

Fieldbus device Operation Manual



EX180 Series for DeviceNet™

Thank you for purchasing an SMC EX180 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.

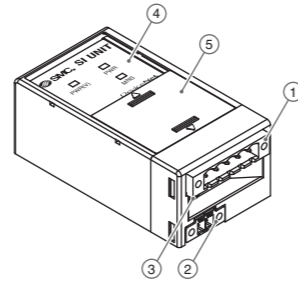
- Caution:** CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
- Warning:** WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
- Danger:** DANGER indicates a hazard with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

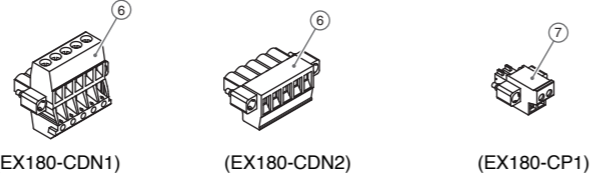
Summary of Product Parts

<EX180-SDN3□/-SDN4□/-SDN5□/-SDN6□>



<Accessories>

Communication connector for DeviceNet™ (1 pc.)
EX180-SDN3/4/5/6 EX180-SDN3A/4A/5A/6A Power supply connector (1 pc.)



No.	Element	Description
1	Fieldbus interface connector (BUS)	The connector for DeviceNet™ () that is used to connect to the DeviceNet™ bus line.
2	Socket for the power supply (PWR(V))	The connector for the power supply () that is used to supply the power for the solenoid valves.
3	FG terminal	Functional Earth.
4	Display	LED diagnostic display.
5	Switch setting part	Configures the MAC ID/communication speed.

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.

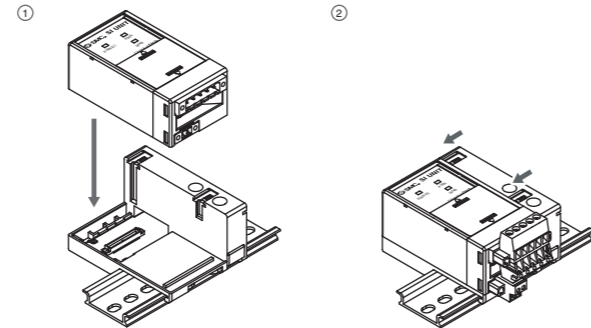
Installation

General Instructions on Installation

○ Applicable valve series
The EX180 series SI unit can be mounted on the following valve manifolds.

- Manifolds
SJ2000/3000, S0700 series
- * Refer to the catalogues and operation manuals for details on the solenoid valves and manifolds.

- How to mount the manifold
 1. Mount the SI unit to the manifold so that the mounting guide of the SI unit case mates with the manifold groove.
 2. Secure the SI unit using the two sliding locks.



Connecting Cables

1. Wiring for communication

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

- (1) Connect the signal lines to the assigned pins. (Figure 1)
The required tightening torque is 0.5 to 0.6 Nm.



Figure 1

(2) A bus termination is required at both ends of DeviceNet™ bus segment as shown in the Figure 2.
The specification of the terminating resistor is 121 Ω ±1%, 1/4 W.



Figure 2

(3) How to connect.

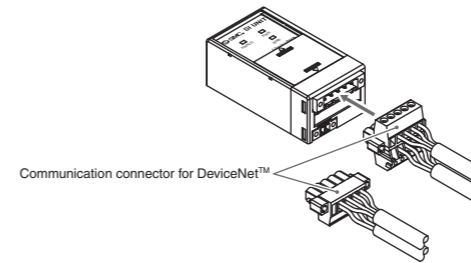


Figure 3

2. Wiring of the power supply

Connect the power supply to the power supply connector (1 pc.). The EX180 power supply structure consists of two systems. These systems can operate alone or with another power supply. Wire to the assigned pins. (Figure 4, Figure 5)
The tightening torque is 0.22 to 0.25 Nm.

- Note
Ground the FG terminal with a ground resistance of 100 Ω or less.

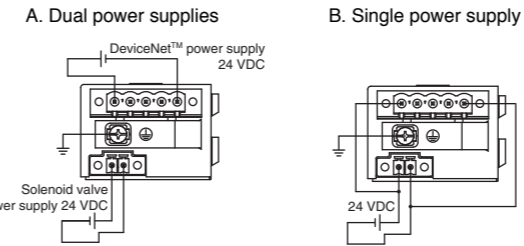


Figure 4

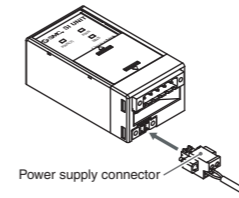
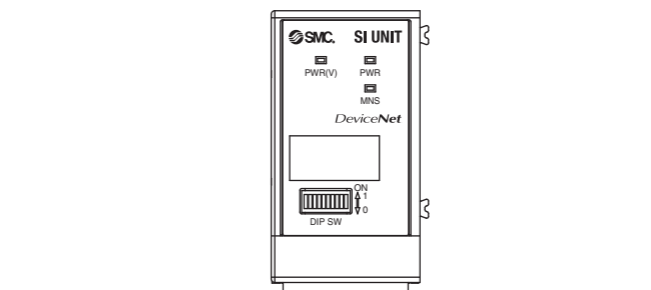


Figure 5

LED Indication



LED	Description	LED status
PWR(V)	Solenoid valve power supply is supplied at specified voltage	ON
	Solenoid valve power supply is not supplied at specified voltage	OFF
PWR	Communication power supply for DeviceNet™ is supplied	ON
	Communication power supply for DeviceNet™ is not supplied	OFF
MNS	Communication power supply for DeviceNet™ is OFF, off line or a MAC ID duplication is present	OFF
	I/O connection is waiting (On line status)	Green flashing
	I/O connection is established (On line status)	Green ON
	I/O connection / time out (Minor communication error)	Red flashing
	MAC ID duplication error or BUS OFF error (Serious communication error)	Red ON

Setting

Turn off the power supply while setting the DIP switches.
Open the cover and set the DIP switches with a small flat blade screwdriver.

Communication speed setting

Communication speed	No.7	No.8
125 kbps	0	0
250 kbps	1	0
500 kbps	0	1
Invalid	1	1

Factory default setting is 125 kbps.

HOLD/CLR setting

HOLD/CLR	No.9	Description
HOLD	1	Hold the last state before communication error.
CLR	0	Clear all outputs.

Factory default setting is CLEAR.
It is possible to set the output behaviour in the event of a communication error individually via the DeviceNet™ network.
If the output behaviour is set via the DeviceNet™ Network then the setting of DIP switch 9 is invalid.

SW/HW mode setting

SW/HW	No.10	Description
SW	1	Setting for MAC ID and baud rate are done via a network. *: No.1 to No.8 of DIP SW will be invalid.
HW	0	Setting for MAC ID and baud rate are done with No.1 to No.8 of DIP SW.

Factory default setting is HW mode.
The MAC ID and communication speed will be retained if the unit is powered off and software mode is selected (DIP switch 10).
If HW mode is selected then the settings stored using SW mode will be replaced by the HW settings.

MAC ID setting

MAC ID setting	No.1	No.2	No.3	No.4	No.5	No.6
#0	0	0	0	0	0	0
#1	0	0	0	0	0	1
#2	0	0	0	0	1	0
:	:	:	:	:	:	:
#62	1	1	1	1	1	0
#63	1	1	1	1	1	1

The default setting is all switches ON, so the MAC ID is set to 63.
The MAC ID should be set in a range of 0 to 63.

DeviceNet™ Objects

The technical document states detail objects information can be found on the SMC website (URL <http://www.smcworld.com>)

Troubleshooting

The technical document states detail troubleshooting information can be found on the SMC website (URL <http://www.smcworld.com>)

Specifications

Connected load: 24 VDC Solenoid valve with light and surge voltage suppressor of 1 W or less (manufactured by SMC)
Current consumption of power supply for SI unit operation: 0.1 A max.
Ambient temperature for operation: -10 to 50 °C
Ambient temperature for storage: -20 to 60 °C
Pollution degree 2: (UL508)

The technical document states detail specification information can be found on the SMC website (URL <http://www.smcworld.com>)

Outline Dimensions

The technical document states detail outline dimensions 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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