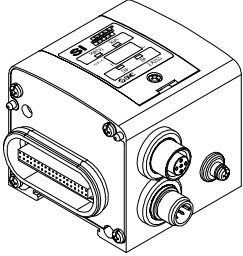




ORIGINAL INSTRUCTIONS

Instruction Manual
Fieldbus device - SI unit for PROFIBUS-DP
Series 56-EX250-SPR1-X42

II 3G Ex ec IIC T4 Gc 5°C ≤ Ta ≤ 45°C
II 3D Ex tc IIIC T66°C Dc IP67



The intended use of this SI unit is for the control of pneumatic valves.

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.

ATEX Marking Description	
II 3G Ex ec IIC T4 Gc 5°C ≤ Ta ≤ 45°C	
II 3D Ex tc IIIC T66°C Dc IP67	
Equipment Group II	T4 - Temperature classification tc -
Category 3	protected by enclosure
Gas (G) and Dust (D) environment	IIIC – for all types of dust
Ex - European standards apply	T66°C - Max. surface temperature
ec – Increased safety	Ta – ambient temperature
IIC - for all types of gas	IP67 - Protection structure

Based on the conformity assessment carried out by SMC Corporation.

Certificate Number: SMC 21.0006 X

If the Certificate number includes an X, special conditions for safe use apply as follows:-

- Protect the product from sources of heat which can generate surface temperatures higher than the temperature classification.
- Protect the product and cables against all impact or mechanical damage using a suitable ATEX compliant enclosure.
- Protect the product from direct sunlight or UV light using a suitable protective cover.

1 Safety Instructions (continued)

- Do not disconnect the M12 connectors before first switching off the power supply.
- Use only ATEX approved connectors and use only shielded cable to provide grounding.
- Use only a damp cloth to clean the product to avoid electrostatic discharge.

2 Specifications

2.1 General specifications

Item	Specification
Ambient temperature	+5 °C to +45 °C
Ambient humidity	35 to 85% RH (no condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC for 1 minute
Insulation resistance	500 VDC min. 10 MΩ
Operating environment	No corrosive gas or dust

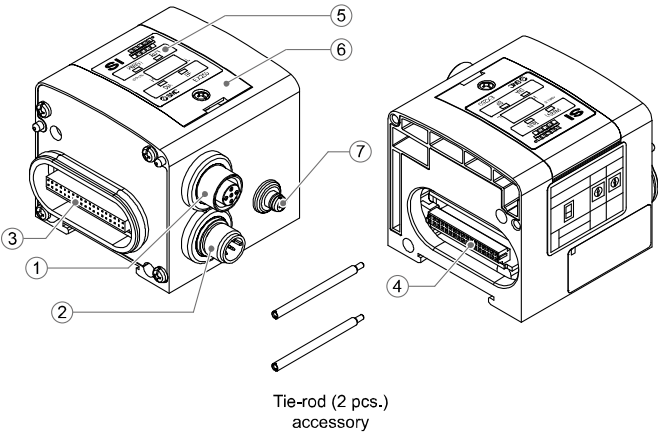
2.2 Electrical specifications

Item	Specification
Power supply voltage range / current consumption	Power supply for SI unit / Input blocks 19.2 to 28.8 VDC 1.1 A maximum, depending on number of input blocks and sensor specifications. Inside SI unit: 0.1 A max.
	Power supply for solenoid valve / outputs 22.8 to 26.4 VDC 2.0 A maximum, depending on number of solenoid valve stations / specification
Solenoid valve specification	Output type PNP (negative common) / source
	Connected load Solenoid valve with surge voltage suppressor of 24 VDC and 1.5 W or less (manufactured by SMC)
	Insulation type Photo coupler
	Residual voltage 0.3 VDC or less

2.3 Communication specifications

Item	Specification
Protocol	PROFIBUS-DP (EN50170, EN50254)
BUS Interface	EIA RS485
Communication from	Token passing
Transmission rate (kbps)	9.6, 19.2, 45.45, 93.75, 187.5, 500, 1500, 12000
Transmission media	STP cable
Connected nodes	125 stations maximum
Network topology	Bus, Tree, Star
Cable length	23 km maximum (repeater needed)
Freeze mode	Available
Sync mode	Available
Number of Inputs	32 inputs
Number of Outputs	32 outputs
ID number	1408 hex (SW setting mode) 1409 hex (HW setting mode)

3 Names and function of Individual parts



No	Part	Description
1	Communication connector	Connect to PROFIBUS-DP.
2	Power supply connector	Supply power to the SI unit, input blocks, solenoid valve and outputs.
3	Input block connector	Connect to the Input block.
4	Output block connector	Connect the solenoid valve and Output block.
5	Display	LED display to show the SI unit status.
6	Switch cover	Switches under cover for setting station number and baud rate.
7	Ground terminal	Connect to Ground.

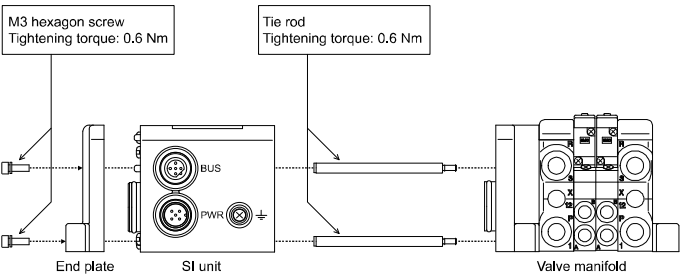
4 Installation

4.1 Installation

Warning

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

• Assembly and disassembly of the units



4.2 Assembly of the SI unit

- Hold the SI unit and the Input / Output blocks together in order to ensure there is no gap between them, while tightening the screws.
- Tighten the screws with the specified tightening torque (0.6 N•m).

4.3 Assembly Precautions

- Be sure to turn off the power supply.
- 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.

4.4 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.

4 Installation (continued)

4.5 Cable Connection

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

○ Communication connector

BUS: M12 5-pin socket (reverse)

No.	Designation	Description
1	VP	Supply voltage to terminating resistor
2	A-N	Send / receive data - Negative
3	DGND	Ground for terminating resistor
4	B-P	Send / receive data - Positive
5	N.C.	Not used

- Use a Bus Tee connector for communication, for example Turck VB2/FSW/FKW/FSW45 or equivalent.
- Align the key groove of the PROFIBUS communication cable (plug) with the communication connector (socket).
- Tighten the locknut on the cable by turning it clockwise by hand.
- Confirm that the connector portion does not move.

○ Power supply connector

PWR: M12 5-pin plug

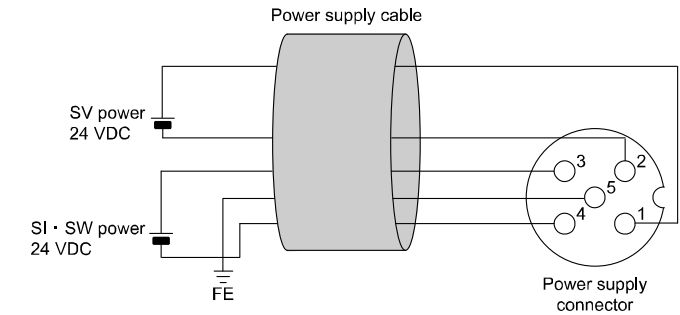
No.	Designation	Description
1	SV 24V	24 V for solenoid valve / outputs
2	SV 0V	0 V for solenoid valve / outputs
3	SI 24V	24 V for SI unit / inputs
4	SI 0V	0 V for SI unit / inputs
5	FE	Ground connection

4.6 Connecting single or dual power supplies

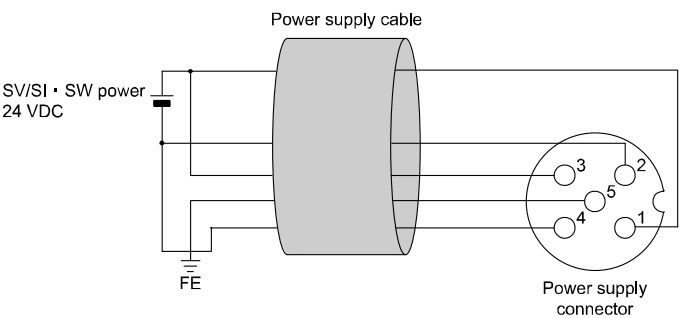
- Both single and dual power supply systems can be adopted, however the wiring shall be made separately (for solenoid valves / outputs and

for input and control) for either system.

• Dual Power supplies



• Single Power supply



4.7 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.
- Leave the power supply connector pin 5 not grounded, in order to

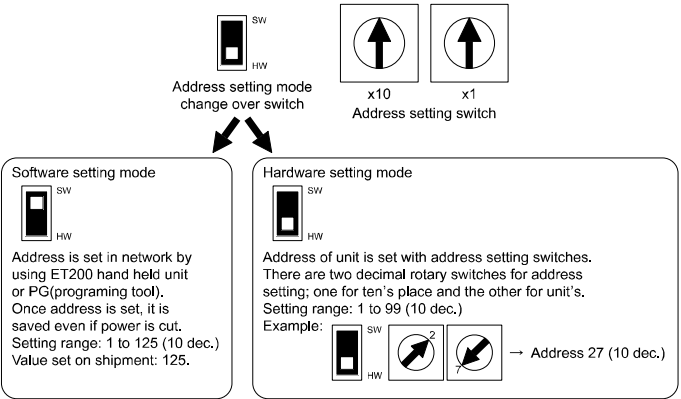
56-EX250-TF2Z324EN
ground in one point only.

5 Setting

5.1 Switch Setting

- The switches should only be set with the power supply turned off.
- Open the switch protection cover and set the switches with a small flat blade screwdriver.
- Be sure to set the switches before use.
- After setting the switches close the protection cover and tighten the screw with the specified tightening torque (tightening torque: 0.6 N•m).

- Address Setting



* When software setting mode is selected, address setting switches are not active. Moreover, software setting mode and hardware setting mode differ in ID numbers of units.

5.2 Configuration

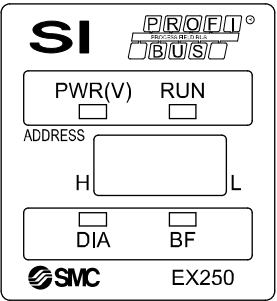
In order to configure the SI unit for the PROFIBUS DP network, the appropriate device master file (GSD file) for the SI unit will be required. The GSD file for this product depends on the address setting mode

(selected by the address setting mode switch).

GSD file	
SW setting mode	SMCA1408.gsd
HW setting mode	SMCA1409.gsd

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

6 Display



LED	Description	
PWR(V)	OFF	Power supply for solenoids is outside of specification (19 V or less).
	Green ON	Power supply for solenoids is ON
RUN	OFF	Power supply for SI unit is not supplied
	Green ON	Power supply for SI unit is ON
DIA	Red ON	Error detected by diagnostics
BF	Red ON	Bus failure detected

7 Maintenance

7.1 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.

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 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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