



ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - SI unit for CC-Link

EX140-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 and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robotics — Safety requirements — Part 1: Industrial robots

- 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.

	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate 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 (8 points ON) 0 to +50 °C (16 points ON)
Ambient humidity	35 to 85%RH (no condensation)
Storage temperature	-10 to +60 °C
Withstand voltage	1500 VAC applied for 1 minute (between FG and external terminal)
Insulation resistance	2 MΩ or more (500 VDC, between FG and external terminal)
Operating atmosphere	No corrosive gas, no dust
Enclosure	IP20
Weight	80 g

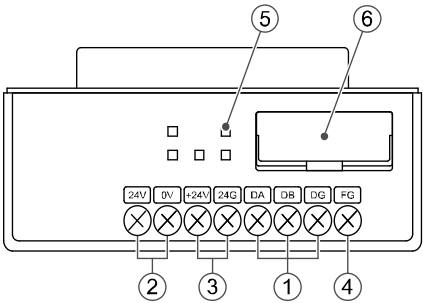
2.2 Electrical specifications

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.	Hold / Clear (switch setting)

2.3 Communication specifications

Item	Specifications
Applicable system	CC-Link Ver. 1.10
Occupied number of stations	1 station
Allowable node number setting	1 to 64 (set by switches)
Station type	Remote I/O
Transmission speed	156 kbps 625 kbps 2.5 Mbps 5 Mbps 10 Mbps
Min. cable length between nodes	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



No.	Part	Description
1	Communication terminals (DA, DB, DG)	Connector for CC-Link line using a CC-Link dedicated cable.
2	Power supply terminals (24 V, 0 V)	Power supply to solenoid valves.
3	Power supply terminals (+24 V, 24 G)	Power supply to SI unit controller.
4	FG terminal	Connection for Functional Earth.
5	Display	LED display to indicate the status of the SI unit.
6	Switch setting area	Switches for setting the station number and transmission speed.

4 Installation

4.1 Mounting

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Applicable valve series: SQ1000, SQ2000, SZ3000
- Refer to the operation manual for the applicable valve manifold on the SMC website (URL: <https://www.smcworld.com>) for mounting.

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.

4.2 Environment

Warning

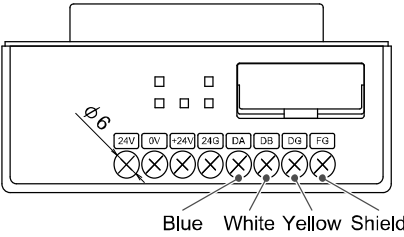
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- 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).
- A suitable screwdriver is #2 pozi head screwdriver with body diameter of 6 mm max.
- The terminal screws tightening torque is 0.5 to 0.6 N•m.



5.2 Terminating Resistor

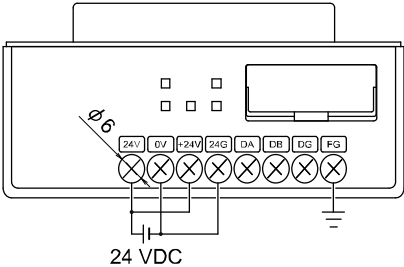
- A bus termination resistor is required at both ends of the CC-Link main line.
- Connect a terminating resistor between “DA” and “DB” at both ends of the CC-Link system.
- Use a CC-Link dedicated cable, or a cable with the same specifications. If a cable with any other specifications is used, normal 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	

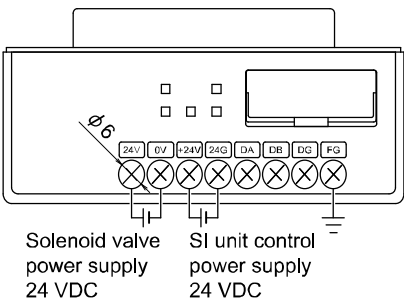
5.3 Power supply connector

- Connect the power supply wiring to the SI unit control power supply terminals and the solenoid valve power supply terminals.
- The EX140 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).
- A suitable screwdriver is #2 pozi head screwdriver with body diameter of 6 mm max.
- The terminal screws tightening torque is 0.5 to 0.6 N•m.

Single Power Supply



Dual Power Supply



5 Wiring (continued)

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 EX140-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 SI unit 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.

STATION NO.

SW2

SW3

0 1 2 3 4 5 6 7 8 9

↑

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

↑

0 1 2 3 4 5 6 7 8 9

x10

x1

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).

B RATE
SW1

0 1 2 3 4 5 6 7 8 9

↑

0 1 2 3 4 5 6 7 8 9

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

6.1.3 HOLD / CLEAR setting

- Set the reaction of outputs to a communication error.
- The default setting is CLEAR.

HOLD

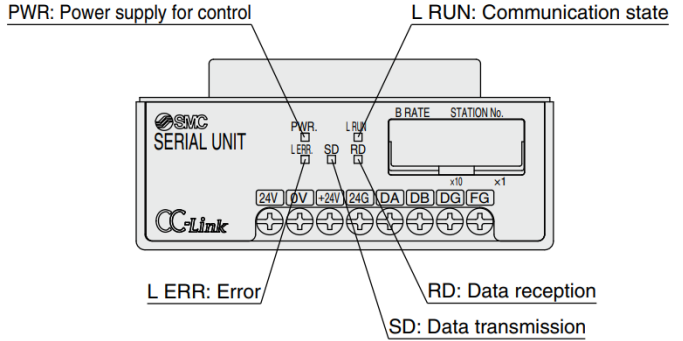
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CLEAR

SW4

Status	Description
HOLD	Hold the last state before communication error.
CLEAR	Clear all outputs.

7 LED display



LED		Description
PWR	ON	SI unit control power supply is ON.
	OFF	SI unit control 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.
	OFF	Normal communication.
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, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN
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Template DKP50047-F-085O