Module Type Controller SRZ

Communication Extension Module

Z-COM

Installation Manual

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 mounting, wiring and specifications only. For the basic operations, see Z-COM PLC Communication Quick Instruction Manual (IMS01T14-E □), Z-COM PLC Communication Data List (IMS01T15-E □) and Z-COM Host Communication Quick Instruction Manual (IMS01T09-E □). For the detail handling procedures and various function settings, please refer to separate Z-COM Instruction Manual (IMS01T07-E □).

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

■ Accessories check

Z-COM Installation Manual (This manual)	1
Z-COM PLC Communication Quick Instruction Manual (IMS01T14-E □)	1
Z-COM PLC Communication Data List (IMS01T15-E □)	1
Z-COM Host Communication Quick Instruction Manual (IMS01T09-E □)	1
Joint connector cover (KSRZ-517A)	2
Power terminal cover (KSRZ-518A)	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.
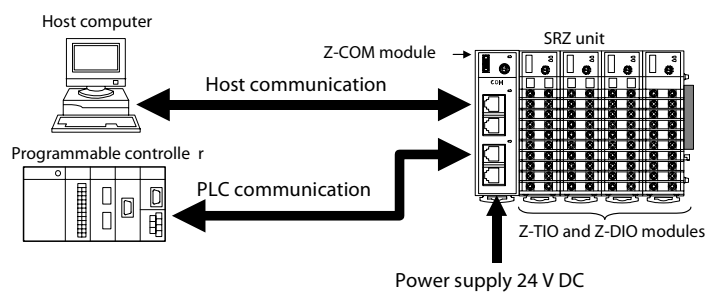
CAUTION

● This 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 adequate 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.
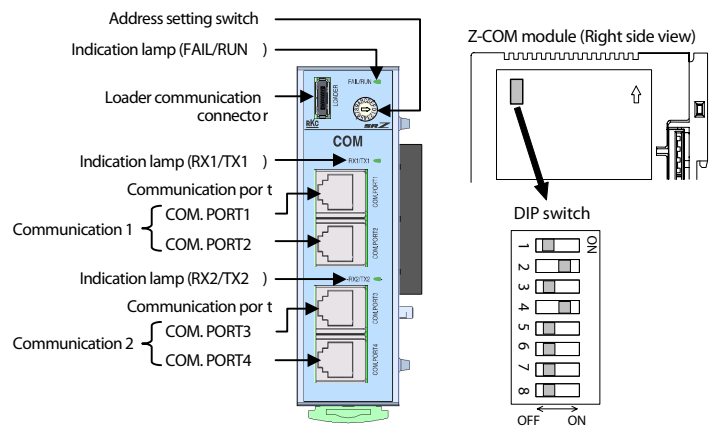
NOTICE

● 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.

The Z-COM module joins with functional modules (Z-TIO, Z-DIO modules) and performs PLC communication and host communication. The combination of Z-COM module and functional module is called an SRZ unit.
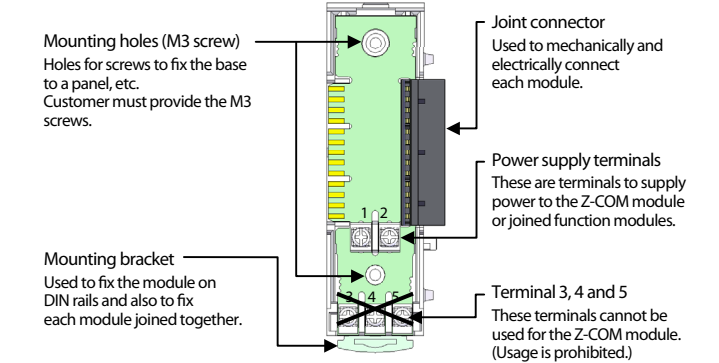

1. PARTS DESCRIPTION

■ Module mainframe

Indication lamp

FAIL/RUN [Green or Red]	When normal:	A green lamp is on (RUN)
	Self-diagnostic error:	A green lamp flashes (FAIL)
	Instrument abnormality:	A red lamp is on (FAIL)
RX1/TX1 [Green]	The green lamp is lit when data corresponding to communication 1 (COM. PORT1/COM. PORT2) is sent or received.	
RX2/TX2 [Green]	The green lamp is lit when data corresponding to communication 2 (COM. PORT3/COM. PORT4) is sent or received.	

Communication port (modular connector) and Communication connector

COM. PORT1 (Communication 1)	Used to connecting the Operation panel or Host computer. [RS-485 or RS-422A]
COM. PORT2 (Communication 1)	The COM. PORT2 is used for the extension of the SRZ unit. [RS-485 or RS-422A]
COM. PORT3 (Communication 2)	Used to connecting the programmable controller (PLC), Operation panel or Host computer. [RS-485 or RS-422A]
COM. PORT4 (Communication 2)	The COM. PORT4 is used for the extension of the SRZ unit. [RS-485 or RS-422A]
Loader communication connector	This is a connector to be connected to converter and personal computer when loader communication is performed.

Switch

Address setting switch	Set unit address of SRZ unit with address setting switch.
DIP switch	• Sets communication speed, communication protocol and data bit configuration corresponding to each of communication 1 and communication 2. • Sets dip switch setting validity/invalidity.

■ Base

Mounting holes (M3 screw)
Holes for screws to fix the base to a panel, etc.
Customer must provide the M3 screws.

Joint connector
Used to mechanically and electrically connect each module.

Power supply terminals
These are terminals to supply power to the Z-COM module or joined function modules.

Mounting bracket
Used to fix the module on DIN rails and also to fix each module joined together.

Terminal 3, 4 and 5
These terminals cannot be used for the Z-COM module. (Usage is prohibited.)

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2. MOUNTING

⚠ **WARNING**

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

2.1 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) Take the following points into consideration when mounting this instrument in the panel.
  • 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, or the like. However, do not allow cooled air to blow this instrument directly.
  • 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.
  • Be sure the Z-COM module and functional modules (Z-TIO, Z-DIO) are joined when using them.
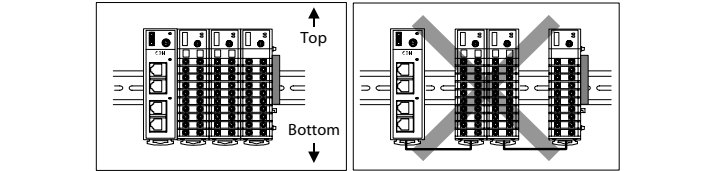
(5) This instrument is Permanently connected to equipment, please take the following points.
  • A switch or circuit-breaker shall be included in the building installation.
  • It shall be in close proximity to the equipment and within easy reach of the operator.
  • It shall be marked as the disconnecting device for the equipment.

2.2 Joining Each Module

📖 Before joining the Z-COM module and functional modules, use the DIP switches to make the communication settings. For the setting procedure, see Z-COM PLC Communication Quick Instruction Manual (IMS01T14-E □).

The maximum number of functional modules (Z-TIO-A/B, Z-DIO) described in the following can be joined per Z-COM module. For details on joining functional modules with the Z-COM module, see the Z-TIO INSTRUCTION MANUAL (IMS01T01-E □).

• When joining functional modules of the same type: Up to 16 modules
• When joining functional modules of two or more different types: Up to 31 modules (However, the maximum joinable number of functional modules of the same type is 16.)

[Example] When the Z-TIO-A/B and Z-DIO modules are joined

SRZ unit
16 Z-TIO-A/B modules
15 Z-DIO modules
Functional modules: Up to 31 modules
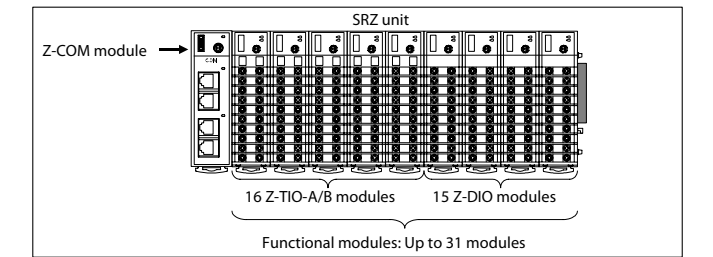
📖 When the number of correspondence channels is specified using the model code, only the amount of data corresponding to the specified number of channels can be sent or received (PLC communication only).

The number of the correspondence channels	Z-TIO-A/B module	Z-DIO module
64 channels	64 channels (However, up to 16 modules)	128 channels (Up to 16 modules)
48 channels	48 channels (However, up to 16 modules)	96 channels (Up to 12 modules)
32 channels	32 channels	64 channels (Up to 8 modules)
16 channels	16 channels	32 channels (Up to 4 modules)

2.3 Dimensions

(Unit: mm)
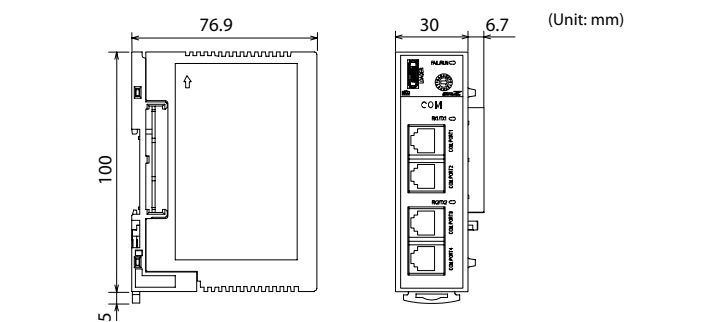
● Space required between each module vertically

When the module is mounted on the panel, allow a minimum of 50 mm at the top and bottom of the module to attach the module to the mainframe.

● Depth for communication cables mount type module

Space for communication cables must be considered when installing.
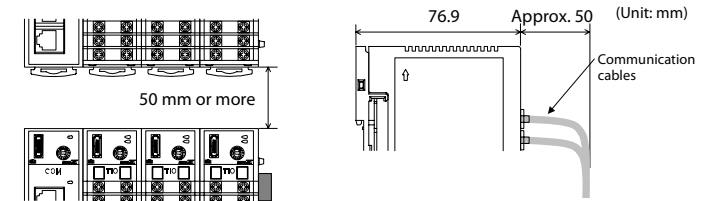
■ Procedure for mounting or removing

The procedure for mounting or removing the Z-COM module is the same as that of the function module (Z-TIO or Z-DIO). Both DIN rail mounting and screw mounting are available.
For details on module mounting or removing, see the Z-TIO INSTRUCTION MANUAL (IMS01T01-E □).
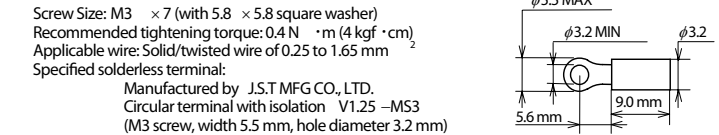
3. WIRING

⚠ **WARNING**

To prevent electric shock or instrument failure, do not turn on the power until all the wiring is completed.

3.1 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 the end-use equipment.
  The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
• Supply the power to only one of the joined modules. When power is supplied to any one of the joined modules, all of the joined modules will receive power.
• Select the power capacity which is appropriate for the total power consumption of all joined modules and the initial current surge when the power is turned on.
  Power consumption (at maximum load): 30 mA max. (at 24 V DC)
  Rush current: 10 A or less
• When connecting the wiring to the power supply terminals on the base, use the specified solderless terminals. Only these specified solderless terminals can be used due to the insulation between the terminals.
  Screw Size: M3 × 7 (with 5.8 × 5.8 square washer)
  Recommended tightening torque: 0.4 N·m (4 kgf·cm)
  Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm²
  Specified solderless terminal:
    Manufactured by J.S.T MFG CO., LTD.
    Circular terminal with isolation V1.25 –MS3
    (M3 screw, width 5.5 mm, hole diameter 3.2 mm)

3.2 Terminal Configuration

■ Base

Power supply terminals

Supply the power to only one of the joined modules.
When power is supplied to any one of the joined modules, all of the joined modules will receive power.
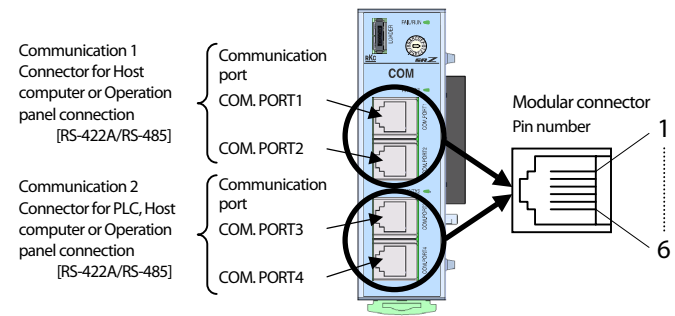
Terminals 3, 4 and 5 (Usage is prohibited.)

(Continued on the next page ➜)
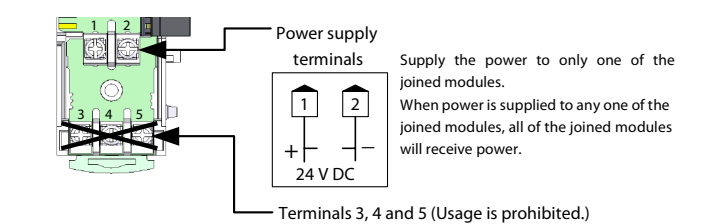
3.3 Contents of the Communication Port

The contents of the modular connector signal are all the same from COM.PORT1 to COM.PORT4.

Communication 1
Connector for Host computer or Operation panel connection
[RS-422A/RS-485]
COM.PORT1
COM.PORT2

Communication 2
Connector for PLC, Host computer or Operation panel connection
[RS-422A/RS-485]
COM.PORT3
COM.PORT4

Communication port

Modular connector
Pin number
1 ... 6

Z-COM module internal block diagram

The Z-COM module's COM.PORT is internally connected.
Two systems are used for communication.

Communication 1 — COM.PORT1, COM.PORT2
Communication 2 — COM.PORT3, COM.PORT4
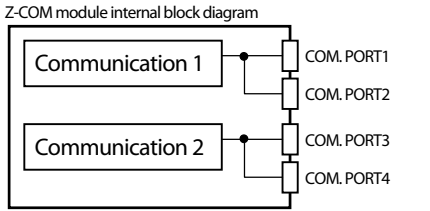
■ RS-422A

Pin No.	Signal name	Symbol
1	Receive data	R (A)
2	Receive data	R (B)
3	Signal ground	SG
4	Send data	T (B)
5	Send data	T (A)
6	Signal ground	SG

■ RS-485A

Pin No.	Signal name	Symbol
1	Send/receive data	T/R (A)
2	Send/receive data	T/R (B)
3	Signal ground	SG
4	Unused	—
5	Unused	—
6	Signal ground	SG

The six-pin type modular connector should be used for the connection to the Z-COM module. (Recommended manufacturer and model: Hirose Electric, TM4P-66P)

3.4 Example of Connection to PLC

Up to four SRZ units can be multi-drop connected to one PLC communication port.
Customer is requested to prepare a communication cable fit for the Z-COM to be connected by the PLC.
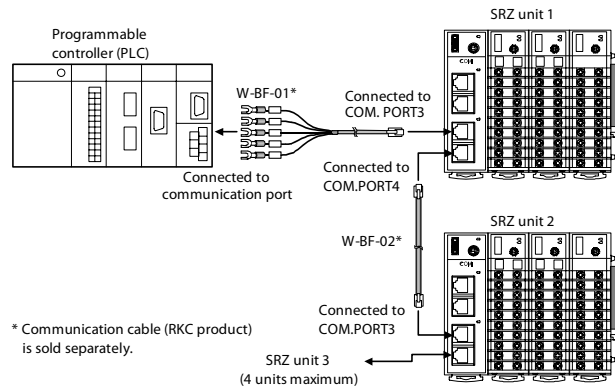
SRZ unit 1
SRZ unit 2
SRZ unit 3 (4 units maximum)

* Communication cable (RKC product) is sold separately.

If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors to the Z-COM module and the other party unit.
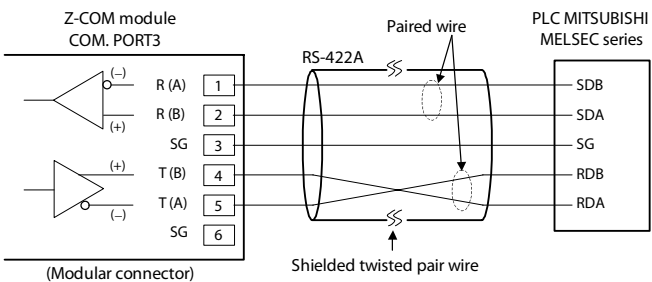☞ For termination resistor of Z-COM modules, see 3.6 Z-COM Module Termination Resistor.
☞ For the termination resistor of PLC side, see the PLC Instruction Manual.

■ RS-422A
● MITSUBISHI MELSEC series

Z-COM module COM. PORT3 / PLC MITSUBISHI MELSEC series

	R (A)	1	SDB
	R (B)	2	SDA
	SG	3	SG
	T (B)	4	RDB
	T (A)	5	RDA
	SG	6	

(Modular connector) — Paired wire — Shielded twisted pair wire

When preparing a cable of connecting the computer link module belonging to the MITSUBISHI MELSEC series to our Z-COM module, cross each pair of wires the A and B terminal positions on their terminal boards are not symmetrical.

● OMRON SYSMAC series

Z-COM module COM. PORT3 / OMRON PLC SYSMAC series

	R (A)	1	SDB
	R (B)	2	SDA
	SG	3	SG
	T (B)	4	RDB
	T (A)	5	RDA
	SG	6	

(Modular connector) — Paired wire — Shielded twisted pair wire

■ RS-485
● MITSUBISHI MELSEC series

Z-COM module COM. PORT3 / PLC MITSUBISHI MELSEC series

	T/R (A)	1	SDB
	T/R (B)	2	SDA
	SG	3	SG
		4	RDB
		5	RDA
	SG	6	

*R: Termination resistor (PLC side)

(Modular connector) — Paired wire — Shielded twisted pair wire

3.5 Example of Connection to the Host Computer

Up to 16 SRZ units can be connected to a host computer communication port. The communication cable must be provided by the customer.

RS-232C/RS-422A converter COM-A (RKC product)
RS-422A
SRZ unit 1
SRZ unit 2
SRZ unit 3 (16 units maximum)

Connected to COM.PORT1
Connected to COM.PORT2
W-BF-02*

RS-232C
Host computer
W-BF-28*

* Communication cable (RKC product) is sold separately.

If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors to the Z-COM module and the other party unit.
☞ For termination resistor of Z-COM modules, see 3.6 Z-COM Module Termination Resistor.
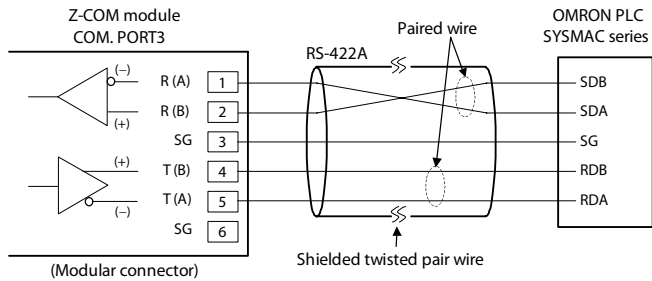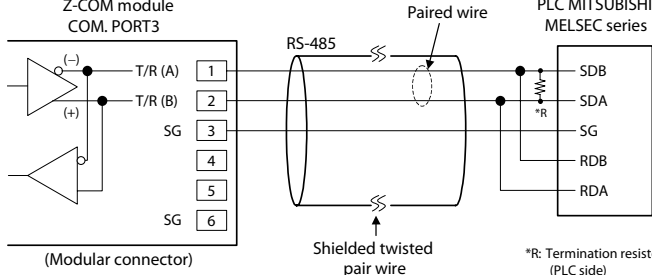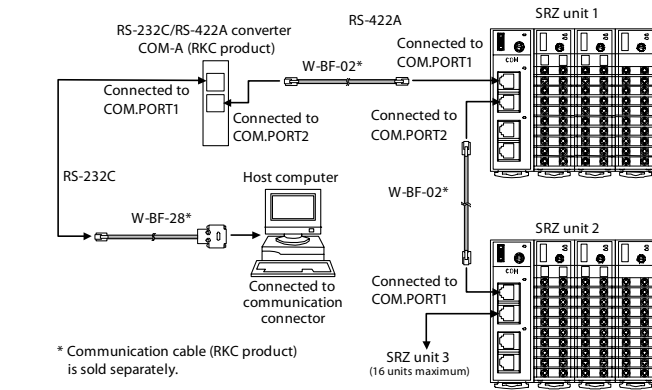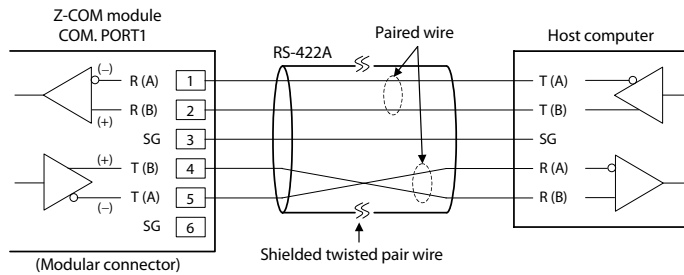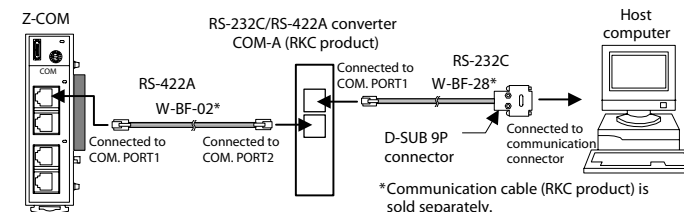☞ For the termination resistor of PLC side, see the PLC Instruction Manual.

■ RS-422A
● When the interface of host computer is RS-422A

Z-COM module COM. PORT1 / Host computer

	R (A)	1	T (A)
	R (B)	2	T (B)
	SG	3	SG
	T (B)	4	R (A)
	T (A)	5	R (B)
	SG	6	

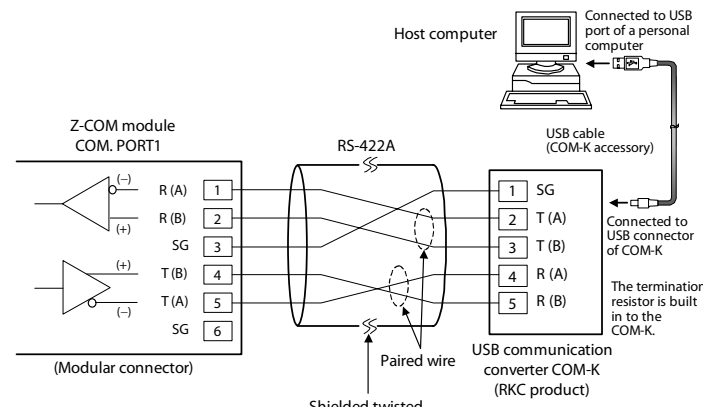(Modular connector) — Paired wire — Shielded twisted pair wire

● When the interface of host computer is RS-232C (RS-232C ↔ RS-422A)

When the interface of host computer is RS-232C, connect the RS-232C/RS-422A converter between the host computer and the Z-COM.
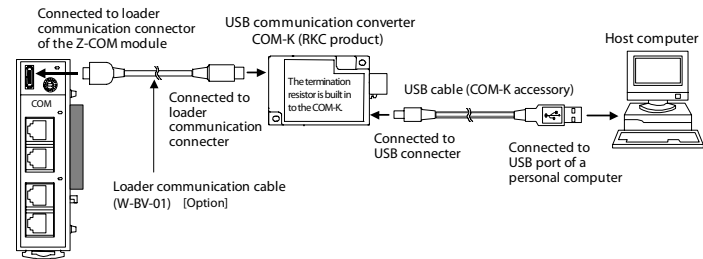
Z-COM — RS-232C/RS-422A converter COM-A (RKC product) — RS-232C — Host computer
RS-422A W-BF-02*
Connected to COM. PORT1
Connected to COM. PORT2
D-SUB 9P connector W-BF-28*

*Communication cable (RKC product) is sold separately.

● When the host computer has a USB connector

When the host computer has a USB connector, connect the USB communication converter between the host computer and the Z-COM module.
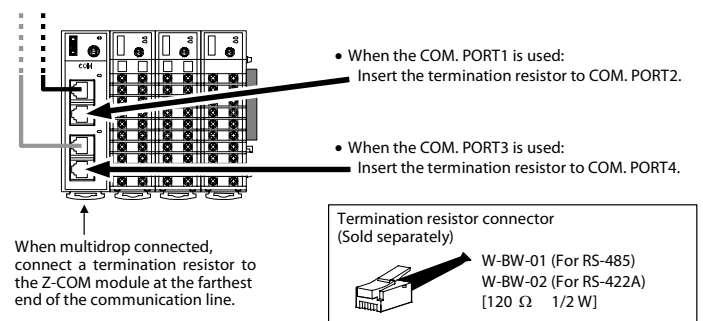
Host computer
USB cable (COM-K accessory)
Connected to USB port of a personal computer

Z-COM module COM. PORT1

	R (A)	1	1	SG
	R (B)	2	2	T (A)
	SG	3	3	T (B)
	T (B)	4	4	R (A)
	T (A)	5	5	R (B)
	SG	6		

RS-422A
Connected to USB connector of COM-K
The termination resistor is built in to the COM-K.

(Modular connector) — Paired wire — Shielded twisted pair wire

USB communication converter COM-K (RKC product)

■ Loader communication

Connect a USB communication converter between the host computer and the Z-COM module.

Connected to loader communication connector of the Z-COM module
USB communication converter COM-K (RKC product)
Host computer

Connected to loader communication connecter
The termination resistor is built in to the COM-K.
Connected to USB connector
USB cable (COM-K accessory)
Connected to USB port of a personal computer

Loader communication cable (W-BV-01) [Option]

3.6 Z-COM Module Termination Resistor

If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors to the Z-COM module and the other party unit.

● When the COM. PORT1 is used:
  Insert the termination resistor to COM. PORT2.
● When the COM. PORT3 is used:
  Insert the termination resistor to COM. PORT4.

When multidrop connected, connect a termination resistor to the Z-COM module at the farthest end of the communication line.

Termination resistor connector (Sold separately)
W-BW-01 (For RS-485)
W-BW-02 (For RS-422A)
[120 Ω 1/2 W]

4. SPECIFICATIONS

■ PLC communication

Interface: Base on RS-422A, EIA standard
Base on RS-485, EIA standard

Protocol:
● MITSUBISHI MELSEC series special protocol (type 4)
  – A compatible, 1C frame, ACPU common command (WR/WW) (A series, FX2N/FX2NC series or FX3U/FX3UC series)
  – A compatible, 1C frame, AnA/AnUCPU common command (QR/QW) (AnA/QnA series, Q series) D register, R register, W register, ZR register
● OMRON SYSMAC series special protocol
  – C mode command (RD/WD) DM register, EM register (Specify the bank No. +10), EM register (Specify the current bank)

Communication speed: 4800 bps, 9600 bps, 19200 bps, 38400 bps
Maximum connections: Four SRZ units per communication port of PLC
Usable PLC type:
● MITSUBISHI MELSEC series
  – Computer link unit AJ71UC24, A1SJ71UC24-R4, A1SJ71C24-R4, etc. The unit which can use AnA/AnUCPU common command (type 4) can use.
  – Serial communication unit AJ71QC24N, A1SJ71QC24N, QJ71C24, etc. The unit which can use AnA/AnUCPU common command (type 4) can use.
  – Adapter FX0N-485ADP, FX2NC-485ADP, FX3U-485ADP
  – Expanded function board FX2N-485BD, FX3U-485-BD

● OMRON SYSMAC series
  – High-order link unit C200H-LK202-V1, C500-LK203, C120-LK202-V1 (SYSMAC C series), etc.
  – CPU unit with a built-in communication port CPU unit of SYSMAC CS1 series and CJ1 series
  – Serial communication board CS1W-SCB41 (SYSMAC CS1 series), CJ1W-SCU41 (SYSMAC CJ1 series), etc.

■ Host communication
Interface: Base on RS-422A, EIA standard
Base on RS-485, EIA standard
Protocol: RKC communication or Modbus-RTU
Communication speed: 4800 bps, 9600 bps, 19200 bps, 38400 bps
Maximum connections: Sixteen SRZ units per communication port of Host computer

■ General specifications
Power supply voltage: 24 V DC
Power supply voltage range: 21.6 V to DC 26.4 V DC [Including power supply voltage variation]
Current consumption: 30 mA max. Rush current: 10 A or less
Allowable ambient temperature: −10 to +50 ℃
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. 110 g

■ Standard
Safety standard: UL: UL61010-1
cUL: CAN/CSA-C22.2 No. 61010-1
CE marking: LVD: EN61010-1
OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2, Class II (Reinforced insulation)
EMC: EN61326
C-Tick: AS/NZS CISPR11 (equivalent to EN55011)

5. MODEL CODE

Z - C O M - A - □ □ □ □ □ □
(1) (2) (3) (4) (5) (6)

Code (4) to (6) are for quick start codes to specify software configurable settings. If not specified, these codes will not be printed on labels and all settings will be factory default.

(1) Communication 1 (COM. PORT1, COM. PORT2)
  4: RS-422A   5: RS-485

(2) Communication 2 (COM. PORT3, COM. PORT4)
  4: RS-422A   5: RS-485

(3) Quick start code (Communication protocol selection)
  N*: No quick start code (Configured as factory default)
  1: Specify quick start code 1

(4) Communication 1 protocol (COM. PORT1, COM. PORT2) [Quick start code 1]
  No code: No specify quick start code
  1: RKC communication (ANSI X3.28)
  2: Modbus

(5) Communication 2 protocol (COM. PORT3, COM. PORT4) [Quick start code 1]
  No code: No specify quick start code
  1: RKC communication (ANSI X3.28)
  2: Modbus
  3: MITSUBISHI MELSEC series special protocol (PLC communication) AnA/AnUCPU common command (QR/QW) (AnA/QnA series, Q series)
  4: OMRON SYSMAC series special protocol (PLC communication)
  5: MITSUBISHI MELSEC series special protocol (PLC communication) ACPU common command (WR/WW) (A series, FX2N/FX2NC series or FX3U/FX3UC series)

(6) The number of the correspondence channels (Only PLC communication)
  No code: No specify quick start code
  A: 16 CH
  B: 32 CH
  C: 48 CH
  D: 64 CH

* Factory set value when there is not specification of quick start code:
Communication 1/communication 2   RKC communication
The number of the correspondence channels: 64 CH

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