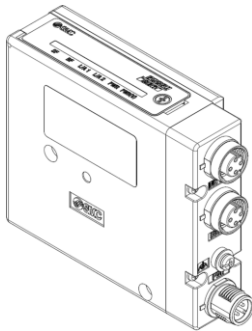




ORIGINAL INSTRUCTIONS

Instruction Manual  
Fieldbus device - SI Unit for PROFINET  
EX260-PPN1



The intended use of this SI Unit is for the control of pneumatic valves and I/O while connected to the PROFINET network.

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: Robots and robotic devices - Safety requirements for industrial robots - Part 1: 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.

**Caution**

- **Provide grounding to assure the safety and noise resistance of the Fieldbus system.**  
Individual grounding should be provided close to the product using a short cable.
- **When conformity to UL is required the SI Unit must be used with a UL1310 Class 2 power supply.**

2 Specifications

2.1 General specifications

Item	Specifications
Ambient temperature	-10 to +50 °C
Ambient storage temperature	-20 to +60 °C
Ambient humidity	35 to 85% RH (no condensate)
Withstand voltage	500 VAC applied for 1 minute (between FE and terminals)
Insulation resistance	500 VDC, 10 MΩ or more (between FE and terminals)
Operating atmosphere	No corrosive gas
Protection class	IP67 (IEC 60529) when connected to valve manifold
Dimensions (W x L x H) mm	34.2 x 102.4 x 76.5
Weight	200 g

2.2 Electrical specifications

Item		Specifications
Power supply for control / sensors (PWR)	Operating voltage	24 VDC +20% / -15%
	Current consumption	100 mA or less (at 24 VDC)
	Under voltage detection	Approx. 18 VDC
Power supply for valves (PWR(V))	Operating voltage	24 VDC +20% / -15%
	Voltage drop	1.2 VDC or less (at 24 VDC)
Protection against polarity reversal		Yes (PWR and PWR(V))
Galvanic isolation		Yes (between PWR and PWR(V))

\*1: SI Unit power supply voltage specification. Supply power according to the solenoid valve used.

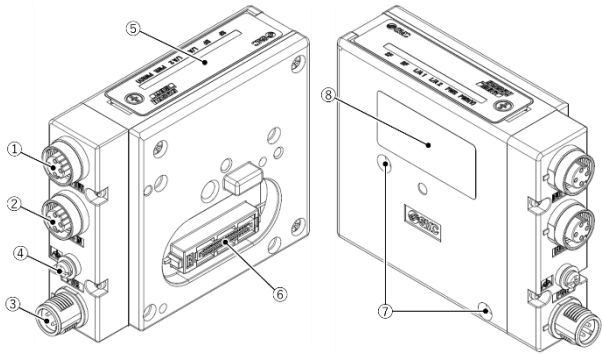
2.3 Manifold specifications

Item		Specifications
Applicable series		JSY series: Valve manifold integrated with ejector system
Pressure sensor (input)	Max. number of points	5
	Load	Digital pressure sensor with built-in manifold
Valve (output)	Max. number of points	24
	Load	Solenoid valve with voltage suppressor of 24 VDC, 0.5 W or less (SMC)
	Output type	Source / PNP (negative common)
	Over current protection/detection	Yes (per 1 output)

2.4 Communication specifications

Item	Specifications
Bus protocol	PROFINET IO
Version	PROFINET Specification Version 2.43
Conformance	Class C (only for IRT switch function).
FSU (Fast Start Up)	Yes
MRP (Media Redundancy Protocol)	Yes
MRPD (Media Redundancy for Planned Duplication)	Yes
Shared device	Yes
PROFIenergy	Yes
System redundancy S2	Yes
Net Load Class III of Security level 1	Yes
Vendor ID	0083h
Device ID	0030h
Configuration file	GSDML file

3 Name and function of parts



No	Part	Description
1	Fieldbus connector (BUS OUT)	PROFINET connection PORT2 (M12 4-pin socket, D-coded).
2	Fieldbus connector (BUS IN)	PROFINET connection PORT1 (M12 4-pin socket, D-coded).
3	Power supply connector	Power supply for control / sensors and valves (M12 4-pin plug, A-coded).
4	FE terminal	Functional Earth terminal (M3).
5	LED display	LED display to indicate the SI Unit status.
6	Valve manifold connection	Connection for the valve manifold.
7	Mounting hole	Mounting hole for connection to the valve manifold.
8	Product label	Label to indicate the SI Unit MAC address, Serial number, etc.

Accessories

Item	Description
Hexagon socket head cap screw	M3 x 30 mm, 2 pcs. For valve manifold connection.
Seal cap	Seal cap (1 pc.) for M12 unused connector.

4 Installation

4.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.
- For further details on mounting and installation to the valve manifold, refer to the valve manifold operation manual.
- The SI Unit must be connected to a valve manifold before supplying power.

4.2 Environment

**Warning**

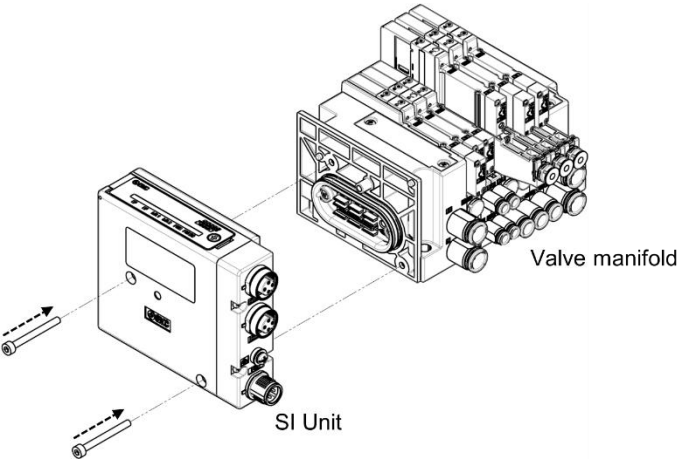
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.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

4.3 Mounting

**Caution**

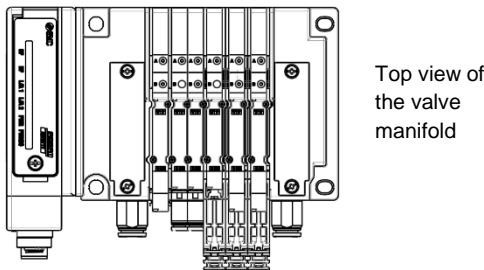
- Be sure to turn OFF the power.
- Check there is no foreign matter inside the SI Unit.
- Check there is no damage and no foreign matter on the gasket.
- If the SI Unit is not assembled correctly, the internal PCB's may be damaged or liquid and/or dust may enter into the SI Unit.
- Connect the SI Unit to the valve manifold with the 2 screws on the SI Unit (Hexagonal socket wrench size 2.5 mm).
- Tighten the mounting screws to the tightening torque specified (Tightening torque: 0.6 N·m). For a protection rating of IP67 to be assured, the recommended tightening torque must be applied.

4 Installation (continued)



4.4 Valve manifold mounting

- The SI Unit does not have any holes for mounting purposes. Refer to the relevant valve manifold operation manual for mounting details.



5 Wiring

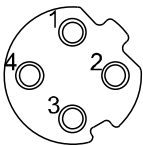
- Wiring must be carried out with the power supply turned OFF.

5.1 Communication Connectors (BUS IN and BUS OUT)

The SI Unit has 2 PROFINET communication connectors. Select the appropriate cable (SMC Part No. EX9-AC###EN-####) to mate with the PROFINET connectors mounted on the SI Unit.

- **Fieldbus interface connector**

BUS IN / BUS OUT: M12 4-pin socket, D-coded

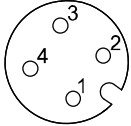


No.	BUS IN - Port1 (Type MDI)	BUS OUT - Port2 (Type MDI-X)
1	TD+ Transmit Data +	RD+ Receive Data +
2	RD+ Receive Data +	TD+ Transmit Data +
3	TD- Transmit Data -	RD- Receive Data -
4	RD- Receive Data -	TD- Transmit Data -

5.2 Power supply connector layout

- Select the appropriate cable (SMC Part No. EX500-AP0#0-#) to mate with the power supply connector mounted on the SI Unit.

PWR: M12 4-pin plug, A-coded



No.	Designation	Description
1	24 V (PWR(V))	+24 V for valves
2	0 V (PWR(V))	0 V for valves
3	24 V (PWR)	+24 V for control/sensors
4	0 V (PWR)	0 V for control/sensors

- The power supply line for control/sensors and power supply line for valves are isolated. Be sure to supply power respectively. Either single source power or two different power supplies can be used.
- The 24 VDC supply for control/sensors (PWR) and the 24 VDC supply for the valves (PWR(V)) should be protected with an external fuse.

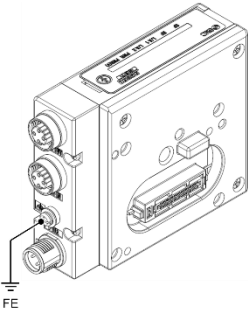
**Warning**

- 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 Wiring (continued)

5.3 FE Terminal

- The SI Unit must be connected to FE (Functional Earth) to divert electromagnetic interference.
- Connect a grounding cable from the FE terminal screw on the SI Unit to the nearest functional earth point.
- The grounding cable should be as thick and short as reasonably possible.
- The recommended tightening torque for the FE terminal is 0.3 N•m.



6 Setting

6.1 Configuration

The appropriate GSDML file is required to configure the SI Unit with software of PROFINET IO controller.  
The GSDML file contains all of the necessary information to configure the SI Unit using the software of PROFINET IO controller.  
The appropriate symbol file is also required to display the icon of the SI Unit on the software of the IO controller.

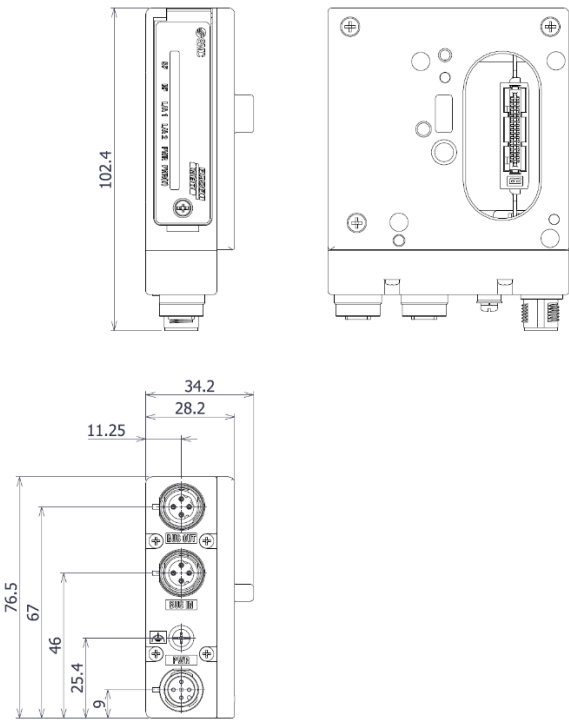
Item	Name
GSDML file	GSDML-V2.43-SMC-EX260-PPN1-*****.xml
Symbol file	GSDML-0083-0030-EX260.bmp

The GSDML file can be downloaded from the SMC website (URL: <https://www.smcworld.com>).

7 How to Order

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

8 Outline Dimensions (mm)




9 LED Display

LED	Indication	Description
SF	OFF	No diagnostic information
	Red ON	One of the following may have occurred. (Fault alarm) <ul style="list-style-type: none"><li>• Valve has a short circuit.</li><li>• The number of connected sensors is less than the module setting or a sensor has a communication error.</li></ul>
	Green flashing (1 Hz)	One of the following may have occurred. (Maintenance required alarm) <ul style="list-style-type: none"><li>• Power supply for control/sensors is low state. (&lt; approx. 18 VDC)</li><li>• Valve protection is operating.</li><li>• Output count exceeded the limit value.</li><li>• Energy saving parameter has an error.</li></ul>
BF	OFF	No diagnostic information
	Red ON	One of the following may have occurred. (Bus fault) <ul style="list-style-type: none"><li>• There is no connection to the IO Controller, or the connection has an error.</li><li>• The Device name stored in the SI Unit does not match the configured Device name.</li><li>• The configuration is not correct.</li><li>• The SI Unit detects a fault via the PROFINET function.</li></ul>
	Green / Orange ON	Communication Port 1 (BUS IN) is connected to the Ethernet communication network and data is being sent and received.
L/A1	Green ON	Communication Port 1 (BUS IN) is connected to the Ethernet communication network and no data is being sent or received.
	OFF	Communication Port 1 (BUS IN) is not connected to the Ethernet communication network.
	Green / Orange flashing (1 Hz)	Flash request to locate the device is received. (flashing simultaneously with L/A2)
L/A2	Green / Orange ON	Communication Port 2 (BUS OUT) is connected to the Ethernet communication network and data is being sent and received.
	Green ON	Communication Port 2 (BUS OUT) is connected to the Ethernet communication network and no data is being sent or received.
	OFF	Communication Port 2 (BUS OUT) is not connected to the Ethernet communication network.
PWR	Green / Orange flashing (1 Hz)	Flash request to locate the device is received. (flashing simultaneously with L/A1)
	Green ON	Power supply for control/sensors (PWR) is present.
	Green flashing (1 Hz)	Power supply for control/sensors (PWR) is present but is low. (< approx. 18 VDC)
PWR(V)	OFF	Power supply for control/sensors (PWR) is not present.
	Green ON	Power supply for valves (PWR(V)) is present.
	OFF	Power supply for valves (PWR(V)) is low or is not present.

10 Maintenance

10.1 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.

11 Limitations of Use

11.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Product Disposal

This product shall 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)  
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan  
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