

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

This manual describes the handling precautions, mounting, wiring and specifications only. For the basic operations, see **COM-JL [For FB100/FB400/FB900] Quick Instruction Manual (IMR01Y15-EC)**. For the detail handling procedures and various function settings, please refer to separate **COM-JL [For FB100/FB400/FB900] Instruction Manual (IMR01Y10-EC)**.



The above manuals can be downloaded from our website:
URL: http://www.rkcinst.com/english/manual_load.htm

Product Check

COM-JL [For FB100/FB400/FB900] Installation Manual (IMR01Y05-E4).....	1
COM-JL [For FB100/FB400/FB900] Quick Instruction Manual (IMR01Y15-EC)	1
COM-JL [For FB100/FB400/FB900] Communication Data List (IMR01Y21-EC).....	1

Safety Precautions



WARNING

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and 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 can 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.)
- 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 by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- 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 will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- Do not connect modular connectors to telephone line.

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 purpose of illustration.
- 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.

1. MOUNTING



WARNING

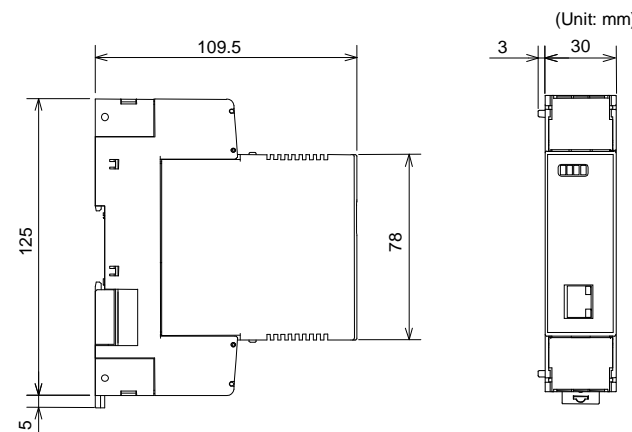
To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

1.1 Mounting Cautions

- (1) This instrument is intended to be used under the following environmental conditions. **(IEC61010-1)** [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 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.
 - (5) If this instrument is permanently connected to equipment, it is important to include a switch or circuit-breaker into the installation. This should be in close proximity to the equipment and within easy reach of the operator. It should be marked as the disconnecting device for the equipment.

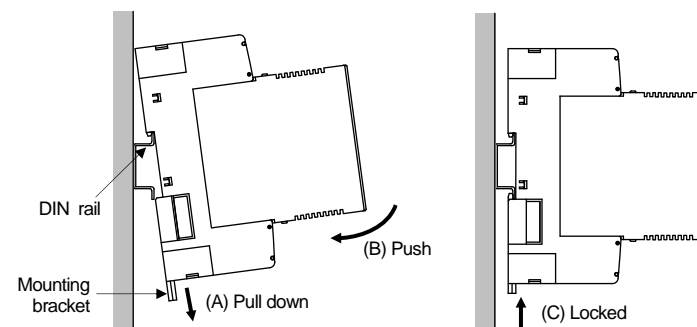
1.2 Dimensions



1.3 DIN rail Mounting

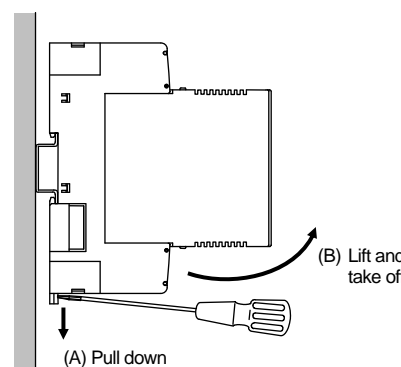
Mounting procedures

1. Pull down the mounting bracket at the bottom of the instrument (A). Attach the hooks on the top of the instrument 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 instrument to the DIN rail (C).



Removal procedures

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



1.4 Panel Mounting

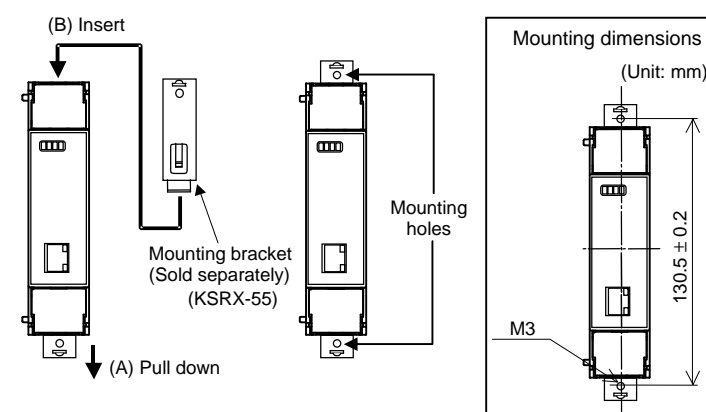
Mounting procedures

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

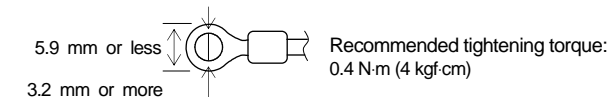


WARNING

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.

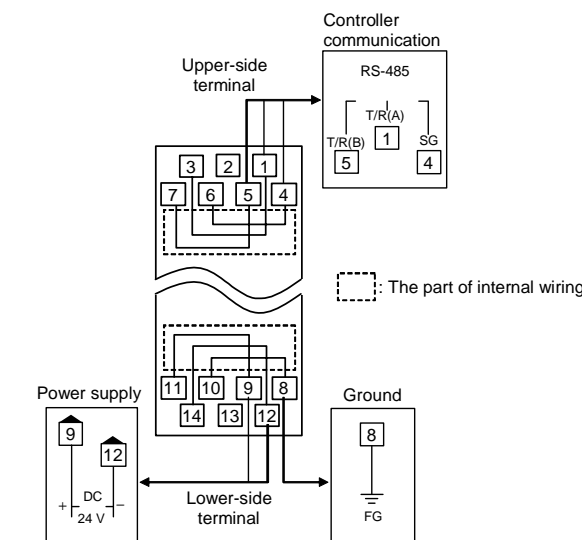
2.1 Wiring Cautions

- 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, supply power from a SELV circuit.
- 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 (M3).



- Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.

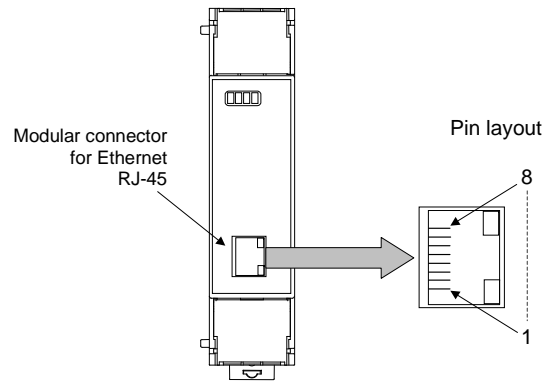
2.2 Terminal Configuration



- 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



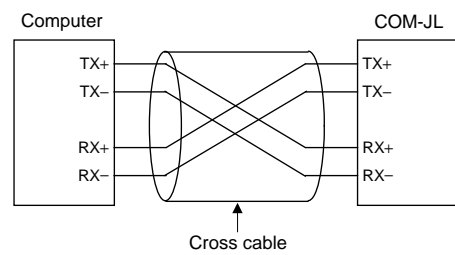
Pin No.	Signal name	Symbol
1	Send data +	TX+
2	Send data -	TX-
3	Receive data +	RX+
4	Unused	—
5	Unused	—
6	Receive data -	RX-
7	Unused	—
8	Unused	—

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

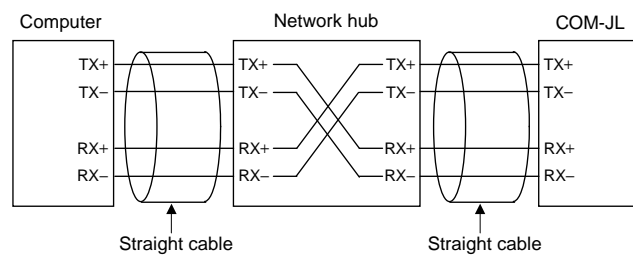
When directly connected to client

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



When use network hub

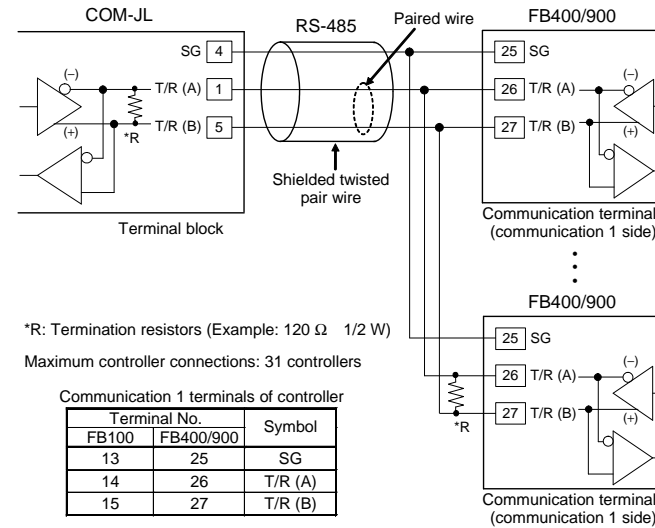
Use straight cables when connected to the network hub.



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 (FB100/400/900) as shown in the following. (When conducting wiring to the FB100/400/900, always conduct wiring to the Communication 1 terminal.)



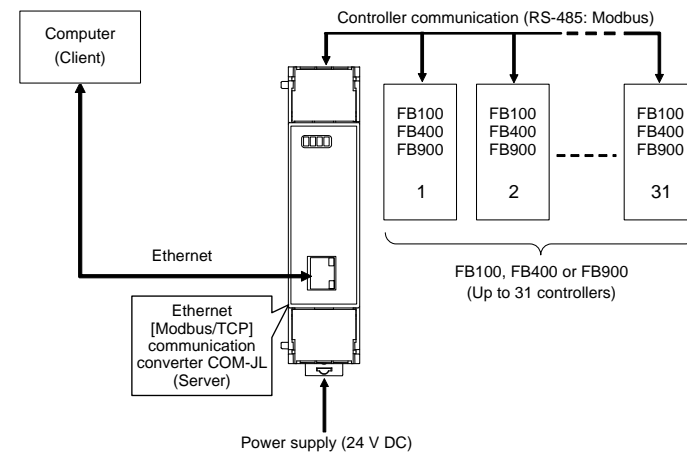
*R: Termination resistors (Example: 120 Ω 1/2 W)
 Maximum controller connections: 31 controllers

Communication 1 terminals of controller

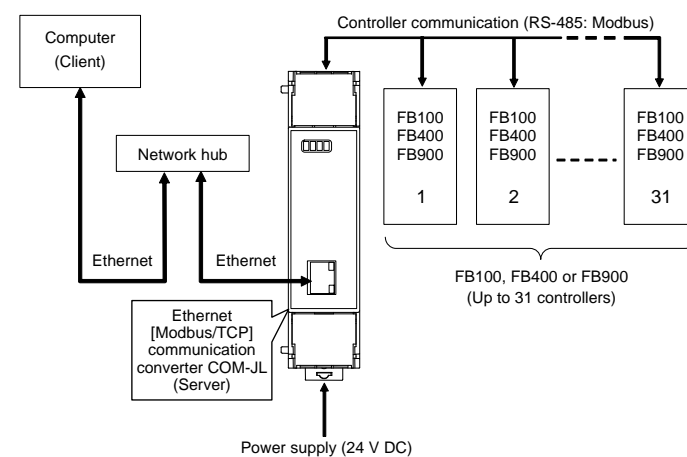
- The cable must be provided by the customer.
- The termination resistor existing within the COM-JL can be connected or disconnected by the switch. (Factory set value: Termination resistor connected)

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
 Protocol: Modbus-RTU
 Communication speed: 9600 bps, 19200 bps, 38400 bps
 Data bit configuration: Data 8-bit, Without parity, Stop 1-bit
 Maximum connections: 31 controllers (FB100/400/900)

General specifications

Power supply voltage: 24 V DC
 Power supply voltage range: 21.6 to 26.4 V DC
 Current consumption: 110 mA max.
 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
 Weight: Approx. 180 g

Standard

Safety standard: UL: UL61010-1
 cUL: CAN/CSA-C22.2 No.61010-1
 CE marking: LVD: EN61010-1
 EMC: EN61326-1
 RCM: EN55011

4. MODEL CODE

COM-JL-1 * 01
 (1) (2)

(1) Communication type
 1: Modbus/TCP

(2) Corresponding to the RKC controller
 01: FB100/400/900

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 HEADQUARTERS: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN
 PHONE: 03-3751-9799 (+81 3 3751 9799) E-mail: info@rkcinst.co.jp
 FAX: 03-3751-8585 (+81 3 3751 8585) DEC. 2015