

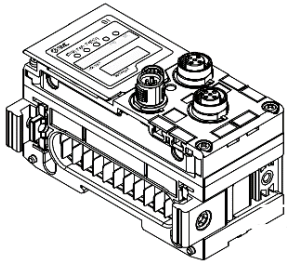


ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - SI unit for DeviceNet®

EX600-SDN1A / -SDN2A



The intended use of this SI unit is for the control of 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) <sup>\*)</sup>, and other safety regulations.

- <sup>\*)</sup>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.

	<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious 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>Caution</b>	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.

2 Specifications

The EX600 range of units can be connected to a fieldbus to realize the reduction of input / output device wiring and a distributed control system. The system communicates with the fieldbus through the SI unit. One SI unit can be connected to manifold valves with up to 32 outputs, and to input, output, I/O units to a maximum of 9 units.

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
Enclosure rating	IP67 (manifold assembled)
Weight	300 g

2 Specifications (continued)

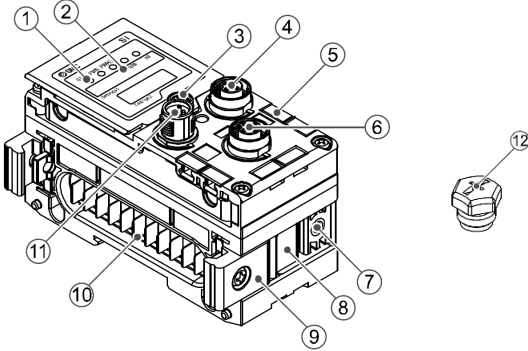
2.2 Electrical specifications

Item			Specifications
Power supply voltage / current	Control and Input power supply		24.0 VDC 2.0 A max.
	Solenoid valve and Output power supply		24.0 VDC 2.0 A max.
	Internal current consumption		55 mA maximum
Solenoid valve specification	Output type	EX600-SDN1A	PNP / source (negative common)
		EX600-SDN2A	NPN / sink (positive common)
	Number of outputs		32 outputs
	Output condition at the time of communication error		HOLD / CLEAR / Force ON
	Connected load		24 VDC and 1.5 W max. Solenoid valve with LED and surge voltage suppression (manufactured by SMC).
	Protection function		Short circuit protection

2.3 Communication specifications

Item	Specifications
Protocol	DeviceNet® volume 1 (edition 2.1) Volume 3 (edition 1.1)
Device type	12 (communication adapter)
Slave type	Group 2 only server
Communication speed	125 / 250 / 500 kbps
Occupied area (No. of I/O)	512 inputs / 512 outputs maximum
Configuration file	EDS file

3 Name and function of Individual parts



No	Part	Description
1	LED display	Displays the SI unit status.
2	Display cover	Display cover should not be opened.
3	Display cover screw	Screw to open the display cover.
4	Connector (BUS OUT)	Connector for Fieldbus outputs.
5	Marker groove	Groove for identification marker.
6	Connector (PCI)	Connector for Handheld terminal.
7	Valve plate hole	Hole for valve plate mounting.
8	Valve plate groove	Groove for valve plate mounting.
9	Joint bracket	Bracket for joining to adjacent units.
10	Unit connector	Connector for signal/power to next unit.
11	Connector (BUS IN)	Connector for Fieldbus Inputs.
12	Seal cap (2 pcs.)	For unused connectors (BUS OUT, PCI)

4 Assembly

4.1 Assembling the unit

**Warning**

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

- (1) Connect an I/O unit to the end plate. Digital and analogue units can be connected in any order. Joint bracket screw tightening torque: 1.5 to 1.6 N•m.

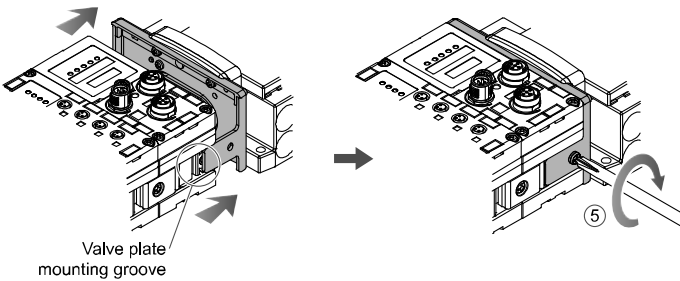
- (2) Add more I/O units. Up to 9 I/O units can be connected to one manifold.

- (3) Connect the SI unit. After connecting the required I/O units, connect the SI unit. The connection method is as above.

- (4) Mount the valve plate (EX600-ZMV#) to the valve manifold using the valve screws (M3 x 8) supplied. (Tightening torque: 0.6 to 0.7 N•m).

- (5) Connect the SI unit assembly to the valve manifold. Insert the valve plate into the valve plate mounting groove.

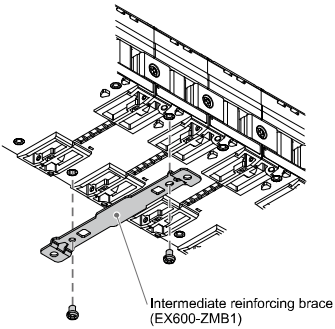
Then fix using the valve plate mounting screws (M4 x 6) supplied (Tightening torque: 0.7 to 0.8 N•m).



5 Installation

• **Direct mounting**

- (1) When assembling six or more units, the middle part of the assembly must be fitted with an intermediate reinforcing brace (EX600-ZMB1) before mounting using 2-M4x5 screws (Tightening torque: 0.7 to 0.8 N•m).



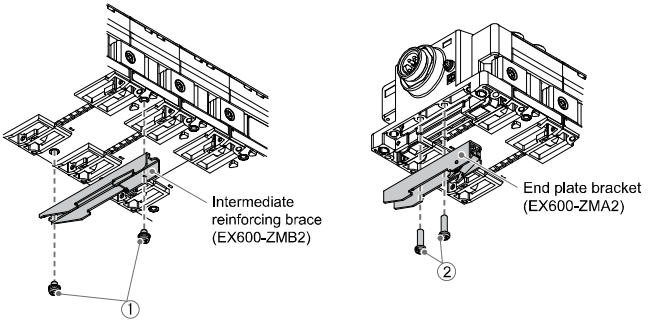
- (2) Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the end plate at the valve side while referring to the operation manual for the applicable valve series.

• **DIN rail mounting**

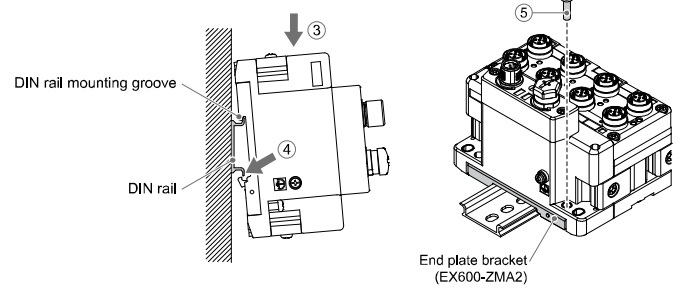
- (1) When assembling six or more units, the middle part of the complete assembly must be fitted with an intermediate reinforcing brace for DIN rail mounting (EX600-ZMB2), using 2-M4 x 6 screws. (Tightening torque: 0.7 to 0.8 N•m).

5 Installation (continued)

- (2) Mount the end plate bracket (EX600-ZMA2) to the end plate using 2-M4 x 14 screws (Tightening torque: 0.7 to 0.8 N•m). For the SY series, use end plate bracket (EX600-ZMA3).



- (3) Hook the DIN rail mounting groove on to the DIN rail.  
(4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIL rail.  
(5) Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 0.7 to 0.8 N•m). Refer to the Operation Manual for the applicable valve series on the SMC website (URL: <https://www.smcworld.com>) for the mounting method of the valve manifold.



5.1 Wiring connections

• **Communication Connector**

Select the appropriate cables to mate with the connectors on the SI unit. The DeviceNet® connection has 2 ports, BUS IN and BUS OUT, and both ports can be used to connect.

M12 5-pin Plug / Socket - A coded

Connector		Pin No.	Signal name
BUS IN	BUS OUT		
		1	DRAIN
		2	V+
		3	V-
		4	CAN_H
		5	CAN_L

• **Power Supply Connector**

The system is operated using power supplied from the 56-EX600-ED# end plate. Refer to the end plate instruction manual and operation manual for the power supply connection details.

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 a 1/2 rotation. A standard connector can be connected to a SPEEDCON connector.

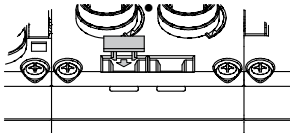
**Warning**

- Be sure to fit a seal cap (EX9-AWTS) on any unused connectors. Proper use of the seal cap enables the enclosure to maintain IP67 specification.

5 Installation (continued)

5.2 Identification marker

The signal name of the input or output devices and unit address can be written on the marker and can be installed on each unit.  
Mount a marker (EX600-ZT1) into the marker groove as required.



5.3 Environment

Warning

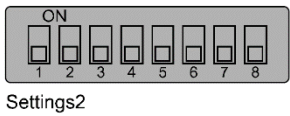
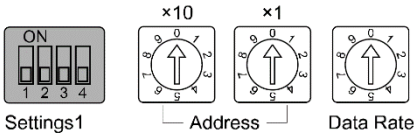
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

6 Setting

6.1 Switch Setting

- Open the display cover.
- Turn OFF the power before setting the switches.
- Set the switches using a small flat blade screwdriver, referring to the information below.
- After setting the switches close the cover and tighten the screw (Tightening torque: 0.3 to 0.4 N•m).

Address / Data rate switch setting



Address setting			Data Rate setting	
Address		Node Address	Data Rate	Communication speed
x10	X1			
0	0	0 (default)	0	125 kbps (default)
0	1	1	1	250 kbps
0	2	2	2	500 kbps
:	:	:	3	PGM *
6	2	62	:	
6	3	63	9	
6	4	PGM *		
:	:			
9	9			

\* When PGM is set, the data rate is set via the DeviceNet® network.  
Turn ON the HW/SW switch for setting.

V\_SEL switch setting

Select the number of outputs (size) occupied by the SI unit.

Settings1	Settings1		No. of valves	Output data size used by SI unit
	1	2		
OFF	OFF	OFF	32 outputs	4 bytes (default)
OFF	ON	OFF	24 outputs	3 bytes
ON	OFF	ON	16 outputs	2 bytes
ON	ON	ON	8 outputs	1 byte

\* Set the number of occupied valve outputs to at least the number of valves used.

Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for all other switch settings.

Baud rate setting switch      HW/SW selection switch  
Diagnostics allocation switch      Memory configuration switch  
HOLD / CLEAR setting switch

6 Setting (continued)

6.2 Configuration

An applicable EDS file is required to configure the SI unit in the DeviceNet® network. A special icon is also required to display the EX600 icon. Please download the latest EDS and icon files from the SMC website (URL: <https://www.smcworld.com>).

Product number	GSDML and icon files
EX600-SDN1A	ex600_sdn1_v22.zip
EX600-SDN2A	ex600_sdn2_v22.zip

Technical documentation giving detailed configuration information can be found on the SMC website (URL: <https://www.smcworld.com>).

7 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for How to order information.

8 Outline Dimensions (mm)

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

9 Maintenance

9.1 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.

10 LED Display

ST(M)   PWR   PWR(V)   MS   NS



SI unit status

LED	Description
ST(M) PWR PWR(V) OFF	Power supply for control and input is OFF.
ST(M) PWR PWR(V) Green LED's ON	The SI unit is operating normally.
ST(M) PWR PWR(V) ST(M) Red ON	Component failure inside the SI unit.
ST(M) PWR PWR(V) PWR Red ON	Power supply voltage for control and input is abnormal.
ST(M) PWR PWR(V) PWR(V) Red ON	Power supply voltage for outputs is abnormal.
ST(M) PWR PWR(V) ST(M) Green flashing	A unit other than the SI unit is detected.
ST(M) PWR PWR(V) ST(M) Red flashing	<ul style="list-style-type: none"><li>The valve ON/OFF counter has exceeded the set value.</li><li>The valve is short circuited or disconnected.</li></ul>
ST(M) PWR PWR(V) ST(M) Red/Green flashing alternately	<ul style="list-style-type: none"><li>Connection error between units.</li><li>Configuration memory error has occurred.</li></ul>

Communication status

LED	Description
MS NS OFF	Power supply for control and input is OFF.
MS NS MS Green ON, NS OFF	<ul style="list-style-type: none"><li>Check the node address.</li><li>Communication error.</li></ul>
MS NS MS and NS Green ON	Communication normal.
MS NS MS Green ON, NS flashing	Connection is not established.
MS NS MS Red ON, NS OFF	Component failure inside the SI unit.
MS NS MS Green ON, NS Red ON	Fatal communication error: <ul style="list-style-type: none"><li>Check and correct the node address.</li><li>Check that the communication speed of the PLC and the SI unit are the same.</li><li>Check for correct length of cable and check the cable is not loose/disconnected.</li><li>Ensure that a terminating resistor is properly connected.</li></ul>
MS NS MS Green ON, NS Red flashing	Minor communication error: <ul style="list-style-type: none"><li>Check that the communication speed of the PLC and SI unit are the same.</li><li>Check for correct length of the cable and check the cable is not loose/disconnected.</li><li>Ensure that a terminating resistor is properly connected.</li></ul>
MS NS MS and NS flashing Red/Green alternately	Performing self diagnostics test when power is supplied.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Product disposal

This product should 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](https://www.smcworld.com) or [www.smc.eu](https://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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