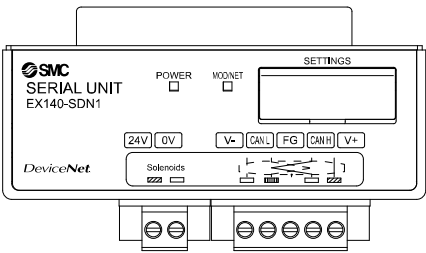




Instruction Manual
Fieldbus device - SI unit for DeviceNet®
EX140-SDN1



The intended use of this product is to control pneumatic valves and I/O while connected to the DeviceNet® 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 +50 °C
Ambient humidity	35 to 85%RH (no condensation)
Storage temperature	-20 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 or less

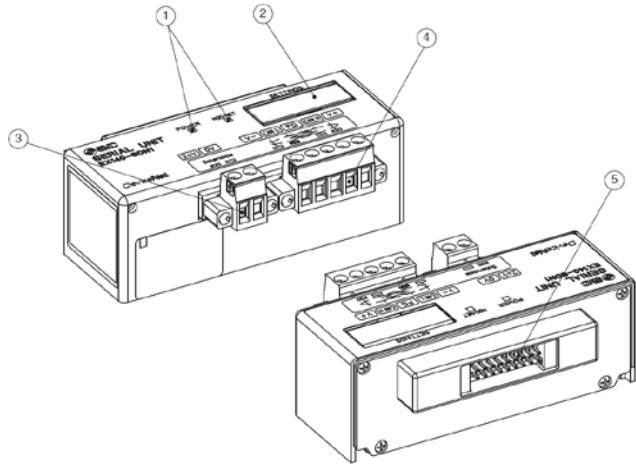
2.2 Electrical specifications

Item		Specifications
Rated voltage		24 VDC
Power supply voltage range		Power supply for SI unit control: 11 to 25 VDC
		Power supply for solenoid valves: 24 VDC +10/-5%
Current consumption		0.1 A or less (for SI unit) 1.5 A or less (for solenoid valves)
Residual voltage		0.3 V or less
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	DeviceNet® release 2.0
Applicable DeviceNet®	Volume I – release 1.2 Volume II – release 1.1
Node address setting	0 to 63 (set by switches)
Transmission speed (Baud rate)	500 kbps / 250 kbps / 125 kbps
Slave (branch station) type	Group 2 only server
Connection type	T branch, Multi drop
Device type	27
Product code	1202
Vendor ID	7 (SMC Corporation)
Configuration file	EDS file
Corresponding message	Polled command (I/O message) Explicit message

3 Name and function of parts



No.	Part	Description
1	Indicator LED	LED display to indicate SI unit status.
2	Switch settings	Switch to configure the address communication speed.
3	Power Supply connector (PWR)	Connector for power supply used to supply power for the solenoid valves.
4	Communication connector (BUS)	Connector for DeviceNet® used to connect to the DeviceNet® bus line.
5	Solenoid valve connector	Connector for solenoid valves.

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

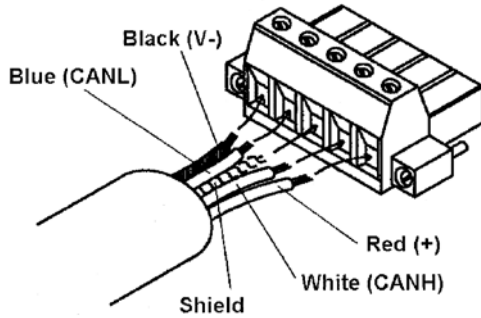
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.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

Wiring of the DeviceNet® cable and communication connector is shown below.

- Connect the signal lines to the assigned pins (shown below).
- The connector is suitable for use with wire sizes from AWG24 to AWG12 (0.2 mm² to 2.5 mm²).
- The screws for cable and connector should be tightened to a torque of 0.5 to 0.6 N•m.



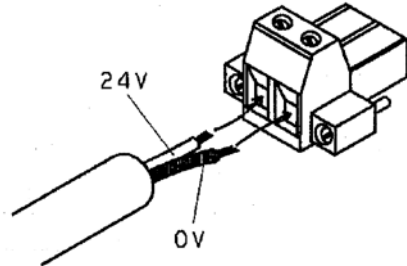
Pin.	Wire colour	Description
V-	Black	Power supply (-)
CANL	Blue	Communication low side
FG	-	Ground / shield connection
CANH	White	Communication high side
V+	Red	Power supply (+)

5.2 Terminating Resistor

- A bus termination resistor is required at both ends of the DeviceNet® bus segment.

5.3 Power supply connector

- Connect the power supply wiring to the power supply connector.
- 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).
- The connector is suitable for use with wire sizes from AWG24 to AWG12 (0.2 mm² to 2.5 mm²).
- The screws for cable and connector should be tightened to a torque of 0.5 to 0.6 N•m.



Pin.	Wire colour	Description
24V	-	Solenoid valve power supply (+)
0V	-	Solenoid valve power supply (-)

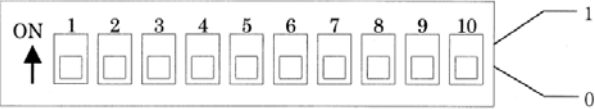
5.4 Ground Connection

- Connect the ground (FG) terminal to ground. Individual grounding should be provided close to the product. Resistance to ground should be 100 ohms or less.

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 Node Address setting

- The DeviceNet® node address can be set from 0 to 63 using Switch No. 1 to 6. The factory default setting is 63 (all switches ON).

MAC ID	SW1	SW2	SW3	SW4	SW5	SW6
0	0	0	0	0	0	0
1	1	0	0	0	0	0
2	0	1	0	0	0	0
⋮	⋮	⋮	⋮	⋮	⋮	⋮
62	0	1	1	1	1	1
63	1	1	1	1	1	1

6.1.2 Communication speed setting

- The DeviceNet® communication speed can be set using Switch No. 7 and 8. The default setting is 125 kbps.

SW7	SW8	Communication speed	Max. transmission length (m)			
			Thick cable	Thin cable	Branch length	Total branch line
0	0	125 kbps	500	100	6	156
1	0	250 kbps	250			78
0	1	500 kbps	125			39
1	1	Not used	Not used			

6.1.3 HOLD / CLEAR setting

- Set the reaction of outputs to a communication error using Switch No. 9. The factory default setting is CLEAR.

Status	SW9	Description
CLEAR	0	Clear all outputs.
HOLD	1	Hold the last state before communication error.

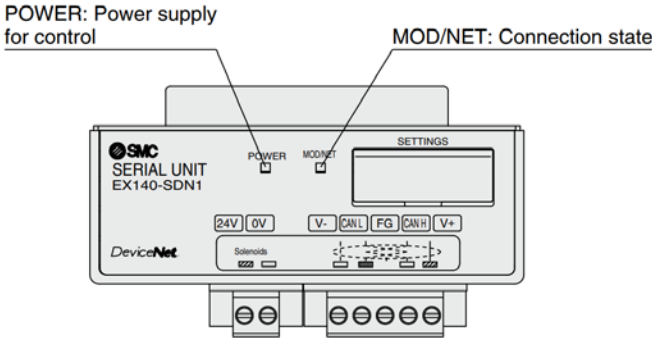
6.1.4 HW / SW setting

- Modifications to the address and speed can be made locally (HW mode using switch 10) or over the network (SW mode). The default setting is "HW mode".

SW10	Mode	Desription
0	HW	Set the address and speed locally using the SI unit switches 1 to 8.
1	SW	Set the address and speed over the DeviceNet® network. (switch setting is invalid).

If HW mode is selected then the settings stored using SW mode will be replaced by the HW settings.

7 LED display



LED		Description
POWER	ON	Communication power supply for DeviceNet® is supplied.
	OFF	Communication power supply for DeviceNet® is not supplied.
MOD / NET	OFF	Communication power supply for DeviceNet® is OFF, off-line or a node address duplication is present.
	Green flashing	Waiting for connection (On line).
	Green ON	Connection is established (On line).
	Red flashing	Connection time out (minor communication error)
	Red ON	MAC ID duplication error or BUS OFF error (major communication error).

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
Specifications are subject to change without prior notice from the manufacturer.
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