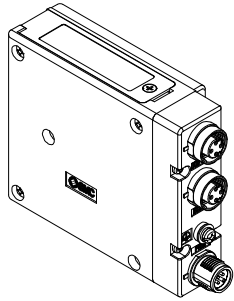




ORIGINAL INSTRUCTIONS

Instruction Manual

**Fieldbus device - SI unit for PROFINET
EX260-SPN1 / SPN2 / SPN3 / SPN4**


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 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.

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

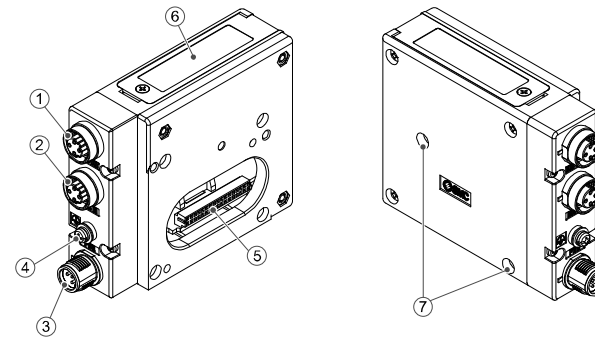
Item	Specifications
Ambient temperature	-10 to +50 °C
Ambient humidity	35 to 85%RH (No condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more
Operating atmosphere	No corrosive gas
Enclosure	IP67
Weight	200 g or less

2.2 Electrical specifications

Item		Specifications	
Power supply voltage range / current consumption	Controller power supply	21.6 to 26.4 VDC 0.1 A max.	
	Solenoid valve power supply	22.8 to 26.4 VDC 2.0 A or less, according to the solenoid valve station specification	
Solenoid valve specification	Output type	EX260-SPN1 EX260-SPN3	PNP (negative common) / source
		EX260-SPN2 EX260-SPN4	NPN (positive common) / sink
	Output condition at the time of communication error	HOLD / CLEAR / Force ON	
	Connected load	Solenoid valve with surge voltage suppressor of 24 VDC and 1.0 W or less (manufactured by SMC)	
	Insulation type	Photo coupler	
	Residual voltage	0.4 VDC or less	

2.3 Communication specifications

Item	Specifications	
Protocol	PROFINET IO (PROFINET RT) (specification version 2.3)	
Transmission medium	Standard Ethernet cable (CAT5) (100BASE-TX)	
Transmission speed	100 Mbps	
Number of outputs	EX260-SPN1 EX260-SPN2	32 outputs
	EX260-SPN3 EX260-SPN4	16 outputs
Vendor ID	0083 hex	
Device ID	0001 hex	
Conformance class	Class C (only for IRT switch function)	
Applicable function	FSU (Fast Start Up) MRP (Media Redundancy Protocol)	
Configuration file	GSD file (download from the SMC website)	

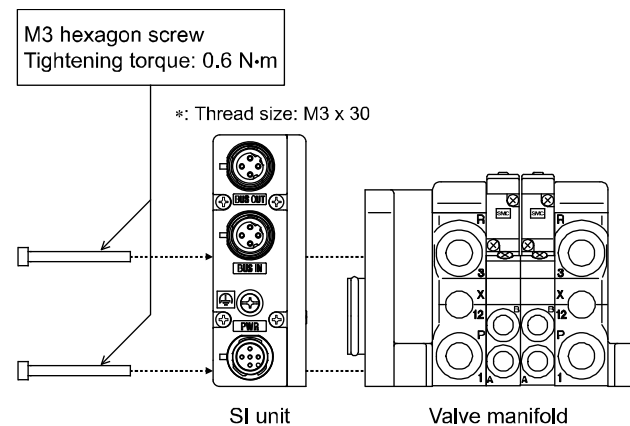
3 Name and function of parts


No	Part	Description
1	Fieldbus connector (BUS OUT)	PROFINET connection PORT2 (M12 4-pin socket, D-coded)
2	Fieldbus connector (BUS IN)	PROFINET connection PORT 1 (M12 4-pin socket, D-coded)
3	Power supply connector	Power supply for valves and operation of SI unit (M12 5-pin plug, A-coded)
4	Ground terminal	Functional Earth (M3)
5	Output connector	Output signal interface for valve manifold
6	LED display	Bus status specific and SI unit status LED's
7	Mounting hole	Mounting hole for connection to the valve manifold

4 Installation
4.1 Installation
Warning

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

- General instructions on installation and maintenance**
Connect the valve manifold to the SI unit.
- Assembly and disassembly of the SI unit**


4.2 Replacement of the SI unit

- Remove the M3 hexagon screws from the SI unit and release the SI unit from the valve manifold.
- Replace the SI unit.
- Tighten the screws with the specified tightening torque. (0.6 N·m)

4 Installation (continued)
4.3 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.

4.4 Connecting Cables

Select the appropriate cables to mate with the connectors mounted on the SI unit.

Fieldbus interface connector layout

BUS OUT: M12 4-pin socket, D-coded (SPEEDCON)

No.	Designation	Description
1	TD+	Transmit Data +
2	RD+	Receive Data +
3	TD-	Transmit Data -
4	RD-	Receive Data -

BUS IN: M12 4-pin socket, D-coded (SPEEDCON)

No.	Designation	Description
1	TD+	Transmit Data +
2	RD+	Receive Data +
3	TD-	Transmit Data -
4	RD-	Receive Data -

Power supply connector layout

PWR: M12 4-pin plug, A-coded (SPEEDCON)

No.	Designation	Description
1	SV24V	+24 V for solenoid valve
2	SV0V	0 V for solenoid valve
3	SI24V	+24 V for SI unit operation
4	SI0V	0 V for SI unit operation
5	-	Not used

- 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.

NOTE

When conformity to UL is required the SI unit must be used with a UL1310 Class 2 power supply.

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.

4.5 Ground Terminal

- Connect the ground terminal to ground.
- Individual grounding should be provided close to the product with a short cable to assure the safety and noise resistance of the Fieldbus system.
- Resistance to ground should be 100 ohms or less.

4.6 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.

5 Setting

5.1 Configuration

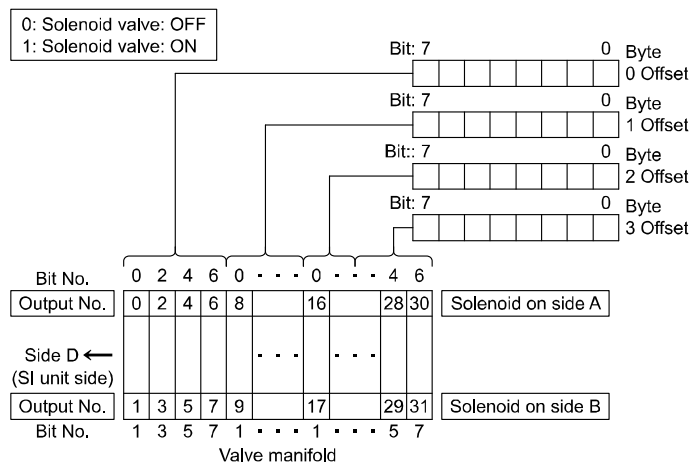
An applicable GSD file is required to configure the SI unit in the PROFINET network. Please download the latest GSD file from the SMC website (URL: <https://www.smcworld.com>).

Product number	GSD file
EX260-SPN1 / -SPN2	GSDML-V2.3-SMC-EX260-*****.xml
EX260-SPN3 / -SPN4	

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

5.2 Output number assignment

Output numbering starts at zero and refers to the solenoid position on the manifold.



6 How to Order

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

7 Outline Dimensions (mm)

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

8 LED Display



LED	Status	Description
SF	OFF	Operating normally
	Red ON	<ul style="list-style-type: none"> SI unit related diagnostic error detected (load voltage for valve not supplied or outside specification). Configuration data registered in master and the number of output points does not match.
BF	OFF	Operating normally
	Red Flashing	<ul style="list-style-type: none"> PROFINET communication is not established. IP address / device name duplicated. Configuration data registered in master and the profile of the SI unit does not match.
	Red ON	Both BUS IN and BUS OUT are not linked.
L/A1	Green ON	BUS IN: Link
	Green OFF	BUS IN: No Link
	Yellow Flashing	BUS IN: Activity
	Yellow OFF	BUS IN: No Activity
L/A2	Green ON	BUS OUT: Link
	Green OFF	BUS OUT: No Link
	Yellow Flashing	BUS OUT: Activity
	Yellow OFF	BUS OUT: No Activity
PWR	Green ON	SI unit operating voltage supplied
	OFF	SI unit operating voltage not supplied
PWR(V)	Green ON	Load voltage for valves supplied.
	OFF	Load voltage for valves not supplied or outside tolerance range (19 V or less).

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 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

11 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.

12 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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 Specifications are subject to change without prior notice from the manufacturer.
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