CC-Link Communication Converter

COM-JC

[For FB100/FB400/FB900]

Instruction Manual

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

SYMBOLS

| 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.

📖 : 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.

⚠ WARNING

● An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.

● All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.

● This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.

● This instrument is not intended for use in locations subject to flammable or explosive gases.

● Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.

● RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- Do not connect modular connectors to telephone line.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

CONTENTS

1. OUTLINE

This manual describes the communication specifications, mounting, wiring, setting and data instructions for the CC-Link communication converter COM-JC.

CC-Link communication converter COM-JC (hereafter called COM-JC) is communication converter to connect the RKC temperature controller (FB100/400/900) to a programmable controller (Mitsubishi Electric PLC MELSEC series: hereafter called PLC) for CC-Link.
In addition, COM-JC is connected to CC-Link as the Remote device station.
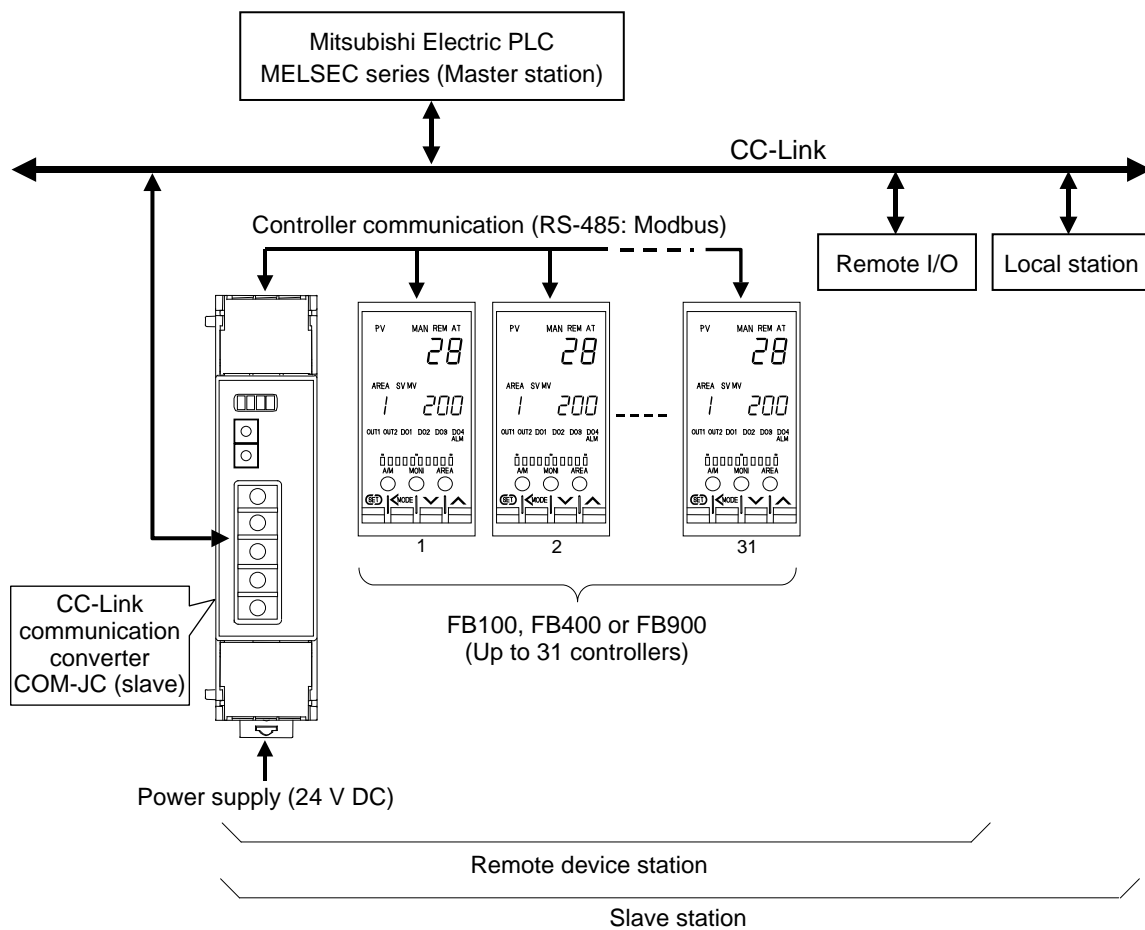
☞ For CC-Link, refer to the website of CC-Link Partner Association.
http://www.cc-link.org/

1.1 Product Check

Before using this product, check each of the following.

● Model code
● Check that there are no scratches or breakage in external appearance (case, front panel, terminal, etc).
● Check that all of the accessories delivered are complete. (Refer to below)

Accessories	Q'TY	Remarks
□ COM-JC [For FB100/FB400/FB900] Installation Manual (IMR01Y01-E□)	1	Enclosed with instrument
□ COM-JC [For FB100/FB400/FB900] Quick Instruction Manual (IMR01Y11-E□)	1	Enclosed with instrument
□ COM-JC [For FB100/FB400/FB900] Communication Data List (IMR01Y16-E□)	1	Enclosed with instrument
□ COM-JC [For FB100/FB400/FB900] Instruction Manual (IMR01Y06-E8)	1	This manual (sold separately) *

* This manual can be downloaded from the official RKC website:
  http://www.rkcinst.com/english/manual_load.htm.

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

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- JC ∗ 01- □
(1)   (2)

(1) Corresponding to the RKC controller

    01: FB100/400/900

(2) RUN/STOP logic selection

    1: 0: RUN
        1: STOP
    2: 0: STOP
        1: RUN

1.3 Parts Description

Terminal cover
Indication lamps
Station number setting switch
CC-Link connection terminals (COM.PORT)
Terminal cover
Mounting bracket

Front view

Terminal base
Mainframe
DIP switch
CC-Link communication speed setting switch

Left side view

[Details of Indication lamps]
RD
SD
RUN
FAIL
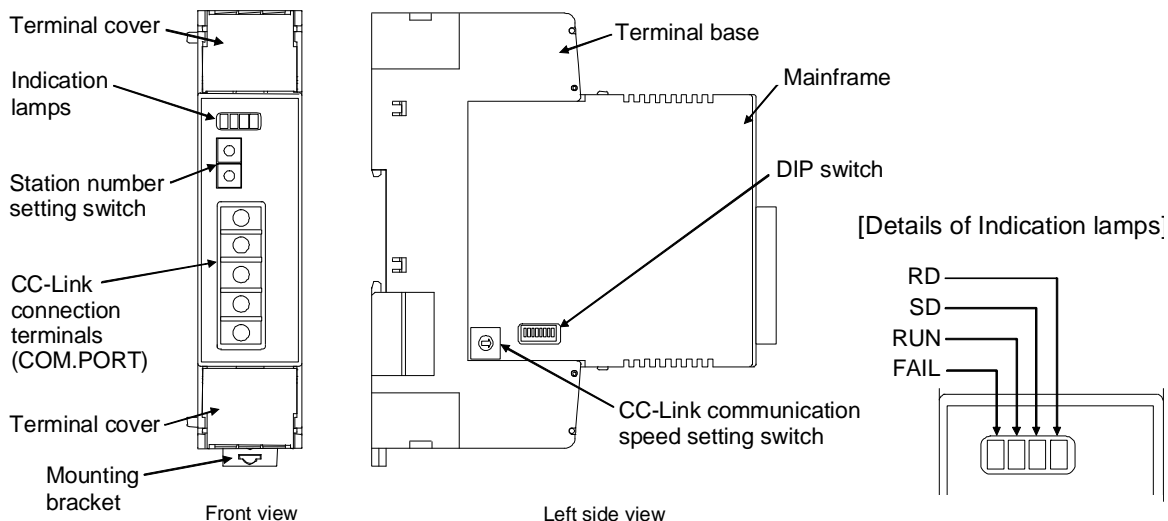
● **Indication lamps**

FAIL [Red]	• When instrument abnormally:	ON
	• CC-Link setting error:	ON
	• CC-Link operation error:	Flashes slowly
	• CC-Link setting is changed:	Flashes rapidly
RUN [Green]	• When normally:	ON
	• Operation error:	Flashes slowly
	• During controller communication initialization:	Flashes rapidly
SD [Green]	During CC-Link data send:	ON
RD [Green]	During CC-Link data receive:	ON

● **CC-Link connection terminals**

COM. PORT	Terminals for PLC (Master) connection

● **Switches**

Station number setting switch	Set the station number for CC-Link
CC-Link communication peed setting switch	Set the communication speed for CC-Link
DIP switch	• Set the number of Occupied station/Extension cyclic for CC-Link • Set the communication speed for controller communication

● **Other**

Terminal cover	Terminal cover above and below the COM-JC
Mounting bracket	• Used for the DIN rail mounting • When panel mounted, two mounting brackets are required for the upper and lower sides (one required for the upper side: separately sold).
Terminal base	Part of the terminal and base of COM-JC (There is the termination resistor transfer switch in the inside of terminal base)
Mainframe	Part of the mainframe of COM-JC

2. HANDLING PROCEDURES

Conduct the setting necessary for performing communication in accordance with the following procedure.

COM-JC Setting	Set the CC-Link station number, Communication speed and Occupied station/Extended cyclic of COM-JC and Controller communication speed. ☞ Refer to **5. SETTING (P. 16)**
Mounting	Install the COM-JC. ☞ • Refer to **3. MOUNTING (P. 5)** • For controller, refer to **FB100 Installation Manual (IMR01W12-E□)** or **FB400/FB900 Installation Manual (IMR01W01-E□)**
Wiring and Connection	Connect power supply wires to the COM-JC, and also connect the COM-JC to the controller and the COM-JC to the PLC, respectively. ☞ • Refer to **4. WIRING (P. 8)** • For controller, refer to **FB100 Installation Manual (IMR01W12-E□)** or **FB400/FB900 Installation Manual (IMR01W01-E□)**
PLC and Controller Settings	Set the PLC and controller. ☞ • Refer to **8.3 Use Instruments Setting (P. 85)** • For controller, refer to **FB100 Communication Quick Manual (IMR01W15-E□)** or **FB400/FB900 Communication Quick Manual (IMR01W07-E□)**
Device Assignment	Do assignments of Remote input/output and Remote register. ☞ Refer to **8.4 Device Assignments Example (P. 87)**
Program Creation	Create the sequence program of PLC. ☞ Refer to **8.5 Sample Program (P. 90)**

📖 **To avoid error at operation start-up, COM-JC 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. **(IEC61010-1)**
[OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: −10 to +50 °C
- Allowable ambient humidity: 5 to 95 %RH
(Absolute humidity: MAX.W.C 29.3 g/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 mainframe.
- Water, oil, chemicals, vapor or steam splashes.
- Excessive dust, salt or iron particles.
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

(4) Mount this instrument in the panel considering the following conditions:
- Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
- Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors).
- If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, etc. Cooled air should not blow directly on this instrument.
- In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
  High voltage equipment: Do not mount within the same panel.
  Power lines: Separate at least 200 mm.
  Rotating machinery: Separate as far as possible.

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

3.2 Dimensions

(Unit: mm)

109.5 9.5 3 30

125

78

5
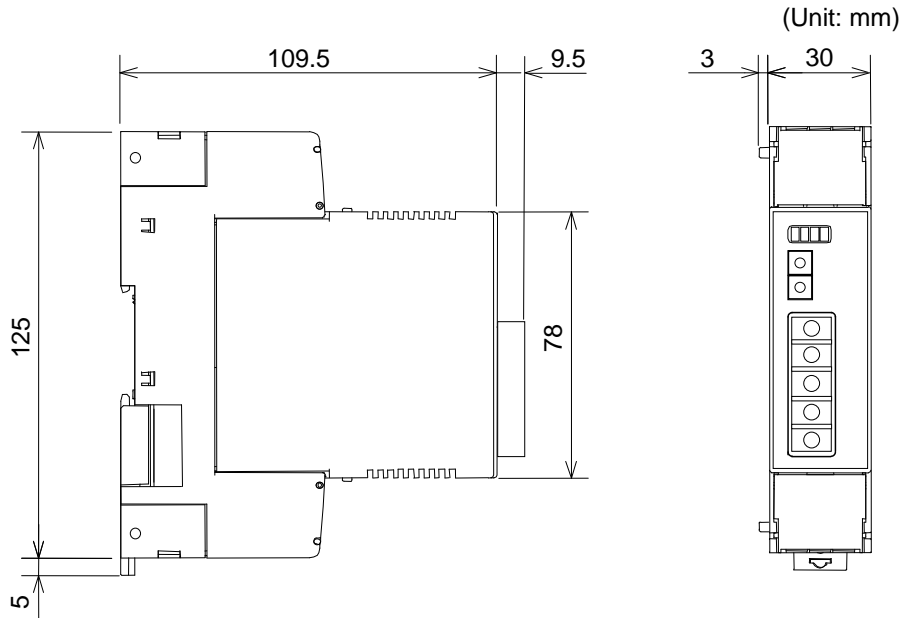
3.3 DIN Rail Mounting

■ Mounting procedures

1. Pull down the mounting bracket at the bottom of the instrument (A). Attach the hooks on the top of the instrument to the DIN rail and push the lower section into place on the DIN rail (B).

2. Slide the mounting bracket up to secure the instrument to the DIN rail (C).

DIN rail

Mounting bracket

(B) Push

(A) Pull down

(C) Locked
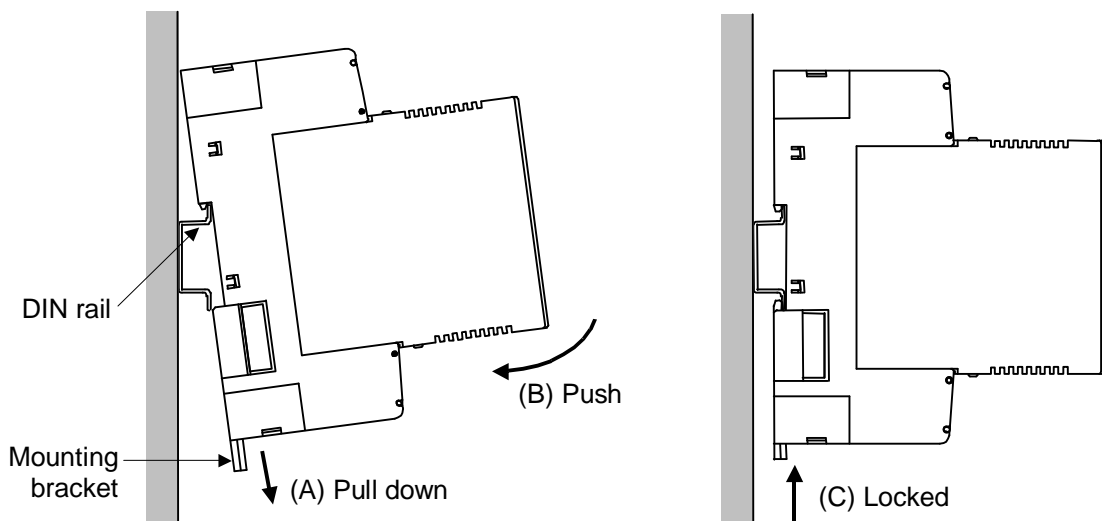
■ **Removal procedures**

1. Turn the power OFF.

2. Remove the wiring.

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

(B) Lift and take off
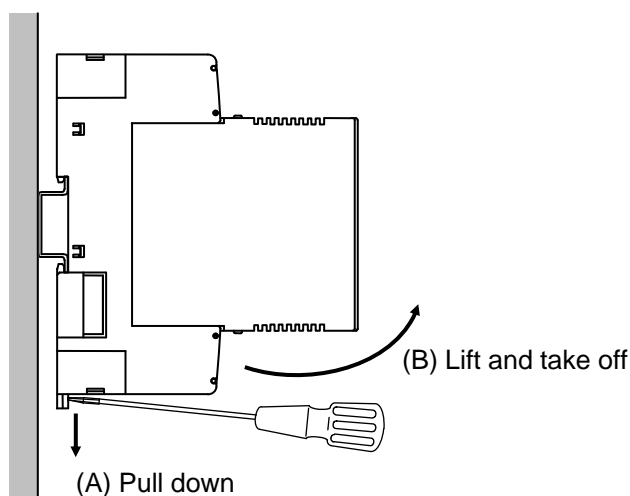
(A) Pull down

3.4 Panel Mounting

■ **Mounting procedures**

1. Pull down the mounting bracket (A) until locked and that a mounting hole appears.

2. Prepare one mounting bracket per instrument (B) sold separately (KSRX-55) and then insert it in the rear of the terminal board at top of the instrument until locked but a mounting hole does not disappear.

3. Mount each module directly on the panel with screws which are inserted in the mounting holes of the top and bottom mounting brackets.

Recommended tightening torque: 0.3 N·m (3 kgf·cm)

📖 The customer needs to provide the M3 size screws. Select the screw length that matches the mounting panel.

(B) Insert

Mounting bracket
(Sold separately)
(KSRX-55)

(A) Pull down

Mounting holes

Mounting dimensions
(Unit: mm)

130.5 ± 0.2

M3
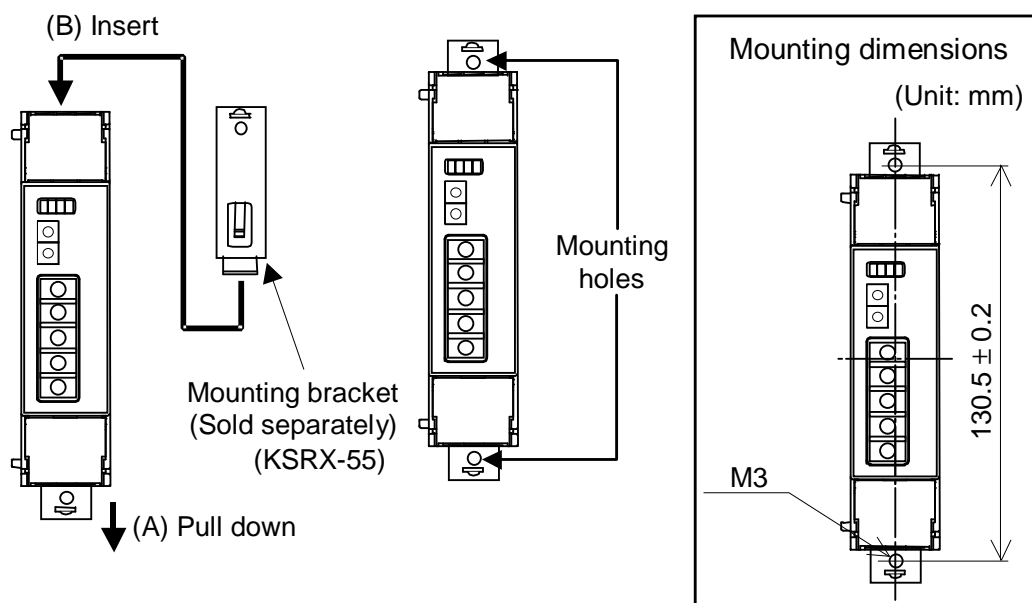
4. WIRING

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 prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
  - Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
  - Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
  - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply, supply power from a SELV circuit.
- A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
- Use the solderless terminal appropriate to the screw size (M3).

5.9 mm or less
3.2 mm or more
Recommended tightening torque: 0.4 N·m (4 kgf·cm)
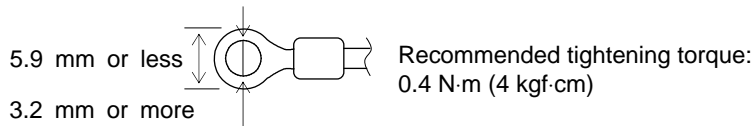
- Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.

4.2 Terminal Configuration

The terminal layout is as follows.

A fuse is installed inside the terminal block.
If the instrument will not turn on even after it has been powered on, the fuse may be blown.
Contact RKC sales office or the agent.
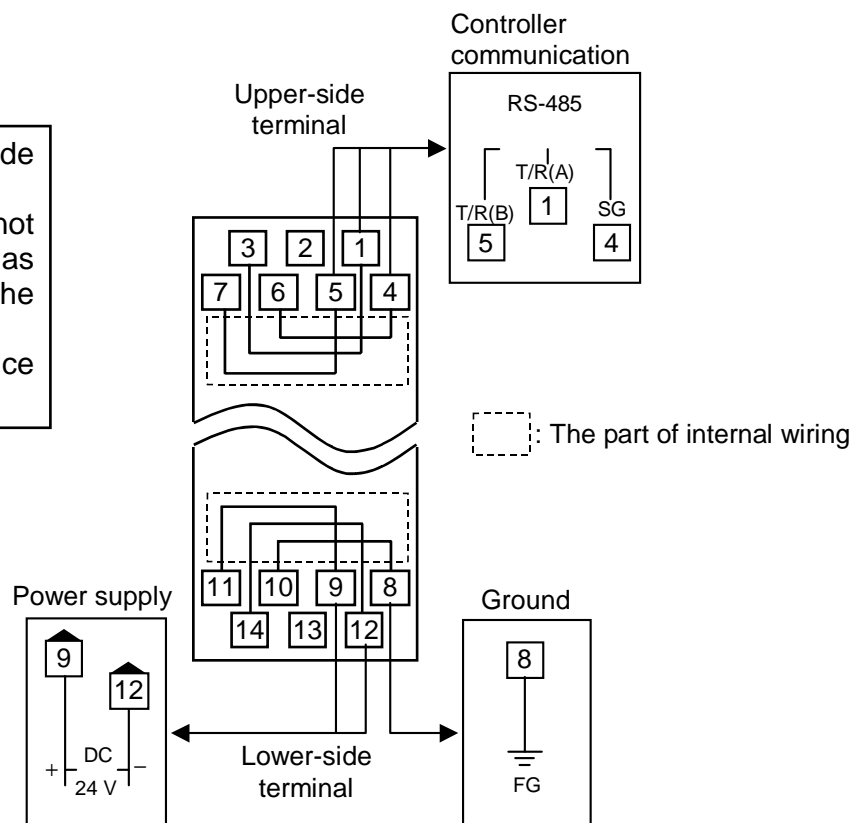
☐ As controller communication terminal No. 1, 4 and 5 are internally connected to terminal No. 3, 6 and 7, any terminals can be used.

☐ As ground and power supply terminal No. 8, 9 and 12 are internally connected to terminal No. 10, 11 and 14, any terminals can be used.

☐ Terminal No. 2 and No. 13 is not used.

4.3 Connection to PLC

■ Connection method

The PLC (Master station) and COM-JC make multi-drop connection in CC-Link dedicated cable Ver. 1.10.
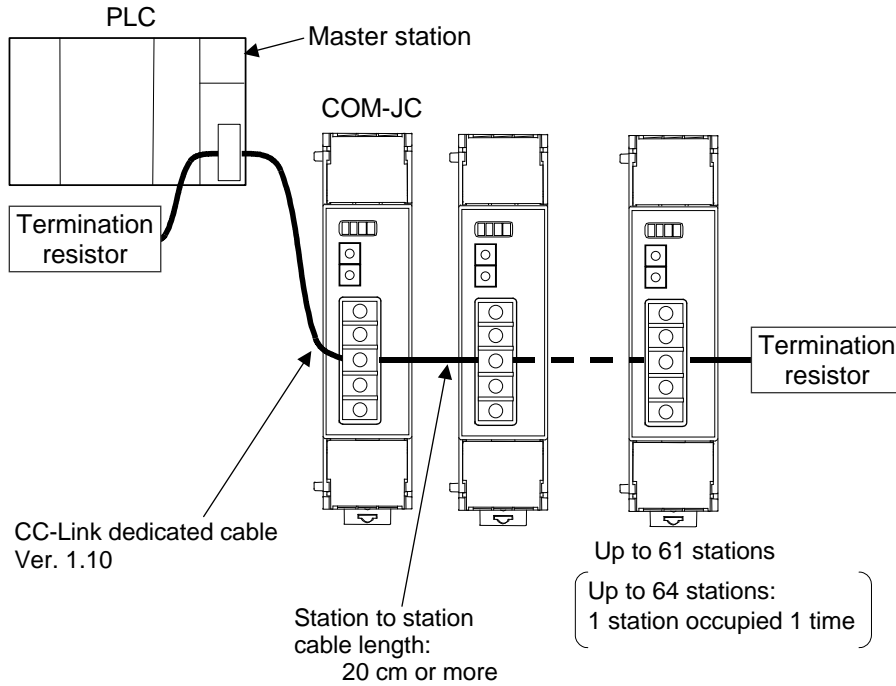
● **Communication speed and maximum transmitter distance (Use the CC-Link dedicated cable Ver. 1.10)**

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

■ **Terminal numbers and signal details**

CC-Link connection terminals

1: DA
2: DB
3: DG
4: SLD
5: FG

Terminal screws
Screws size: M3
Recommended tightening torque: 0.4 N·m (4 kgf·cm)
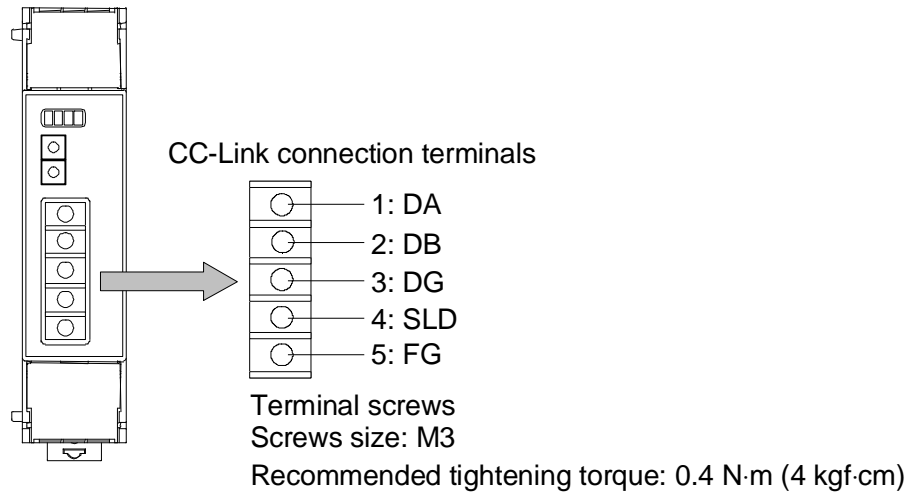
Terminal No.	Signal name	Symbol	Cable color
1	Data A	DA	Blue
2	Data B	DB	White
3	Data ground	DG	Yellow
4	Shield	SLD	Grounding wire (Shield)
5	Frame ground	FG	—

📖 **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 offline. In addition, FG (flame 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 twisted pair cable 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 across section of 2.0 mm^2 or more. (Ground resistance: 100 Ω or less)

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

■ Connection diagram

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

TR: Termination resistor
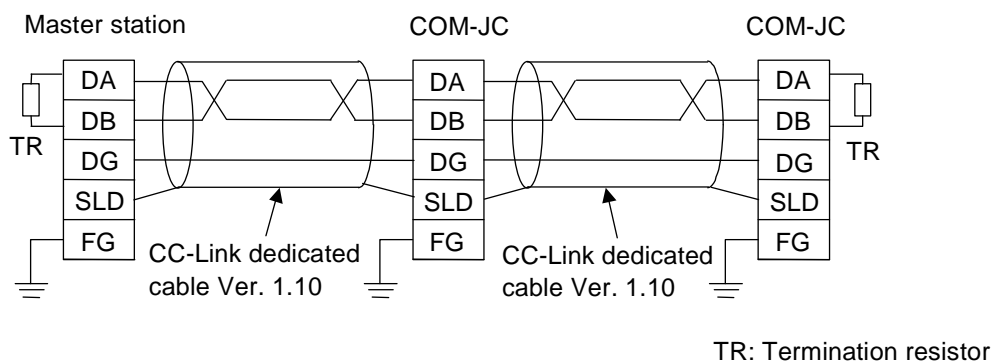
📖 The CC-Link dedicated cable Ver. 1.10 is provided by the customer.

IMR01Y06-E8

4.4 Connection to Controller

Conduct wiring between the COM-JC and controller (FB100/400/900) as shown in the following.

📖 **When conducting wiring to the FB100/400/900, always conduct wiring to the Communication 1 terminal.**

■ Communication terminal number and signal details

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

■ Wiring [FB400/900] (Connections are similar for the FB100)

R1: Internal termination resistor
(120 Ω 1/2 W)

R2: Termination resistor for external
connection (Example: 120 Ω 1/2 W)

If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

☞ For the termination resistors, refer to **4.5 Installation of Termination Resistor (P. 14).**

Maximum controller connections: 31 controllers

📖 The cable and termination resistors must be provided by the customer.

📖 The termination resistor existing within the COM-JC can be connected or disconnected by the switch. (Factory set value: Termination resistor connected)

4.5 Installation of Termination Resistor

If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors to the COM-JC and the controller. Procedure for setting a termination resistor to Controller communication (RS-485) and its setting position are described in the following.

■ Termination resistor setting position

If the COM-JC is connected to the extreme end of the communication line, install one termination resistor each to the COM-JC and the controller located most distantly from the COM-JC.

Controller communication (RS-485: Modbus)

Internal termination resistor ON (Factory set value)

COM-JC

FB100 FB400 FB900 1

FB100 FB400 FB900 2

FB100 FB400 FB900 31

Connect a termination resistor to the terminals from exterior.

☞ For installation position of the termination resistor, refer to ■ **Wiring (P. 13)**.
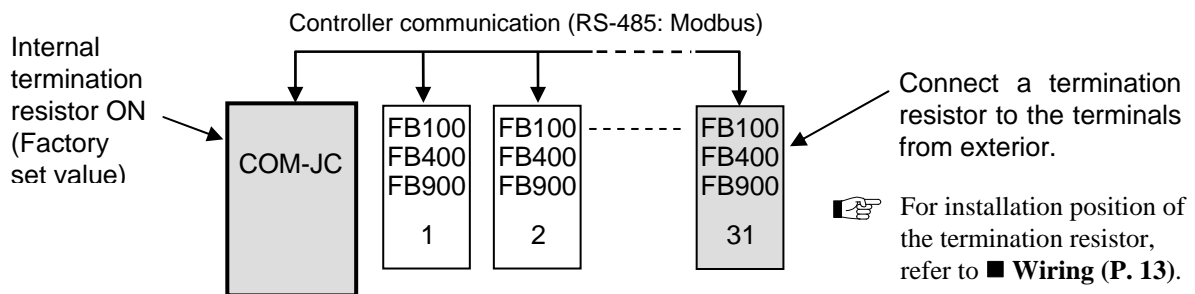
■ Setting procedure of termination resistor (COM-JC)

As the COM-JC is internally provided with a selector switch for choosing the ON/OFF of a termination resistor, it is not required to externally install the termination resistor.
(Factory set value: Termination resistor connected)

1. Turn off the power supply of the COM-JC.
   Do not separate the mainframe from terminal base with the power turned on. If so, instrument failure may result.

2. Pull out the mainframe itself toward you while pushing the locks at its top and bottom (1), and then separate it from the terminal base (2).

Upper-side lock

Top view

Lower-side lock

Bottom view

Terminal base

Mainframe

(1) Push

(2) Pull out

(1) Push

Removing the module mainframe
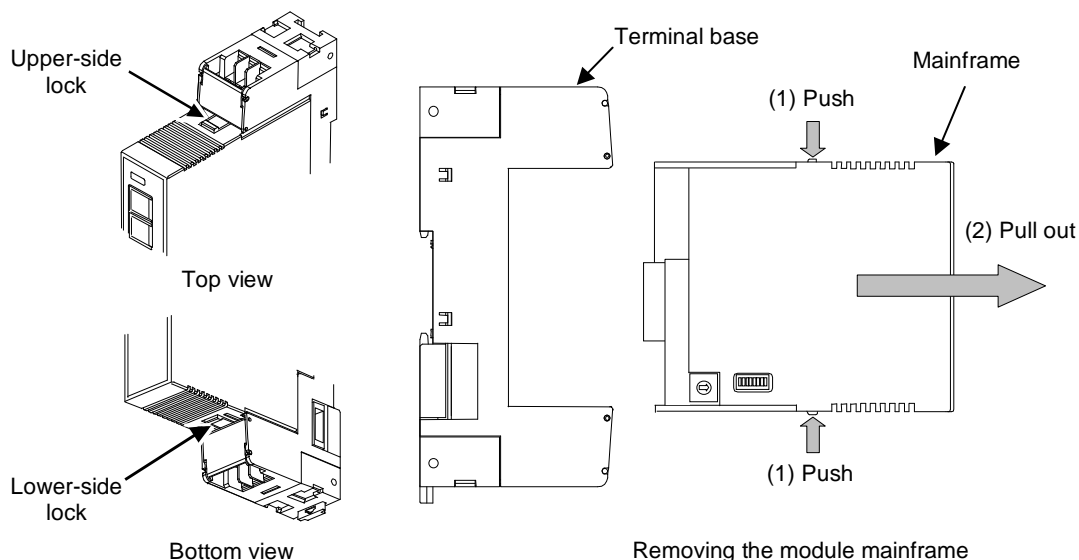
3. Turn on the termination resistor transfer switch in the terminal base.
The COM-JC is shipped from the factory with the selector switch set to "ON: Termination resistor connected."

Termination resistor transfer switch

Termination resistor OFF

Termination resistor ON (120 Ω   1/2 W)

Factory set value: ON
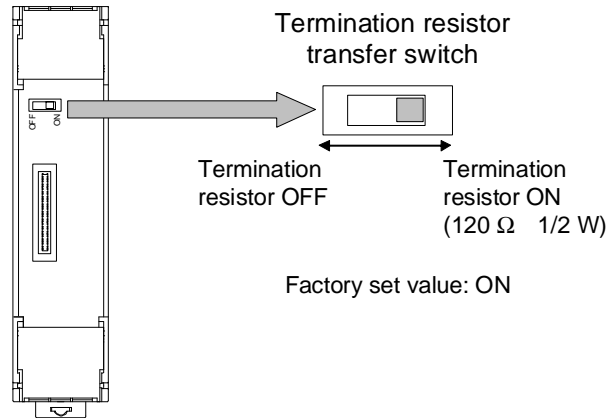
A terminal base of the state which removed module mainframe

4. Push the mainframe thus separated in the terminal base until firmly locked.

Terminal base

Mainframe

Push the module mainframe until firmly locked
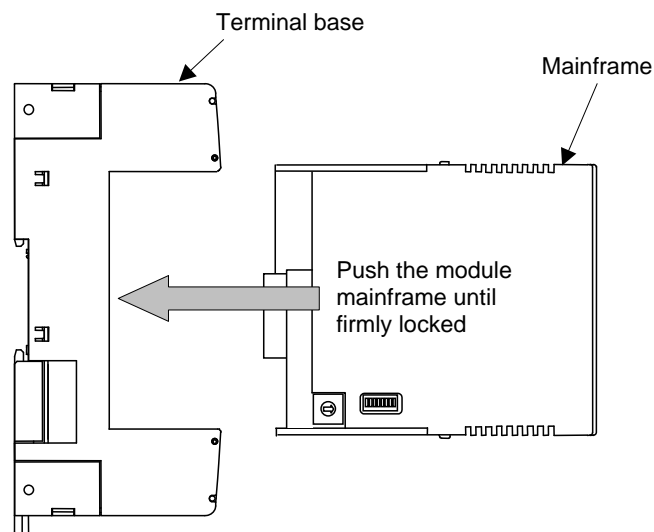
Mounting the module mainframe

5. SETTING

CAUTION

Do not separate the mainframe from the terminal base with the power turned on.
If so, instrument failure may result.

5.1 Station Number Setting

Set the station number of CC-Link. For this setting, use a small blade screwdriver.

📖 **When set to any value out of the setting range, the COM-JC becomes the FAIL state.**

Station number
setting switch

High-order digit
setting
(Set value × 10)

Low-order digit
setting
(Set value × 1)

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
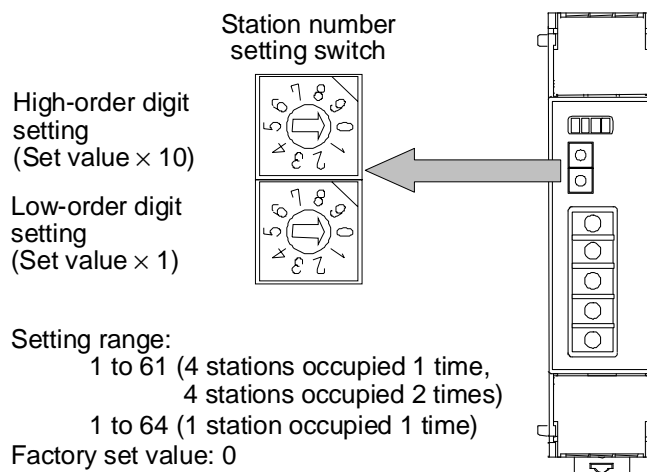
5.2 Communication Speed Setting

The rotary switch at the left side of the mainframe sets the communication speed of the CC-Link.
For this setting, use a small slotted screwdriver.

📖 **When set to any value out of the setting range, the COM-JC becomes the FAIL state.**
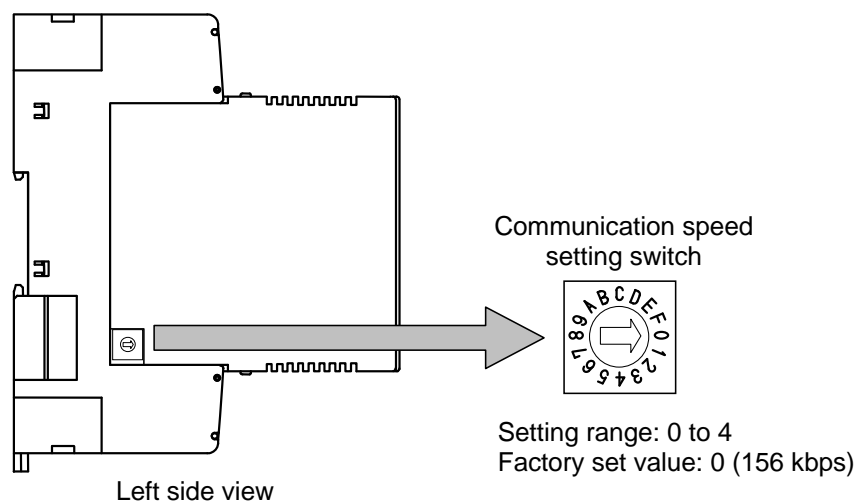
Communication speed
setting switch

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

Left side view

● **Communication speed and maximum transmitter distance**
  (Use the CC-Link dedicated cable Ver. 1.10)

Communication speed setting	Communication speed	Maximum transmitter distance (maximum length of network)
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

5.3 Occupied Station/Extended Cyclic and Controller Communication Speed Setting

The DIP switch at the left side of the mainframe sets the occupied station/extended cyclic and controller communication speed.

Left side view
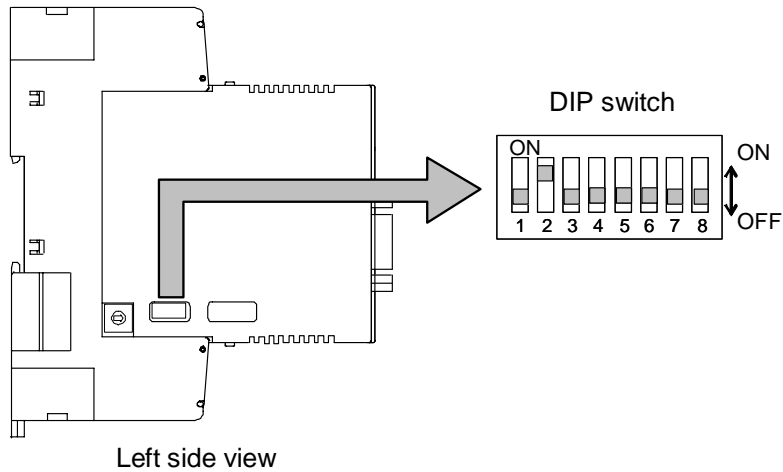
1	2	Controller communication speed
OFF	OFF	38400 bps
ON	OFF	9600 bps
OFF	ON	19200 bps
ON	ON	38400 bps

Factory set value: 19200 bps

3	4	5	Number of Occupied station/Extended cyclic
OFF	OFF	OFF	4 stations occupied 1 time (8 controllers assignment)
ON	OFF	OFF	4 stations occupied 1 time (16 controllers assignment)
OFF	ON	OFF	4 stations occupied 2 times (16 controllers assignment)
ON	ON	OFF	4 stations occupied 2 times (31 controllers assignment)
OFF	OFF	ON	1 station occupied 1 time (1 controller assignment)
ON	OFF	ON	1 station occupied 1 time (2 controllers assignment)
OFF	ON	ON	Do not set this one
ON	ON	ON	

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

📖 CC-Link version varies according to the specification of Occupied station/Extended cyclic of the COM-JC. 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

6	7	8	
OFF	OFF	OFF	Fixed

5.4 Controller Setting

[Controller communication conditions: Use communication 1 side]

- Device address: 1 to 99 (Zero is not settable)

  The device address numbers must be continuous starting from 1.

  To set a non-continuous number, a factory set value of "Extension No. 503 Address setting of connected controller" (P. 79) needs to be changed. Address setting for "Extension No. 503 Address setting of connected controller" can be set to "Automatic address acquisition" at "Extension No. 505 Automatic acquisition of controller address" (P. 80).

- Communication protocol: Modbus-RTU

- Communication speed: 9600 bps, 19200 bps, 38400 bps

  📖 Match the communication speed of the FB series controller to that of the COM-JC. The communication speed of the COM-JC can be adjusted with a DIP switch. (Refer to page 18)

- Data bit configuration: Data 8-bit, Without parity bit, Stop 1-bit

☞ For setting procedure, refer to **FB100 Communication Quick Manual (IMR01W15-E☐)**, **FB400/FB900 Communication Quick Manual (IMR01W07-E☐)** or **FB100/FB400/FB900 Communication Instruction Manual (IMR01W04-E☐)**.

6. CC-Link COMMUNICATION

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

The COM-JC 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-JC (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-JC (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-JC (Remote device station).

[Writing to the Remote register RWw]

(8) The Remote register RWr data of a COM-JC (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-JC (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-JC.

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-JC is set to 1 station occupied 1 time.

■ Initialize request processing at power on

● Initialize processing request from Remote device station (COM-JC)
If the COM-JC 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-JC becomes a ready state, a Remote ready [RX(n+1)B] is turned on.

Initialize data processing request flag [RX(n+1)8]

Initialize data processing completion flag [RY(n+1)8]

Remote ready [RX(n+1)B]
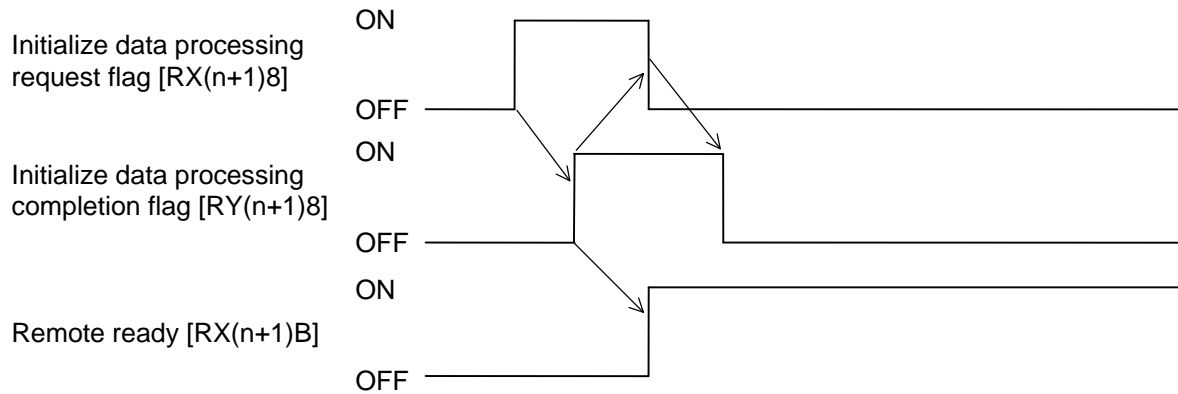
● Initialize processing request from Master station (PLC)
This is a COM-JC initialize setting request. As there is no initialize data specifically, no processing is required.

Initialize data setting request flag [RY(n+1)9]

Initialize data setting completion flag [RX(n+1)9]

Remote ready [RX(n+1)B]
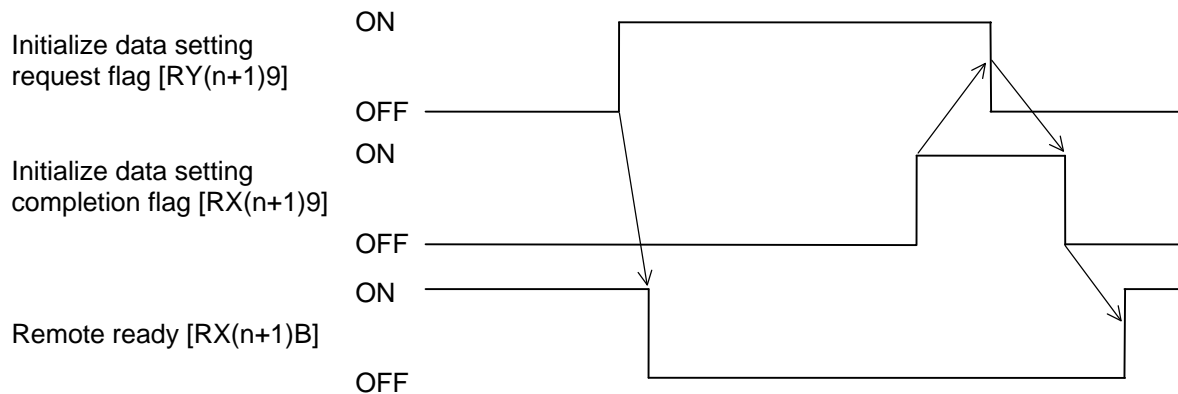
■ **Error flag/Error reset processing**

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.
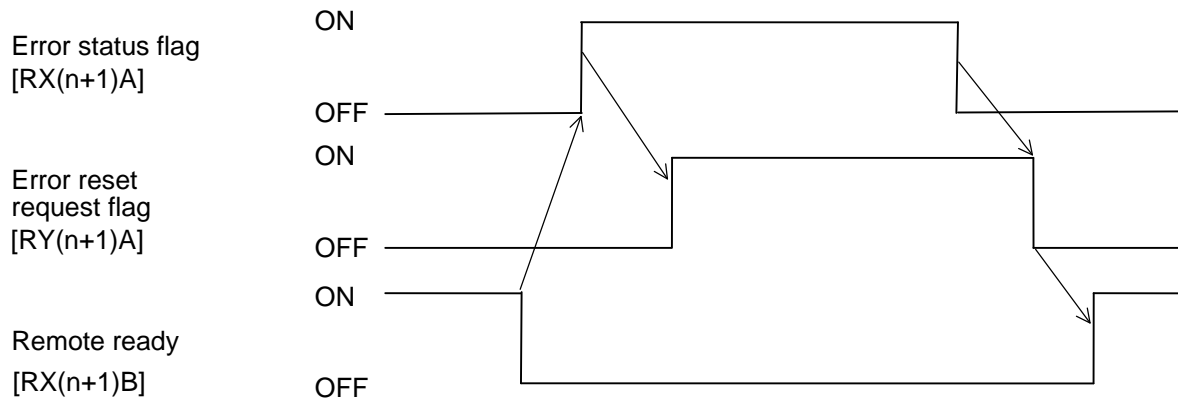
■ **Extension number for display selection processing**

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.
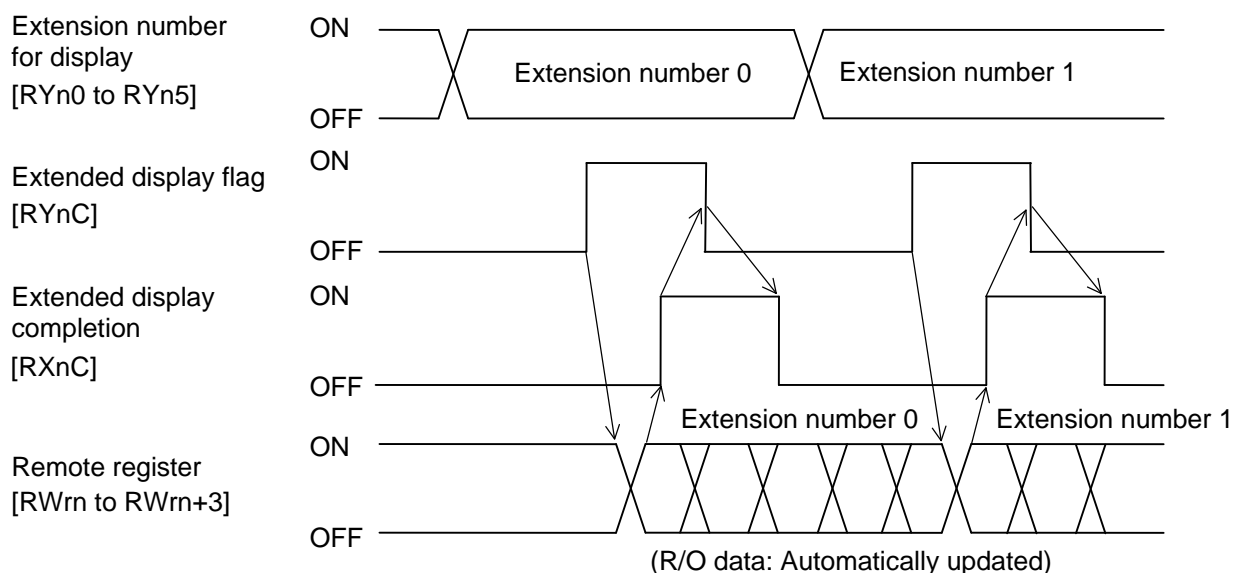
■ Extension number for setting selection processing

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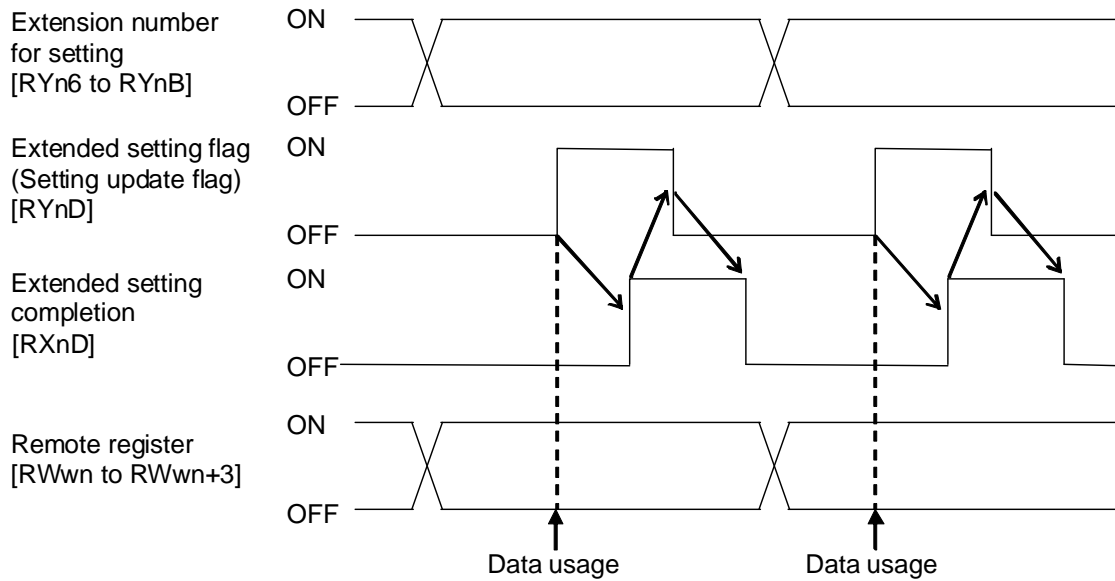
Regardless of the number of Occupied station and the Extended cyclic, the above processing is also necessary if the Set value (SV) assigned to the Remote register (RWw) as a fixed value is changed.

■ AT start procedure

Instructs AT execution.
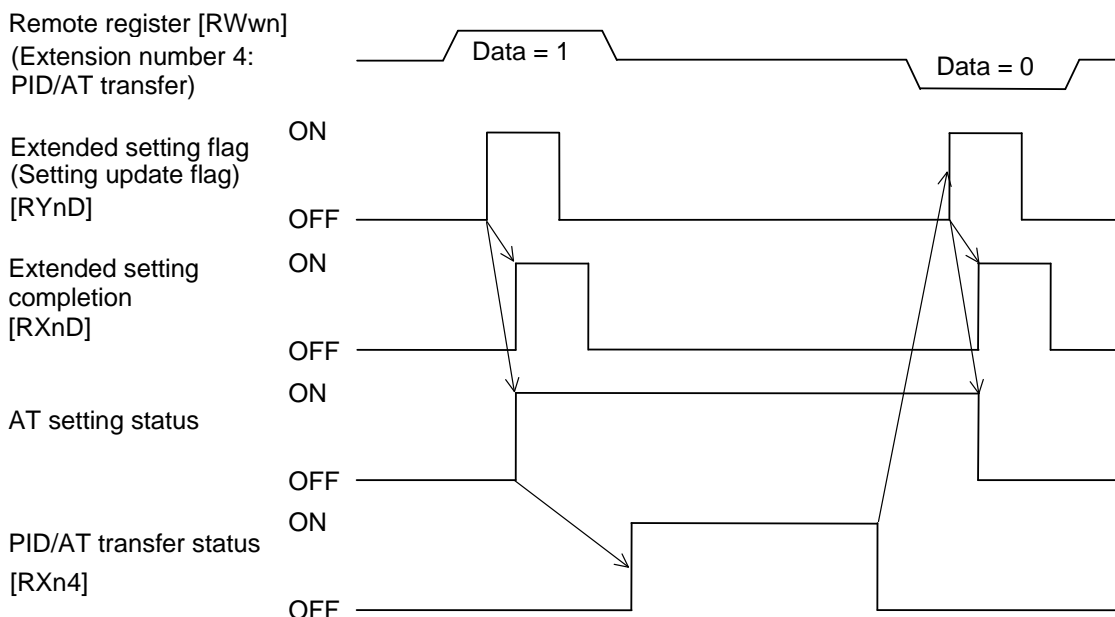
6.3 Processing of Numeric Data Values

Numeric data values used via communication with the PLC and processed by COM-JC 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 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-JCs 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	$n = (\text{Station number}^* - 1) \times 2$
4 stations occupied 1 time	$n = (\text{Station number}^* - 1) \times 2$
4 stations occupied 2 times	$n = (\text{Station number}^* - 1) \times 3.5$

* 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-JC is set to 4 stations occupied 1 time and its station number is 5.

$$n = (5 - 1) \times 2 = 8 \text{ (Decimal number)} \rightarrow 8 \text{ (Hexadecimal number)}$$

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-JC 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-JC 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. 79).
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.

7.1.1 1 station occupied 1 time

■ Remote input

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 32-bit

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	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	0: PID control 1: Autotuning (AT)	—
RXnA	Unused		—	—
RXnB				
RXnC	Extended display completion		0: OFF 1: ON	—
RXnD	Extended setting completion			—
RXnE	Unused		—	—
RXnF	Hardware error flag		0: OFF 1: ON Hardware error flag ON condition • Hardware error • RAM read/write error • Stack overflow • Memory backup error • Configuration error	—
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 • 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-JC (Remote device station)
Data capacity:　32-bit

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-JC∗01-**1** 　0: RUN (Control start) 　1: STOP (Control stop) For COM-JC∗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		—	—

7.1.2 4 stations occupied 1 time

■ Remote input

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 128-bit

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	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	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 • Hardware error • RAM read/write error • Stack overflow • Memory backup error • Configuration error	—
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	0: PID control 1: Autotuning (AT)	—

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—
RX(n+3)E	Unused		—	—
RX(n+3)F				

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—

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	0: PID control 1: Autotuning (AT)	—
RX(n+5)E RX(n+5)F	Unused		—	—
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	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	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 • 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-JC (Remote device station)
Data capacity: 128-bit

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-JC∗01-**1** 　0: RUN (Control start) 　1: STOP (Control stop) For COM-JC∗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 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		—	—

7.1.3 4 stations occupied 2 times

■ Remote input

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 224-bit

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	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	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 • Hardware error • RAM read/write error • Stack overflow • Memory backup error • Configuration error	—
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	0: PID control 1: Autotuning (AT)	—

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—
RX(n+3)E	Unused		—	—
RX(n+3)F				

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—

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	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	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	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	0: PID control 1: Autotuning (AT)	—

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—
RX(n+8)F	Unused		—	—

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	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	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	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	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	0: PID control 1: Autotuning (AT)	—

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	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	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	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	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 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 • 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-JC (Remote device station)
Data capacity: 224-bit

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-JC∗01-**1** 0: RUN (Control start) 1: STOP (Control stop) For COM-JC∗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 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		—	—

7.2 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-JCs 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	$n = (\text{Station number*} - 1) \times 4$
4 stations occupied 1 time	$n = (\text{Station number*} - 1) \times 4$
4 stations occupied 2 times	$n = (\text{Station number*} - 1) \times 8$

* 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-JC is set to 4 stations occupied 1 time and its station number is 5.
                    $n = (5 - 1) \times 4 = 16$ (Decimal number) $\rightarrow$ 10 (Hexadecimal number)

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

If the network consists of COM-JC 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-JC 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 $\rightarrow$ RWr0 to RWr1F
                                          RWwn to RWwn+1F $\rightarrow$ 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 $\rightarrow$ RWr20 to RWr23
                                          RWwn to RWwn+3 $\rightarrow$ RWw20 to RWw23
3rd module [Station number 6]: 4 stations occupied 2 times
          $n = 20 + 4 = 24$ (Total number of assigned registers of station 1 and station 5)
          Remote registers   RWrn to RWrn+F $\rightarrow$ RWr24 to RWr33
                                          RWwn to RWwn+F $\rightarrow$ 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. 79).
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.

7.2.1   1 station occupied 1 time (1 controller assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 4-word

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-JC (Remote device station)
Data capacity: 4-word

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, refer to ■ **Extension number for setting selection processing (P. 24).**

7.2.2 1 station occupied 1 time (2 controllers assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 4-word

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-JC (Remote device station)
Data capacity: 4-word

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, refer to ■ **Extension number for setting selection processing (P. 24).**

7.2.3 4 stations occupied 1 time (8 controllers assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 16-word

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-JC (Remote device station)
Data capacity: 16-word

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, refer to ■ **Extension number for setting selection processing (P. 24).**

7.2.4 4 stations occupied 1 time (16 controllers assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 16-word

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-JC (Remote device station)
Data capacity: 16-word

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)			—

7.2.5 4 stations occupied 2 times (16 controllers assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 32-word

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-JC (Remote device station)
Data capacity: 32-word

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, refer to ■ **Extension number for setting selection processing (P. 24).**

7.2.6 4 stations occupied 2 times (31 controllers assignment)

■ Remote register (RWr)

Data direction: COM-JC (Remote device station) → Master station (PLC)
Data capacity: 32-word

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-JC (Remote device station)
Data capacity: 32-word

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		—	—

7.3 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 set in ON/OFF of remote output.

☞   For Remote output, refer to **7.1 Remote Input/Output (P. 26)**.

☞   For Remote register, refer to **7.2 Remote Register (P. 45)**.

☞   For Memory area function, refer to **FB100 Instruction Manual (IMR01W16-E☐)** or **FB400/FB900 Instruction Manual (IMR01W03-E☐)**.

■ When read 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 write 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 set extension number for setting to "3: Set value (SV)," 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

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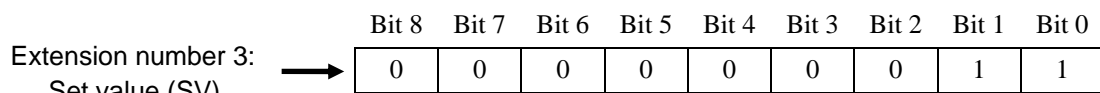
RY(n+1)A	RY(n+1)9	RY(n+1)8	RYnB	RYnA	RYn9	RYn8	RYn7	RYn6
OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

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

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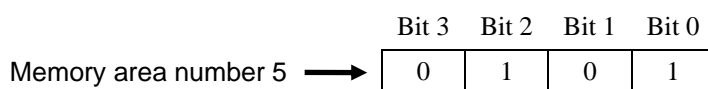
RY(n+2)B	RY(n+2)A	RY(n+2)9	RY(n+2)8
OFF	ON	OFF	ON

Bit data: 0: OFF   1: ON

■ Extension number list

📖 Attribute:
   RO: Read only data   [Remote device station (COM-JC) → Master station (PLC)]
   R/W: Read and Write data [Remote device station (COM-JC) ↔ Master station (PLC)]

★: 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.

Extension number	Communication item	Attri-bute	Data range	Factory set value
0	Measured value (PV)	RO	Input scale low to Input scale high Varies with the setting of the Decimal point position selection.	—
1	Manipulated output value (MV1) monitor [heat-side]	RO	PID control or Heat/Cool PID control: −5.0 to +105.0 % Position proportioning PID control with feedback resistance (FBR) input: 0.0 to 100.0 %	—
2	Current transformer 1 (CT1) input value monitor	RO	0.0 to 30.0 A (CTL-6-P-N) 0.0 to 100.0 A (CTL-12-S56-10L-N)	—
3	Set value (SV) ★	R/W	Setting limiter low to Setting limiter high Varies with the setting of the Decimal point position selection.	TC/RTD: 0, 0.0 or 0.00 V/I: 0.0
4	PID/AT transfer [1]	R/W	0: PID control 1: Autotuning (AT) * * When the Autotuning (AT) is finished, the control will automatically returns to 0: PID control.	0

5	Proportional band [heat-side] ★	R/W	TC/RTD inputs:
			   0 to Input span, 0.0 to Input span or
			   0.00 to Input span (Unit: °C [°F])
			Varies with the setting of the Decimal point position selection.
			Voltage (V)/Current (I) inputs:
			   0.0 to 1000.0 % of input span
			(0, 0.0 or 0.00: ON/OFF action)
				TC/RTD: 30, 30.0 or 30.00
				
				V/I: 30.0

6	Integral time [heat-side] ★	R/W	PID control or Heat/Cool PID control:
			   0 to 3600 seconds or 0.0 to 1999.9 seconds
			   (0, 0.0: PD action)
			   [both heat-side and cool-side]
			Position proportioning PID control:
			   1 to 3600 seconds or 0.1 to 1999.9 seconds
			Varies with the setting of the Integral/Derivative time decimal point position selection.
				240

7	Derivative time [heat-side] ★	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action) Varies with the setting of the Integral/Derivative time decimal point position selection.	60
8	PV bias	R/W	−Input span to +Input span Varies with the setting of the Decimal point position selection.	0, 0.0 or 0.00

[1] For the operation, refer to the **6.2 CC-Link Flag Operation (P. 22).**

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
9	Event 1 set value ★	R/W	Deviation: −Input span to +Input span Varies with the setting of the Decimal point position selection. Process and set value: Input scale low to Input scale high	50, 50.0 or 50.00
10	Event 2 set value ★	R/W	Varies with the setting of the Decimal point position selection. Manipulated output value (MV1 or MV2): −5.0 to +105.0 % If the Event type corresponds to "0: None," set to RO (Read only data).	50, 50.0 or 50.00
11 ⋮ 15	Reserved	—	—	—
16	Unused	—	—	—
17	RUN/STOP transfer	R/W	Logic of RUN/STOP transfer is different by model code. For COM-JC∗01-**1** 0: RUN (Control start) 1: STOP (Control stop) For COM-JC∗01-**2** 0: STOP (Control stop) 1: RUN (Control start)	0
18	Proportional cycle time [heat-side]	R/W	0.1 to 100.0 seconds M: Relay contact output V: Voltage pulse output T: Triac output D: Open collector output This item becomes RO (Read only data) for the Voltage/Current output specification.	M: 20.0 V, T, D: 2.0
19	Auto/Manual transfer	R/W	0: Auto mode 1: Manual mode	0
20	Manual manipulated output value	R/W	PID control, Position proportioning PID control with feedback resistance (FBR) input: Output limiter low [MV1] to Output limiter high [MV1] Heat/Cool PID control: −Output limiter high [MV2] to +Output limiter high [MV1] (−105.0 to +105.0 %)	0.0
21	Setting limiter high	R/W	Setting limiter low to Input scale high Varies with the setting of the Decimal point position selection.	Input scale high
22	Setting limiter low	R/W	Input scale low to Setting limiter high Varies with the setting of the Decimal point position selection.	Input scale low
23	PV digital filter	R/W	0.0 to 100.0 seconds (0.0: Unused)	0.0

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
24	Heater break alarm 1 (HBA1) set value	R/W	0.0 to 30.0 A (CTL-6-P-N) 0.0 to 100.0 A (CTL-12-S56-10L-N) (0.0: Unused) If there is no Current transformer 1 (CT1) or CT1 is assigned to "0: None," set to RO (Read only data).	0.0

25	Decimal point position	R/W	0: No decimal place
			1: One decimal place
			2: Two decimal places
			3: Three decimal places
			4: Four decimal places
			TC inputs:
			  K, J, E: Only 0 or 1 can be set.
			  T, U, L: Only 1 can be set.
			  Other than the above:
			        Only 0 can be set.
			RTD inputs: From 0 to 2 can be set.
			V/I inputs: From 0 to 4 can be set.
				Based on model code.
				
				When not specifying:
				TC/RTD: 0
				V/I: 1

26	Manipulated output value (MV2) monitor [cool-side]	RO	−5.0 to +105.0 %	—

27	Proportional band [cool-side] ★	R/W	TC/RTD inputs:
			  1 to Input span, 0.1 to Input span or
			  0.01 to Input span (Unit: °C [°F])
			  Varies with the setting of the Decimal
			  point position selection.
			Voltage (V)/Current (I) inputs:
			  0.1 to 1000.0 % of input span
			If control is other than Heat/Cool PID control, set to RO (Read only data).
				TC/RTD: 30, 30.0 or 30.00
				
				V/I: 30.0

28	Proportional cycle time [cool-side]	R/W	0.1 to 100.0 seconds M: Relay contact output V: Voltage pulse output T: Triac output D: Open collector output If control is other than Heat/Cool PID control, set to RO (Read only data). This item becomes RO (Read only data) for the Voltage/Current outputs specification.	M: 20.0 V, T, D: 2.0

29	Overlap/Deadband ★	R/W	TC/RTD inputs:
			  −Input span to +Input span (Unit:°C [°F])
			  Varies with the setting of the Decimal
			  point position selection.
			Voltage (V)/Current (I) inputs:
			  −100.0 to +100.0 % of input span
			Minus (−) setting results in Overlap.
			However, the overlapping range is within the proportional range.
			If control is other than Heat/Cool PID control, set to RO (Read only data).
				0, 0.0 or 0.00

30	Unused	—	—	—

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Extension number	Communication item	Attri-bute	Data range	Factory set value
31	Set value (SV) monitor	RO	Setting limiter low to Setting limiter high Varies with the setting of the Decimal point position selection.	—
32	Error code	RO	Bit data Bit 0: Adjustment data error Bit 1: Back-up error Bit 2: A/D conversion error Bit 3 and Bit 4: Unused Bit 5: Custom data error Bit 6: Unused Bit 7: Watchdog timer error Bit 8: Stack overflow Bit 9 and Bit 10: Unused Bit 11: Program error (Busy) Bit 12 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 2471]	—
33	Memory area transfer	R/W	1 to 8 *	1
34	Control response parameter ★	R/W	0: Slow 1: Medium 2: Fast When the P or PD action is selected, this setting becomes invalid.	PID control, Position proportioning PID control: 0 Heat/Cool PID control: 2
35	Unused	—	—	—
36	Input type	R/W	0: TC input K 6: TC input N 1: TC input J 7: TC input T 2: TC input R 8: TC input W5Re/W26Re 3: TC input S 9: TC input PLII 4: TC input B 10: TC input U 5: TC input E 11: TC input L 12: RTD input Pt100 13: RTD input JPt100 14: Current input 0 to 20 mA DC 15: Current input 4 to 20 mA DC 16: Voltage (high) input 0 to 10 V DC 17: Voltage (high) input 0 to 5 V DC 18: Voltage (high) input 1 to 5 V DC 19: Voltage (low) input 0 to 1 V DC 20: Voltage (low) input 0 to 100 mV DC 21: Voltage (low) input 0 to 10 mV DC 24: Voltage (high) input ±1 V DC 25: Voltage (low) input ±100 mV DC 26: Voltage (low) input ±10 mV DC If changed to Voltage (high) inputs from TC/RTD/Current/Voltage (low) inputs, select the hardware by the input selector switch (for measurement input) at the side of the instrument. For the selecting procedure, refer to **FB100 Instruction Manual (IMR01W16-E□)** or **FB400/FB900 Instruction Manual (IMR01W03-E□)**.	Based on model code. When not specifying: 0

* FB100: When the Digital input (DI) assignment (Extension No. 170) value is 6 to 12 and Control area Local/External transfer [1] is External mode, this data becomes RO (Read only data).
[1] Operation of Control area Local/External transfer is only available for FB100.

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Extension number	Communication item	Attri-bute	Data range	Factory set value
37	Setting change rate limiter (up) ★	R/W	0 to Input span/unit time * (0: Unused) Varies with the setting of the Decimal point position selection. * Unit time: 60 seconds (Factory set value)	0
38	Control action	R/W	0: Brilliant II PID control (Direct action) 1: Brilliant II PID control (Reverse action) 2: Brilliant II Heat/Cool PID control [water cooling] 3: Brilliant II Heat/Cool PID control [air cooling] 4: Brilliant II Heat/Cool PID control [cooling gain linear type] 5: Brilliant II Position proportioning PID control (Reverse sction) 6: Brilliant II Position proportioning PID control (Direct sction)	Based on model code. When not specifying: 1
39	Event 1 type	R/W	0: None 5: Process high [1] 1: Deviation high [1] 6: Process low [1] 2: Deviation low [1] 7: SV high 3: Deviation high/low [1] 8: SV low 4: Band [1] 9: Unused 10: MV1 high [heat-side] [1, 2] 11: MV1 low [heat-side] [1, 2] 12: MV2 high [cool-side] [1] 13: MV2 low [cool-side] [1] [1] Event hold action is available. [2] If there is Feedback resistance (FBR) input in Position proportioning PID control, set to the Feedback resistance (FBR) input value.	Based on model code. When not specifying: 0
40	Event 2 type	R/W		Based on model code. When not specifying: 0
41	Event 1 differential gap	R/W	① Deviation, process or set value: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) Varies with the setting of the Decimal point position selection. ② MV: 0.0 to 110.0 %	①: TC/RTD: 2, 2.0, or 2.00 V/I: 0.2 ②: 0.2
42	Event 2 differential gap	R/W		①: TC/RTD: 2, 2.0, or 2.00 V/I: 0.2 ②: 0.2
43	Event 1 hold action	R/W	0: OFF 1: Hold action ON (when power turned on; when transferred from STOP to RUN) 2: Re-hold action ON (when power turned on; when transferred from STOP to RUN; SV changed)	Based on model code. When not specifying: 0
44	Event 2 hold action	R/W		Based on model code. When not specifying: 0
45	Unused	—	—	—
46	Output limiter high [MV1]	R/W	Output limiter low [MV1] to +105.0 % Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break.	105.0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
47	Output limiter low [MV1]	R/W	−5.0 % to Output limiter high [MV1] Position proportioning PID control: 　Becomes valid only when there is Feedback 　resistance (FBR) input and it does not break.	−5.0
48	Unused	—	—	—
49	Unused	—	—	—
50	Control loop break alarm (LBA) time ★	R/W	0 to 7200 seconds (0: Unused) If Event 4 is other than "9: Control loop break alarm (LBA)," set to RO (Read only data).	480
51	LBA deadband ★	R/W	0 (0.0, 0.00) to Input span Varies with the setting of the Decimal point position selection. If Event 4 is other than "9: Control loop break alarm (LBA)," set to RO (Read only data).	0, 0.0 or 0.00
52	Unused	—	—	—
53	Unused	—	—	—
54	Event 3 set value (EV3) ★	R/W	Deviation: 　−Input span to +Input span 　Varies with the setting of the Decimal 　point position selection. Process and set value: 　Input scale low to Input scale high 　Varies with the setting of the Decimal 　point position selection.	50, 50.0 or 50.00
55	Event 4 set value (EV4) ★	R/W	Manipulated output value (MV1 or MV2): 　−5.0 to +105.0 % If the Event type corresponds to "0: None," set to RO (Read only data). If Event 4 corresponds to "9: Control loop break alarm (LBA)," the Event 4 set value becomes RO (Read only data).	50, 50.0 or 50.00
56	Event 3 type	R/W	0:　None 1:　Deviation high [1] 2:　Deviation low [1] 3:　Deviation high/low [1] 4:　Band [1] 5:　Process high [1] 6:　Process low [1] 7:　SV high 8:　SV low 9:　Event 3: Unused	Based on model code. When not specifying: 0
57	Event 4 type	R/W	Event 4: Control loop break alarm (LBA) 10: MV1 high [heat-side] [1, 2] 11: MV1 low [heat-side] [1, 2] 12: MV2 high [cool-side] [1] 13: MV2 low [cool-side] [1] [1] Event hold action is available. [2] If there is Feedback resistance (FBR) input in Position proportioning PID control, set to the Feedback resistance (FBR) input value.	Based on model code. When not specifying: 0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
58	Event 3 differential gap	R/W	① Deviation, process or set value: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) Varies with the setting of the Decimal point position selection. ② MV: 0.0 to 110.0 %	①: TC/RTD: 2, 2.0, or 2.00 V/I: 0.2 ②: 0.2
59	Event 4 differential gap	R/W		①: TC/RTD: 2, 2.0, or 2.00 V/I: 0.2 ②: 0.2
60	Event 3 hold action	R/W	0: OFF 1: Hold action ON (when power turned on; when transferred from STOP to RUN)	Based on model code. When not specifying: 0
61	Event 4 hold action	R/W	2: Re-hold action ON (when power turned on; when transferred from STOP to RUN; SV changed)	Based on model code. When not specifying: 0
62	Setting change rate limiter (down) ★	R/W	0 to Input span/unit time * (0: Unused) Varies with the setting of the Decimal point position selection. * Unit time: 60 seconds (Factory set value)	0
63	Comprehensive event state	RO	Bit data Bit 0: Burnout Bit 5: Event 3 Bit 1: Event 1 Bit 6: Event 4 Bit 2: Event 2 Bit 7: HBA 2 Bit 3: HBA 1 Bit 8: FBR burnout Bit 4: LBA Bit 9 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 255]	—
64	Remote setting (RS) input value monitor	RO	Setting limiter low to Setting limiter high Varies with the setting of the Decimal point position selection.	—
65	Unused	—	—	—
66	Uuused	—	—	—
67	Burnout state monitor of feedback resistance (FBR) input	RO	0: OFF 1: ON	—
68	Memory area soak time monitor	RO	0 to 11999 seconds or 0 to 5999 minutes Data range of Area soak time can be selected on the Soak time unit.	—
69	Digital input (DI) state monitor	RO	Bit data Bit 0: DI1 Bit 4: DI5 Bit 1: DI2 Bit 5: DI6 * Bit 2: DI3 Bit 6: DI7 * Bit 3: DI4 Bit 7 to Bit 15: Unused Data 0: Contact open 1: Contact closed [Decimal number: 0 to 127] * Unused on the FB100.	—

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Extension number	Communication item	Attri-bute	Data range	Factory set value
70	Operation mode state monitor	RO	Bit data Bit 0: Control STOP Bit 1: Control RUN Bit 2: Manual mode * Bit 3: Remote mode * Bit 4 to Bit 15: Unused Data　0: OFF　　1: ON [Decimal number: 0 to 15] * During operation in Manual mode, the Manual mode of the Operation mode state monitor is set to the "1: ON" state and the Remote mode of the same monitor is set to the "0: OFF" state even if the parameter, Remote/Local transfer is set to "1: Remote mode."	—
71	Unused	—	—	—
72	Unused	—	—	—
73	Unused	—	—	—
74	Output state monitor	RO	Bit data Bit 0: OUT1　　　Bit 4: DO3 * Bit 1: OUT2　　　Bit 5: DO4 * Bit 2: DO1　　　　Bit 6 to Bit 15: Unused Bit 3: DO2 Data　0: OFF　　1: ON [Decimal number: 0 to 63] * Unused on the FB100.	—
75	Current transformer 2 (CT2) input value monitor	RO	0.0 to 30.0 A (CTL-6-P-N) 0.0 to 100.0 A (CTL-12-S56-10L-N)	—
76 ⋮ 89	Unused	—	—	—
90	Remote/Local transfer	R/W	0: Local mode 1: Remote mode When performing remote control by remote setting input and also performing Cascade control and Ratio setting via intercontroller communication, transfer to the Remote mode. [FB100] When the Remote setting (RS) input is not provided, this data becomes RO (Read only data).	0
91 ⋮ 109	Unused	—	—	—
110	Link area number ★	R/W	0 to 8 (0: No link) [FB100] When the Digital input (DI) assignment (Extension No. 170) value is 6 to 12, this data becomes RO (Read only data).	0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
111	Area soak time ★	R/W	0 to 11999 seconds or 0 to 5999 minutes Data range of Area soak time can be selected on the Soak time unit. [FB100] When the Digital input (DI) assignment (Extension No. 170) value is 6 to 12, this data becomes RO (Read only data).	0
112	Integral time [cool-side] ★	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PD action) [both heat-side and cool-side] Varies with the setting of the Integral/Derivative time decimal point position selection. If control is other than Heat/Cool PID control, set to RO (Read only data).	240
113	Derivative time [cool-side] ★	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action) Varies with the setting of the Integral/Derivative time decimal point position selection. If control is other than Heat/Cool PID control, set to RO (Read only data).	60
114 ⋮ 127	Unused	—	—	—
128	Manual reset ★	R/W	−100.0 to +100.0 % The offset can be manually eliminated. If the Integral function is valid, set to RO (Read only data).	0.0
129 ⋮ 139	Unused	—	—	—
140	Heater break determination point 1	R/W	0.0 to 100.0 % of HBA1 set value (0.0: Heater break determination is invalid) If there is no Current transformer 1 (CT1) or CT1 is assigned to "0: None," set to RO (Read only data). If Heater break alarm 1 (HBA1) corresponds to "0: Type A," set to RO (Read only data).	30.0
141	Heater melting determination point 1	R/W	0.0 to 100.0 % of HBA1 set value (0.0: Heater melting determination is invalid) If there is no Current transformer 1 (CT1) or CT1 is assigned to "0: None," set to RO (Read only data). If Heater break alarm 1 (HBA1) corresponds to "0: Type A," set to RO (Read only data).	30.0
142	PV ratio	R/W	0.500 to 1.500	1.000

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Extension number	Communication item	Attri-bute	Data range	Factory set value
143	PV low input cut-off	R/W	0.00 to 25.00 % of input span If the Input square root extraction corresponds to "0: Unused," set to RO (Read only data).	0.00
144	Set lock level	R/W	Bit data Bit 0: Lock only setting items other than SV and Event set value (EV1 to EV4). Bit 1: Lock only Event set value (EV1 to EV4) Bit 2: Lock only Set value (SV) Bit 3 to Bit 15: Unused Data 0: Unlock 1: Lock [Decimal number: 0 to 7]	0
145	Unused	—	—	—
146	Backup memory state monitor	RO	0: The content of the backup memory does not coincide with that of the RAM. 1: The content of the backup memory coincides with that of the RAM.	—
147	Unused	—	—	—

148	RS bias
	  Cascade control:
	    Cascade bias
	  Ratio setting:
	    Ratio setting bias
		R/W	−Input span to +Input span
			Varies with the setting of the Decimal point position selection.
			[FB100]
			When the Remote setting (RS) input is not provided, this data becomes RO (Read only data).
				0, 0.0, 0.00

149	RS digital filter
	  Cascade control:
	    Cascade digital filter
	  Ratio setting:
	    Ratio setting digital filter
		R/W	0.0 to 100.0 seconds
			(0.0: Unused)
			[FB100]
			When the Remote setting (RS) input is not provided, this data becomes RO (Read only data).
				0.0

150	RS ratio
	  Cascade control:
	    Cascade ratio
	  Ratio setting:
	    Ratio setting ratio
		R/W	0.001 to 9.999
			[FB100]
			When the Remote setting (RS) input is not provided, this data becomes RO (Read only data).
				1.000

151	Heater break alarm 2 (HBA2) set value	R/W	When CT is CTL-6-P-N:
			  0.0 to 30.0 A (0.0: Not used)
			When CT is CTL-12-S56-10L-N:
			  0.0 to 100.0 A (0.0: Not used)
			If there is no Current transformer 2 (CT2) or CT2 is assigned to "0: None," set to RO (Read only data).
				0.0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
152	Heater break determination point 2	R/W	0.0 to 100.0 % of HBA2 set value (0.0: Heater break determination is invalid) If there is no Current transformer 2 (CT2) or CT2 is assigned to "0: None," set to RO (Read only data). If Heater break alarm 2 (HBA2) corresponds to "0: Type A," set to RO (Read only data).	30.0
153	Heater melting determination point 2	R/W	0.0 to 100.0 % of HBA2 set value (0.0: Heater melting determination is invalid) If there is no Current transformer 2 (CT2) or CT2 is assigned to "0: None," set to RO (Read only data). If Heater break alarm 2 (HBA2) corresponds to "0: Type A," set to RO (Read only data).	30.0
154 ⋮ 159	Unused	—	—	—
160	Display unit	R/W	0: °C 1: °F Use to select the temperature unit for Thermocouple (TC) and RTD inputs.	Based on model code. When not specifying: 0

161	Input scale high	R/W	TC/RTD inputs:
			  Input scale low to Maximum value of the selected input range
			Voltage (V)/Current (I) inputs:
			  −19999 to +19999
			Varies with the setting of the Decimal point position selection.
				TC/RTD: Maximum value of the selected input range
				
				V/I: 100.0

162	Input scale low	R/W	TC/RTD inputs:
			  Minimum value of the selected input range to Input scale high
			Voltage (V)/Current (I) inputs:
			  −19999 to +19999
			Varies with the setting of the Decimal point position selection.
				TC/RTD: Minimum value of the selected input range
				
				V/I: 0.0

163	Input error determination point (high)	R/W	Input scale low − (5 % of input span) to Input scale high + (5 % of input span) Varies with the setting of the Decimal point position selection.	TC/RTD: Input scale high + (5 % of input span) V/I: 105.0
164	Input error determination point (low)	R/W		TC/RTD: Input scale low − (5 % of input span) V/I: −5.0

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Extension number	Communication item	Attri- bute	Data range	Factory set value
165	Burnout direction	R/W	0: Upscale 1: Downscale Valid only when the TC input and Voltage (low) input are selected.	0
166	Square root extraction	R/W	0: Unused 1: Used	0
167	Power supply frequency	R/W	0: 50 Hz 1: 60 Hz If power frequency measurement was made possible with CT input and/or Power feed forward (PFF) input applied, set to RO (Read only data).	0
168	Sampling cycle	R/W	0: 50 ms 1: 100 ms 2: 250 ms	1
169	Remote setting input type	R/W	14: Current input 0 to 20 mA DC 15: Current input 4 to 20 mA DC 16: Voltage (high) input 0 to 10 V DC 17: Voltage (high) input 0 to 5 V DC 18: Voltage (high) input 1 to 5 V DC 19: Voltage (low) input 0 to 1 V DC 20: Voltage (low) input 0 to 100 mV DC 21: Voltage (low) input 0 to 10 mV DC If changed to Voltage (high) inputs from Current/Voltage (low) inputs, select the hardware by the input selector switch [for Remote setting (SR) input] at the side of the instrument. For the selecting procedure, refer to **FB100 Instruction Manual (IMR01W16-E□)** or **FB400/FB900 Instruction Manual (IMR01W03-E□)**.	Based on model code. When not specifying: 15
170	Digital input (DI) assignment	R/W	[FB100] 1 to 26 [FB400/900] 1 to 8 Refer to **Table 1 "Digital input (DI) assignment" (P. 81)**.	Based on model code. When not specifying: 1
171 ⋮ 179	Unused	—	—	—
180	Output assignment	R/W	[FB100] 1 to 15 [FB400/900] 1 to 7 Refer to **Table 2 "Output assignment" (P. 82)**.	Based on model code. When not specifying: FB100: 1 FB400/900: 2

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Extension number	Communication item	Attri-bute	Data range	Factory set value
181	Timer 1	R/W	0.0 to 600.0 seconds	0.0
182	Timer 2	R/W	Customization tool is necessary when the timer function is availed.	0.0
183	Timer 3	R/W		0.0
184	Timer 4	R/W		0.0
185	Unused	—	—	—
186	Energized/De-energized	R/W	Bit data Bit 0: DO1 Bit 1: DO2 Bit 2: DO3 * Bit 3: DO4 * Bit 4 to Bit 15: Unused Data 0: Energized 1: De-energized [Decimal number: 0 to 15] * Unused on the FB100.	0
187	Alarm (ALM) lamp lighting condition 1 [a]	R/W	Bit data Bit 0: Event 1 Bit 1: Event 2 Bit 2: Event 3 Bit 3: Event 4 Bit 4 to Bit 15: Unused Data 0: ALM lamp is not lit 1: ALM lamp is lit [Decimal number: 0 to 15]	1111 (Bit image)
188	Alarm (ALM) lamp lighting condition 2 [a]	R/W	Bit data Bit 0: HBA1 Bit 1: HBA2 Bit 2 to Bit 15: Unused Data 0: ALM lamp is not lit 1: ALM lamp is lit [Decimal number: 0 to 3]	11 (Bit image)
189	Output status at STOP mode	R/W	Bit data Bit 0: Event output and HBA output Bit 1: Transmission output Bit 2 to Bit 15: Unused Data 0: OFF 1: Action continued [Decimal number: 0 to 3]	0

[a] When two or more items are set to "1: ALM lamp is lit," if an error occurs in any one of these item, the alarm lamp on the front of the controller (FB100/400/900) lights.

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Extension number	Communication item	Attri-bute	Data range	Factory set value
190	Transmission output type	R/W	0: None 1: PV 2: SV monitor 3: Deviation value 4: MV1 [heat-side] * 5: MV2 [cool-side] 6: SV 7: Remote setting (RS) input value * For Position proportioning PID control: Feedback resistance input value	1

191	Transmission output scale high	R/W	When the PV, SV, SV monitor and RS:
			   Input scale low to Input scale high
			When the MV1 and MV2:
			   −5.0 to +105.0 %
				Input scale high

192	Transmission output scale low	R/W	When the deviation value: −Input span to +Input span Varies with the setting of the Decimal point position selection.	Input scale low
193 ⋮ 199	Unused	—	—	—

200	Force ON of Event 1 action	R/W	Bit data
			Bit 0: Event output turned on at input error
			       occurrence
			Bit 1: Event output turned on in Manual mode
			Bit 2: Event output turned on during the
			       Autotuning (AT) function is being
			       executed
			Bit 3: Event output turned on during the
			       Setting change rate limiter is being
			       operated
			Bit 4 to Bit 15: Unused
			Data 0: Invalid 1: Valid
			[Decimal number: 0 to 15]
				0

201	Unused	—	—	—
202	Event 1 interlock	R/W	0: Unused 1: Used	0
203	Event 1 delay timer	R/W	0.0 to 600.0 seconds	0.0

204	Force ON of Event 2 action	R/W	Bit data
			Bit 0: Event output turned on at input error
			       occurrence
			Bit 1: Event output turned on in Manual mode
			Bit 2: Event output turned on during the
			       Autotuning (AT) function is being
			       executed
			Bit 3: Event output turned on during the
			       Setting change rate limiter is being
			       operated
			Bit 4 to Bit 15: Unused
			Data 0: Invalid 1: Valid
			[Decimal number: 0 to 15]
				0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
205	Unused	—	—	—
206	Event 2 interlock	R/W	0: Unused 1: Used	0
207	Event 2 delay timer	R/W	0.0 to 600.0 seconds	0.0
208	Force ON of Event 3 action	R/W	Bit data Bit 0: Event output turned on at input error 　　　 occurrence Bit 1: Event output turned on in Manual mode Bit 2: Event output turned on during the 　　　 Autotuning (AT) function is being 　　　 executed Bit 3: Event output turned on during the 　　　 Setting change rate limiter is being 　　　 operated Bit 4 to Bit 15: Unused Data　　0: Invalid　　1: Valid [Decimal number: 0 to 15]	0
209	Unused	—	—	—
210	Event 3 interlock	R/W	0: Unused 1: Used	0
211	Event 3 delay timer	R/W	0.0 to 600.0 seconds	0.0
212	Force ON of Event 4 action	R/W	Bit data Bit 0: Event output turned on at input error 　　　 occurrence Bit 1: Event output turned on in Manual mode Bit 2: Event output turned on during the 　　　 Autotuning (AT) function is being 　　　 executed Bit 3: Event output turned on during the 　　　 Setting change rate limiter is being 　　　 operated Bit 4 to Bit 15: Unused Data　　0: Invalid　　1: Valid [Decimal number: 0 to 15]	0
213	Unused	—	—	—
214	Event 4 interlock	R/W	0: Unused 1: Used	0
215	Event 4 delay timer	R/W	0.0 to 600.0 seconds	0.0
216 ⋮ 219	Unused	—	—	—
220	CT1 ratio	R/W	0 to 9999	When not specifying: 800 CTL-6-P-N: 800 CTL-12-S5 6-10L-N: 1000

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Extension number	Communication item	Attri-bute	Data range	Factory set value
221	Heater break alarm 1 (HBA1) type	R/W	0: Heater break alarm 1 (HBA1) type A (Time-proportional control output) 1: Heater break alarm 1 (HBA1) type B (Continuous control output) Time-proportional control output: Relay, Voltage pulse, Triac, or Open collector output Continuous control output: Voltage/Current continuous output	Based on OUT1 of FB100/400/900 model code. Time-proportional control output: 0 Continuous control output: 1
222	Number of heater break alarm 1 (HBA1) delay times	R/W	0 to 255 times	5
223	CT1 assignment	R/W	0: None 1: OUT1 2: OUT2 3 to 6: Do not set this one	1
224	CT2 ratio	R/W	0 to 9999	When not specifying: 800 CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000
225	Heater break alarm 2 (HBA2) type	R/W	0: Heater break alarm 2 (HBA2) type A (Time-proportional control output) 1: Heater break alarm 2 (HBA2) type B (Continuous control output)	0
226	Number of heater break alarm 2 (HBA2) delay times	R/W	0 to 255 times	5
227	CT2 assignment	R/W	0: None 1: OUT1 2: OUT2 3 to 6: Do not set this one	1
228	Unused	—	—	—
229	Unused	—	—	—
230	Hot/Cold start	R/W	0: Hot start 1 1: Hot start 2 2: Cold start 3: Stop start	0
231	External input type	R/W	0: Remote setting input (Remote control) 1: Intercontroller communication Cascade control 2: Intercontroller communication Ratio setting When performing Cascade control or Ratio setting, set the master controller to 0 (Remote control). Set slave controllers to 1 (Cascade control) or 2 (Ratio setting).	0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
232	Unused	—	—	—
233	Unused	—	—	—
234	SV tracking	R/W	0: Unused 1: Used	1

235	MV transfer function
	
	[Action taken when changed to Manual mode from Auto mode]
		R/W	0: MV1 or MV2 in Auto mode is used.
			1: When selected by Digital input (DI):
			    MV1 or MV2 in previous Manual mode is used.
			   When selected by front key:
			    MV1 or MV2 in Auto mode is used.
			2: MV1 or MV2 in previous Manual mode is used.
				0

236	Start determination point	R/W	0 (0.0, 0.00) to Input span (The unit is the same as input value.) 0 (0.0, 0.00): Action depending on the Hot/Cold start selection	3 % of input span
237	Unused	—	—	—
238	Master channel selection	R/W	0 to 31 If the external input type corresponds to "1: Cascade control" or "2: Ratio setting," the setting becomes valid.	0
239	Unused	—	—	—
240	Integral/Derivative time decimal point position	R/W	0: 1 second setting (No decimal place) 1: 0.1 seconds setting (One decimal place)	0
241	Derivative gain	R/W	0.1 to 10.0	6.0

242	ON/OFF action differential gap (upper)	R/W	TC/RTD inputs:
			  0 (0.0, 0.00) to Input span (Unit: °C [°F])
			  Varies with the setting of the Decimal
			  point position selection.
			Voltage (V)/Current (I) inputs:
			  0.0 to 100.0 % of input span
				TC/RTD:
				1, 1.0 or 1.00
				V/I: 0.1

243	ON/OFF action differential gap (lower)	R/W		TC/RTD: 1, 1.0 or 1.00 V/I: 0.1
244	Action (high) at input error	R/W	0: Normal control	0
245	Action (low) at input error	R/W	1: Manipulated output value at input error	0
246	Manipulated output value at input error	R/W	−105.0 to +105.0 % Actual output values become those restricted by the Output limiter. Position proportioning PID control: If there is no Feedback resistance (FBR) input or the Feedback resistance (FBR) input is disconnected, an action taken when abnormal is in accordance with the value action setting during STOP.	0.0
247	Output change rate limiter (up) [MV1]	R/W	0.0 to 100.0 % of manipulated output/seconds (0.0: OFF) Becomes invalid when in Position proportioning PID control.	0.0
248	Output change rate limiter (down) [MV1]	R/W		0.0

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Extension number	Communication item	Attri-bute	Data range	Factory set value
249	Power feed forward selection [Unused on the FB100]	R/W	0: Unused 1: Used	1
250	Power feed forward gain [Unused on the FB100]	R/W	0.01 to 5.00	1.00
251	Derivative action	R/W	0: Measured value derivative 1: Deviation derivative In Position proportioning PID control, action becomes Measured value derivative regardless of the setting.	0
252	Undershoot suppression factor	R/W	0.000 to 1.000 The Undershoot suppression factor is invalid even if set when control is not in Heat/Cool PID control.	Water cooling: 0.100 Air cooling: 0.250 Cooling gain linear type: 1.000
253	Unused	—	—	—
254	Output limiter high [MV2]	R/W	Output limiter low [MV2] to 105.0 % Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break.	105.0
255	Output limiter low [MV2]	R/W	−5.0 % to Output limiter high [MV2] Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break.	−5.0
256	Output change rate limiter (up) [MV2]	R/W	0.0 to 100.0 % of manipulated output/seconds (0.0: OFF) Becomes invalid when in Position proportioning PID control.	0.0
257	Output change rate limiter (down) [MV2]	R/W		0.0
258	Manipulated output value (MV1) at STOP mode [heat-side]	R/W	−5.0 to +105.0 % Position proportioning PID control: Only when there is Feedback resistance (FBR) input and no Feedback resistance (FBR) input is disconnected, the Manipulated output value (MV1) during STOP is output.	−5.0
259	Manipulated output value (MV2) at STOP mode [cool-side]	R/W		−5.0
260	Action at feedback resistance (FBR) input break	R/W	0: Action depending on the valve action at STOP 1: Control action continued	0
261	Unused	—	—	—
262	Open/Close output neutral zone	R/W	0.1 to 10.0 % of output	2.0
263	Open/Close output differential gap	R/W	0.1 to 5.0 % of output	1.0
264	Feedback adjustment	R/W	0: Adjustment end 1: During adjustment on the open-side 2: During adjustment on the close-side	—

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
265	Integrated output limiter	R/W	0.0 to 200.0 % of control motor time (0.0: OFF) Becomes invalid when there is Feedback resistance (FBR) input.	150.0
266	Control motor time	R/W	5 to 1000 seconds	10

267	Valve action at STOP	R/W	0: Close-side output OFF,
			    Open-side output OFF
			1: Close-side output ON,
			    Open-side output OFF
			2: Close-side output OFF,
			    Open-side output ON
			
			Becomes valid when there is no Feedback resistance (FBR) input or the Feedback resistance (FBR) input is disconnected.
				0

268	Unused	—	—	—
269	Unused	—	—	—
270	AT bias	R/W	−Input span to +Input span Varies with the setting of the Decimal point position selection.	0, 0.0 or 0.00
271	AT cycles	R/W	0: 1.5 cycles 1: 2.0 cycles 2: 2.5 cycles 3: 3.0 cycles	1
272	AT differential gap time	R/W	0.0 to 50.0 seconds	10.0
273	Output value with AT turned on	R/W	Output value with AT turned off to +105.0 % Actual output values become those restricted by the Output limiter. Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break (high limit of Feedback resistance input at AT).	105.0
274	Output value with AT turned off	R/W	−105.0 % to Output value with AT turned on Actual output values become those restricted by the Output limiter. Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break (low limit of Feedback resistance input at AT).	−105.0
275	Proportional band adjusting factor [heat-side]	R/W	0.01 to 10.00 times	1.00
276	Integral time adjusting factor [heat-side]	R/W		1.00
277	Derivative time adjusting factor [heat-side]	R/W		1.00
278	Proportional band adjusting factor [cool-side]	R/W		1.00

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
279	Integral time adjusting factor [cool-side]	R/W	0.01 to 10.00 times	1.00
280	Derivative time adjusting factor [cool-side]	R/W		1.00

281	Proportional band limiter high [heat-side]	R/W	TC/RTD inputs:
			  0 to Input span, 0.0 to Input span or
			  0.00 to Input span (Unit: °C [°F])
			  Varies with the setting of the Decimal point position selection.
			Voltage (V)/Current (I) inputs:
			  0.0 to 1000.0 % of input span
				TC/RTD: Input span
				V/I: 1000.0

282	Proportional band limiter low [heat-side]	R/W		TC/RTD: 0, 0.0 or 0.00 V/I: 0.0
283	Integral time limiter high [heat-side]	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds Varies with the setting of the Integral/Derivative time decimal point position selection.	3600
284	Integral time limiter low [heat-side]	R/W		0
285	Derivative time limiter high [heat-side]	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds Varies with the setting of the Integral/Derivative time decimal point position selection.	3600
286	Derivative time limiter low [heat-side]	R/W		0

287	Proportional band limiter high [cool-side]	R/W	TC/RTD inputs:
			  1 to Input span, 0.1 to Input span or
			  0.01 to Input span (Unit: °C [°F])
			  Varies with the setting of the Decimal point position selection.
			Voltage (V)/Current (I) inputs:
			  0.1 to 1000.0 % of input span
				TC/RTD: Input span
				V/I: 1000.0

288	Proportional band limiter low [cool-side]	R/W		TC/RTD: 1, 0.1 or 0.01 V/I: 0.1
289	Integral time limiter high [cool-side]	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds Varies with the setting of the Integral/Derivative time decimal point position selection.	3600
290	Integral time limiter low [cool-side]	R/W		0
291	Derivative time limiter high [cool-side]	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds Varies with the setting of the Integral/Derivative time decimal point position selection.	3600
292	Derivative time limiter low [cool-side]	R/W		0
293 ⋮ 299	Unused	—	—	—
300	Setting change rate limiter unit time	R/W	1 to 3600 seconds	60
301	Soak time unit	R/W	0: 0 to 5999 minutes 1: 0 to 11999 seconds Set the data range of Memory area soak time monitor and Area soak time.	1
302 ⋮ 319	Unused	—	—	—
320	STOP display	R/W	0: 𝖲𝖳𝗈𝖯 is displayed on the PV display. 1: 𝖲𝖳𝗈𝖯 is displayed on the SV display.	1

Continued from the previous page.

Extension number	Communication item	Attribute	Data range	Factory set value
321	Bar graph display	R/W	0: No display 1: MV1 or MV2 2: PV 3: SV monitor 4: Deviation value 5: CT1 input value 6: CT2 input value	1
322	Bar graph display resolution	R/W	1 to 100 digit/dot Becomes valid when the Bar graph display is "4: Deviation value," "5: CT1 input value" or "6: CT2 input value."	100
323	Direct key 1 [FB100] Direct key selection	R/W	[FB100] 0: Unused 1: Used [FB400/900] 0: Unused 1: A/M transfer key (Type 1, Type 2)	1
324	Direct key 2 [Unused on the FB100]	R/W	0: Unused 1: MONI key (For type 1) or R/L transfer key (For type 2)	1
325	Direct key 3 [Unused on the FB100]	R/W	0: Unused 1: AREA key (For type 1) or RUN/STOP transfer key (For type 2)	1
326 ⋮ 331	Unused	—	—	—
332	Direct key type	R/W	[FB100] 1: Auto/Manual transfer 2: Monitor 3: Memory area transfer 4: Remote/Local transfer 5: RUN/STOP transfer [FB400/900] 1: Type 1 2: Type 2	1
333	PV flashing display at input error	R/W	Bit data Bit 0: Input error Bit 1 to Bit 15: Unused Data 0: Flashing display 1: Non-flashing display [Decimal number: 0 to 1]	0
334 ⋮ 340	Unused	—	—	—
341	Integrated operating time monitor	RO	0 to 19999 hours	—
342	Holding peak value ambient temperature monitor	RO	−10.0 to +100.0 °C	—
343	Power feed forward input value monitor [Unused on the FB100]	RO	0.0 to 160.0 % Display in the percentage of the load voltage (Rated value).	—

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Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
344 ⋮ 349	Unused	—	—	—
350	Startup tuning (ST)	R/W	0: ST unused 1: Execute once * 2: Execute always * When the Startup tuning (ST) is finished, the setting will automatically returns to "0: ST unused." The Startup tuning (ST) function is activated according to the ST start condition selected. If control is other than Position proportioning PID control, set to RO (Read only data).	0
351	ST proportional band adjusting factor	R/W	0.01 to 10.00 times	1.00
352	ST integral time adjusting factor	R/W		1.00
353	ST derivative time adjusting factor	R/W		1.00
354	ST start condition	R/W	0: Activate the Startup tuning (ST) function when the power is turned on; when transferred from STOP to RUN; or when the Set value (SV) is changed. 1: Activate the Startup tuning (ST) function when the power is turned on; or when transferred from STOP to RUN. 2: Activate the Startup tuning (ST) function when the Set value (SV) is changed.	0
355	Automatic temperature rise group	R/W	0 to 16 (0: Automatic temperature rise function OFF)	0
356	Automatic temperature rise learning	R/W	0: Unused 1: Learning * * When the Automatic temperature rise learning is finished, the setting will automatically returns to "0: Unused." If the Automatic temperature rise group corresponds to "0: Automatic temperature rise function OFF," set to RO (Read only data).	1
357	Automatic temperature rise dead time	R/W	0.1 to 1999.9 seconds	10.0
358	Automatic temperature rise gradient data	R/W	1 (0.1, 0.01) to Input span/minutes Varies with the setting of the Decimal point position selection.	1, 1.0 or 1.00
359	RUN/STOP group	R/W	0 to 16 (0: Group RUN/STOP function OFF)	0
360 ⋮ 499	Unused	—	—	—

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
500	Action mode selection *	R/W	Bit data Bit 0: Address setting * Bit 1 to Bit 15: Unused Data　0: Continuous setting　1: Free setting [Decimal number: 0 to 1]	0

☐　COM-JC data.

* Address setting (bit 0) of Action mode selection (Extension No. 500)

Select a recognition method of the controller (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-JC 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	◁ No response
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	

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 from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
501	Transmission wait time of controller communication	R/W	0 to 100 ms	0
502	Type of connected controller	R/W	0: FB100/400/900 Used with no changes to the factory set values (Do not change)	0
503	Address setting of connected controller *	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 [Decimal number: 0 to 3]	—

☐ COM-JC data.

* Address setting of connected controller (Extension No. 503)
  Device addresses set on the connected controllers will be assigned to the register addresses of COM-JC.
  [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-JC 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

Continued from the previous page.

Extension number	Communication item	Attri-bute	Data range	Factory set value
505	Automatic acquisition of controller address [1]	R/W	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition [2] [2] Automatically reverts to 0 after automatic acquisition ends.	0
506 ⋮ 511	Unused	—	—	—

▭ COM-JC data.

[1] 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, controller addresses are sequentially acquired from "1." The acquisition continues until 31 addresses are acquired or until controller address 99 is verified. When the automatic acquisition is completed, the acquired controller address will be automatically set to "Extension No. 503 Address setting of connected controller."

Table 1: Digital input (DI) assignment

[FB100]

Set value	DI 1	DI 2	DI 3	DI 4	DI 5
1	Unused	Unused	Unused	Unused	Unused
2	Memory area number selection (1 to 8)			Memory area set	RUN/STOP
3	Memory area number selection (1 to 8)			Memory area set	Unused
4	Memory area number selection (1 to 8)			Memory area set	AUTO/MAN
5	Memory area number selection (1 to 8)			Memory area set	Interlock release
6	Memory area number selection (1 to 8)			RUN/STOP	Unused
7	Memory area number selection (1 to 8)			RUN/STOP	AUTO/MAN
8	Memory area number selection (1 to 8)			RUN/STOP	Interlock release
9	Memory area number selection (1 to 8)			Unused	AUTO/MAN
10	Memory area number selection (1 to 8)			Unused	Interlock release
11	Memory area number selection (1 to 8)			AUTO/MAN	Interlock release
12	Memory area number selection (1 to 8)				
13	RUN/STOP	REM/LOC *	AUTO/MAN		
14	RUN/STOP	REM/LOC *	Interlock release		
15	RUN/STOP	AUTO/MAN	Interlock release		
16	REM/LOC *	AUTO/MAN	Interlock release		
17	RUN/STOP	REM/LOC *			
18	RUN/STOP	AUTO/MAN			
19	RUN/STOP	Interlock release			
20	REM/LOC *	AUTO/MAN			
21	REM/LOC *	Interlock release			
22	AUTO/MAN	Interlock release			
23	RUN/STOP				
24	REM/LOC *				
25	AUTO/MAN				
26	Interlock release				

RUN/STOP: RUN/STOP transfer   AUTO/MAN: Auto/Manual transfer   REM/LOC: Remote/Local transfer

* When the optional function A, C or D is selected, the Remote/Local transfer is invalid.

[FB400/900]

Set value	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7
1	Memory area number selection (1 to 8)			Memory area set	Unused		
2					RUN/STOP	REM/LOC	AUTO/MAN
3					RUN/STOP	REM/LOC	Interlock release
4					RUN/STOP	AUTO/MAN	Interlock release
5					REM/LOC	AUTO/MAN	Interlock release
6					RUN/STOP	Unused	Interlock release
7					REM/LOC	Unused	Interlock release
8					AUTO/MAN	Unused	Interlock release

RUN/STOP: RUN/STOP transfer   AUTO/MAN: Auto/Manual transfer   REM/LOC: Remote/Local transfer

Table 2: Output assignment

[FB100]

Set value	Output 1 (OUT1)	Output 2 (OUT2)	Digital output 1 (DO1)	Digital output 2 (DO2)
1	Control output 1	Control output 2	Event 1 (EV1)	Event 2 (EV2)
2	Control output 1	Control output 2	Event 1 (EV1)	Event 4 (EV4)
3	Control output 1	Control output 2	Event 1 (EV1)	HBA
4	Control output 1	Control output 2	Event 1 (EV1)	FAIL (De-energized)
5	Control output 1	Control output 2	Event 4 (EV4)	HBA
6	Control output 1	Control output 2	Event 4 (EV4)	FAIL (De-energized)
7	Control output 1	Control output 2	HBA	FAIL (De-energized)
8	Control output 1	HBA	Event 1 (EV1)	Event 2 (EV2)
9	Control output 1	HBA	Event 1 (EV1)	Event 4 (EV4)
10	Control output 1	HBA	Event 1 (EV1)	FAIL (De-energized)
11	Control output 1	HBA	Event 4 (EV4)	FAIL (De-energized)
12	Control output 1	FAIL (De-energized)	Event 1 (EV1)	Event 2 (EV2)
13	Control output 1	FAIL (De-energized)	Event 1 (EV1)	Event 4 (EV4)
14	Control output 1	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)
15	Control output 1	Event 4 (EV4)	Event 1 (EV1)	Event 2 (EV2)

HBA: Heater break alarm (HBA) output

- For Position proportioning PID control, Output 1 (OUT1) is open-side output and Output 2 (OUT2) is close-side output, regardless of the above selection.
- When Current transformer (CT) input is 2-point input, Heater break alarm (HBA) output is *OR* output.
- Energized or De-energized can be selected for the Digital outputs (DO1 to DO4). [Factory set value: Energized] However, with the exception of FAIL (De-energized, Fixed).
- When using for Heat/Cool PID control, select one of set values 1 to 7.
- Invalid for a non-existing Output/Event function.

[FB400/900]

Set value	Output 1 (OUT1)	Output 2 (OUT2)	Digital output 1 (DO1)	Digital output 2 (DO2)	Digital output 3 (DO3)	Digital output 4 (DO4)
1	Control output 1	Control output 2	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)	Event 4 (EV4)
2	Control output 1	Control output 2	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)	HBA1 HBA2
3	Control output 1	Control output 2	Event 1 (EV1)	Event 2 (EV2)	HBA1 HBA2	FAIL (De-energized)
4	Control output 1	Control output 2	Event 1 (EV1)	HBA1 HBA2	Event 3 (EV3)	Event 4 (EV4)
5	Control output 1	HBA1 HBA2	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)	Event 4 (EV4)
6	Control output 1	HBA1 HBA2	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)	FAIL (De-energized)
7	Control output 1	FAIL (De-energized)	Event 1 (EV1)	Event 2 (EV2)	Event 3 (EV3)	Event 4 (EV4)

HBA1: Heater break alarm 1 (HBA1) output   HBA2: Heater break alarm 2 (HBA2) output

- When Current transformer (CT) input is 2-point input, Heater break alarm (HBA) output is *OR* output.
- Energized or De-energized can be selected for the Digital outputs (DO1 to DO4). [Factory set value: Energized] However, with the exception of FAIL (De-energized, Fixed).
- To use for Heat/Cool PID control or Position proportioning PID control, select a set value from 1 to 4.
- Outputs and Event functions not specified in the model code is not valid if specified.

8. USAGE EXAMPLE

This chapter describes a usage example of CC-Link communication.

8.1 Handling Procedures

Preparations of Configuration Instrument

☞ Refer to **8.2 System Configuration (P. 84)**

↓

Mounting and Wiring

☞ • For mounting and wiring of the COM-JC, refer to **3. MOUNTING (P. 5)** and **4. WIRING (P. 8)**.
• 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.
http://www.cc-link.org/

↓

Use Instruments Setting

☞ Refer to **5. SETTING (P. 16) and 8.3 Use Instruments Setting (P. 85)**.

↓

Device Assignments

☞ Refer to **8.4 Device Assignments Example (P. 87)**.

↓

Program Creation

☞ Refer to **8.5 Sample Program (P. 90)**.

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

8.2 System Configuration

In this usage example, described the following system configuration.

Mitsubishi PLC
MELSEC Q series

CC-Link system
Master local unit
QJ 61BT11N (Master station)
Station number: 0
Communication speed: 156 kbps

CPU unit
Q02HCPU

CC Link Ver. 1.10

Controller communication (RS-485: Modbus)

CC-Link communication converter
COM-JC
Remote device station
(Slave station)
Station number: 1
Communication speed: 156 kbps
1 station occupied 1 time

Controller 1
(Device address 1)

Controller 2
(Device address 2)

Controller (FB400)

■ Use instruments

• CC-Link communication converter: COM-JC 1

• Temperature controller: FB400 [Input type: TC (K) 0 to 400 °C,
                                                           Communication 1: with RS-485] 2

• Mitsubishi Electric PLC MELSEC Q series
  − CPU unit: Q02HCPU
  − CC-Link system master local unit: QJ61BT11N

• CC-Link dedicated cable Ver. 1.10

• COM-JC and controller connection cable

8.3 Use Instruments Setting

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

■ PLC setting

☞ For operating of CC-Link system master local unit QJ61BT11N and MELSEC sequencer programming software GX Developer, 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 Developer]

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-JC 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-JC. 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 Developer]

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-JC 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, refer to **5. SETTING (P. 16)**.

■ 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. 79) without any changes.

• Communication protocol: Modbus-RTU

• Communication speed: 19200 bps (Factory set value)

• Data bit configuration: Data 8-bit, Without parity bit, Stop 1-bit

☞ For setting procedure, refer to **FB400/FB900 Communication Quick Manual (IMR01W07-E□)**.

8.4 Device Assignments Example

According to the contents set by **8.3 Use Instruments Setting (P. 85)**, each device is assigned.

■ Assignment conditions

Station number of COM-JC: 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)

CPU of PLC   COM-JC (Station number 1)

X100F to X1000
X101F to X1010   RX0F to RX00
                            RX1F to RX10

Y100F to Y1000
Y101F to Y1010   RY0F to RY00
                            RY1F to RY10

1 station occupied 1 time

▢ : The device that a COM-JC actually uses
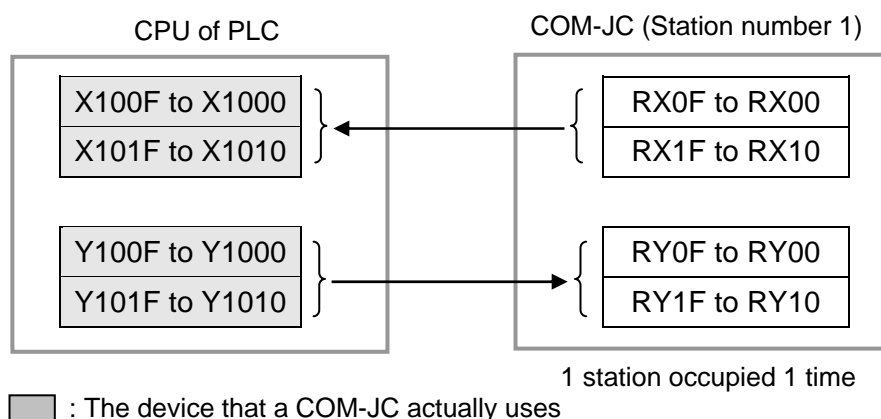
● Device assignment table of Remote input (RX)

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	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	RX09
X100A	Unused		RX0A
X100B	Unused		RX0B

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)**

CPU of PLC   COM-JC (Station number 1)

For writes

| W102 |
| W103 |

→

| RWw2 |
| RWw3 |

For reads

| W002 |
| W003 |

←

| RWr2 |
| RWr3 |

1 station occupied 1 time

▢ : The device that a COM-JC actually uses
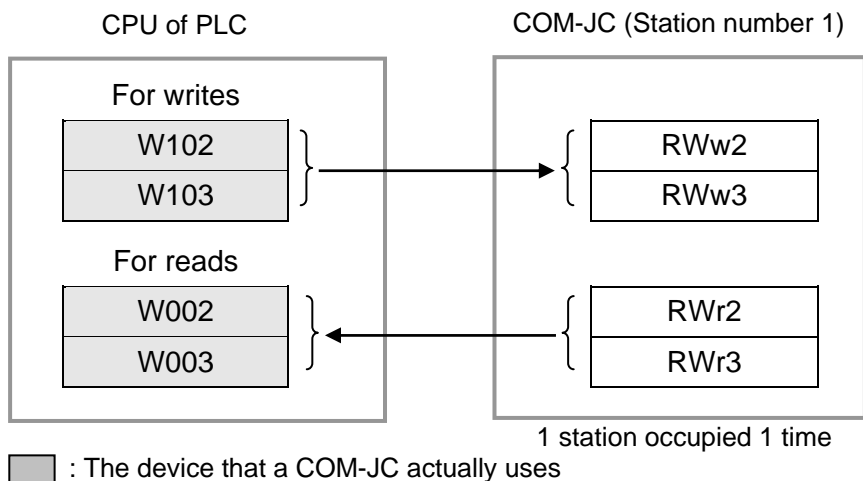
● **Device assignment table of Remote register (RWw)**

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 address	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-JC: 1

Number of Occupied station/Extended cyclic:

      1 station occupied 1 time (2 controllers assignment)

Automatic refresh device assignment: Refer to **8.4 Device Assignments Example (P. 87)**.

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

When the PLC initial processing (PLC STOP → RUN).

| | | RST Y100F | Control STOP of controller. Turn off the control RUN/STOP transfer (Y100F: RY0F). |

| | | SET Y1019 | Turn on the Initialize data setting request flag (Y1019: RY19). |

| | | BKRST M0 K3 | Turn off the Extension number setting flag for display (M0). |

When no initial data processing is finished with the initial data processing requested.
Initialize data processing request flag (X1018: RX18) ON
Initialize data processing completion flag (Y1018: RY18) OFF

| X1018 Y1018 | | SET Y1018 | Turn on the Initialize data processing completion flag (Y1018: RY18). |

When the initial data processing is finished with no initial data processing requested.
Initialize data processing request flag (X1018: RX18) OFF
Initialize data processing completion flag (Y1018: RY18) ON

| X1018 Y1018 | | RST Y1018 | Turn off the Initialize data processing completion flag (Y1018: RY18). |

When the initial data processing is finished and the initial data setting is being requested.
Initialize data setting completion flag (X1019: RX19) ON
Initialize data setting request flag (Y1019: RY19) ON

| X1019 Y1019 | | RST Y1019 | Turn off the Initialize data setting request flag (Y1019: RY19). |

When the COM-JC is in the error state.
Error status flag (X101A: RX1A) ON

| X101A | | SET Y101A | Turn on the Error reset request flag (Y101A: RY1A). |

When the COM-JC is in the normal state and the error reset action is being requested.
Error status flag (X101A: RX1A) OFF
Error reset request flag (Y101A: RY1A) ON

| X101A Y101A | | RST Y101A | Turn off the Error reset request flag (Y101A: RY1A). |

Continued from the previous page.

When the COM-JC 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

When Measured value (PV)/Manipulated output value (M1) is transferred to Measured value (PV).

X101B   M0   M1

—| |——|/|——|/|————————————[RST   Y1000]

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

When Measured value (PV)/Manipulated output value (M1) is transferred to Manipulated output value (M1).

M1

—| |————————————————————[SET   Y1000]

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.

————————————————————————[RST   Y100C]

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

The Extension display completion flag (X100C: RX0C) is turned OFF.

  X100C

—|/|————————————————————[SET   Y100C]

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

————————————————————————[SET   M0]

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

When Measured value (PV)/Manipulated output value (M1) is transferred to Measured value (PV).

X100C   M0   M1

—| |——| |——|/|————————[MOV   W2   D0]

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.

————————————————————[MOV   W3   D1]

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 from the previous page.

When Measured value (PV)/Manipulated output value (M1) is transferred to Manipulated output value (M1).

M1
─┤ ├──────┤ MOV   W2   D2 ├─

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.

──────┤ MOV   W3   D3 ├─

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.

──────┤ FF   M1 ├─

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

──────┤ RST   M0 ├─

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

When a set of setting extension numbers are not processed yet.
Extension number setting flag for setting (M2) OFF

M2
─┤/├──────┤ SET   Y1006 ├─

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

──────┤ SET   Y1007 ├─

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.

──────┤ MOV   K150   W102 ├─

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

──────┤ MOV   K200   W103 ├─

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

Continued from the previous page.

```
                                          ┌                 ┐
 ─────────────────────────────────────────┤ RST      Y100D  ├──   Turn off the Extended setting flag
                                          └                 ┘      (Y100D: RY0D)
         The Extension setting completion flag (X100D: RX0D) is
         turned OFF.
         X100D                            ┌                 ┐
      ────┤/├─┬───────────────────────────┤ SET      Y100D  ├──   Turn on the Extended setting flag
             │                            └                 ┘      (Y100D: RY0D).
             │                            ┌                 ┐
             └───────────────────────────┤ SET      M2     ├──    Extension number setting end for
                                          └                 ┘      setting. Turn on the Extension number
                                                                   setting flag for setting (M2).

       When the extension setting is finished and the setting extension
       number has been set.
         Extended setting completion flag (X100D: RX0D) ON
         Extension number setting flag for setting (M2) ON

                            When control RUN/STOP (Y100F: RY0F)
                            is transferred to control STOP.
       X100D    M2    Y100F                 ┌                 ┐
      ───┤├────┤├────┤/├──────────────────┤ SET      Y100F  ├──   Control RUN of controller.
                                          └                 ┘      Turn on the control RUN/STOP
                                                                   transfer (Y100F: RY0F).
                                          ┌                 ┐
 ─────────────────────────────────────────┤         FEND    ├──
                                          └                 ┘
                                          ┌                 ┐
 ─────────────────────────────────────────┤         END     ├──
                                          └                 ┘
```

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 sales office or the agent.

If it is necessary to replace a device, 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

Do not separate the mainframe from the terminal base with the power turned on. If so, instrument failure may result.

📖 **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 reset each data item.**

■ COM-JC

Problem	Possible cause	Solution
FAIL lamp flashes RUN lamp OFF SD/RD lamp OFF	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
	The number of Occupied station/ Extended cyclic setting of the COM-JC differs from that of the master instrument (PLC).	Coincide the number of Occupied station/Extended cyclic setting of the COM-JC with that of the master instrument (PLC).
	The station number and communication speed settings of the COM-JC have been changed during communication.	• Turn on the power again. • Return the switch setting to the original setting.
FAIL lamp ON RUN lamp OFF SD/RD lamp OFF	The station number and communication speed settings of COM-JC are out of their setting ranges.	Set the station number and communication speed settings of COM-JC to values within their setting ranges.

FAIL lamp flashes
RUN lamp ON
SD/RD lamp flashes
	The CC-Link version of the COM-JC differs from that of the master instrument (PLC).	Coincide the CC-Link version of the COM-JC 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

RUN lamp flashes	Controller communication (Between COM-JC and controllers) is abnormal	• Check that the signal line of the COM-JC and controller are correctly connected. • Check that the communication setting (Address, protocol, communication speed and data bit configuration) of the COM-JC coincides with that of the controller. • Confirm whether a termination resistor is connected.
FAIL lamp ON	Hardware abnormality or software abnormality	Replace the COM-JC with a new one it in the abnormal state even with the power turned on again.
Can not recognize the controller	Incorrect sequence of power-on	COM-JC must be powered on last.

10. SPECIFICATIONS

■ CC-Link communication

Protocol: CC-Link Ver. 2.00/Ver. 1.10

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

Communication distance: Refer to table shown below

Communication speed	Maximum network length
10 Mbps	100 m
5 Mbps	200 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 1/2 W)

Communication data length:

Refer to 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-bit Output: 128-bit	RWr: 16-word RWw: 16-word	8 controllers or 16 controllers
4 stations occupied 2 times	Input: 224-bit Output: 224-bit	RWr: 32-word RWw: 32-word	16 controllers or 32 controllers
1 station occupied 1 time	Input: 32-bit Output: 32-bit	RWr: 4-word RWw: 4-word	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 method: 2-wire system, half-duplex multi-drop connection

Communication speed: 9600 bps, 19200 bps, 38400 bps

Data bit configuration: Data 8-bit, Without parity bit, Stop 1-bit

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

Connection method: Terminals

Termination resistor: Built-in terminal base of COM-JC

[ON/OFF select with switch (120 Ω   1/2 W)]

■ Self-diagnostic function

Hardware error, RAM read/write error, Stack overflow:
> Display: FAIL lamp ON
> Status: Hardware error flag [RXnF] "ON" on the CC-Link

Communication error, Memory backup error, Configuration error (Cannot recognize connection of a controller):
> Display: RUN lamp flashes
> Status: Hardware error flag [RXnF] "ON" on the CC-Link
> > (Memory backup error, Configuration error)
> > Error status flag [RX(n+1)A] "ON" on the CC-Link
> > > (Communication error)

■ General specifications

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

Power consumption: 120 mA max. (at 24 V DC)

Rush current: 12 A or less

Insulation resistance: Between communication terminal and grounding:
> 20 MΩ or more at 500 V DC

Between power supply terminal and grounding:
> 20 MΩ or more at 500 V DC

Between power supply and communication terminals:
> 20 MΩ or more at 500 V DC

Withstand voltage: Refer to table shown below

Time: 1 minute	①	②
① Grounding terminal		
② Power terminal	600 V AC	
③ Communication terminal	600 V AC	600 V AC

> 📖 CC-Link ground terminal is for CC-Link communication, and be not included in an above condition.

Power failure: A power failure of 20 ms or less will not affect the control action.

Memory backup: Backed up by non-volatile memory

Number of writing: Approx. 100,000 times.

Data storage period: Approx. 10 years

Vibration: Amplitude: < 1.5 mm (5 to 9 Hz)

Acceleration: < 5 m/s^2 (9 to 150 Hz)

> Each direction of XYZ axes

Shock: Height 50 mm or less

> Each direction of XYZ axes (de-energized state)

Allowable ambient temperature:
> −10 to +50 °C

Allowable ambient humidity:
> 5 to 95 %RH(Absolute humidity: MAX.W.C 29.3 g/m^3 dry air at 101.3 kPa)

Installation environment conditions:
> Indoor use
> Altitude up to 2000 m

Operating environment: Avoid the following conditions when selecting the mounting location.
- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the mainframe.
- Water, oil, chemicals, vapor or steam splashes.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

Weight: Approx. 220 g

Dimensions: $30 \times 125 \times 109.5$ mm (W $\times$ H $\times$ D)

■ Standard

Safety standard: UL: UL61010-1

                cUL: CAN/CSA-C22.2 No. 61010-1

CE marking: LVD: EN61010-1

                      OVERVOLTAGE CATEGORYII,

                      POLLUTION DEGREE 2,

                      Class II (Reinforced insulation)

                EMC: EN61326-1

RCM: EN55011

MEMO

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