

Fieldbus device Operation Manual



EX250 Series for CC-Link

Thank you for purchasing an SMC EX250 Series Fieldbus device (Hereinafter referred to as "SI unit"). Please read this manual carefully before operating the product and make sure you understand its capabilities and limitations. Please keep this manual handy for future reference.

To obtain more detailed information about operating this product, please refer to the SMC website (URL <http://www.smcworld.com>) or contact SMC directly.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger". They are all important notes for safety and must be followed in addition to International standards (ISO/IEC) and other safety regulations.

- Caution:** CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
- Warning:** WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
- Danger:** DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Operator

- ◆ This operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- ◆ Read and understand this operation manual carefully before assembling, operating or providing maintenance to the product.

Safety Instructions

Warning

- Do not disassemble, modify (including changing the printed circuit board) or repair. An injury or failure can result.
- Do not operate the product outside of the specifications. Do not use for flammable or harmful fluids. Fire, malfunction, or damage to the product can result. Verify the specifications before use.
- Do not operate in an atmosphere containing flammable or explosive gases. Fire or an explosion can result. This product is not designed to be explosion proof.
- If using the product in an interlocking circuit:
 - Provide a double interlocking system, for example a mechanical system.
 - Check the product regularly for proper operation.
 - Otherwise malfunction can result, causing an accident.
- The following instructions must be followed during maintenance:
 - Turn off the power supply.
 - Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance.
 - Otherwise an injury can result.

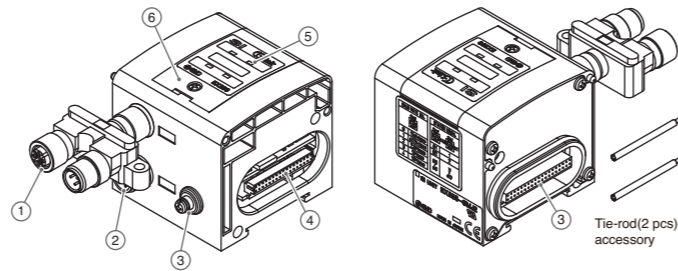
Caution

- After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the safety and noise resistance of the Fieldbus system. Individual grounding should be provided close to the product with a short cable.

NOTE

- ◆ When conformity to UL is necessary the SI unit must be used with a UL1310 Class2 power supply.

Summary of Product element



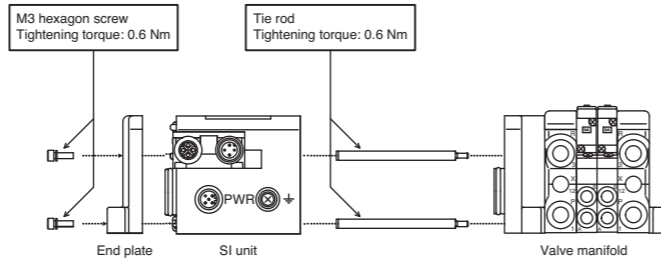
No.	Description	Function
1	Communication connector	Connect with CC-Link communication line. (Accessory)
2	Power supply connector	Supplies power to the solenoid valve, the Output block, SI unit and the Input block.
3	Input block connector	Connects the Input block.
4	Output block connector	Connects the solenoid valve, Output block and etc.
5	Display	LED display shows the SI unit status.
6	Switch protective cover	Set Station no. and Baud rate by using the switches under the cover.
7	Ground terminal (FE)	Used for grounding.

Mounting and Installation

Installation

Not having mounting hole, it can't be set to BUS independently. Be sure to connect manifold to SI unit for setting. And if Input block is unnecessary, connect End plate directly to SI unit.

Assembly and disconnection of unit



Exchange of SI unit

- Remove screws from End Plate and release connection of each unit.
- Replace old SI unit with new one. (Tie rod does not need to be removed.)
- Connect Input Block and End Plate and tighten removed screws by specified tightening torque. (0.6 Nm)

Assembly and disconnection of unit

- Addition of Input Block
- Remove screws from End Plate.
 - Mount attached tie rod.
 - Connect additional Input Block.
 - Connect End Plate and tighten removed screws by specified tightening torque. (0.6 Nm)

Caution for maintenance

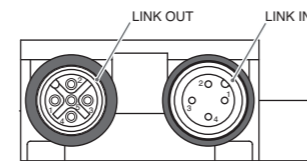
- (1) Be sure to turn-off all power supplies.
- (2) Be sure that there is no foreign object in any of units.
- (3) Be sure that gasket is lined properly.
- (4) Be sure that tightening torque is according to specification.

If these items are not kept, it may lead to the breakage of substrate or intrusion of liquid or dust into the units.

Wiring

Communication wiring

- Communication connector (Bus adapter: EX9-ACY00-MJ)



LINK IN: M12 4pins plug A-coded

Pin No.	Description	Function
1	SLD	Shield
2	DB	Communication wire DB
3	DG	Communication wire DG
4	DA	Communication wire DA

Example of the cable with connector: PCA-1567720 (SMC)

Example of the connector: PCA-1557620 (SMC)

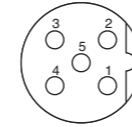
LINK OUT: M12 5pins socket A-coded

Pin No.	Description	Function
1	SLD	Shield
2	DB	Communication wire DB
3	DG	Communication wire DG
4	DA	Communication wire DA
5	-	Unused

Example of the cable with connector: PCA-1567717 (SMC)

Example of the connector: PCA-1557617 (SMC)

Power supply connector



M12 5pins plug B-coded (reverse)

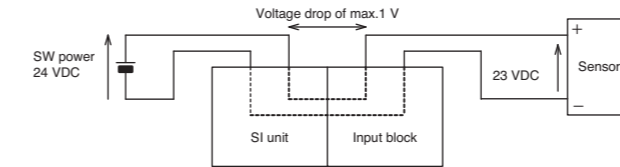
Pin No.	Description	Function
1	SV24 V	+24 V for solenoid valve.
2	SV0 V	0 V for solenoid valve.
3	SW24 V	+24 V for SI unit and Input Block
4	SW0 V	0 V for SI unit and Input Block
5	FE	Ground

Example of the cable with connector: EX9-AC010-1 (1 m)

EX9-AC030-1 (3 m)

EX9-AC050-1 (5 m) etc. (SMC)

Power for sensor is supplied to sensor connected with Input block. Select sensor concerning voltage drop up to maximum 1 V inside the unit at this moment. If sensor requires 24 V, it is necessary to lower power supply voltage for sensor slightly or secure power supply for sensor separately without going through SI unit so that sensor input voltage can be 24 V with actual loading (allowable voltage of power supply: 19.2 V to 28.8 V).



Terminator

Station No. and Baud rate are set by the rotary switch inside of the SI unit cover. Set parameters while the power of SI unit is OFF. The setting of each switches can be fixed after power is ON.

Terminating resistance and cable

If this SI unit is the terminal of CC-Link connection, connect the terminal resistor to "OUT" side of the bus adapter. There are two types of terminal resistors depending on the cable to use. Refer to the following table and select an appropriate terminal resistor.

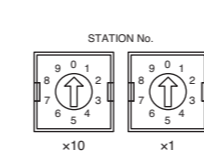
Cable to use	Ver. 1.10-compatible CC-Link dedicated cable CC-Link dedicated (110 Ω, 1/2 W)		CC-Link dedicated high-performance cable (130 Ω, 1/2 W)		
	Manufacturer	Model	Color of molded portion	Model	Color of molded portion
Correns	VA-4DCC-110		Black	VA-4DCC-130	Grey
PHOENIX CONTACT	SAC-4P-M12MS CCL TR		Black		

Setting

Switch setting

Station No., Baud rate and HOLD/CLEAR are set by the switch inside of the SI unit cover. Set parameters while the power of SI unit is OFF. The setting of each switches can be fixed after power is ON.

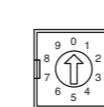
Station no. setting



Setting	Setting range
x10	0 to 6
x1	0 to 9

- *: Set stations within 01 to 63
- *: "L ERR" display lights if 00 and station 64 or larger is selected. Turn off the power and select correct station.
- *: "L ERR" display blinks if the switch is operated which the power is ON.

Baud rate setting



Setting	Setting range
1	156 kbps
2	625 kbps
3	2.5 Mbps
4	5 Mbps
5	10 Mbps

- *: Set stations within 01 to 63
- *: "L ERR" display lights if 00 and station 64 or larger is selected. Turn off the power and select correct station.
- *: "L ERR" display blinks if the switch is operated which the power is ON.

HOLD/CLEAR setting



Setting	Contents	Function
H (ON)	HOLD	Hold the last state before communication error.
C (OFF)	CLEAR	Clear all outputs.

Adjusted when shipped

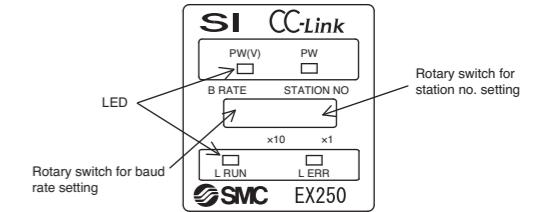
Please refer to the table below for setting at the time of shipment from the factory.

Set parameters	Switch setting	Contents
B RATE (Baud rate)	0	156 kbps
STATION NO.	x10	0
	x1	0
HOLD/CLEAR	C(OFF)	CLEAR

Assignment of I/O number

- Standard wiring
The outputs of the SI unit are assigned from the D side solenoid valve in the order 0,1,2...maximum of 31. Refer to each solenoid valves catalogue for details. The inputs of the Input block are assigned from the SI unit side Input block in the order 0,1,2...maximum of 31.
- Semi-standard wiring for valve output (Mixed wiring)
As semi-standard wiring, mixed wiring inside the manifold is available. The wiring type is specified by description of single or double solenoid valve mounted on the manifold. In order to specify the mixed wiring, completion of Manifold type solenoid valve Specifications Sheet is required.

LED indication



LED	Contents
PW	Lights up: Input and control power is ON. Lights off: Input and control power is OFF.
PW (V)	Lights up: When power supply for solenoid valves is turned ON. Lights off: When supply voltage decreases below 19 V.
L RUN	Lights up: Communication is normal. Lights off: Communication terminated. (Time over error)
L ERR	Lights up: Communication error. Flashing: Assignment of station no. and baud rate are made during communication. (Flicker every 0.4 s) Lights off: Communication is normal.

"PW", "PW(V)", "L RUN" light while data link is normal.

Troubleshooting

Technical documentation giving detailed troubleshooting information can be found on the SMC website (URL <http://www.smcworld.com>).

Specifications

Power for SI unit/Input Block: 24 VDC ±20%, 1.1 A or less
 (Inside of SI unit: 0.1 A or less
 Input block: 1 A or less (Depending on number of connecting sensors and specifications))
 Power for solenoid valve: 24 VDC +10%/5%, 2 A or less
 (Depending on number of solenoid valve station and specifications)

Connection load: Solenoid valve with protection circuit for 24 VDC and 1.5 W or less surge voltage. (made by SMC)

Operating ambient temp: 5 to 45 °C Storage ambient temp: -20 to 60 °C
 Pollution degree: Pollution degree 3 (UL508)

Technical documentation giving detailed specification information can be found on the SMC website (URL <http://www.smcworld.com>).

Outline Dimensions

Technical documentation giving detailed outline dimensions information can be found on the SMC website (URL <http://www.smcworld.com>).

Accessories

Technical documentation giving detailed accessories information can be found on the SMC website (URL <http://www.smcworld.com>).

SMC Corporation URL <http://www.smcworld.com>

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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