CC-Link Communication Converter

COM-JC [For FB100/FB400/FB900] Quick Instruction Manual

IMR01Y11-E5

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

This manual describes the basic operation only.

For detailed handling procedures and functions, refer to separate **COM-JC [For FB100/FB400/FB900] Instruction Manual (IMR01Y06-E□)**.
The manual can be downloaded from the official RKC website:
http://www.rkcinst.com/english/manual_load.htm.

1. HANDLING PROCEDURES

Communication setting → Refer to **2. COMMUNICATION SETTING**

Mounting and Wiring → Refer to **COM-JC [For FB100/FB400/FB900] Installation Manual (IMR01Y01-E□)**; For controller, refer to **FB100 Installation Manual (IMR01W12-E□)** or **FB400/FB900 Installation Manual (IMR01W01-E□)**

PLC setting → Refer to **4.2 Setting the Instruments Used**

Controller setting → Refer to **4.2 Setting the Instruments Used**; Refer to **FB100 Communication Quick Manual (IMR01W15-E□)** or **FB400/FB900 Communication Quick Manual (IMR01W07-E□)**

Device assignment → Refer to **4.3 Device Assignment Example**

Program creation → Refer to **4.4 Sample Program**

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

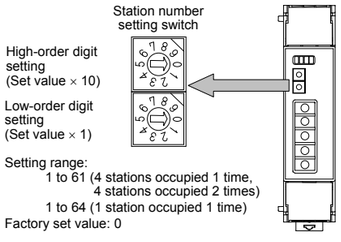
2. COMMUNICATION SETTING

CAUTION

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

2.1 Station Number Setting

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

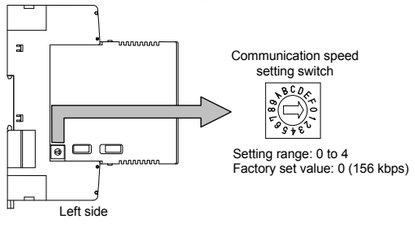


Setting range:
1 to 61 (4 stations occupied 1 time, 4 stations occupied 2 times)
1 to 64 (1 station occupied 1 time)
Factory set value: 0

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

2.2 Communication Speed Setting

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



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

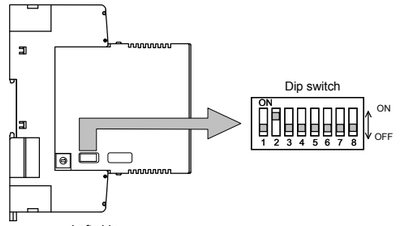
When set to any value out of the setting range, the COM-JC becomes the FAIL state.

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

Communication speed setting	Communication speed	Maximum transmitter distance
0	156 kbps	1200 m
1	625 kbps	900 m
2	2.5 Mbps	400 m
3	5 Mbps	160 m
4	10 Mbps	100 m

2.3 Occupied Stations/Extended Cyclic and Controller Communication Speed Setting

Set the number of Occupied stations/Extended cyclic and controller communication speed.



1	2	Controller communication speed
OFF	OFF	38400 bps
ON	OFF	9600 bps
OFF	ON	19200 bps
ON	ON	38400 bps

Factory set value: 19200 bps

3	4	5	Number of Occupied stations/Extended cyclic setting
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)

6	7	8	
OFF	OFF	OFF	Fixed

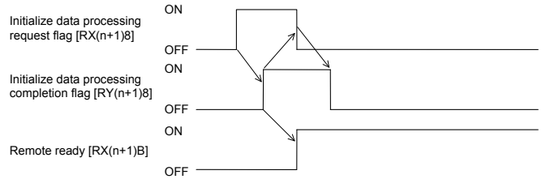
3. CC-Link FLAG OPERATION

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

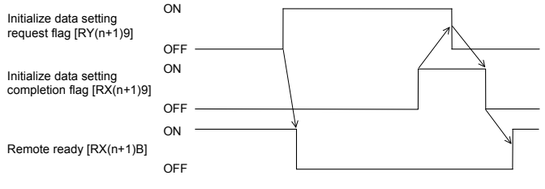
● **Initialize processing request from remote device station (COM-JC)**

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.



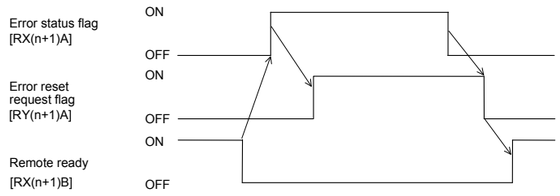
● **Initialize processing request from master station (PLC)**

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



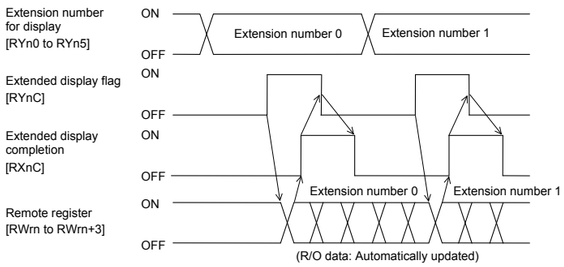
■ Error flag/Error reset processing

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.



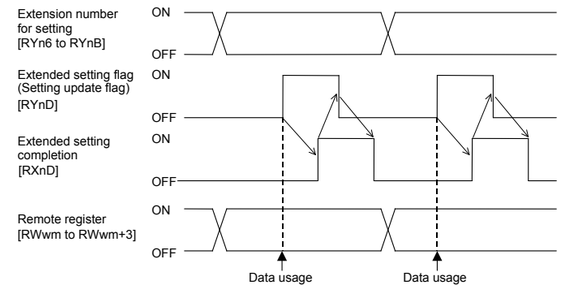
■ Extension number for display selection processing

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

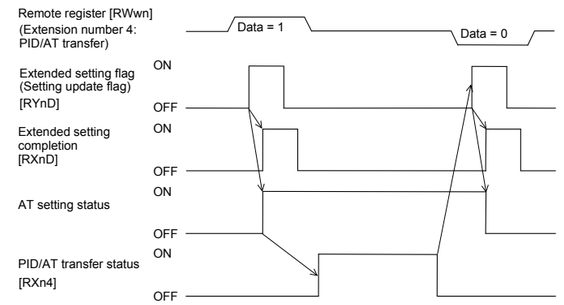
The content of the extended setting remote register is selected and the set value is changed. After the Extension number for setting [RYn6 to RYnB] is set, turn on the Extended setting flag [RYnD]. After the content of the Remote register [RWwm to RWwm+3] is set, check that Extended setting completion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



Regardless of the number of occupied stations 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.



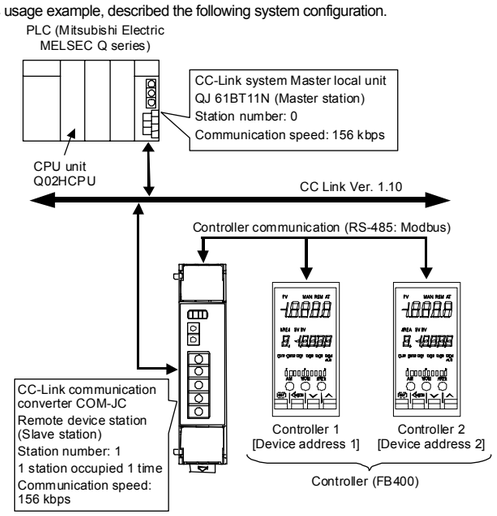
For Remote input/output and Remote register, refer to **COM-JC [For FB100/FB400/FB900] Communication Data List (IMR01Y16-E□)** or **COM-JC [For FB100/FB400/FB900] Instruction Manual (IMR01Y06-E□)**.

4. USAGE EXAMPLE

A usage example of CC-Link communication is described in the following.

4.1 System Configuration

In this usage example, described the following system configuration.



■ Use instruments

- CC-Link communication converter: COM-JC.....1
- Temperature controller: FB400 [Input type: TC (K) 0 to 400 °C].....2
- Mitsubishi PLC MELSEC Q series
  - CPU unit: Q02HCPU
  - CC-Link system master local unit: QJ 61BT11N
- CC-Link dedicated cable Ver. 1.10
- COM-JC and controller connection cable

4.2 Setting the Instruments Used

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

■ PLC setting

For operation of the CC-Link system master local unit QJ61BT11N and MELSEC sequencer programming software GX Developer, refer to Instruction Manual of PLC.

[CC-Link system master local unit QJ61BT11N setting]

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

[Master station network parameter setting by GX Developer]

Setting item	Setting value
No. 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 stations: Occupies 1 station Remote station points: 32 points Reserved/invalid station select: No setting Intelligent buffer select (word): No setting

[Automatic refresh parameter setting by GX Developer]

Setting item	Setting value
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 speed: 19200 bps (Factory set value)

☞ For setting method, refer to **2. COMMUNICATION SETTING**.

■ Controller (FB400) setting

[Controller communication conditions: Communication 1 side]

- Protocol: Modbus
- Device address: 1 and 2
- Communication speed: 19200 bps (Factory set value)
- Data bit configuration: Data 8-bit, Without parity bit, Stop 1-bit

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

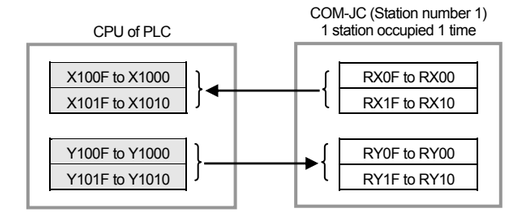
4.3 Device Assignment Example

According to the contents set by **4.2 Setting the Instrument Used**, each device is assigned.

■ Assignment conditions

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

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



: The device that a controller actually uses

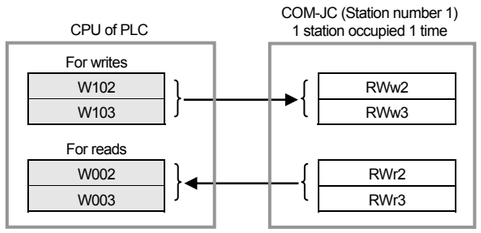
● **Device assignment table of Remote input (RX)**

CPU device number	Communication item		Remote input (RX) address
X1000	Device address 1 (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 2 (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
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		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)



: The device that a controller 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 1 (Controller 1)	RWw2
W103	For extension area setting of device address 2 (Controller 2)	RWw3

● **Device assignment table of Remote register (RWr)**

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

4.4 Sample Program

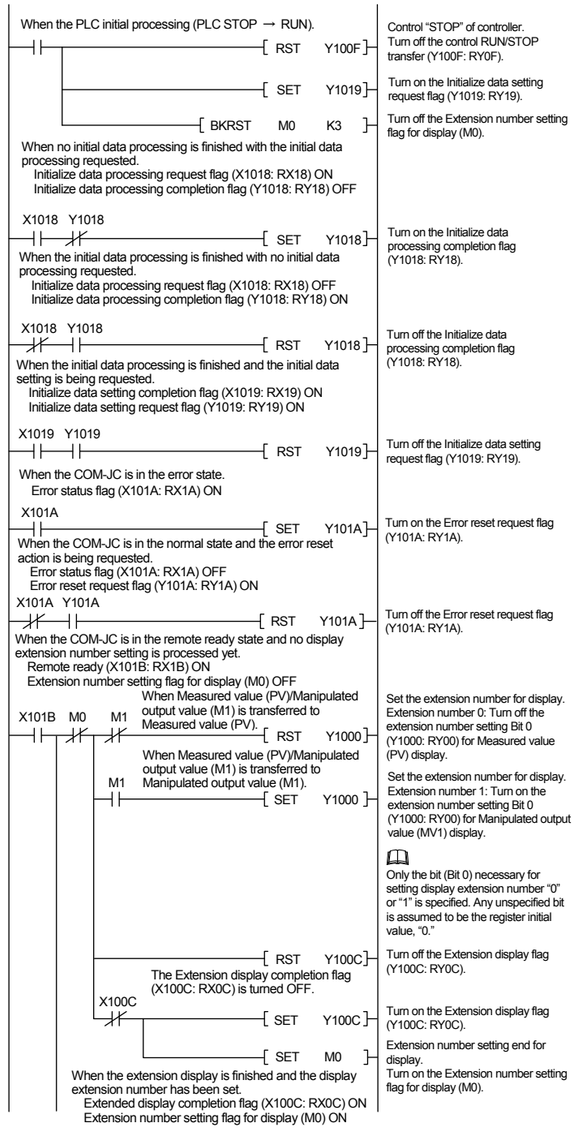
■ Program conditions

COM-JC station number: 1
Number of Occupied station/Extended cyclic:
1 station occupied 1 time (2 controllers assignment)
Automatic refresh device assignment:
Refer to **4.3 Device Assignment Example**
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) storage of controller 1
D1: Measured value (PV) storage of controller 2
D3: Manipulated output value (MV1) storage of controller 1
D4: Manipulated output value (MV1) storage 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



■ Data processing precautions

Numeric data values (Remote register) obtained via communication with the COM-JC and processed by PLC 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.
- For numeric data value with decimal point
  The decimal point is omitted.
  [Example] When the Measured value (PV) is 120.5 °C
  Read value of Remote register (RWm) [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) is –2.5 °C
  Read value of Remote register (RWm) [Measured value (PV)]:
  Hexadecimal number: FFE7H
  (10000H – 25 = 10000H – 19H = FFE7H)

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