

Module Type Controller SRZ

Communication Extension Module

All Rights Reserved, Copyright © 2006, RKC INSTRUMENT INC.


Installation Manual

Z-COM

IMS01T05-E3


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

■ Product 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

 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.

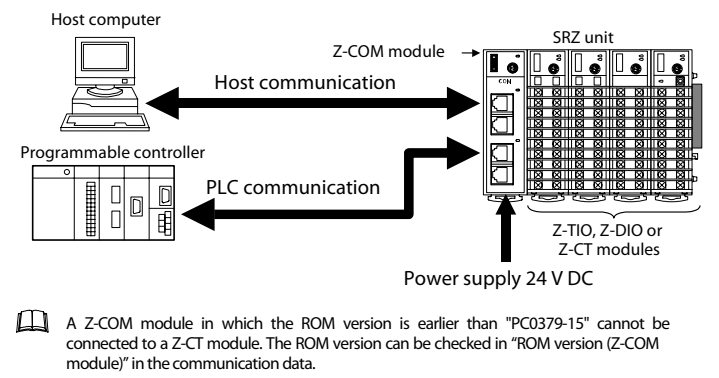
CAUTION


- 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 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.

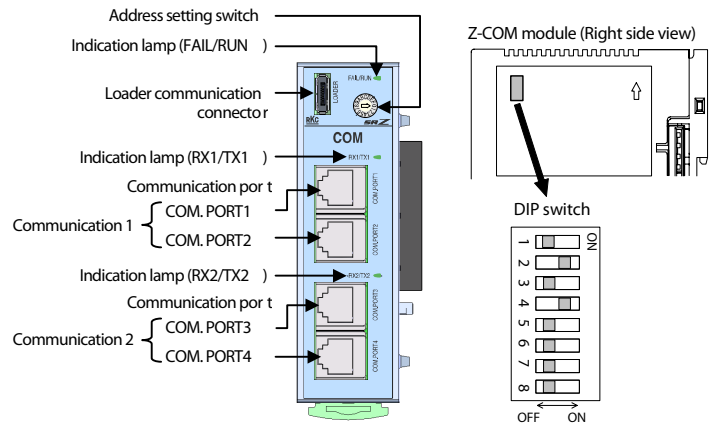
NOTICE

- 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 or Z-CT modules) and performs PLC communication and host communication. The combination of Z-COM module and functional module is called an SRZ unit.



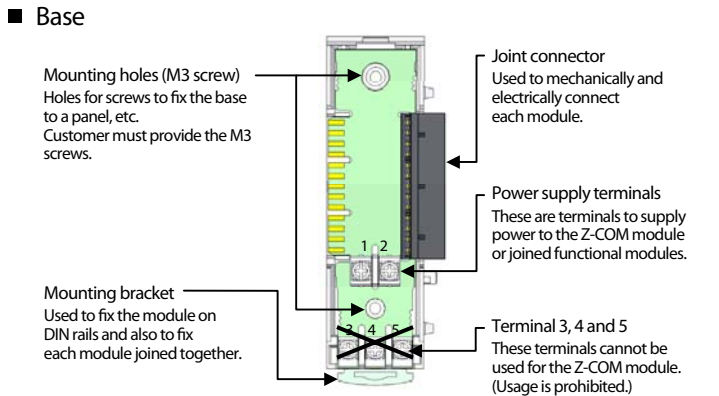
 A Z-COM module in which the ROM version is earlier than "PC0379-15" cannot be connected to a Z-CT module. The ROM version can be checked in "ROM version (Z-COM module)" in the communication data.




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	<ul style="list-style-type: none">● Sets communication speed, communication protocol and data bit configuration corresponding to each of communication 1 and communication 2.● Sets dip switch setting validity/invalidity.	

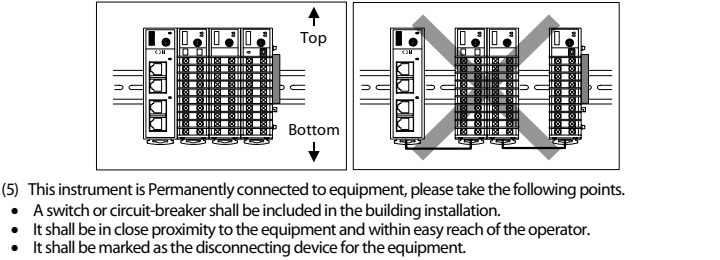


 WARNING


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 or Z-CT modules) are joined when using them.



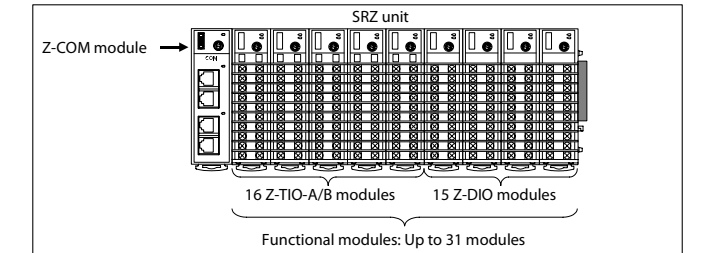
2.2 Joining Each Module


 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 or Z-CT modules) 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

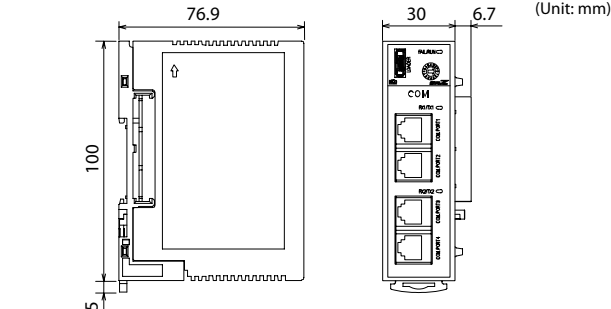


 When the number of correspondence channels is specified using the model code, only the amount of data corresponding to the specified number of channels can be sent or received (PLC communication specification only).

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

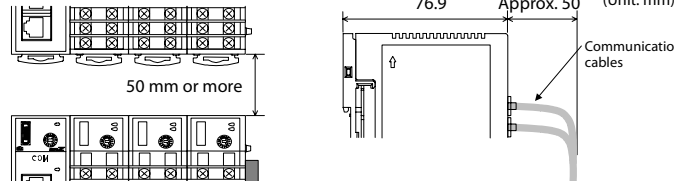
* The number indicated in parentheses is the maximum joinable number per module when the indicated number of correspondence channels is specified. The amount of data that can be sent or received does not increase even when modules exceeding the maximum number are joined.

2.3 Dimensions




- Space required between each module vertically
- Depth for communication cables mount type module

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.



Procedure for mounting or removing

The procedure for mounting or removing the Z-COM module is the same as that of the functional module (Z-TIO, Z-DIO or Z-CT modules). Both DIN rail mounting and screw mounting are available. For details on module mounting or removing, see the Z-TIO Instruction Manual (IMS01T01-E □).

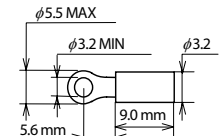
 WARNING

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

3.1 Wiring Cautions

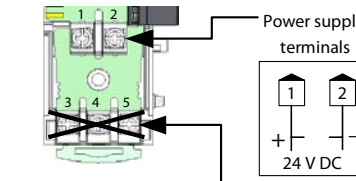
- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
 - Shorten the distance between the twisted 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 VDC)
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

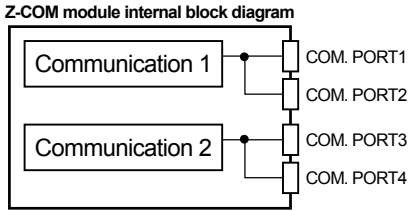
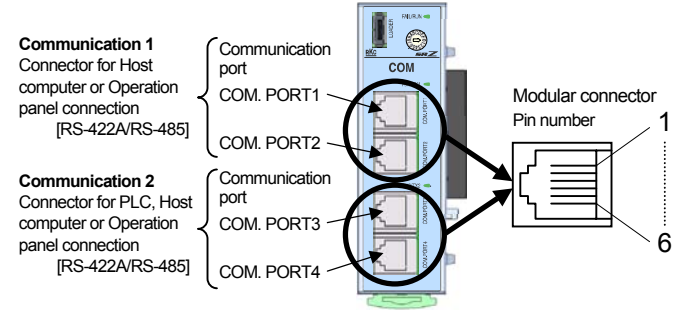


Power supply terminals

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.

3.3 Contents of the Communication Port

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



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

■ 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

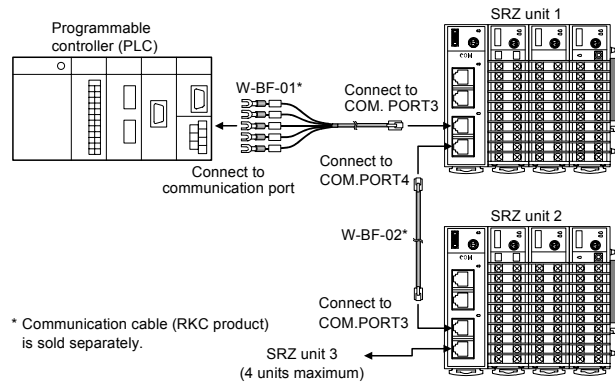
Pin No.	Signal name	Symbol
1	Send/receive data	T/R (A)
2	Send/receive data	T/R (B)
3	Signal ground	SG
4	Unused	—
5	Unused	—
6	Signal ground	SG



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 the 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.



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.



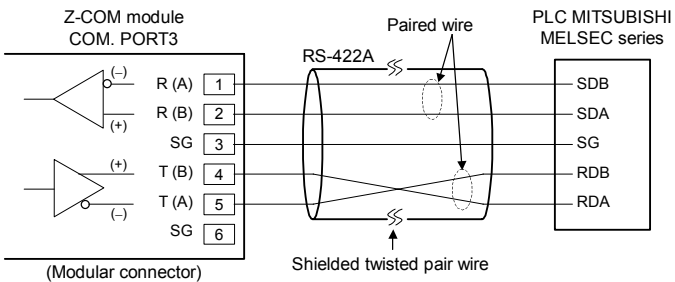
For termination resistor of Z-COM modules, see 3.6 Z-COM Module Termination Resistor.



For the termination resistor of PLC side, see the PLC Instruction Manual.

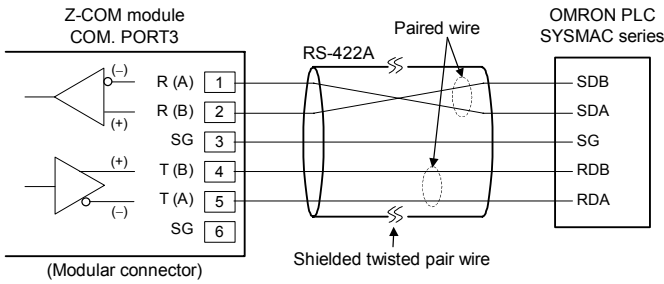
■ RS-422A

● MITSUBISHI MELSEC series



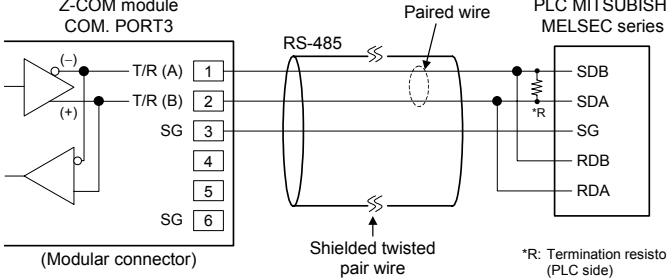
When preparing a cable of connecting the computer link module belonging to the MITSUBISHI MELSEC series to our Z-COM module, cross each pair of wires the A and B terminal positions on their terminal boards are not symmetrical.

● OMRON SYSMAC series



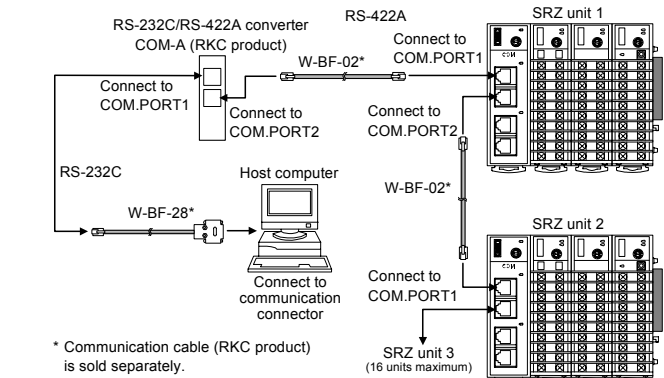
■ RS-485

● MITSUBISHI MELSEC series



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.



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.



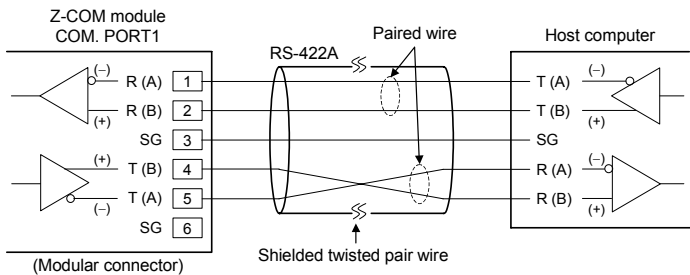
For termination resistor of Z-COM modules, see 3.6 Z-COM Module Termination Resistor.



For the termination resistor of PLC side, see the PLC Instruction Manual.

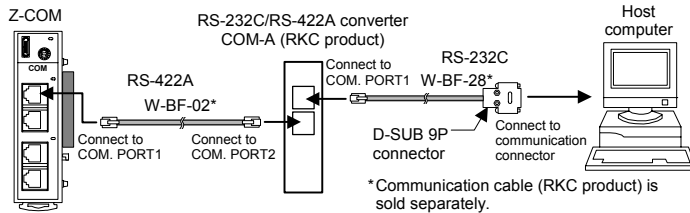
■ RS-422A

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



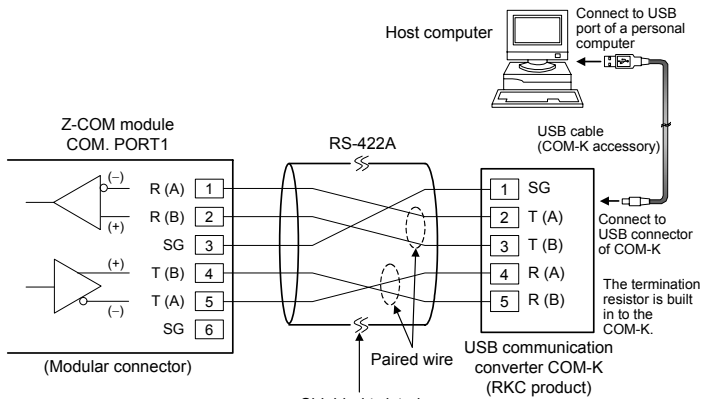
● When the interface of host computer is RS-232C (RS-232C ↔ RS-422A)

When the interface of host computer is RS-232C, connect the RS-232C/RS-422A converter between the host computer and the Z-COM.



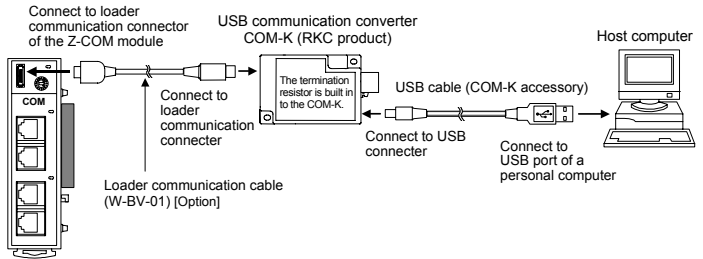
● When the host computer has a USB connector

When the host computer has a USB connector, connect the USB communication converter between the host computer and the Z-COM module.



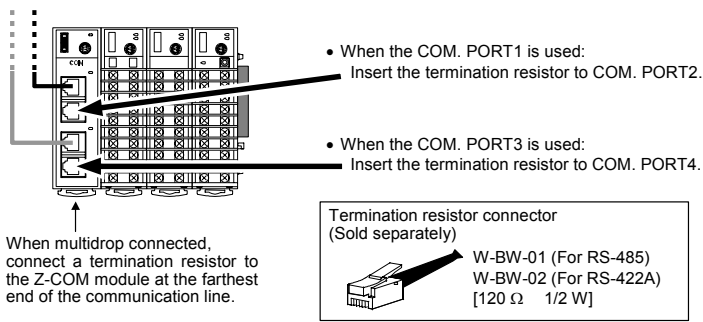
■ Loader communication

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



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.



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 AnA/AnUCPU common command (type 4) can use.
 - Serial communication unit
AJ71QC24N, A1SJ71QC24N, QJ71C24, etc.
The unit which AnA/AnUCPU common command (type 4) can use.
 - Adapter
FX0N-485ADP, FX2NC-485ADP, FX3U-485ADP
 - Expanded function board
FX2N-485BD, FX3U-485BD

● 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
RKC communication (ANSI X3.28-1976 subcategory 2.5, B1) 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]
30 mA max. Rush current: 10 A or less

Current consumption:

–10 to +50 °C

Allowable ambient temperature:

5 to 95 %RH

Allowable ambient humidity:

(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
Approx. 110 g

Weight:

■ 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) COM. PORT1, COM. PORT2 communication (Communication 1)

4: RS-422A 5: RS-485

(2) COM. PORT3, COM. PORT4 communication (Communication 2)

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

(4) COM. PORT1, COM. PORT2 communication protocol (Communication 1) [Quick start code]

No code: No quick start code
1: ANSI/RKC standard protocol
2: Modbus protocol

(5) COM. PORT3, COM. PORT4 communication protocol (Communication 2) [Quick start code]

No code: No quick start code
1: ANSI/RKC standard protocol
2: Modbus protocol
3: PLC special protocol (MAPMAN)
MITSUBISHI MELSEC series:
AnA/AnUCPU common command (QR/QW)
(AnA/QnA series, Q series)
4: PLC special protocol (MAPMAN)
OMRON SYSMAC series
PLC special protocol (MAPMAN)
MITSUBISHI MELSEC series:
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 quick start code C: 48 CH
A: 16 CH D: 64 CH
B: 32 CH

* Factory set value when there is not specification of quick start code:

Communication 1/communication 2 ANSI/RKC standard protocol
The number of the correspondence channels: 64 CH

Modbus is a registered trademark of Schneider Electric.

The name of each programmable controller (PLC) means the products of each manufacturer. Company names and product names used in this manual are the trademarks or registered trademarks of the respective companies.

RKC RKC INSTRUMENT INC. The first edition: JUN. 2006 [IMQ00]
The third edition: OCT. 2007 [IMQ00]
HEADQUARTERS: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN
PHONE: 03-3751-9799 (+81 3 3751 9799) E-mail: info@rkinst.co.jp
FAX: 03-3751-8585 (+81 3 3751 8585) OCT. 2007