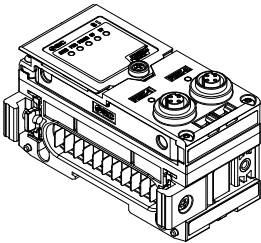




Instruction Manual  
Fieldbus device - SI unit for PROFINET  
EX600-MPN1



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) <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 64 stations (128 outputs) and up to 4 ITV modules in random order. In addition, up to 9 sets of input, output, input/output units, and IO-Link master units, including SI units, can be connected in random order.

2.1 General specifications

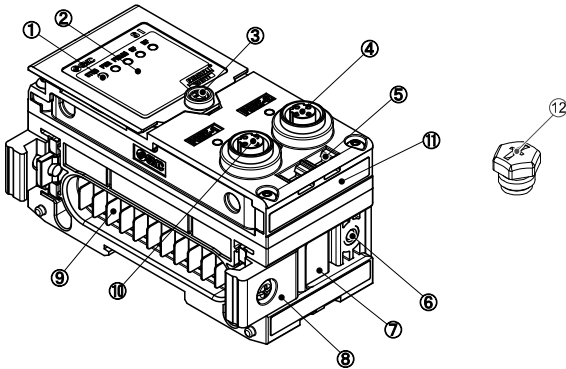
Item	Specifications
Enclosure rating	IP67 (with manifold assembled)
Ambient temperature	-10 to +50 °C
Ambient humidity	35 to 85% RH (no condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more
Weight	310 g

2 Specifications (continued)

2.2 Specifications

Model		EX600-MPN1
Communication	Protocol	PROFINET IO
	Conformance class	Class C (only for IRT switch function)
	Communication speed	100 Mbps
	Configuration file	GSDML file
Electrical	Applicable function	Fast start up MRP (Media redundancy protocol) System redundancy S2 Web server
	Power supply for control / input	24 VDC, Class 2, 1 A (US1)
	Internal current consumption (power supply for control / input)	170 mA or less
	Power supply for output	24 VDC, Class2, 2 A (US2)
Valve control	Applicable manifold series	Plug-in Connector Connecting Base (64-station Compatible Manifold)
	Number of outputs	Max. 128 outputs
	Output operation at network fault	HOLD / CLEAR / Force ON
	Protection	Short circuit protection (on the valve manifold)
ITV control	Applicable ITV series	Plug-in type electro-pneumatic regulator for manifold
	Number of modules	Max. 4 modules
	Protection	Short circuit protection

3 Name and function of parts



No	Part	Description
1	Status display LED	Displays the status of the unit.
2	Display cover	The display cover should not be opened.
3	Display cover screw	Do not loosen the screw.
4	Communication connector (PORT 2)	Connector for Fieldbus communication.
5	Marker groove	Groove for an identification marker.
6	Valve plate mounting screw hole	Holes for fixing the valve plate.
7	Valve plate mounting groove	Groove for mounting valve plate.
8	Joint bracket	Bracket for joining to adjacent units.
9	Unit connector (plug)	Connector for transmitting signals and power to adjacent units.
10	Communication connector (PORT 1)	Connector for Fieldbus communication.
11	MAC address label	12-digit MAC address unique for SI unit.
12	Seal cap	Seal cap for unused connectors (installed in PORT2).

4 Assembly

4.1 Assembling the unit

**Warning**

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

- (1) Connect a unit to the end plate. Digital, analogue or IO-Link master units can be connected in any order. Joint bracket screw tightening torque: 1.5 to 1.6 N•m.

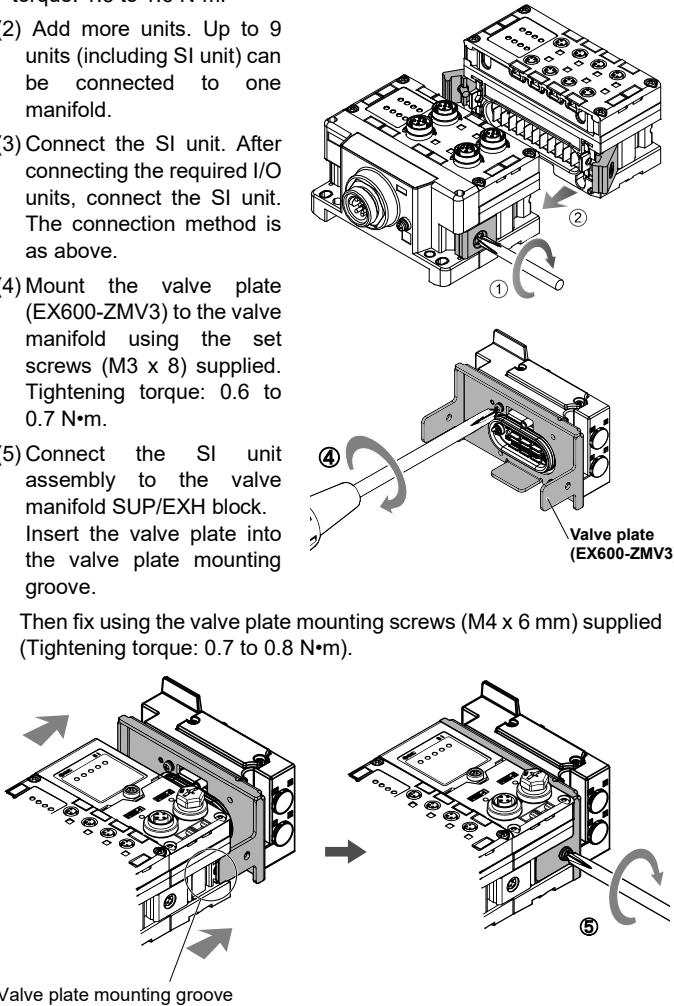
- (2) Add more units. Up to 9 units (including SI unit) can be connected to one manifold.

- (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-ZMV3) to the valve manifold using the set screws (M3 x 8) supplied. Tightening torque: 0.6 to 0.7 N•m.

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

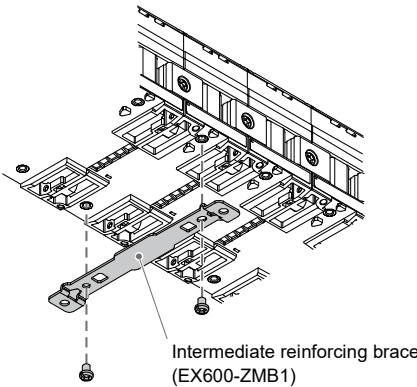
Then fix using the valve plate mounting screws (M4 x 6 mm) supplied (Tightening torque: 0.7 to 0.8 N•m).



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).

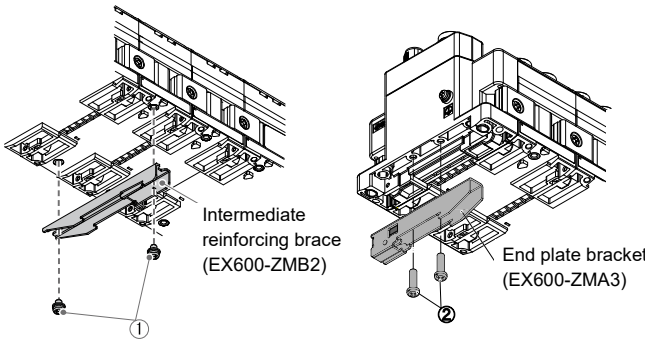


- (2) Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the SUP/EXH block assembly side while referring to the operation manual of the corresponding valve manifold or ITV module.

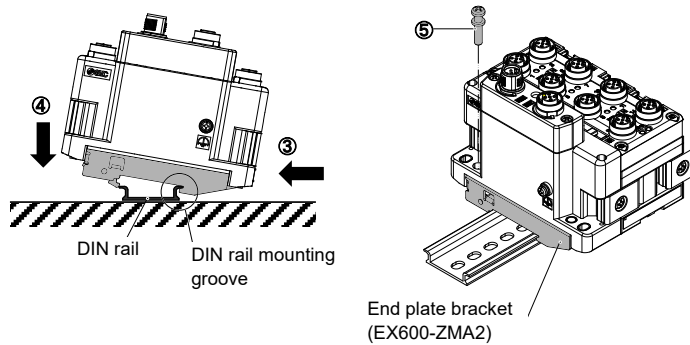
5 Installation (continued)

• **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-ZMA3) to the end plate using 2-M4 x 14 screws (Tightening torque: 0.7 to 0.8 N•m).

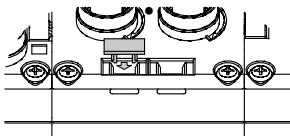


- (3) Hook the DIN rail mounting groove on to the DIN rail.
- (4) Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIN rail.
- (5) Fix the manifold by tightening the DIN rail fixing screws supplied of the EX600-ZMA3 (M4 x 20 mm). Tightening torque: 0.7 to 0.8 N•m. Fix the SUP/EXH block assembly while referring to the operation manual of the corresponding valve manifold or ITV module.



5.1 Identification marker

The signal name of the input or output devices and unit address can be written on a 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 specifications.
- Select the appropriate type of protection according to the environment of operation.  
IP67 protection is achieved when the following conditions are met.  
(1) The units are connected properly with fieldbus cable with M12 connector and power cable with M12 (M8) connector.  
(2) Suitable mounting of each unit and manifold valve.  
(3) Be sure to fit a waterproof cap on any unused connectors.
- Do not use in a place where the product could be splashed by oil or chemicals.
- Do not use in an area where electrical surges are generated.

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
PORT1 / PORT2		
	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

A GSDML file is required to configure the EX600 with the PLC.  
At the same time, a special icon is required to display the icon for EX600 in the software of the PLC.  
The GSDML and icon files can be downloaded from the SMC website  
(URL: <https://www.smcworld.com>).

Documents/Download >> Operation Manuals >> Fieldbus System  
Serial Transmission System >> PROFINET Compatible >> EX600-  
MPN1 >> Configuration File

GSDML file: GSDML-V2.41-SMC-EX600-MPN1-20230425.xml  
Icon file: GSDML-0083-0008-EX600\_N.bmp

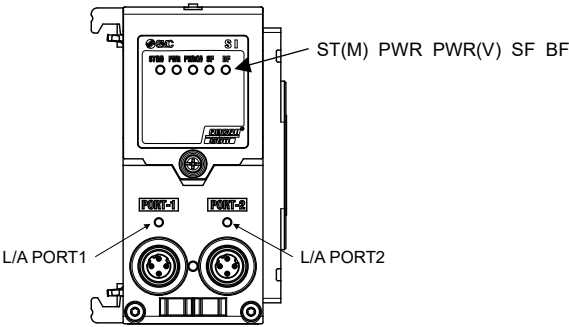
8 How to Order

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



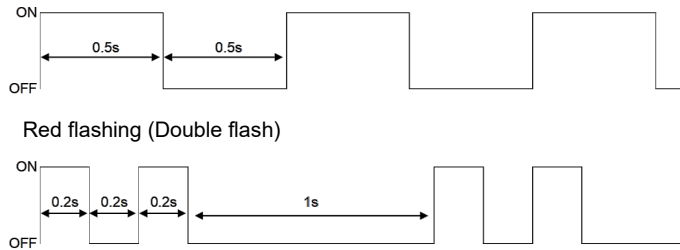
Display	Content
ST(M)	Displays the diagnostic status of the unit.
PWR	Displays the status of the power supply for control and input.
PWR(V)	Displays the status of the power supply for output.
SF	Displays the system status.
BF	Displays the communication status.
L/A PORT1	Displays the communication status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

10 LED Display (continued)

10.1 ST(M)-LED

LED display	Content
Green ON	Normal operation.
Green flashing	Diagnostic error in I/O unit is detected.
Red flashing (1 Hz)*	Any of the following diagnostic errors is detected. <ul style="list-style-type: none"><li>• Valve ON/OFF counter has exceeded the set value. (When diagnostic parameter is enabled)</li><li>• Valve is short-circuited.</li><li>• The connected valve stations have increased or decreased.</li></ul>
Red flashing (Double flash)*	Any of the following diagnostic errors is detected. <ul style="list-style-type: none"><li>• The power supply for ITV module is short-circuited.</li><li>• ITV module has failed.</li><li>• Internal communication error between SI unit and ITV module is detected.</li></ul>
Red/green flashing alternately	Internal communication error between SI unit and I/O unit is detected.
Red ON	SI unit has failed.

- ST(M) LED Flashing pattern  
Red flashing (1 Hz)



10.2 PWR-LED

LED display	Content
Green ON	Power supply voltage for control and input is correct.
Red ON	Power supply voltage for control and input is below 19 VDC (diagnostic parameter enabled).

10.3 PWR(V)-LED

LED display	Content
OFF	Power supply voltage for output is below 19 VDC (diagnostic parameter disabled).
Green ON	Power supply for output is correct.
Red ON	Power supply voltage for output is below 19 VDC (diagnostic parameter enabled).

10.4 SF-LED

LED display	Content
OFF	Normal operation
Red ON	Diagnostic error is detected.
Green flashing	Node flashing test.

10.5 BF-LED

LED display	Content
OFF	PROFINET communication is established.
Red flashing	The configuration data of PLC and actual EX600 configuration is not consistent.
Red ON	Either of the following conditions. <ul style="list-style-type: none"><li>• Device name setting to PLC and SI unit is not consistent.</li><li>• Power supply for PLC is OFF.</li><li>• Communication cable is not connected.</li><li>• The PLC or SI unit has broken.</li></ul>

10 LED Display (continued)

10.6 L/A PORT1-LED

LED display	Content
OFF	Port1 side: No Link, No Activity
Green ON	Port1 side: Link, No Activity
Green flashing	Port1 side: Link, Activity

10.7 L/A PORT2-LED

LED display	Content
OFF	Port2: No Link, No Activity
Green ON	Port2: Link, No Activity
Green flashing	Port2: 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](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor / importer.

SMC Corporation

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