



## Installation and Maintenance Manual

### SI unit - DeviceNet compatible

#### Type EX240-SDN1

#### EX240-SDN2



### Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

<b>Caution</b>	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
<b>Warning</b>	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
<b>Danger</b>	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

This product is class A equipment that is intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.

### Warning

- **Do not disassemble, modify (including change of printed circuit board) or repair the product.**  
An injury or product failure may result.
- **Do not operate the product beyond the specification range.**  
Fire, malfunction or equipment damage may result. Use the product only after confirming the specifications.
- **Do not use the product in the presence of flammable, explosive or corrosive gas.**  
Fire, explosion or corrosion may result. This product does not have an explosion proof construction.
- **When using the product as part of an interlocking system:**
  - 1) Provide a double interlocking system, for example a mechanical system.
  - 2) Check the product regularly to ensure proper operation.
- **Before performing maintenance, be sure of the following:**
  - 1) Turn off the power supply.
  - 2) Stop the air supply, exhaust the residual pressure and verify the release of air from the system.

### Caution

- **Always perform a system check after maintenance.**  
Do not use the product if any error occurs.  
Safety cannot be assured if caused by un-intentional malfunction.
- **Provide grounding to ensure correct operation and to improve noise resistance of the product.**  
This product should be individually grounded using a short cable.
- **Follow the instructions given below when handling the product. Failing to do so may result in product damage.**
  - Maintenance space should always be provided around the product.
  - Do not remove labels from the product.
  - Do not drop, hit or apply excessive shock to the product.
  - Follow all specified tightening torques.

### Safety Instructions (continued)

- Connect wires and cables correctly, and do not connect while the power is ON.
- Do not route wires and cables together with power or high-voltage cables.
- Check the insulation of wires and cables.
- Take proper measures against noise, such as noise filters, when the product is incorporated in equipment or devices.
- Select the required protection (IP) rating according to the environment of operation.
- Take sufficient shielding measures when the product is to be used in the following conditions:
  - (1) where noise due to static electricity is generated.
  - (2) where electro-magnetic field strength is high.
  - (3) where radioactivity is present.
  - (4) where power lines are located.
- Do not use the product in a place where electric surges are generated.
- Use suitable surge protection when a surge generating load such as a solenoid valve are to be directly driven.
- Prevent any foreign matter from entering this product.
- Do not expose the product to vibration or impact.
- Use the product within the specified ambient temperature range.
- Do not expose the product to any heat radiation.
- Use a precision screwdriver with flat blade to adjust the DIP switch.
- Close the cover over the switches before power is applied.
- Do not clean the product with chemicals such as benzene or thinners.

### NOTE

- When conformity to UL is necessary the SI unit must be used with a UL 1310 Class2 power supply.

### Specifications

#### Communication specifications

Protocol	DeviceNet Release2.0
Communication speed	125k, 250k, 500kbps
MAC ID setting range	0 to 63
Slave (branch) type	Group2 Only Server
Input	32 points (not dependant on number of DI units)
Output	32 points (not dependant on points of solenoid valves)
Device information	Device type : 27 (Pneumatic valve) Product code : 2401 Vendor ID : 7 (SMC Corp.)
Corresponding message	Explicit Polled IO

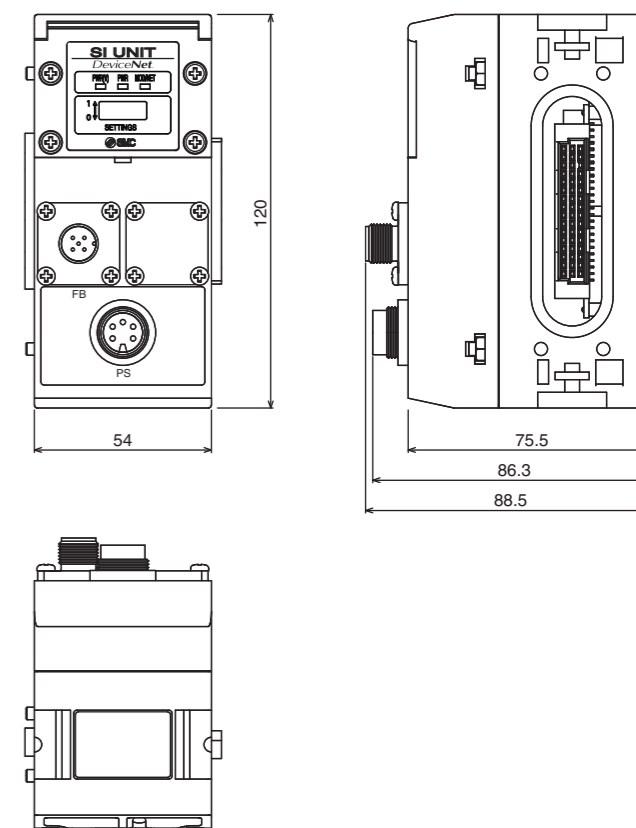
#### General specifications

Dimension (W x H x D)	54 x 88.5 x 120 *1
Weight	400g *1
Ambient temperature	0 to 50°C
Ambient humidity	30 to 95%RH (without condensation)
Applicable altitude	Less than 1000m above sea
Vibration proof	10 to 57Hz 0.35mm (constant amplitude) 57 to 150Hz 5G (constant speed)
Shock resistance	Peak value : 15G / 11ms 3 times each in directions of ± X, Y and Z
Enclosure	IP65

\*1: Attachments excluded.

Rated voltage	24VDC
Power supply voltage	Power supply for solenoid valve: 21.6 to 26.4V (warning of voltage drop given at approx. 19V)
	Power supply for SI units: 11 to 25V
	Power supply for DI units: 19.2 to 28.8V
Current consumption	Power supply for solenoid valve: depends on solenoid valve specifications and number of stations.
	Power supply for SI/DI units: 200mA (at Min. power supply voltage for SI unit) + sensor supply current.
Withstand voltage	AC1500V 1min. (between PE-external terminal package)
Insulation resistance	10MΩ or more (DC500V meg. between PE-external terminal package)
Momentary power failure	1 ms (power supply for SI/DI units)
Applicable load	Solenoid valve with 2.1W or less of light and surge voltage suppressor
Driving current/Residual voltage	100mA/0.3V Max. (at ON)
Output type	EX240-SDN1: PNP (negative common) EX240-SDN2: NPN (positive common)

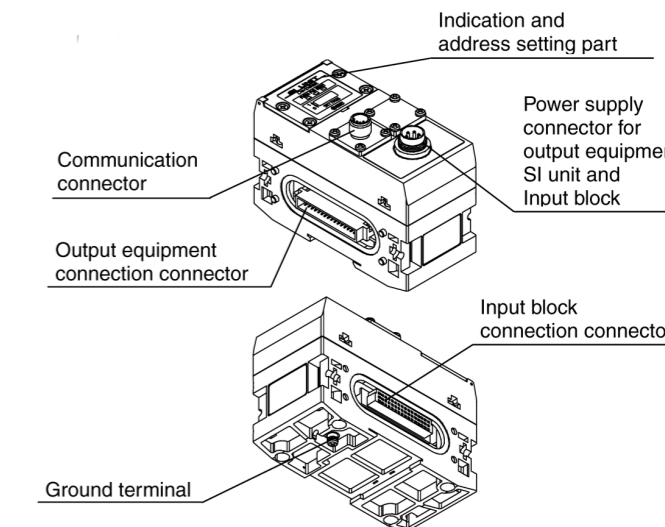
### Outline dimensions (mm)



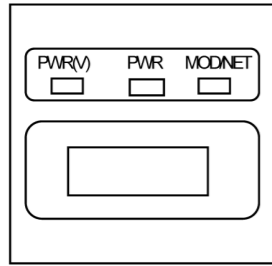
### Names and Functions of individual Parts

#### Body

- **Communication connector**  
To send and receive communication signals through DeviceNet line.
- **Power supply connector for output equipment, SI unit and Input block**  
To supply power to the output equipment such as a solenoid valve, and output block, SI unit and Input block.
- **Output equipment connection connector**  
To connect the output equipment such as a solenoid valve and output block.
- **Input block connection connector**  
To connect the input block.
- **Indication and address setting part**  
To provide LED's to indicate the condition of the unit, and the setting of address and HOLD/CLEAR functions.
- **Ground terminal**  
To be connected to the ground.



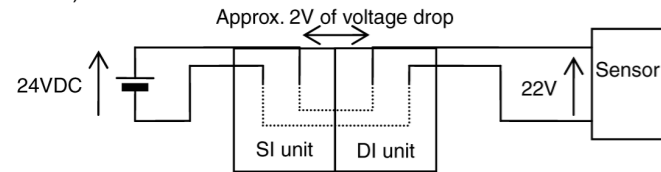
**Names and Functions of individual Parts (continued)**



Indication	Contents
PWR(V)	LED is ON when power for solenoid valve is supplied
PWR	LED is ON when power for DeviceNet line is supplied.
MOD/NET	LED is OFF: power off, off line, or duplicate check MAC_ID.
	Green LED flashing: waiting for connection (online)
	Green LED is ON: connection completed (online)
	Red LED flashing: connection time-out (light degree of communication error)
	Red LED is ON: MAC_ID duplicate error, or BUSOFF error (Heavy degree of communication error)

**Wiring**

Power for SI/DI units is also distributed to sensor connected with DI unit. Select sensor concerning voltage drop inside the unit. It may reach approximately 2 V maximum. If sensor requires 24 V, it is necessary to lower power supply voltage for SI/DI unit slightly or secure power supply for sensor separately without going through SI unit so that sensor input voltage can be 24 V with actual loading (allowable voltage of SI/DI unit power supply: 19.2 V to 28.8 V)



**Power supply connector**

DIN type 5 pins (Plug)  
Connector example for cable: Franz Binder 72309-0114-70-15

No.	Description	Function
1	SV24V	+ 24V for solenoid valve
2	SV0V	0V for solenoid valve
3	PE	Protection earth
4	SW24V	+ 24V for Sensor unit
5	SW0V	0V for Sensor unit

**Communication connector**

M12 5 pin (Plug) [Special for DeviceNet]

No.	Description	Function
1	Drain	Drain/Shield
2	V+	Power for line +
3	V-	Power for line -
4	CAN_H	Signal line H
5	CAN_L	Signal line L

**Switch Setting**

**DIP switch setting**

When DIP switch is to be set, turn OFF power supply to SI unit.

**Setting of address**

Address	SW1	SW2	SW3	SW4	SW5	SW6
	1	2	4	8	16	32
#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

**Setting of Baud rate**

Setting	Baud rate (kbps)
SW7 SW8	
0 0	125
1 0	250
0 1	500
1 1	Not used

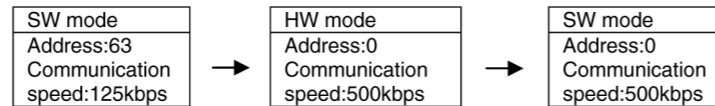
**Setting of solenoid output state in communication fault**  
Solenoid output state: Communication stops (I/O connection time out) or fault message is received.

SW9	Solenoid output state
1	HOLD All solenoid valve outputs are held before communication fault. (Fault state=1, Fault value=0)
0	CLEAR All solenoid outputs are reset to zero. (Fault state=0, Fault value=0)

**Mode setting**

Mode	Setting
0	HW mode Set address and Baud rate by SW1 to 8
1	SW mode Set address and Baud rate by network. SW1 to 8 are invalid.

- Node address 63 / communication speed 125 kbps is set at delivery (Both HW mode and SW mode.)
- Address and communication speed set at SW mode is maintained even after power of SI unit is turned off. Also, when turning on power at HW mode, address and communication speed set at SW mode is deleted and address and communication speed set by switch is memorized.



- Output setting for communication shutdown is 0 (all output clear mode) at delivery. It is possible to change the output setting for communication shutdown individually for 1 point via the DeviceNet network. In this case, the setting of SW 9 is invalid.

**Contacts**

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
ITALY	(39) 02 92711		

**SMC Corporation**

URL <http://www.smcworld.com> (Global) <http://www.smceu.com> (Europe)  
Specifications are subject to change without prior notice from the manufacturer.  
© 2010 SMC Corporation All Rights Reserved.