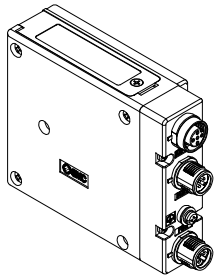




ORIGINAL INSTRUCTIONS

Instruction Manual
Fieldbus device - SI unit for CANopen
EX260-SCA1-X181



The intended use of this product is to control pneumatic valves and I/O while connected to the CANopen 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) ⁽¹⁾, and other safety regulations.

- ⁽¹⁾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.
- **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.
- **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 for correct operation.**
Otherwise malfunction can result, causing an accident.

Caution

- **Provide grounding to assure the safety and noise resistance of the Fieldbus system.**
Individual grounding should be provided close to the product using a short cable.
- **When conformity to UL is required the SI unit must be used with a UL1310 Class 2 power supply.**

2 Specifications

2.1 General specifications

Item	Specifications
Ambient temperature	−10 to +50 °C
Ambient humidity	35 to 85%RH (No condensate)
Ambient storage temperature	−20 to +60 °C
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more
Operating atmosphere	No corrosive gas
Enclosure	IP67
Weight	200 g or less

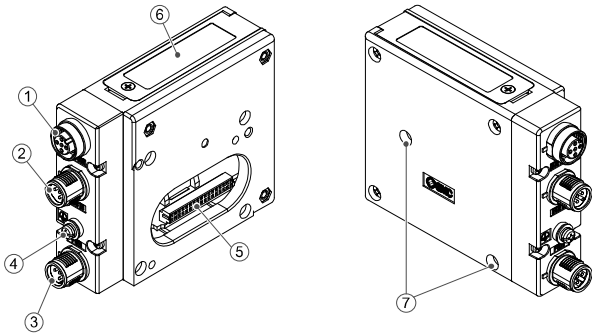
2.2 Electrical specifications

Item		Specifications
Power supply voltage range / Current consumption	Controller power supply	18 to 30 VDC (24 VDC typical) 0.1 A max.
	Solenoid valve power supply	22.8 to 26.4 VDC 1.7 A or less (according to the solenoid valve specification)
Solenoid valve specification	Output type	PNP (negative common) / source
	Connected load	Solenoid valve (with surge voltage suppressor) 24 VDC and 1.1 W or less (manufactured by SMC)
	Insulation	Power supply for SI unit – Power supply for solenoid valve. CAN_GND and SV0 V are connected inside the unit.
	Residual voltage	1.2 VDC or less

2.3 Communication specifications

Item	Specifications
Protocol	CANopen CiA DS-301 V4.02 and CiA DS-401
Node-ID setting range	1 to 99 (1 to 127 at SW mode)
Baud rate setting range (Transmission speed)	1000 / 800 / 500 / 250 / 125 / 50 / 20 / 10 kbps
COB-Identifier	11 bit ID (CAN 2.0 A)
Number of outputs	32 outputs
Device Profile number	0191h

3 Name and Function of Individual Parts



No.	Element	Description
1	Communication connector (BUS OUT)	CANopen communication and power supply for communication (OUT).
2	Communication connector (BUS IN)	CANopen communication and power supply for communication (IN).
3	Power supply connector	Power supply with load voltage for valves and operating voltage for SI unit
4	Ground terminal	Functional earth. (M3 screw)
5	Output connector	Output signal interface for valve manifold.
6	LED display and Switch cover	LED display to indicate the status of the SI unit and switch setting.
7	Mounting hole	Mounting hole for connection to the valve manifold.

• Accessories

Hexagon socket head cap screw	M3 x 30 screw for connection to the valve manifold (2 pcs).
Seal cap	Seal cap for unused BUS OUT connector.

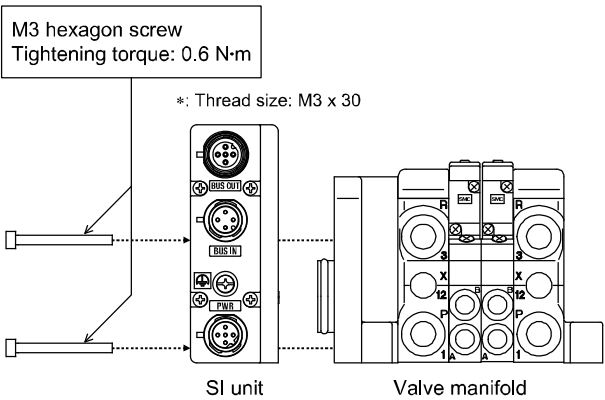
4 Installation

4.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.

- Assembly of the SI unit to the Valve manifold.



Caution

- Be sure to turn off the power.
- Check there is no foreign matter inside the SI unit.
- Check there is no damage and no foreign matter on the gasket.
- If the SI unit is not assembled properly, the internal PCBs may be damaged or liquid and/or dust may enter into the unit.
- Tighten the screws with the specified tightening torque (0.6 N•m).

3 Installation (continued)

4.2 Environment

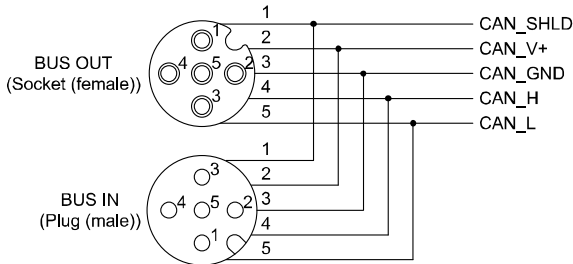
Warning

- 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

Connector: M12 5-pin plug (male) / socket (female) A coded.

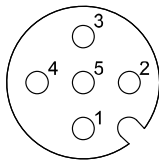


Pin No.	Description	Function
1	CAN_SHLD	Shield
2	CAN_V+	Power supply+ for CANopen
3	CAN_GND	Power supply– for CANopen
4	CAN_H	CAN_H bus line (dominant high)
5	CAN_L	CAN_L bus line (dominant low)

BUS connector: M12 5-pin cable with shield (according to ISO11898).
The permissible current of the internal wiring (CAN_V+ and CAN_GND) between communication connectors is 2 A maximum.

5.2 Power Supply Connector

Connector: M12 5-pin plug (male) B-coded.



No.	Signal	Description
1	SV 24 V	+24 V for solenoid valve
2	SV 0 V	0 V for solenoid valve
3	-	Not used
4	-	Not used
5	-	Not used

The M12 connector cable for fieldbus and power supply connections has two types, standard M12 and SPEEDCON compatible. If both plug and socket have SPEEDCON connectors, the cable can be inserted and connected by turning it 1/2 rotation.
A standard M12 connector can be connected to a SPEEDCON connector.

- Select the appropriate cables to mate with the connectors on the SI unit. Cable accessory details can be found in the operation manual on the SMC website (URL: <https://www.smcworld.com>).

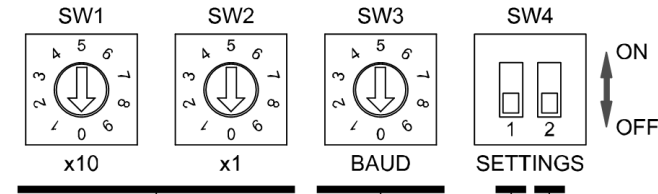
5.3 Ground Connection

- Connect the ground terminal to ground.
Individual grounding should be provided close to the product with a short cable to assure the safety and noise resistance of the Fieldbus system.
Resistance to ground should be 100 ohms or less.

6 Settings

6.1 Switch Setting

- The switches should only be set with the power supply turned OFF.
- Open the cover and set the rotary switches and DIP switch with a small flat blade screwdriver.



6.2 Node ID setting

The setting range is 1-99 using SW1 and SW2 (0 is invalid).

6.3 Baud Rate Setting

SW3	Baud Rate [kbps]	SW3	Baud Rate [kbps]
0	1000	5	Reserved
1	800	6	50
2	500	7	20
3	250	8	10
4	125	9	Reserved

6.4 Output Condition setting

SW4 No.1	Output condition of solenoid valve when “Stop Remote Node” command is received or stopped state by an error occurs (Error control, Emergency Object). The object 1029h specifies to which state the unit should be set, when an error is detected.
0	Output value shall take the pre-defined condition specified in Error Value Output Object (6207h, 6307h, 5327h). Default: All outputs are CLEARED.
1	Output Value shall be HELD.

6.5 Mode setting

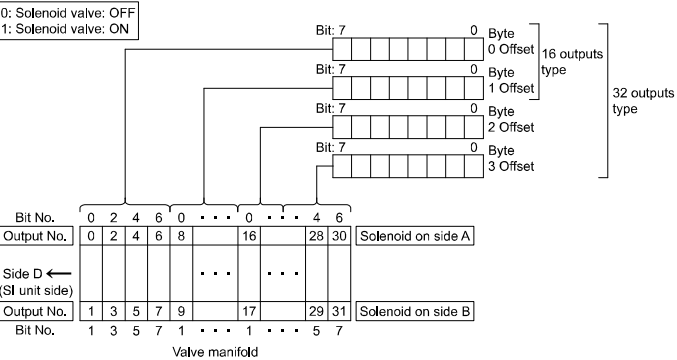
SW4 No.2	Mode
0	HW Mode. Setting of Node-ID is achieved using rotary coded switches SW1 and SW2. Setting of Baud Rate is achieved using rotary coded switch SW3.
1	SW Mode. Setting of Node-ID is achieved via the network. SW1 and SW2 become invalid. Node-ID can be set in the range 1 to 127. Default is 127 (7Fh).

6.6 Configuration

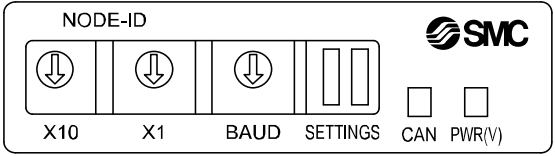
To configure the SI unit for the CANOpen network refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>).

6.7 Output Number Assignment

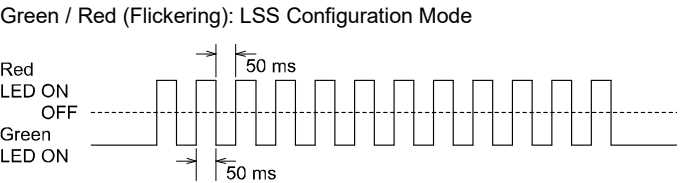
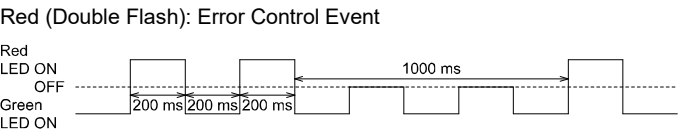
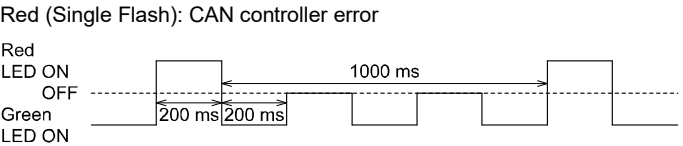
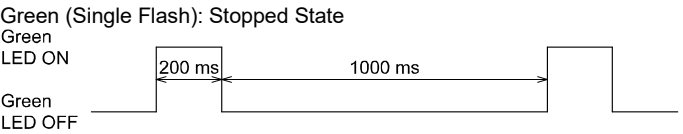
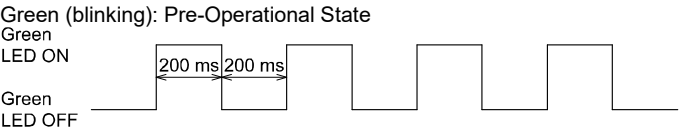
Output numbering refers to the solenoid position on the manifold and starts at zero.



7 LED Indication



LED	Content	
PWR(V)	Green ON	Power for solenoid valves is supplied
CAN	Green ON	SI unit is in the Operational state
	Green blinking	SI unit is in the Pre-Operational state
	Green single flash	SI unit is in Stopped state
	Red single flash	CAN controller error occurs
	Red double flash	Error Control Event occurs
	Green / Red flickering	SI unit is in Configuration mode (LSS services)
	Red ON	SI unit is in "Bus OFF" state



*: LED Indication is based on CANOpen specification (DR-303-3).

8 How to Order

Refer to the catalogue and operation manual available on the SMC website (URL: <https://www.smcworld.com>) for 'How to Order' details.

9 Outline Dimensions (mm)

Refer to the Operation manual available 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.

How to reset the product after a power cut or when the power has been forcibly cut off. The output condition before a power cut cannot be held by the product when recovering the power supply.
Be sure to confirm safety before supplying power and operating the product.

11 Limitations of Use

8.1 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 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)
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