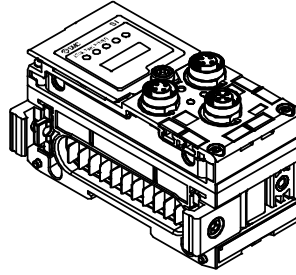




Instruction Manual

Fieldbus device - SI unit for PROFINET

EX600-SPN1 / -SPN2



The intended use of this product is to control pneumatic valves and I/O while connected to the PROFINET (and IO-Link) protocols.

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 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.

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 and IO-Link master 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)

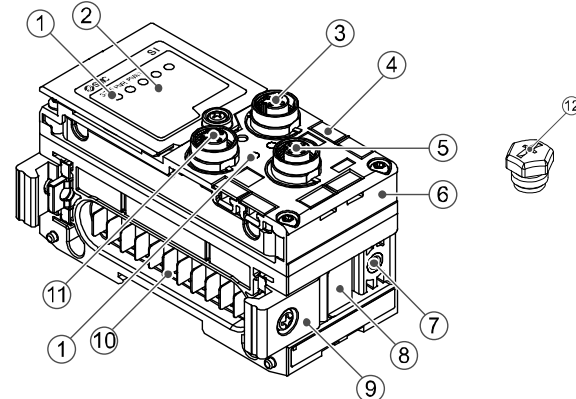
2.2 Electrical specifications

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	120 mA maximum	
Solenoid valve specification	Output type	EX600-SPN1	PNP / source (negative common)
		EX600-SPN2	NPN / sink (positive common)
	Number of outputs	32 outputs	
	Applicable valve series	24 VDC and 1.0 W max. Solenoid valve with lamp and surge voltage suppression (manufactured by SMC)	
	Output condition during communication error	HOLD / CLEAR / Force ON	
Protection function	Short circuit protection		

2.3 Communication specifications

Item	Specifications
Protocol	PROFINET IO (PROFINET RT)
Communication medium	Standard Ethernet cable (CAT5) (100BASE-TX)
Communication speed	100 Mbps
Occupied area (No. of IO)	512 inputs / 512 outputs maximum
Configuration file	GSDML-V2.3-SMC-EX600-***.xml

3 Name and function of parts



No	Part	Description
1	LED display	Displays the SI unit status.
2	Display cover	Display cover should not be opened.
3	Connector (BUS OUT)	Connector for Fieldbus Outputs.
4	Marker groove	Groove for identification marker.
5	Connector (PCI)	Connector for Handheld terminal.
6	MAC address label	Displays the 12 bit MAC address.
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 all unused M12 connectors.

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.

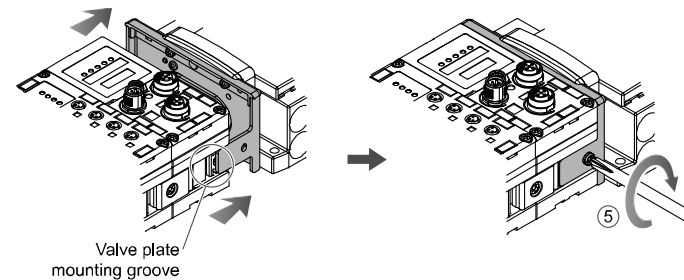
(3) Connect the SI unit. After connecting the required I/O units, connect the SI unit. The connection method is as above.

(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.

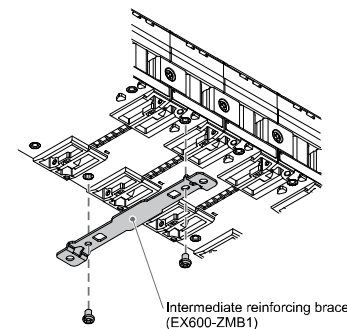
Then fix using the valve plate mounting screws (M4 x 6) supplied (Tightening torque: 0.7 to 0.8 N•m).



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.

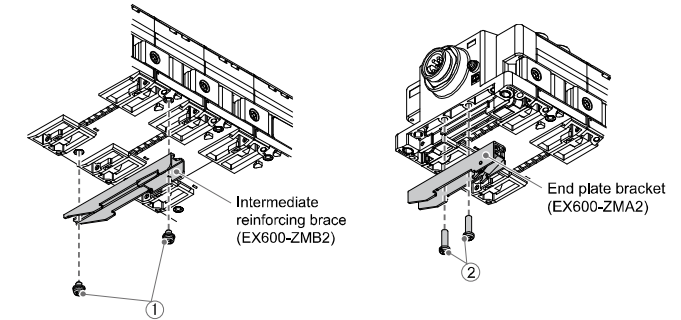
5 Installation (continued)

• 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).

(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).

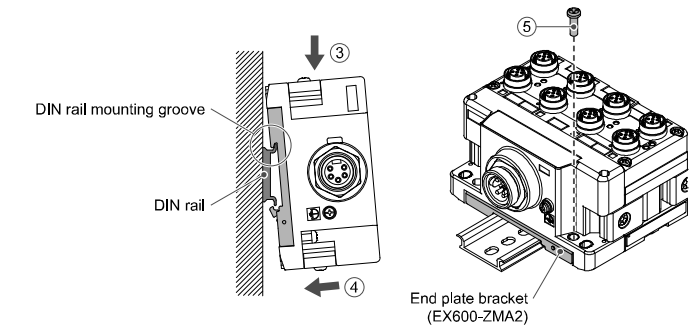


(3) Hook the DIN rail mounting groove on to the DIN rail.

(4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIN rail.

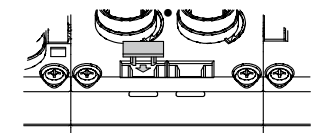
(5) Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 0.7 to 0.8 N•m).

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 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.



5.2 Environment

Warning

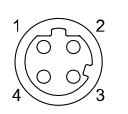
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of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

6 Wiring

6.1 Wiring connections

• Communication Connection

Select the appropriate cables to mate with the connectors on the SI unit. The PROFINET connection port pin layout is as shown below.

Connector	Pin No.	Signal name
BUS IN / BUS OUT		
	1	TD+
	2	RD+
	3	TD-
	4	RD-

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.

7 Settings

7.1 Configuration

Download the latest GSDML file and refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for further information on settings.

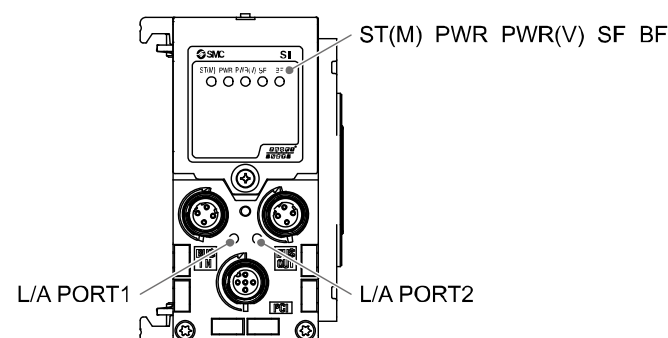
8 How to Order

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

9 Outline Dimensions (mm)

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

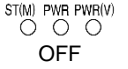



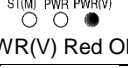
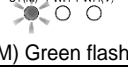


10 LED Display







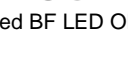
Display	Content
ST(M)	Displays the diagnostic status of the unit.
PWR	Displays the status of the power supply voltage for control and input.
PWR(V)	Displays the status of the power supply voltage for output.
SF	Displays the system status.
BF	Displays the communication status.
L/A PORT1	Displays the communication status of the BUS IN.
L/A PORT2	Displays the communication status of the BUS OUT.

10 LED Display (continued)

• SI unit status

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

• Communication status

LED	Description
 OFF	Communication with the PLC has been established, or the power supply for control and input is OFF.
 Red SF LED ON	Communication with the PLC has been established, but a diagnostic error has occurred.
 Red BF LED flashing	Configuration data of the PLC and EX600 are not consistent.
 Red BF LED ON	<ul style="list-style-type: none"> Power supply for the PLC is OFF. Cable not connected between PLC and SI unit. The PLC or SI unit is faulty. The PLC configuration data and the SI unit device name are not consistent.
 Green SF LED flashing	The SI unit received a Node flashing test command.

LED	LED colour	Content
L/A IN	OFF	BUS IN: No Link, No Activity
	Green ON	BUS IN: Link, No Activity
	Green flashing	BUS IN: Link, Activity
L/A OUT	OFF	BUS OUT: No Link, Activity
	Green ON	BUS OUT: Link, No Activity
	Green flashing	BUS OUT: Link, Activity

11 Maintenance

11.1 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.

12 Limitations of Use

12.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

13 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.

14 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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