



# Installation & Maintenance Manual

## Gateway unit for CC-Link

### Type EX510-GMJ1



## Safety Instructions

The body of unit and this manual contain the essential information for the protection of users and others from possible injury and property damage and to ensure correct handling. Please check that you fully understand the definitions of the following messages ( symbols ) before going on to read the body of this manual, and always follow the instructions. Please also read the instruction manuals etc. of related machines and understand the contents before use.

### IMPORTANT MESSAGES

Read this manual and follow its instructions. Signal words such as WARNING, CAUTION and NOTE will be followed by important safety information that must be carefully reviewed.

<b>WARNING</b>	Indicates a potentially hazardous situation that could result in death or severe injury if you do not follow instructions.
<b>CAUTION</b>	Indicates a potentially hazardous situation that, if not avoided, may result in minor injury or moderate injury.
<b>NOTE</b>	Gives you helpful information.

### WARNING

**Do not disassemble, modify (including change of printed circuit board) or repair.**

An injury or failure can result.

**Do not operate beyond the specification range.**

Fire, malfunction or damage can result.

Only use the unit after confirming the specification.

**Do not use the product in an environment of flammable, explosive or corrosive gas.**

Otherwise fire, explosion or corrosion can result.

This product is not explosion-proof type.

**For use in interlock circuit:**

•Provide double interlock system by adding different type of protection (such as mechanical protection).

•Check the product regularly to ensure proper operation.

Otherwise accident caused by malfunction can result.

**Before performing maintenance:**

•Turn off the power supply.

•Stop air supply, exhaust compressed air in piping, and confirm the release to atmosphere.

Otherwise injury can result.

## Safety Instructions (continued)

### CAUTION

**Conduct proper functional inspection after completing maintenance.**

In the case of abnormality such as unit does not work normally, stop the operation. Otherwise safety cannot be assured due to unintended malfunction.

**Provide grounding to improve safety and noise resistance of reduced wiring system.**

Provide grounding as close to the unit as possible to shorten distance for grounding.

### NOTE

The direct-current power supply to combine should be UL authorization power supply.

1. A limited voltage/current circuit which conforms to UL508.

A circuit to which power is supplied by the secondary coil of a transformer that meets the following conditions.

- Maximum voltage (with no load) : less than 30Vrms (42.4V peak)
- Maximum current : (1)less than 8A (including when short circuited)  
(2)limited by circuit protector (such as fuse) with the following ratings

No load voltage (V peak)	Max. current rating (A)
0 to 20 [V]	5.0
20 to 30 [V]	100/peak voltage

2. UL1310 Class 2 power supply unit or circuit of max.30Vrms (42.4Vpeak) or less using a UL1585 Class 2 transformer as power source.

Follow the instructions given below when handling the reduced wiring system.

Failure to follow instructions may damage the unit.

- Operate the unit within the specified voltage range.
- Reserve a space for maintenance.

- Do not remove labels.
- Do not drop, hit or apply excessive shock to the product.
- Follow the specified tightening torque.
- Do not bend or apply tensile force to cables, or apply force by placing heavy load on them.
- Connect wires and cables correctly.
- Do not connect wires while the power is on.
- Do not lay wires or cables with power cable or high-voltage cable in the same wiring route.
- Verify the insulation of wiring.
- Separate power cables for solenoid valves from power cables for Input and control unit.
- Take proper measurements against noise such as noise filter when the reduced wiring system is incorporated in equipment or devices.
- Select the proper type of protection according to the environment of operation.
- Take sufficient shielding measures when installing at the following place.

- (1) A place where noise due to static electricity is generated
- (2) A place where electric field strength is high
- (3) A place where there is radioactive irradiation
- (4) A place near power line

- Do not use the product nearby a place where electric surges are generated.
- Use reduced wiring system equipped with surge absorber when a surge-generating load such as a solenoid valve is driven directly.
- Prevent foreign matter such as remnant of wires from entering this product.
- Do not expose the reduced wiring system to vibration and impact.
- Keep the specified ambient temperature range.
- Do not expose reduced wiring system to heat radiation from a heat source located nearby.
- Use a precision screwdriver with small flat blade when setting DIP switch.
- Perform maintenance and check regularly.
- Perform a proper functional check.
- Do not use the product with chemicals such as benzene and thinner.

## Specification

### Basic specifications

Rated voltage	24VDC
Range of power supply voltage	Power supply for input and controlling GW : 24VDC $\pm$ 10% Power supply for output : 24VDC +10%/-5% (Warning for voltage decline is given at about 20V.)
Rated current	Power supply for input and controlling GW : Max. 4.1A ( Inside GW unit : 0.1A ) ( Input equipment : 4A ) Current for output : Max. 6A
Number of input/output	Input : 64/Output : 64

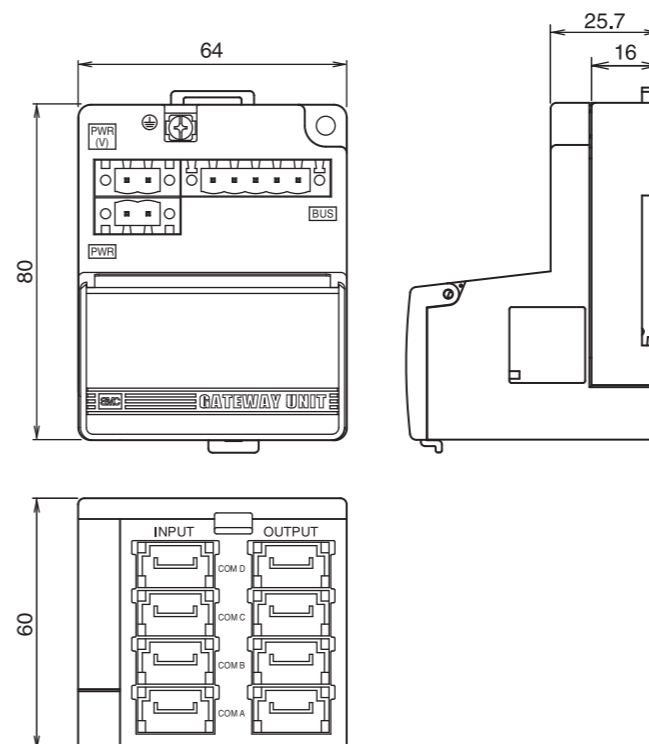
### Bus for upper level

Compatible system	CC-Link Ver.1.10
Number of station occupied	3 stations (it is possible to change for 2 stations)
Station type	Remote device station
Communication speed	156kbps 625kbps 2.5Mbps 5Mbps 10Mbps
Cable length between stations	20 cm and over
Maximum extended cable length	1200m 900m 400m 160m 100m

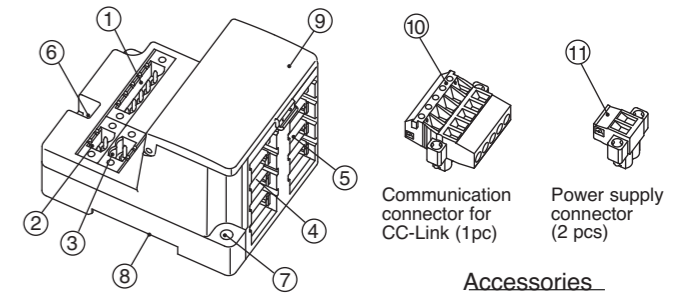
### Lower level bus

Number of branches for input/output	4 branches for input (16 points for each), 4 branches for output (16 points for each)
Communication type	Communication protocol : dedicated for SMC Communication speed : 750kbps
Branch current for input	Maximum 1[A] per branch
Branch current for output	Maximum 1.5[A] per branch
Branch cable length	At 0.75A per branch : 20m and less At 1.0 A per branch : 16m and less At 1.5 A per branch : 10m and less

## Outline with Dimension (in mm)



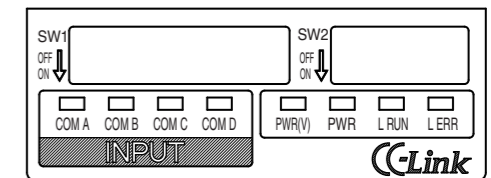
## Name of Parts/Accessories



No.	Parts	Purpose
1	Communication socket (BUS)	Connect to CC-Link line with an accessory connector for CC-Link (10). *
2	Power supply socket (PWR(V))	Supplying power for output instruments such as a solenoid valve with an accessory connector (11). *
3	Power supply socket (PWR)	Supply power for controlling GW and for input instruments such as a sensor with an accessory connector (11). *
4	GW unit side branch connector (for input)	Connecting an input unit etc. by using branch cables (EX510-FC□□).
5	GW unit side branch connector (for output)	Connecting SI unit (manifold valve) etc. by using branch cables (EX510-FC□□).
6	PE terminal	Used for grounding.
7	Mounting hole	Used when a unit is mounted with 2 M4 screws.
8	DIN rail mounting slot	Used when a unit is mounted to DIN rail.
9	Display/ switch setting area	Setting such as LED display in unit state, transmission speed, and occupied station number.

\*Note: For wiring method, see "Wiring" section.

## Setting for Display

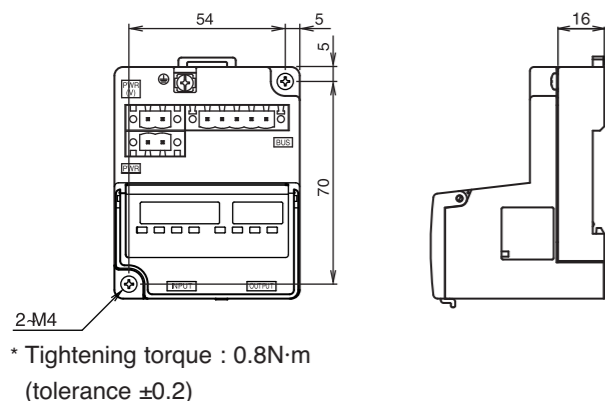


Display	Meaning
PWR (V)	Light ON : The power for output is supplied with specified voltage Light OFF : The power for output is not supplied with specified voltage
PWR	Light ON : Power for Input and controlling GW is supplied Light OFF : Power for Input and controlling GW is not supplied
L RUN	Light ON : Normal communication Light OFF : Communication intercepted
L ERR	Light ON : Communication error Light ON : Setting of station number/Transmitting speed switch is changed while powered (Flashing with 0.4s interval) Light OFF : Normal communication
COM.A	Light ON : COM A is receiving data * Light OFF : COM A has no data to receive
COM.B	Light ON : COM B is receiving data * Light OFF : COM B has no data to receive
COM.C	Light ON : COM C is receiving data * Light OFF : COM C has no data to receive
COM.D	Light ON : COM D is receiving data * Light OFF : COM D has no data to receive

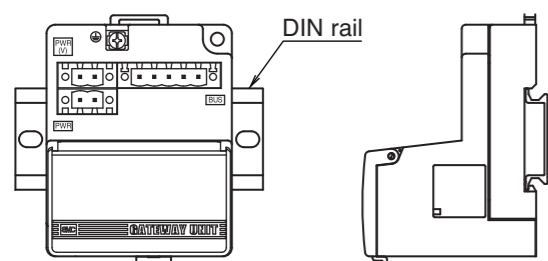
\*Note : Lit when input unit is connected and communicating normally.

## Installation

### Screw installation



### DIN rail installation

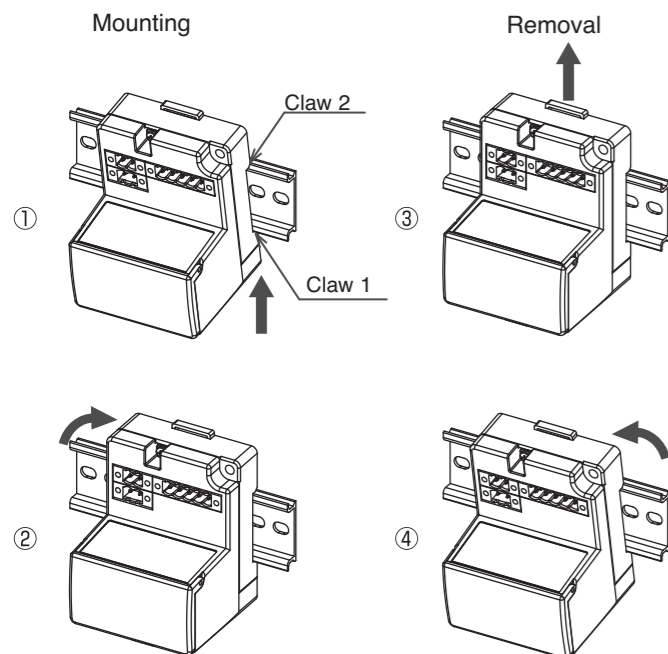


Put Claw 1 of the body under DIN rail and push it upward. Push down Claw 2 to the opposite rail until the claw clicks securely on to DIN rail.

(Mounting procedure ① and ② )

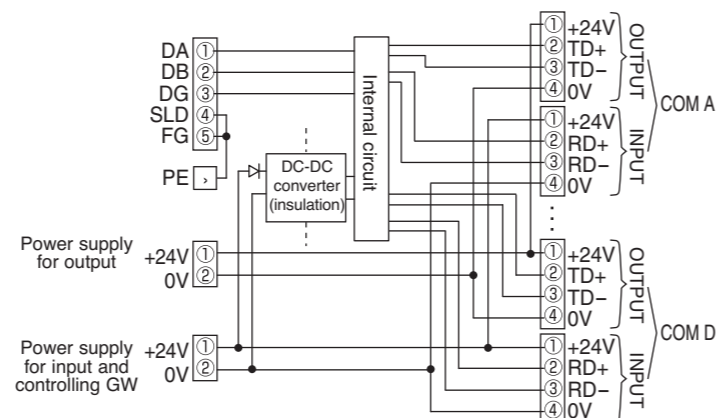
For removing, lever up the DIN rail fixing plate of the body with a flat blade screwdriver, and remove it by tilting Claw 2 side forward.

(Removal procedure ③ and ④ )



## Wiring

### Internal circuit



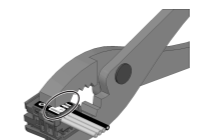
### ② Tentative fixing to the body

Fit 4 latches on a body to 4 ditches on the cover, and press them until the latch engages to the level 1.



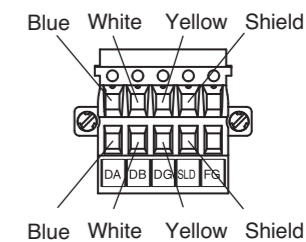
### ③ Press fitting

Press the cover to the body with suitable pliers.



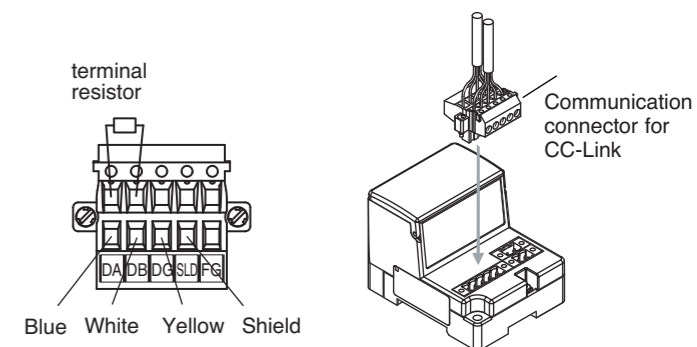
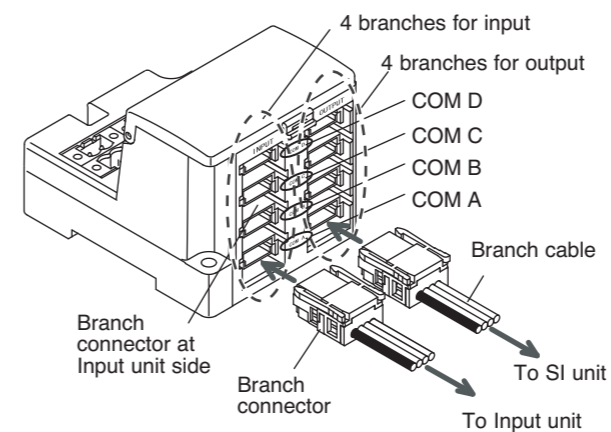
### ④ Confirmation

Check that all of the 4 latches are fully engaged.



Drawing1

### Wiring of branch cables



Drawing2

Drawing3

Insert branch cable connectors from the bottom (COM A, B, C, D at the side GW unit).

### Branch cable wiring

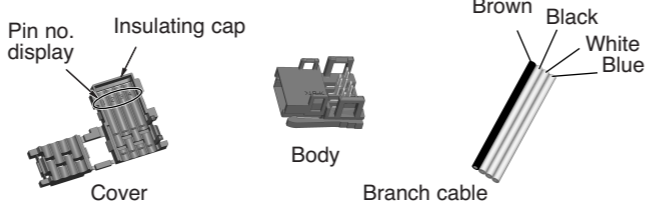
The wiring between each unit should use branch cables, and connected with branch connectors.

The SI unit and input unit have 2 branch connectors each.

#### Pressure welding for branch connector

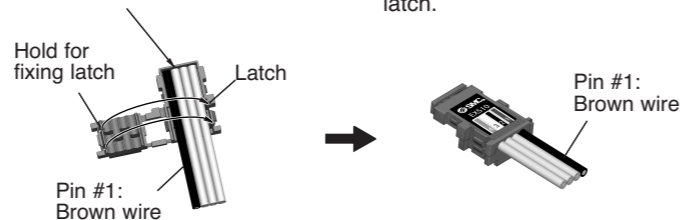
The method of pressure assembly of the branch connector is explained.

#### (1) Components



#### (2) Working procedure

- Set a branch cable in the cover.
- Set the brown wire of the branch cable so that it matches to pin #1.
- Push the 4 cable ends securely against insulating cap in cover.
- Fold the cover so that the branch cable is trapped between the cover.
- Fix the latch tip by inserting through the hole for the fixing latch.



Note) Check the color of the wires printed on the branch connector and the color of the cables are the same.

### Communication wiring

Connect CC-Link dedicated cables to the communication connector for CC-Link.

- Make sure to connect the signal cables to designated pins (Refer to Drawing 1)
- Make sure to connect "terminal resistor" to the units at the both ends of the system. Connect the terminal resistor between "DA"- "DB" (Refer to Drawing 2).
- The terminal resistor to connect differs depending on the cable to use at CC-Link system. See the table below.

Cable type	terminal resistor
CC-Link dedicated cable	110Ω 1/2W (brown, brown, brown)
CC-Link dedicated cable compatible to Ver.1.10	
CC-Link dedicated high performance cable	130Ω 1/2W (brown, orange, brown)

- Refer to Drawing 3 about how to connecting.

#### Note

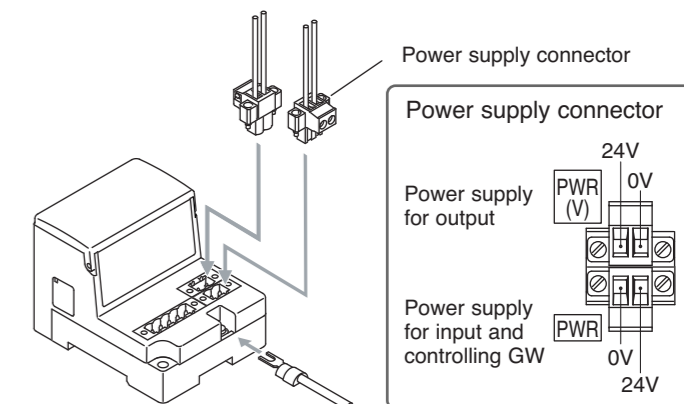
- CC-Link dedicated high performance cable cannot be mixed with other cables (CC-Link dedicated cable, CC-Link dedicated cable compatible to Ver.1.10). If mixed, transmission of normal data cannot be secure.
- Connect the shield line of CC-Link dedicated cable to "SLD" at each unit.

### Power supply wiring

Connect power supply wiring to the two power supply connector which have 2 pins. Power supply structure consists of 2 systems, but it can be used with both single power supply and dual power supply.

Individual power supply for other units is not necessary. Make sure to connect the designated pin.

Tighten the connector securely to 0.5 to 0.6N·m tightening torque.



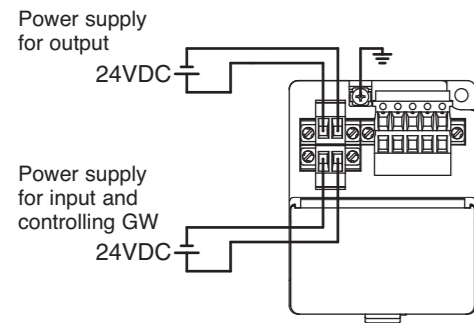
#### Note

- A secure earth connection (Protection class 3) should be made for PE terminal.

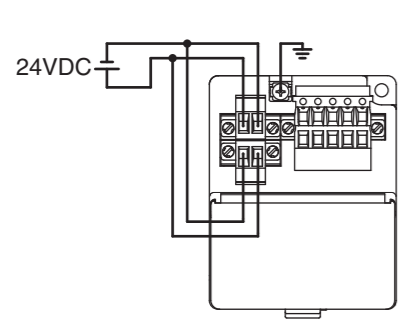


## Wiring (continued)

## A. For Dual power supply use



## B. For single power supply use



## SW setting (continued)

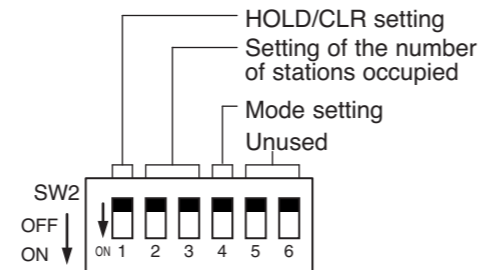
## Transmitting speed setting (switch No. 8 to 10)

Make sure to set the transmitting speed in the range as follows. All of the settings when shipped from plant are turned OFF, and set to 156kbps.

Transmitting speed	No.8	No.9	No.10
156Kbps	OFF	OFF	OFF
625Kbps	OFF	OFF	ON
2.5Mbps	OFF	ON	OFF
5Mbps	OFF	ON	ON
10Mbps	ON	OFF	OFF

## HOLD/CLR setting/Setting of the number of stations occupied/Mode setting (SW2)

HOLD/CLR setting/Setting of the number of stations occupied/Mode setting is performed with SW2.



\* Switch No. 5 and 6 is unused (Turned off).

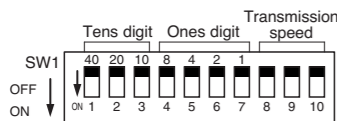
## SW setting

## Switch setting

Make sure that switch setting is done with power supply turned off. Open the cover, and set DIP switch with a flat blade screwdriver etc.

## Setting of station number/transmitting speed (SW1)

Setting of station number/transmitting speed is done at SW1.



## Station number setting (switch No.1 to 7)

Set the number of tens for station number at STATION NO. "10", "20", and "40", and set the unit for the station number at STATION NO. "1", "2", "4", and "8".

All of the settings when shipped from plant are turned OFF and no station number is set. Make sure to set the station number in the range of 1 to 62 (with 3 stations occupied).

Station number	Tens digit (switch No.)			Ones digit (switch No.)			
	40 (No.1)	20 (No.2)	10 (No.3)	8 (No.4)	4 (No.5)	2 (No.6)	1 (No.7)
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
:	:	:	:	:	:	:	:
10	OFF	OFF	ON	OFF	OFF	OFF	ON
11	OFF	OFF	ON	OFF	OFF	OFF	OFF
:	:	:	:	:	:	:	:
62	ON	ON	OFF	OFF	OFF	ON	OFF
63	ON	ON	OFF	OFF	OFF	ON	ON

\*: with 2 stations occupied

## Trouble shooting

## Overall system

No.	Item	Remedy/Disposal
1	Solenoid valve is not working	<ul style="list-style-type: none"> <li>Check the power for output (24VDC) is supplied.</li> <li>Check the branch cable is connected to SI unit.</li> <li>Check the LED for power supply (PWR) and the LED for communication (COM) at SI unit are ON.</li> <li>Ensure output branch current does not exceed the specification range.</li> </ul>
2	Valve is not working as program directs	<ul style="list-style-type: none"> <li>Program it after checking the wiring specification of manifold block assembly.</li> </ul>
3	Signals cannot be received even with a sensor	<ul style="list-style-type: none"> <li>Check the power for input and controlling GW (24VDC) is supplied.</li> <li>Check the input unit indication LED is ON.</li> <li>Ensure input branch current does not exceed the specification range.</li> </ul>
4	COM A-D is not lit	<ul style="list-style-type: none"> <li>Check the connection of unlit COM port branch to input unit.</li> </ul>

## CC-Link compatible communication

No.	Item	Remedy/Disposal
1	PWR LED is turned off	<ul style="list-style-type: none"> <li>Check the power for input and controlling GW (24VDC) is supplied.</li> </ul>
2	PWR(V) is turned off	<ul style="list-style-type: none"> <li>Check the power for output (24VDC) is supplied.</li> <li>Check the power supply voltage for output is above 20V.</li> </ul>
3	RUN LED is turned off/ERR LED is turned on	<ul style="list-style-type: none"> <li>Check the signal line from PLC is correctly connected.</li> <li>Check the wiring and pin numbers.</li> <li>Check the address setting is correct.</li> </ul>
4	ERR LED is flashing	<ul style="list-style-type: none"> <li>Check the communication speed setting/station number setting is set correctly.</li> </ul>

## HOLD/CLR setting (switch No.1)

The setting is as follows.

The setting when shipped from plant are turned OFF, which means the setting is CLR.

HOLD/CLR	No.1	Function
CLR	OFF	Output is cleared when an error occurs.
HOLD	ON	Output is held when an error occurs.

## Setting of the number of stations occupied (Switch No. 2 to 3)

The setting of the number of stations occupied is performed with switch No. 2 to 3.

It is set as 3 station-occupied when the product is shipped.

Station setting	No.2	No.3	Number of output/input
2 station-occupied	OFF	ON	Input 32/output 32
3 station-occupied	ON	OFF	Input 64/output 64

## Mode setting (switch No. 4)

Port mode setting is available when two stations are occupied.

Switch No. 4 is used for mode setting.

Mode A is assigned when shipping from plant.

Mode	No.4	Number of branch	Valid port
A	OFF	16 points per port	COM.A,B
B	ON	8 points per port	COM.A-D

\* See operating technical data for details.

## Contact

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
ITALY	(39) 02 92711		

## SMC Corporation

URL <http://www.smcworld.com> (Global) <http://www.smceu.com> (Europe)

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