Ethernet [Modbus/TCP] Communication Converter

COM-JL [For SRJ] Installation Manual

IMR01Y48-E1

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of the instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.
This manual describes the mounting, wiring and specifications only.

For detailed handling procedures and various function settings, refer to separate **COM-JL [For SRJ] Instruction Manual (IMR01Y51-E□)**.
The manual can be downloaded from the official RKC website:
http://www.rkcinst.com/english/manual_load.htm

■ Product check

COM-JL [For SRJ] Installation Manual (IMR01Y48-E1).....1
COM-JL [For SRJ] Quick Instruction Manual (IMR01Y49-E□).....1
COM-JL [For SRJ] Communication Data List (IMR01Y50-E□).....1

■ Safety precautions

⚠ WARNING

- To prevent injury to persons, damage to the instrument and the equipment, a suitable external protection device shall be required.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to the instrument and the equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to the instrument and the equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction may occur and warranty is void under these conditions.

⚠ CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy plant.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock to operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as a fuse, circuit breaker, etc.
- A malfunction in this product may occasionally make control operations impossible or prevent alarm outputs, resulting in a possible hazard. Take appropriate measures in the end use to prevent hazards in the event of malfunction.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dissipation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration may occur. Use a soft, dry cloth to remove stains from the instrument.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for explanation purpose.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty, expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.
- Various symbols are used on the equipment, and they have the following meaning.
  ⎓ : Direct current ⧈ : Reinforced insulation
  ⚠ : Safety precaution
  This symbol is used where the instruction manual needs to be consulted for the safety of both the operator and the equipment. Carefully read the cautions in this manual before using the instrument.

1. MOUNTING

⚠ WARNING

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

1.1 Mounting Cautions

(1) This instrument is intended to be used under the following environmental conditions. **(IEC 61010-1)** [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: –10 to +50 °C
- Allowable ambient humidity: 5 to 95 %RH
  (Absolute humidity: MAX.W.C 29.3 g/m³ dry air at 101.3 kPa)
- Installation environment conditions: Indoor use,
  Altitude up to 2000 m

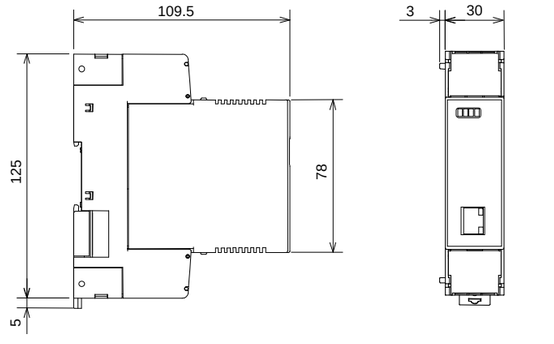
(3) Avoid the following conditions when selecting the mounting location:
- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the mainframe.
- Water, oil, chemicals, vapor or steam splashes.
- Excessive dust, salt or iron particles.
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

(4) Mount this instrument in the panel considering the following conditions:
- Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
- Do not mount this instrument directly above the equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
- If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, cooler, etc. Cooled air should not blow directly on this instrument.
- In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
  High voltage equipment: Do not mount within the same panel.
  Power lines: Separate at least 200 mm.
  Rotating machinery: Separate as far as possible.
- For correct functioning mount this instrument in a horizontal position.

(5) In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

1.2 Dimensions

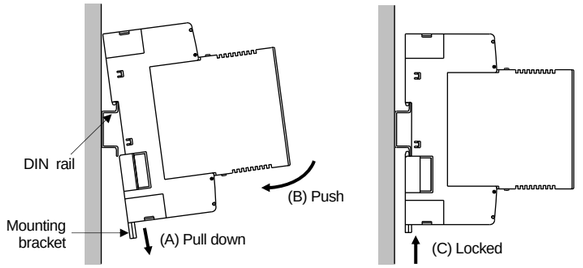
(Unit: mm)



1.3 DIN Rail Mounting and Removing

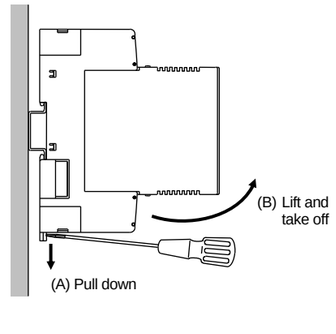
■ Mounting procedures

1. Pull down the mounting bracket at the bottom of the module (A). Attach the hooks on the top of the module to the DIN rail and push the lower section into place on the DIN rail (B).
2. Slide the mounting bracket up to secure the module to the DIN rail (C).



■ Removal procedures

Pull down a mounting bracket with a blade screwdriver (A). Lift the module from bottom, and take it off (B).



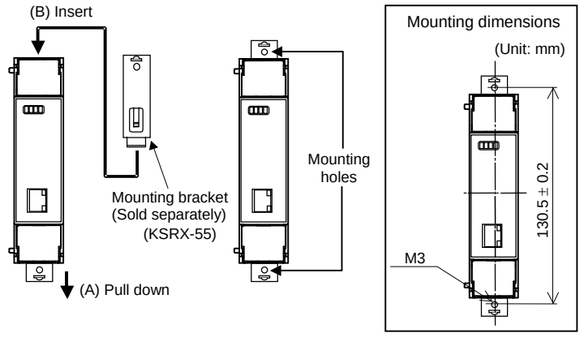
1.4 Panel Mounting

■ Mounting procedures

1. Pull down the mounting bracket (A) until locked and that a mounting hole appears.
2. Prepare one mounting bracket per instrument (B) sold separately (KSRX-55) and then insert it in the rear of the terminal board at top of the instrument until locked but a mounting hole does not disappear.
3. Mount each module directly on the panel with screws which are inserted in the mounting holes of the top and bottom mounting brackets.

   Recommended tightening torque: 0.3 N·m (3 kgf·cm)

The customer needs to provide the M3 size screws. Select the screw length that matches the mounting panel.



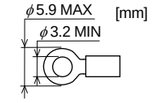
2. WIRING

⚠ WARNING

To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

2.1 Wiring Cautions

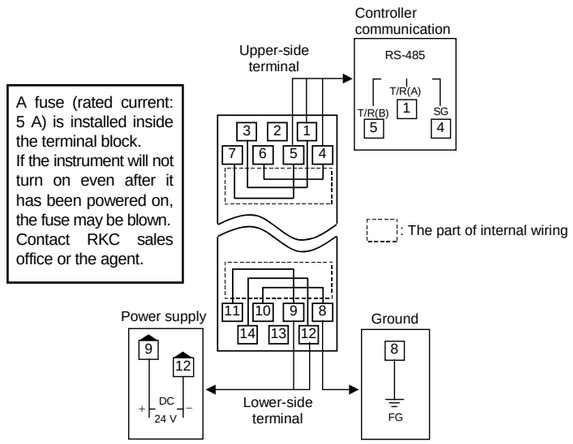
- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
  - Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
  - Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
  - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply input, supply power from "SELV" circuit defined as IEC 60950-1.
- A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
- Use the solderless terminal appropriate to the screw size.
  Screw size: M3 × 6 (with 5.8 × 5.8 square washer)
  Recommended tightening torque:
  0.4 N·m [4 kgf·cm]
  Specified dimension:
  Refer to Fig. at the right



- Make sure that during field wiring parts of conductors cannot come into contact with adjacent conductive parts.

2.2 Terminal Configuration

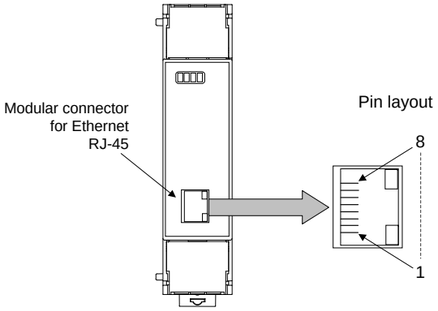
A fuse (rated current: 5 A) is installed inside the terminal block.
If the instrument will not turn on even after it has been powered on, the fuse may be blown. Contact RKC sales office or the agent.



- As controller communication terminal Nos. 1, 4 and 5 are internally connected to terminal Nos. 3, 6 and 7, any terminals can be used.
- As ground and power supply terminal Nos. 8, 9 and 12 are internally connected to terminal Nos. 10, 11 and 14, any terminals can be used.
- Terminal No. 2 and No. 13 is not used.

2.3 Connection to Ethernet

■ Pin layout of connector



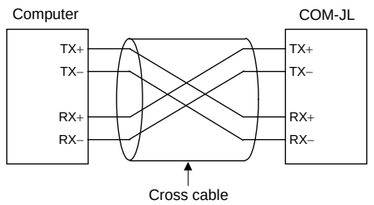
Pin No.	Signal name	Symbol
1	Send data +	TX+
2	Send data –	TX–
3	Receive data +	RX+
4	Unused	—
5	Unused	—
6	Receive data –	RX–
7	Unused	—
8	Unused	—

The cable must be provided by the customer.
Used cable: The cable is based on the 10BASE-T or the 100BASE-TX standard of Ethernet.
Used connector: RJ-45 type

■ Wiring example

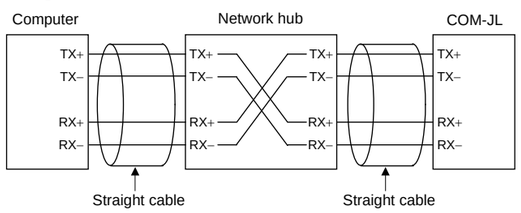
● When directly connected to client

Use a cross cable when directly connected to the client (such as computer).



● When use network hub

Use straight cables when connected to the network hub.

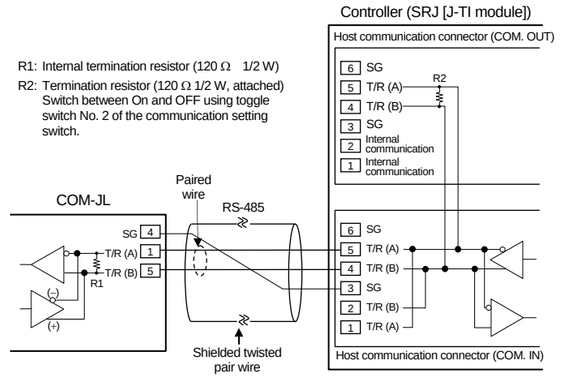


Cross cables may be used depending on the connecting device used. Therefore, follow the instructions for the respective device.

2.4 Connection to the Controllers

Conduct wiring between the COM-JL and controller (SRJ) as shown in the following.

■ Connection diagram

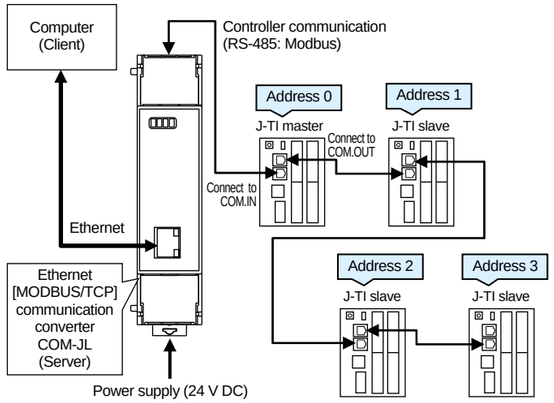


Up to 4 J-TI modules can be connected

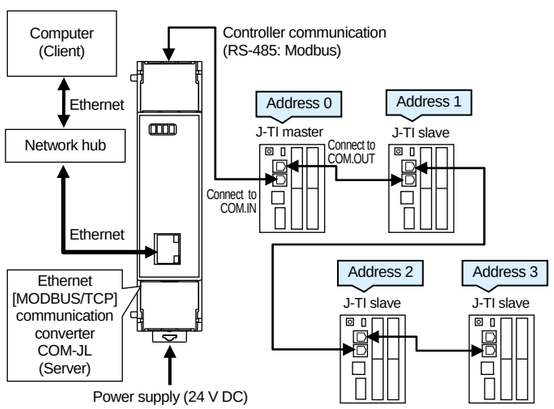
- The cable must be provided by the customer.
- The termination resistor existing within the COM-JL can be connected or disconnected by the switch. (Factory set value: Termination resistor connected)

2.5 System Configuration Example

■ When directly connected to client



■ When use network hub



The data request side (such as computer) is called “client” and the data response (supply) side (COM-JL) is called “server.”

Basically, one client corresponds to one server (COM-JL) (i.e. one to one). However, one client can communicate with two or more servers depending on the program on the client side, but two or more clients cannot communicate with one server.

3. SPECIFICATIONS

■ Ethernet communication

Physical layer:	Ethernet
	10BASE-T/100BASE-TX automatic recognition
Application layer:	Modbus/TCP
Communication data:	Based on Modbus message format
Connector type:	RJ-45

■ Controller communication

Interface:	Based on RS-485, EIA standard
Connection method:	2-wire system, half-duplex multi-drop connection
Synchronous method:	Start/Stop synchronous type
Protocol:	Modbus-RTU
Communication speed:	9600 bps, 19200 bps, 38400 bps
Data bit configuration:	Data 8-bit, Without parity, Stop 1-bit
Maximum connections:	Four J-TI modules *
	* Up to a single J-TI master and three J-TI slaves can be connected.

■ General specifications

Power supply voltage:	21.6 to 26.4 V DC [Including power supply voltage variation] (Rating 24 V DC)
Current consumption (at maximum load):	110 mA max. (at 24 V DC) Rush current: 12 A or less
Allowable ambient temperature:	–10 to +50 °C
Allowable ambient humidity:	5 to 95 %RH (Absolute humidity: MAX.W.C 29.3 g/m^3 dry air at 101.3 kPa)
Installation environment conditions:	Indoor use Altitude up to 2000 m
Weight:	Approx. 180 g

■ Standard

Safety standard:	UL:	UL 61010-1
	cUL:	CAN/CSA-C22.2 No.61010-1
CE marking:	LVD:	EN61010-1
	EMC:	EN61326-1
RCM:		EN55011

4. MODEL CODE

COM- JL - 1 ＊ 05
(1) (2)

(1) Communication type
1: Modbus/TCP

(2) Corresponding to the RKC controller
05: SRJ (J-TI)

The first edition: SEP. 2017 [IMQ00]

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