CC-Link Communication Converter

COM-MC*02 [For SRZ] Installation Manual

IMR02E43-E1

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-MC*02 [For SRZ] Instruction Manual (IMR02E46-E□)**.
The manual can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

■ Product check

COM-MC*02 [For SRZ] Installation Manual (IMR02E43-E1) 1
Joint connector cover (KSRZ-517A) 2
Power terminal cover (KSRZ-518A) 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

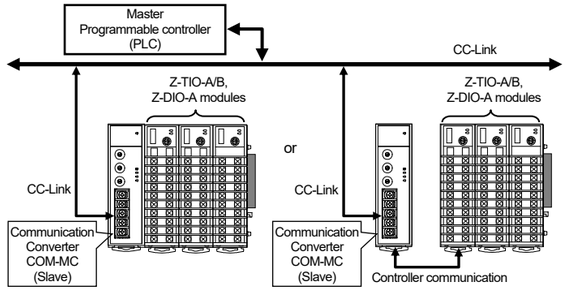
- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy plant.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- 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.
- 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 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, they have the following meaning.
  ⚠ : Caution (This symbol is used where the instruction manual needs to be consulted for the safety of operator and equipment.)
  This symbol on the left side of the product denotes caution for electric shock and damages to the equipment. Read the following items before using this product.
  - ■ **Safety precautions** "**WARNING**"
  - **3. MOUNTING** "**WARNING**" and **4. WIRING** "**WARNING**"

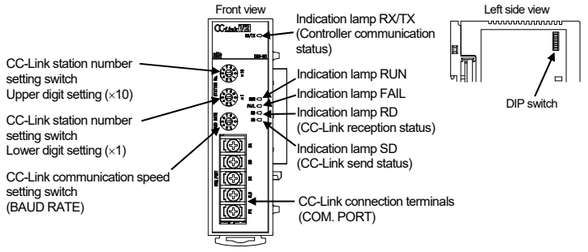
1. OUTLINE

The model COM-MC*02 (hereinafter called the COM-MC) is a communication converter for connecting the SRZ module type controllers to CC-Link. The COM-MC can be connected to the function modules of the SRZ (Z-TIO-A/B, Z-DIO-A modules), hereinafter called the controller, via a connector or a screw terminal block and create a multi-zone temperature control system.



2. PARTS DESCRIPTION

■ Main unit



Indication lamps

RX/TX (Controller communication status)	[Green]	During controller communication data send and receive: Green lamp turns on
RUN	[Green]	• While in normal state: Green lamp turns on • Self-diagnostic error (Recoverable fault): Green lamp blinks (1000 ms cycle) • Initialization of controller communication Green lamp blinks (200 ms cycle)
FAIL	[Red]	• Self-diagnostic error (Major fault) and CC-Link setting error: Red lamp turns on • CC-Link operation error: Red lamp blinks (2000 ms cycle) • CC-Link setting is changed: Red lamp blinks (800 ms cycle)
RD (CC-Link reception status)	[Green]	• While not receiving: Turns off • While receiving: Green lamp turns on
SD (CC-Link send status)	[Green]	• While not sending: Turns off • While sending: Green lamp turns on

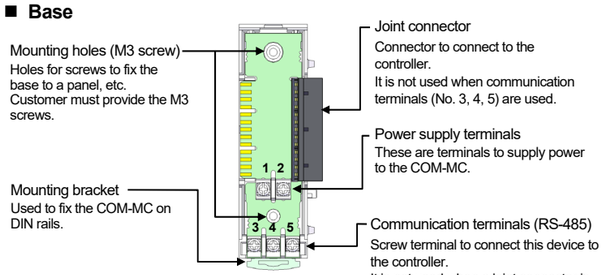
CC-Link connection terminals

COM. PORT	This is a communication terminal block for connecting a CC-Link master (PLC) and a slave device.

Switches

CC-Link station number setting switch (×10, ×1)	Set the station number for CC-Link.
CC-Link communication speed setting switch (BAUD RATE)	Set the communication speed for CC-Link.
DIP switch	• Sets communication speed corresponding to controller communication. • Set the number of Occupied station/Extension cyclic for CC-Link.

■ Base



3. MOUNTING

⚠ WARNING

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

3.1 Mounting Cautions

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

(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: 0 to 55 °C
- Allowable ambient humidity: 5 to 95 %RH
  (Absolute humidity: MAX. W. C 29 g/m^3 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 main unit.
- 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 55 °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.
- Do not connect the COM-MC module to the others. Otherwise the communication may not be established properly.

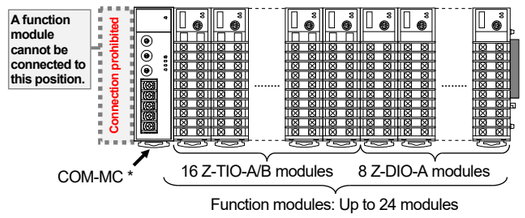
(5) In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

3.2 Connecting Each Module

The maximum number of function modules (Z-TIO-A/B and Z-DIO-A) connectable to one COM-MC is described below. For details on connecting function modules with the COM-MC, refer to the **Z-TIO Instruction Manual (IMS01T01-E□)**.

- Z-TIO-A/B modules: Up to 16 modules
- Z-DIO-A modules: Up to 8 modules

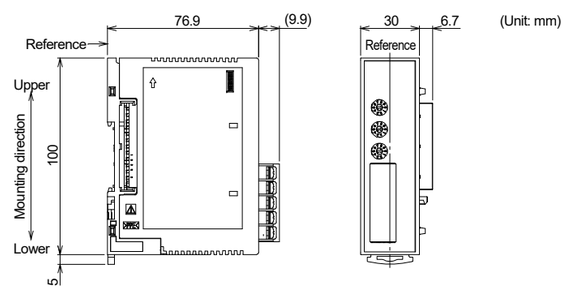
[Example] When connecting Z-TIO-A/B modules and Z-DIO-A modules



* COM-ME, COM-ML, Z-COM and Z-CT modules cannot be connected to the COM-MC module.

Even when function modules are not connected to the COM-MC (wired via the communication terminal), follow the above instructions when connecting the function modules.

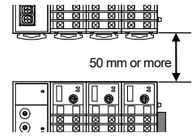
3.3 Dimensions



Allowable tilt angle is ± 90°, back and force, right and left from the reference.

● Space required between each instrument vertically

To install/uninstall the main unit of the COM-MC on/from the Base unit, the main unit needs to be slightly inclined and thus requires at least 50 mm clearance above and below it.



■ Procedure for mounting or removing

The procedure for mounting or removing the COM-MC is the same as that of the function module (Z-TIO-A/B or Z-DIO-A). Both DIN rail mounting and screw mounting are available.
For the mounting or removing, refer to the **Z-TIO Instruction Manual (IMS01T01-E□)**.

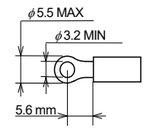
4. WIRING

⚠ 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.

4.1 Wiring Cautions

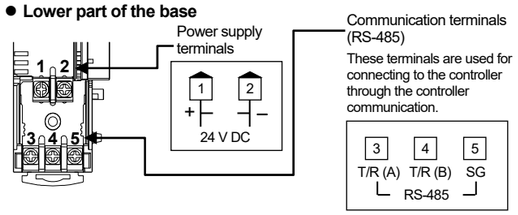
- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
  - Shorten the distance between the twisted 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 a "SELV" circuit defined as IEC 60950-1.
- A suitable power supply should be considered in the end-use equipment.
  The power supply must be in compliance with a limited-energy circuit (maximum available current of 5.6 A).
- Supply the power to only one of the connected modules or COM-MC. When power is supplied to any one of the connected modules or COM-MC, all of the connected modules and COM-MC will receive power.
- Select the power capacity which is appropriate for the total power consumption of all connected modules (including COM-MC) and the initial current surge when the power is turned on.
  Power consumption (at maximum load): 45 mA max. (at 24 V DC)
  Rush current: 15 A or less
- When connecting the wiring to the terminals, use the recommended solderless terminals. Only these recommended solderless terminals can be used due to the insulation between the terminals.
  Screw Size:
  - Power supply terminals and Communication terminals:
    M3 × 7 (with 5.8 × 5.8 square washer)
  - CC-Link connection terminals: M3 × 6
  Recommended tightening torque:
  - Power supply terminals and Communication terminals:
    0.4 N·m (4 kgf·cm)
  - CC-Link connection terminals: 0.49 N·m (5 kgf·cm)
  Applicable wire:
  - Power supply terminals and Communication terminals:
    Solid/twisted wire of 0.25 to 1.65 mm^2
  - CC-Link connection terminals: AWG20
  Recommended solderless terminal:
  Manufactured by J.S.T MFG CO., LTD. Circular terminal with isolation V1.25–MS3



- Make sure that during field wiring parts of conductors cannot come into contact with adjacent conductive parts.
- When connecting the COM-MC and the controller, ensure that the wiring of the CC-Link does not interfere with the controller wiring.

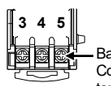
4.2 Terminal Configuration

● Lower part of the base



4.3 Connection to Controller

When trying to connect the COM-MC and the controller, see **3.2 Connecting Each Module**. See the following wiring example when connecting the COM-MC and the controller.



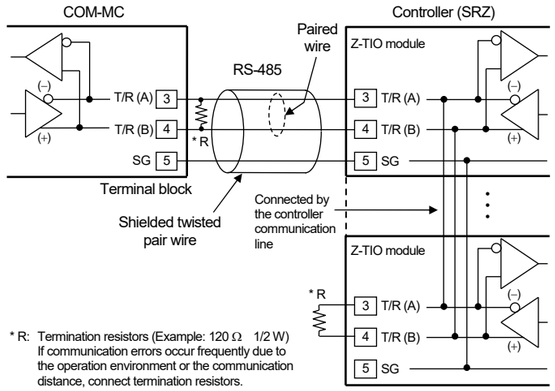
Communication terminals (RS-485)

Terminal No.	Symbol	Signal name
3	T/R (A)	Send data/Receive data
4	T/R (B)	Send data/Receive data
5	SG	Signal ground

■ Wiring example

The communication cable and termination resistor(s) must be provided by the customer.

Refer to the SRZ instruction manual for the details of the size of the solderless terminal and how to conduct wiring.
- SRZ Instruction Manual (IMS01T04-E□)
- Z-TIO Instruction Manual (IMS01T01-E□)

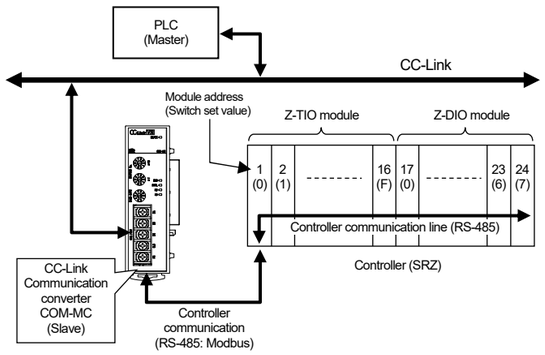


* R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

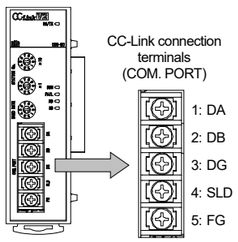
The maximum number of SRZ connected is 16 for Z-TIO-A/B modules and 8 for Z-DIO-A modules. (Connectable module type to COM-MC: Z-TIO-A, Z-TIO-B, Z-DIO-A)

When trying to join the COM-MC and the controllers, connect a termination resistor by referring to the above wiring example if required.

■ Wiring example



4.4 Connection to CC-Link



Terminal No.	Signal name	Symbol	Cable color
1	Data A	DA	Blue
2	Data B	DB	White
3	Data ground	DG	Yellow
4	Shield (Grounding wire)	SLD	—
5	Frame ground	FG	—

Terminal screws
Screw size: M3 × 6
Recommended tightening torque:
0.49 N·m (5 kgf·cm)

The CC-Link connecting terminal cannot do on-line installation or dismount for terminal block of dismount impossibility. The device cannot be replaced unless the link is set off-line. In addition, FG (frame ground) terminal of terminal number 5 is FG in a CC-Link function, and it is not FG of instrument all.

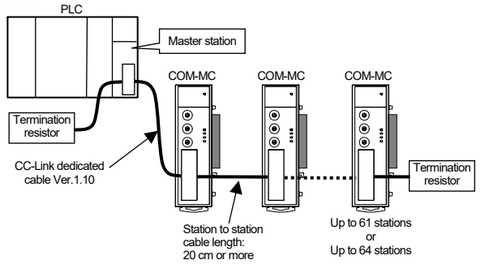
Ground both ends of the shield wire on the CC-Link dedicated cable Ver.1.10 via the SLD or FG terminal of each module. In addition, the SLD terminal is internally connected with the FG terminal.

Do not ground the instrument together with other equipment. In addition, use grounding wires with a cross section of 2.0 mm² or more. (Ground resistance: 100 ohm or less)

For cable specifications, connection method and vendor, refer to the website of CC-Link Partner Association.
URL: https://www.cc-link.org/

■ Connection example

The PLC (master station) and COM-MC make multi-drop connection in CC-Link dedicated cable Ver.1.10.

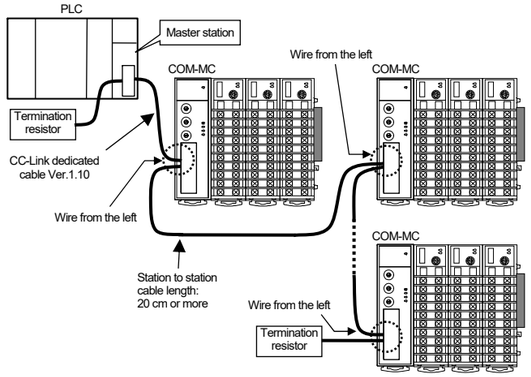


Communication speed and maximum transmitter distance

Communication speed	Station to station cable length	Maximum transmitter distance (maximum length of network)
10 Mbps	20 cm or more	100 m
5 Mbps		160 m
2.5 Mbps		400 m
625 kbps		900 m
156 kbps		1200 m

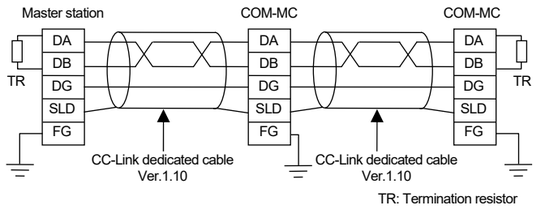
For communication speed and cable length, refer to the “CC-Link Cable Wiring Manual” of CC-Link Partner Association.

When connecting the COM-MC and the Controller (SRZ), wiring from the left side of the COM-MC is recommended. Attempting to wire from the right side of the COM-MC may interfere with the controller wiring.



■ Connection diagram

Always connect a termination resistor between the DA and DB terminals of the module to be located at the far end.
Termination resistor: 110 Ω ± 5 % 1/2 W

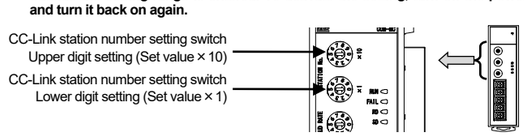


5. CC-Link COMMUNICATION SETTING

5.1 CC-Link Station Number Setting

Set the station number of CC-Link using a small blade screwdriver.

The setting will not be reflected if it is changed while the instrument is powered on. The FAIL lamp flashes to indicate it. The FAIL lamp also flashes when a set value outside the setting range is entered. To activate the setting, turn off the power once and turn it back on again.



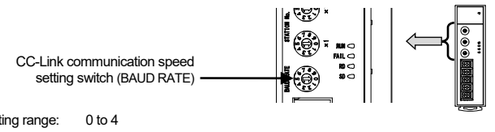
Setting range:
1 to 61 (4 stations occupied 1 time, 4 stations occupied 2 times, 4 stations occupied 4 times)
1 to 64 (1 station occupied 1 time)

Factory set value: 0

5.2 CC-Link Communication Speed Setting

Set the communication speed of CC-Link using a small blade screwdriver.

The setting will not be reflected if it is changed while the instrument is powered on. The FAIL lamp flashes to indicate it. The FAIL lamp also flashes when a set value outside the setting range is entered. To activate the setting, turn off the power once and turn it back on again.



Setting range: 0 to 4
Factory set value: 0 (156 kbps)

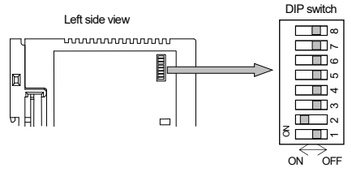
Communication speed and maximum transmitter distance
[Use the CC-Link dedicated cable Ver. 1.10]

Communication speed setting	Communication speed	Maximum transmitter distance
0	156 kbps	1200 m
1	625 kbps	900 m
2	2.5 Mbps	400 m
3	5 Mbps	160 m
4	10 Mbps	100 m
5 to 9	Do not set this one	

For communication speed and cable length, refer to the “CC-Link Cable Wiring Manual” of CC-Link Partner Association.

5.3 Occupied Stations/Extended Cyclic and Controller Communication Speed Setting

DIP switches are used to set the number of CC-Link occupied stations/extended cyclic and controller communication speed.



1	2	Controller communication speed
OFF	OFF	38400 bps
ON	OFF	9600 bps
OFF	ON	19200 bps ← A
ON	ON	57600 bps *

* When the switch is set to 57600 bps, the controller communication with the SRZ is not possible.
A: Factory set value: 19200 bps

3	4	5	Number of occupied stations/extended cyclic setting	Maximum connections Z-TIO	Maximum connections Z-DIO
OFF	OFF	OFF	4 stations occupied 1 time (8 channels assignment)	2	1 ← A
ON	OFF	OFF	4 stations occupied 1 time (16 channels assignment)	4	2
OFF	ON	OFF	4 stations occupied 2 times (16 channels assignment)	4	2
ON	ON	OFF	4 stations occupied 2 times (32 channels assignment)	8	4
OFF	OFF	ON	1 station occupied 1 time (1 channel assignment)	1	1
ON	OFF	ON	1 station occupied 1 time (2 channels assignment)	1	1
OFF	ON	ON	4 stations occupied 4 times (32 channels assignment)	8	4
ON	ON	ON	4 stations occupied 4 times (64 channels assignment)	16	8

A: Factory set value: 4 stations occupied 1 time (8 channels assignment)

6	7	8	
OFF	OFF	OFF	Fixed (Do not change)

CC-Link version varies according to the specification of Occupied station/Extended cyclic of the COM-MC. Select CC-Link version of PLC by setting the following CC-Link specifications:
- 1 station occupied 1 time/4 stations occupied 1 time: CC-Link Ver. 1.10
- 4 stations occupied 2 times/4 stations occupied 4 times: CC-Link Ver. 2.00

● Relationship between number of occupied station/extended cyclic and number of CC-Link assignment channel

Number of occupied station/ extended cyclic	Maximum number of CC-Link assignment channel *
1 station occupied 1 time	2 channels
4 stations occupied 1 time	16 channels
4 stations occupied 2 times	32 channels
4 stations occupied 4 times	64 channels

* The number of channels used depends on the data type.
On a Z-TIO module (4-channel type), four channels are used if the data is channel data; however, only one channel is used if the data is module data.
For example, when 16 Z-TIO modules (4-channel type) are connected, 64 channels are used for channel data, or 16 channels are used for module data.

In the case of 1 station occupied 1 time, the maximum number of CC-Link assignment channels is two channels, and thus it may not be possible to use the amount of data of one module, depending on the data type. For this reason, caution is necessary when using 1 station occupied 1 time.
[Example] When one Z-TIO module (4-channel type) is connected, CH3 and CH4 data cannot be used.

6. SPECIFICATIONS

■ CC-Link communication

Protocol: CC-Link Ver. 2.00/Ver. 1.10
Communication speed: 156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps
Station number: 1 to 61 (4 stations occupied 1 time, 4 stations occupied 2 times, 4 stations occupied 4 times)
1 to 64 (1 station occupied 1 time)
Connection cable: CC-Link dedicated cable Ver.1.10 (3-core twisted cable with shield)
Connection method: Terminals
Termination resistor: External installation is necessary (Between the DA and DB terminals: 110 Ω ± 5 % 1/2 W)
Communication data length:
See table shown below

Number of occupied station/extended cyclic	Remote Input/Output (RX/RY)	Remote register (RWr/RWw)	Number of CC-Link channel assignments
4 stations occupied 1 time	128 bits each	16 words each	8 channels or 16 channels
4 stations occupied 2 times	244 bits each	32 words each	16 channels or 32 channels
4 stations occupied 4 times	448 bits each	64 words each	32 channels or 64 channels
1 station occupied 1 time	32 bits each	4 words each	1 channel or 2 channels

Number of occupied station/extended cyclic and CC-Link version:
CC-Link Ver. 1.10: 1 station occupied 1 time, 4 stations occupied 1 time
CC-Link Ver. 2.00: 4 stations occupied 2 times, 4 stations occupied 4 times

■ Controller communication

Interface: Base on RS-485, EIA standard
Synchronous method: Half-duplex start-stop synchronous type
Communication speed: 9600 bps, 19200 bps, 38400 bps, 57600 bps *
* When the switch is set to 57600 bps, the controller communication with the SRZ is not possible.
Data bit configuration: Start bit: 1
Data bit: 8
Parity bit: None
Stop bit: 1
Protocol: Modbus-RTU
Maximum connections: Z-TIO-A/B modules: Up to 16 modules
Z-DIO-A modules: Up to 8 modules
Connection method: Joint connector or terminals
Termination resistor: Externally connected (Example: 120 Ω 1/2 W)

■ General specifications

Power supply voltage: 24 V DC (Rating)
Power supply voltage range: 21.6 V to 26.4 V DC [Including power supply voltage variation]
Power consumption (at maximum load): 45 mA max. (24 V DC)
Rush current: 15 A or less
Allowable ambient temperature: 0 to 55 °C
Allowable ambient humidity: 5 to 95 %RH (Absolute humidity: MAX.W.C 29 g/m³ dry air at 101.3 kPa)
Weight: Approx. 130 g

7. MODEL CODE

COM-MC ∗ 02 - □
(1) (2)

(1) Corresponding to the RKC controller
02: SRZ (Z-TIO-A/Z-TIO-B, Z-DIO-A)

(2) RUN/STOP logic selection
1: 0: RUN
1: STOP
2: 0: STOP
1: RUN

The first edition: DEC. 2024 [IMQ00]

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