item	Setting Value	Remarks
Comm Type	RS422 / RS485	RS-422: 4-wire connection RS-485: 2-wire connection
Protocol	**CICON(Loader) Protocol**	
Station No.	0 to 31	
Baud Rate	4800 / 9600 / 19200 / 38400 / 76800 bps	
Parity	Even / Odd / None	
Data Bit	7 / 8 bits	
Stop Bit	1 / 2 bits	

Available Device Memory

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

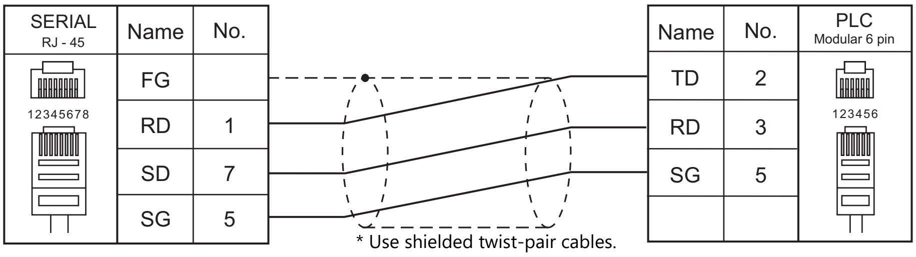
Device Memory		TYPE	Remarks
D	(Data Memory)	00H	
X	(External Input)	01H	
Y	(External Output)	02H	
M	(Internal Relay)	03H	
L	(Internal Relay)	04H	
K	(Latch Relay)	05H	
F	(Flags)	06H	Read only
T	(Timer Output)	07H	
TS	(Timer PV)	08H	
TC	(Timer SV)	09H	
C	(Counter Output)	0AH	
CS	(Counter PV)	0BH	
CC	(Counter SV)	0CH	
S	(Step Control Relay)	0DH	*1
Z	(Subroutine)	0EH	
R	(Index Register)	0FH	
Q	(Sequential Function Chart)	10H	

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

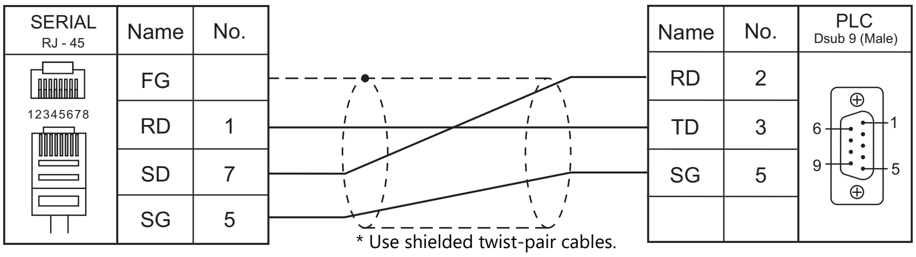
12.1.7 Wiring Diagrams

RS-232C

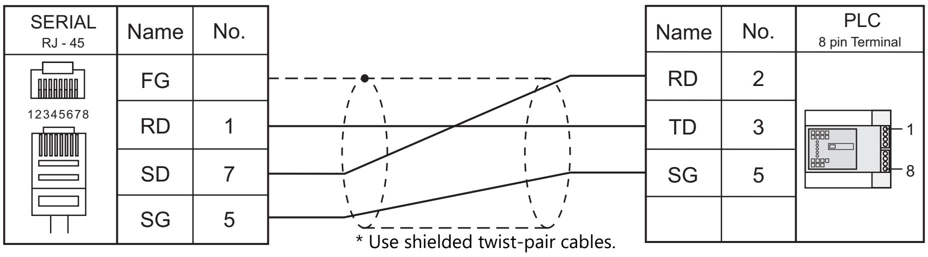
Wiring diagram 1 - M2



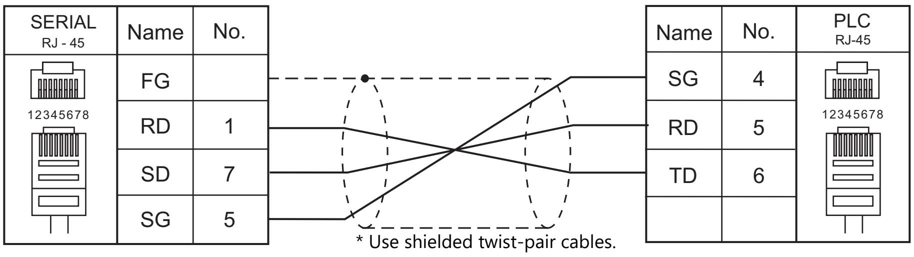
Wiring diagram 2 - M2



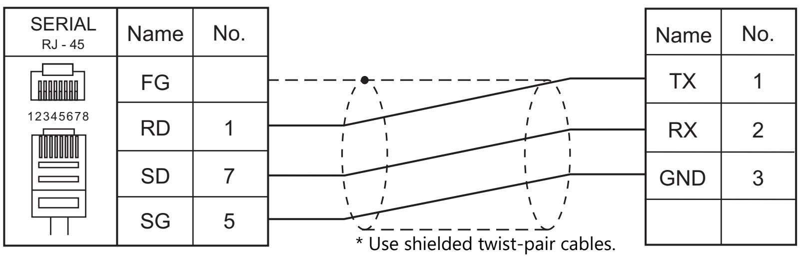
Wiring diagram 3 - M2



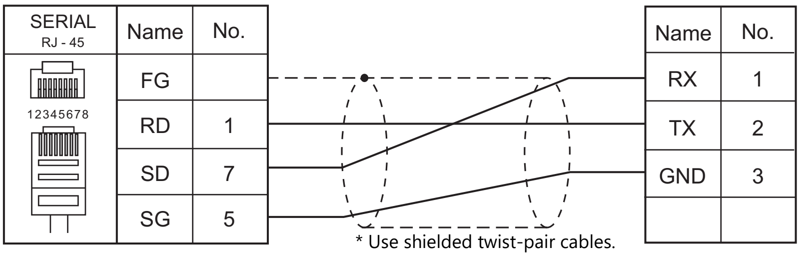
Wiring diagram 4 - M2



Wiring diagram 5 - M2

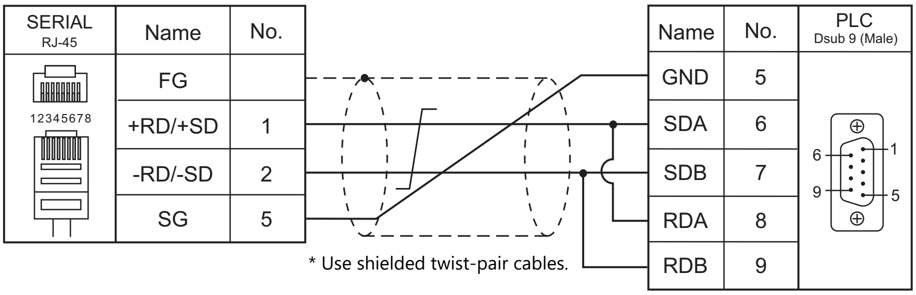


Wiring diagram 6 - M2

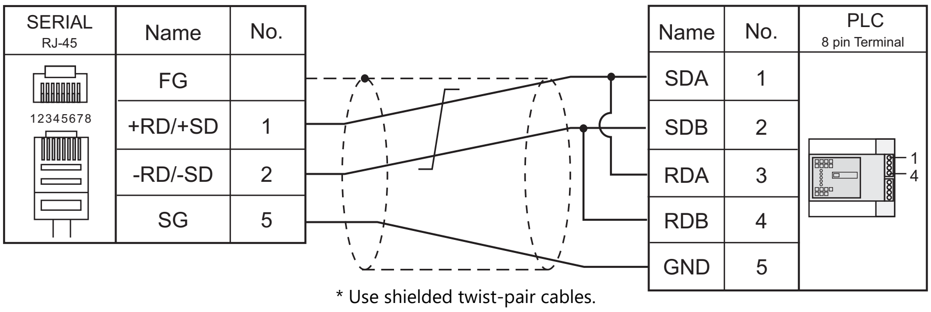


RS-422/RS-485

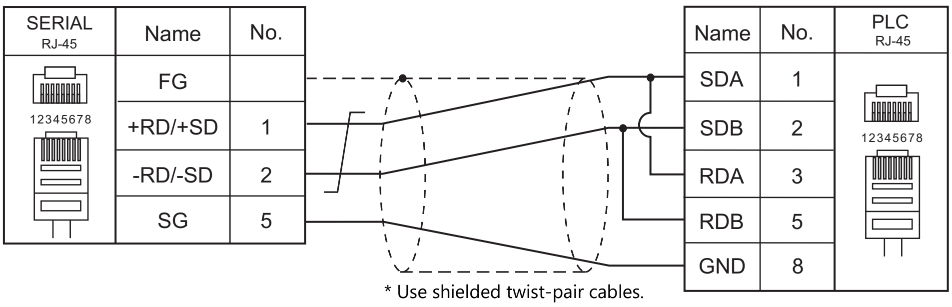
Wiring diagram 1 - M4



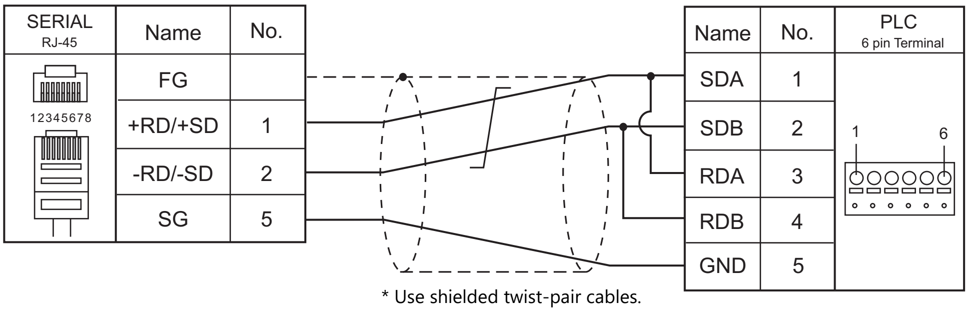
Wiring diagram 2 - M4



Wiring diagram 3 - M4

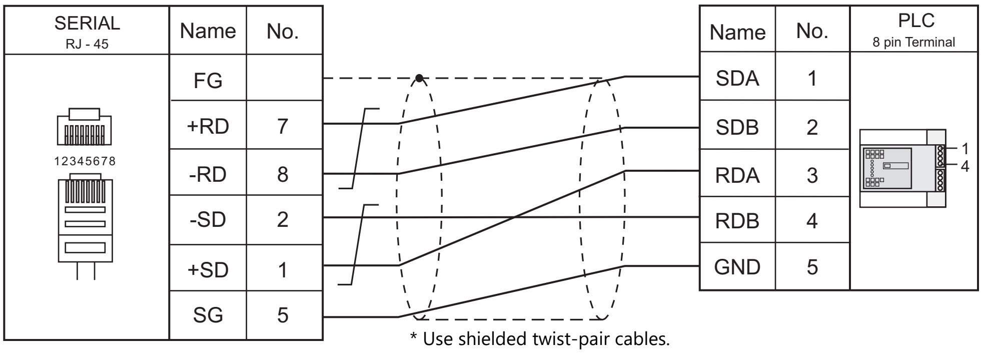


Wiring diagram 4 - M4



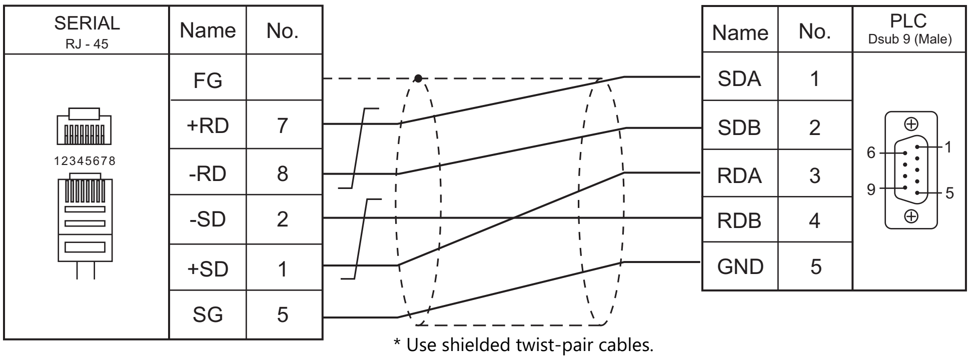
* Use shielded twist-pair cables.

Wiring diagram 5 - M4



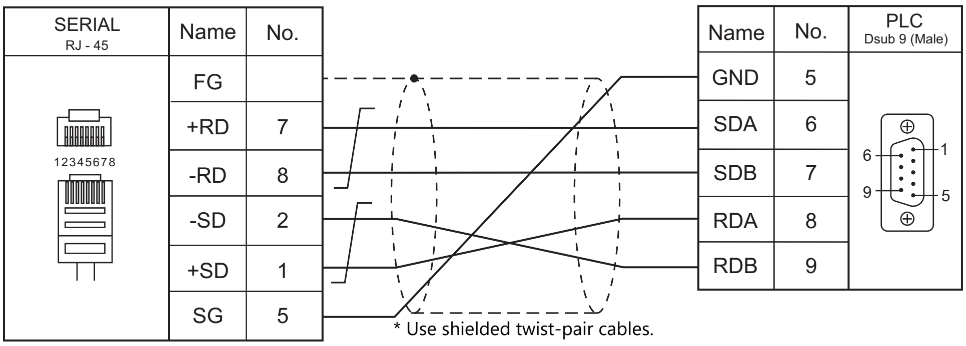
* Use shielded twist-pair cables.

Wiring diagram 6 - M4



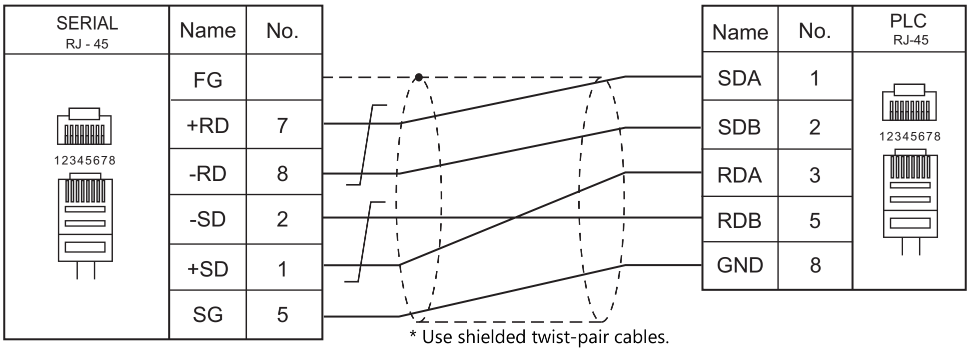
* Use shielded twist-pair cables.

Wiring diagram 7 - M4

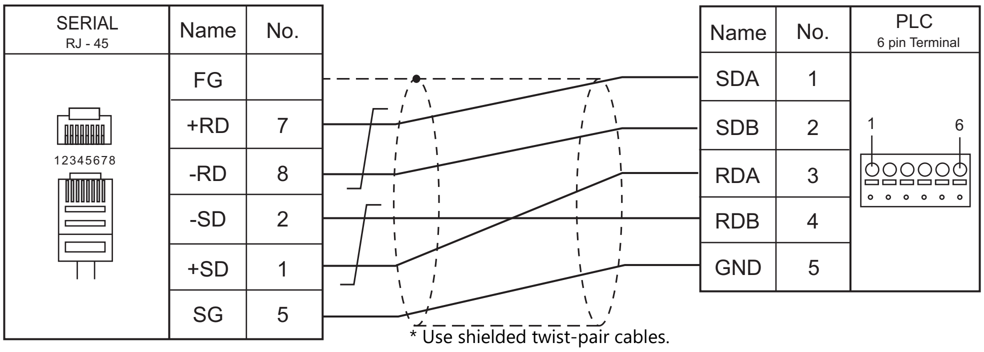


* Use shielded twist-pair cables.

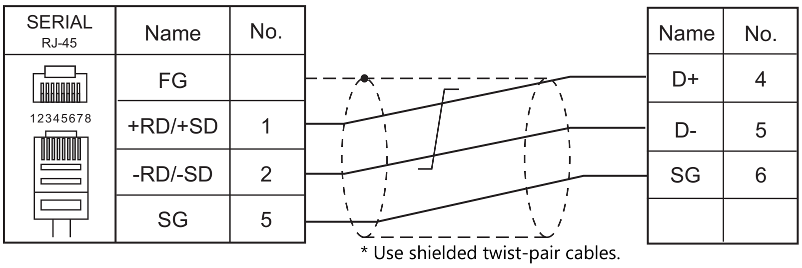
Wiring diagram 8 - M4



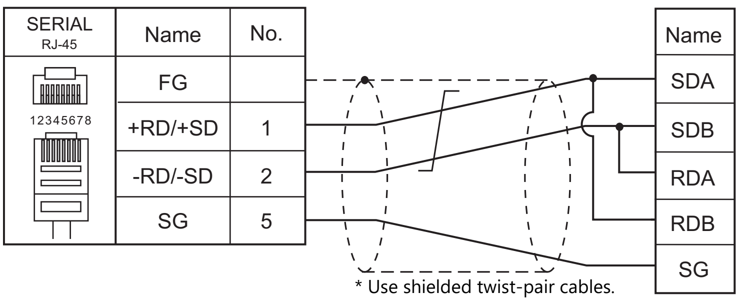
Wiring diagram 9 - M4



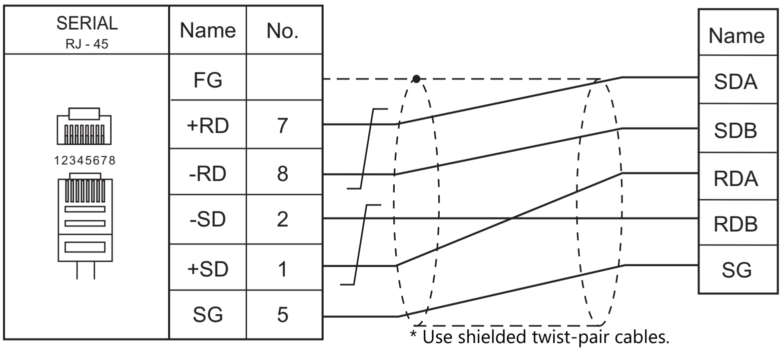
Wiring diagram 10 - M4



Wiring diagram 11 - M4



Wiring diagram 12 - M4



13. DELTA

13.1 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)
DVP series	DVP-EH2 DVP-ES DVP-EX DVP-SS DVP-SA DVP-SX DVP-SC DVP-SV DVP-PM	RS-232C communication port	RS-232C	Wiring diagram 1 - M2	×
		RS-485 communication port	RS-485	Wiring diagram 1 - M4	×
DVP-SE (MODBUS ASCII)	DVP-SE	RS-485 communication port	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	TCP/IP	UDP/IP	Port No.	Keep Alive*1
DVP-SE (MODBUS TCP/IP)	DVP-SE	Built-in Ethernet port	○	×	502 (fixed)	○

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

13.1.1 DVP Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

(Underlined setting: default)

Item	Setting	Remarks
Baud rate	9600	For more information, refer to the PLC manual issued by the manufacturer.
Station number	1	
Data length	7	
Stop bit	1	
Parity	Even	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

13.1.2 DVP-SE (MODBUS ASCII)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Item	Setting	Remarks
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200	For more information, refer to the PLC manual issued by the manufacturer.
Target Port No.	1 to 31	
Data Length	7 / 8	
Stop Bit	1 / 2	
Parity	None / Odd / Even	

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

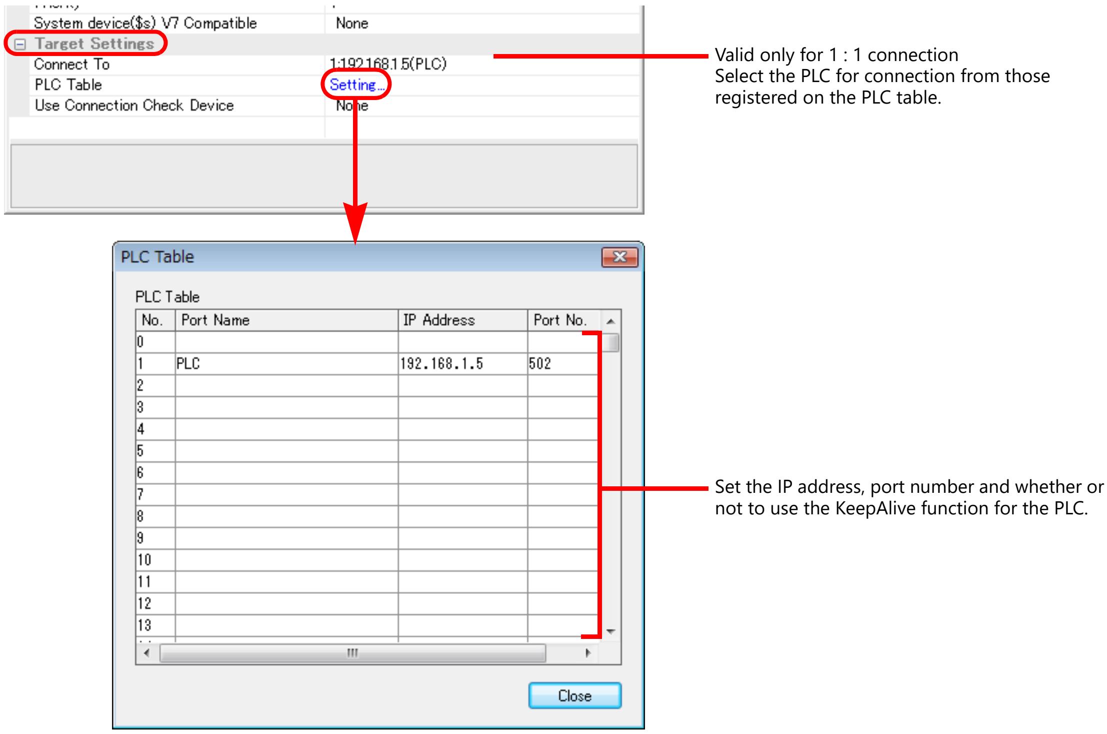
13.1.3 DVP-SE (MODBUS TCP/IP)

Communication Setting

Editor

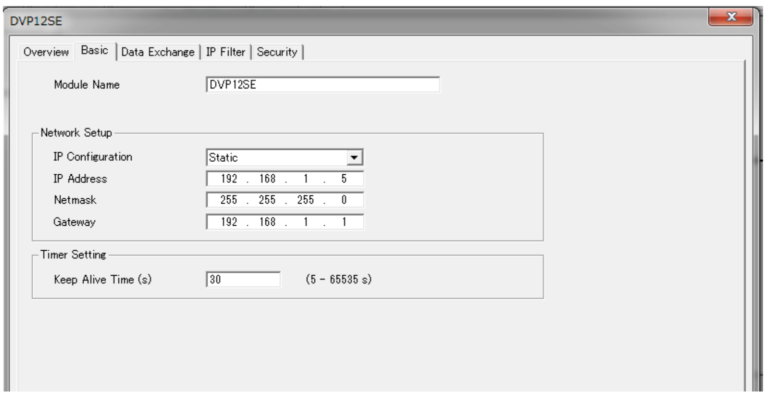
Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- IP address for the 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. 502) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



PLC

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



Item	Setting	Remarks
IP Configration	**Static**	For more information, refer to the PLC manual issued by the manufacturer.
IP Address	Set the IP address of the PLC.	
Netmask	Set the subnet mask of the PLC.	
Gateway	Specify according to the environment.	

Available Device Memory

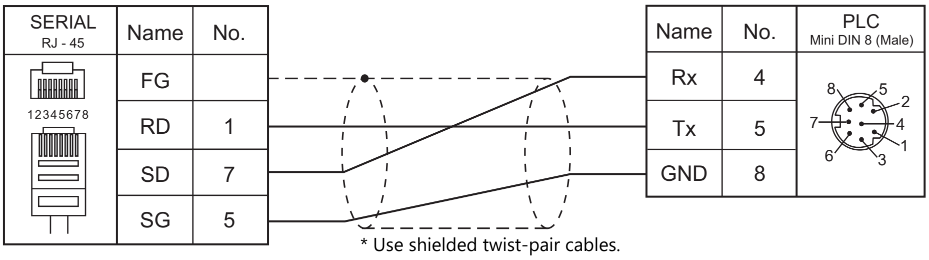
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(Data register)	00H	
X	(Input relay)	01H	Read only
Y	(Output relay)	02H	
M	(Auxiliary relay)	03H	
S	(Step relay)	04H	
T	(Timer)	05H	
C	(Counter)	06H	
32C	(High-speed counter)	07H	Double-word

13.1.4 Wiring Diagrams

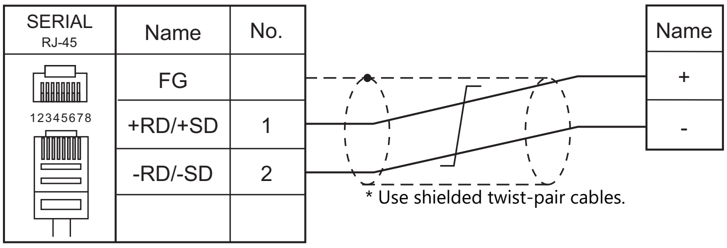
RS-232C

Wiring diagram 1 - M2



RS-422/RS-485

Wiring diagram 1 - M4



14. DELTA TAU DATA SYSTEMS

14.1 Temperature Controller/Servo/Inverter Connection

Serial Connection

Motion Controller

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">Model</th><th rowspan="2" colspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="2">Connection</th><th rowspan="2">Lst File</th></tr>
<tr><th>RS-232C*1 / RS-485 (2-wire)</th><th>RS-422 (4-wire)</th></tr>
<tr><td rowspan="8">PMAC</td><td>PMAC PCI</td><td>Serial port</td><td>J4</td><td rowspan="8">RS-232C</td><td>Wiring diagram 1 - M2</td><td>×</td><td rowspan="8">PMAC.Lst</td></tr>
<tr><td>Turbo PMAC PCI</td><td>Option-9T</td><td>J8</td><td rowspan="5">Wiring diagram 2 - M2</td><td rowspan="5">×</td></tr>
<tr><td>PMAC2 PCI</td><td>Serial port</td><td>J5</td></tr>
<tr><td>Turbo PMAC2 PCI</td><td>Option-9T</td><td>J8</td></tr>
<tr><td rowspan="2">UMAC Turbo CPU</td><td>Serial port</td><td>J7</td></tr>
<tr><td>Sub-serial port</td><td>J8</td></tr>
<tr><td rowspan="2">3U Turbo PMAC2</td><td>Serial port</td><td>J7</td><td>Wiring diagram 1 - M2</td><td>×</td></tr>
<tr><td>Option-9T</td><td>J8</td><td>Wiring diagram 2 - M2</td><td>×</td></tr>
</table>

*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).

Ethernet Connection

Motion Controller

PLC Selection on the Editor	Model	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1	Lst File
PMAC (Ethernet TCP/IP)	UMAC Turbo CPU	CPU with built-in Ethernet	○	×	1025 (max. 4 units)	○	PMAC_Eth.Lst

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

14.1.1 PMAC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	**RS-232C**	
Baud Rate	4800 / 9600 / 19200 / <u>38400</u> / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	<u>0</u> to 31	

PMAC

Make PMAC settings by using the software "PEWIN32PRO2". For more information, refer to the PMAC instruction manual issued by the manufacturer.
Values after change are saved in FROM and determined when the power is turned off and back on again.

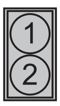
I-Variables by number

Address	Contents	Setting
I0	Serial card number	0: 1:1 connection
I1	Serial port mode	0: CTS signal used
I3	Handshake I/O control	2
I4	Communication sum check mode	0: Without sum check
I6	Error notification mode	1
I43	Protocol selection [*1]	0: Standard protocol
I53	Sub port [*2]	Baud rate 6: 4800, 8: 9600, 10: 19200, 12: 38400, 13: 57600, 14: 78600, 15: 115K [*3] bps
I54	Main port	Baud rate 6: 4800, 8: 9600, 10: 19200, 12: 38400, 13: 57600, 14: 78600, 15: 115K [*3] bps
I63	Echo back selection	1: Valid

*1 Set when Turbo PMAC PCI, Turbo PMAC2 CPCI, UMAC Turbo CPU or 3U Turbo PMAC2 is used.
*2 Valid when "Option-9T" is used with Turbo PMAC PCI, Turbo PMAC2 CPCI / 3U Turbo PMAC2 or the sub port of UMAC Turbo CPU is used.
*3 When "115K bps" is set, set the multiples of 30 MHz for "I52" (CPU frequency).

PMAC PCI

MAIN BOARD E-POINT

E-POINT		Contents	Setting
	E49	Parity control for serial communication	No parity: Install a jumper between pins 1 and 2.
	E110	Serial port setting	RS-232C: Install a jumper between pins 1 and 2.

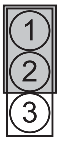
PMAC2 PCI

BASE BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port type selection	RS-232C: Install a jumper between pins 1 and 2.

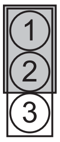
Turbo PMAC PCI

MAIN BOARD E-POINT

E-POINT		Contents	Setting
	E49	Parity control for serial communication	No parity: Install a jumper between pins 1 and 2.
	E110	Serial port setting	RS-232C: Install a jumper between pins 1 and 2.

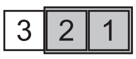
Turbo PMAC2 PCI

BASE BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port type selection	RS-232C: Install a jumper between pins 1 and 2.

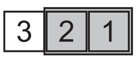
UMAC Turbo CPU

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E17A	PHASE+ valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E17B	PHASE- valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E18A	SERVO+ valid/invalid	Invalid: Install a jumper between pins 1 and 2.
	E18B	SERVO- valid/invalid	Invalid: Install a jumper between pins 1 and 2.

3U Turbo MPMAC2

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E17 E18	Serial port selection	RS-232C: Install a jumper between pins 1 and 2.

Available Device Memory

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

Device Memory		TYPE	Remarks
P	(variable P)	00H	Real number
Q	(variable Q)	01H	Real number
M	(variable M)	02H	Real number
I	(variable I)	03H	Real number
M_INT	(variable M (integer))	04H	Double-word
I_INT	(variable I (integer))	05H	Double-word
P_INT	(variable P (integer))	06H	Double-word

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).

15							8
0	0	0	0	0	0	0	

Expansion bit designation
0: 0 to 15 bits
1: 16 to 31 bits

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Write of data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0000H	
		n + 2	Timeout time: 1 to 300 sec. (0: Time set on the editor*)	
Control-X	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0001H	

* Depends on the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).

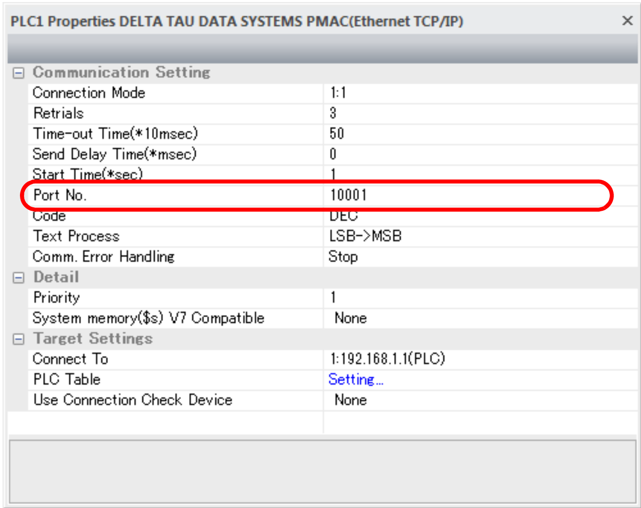
14.1.2 PMAC (Ethernet TCP/IP)

Communication Setting

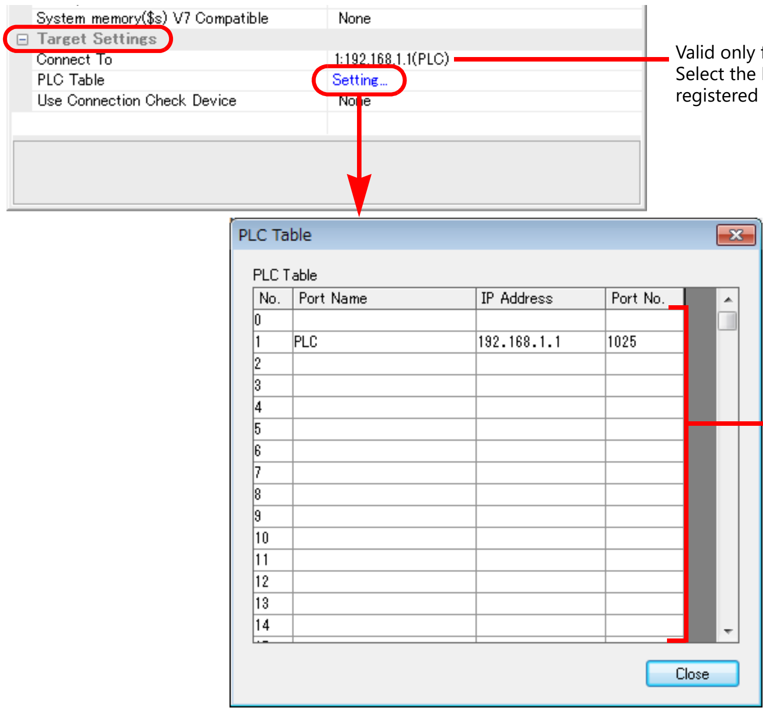
Editor

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

- 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.

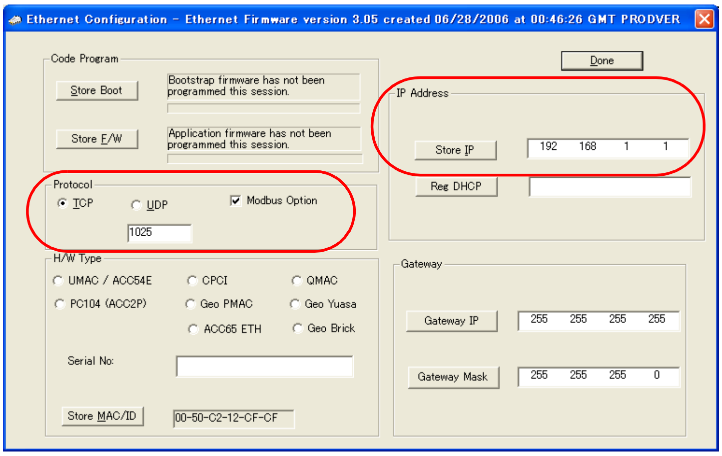
Set the IP address, port number 1025 and whether or not to use the KeepAlive function of the PLC.

UMAC

Make UMAC settings by using the software "PEWIN32PRO2 *". For more information, refer to the UMAC manual issued by the manufacturer.

* For Ethernet communication, PEWIN32PRO service pack 2.0 and later is necessary.

Ethernet configuration

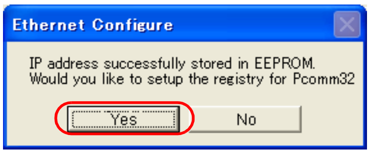


Item		Setting	Remarks
Protocol		**TCP**	For more information, refer to the UMAC instruction manual.
	Port No.	**1025 (fixed)**	
IP Address		IP address of UMAC	

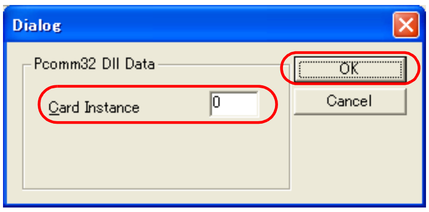
Procedure for changing the IP address

1. Change the IP address on the [Ethernet Configuration] dialog.
2. Click [Store IP] on the [Ethernet Configuration] dialog.

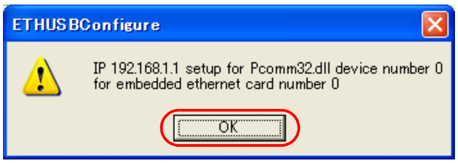
3. The [Ethernet Configure] dialog is displayed.
   Click [Yes].



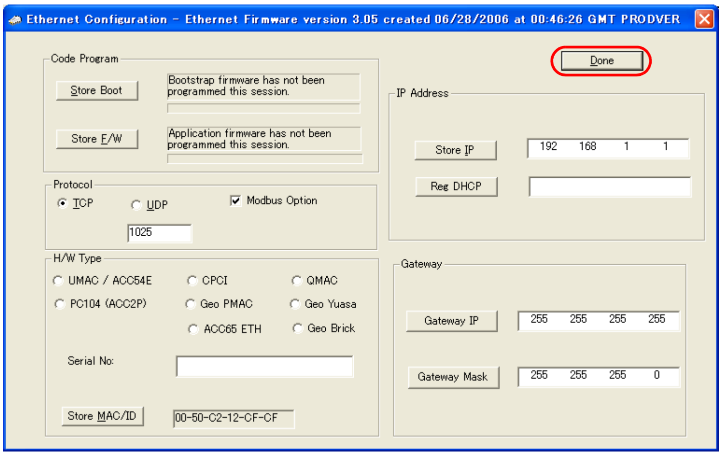
4. The [Dialog] dialog is displayed.
   Set "0" for [Card Instance] and click [OK].



5. The [ETHUSBConfigure] dialog is displayed.
   Click [OK].



6. The [Ethernet Configuration] dialog is displayed again.
   Click [Done] in the dialog.



7. Turn the power off and back on again.

* UMAC settings must be made via USB communication.
Before performing Ethernet communication with MONITOUCH, turn the power to UMAC off and remove the USB cable. Then, insert the Ethernet cable and turn the power on again.

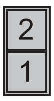
I-Variables by number

Address	Contents	Setting
I3	Handshake I/O control	2
I6	Error notification mode	1
I63	<Control-X> Echo valid/invalid	1: Valid

* Values after change are saved in FROM and determined when the power is turned off and back on again.

UMAC Turbo CPU

TURBO CPU BOARD E-POINT

E-POINT		Contents	Setting
	E6	Reloading the micro controller firmware	Normal operation: Install a jumper between pins 1 and 2.

Available Device Memory

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

Device Memory		TYPE	Remarks
P	(variable P)	00H	Real number
Q	(variable Q)	01H	Real number
M	(variable M)	02H	Real number
I	(variable I)	03H	Real number
M_INT	(variable M (integer))	04H	Double-word
I_INT	(variable I (integer))	05H	Double-word
P_INT	(variable P (integer))	06H	Double-word

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).

15							8
0	0	0	0	0	0	0	

Expansion bit designation
0: 0 to 15 bits
1: 16 to 31 bits

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

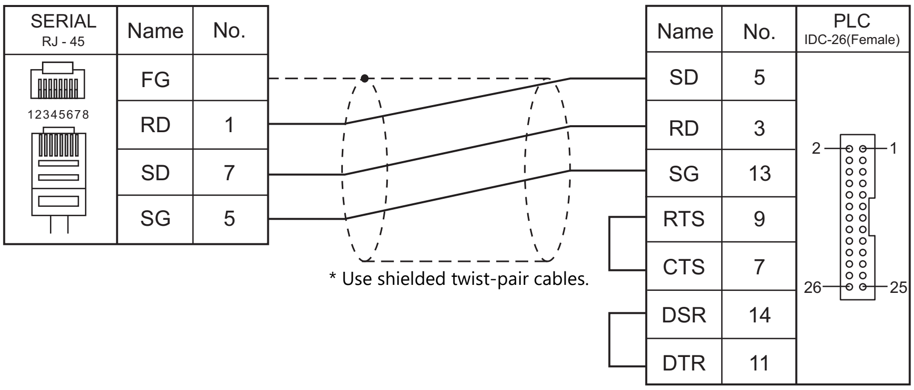
Contents	F0	F1 (= $u n)		F2
Write of data	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0000H	
		n + 2	Timeout time: 1 to 300 sec. (0: Time set on the editor*)	
Control-X	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0001H	

* Depends on the time set for [Time-out Time] under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).

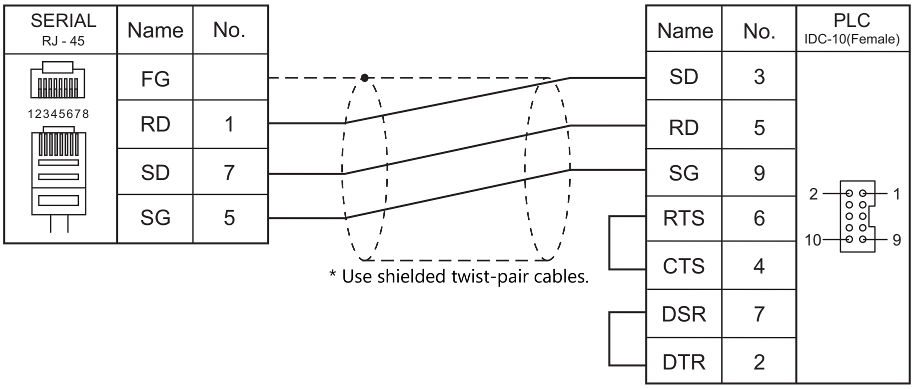
14.1.3 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



Wiring diagram 2 - M2



15. EATON Cutler-Hammer

15.1 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)
ELC	ELC-PA10 ELC-PC12 ELC-PH12 ELC-PB14	Programming port (COM1) on the CPU unit	RS-232C	Wiring diagram 1 - M2	×
		Communication port (COM2) on the CPU unit	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 ELC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

Make the PLC setting using device memory "D" (data register). For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

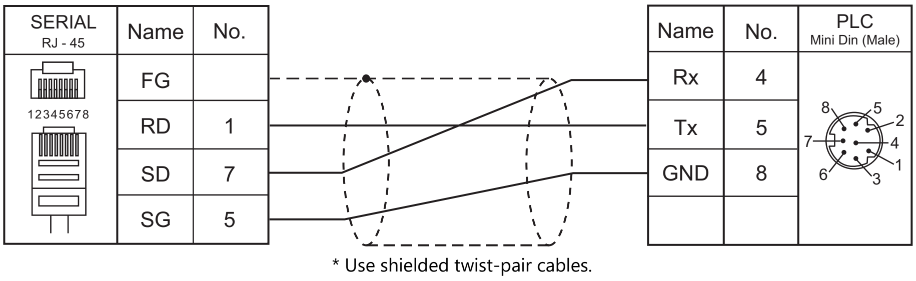
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data register)	00H	
X	(input)	01H	Read only
Y	(output)	02H	
M	(auxiliary relay)	03H	
S	(step point)	04H	
T	(timer)	05H	
C	(counter)	06H	
32C	(high-speed counter)	07H	Double-word

15.1.2 Wiring Diagrams

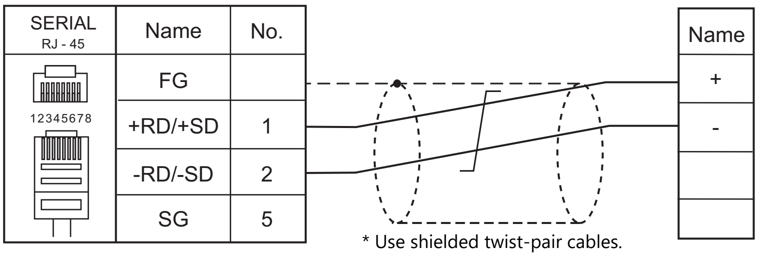
RS-232C

Wiring diagram 1 - M2



RS-422

Wiring diagram 1 - M4



16. EMERSON

16.1 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)
EC10/EC20/EC20H (MODBUS RTU)	EC10	Port1 *3	RS-232C	Wiring diagram 1 - M2	×
			RS-485	Wiring diagram 1 - M4	×
	EC20	COM2 *3	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).

16.1.1 EC10/EC20/EC20H (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	Odd /Even / None	
Target Port No.	1 to 247	

PLC

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

Available Device Memory

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

Device Memory		TYPE	Remarks
D	(Data register)	00H	
SD	(Special data register)	01H	
Y	(Output I/O)	02H	
X	(Input I/O)	03H	
M	(Auxiliary relay)	04H	
SM	(Special auxiliary relay)	05H	
S	(State relay)	06H	
T	(Timer)	07H	
C	(Counter)	08H	
Z	(Offset addressing register)	09H	
TW	(Timer)	0AH	
CW	(Counter)	0BH	
CDW	(Counter)	0CH	Double-word
R	(R)	0DH	

Indirect Device Memory Designation

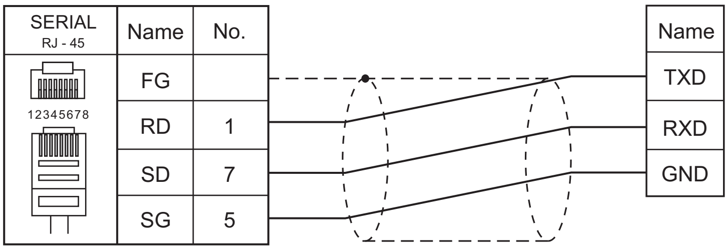
	15 8	7 0
n+0	Model	Device type
n+1	Address No.	
n+2	Expansion code *	Bit designation
n+3	00	Station number

* For bit designation, an expansion code setting is required.
00H: when designating bit 0 to 15
01H: when designating bit 16 to 31

16.1.2 Wiring Diagrams

RS-232C

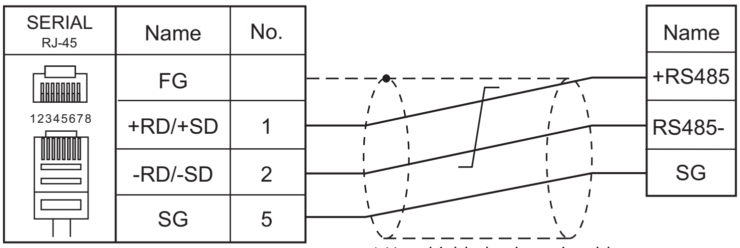
Wiring diagram 1 - M2



* Use shielded twist-pair cables.

RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

17. FANUC

17.1 PLC Connection

Serial Connection

<table>
<tr><th rowspan="2">PLC Selection on the Editor</th><th rowspan="2">CPU</th><th rowspan="2">Port</th><th rowspan="2">Signal Level</th><th colspan="2">Connection</th></tr>
<tr><th>RS-232C*1 / RS-485 (2-wire)</th><th>RS-422 (4-wire)*2</th></tr>
<tr><td rowspan="7">Power Mate</td><td>Power Mate
Model H/D</td><td>JD14</td><td>RS-422</td><td>×</td><td>Wiring diagram 1 - M4</td></tr>
<tr><td rowspan="2">Power Mate
i Model H/D</td><td>JD40</td><td>RS-422</td><td>×</td><td>Wiring diagram 2 - M4</td></tr>
<tr><td>JD42</td><td>RS-232C</td><td>Wiring diagram 1 - M2</td><td>×</td></tr>
<tr><td>16-Model C</td><td>JD5B</td><td>RS-232C</td><td rowspan="3">Wiring diagram 2 - M2</td><td rowspan="3">×</td></tr>
<tr><td>16i-Model A
16i-Model B
18i-Model A
18i-Model B
18-Model C
21i-Model A
21i-Model B</td><td>JD36B</td><td rowspan="3">RS-232C</td></tr>
<tr><td rowspan="2">30i-Model A
31i-Model A
32i-Model A</td><td>JD36A</td></tr>
<tr><td>JD54</td><td>Wiring diagram 3 - M2</td><td>×</td></tr>
</table>

*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).

17.1.1 Power Mate

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 (fixed)	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	19200 bps (fixed)	
Data Length	8 bits (fixed)	
Stop Bit	1 bit (fixed)	
Parity	Even (fixed)	

Available Device Memory

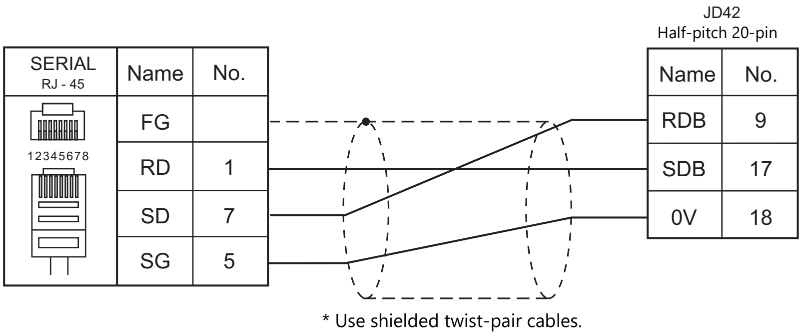
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
D	(data table)	00H	
X	(input relay)	01H	WX as word device
Y	(output relay)	02H	WY as word device
R	(internal relay)	03H	WR as word device
K	(keep relay)	04H	WK as word device
T	(timer)	05H	
C	(counter)	06H	
E	(extensional relay)	07H	WE as word device, available only with 30i/31i/32i-ModelA

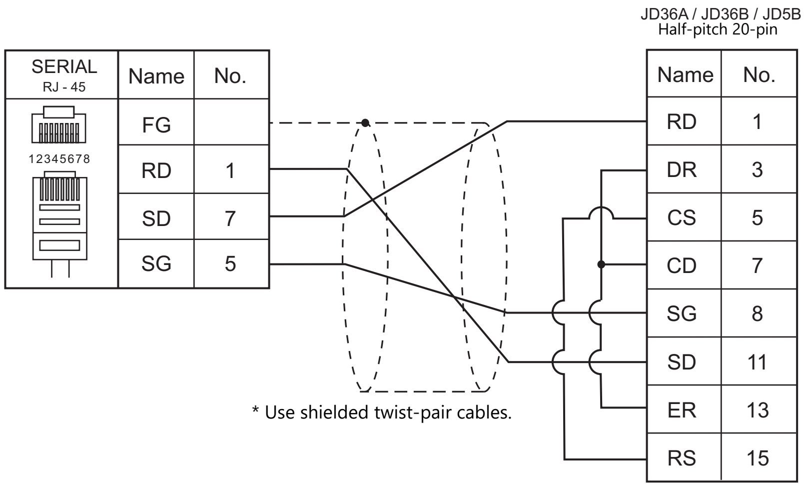
17.1.2 Wiring Diagrams

RS-232C

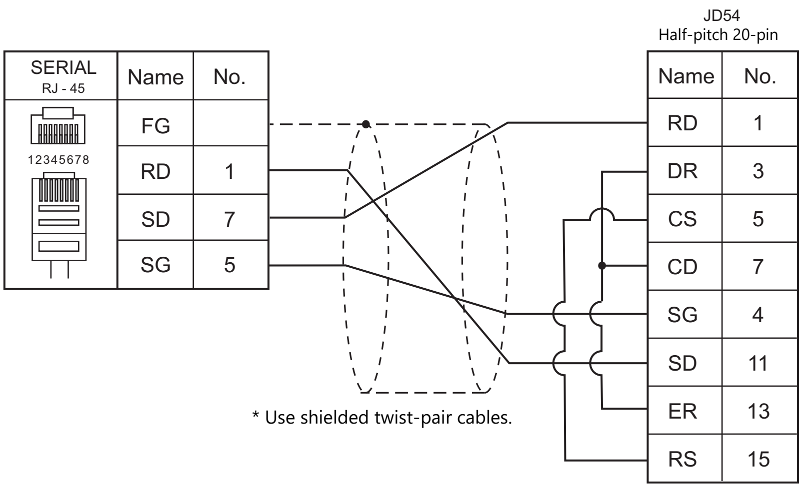
Wiring diagram 1 - M2



Wiring diagram 2 - M2

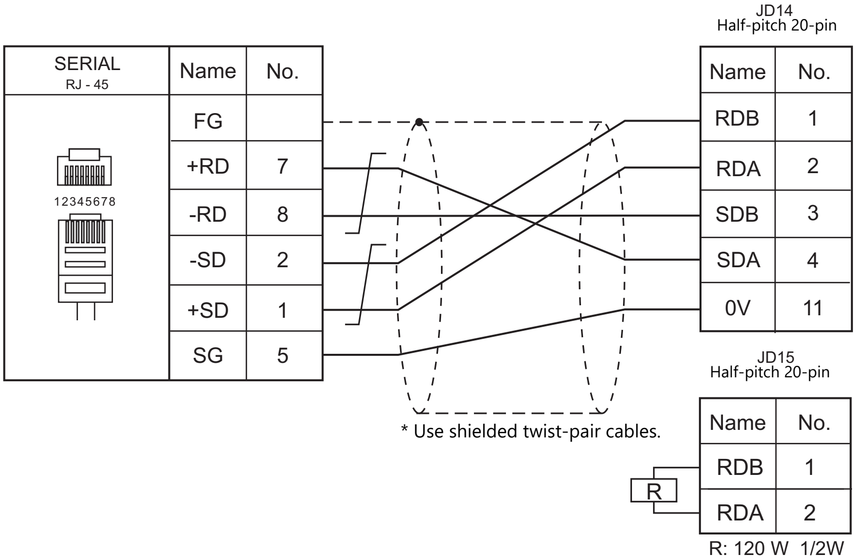


Wiring diagram 3 - M2

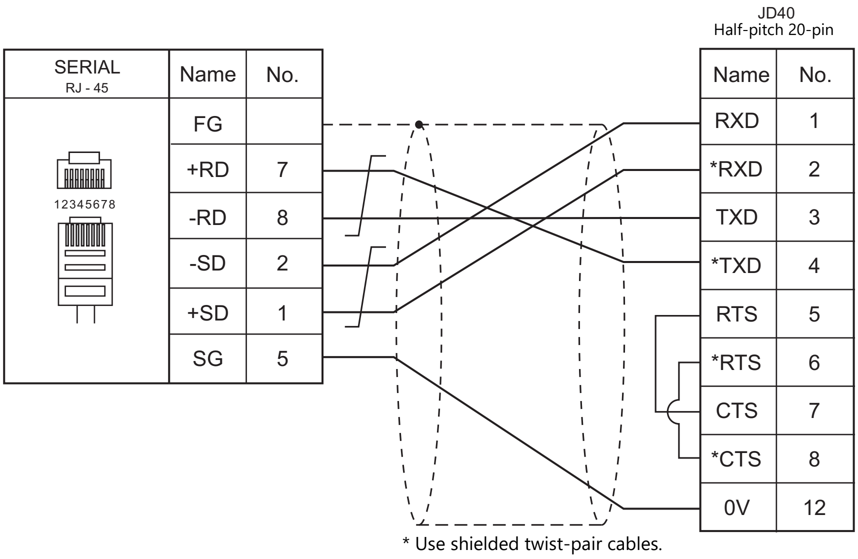


RS-422

Wiring diagram 1 - M4



Wiring diagram 2 - M4



18. Fatek Automation

18.1 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)
FACON FB series	FBE-20MC FBE-28MC FBE-40MC	Programming port on the CPU unit	Port1	RS-232C	Wiring diagram 1 - M2	×
			Port2	RS-485	Wiring diagram 1 - M4	×
		FB-DTBR	Port1 (D-sub 15)	RS-232C	Wiring diagram 1 - M2	×
			Port1 (D-sub 9)	RS-232C	Wiring diagram 2 - M2	×
			Port2 (terminal block)	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).

18.1.1 FACON FB Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Transmission Mode	Continuous Command / Single Command	To access a bit device: Continuous Command: block write command is used. Single Command : bit write command is used.

PLC

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

Available Device Memory

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

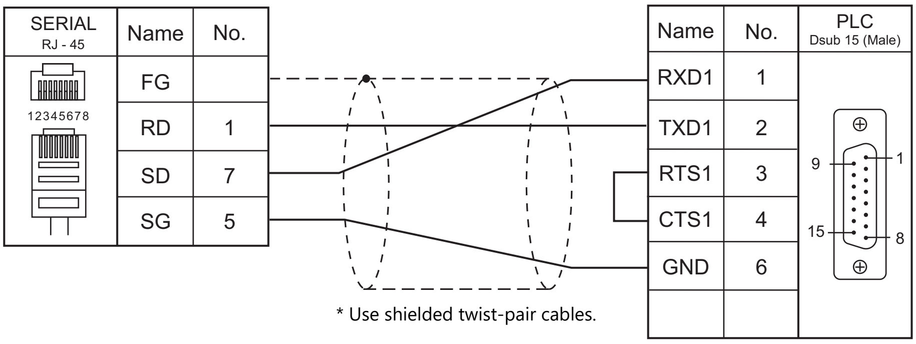
Device Memory		TYPE	Remarks
HR	(data register)	00H	
DR	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
RT	(timer/current value)	08H	
RC	(counter/current value)	09H	
DRC	(32-bit counter/current value)	0AH	*1

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

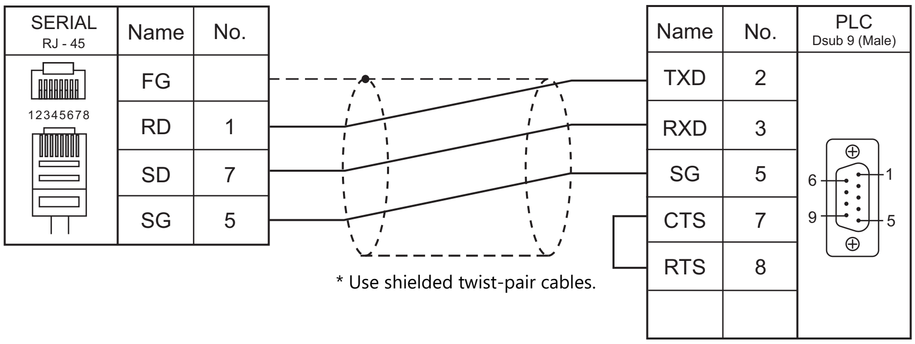
18.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2

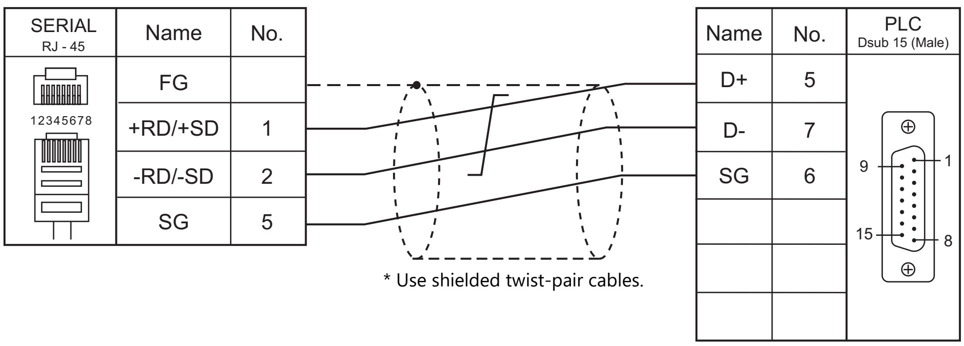


Wiring diagram 2 - M2

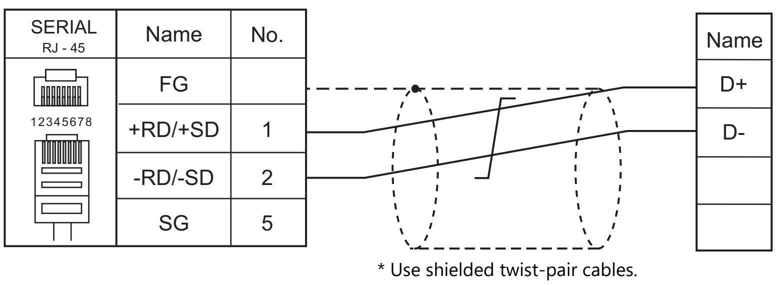


RS-422

Wiring diagram 1 - M4



Wiring diagram 2 - M4



18.2 Temperature Controller/Servo/Inverter Connection

Ethernet Connection

Controller

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Lst File
FACON FBs series (Ethernet)	FBs-xxMNxxx-x FBs-xxMCxxx-x-XY FBs-xxMAxxx-x	FBs-CBE	○ (Max. 8 units)	○	500	○	FBs_Eth.Lst

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

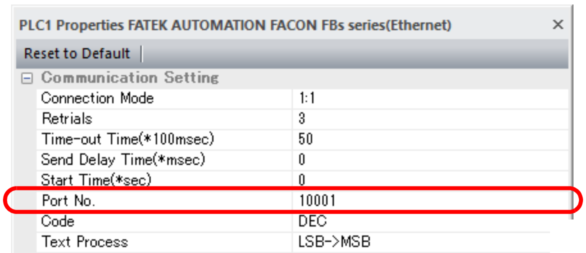
18.2.1 FACON FBs Series (Ethernet)

Communication Setting

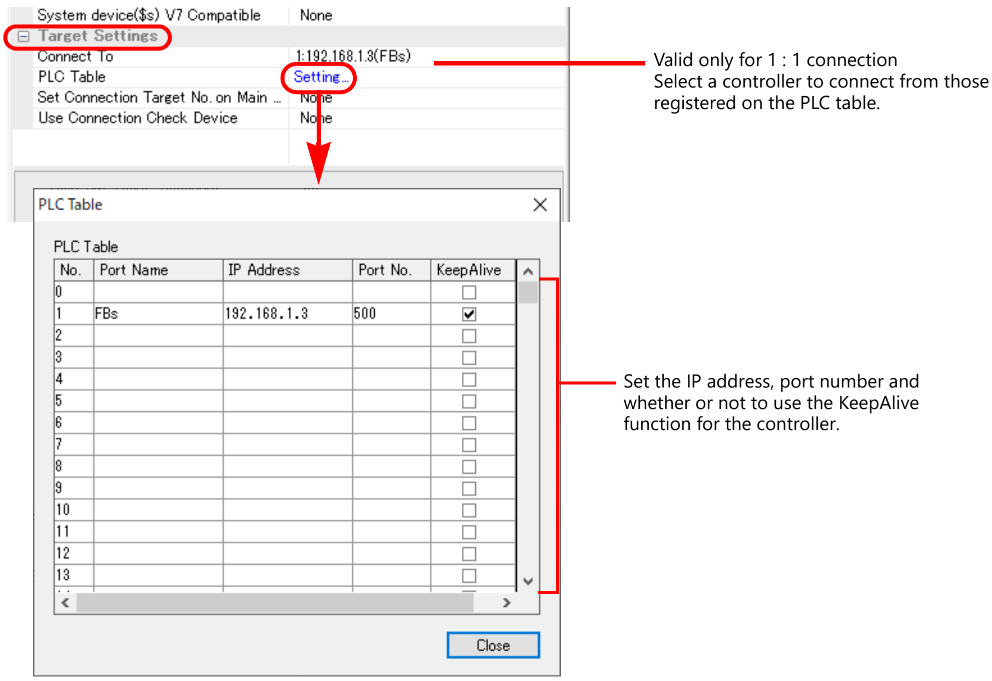
Editor

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]



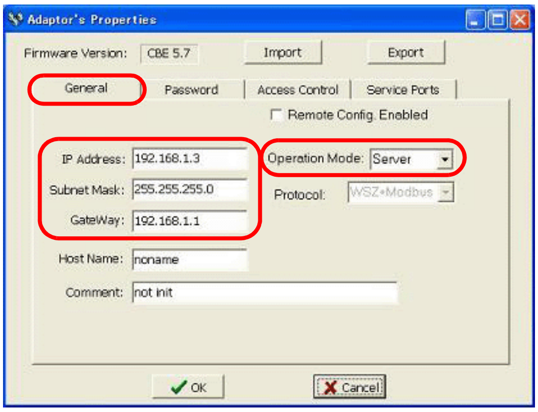
- IP address and port number of the controller
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

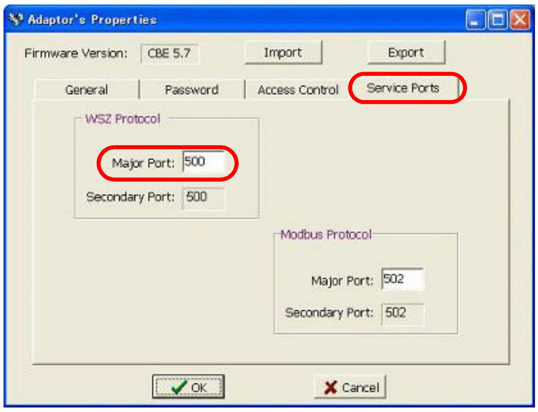


FBs Series

Make the following settings using the application software “Ethernet Module Configuration Tool”. For more information, refer to the instruction manual of the controller issued by the manufacturer.

Adaptor’s Properties





Item			Setting	Remarks
General		IP Address	Set the IP address of the PLC.	
		Subnet Mask	Specify according to the environment.	
		GateWay	Specify according to the environment.	
		Operation Mode	**Server**	
Service Ports	WSZ Protocol	Major Port	Set the port number of the PLC.	Default: 500

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
R	(data register)	00H	
D	(data register)	01H	
WX	(input relay)	02H	
WY	(output relay)	03H	
WM	(internal relay)	04H	
WS	(step relay)	05H	
WT	(timer/contact)	06H	
WC	(counter/contact)	07H	
TR	(timer/current value)	08H	
CR	(counter/current value)	09H	
32CR	(32-bit counter/current value)	0AH	Double-word *1
F	(file register)	0BH	

*1 For items where double-words can be used (numerical data display, graphs, sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of the lower 16 bits.
Input: Higher 16 bits are ignored.
Output: “0” is written into the higher 16 bits.

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits
1: 16 to 31 bits

19. FESTO

19.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Port	Signal Level	Connection	
					RS-232C*1 / RS-485 (2-wire)	RS-422 (4-wire)
FEC	FEC Compact	FC20-FST FC21-FST FC22-FST FC23-FST FC30-FST FC34-FST	EXT	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).

19.1.1 FEC

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	**None**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	

PLC

No particular setting is necessary on the PLC.

Available Device Memory

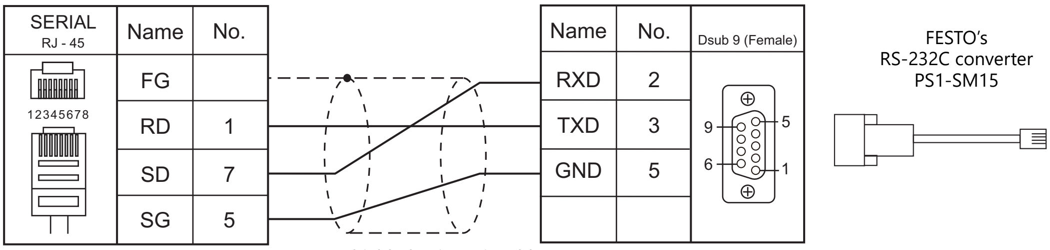
The available setting range of device memory varies depending on the connected device. Be sure to set within the range available with the device to be used.
Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
FW	(flag word)	00H	
IW	(input)	01H	
OW	(output)	02H	
R	(register)	03H	
T	(pulse timer)	04H	
TP	(timer [preset value])	05H	
TW	(timer [current value])	06H	
C	(counter)	07H	
CP	(counter [preset value])	08H	
CW	(counter [current value])	09H	

19.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2



* Use shielded twist-pair cables.

20. FUFENG

20.1 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)
APC Series Controller	APB-50	COM1	RS-232C	Wiring diagram 1 - M2	×
			RS-422/485	Wiring diagram 1 - M4	×
		COM2	RS-232C	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).
*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).

20.1.1 APC Series Controller

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 115K bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**None**	
Target Port No.	0 to 98	

PLC

COM1

Communication setting

Make PLC settings using the application software “APC Pro”. For more information, refer to the PLC manual issued by the manufacturer.

Item		Setting	Remarks
APC system	APC number setup	0 to 98	
	APC baud rate setup	115200 / 38400 / 19200 / 9600 / 4800	

Parity: none, data length: 8 bits, stop bit: 1 bit (fixed)

Signal level selection

Item			Setting	Remarks
Jumper	J1-1 J1-2 J1-3	RS-232C	J1-1: Jumper across pins 2 and 3 J1-2: Jumper across pins 2 and 3 J1-3: Jumper across pins 2 and 3	
		RS-485	J1-1: Jumper across pins 1 and 2 J1-2: Jumper across pins 1 and 2 J1-3: Jumper across pins 1 and 2	

COM2

Station number: 0, parity: none, data length: 8 bits, stop bit: 1 bit, baud rate: 115200 bps (fixed)

Available Device Memory

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

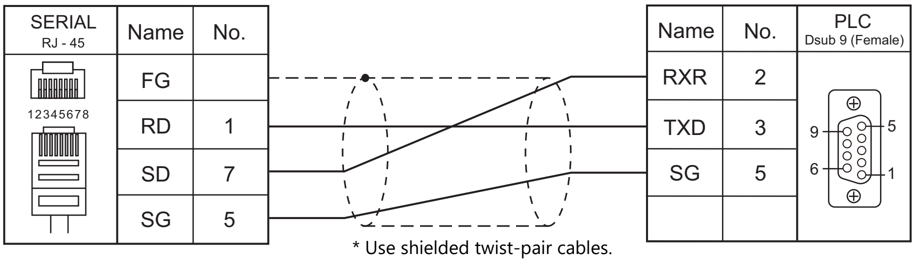
Device Memory		TYPE	Remarks
D	(Data area)	00H	
T	(Timer relay area)	01H	Read only
C	(Counter relay area)	02H	Read only
R	(Accessory relay area)	03H	Common to D0 to D15 *1
X	(Input channel)	04H	Common to D16 to D30 *1
Y	(Output channel)	05H	Common to D31 to D40 *1
S	(System relay area)	06H	Common to D41 to D55 *1
K	(Thermal control relay area)	07H	Common to D56 to D63 *1
TSW	(Timer setting area)	08H	Common to D208 to D335
TP	(Present timer setting area)	09H	Read only, common to D336 to D463
CSW	(Counter setting area)	0AH	Common to D464 to D591
CP	(Present counter setting area)	0BH	Read only, common to D592 to D719
KJS	(Thermal control temperature setting)	0CH	Common to D80 to D95
KP	(Present thermal control temperature setting)	0DH	Read only, common to D96 to D111
KJL	(Thermal control low-temperature alarm setting)	0EH	Common to D112 to D127
KJH	(Thermal control high-temperature alarm setting)	0FH	Common to D128 to D143
KI	(Present thermal control current setting)	10H	Read only, common to D144 to D159
KJC	(Insufficient thermal control)	11H	Common to D160 to D175
KJR	(Thermal control cycle setting)	12H	Common to D192 to D207

*1 When using consecutive bit devices, select device memory “D” for improved performance.

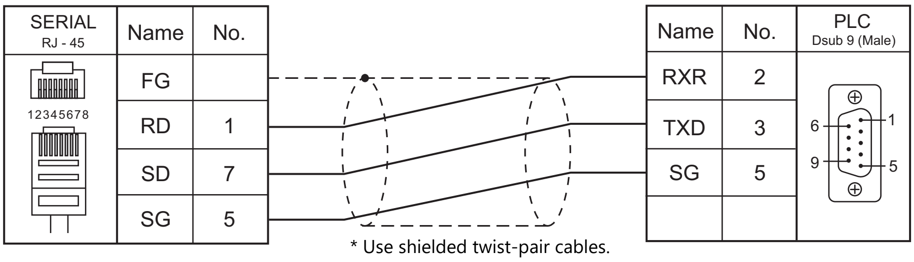
20.1.2 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2

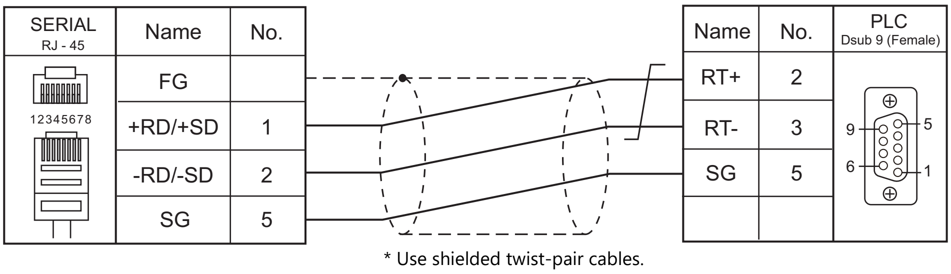


Wiring diagram 2 - M2



RS-422/RS-485

Wiring diagram 1 - M4



21. Fuji Electric

21.1 PLC Connection

Serial Connection

MICREX-F Series

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2
MICREX-F series	NV1P-x (F55)	NV1L-RS2	RS-232C	Wiring diagram 1 - M2	×
	NC1P-E (F70) NC1P-S (F70S)	NC1L-RS2	RS-232C	Wiring diagram 1 - M2	×
		NC1L-RS4	RS-485	Wiring diagram 1 - M4	Wiring diagram 2 - M4 *3
	FPU080H (F80H) FPU120H (F120H) FPU120S (F120S) FPU140S (F140S) FPU15xS (F15xS)	FFU120B	RS-232C	Wiring diagram 1 - M2	×
		FFK120A	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).

SPB (N Mode), FLEX-PC

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C *1/RS-485 *2	RS-422 (4-wire)*2
SPB (N mode) & FLEX-PC series	NS-CPU-xx	NS-RS1	RS-232C	Wiring diagram 1 - M2	×
			RS-485	×	Wiring diagram 2 - M4
	NJ-CPU-xx	NJ-RS2	RS-232C	Wiring diagram 1 - M2	×
		NJ-RS4	RS-485	×	Wiring diagram 2 - M4
	NBxx	NB-RS1	RS-232C	Wiring diagram 1 - M2	×
			RS-485	×	Wiring diagram 2 - M4
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - M2	×
		NW0LA-RS4	RS-485 (4-wire)	×	Wiring diagram 2 - M4 *3
			RS-485 (2-wire)	Wiring diagram 1 - M4	×
SPB (N mode) & FLEX-PC CPU	NS-CPU-xx NJ-CPU-xx NBxx NW0Pxx (SPB)	CPU port	RS-485	×	Wiring diagram 5 - M4
	NJ-CPU-B16	RS-232C port	RS-232C	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).
*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).

MICREX-SX, SPB (IEC Mode)

PLC Selection on the Editor	CPU	Unit/Port	Signal Level	Connection	
				RS-232C[*1] / RS-485 (2-wire)[*2]	RS-422 (4-wire)[*2]
MICREX-SX SPH/SPB/SPM/SPE/SPF series	NP1Px-xx (SPH)	NP1L-RS1	RS-232C	Wiring diagram 4 - M2	×
			RS-485	×	Wiring diagram 3 - M4
		NP1L-RS2 NP1L-RS3	RS-232C	Wiring diagram 4 - M2	×
		NP1L-RS4	RS-485	×	Wiring diagram 3 - M4
		NP1L-RS5	RS-485	×	Wiring diagram 2 - M4
	NW0Pxx (SPB)	NW0LA-RS2	RS-232C	Wiring diagram 3 - M2	×
		NW0LA-RS4	RS-485	×	Wiring diagram 2 - M4
	NA0PAxxx-xxx (SPF)	NA3LA-RS1	RS-232C	Wiring diagram 5 - M2	×
			RS-485	Wiring diagram 4 - M4	×
		NA0LA-RS3	RS-232C	Wiring diagram 5 - M2	×
		NA0LA-RS5	RS-485	Wiring diagram 4 - M4	×
MICREX-SX SPH/SPB/SPM/SPE/SPF CPU	NP1Px-xx (SPH)	CPU port	RS-485	×	Self-made cable[*3]
	NW0Pxx (SPB)	CPU port	RS-485	×	Wiring diagram 5 - M4
	NA0PAxxx-xxx (SPF)	CPU port	RS-232C	Wiring diagram 6 - 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 cable for connection varies depending on the model and hardware version of the CPU.

CPU Model: Hardware Version		Connector Shape	SERIAL
NP1PH-08/16: NP1PS-32: NP1PS-32R/74R/117R: NP1PS-245R: NP1PM-48R/48E/256E/256H: NP1PU-048E/128E/256E: NP1PU-048EZM/096EZM/128EZM/256EZM: NP1PU2-048E/256E:	Before V22 Before V26 Before V29 Before V23 Before V25 Before V22 Before V22 Before V22	Small-type connector	Wiring diagram 6 - M4
NP1PH-08/16: NP1PS-32: NP1PS-32R/74R/117R: NP1PS-245R: NP1PM-48R/48E/256E/256H: NP1PU-048E/128E/256E: NP1PU-048EZM/096EZM/128EZM/256EZM: NP1PU2-048E/256E: NP1PU1-512H: NP1PA1-096E/128E/256E/512E:	V22 or later V26 or later V29 or later V23 or later V25 or later V22 or later V22 or later V22 or later All All	RJ-45	Wiring diagram 5 - M4

Ethernet Connection

MICREX-SX Series

PLC Selection on the Editor	CPU	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive[*1]
MICREX-SX (Ethernet)	NP1PH-xx (SPH200) NP1PS-xx (SPH300) NP1PM-xxx (SPH2000) NP1PU-xxxE (SPH3000) NP1PU-xxxEZM (SPH3000D) NP1PU2-xxxE (SPH3000MM) NP1PU1-512H (SPH5000H) NP1PU1-xxxE (SPH5000M)	NP1L-ET1	○	×	Self port standard No. + 251 (Default 256 + 251)	○
	NP1PM-xxx (SPH2000) NP1PU-xxxE (SPH3000) NP1PU-xxxEZM (SPH3000D) NP1PU2-xxxE (SPH3000MM) NP1PU1-512H (SPH5000H) NP1PU1-xxxE (SPH5000M)	CPU with built-in Ethernet				
	NA0PAxxx-xxx (SPF)	NA3LA-ET1 NA0LA-ET1			Loader Command Receive Port No. (Default 507)	

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

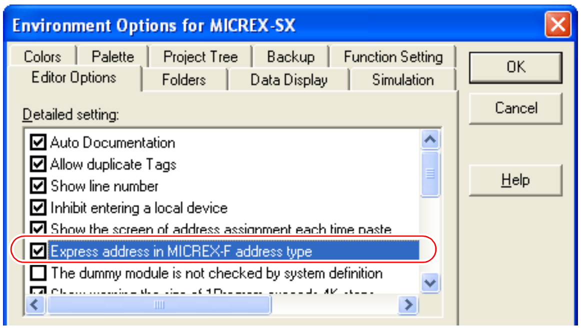
MICREX-SX Model Selection

When the MICREX-SX SPH or SPB series is connected, a mode selection may be required on the X1 editor depending on the programming tool used on the PLC or the setting on the programming tool.

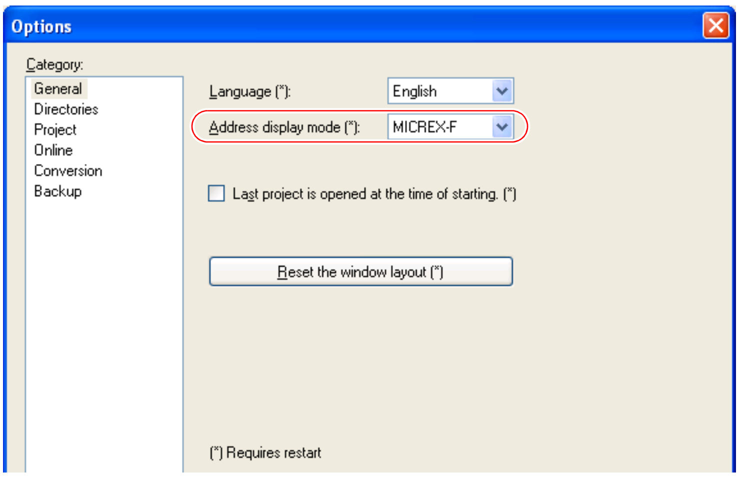
PLC	PLC Programming Tool	Address Expression		Setting on the X1 Editor: PLC Selection	Mode Selection *2
SPH series	SX-Programmer Expert (D300win)			MICREX-SX SPH/SPB/SPM/SPE/SPF series MICREX-SX SPH/SPB/SPM/SPE/SPF CPU MICREX-SX (Ethernet) MICREX-SX (T-Link) MICREX-SX (OPCN-1) MICREX-SX (SX BUS)	IEC Mode
	SX-Programmer Standard (Ver. 1 / 2)		Unchecked *1		N Mode
			Checked *1		F Mode
	SX-Programmer Standard (Ver. 3)		FLEX-PC *1		N Mode
			MICREX-F *1		F Mode
SPB series	SX-Programmer Expert (D300win)			MICREX-SX SPH/SPB/SPM/SPE/SPF series MICREX-SX SPH/SPB/SPM/SPE/SPF CPU	IEC Mode
	SX-Programmer Standard (Ver. 1 / 2)	SX-MODE	Unchecked *1		N Mode
			Checked *1		F Mode
	SX-Programmer Standard (Ver. 3)		FLEX-PC *1		N Mode
			MICREX-F *1		F Mode
	SX-Programmer Standard (Ver. 1 / 2)	N-MODE	-	SPB (N mode) & FLEX-PC series SPB (N mode) & FLEX-PC CPU	-
	FLEX-PC Programmer	-			-

*1 The setting procedure differs depending on the version of the SX-Programmer Standard tool.

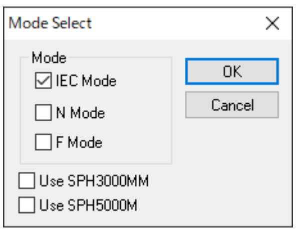
- Ver. 1 or 2:
  Check or uncheck the box for [Express address in MICREX-F address type] on the [Editor Options] tab window in the [Environment Options for MICREX-SX] dialog ([Options] → [MICREX-SX Environment]).



- Ver. 3:
  Select "MICREX-F" from [Address display mode] ([Tool] →[Options] → [Category: General]).



*2 [Mode Select] dialog on the X1 editor



- [IEC Mode]: Variable name cooperation function
- [N Mode]: Address denotation "hexadecimal" *
- [F Mode]: Address denotation "decimal" *
  * Except bit addresses
- [Use SPH3000MM]: Check when SPH3000MM is connected.
- [Use SPH5000M]: Check when SPH5000H or SPH5000M is connected.
  * Only one of the two can be selected.

21.1.1 MICREX-F Series

Communication Setting

Editor

Communication setting

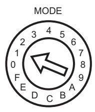
(Underlined setting: default)

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

PLC

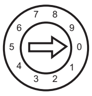
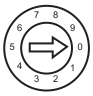
Be sure to match the settings to those made under [Communication Setting] of the editor.

Mode setting

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

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

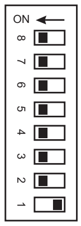
Station number setting

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

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

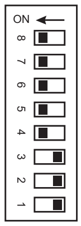
Transmission setting

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

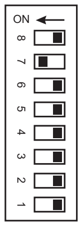
Switch	Contents	ON	OFF	E.g.) Editor Default Setting
8	Initializing method	Switch	Initial file	
7	Parity	Provided	Not provided	
6	Parity bit	Even	Odd	
5	Data bit length	7 bits	8 bits	
4	Stop bit length	1 bit	2 bits	
	Baud rate	19200	9600	
3		ON	ON	
2		ON	OFF	
1		OFF	ON	

FFK120A

- Character switches

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

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

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

Available Device Memory

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

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

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

*2 WS (step relay) is a byte device processed as described below.
For input: Upper 8 bits are "0".
For output: Lower 8 bits are written.

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

Example: W30 : 00002
Address
Colon
File number

*4 Define the file area as "**SI".**

21.1.2 SPB (N Mode) & FLEX-PC Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

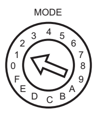
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 31	

PLC

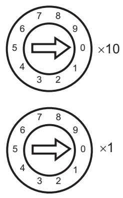
Be sure to match the settings to those made under [Communication Setting] of the editor.

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

Mode setting

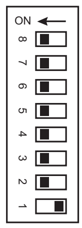
MODE	Setting	Contents	
	1	RS-232C	Command-defined asynchronous communication (non-procedure)
	3	RS-485	Command-defined asynchronous communication (non-procedure)

Station number setting

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

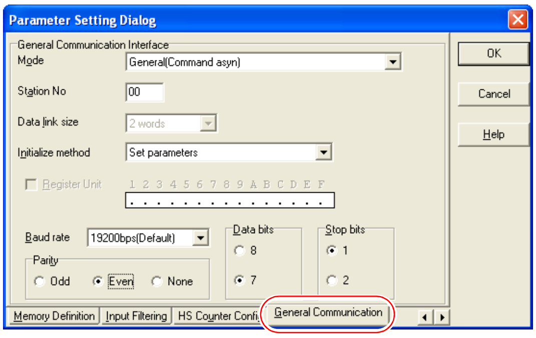
* The station number setting switch is not provided on NJ-RS2.

Transmission setting

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

NW0LA-RS2, NW0LA-RS4 (parameter setting)

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



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

Notes on use of 2-wire connection with NW0LA-RS4

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

Available Device Memory

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

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

21.1.3 SPB (N Mode) & FLEX-PC CPU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

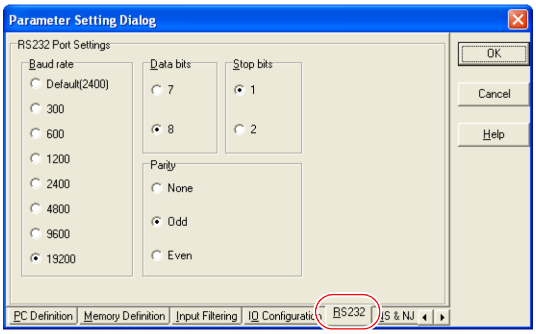
PLC

SPB, FLEX-PC CPU port

No particular setting is necessary on the PLC.

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

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



Available Device Memory

The available device memory is the same as the one described in "21.1.2 SPB (N Mode) & FLEX-PC Series".

21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)

Communication Setting

Editor

Communication setting

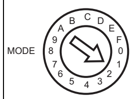
(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	**38400 bps**	For the SPH series: Do not change the default setting.
Data Length	**8 bits**	
Stop Bit	**1 bits**	
Parity	**Even**	
Target Port No.	0 to 31	
N Block Read/Write	None / Yes	Available only when [Use SPH5000M] is checked.

PLC

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

Mode setting

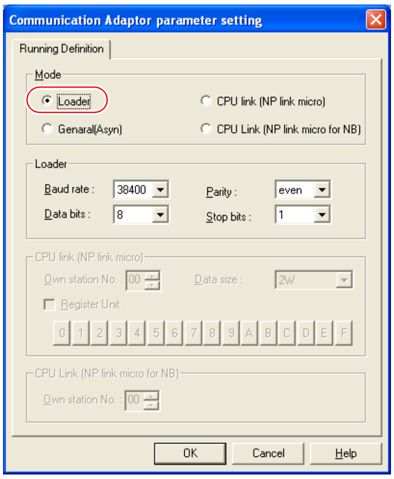
MODE	Setting	RS1, 2, 4	RS-232C Port	RS-485 Port	Remarks
		RS3, 5	CH1	CH2	
	0		General equipment	General equipment	
	1		Loader	General equipment	
	2		General equipment	Loader	
	3		Loader	Loader	
	4		General equipment	General equipment	RS3 and 5 are not used.
	5		Not used		
	6		Modem loader 19200 bps	General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

* Set the port (or CH No.) where the X1 is connected to "loader".
Communication parameters are fixed to 38400 bps (baud rate), 8 bits (data length), 1 bit (stop bit), and even (parity).

* When the PLC is connected with the X1, the station number setting switch for RS-485 is not used.

NW0LA-RS2, NW0LA-RS4 (parameter setting)

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



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

Available Device Memory

Variable name cooperation function
The variable name cooperation function can be used only for PLC1. For device memory assignment, basically use the variable name cooperation function. **It is recommended that you specify a device memory address in the [AT] field to define the area (variable) that is used for communications with the X1.**
For details on variable name cooperation function, refer to the “V9/TS2060 MICREX-SX Variable Name Cooperation Function” manual.

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

Device Memory		TYPE	Remarks
%IX	(input memory) *1	-	%IW as word device, %ID as double-word device
%QX	(output memory) *1	-	%QW as word device, %QD as double-word device
%MX1.	(standard memory)	02H	%MW1. as word device, %MD1. as double-word device *2 *3
%MX3.	(retain memory)	04H	%MW3. as word device, %MD3. as double-word device *2 *3
%MX10.	(system memory)	08H	%MW10. as word device, %MD10. as double-word device *2 *3
%MX15.	(shared memory for CPUs)	16H	%MW15. as word device, %MD15. as double-word device *2 *4

*1 The variable name cooperation function of the PLC1 must be used. Indirect designation is not available.
*2 Double-word addresses (%MD1., %MD3., %MD10., %MD15.) can be specified only for PLC1.
In the case with PLC2 to PLC8, access to the above addresses is possible when the data length is set to 2 words in the word address (%MW1., %MW3., %MW10., %MW15.).
Example: When accessing the address in %MD1.100:
Set the data length to 2 words for %MW1.100.
*3 For the P/PE link or FL-NET memory (CPU No. 8 or 9), the variable name cooperation function of the PLC1 must be used.
*4 Available only when [Use SPH3000MM] is checked in [MICREX-SX] → [Select Device] on PLC1.

Device Designation Method During Screen Creation

For details on device designation method during screen creation, refer to the “Device of MICREX-SX Designation Method” manual.
Click here to download.

Indirect Device Memory Designation

- Specify the CPU number or SX bus station number in the expansion code.
- When specifying the ES1 / APL1 device using SPH3000MM / SPH5000M, set the device type with +1.
  e.g.) To set %MX254.1.1.0 for ES1
  SX station number = 254 (FEH), ES number = 1, device type = 02H, word address = 1, bit address = 0
  The device type is set to "03H" ("02H" + 1).

	15 8	7 0
n+0	Model = 01	Device type = 03
n+1	Word address = 0001	
n+2	Expansion code = FE	Bit address = 00
n+3	00	Station number = 00

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
All start	1 - 8 (PLC1 - 8)	n	Station number: 0000H	2
		n + 1	Command: 0400H	
All stop	1 - 8 (PLC1 - 8)	n	Station number: 0000H	2
		n + 1	Command: 0402H	
Operation / standby switching *	1 - 8 (PLC1 - 8)	n	Station number: 0000H	3
		n + 1	Command: 040BH	
		n + 2	CPU No. operated by default: m (0, 2, 4, 6)	

* Valid only for the redundant system.

21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	**38400 bps**	For the SPH series: Do not change the default setting.
Data Length	**8 bits**	
Stop Bit	**1 bits**	
Parity	**Even**	
Target Port No.	0 to 31	
Numerical form	Signed BCD / Standard	Available only when the F mode is selected.
N Block Read/Write	None / Yes	Available only when [Use SPH5000M] is checked.

PLC

The communication setting is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

Available Device Memory

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

Device Memory		TYPE	Remarks
X	(input memory) *1	-	WX as word device, DX as double-word device *5
Y	(output memory) *1	-	WY as word device, DY as double-word device *5
M	(standard memory)	02H	WM as word device, DM as double-word device *2
L	(retain memory)	04H	WL as word device, DL as double-word device *2
SM	(system memory)	08H	WSM as word device, DSM as double-word device *2
WFL	(user file)	-	DFL as double-word device *2 *3
ESM	(system memory in E-SX bus)	14H	WESM as word device, DESM as double-word device *2 *4
CM	(shared memory for CPUs)	16H	WCM as word device, DCM as double-word device *2 *4

*1 Can be used only for PLC1. Indirect designation is not available.
*2 Double-word addresses (DM, DL, DSM, DFL, DESM, DCM) can be specified only for PLC1.
In the case with PLC2 to PLC8, access to the above addresses is possible when the data length is set to 2 words in the word address (WM, WL, WSM, WFL, WESM, WCM).
Example: When accessing the address in DM100:
Set the data length to 2 words for WM100.
*3 Can be used only in F mode. Bit designation is not available.
*4 Usable only when [Use SPH3000MM] or [Use SPH3000MM] is checked in [MICREX-SX] → [Select Device]. (The device [CM] is usable only in SPH3000MM.)
*5 Specification of the E-SX bus (EX, EY) is not supported. Can be specified in IEC mode.

Device Designation Method During Screen Creation

For details on device designation method during screen creation, refer to the "Device of MICREX-SX Designation Method" manual.
Click here to download.

Importing Device Memory Information

In the following cases, **be sure to import device memory information**.
Without importing, a device memory setting error occurs and the screen program cannot function properly.
However, the only one file of device memory information can be imported. If the system configuration of each PLC is different in 1:n connection, replace the following device memory with WM device memory in the PLC program.

1. Input (X, WX or DX) or output (Y, WY or DY) memory is specified in the screen program.
2. P/PE link or FL-NET memory (CPU No. 8 or 9) is specified in the screen program.
3. User file (WFL or DFL) is specified in the screen program. (Only F mode in mode select.)

* **It is necessary to add the circuit using WFL/DFL to the ladder.**
If WFL/DFL is not used in the ladder, the WFL/DFL information can not be output to the import file.

For details on device designation method during screen creation, refer to the “Device of MICREX-SX Designation Method” manual.
Click here to download.

Indirect Device Memory Designation

- Specify the CPU number or SX bus station number in the expansion code.
- When specifying the ES1 / APL1 device using SPH3000MM / SPH5000M, set the device type with +1.
  e.g.) To WM00000001 for ES1
  Since the device type = 02H, set the device type to “03H” (“02H” + 1).

PLC_CTL

The macro command is the same as the one described in “21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)”.

21.1.6 MICREX-SX SPH/SPB/SPM/SPE/SPF CPU (IEC Mode)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422 / 485	SPH/SPB/SPM/SPE: RS-422/485 SPF: RS-232C
Baud Rate	**38400 bps**	Do not change the setting from default.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	0 to 31	
N Block Read/Write	None / Yes	Available only when [Use SPH5000M] is checked.

PLC

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

Available Device Memory

The available device memory is the same as the one described in “21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)”.

PLC_CTL

The macro command is the same as the one described in “21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)”.

21.1.7 MICREX-SX SPH/SPB/SPM/SPE/SPF CPU (N Mode / F Mode)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422 / 485	SPH/SPB/SPM/SPE: RS-422/485 SPF: RS-232C
Baud Rate	**38400 bps**	Do not change the setting from default.
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	0 to 31	
Numerical form	Signed BCD / Standard	Available only when the F mode is selected.
N Block Read/Write	None / Yes	Available only when [Use SPH5000M] is checked.

PLC

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

Available Device Memory

The available device memory is the same as the one described in “21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)”.

PLC_CTL

The macro command is the same as the one described in “21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)”.

21.1.8 MICREX-SX (Ethernet) (IEC Mode)

Communication Setting

Editor

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

- 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].
  SPH: The PLC port number is "Self port standard No." plus 251 set on the PLC.
  SPF: The PLC port number must be the same number as the one set by "Loader Command Receive Port No." on the PLC.
- Others (Available only when [Use SPH5000M] is checked.)
  [System Setting] → [Hardware Setting] → [PLC Properties] → [N Block Read/Write]
  - When using multiple single block read/write, set [N Block Read/Write] to [Yes].
  - When not using multiple single block read/write, set [N Block Read/Write] to [No].

PLC (Ethernet Parameter Setting)

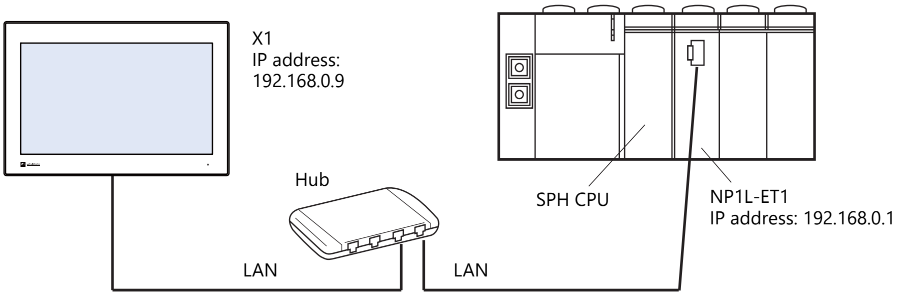
The table below shows settings required for communication with the X1. (Underlined setting: default)

Item	Setting	Remarks
IP Address	192.168.0.1	
Subnet Mask	255.255.255.0	
Self-port Standard No.	256	SPH
Loader Command Receive Port No.	507	SPF

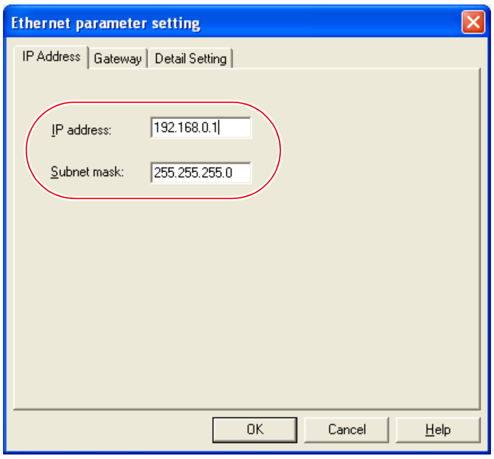
For more information on other setting items, refer to the PLC manual issued by the manufacturer.

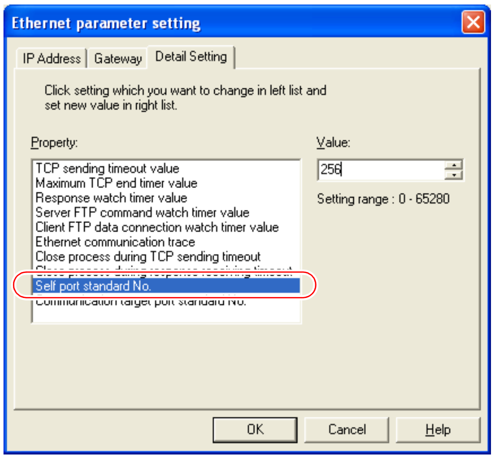
Setting Example

The following example shows the setting for communication between MICREX-SX ET1 module and the X1 unit via Ethernet.



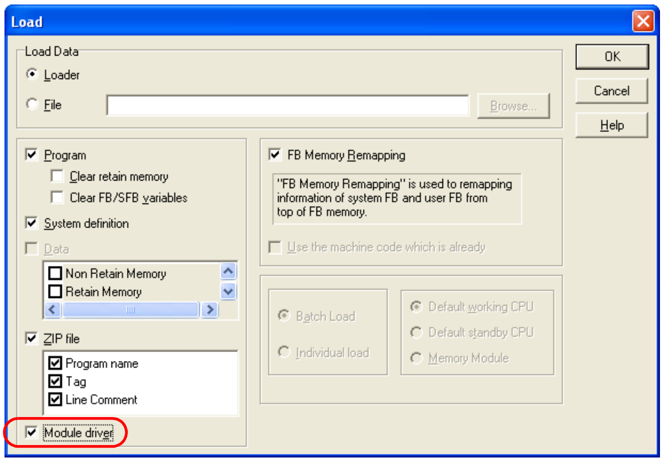
Setting on the PLC loader



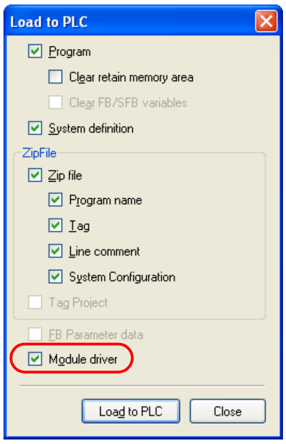


When the Ethernet module is used, the module driver must be transferred to the PLC.
To transfer it to the PLC, check [Module driver] on the relevant PLC transfer setting dialog.

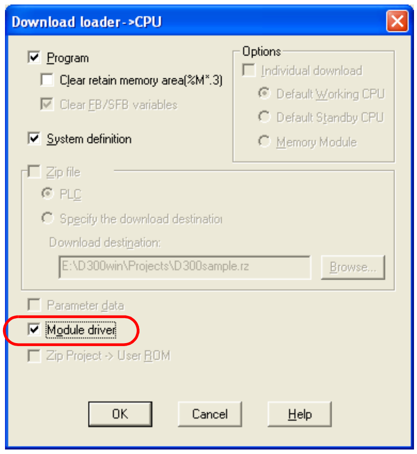
- SX Programmer Standard Ver. 2



- SX Programmer Standard Ver. 3

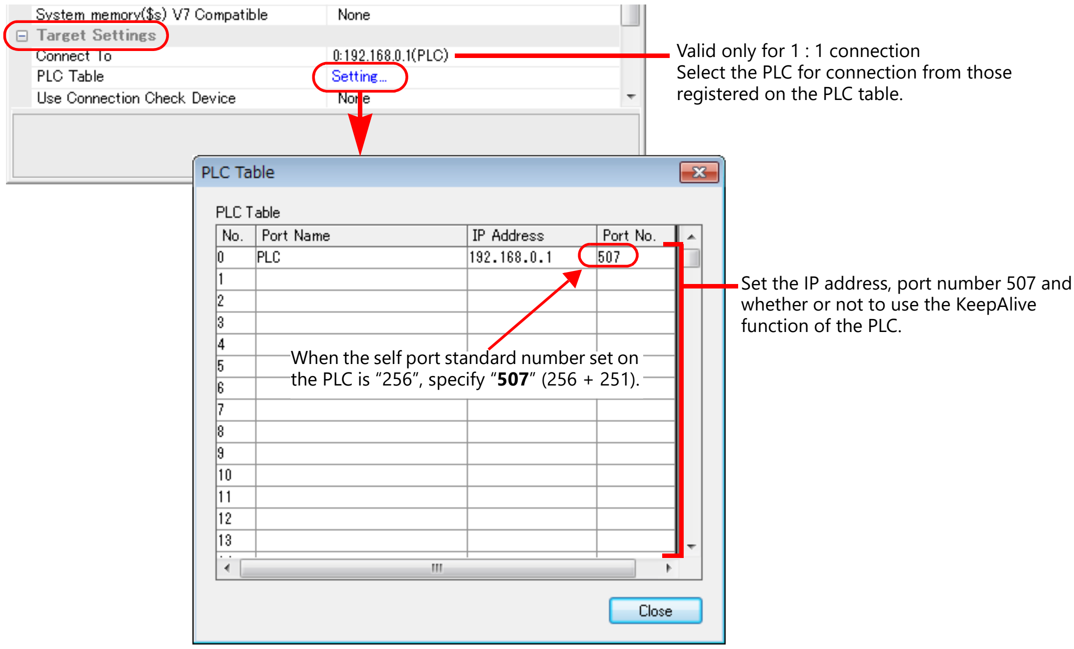


- D300win



Settings on the editor

- PLC Table
  [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings] → [PLC Table]



Available Device Memory

The available device memory is the same as the one described in "21.1.4 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (IEC Mode)".

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
All start	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	2
		n + 1	Command: 0400H	
All stop	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	2
		n + 1	Command: 0402H	
Operation / standby switching *2	1 - 8 (PLC1 - 8)	n	Station number: 00H to FFH *1	3
		n + 1	Command: 040BH	
		n + 2	CPU No. operated by default: m (0, 2, 4, 6)	

*1 Valid only when "1 : n" connection mode is selected under [Communication Setting] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).
For the station number, set the PLC table number under [Target Settings] in the [PLC Properties] window ([System Setting] → [Hardware Setting]).
*2 Valid only for a redundant system.

21.1.9 MICREX-SX (Ethernet) (N Mode / F Mode)

Communication Setting

The communication setting is the same as the one described in "21.1.8 MICREX-SX (Ethernet) (IEC Mode)".

Available Device Memory

The available device memory is the same as the one described in "21.1.5 MICREX-SX SPH/SPB/SPM/SPE/SPF Series (N Mode / F Mode)".

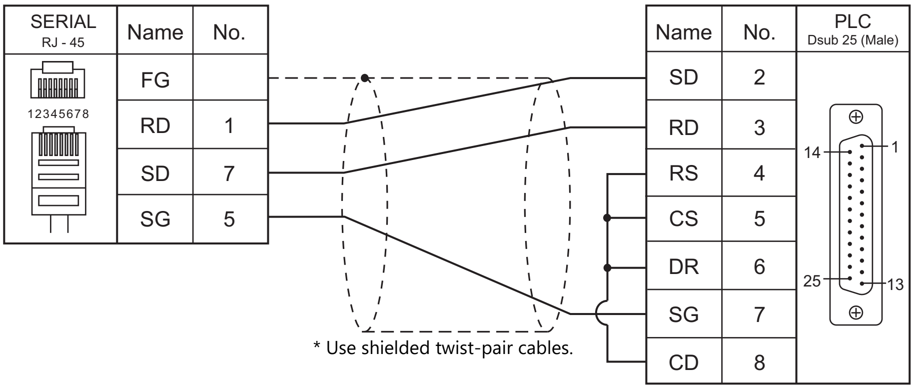
PLC_CTL

The macro command is the same as the one described in "21.1.8 MICREX-SX (Ethernet) (IEC Mode)".

21.1.10 Wiring Diagrams

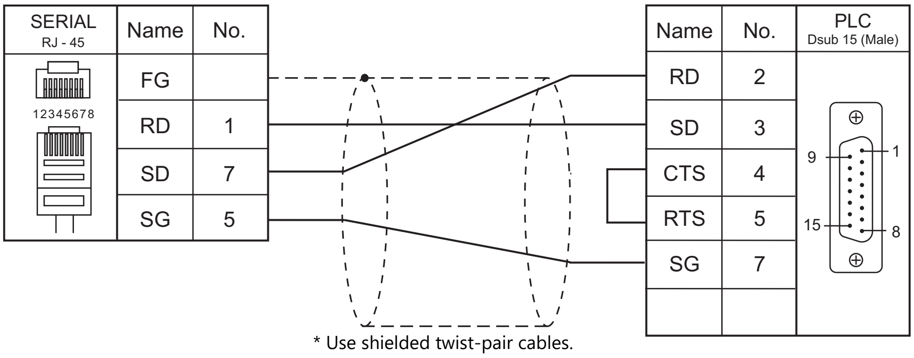
RS-232C

Wiring diagram 1 - M2



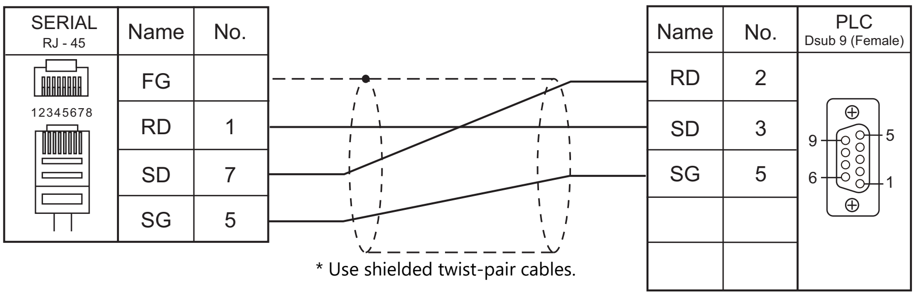
* Use shielded twist-pair cables.

Wiring diagram 2 - M2



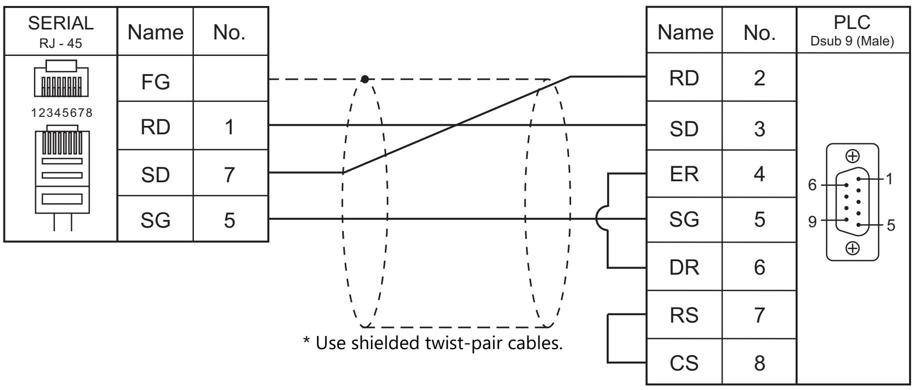
* Use shielded twist-pair cables.

Wiring diagram 3 - M2



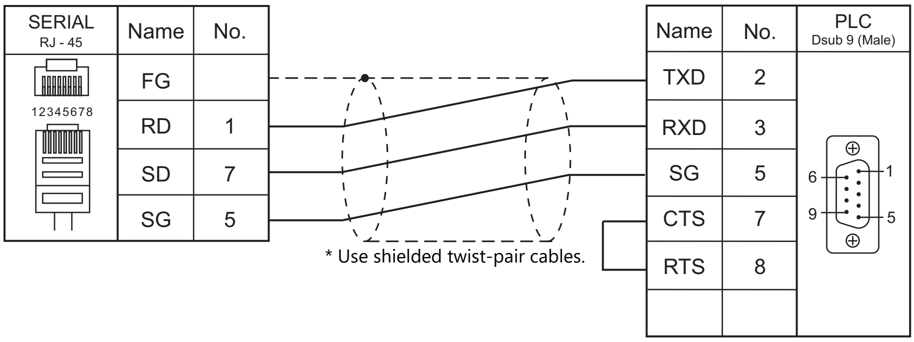
* Use shielded twist-pair cables.

Wiring diagram 4 - M2

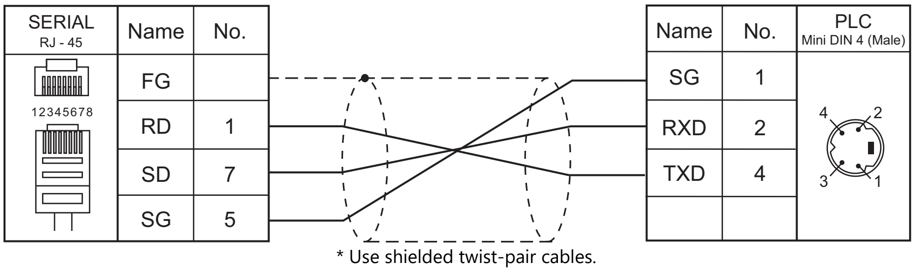


* Use shielded twist-pair cables.

Wiring diagram 5 - M2

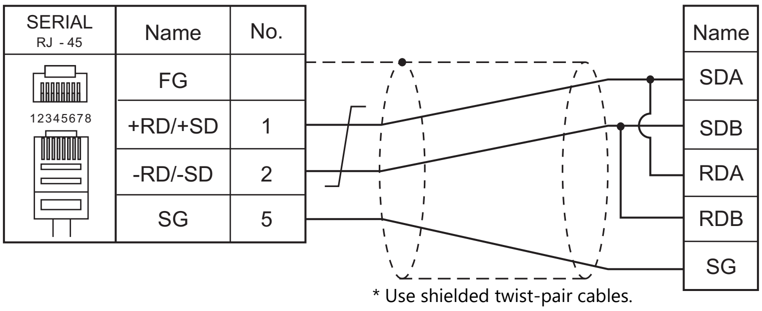


Wiring diagram 6 - M2

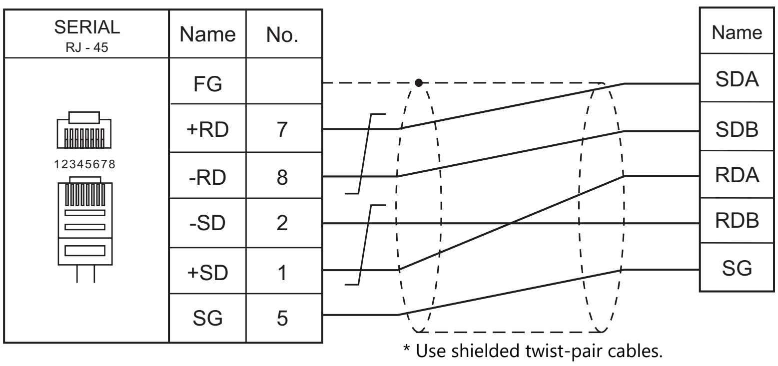


RS-422/RS-485

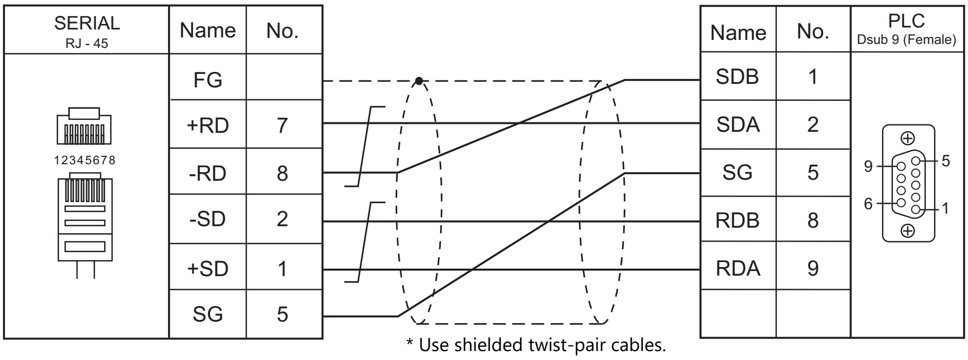
Wiring diagram 1 - M4



Wiring diagram 2 - M4

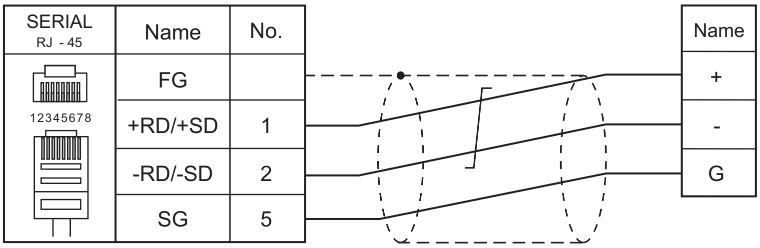


Wiring diagram 3 - M4



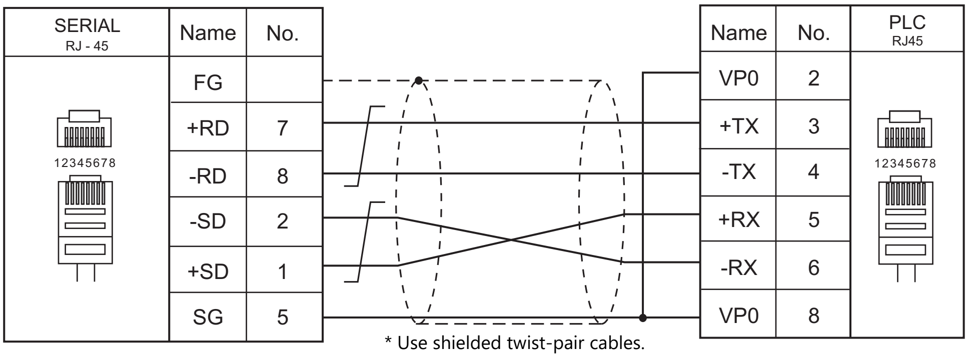
* Use shielded twist-pair cables.

Wiring diagram 4 - M4



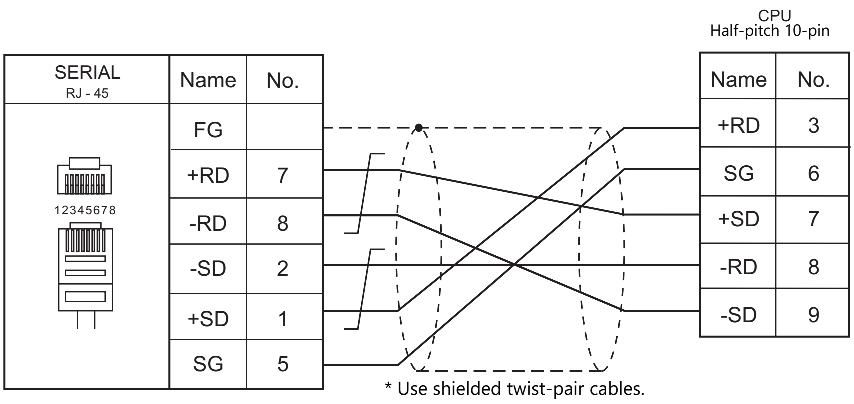
* Use shielded twist-pair cables.

Wiring diagram 5 - M4



* Use shielded twist-pair cables.

Wiring diagram 6 - M4



* Use shielded twist-pair cables.

21.2 Temperature Controller/Servo/Inverter Connection

Serial Connection

Temperature Controller

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
PYX (MODBUS RTU)	PYX4xx PYX5xx *2 PYX9xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	PYX.Lst
PXR (MODBUS RTU)	PXR3xx PXR4xx PXR5xx *2 PXR7xx PXR9xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	PXR.Lst
PXF (MODBUS RTU)	PXF4xx PXF5xx *2 PXF9xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	PXF.Lst
PXG (MODBUS RTU)	PXG4xx PXG5xx *2 PXG9xx	Terminal block	RS-485	Wiring diagram 1 - M4	×	F_PXG.Lst
PXH (MODBUS RTU)	PXH9xx *2	Terminal block	RS-485	Wiring diagram 2 - M4	×	F_PXH.Lst
PUM (MODBUS RTU)	PUMxx	Terminal block (base)	RS-485	Wiring diagram 2 - M4	×	F_PUMA_B.Lst F_PUME.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).
*2 Select a model on which Modbus communication is available.

Power Monitor Unit

PLC Selection on the Editor	Series Name	Model	Port	Signal Level	Connection		Lst File
					RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
F-MPC04P (loader)	F-MPC04P	UM02-AR2 UM02-AR3 UM02-AR4	RS-485 connector	RS-485	Wiring diagram 3 - M4	×	F-MPC04P.Lst
F-MPC series / FePSU	F-MPC04	UM01-ARxx	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM01_ARA4.Lst
	F-MPC04P	UM02-AR2	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM02_AR2.Lst
		UM02-AR3					UM02_AR3.Lst
		UM02-AR4					UM02_AR4.Lst
	F-MPC04S	UM03-ARA3x	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM03_ARA3G.Lst
	F-MPC30	UM5ACxx *2	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM5A.Lst
		UM45xx *2					
	F-MPC50	UM50xx *2	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM50.Lst
	F-MPC55	UM55V	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM55V.Lst
	F-MPC60B	UM4Bxx *2	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM4_UM42_UM43.Lst
		UM42Cxx *2					
		UM42Fxx *2					
		UM43FDxx *2					
		UM43FGxx *2					
		UM44Bxx *2					UM44.Lst
		UM44CDxx *2					
		UM44FGxx *2					
	FePSU	EAxx EGxx SAxx SGxx	Terminal block	RS-485	Wiring diagram 5 - M4	×	FePSU.Lst
		BWxxxxxx EWxxxxxx	Terminal block	RS-485	Wiring diagram 5 - M4	×	FePSUBk.Lst
	F*JF-R	F1JF-R F2JF-R F3JF-R	Terminal block	RS-485	Wiring diagram 4 - M4	×	FJF-R.Lst
	F-MPC04E	UM05-AR3	Terminal block	RS-485	Wiring diagram 4 - M4	×	UM05_AR3.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).
*2 Select a model on which RS-485 communication is available.

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	
FVR-E11S	FVRxxE11S-x	Touch panel Connector	RS-485	Wiring diagram 6 - M4	×	FVR-E11S.Lst
FVR-E11S (MODBUS RTU)						FVR-E11S(Modbus).Lst
FVR-C11S (MODBUS RTU)	FVRxxC11S-x	OPC-C11S-RSx	RS-485	Wiring diagram 7 - M4	×	FVR-C11S(Modbus).Lst
FRENIC5000G11S / P11S	FRNxxG11S-x FRNxxP11S-x	Terminal block	RS-485	Wiring diagram 8 - M4	×	F-G11S.Lst
FRENIC5000G11S / P11S (MODBUS RTU)						FRENIC5000G11S_P11S(Modbus).Lst
FRENIC5000VG7S (MODBUS RTU)	FRNxxVG7S-x	RS-485 Connector	RS-485	Wiring diagram 9 - M4	Wiring diagram 19 - M4 *2	FRENIC5000VG7S (Modbus).Lst
		OPC-VG7-RS (communication board)		Wiring diagram 8 - M4	×	
FRENIC-Mini (MODBUS RTU)	FRNxxC1S-x	OPC-C1-RS (communication board)	RS-485	Wiring diagram 10 - M4	×	F-Mini.Lst
	FRNxxxC2x-xx	RS-485 Communication port				
FRENIC-Eco (MODBUS RTU)	FRNxxF1S-x	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	F-Eco(Modbus).Lst
		OPC-F1-RS (communication board)		Wiring diagram 8 - M4	×	
FRENIC-Multi (MODBUS RTU)	FRNxxE1S-x	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	F-Multi.Lst
		OPC-E1-RS (communication board)		Wiring diagram 10 - M4	×	
FRENIC-MEGA (MODBUS RTU)	FRNxxxG1x-xx	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	FRENIC-MEGA (Modbus).Lst
		Control circuit Terminal block		Wiring diagram 8 - M4	×	
FRENIC-MEGA SERVO (MODBUS RTU)	FRNxxxG1x-xxxQ	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	FRENIC-MEGA SERVO(Modbus).Lst
		Control circuit Terminal block		Wiring diagram 8 - M4	×	
FRENIC-HVAC/ AQUA (MODBUS RTU)	FRNxxxAR1x-4x FRNxxxAQ1x-4x	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	FRENIC-HVAC (Modbus).Lst FRENIC-AQUA (Modbus).Lst
		Control circuit Terminal block		Wiring diagram 8 - M4	×	
FRENIC-VG1 (MODBUS RTU)	FRNxxVG1S-xx	Control circuit Terminal block	RS-485	Wiring diagram 8 - M4	×	FRENIC-VG1 (MODBUS RTU).Lst
FRENIC-Ace (MODBUS RTU)	FRNxE2x-xJ	RS-485 communication port 1	RS-485	Wiring diagram 10 - M4	×	FRENIC-VG1 (MODBUS RTU).Lst
		RS-485 communication port 2	RS-485	Wiring diagram 24 - M4	×	
FRENIC series (loader)	FRENIC5000VG7S	RS-485 Connector	RS-485	Wiring diagram 9 - M4	Wiring diagram 19 - M4 *2	-
		OPC-VG7-RS (communication board)	RS-485	Wiring diagram 8 - M4	×	
	FRENIC-Mini	OPC-C1-RS (communication board)	RS-485	Wiring diagram 10 - M4	×	
		RS-485 Communication port				
	FRENIC-Eco FRENIC-Multi FRENIC-MEGA FRENIC-MEGA SERVO FRENIC-HF FRENIC-Lift	Touch panel Connector				
	FRENIC-HVAC/ AQUA	Touch panel Connector	RS-485	Wiring diagram 10 - M4	×	
		Control circuit Terminal block	RS-485	Wiring diagram 8 - M4	×	
	FRENIC-VG1	Control circuit Terminal block	RS-485	Wiring diagram 8 - M4	×	
	FRENIC-Ace	RS-485 communication port 1	RS-485	Wiring diagram 10 - M4	×	
		RS-485 communication port 2	RS-485	Wiring diagram 24 - M4	×	

*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).
*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).

IH Inverter

Editor PLC Selection	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
HFR-C9K	HFR030C9Kxx HFR050C9Kxx	HFR-OPC01 (communication board)	RS-485	Wiring diagram 13 - M4	×	F_HFR.Lst
HFR-C11K	HFR3.0C11Kxx HFR5.0C11Kxx HFR7.0C11Kxx	Terminal block	RS-485	Wiring diagram 8 - M4	×	HFR-C11K.Lst
HFR-K1K	HFR2.5K1K-2 HFR3.0K1K-2 HFR5.0K1K-2 HFR6.0K1K-2	CN3	RS-485	Wiring diagram 23 - M4	×	HFR-K1K.Lst
		I/O PCB (option) *2	RS-485	Wiring diagram 8 - M4	×	

*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).
*2 This port is available only with models equipped with the option.

AC Power Monitor

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)	
PPMC (MODBUS RTU)	PPMCxx *3	Terminal block	RS-232C	Wiring diagram 1 - M2	×	F-PPMC.Lst
			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 Select a model on which RS-485 or RS-232C communication is available.

Servo Amplifier

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)*1	
FALDIC-α series	RYSxx *3	CN3	RS-485	Wiring diagram 12 - M4	Wiring diagram 20 - M4 *2	F_FAL-A.Lst
FALDIC-W series	RYCxxx x3-VVT2	CN3A (UP port)	RS-485	Wiring diagram 17 - M4	Wiring diagram 22 - M4 *2	F_Fal-W.Lst
ALPHA5 (MODBUS RTU)	RYTxxxx5-VVx	CN3A	RS-485	Wiring diagram 14 - M4	×	ALPHA5.Lst
ALPHA5 Smart (MODBUS RTU)	RYHxxxF5-VV2	CN3A	RS-485	Wiring diagram 14 - M4	×	ALPHA5Smart.Lst
ALPHA7 (MODBUS RTU)	RYTxxxF7-VV2	CN3A	RS-485	Wiring diagram 14 - M4	×	ALPHA7.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).
*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).
*3 Select a universal communication (RS-485) model as the host interface.

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)	
WSZ series	WSZ-24MCT2-AC WSZ-32MCT2-AC WSZ-40MCT2-AC WSZ-60MCT2-AC	PORT0		RS-232C	Wiring diagram 3 - M2	×	WSZ.Lst
		WSZ-CB25	PORT1	RS-232C	Wiring diagram 4 - M2	×	
			PORT2	RS-485	Wiring diagram 18 - 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).

Recorder

PLC Selection on the Editor	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
PH series	PHAxxxx4-xxxRY PHCxxxx3-xxxRY	Terminal block	RS-485	Wiring diagram 16 - M4	×	F_PHC.Lst
PHR (MODBUS RTU)	PHRxx	Terminal block	RS-485	Wiring diagram 2 - M4	×	F_PHR.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).

Digital Panel 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)	
WA5000	WA5xx3-yy WA5xx4-yy *3 WA5xx6-yy WA5xx7-yy	Modular jack	RS-232C	Wiring diagram 2 - M2	×	WA5000.Lst
			RS-485	Wiring diagram 11 - 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 Specify an input unit (-yy: 01 to 12, or 18) when selecting the model.

AC Power Regulator

Editor PLC Selection	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)*1	
APR-N (MODBUS RTU)	RPNExxxx-xx-ZAM-xx/xx	RPN003-AM (communication board)	RS-485	Wiring diagram 4 - M4	Wiring diagram 21 - M4 *2	F_APR-N.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).
*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).

Electronic Multimeter

Editor PLC Selection	Model	Port	Signal Level	Connection		Lst File
				RS-232C / RS-485 (2-wire)*1	RS-422 (4-wire)	
WE1MA (Ver.A) (MODBUS RTU)	WE1MA-AFxxx-Mxx WE1MA-AGxxx-Mxx	Terminal block	RS-485	Wiring diagram 15 - M4	×	F_WE1MA.Lst
	WE1MA-A1xxx-Mxx WE1MA-A5xxx-Mxx					F_WE1MA_1P.Lst *2
	WE1MA-A2xxx-Mxx WE1MA-A6xxx-Mxx					F_WE1MA_1P3L.Lst *2
	WE1MA-A3xxx-Mxx WE1MA-A7xxx-Mxx					F_WE1MA_3P3L.Lst *2
	WE1MA-A4xxx-Mxx					F_WE1MA_3P4L.Lst *2
WE1MA (Ver. B) (MODBUS RTU)	WE1MA-AFxxx-Mxx WE1MA-AGxxx-Mxx	Terminal block	RS-485	Wiring diagram 15 - M4	×	F_WE1MA (Ver. B).Lst
	WE1MA-A1xxx-Mxx WE1MA-A5xxx-Mxx					F_WE1MA_1P (Ver. B).Lst *2
	WE1MA-A2xxx-Mxx WE1MA-A6xxx-Mxx					F_WE1MA_1P3L (Ver. B).Lst *2
	WE1MA-A3xxx-Mxx WE1MA-A7xxx-Mxx					F_WE1MA_3P3L (Ver. B).Lst *2
	WE1MA-A4xxx-Mxx					F_WE1MA_3P4L (Ver. B).Lst *2

*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).
*2 List files "F_WE1MA.Lst" and "F_WE1MA(Ver. B).Lst" can be browsed as default by using the [Refer] button. These files can be used for device memory settings.

Ethernet Connection

Controller

PLC Selection on the Editor	CPU	Unit/Port	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Lst File
WSZ series (Ethernet)	WSZ-xxMAR2-D24 WSZ-xxMCT2-D24 WSZ-xxMCT2-AC	WSZ-CBE	○	○	500: Default (Max. 8 units for TCP/IP)	○	WSZ_Eth.Lst
	FBs-xxMNxxx-x FBs-xxMCxxx-x-XY FBs-xxMAxxx-x	FBs-CBE	○	○			

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

21.2.1 PYX (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

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

(Underlined setting: default)

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

* The communication function of the temperature controller can be selected from Fuji protocol or Modbus protocol at the time of purchase. For communication with a X1, select a model on which the Modbus protocol is available.
* The following communication parameters are fixed; baud rate: 9600 bps, data length: 8 bits, stop bit: 1 bit, and parity: odd.

Available Device Memory

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

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

21.2.2 PXR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

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

(Underlined setting: default)

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

*1 The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
*2 The following communication parameters are fixed; baud rate: 9600 bps, data length: 8 bits, and stop bit: 1 bit.

Available Device Memory

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

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

21.2.3 PXF (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 / 115200 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	None / Odd / Even	
Target Port No.	1 to 255	

Temperature Controller

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

(Underlined setting: default)

Parameter Channel	Display	Parameter Name	Setting	Example
Ch9 COM	CtyP	Communication type selection	**0: Modbus RTU**	0
	STno	ST No. setting	1 to 255	1
	SPEd	RS-485 baud rate	96: 9600 bps 192: 19200 bps 384: 38400 bps 115K:115K bps	96
	PrTy	RS-485 Parity	NoNe odd EVEN	odd

*1 The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available as an option.
*2 The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	
3	03H	Read only

21.2.4 PXG (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

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

(Underlined setting: default)

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

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

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

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

21.2.5 PXH (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Temperature Controller

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

(Underlined setting: default)

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

* The communication function of the temperature controller can be selected at the time of purchase. Select a model on which RS-485 (Modbus) communication is available.
* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

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

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

21.2.6 PUM (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

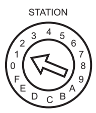
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	Do not change the default settings of the signal level, data length and stop bit because these settings on the temperature controller cannot be changed.
Baud Rate	9600 / 19200 / 38400 / 115200 bps	
Data Length	**8 bits**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

Temperature Controller

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

Station number setting

(Underlined setting: default)

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

Communication setting

On the temperature controller loader, set communication parameters.

(Underlined setting: default)

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

* The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

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

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

Note on Setting the Device Memory

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

Model		List File Name
PUMAxx	Control module (4 ch)	F_PUMA_B.Lst
PUMBxx	Control module (2 ch)	
PUMExx	Event input/output module	F_PUME.Lst

“F_PUMA_B.Lst” is set as default.

21.2.7 F-MPC04P (Loader)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

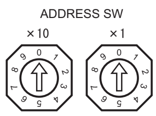
Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	**1 bit**	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / Odd / Even	
Target Port No.	1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

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

Power Monitor Unit

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

Station number setting

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

Communication setting

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

(Underlined setting: default)

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

* The communication parameter (stop bit) is fixed to 1 bit.

Available Device Memory

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

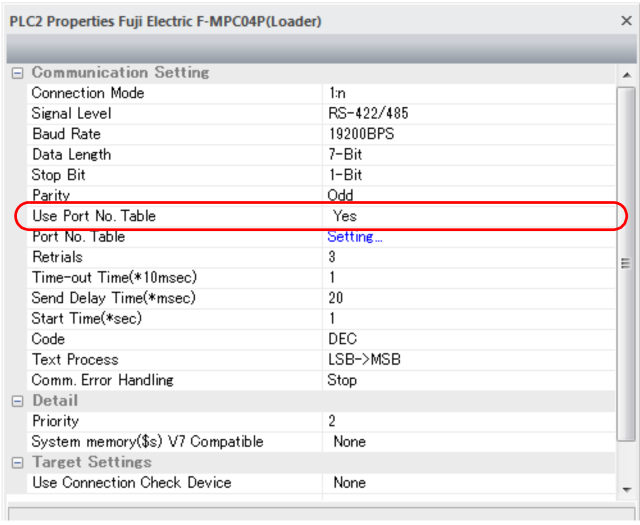
Device Memory	TYPE	Remarks
---	00H	Double-word

Station Number Table

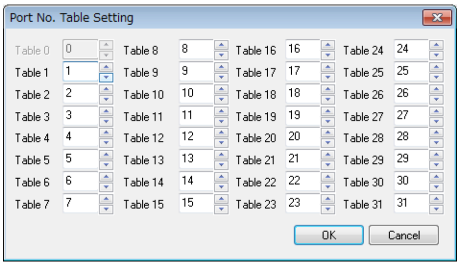
- A maximum of 31 units can be connected via serial communication. Port numbers from 0 to 31 can be set on the [Device Setting] dialog of the editor; however, depending on the controller, port numbers exceeding 32 may be available. In such a case, use the station number table to enable communications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

Setting the Station Number Table

1. Select [Yes] for [Use Port No. Table] under [Communication Setting] on the [PLC Properties] window ([System Setting] → [Hardware Setting]).



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



Macro

To rewrite the station number table on the X1 series screen, use macro commands [FROM_WR] and [RESTART].

FROM_WR

FROM_WR F0 F1

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

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

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

- Data range

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

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

RESTART

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

SYS (RESTART) F0

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

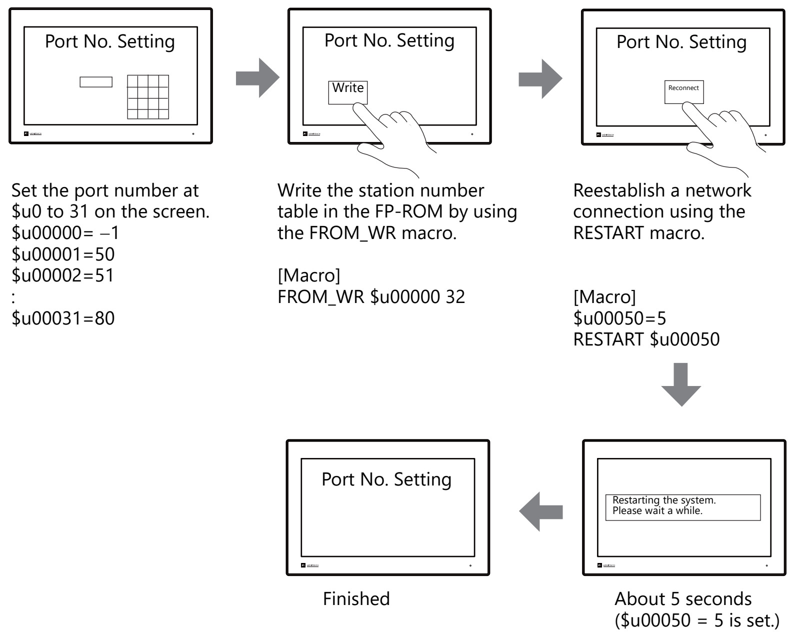
	Internal Device Memory	PLC n Device Memory	Memory Card	Constant
F1	◎			

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

- Data range

	Setting
F0	RESTART
F1	Time: 0 to 60 s

Example of Procedure for Rewriting the Station Number Table



System Device Memory

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

[0]: Normal

[1]: Error

21.2.8 F-MPC Series / FePSU

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / <u>19200</u> / 38400 bps	38400 bps is available for F-MPC04E only.
Data Length	<u>7</u> / 8 bits	
Stop Bit	**1 bit**	Do not change the default setting because the setting on the power monitor unit cannot be changed.
Parity	None / <u>Odd</u> / Even	
Target Port No.	1 to 99*1	

*1 To use port numbers 32 to 99, use the station number table. For the station number table, see “Station Number Table” (page 21-34).

F-MPC04

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

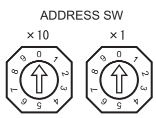
(Underlined setting: default)

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

F-MPC04P

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

Station number setting

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

Communication setting

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

(Underlined setting: default)

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

* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC04S

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

*1 The communication function of F-MPC04 can be selected at the time of purchase. Select a model on which "F-MPC04 mode" is available.
*2 The communication parameter (stop bit) is fixed to 1 bit.

F-MPC30

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

* The communication parameter (stop bit) is fixed to 1 bit.

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

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC60B (UM44xx)

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

* The communication parameter (stop bit) is fixed to 1 bit.

FePSU

Communication setting

The communication parameters can be set using keys attached to the front of the power monitor unit.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

<table>
<tr><th>Type</th><th>Parameter Display</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td rowspan="4">SEL-c</td><td>Adr.□□</td><td>Communicating station number</td><td><u>Loc: Communication not used</u>
01 to 99</td><td>01</td></tr>
<tr><td>bud□□</td><td>Baud rate</td><td>4.8: 4800 bps
9.6: 9600 bps
<u>19.2: 19200 bps</u></td><td>19.2</td></tr>
<tr><td>cbit.□□</td><td>Data length, parity</td><td>8n: Data length 8 bits, without parity
8E: Data length 8 bits, even parity
8o: Data length 8 bits, odd parity
7n: Data length 7 bits, without parity
7E: Data length 7 bits, even parity
<u>7o: Data length 7 bits, odd parity</u></td><td>7o</td></tr>
<tr><td>LtY.□□</td><td>Communication Mode</td><td><u>Psu: FePSU mode</u> *1
_PP: PPM(B) mode</td><td>Psu</td></tr>
</table>

*1 The communication function of FePSU can be selected at the time of purchase. Select a model on which “FePSU mode” is available.
*2 The communication parameter (stop bit) is fixed to 1 bit.

F*JF-R

Communication setting

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

(Underlined setting: default)

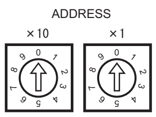
Type	Item	Setting	Example
Communication setting	Address	01 - 99	01
	Baud Rate	4800 bps / 9600 bps / 19.2k bps	19.2k bps
	Data Length	7 / 8 bits	7 bits
	Parity Bit	None / Even / Odd	Odd

* The communication parameter (stop bit) is fixed to 1 bit.

F-MPC04E

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

Station number

Station	Setting	Example	Remarks
	01 to 99 [DEC] (default: 00)	1	Communication is not possible with “00”.

Communication setting

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

(Underlined setting: default)

Type	Item	Setting	Example
Communication setting	Baud rate	4800 bps / 9600 bps / 19200 bps / 38400 bps	19200 bps
	Data length, parity	8E / 8o / 8n / 7E / 7o / 7n	7o

* The communication parameter (stop bit) is fixed to 1 bit.

Available Device Memory

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

Device Memory		TYPE	Remarks
00	(data request of circuit No. 1 to 4) *1	00H	Double-word, read only
01	(data request of circuit No. 5 to 8) *1	01H	Double-word, read only
02	(data request of circuit No. 9, 10 or E) *1	02H	Double-word, read only
03	(Data request of the minimum/maximum voltage, power factor of circuit 1 to 10, and invalid power)*1 *2	03H	Double-word, read only
09	(model code)	09H	Read only
10	(operation status)	0AH	Read only
11	(pre-alarm value) *1	0BH	Double-word, read only
12	(current value measurement data)*1 *2	0CH	Double-word, read only
13	(integrated value data)*1 *2	0DH	Double-word, read only
14	(demand measurement data)*1 *2	0EH	Double-word, read only
15	(data of a maximum value of demand measurement)*1 *2	0FH	Double-word, read only
16	(historical data 1)*1 *2	10H	Double-word, read only
17	(historical data 2)	11H	Double-word, read only
18	(setting data)*3	12H	Double-word
50	(9-digit power request)	32H	Read only, double-word

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

18 (Setting Data)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
00zz	Wiring method (voltage measured)	(Blank)	CT primary rated current	(Blank)
01zz	Ratio of VT 1 (primary voltage) *1	(Blank)	Ratio of VT (primary voltage)	Ratio of VT *3
02zz	Ratio of VT 1 (secondary voltage) *1	(Blank)	Ratio of VT (secondary voltage)	(Blank)
03zz	Demand average time	Demand average time	Rated frequency	(Blank)
04zz	Frequency	(Blank)	Protective INST (current setting)*2	(Blank)
05zz	Number of applicable circuits	(Blank)	Protective INST (output setting)	(Blank)
06zz	Pulse multiplying factor	(Blank)	Protective DT (current setting)*2	Pulse multiplying factor
07zz	Ratio of VT 2 (primary voltage) *1	(Blank)	Protective DT (operation time)*2	(Blank)
08zz	Ratio of VT 2 (secondary voltage) *1	(Blank)	Protective DT (output setting)*2	(Blank)
09zz	Number of turns for CT2 secondary line	(Blank)	Protective OC (current setting)	(Blank)
10zz	CT primary current *1	(Blank)	Protective OC (characteristic)	CT primary current
11zz	OCG sensitivity current	(Blank)	Protective OC (time magnification)*2	(Blank)
12zz	OCG operation time *2	(Blank)	Protective OC (output setting)	(Blank)
13zz	Load pre-alarm sensitivity current	(Blank)	Protective OCA overcurrent pre-alarm (current setting)	(Blank)
14zz	Load pre-alarm operation time	(Blank)	Protective OCA overcurrent pre-alarm (operation time)	(Blank)
15zz	Automatic display circuit register	(Blank)	Protective OCA overcurrent pre-alarm (output setting)	(Blank)
16zz	ZCT select	(Blank)	Protective OCG (51G) (current setting) *3	(Blank)
17zz	VT select	(Blank)	Protective OCG (51G) (characteristic)	(Blank)
18zz	(Blank)	(Blank)	Protective OCG (51G) (time magnification) *2	(Blank)
19zz	(Blank)	(Blank)	Protective OCG (51G) (output setting)	(Blank)
20zz	Phase selection	(Blank)	Protective OCG (50G) (current setting) *2	(Blank)
21zz	Power alarm upper limit	Power alarm upper limit	Protective OCG (50G) (operation time) *2	(Blank)
22zz	Integral power pulse multiplying factor *4	Pulse multiplying factor *4	Protective OCG (50G) (output setting)	(Blank)
23zz	Load pre-alarm operation value	Load pre-alarm operation value	Protective DG (DG/OCG) (current setting) *3	(Blank)
24zz	Load pre-alarm operation time	(Blank)	Protective DG (DG/OCG) (operation time) *3	(Blank)
25zz	Leak pre-alarm sensitivity current	Leak pre-alarm sensitivity current	Protect DG (DG/OCG) (output setting)	(Blank)
26zz	Leak pre-alarm operation time *2	Leak pre-alarm operation time *2	Protective DG (DG/OCG) (maximum sensitivity phase angle)	(Blank)
27zz	OCG sensitivity current	Leak alarm sensitivity current	Protective DG (DG/OCG) (voltage setting) *2	(Blank)
28zz	OCG operation time *2	Leak alarm operation time *2	Protective DG (DG/OCG) (selected from DG or OCG)	(Blank)
29zz	Operation type for power	Operation type for power	Protective 0 V (voltage setting)	(Blank)
30zz	(Blank)	Phase R input position	Protective 0 V (operation time)*2	(Blank)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
31zz	(Blank)	History of turning breaker ON	Protective 0 V (output setting)	(Blank)
32zz	(Blank)	Show/hide cause of trouble	Protective UV (voltage setting)	(Blank)
33zz	(Blank)	Phase interruption alarm of neutral line	Protective UV (operation time)*2	(Blank)
34zz	(Blank)	Alarm output 1	Protective UV (output setting)	(Blank)
35zz	(Blank)	Alarm output 2	Protective UV2 (voltage setting)	(Blank)
36zz	(Blank)	Contact input 1	Protective UV2 (operation time)*2	(Blank)
37zz	(Blank)	Contact input 2	Protective UV2 (output setting)	(Blank)
38zz	(Blank)	(Blank)	Protective UV operation setting	(Blank)
39zz	(Blank)	Rated current (IN)	Voltage establishment VR (voltage setting)	(Blank)
40zz	(Blank)	Current demand time	Voltage establishment VR (operation time) *2	(Blank)
41zz	(Blank)	Voltage demand time	Voltage establishment VR (output setting)	(Blank)
42zz	(Blank)	Power demand time	Protective OVG (voltage setting)*2	(Blank)
43zz	(Blank)	Leak demand time	Protective OVG (operation time)	(Blank)
44zz	(Blank)	(Blank)	Protective OVG (output setting)	(Blank)
45zz	(Blank)	(Blank)	ZPD/EVT selection	(Blank)
46zz	(Blank)	(Blank)	Phase interruption relay	(Blank)
47zz	(Blank)	(Blank)	Reverse phase relay	(Blank)
48zz	(Blank)	(Blank)	Demand average time	(Blank)
49zz	(Blank)	Year setting	CB opening jam monitoring time *3	(Blank)
50zz	(Blank)	Month setting	CB closing jam monitoring time *3	(Blank)
51zz	(Blank)	Date setting	Monitoring trip coil TC disconnection, OFF expedited, function application setting	(Blank)
52zz	(Blank)	Hour setting	kWh pulse constant *5	(Blank)
53zz	(Blank)	Minute setting	kvarh pulse constant *5	(Blank)
54zz	(Blank)	(Blank)	Selective input 1 function setting	(Blank)
55zz	(Blank)	(Blank)	Selective input 2 function setting	(Blank)
56zz	(Blank)	(Blank)	Selective input 3 function setting	(Blank)
57zz	(Blank)	(Blank)	Selective input 4 function setting	(Blank)
58zz	(Blank)	(Blank)	Selective input 5 function setting	(Blank)
59zz	(Blank)	(Blank)	Selective input 6 function setting	(Blank)
60zz	(Blank)	(Blank)	Selective input 7 function setting	(Blank)
61zz	(Blank)	(Blank)	Selective input 8 function setting	(Blank)
62zz	(Blank)	(Blank)	Device fault detection function setting	(Blank)
63zz	(Blank)	(Blank)	Fault pick-up output setting	(Blank)
64zz	(Blank)	(Blank)	Transmission component 1 output setting	(Blank)
65zz	(Blank)	(Blank)	Transmission component 2 output setting	(Blank)
66zz	(Blank)	(Blank)	Distant/direct state output setting	(Blank)
67zz	(Blank)	(Blank)	Transducer output current phase setting	(Blank)
68zz	(Blank)	(Blank)	Transducer output voltage phase setting	(Blank)

Address	F-MPC04/F-MPC04P/F-MPC04S	FePSU	F-MPC30/F-MPC50/F-MPC55V/F-MPC60B	F-MPC04E
69zz	(Blank)	(Blank)	Residue/CT 3rd selection (zero-phase current)	(Blank)
70zz	(Blank)	(Blank)	Protective INST (phase N) (current setting)[*2]	(Blank)
71zz	(Blank)	(Blank)	Protective INST (phase N) (output setting)	(Blank)
72zz	(Blank)	(Blank)	Protective OC (phase N) (current setting)	(Blank)
73zz	(Blank)	(Blank)	Protective OC (phase N) (characteristic)	(Blank)
74zz	(Blank)	(Blank)	Protective OC (phase-N) (time magnification)[*2]	(Blank)
75zz	(Blank)	(Blank)	Protective OC (phase N) (output setting)	(Blank)
76zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (current setting)	(Blank)
77zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (operation time)	(Blank)
78zz	(Blank)	(Blank)	Protective OCA overcurrent pre-alarm (phase N) (output setting)	(Blank)
79zz	(Blank)	(Blank)	Protective OCGA pre-alarm (current setting)	(Blank)
80zz	(Blank)	(Blank)	Protective OCGA pre-alarm (operation time)	(Blank)
81zz	(Blank)	(Blank)	Protective OCGA pre-alarm (output setting)	(Blank)
82zz	(Blank)	(Blank)	Protective DT2 (current setting)	(Blank)
83zz	(Blank)	(Blank)	Protective DT2 (operation time) [*2]	(Blank)
84zz	(Blank)	(Blank)	Protective DT2 (output setting)	(Blank)
85zz	(Blank)	(Blank)	Transducer output CH1 setting	(Blank)
86zz	(Blank)	(Blank)	Transducer output CH2 setting	(Blank)
87zz	(Blank)	(Blank)	Transducer output CH3 setting	(Blank)
88zz	(Blank)	(Blank)	Transducer output CH4 setting	(Blank)
89zz	(Blank)	(Blank)	Transducer output CH5 setting	(Blank)
90zz	(Blank)	(Blank)	Transducer output CH6 setting	(Blank)
91zz	(Blank)	(Blank)	External change-over function setting of transducer output	(Blank)
92zz	(Blank)	(Blank)	Display mode selection	(Blank)

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

Address denotations:

- For the device memory for which the circuit number is set (00 to 02, 12 to 18, 50):

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

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

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

XXYYYY
Setting item (00 to 99)
Device type

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

PLC_CTL

<table>
<tr><th>Content</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="2">kWh integrated value reset *1</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 0</td></tr>
<tr><td rowspan="2">Max. kW (amount of power) reset</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 1</td></tr>
<tr><td rowspan="3">Operation control *2</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
<tr><td>n + 2</td><td>0: Turning ON the input/output
1: Turning ON the output of Power OFF
2: Turning OFF the output of power ON/OFF</td></tr>
<tr><td rowspan="2">Reset all of the demand maximum values *3</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 3</td></tr>
<tr><td rowspan="2">Alarm reset *3</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 4</td></tr>
<tr><td rowspan="9">Time setting *3</td><td rowspan="9">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number *4</td><td rowspan="9">8
(9 when broadcast is specified)</td></tr>
<tr><td>n + 1</td><td>Command: 5</td></tr>
<tr><td>n + 2</td><td>0: Specific station number
1: Broadcast</td></tr>
<tr><td>n + 3</td><td>Year</td></tr>
<tr><td>n + 4</td><td>Month</td></tr>
<tr><td>n + 5</td><td>Day</td></tr>
<tr><td>n + 6</td><td>Hour</td></tr>
<tr><td>n + 7</td><td>Minute</td></tr>
<tr><td>n + 8</td><td>Second *5</td></tr>
<tr><td rowspan="2">Reset the maximum and minimum voltage values *6</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 6</td></tr>
<tr><td rowspan="3">Entering test mode *6</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number *4</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 7</td></tr>
<tr><td>n + 2</td><td>0: Specific station number
1: Broadcast</td></tr>
<tr><td rowspan="3">Exiting test mode *6</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number *4</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 8</td></tr>
<tr><td>n + 2</td><td>0: Specific station number
1: Broadcast</td></tr>
</table>

*1 Not available with F*JF-R.
*2 Available only with F-MPC60B.
*3 Available only with FePSU.
*4 Select station No. 0 for broadcast commands.
*5 Can be set only for a broadcast command.
*6 Available only with F*JF-R.

21.2.9 FVR-E11S

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td><table>
<tr><th></th><th>Monitor</th><th>Frequency</th><th>Operation Command</th></tr>
<tr><td>0</td><td>○</td><td>X</td><td>X</td></tr>
<tr><td>1</td><td>○</td><td>○</td><td>X</td></tr>
<tr><td>2</td><td>○</td><td>X</td><td>○</td></tr>
<tr><td>3</td><td>○</td><td>○</td><td>○</td></tr>
</table></td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td>1 to 31</td><td>1</td></tr>
<tr><td>H34</td><td>Baud rate</td><td>0: 19200 bps
1: 9600 bps
2: 4800 bps</td><td>1</td></tr>
<tr><td>H35</td><td>Data length</td><td>0: 8 bits
1: 7 bits</td><td>0</td></tr>
<tr><td>H36</td><td>Parity bit</td><td>0: None
1: Even
2: Odd</td><td>0</td></tr>
<tr><td>H37</td><td>Stop bit</td><td>0: 1 bits
1: 2 bits</td><td>0</td></tr>
<tr><td>-</td><td>Communication protocol *2</td><td>“FGI-bus” is set as default.</td><td>-</td></tr>
</table>

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set “18 (link operation)” for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X5 can also be used. Set the function code corresponding to the digital input terminal to use.

*2 When “FVR-E11S” is selected for model selection on the editor, use “FGI-bus” for the communication protocol on the inverter.

Available Device Memory

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

Device Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	Double-word
F	(basic function)	02H	
E	(terminal function)	03H	
C	(control function)	04H	
P	(motor 1)	05H	
H	(high level function)	06H	
A	(motor 2)	07H	
o	(optional function)	08H	

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

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

21.2.10 FVR-E11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.11 FVR-C11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

Be sure to match the communication settings of the inverter to those made on the editor.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.12 FRENIC5000 G11S / P11S

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

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

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

*2 When "FRENIC5000G11S/P11S" is selected for model selection on the editor, select "FGI-bus" for the communication protocol on the inverter.

Available Device Memory

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

Device Memory		TYPE	Remarks
S	(command data)	00H	
M	(monitor data)	01H	Double-word, read only
F	(basic function)	02H	
E	(terminal function)	03H	
C	(control function)	04H	
P	(motor 1)	05H	
H	(high level function)	06H	
A	(motor 2)	07H	
o	(optional function)	08H	
U	(user function)	0AH	

Indirect Device Memory Designation

- When “S” (command data) or “M” (monitor data) is used:
  For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

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

21.2.13 FRENIC5000 G11S / P11S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

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

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

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.14 FRENIC5000 VG7S (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

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

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

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

(Underlined setting: default)

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

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

* The communication parameter (data length) is fixed to 8 bits.

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

Communication setting

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

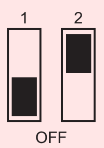
(Underlined setting: default)

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

*1 Available when the communication is enabled by digital input.
Example: To make the communication enabled when digital input terminal X1 is turned ON;
Set "24 (link operation)" for function code E01 and turn on the digital input terminal X1 externally.
Terminals from X2 to X9 can also be used. Set the function code corresponding to the digital input terminal to use.
*2 When "FRENIC5000G11S/P11S (MODBUS RTU)" is selected for model selection on the editor, select "Modbus RTU" for the communication protocol on the inverter.
*3 The communication parameter (data length) is fixed to 8 bits.

Notes on Using "OPC-VG7-RS" (Optional Communication Board)
Set the DIPSW2 on the optional communication board "OPC-VG7-RS" as shown below when connecting the X1 and the terminal block of the board.

The underlined settings are set as default.

<table>
<tr><th>SW2</th><th>SW2-1 Setting</th><th>SW2-2 Setting</th><th>Function</th><th>Remarks</th></tr>
<tr><td rowspan="4"></td><td>OFF</td><td>OFF</td><td rowspan="2">-</td><td>-</td></tr>
<tr><td>ON</td><td>OFF</td><td>-</td></tr>
<tr><td><u>OFF</u></td><td><u>ON</u></td><td>Optional communication board enabled</td><td>Do not change the default setting when connecting with the X1.</td></tr>
<tr><td>ON</td><td>ON</td><td>-</td><td>-</td></tr>
</table>

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.15 FRENIC-Mini (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

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

Inverter

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

(Underlined setting: default)

Function Code	Item	Setting	Example
y01	Station address	1 to 31	1
y04	Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps	3
y06	Parity bit	0: None 1: Even 2: Odd	0
y07	Stop bit	For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting. When no parity setting is made, "2 bits" is set for stop bit. When a parity setting (even or odd) is made, "1 bit" is set for stop bit.	-
y10	Communication protocol*1	**0: Modbus RTU** 1: SX (loader) protocol 2: FGI-bus	0
y99	Support link function	(No.) / Frequency / Operation Command 0 / Function code H30 / Function code H30 1 / Commanded from RS-485 / Function code H30 2 / Function code H30 / Commanded from RS-485 3 / Commanded from RS-485 / Commanded from RS-485	0
H30	Link function *2	(No.) / Frequency / Operation Command 0 / Inverter / Inverter 1 / RS-485 communication / Inverter 2 / Inverter / RS-485 communication 3 / RS-485 communication / RS-485 communication	3

*1 Select "Modbus RTU" for the communication protocol on the inverter when connecting with the X1.
*2 When "0" is specified for y99 (support link function), command from function code H30 is valid for the frequency setting and operation command.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
---	02H	

Address denotations XXYY

Function code identification number

Function code group

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

21.2.16 FRENIC-Eco (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

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

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

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

<table>
<tr><th>Function Code</th><th>Item</th><th colspan="3">Setting</th><th>Example</th></tr>
<tr><td rowspan="10">H30</td><td rowspan="10">Link function *2</td><td></td><td>Frequency</td><td>Operation Command</td><td rowspan="10">3</td></tr>
<tr><td>0</td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>4</td><td>RS-485 communication (optional)</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (optional)</td><td>RS-485 communication</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (optional)</td></tr>
<tr><td>7</td><td>RS-485 communication</td><td>RS-485 communication (optional)</td></tr>
<tr><td>8</td><td>RS-485 communication (optional)</td><td>RS-485 communication (optional)</td></tr>
</table>

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the X1.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making the frequency and operation command settings on the X1 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the X1 connected to the optional communication board, specify “8” for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.17 FRENIC-Multi (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

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

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

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

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

*1 Select "Modbus RTU" for the communication protocol on the inverter when connecting with the X1.
*2 When "0" is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making the frequency and operation command settings on the X1 connected to the connector for the touch panel, specify "3" for function code H30. When making those settings on the X1 connected to the optional communication board, specify "8" for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.18 FRENIC-MEGA (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Inverter

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

(Underlined setting: default)

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

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

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

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

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the X1.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making the frequency and operation command settings on the X1 connected to the connector for the touch panel, specify “3” for function code H30. When making those settings on the X1 connected to the terminal block on control circuit, specify “8” for function code H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.19 FRENIC-MEGA SERVO (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	On the inverter: 2 bits when “0” is specified for y06 or y16 1 bit when “1”, “2” or “3” is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

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

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th colspan="2">Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td rowspan="5">RS-485 setting 1
(Touch panel)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y06</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When “0” is specified for y06, “2 bits” is set for stop bit.
When “1”, “2”, or “3” is specified for y06, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol *1</td><td>0: Modbus RTU
1: SX (loader) protocol
2: FGI-bus</td><td>0</td></tr>
<tr><td>y11</td><td rowspan="5">RS-485 setting 2
(Control circuit)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y14</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y16</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y17</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

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

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

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the X1.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making frequency and operation command settings on the X1 connected to the connector for the touch panel, specify “3” for function code H30. When making the settings on the X1 connected to the control circuit terminal block, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.20 FRENIC-HVAC/AQUA (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	On the inverter: 2 bits when “0” is specified for y06 or y16 1 bit when “1”, “2” or “3” is specified for y06 or y16
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

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

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th colspan="2">Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td rowspan="5">RS-485 setting 1
(Touch panel)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y06</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When “0” is specified for y06, “2 bits” is set for stop bit.
When “1”, “2”, or “3” is specified for y06, “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol *1</td><td>0: Modbus RTU</td><td>0</td></tr>
<tr><td>y11</td><td rowspan="5">RS-485 setting 2
(terminal block)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y14</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y16</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y17</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

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

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

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the X1.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making frequency and operation command settings on the X1 connected to the connector for the touch panel, specify “3” for function code H30. When making the settings on the X1 connected to the control circuit terminal block, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.21 FRENIC-VG1 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

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

(Underlined setting: default)

Function Code	Item	Setting	Example
H31	Station address	1 to 247	1
H34	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps	0
H35	Data length	**0: 8 bits**	0
H36	Parity bit	0: None 1: Even parity 2: Odd parity	1
H37	Stop bit	0: 2 bits 1: 1 bit	1
H40	Protocol selection	**2: Modbus-RTU protocol**	2

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.22 FRENIC-Ace (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 247	0: Broadcast

Inverter

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

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th colspan="2">Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>y01</td><td rowspan="6">RS-485 setting (communication port 1)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y04</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y05</td><td>Data length</td><td>0: 8 bits
1: 7 bits</td><td>0</td></tr>
<tr><td>y06</td><td>Parity bit</td><td>0: None
1: Even parity
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y07</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

When “0” is specified for y06, “2 bits” is set for stop bit.
When “1”, “2”, or “3” is specified for y06 “1 bit” is set for stop bit.</td><td>-</td></tr>
<tr><td>y10</td><td>Communication protocol *1</td><td>0: Modbus RTU</td><td>0</td></tr>
<tr><td>y11</td><td rowspan="6">RS-485 setting 2 (communication port 2)</td><td>Station address</td><td>1 to 247</td><td>1</td></tr>
<tr><td>y14</td><td>Baud rate</td><td>1: 4800 bps
2: 9600 bps
3: 19200 bps
4: 38400 bps</td><td>3</td></tr>
<tr><td>y15</td><td>Data length</td><td>0: 8 bits
1: 7 bits</td><td>0</td></tr>
<tr><td>y16</td><td>Parity bit</td><td>0: None
1: Even
2: Odd
3: None</td><td>0</td></tr>
<tr><td>y17</td><td>Stop bit</td><td>For Modbus RTU communication, the stop bit setting is automatically made according to the parity bit setting.

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

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

*1 Select “Modbus RTU” for the communication protocol on the inverter when connecting with the X1.
*2 When “0” is specified for y98 (bus function) as well as y99 (support link function), the frequency and operation command can be set on the X1.
When making frequency and operation command settings on the X1 connected to communication port 1, specify “3” for function code H30. When making the settings on the X1 connected to communication port 2, specify “8” for H30.
*3 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
4	02H	

21.2.23 FRENIC Series (Loader)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Even**	
Target Port No.	1 to 255	

Inverter

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

FRENIC5000VG7S

Built-in RS-485 port

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td><table><tr><th></th><th>Writing of Monitor/Function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>○</td><td>×</td><td>×</td></tr><tr><td>1</td><td>○</td><td>○</td><td>×</td></tr><tr><td>2</td><td>○</td><td>×</td><td>○</td></tr><tr><td>3</td><td>○</td><td>○</td><td>○</td></tr></table></td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td>1 to 255</td><td>1</td></tr>
<tr><td>H34</td><td>Baud rate</td><td>0: 38400 bps
1: 19200 bps
2: 9600 bps
3: 4800 bps</td><td>1</td></tr>
<tr><td>H40</td><td>Communication protocol</td><td>0: FGI-bus
1: SX (loader) protocol
2: Modbus RTU</td><td>1</td></tr>
</table>

Connecting to terminal block of “OPC-VG7-RS” optional communication board

(Underlined setting: default)

<table>
<tr><th>Function Code</th><th>Item</th><th>Setting</th><th>Example</th></tr>
<tr><td>H30</td><td>Link function *1</td><td><table><tr><th></th><th>Writing of Monitor/Function Data</th><th>Frequency Setting</th><th>Operation Command</th></tr><tr><td>0</td><td>○</td><td>×</td><td>×</td></tr><tr><td>1</td><td>○</td><td>○</td><td>×</td></tr><tr><td>2</td><td>○</td><td>×</td><td>○</td></tr><tr><td>3</td><td>○</td><td>○</td><td>○</td></tr></table></td><td>3</td></tr>
<tr><td>H31</td><td>Station address</td><td>1 to 255</td><td>1</td></tr>
</table>

Function Code	Item	Setting	Example
o37	Communication definition setting	Baud rate 0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 4800 bps Parity 0: None (stop bit: 2 bits) **1: Even (stop bit: 1 bit)** 2: Odd (stop bit: 1 bit)	11
H40	Communication protocol	0: FGI-bus **1: SX (loader) protocol** 2: Modbus RTU	1

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

Notes on Using the "OPC-VG7-RS" (Optional Communication Board)
Set the DIPSW2 on the optional communication board "OPC-VG7-RS" as shown below when connecting the X1 and the terminal block of the board.

The underlined settings are set as default.

SW2	SW2-1 Setting	SW2-2 Setting	Function	Remarks
1 2 OFF	OFF	OFF	-	-
	ON	OFF		-
	OFF	ON	Optional communication board enabled	Do not change the default setting when connecting with the X1.
	ON	ON	-	-

FRENIC-Mini/Eco/Multi/MEGA/MEGA SERVO/HVAC/AQUA/Ace/HF/Lift

(Underlined setting: default)

Function Code	Name		Setting	Example	Remarks
y01	RS-485 setting 1 (touch panel / communication port 1)	Station address	1 to 255	1	
y04		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3	
y10		Communication protocol *1	0: Modbus RTU **1: SX (loader) protocol** 2: FGI-bus	1	
y11	RS-485 setting 2 (control circuit terminal block / communication port 2)	Station address	1 to 255	1	The control circuit terminal block / communication port 2 is available only with FRENIC-HVAC/ AQUA/Ace.
y14		Baud rate	1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps	3	
y20		Communication protocol	0: Modbus RTU **1: SX (loader) protocol** 2: FGI-bus	1	
y98	Bus function		(see table below)	0	

y98 setting:

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

<table>
<tr><th>Function Code</th><th>Name</th><th>Setting</th><th>Example</th><th>Remarks</th></tr>
<tr><td>y99</td><td>Support link function</td><td>
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td><u>0</u></td><td>Function code H30, y98</td><td>Function code H30, y98</td></tr>
<tr><td>1</td><td>Command from FRENIC loader</td><td>Function code H30, y98</td></tr>
<tr><td>2</td><td>Function code H30, y98</td><td>Command from FRENIC loader</td></tr>
<tr><td>3</td><td>Command from FRENIC loader</td><td>Command from FRENIC loader</td></tr>
</table>
</td><td>0</td><td></td></tr>
<tr><td>H30</td><td>Link function *1</td><td>
• FRENIC-Mini/Eco/Multi/MEGA/MEGA SERVO/
HVAC/AQUA/Ace/HF
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th></tr>
<tr><td><u>0</u></td><td>Inverter</td><td>Inverter</td></tr>
<tr><td>1</td><td>RS-485 communication (port 1)</td><td>Inverter</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>3</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>4</td><td>RS-485 communication (port 2) *</td><td>Inverter</td></tr>
<tr><td>5</td><td>RS-485 communication (port 2) *</td><td>RS-485 communication (port 1)</td></tr>
<tr><td>6</td><td>Inverter</td><td>RS-485 communication (port 2) *</td></tr>
<tr><td>7</td><td>RS-485 communication (port 1)</td><td>RS-485 communication (port 2) *</td></tr>
<tr><td>8</td><td>RS-485 communication (port 2) *</td><td>RS-485 communication (port 2) *</td></tr>
</table>
• FRENIC-Lift
<table>
<tr><th></th><th>Frequency Setting</th><th>Operation Command</th><th>Torque Bias Command</th></tr>
<tr><td><u>0</u></td><td>Inverter</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>1</td><td>RS-485 communication</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>2</td><td>Inverter</td><td>RS-485 communication</td><td>L54</td></tr>
<tr><td>3</td><td>RS-485 communication</td><td>RS-485 communication</td><td>L54</td></tr>
<tr><td>4</td><td>CAN</td><td>Terminal block</td><td>L54</td></tr>
<tr><td>5</td><td>Inverter</td><td>CAN</td><td>L54</td></tr>
<tr><td>6</td><td>CAN</td><td>CAN</td><td>L54</td></tr>
<tr><td>7</td><td>Inverter</td><td>Terminal block</td><td>RS-485 communication</td></tr>
<tr><td>8</td><td>RS-485 communication</td><td>Terminal block</td><td>RS-485 communication</td></tr>
<tr><td>9</td><td>Inverter</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>10</td><td>RS-485 communication</td><td>RS-485 communication</td><td>RS-485 communication</td></tr>
<tr><td>11</td><td>Inverter</td><td>Terminal block</td><td>CAN</td></tr>
<tr><td>12</td><td>CAN</td><td>Terminal block</td><td>CAN</td></tr>
<tr><td>13</td><td>Inverter</td><td>CAN</td><td>CAN</td></tr>
<tr><td>14</td><td>CAN</td><td>CAN</td><td>CAN</td></tr>
</table>
</td><td>3</td><td>* The communication port 2 is available only with FRENIC-HVAC/AQUA/Ace.</td></tr>
</table>

*1 When “0” is specified for y98 (bus function) and “3” is specified for y99 (support link function), the frequency and operation command can be set on the X1.
When making frequency and operation command settings on the X1 connected to communication port 1, specify “3” for function code H30. When making the settings on the X1 connected to communication port 2, specify “8” for H30.

FRENIC-VG1

(Underlined setting: default)

Function Code	Name	Setting	Example
H31	Station address	<u>1</u> to 255	1
H34	Baud rate	<u>0: 38400 bps</u> 1: 19200 bps 2: 9600 bps 3: 4800 bps	1
H40	Protocol selection	0: FGI-bus **<u>1: SX (loader) protocol</u>** 2: Modbus RTU	1

Available Device Memory

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

Device Memory		TYPE	Remarks
F	(basic function)	00H	
E	(terminal function)	01H	
C	(control function)	02H	
P	(motor parameter function M1)	03H	
H	(high performance function)	04H	
A	(motor parameter function M2, 3)	05H	
o	(optional function)	06H	
S	(communication command function)	07H	
M	(monitor data function)	08H	
L	(lift function)	09H	
r	(VG7, UPAC RAS function)	0AH	
U	(user function)	0BH	
J	(application function)	0DH	
y	(communication function)	0EH	
W	(extensional monitor)	0FH	
X	(alarm information 1)	10H	
Z	(alarm information 2)	11H	
b	(ASR/torque)	12H	
d	(soft relay)	13H	
E1	(terminal function 1)	14H	
H1	(high level function 1)	15H	
H2	(high level function 2)	16H	
H3	(high level function 3)	17H	
H4	(high level function 4)	18H	
H5	(high level function 5)	19H	
A1	(motor 3 function)	1AH	
o1	(optional function 1)	1BH	
o2	(optional function 2)	1CH	
U1	(user function 1)	1DH	
M1	(monitor data function 1)	1EH	
M2	(monitor data function 2)	1FH	
q	(for validation by manufacturer)	21H	
i	(model-specific adjustment value)	22H	
u	(back 1 function code)	23H	
n	(back 2 function code)	24H	
K	(touch panel / loader communication (K))	26H	

21.2.24 HFR-C9K

Communication Setting

Editor

Communication setting

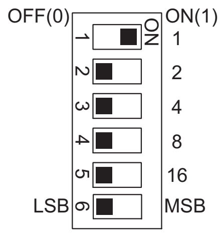
(Underlined setting: default)

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

IH Inverter

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

SW1 setting (station address / optional selection)

<table>
<tr><th>Switch</th><th colspan="2">Contents</th><th>Example:
Station Address: 1
Optional Selection: Selection for Communication Operation
(Start from LSB)</th></tr>
<tr><td>1
2
3
4
5</td><td>Station Address*1</td><td>
<table>
<tr><th>Switch / Address</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>3</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td><td>:</td></tr>
<tr><td>28</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>29</td><td>ON</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>30</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
<tr><td>31</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr>
</table>
</td><td rowspan="2">
</td></tr>
<tr><td>6</td><td>Optional Selection</td><td>
<table>
<tr><th>Contents</th><th>LSB</th><th>MSB</th></tr>
<tr><td>Selection for Communication Operation (Start from LSB)</td><td>ON</td><td>OFF</td></tr>
<tr><td>Selection for Communication Operation (Start from MSB)</td><td>OFF</td><td>ON</td></tr>
</table>
</td></tr>
</table>

*1 For connection to a X1, be sure to set the station address other than 0.

Communication setting

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

(Underlined setting: default)

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

Available Device Memory

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

Device Memory	TYPE	Remarks
---	00H	

21.2.25 HFR-C11K

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

IH Inverter

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

SW3 setting (station address / terminating resistance)

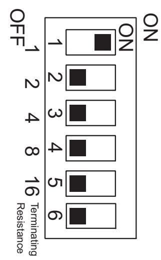
Switch	Contents	Example: Station Address: 1 Terminating Resistance: None
1, 2, 3, 4, 5	Station Address*1	
6	Terminating Resistance	

Station Address:

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

Terminating Resistance:

Contents	OFF	ON
Terminating resistance	None	Provided



*1 For connection to a X1, be sure to set the station address other than 0.

Communication setting

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

(Underlined setting: default)

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

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

Available Device Memory

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

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

PLC_CTL

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

21.2.26 HFR-K1K

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

IH Inverter

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

Control PCB internal switch

Internal Switch		Description
SW3	SW4	
RS	RS	For RS-485 communication

Communication setting

Set communication parameters.

(Underlined setting: default)

Function Code	Item		Setting	Example
R00	Communication host setting		0: Touch panel connection terminal 1: I/O PCB (option)	0
R01		Station address	1 to 31	1
R04		Baud Rate	3: 9600 bps 4: 19200 bps 5: 38400 bps	5
R05		Data length	0: 8 bits 1: 7 bits	1
R06	RS-485 setting (touch panel connection terminal)	Parity bit	0: None 1: Even parity 2: Odd parity 3: None	1
R07		Stop bit	0: 2 bits 1: 1 bit	1
R10		Protocol selection	**0: FGI-bus**	0
R12		Station address	1 to 31	1
R15		Baud Rate	3: 9600 bps 4: 19200 bps 5: 38400 bps	5
R16		Data length	0: 8 bits 1: 7 bits	1
R17	RS-485 setting (I/O PCB (option))	Parity bit	0: None 1: Even parity 2: Odd parity 3: None	1
R18		Stop bit	0: 2 bits 1: 1 bit	1
R21		Protocol selection	**0: FGI-bus**	0

Available Device Memory

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

Device Memory		TYPE	Remarks
S	(command data)	00H	
d	(monitor data)	01H	
F	(basic function)	02H	
E	(error display function)	03H	
C	(control function)	04H	
P	(optional function)	05H	
H	(advanced function)	06H	
o	(output terminal function)	08H	
I	(input terminal function)	0BH	
t	(trip (alarm) control function)	0CH	
r	(RS communication function)	0DH	
Pn	(touch panel function)	0EH	

PLC_CTL

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

21.2.27 PPMC (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

AC Power Monitor

The communication parameters can be set using keys attached to the front of the AC power monitor.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

*1 The unit number is set for the ID number upon delivery. The unit number is indicated on the instruction plate attached to the side of the case.
*2 Select “rtu (Modbus RTU)” for the communication protocol when communicating with the X1.
*3 The communication parameter (stop bit) is fixed to 1 bit.
*4 The communication function of the AC power monitor can be selected at the time of purchase. Select a model on which RS-485/RS-232C communication is available.

Available Device Memory

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

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

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

21.2.28 FALDIC-α Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo Amplifier

Set the communication parameters using the touch panel mounted on the servo amplifier.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

*1 The communication function of the servo amplifier can be selected at the time of purchase. Select a model on which host interface: universal communication (RS-485) is available.
*2 The following communication parameters are fixed; data length: 8 bits, stop bit: 1 bit, and parity: even.

Available Device Memory

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

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

*1 Input a parameter number by manual operation.
*2 Address denotations XXYY
Address
Positioning data number (01H - 63H)

PLC_CTL

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

21.2.29 FALDIC-W Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

* When changing the time-out time, note the following points. (Default: 500 (msec))

- When the baud rate is 19200 bps or 38400 bps, set 200 (msec) or greater.
- When the baud rate is 9600 bps, set 500 (msec) or greater.

Servo Amplifier

Set the communication parameters using the touch panel mounted on the servo amplifier.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Parameter			Item	Setting	Example	Remarks
Pn01 Parameter editing mode	no.82	(No. 82)	Station number	1 to 31	1	The setting takes effect when the power is turned off and back on again.
	no.83	(No. 83)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps	0	

* The following communication parameters are fixed; data length: 8 bits, stop bit: 1 bit, and parity: even.

Available Device Memory

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

Device Memory		TYPE	Remarks
01	(monitor data)	00H	Double-word, read only
02	(sequence mode)	01H	Read only
03	(sequence I/O signal)	02H	Read only
04	(alarm history)	03H	Read only
06	(current alarm readout)	04H	Read only
07	(parameter)	05H	Double-word
09	(alarm reset)	06H	Write only

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified (expansion bit designation).

15							8
0	0	0	0	0	0	0	

Expansion bit designation
0: 0 to 15 bits
1: 16 to 31 bits

PLC_CTL

Contents	F0	F1 (= $u n)		F2
System status readout	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
		n + 2	System 1	
		n + 3	System 2	
		n + 4	Model	
		n + 5	Occupied by maker, Zno	
		n + 6 - n + 10	Occupied by maker (max. 10 bytes)	

Return data: Data stored from the servo amplifier to the X1

21.2.30 PH Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Recorder

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

(Underlined setting: default)

Parameter	Setting	Example	Remarks
Station No.	1 to 31	1	
Baud rate	4800 / 9600 / 19200 bps	19200 bps	
Stop bit	1 / 2 bits	1	
Parity	None / Even / Odd	Odd	

* The communication function of the recorder can be selected at the time of purchase. Select a model on which RS-485 transmission mode is available.
* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory		TYPE	Remarks
F00	(setting value file)	00H	
F01	(range file CH1)	01H	
F02	(range file CH2)	02H	
F03	(range file CH3)	03H	
F04	(range file CH4)	04H	
F05	(range file CH5)	05H	
F06	(range file CH6)	06H	
F07	(range file CH7)	07H	
F08	(range file CH8)	08H	
F09	(range file CH9)	09H	
F10	(range file CH10)	0AH	
F11	(range file CH11)	0BH	
F12	(range file CH12)	0CH	
F13	(warning setting file)	0DH	
F14	(system file)	0EH	
F15	(command file)	0FH	
F16	(abnormal input information file)	10H	Read only
F17	(input data file)	11H	Read only
F19	(alarm output file)	13H	Read only
F21	(transmission input data file)	15H	Write only
F22	(message file)	16H	
F33	(daily report file 1)	21H	Read only
F34	(daily report file 2)	22H	Read only
F35	(daily report file 3)	23H	Read only
F37	(integral file 1)	25H	Read only
F38	(integral file 2)	26H	Read only
F51	(status information control file)	33H	

21.2.31 PHR (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Recorder

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

(Underlined setting: default)

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

*1 The communication function of the recorder can be selected at the time of purchase. Select a model on which RS-485 communication is available.
*2 The following communication parameters are fixed; data length: 8 bits and stop bit: 1 bit.

Available Device Memory

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

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

21.2.32 WA5000

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / <u>1 : n</u>	
Signal Level	<u>RS-232C</u> / RS-422/485	
Baud Rate	4800 / <u>9600</u> / 19200 / 38400 bps	
Data Length	<u>7</u> / 8 bits	
Stop Bit	1 / <u>2</u> bits	
Parity	None / <u>Even</u> / Odd	
CR / LF	<u>CR</u> / CR/LF	
Target Port No.	<u>1</u> to 31	
Send Delay Time	0 to 255 msec	*1

*1 If the send delay time is too short, “Communication Error “Format”” may occur. If this error occurs, set the send delay time to 5 msec or longer.

Digital Panel Meter

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

(Underlined setting: default)

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

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

Available Device Memory

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

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

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

PLC_CTL

Contents	F0	F1 (=$u n)		F2
Hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 0	
		n + 2	Hold status 0: OFF, 1: ON	
Hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 1	
		n + 2	Hold status 0: OFF, 1: ON	
Hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 2	
		n + 2	Hold status 0: OFF, 1: ON	
Trigger input	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 3	
		n + 2	Display type 0: Normal display 1: Over display 2: Peak hold display 3: Valley hold display 4: Peak valley hold display	
		n + 3	Measurement value	
		n + 4	Comparison result 0: OFF 1: HI 2: GO 3: LO	
Hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
Peak hold remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 5	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
		n + 3	Peak hold status 0: OFF, 1: ON	
Peak hold terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 6	
		n + 2	Peak hold status 0: OFF, 1: ON	
Peak hold type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 7	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peak hold remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 8	
		n + 2	Peak hold remote 0: OFF, 1: ON	
Peak hold value response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	Peak hold value	
		n + 3	Valley hold value	
		n + 4	Peak valley hold value	
Peak hold value clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 10	
		n + 2	Peak hold type 0: Peak hold 1: Valley hold 2: Peak valley hold	
Peal hold remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	
Digital zero remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 12	
		n + 2	Digital zero 0: OFF, 1: ON	
		n + 3	Displayed value	

Contents	F0	F1 (=$u n)		F2
Digital zero terminal response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 13	
		n + 2	Digital zero 0: OFF, 1: ON	
Digital zero remote control	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	Command: 14	
		n + 2	Digital zero 0: OFF, 1: ON, 2: ON when the value reaches the set value	
		n + 3	Setting value	
Digital zero remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 15	
Comparison output remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 16	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 17	
		n + 2	Status 0: OFF 1: Set (ON) HI 2: Set (ON) GO 3: Set (ON) LO	
Comparison output remote control cancel	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 18	
Remote control response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 19	
		n + 2	Remote control status Bit: - , 3, 2, 1, 0 0: Hold function 1: Peak hold 2: Digital zero 3: Comparison output * No remote control is performed when all bits are reset (OFF).	
Maximum / minimum / (maximum - minimum) response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 20	
		n + 2	Maximum	
		n + 3	Minimum	
		n + 4	(Maximum - minimum)	
Maximum / minimum / (maximum - minimum) clear	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 21	
		n + 2	Maximum /minimum /(maximum - minimum) clear 0: Maximum 1: Minimum 2: Maximum - minimum	
Range response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 22	
		n + 2	Range 0: No designation 1: Range 11 2: Range 12 3: Range 13 4: Range 14 5: Range 15 6: Range 23 7: Range 24 8: Range 25 9: Range 26 10: KA 11: KB 12: J 13: T 14: R 15: S 16: B 17: PA 18: Pb 19: JPA 20: JPb 21: 1V 22: 2A	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="3">Range setting</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 23</td></tr>
<tr><td>n + 2</td><td>Range
1: Range 11 12: J
2: Range 12 13: T
3: Range 13 14: R
4: Range 14 15: S
5: Range 15 16: B
6: Range 23 17: PA
7: Range 24 18: Pb
8: Range 25 19: JPA
9: Range 26 20: JPb
10: KA 21: 1V
11: KB 22: 2A</td></tr>
<tr><td rowspan="3">Average number of responses</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 24</td></tr>
<tr><td>n + 2</td><td>Average number of times
1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)</td></tr>
<tr><td rowspan="3">Setting for average number of times</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 25</td></tr>
<tr><td>n + 2</td><td>Average number of times
1 / 2 / 4 / 8 / 10 / 20 / 40 / 80 (times)</td></tr>
<tr><td rowspan="3">Average number of movement times</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 26</td></tr>
<tr><td>n + 2</td><td>Average number of movement times
0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)</td></tr>
<tr><td rowspan="3">Setting for average number of movement times</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 27</td></tr>
<tr><td>n + 2</td><td>Average number of movement times
0 (OFF) / 2 / 4 / 8 / 16 / 32 (times)</td></tr>
<tr><td rowspan="3">Step-wide response</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 28</td></tr>
<tr><td>n + 2</td><td>Step wide
1:1, 2:2, 5:5, 0:10 (digit)</td></tr>
<tr><td rowspan="3">Step-wide setting</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 29</td></tr>
<tr><td>n + 2</td><td>Step wide
1:1, 2:2, 5:5, 0:10 (digit)</td></tr>
<tr><td rowspan="7">Communication function parameter response</td><td rowspan="7">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="7">2</td></tr>
<tr><td>n + 1</td><td>Command: 30</td></tr>
<tr><td>n + 2</td><td>Baud rate
0: 2400, 1: 4800, 2: 9600,
3: 19200, 4: 38400</td></tr>
<tr><td>n + 3</td><td>Data length
0: 7 bits, 1: 8 bits</td></tr>
<tr><td>n + 4</td><td>Parity
0: none, 1: odd, 2: even</td></tr>
<tr><td>n + 5</td><td>Stop bit
0: 1 bit, 1: 2 bits</td></tr>
<tr><td>n + 6</td><td>Delimiter
0: CR/LF, 1: CR</td></tr>
<tr><td rowspan="7">Communication function parameter setting</td><td rowspan="7">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="7">7</td></tr>
<tr><td>n + 1</td><td>Command: 31</td></tr>
<tr><td>n + 2</td><td>Baud rate
0: 2400, 1: 4800, 2: 9600,
3: 19200, 4: 38400</td></tr>
<tr><td>n + 3</td><td>Data length
0: 7 bits, 1: 8 bits</td></tr>
<tr><td>n + 4</td><td>Parity
0: none, 1: odd, 2: even</td></tr>
<tr><td>n + 5</td><td>Stop bit
0: 1 bit, 1: 2 bits</td></tr>
<tr><td>n + 6</td><td>Delimiter
0: CR/LF, 1: CR</td></tr>
<tr><td rowspan="3">Unit ID response</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 32</td></tr>
<tr><td>n + 2</td><td>Unit ID
1 to 99</td></tr>
<tr><td rowspan="3">Unit ID setting</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">3</td></tr>
<tr><td>n + 1</td><td>Command: 33</td></tr>
<tr><td>n + 2</td><td>Unit ID
1 to 99</td></tr>
</table>

Contents	F0	F1 (=$u n)		F2
Analog output type response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 34	
		n + 2	Analog output type 0: Not provided 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Analog output type setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 35	
		n + 2	Analog output type 1: OFF 2: 0 - 1 (V) 3: 0 - 10 (V) 4: 1 - 5 (V) 5: 0 - 20 (mA) 6: 4 - 20 (mA)	
Digital zero backup status response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 36	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero backup control	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 37	
		n + 2	Digital zero backup status 0: OFF 1: ON	
Digital zero data save command	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 38	
Input change response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 39	
		n + 2	Input change 0: Not provided 1: Open collector 2: Logic 3: Magnetic	
Input change setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 40	
		n + 2	Input change 1: Open collector 2: Logic 3: Magnetic	
Tracking zero response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 41	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
		n + 3	Tracking zero width 0 (OFF) / 1 to 99	
Tracking zero time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 42	
		n + 2	Tracking zero time 0 (OFF) / 1 to 99	
Tracking zero width setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 43	
		n + 2	Tracking zero width 0 (OFF) /1 to 99	
Sensor power response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 44	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Sensor power setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 45	
		n + 2	Sensor power 0: 5 V 1: 10 V	
Power-on delay time response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 46	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	

Contents	F0	F1 (=$u n)		F2
Power-on delay time setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 47	
		n + 2	Power-on delay time 0 (OFF) / 1 to 30	
Protection response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 48	
		n + 2	Protect 0: OFF 1: ON	
Protection setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 49	
		n + 2	Protect 0: OFF 1: ON	
Unit No. response	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 50	
		n + 2	Input unit number 1 to 18	
		n + 3	Output unit number 0 to 7	
Response to prohibition of key operations	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 51	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Prohibition of key operations setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 52	
		n + 2	Prohibition of key operations 0: OFF 1: ON	
Response to linearizing function status	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 53	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	
Linearizing function status setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 54	
		n + 2	Linearizing function 0: OFF 1: ON 2: CLR	
Response to the number of linearization correction data	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 55	
		n + 2	Linearization correction data 0 (clear) to 16	
The number of linearization correction data setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 56	
		n + 2	Linearization correction data 1 to 16	

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

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

Return data: Data stored from the panel meter to the X1

21.2.33 APR-N (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

AC Power Regulator

The communication parameter can be set using keys attached to the front of the AC power regulator.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

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

*1 For communication with X1, select "Network device" for the setting device selection and "MODBUS RTU" for the communication protocol selection on this regulator.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory	TYPE	Remarks
---	02H	Byte address

Indirect Device Memory Designation

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

21.2.34 ALPHA5 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo Amplifier

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

(Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extensional Function Setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 115200 bps	0
	PA2_93	(No. 93)	Parity bit / Stop bit selection	0: Even parity, Stop bit 1 bits 1: Odd parity, Stop bit 1 bits 2: Without parity, Stop bit 1 bits 3: Even parity, Stop bit 2 bits 4: Odd parity, Stop bit 2 bits 5: Without parity, Stop bit 2 bits	0
	PA2_97	(No. 97)	Communication protocol selection*	0: PC Loader protocol **1: MODBUS RTU**	1

*1 For communication with X1, select "MODBUS RTU" for the communication protocol selection on the servo amplifier.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

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

* Communication OUT signal is read only.

PLC_CTL

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

Return data: Data stored from the servo amplifier to the X1

*1 Select station No. 0 for broadcast commands.

21.2.35 ALPHA5 Smart (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo Amplifier

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

(Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extended function setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 115200 bps	0
	PA2_93	(No. 93)	Parity bit and stop bit selection	0: Even parity, stop bit 1 1: Odd parity, stop bit 1 2: Without parity, stop bit 1 3: Even parity, stop bit 2 4: Odd parity, stop bit 2 5: Without parity, stop bit 2	0
	PA2_97	(No. 97)	Communication protocol selection*1	0: PC loader protocol **1: MODBUS RTU**	1

*1 For communication with X1, select “MODBUS RTU” for the communication protocol.
*2 The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

Device Memory		TYPE	Remarks
00	(communication CONT/OUT signal)	00H	Double-word *1
01	(monitor)	01H	Double-word, read only
02	(sequence monitor)	02H	Double-word, read only
03	(various commands)	03H	Double-word
04	(parameter)	04H	Double-word
05	(immediate data)	05H	Double-word

*1 Communication OUT signal: Read only

PLC_CTL

<table>
<tr><th>Contents</th><th>F0</th><th colspan="3">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="11">Reading of positioning data</td><td rowspan="11">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number</td><td rowspan="11">4</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 03 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Reading address</td></tr>
<tr><td>n+3</td><td colspan="2">Number of positioning data to read: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="6">Positioning data

m = 1</td><td>Positioning status & M code
Bit: 15 - 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0
15 - 8: M code
7 - 6: Not used
5: M code output timing
4: M code Valid/invalid
3: Not used
2 - 1: Step mode
0: Command method</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
<tr><td rowspan="11">Writing of positioning data</td><td rowspan="11">1 - 8
(PLC1 - 8)</td><td>n</td><td colspan="2">Station number *1</td><td rowspan="11">4+10m</td></tr>
<tr><td>n+1</td><td colspan="2">Command: 10 (HEX)</td></tr>
<tr><td>n+2</td><td colspan="2">Writing address</td></tr>
<tr><td>n+3</td><td colspan="2">Number of positioning data to write: m (1 to 9)</td></tr>
<tr><td>n+4</td><td rowspan="6">Positioning data

m = 1</td><td>Positioning status & M code
Bit: 15 - 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0
15 - 8: M code
7 - 6: Not used
5: M code output timing
4: M code Valid/invalid
3: Not used
2 - 1: Step mode
0: Command method</td></tr>
<tr><td>n+5</td><td>Stop timer</td></tr>
<tr><td>n+6 to n+7</td><td>Stop position</td></tr>
<tr><td>n+8 to n+9</td><td>Rotation speed</td></tr>
<tr><td>n+10 to n+11</td><td>Acceleration time</td></tr>
<tr><td>n+12 to n+13</td><td>Deceleration time</td></tr>
<tr><td>n+14 to n+(3+10m)</td><td colspan="2">Positioning data (m = 2)</td></tr>
</table>

Return data: Data stored from servo amplifier to X1 series

*1 Select station No. 0 for broadcast commands.

21.2.36 ALPHA7 (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

Servo Amplifier

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

(Underlined setting: default)

Parameter			Item	Setting	Example
PA2 Extensional Function Setting	PA2_72	(No. 72)	Station number	1 to 31	1
	PA2_73	(No. 73)	Baud rate	0: 38400 bps 1: 19200 bps 2: 9600 bps 3: 115200 bps	0
	PA2_93	(No. 93)	Parity bit / Stop bit selection	0: Even parity, Stop bit 1 bits 1: Odd parity, Stop bit 1 bits 2: Without parity, Stop bit 1 bits 3: Even parity, Stop bit 2 bits 4: Odd parity, Stop bit 2 bits 5: Without parity, Stop bit 2 bits	0
	PA2_97	(No. 97)	Communication protocol selection*	0: PC Loader protocol **1: MODBUS RTU**	1

*1 For communication with X1, select "MODBUS RTU" for the communication protocol selection on the servo amplifier.
*2 The communication parameter (data length) is fixed to 8 bits.

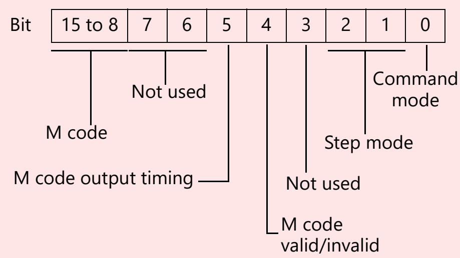
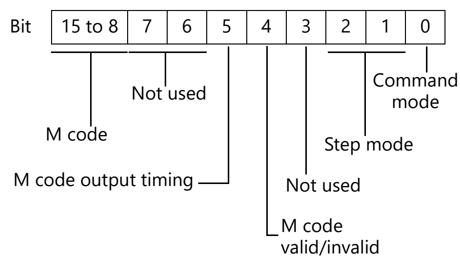
Available Device Memory

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

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

* Communication OUT signal is read only.

PLC_CTL

Contents	F0	F1 (=$u n)			F2
Positioning data reading	1 - 8 (PLC1 - 8)	n	Station number		4
		n+1	Command: 03 (HEX)		
		n+2	Reading device memory address		
		n+3	Read count: m (1 to 9)		
		n+4	Positioning data m = 1	Positioning status and M code 	
		n+5		Stop timer	
		n+6 to n+7		Stop position	
		n+8 to n+9		Rotation speed	
		n+10 to n+11		Acceleration time	
		n+12 to n+13		Deceleration time	
		n+14 to n+(3+10m)	Positioning data (m = 2 to 9)		
Positioning data writing	1 - 8 (PLC1 - 8)	n	Station number *1		4+10m
		n+1	Command: 10 (HEX)		
		n+2	Writing device memory address		
		n+3	Writing positioning data count: m (1 to 9)		
		n+4	Positioning data m = 1	Positioning status and M code 	
		n+5		Stop timer	
		n+6 to n+7		Stop position	
		n+8 to n+9		Rotation speed	
		n+10 to n+11		Acceleration time	
		n+12 to n+13		Deceleration time	
		n+14 to n+(3+10m)	Positioning data (m = 2 to 9)		

Return data: Data stored from the servo amplifier to X1 series

*1 Select station No. 0 for broadcast commands.

21.2.37 WE1MA (Ver. A) (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	0 to 247	0: Broadcast

Electronic Multimeter

The communication parameter can be set using keys attached to the front of the electronic multimeter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Setting Component	Setting No.	Item	Setting	Example
Adr	231C	Station address	1 to 247	1
bPS	232C	Baud rate	4800 / 9600 / 19200 / 38400 bps	9600
PAr	233C	Parity bit	E: Even o: Odd -: None	E
StoP	234C	Stop bit	1 / 2 bits	1
WEr	235C	Protocol version	**A: Version A**	A

* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

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

21.2.38 WE1MA (Ver. B) (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	**RS-422/485**	
Baud Rate	4800 / 9600 / 19200 / 38400 bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	0 to 247	0: Broadcast

Electronic Multimeter

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

(Underlined setting: default)

Setting Component	Setting No.	Item	Setting	Example
Adr	231C	Address	1 to 247	1
bPS	232C	Baud rate	4800 / 9600 / 19200 / 38400 bps	9600
PAr	233C	Parity	E: Even o: Odd -: None	E
StoP	234C	Stop bit	1 / 2 bits	1
WEr	235C	Protocol version	**B: Version B**	B

* The communication parameter (data length) is fixed to 8 bits.

Available Device Memory

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

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

21.2.39 WSZ Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115k bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Even / Odd	
Target Port No.	1 to 254	

WSZ Series

Make settings for the controller by using the software “WinProladder”. For more information, refer to the instruction manual of the controller issued by the manufacturer.

Station number

(Underlined setting: default)

Setting Items	Setting	Remarks
Station Number	1 to 254	

PORT 0

Comm. parameters setting - Port 0

(Underlined setting: default)

Setting Items	Setting	Remarks
Baud Rate	9600 / 19200 / 38400 / 57600 / 115200	The baud rate can also be set by specifying a value for the designated address. For more information, refer to the instruction manual of the controller issued by the manufacturer.

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

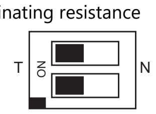
WSZ-CB25 (PORT 1 / PORT 2)

Comm. parameters setting - Port 1 / Port 2

(Underlined setting: default)

Setting Items	Setting	Remarks
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115200	The baud rate can also be set by specifying a value for the designated address. For more information, refer to the instruction manual of the controller issued by the manufacturer.
Parity	None / Even / Odd	
Data Bit	7 / 8	
Stop Bit	1 / 2	
Protocol	**Fatek Communication protocol**	

DIPSW

Setting Items	Setting	Remarks
Terminating resistance 	ON: With terminating resistance OFF: Without terminating resistance	This setting must be the same for both switches.

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(data register)	00H	
D	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
TR	(timer/current value)	08H	
CR	(counter/current value)	09H	
32CR	(32-bit counter/current value)	0AH	Double-word *1

*1 For items where double-words can be used (numerical data display, graphs, sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of the lower 16 bits.
Input: Higher 16 bits are ignored.
Output: "0" is written into the higher 16 bits.

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits
1: 16 to 31 bits

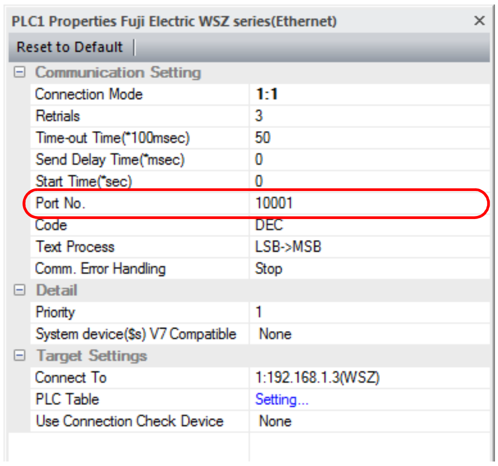
21.2.40 WSZ Series (Ethernet)

Communication Setting

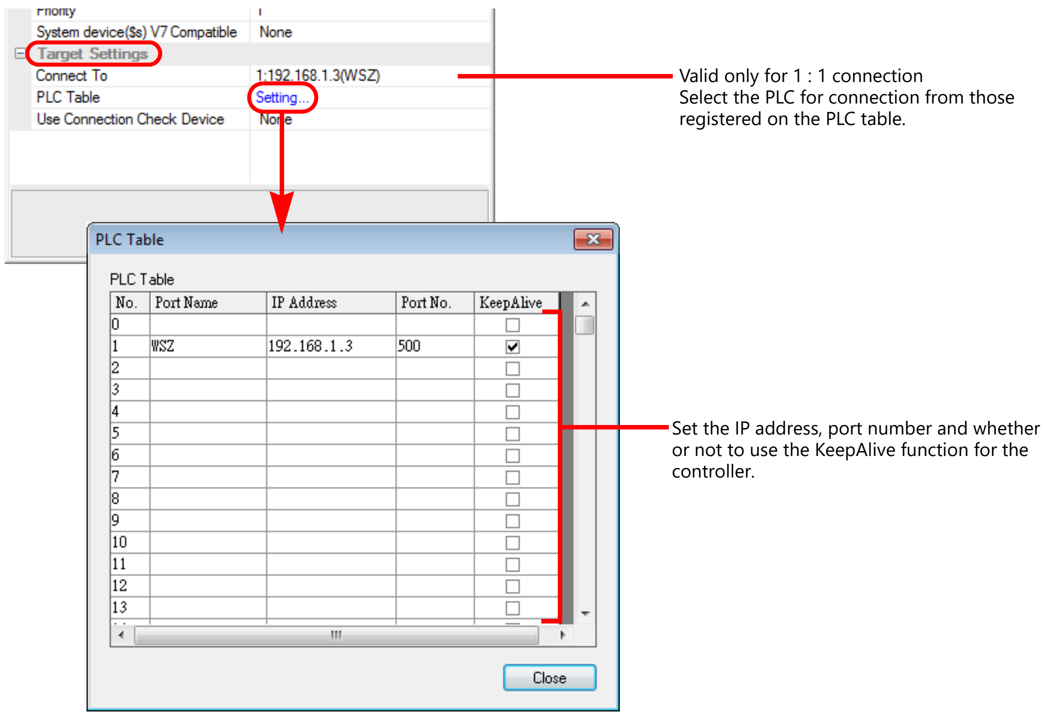
Editor

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]

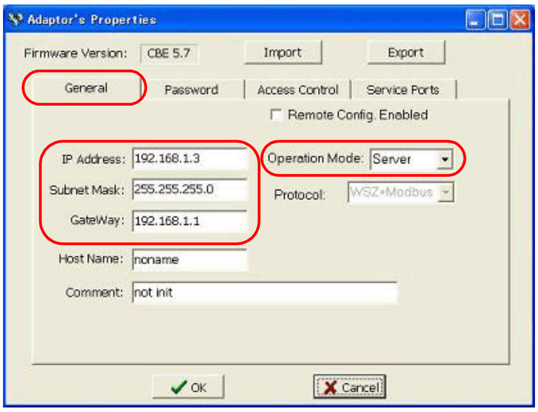


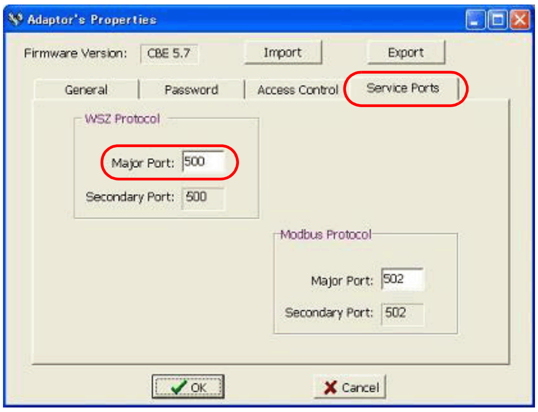
- IP address, port number, and maximum read value of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].



WSZ Series

Make settings for the controller using the software "Ethernet Module Configuration Tool Version. 3. 3" For more information, refer to the instruction manual of the controller issued by the manufacturer.





Item			Remarks
General	IP Address		
	Subnet Mask		
	GateWay		
	Operation Mode	**Server**	
Service Ports	WSZ Protocol	Major Port	Default: 500

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(data register)	00H	
D	(data register)	01H	
X	(input relay)	02H	WX as word device
Y	(output relay)	03H	WY as word device
M	(internal relay)	04H	WM as word device
S	(step relay)	05H	WS as word device
T	(timer/contact)	06H	WT as word device
C	(counter/contact)	07H	WC as word device
TR	(timer/current value)	08H	
CR	(counter/current value)	09H	
32CR	(32-bit counter/current value)	0AH	Double-word *1
F	(file register)	0BH	

*1 For items where double-words can be used (numerical data display, graphs, sampling), data is processed as double-words.
For those where bits or words can be used, data is processed as words consisting of the lower 16 bits.
Input: Higher 16 bits are ignored.
Output: "0" is written into the higher 16 bits.

Indirect Device Memory Designation

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

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

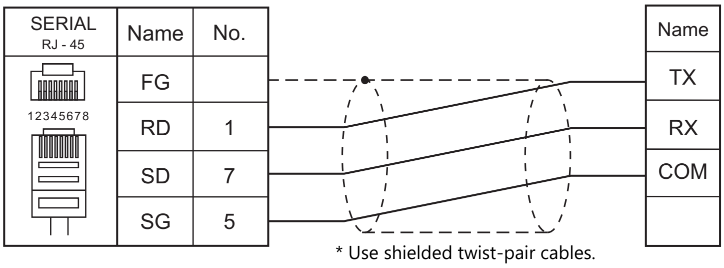
15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits
1: 16 to 31 bits

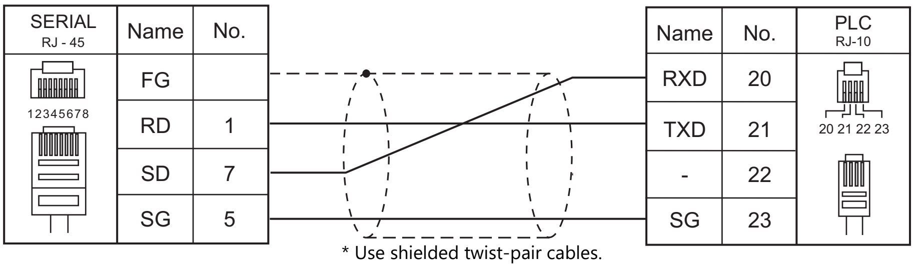
21.2.41 Wiring Diagrams

RS-232C

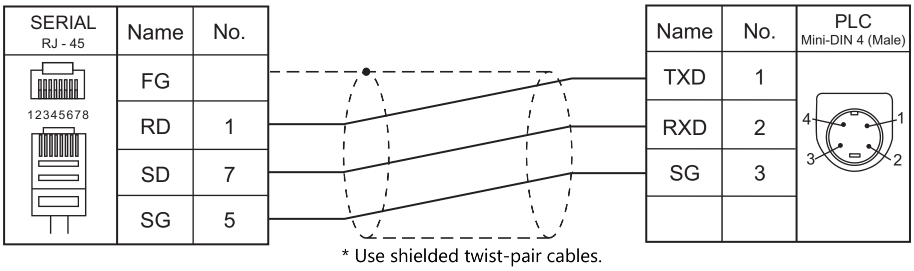
Wiring diagram 1 - M2



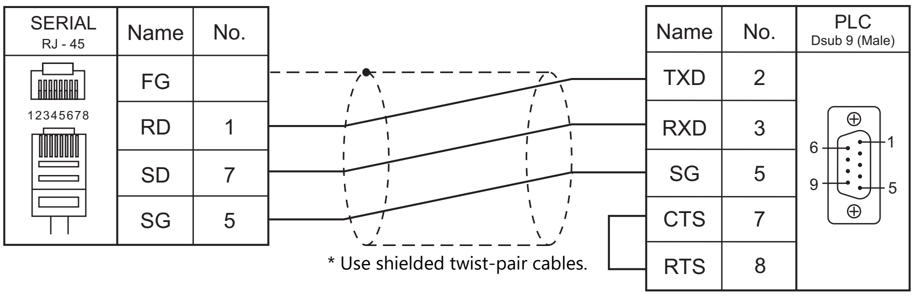
Wiring diagram 2 - M2



Wiring diagram 3 - M2

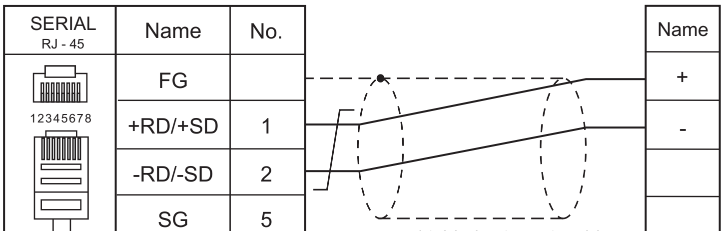


Wiring diagram 4 - M2



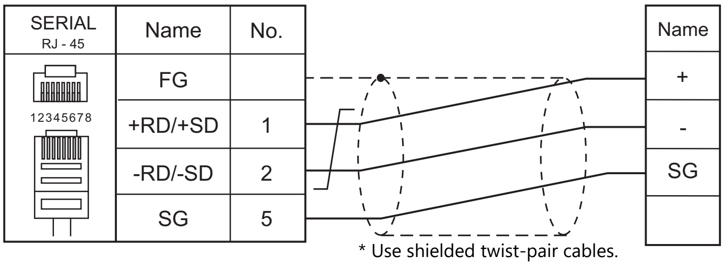
RS-422/RS-485

Wiring diagram 1 - M4



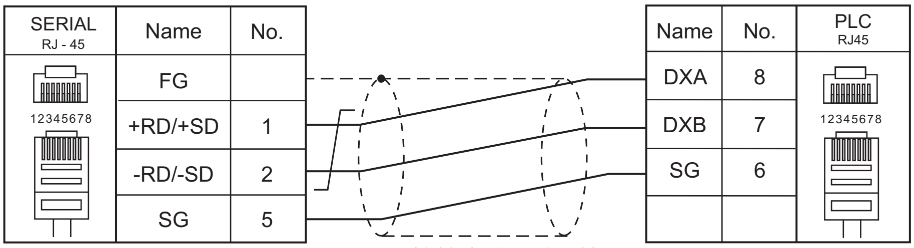
* Use shielded twist-pair cables.

Wiring diagram 2 - M4



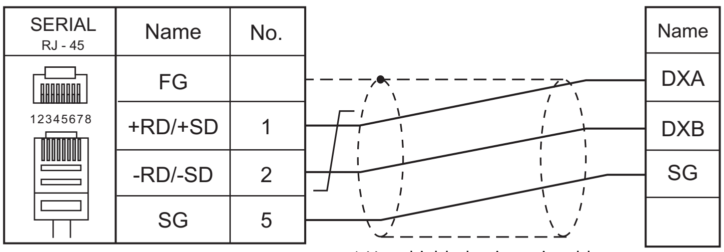
* Use shielded twist-pair cables.

Wiring diagram 3 - M4



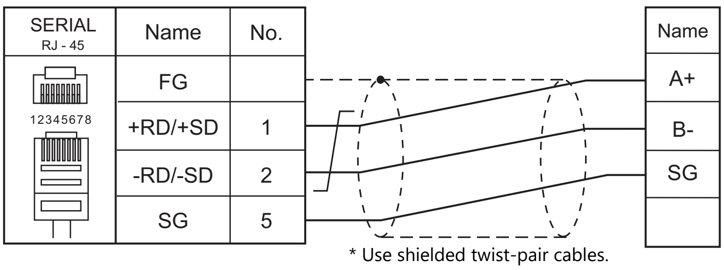
* Use shielded twist-pair cables.

Wiring diagram 4 - M4



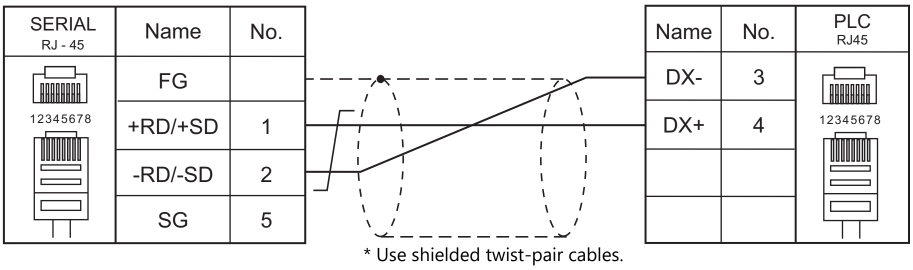
* Use shielded twist-pair cables.

Wiring diagram 5 - M4

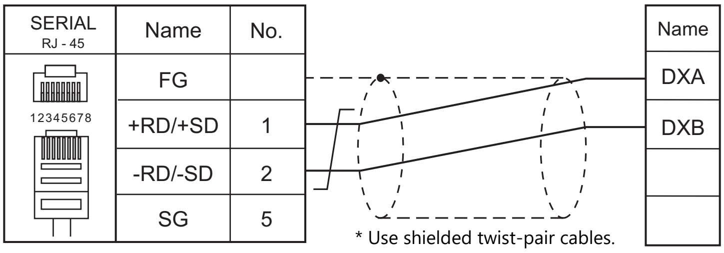


* Use shielded twist-pair cables.

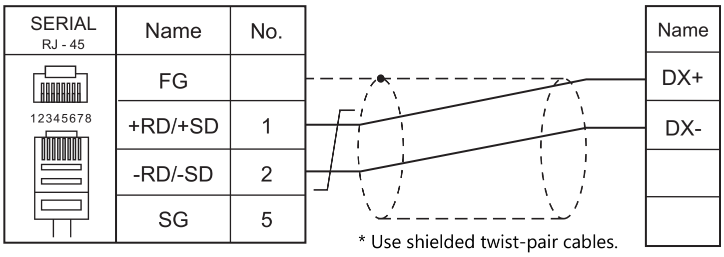
Wiring diagram 6 - M4



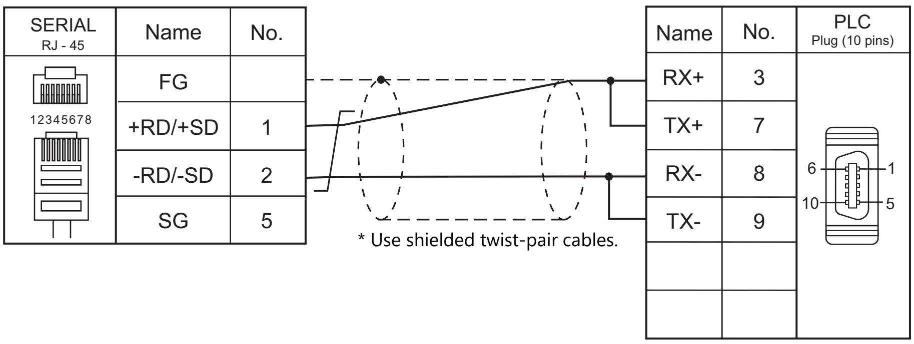
Wiring diagram 7 - M4



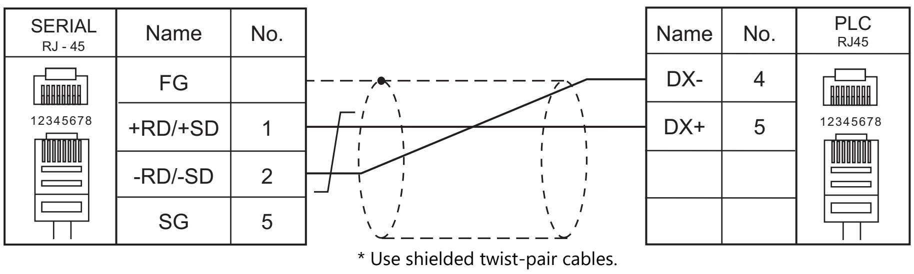
Wiring diagram 8 - M4



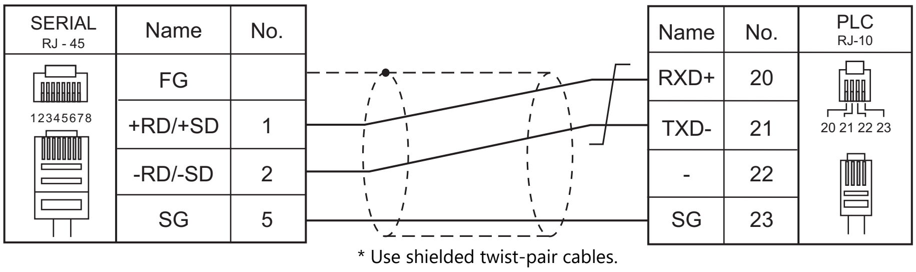
Wiring diagram 9 - M4



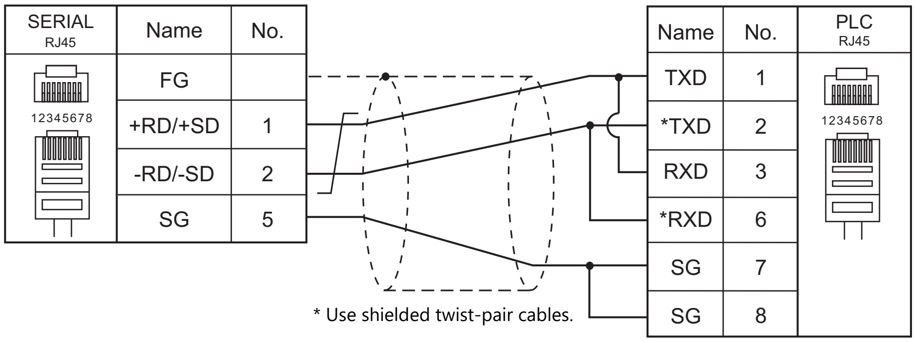
Wiring diagram 10 - M4



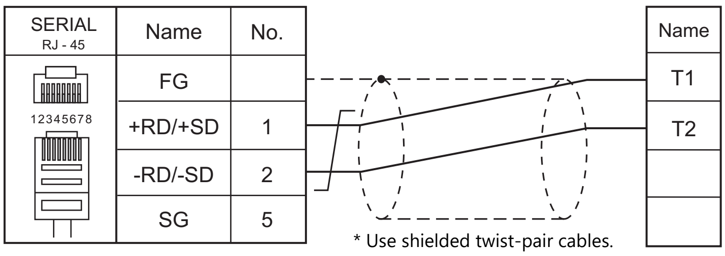
Wiring diagram 11 - M4



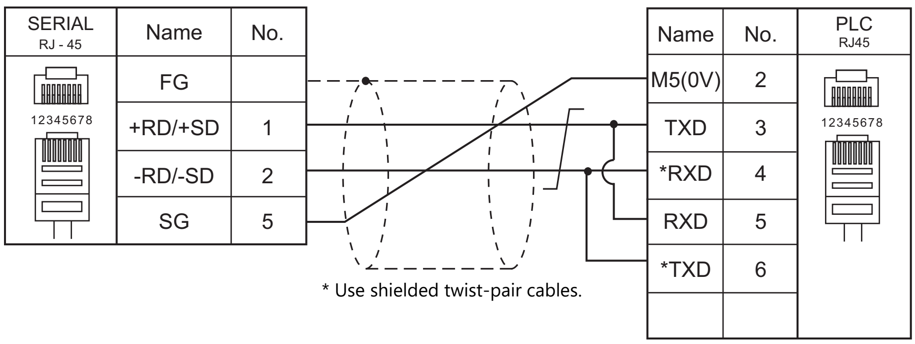
Wiring diagram 12 - M4



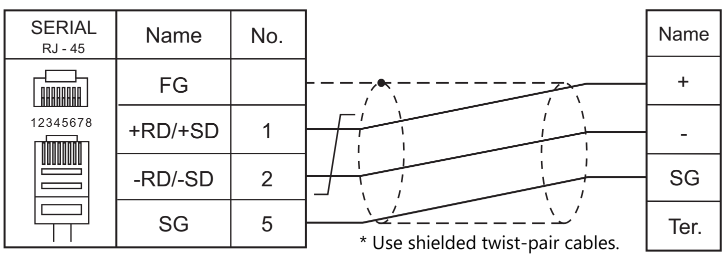
Wiring diagram 13 - M4



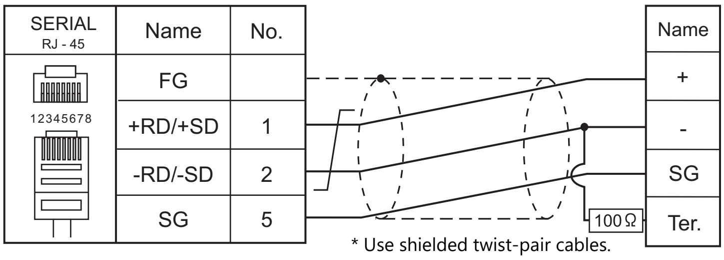
Wiring diagram 14 - M4



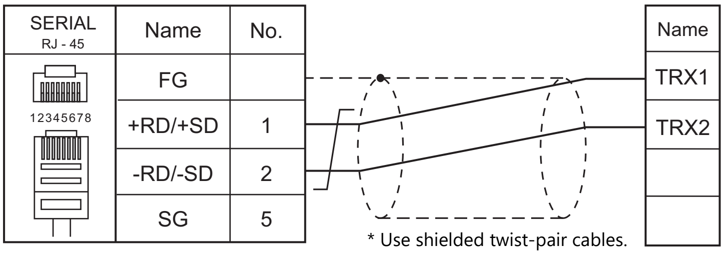
Wiring diagram 15 - M4



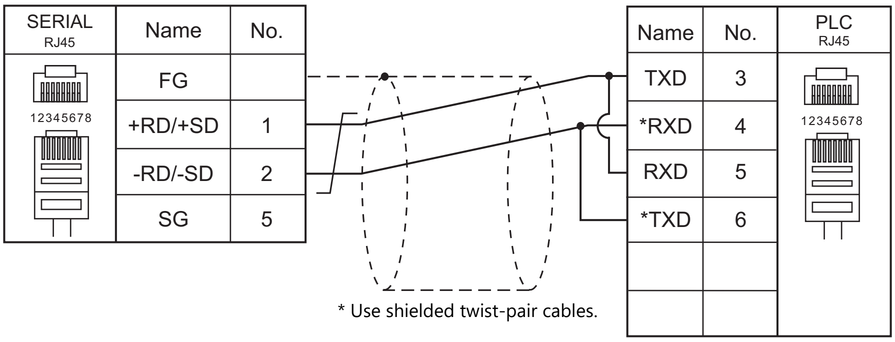
With an electronic multimeter connected at the terminal



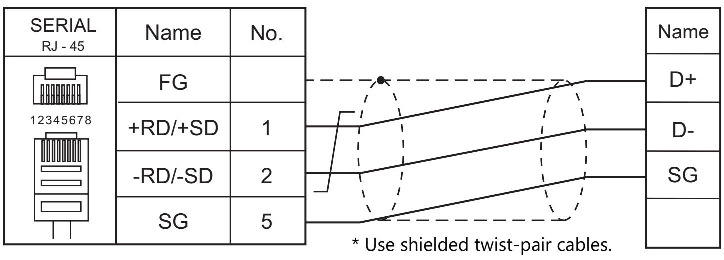
Wiring diagram 16 - M4



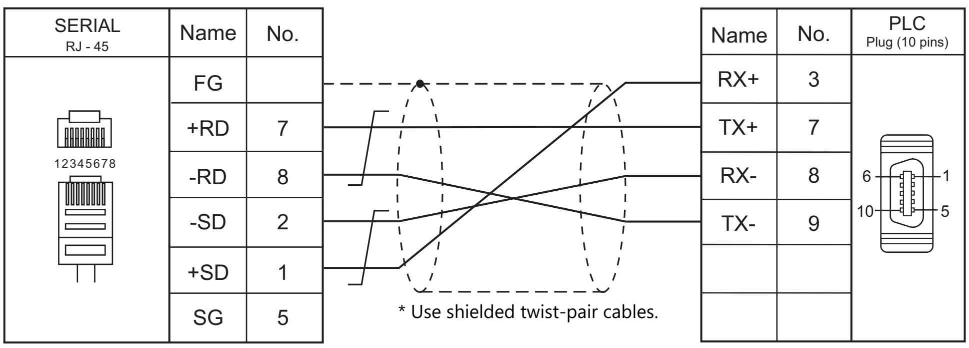
Wiring diagram 17 - M4



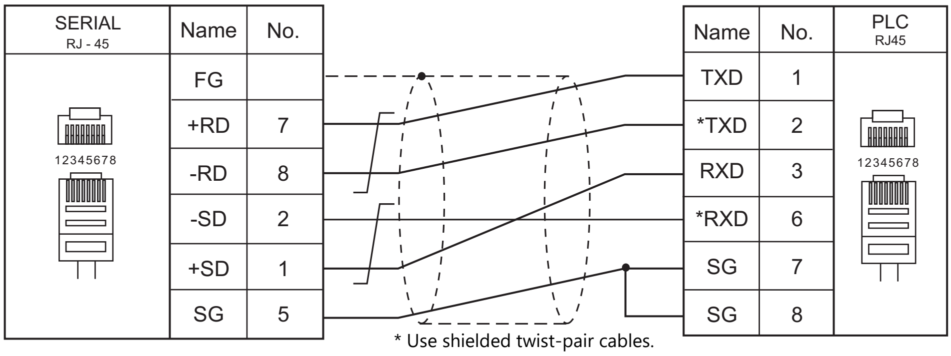
Wiring diagram 18 - M4



Wiring diagram 19 - M4

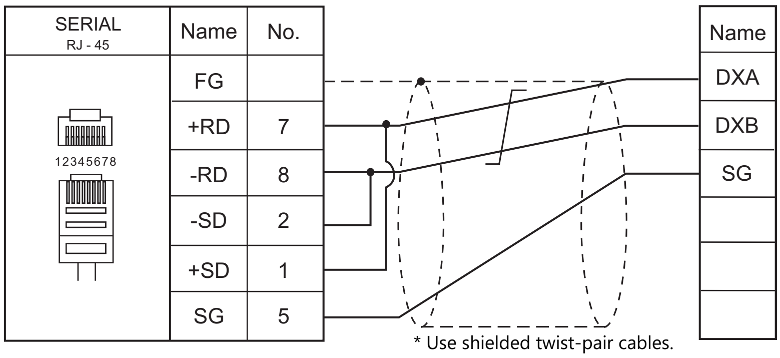


Wiring diagram 20 - M4



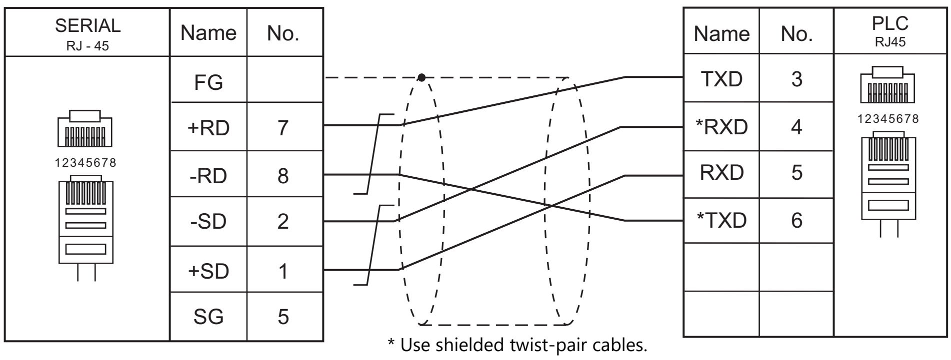
* Use shielded twist-pair cables.

Wiring diagram 21 - M4



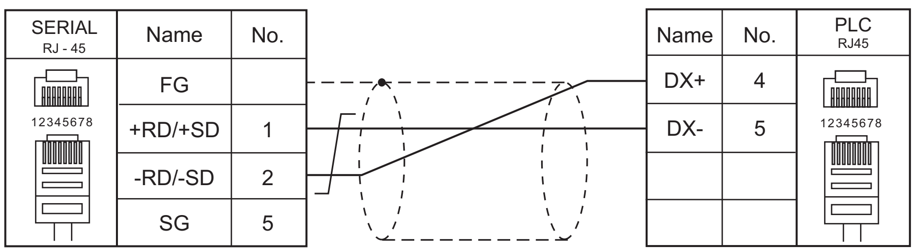
* Use shielded twist-pair cables.

Wiring diagram 22 - M4



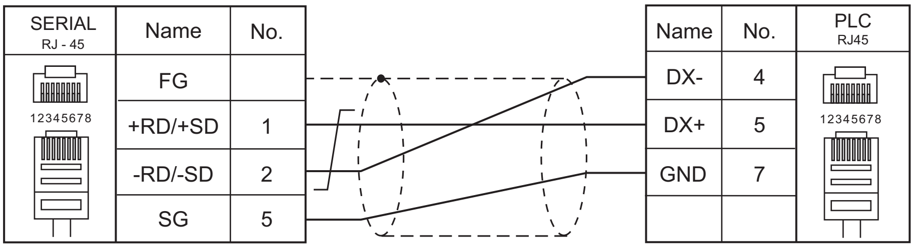
* Use shielded twist-pair cables.

Wiring diagram 23 - M4



* Use shielded twist-pair cables.

Wiring diagram 24 - M4



* Use shielded twist-pair cables.

22. Gammaflux

22.1 Temperature Controller/Servo/Inverter 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)	
TTC2100	TTC2100-1 TTC2100-2 TTC2200-1	COM2	RS-485	Wiring diagram 1 - M4	×	TTC2100.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).

Ethernet Connection

PLC Selection on the Editor	Model	Unit	TCP/IP	UDP/IP	Port No.	Keep Alive*1	Lst File
G24 (Ethernet TCP/IP)	G24 series	Ethernet port	○	×	4840, 34210	○	Gflux_G24_E.Lst

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

22.1.1 TTC2100

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</u>/<u>485</u>	
Baud Rate	**57600 bps**	
Data Length	**8 bits**	
Stop Bit	**1 bit**	
Parity	**Not provided**	
Target Port No.	**0 to 31**	

Temperature Controller

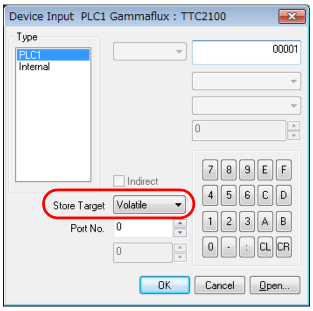
Be sure to match the settings to those made under [Communication Setting] of the editor.

Available Device Memory

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

Device Memory	TYPE	Remarks
TD (temperature data)	00H	Read only
ZC (zone commands)	01H	Partially read only
ZD (zone commands2)	02H	Partially read only

Specify the storage device memory.



Address denotations are as follows.

- For the TD:
  Example: 0 : #0 : TD0000A
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number

- For ZC, ZD:
  Example: 0 : #1 : ZC000A0
  - Data No. (HEX)
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)*
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number

* ZD ignores the ZONE No. setting as it is common to all ZONE.

Indirect Device Memory Designation

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

- Specify the ZONE number, command number, and the data number for the address number.

  Example: When specifying TD1000A
  Store "1000A" as the address number.
  Lower address No. = 000A (HEX)
  Higher address No. = 0001 (HEX)

  Example: When specifying ZC100A0
  Store "100A0" as the address number.
  Lower address No. = 00A0 (HEX)
  Higher address No. = 0001 (HEX)

- Specify the storage device memory address with the expansion code.
  00H: Volatile
  01H: Nonvolatile

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (=$u n)</th><th>F2</th></tr>
<tr><td rowspan="7">External Standby Group</td><td rowspan="7">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="7">7</td></tr>
<tr><td>n + 1</td><td>ZONE No.: Fixed to 0</td></tr>
<tr><td>n + 2</td><td>ZONE COMMAND
008CH (Storage device memory: Volatile)
808CH (Storage device memory: Nonvolatile)</td></tr>
<tr><td>n + 3</td><td>Bit
15 | 14 | - | 2 | 1 | 0
Zone16 ... Zone1</td></tr>
<tr><td>n + 4</td><td>Bit
15 | 14 | - | 2 | 1 | 0
Zone32 ... Zone17</td></tr>
<tr><td>n + 5</td><td>Bit
15 | 14 | - | 2 | 1 | 0
Zone48 ... Zone33</td></tr>
<tr><td>n + 6</td><td>Bit
15 | 14 | - | 2 | 1 | 0
Zone64 ... Zone49</td></tr>
<tr><td rowspan="4">Data Concentrator
Resettable Alarm Relays</td><td rowspan="4">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="4">4</td></tr>
<tr><td>n + 1</td><td>ZONE No.: Fixed to 0</td></tr>
<tr><td>n + 2</td><td>ZONE COMMAND: 91H</td></tr>
<tr><td>n + 3</td><td>Bit
- | 12 | 11 | 10 | 9 | 8 | - | 3 | 2 | 1 | 0
-: Not used
0: Set Output1, Resettable Alarm
1: Set Output2, Non-resettable Alarm
2: Set Output3
3: Set Output4 (Alarm Bar)
8: Clear1, Resettable Alarm
9: Clear2, Non-resettable Alarm
10: Clear Output3
11: Clear Output4 (Alarm Bar)
12: Clear Overtemp Occurred</td></tr>
</table>

Contents	F0	F1 (=$u n)		F2
Turn All Zones On/Off	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 0099H (Storage device memory: Volatile) 8099H (Storage device memory: Nonvolatile)	
		n + 3	Bit 15 | 14 | - | 2 | 1 | 0 Zone16 … Zone1	
		n + 4	Bit 15 | 14 | - | 2 | 1 | 0 Zone32 … Zone17	
		n + 5	Bit 15 | 14 | - | 2 | 1 | 0 Zone48 … Zone33	
		n + 6	Bit 15 | 14 | - | 2 | 1 | 0 Zone64 … Zone49	
Zones Temporarily in Group	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 009AH (Storage device memory: Volatile) 809AH (Storage device memory: Nonvolatile)	
		n + 3	Bit 15 | 14 | - | 2 | 1 | 0 Zone16 … Zone1	
		n + 4	Bit 15 | 14 | - | 2 | 1 | 0 Zone32 … Zone17	
		n + 5	Bit 15 | 14 | - | 2 | 1 | 0 Zone48 … Zone33	
		n + 6	Bit 15 | 14 | - | 2 | 1 | 0 Zone64 … Zone49	

22.1.2 G24 (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].

Temperature Controller

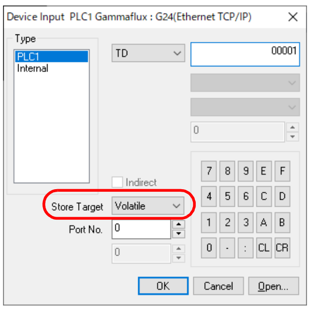
The IP addresses are “LAN1: 192.168.50.185” and “LAN2: 192.168.50.186” by default.
The port number is 4840 (default) and 34210.
For more information, refer to the manual of the temperature controller.

Available Device Memory

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

Device Memory		TYPE	Remarks
TD	(temperature data)	00H	Read only
ZC	(zone commands)	01H	Partially read only
ZD	(zone commands2)	02H	Read only

Specify the storage device memory.



Address denotations are as follows.

- For the TD:
  Example: 0 : #0 : TD0000A
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number
- For ZC, ZD:
  Example: 0 : #1 : ZC000A0
  - Data No. (HEX)
  - Command No. (HEX)
  - ZONE No. 00 - 3FH (1 - 64)*
  - Storage device memory
    0: Volatile
    1: Nonvolatile
  - Station number

* ZD ignores the ZONE No. setting as it is common to all ZONE.

Indirect Device Memory Designation

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

- Specify the ZONE number, command number, and the data number for the address number.

  Example: When specifying TD1000A
  Store “1000A” as the address number.
  Lower address No. = 000A (HEX)
  Higher address No. = 0001 (HEX)

  Example: When specifying ZC100A0
  Store “100A0” as the address number.
  Lower address No. = 00A0 (HEX)
  Higher address No. = 0001 (HEX)

- Specify the storage device memory address with the expansion code.
  00H: Volatile
  01H: Nonvolatile

PLC_CTL

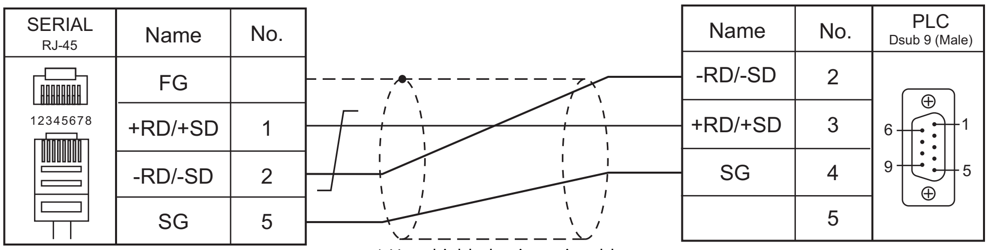
Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (=$u n)		F2
Data Concentrator Resettable Alarm Relays	1 - 8 (PLC1 - 8)	n	Station number	4
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND: 91H	
		n + 3	Clear1, Resettable Alarm:100H	
Turn All Zones On/Off	1 - 8 (PLC1 - 8)	n	Station number	7
		n + 1	ZONE No.: Fixed to 0	
		n + 2	ZONE COMMAND 0099H (Storage device memory: Volatile) 8099H (Storage device memory: Nonvolatile)	
		n + 3	Bit: 15 | 14 | - | 2 | 1 | 0 Zone16 (bit 15) … Zone1 (bit 0)	
		n + 4	Bit: 15 | 14 | - | 2 | 1 | 0 Zone32 (bit 15) … Zone17 (bit 0)	
		n + 5	Bit: 15 | 14 | - | 2 | 1 | 0 Zone48 (bit 15) … Zone33 (bit 0)	
		n + 6	Bit: 15 | 14 | - | 2 | 1 | 0 Zone64 (bit 15) … Zone49 (bit 0)	

22.1.3 Wiring Diagrams

RS-422/RS-485

Wiring diagram 1 - M4



* Use shielded twist-pair cables.

23. GE Fanuc

23.1 PLC Connection

Serial Connection

PLC Selection on the Editor	CPU		Unit/Port		Signal Level	Connection: RS-232C*1 / RS-485 (2-wire)*2	Connection: RS-422 (4-wire)*2
90 series	IC693CPU331 IC693CPU340 IC693CPU341 IC693CPU350 IC693CPU351 IC693CPU352 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU370 IC693CPU372 IC693CPU374		IC693CMM 311	Port 1	RS-232C	Wiring diagram 1 - M2	×
				Port 2	RS-232C	Wiring diagram 2 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
90 series (SNP-X)	IC698CPE010 IC698CPE020 IC698CRE020 IC697CPU731 IC697CPX772 IC697CPX782 IC697CPX928 IC697CPX935 IC697CPU780 IC697CGR772 IC697CGR935 IC697CPU789 IC697CPM790		IC697CMM711		RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
	IC693CPU350 IC693CPU360 IC693CPU363 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU374		COM port of the CPU		RS-422	×	Wiring diagram 4 - M4
90 series (SNP)	90-30 series	IC693CPU311 IC693CPU313 IC693CPU323 IC693CPU331 IC693CPU340 IC693CPU341 IC693CPU350 IC693CPU360 IC693CPU364 IC693CPU366 IC693CPU367 IC693CPU370 IC693CPU372 IC693CPU374 PLUS	Serial port (power supply)		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			IC693CMM 311	Port 1	RS-232C	Wiring diagram 1 - M2	×
				Port 2	RS-232C	Wiring diagram 2 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
		IC693CPU351 IC693CPU352 IC693CPU363	Serial port (power supply)		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			PORT1		RS-232C	Wiring diagram 3 - M2	×
			PORT2		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			IC693CMM 311	Port 1	RS-232C	Wiring diagram 1 - M2	×
				Port 2	RS-232C	Wiring diagram 2 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
	90-70 series	IC697CPU731 IC697CPU780 IC697CPU789 IC697CPM790	Serial Port		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
		IC697CPX772 IC697CPX782 IC697CPX928 IC697CPX935 IC697CGR772 IC697CGR935	Serial Port1		RS-232C	Wiring diagram 3 - M2	×
			Serial Port2 Serial Port3		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3

PLC Selection on the Editor	CPU		Unit/Port		Signal Level	Connection	
						RS-232C*1 / RS-485 (2-wire)*2	RS-422 (4-wire)*2
90 series (SNP)	PAC Systems RX3i	IC695CPU310 IC695CPU315 IC695CPU320 IC695CMU310 IC695CRU320 IC695CPE310	COM1		RS-232C	Wiring diagram 4 - M2	×
			COM2		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
		IC695CPE305	COM1		RS-232C	Wiring diagram 4 - M2 + GE Fanuc's IC693CBL316	×
	PAC Systems RX7i	IC698CPE010 IC698CPE020 IC698CPE030 IC698CPE040 IC698CRE020 IC698CRE030 IC698CRE040	COM1		RS-232C	Wiring diagram 4 - M2	×
			COM2		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
			IC697CMM 711	Port 1/ Port 2	RS-232C	Wiring diagram 1 - M2	×
					RS-422	Wiring diagram 1 - M4	Wiring diagram 5 - M4 *3
	VersaMax	IC200CPU001 IC200CPU002 IC200CPU005 IC200CPUE05	PORT1		RS-232C	Wiring diagram 4 - M2	×
			PORT2		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
	VersaMax Micro & Nano	Nano 10 PLCs Micro 14 PLCs	Serial Port		RS-232C	Wiring diagram 5 - M2	×
		Micro 23 PLCs Micro 28 PLCs	Serial Port 1		RS-232C	Wiring diagram 5 - M2	×
			Serial Port 2		RS-422	Wiring diagram 2 - M4	Wiring diagram 4 - M4 *3
		Micro 20 PLCs Micro 40 PLCs Micro 64 PLCs	Serial Port		RS-232C	Wiring diagram 5 - M2	×
			IC200USB001		RS-232C	Wiring diagram 5 - M2	×
			IC200USB002		RS-422	Wiring diagram 3 - 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).

Ethernet Connection

PLC Selection on the Editor	CPU		Unit	TCP/IP	UDP/IP	Port No.	Keep Alive *1
90 series (Ethernet TCP/IP)	Series 90-70		IC697CMM742 (Type 2)	○	×	18245 fixed	○
	Series 90-30		IC693CMM321	○	×		
			CPU with built-in port				
RX3i (Ethernet TCP/IP)	PACSystems RX3i	IC695CPU310	ETM001	○	×	18245 fixed	

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

23.1.1 90 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

PCM

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		CCM ONLY, BAS/CCM, PROG/CCM, CCM/PROG	
Port 1	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	**RS-232**	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CPU ID	1 to 31	
Port 2	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	RS-232 / RS-485	Only RS-485 is available with IC693PCM300.
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CPU ID	1 to 31	

IC693CMM311

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		CCM ONLY, CCM/RTU, RTU/CCM, SNP/CCM, CCM/SNP	
Port 1	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	**RS-232**	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CCM CPU ID	1 to 31	
Port 2	CCM Enable	**YES**	
	CCM Mode	**SLAVE**	
	Interface	RS-232 / RS-485	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	NONE / ODD	
	Retry Count	NORMAL / SHORT	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Turnaround Delay	NONE / 10 ms / 100 ms / 500 ms	
	CCM CPU ID	1 to 31	

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.2 90 Series (SNP-X)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

90 series (SNP-X)

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

Available Device Memory

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

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

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.3 90 Series (SNP)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	

PLC

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

IC693CMM311 / IC697CMM711

(Underlined setting: default)

Item		Setting	Remarks
Configuration Mode		SNP ONLY, SNP/CCM, CCM/SNP, SNP/RTU, RTU/SNP	
Port 1	SNP Enable	**YES**	
	SNP Mode	**SLAVE**	
	Interface	RS485 / RS232	Only RS232C supported by IC693CMM311
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	ODD / EVEN / NONE	
	Stop Bits	1 / 2	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Modem Turnaround Delay	NONE/ 10 ms / 100 ms / 500 ms	
Port 2	SNP Enable	**YES**	
	SNP Mode	**SLAVE**	
	Interface	RS485 / RS232	
	Date Rate	4800 / 9600 / 19200 bps	
	Flow Control	**NONE**	
	Parity	ODD / EVEN / NONE	
	Stop Bits	1 / 2	
	Timeout	LONG / MEDIUM / SHORT / NONE	
	Modem Turnaround Delay	NONE/ 10 ms / 100 ms / 500 ms	

90-30 Series / 90-70 Series

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP Slave**	
Data Rate	4800 / 9600 / 19200 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	1 / 2	
Physical Interface	2-wire / 4-wire	Both valid for RS232

PAC Systems

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP Slave**	
Data Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115200 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	**1**	
Physical Interface	2-wire / 4-wire	Both valid for RS232

VersaMax / VersaMax Micro & Nano / IC200USB001 / IC200USB002

(Underlined setting: default)

Parameter	Setting	Remarks
Port Mode	**SNP**	
Port Type	**Slave**	
Data Rate	4800 / 9600 / 19200 / 38400 bps	
Parity	ODD / EVEN / NONE	
Stop Bits	1 / 2	
Physical Interface	2-wire / 4-wire	Both valid for RS232

Available Device Memory

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

Device Memory		TYPE	Remarks
R	(register)	00H	
I	(input)	01H	
Q	(output)	02H	
M	(internal relay)	03H	
G	(global relay)	04H	
AI	(analog input)	05H	
AQ	(analog output)	06H	
T	(temporary memory relay)	07H	
S	(system status)	08H	Read only
SA	(system status)	09H	
SB	(system status)	0AH	
SC	(system status)	0BH	
P	(local subblock data)	0CH	90-70 series only
L	(program block data)	0DH	90-70 series only

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

23.1.4 90 Series (Ethernet TCP/IP)

Communication Setting

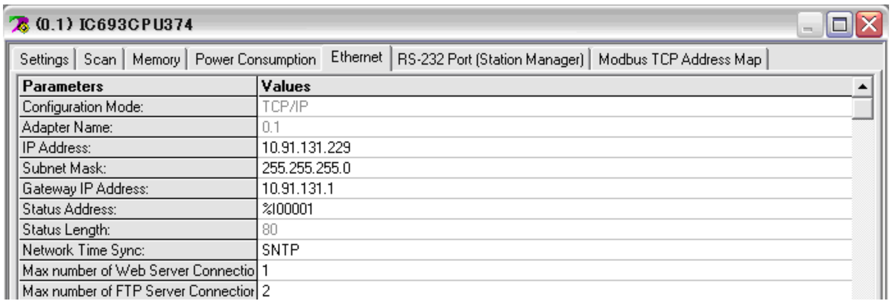
Editor

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

- 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. 18245) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Parameters



Item	Setting	Remarks
IP Address	Set the IP address of the PLC.	
Subnet Mask	Set the subnet mask of the PLC.	
Gateway IP Address	Make settings in accordance with the network environment.	

Available Device Memory

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

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

Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

23.1.5 RX3i (Ethernet TCP/IP)

Communication Setting

Editor

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

- 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. 18245) of the PLC
  Register on the [PLC Table] in [System Setting] → [Hardware Setting] → [PLC Properties] → [Target Settings].

PLC

Parameters

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

Available Device Memory

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

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

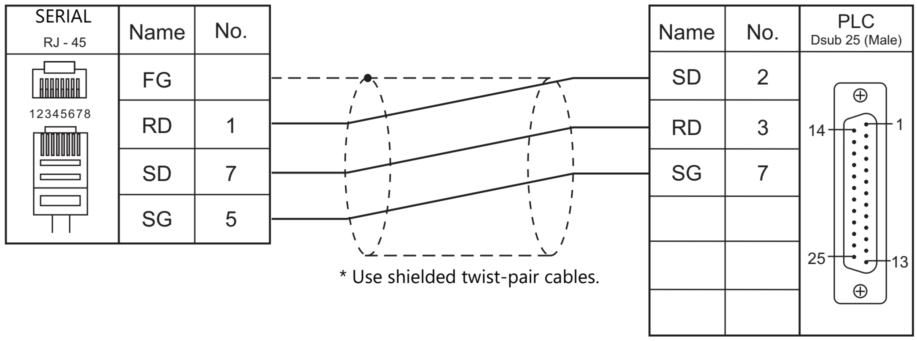
Indirect Device Memory Designation

For the device memory address number, specify the value obtained by subtracting “1” from the actual address.

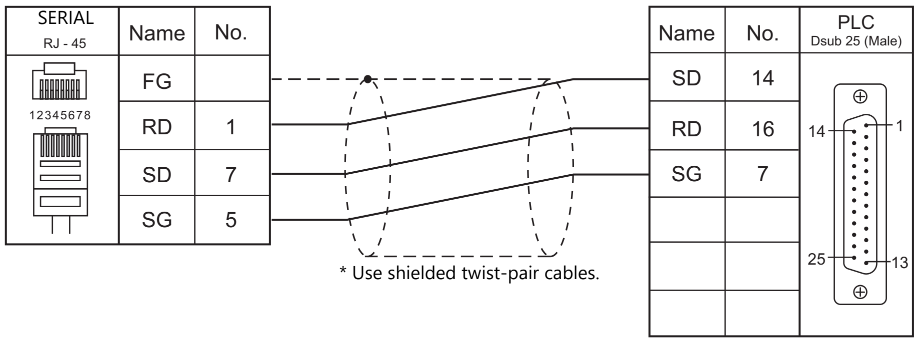
23.1.6 Wiring Diagrams

RS-232C

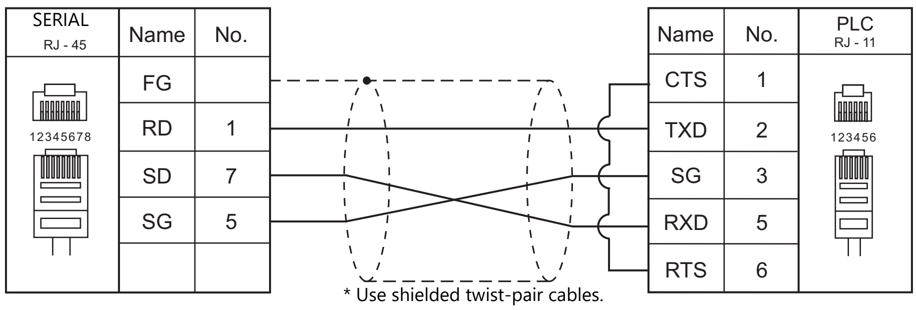
Wiring diagram 1 - M2



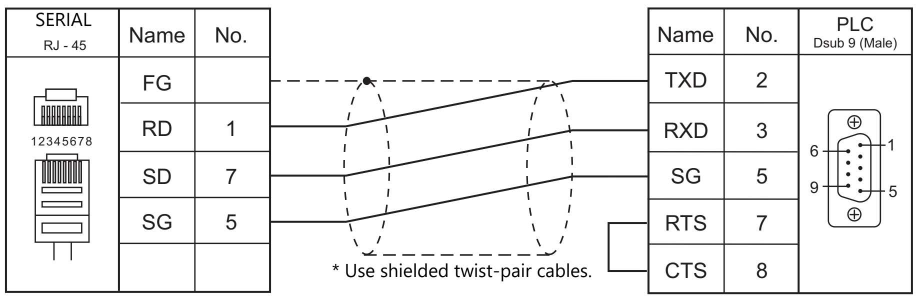
Wiring diagram 2 - M2



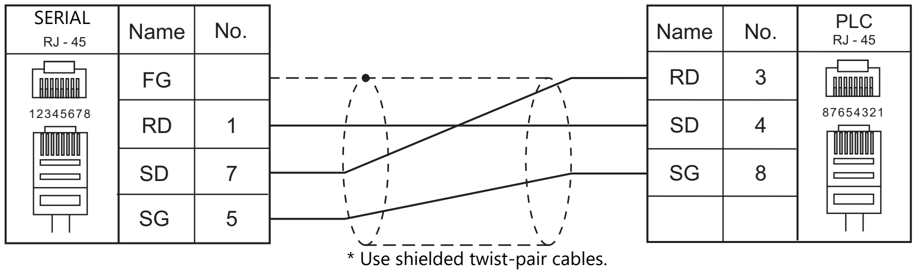
Wiring diagram 3 - M2



Wiring diagram 4 - M2

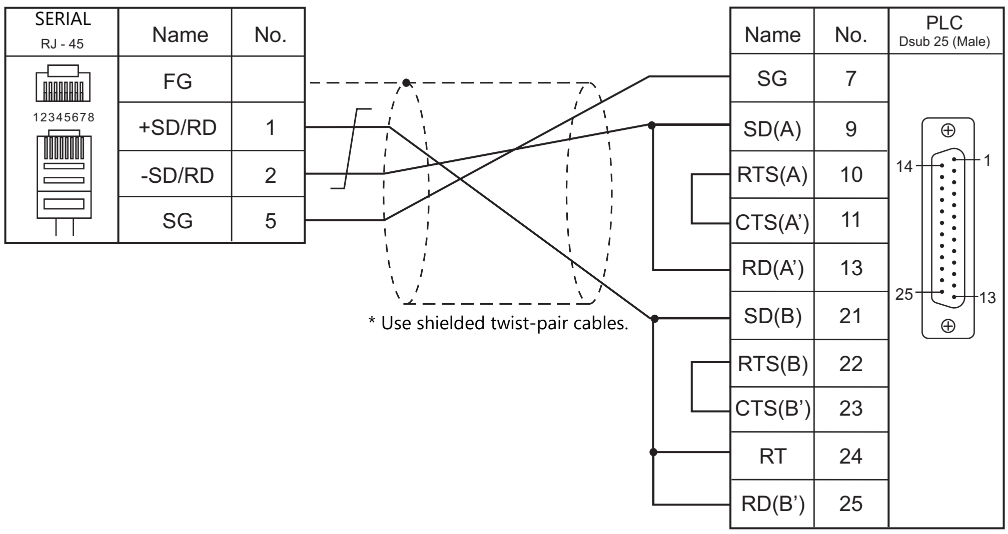


Wiring diagram 5 - M2

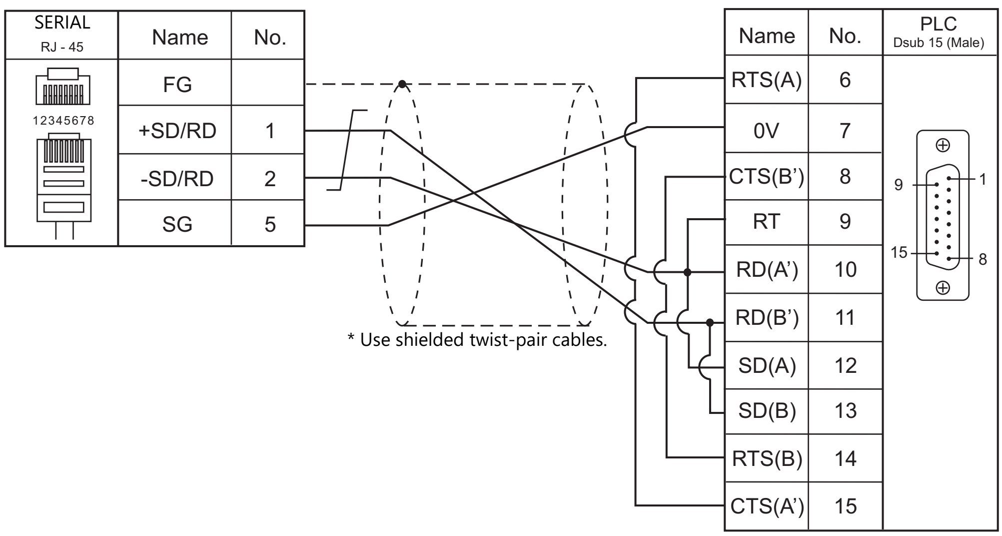


RS-422/RS-485

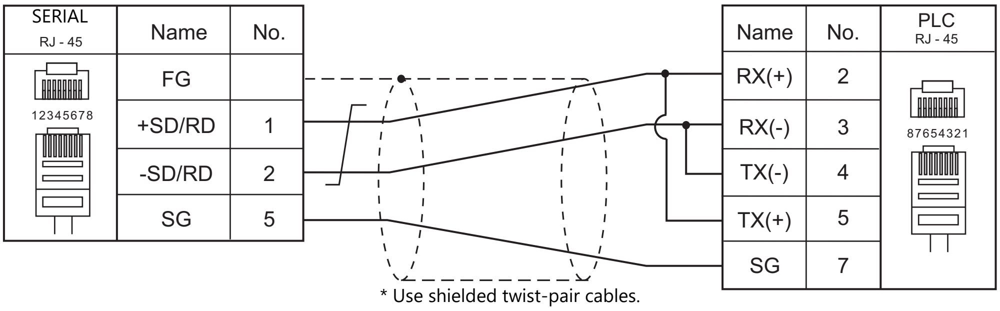
Wiring diagram 1 - M4



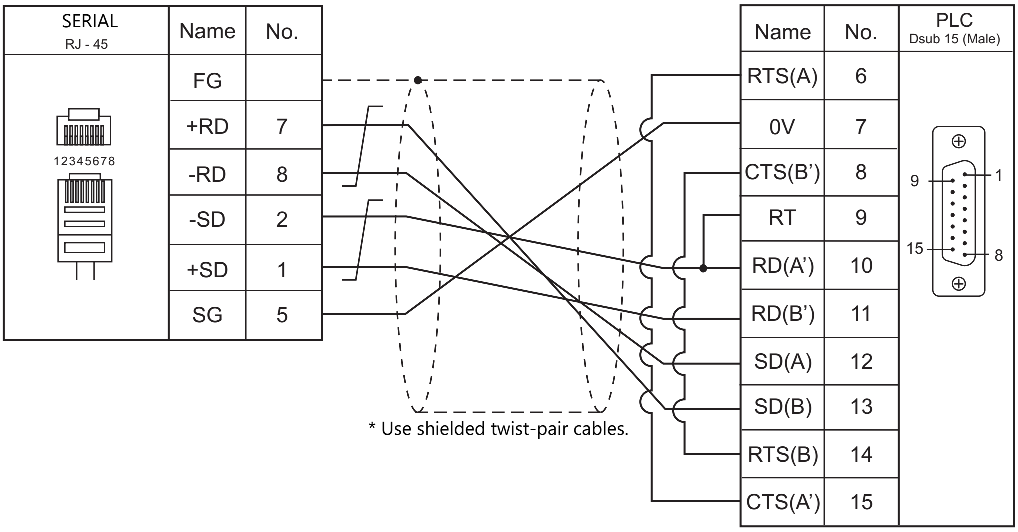
Wiring diagram 2 - M4



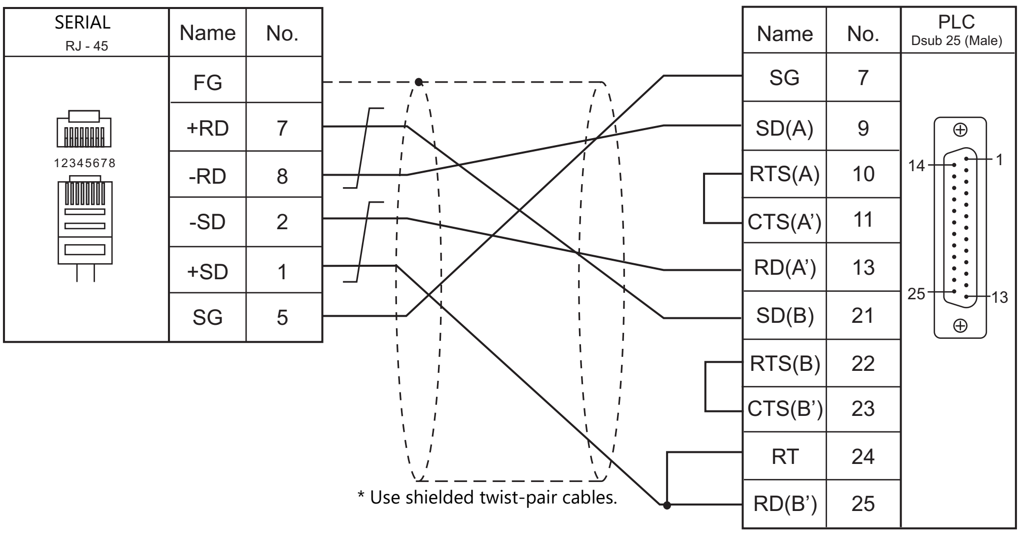
Wiring diagram 3 - M4



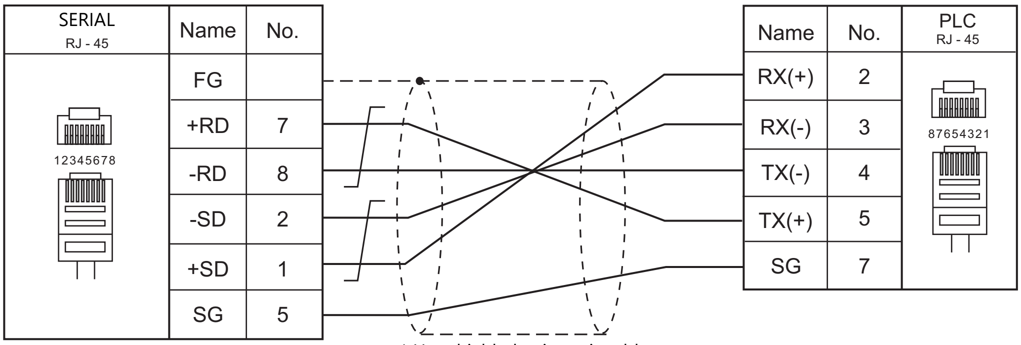
Wiring diagram 4 - M4



Wiring diagram 5 - M4



Wiring diagram 6 - M4



* Use shielded twist-pair cables.

24. Hitachi

24.1 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) *2
HIDIC-S10/2α, S10mini	S10 2α	Interface on the CPU unit	RS-422	×	Wiring diagram 1 - M4
	LQP000 LQP010 LQP011 LQP120	RS-232C connector on the CPU unit	RS-232C	Wiring diagram 1 - M2	×
		LQE060 (CN1,CN2)	RS-232C	Wiring diagram 2 - M2	×
		LQE160 (CN1,CN2)			
		LQE560 (CN1,CN2)			
		LQE165 (CN1,CN2)	RS-422	×	Wiring diagram 2 - M4
		LQE565 (CN1,CN2)			
HIDIC-S10/4α	S10 4α	LWE805	RS-422	×	Wiring diagram 1 - M4
HIDIC-S10/ABS	ABS	-	RS-422	×	Wiring diagram 1 - M4
HIDIC-S10V	LQP510	UP LINK	RS-422	×	Wiring diagram 2 - M4
		LQE560 (CN1,CN2)	RS-232C	Wiring diagram 2 - M2	×
		LQE565 (CN1,CN2)	RS-422	×	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

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

*1 For KeepAlive functions, see “1.3.2 Ethernet Communication”.

24.1.1 HIDIC-S10/2α, S10mini

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

Channel No./Protocol Setting Switch

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

LQE060

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

LQE160 / LQE165 / LQE560 / LQE565

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

Available Device Memory

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

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

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

Communication Setting

Editor

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

- 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

LQE020

Module No. setting switch

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

ET. NET system

Specify the IP address and the subnet mask.

LQE520

Module No. setting switch

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

S10V ET.NET system

Specify the IP address and the subnet mask.

Available Device Memory

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

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

24.1.3 HIDIC-S10/4α

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1	
Signal Level	RS-232C / RS-422/485	
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd

Only RS-422 (4-wire) connection can be used. For RS-232C or RS-485 (2-wire) connection, a commercially available converter must be used.

Available Device Memory

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

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

24.1.4 HIDIC-S10/ABS

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	<u>1 : 1</u> / 1 : n	
Signal Level	RS-232C / <u>RS-422/485</u>	
Baud Rate	19200 bps	
Data Length	8 bits	
Stop Bit	1 bit	
Parity	Odd	

PLC

All PLC parameters are fixed to the following settings:
Baud rate: 19200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd

Only RS-422 (4-wire) connection can be used. For RS-232C or RS-485 (2-wire) connection, a commercially available converter must be used.

Available Device Memory

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

Device Memory		TYPE	Remarks
0E	(PI/O word type)	00H	*1, *2
06	(input)	01H	*1, *2
18	(output)	02H	*1, *2
19	(internal relay)	03H	*1, *2
1A	(global link relay)	04H	*1, *2
1B	(keep relay)	05H	*1, *2
1C	(on-delay timer/contact)	06H	*1, *2
1D	(one-shot timer/contact)	07H	*1, *2

*1 The addresses are expressed in "bytes". For word designation, specify an even-numbered address.
*2 Specify the device setting by absolute address. For more information, refer to the PLC manual issued by the manufacturer.

Indirect Device Memory Designation

When setting the address, specify a value equal to the actual address divided by 2.

24.1.5 HIDIC-S10V

Communication Setting

Editor

Communication setting

(Underlined setting: default)

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

PLC

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

Channel No./Protocol Setting Switch

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

LQE560 / LQE565

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

Available Device Memory

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

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

24.1.6 HIDIC-S10V (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

LQE520

Module No. setting switch

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

S10V ET.NET

Specify the IP address and the subnet mask.

LQP520

Station No. setting switch

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

Standard system tool

Specify the IP address and the subnet mask.

Available Device Memory

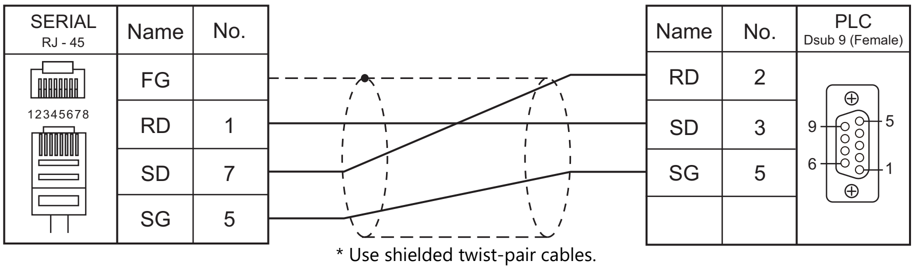
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

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

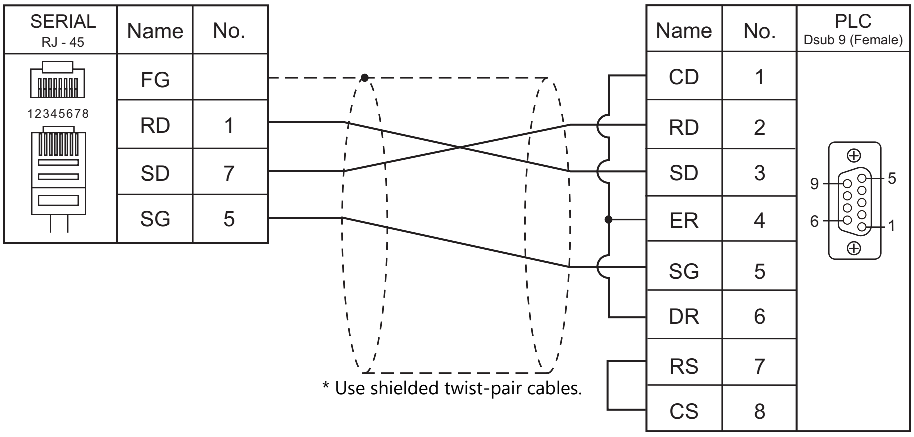
24.1.7 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2

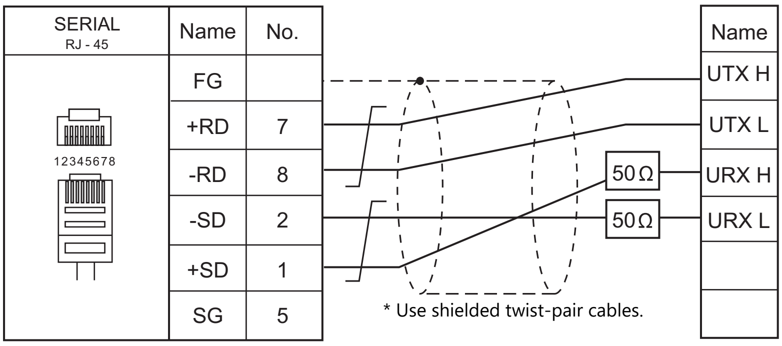


Wiring diagram 2 - M2

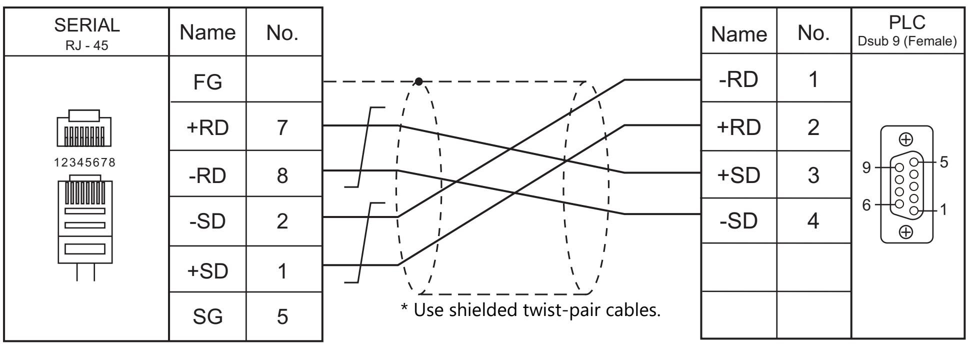


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



25. Hitachi Industrial Equipment Systems

25.1 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
HIDIC-H	H series	COMM-2H		RS-232C	Wiring diagram 1 - M2*3	×
				RS-422	×	Wiring diagram 6 - M4
	EH-150*3	On CPU	PORT1	RS-232C	Wiring diagram 2 - M2	×
				RS-422	Wiring diagram 1 - M4	Wiring diagram 7 - M4*5
		EH-SIO*4	PORT1	RS-232C	Wiring diagram 2 - M2	×
			PORT2	RS-232C	Wiring diagram 2 - M2	
				RS-422	Wiring diagram 2 - M4	Wiring diagram 8 - M4*5
	MICRO-EH*3	On CPU	PORT1	RS-232C	Wiring diagram 2 - M2	×
			PORT2	RS-422	Wiring diagram 3 - M4	Wiring diagram 9 - M4*5
		EH-OB232		RS-232C	Wiring diagram 2 - M2	×
		EH-OB485		RS-422	Wiring diagram 4 - M4	Wiring diagram 10 - M4*5
	Web controller*3	EH-WD10DR	SERIAL	RS-232C	Wiring diagram 3 - M2	×
		EH-WA23DR	PORT1			×
				RS-422	Wiring diagram 5 - M4	Wiring diagram 11 - M4*5
HIDIC-EHV	EH-150 EHV*3	EHV-CPU128	SERIAL	RS-232C	Wiring diagram 2 - M2	×
				RS-422	Wiring diagram 4 - M4	Wiring diagram 10 - M4*5
		EH-SIO*4	PORT1	RS-232C	Wiring diagram 2 - M2	×
			PORT2			×
				RS-422	Wiring diagram 2 - M4	Wiring diagram 8 - M4*5

*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 Communication cannot be established when "transmission control protocol 1, without port" is set. Set another transmission mode. For details on the transmission control protocol available with the CPU, refer to the PLC manual issued by the manufacturer.
*4 Only EH-CPU548 (version E402 or later) and EH-CPU516 (version E202 or later) can be used with the EH-SIO unit.
*5 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/Port	TCP/IP	UDP/IP	Port No.	KeepAlive*1
HIDIC-H (Ethernet)	H series	LAN-ETH2	×	○	3004 to 3005 (1 each)	○
	EH-150	EH-ETH			3004 to 3007 (1 each)	
	Web controller	ETHENRNET				
HIDIC-EHV (Ethernet)	EHV-CPU128	ETHENRNET				

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

25.1.1 HIDIC-H

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 115K bps	
Parity	None / Odd / Even	
Signal Level	RS-232C / RS-422/485	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Target Port No.	0 to 31	
Transmission Mode	Protocol 2 with port Protocol 2 without port Protocol 1 with port	• Communication cannot be established when "transmission control protocol 1, without port" is set. • Protocol 2 achieves a communication speed higher than protocol 1.

COMM-2H

ST No. switch

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

MODE switch

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

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

DIP switch

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

EH-150 CPU

PORT1

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

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

Procedure

1. Turn the PLC off and set the "Mode setting switch" (page 25-3).
2. Turn the power on and check the value for "Special internal output: WRF037" (page 25-4).
3. When the signal level and the communication control protocol have correctly been selected, setting is completed. If they are wrong, set a correct value and turn the power off and back on again.
4. Check the value set for WRF037.

Mode setting switch

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

Special internal output: WRF037

Device Memory	Setting
WRF037	(see bit layout below)

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

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

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

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

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

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

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

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

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

Setting example

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

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

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

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

MICRO EH

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

CPU Model	Port	Signal Level	Communication Protocol
EH-D10 EH-D14 / EH-A14 EH-D20 / EH-A20 EH-D23 / EH-A23 EH-D28 / EH-A28 EH-D40 / EH-A40 EH-D64 / EH-A64	PORT1	RS-232C	Transmission control protocol 2
EH-D23 / EH-A23 EH-D28 / EH-A28	PORT2	RS-422	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
EH-x64xxx + EH-OB232	PORT2	RS-232C	Transmission control protocol 2
EH-x64xxx + EH-OB485		RS-422	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

PORT1

Procedure

1. Turn the PLC off and set the baud rate using the “DIPSW”.
2. Turn the power on and check the value set for ““Special internal output: WRF01A””.
3. When the transmission control protocol has correctly been selected, setting is completed. If it is wrong, set a correct value.
4. Set the bit “R7F6” (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory. Note that the ladder tool cannot be connected when the setting has been saved using the transmission control protocol 2.

DIPSW

SW1	SW2	SW3	SW4	Baud Rate
ON	OFF	ON	OFF	38.4 kbps
ON	OFF	OFF	OFF	19.2 kbps
OFF	OFF	ON	OFF	9600 bps
OFF	OFF	OFF	OFF	4800 bps

Special internal output: WRF01A

Device Memory	Setting	Contents
WRF01A	H8000	Transmission control protocol 2

PORT2

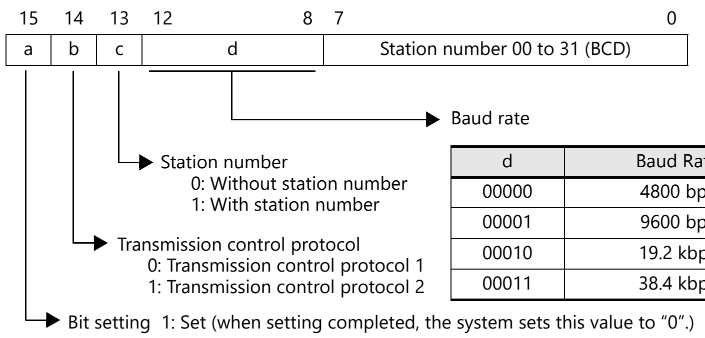
Procedure

1. Check the value set for special internal output “WRF03D”.
2. When the setting, such as transmission control protocol or baud rate, has correctly been defined, the setting is completed. If it is wrong, set a correct value. See “User Setting” described in ““Special internal output: WRF03D””.
3. Check that the value set for WRF03D has been changed to the one shown in the “System Setting” column.
4. Set the bit “R7F6” (setting write request) to save the setting in the flash memory.

* It is not necessary to make the setting again upon next power-up once the setting has been saved in the flash memory.

Special internal output: WRF03D

Device Memory	Setting
WRF03D	(see below)



d	Baud Rate
00000	4800 bps
00001	9600 bps
00010	19.2 kbps
00011	38.4 kbps

Setting example

User Setting	System Setting	Interface	Baud Rate
HC300	H4300	Transmission control protocol 2	38.4 kbps
HA300	H2300	Transmission control protocol 1 with port	
HE300	H6300	Transmission control protocol 2 with port	

Web Controller

The following table shows the signal level and the communication protocol for each PLC. Other parameters (7 bits, 1 bit, even) are fixed.

PLC	Port	Signal Level	Communication Protocol
EH-WD10DR	SERIAL	RS-232C	Transmission control protocol 2
EH-WA23DR	PORT1	RS-232C	Transmission control protocol 2
		RS-422	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port
		RS-485	Transmission control protocol 2
			Transmission control protocol 1 with port
			Transmission control protocol 2 with port

Procedure

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (RS-232C protocol/serial protocol → passive HI protocol)

Make settings for “Interface Type”, “Transmission Control Procedure”, “Transmission Speed”.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

25.1.2 HIDIC-H (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see "1.3.2 Ethernet Communication".

- 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].

LAN-ETH2 (H Series)

The IP address setting tool can be downloaded from the Hitachi Industrial Equipment Systems website.
Connect the computer (PC) to the RS-232C port of PORT1 and specify the IP address and the task port. For more information, refer to the PLC manual issued by the manufacturer.

EH-ETH (EH-150)

Make settings using the web server function incorporated in EH-ETH. For more information, refer to the PLC manual issued by the manufacturer.

IP address information setup

Set the IP address and the subnet mask.

Task code information setup

Select [UDP/IP] for [Protocol] and specify the port number.

Web Controller

Connect the computer (PC) to the web controller and make the setting for the PLC with the web browser. For more information, refer to the PLC manual issued by the manufacturer.

System configuration (IP address)

Specify the IP address and the subnet mask.

System configuration (ethernet protocol → passive HI protocol)

Select [UDP/IP] for [Task code port] and specify the port number.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	

25.1.3 HIDIC-EHV

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 bps	
Data Length	7 bits	
Stop Bit	1 bit	
Parity	Even	
Target Port No.	0 to 31	
Transmission Mode	Protocol 2 with port Protocol 2 without port Protocol 1 with port	• Communication cannot be established when "transmission control protocol 1, without port" is set. • Protocol 2 achieves a communication speed higher than protocol 1.

EHV-CPU

CPU communication setting on control editor

<table>
<tr><th>Item</th><th>Setting</th></tr>
<tr><td>Serial communication setting</td><td>Dedicated</td></tr>
<tr><td>Port type</td><td>RS-232C/RS-422/RS-485
The following table shows the combination of port type and communication protocols available.
<table>
<tr><th>Port Type</th><th>Communication Protocol</th></tr>
<tr><td>RS-232C</td><td>Transmission control protocol 2 (1 : 1)</td></tr>
<tr><td rowspan="3">RS-422</td><td>Transmission control protocol 2 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 1 (1 : n)</td></tr>
<tr><td>Transmission control protocol 2 (1 : n)</td></tr>
<tr><td rowspan="3">RS-485</td><td>Transmission control protocol 2 (1 : 1)</td></tr>
<tr><td>Transmission control protocol 1 (1 : n)</td></tr>
<tr><td>Transmission control protocol 2 (1 : n)</td></tr>
</table></td></tr>
<tr><td>Baud rate</td><td>4800 / 9600 / 19200 / 38400 / 57600 bps</td></tr>
<tr><td>Communication protocol</td><td>See "Port Type" shown above.</td></tr>
<tr><td>Station number</td><td>0 to 31 (to be specified when "with port" is selected)</td></tr>
</table>

EH-SIO

PORT1/PORT2

The following table shows the signal level and the communication protocol for each port. Other parameters (7 bits, 1 bit, even) are fixed.

Port	Signal Level	Communication Protocol	EH-SIO Version
PORT1	RS-232C	Transmission control protocol 2	Version 2.1 and later
PORT2	RS-232C	Transmission control protocol 2	Version 2.1 and later
	RS-422	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later
	RS-485	Transmission control protocol 2	Version 2.1 and later
		Transmission control protocol 1 with port	Version 2.0 and later
		Transmission control protocol 2 with port	Version 2.1 and later

DIP switch 1/2

Set the baud rate for PORT1/2 using the DIPSW1/2 attached to the side of EH-SIO. For more information, refer to the PLC manual issued by the manufacturer.

Ladder program

Make initial settings for the transmission control protocol and the station number.
For more information, refer to the PLC manual issued by the manufacturer.

Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

25.1.4 HIDIC-EHV (Ethernet)

Communication Setting

Editor

Make the following settings on the editor. For more information, see “1.3.2 Ethernet Communication”.

- 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

Control Editor

IP address setting

Item	Contents	
IP address	Specify the IP address for the PLC.	
Subnet mask	Specify the subnet mask for the PLC.	
Default gateway	Specify according to the environment.	

Ethernet communication (task code) setting

Item	Contents	
Valid	Select a port to which the X1 unit is connected and make the port enabled.	
Port No.	Set the port number of the PLC.	
Protocol	UDP/IP	

Available Device Memory

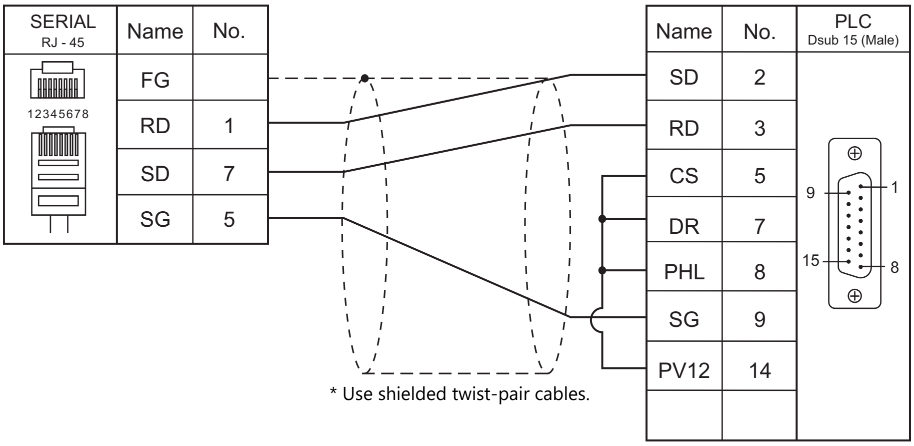
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
WR	(internal output/word)	00H	
X	(external input)	01H	WX as word device
Y	(external output)	02H	WY as word device
L	(CPU link area)	03H	WL as word device
M	(data area)	04H	WM as word device
TC	(timer, counter/elapsed time)	05H	
R	(internal output/bit)	06H	
TD	(timer, counter/contact)	07H	
WN	(network input/output)	08H	
CL	(counter clear)	09H	
EX	(extensional external input)	0BH	WEX as word device
EY	(extensional external output)	0CH	WEY as word device

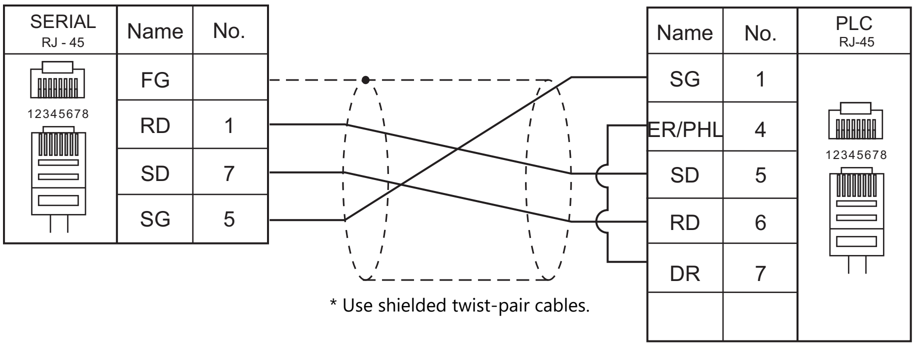
25.1.5 Wiring Diagrams

RS-232C

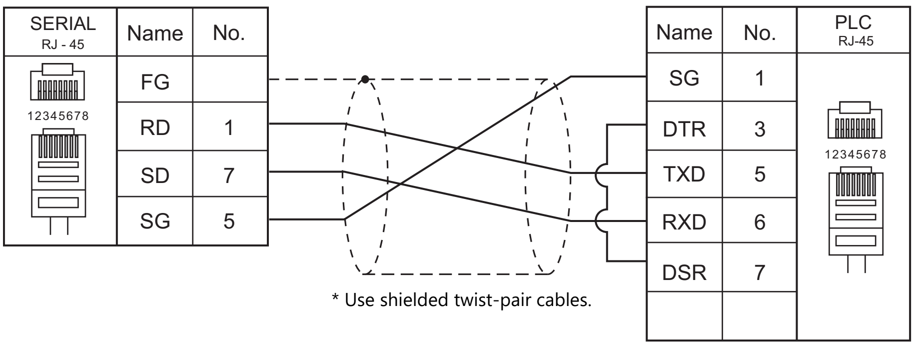
Wiring diagram 1 - M2



Wiring diagram 2 - M2

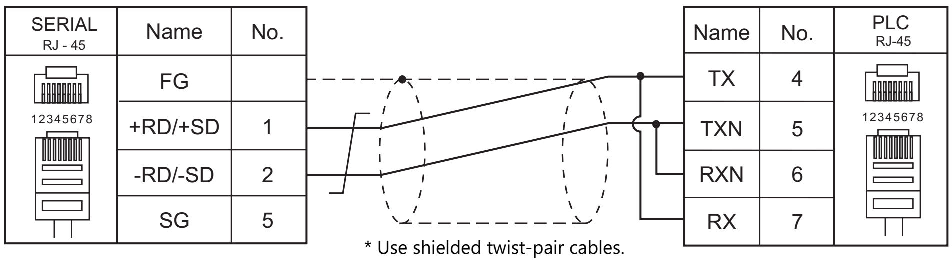


Wiring diagram 3 - M2

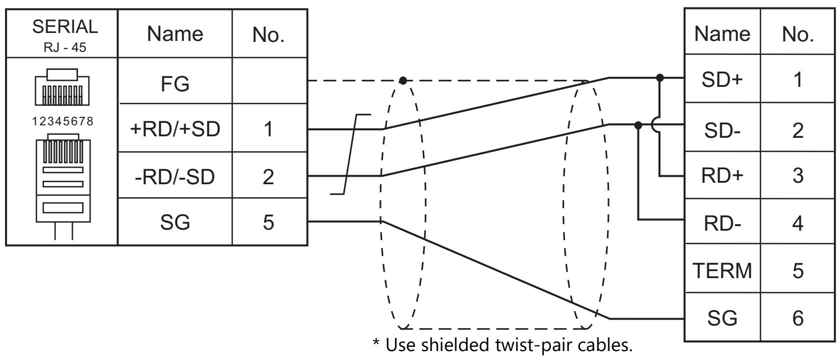


RS-422/RS-485

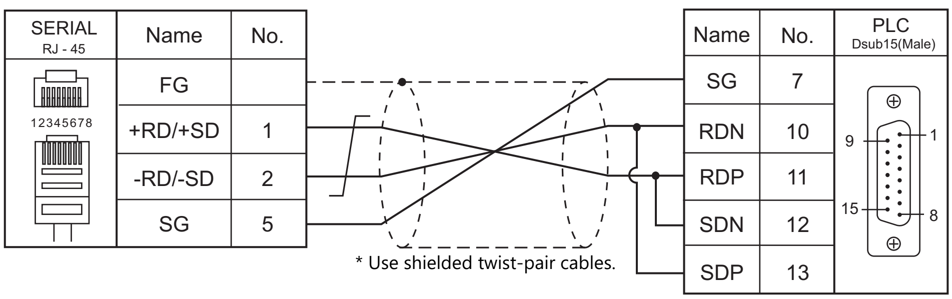
Wiring diagram 1 - M4



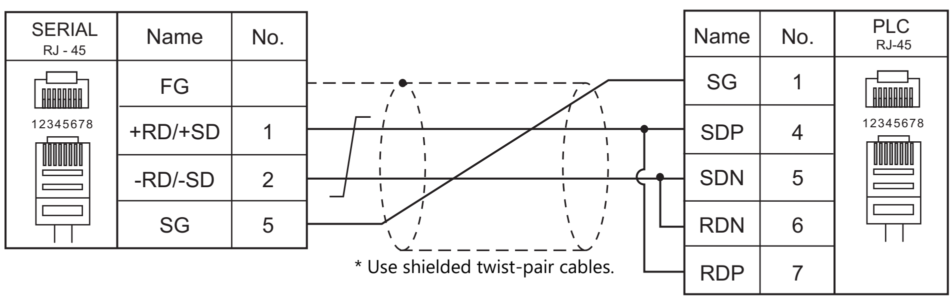
Wiring diagram 2 - M4



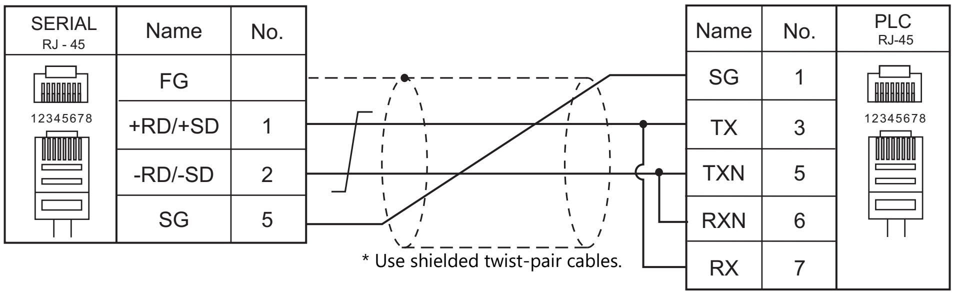
Wiring diagram 3 - M4



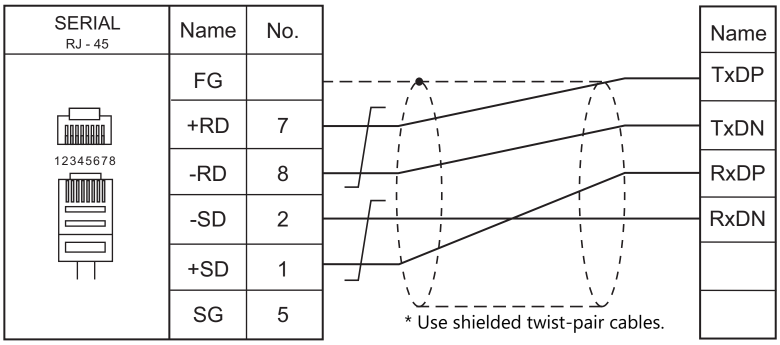
Wiring diagram 4 - M4



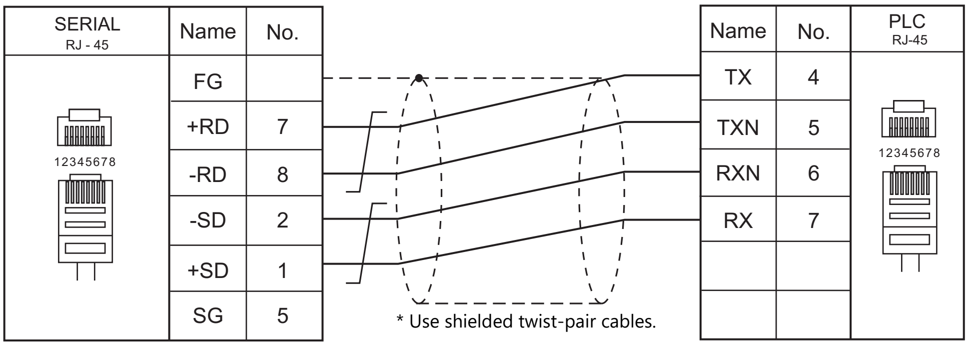
Wiring diagram 5 - M4



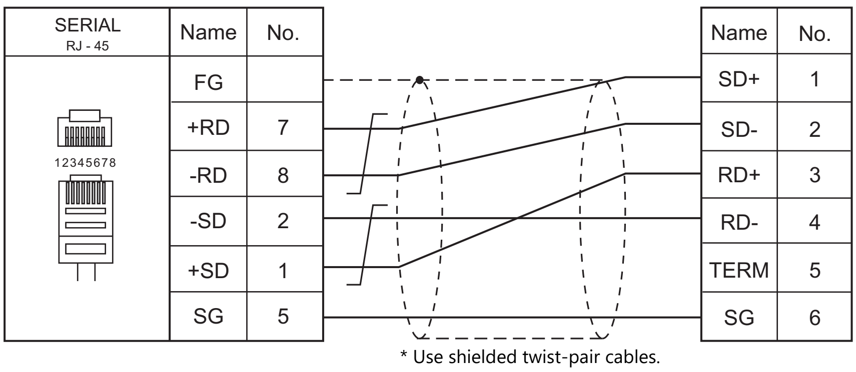
Wiring diagram 6 - M4



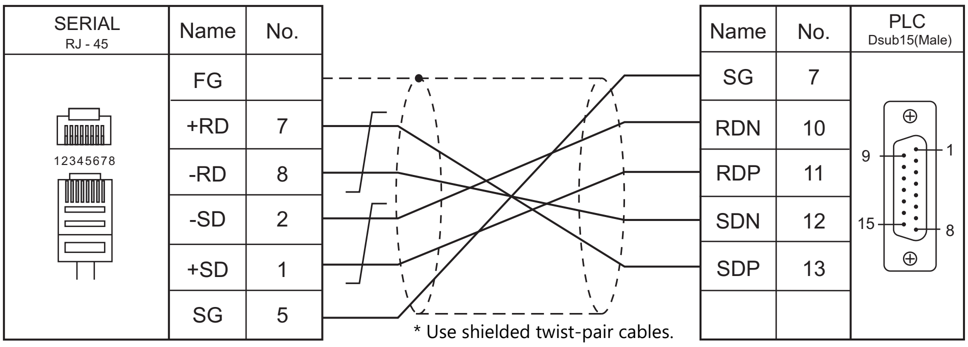
Wiring diagram 7 - M4



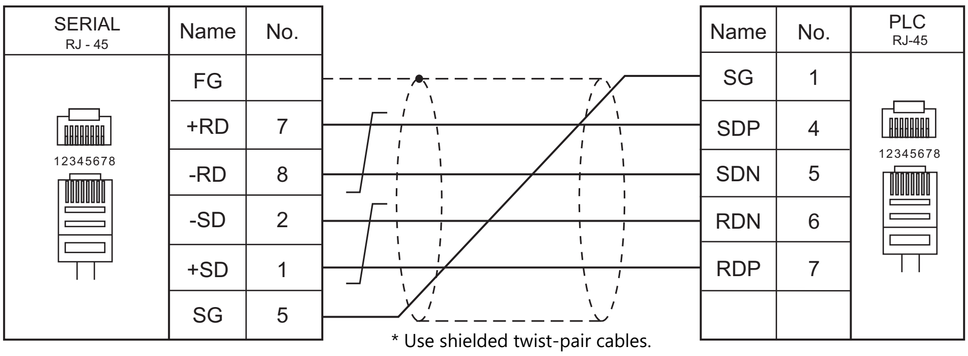
Wiring diagram 8 - M4



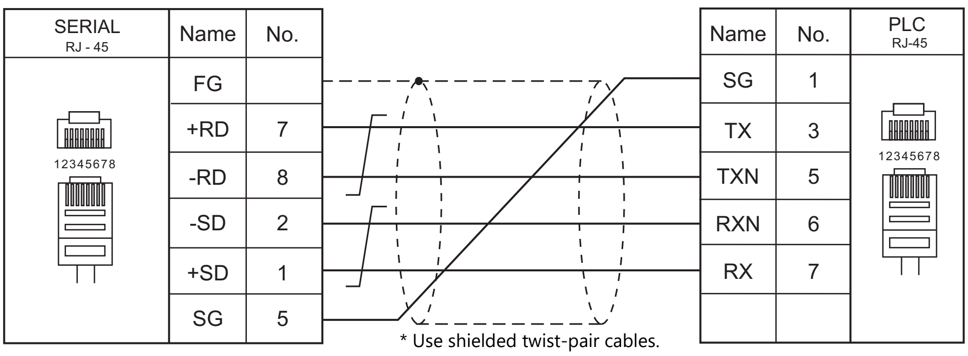
Wiring diagram 9 - M4



Wiring diagram 10 - M4



Wiring diagram 11 - M4



25.2 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)	
SJ300 series	SJ300 SJH300	TM2	RS-485	Wiring diagram 1 - M4	×	H_SJ300.Lst
SJ700 series	SJ700 SJ700-2	TM2	RS-485	Wiring diagram 1 - M4	×	H_SJ700.Lst
SJ series P1 (Modbus RTU)	P1-xxxxx-xxxx	Terminal block	RS-485	Wiring diagram 2 - M4	×	H_SJP1.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).

25.2.1 SJ300 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 32	

Inverter

Parameter

The communication parameters can be set using keys attached to the inverter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code		Function Name	Setting	Remarks
Basic setting	A001	Frequency command selection	**03: RS-485**	To give the frequency command from X1, always select “03”.
	A002	Operation command selection	**03: RS-485**	To give the operation command from X1, always select “03”.
Communication function adjustment	C070	Data command selection	**03: RS-485**	
	C071	Baud rate selection	04: 4800 bps 05: 9600 bps 06: 19200 bps	
	C072	Communication station number selection	1. to 32.	
	C073	Communication bit length selection	7: 7 bits 8: 8 bits	
	C074	Communication parity selection	00: No parity 01: Even parity 02: Odd parity	
	C075	Communication stop bit selection	1: 1 bit 2: 2 bits	
	C078	Communication latency	0. to 1000. (msec)	

Terminating resistance

Short-circuit RP-SN (control terminal block) on the terminal inverter.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
d	00H	Double-word, read only
F	01H	Double-word
A	02H	Double-word
b	03H	Double-word
C	04H	Double-word
H	05H	Double-word
P	06H	Double-word
T (trip history)	07H	Double-word, read only

Indirect Device Memory Designation

	15 8	7 0
n + 0	Models (11 to 18)	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits (lower)
1: 16 to 31 bits (higher)

PLC_CTL

Macro command "PLC_CTL F0 F1 F2"

Contents	F0	F1 (= $u n)		F2
Normal turn, reverse turn or stop command	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0: Stop command 1: Normal turn command 2: Reverse turn command	
Frequency command setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 1	
		n + 2	Frequency (0 to 400 Hz)	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="6">Intelligent terminal status setting</td><td rowspan="6">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="6">6</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
<tr><td>n + 2</td><td>Data (HH)
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Bit 0: “STAT” Pulse train input enabled</td></tr>
<tr><td>n + 3</td><td>Data (HL)
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Bit 0: “SF1” Multistep speed (bit operation)
Bit 1: “SF2” Multistep speed (bit operation)
Bit 2: “SF3” Multistep speed (bit operation)
Bit 3: “SF4” Multistep speed (bit operation)
Bit 4: “SF5” Multistep speed (bit operation)
Bit 5: “SF6” Multistep speed (bit operation)
Bit 6: “SF7” Multistep speed (bit operation)
Bit 7: “OLR” Overload limitation selection
Bit 8: “TL” Torque limitation valid/invalid
Bit 9: “TRQ1” Torque limit selection 1
Bit 10: “TRQ2” Torque limit selection 2
Bit 11 “PPI” P/PI selection
Bit 12: “BOK” Brake check
Bit 13: “ORT” Orientation
Bit 14: “LAC” LAD cancel
Bit 15: “PCLR” Positioning deviation clear</td></tr>
<tr><td>n + 4</td><td>Data (LH)
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Bit 0: “AT” Analog input selection
Bit 1: “SET3” 3rd control
Bit 2: “RS” Reset
Bit 3: --
Bit 4: “STA” 3-wire start
Bit 5: “STP” 3-wire retain
Bit 6: “F/R” 3-wire normal/reverse turn
Bit 7: “PID” PID selection (valid/invalid)
Bit 8: “PIDC” PID integral reset
Bit 9: --
Bit 10: “CAS” Control gain selection
Bit 11: “UP” Remote control acceleration
Bit 12: “DWN” Remote control deceleration
Bit 13: “UDC” Remote control data clear
Bit 14: --
Bit 15: “OPE” Forced operation</td></tr>
<tr><td>n + 5</td><td>Data (LL)
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Bit 0: “FW” Normal turn command
Bit 1: “RV” Reverse turn command
Bit 2: “CF1” Multistep speed 1 (binary operation)
Bit 3: “CF2” Multistep speed 2 (binary operation)
Bit 4: “CF3” Multistep speed 3 (binary operation)
Bit 5: “CF4” Multistep speed 4 (binary operation)
Bit 6: “JG” Jogging (inching operation)
Bit 7: “DB” External DC braking
Bit 8: “SET” 2nd control
Bit 9: “2CH” 2-step acceleration/deceleration
Bit 10: --
Bit 11: “FRS” Free-run stop
Bit 12: “EXP” External trip
Bit 13: “USP” Unattended start protection function
Bit 14: “CS” Commercial switching
Bit 15: “SFT” Soft lock (control terminal block)</td></tr>
</table>

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="5">Inverter status readout</td><td rowspan="5">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="5">2</td></tr>
<tr><td>n + 1</td><td>Command: 4</td></tr>
<tr><td>n + 2</td><td>Status A (BCD)
00: Initial status
01: Waiting for Vdc establishment
02: Stopping
03: Running
04: FRS in progress
05: JG in progress
06: DB in progress
07: F acquisition in progress
08: Retry in progress
09: UV in progress
10: Tripping
11: Waiting for reset</td></tr>
<tr><td>n + 3</td><td>Status B (BCD)
00: Stopping
01: Running
02: Tripping</td></tr>
<tr><td>n + 4</td><td>Status C (BCD)
00: --
01: Stop
02: Deceleration
03: Constant speed
04: Acceleration
05: Normal turn
06: Reverse turn
07: Normal to reverse turn
08: Reverse to normal turn
09: Normal turn start
10: Reverse turn start</td></tr>
<tr><td rowspan="2">Resetting of setting value to default *</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 8</td></tr>
<tr><td rowspan="3">Check for EEPROM availability</td><td rowspan="3">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="3">2</td></tr>
<tr><td>n + 1</td><td>Command: 9</td></tr>
<tr><td>n + 2</td><td>01: Allowed</td></tr>
<tr><td rowspan="2">Storing of setting values in EEPROM</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 10</td></tr>
<tr><td rowspan="2">Re-calculation of internal constant</td><td rowspan="2">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="2">2</td></tr>
<tr><td>n + 1</td><td>Command: 11</td></tr>
</table>

Return data: Data stored from inverter to X1 series

* When the initialize parameter of "b084" is set to "00", only trip history is cleared.

25.2.2 SJ700 Series

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 bps	
Data Length	7 / 8 bits	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 32	

Inverter

Parameter

The communication parameters can be set using keys attached to the inverter.
Be sure to match the settings to those made under [Communication Setting] of the editor.

(Underlined setting: default)

Function Code		Function Name	Setting	Remarks
Basic setting	A001	Frequency command selection	**03: RS-485**	To give the frequency command from X1, always select "03".
	A002	Operation command selection	**03: RS-485**	To give the operation command from X1, always select "03".
Communication function adjustment	C071	Baud rate selection	04: 4800 bps 05: 9600 bps 06: 19200 bps	
	C072	Communication station number selection	1. to 32.	
	C073	Communication bit length selection	7: 7 bits 8: 8 bits	
	C074	Communication parity selection	00: No parity 01: Even parity 02: Odd parity	
	C075	Communication stop bit selection	1: 1 bit 2: 2 bits	
	C076	Communication error selection	**02: Ignored**	
	C077	Communication trip time	0.00 - 99.99 (s)	
	C078	Communication latency	0. - 1000. (ms)	
	C079	Communication mode selection	**00: ASCII**	

Terminating resistance

Short-circuit RP-SN (control terminal block) on the terminal inverter.

Available Device Memory

The available setting range of device memory varies depending on the model. Be sure to set within the range available for the model to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory	TYPE	Remarks
d	00H	Double-word, read only
F	01H	Double-word
A	02H	Double-word
b	03H	Double-word
C	04H	Double-word
H	05H	Double-word
P	06H	Double-word
T (trip history)	07H	Double-word, read only

Indirect Device Memory Designation

	15 … 8	7 … 0
n + 0	Models (11 to 18)	Device type
n + 1	Address No.	
n + 2	Expansion code *	Bit designation
n + 3	00	Station number

* In the expansion code, set which word, higher or lower, is to be read when a double-word address is specified.

15							8
0	0	0	0	0	0	0	

0: 0 to 15 bits (lower)
1: 16 to 31 bits (higher)

PLC_CTL

Macro command “PLC_CTL F0 F1 F2”

Contents	F0	F1 (= $u n)		F2
Normal turn, reverse turn or stop command	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 0	
		n + 2	0: Stop command 1: Normal turn command 2: Reverse turn command	
Frequency command setting	1 - 8 (PLC1 - 8)	n	Station number	3
		n + 1	Command: 1	
		n + 2	Frequency (0 to 400 Hz)	

<table>
<tr><th>Contents</th><th>F0</th><th colspan="2">F1 (= $u n)</th><th>F2</th></tr>
<tr><td rowspan="6">Intelligent terminal status setting</td><td rowspan="6">1 - 8
(PLC1 - 8)</td><td>n</td><td>Station number</td><td rowspan="6">6</td></tr>
<tr><td>n + 1</td><td>Command: 2</td></tr>
<tr><td>n + 2</td><td>Data (HH)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “STAT” Pulse train position command enabled
Bit 1: --
Bit 2: “ADD” Set frequency addition
Bit 3: “F-TM”: Forced terminal
Bit 4: “ATR” Torque command input enabled
Bit 5: “KHC” Integral power clear
Bit 6: “SON” Servo ON
Bit 7: “FOC” Pre-excitation
Bit 8: “MI1” General-purpose input 1
Bit 9: “MI2” General-purpose input 2
Bit 10: “MI3” General-purpose input 3
Bit 11: “MI4” General-purpose input 4
Bit 12: “MI5” General-purpose input 5
Bit 13: “MI6” General-purpose input 6
Bit 14: “MI7” General-purpose input 7
Bit 15: “MI8” General-purpose input 8</td></tr>
<tr><td>n + 3</td><td>Data (HL)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “SF1” Multistep speed (bit operation)
Bit 1: “SF2” Multistep speed (bit operation)
Bit 2: “SF3” Multistep speed (bit operation)
Bit 3: “SF4” Multistep speed (bit operation)
Bit 4: “SF5” Multistep speed (bit operation)
Bit 5: “SF6” Multistep speed (bit operation)
Bit 6: “SF7” Multistep speed (bit operation)
Bit 7: “OLR” Overload limitation selection
Bit 8: “TL” Torque limitation valid/invalid
Bit 9: “TRQ1” Torque limit selection 1
Bit 10: “TRQ2” Torque limit selection 2
Bit 11 “PPI” P/PI selection
Bit 12: “BOK” Brake check
Bit 13: “ORT” Orientation
Bit 14: “LAC” LAD cancel
Bit 15: “PCLR” Positioning deviation clear</td></tr>
<tr><td>n + 4</td><td>Data (LH)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “AT” Analog input selection
Bit 1: --
Bit 2: “RS” Reset
Bit 3: --
Bit 4: “STA” 3-wire start
Bit 5: “STP” 3-wire retain
Bit 6: “F/R” 3-wire normal/reverse turn
Bit 7: “PID” PID selection (valid/invalid)
Bit 8: “PIDC” PID integral reset
Bit 9: --
Bit 10: --
Bit 11: “UP” Remote control acceleration
Bit 12: “DWN” Remote control deceleration
Bit 13: “UDC” Remote control data clear
Bit 14: --
Bit 15: “OPE” Forced operation</td></tr>
<tr><td>n + 5</td><td>Data (LL)

15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

Bit 0: “FW” Normal turn command
Bit 1: “RV” Reverse turn command
Bit 2: “CF1” Multistep speed 1 (binary operation)
Bit 3: “CF2” Multistep speed 2 (binary operation)
Bit 4: “CF3” Multistep speed 3 (binary operation)
Bit 5: “CF4” Multistep speed 4 (binary operation)
Bit 6: “JG” Jogging (inching operation)
Bit 7: “DB” External DC braking
Bit 8: “SET” 2nd control
Bit 9: “2CH” 2-step acceleration/deceleration
Bit 10: --
Bit 11: “FRS” Free-run stop
Bit 12: “EXP” External trip
Bit 13: “USP” Unattended start protection function
Bit 14: “CS” Commercial switching
Bit 15: “SFT” Soft lock (control terminal block)</td></tr>
</table>

Contents	F0	F1 (= $u n)		F2
Inverter status readout	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 4	
		n + 2	Status A (BCD) 00: Initial status 01: Waiting for Vdc establishment 02: Stopping 03: Running 04: FRS in progress 05: JG in progress 06: DB in progress 07: F acquisition in progress 08: Retry in progress 09: UV in progress 10: Tripping 11: Waiting for reset	
		n + 3	Status B (BCD) 00: Stopping 01: Running 02: Tripping	
		n + 4	Status C (BCD) 00: -- 01: Stop 02: Deceleration 03: Constant speed 04: Acceleration 05: Normal turn 06: Reverse turn 07: Normal to reverse turn 08: Reverse to normal turn 09: Normal turn start 10: Reverse turn start	
Resetting of setting value to default *	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 8	
Check for EEPROM availability	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 9	
		n + 2	01: Allowed	
Storing of setting values in EEPROM	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 10	
Re-calculation of internal constant	1 - 8 (PLC1 - 8)	n	Station number	2
		n + 1	Command: 11	

Return data: Data stored from inverter to X1 series

* When the initialize parameter of "b084" is set to "00", only trip history is cleared.

25.2.3 SJ Series P1 (Modbus RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting Value	Remarks
Connection Mode	1:1 / 1:n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	0 to 254	0: Broadcast (destination: 1 to 247) 250: Broadcast (destination: 1 to 9) 251: Broadcast (destination: 10 to 19) 252: Broadcast (destination: 20 to 29) 253: Broadcast (destination: 30 to 39) 254: Broadcast (destination: 40 to 247)

Inverter

Communication parameters can be set using the ladder tool “ProDriveNext”.
Be sure to match the settings to those made under [Communication Setting] of the editor.

Parameter settings (CODE-C)

(Underlined setting: default)

Data ID	Data Name	Setting Value	Remarks
CF-01	Baud rate	04: 4800 bps 05: 9600 bps 06: 19200 bps 07: 38400 bps 08: 57600 bps 09: 76800 bps 10: 115200 bps	
CF-02	Communication station number	1 to 247	
CF-03	Communication parity	00: No parity 01: Even parity 02: Odd parity	
CF-04	Communication stop bit	01: 1 bit 02: 2 bits	
CF-08	Communication mode	**01: Modbus RTU**	

Terminating resistance

Short-circuit RP-SN (control terminal block) on the terminal inverter.

Available Device Memory

The available setting range of device memory varies depending on the 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
X (coil number)	00H	
dA-	01H	
db-	02H	
dC-	03H	
dE-01 (trip/rotation monitor)	04H	
dE-11 (trip monitor 1)	05H	
dE-12 (trip monitor 2)	06H	
dE-13 (trip monitor 3)	07H	
dE-14 (trip monitor 4)	08H	
dE-15 (trip monitor 5)	09H	
dE-16 (trip monitor 6)	0AH	
dE-17 (trip monitor 7)	0BH	
dE-18 (trip monitor 8)	0CH	
dE-19 (trip monitor 9)	0DH	
dE-20 (trip monitor 10)	0EH	
dE-31 (retry monitor 1)	0FH	
dE-32 (retry monitor 2)	10H	
dE-33 (retry monitor 3)	11H	
dE-34 (retry monitor 4)	12H	
dE-35 (retry monitor 5)	13H	
dE-36 (retry monitor 6)	14H	
dE-37 (retry monitor 7)	15H	
dE-38 (retry monitor 8)	16H	
dE-39 (retry monitor 9)	17H	
dE-40 (retry monitor 10)	18H	
dE-50 (warning monitor)	19H	
FA-	1AH	
AA-	1BH	
AA1	1CH	
AA2	1DH	
Ab-	1EH	
Ab1	1FH	
Ab2	20H	
AC-	21H	
AC1	22H	
AC2	23H	
Ad-	24H	
AE-	25H	
AF1	26H	
AF2	27H	
AG-	28H	
AG1	29H	
AG2	2AH	
AH-	2BH	
AJ-	2CH	
bA-	2DH	
bA1	2EH	
bA2	2FH	
bb-	30H	
bb1	31H	
bb2	32H	
bC-	33H	
bC1	34H	
bC2	35H	
bd-	36H	
CA-	37H	
Cb-	38H	
CC-	39H	

Device Memory	TYPE	Remarks
Cd-	3AH	
CE-	3BH	
CE1	3CH	
CE2	3DH	
CF-	3EH	
HA-	3FH	
HA1	40H	
HA2	41H	
Hb1	42H	
Hb2	43H	
HC1	44H	
HC2	45H	
Hd-	46H	
Hd1	47H	
Hd2	48H	
oA-	49H	
0b-	4AH	
oC-	4BH	
oE-	4CH	
0H-	4DH	
oJ-	4EH	
oL-	4FH	
PA-	50H	
UA-	51H	
Ub-	52H	
UC-	53H	
Ud-	54H	
UE-	55H	
UF-	56H	
D (holding register number)	57H	

Note on device memory setting
- Two consecutive words are used for high-order and low-order data depending on addresses. In such cases, specify in big endian format.
- When storing any changes into the holding register (other than device memory X), all data must be written into RAM upon issuance of the enter command (D9000 = 1), or only changed data must be written into RAM and ROM in the data writing mode* (D9002 = 1).
  For more information, refer to the specifications sheet of the inverter.
  * The data writing mode cannot be selected when the inverter's device memory is read on the displayed screen.
    To switch to the data writing mode during communication with the inverter, display a screen with no reading of inverter device memory.

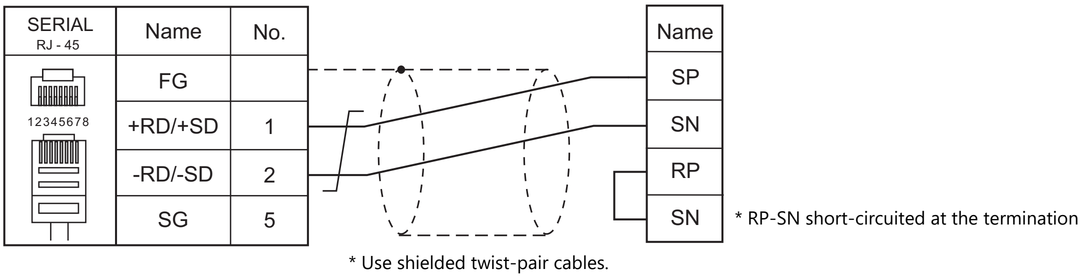
Indirect Device Memory Designation

- Device memory other than "dE-xx" (trip/rotation monitor, trip monitor, retry monitor, and warning monitor)
  For the device memory address number, specify the value obtained by subtracting "1" from the actual address.

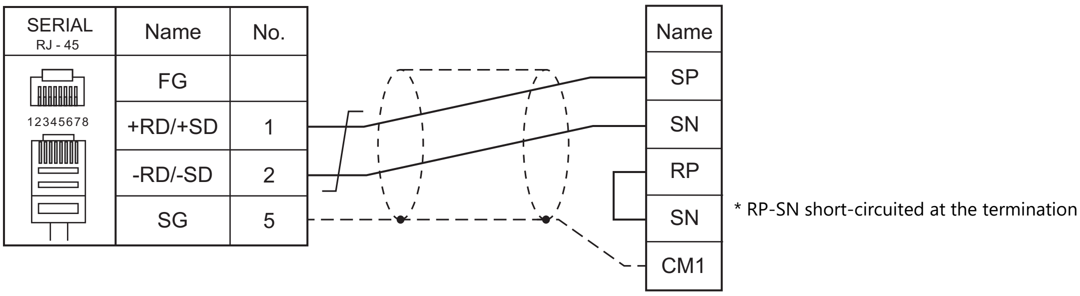
25.2.4 Wiring Diagrams

RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



26. HYUNDAI

26.1 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)*2
Hi4 Robot (MODBUS RTU)	Hi4-0010 Hi4-A010 Hi4-0018 Hi4-A018 Hi4-0002 Hi4-0000-CP	Serial port #1	RS-232C	Wiring diagram 1 - M2	×
		Serial port #2		Wiring diagram 2 - M2	
Hi5 Robot (MODBUS RTU)	Hi5	Serial port #1	RS-232C	Wiring diagram 1 - M2	
		Serial port #2		Wiring diagram 2 - M2	
		Serial port #1	RS-422/485	×	Wiring diagram 1 - M4
		Serial port #2		×	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).

26.1.1 Hi4 Robot (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	0: Broadcast

PLC

Serial Port #1 / Serial Port #2

DIP switches of built-in PLC

DIPSW	Setting
SW1	OFF
SW2	OFF
SW3	OFF
SW4	OFF
SW5	ON
SW6	OFF
SW7	OFF
SW8	OFF

Communication setting

Set parameters using the dedicated controller.
Turn the key on the upper right of the controller clockwise to switch to manual mode. Press the “F2 System” button to display the system menu. Then select “2: Control parameter” with the cursor keys.
For more information, refer to the manual issued by HYUNDAI.

Item	Setting	Remarks
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Character length	**8 bits**	
Stop bit	1 / 2 bits	
Parity bit	Disable / Odd / Even	
Port usage	**MODBUS**	
Slave address	1 to 247	

Available Device Memory

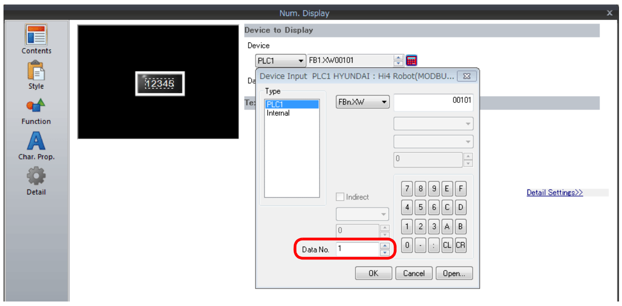
The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
X	(External Input)	00H	XW as word device, read only
D0	(PLC Input)	01H	D0W as word device, read only
FBn.X	(Fieldbus Input)	02H	FBn.XW as word device, read only *1
T	(Timer (Contact))	04H	Read only
C	(Counter (Contact))	05H	Read only
AI	(Analog Input)	06H	Read only
Y	(External Output)	07H	YW as word device
DI	(PLC Output)	08H	DIW as word device
FBn.Y	(Fieldbus Output)	09H	FBn.YW as word device, read only *1
SP	(Special)	0BH	SPW as word device
R	(Auxiliary)	0CH	RW as word device
K	(Keep)	0DH	KW as word device
TW	(Timer (Current Value))	0EH	
CW	(Counter (Current Value))	0FH	
A0	(Analog Output)	10H	
SW	(System Memory)	11H	
MW	(Data Memory)	12H	
V%	(V% variable)	13H	
RN	(RN Register)	14H	
V$	(V$ Variable)	15H	*2
V!	(V! Variable)	16H	Real number

*1 Specify the array number for the data number.

Example: FBn.XW

Data No. of FBn device memory: 1 to 5



*2 The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is V$1.0 to V$65536.17.

Example: V$1.17
- 0 to 17
- 1 to 65536

Indirect Device Memory Designation

	15 8	7 0
n+0	Model	Device type
n+1	Address No. *1	
n+2	Expansion code *2	Bit designation
n+3	00	Station number

*1 Address numbers

- Other than V$ device memory:
  Specify the value obtained by subtracting "1" from the actual address.
- V$ device memory:
  V$20.17
  - [B]: 0 to 17
  - [A]: 1 to 65536

  Designate the address number as follows: ([A] - 1) * 18 + [B] = (20 - 1) * 18 + 17 = 359 (DEC)

*2 FBn.XW, FBn.YW device memory

15							8
0	0	0	0				0

Data No.: 1 to 5

26.1.2 Hi5 Robot (MODBUS RTU)

Communication Setting

Editor

Communication setting

(Underlined setting: default)

Item	Setting	Remarks
Connection Mode	1 : 1 / 1 : n	
Signal Level	RS-232C / RS-422/485	
Baud Rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Data Length	**8 bits**	
Stop Bit	1 / 2 bits	
Parity	None / Odd / Even	
Target Port No.	1 to 247	0: Broadcast

PLC

Serial Port #1 / Serial Port #2

DIP switches of built-in PLC

DIPSW	Setting
SW1	OFF
SW2	OFF
SW3	OFF
SW4	OFF
SW5	ON
SW6	OFF
SW7	OFF
SW8	OFF

Communication setting

Set parameters using the dedicated controller.
Turn the key on the upper right of the controller clockwise to switch to manual mode. Press the "F2 System" button to display the system menu. Then select "2: Control parameter" with the cursor keys.
For more information, refer to the manual issued by HYUNDAI.

Item	Setting	Remarks
Baud rate	4800 / 9600 / 19200 / 38400 / 57600 / 76800 / 115K bps	
Character length	**8 bits**	
Stop bit	1 / 2 bits	
Parity bit	Disable / Odd / Even	
Port usage	**MODBUS**	
Communication	RS-232C / RS-422 / RS-485	
Slave address	1 to 247	

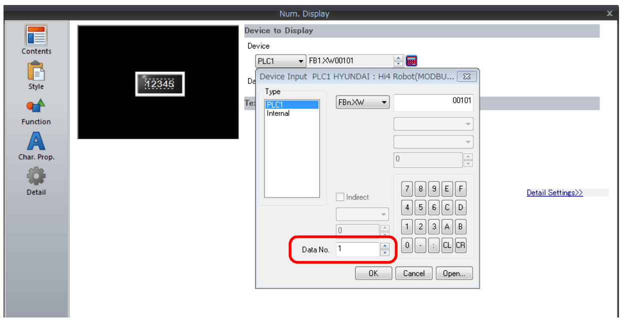
Available Device Memory

The available setting range of device memory varies depending on the PLC model. Be sure to set within the range available for the PLC to be used. Use [TYPE] when assigning indirect device memory for macro programs.

Device Memory		TYPE	Remarks
X	(External Input)	00H	XW as word device, read only
D0	(PLC Input)	01H	D0W as word device, read only
FBn.X	(Fieldbus Input)	02H	FBn.XW as word device, read only *1
FNn.X	(Fieldbus Node Input)	03H	FNn.XW as word device, read only *1
T	(Timer (Contact))	04H	Read only
C	(Counter (Contact))	05H	Read only
AI	(Analog Input)	06H	Read only
Y	(External Output)	07H	YW as word device
DI	(PLC Output)	08H	DIW as word device
FBn.Y	(Fieldbus Output)	09H	FBn.YW as word device, read only *1
FNn.Y	(Fieldbus Node Output)	0AH	FNn.YW as word device, read only *1
SP	(Special)	0BH	SPW as word device
R	(Auxiliary)	0CH	RW as word device
K	(Keep)	0DH	KW as word device
TW	(Timer (Current Value))	0EH	
CW	(Counter (Current Value))	0FH	
A0	(Analog Output)	10H	
SW	(System Memory)	11H	
MW	(Data Memory)	12H	
V%	(V% Variable)	13H	
RN	(RN Register)	14H	
V$	(V$ Variable)	15H	*2
V!	(V! Variable)	16H	Real number
XL	(External Input (Dword))	17H	Read only, double-word
D0L	(PLC Input (Dword))	18H	Read only, double-word
FBn.XL	(Fieldbus Input (Dword))	19H	Read only, double-word *1
FNn.XL	(Fieldbus Node Input (Dword))	1AH	Read only, double-word *1
YL	(External Output (Dword))	1BH	Double-word
DIL	(PLC Output (Dword))	1CH	Double-word
FBn.YL	(Fieldbus Output (Dword))	1DH	Double-word *1
FNn.YL	(Fieldbus Node Output (Dword))	1EH	Double-word *1
SPL	(Special (Dword))	1FH	Double-word
RL	(Auxiliary (Dword))	20H	Double-word
KL	(Keep (Dword))	21H	Double-word
TL	(Timer (Current Value) (Dword))	22H	Double-word
CL	(Counter (Current Value) (Dword))	23H	Double-word
SL	(System Memory (Dword))	24H	Double-word
ML	(Data Memory (Dword))	25H	Double-word

*1 Specify the array number for the data number.

Data No. of FBn: 1 to 5
Data No. of FNn: 1 to 64



*2 The assigned device memory is expressed as shown on the right when editing the screen.
The address range available on MONITOUCH is V$1.0 to V$65536.17.

Example: V$1.17
0 to 17
1 to 65536

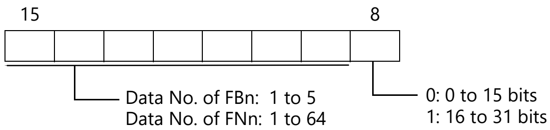
Indirect Device Memory Designation

	15 8	7 0
n+0	Model	Device type
n+1	Address No. *1	
n+2	Expansion code *2	Bit designation
n+3	00	Station number

*1 Address numbers
- Other than V$ device memory:
  Specify the value obtained by subtracting “1” from the actual address.
- V$ device memory:
  V$20.17
  [B]: 0 to 17
  [A]: 1 to 65536

  Designate the address number as follows: ([A] - 1) * 18 + [B] = (20 - 1) * 18 + 17 = 359 (DEC)

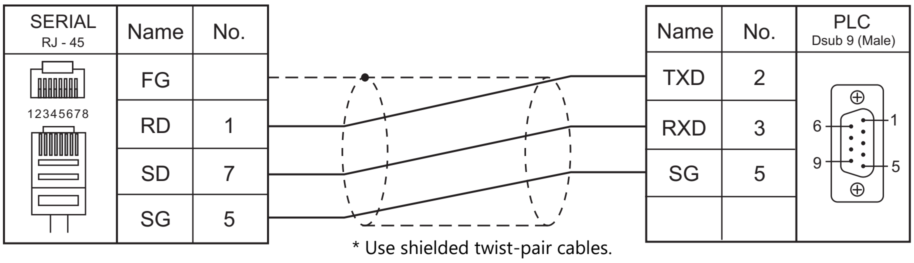
*2 FBn.XW, FNn.XW, FBn.YW, FNn.YW, FBn.X, FNn.XL, FBn.YL, FNn.YL device memory



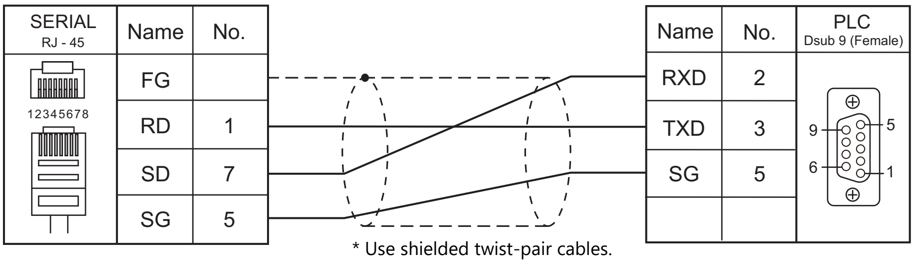
26.1.3 Wiring Diagrams

RS-232C

Wiring diagram 1 - M2

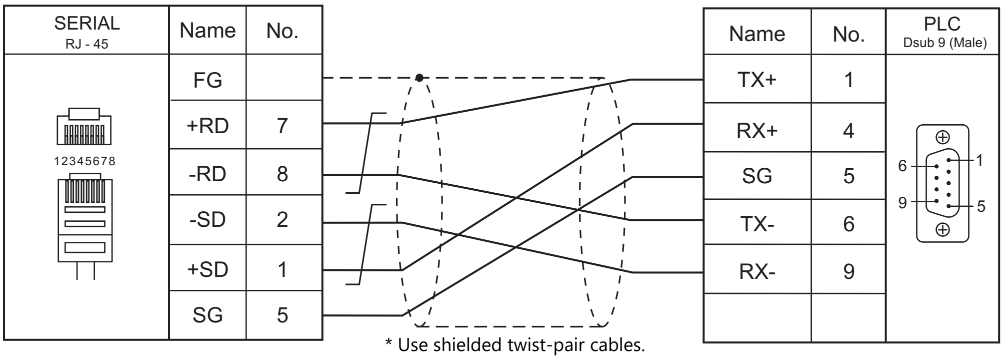


Wiring diagram 2 - M2

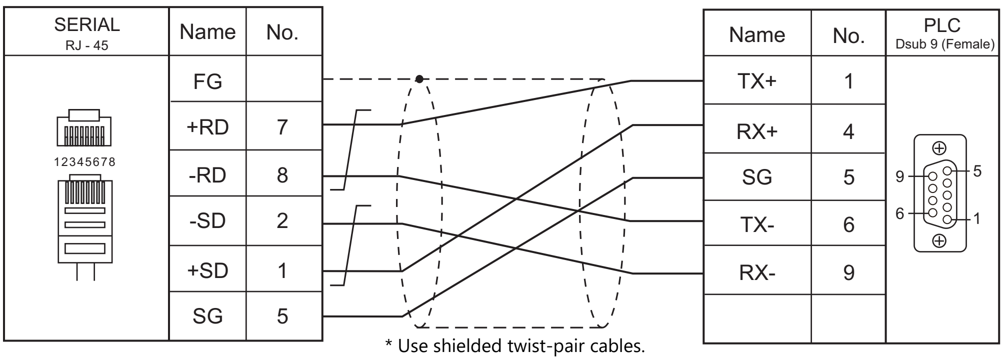


RS-422/RS-485

Wiring diagram 1 - M4



Wiring diagram 2 - M4



Connection Compatibility List

June, 2022

Manufacturer	Models	Applicable Connection Mode 1 : 1	Applicable Connection Mode 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)	○	○
	PXG (MODBUS RTU)	○	○
	PXH (MODBUS RTU)	○	○
	PUM (MODBUS RTU)	○	○
	F-MPC04P (loader)	○	○
	F-MPC series / FePSU	○	○
	FVR-E11S	○	○
	FVR-E11S (MODBUS RTU)	○	○
	FVR-C11S (MODBUS RTU)	○	○
	FRENIC5000 G11S/P11S	○	○
	FRENIC5000 G11S/P11S (MODBUS RTU)	○	○
	FRENIC5000 VG7S (MODBUS RTU)	○	○
	FRENIC-Ace (MODBUS RTU)	○	○
	FRENIC-HVAC/AQUA (MODBUS RTU)	○	○
	FRENIC-Mini (MODBUS RTU)	○	○
	FRENIC-Eco (MODBUS RTU)	○	○
	FRENIC-Multi (MODBUS RTU)	○	○
	FRENIC-MEGA (MODBUS RTU)	○	○
	FRENIC-MEGA SERVO(MODBUS RTU)	○	○
	FRENIC-VG1(MODBUS RTU)	○	○
	FRENIC series (loader)	○	○
	HFR-C9K	○	○
	HFR-C11K	○	○
	HFR-K1K	○	○
	PPMC (MODBUS RTU)	○	○
	FALDIC-α series	○	○
	FALDIC-W series	○	○
	PH series	○	○
	PHR (MODBUS RTU)	○	○
	WA5000	○	○
	APR-N (MODBUS RTU)	○	○
	ALPHA5 (MODBUS RTU)	○	○
	ALPHA5 Smart (MODBUS RTU)	○	○
	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		○
	Q170MCPU (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)	○	○
	FB100/FB400/FB900 (MODBUS RTU)	○	○
RS Automation	NX7/NX Plus Series (70P/700P/CCU+)	○	○
	N7/NX Series (70/700/750/CCU)	○	○
	NX700 Series (Ethernet)	○	○
	X8 Series	○	○
	X8 Series (Ethernet)	○	○
	CSD5 (MODBUS RTU)	○	○
	Moscon-F50 (MODBUS RTU)	○	○
SAIA	PCD 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	○	○
	FA-M3R	○	○
	FA-M3/FA-M3R (Ethernet UDP/IP)	○	○
	FA-M3/FA-M3R (Ethernet UDP/IP ASCII)	○	○
	FA-M3/FA-M3R (Ethernet TCP/IP)	○	○
	FA-M3/FA-M3R (Ethernet TCP/IP ASCII)	○	○
	FA-M3V	○	○
	FA-M3V (Ethernet)	○	○
	FA-M3V(Ethernet ASCII)	○	○
	UT100	○	○
	UT750	○	○
	UT550	○	○
	UT520	○	○
	UT350	○	○
	UT320	○	○
	UT2400/2800	○	○
	UT450	○	○
	UT32A/35A (MODBUS RTU)	○	○
	UT52A/55A (MODBUS RTU)	○	○
	UT75A (MODBUS RTU)	○	○
	μR10000/20000 (Ethernet TCP/IP)	○	○
None	Universal serial	○	○
	General AE-LINK	○	○
	Without PLC Connection		
	MODBUS RTU	○	○
	MODBUS RTU EXT Format	○	○
	MODBUS TCP/IP (Ethernet)	○	○
	MODBUS TCP/IP (Ethernet) Sub Station	○	○
	MODBUS TCP/IP (Ethernet) EXT Format	○	○
	MODBUS ASCII	○	○
	RFID controller (Stepless protocol)	○	
	OPC UA server TCP/IP (Ethernet)	○	

Slave Communication

Manufacturer	Models	Setting	Remarks
None	Universal serial	○	
	V-Link	○	
	Modbus slave (RTU)	○	
	Modbus slave (TCP/IP)	○	
	Modbus slave (ASCII)	○	

Hakko Electronics Co., Ltd.
www.monitouch.com

Sales 890-1, Kamikashiwano-machi, Hakusan-shi, Ishikawa, 924-0035 Japan
TEL +81-76-274-2144 FAX +81-76-274-5136

2217NE2

20600000