CC-Link Communication Converter

*COM-MC*01*

[For FB series, FZ/GZ series]

Instruction Manual

RKC INSTRUMENT INC.

IMR02E45-E2

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.

- CC-Link is a registered trademark of Mitsubishi Electric Co. Ltd.
- 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.

Safety Precautions

■ Pictorial Symbols (safety symbols)

Various pictorial symbols are used in this manual to ensure safe use of the product, to protect you and other people from harm, and to prevent damage to property. The symbols are described below.
Be sure you thoroughly understand the meaning of the symbols before reading this manual.

⚠ WARNING : This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury.

⚠ CAUTION : This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result.

⚠ : This mark indicates that all precautions should be taken for safe usage.

⚠ 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.

For Proper Disposal

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

Symbols

■ Pictorial Symbols (safety symbols)

NOTE : This mark indicates important information on installation, handling and operating procedures.

: This mark indicates supplemental information on installation, handling and operating procedures.

: This mark indicates where additional information may be located.

■ Abbreviation symbols

These abbreviations are used in this manual:

Abbreviation symbols	Name	Abbreviation symbols	Name
PV	Measured value	TC (input)	Thermocouple (input)
SV	Set value	RTD (input)	Resistance temperature detector (input)
MV	Manipulated output value	V (input)	Voltage (input)
AT	Autotuning	I (input)	Current (input)
ST	Startup tuning	HBA	Heater break alarm
OUT	Output	CT	Current transformer
DI	Digital input	LBA	Control loop break alarm
DO	Digital output	LBD	LBA deadband

About This Manual

There are two manuals pertaining to this product. Please be sure to read all manuals specific to your application requirements.

The following manuals can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

Manual	Manual Number	Remarks
COM-MC∗01/03 [For FB/FZ/GZ series] Installation Manual	IMR02E42-E□	This manual is enclosed with instrument. This manual explains the mounting and wiring.
COM-MC∗01 [For FB series, FZ/GZ series] Instruction Manual	**IMR02E45-E2**	This manual you are reading now. This manual describes mounting, wiring, communication setting, protocol, communication data, troubleshooting and product specification.

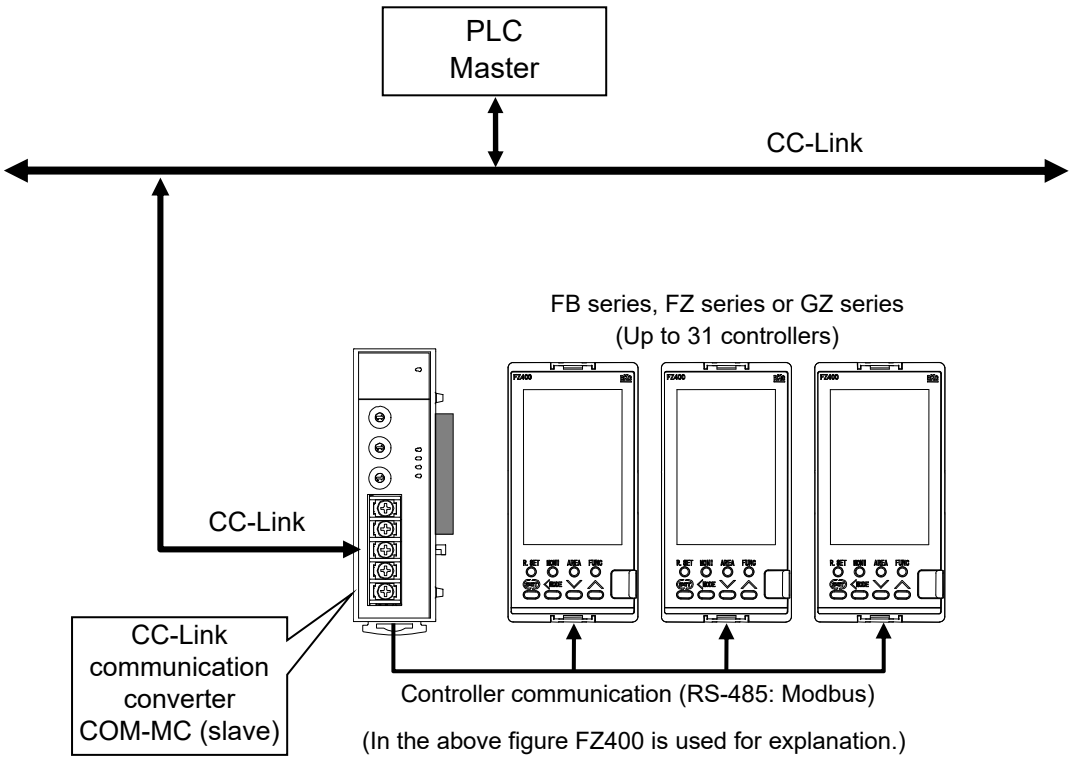
Read this manual carefully before operating the instrument. Please place the manual in a convenient location for easy reference.

Contents

Page

1. OUTLINE

CC-Link communication converter COM-MC∗01 [For FB series, FZ/GZ series (FB series compatible setting)] (hereafter called COM-MC) is communication converter to connect the RKC digital controllers (FB100/400/900, FZ110/400/900 or GZ400/900: hereafter called controller) to a programmable controller (Mitsubishi Electric PLC MELSEC series: hereafter called PLC) for CC-Link.
In addition, COM-MC is connected to CC-Link as the Remote device station.



Example of System Configuration

☞ For CC-Link, refer to the website of CC-Link Partner Association.
https://www.cc-link.org/

1.1 Checking the Product

Before using this product, check each of the following:

- Model code
- Check that there are no scratches or breakages in external appearance (case, front panel, or terminal, etc.)
- Check that all of the items delivered are complete. (See below)

	Name	Q'TY	Remarks
☐	COM-MC∗01/03 [For FB/FZ/GZ series] Installation Manual (IMR02E42-E☐)	1	Enclosed with instrument
☐	Joint connector cover KSRZ-517A	2	Enclosed with instrument
☐	Power terminal cover KSRZ-518A	1	Enclosed with instrument
☐	COM-MC∗01 [For FB series, FZ/GZ series] Instruction Manual (IMR02E45-E2)	1	This manual (sold separately) This manual can be downloaded from the official RKC website.

If any of the above are missing, damaged, or if your manual is incomplete, please contact RKC sales office or the agent.

■ Accessories (sold separately)

	Name	Q'TY	Remarks
☐	End plate DEP-01	2	Secures the COM-MC on the DIN rail

1.2 Model Code

Check that the product received is correctly specified by referring to the following model code list:
If the product is not identical to the specifications, please contact RKC sales office or the agent.

COM - MC ∗ 01 - □
(1) (2)

(1) Corresponding to the RKC controller

01: FB100/FB400/FB900,
FZ110/FZ400/FZ900 (FB series compatible setting *),
GZ400/GZ900 (FB series compatible setting *)

* This product can be used only with some of the data (of the FZ and the GZ series) compatible with the FB series.

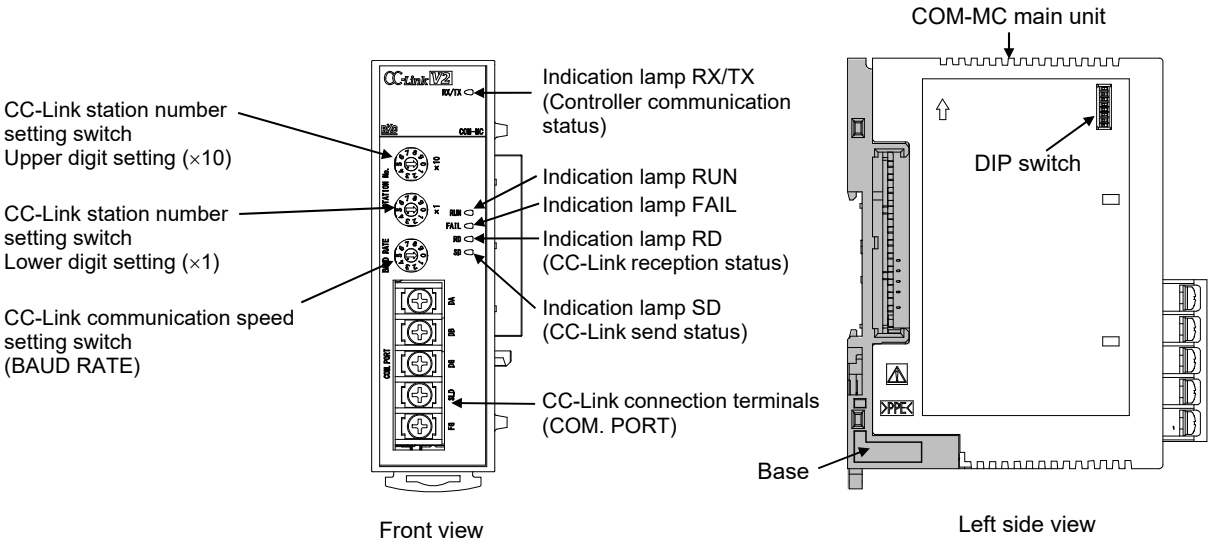
(2) RUN/STOP logic selection

1: 0: RUN
1: STOP

2: 0: STOP
1: RUN

1.3 Parts Description

■ COM-MC main unit



● Indication lamps

RX/TX [Green] (Controller communication status)	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 [Green] (CC-Link reception status)	• While not receiving: Turns off • While receiving: Green lamp turns on
SD [Green] (CC-Link send status)	• While not sending: Turns off • While sending: Green lamp turns on

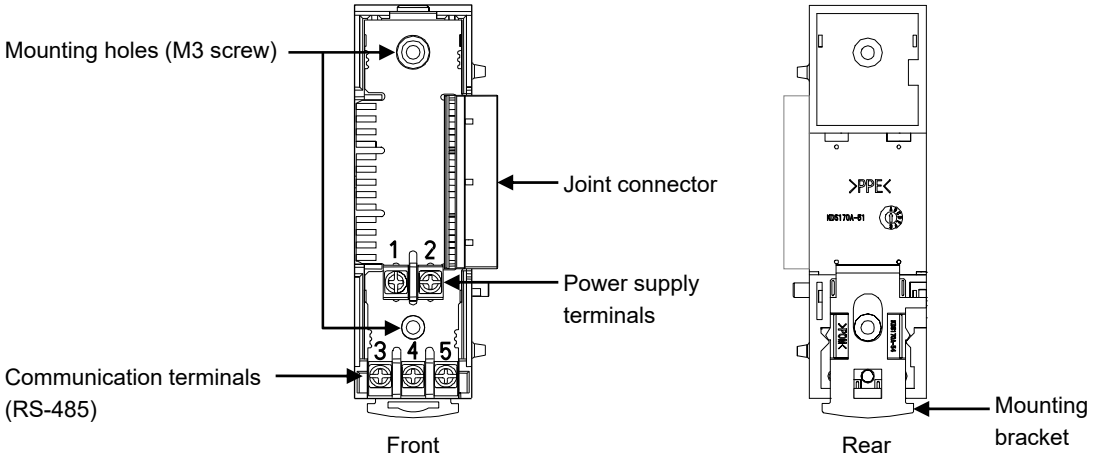
● CC-Link connection terminals

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



Mounting holes (M3 screw)	Holes for screws to fix the base to a panel, etc. Customer must provide the M3 screws.
Joint connector	Not used. Use the supplied joint connector cover.
Power supply terminals	These are terminals to supply power to the COM-MC. Terminal number / Signal name 1 / 24 V DC (+) 2 / 24 V DC (–)
Communication terminals (RS-485)	Terminal for connection to a controller. Terminal number / Signal name 3 / T/R (A) 4 / T/R (B) 5 / SG
Mounting bracket	Used to fix the COM-MC on DIN rails.

2. HANDLING PROCEDURES

Conduct necessary setting before operation according to the procedure described below.

Mounting

Install the COM-MC.

☞ • See **3. MOUNTING (P. 8)**.
• For controller, refer to **FB100 Instruction Manual (IMR01W16-E□), FB400/FB900 Instruction Manual (IMR01W03-E□), FZ110/FZ400/FZ900 Instruction Manual [Part1: Hardware] (IMR03A04-E□)** and **GZ400/GZ900 Instruction Manual [Part1: Hardware] (IMR03D04-E□)**.

Wiring and Connection

Connect power supply wires to the COM-MC, and also connect the COM-MC to the controller and the COM-MC to the PLC, respectively.

☞ • See **4. WIRING (P. 13)**.
• For controller, refer to **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□), FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)** and **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**.

Setting of the CC-Link communication

To establish communication on the CC-Link, perform CC-Link communication settings of the COM-MC.

☞ See **5. COMMUNICATION SETTING (P. 21)**.

Setting of the controller communication

Make setting of the Controller communication to establish communication between the COM-MC and the controller.

☞ • See **5. COMMUNICATION SETTING (P. 21)**.
• For controller, refer to **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□), FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)** and **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**.

PLC and Controller Settings

Set the PLC and controller.

☞
- See **8.3. Use Instruments Setting (P. 90)**.
- For controller, refer to **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□),** **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)** and **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**.

Device Assignment

Do assignments of Remote input/output and Remote register.

☞ See **8.4. Device Assignments Example (P. 92)**.

Program Creation

Create the sequence program of PLC.

☞ See **8.5 Sample Program (P. 95)**.

NOTE

To avoid error at operation start-up, COM-MC must be powered on LAST (after the Controller, PLC, etc.).

3. MOUNTING

This chapter describes installation environment, mounting cautions, dimensions and mounting procedures.

> **⚠ 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]

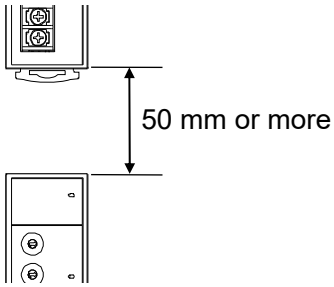
(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: 0 to 55 °C
- Allowable ambient humidity: 5 to 95 %RH
  (Absolute humidity: MAX. W. C 29 g/m^3 dry air at 101.3 kPa)
- Installation environment conditions: Indoor use
  Altitude up to 2000 m

(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.

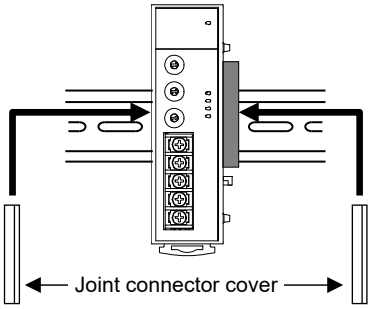
  High voltage equipment: Do not mount within the same panel.
  Power lines: Separate at least 200 mm.
  Rotating machinery: Separate as far as possible.

- 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.

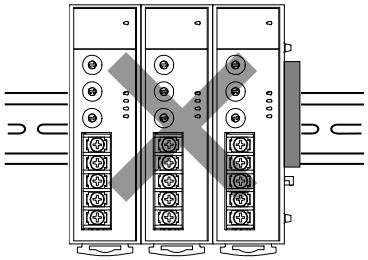


- It is recommended to use a joint connector cover on the connector on both sides of the mounted COM-MC for protection of connectors.

  When mounting COM-MC, leave space at both ends for covers.



- Do not connect the COM-MC module to the others. Otherwise the communication may not be established properly.

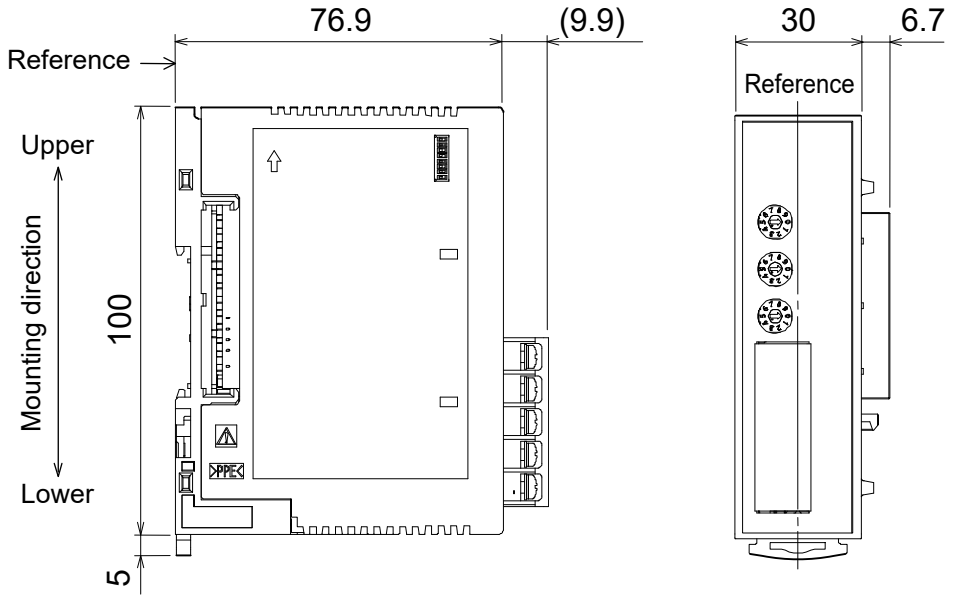


- To firmly fix the COM-MC, use end plates (DEP-01) sold separately on both sides of the mounted COM-MC. When mounting COM-MC, leave space at both ends for end plates.

(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 Dimensions

(Unit: mm)



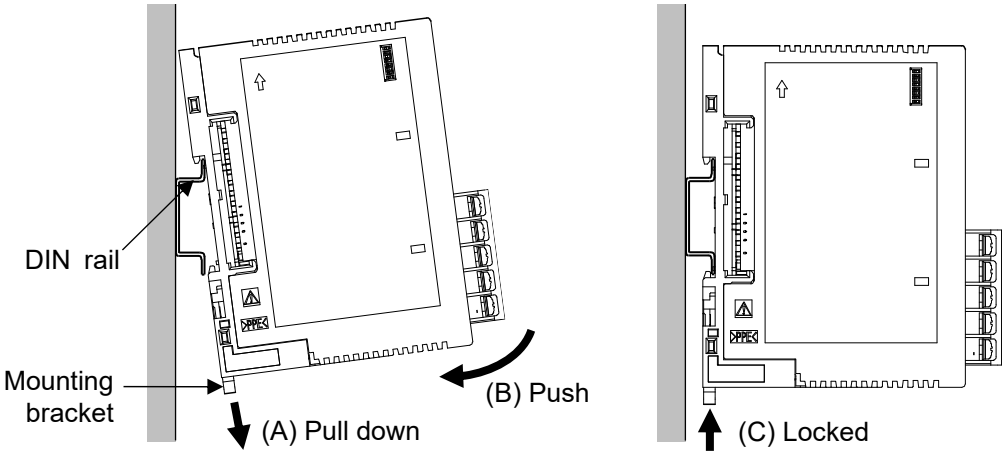
Allowable tilt angle is ± 90°, back and force, right and left from the reference.

3.3 DIN Rail Mounting

■ Mounting procedures

1. Pull down the mounting bracket at the bottom of the base (A). Attach the hooks on the top of the base 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 COM-MC module to the DIN rail (C).

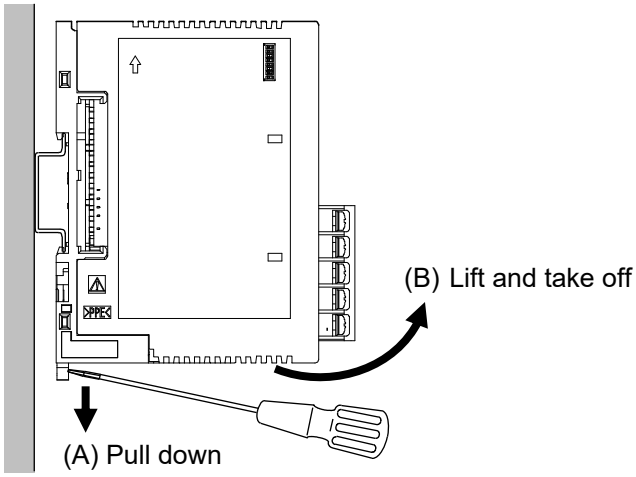


■ Removing procedures

1. Turn the power OFF.

2. Remove the wiring.

3. Pull down a mounting bracket with a slotted screwdriver (A).
Lift the COM-MC module from bottom, and take it off (B).

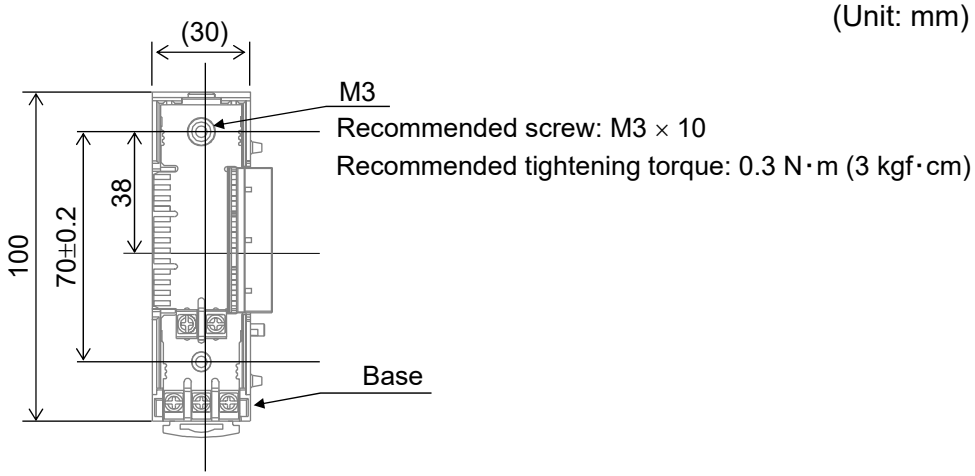


3.4 Panel Mounting

■ Mounting procedures

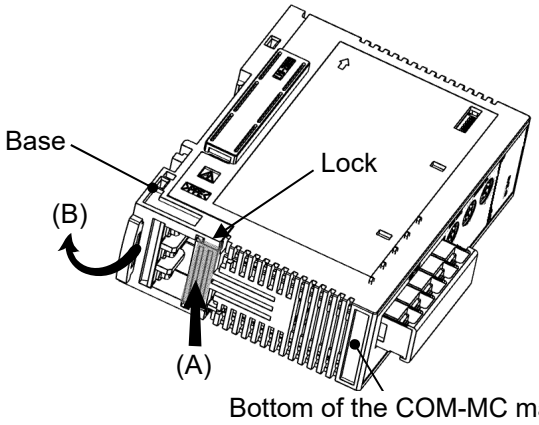
1. See the mounting dimensions below when selecting the location.

(Unit: mm)



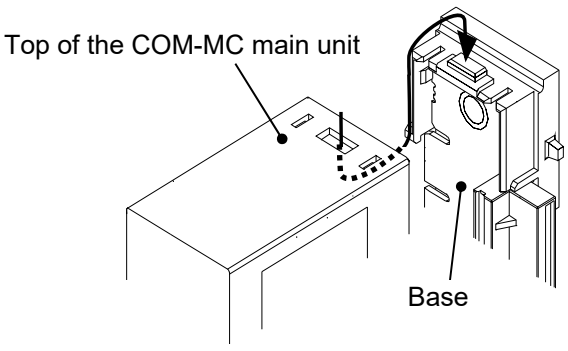
Mounting dimensions

2. Remove the base from the COM-MC main unit (B) while the lock is pressed (A).



3. Fix the base to its mounting position using M3 screws. Customer must provide the screws.

4. Mount the COM-MC main unit on the base.



4. WIRING

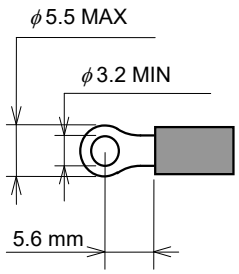
This chapter describes wiring cautions, terminal configuration and connections.

4.1 Wiring Cautions

⚠ WARNING

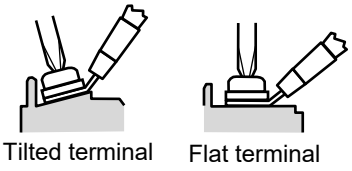
To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

- 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 end-use equipment. The power supply must be in compliance with a limited-energy circuit (maximum available current of 5.6 A).
- The power supply must handle the rush current 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.

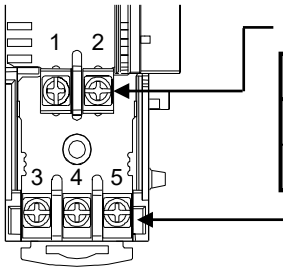
When tightening a screw of the controllers, make sure to fit the screwdriver properly into the screw head mounted tilted or flat as shown in the right figure. Tightening the screw with excessive torque may damage the screw thread.



4.2 Terminal Configuration

■ Power supply terminals and Communication terminals

The terminal layout of COM-MC (base) is as follows.



Power supply terminals

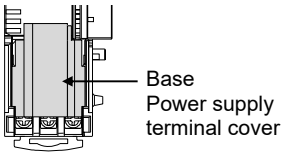
No.	Description
1	24 V DC (+)
2	24 V DC (–)

Communication terminals (RS-485)

No.	Description
3	T/R (A)
4	T/R (B)
5	SG

● Wiring method

As an example, the method of connecting to the power supply terminals (terminal numbers 1 and 2) is shown below.

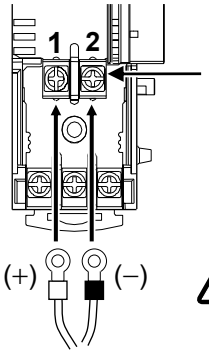


1. Turn the power OFF.

2. Remove COM-MC main unit from the base.

3. Remove the Power supply terminal cover on the base.

4. Attach the solderless terminals to the power terminals with a Phillips head screwdriver. When attaching the terminals, make sure that the polarity (+ and –) is correct.



Power supply terminals (base)

Prior to conducting the wiring, always turn OFF the Power.

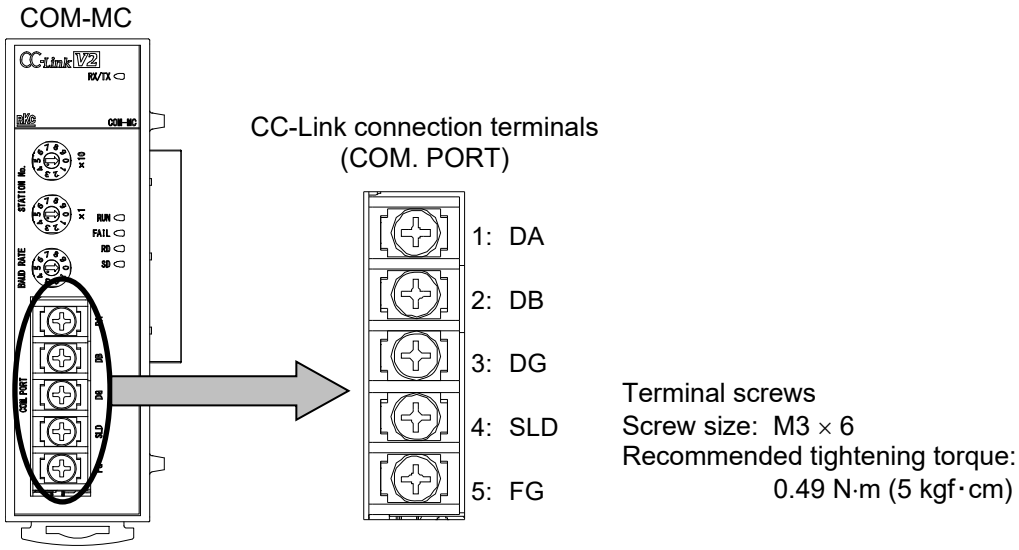
5. Attach the Power supply terminal cover on the terminal and return the COM-MC main unit to the base. This completes the wiring work.

Connections to the communication terminals (terminal numbers 3 to 5) are made in the same way.

4.3 Connection to CC-Link

Connect COM-MC to CC-Link.

■ Terminal layout



■ Terminal number and signal details

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	—

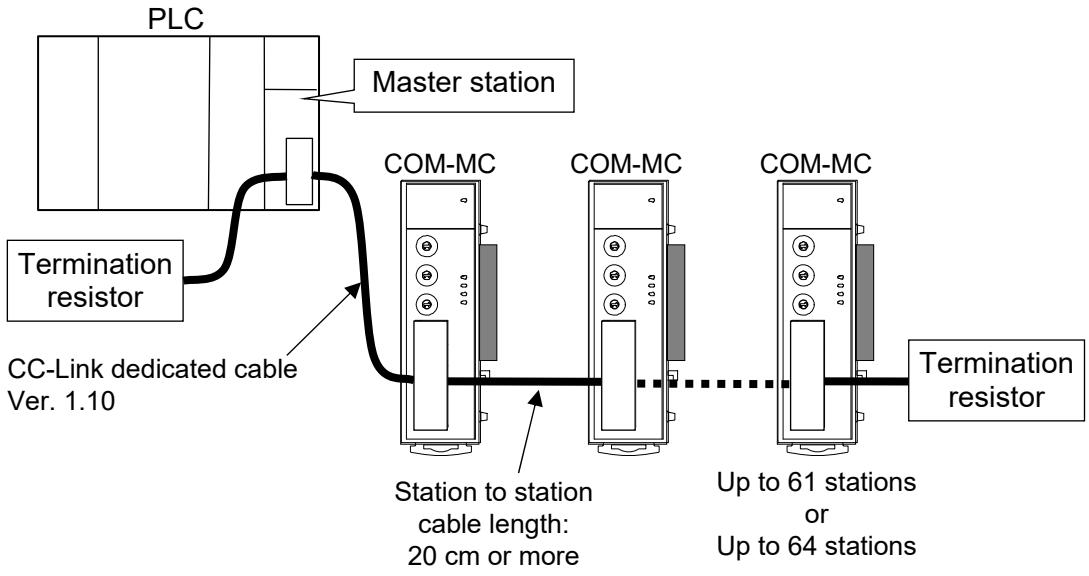
NOTE

- **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 mm^2 or more. (Ground resistance: 100 ohm or less)**

☞ For cable specifications, connection method and vendor, refer to the website of CC-Link Partner Association.
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 cable length (Use the CC-Link dedicated cable Ver. 1.10)**

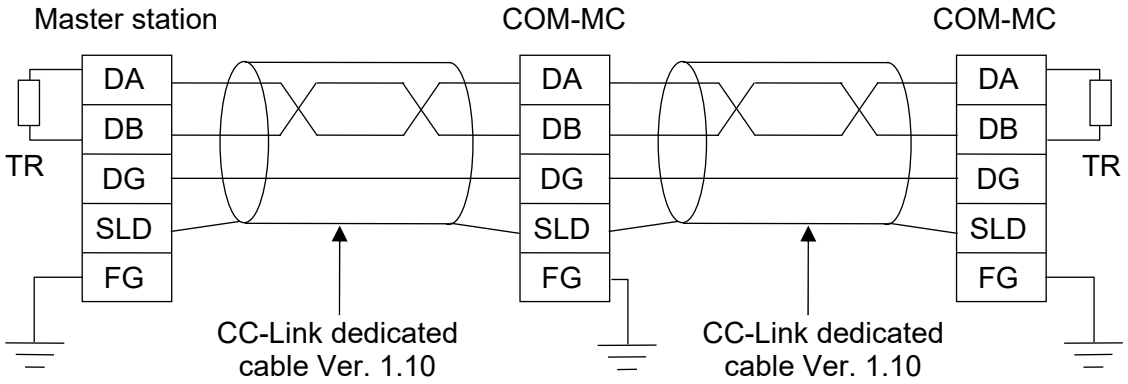
Communication speed	Station to station cable length	Maximum transmitter distance (maximum length of network)
10 Mbps	20 cm or more	100 m
5 Mbps		160 m
2.5 Mbps		400 m
625 kbps		900 m
156 kbps		1200 m

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

■ Connection diagram

NOTE

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



TR: Termination resistor

The CC-Link dedicated cable Ver. 1.10 is provided by the customer.

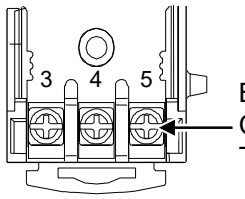
4.4 Connection to Controller

Connect the COM-MC and controllers as shown below.
The communication cable and termination resistor(s) must be provided by the customer.

☞ Refer to the instruction manual of the relevant model for the details of the size of the solderless terminal and how to conduct transition wiring.

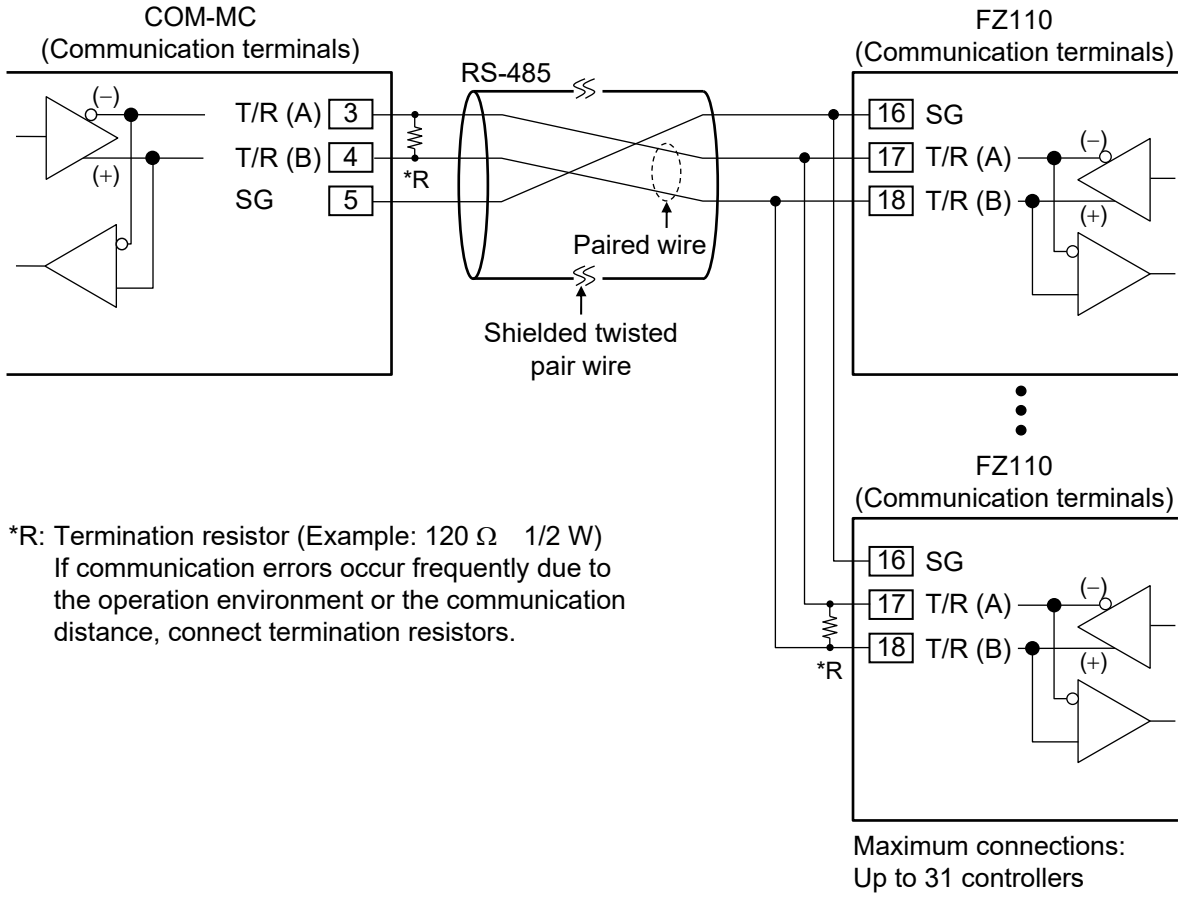
- **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□)**
- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

■ Communication terminal number and signal details



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

■ Wiring example (FZ110)



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

■ Terminal layout of controller

FB100/400/900 communication terminals (RS-485)

Terminal No.		Symbol	Signal name
FB100	FB400/900		
13	25	SG	Signal ground
14	26	T/R (A)	Send data/Receive data
15	27	T/R (B)	Send data/Receive data

FZ110/400/900 communication terminals (RS-485)

Terminal No.		Symbol	Signal name
FZ110	FZ400/900		
16	34	SG	Signal ground
17	35	T/R (A)	Send data/Receive data
18	36	T/R (B)	Send data/Receive data

GZ400/900 communication terminals (RS-485)

Terminal No.	Symbol	Signal name
34	SG	Signal ground
35	T/R (A)	Send data/Receive data
36	T/R (B)	Send data/Receive data

5. COMMUNICATION SETTING

⚠ WARNING

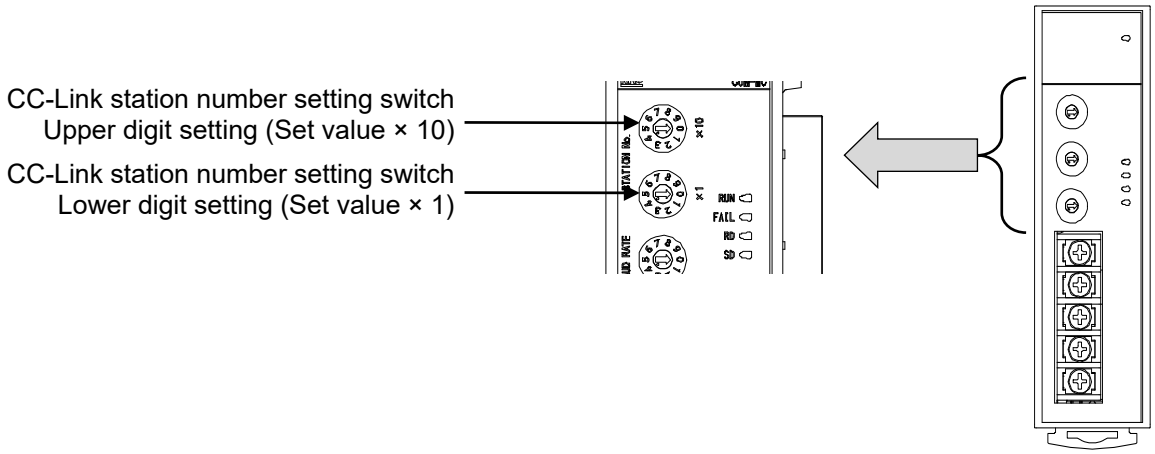
- To prevent electric shock or instrument failure, always turn off the power before setting the switch.
- To prevent electric shock or instrument failure, never touch any section other than those instructed in this manual.

5.1 CC-Link Station Number Setting

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

NOTE

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.



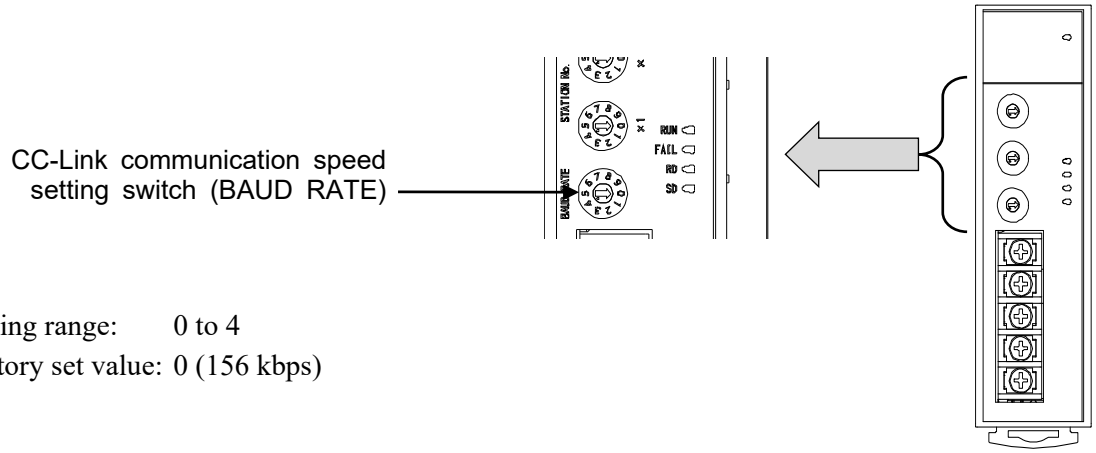
Setting range: 1 to 61 (4 stations occupied 1 time, 4 stations occupied 2 times)
1 to 64 (1 station occupied 1 time)
Factory set value: 0

5.2 CC-Link Communication Speed Setting

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

NOTE

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)

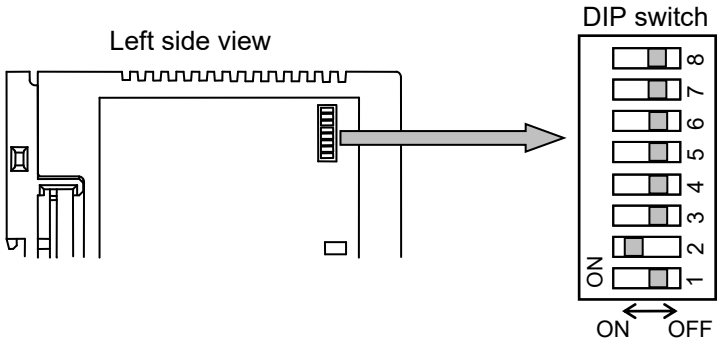
- **Communication speed and maximum transmitter distance [Use the CC-Link dedicated cable Ver. 1.10]**

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	← Factory set value
ON	ON	57600 bps *	

* When the switch is set to 57600 bps, the controller communication with the FB series is not possible.

3	4	5	Number of occupied stations/extended cyclic setting		
OFF	OFF	OFF	4 stations occupied 1 time (8 channels assignment)	8 instruments	← Factory set value
ON	OFF	OFF	4 stations occupied 1 time (16 channels assignment)	16 instruments	
OFF	ON	OFF	4 stations occupied 2 times (16 channels assignment)	16 instruments	
ON	ON	OFF	4 stations occupied 2 times (31 channels assignment)	31 instruments	
OFF	OFF	ON	1 station occupied 1 time (1 channel assignment)	1 instrument	
ON	OFF	ON	1 station occupied 1 time (2 channels assignment)	2 instruments	
OFF	ON	ON	**Do not set this one**		
ON	ON	ON			

NOTE

DIP switches No. 6, No. 7 and No. 8 are set to OFF at the time of shipment. Do not change the setting. Improper setting may result in unavailability of proper communication.

6	7	8		
OFF	OFF	OFF	**Fixed (Do not change)**	← Factory set value

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: CC-Link Ver. 2.00

5.4 Controller Communication Setting of FB Series and FZ/GZ Series

To establish controller communication with the COM-MC, set the following communication data of the controller. Refer to the instruction manual of the relevant model for the details of setting.

- **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□)**
- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

■ Communication data to be set

(1) Communication protocol

Set up the Modbus communication.

• FB series

[Controller communication conditions: Use communication 1 side]

Data range
Communication 1 protocol 1: Modbus

• FZ/GZ series

Data range
1: Modbus

(2) Device address

Set the device address on each controller. And set the device address of the controller connected to the COM-MC on the COM-MC. For details, see **5.5 Device Address Recognition Method of Controller (P. 26)**.

NOTE

Set a unique address to each device on the same line. Overlapped device address may cause a failure or a malfunction of the device.

Data range
1 to 99 (Zero is not settable)

(3) Communication speed

• FB series

Data range
9.6: 9600 bps
19.2: 19200 bps
38.4: 38400 bps

• FZ/GZ series

Data range
2: 9600 bps
3: 19200 bps
4: 38400 bps
5: 57600 bps

The COM-MC does not support communication speed of "2400 bps" and "4800 bps."

(4) Data bit configuration

The data bit configuration of the controller must be the same as the configuration set on the COM-MC.

• FB series

Data range			
Set value	Data bit	Parity bit	Stop bit
8n1	8	None	1

COM-MC only supports "8n1" (Data 8 bits, non parity, Stop 1 bit).

• FZ/GZ series

Data range			
Set value	Data bit	Parity bit	Stop bit
0	8	None	1

COM-MC only supports "0" (Data 8 bits, non parity, Stop 1 bit).

(5) Input data type (only FZ/GZ series)

Set "Set value: 1" (single word).

Data range
1: Number of measured value digits: 4 Modbus data: Single word

The COM-MC∗01 does not support "Double word."

5.5 Device Address Recognition Method of Controller

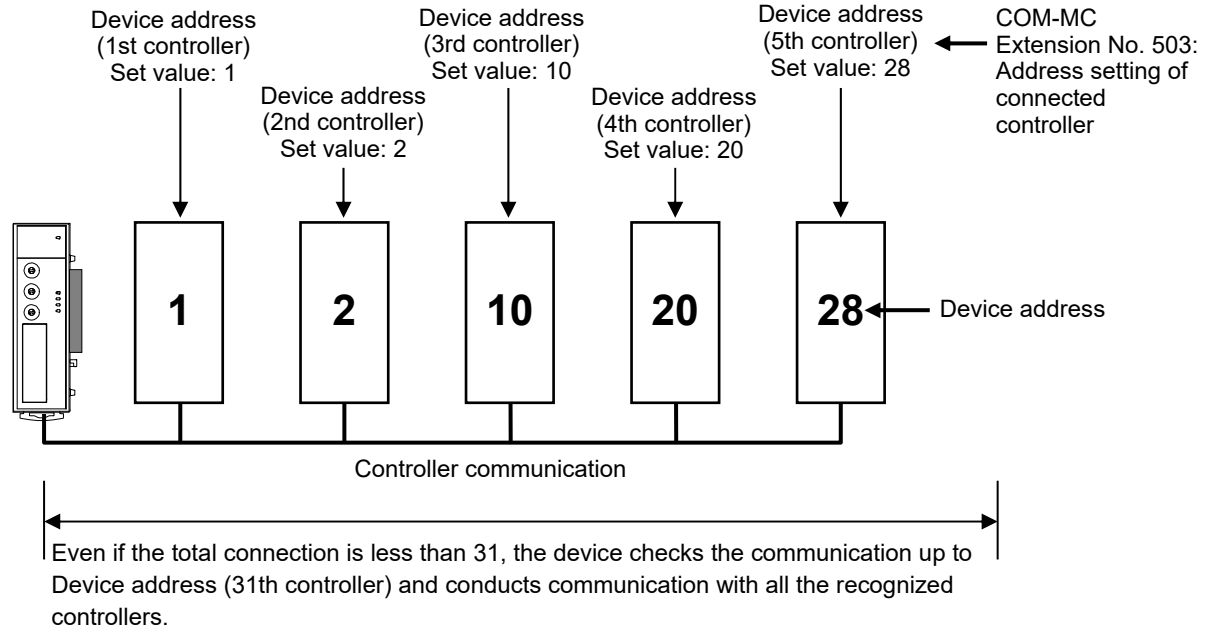
When conducting controller communication, set the device address on each controller, and set the device address (Extension No. 503) of the controller connected to the COM-MC on the COM-MC. There are two ways for a recognition method of the device address (Continuous setting and Free setting) that can be selected at "Action mode selection" of the COM-MC communication data (Extension No. 500). At the time of shipment, it is preset to "Continuous setting."
If the controller device address has been changed, the COM-MC needs to recognize the device address again. Use COM-MC communication data (Extension No. 505) "Automatic acquisition of controller address" to ensure that the COM-MC recognizes the device address again.

In this manual the controller address is generally described as "device address." You might find some addresses are described as "controller address," but these are both the same.

5.5.1 Free setting

The COM-MC performs communication check from Device address (1st controller) up to the maximum number of connections in sequence. The COM-MC conducts communication with recognized controllers.
The controller device address can be freely settable in the range of 1 to 99.
The device address is required on both the controller and the communication data (Extension No. 503) "Address setting of connected controller" of the COM-MC. The factory set values of Extension number 503 (Address setting of connected controller) are set sequentially from 1 to 31, starting from the Device address (1st controller).

When 5 controllers are connected (Maximum connections: Up to 31 controllers)



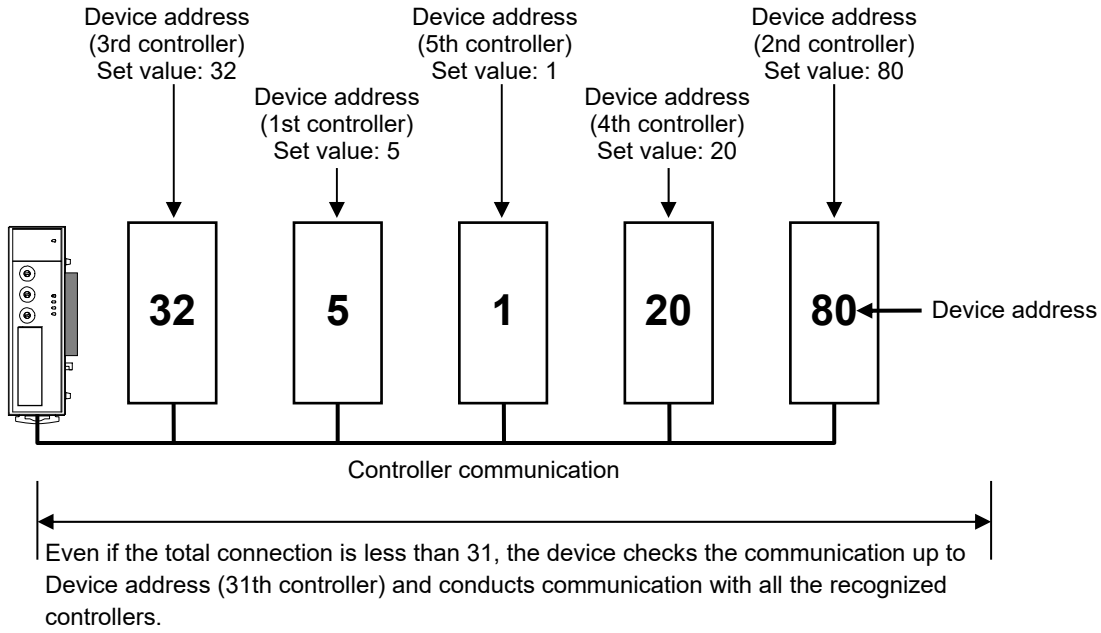
Continued on the next page

When device addresses are randomly set, including device addresses of 32 or more

To set a device address 32 or more, the device address same as that set on the controller must be set at the device address of the extension number 503 (Address setting of connected controller).

Example: When device address is randomly set including device address over 32
(Total connection: 5)

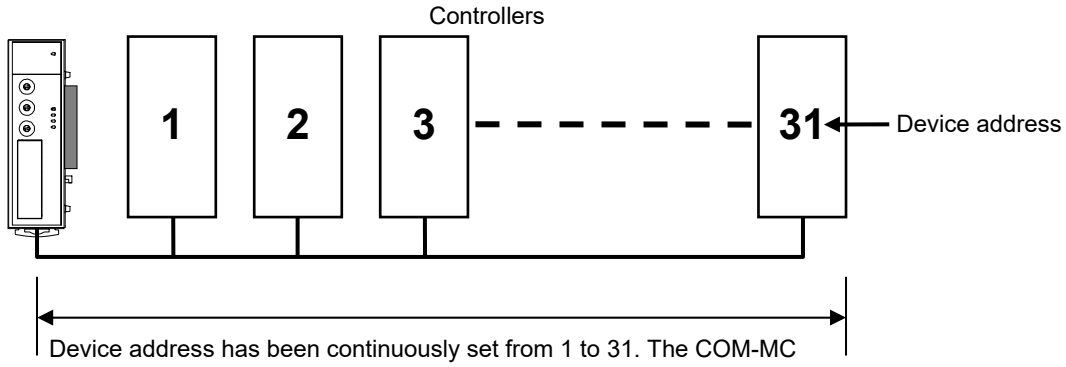
Extension No. 503 Address setting of connected controller	Device address of controller
Device address (1st controller)	Device address 5
Device address (2nd controller)	Device address 80
Device address (3rd controller)	Device address 32
Device address (4th controller)	Device address 20
Device address (5th controller)	Device address 1



5.5.2 Continuous setting

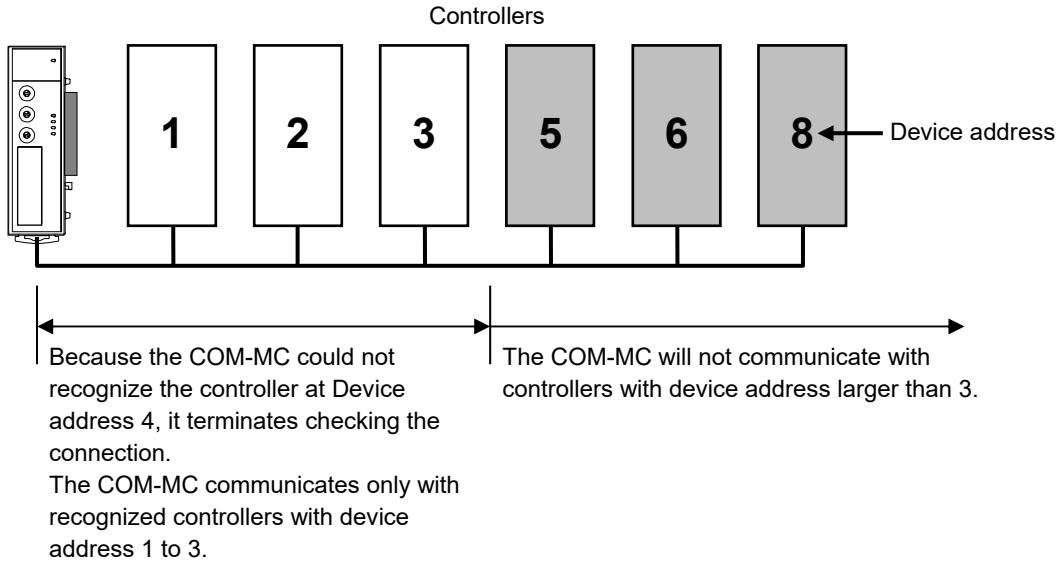
The COM-MC scans the devices for connection of the communication in the order from Device address (1st controller). If there is a controller that cannot be recognized, then the COM-MC finishes checking the connection. The COM-MC conducts communication with recognized controllers only.
The device address is required on both the controller and the communication data (Extension No. 503) "Address setting of connected controller" of the COM-MC. The factory set values of Extension number 503 (Address setting of connected controller) are set sequentially from 1 to 31, starting from the Device address (1st controller).

When controller device address is continuously set from 1 to 31



When controller device address has been intermittently set

If controller device addresses 4 and 7 are empty:



5.5.3 Controller address auto acquisition

In such cases as shown below, conduct Controller address automatic acquisition.

- The COM-MC was powered on, but communication with controllers was not established.
- Device address of the controller was changed.
- Device address set at the Extension No. 503 “Address setting of connected controller” of the COM-MC communication data as changed.

■ Procedure of Controller address automatic acquisition

Controller address automatic acquisition is implemented at the Extension No. 505 “Automatic acquisition of controller address” of the COM-MC communication data.

NOTE

Implement Controller address automatic acquisition while the system is off.

1. Set the Extension No. 505 “Automatic acquisition of controller address” to “1: Execute the automatic acquisition.”
2. Turn off the power of the COM-MC.
3. Turn on the power of the COM-MC.
4. Automatic acquisition is completed when the set value of Extension No. 505 “Automatic acquisition of controller address” changes from “1: Execute the automatic acquisition” to “0: Do not execute the automatic acquisition.”
5. Ensure that the communication is established with the controller(s) connected to the COM-MC.

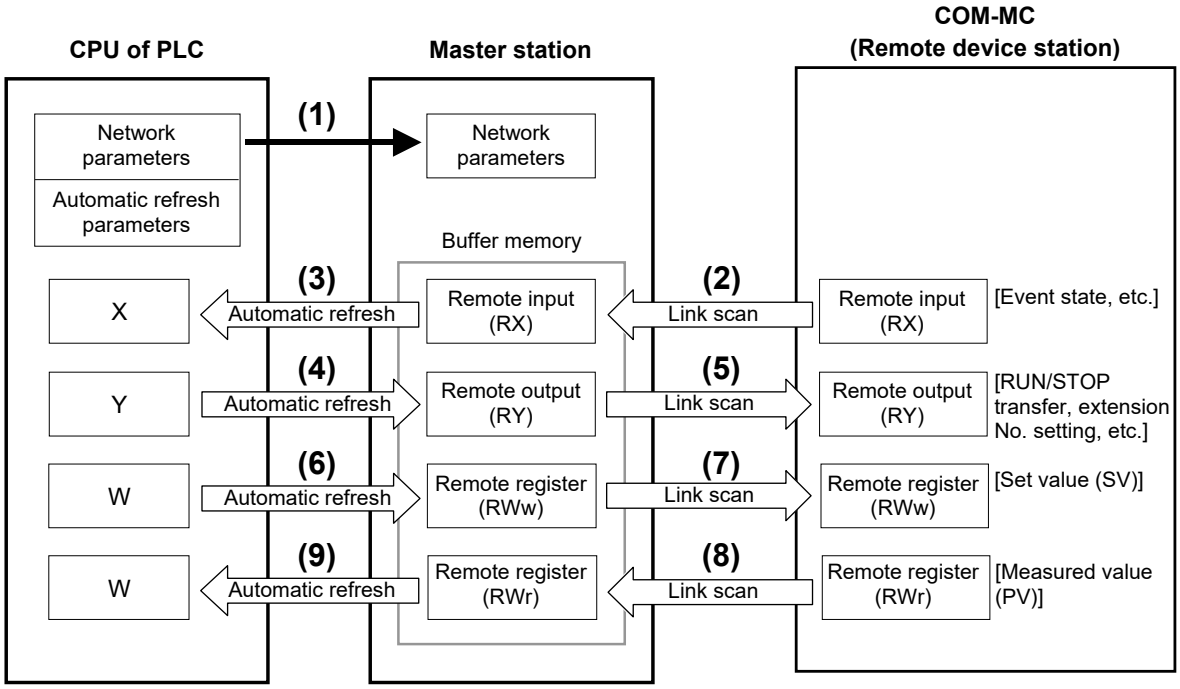
After the controller device addresses are automatically acquired, they are stored in Extension No. 503 (Address Setting of Connected Controllers) in ascending address order.

6. CC-Link COMMUNICATION

6.1 Communication Between Master Station and COM-MC (Remote Device Station)

The COM-MC which is a remote device station can process Remote input (RX), Remote output (RY) and Remote registers (RWw and RWr).

■ Outline of communication between master station and COM-MC (Remote device station)



(1) When the PLC system is powered on, the network parameters in the PLC CPU are transferred to the master station, and the CC-Link system automatically starts up. [Data link startup]

(2) The Remote input RX of a COM-MC (Remote device station) is stored automatically (for each link scan) in the master station's Remote input RX buffer memory. [Remote input]

(3) The input status stored in the Remote input RX buffer memory is stored in the CPU device set with the automatic refresh parameters.

(4) The ON/OFF data of the CPU device set with the automatic refresh parameters is stored in the Remote output RY buffer memory. [Remote output]

(5) Remote output RY is automatically set to ON/OFF (for each link scan) according to the output status stored in the Remote output RY buffer memory.

(6) The transmission data of the CPU device set with the automatic refresh parameters is stored in the Remote register RWw buffer memory.

(7) The data stored in the Remote register RWw buffer memory is automatically sent to the Remote register RWw of COM-MC (Remote device station).

[Writing to the Remote register RWw]

(8) The Remote register RWr data of a COM-MC (Remote device station) is automatically stored in the Remote register RWr buffer memory of the master station.

(9) The Remote register RWr data of a COM-MC (Remote device station) stored in the Remote register RWr buffer memory is stored in the CPU device set with the automatic refresh parameters.

[Reading from the Remote register (RWr)]

With the master station (PLC) set to the STOP state, neither the Remote output (RY) nor data write to the Remote register (RWw) is reflected to the COM-MC.

For details of the communication, refer to the **Instruction manual for PLC**.

6.2 CC-Link Flag Operation

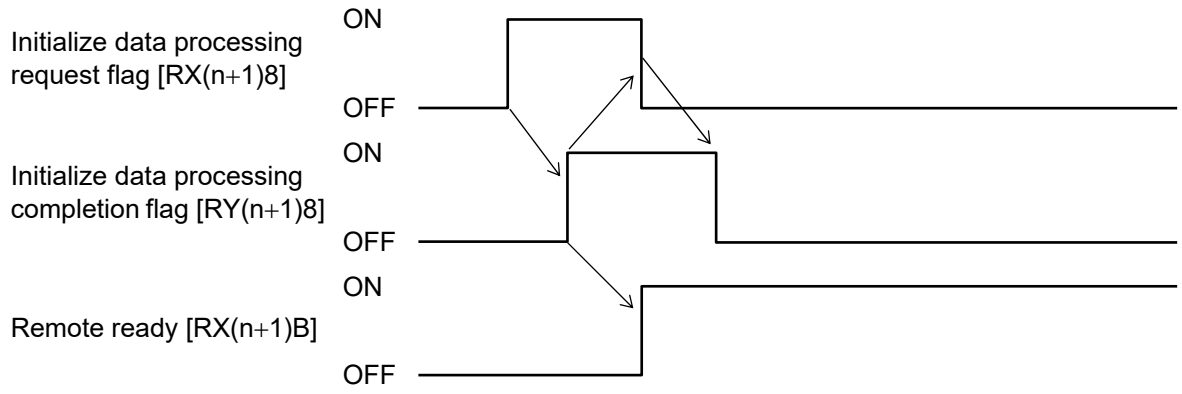
Remote input/output and Remote register flag operations are as follows.

[Example] When the Occupied station/Extended cyclic of COM-MC is set to 1 station occupied 1 time.

■ Initialize request processing at power on

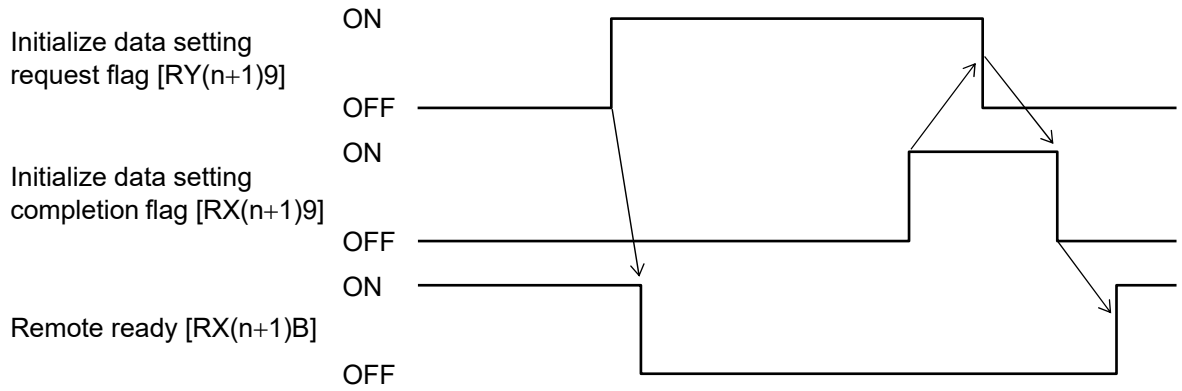
● Initialize processing request from Remote device station (COM-MC)

If the COM-MC is initialized at power on, the Initialize data processing request flag [RX(n+1)8] is turned on. Thus, turn on the Initialize data processing completion flag [RY(n+1)8].
When COM-MC becomes a ready state, a Remote ready [RX(n+1)B] is turned on.



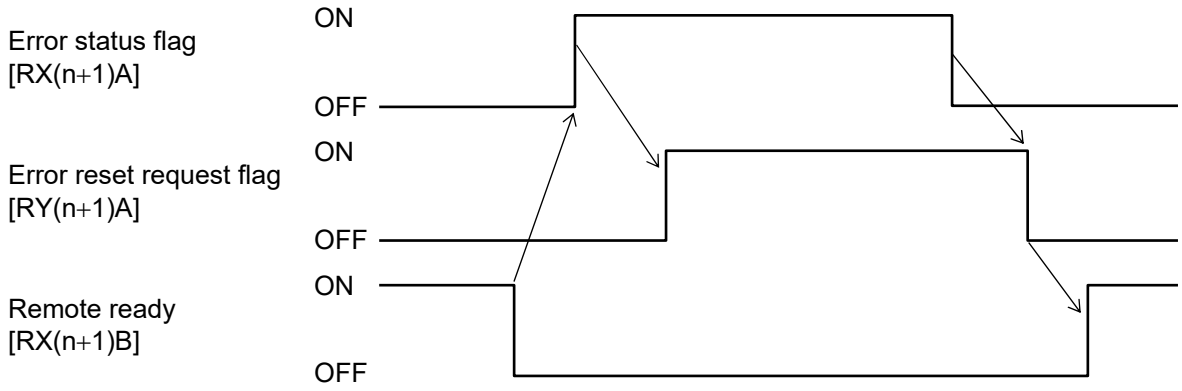
● Initialize processing request from Master station (PLC)

This is a COM-MC initialize setting request. As there is no initialize data specifically, no processing is required.



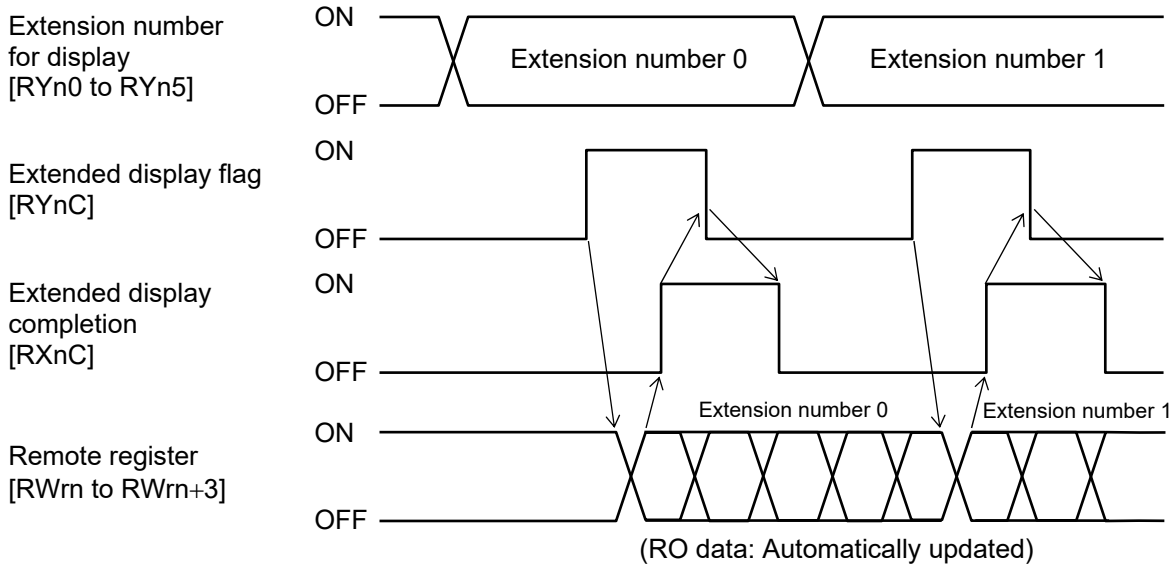
■ Error flag/Error reset processing

If the Error reset request flag [RY(n+1)A] is turned on while the Error status flag [RX(n+1)A] is turned on, the Error status flag history is cleared and the flag [RX(n+1)A] turns off.



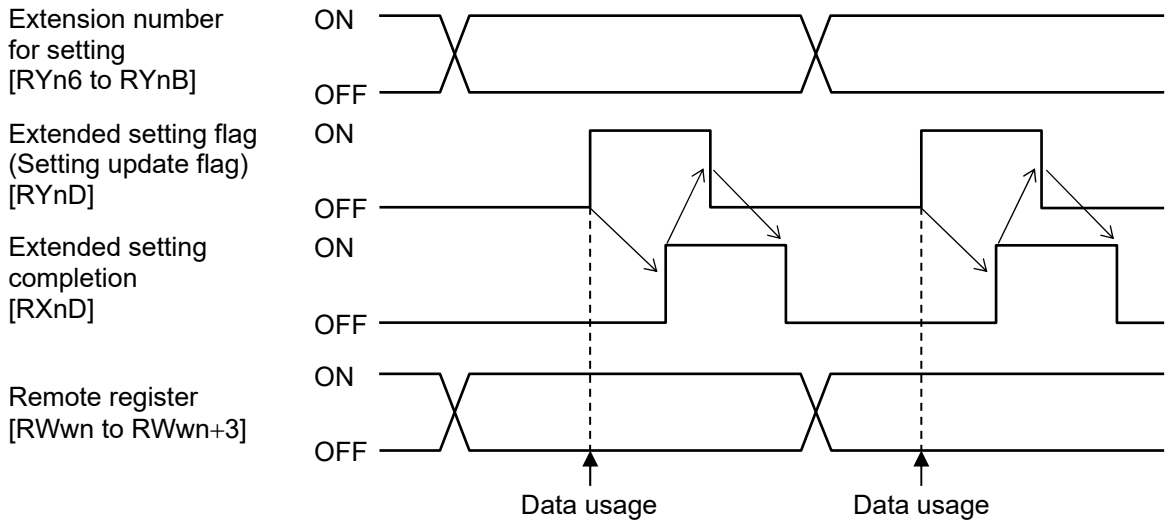
■ Extension number for display selection processing

The content of the Extended display remote register is selected.
After the Extension number for display [RYn0 to RYn5] is set, turn on the Extended display flag [RYnC]. After the data in the Remote register [RWrn to RWrn+3] is displayed, check that Extended display completion [RXnC] is turned on and then turn off the Extended display flag [RYnC]. If the Extended display flag is turned off, the Extended display completion is turned off.



■ Extension number for setting selection processing

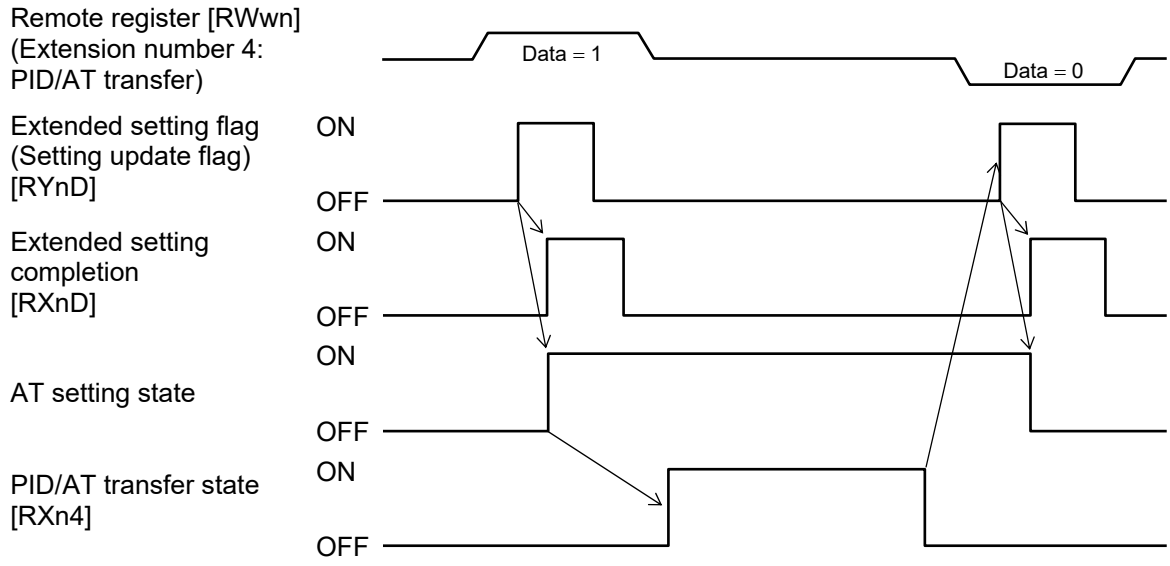
The content of the Extended setting remote register is selected and the set value is changed.
After the Extension number for setting [RYn6 to RYnB] is set, turn on the Extended setting flag (Setting update flag) [RYnD]. After the content of the Remote register [RWwn to RWwn+3] is set, check that Extended setting completion [RXnD] is turned on and then turn off the Extended setting flag (Setting update flag) [RYnD]. If the Extended setting flag (Setting update flag) [RYnD] is turned off, the Extended setting completion [RXnD] is turned off.



Regardless of the number of Occupied station and the Extended cyclic, the above processing is also necessary if the Set value (SV) assigned to the Remote register (RWw) as a fixed value is changed.

■ AT start procedure

Instructs AT execution.



6.3 Processing of Numeric Data Values

Numeric data values used via communication with the PLC and processed by COM-MC include those with and without decimal points and also those with minus signs.

● For numeric data value without decimal point

If there is no decimal point, the value is processed as it is.
In parameters which only have ON or OFF status, 1 = ON, 0 = OFF.

[Example]

A signal wire for temperature input is disconnected and the burnout state occurs.

→ Read value corresponding to extension number 63 (comprehensive event state):
1 (Hexadecimal number: 0001H)

● For numeric data value with decimal point

The decimal point is omitted.

[Example]

When the Measured value (PV) of controller [device address (1st controller)] is 120.5 °C

→ Read value of Remote register (RWrn) [Measured value (PV) of device address (1st controller)]:
1205 (Hexadecimal number: 04B5H)

→ Read value corresponding to extension number 0 [Measured value (PV)]:
1205 (Hexadecimal number: 04B5H)

● For numeric data value with minus sign

The value is expressed as a 2's complement value which is obtained by subtracting the minus value from the hexadecimal number 10000H.

[Example]

When the Measured value (PV) of controller [device address (1st controller)] is −2.5 °C

→ Read value of Remote register (RWrn) [Measured value (PV) of device address (1st controller)]:
Hexadecimal number: FFE7H (10000H − 25 =10000H − 19H = FFE7H)

→ Read value corresponding to extension number 0 [Measured value (PV)]:
Hexadecimal number: FFE7H (10000H − 25 = 10000H − 19H = FFE7H)


Read data of unused item becomes 0.


Any attempt to write to an unused item is not processed as an error.
Data cannot be written into an unused item.

7. COMMUNICATION DATA LIST

7.1 FB Series Data List

7.1.1 Remote input/output

Remote input (RX) and Remote output (RY) is ON/OFF data.

"n" in the table is the address assigned to the master station by the station number setting.
It can be calculated by the following equation. However, the computing equation is when a network is configured only by using our COM-MCs and the number of all Occupied station/Extended cyclic are at the same setting.

Number of Occupied station/Extended cyclic setting	Equation
1 station occupied 1 time	n = (Station number* − 1) × 2
4 stations occupied 1 time	n = (Station number* − 1) × 2
4 stations occupied 2 times	n = (Station number* − 1) × 3.5

* Station number when there is one occupied station: 1 to 64 (each number can be set)
Station number when there are four occupied stations: 1 to 61 (Four stations are occupied for each station number, and thus only numbers that are increments of four can be set: 1, 5, 9 …61)

As the calculation result is expressed in decimal number it is converted to hexadecimal number before substituted for "n" in the table.

Example: When the COM-MC is set to 4 stations occupied 1 time and its station number is 5.
n = (5 − 1) × 2 = 8 (Decimal number) → 8 (Hexadecimal number)

For station number 5: Remote inputs RXn0 to RX (n+7) F → RX80 to RXFF
Remote outputs RYn0 to RY (n+7) F → RY80 to RYFF

If the network consists of COM-MC modules with differing Number of Occupied station/ Extended cyclic settings, use for "n" the total of the highest digits of the number of assigned registers with station number lower than the module's own station in order from the lowest station number.

Number of Occupied station/Extended cyclic setting	Number of assigned registers
1 station occupied 1 time	20H (Hexadecimal number)
4 stations occupied 1 time	80H (Hexadecimal number)
4 stations occupied 2 times	E0H (Hexadecimal number)

Example: Calculation of "n" when the network consists of three COM-MC modules and the station numbers and Number of Occupied station/Extended cyclic settings are as shown below.

1st module [Station number 1]: 4 stations occupied 2 times
n = 0 (No station numbers less than the module's own station, thus 0)
Remote inputs: RXn0 to RX (n+D) F → RX00 to RXDF
Remote outputs: RYn0 to RY (n+D) F → RY00 to RYDF

2nd module [Station number 5]: 1 station occupied 1 time
n = E (Highest digit of E0H, the number of assigned registers of station 1)
Remote inputs: RXn0 to RX (n+1) F → RXE0 to RXFF
Remote outputs: RYn0 to RY (n+1) F → RYE0 to RYFF

3rd module [Station number 6]: 4 stations occupied 1 time
n = E + 2 = 10
(Total of highest digits of E0H and 20H, the number of assigned registers of station 1 and station 5)
Remote inputs: RXn0 to RX (n+7) F → RX100 to RX17F
Remote outputs: RYn0 to RY (n+7) F → RY100 to RY17F

Assignment of controllers to “Device address (1st to 31st controller)” in the list can be done at Extension No. 503 “Address setting of connected controller” (P. 75).
In case controllers are used with the factory set values, controllers 1 to 31 (Device address 1 to 31) are assigned to “Device address (1st to 31st controller)” in the list.

■ 1 station occupied 1 time

● Remote input

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 32 bits

Address	Communication item		Data range	Factory set value
RXn0	Device address (1st controller)	Event 1 state	0: OFF 1: ON	—
RXn1		Event 2 state		—
RXn2		Burnout state	0: OFF 1: ON	—
RXn3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXn5	Device address (2nd controller)	Event 1 state	0: OFF 1: ON	—
RXn6		Event 2 state		—
RXn7		Burnout state	0: OFF 1: ON	—
RXn8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXnA	Unused		—	—
RXnB				
RXnC	Extended display completion		0: OFF 1: ON	—
RXnD	Extended setting completion		0: OFF 1: ON	—
RXnE	Unused		—	—
RXnF	Hardware error flag		0: OFF 1: ON Hardware error flag ON condition • Major fault	—
RX(n+1)0 • • • RX(n+1)7	Reserved		—	—
RX(n+1)8	Initialize data processing request flag		0: OFF 1: ON	—
RX(n+1)9	Initialize data setting completion flag		0: OFF 1: ON	—
RX(n+1)A	Error status flag		0: OFF 1: ON Error status flag ON condition • Recoverable fault • Controller communication error	—
RX(n+1)B	Remote ready		0: Not ready state 1: Ready state	—
RX(n+1)C • • • RX(n+1)F	Reserved		—	—

● Remote output

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 32 bits

Address	Communication item		Data range	Factory set value
RYn0	Bit 0	Extension number for display	Display extension number are specified by the ON/OFF states of RYn0 to RYn5. Data 0: OFF 1: ON [Decimal number: 0 to 63]	0
RYn1	Bit 1			
RYn2	Bit 2			
RYn3	Bit 3			
RYn4	Bit 4			
RYn5	Bit 5			
RYn6	Bit 0	Extension number for setting	Setting extension number are specified by the ON/OFF states of RYn6 to RYnB. Data 0: OFF 1: ON [Decimal number: 0 to 63]	0
RYn7	Bit 1			
RYn8	Bit 2			
RYn9	Bit 3			
RYnA	Bit 4			
RYnB	Bit 5			
RYnC	Extended display flag		0: OFF 1: ON	0
RYnD	Extended setting flag (Setting update flag)		0: OFF 1: ON	0
RYnE	Unused		—	—
RYnF	RUN/STOP transfer		Logic of RUN/STOP transfer is different by model code. For COM-MC∗01-**1** 0: RUN (Control start) 1: STOP (Control stop) For COM-MC∗01-**2** 0: STOP (Control stop) 1: RUN (Control start)	0
RY(n+1)0 • • • RY(n+1)7	Reserved		—	—
RY(n+1)8	Initialize data processing completion flag		0: OFF 1: ON	0
RY(n+1)9	Initialize data setting request flag		0: OFF 1: ON	0
RY(n+1)A	Error reset request flag		0: OFF 1: ON	0
RY(n+1)B • • • RY(n+1)F	Reserved		—	—

■ 4 stations occupied 1 time

● Remote input

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 128 bits

Address	Communication item		Data range	Factory set value
RXn0	Device address (1st controller)	Event 1 state	0: OFF 1: ON	—
RXn1		Event 2 state		—
RXn2		Burnout state	0: OFF 1: ON	—
RXn3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXn5	Device address (2nd controller)	Event 1 state	0: OFF 1: ON	—
RXn6		Event 2 state		—
RXn7		Burnout state	0: OFF 1: ON	—
RXn8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXnA	Unused		—	—
RXnB				
RXnC	Extended display completion		0: OFF 1: ON	—
RXnD	Extended setting completion		0: OFF 1: ON	—
RXnE	Unused		—	—
RXnF	Hardware error flag		0: OFF 1: ON Hardware error flag ON condition • Major fault	—
RX(n+1)0 • • • RX(n+1)F	Unused		—	—
RX(n+2)0	Device address (3rd controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)1		Event 2 state		—
RX(n+2)2		Burnout state	0: OFF 1: ON	—
RX(n+2)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+2)5	Device address (4th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)6		Event 2 state		—
RX(n+2)7		Burnout state	0: OFF 1: ON	—
RX(n+2)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+2)A	Device address (5th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)B		Event 2 state		—
RX(n+2)C		Burnout state	0: OFF 1: ON	—
RX(n+2)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+2)F	Device address (6th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)0		Event 2 state		—
RX(n+3)1		Burnout state	0: OFF 1: ON	—
RX(n+3)2		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)3		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)4	Device address (7th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)5		Event 2 state		—
RX(n+3)6		Burnout state	0: OFF 1: ON	—
RX(n+3)7		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)8		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)9	Device address (8th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)A		Event 2 state		—
RX(n+3)B		Burnout state	0: OFF 1: ON	—
RX(n+3)C		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)D		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)E	Unused		—	—
RX(n+3)F				

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+4)0	Device address (9th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)1		Event 2 state		—
RX(n+4)2		Burnout state	0: OFF 1: ON	—
RX(n+4)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)5	Device address (10th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)6		Event 2 state		—
RX(n+4)7		Burnout state	0: OFF 1: ON	—
RX(n+4)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)A	Device address (11th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)B		Event 2 state		—
RX(n+4)C		Burnout state	0: OFF 1: ON	—
RX(n+4)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)F	Device address (12th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)0		Event 2 state		—
RX(n+5)1		Burnout state	0: OFF 1: ON	—
RX(n+5)2		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)3		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+5)4	Device address (13th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)5		Event 2 state		—
RX(n+5)6		Burnout state	0: OFF 1: ON	—
RX(n+5)7		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)8		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+5)9	Device address (14th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)A		Event 2 state		—
RX(n+5)B		Burnout state	0: OFF 1: ON	—
RX(n+5)C		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)D		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+5)E	Unused		—	—
RX(n+5)F				
RX(n+6)0	Device address (15th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+6)1		Event 2 state		—
RX(n+6)2		Burnout state	0: OFF 1: ON	—
RX(n+6)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+6)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+6)5	Device address (16th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+6)6		Event 2 state		—
RX(n+6)7		Burnout state	0: OFF 1: ON	—
RX(n+6)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+6)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+6)A • • • RX(n+6)F	Unused		—	—
RX(n+7)0 • • • RX(n+7)7	Reserved		—	—
RX(n+7)8	Initialize data processing request flag		0: OFF 1: ON	—
RX(n+7)9	Initialize data setting completion flag		0: OFF 1: ON	—
RX(n+7)A	Error status flag		0: OFF 1: ON Error status flag ON condition • Recoverable fault • Controller communication error	—
RX(n+7)B	Remote ready		0: Not ready state 1: Ready state	—
RX(n+7)C • • • RX(n+7)F	Reserved		—	—

● Remote output

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 128 bits

Address	Communication item		Data range	Factory set value
RYn0	Bit 0	Extension number for display	Display extension number are specified by the ON/OFF states of RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RYn1	Bit 1			
RYn2	Bit 2			
RYn3	Bit 3			
RYn4	Bit 4			
RYn5	Bit 5			
RYn6	Bit 0	Extension number for setting	Setting extension number are specified by the ON/OFF states of RYn6 to RYnB and RY(n+1)8 to RY(n+1)A. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RYn7	Bit 1			
RYn8	Bit 2			
RYn9	Bit 3			
RYnA	Bit 4			
RYnB	Bit 5			
RYnC	Extended display flag		0: OFF 1: ON	0
RYnD	Extended setting flag (Setting update flag)		0: OFF 1: ON	0
RYnE	Unused		—	—
RYnF	RUN/STOP transfer		Logic of RUN/STOP transfer is different by model code. For COM-MC∗01-**1** 0: RUN (Control start) 1: STOP (Control stop) For COM-MC∗01-**2** 0: STOP (Control stop) 1: RUN (Control start)	0
RY(n+1)0	Bit 6	Extension number for display Bit 9 to Bit 13: Unused	Display extension number are specified by the ON/OFF states of RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RY(n+1)1	Bit 7			
RY(n+1)2	Bit 8			
RY(n+1)3	Bit 9			
RY(n+1)4	Bit 10			
RY(n+1)5	Bit 11			
RY(n+1)6	Bit 12			
RY(n+1)7	Bit 13			
RY(n+1)8	Bit 6	Extension number for setting Bit 9 to Bit 13: Unused	Setting extension number are specified by the ON/OFF states of RYn6 to RYnB and RY(n+1)8 to RY(n+1)A. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RY(n+1)9	Bit 7			
RY(n+1)A	Bit 8			
RY(n+1)B	Bit 9			
RY(n+1)C	Bit 10			
RY(n+1)D	Bit 11			
RY(n+1)E	Bit 12			
RY(n+1)F	Bit 13			

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RY(n+2)0	Bit 0	Area number for display Bit 4 to Bit 7: Unused	Display area number are specified by the ON/OFF states of RY(n+2)0 to RY(n+2)3. Data 0: OFF 1: ON [Decimal number: 0 to 16] (0, 9 to 16: Control area)	0
RY(n+2)1	Bit 1			
RY(n+2)2	Bit 2			
RY(n+2)3	Bit 3			
RY(n+2)4	Bit 4			
RY(n+2)5	Bit 5			
RY(n+2)6	Bit 6			
RY(n+2)7	Bit 7			
RY(n+2)8	Bit 0	Area number for setting Bit 4 to Bit 7: Unused	Setting area number are specified by the ON/OFF states of RY(n+2)8 to RY(n+2)B. Data 0: OFF 1: ON [Decimal number: 0 to 16] (0, 9 to 16: Control area)	0
RY(n+2)9	Bit 1			
RY(n+2)A	Bit 2			
RY(n+2)B	Bit 3			
RY(n+2)C	Bit 4			
RY(n+2)D	Bit 5			
RY(n+2)E	Bit 6			
RY(n+2)F	Bit 7			
RY(n+3)0 • • • RY(n+6)F	Unused		—	—
RY(n+7)0 • • • RY(n+7)7	Reserved		—	—
RY(n+7)8	Initialize data processing completion flag		0: OFF 1: ON	0
RY(n+7)9	Initialize data setting request flag		0: OFF 1: ON	0
RY(n+7)A	Error reset request flag		0: OFF 1: ON	0
RY(n+7)B • • • RY(n+7)F	Reserved		—	—

■ 4 stations occupied 2 times

● Remote input

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 224 bits

Address	Communication item		Data range	Factory set value
RXn0	Device address (1st controller)	Event 1 state	0: OFF 1: ON	—
RXn1		Event 2 state		—
RXn2		Burnout state	0: OFF 1: ON	—
RXn3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXn5	Device address (2nd controller)	Event 1 state	0: OFF 1: ON	—
RXn6		Event 2 state		—
RXn7		Burnout state	0: OFF 1: ON	—
RXn8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RXn9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RXnA	Unused		—	—
RXnB				
RXnC	Extended display completion		0: OFF 1: ON	—
RXnD	Extended setting completion		0: OFF 1: ON	—
RXnE	Unused		—	—
RXnF	Hardware error flag		0: OFF 1: ON Hardware error flag ON condition • Major fault	—
RX(n+1)0 • • • RX(n+1)F	Unused		—	—
RX(n+2)0	Device address (3rd controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)1		Event 2 state		—
RX(n+2)2		Burnout state	0: OFF 1: ON	—
RX(n+2)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+2)5	Device address (4th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)6		Event 2 state		—
RX(n+2)7		Burnout state	0: OFF 1: ON	—
RX(n+2)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+2)A	Device address (5th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+2)B		Event 2 state		—
RX(n+2)C		Burnout state	0: OFF 1: ON	—
RX(n+2)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+2)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+2)F	Device address (6th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)0		Event 2 state		—
RX(n+3)1		Burnout state	0: OFF 1: ON	—
RX(n+3)2		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)3		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)4	Device address (7th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)5		Event 2 state		—
RX(n+3)6		Burnout state	0: OFF 1: ON	—
RX(n+3)7		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)8		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)9	Device address (8th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+3)A		Event 2 state		—
RX(n+3)B		Burnout state	0: OFF 1: ON	—
RX(n+3)C		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+3)D		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+3)E	Unused		—	—
RX(n+3)F				

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+4)0	Device address (9th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)1		Event 2 state		—
RX(n+4)2		Burnout state	0: OFF 1: ON	—
RX(n+4)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)5	Device address (10th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)6		Event 2 state		—
RX(n+4)7		Burnout state	0: OFF 1: ON	—
RX(n+4)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)A	Device address (11th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+4)B		Event 2 state		—
RX(n+4)C		Burnout state	0: OFF 1: ON	—
RX(n+4)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+4)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+4)F	Device address (12th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)0		Event 2 state		—
RX(n+5)1		Burnout state	0: OFF 1: ON	—
RX(n+5)2		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)3		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+5)4	Device address (13th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)5		Event 2 state		—
RX(n+5)6		Burnout state	0: OFF 1: ON	—
RX(n+5)7		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)8		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+5)9	Device address (14th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+5)A		Event 2 state		—
RX(n+5)B		Burnout state	0: OFF 1: ON	—
RX(n+5)C		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+5)D		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+5)E	Unused		—	—
RX(n+5)F				
RX(n+6)0	Device address (15th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+6)1		Event 2 state		—
RX(n+6)2		Burnout state	0: OFF 1: ON	—
RX(n+6)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+6)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+6)5	Device address (16th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+6)6		Event 2 state		—
RX(n+6)7		Burnout state	0: OFF 1: ON	—
RX(n+6)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+6)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+6)A ⋮ RX(n+6)F	Unused		—	—
RX(n+7)0	Device address (17th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+7)1		Event 2 state		—
RX(n+7)2		Burnout state	0: OFF 1: ON	—
RX(n+7)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+7)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+7)5	Device address (18th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+7)6		Event 2 state		—
RX(n+7)7		Burnout state	0: OFF 1: ON	—
RX(n+7)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+7)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+7)A	Device address (19th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+7)B		Event 2 state		—
RX(n+7)C		Burnout state	0: OFF 1: ON	—
RX(n+7)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+7)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+7)F	Unused		—	—
RX(n+8)0	Device address (20th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+8)1		Event 2 state		—
RX(n+8)2		Burnout state	0: OFF 1: ON	—
RX(n+8)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+8)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+8)5	Device address (21st controller)	Event 1 state	0: OFF 1: ON	—
RX(n+8)6		Event 2 state		—
RX(n+8)7		Burnout state	0: OFF 1: ON	—
RX(n+8)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+8)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+8)A	Device address (22nd controller)	Event 1 state	0: OFF 1: ON	—
RX(n+8)B		Event 2 state		—
RX(n+8)C		Burnout state	0: OFF 1: ON	—
RX(n+8)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+8)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+8)F	Unused		—	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+9)0	Device address (23rd controller)	Event 1 state	0: OFF 1: ON	—
RX(n+9)1		Event 2 state		—
RX(n+9)2		Burnout state	0: OFF 1: ON	—
RX(n+9)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+9)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+9)5	Device address (24th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+9)6		Event 2 state		—
RX(n+9)7		Burnout state	0: OFF 1: ON	—
RX(n+9)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+9)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+9)A	Device address (25th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+9)B		Event 2 state		—
RX(n+9)C		Burnout state	0: OFF 1: ON	—
RX(n+9)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+9)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+9)F	Unused		—	—
RX(n+A)0	Device address (26th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+A)1		Event 2 state		—
RX(n+A)2		Burnout state	0: OFF 1: ON	—
RX(n+A)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+A)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+A)5	Device address (27th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+A)6		Event 2 state		—
RX(n+A)7		Burnout state	0: OFF 1: ON	—
RX(n+A)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+A)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RX(n+A)A	Device address (28th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+A)B		Event 2 state		—
RX(n+A)C		Burnout state	0: OFF 1: ON	—
RX(n+A)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+A)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+A)F	Unused		—	—
RX(n+B)0	Device address (29th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+B)1		Event 2 state		—
RX(n+B)2		Burnout state	0: OFF 1: ON	—
RX(n+B)3		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+B)4		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+B)5	Device address (30th controller)	Event 1 state	0: OFF 1: ON	—
RX(n+B)6		Event 2 state		—
RX(n+B)7		Burnout state	0: OFF 1: ON	—
RX(n+B)8		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+B)9		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+B)A	Device address (31st controller)	Event 1 state	0: OFF 1: ON	—
RX(n+B)B		Event 2 state		—
RX(n+B)C		Burnout state	0: OFF 1: ON	—
RX(n+B)D		Heater break alarm (HBA) state	0: OFF 1: ON	—
RX(n+B)E		PID/AT transfer state	0: PID control 1: Autotuning (AT)	—
RX(n+B)F • • • RX(n+C)F	Unused		—	—
RX(n+D)0 • • • RX(n+D)7	Reserved		—	—

Continued on the next page.

Continued from the previous page.

Address	Communication item	Data range	Factory set value
RX(n+D)8	Initialize data processing request flag	0: OFF 1: ON	—
RX(n+D)9	Initialize data setting completion flag	0: OFF 1: ON	—
RX(n+D)A	Error status flag	0: OFF 1: ON Error status flag ON condition • Recoverable fault • Controller communication error	—
RX(n+D)B	Remote ready	0: Not ready state 1: Ready state	—
RX(n+D)C • • • RX(n+D)F	Reserved	—	—

● Remote output

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 224 bits

Address	Communication item		Data range	Factory set value
RYn0	Bit 0	Extension number for display	Display extension number are specified by the ON/OFF states of RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RYn1	Bit 1			
RYn2	Bit 2			
RYn3	Bit 3			
RYn4	Bit 4			
RYn5	Bit 5			
RYn6	Bit 0	Extension number for setting	Setting extension number are specified by the ON/OFF states of RYn6 to RYnB and RY(n+1)8 to RY(n+1)A. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RYn7	Bit 1			
RYn8	Bit 2			
RYn9	Bit 3			
RYnA	Bit 4			
RYnB	Bit 5			
RYnC	Extended display flag		0: OFF 1: ON	0
RYnD	Extended setting flag (Setting update flag)		0: OFF 1: ON	0
RYnE	Unused		—	—
RYnF	RUN/STOP transfer		Logic of RUN/STOP transfer is different by model code. For COM-MC∗01-**1** 0: RUN (Control start) 1: STOP (Control stop) For COM-MC∗01-**2** 0: STOP (Control stop) 1: RUN (Control start)	0
RY(n+1)0	Bit 6	Extension number for display Bit 9 to Bit 13: Unused	Display extension number are specified by the ON/OFF states of RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RY(n+1)1	Bit 7			
RY(n+1)2	Bit 8			
RY(n+1)3	Bit 9			
RY(n+1)4	Bit 10			
RY(n+1)5	Bit 11			
RY(n+1)6	Bit 12			
RY(n+1)7	Bit 13			
RY(n+1)8	Bit 6	Extension number for setting Bit 9 to Bit 13: Unused	Setting extension number are specified by the ON/OFF states of RYn6 to RYnB and RY(n+1)8 to RY(n+1)A. Data 0: OFF 1: ON [Decimal number: 0 to 511]	0
RY(n+1)9	Bit 7			
RY(n+1)A	Bit 8			
RY(n+1)B	Bit 9			
RY(n+1)C	Bit 10			
RY(n+1)D	Bit 11			
RY(n+1)E	Bit 12			
RY(n+1)F	Bit 13			

Continued on the next page.

Continued from the previous page.

Address	Communication item		Data range	Factory set value
RY(n+2)0	Bit 0	Area number for display Bit 4 to Bit 7: Unused	Display area number are specified by the ON/OFF states of RY(n+2)0 to RY(n+2)3. Data 0: OFF 1: ON [Decimal number: 0 to 16] (0, 9 to 16: Control area)	0
RY(n+2)1	Bit 1			
RY(n+2)2	Bit 2			
RY(n+2)3	Bit 3			
RY(n+2)4	Bit 4			
RY(n+2)5	Bit 5			
RY(n+2)6	Bit 6			
RY(n+2)7	Bit 7			
RY(n+2)8	Bit 0	Area number for setting Bit 4 to Bit 7: Unused	Setting area number are specified by the ON/OFF states of RY(n+2)8 to RY(n+2)B. Data 0: OFF 1: ON [Decimal number: 0 to 16] (0, 9 to 16: Control area)	0
RY(n+2)9	Bit 1			
RY(n+2)A	Bit 2			
RY(n+2)B	Bit 3			
RY(n+2)C	Bit 4			
RY(n+2)D	Bit 5			
RY(n+2)E	Bit 6			
RY(n+2)F	Bit 7			
RY(n+3)0 • • • RY(n+C)F	Unused		—	—
RY(n+D)0 • • • RY(n+D)7	Reserved		—	—
RY(n+D)8	Initialize data processing completion flag		0: OFF 1: ON	0
RY(n+D)9	Initialize data setting request flag		0: OFF 1: ON	0
RY(n+D)A	Error reset request flag		0: OFF 1: ON	0
RY(n+D)B • • • RY(n+D)F	Reserved		—	—

7.1.2 Remote register

Remote registers (RWr, RWw) are numeric data.

"n" in the table is the address assigned to the master station by the station number setting.
It can be calculated by the following equation. However, the computing equation is when a network is configured only by using our COM-MCs and the number of all Occupied station/Extended cyclic are at the same setting.

Number of Occupied station/Extended cyclic setting	Equation
1 station occupied 1 time	n = (Station number* − 1) × 4
4 stations occupied 1 time	n = (Station number* − 1) × 4
4 stations occupied 2 times	n = (Station number* − 1) × 8

* Station number when there is one occupied station: 1 to 64 (each number can be set)
Station number when there are four occupied stations: 1 to 61 (Four stations are occupied for each station number, and thus only numbers that are increments of four can be set: 1, 5, 9 …61)

As the calculation result is expressed in decimal number it is converted to hexadecimal number before substituted for "n" in the table.

Example: When the COM-MC is set to 4 stations occupied 1 time and its station number is 5.
n = (5 − 1) × 4 = 16 (Decimal number) → 10 (Hexadecimal number)

For station number 5: Remote registers RWrn to RWrn+F → RWr10 to RWr1F
RWwn to RWwn+F → RWw10 to RWw1F

If the network consists of COM-MC modules with differing Number of Occupied station/ Extended cyclic settings, use for "n" the total of the number of assigned registers with station number lower than the module's own station in order from the lowest station number.

Number of Occupied station/Extended cyclic setting	Number of assigned registers
1 station occupied 1 time	4H (Hexadecimal number)
4 stations occupied 1 time	10H (Hexadecimal number)
4 stations occupied 2 times	20H (Hexadecimal number)

Example: Calculation of "n" when the network consists of three COM-MC modules and the station numbers and Number of Occupied station/Extended cyclic settings are as shown below.

1st module [Station number 1]: 4 stations occupied 2 times
n = 0 (No station numbers less than the module's own station, thus 0)
Remote registers RWrn to RWrn+1F → RWr0 to RWr1F
RWwn to RWwn+1F → RWw0 to RWw1F

2nd module [Station number 5]: 1 station occupied 1 time
n = 20 (The number of assigned registers of station 1)
Remote registers RWrn to RWrn+3 → RWr20 to RWr23
RWwn to RWwn+3 → RWw20 to RWw23

3rd module [Station number 6]: 4 stations occupied 1 time
n = 20 + 4 = 24 (Total number of assigned registers of station 1 and station 5)
Remote registers RWrn to RWrn+F → RWr24 to RWr33
RWwn to RWwn+F → RWw24 to RWw33

Assignment of controllers to "Device address (1st to 31st controller)" in the list can be done at Extension No. 503 "Address setting of connected controller" (P. 75).
In case controllers are used with the factory set values, controllers 1 to 31 (Device address 1 to 31) are assigned to "Device address (1st to 31st controller)" in the list.

■ 1 station occupied 1 time (1 controller assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 4 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	Measured value (PV)	Input scale low to Input scale high	—
RWrn+1		Manipulated output value (MV1)	−5.0 to +105.0 %	—
RWrn+2		Unused	—	—
RWrn+3		For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5.	—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 4 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	Set value (SV)	Setting limiter low to Setting limiter high	0
RWwn+1		Event 1 set value	Deviation: −Input span to +Input span Process and set value: Input scale low to Input scale high Manipulated output value (MV1/MV2): −5.0 to +105.0 %	50
RWwn+2		Event 2 set value		50
RWwn+3		For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB.	—

When the Set value (SV), Event 1 set value, or Event 2 set value assigned to the Remote register (RWw) as a fixed value is changed, operation of the Extension setting flag (setting update flag) is also necessary. For details, see ■ **Extension number for setting selection processing (P. 34).**

■ 1 station occupied 1 time (2 controllers assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 4 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	Measured value (PV)	Input scale low to Input scale high	—
RWrn+1	Device address (2nd controller)	Measured value (PV)		—
RWrn+2	Device address (1st controller)	For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5.	—
RWrn+3	Device address (2nd controller)	For extended area display		—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 4 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	Set value (SV)	Setting limiter low to Setting limiter high	0
RWwn+1	Device address (2nd controller)	Set value (SV)		0
RWwn+2	Device address (1st controller)	For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB.	—
RWwn+3	Device address (2nd controller)	For extended area setting		—

When the Set value (SV) assigned to the Remote register (RWw) as a fixed value is changed, operation of the Extension setting flag (setting update flag) is also necessary.
For details, see ■ **Extension number for setting selection processing (P. 34).**

■ 4 stations occupied 1 time (8 controllers assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 16 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	Measured value (PV)	Input scale low to Input scale high	—
RWrn+1	Device address (2nd controller)			—
RWrn+2	Device address (3rd controller)			—
RWrn+3	Device address (4th controller)			—
RWrn+4	Device address (5th controller)			—
RWrn+5	Device address (6th controller)			—
RWrn+6	Device address (7th controller)			—
RWrn+7	Device address (8th controller)			—
RWrn+8	Device address (1st controller)	For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5 and from RY(n+1)0 to RY(n+1)2.	—
RWrn+9	Device address (2nd controller)			—
RWrn+A	Device address (3rd controller)			—
RWrn+B	Device address (4th controller)			—
RWrn+C	Device address (5th controller)			—
RWrn+D	Device address (6th controller)			—
RWrn+E	Device address (7th controller)			—
RWrn+F	Device address (8th controller)			—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 16 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	Set value (SV)	Setting limiter low to Setting limiter high	0
RWwn+1	Device address (2nd controller)			0
RWwn+2	Device address (3rd controller)			0
RWwn+3	Device address (4th controller)			0
RWwn+4	Device address (5th controller)			0
RWwn+5	Device address (6th controller)			0
RWwn+6	Device address (7th controller)			0
RWwn+7	Device address (8th controller)			0
RWwn+8	Device address (1st controller)	For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB and from RY(n+1)8 to RY(n+1)A.	—
RWwn+9	Device address (2nd controller)			—
RWwn+A	Device address (3rd controller)			—
RWwn+B	Device address (4th controller)			—
RWwn+C	Device address (5th controller)			—
RWwn+D	Device address (6th controller)			—
RWwn+E	Device address (7th controller)			—
RWwn+F	Device address (8th controller)			—

When the Set value (SV) assigned to the Remote register (RWw) as a fixed value is changed, operation of the Extension setting flag (setting update flag) is also necessary.
For details, see ■ **Extension number for setting selection processing (P. 34).**

■ 4 stations occupied 1 time (16 controllers assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 16 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5 and from RY(n+1)0 to RY(n+1)2.	—
RWrn+1	Device address (2nd controller)			—
RWrn+2	Device address (3rd controller)			—
RWrn+3	Device address (4th controller)			—
RWrn+4	Device address (5th controller)			—
RWrn+5	Device address (6th controller)			—
RWrn+6	Device address (7th controller)			—
RWrn+7	Device address (8th controller)			—
RWrn+8	Device address (9th controller)			—
RWrn+9	Device address (10th controller)			—
RWrn+A	Device address (11th controller)			—
RWrn+B	Device address (12th controller)			—
RWrn+C	Device address (13th controller)			—
RWrn+D	Device address (14th controller)			—
RWrn+E	Device address (15th controller)			—
RWrn+F	Device address (16th controller)			—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 16 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB and from RY(n+1)8 to RY(n+1)A.	—
RWwn+1	Device address (2nd controller)			—
RWwn+2	Device address (3rd controller)			—
RWwn+3	Device address (4th controller)			—
RWwn+4	Device address (5th controller)			—
RWwn+5	Device address (6th controller)			—
RWwn+6	Device address (7th controller)			—
RWwn+7	Device address (8th controller)			—
RWwn+8	Device address (9th controller)			—
RWwn+9	Device address (10th controller)			—
RWwn+A	Device address (11th controller)			—
RWwn+B	Device address (12th controller)			—
RWwn+C	Device address (13th controller)			—
RWwn+D	Device address (14th controller)			—
RWwn+E	Device address (15th controller)			—
RWwn+F	Device address (16th controller)			—

■ 4 stations occupied 2 times (16 controllers assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 32 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	Measured value (PV)	Input scale low to Input scale high	—
RWrn+1	Device address (2nd controller)			—
RWrn+2	Device address (3rd controller)			—
RWrn+3	Device address (4th controller)			—
RWrn+4	Device address (5th controller)			—
RWrn+5	Device address (6th controller)			—
RWrn+6	Device address (7th controller)			—
RWrn+7	Device address (8th controller)			—
RWrn+8	Device address (9th controller)			—
RWrn+9	Device address (10th controller)			—
RWrn+A	Device address (11th controller)			—
RWrn+B	Device address (12th controller)			—
RWrn+C	Device address (13th controller)			—
RWrn+D	Device address (14th controller)			—
RWrn+E	Device address (15th controller)			—
RWrn+F	Device address (16th controller)			—
RWrn+10	Device address (1st controller)	For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5 and from RY(n+1)0 to RY(n+1)2.	—
RWrn+11	Device address (2nd controller)			—
RWrn+12	Device address (3rd controller)			—
RWrn+13	Device address (4th controller)			—
RWrn+14	Device address (5th controller)			—
RWrn+15	Device address (6th controller)			—
RWrn+16	Device address (7th controller)			—
RWrn+17	Device address (8th controller)			—
RWrn+18	Device address (9th controller)			—
RWrn+19	Device address (10th controller)			—
RWrn+1A	Device address (11th controller)			—
RWrn+1B	Device address (12th controller)			—
RWrn+1C	Device address (13th controller)			—
RWrn+1D	Device address (14th controller)			—
RWrn+1E	Device address (15th controller)			—
RWrn+1F	Device address (16th controller)			—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 32 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	Set value (SV)	Setting limiter low to Setting limiter high	0
RWwn+1	Device address (2nd controller)			0
RWwn+2	Device address (3rd controller)			0
RWwn+3	Device address (4th controller)			0
RWwn+4	Device address (5th controller)			0
RWwn+5	Device address (6th controller)			0
RWwn+6	Device address (7th controller)			0
RWwn+7	Device address (8th controller)			0
RWwn+8	Device address (9th controller)			0
RWwn+9	Device address (10th controller)			0
RWwn+A	Device address (11th controller)			0
RWwn+B	Device address (12th controller)			0
RWwn+C	Device address (13th controller)			0
RWwn+D	Device address (14th controller)			0
RWwn+E	Device address (15th controller)			0
RWwn+F	Device address (16th controller)			0
RWwn+10	Device address (1st controller)	For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB and from RY(n+1)8 to RY(n+1)A.	—
RWwn+11	Device address (2nd controller)			—
RWwn+12	Device address (3rd controller)			—
RWwn+13	Device address (4th controller)			—
RWwn+14	Device address (5th controller)			—
RWwn+15	Device address (6th controller)			—
RWwn+16	Device address (7th controller)			—
RWwn+17	Device address (8th controller)			—
RWwn+18	Device address (9th controller)			—
RWwn+19	Device address (10th controller)			—
RWwn+1A	Device address (11th controller)			—
RWwn+1B	Device address (12th controller)			—
RWwn+1C	Device address (13th controller)			—
RWwn+1D	Device address (14th controller)			—
RWwn+1E	Device address (15th controller)			—
RWwn+1F	Device address (16th controller)			—

When the Set value (SV) assigned to the Remote register (RWw) as a fixed value is changed, operation of the Extension setting flag (setting update flag) is also necessary.
For details, see ■ **Extension number for setting selection processing (P. 34).**

■ 4 stations occupied 2 times (31 controllers assignment)

● Remote register (RWr)

Data direction: COM-MC (Remote device station) → Master station (PLC)
Data capacity: 32 words

Address	Communication item		Data range	Factory set value
RWrn	Device address (1st controller)	For extended area display	Data corresponding to the extension number specified by setting the display extension number from RYn0 to RYn5 and from RY(n+1)0 to RY(n+1)2.	—
RWrn+1	Device address (2nd controller)			—
RWrn+2	Device address (3rd controller)			—
RWrn+3	Device address (4th controller)			—
RWrn+4	Device address (5th controller)			—
RWrn+5	Device address (6th controller)			—
RWrn+6	Device address (7th controller)			—
RWrn+7	Device address (8th controller)			—
RWrn+8	Device address (9th controller)			—
RWrn+9	Device address (10th controller)			—
RWrn+A	Device address (11th controller)			—
RWrn+B	Device address (12th controller)			—
RWrn+C	Device address (13th controller)			—
RWrn+D	Device address (14th controller)			—
RWrn+E	Device address (15th controller)			—
RWrn+F	Device address (16th controller)			—
RWrn+10	Device address (17th controller)			—
RWrn+11	Device address (18th controller)			—
RWrn+12	Device address (19th controller)			—
RWrn+13	Device address (20th controller)			—
RWrn+14	Device address (21st controller)			—
RWrn+15	Device address (22nd controller)			—
RWrn+16	Device address (23rd controller)			—
RWrn+17	Device address (24th controller)			—
RWrn+18	Device address (25th controller)			—
RWrn+19	Device address (26th controller)			—
RWrn+1A	Device address (27th controller)			—
RWrn+1B	Device address (28th controller)			—
RWrn+1C	Device address (29th controller)			—
RWrn+1D	Device address (30th controller)			—
RWrn+1E	Device address (31st controller)			—
RWrn+1F	Unused		—	—

● Remote register (RWw)

Data direction: Master station (PLC) → COM-MC (Remote device station)
Data capacity: 32 words

Address	Communication item		Data range	Factory set value
RWwn	Device address (1st controller)	For extended area setting	Data corresponding to the extension number specified by setting the setting extension number from RYn6 to RYnB and from RY(n+1)8 to RY(n+1)A.	—
RWwn+1	Device address (2nd controller)			—
RWwn+2	Device address (3rd controller)			—
RWwn+3	Device address (4th controller)			—
RWwn+4	Device address (5th controller)			—
RWwn+5	Device address (6th controller)			—
RWwn+6	Device address (7th controller)			—
RWwn+7	Device address (8th controller)			—
RWwn+8	Device address (9th controller)			—
RWwn+9	Device address (10th controller)			—
RWwn+A	Device address (11th controller)			—
RWwn+B	Device address (12th controller)			—
RWwn+C	Device address (13th controller)			—
RWwn+D	Device address (14th controller)			—
RWwn+E	Device address (15th controller)			—
RWwn+F	Device address (16th controller)			—
RWwn+10	Device address (17th controller)			—
RWwn+11	Device address (18th controller)			—
RWwn+12	Device address (19th controller)			—
RWwn+13	Device address (20th controller)			—
RWwn+14	Device address (21st controller)			—
RWwn+15	Device address (22nd controller)			—
RWwn+16	Device address (23rd controller)			—
RWwn+17	Device address (24th controller)			—
RWwn+18	Device address (25th controller)			—
RWwn+19	Device address (26th controller)			—
RWwn+1A	Device address (27th controller)			—
RWwn+1B	Device address (28th controller)			—
RWwn+1C	Device address (29th controller)			—
RWwn+1D	Device address (30th controller)			—
RWwn+1E	Device address (31st controller)			—
RWwn+1F	Unused		—	—

7.1.3 Extension number

Communication items which are handled in the extension areas of the Remote registers (RWr and RWw) are specified by the extension number, If the necessary data is selected from a list of extension numbers and that extension number is set by Remote output, the data can be handled in the Remote registers (RWr and RWw).
In addition, communication item corresponding to Memory area function specifies memory area number to use in Remote register extension area for area number. Extension number and area number are set by Remote output ON/OFF.

☞ For Remote output, see **7.1.1 Remote input/output (P. 36)**.

☞ For Remote register, see **7.1.2 Remote register (P. 56)**.

☞ Refer to the following manual for the data range of the communication items with the extension number.
- **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□)**

☞ Refer to the following manuals for the Memory area function.
- **FB100 Instruction Manual (IMR01W16-E□)**
- **FB400/FB900 Instruction Manual (IMR01W03-E□)**

■ When reading data

● Setting of extension number for display

Extension number for display sets it with Remote output RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2.

Bit image

RY(n+1)2	RY(n+1)1	RY(n+1)0	RYn5	RYn4	RYn3	RYn2	RYn1	RYn0
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 511]

For the 1 station occupied 1 time setting, setting range of extension number becomes RYn0 to RYn5 [Decimal number: 0 to 63].

● Setting of area number for display

Area number for display sets it with Remote output RY(n+2)0 to RY(n+2)3.

Bit image

RY(n+2)3	RY(n+2)2	RY(n+2)1	RY(n+2)0
Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 16 (0, 9 to 16: Control area)]

For 1 station occupied 1 time setting, cannot do an assignment of area number.
Become communication item of a control area.

■ When writing data

● Setting of extension number for setting

Extension number for setting sets it with Remote output RYn6 to RYnB and RY(n+1)8 to RY(n+1)A.

Bit image

RY(n+1)A	RY(n+1)9	RY(n+1)8	RYnB	RYnA	RYn9	RYn8	RYn7	RYn6
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 511]

For the 1 station occupied 1 time setting, setting range of extension number becomes RYn6 to RYnB [Decimal number: 0 to 63].

● Setting of area number for setting

Area number for setting sets it with Remote output RY(n+2)8 to RY(n+2)B.

Bit image

RY(n+2)B	RY(n+2)A	RY(n+2)9	RY(n+2)8
Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 16 (0, 9 to 16: Control area)]

For 1 station occupied 1 time setting, cannot do an assignment of area number. Become communication item of a control area.

[Example] When setting extension number for setting to "3," and set area number for setting to "5."
Number of Occupied station/Extended cyclic setting: 4 stations occupied 1 time

- **Setting of extension number for setting**

Extension number 3: Set value (SV) →

Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	0	1	1

↓

RY(n+1)A	RY(n+1)9	RY(n+1)8	RYnB	RYnA	RYn9	RYn8	RYn7	RYn6
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

Bit data: 0: OFF 1: ON

- **Setting of area number for setting**

Memory area number 5 →

Bit 3	Bit 2	Bit 1	Bit 0
0	1	0	1

↓

RY(n+2)B	RY(n+2)A	RY(n+2)9	RY(n+2)8
OFF	ON	OFF	ON

Bit data: 0: OFF 1: ON

■ Extension number list

Attribute:
- RO: Read only data [Remote device station (COM-MC) → Master station (PLC)]
- R/W: Read and Write data [Remote device station (COM-MC) ↔ Master station (PLC)]
- *: Some data may have write restrictions. Refer to the relevant instruction manuals for the details of the controller.
- **: Read: Zero is displayed (Extension display works properly)
  Write: Not reflected (Extension setting works properly)

★: Data related multi-memory area function

Reading data of unused setting items are factory set values. Unused setting items may not be written. To do so will not cause an error however and data will be rejected.

Refer to the following manuals for the data range of each communication item.
- **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E□)**

Extension number	FB series communication items	
	Name	Attribute
0	Measured value (PV)	RO
1	Manipulated output value (MV1) monitor [heat-side]	RO
2	Current transformer 1 (CT1) input value monitor	RO
3	Set value (SV) ★	R/W
4	PID/AT transfer [1]	R/W
5	Proportional band [heat-side] ★	R/W
6	Integral time [heat-side] ★	R/W
7	Derivative time [heat-side] ★	R/W
8	PV bias	R/W
9	Event 1 set value ★	R/W *
10	Event 2 set value ★	R/W *
11 ⋮ 15	Reserved	— **
16	Unused	— **
17	RUN/STOP transfer	R/W
18	Proportional cycle time [heat-side]	R/W *
19	Auto/Manual transfer	R/W
20	Manual manipulated output value	R/W
21	Setting limiter high	R/W *
22	Setting limiter low	R/W *
23	PV digital filter	R/W
24	Heater break alarm 1 (HBA1) set value	R/W *
25	Decimal point position	R/W *
26	Manipulated output value (MV2) monitor [cool-side]	RO
27	Proportional band [cool-side] ★	R/W *
28	Proportional cycle time [cool-side]	R/W *
29	Overlap/Deadband ★	R/W *
30	Unused	— **
31	Set value (SV) monitor	RO

[1] For the operation, see the **6.2 CC-Link Flag Operation (P. 32).**

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
32	Error code	RO
33	Memory area transfer	R/W
34	Control response parameter ★	R/W
35	Unused	— **
36	Input type	R/W
37	Setting change rate limiter (up) ★	R/W
38	Control action	R/W *
39	Event 1 type	R/W *
40	Event 2 type	R/W *
41	Event 1 differential gap	R/W *
42	Event 2 differential gap	R/W *
43	Event 1 hold action	R/W *
44	Event 2 hold action	R/W *
45	Unused	— **
46	Output limiter high (MV1)	R/W *
47	Output limiter low (MV1)	R/W *
48	Unused	— **
49		
50	Control loop break alarm (LBA) time ★	R/W *
51	LBA deadband ★	R/W *
52	Unused	— **
53		
54	Event 3 set value (EV3) ★	R/W *
55	Event 4 set value (EV4) ★	R/W *
56	Event 3 type	R/W *
57	Event 4 type	R/W *
58	Event 3 differential gap	R/W *
59	Event 4 differential gap	R/W *
60	Event 3 hold action	R/W *
61	Event 4 hold action	R/W *
62	Setting change rate limiter (down) ★	R/W
63	Comprehensive event state	RO
64	Remote setting (RS) input value monitor	RO
65	Unused	— **
66		
67	Burnout state monitor of feedback resistance (FBR) input	RO
68	Memory area soak time monitor	RO
69	Digital input (DI) state monitor	RO
70	Operation mode state monitor	RO
71 ⋮ 73	Unused	— **
74	Output state monitor	RO
75	Current transformer 2 (CT2) input value monitor	RO

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
76 ⋮ 89	Unused	— **
90	Remote/Local transfer	R/W *
91 ⋮ 109	Unused	— **
110	Link area number ★	R/W
111	Area soak time ★	R/W
112	Integral time [cool-side] ★	R/W *
113	Derivative time [cool-side] ★	R/W *
114 ⋮ 127	Unused	— **
128	Manual reset ★	R/W *
129 ⋮ 139	Unused	— **
140	Heater break determination point 1	R/W *
141	Heater melting determination point 1	R/W *
142	PV ratio	R/W
143	PV low input cut-off	R/W *
144	Set lock level	R/W
145	Unused	— **
146	Backup memory state monitor	RO
147	Unused	— **
148	RS bias Cascade control: Cascade bias Ratio setting: Ratio setting bias	R/W
149	RS digital filter Cascade control: Cascade digital filter Ratio setting: Ratio setting digital filter	R/W
150	RS ratio Cascade control: Cascade ratio Ratio setting: Ratio setting ratio	R/W
151	Heater break alarm 2 (HBA2) set value	R/W *
152	Heater break determination point 2	R/W *
153	Heater melting determination point 2	R/W *
154 ⋮ 159	Unused	— **
160	Display unit	R/W *
161	Input scale high	R/W *
162	Input scale low	R/W *
163	Input error determination point (high)	R/W *

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
164	Input error determination point (low)	R/W *
165	Burnout direction	R/W *
166	Square root extraction	R/W *
167	Power supply frequency	R/W *
168	Sampling cycle	R/W *
169	Remote setting input type	R/W *
170	Digital input (DI) assignment	R/W *
171 : 179	Unused	— **
180	Output assignment	R/W *
181	Timer 1	R/W *
182	Timer 2	R/W *
183	Timer 3	R/W *
184	Timer 4	R/W *
185	Unused	— **
186	Energized/De-energized	R/W *
187	Alarm (ALM) lamp lighting condition 1	R/W *
188	Alarm (ALM) lamp lighting condition 2	R/W *
189	Output status at STOP mode	R/W *
190 : 195	Unused	— **
196	Transmission output type	R/W *
197	Transmission output scale high	R/W *
198	Transmission output scale low	R/W *
199	Unused	— **
200	Force ON of Event 1 action	R/W *
201	Unused	— **
202	Event 1 interlock	R/W *
203	Event 1 delay timer	R/W *
204	Force ON of Event 2 action	R/W *
205	Unused	— **
206	Event 2 interlock	R/W *
207	Event 2 delay timer	R/W *
208	Force ON of Event 3 action	R/W *
209	Unused	— **
210	Event 3 interlock	R/W *
211	Event 3 delay timer	R/W *
212	Force ON of Event 4 action	R/W *
213	Unused	— **
214	Event 4 interlock	R/W *
215	Event 4 delay timer	R/W *
216 : 219	Unused	— **

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
220	CT1 ratio	R/W *
221	Heater break alarm 1 (HBA1) type	R/W *
222	Number of heater break alarm 1 (HBA1) delay times	R/W *
223	CT1 assignment	R/W *
224	CT2 ratio	R/W *
225	Heater break alarm 2 (HBA2) type	R/W *
226	Number of heater break alarm 2 (HBA2) delay times	R/W *
227	CT2 assignment	R/W *
228	Unused	— **
229		
230	Hot/Cold start	R/W *
231	External input type	R/W *
232	Unused	— **
233		
234	SV tracking	R/W *
235	MV transfer function [Action taken when changed to Manual mode from Auto mode]	R/W *
236	Start determination point	R/W *
237	Unused	— **
238	Master channel selection	R/W *
239	Unused	— **
240	Integral/Derivative time decimal point position	R/W *
241	Derivative gain	R/W *
242	ON/OFF action differential gap (upper)	R/W *
243	ON/OFF action differential gap (lower)	R/W *
244	Action (high) at input error	R/W *
245	Action (low) at input error	R/W *
246	Manipulated output value at input error	R/W *
247	Output change rate limiter (up) [MV1]	R/W *
248	Output change rate limiter (down) [MV1]	R/W *
249	Power feed forward selection [Unused on the FB100]	R/W *
250	Power feed forward gain [Unused on the FB100]	R/W *
251	Derivative action	R/W *
252	Undershoot suppression factor	R/W *
253	Unused	— **
254	Output limiter high (MV2)	R/W *
255	Output limiter low (MV2)	R/W *
256	Output change rate limiter (up) [MV2]	R/W *
257	Output change rate limiter (down) [MV2]	R/W *
258	Manipulated output value (MV1) at STOP mode [heat-side]	R/W *
259	Manipulated output value (MV2) at STOP mode [cool-side]	R/W *
260	Action at feedback resistance (FBR) input break	R/W *
261	Unused	— **

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
262	Open/Close output neutral zone	R/W *
263	Open/Close output differential gap	R/W *
264	Feedback adjustment	R/W *
265	Integrated output limiter	R/W *
266	Control motor time	R/W *
267	Valve action at STOP	R/W *
268 269	Unused	— **
270	AT bias	R/W *
271	AT cycles	R/W *
272	AT differential gap time	R/W *
273	Output value with AT turned on	R/W *
274	Output value with AT turned off	R/W *
275	Proportional band adjusting factor [heat-side]	R/W *
276	Integral time adjusting factor [heat-side]	R/W *
277	Derivative time adjusting factor [heat-side]	R/W *
278	Proportional band adjusting factor [cool-side]	R/W *
279	Integral time adjusting factor [cool-side]	R/W *
280	Derivative time adjusting factor [cool-side]	R/W *
281	Proportional band limiter high [heat-side]	R/W *
282	Proportional band limiter low [heat-side]	R/W *
283	Integral time limiter high [heat-side]	R/W *
284	Integral time limiter low [heat-side]	R/W *
285	Derivative time limiter high [heat-side]	R/W *
286	Derivative time limiter low [heat-side]	R/W *
287	Proportional band limiter high [cool-side]	R/W *
288	Proportional band limiter low [cool-side]	R/W *
289	Integral time limiter high [cool-side]	R/W *
290	Integral time limiter low [cool-side]	R/W *
291	Derivative time limiter high [cool-side]	R/W *
292	Derivative time limiter low [cool-side]	R/W *
293 ⋮ 299	Unused	— **
300	Setting change rate limiter unit time	R/W *
301	Soak time unit	R/W *
302 ⋮ 319	Unused	— **
320	STOP display	R/W *
321	Bar graph display	R/W *
322	Bar graph display resolution	R/W *
323	Direct key 1 [FB100] Direct key selection	R/W *

Continued on the next page.

Continued from the previous page.

Extension number	FB series communication items	
	Name	Attribute
324	Direct key 2 [Unused on the FB100]	R/W *
325	Direct key 3 [Unused on the FB100]	R/W *
326 ⋮ 331	Unused	— **
332	Direct key type	R/W *
333	PV flashing display at input error	R/W *
334 ⋮ 340	Unused	— **
341	Integrated operating time monitor	RO
342	Holding peak value ambient temperature monitor	RO
343	Power feed forward input value monitor [Unused on the FB100]	RO
344 ⋮ 349	Unused	— **
350	Startup tuning (ST)	R/W *
351	ST proportional band adjusting factor	R/W *
352	ST integral time adjusting factor	R/W *
353	ST derivative time adjusting factor	R/W *
354	ST start condition	R/W *
355	Automatic temperature rise group	R/W *
356	Automatic temperature rise learning	R/W *
357	Automatic temperature rise dead time	R/W *
358	Automatic temperature rise gradient data	R/W *
359	RUN/STOP group	R/W *
360 ⋮ 499	Unused	— **

Continued on the next page.

Continued from the previous page.

The data with an extension number equal to or greater than 500 are for the COM-MC. The table shows different contents of description from here on. Extension numbers, communication items, attributes, data ranges and factory set values are described.

Extension number	Communication item	Attribute	Data range	Factory set value
500	Action mode selection [1]	R/W *	Bit data Bit 0: Address setting 0: Continuous setting 1: Free setting Bit 1 to Bit 15: Reserved [a] [a] Setting is prohibited. Doing so may result in malfunction or failure of the product.	0
501	Transmission wait time of controller communication	R/W *	0 to 100 ms	0

* When data outside the valid range is written, the following behavior occurs.
Written data: Not reflected
Extended setting: Works properly (Extended setting completion turns ON)

[1] Address setting (bit 0) of Action mode selection (Extension No. 500)

Select a recognition method of the device address (continuous or free setting) at power on.

- Continuous setting

  Controllers are sequentially recognized from Device address (1st controller) according to Extension No. 503 "Address setting of connected controller." Controllers which were connected after the controller got into the following condition (*n* th controller) will not be recognized.
  - No response from Controller (No response)
  - Value of Extension No. 503 "Address setting of connected controller" is 0 (No connected controllers)
- Free setting

  Controller is recognized sequentially from Device address (1st controller) according to Extension No. 503 "Address setting of connected controller." In this mode, recognition continues even if no response is received from controllers. For this reason, Free setting takes more time to complete the recognition compared to Continuous setting. However, if Extension No. 503 "Address setting of connected controller" is set to "0" (No connected controller), controllers connected at and after that will be ignored and not recognized.

[Example] If a controller with Device address (4th controller) gives no response while Extension No. 503 "Address setting of connected controller" is set as follows:

- 4 stations occupied 1 time (8 controllers assignment)

COM-MC Remote register (RWw)

Address	Extension No. 503 Address setting of connected controller	Set value
RWwn+8	Device address (1st controller)	2
RWwn+9	Device address (2nd controller)	8
RWwn+A	Device address (3rd controller)	10
RWwn+B	Device address (4th controller)	16
RWwn+C	Device address (5th controller)	30
RWwn+D	Device address (6th controller)	0
RWwn+E	Device address (7th controller)	0
RWwn+F	Device address (8th controller)	0

No response

Continuous setting:
Controllers with device address (1st to 3rd controller) [RWwn+8 to RWwn+A] will be recognized.
Controllers with device address (4th to 8th conttoller) [RWwn+B to RWwn+F] will not be recognized.
Controllers with device address 2, 8, or 10 can be used in CC-Link communication.

Free setting:
Controllers with device address (1st to 5th controller) [RWwn+8 to RWwn+C] will be recognized.
Controllers with device address (6th to 8th controller) [RWwn+D to RWwn+F] will not be recognized.
Controllers with device address 2, 8, 10 or 30 can be used in CC-Link communication.

Continued on the next page.

Continued from the previous page.

Extension number	Communication item	Attribute	Data range	Factory set value
502	Unused	— *	—	—
503	Address setting of connected controller [1]	R/W **	0 to 99 0: No connected controller	1 to 31
504	State of connected controller	RO	Bit data Bit 0: Presence or absence of controller Bit 1: Presence or absence of abnormal response Bit 2 to Bit 15: Unused Data 0: Absence 1: Presence	—
505	Automatic acquisition of controller address [2]	R/W **	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition [a] [a] Automatically reverts to 0 after automatic acquisition ends.	0
506 ⋮ 511	Unused	— *	—	—

* Read: Zero is displayed (Extension display works properly)
Write: Not reflected (Extension setting works properly)

** When data outside the valid range is written, the following behavior occurs.
Written data: Not reflected
Extended setting: Works properly (Extended setting completion turns ON)

[1] Address setting of connected controller (Extension No. 503)
Device addresses set on the connected controllers will be assigned to the register addresses of COM-MC.
[Example] When 4 controllers are connected and the device addresses set on the controllers are 2, 8, 10 or 30.
Device address set on the 1st controller: 2
Device address set on the 2nd controller: 8
Device address set on the 3rd controller: 10
Device address set on the 4th controller: 30

Set as follows for Extension No. 503 “Address setting of connected controller.”

- 4 stations occupied 1 time (8 controllers assignment)

COM-MC Remote register (RWw)

Address	Extension No. 503 Address setting of connected controller	Set value
RWwn+8	Device address (1st controller)	2
RWwn+9	Device address (2nd controller)	8
RWwn+A	Device address (3rd controller)	10
RWwn+B	Device address (4th controller)	30
RWwn+C	Device address (5th controller)	0
RWwn+D	Device address (6th controller)	0
RWwn+E	Device address (7th controller)	0
RWwn+F	Device address (8th controller)	0

[2] Automatic acquisition of controller address (Extension No. 505)
After having set “1: Execute the automatic acquisition”, power off the instrument once and then power on again. Controller address (device address set on the controller) will be automatically acquired. In the automatic acquisition, device addresses are sequentially acquired from “1.” The acquisition continues until 31 addresses are acquired or until device address 99 is verified. When the automatic acquisition is completed, the acquired device address will be automatically set to Extension No. 503 “Address setting of connected controller.”

7.2 FZ/GZ Series (FB Series Compatible Setting) Data List

7.2.1 Remote input/output

The description of the data is similar to that of the FB series. See **7.1.1 Remote input/output (P. 36)** for details.

7.2.2 Remote register

The description of the data is similar to that of the FB series. See **7.1.2 Remote register (P. 56)** for details.

7.2.3 Extension number

Communication items which are handled in the extension areas of the Remote registers (RWr and RWw) are specified by the extension number, If the necessary data is selected from a list of extension numbers and that extension number is set by Remote output, the data can be handled in the Remote registers (RWr and RWw).
In addition, communication item corresponding to Memory area function specifies memory area number to use in Remote register extension area for area number. Extension number and area number are set by Remote output ON/OFF.

☞ For Remote output, refer to **7.1.1 Remote input/output (P. 36)**.

☞ For Remote register, refer to **7.1.2 Remote register (P. 56)**.

☞ Refer to the following manual for the data range of the communication items with the extension number.
- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

☞ Refer to the following manuals for the Memory area function.
- **FZ110/FZ400/FZ900 Instruction Manual [Part2: Parameters/Functions] (IMR03A05-E□)**
- **GZ400/GZ900 Instruction Manual [Part2: Parameters/Functions] (IMR03D05-E□)**

■ When reading data

● Setting of extension number for display

Extension number for display sets it with Remote output RYn0 to RYn5 and RY(n+1)0 to RY(n+1)2.

Bit image

RY(n+1)2	RY(n+1)1	RY(n+1)0	RYn5	RYn4	RYn3	RYn2	RYn1	RYn0
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 511]

For the 1 station occupied 1 time setting, setting range of extension number becomes RYn0 to RYn5 [Decimal number: 0 to 63].

● Setting of area number for display

Area number for display sets it with Remote output RY(n+2)0 to RY(n+2)3.

Bit image

RY(n+2)3	RY(n+2)2	RY(n+2)1	RY(n+2)0
Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 16 (0, 9 to 16: Control area)]

For 1 station occupied 1 time setting, cannot do an assignment of area number.
Become communication item of a control area.

■ When writing data

● Setting of extension number for setting

Extension number for setting sets it with Remote output RYn6 to RYnB and RY(n+1)8 to RY(n+1)A.

Bit image

RY(n+1)A	RY(n+1)9	RY(n+1)8	RYnB	RYnA	RYn9	RYn8	RYn7	RYn6
Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 511]

For the 1 station occupied 1 time setting, setting range of extension number becomes RYn6 to RYnB [Decimal number: 0 to 63].

● Setting of area number for setting

Area number for setting sets it with Remote output RY(n+2)8 to RY(n+2)B.

Bit image

RY(n+2)B	RY(n+2)A	RY(n+2)9	RY(n+2)8
Bit 3	Bit 2	Bit 1	Bit 0

Bit data: 0: OFF 1: ON [Decimal number: 0 to 16 (0, 9 to 16: Control area)]

For 1 station occupied 1 time setting, cannot do an assignment of area number. Become communication item of a control area.

[Example] When setting extension number for setting to "3," and set area number for setting to "5."
Number of Occupied station/Extended cyclic setting: 4 stations occupied 1 time

- **Setting of extension number for setting**

Extension number 3: Set value (SV) →

Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	0	0	0	0	0	1	1

↓

RY(n+1)A	RY(n+1)9	RY(n+1)8	RYnB	RYnA	RYn9	RYn8	RYn7	RYn6
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

Bit data: 0: OFF 1: ON

- **Setting of area number for setting**

Memory area number 5 →

Bit 3	Bit 2	Bit 1	Bit 0
0	1	0	1

↓

RY(n+2)B	RY(n+2)A	RY(n+2)9	RY(n+2)8
OFF	ON	OFF	ON

Bit data: 0: OFF 1: ON

■ Extension number list

Attribute:
- RO: Read only data [Remote device station (COM-MC) → Master station (PLC)]
- R/W: Read and Write data [Remote device station (COM-MC) ↔ Master station (PLC)]
- *: Some data may have write restrictions. Refer to the relevant instruction manuals for the details of the controller.
- **: Read: Zero is displayed (Extension display works properly)
  Write:Not reflected (Extension setting works properly)
- ★: Data related multi-memory area function

Reading data of unused setting items are factory set values. Unused setting items may not be written. To do so will not cause an error however and data will be rejected.

Refer to the following manuals for the data range of each communication item.
- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
  FB series equivalent communication data [Modbus single word]
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**
  FB series equivalent communication data [Modbus single word]

Extension number	FZ/GZ series communication items	
	Name	Attribute
0	Input 1_Measured value (PV)	RO
1	Input 1_Manipulated output value monitor [heat-side]	RO
2	Current transformer 1 (CT1) input value monitor	RO
3	Input 1_Set value (SV) ★	R/W
4	Input 1_Autotuning (AT) [1]	R/W
5	Input 1_Proportional band [heat-side] ★	R/W
6	Input 1_Integral time [heat-side] ★	R/W
7	Input 1_Derivative time [heat-side] ★	R/W
8	Input 1_PV bias	R/W
9	Event 1 set value (EV1) ★	R/W *
	When Event 1 type is either high or low limit with individual setting Event 1 set value (EV1) [high] ★	
10	Event 2 set value (EV2) ★	R/W *
	When Event 2 type is either high or low limit with individual setting Event 2 set value (EV2) [high] ★	
11 ⋮ 15	Reserved	— **
16	Unused	— **
17	RUN/STOP transfer	R/W
18	OUT1 proportional cycle time	R/W *
19	Input 1_Auto/Manual transfer	R/W
20	Input 1_Manual manipulated output value	R/W
21	Input 1_Setting limiter high	R/W *
22	Input 1_Setting limiter low	R/W *
23	Input 1_PV digital filter	R/W
24	Heater break alarm 1 (HBA1) set value	R/W *

[1] For the operation, see the **6.2 CC-Link Flag Operation (P. 32).**

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
25	Input 1_Decimal point position	R/W *
26	Input 1_Manipulated output value monitor [cool-side]	RO
27	Input 1_Proportional band [cool-side] ★	R/W *
28	OUT2 proportional cycle time	R/W *
29	Input 1_Overlap/Deadband ★	R/W *
30	Unused	— **
31	Input 1_Set value (SV) monitor	RO
32	Error code	RO
33	Memory area transfer	R/W
34	Input 1_Control response parameter ★	R/W
35	Unused	— **
36	Input 1_Input type	R/W
37	Input 1_Setting change rate limiter (up) ★	R/W
38	Input 1_Control action	R/W *
39	Event 1 type	R/W *
40	Event 2 type	R/W *
41	Event 1 differential gap	R/W *
42	Event 2 differential gap	R/W *
43	Event 1 hold action	R/W *
44	Event 2 hold action	R/W *
45	Unused	— **
46	Input 1_Output limiter high [heat-side]	R/W *
47	Input 1_Output limiter low [heat-side]	R/W *
48	Unused	— **
49		
50	Input 1_Control loop break alarm (LBA) time ★	R/W *
51	Input 1_LBA deadband (LBD) ★	R/W *
52	Unused	— **
53		
54	Event 3 set value (EV3) ★	R/W *
	When Event 3 type is either high or low limit with individual setting Event 3 set value (EV3) [high] ★	
55	Event 4 set value (EV4) ★	R/W *
	When Event 4 type is either high or low limit with individual setting Event 4 set value (EV4) [high] ★	
56	Event 3 type	R/W *
57	Event 4 type	R/W *
58	Event 3 differential gap	R/W *
59	Event 4 differential gap	R/W *
60	Event 3 hold action	R/W *
61	Event 4 hold action	R/W *
62	Input 1_Setting change rate limiter (down) ★	R/W
63	Comprehensive event state	RO
64	Remote setting input value monitor	RO

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
65	Unused	— **
66		
67	Feedback resistance (FBR) break monitor [1]	RO
68	Memory area soak time monitor	RO
69 to 74	Unused	— **
75	Current transformer 2 (CT2) input value monitor	RO
76 to 89	Unused	— **
90	• When Select function for input 2 is: "Remote setting input" [FZ400/900, GZ400/900] Remote/Local transfer • When Remote setting input is specified [FZ110] Remote/Local transfer	R/W *
	When Select function for input 2 is: "Control with PV select" [FZ400/900, GZ400/900] Input transfer of Control with PV select	
	When Select function for input 2 is: "2-loop control/Differential temperature control" [FZ400/900, GZ400/900] 2-loop control/Differential temperature control	
	When Select function for input 2 is: "Cascade control" [FZ400/900] Cascade mode transfer	
91 to 109	Unused	— **
110	Link area number ★	R/W
111	Area soak time ★	R/W
112	Input 1_Integral time [cool-side] ★	R/W *
113	Input 1_Derivative time [cool-side] ★	R/W *
114 to 127	Unused	— **
128	Input 1_Manual reset ★	R/W *
129 to 141	Unused	— **
142	Input 1_PV ratio	R/W
143	Input 1_PV low input cut-off	R/W *
144	Set lock level	R/W
145 to 147	Unused	— **

[1] Not used for GZ400/900.

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
148	• When Select function for input 2 is: “Remote setting input” [FZ400/900, GZ400/900] RS bias • When Remote setting input is specified [FZ110] RS bias	R/W
	Input 2_PV bias	
	No applicable models Cascade bias Ratio setting bias	
149	• When Select function for input 2 is: “Remote setting input” [FZ400/900, GZ400/900] RS digital filter • When Remote setting input is specified [FZ110] RS digital filter	R/W
	When Select function for input 2 is: “Cascade control” [FZ400/900] Cascade_Digital filter Input 2_PV digital filter is invalid	
	Input 2_PV digital filter	
	• No applicable models [FZ400/900] Ratio setting digital filter • No applicable models [GZ400/900] Cascade digital filter Ratio setting digital filter	
150	• When Select function for input 2 is: “Remote setting input” [FZ400/900, GZ400/900] RS ratio • When Remote setting input is specified [FZ110] RS ratio	R/W
	Input 2_PV ratio	
	No applicable models Cascade ratio Ratio setting ratio	
151	Heater break alarm 2 (HBA2) set value	R/W *
152 ⋮ 159	Unused	— **
160	Input 1_Display unit	R/W *
161	Input 1_Input range high	R/W *
162	Input 1_Input range low	R/W *
163	Input 1_Input error determination point (high)	R/W *
164	Input 1_Input error determination point (low)	R/W *
165	Input 1_Burnout direction	R/W *
166	Input 1_Square root extraction	R/W *
167 ⋮ 185	Unused	— **
186	Energized/De-energized selection	R/W *
187	ALM lamp lighting condition	R/W *
188	Unused	— **

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
189	Output action at control stop	R/W *
190	Retransmission output 1 type	R/W *
191	Retransmission output 1 scale high	R/W *
192	Retransmission output 1 scale low	R/W *
193 ⋮ 202	Unused	— **
203	Event 1 timer	R/W *
204 ⋮ 206	Unused	— **
207	Event 2 timer	R/W *
208 ⋮ 210	Unused	— **
211	Event 3 timer	R/W *
212 ⋮ 214	Unused	— **
215	Event 4 timer	R/W *
216 ⋮ 219	Unused	— **
220	CT1 ratio	R/W *
221	Unused	— **
222	Number of heater break alarm 1 (HBA1) delay times	R/W *
223	CT1 assignment	R/W *
224	CT2 ratio	R/W *
225	Unused	— **
226	Number of heater break alarm 2 (HBA2) delay times	R/W *
227	CT2 assignment	R/W *
228	Unused	— **
229		
230	Hot/Cold start	R/W *
231	Select function for input 2	R/W *
232	Unused	— **
233		
234	SV tracking	R/W *
235	Manual manipulated output value selection	R/W *
236	Input 1_Start determination point	R/W *
237 ⋮ 239	Unused	— **
240	Integral/Derivative time decimal point position	R/W *
241	Unused	— **

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
242	Input 1_ON/OFF action differential gap (upper)	R/W *
243	Input 1_ON/OFF action differential gap (lower)	R/W *
244	Input 1_Action (high) input error	R/W *
245	Input 1_Action (low) input error	R/W *
246	Input 1_Manipulated output value at input error	R/W *
247	Input 1_Output change rate limiter (up) [heat-side]	R/W *
248	Input 1_Output change rate limiter (down) [heat-side]	R/W *
249 ⋮ 251	Unused	— **
252	Undershoot suppression factor	R/W *
253	Unused	— **
254	Input 1_Output limiter high [cool-side]	R/W *
255	Input 1_Output limiter low [cool-side]	R/W *
256	Input 1_Output change rate limiter (up) [cool-side]	R/W *
257	Input 1_Output change rate limiter (down) [cool-side]	R/W *
258	Input 1_Manipulated output value at STOP [heat-side]	R/W *
259	Input 1_Manipulated output value at STOP [cool-side]	R/W *
260	Action at feedback resistance (FBR) input error [1]	R/W *
261	Unused	— **
262	Open/Close output neutral zone [1]	R/W *
263	Open/Close output differential gap [1]	R/W *
264	Feedback adjustment [1]	R/W *
265	Integrated output limiter [1]	R/W *
266	Control motor time [1]	R/W *
267	Valve action at STOP [1]	R/W *
268	Unused	— **
269		
270	AT bias	R/W *
271 ⋮ 299	Unused	— **
300	Setting change rate limiter unit time	R/W *
301	Soak time unit	R/W *
302 ⋮ 319	Unused	— **
320	STOP display selection	R/W *
321 ⋮ 332	Unused	— **
333	PV flashing display at input error	R/W *
334 ⋮ 340	Unused	— **

[1] Not used for GZ400/900.

Continued on the next page.

Continued from the previous page.

Extension number	FZ/GZ series communication items	
	Name	Attribute
341	Integrated operating time	RO
342	Peak hold monitor of ambient temperature	RO
343 : 349	Unused	— **
350	Input 1_Startup tuning (ST)	R/W *
351 : 353	Unused	— **
354	ST start condition	R/W *
355 : 499	Unused	— **

Continued on the next page.

Continued from the previous page.

The data with an extension number equal to or greater than 500 are for the COM-MC. The table shows different contents of description from here on. Extension numbers, communication items, attributes, data ranges and factory set values are described.

Extension number	Communication item	Attribute	Data range	Factory set value
500	Action mode selection [1]	R/W *	Bit data Bit 0: Address setting 0: Continuous setting 1: Free setting Bit 1 to Bit 15: Reserved [a] [a] Setting is prohibited. Doing so may result in malfunction or failure of the product.	0
501	Transmission wait time of controller communication	R/W *	0 to 100 ms	0

* When data outside the valid range is written, the following behavior occurs.
Written data: Not reflected
Extended setting: Works properly (Extended setting completion turns ON)

[1] Address setting (bit 0) of Action mode selection (Extension No. 500)
Select a recognition method of the device address (continuous or free setting) at power on.

- Continuous setting
  Controllers are sequentially recognized from Device address (1st controller) according to Extension No. 503 "Address setting of connected controller." Controllers which were connected after the controller got into the following condition (*n* th controller) will not be recognized.
  - No response from Controller (No response)
  - Value of Extension No. 503 "Address setting of connected controller" is 0 (No connected controllers)
- Free setting
  Controller is recognized sequentially from Device address (1st controller) according to Extension No. 503 "Address setting of connected controller." In this mode, recognition continues even if no response is received from controllers. For this reason, Free setting takes more time to complete the recognition compared to Continuous setting. However, if Extension No. 503 "Address setting of connected controller" is set to "0" (No connected controller), controllers connected at and after that will be ignored and not recognized.

[Example] If a controller with Device address (4th controller) gives no response while Extension No. 503 "Address setting of connected controller" is set as follows:

- 4 stations occupied 1 time (8 controllers assignment)

COM-MC Remote register (RWw)

Address	Extension No. 503 Address setting of connected controller	Set value
RWwn+8	Device address (1st controller)	2
RWwn+9	Device address (2nd controller)	8
RWwn+A	Device address (3rd controller)	10
RWwn+B	Device address (4th controller)	16
RWwn+C	Device address (5th controller)	30
RWwn+D	Device address (6th controller)	0
RWwn+E	Device address (7th controller)	0
RWwn+F	Device address (8th controller)	0

No response

Continuous setting:
Controllers with device address (1st to 3rd controller) [RWwn+8 to RWwn+A] will be recognized.
Controllers with device address (4th to 8th controller) [RWwn+B to RWwn+F] will not be recognized.
Controllers with device address 2, 8, or 10 can be used in CC-Link communication.

Free setting:
Controllers with device address (1st to 5th controller) [RWwn+8 to RWwn+C] will be recognized.
Controllers with device address (6th to 8th controller) [RWwn+D to RWwn+F] will not be recognized.
Controllers with device address 2, 8, 10 or 30 can be used in CC-Link communication.

Continued on the next page.

Continued from the previous page.

Extension number	Communication item	Attribute	Data range	Factory set value
502	Unused	— *	—	—
503	Address setting of connected controller [1]	R/W **	0 to 99 0: No connected controller	1 to 31
504	State of connected controller	RO	Bit data Bit 0: Presence or absence of controller Bit 1: Presence or absence of abnormal response Bit 2 to Bit 15: Unused Data 0: Absence 1: Presence	—
505	Automatic acquisition of controller address [2]	R/W**	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition [a] [a] Automatically reverts to 0 after automatic acquisition ends.	0
506 ⋮ 511	Unused	— *	—	—

* Read: Zero is displayed (Extension display works properly)
Write: Not reflected (Extension setting works properly)

** When data outside the valid range is written, the following behavior occurs.
Written data: Not reflected
Extended setting: Works properly (Extended setting completion turns ON)

[1] Address setting of connected controller (Extension No. 503)
Device addresses set on the connected controllers will be assigned to the register addresses of COM-MC.
[Example] When 4 controllers are connected and the device addresses set on the controllers are 2, 8, 10 or 30.
Device address set on the 1st controller: 2
Device address set on the 2nd controller: 8
Device address set on the 3rd controller: 10
Device address set on the 4th controller: 30

Set as follows for Extension No. 503 “Address setting of connected controller.”

- 4 stations occupied 1 time (8 controllers assignment)

COM-MC Remote register (RWw)

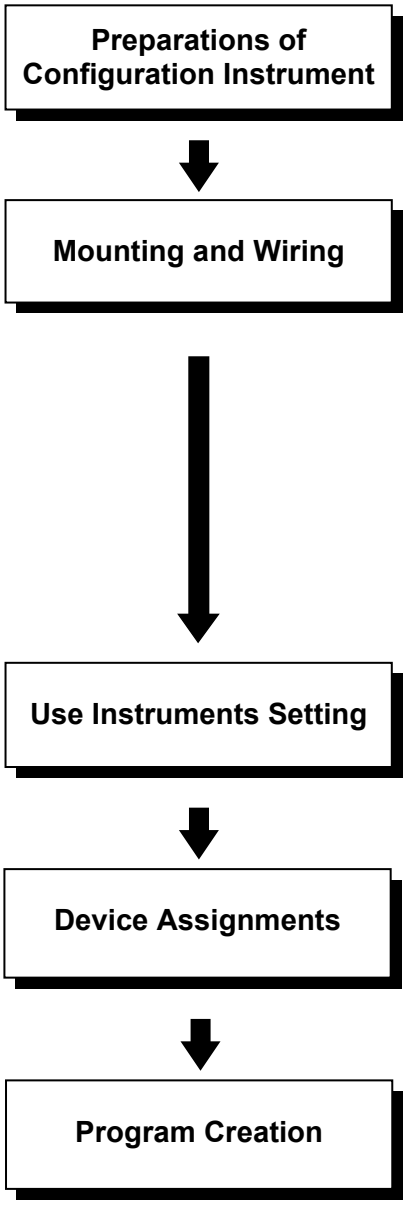
Address	Extension No. 503 Address setting of connected controller	Set value
RWwn+8	Device address (1st controller)	2
RWwn+9	Device address (2nd controller)	8
RWwn+A	Device address (3rd controller)	10
RWwn+B	Device address (4th controller)	30
RWwn+C	Device address (5th controller)	0
RWwn+D	Device address (6th controller)	0
RWwn+E	Device address (7th controller)	0
RWwn+F	Device address (8th controller)	0

[2] Automatic acquisition of controller address (Extension No. 505)
After having set “1: Execute the automatic acquisition”, power off the instrument once and then power on again. Controller address (device address set on the controller) will be automatically acquired. In the automatic acquisition, device addresses are sequentially acquired from “1.” The acquisition continues until 31 addresses are acquired or until device address 99 is verified. When the automatic acquisition is completed, the acquired device address will be automatically set to Extension No. 503 “Address setting of connected controller.”

8. USAGE EXAMPLE

This section describes a communication example of the CC-Link (with the FB series controllers).

8.1 Handling Procedures



☞ See **8.2 System Configuration (P. 89)**.

☞
- For mounting and wiring of the COM-MC, see **3. MOUNTING (P. 8)** and **4. WIRING (P. 13)**.
- For mounting and wiring of the controller (FB400), refer to **FB400/FB900 Installation Manual (IMR01W01-E□)**.
- For mounting and wiring of PLC, refer to **PLC Instruction Manual**.

☞ For cable wiring of CC-Link network system, refer to Instruction Manual of master instrument or website of CC-Link Partner Association.
https://www.cc-link.org/

☞ See **5. SETTING (P. 21)** and **8.3 Use Instruments Setting (P. 90)**.

☞ See **8.4 Device Assignments Example (P. 92)**.

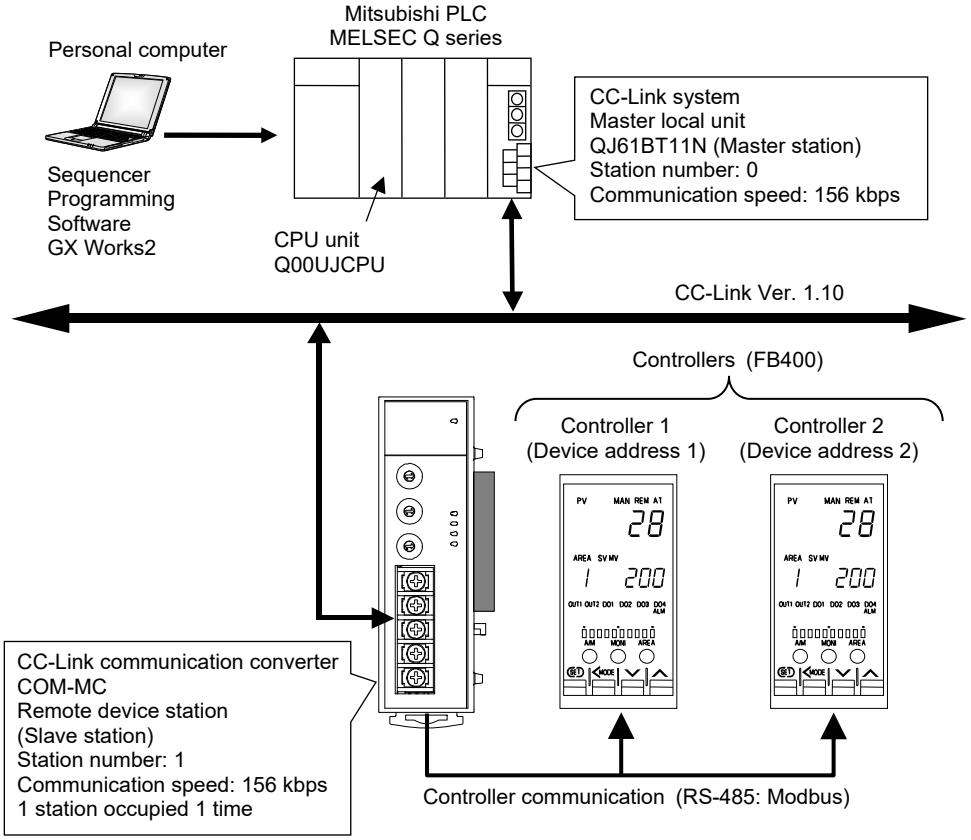
☞ See **8.5 Sample Program (P. 95)**.

NOTE

To avoid error at operation start-up, COM-MC must be powered on LAST (after the Controller, PLC, etc.).

8.2 System Configuration

In this usage example, described the following system configuration.



■ Use instruments

- **Mitsubishi PLC MELSEC Q series**
  CPU unit Q00UJCPU: 1
  CC-Link system master local unit QJ61BT11N: 1
  Power supply, I/O module, etc.
- **Controllers**
  FB400 (Input type: TC (K) 0 to 400 °C, Communication 1: with RS-485): 2
- **Communication converter**
  CC-Link communication converter COM-MC∗01: 1
- **Personal computer:** 1
- **Communication programs**
  Sequencer Programming Software GX Works2 [Manufactured by MITSUBISHI ELECTRIC CO., LTD.,] *
  * Consult the instruction manuals of the PLC for how to use GX Works 2 and how to wire to the PLC.
- **Cable**
  CC-Link dedicated cable Ver. 1.10
  Connection cable used between COM-MC and controller

8.3 Use Instruments Setting

Set the PLC, COM-MC and controller as the following.

■ PLC setting

☞ For operating of CC-Link system master local unit QJ61BT11N and MELSEC sequencer programming software GX Works2, refer to PLC Instruction Manual.

[CC-Link system master local unit QJ61BT11N setting]

Setting item	Content
Station number	0
CC-Link communication speed	156 kbps

[Master station network parameter setting by GX Works2]

Setting item	Content
Number of boards in module	1
Start I/O number	0000
Operational settings	Parameter name: None Data link disorder station setting: Clear Case of CPU STOP setting: Refresh
Type	Master station
CC-Link mode setting	Remote net (Ver. 1 mode)
Total number of connected modules	1
Number of retries	5
Number of automatic return modules	1
Standby master station number	Blank
Operation specification when CPU is down	Stop
Scan mode specification	Asynchronous
Delay time setting	10 (500 μs)
Station information [Number of COM-MC connection: 1 (Station number: 1)]	Station type: Remote device station Expanded cyclic setting: Single Number of occupied station: Occupies 1 station Remote station points: 32 points Reserved/Invalid station select: No setting Intelligent buffer select (word): No setting

📖 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: CC-Link Ver. 2.00

[Automatic refresh parameter setting by GX Works2]

Setting item	Content
Remote input (RX) refresh device	X1000
Remote output (RY) refresh device	Y1000
Remote register (RWr) refresh device	W0
Remote register (RWw) refresh device	W100
Special relay (SB) refresh device	SB0
Special register (SW) refresh device	SW0

■ COM-MC setting

[CC-Link communication conditions]

- Number of Occupied station/Extended cyclic: 1 station occupied 1 time (2 controllers assignment)
- Station number: 1
- CC-Link communication speed: 156 kbps

[Controller communication condition]

- Controller communication speed: 19200 bps (Factory set value)

☞ For setting procedure, see **5. SETTING (P. 21)**.

■ Controller setting

[Controller communication conditions: Use communication 1 side]

- Device address: 1 (Controller 1) and 2 (Controller 2)
  Use factory set values for Extension No. 503 “Address setting of connected controller” (P. 75) without any changes.
- Communication protocol: Modbus-RTU
- Communication speed: 19200 bps (Factory set value)
- Data bit configuration: Data 8 bits, non parity, Stop 1 bit

☞ For setting procedure, refer to **FB400/FB900 Instruction Manual (IMR01W03-E□)**.

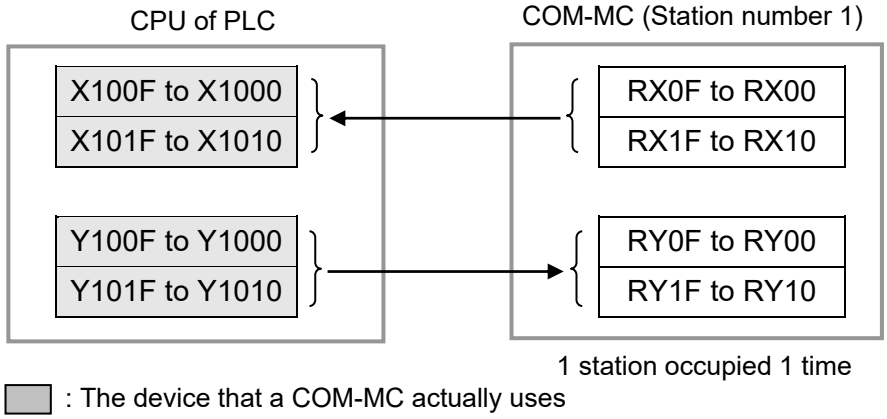
8.4 Device Assignments Example

According to the contents set by **8.3 Use Instruments Setting (P. 90)**, each device is assigned.

■ Assignment conditions

Station number of COM-MC: 1
Number of Occupied station/Extended cyclic: 1 station occupied 1 time (2 controllers assignment)
Automatic refresh device setting
- Remote input (RX) refresh device: X1000
- Remote output (RY) refresh device: Y1000
- Remote register (RWr) refresh device: W0
- Remote register (RWw) refresh device: W100
- Special relay (SB) refresh device: SB0
- Special register (SW) refresh device: SW0

■ Remote input (RX) and Remote output (RY)



● Device assignment table of Remote input (RX)

CPU device number	Communication item		Remote input (RX) address
X1000	Device address (1st controller) [Controller 1]	Event 1 state	RX00
X1001		Event 2 state	RX01
X1002		Burnout state	RX02
X1003		Heater break alarm (HBA) state	RX03
X1004		PID/AT transfer state	RX04
X1005	Device address (2nd controller) [Controller 2]	Event 1 state	RX05
X1006		Event 2 state	RX06
X1007		Burnout state	RX07
X1008		Heater break alarm (HBA) state	RX08
X1009		PID/AT transfer state	RX09
X100A	Unused		RX0A
X100B	Unused		RX0B

Continued on the next page.

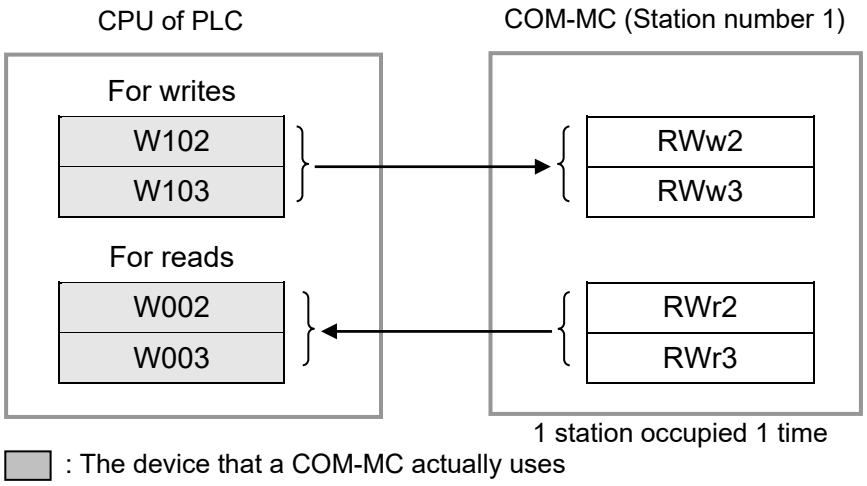
Continued from the previous page.

CPU device number	Communication item	Remote input (RX) address
X100C	Extended display completion	RX0C
X100D	Extended setting completion	RX0D
X100E	Unused	RX0E
X100F	Hardware error flag	RX0F
X1010 ⋮ X1017	Reserved	RX10 ⋮ RX17
X1018	Initialize data processing request flag	RX18
X1019	Initialize data setting completion flag	RX19
X101A	Error status flag	RX1A
X101B	Remote ready	RX1B
X101C ⋮ X101F	Reserved	RX1C ⋮ RX1F

- **Device assignment table of Remote output (RY)**

CPU device number	Communication item		Remote output (RY) address
Y1000	Bit 0	Extension number for display	RY00
Y1001	Bit 1		RY01
Y1002	Bit 2		RY02
Y1003	Bit 3		RY03
Y1004	Bit 4		RY04
Y1005	Bit 5		RY05
Y1006	Bit 0	Extension number for setting	RY06
Y1007	Bit 1		RY07
Y1008	Bit 2		RY08
Y1009	Bit 3		RY09
Y100A	Bit 4		RY0A
Y100B	Bit 5		RY0B
Y100C	Extended display flag		RY0C
Y100D	Extended setting flag (Setting update flag)		RY0D
Y100E	Unused		RY0E
Y100F	RUN/STOP transfer		RY0F
Y1010 ⋮ Y1017	Reserved		RY10 ⋮ RY17
Y1018	Initialize data processing completion flag		RY18
Y1019	Initialize data setting request flag		RY19
Y101A	Error reset request flag		RY1A
Y101B ⋮ Y101F	Reserved		RY1B ⋮ RY1F

■ Remote register (RWr, RWw)



● Device assignment table of Remote register (RWw)

CPU device number	Communication item	Remote register (RWw) address
W102	For extension area setting of device address (1st controller) [Controller 1]	RWw2
W103	For extension area setting of device address (2nd controller) [Controller 2]	RWw3

● Device assignment table of Remote register (RWr)

CPU device number	Communication item	Remote register (RWr) address
W002	For extension area display of device address (1st controller) [Controller 1]	RWr2
W003	For extension area display of device address (2nd controller) [Controller 2]	RWr3

8.5 Sample Program

■ Program conditions

Station number of COM-MC: 1

Number of Occupied station/Extended cyclic:
1 station occupied 1 time (2 controllers assignment)

Automatic refresh device assignment: See **8.4 Device Assignments Example (P. 92)**.

Special relay (M) assignment:
M0: Extension number setting flag for display
M1: Measured value (PV)/Manipulated output value (MV1) transfer
M2: Extension number setting flag for setting

Data register (D) assignment:
D0: Measured value (PV) store of controller 1
D1: Measured value (PV) store of controller 2
D2: Manipulated output value (MV1) store of controller 1
D3: Manipulated output value (MV1) store of controller 2

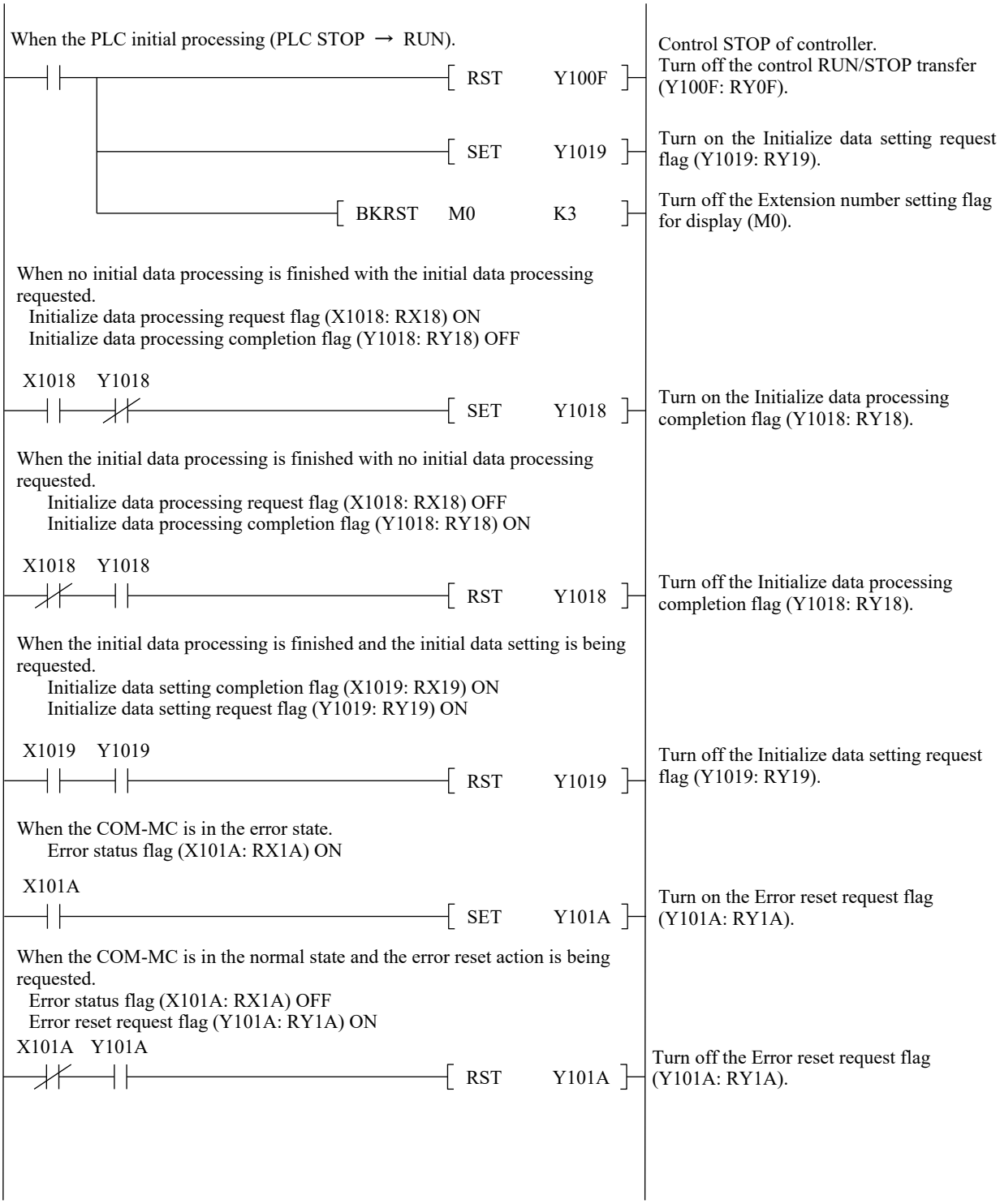
■ Program operation

1. Store Measured value (PV) and Manipulated output value (MV1) to a data register.

2. Write in Set value (SV) of controller 1 and Set value (SV) of controller 2.
Controller 1 set value (SV): 150 °C
Controller 2 set value (SV): 200 °C

3. Change the controller to the control RUN.

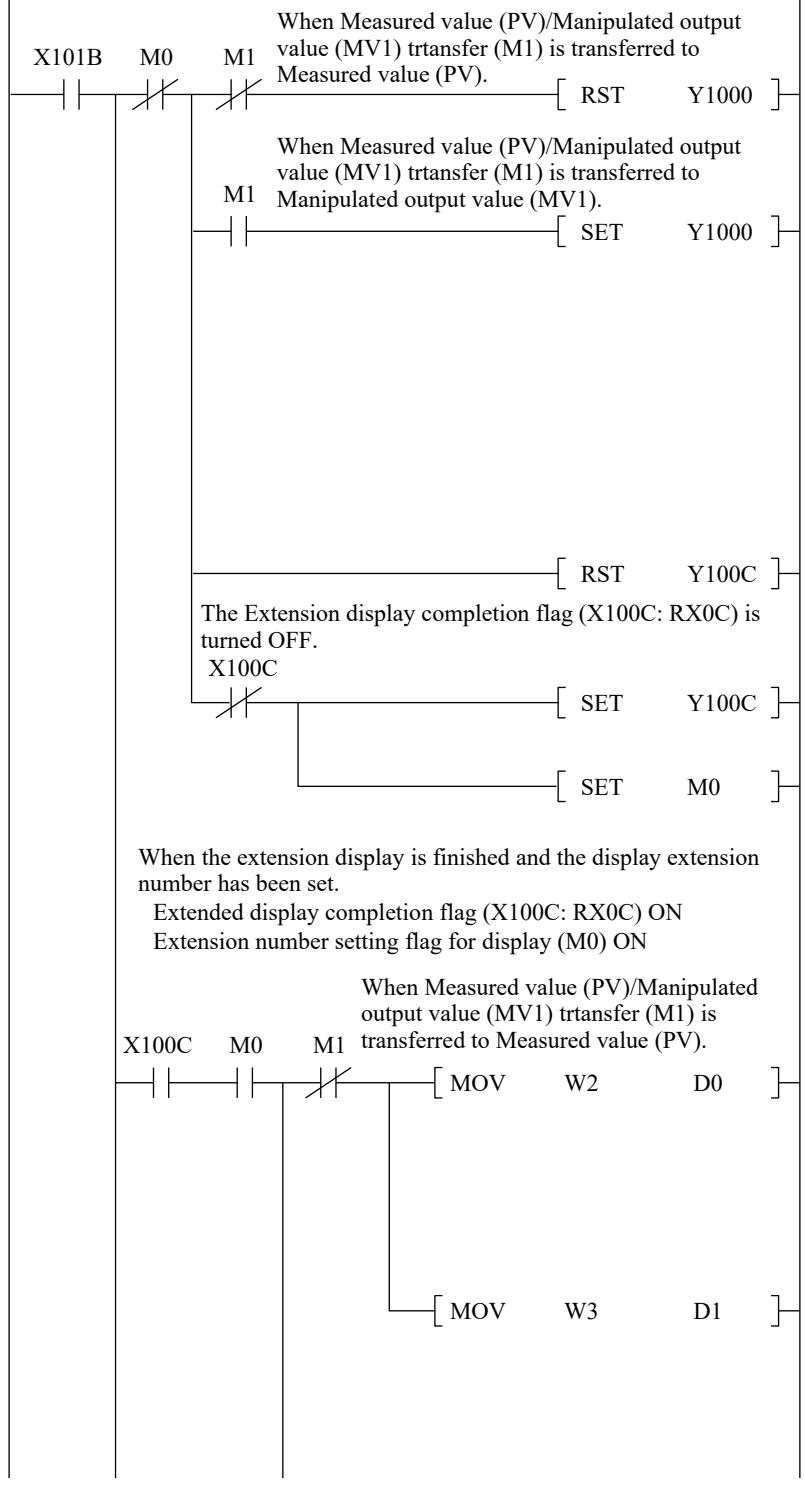
■ Sample program



Continued on the next page.

Continued from the previous page.

When the COM-MC is in the remote ready state and no display extension number setting is processed yet.
Remote ready (X101B: RX1B) ON
Extension number setting flag for display (M0) OFF



Set the extension number for display.
Extension number 0: Turn off the extension number setting Bit 0 (Y1000: RY00) for Measured value (PV) display.

Set the extension number for display.
Extension number 1: Turn on the extension number setting Bit 0 (Y1000: RY00) for Manipulated output value (MV1) display.

Only the bit (Bit 0) necessary for setting display extension number 0 or 1 is specified.
Any unspecified bit is assumed to be the register initial value, 0.

Turn off the Extension display flag (Y100C: RY0C).

Turn on the Extension display flag (Y100C: RY0C).

Extension number setting end for display.
Turn on the Extension number setting flag for display (M0).

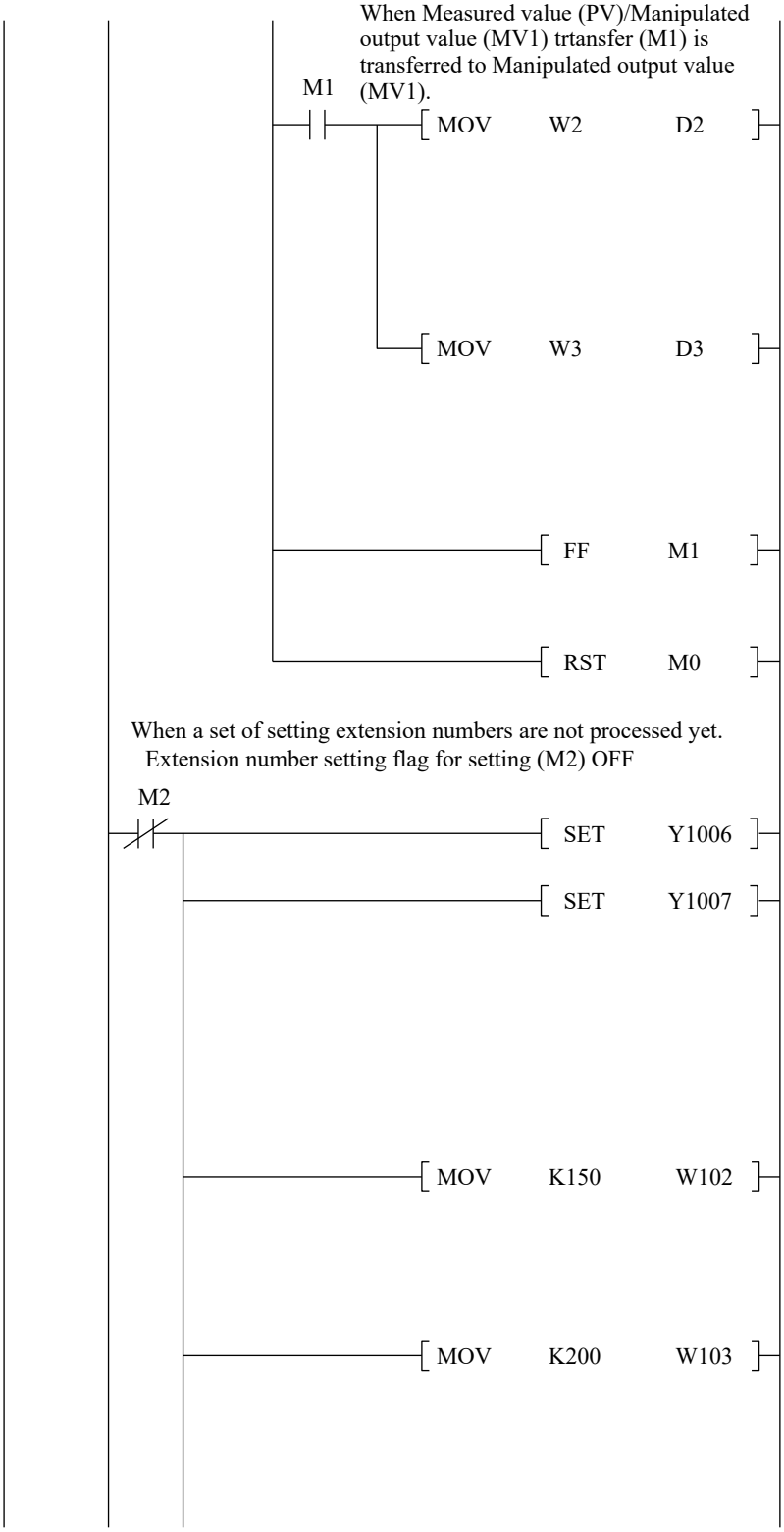
When the extension display is finished and the display extension number has been set.
Extended display completion flag (X100C: RX0C) ON
Extension number setting flag for display (M0) ON

Store the Measured value (PV) of controller 1 into the data register D0.
Store the Extension area for display (W002: RWr2) of controller 1 into the data register D0.

Store the Measured value (PV) of controller 2 into the data register D1.
Store the Extension area for display (W003: RWr3) of controller 1 into the data register D1.

Continued on the next page.

Continued from the previous page.



Store the Manipulated output value (MV1) of controller 1 into the data register D2.
Store the Extension area for display (W002: RWr2) of controller 1 into the data register D2.

Store the Manipulated output value (MV1) of controller 2 into the data register D3.
Store the Extension area for display (W003: RWr3) of controller 1 into the data register D3.

Measured value (PV)/Manipulated output value (MV1) trtansfer (M1) is inversely transferred. Variables to be read are alternately selected.

Turn off the Extension number setting flag for display (M0).

Set the extension number for setting.
Extension number 3: Turn on the extension number setting Bit 0 (Y1006: RY06) for set value (SV) setting.

Turn on the Extension number setting Bit 1 (Y1007: RY07)

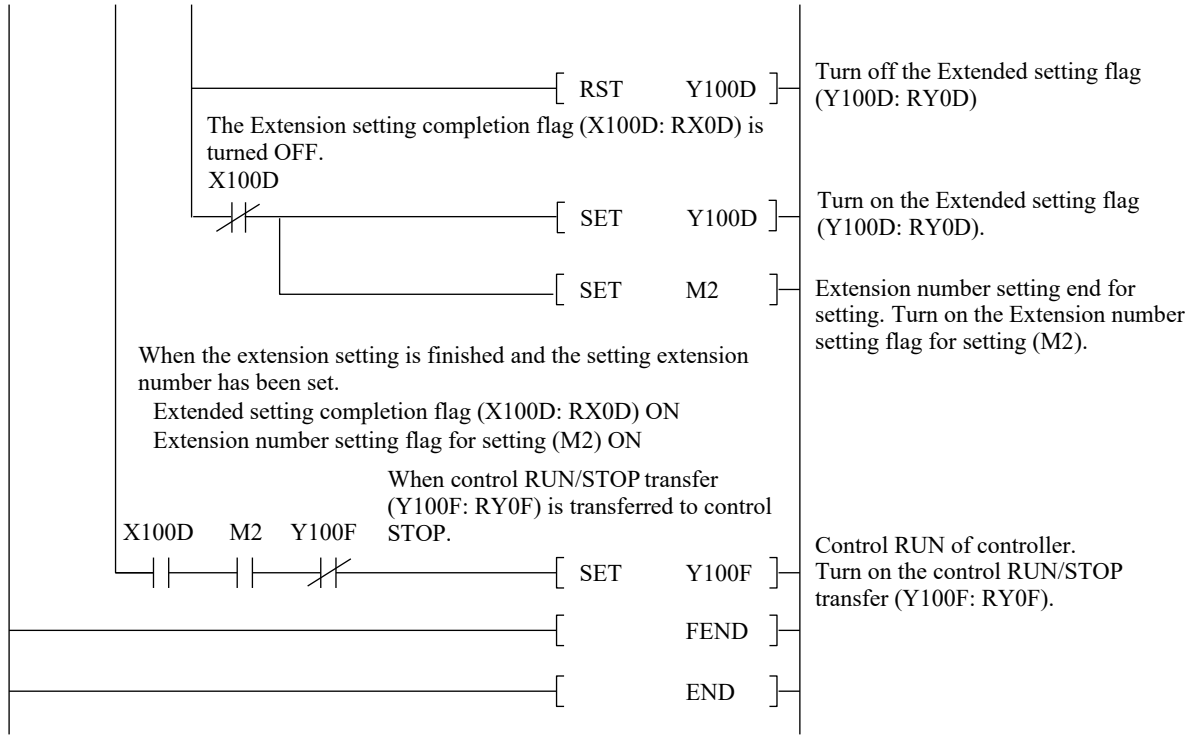
Only the bits (Bit 0 and Bit 1) necessary forsetting extension number 3 are specified. Any unspecified bit is assumed to be the register initial value, 0.

Set “150 °C” to Set value (SV) of controller 1.
Write “150” for Extension area setting (W102: RWw2) of controller 1.

Set “200 °C” to Set value (SV) of controller 2
Write “200” for Extension area setting (W103: RWw3) of controller 2

Continued on the next page.

Continued from the previous page.



9. TROUBLESHOOTING

This section explains possible causes and solutions if any abnormality occurs in the instrument. For any inquiries or to confirm the specifications of the product, please contact RKC or our distributors.

If the instrument needs to replaced, always strictly observe the warnings below.

⚠ WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.
- 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.
- To prevent electric shock or instrument failure, do not touch the inside of the instrument.
- All wiring must be performed by authorized personnel with electrical experience in this type of work.

⚠ CAUTION

All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.

NOTE

When replacing the instrument with a new one, always use the instrument with the same model code. If the instrument is replaced, it is necessary to re-set each data item.

■ COM-MC

Problem	Possible cause	Solution
FAIL lamp: Turns on	The station number and communication speed settings of COM-MC are out of their setting ranges.	Set the station number and communication speed settings of COM-MC to values within their setting ranges. And turn on the power again.
	Hardware abnormality or software abnormality	Replace the COM-MC with a new one it in the abnormal state even with the power turned on again.
FAIL lamp: Rapid blinking (800 ms cycle)	The station number and communication speed settings of the COM-MC have been changed during communication.	• Turn on the power again. • Return the switch setting to the original setting.
FAIL lamp: Slow blinking (2000 ms cycle)	The CC-Link version of the COM-MC differs from that of the master instrument (PLC).	Coincide the CC-Link version of the COM-MC with that of the master instrument (PLC). • 1 station occupied 1 time/ 4 stations occupied 1 time: CC-Link Ver. 1.10 • 4 stations occupied 2 times: CC-Link Ver. 2.00
	The number of Occupied station/ Extended cyclic setting of the COM-MC differs from that of the master instrument (PLC).	Coincide the number of Occupied station/Extended cyclic setting of the COM-MC with that of the master instrument (PLC).
	The station number and the communication speed settings are different between the COM-MC and the master instrument (PLC).	Use the same station number and the communication speed settings for both the COM-MC and the master instrument (PLC).
	No connection, disconnection, breakage or wrong wiring of CC-Link cable	Confirm the connection method or condition and connect correctly
	A termination resistor of CC-Link is not connected	Confirm the termination resistor, and connected correctly
RUN lamp: Slow blinking (1000 ms cycle)	Controller communication (Between COM-MC and controllers) is abnormal	• Check that the signal line of the COM-MC and controller are correctly connected. • Check that the communication setting (Address, protocol, communication speed and data bit configuration) of the COM-MC coincides with that of the controller. • Confirm whether a termination resistor is connected.

Continued on the next page.

Continued from the previous page.

Problem	Possible cause	Solution
RUN lamp: Slow blinking (1000 ms cycle)	Backup circuit seems to be faulty.	Turn on the power again.
Cannot recognize the controller	Incorrect sequence of power-on	COM-MC must be powered on last.

If you are unable to solve the problem by following the recommended instructions, contact RKC or our distributors.

10. SPECIFICATIONS

■ CC-Link communication

Corresponding standards: CC-Link Ver. 2.00/Ver. 1.10

Communication speed: 156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps

Maximum transmission distance:

See table shown below

Communication speed	Maximum network length
10 Mbps	100 m
5 Mbps	160 m
2.5 Mbps	400 m
625 kbps	900 m
156 kbps	1200 m

Station number: 1 to 61 (4 stations occupied 1 time, 4 stations occupied 2 times)
1 to 64 (1 station occupied 1 time)

Connection cable: CC-Link dedicated cable Ver. 1.10 (Shielded twisted pair wire)

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

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 Controller connection
4 stations occupied 1 time	Input: 128 bits Output: 128 bits	RWr: 16 words RWw: 16 words	8 controllers or 16 controllers
4 stations occupied 2 times	Input: 224 bits Output: 224 bits	RWr: 32 words RWw: 32 words	16 controllers or 31 controllers
1 station occupied 1 time	Input: 32 bits Output: 32 bits	RWr: 4 words RWw: 4 words	1 controller or 2 controllers

■ Controller communication

Interface: Base on RS-485, EIA standard (Multi-drop connection is available.)

Protocol: Modbus-RTU

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 FB series is not possible.

Data bit configuration: Start bit: 1, Data bit: 8, Parity bit: None, Stop bit: 1

Maximum connections: 31 controllers (FB100/400/900, FZ110/400/900 or GZ400/900)
[Device address setting: 1 to 99]

Connection method: Terminals

Termination resistor: Externally terminal connected (120 Ω 1/2 W)

■ Self-diagnostic function

Operation stopped

Self-diagnosis items	Display at error occurrence	Communication at error occurrence
Power supply voltage error	RUN lamp turns off FAIL lamp turns on	Controller communication: Stopped CC-Link communication: Stopped
Watchdog timer error	RUN lamp turns off FAIL lamp turns on	Controller communication: Stopped CC-Link communication: Stopped

Major fault

Self-diagnosis items	Display at error occurrence	Communication at error occurrence
Hardware error	FAIL lamp turns on	Controller communication: Stopped CC-Link communication: Continuing Hard error flag RXnF=ON Watchdog timer error (Corresponding bits of SW0084 to SW0087) =ON
RAM read/write error	FAIL lamp turns on	Controller communication: Stopped CC-Link communication: Continuing Hard error flag RXnF=ON Watchdog timer error (Corresponding bits of SW0084 to SW0087) =ON
Stack overflow	FAIL lamp turns on	Controller communication: Stopped CC-Link communication: Continuing Hard error flag RXnF=ON Watchdog timer error (Corresponding bits of SW0084 to SW0087) =ON

Recoverable fault

Self-diagnosis items	Display at error occurrence	Communication at error occurrence
Configuration error	RUN lamp blinks (1000 ms cycle)	Controller communication: Continuing CC-Link communication: Continuing Error status flag RX(n+1/n+7/n+D/n+1B)A=ON
Memory back-up error	RUN lamp blinks (1000 ms cycle)	Controller communication: Continuing CC-Link communication: Continuing Error status flag RX(n+1/n+7/n+D/n+1B)A=ON

CC-Link error

Self-diagnosis items	Display at error occurrence	Communication at error occurrence
CC-Link setting error	FAIL lamp turns on	Controller communication: Continuing CC-Link communication: Stopped
CC-Link operation error	FAIL lamp blinks (2000 ms cycle)	Controller communication: Continuing CC-Link communication: Stopped
CC-Link setting is changed	FAIL lamp blinks (800 ms cycle)	Controller communication: Continuing CC-Link communication: Continuing

■ General specifications

Power supply voltage: 21.6 to 26.4 V DC [Including power supply voltage variation]
(Rating 24 V DC)

Power consumption: 45 mA max. (at 24 V DC)
Rush current: 15 A or less

Insulation resistance: See table shown below

	①	②
① Grounding terminal/ CC-Link communication terminal		
② Power terminal	20 MΩ or more at 500 V DC	
③ Controller communication terminal	20 MΩ or more at 500 V DC	20 MΩ or more at 500 V DC

Withstand voltage: See table shown below

Time: 1 minute	①	②
① Grounding terminal/ CC-Link communication terminal		
② Power terminal	750 V AC	
③ Controller communication terminal	750 V AC	600 V AC

Power failure: A power failure of 5 ms or less will not affect the control action.
(Rating 24 V DC)

Memory backup: Backed up by non-volatile memory
Number of writing: Approx. 100,000 times (EEP-ROM)
Data storage period: Approx. 10 years (EEP-ROM)

Vibration: Frequency range: 10 to 150 Hz
Amplitude: < 0.075 mm
Acceleration: < 9.8 m/s^2
Each direction of XYZ axes

Shock: Drop (in X- and Y-axes) when the instrument is tilted along one bottom edge so that the height between the opposite edge and the instrument is 50 mm or the angle made by the opposite edge and the instrument is 30°, whichever is less severe.

Allowable ambient temperature:
0 to 55 °C

Allowable ambient humidity:
5 to 95 %RH (Non condensing)
Absolute humidity: MAX.W.C 29 g/m^3 dry air at 101.3 kPa

Ambient atmosphere: 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.

Weight: Approx. 130 g

Dimensions: 30 × 100 × 76.9 mm (W × H × D)

■ Standard

Safety standard: UL: UL61010-1
cUL: CAN/CSA-C22.2 No. 61010-1

CE marking: LVD: EN61010-1
EMC: EN61326-1
RoHS: EN IEC 63000

RCM: EN55011

KC Mark: Radio Waves Act: KS C 9610-6-2
KS C 9610-6-4

Environment conditions: POLLUTION DEGREE 2
Altitude up to 2000 m (Indoor use)

The first edition: DEC. 2024 [IMQ00]
The second edition: FEB. 2025 [IMQ01]

RKC INSTRUMENT INC.

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
Website: https://www.rkcinst.co.jp/english/

IMR02E45-E2 FEB. 2025