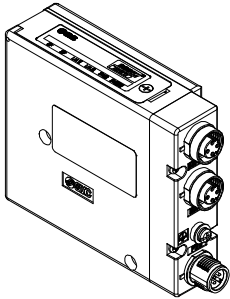




ORIGINAL INSTRUCTIONS

Instruction Manual
Fieldbus device - SI unit for PROFINET
EX260-MPN1



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)^{*)}, and other safety regulations.

^{*)}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.

	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Caution	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.
- Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for further Safety Instructions.

2 Specifications

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
Operating atmosphere	No corrosive gas
Enclosure protection class	IP67 (IEC 60529)
Weight	200 g or less
Dimensions (W x L x H) mm	28.2 x 102.4 x 76.5

2.2 Electrical specifications

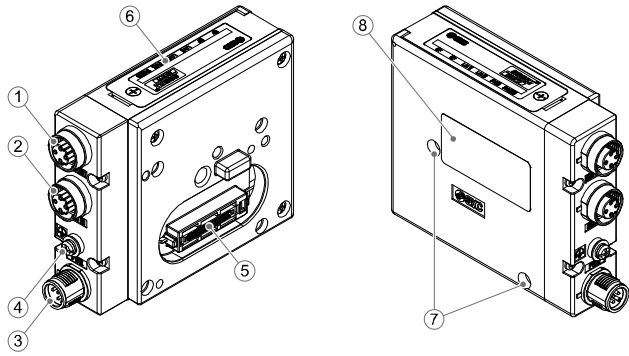
Item		Specifications
PWR For logic	Operating voltage	24 VDC +20% / -15%
	Under voltage detection	Less than 18 VDC approx.
	Internal current consumption at 24 VDC	150 mA or less
	Supply interruption for no loss of function	1 ms max. (depending on number of valve stations)
PWR(V) For valves *1	Operating voltage	24 VDC +20% / -15%
	Max. current	3 A
	Voltage drop to valve supply	1.2 V max. at 24 VDC
Protection against polarity reversal		Yes (PWR and PWR(V))
Galvanic isolation		Yes (between PWR and PWR(V))
Solenoid valve specification	Applicable valve series	64-station compatible manifold series
	Maximum number of valve outputs	128
	Over current detection / protection	Yes (on the valve manifold)

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

2.3 Communication specifications

Item	Specifications
Protocol	PROFINET IO
Conformance class C	Yes (only for IRT switch function).
Transmission medium	Standard Ethernet cable (CAT5) (100BASE-TX)
Transmission speed	100 Mbps
FSU (Fast Start Up)	Yes
MRP (Media Redundancy Protocol)	Yes
MRPD (Media Redundancy for Planned Duplication)	Yes
Shared device	Yes
PROFenergy	Yes
System redundancy S2	Yes
Security level 1 Net Load Class III	Yes
Vendor ID	0083h
Device ID	0016h
GSD configuration file	GSDML-V2.41-SMC-EX260-MPN1-*****.xml

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 valves and logic of the SI unit (M12 4-pin plug, A-coded).
4	Ground terminal	Functional Earth terminal (M3).
5	Output connector	Output signal interface for valve manifold.
6	LED display	LED display to indicate the SI unit status.
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

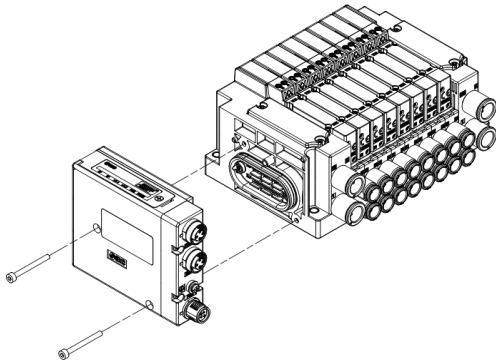
4.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Assemble the SI unit to the valve manifold using the 2 screws supplied (Hexagonal socket wrench size 2.5 mm).
- Tighten the screws while holding the SI unit and the valve manifold so that there is no gap between them.
- Tighten the screws with the tightening torque specified: 0.6 N•m. For a protection rating of IP67 to be ensured, apply the recommended tightening torque.

4.2 Assembly Precautions

- Be sure to switch OFF the power.
- Check there is no foreign matter inside the SI unit.
- Check there is no damage and no foreign matter stuck to the gasket.
- Be sure to tighten the screws with the specified torque.
- If the SI unit is not assembled properly, the internal PCBs may be damaged or liquid and/or dust may enter into the unit.



4 Installation (continued)

4.3 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 specifications.
- Do not use in a place where the product could be splashed by oil or chemicals.
- Do not use in an area where surges are generated.
- Do not operate close to a heat source, or in a location exposed to radiant heat.
- Do not use the product in an environment that is exposed to temperature cycles.
- Do not expose the product to direct sunlight or UV light.

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

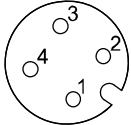


No.	BUS IN - Port1 (Type MDI)	BUS OUT - Port2 (Type MDI-X)
1	TD+ Transmit Data +	RD+ Receive Data +
2	RD+ Receive Data +	TD+ Transmit Data +
3	TD- Transmit Data -	RD- Receive Data -
4	RD- Receive Data -	TD- Transmit Data -

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 solenoid valve
2	0 V (PWR(V))	0 V for solenoid valve
3	24 V (PWR)	+24 V for SI unit operation
4	0 V (PWR)	0 V for SI unit operation

- The power supply for the solenoid valve and SI unit operation 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 logic (PWR) and the 24 VDC supply for the valves (PWR(V)) should be protected with an external fuse.

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 of a rotation, leading to a reduction in man hours. 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.

5.3 Ground 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 possible (tightening torque = 0.6 N•m).
- Resistance to ground should be 100 ohms or less.

6 Setting

6.1 Configuration

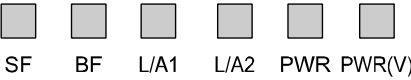
- The SI Unit is a modular station that consists of several modules. Set up your PROFINET IO Controller software to reflect the configuration of your system.
- In order to configure the SI Unit with your PROFINET IO Controller's software the appropriate GSD file and symbol file are required. The GSD file contains all of the necessary information to configure the SI Unit using the PROFINET IO Controller's software.

Current GSD file and symbol file names are as follows:

- GSD file: GSDML-V2.41-SMC-EX260-MPN1-*****.xml
- Symbol file: GSDML-0083-0016-EX260.bmp

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

7 LED Display



LED	Description	Colour
SF	Faults related to operation	Red
	Maintenance alarm	Green
BF	Bus fault, Configuration fault	Red
L/A1	A combination of Link LED and Act LED Connection via PROFINET on BUS IN, and Data exchange on BUS IN	Green / Orange
L/A2	A combination of Link LED and Act LED Connection via PROFINET on BUS OUT, and Data exchange on BUS OUT	Green / Orange
PWR	Supply for the logic	Green
PWR(V)	Supply for the valves	Green

7.1 SF and BD LED

SF	BF	Meaning
OFF	OFF	No fault (SI Unit is currently exchanging data with the IO Controller without errors).
ON Red	-	One of the following may have occurred: <ul style="list-style-type: none">• The valve coil has a short circuit.• Physical connection between manifold/station(s) has been broken during operation.• Supply voltage PWR is below the permissible level (lower than approx. 18 VDC).• Valve manifold not connected correctly (SI unit detected 0 or more than 64 valve stations).
-	ON Red	One of the following may have occurred: <ul style="list-style-type: none">• Connection to the IO Controller is not present, or the connection is broken.• Device name does not match the name in the configuration.• Incorrect GSD file has been used.• The configuration data sent by the IO Controller does not match the actual layout. (e.g., the quantity of '8 valve' modules configured exceeds the actual connected quantity of valve stations).
Green flashing at 1 Hz	-	A maintenance alarm has been generated. Alarms are only generated when the 'valve counter limit' parameter is set to Enable and the number of valve output cycles exceeds the set value of the 'Counter limit value' parameter.

7.2 PWR LED

PWR	Meaning
OFF	PWR is not present.
Green flashing at 1 Hz	PWR is present but is below the permissible level (lower than approx. 18 VDC).
ON Green	PWR is present.

7 LED Display (continued)

7.3 PWR(V) LED

PWR(V)	Meaning
OFF	PWR(V) is not present or is below the permissible level.
ON Green	PWR is present.

7.4 L/A LED

L/A 1, L/A 2	Meaning
Green / Orange ON	Connection via Ethernet to the SI Unit via BUS IN / BUS OUT connectors. Transmission or reception of Ethernet telegrams on BUS IN / BUS OUT connectors.
ON Green	Connection via Ethernet to the SI Unit via BUS IN / BUS OUT connectors No transmission or reception of Ethernet telegrams on BUS IN / BUS OUT connectors.
OFF	No connection established via BUS IN / BUS OUT connectors
Green / Orange flashing at 1 Hz	Received node flash request. The L/A 1 and L/A 2 LED's flash at the same time regardless of the connection status.

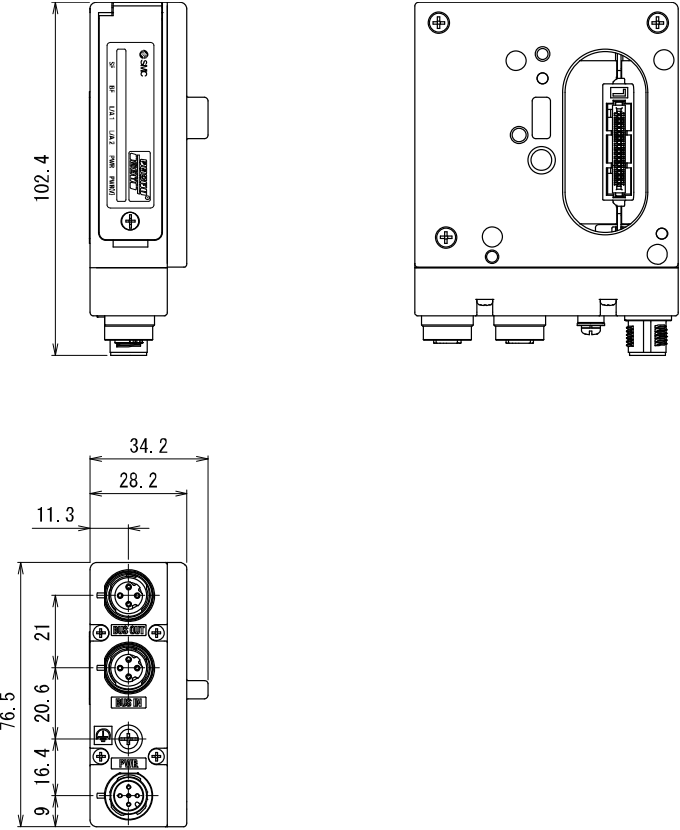
7.5 LED indicator during energy saving mode

- The SI Unit goes into energy saving mode when the SI Unit receives the PROFenergy command.
In energy saving mode all LED's are OFF except PWR is flashing Green for 0.5 sec. ON ⇔ 3 sec. OFF.

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)



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 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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