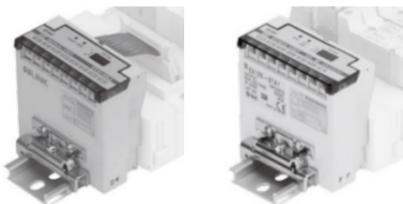




ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - SI unit for CC-Link

EX120-SMJ1 / EX121-SMJ1 / EX122-SMJ1 /
EX124D/U-SMJ1 / EX126D-SMJ1

The intended use of this product is to control pneumatic valves and I/O while connected to the CC-Link protocol.

1 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.

^{*)} ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1: Manipulating industrial robots -Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	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.

Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

Caution

- Provide grounding to assure the noise resistance of the Fieldbus system. Individual grounding should be provided close to the product using a short cable.
- Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for further Safety Instructions.
- Special products (-X) might have specifications different from those shown in the specifications section. Contact SMC for specific drawings.

2 Specifications

2.1 General specifications

Item	Specifications
Ambient temperature	0 to +55 °C (with 8 outputs) 0 to +50 °C (with 16 outputs)
Ambient humidity	35 to 85%RH (No condensation)
Storage temperature	-10 to +60 °C
Withstand voltage	1500 VAC applied for 1 minute
Insulation resistance	2 MΩ or more 500 VDC
Operating atmosphere	No corrosive gas
Enclosure	EX120/121/122: IP20 EX124D/U-SMJ1: IP65 EX126D-SMJ1: IP67
Weight	EX120-SMJ1: 110 g EX121-SMJ1: 140 g EX122-SMJ1: 130 g EX124D/U-SMJ1: 240 g EX126D-SMJ1: 360 g

2.2 Electrical specifications

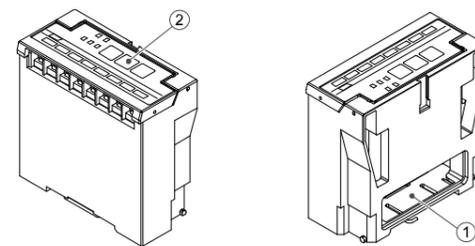
Item	Specifications	
Rated voltage	24 VDC	
Power supply voltage range	Power supply for SI unit control: 15 to 30 VDC	
	Power supply for solenoid valves: 24 VDC +10/-5%	
Current consumption	0.1 A or less (for SI unit)	
Output specification	Output type	NPN (positive common) / sink
	Number of outputs	16 outputs
	Connection load	Solenoid valve with surge voltage suppressor of 24 VDC and 1 W or less (manufactured by SMC)
	Output setting at communication error.	CLEAR

2.3 Communication specifications

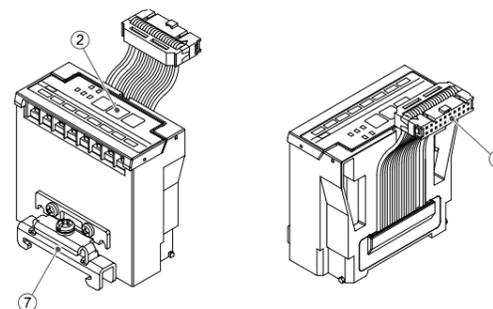
Item	Specifications
Applicable system	CC-Link Ver.1.10
Occupied number of stations	1 station
Station number setting range	1 to 64 (set with switches)
Station type	Remote I/O
Transmission speed	156 kbps 625 kbps 2.5 Mbps 5 Mbps 10 Mbps
Cable length between stations	20 cm or more
Max. total cable length	1200 m 900 m 400 m 160 m 100 m
Configuration file	CSP+ file

3 Name and function of parts

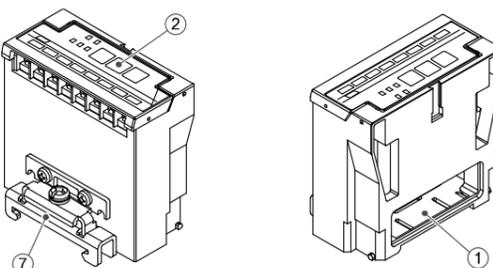
EX120-SMJ1



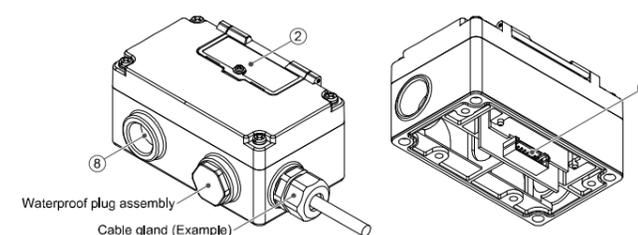
EX121-SMJ1



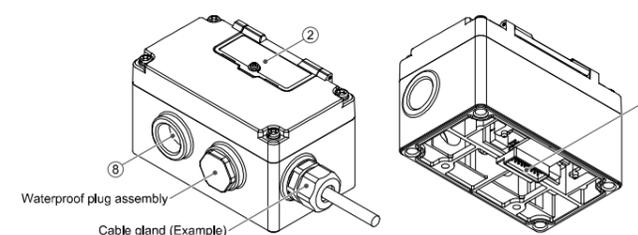
EX122-SMJ1



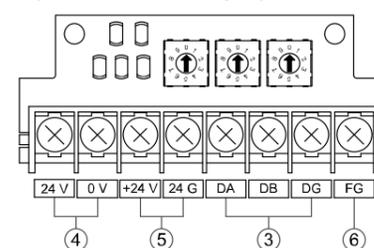
EX124D/U-SMJ1



EX126D-SMJ1



Terminal block (with switch cover open)



3 Name and function of parts (continued)

No.	Part	Description
1	Output connector	Connector for the valve manifold
2	LED and Switch cover	LED display to indicate the status of the SI unit. Switches for setting the station number and transmission speed.
3	Communication terminals (DA, DB, DG)	Connector for the CC-Link line using a CC-Link dedicated cable.
4	Power supply terminals (24V, 0V)	To supply power to the solenoid valves.
5	Power supply terminals (+24V, 24G)	To supply power for communication.
6	FG terminal	To connect to Functional Earth (and CC-Link cable shield wire).
7	DIN rail mounting bracket	For mounting to a DIN rail.
8	Wiring entry (4 places)	For connecting the communication and power supply cables to the SI unit (EX124D/U-SMJ1 and EX126D-SMJ1 only). For wiring, use a G1/2 cable gland to ensure an enclosure rating of IP65 / IP67. Use waterproof plug (Part number AXT100-B04A) for unused wire entries.

4 Installation

4.1 Installation

Warning

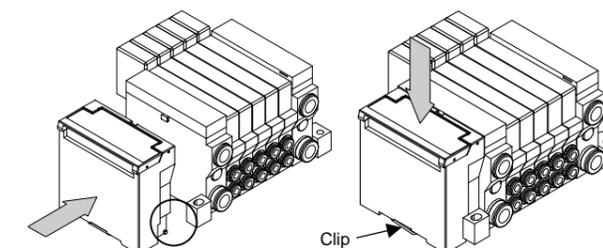
- Do not install the product unless the safety instructions have been read and understood.
- Applicable valve series: SV, SY, VQ series.

Caution

- Be sure to turn OFF the power.
- Check there is no foreign matter inside the SI unit.
- If the SI unit is not assembled properly, the internal PCBs may be damaged or liquid and/or dust may enter into the unit.
- Refer to the catalogue or operation manual for the applicable valve manifold on the SMC website (URL: <https://www.smcworld.com>) for further assembly details.

4.2 Mounting (EX120-SMJ1)

- Align the raised part on the manifold side of the SI unit (at the bottom) with the groove on the manifold and press it in evenly.
- Confirm that the SI unit and manifold are securely locked together and slide the SI unit downwards.

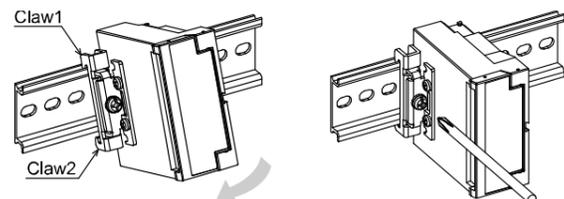


4 Installation (continued)

- For removal lift the clip at the bottom of the SI unit using a flat blade screwdriver. By lifting the clip the hook will be removed from the manifold to release the SI unit.
- Slide the SI unit upwards with the clip pulled out.

4.3 DIN rail mounting (EX121-SMJ1, EX122-SMJ1)

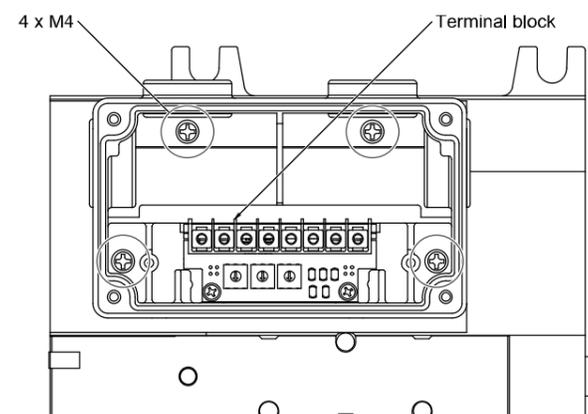
- Hook claw 1 to the upper side of the DIN rail and claw 2 to the lower side.
- Tighten the mounting bracket screw to fix the SI unit to the DIN rail (Tightening torque: 0.6 N•m).



- For removal loosen the mounting bracket screw and remove the SI unit by unhooking claw 2 then claw 1.

4.4 Mounting (EX124#-SMJ1 and EX126D-SMJ1)

- Connect the SI unit wiring to the valve manifold. Ensure the cable does not get caught between the SI unit and the valve manifold.
- Mount the SI unit to the manifold, then connect the communication wiring and power supply wiring to the terminal block. Tighten the 4 x M4 screws diagonally so that the SI unit is securely fixed (Tightening torque: 0.6 N•m).



- Mount the cover to the SI unit after setting the switches. Tighten the 4 x M4 screws diagonally so that the cover unit is securely fitted (Tightening torque: 0.6 N•m).

4.5 Environment

Warning

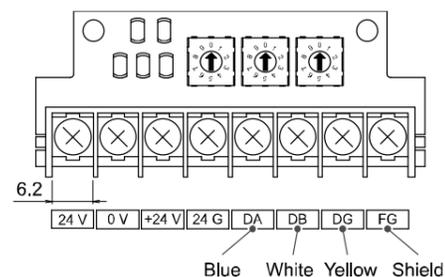
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

5 Wiring

5.1 Communication Connector

The connection between the CC-Link dedicated cable and the SI unit communication terminals is shown below.

- Connect the signal lines to the assigned terminals (shown below).
- The M3 terminal screws tightening torque is 0.5 to 0.6 N•m.



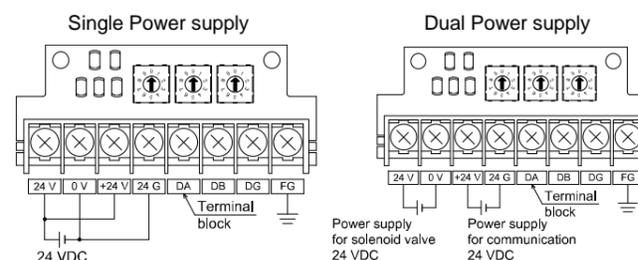
5.2 Terminating Resistor

- A bus termination resistor is required at both ends of the CC-Link main line.
- Connect a terminating resistor between "DA" and "DB" at both ends of the CC-Link system.
- Use a CC-Link dedicated cable, or a cable with the same specifications. If a cable with any other specifications is used, normal data transmission cannot be guaranteed.
- The terminating resistor value depends on the cable being used.

Cable type	Terminating resistor
CC-Link dedicated cable	110 Ω 1/2 W
CC-Link dedicated cable compatible to Ver.1.10	

5.3 Power supply connector

- Connect the power supply wiring to the SI unit control power supply terminals and the solenoid valve power supply terminals.
- The EX120 power supply structure consists of two systems. These systems can operate using a single or dual power supply.
- Connect the wires to the assigned terminals (shown below).
- The M3 terminal screws tightening torque is 0.5 to 0.6 N•m.



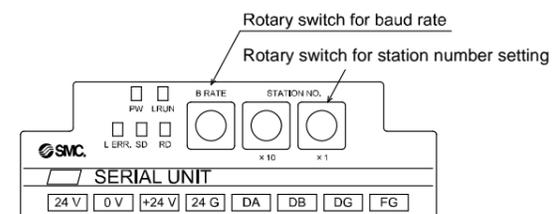
5.4 Ground Connection

- Connect the ground (FG) terminal to Functional Earth. Individual grounding should be provided close to the product. Resistance to ground should be 100 ohms or less. Tighten the FG terminal (M3 round head screw) firmly with a tightening torque of 0.3 N•m.
- The CC-Link dedicated cable shield wire (SLD) should be connected to the "FG" terminal of the SI unit. For the EX12#-SMJ1, the "SLD terminal" and "FG terminal" are common. Therefore, connect 3 wires to the "FG Terminal". When connecting 3 wires to the "FG terminal", crimp 2 wires together into one crimp terminal. Use another crimped terminal for other wires. After crimping, connect the wires so that the back of the two crimped terminals face each other.

6 Setting

6.1 Switch Settings

- The switches should only be set with the power supply turned OFF.
- Open the cover and set the switches with a small flat blade screwdriver. Close the cover after setting.
- Set the switches before use.



6.1.1 Station number setting

- The setting for the station number can be set using the rotary switches under the switch cover. The station number should be set within the range of 01 to 64. The station number must not be duplicated, this will cause an error. The default setting is 00.

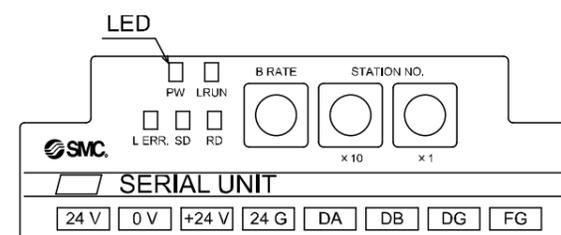
Setting	Setting range
x10	0 to 6
x1	0 to 9

6.1.2 Communication speed setting

- The setting for the communication speed can be set using the rotary switches under the SI unit cover.
- Set the same communication speed as the master station.
- The default setting is 0 (156 kbps).

Setting	Communication speed
0	156 kbps
1	625 kbps
2	2.5 Mbps
3	5 Mbps
4	10 Mbps

7 LED display



LED	Description	
PWR	ON	Communication power supply is ON.
	OFF	Communication power supply is not supplied.
L RUN	ON	Normal communication with the master.
	OFF	Communication terminated (or time out).
L ERR	ON	Communication error or time out.
	Flashing	Address or communication speed changed during operation.
SD	ON	Data is sending.
RD	ON	Data is being received.

8 How to Order

Refer to the catalogue or operation manual on the SMC website (URL: <https://www.smcworld.com>) for the "How to Order" information.

9 Outline Dimensions (mm)

Refer to the catalogue or operation manual on the SMC website (URL: <https://www.smcworld.com>) for Outline dimensions.

10 Maintenance

10.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Stop operation if the product does not function correctly.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

13 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL: <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
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