



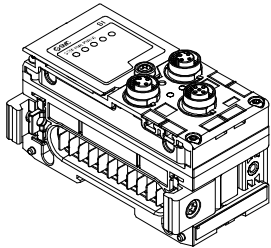
ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - SI unit for PROFINET

Series 56-EX600-SPN1-X10

II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C
II 3D Ex tc IIIC T82°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.

| Ex Marking Description | |
|---|------------------------------------|
| II 3G Ex ec IIC T4 Gc -10°C ≤ Ta ≤ 50°C II 3D Ex tc IIIC T82°C Dc IP67 | |
| Equipment Group II | tc - protected by enclosure |
| Category 3 | IIIC - for all types of dust |
| Gas (G) and Dust (D) environment | T82°C - Max. surface temperature |
| Ex - European standards apply | Gc/Dc - Equipment Protection Level |
| ec – Increased safety | Ta - ambient temperature |
| IIC - for all types of gas | IP67 - Protection structure |
| T4 - Temperature classification | |

Based on the conformity assessment carried out by SMC Corporation.

Certificate Number: SMC 20.0009 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 greater than the temperature classification.
- Protect the product and cable connections against all impact or mechanical damage using a suitable Ex compliant enclosure.

1 Safety Instructions (continued)

- Protect the product from direct sunlight or UV light using a suitable protective cover.
- Do not disconnect the M12 connectors before first switching OFF the power supply.
- Use only Ex approved connectors and use shielded cable to provide grounding.
- Use only a damp cloth to clean the product to avoid an electrostatic charge.

2 Specifications

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 |
| Weight | 300 g |

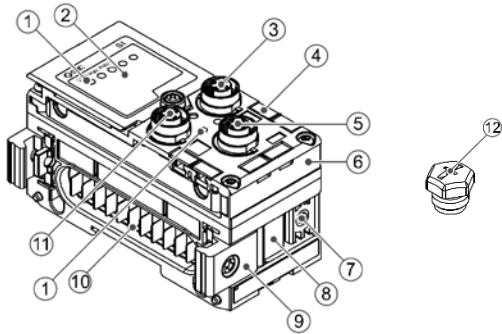
Electrical specifications

| Item | | Specifications |
|--|---|--|
| Power supply voltage range / current consumption | Control and Input power supply | 24.0 VDC 2.0 A max. |
| | Solenoid valve and Output power supply | 24.0 VDC 2.0 A max. |
| | Internal current consumption | 120 mA maximum |
| Solenoid valve specification | Output type | PNP / source (negative common) |
| | Number of outputs | 32 outputs |
| | Output condition at the time of communication error | HOLD / CLEAR / Force ON |
| | Connected load | 24 VDC and 1.0 W max. Solenoid valve with LED and surge voltage suppression (manufactured by SMC) |
| | Protection function | Short circuit protection |

Communication specifications

| Item | Specifications |
|----------------------------|---|
| Protocol | PROFINET IO (PROFINET RT) |
| Transmission medium | Standard Ethernet cable (CAT5) (100BASE-TX) |
| Transmission speed | 100 Mbps |
| Occupied area (No. of I/O) | 512 inputs / 512 outputs maximum |
| Configuration file | GSDML file |

3 Name and function of Individual parts



| No | Part | Description |
|----|---------------------|--|
| 1 | LED display | Displays the SI unit status. |
| 2 | Display cover | Display cover should not be opened. |
| 3 | Connector (BUS OUT) | Connector for Fieldbus outputs. |
| 4 | Marker groove | Groove for identification marker. |
| 5 | Connector (PCI) | Connector for Handheld terminal. |
| 6 | MAC address label | Displays the unique MAC address. |
| 7 | Valve plate hole | Hole for valve plate mounting. |
| 8 | Valve plate groove | Groove for valve plate mounting. |
| 9 | Joint bracket | Bracket for joining to adjacent units. |
| 10 | Unit connector | Connector for signal/power to next unit. |
| 11 | Connector (BUS IN) | Connector for Fieldbus Inputs. |
| 12 | Seal cap (2 pcs) | For unused connectors (BUS OUT, PCI) |

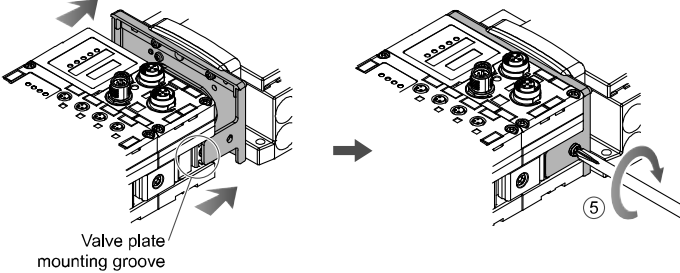
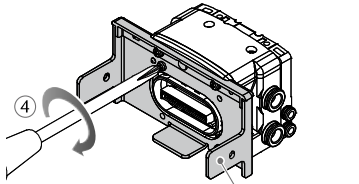
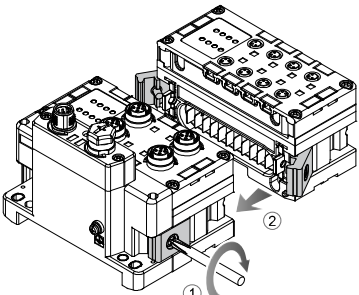
4 Assembly

4.1 Assembling the unit

Warning

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

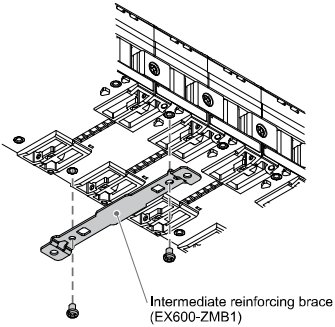
- Connect an I/O unit to the end plate. Digital and analogue units can be connected in any order. Joint bracket screw tightening torque: 1.5 to 1.6 N•m.
- Add more I/O units. Up to 9 I/O units can be connected to one manifold.
- Connect the SI unit. After connecting the required I/O units, connect the SI unit. The connection method is as above.
- Mount the valve plate (EX600-ZMV#) to the valve manifold using the valve screws (M3 x 8) supplied. (Tightening torque: 0.6 to 0.7 N•m).
- Connect the SI unit assembly to the valve manifold. Insert the valve plate into the valve plate mounting groove. Then fix using the valve plate mounting screws (M4 x 6) supplied (Tightening torque: 0.7 to 0.8 N•m).



5 Installation

• Direct mounting

- 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-M4 x 5 screws (Tightening torque: 0.7 to 0.8 N•m).



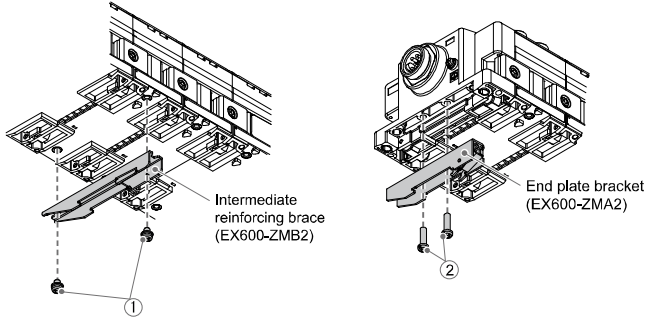
- Mount and tighten the end plate at one end of the unit and mount the intermediate reinforcing brace if required using M4 screws (Tightening torque: 0.7 to 0.8 N•m). Fix the end plate at the valve side while referring to the operation manual for the applicable valve series.

• DIN rail mounting

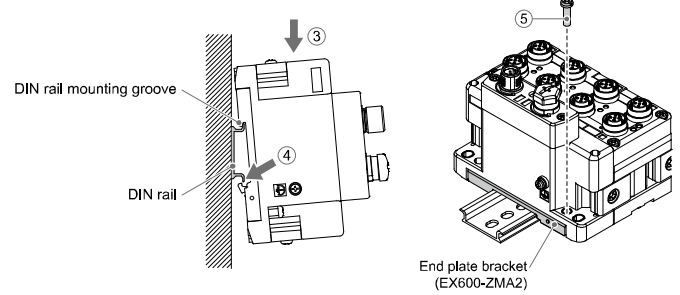
- When assembling six or more units, the middle part of the complete assembly must be fitted with an intermediate reinforcing brace for DIN rail mounting (EX600-ZMB2), using 2-M4 x 6 screws. (Tightening torque: 0.7 to 0.8 N•m).

5 Installation (continued)

- Mount the end plate bracket (EX600-ZMA2) to the end plate using 2-M4 x 14 screws (Tightening torque: 0.7 to 0.8 N•m). For the SY series, use end plate bracket (EX600-ZMA3).



- Hook the DIN rail mounting groove on to the DIN rail.
- Press the manifold using its side hooked to the DIN rail as a fulcrum until the manifold is locked onto the DIL rail.
- Fix the manifold by tightening the DIN rail fixing screws (M4 x 20) on the end plate bracket (Tightening torque: 0.7 to 0.8 N•m). Refer to the Operation Manual for the applicable valve series on the SMC website (URL: <https://www.smcworld.com>) for the mounting method of the valve manifold.



5.1 Wiring connections

• Communication Connector

Select the appropriate cables to mate with the connectors on the SI unit. The PROFINET connection has 2 ports, PORT-1 and PORT-2, and both ports can be used to connect.

M12 4-pin Socket D-coded

| Connector | | Pin No. | Signal name |
|-----------|--------|---------|-------------|
| PORT-1 | PORT-2 | | |
| | | 1 | TD+ |
| | | 2 | RD+ |
| | | 3 | TD- |
| | | 4 | RD- |

• Power Supply Connector

The system is operated using power supplied from the 56-EX600-ED# end plate. Refer to the end plate instruction manual and operation manual for the power supply connection details.

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 rotation. A standard connector can be connected to a SPEEDCON connector.

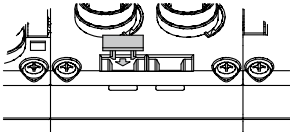
Warning

- 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 Installation (continued)

5.2 Identification marker

The signal name of the input or output devices and unit address can be written on the marker and can be installed on each unit.
Mount a marker (EX600-ZT1) into the marker groove as required.



5.3 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's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
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6 Setting

6.1 Configuration

An applicable GSDML file is required to configure the SI unit in the PROFINET network. A special icon is also required to display the EX600 icon. Please download the latest GSDML and icon files from the SMC website (URL: <https://www.smcworld.com>).

| Product number | GSDML and icon files |
|-------------------|---|
| 56-EX600-SPN#-X10 | GSDML-V2.3-SMC-EX600-***.xml GSDML-0083-0008-EX600_N.bmp |

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

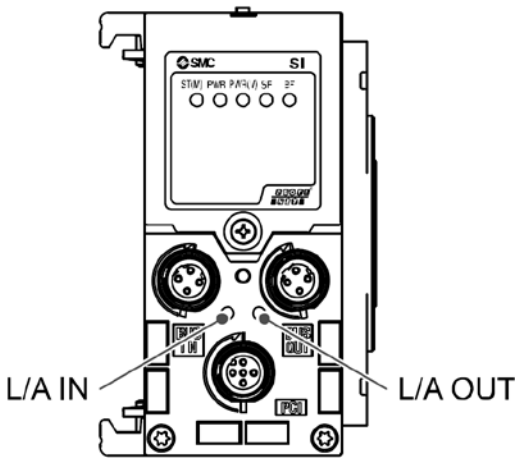
7 How to Order

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

8 Outline Dimensions (mm)

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

9 LED Display








9 LED Display (continued)

ST(M) PWR PWR(V) SF BF

- SI unit status

| LED | Description |
|--|--|
| ST(M) PWR PWR(V) OFF | Power supply for control and input is OFF. |
| ST(M) PWR PWR(V) Green LED's ON | The SI unit is operating normally. |
| ST(M) PWR PWR(V) ST(M) Red ON | Component failure inside the SI unit. |
| ST(M) PWR PWR(V) PWR Red ON | Power supply voltage for control and input is abnormal. |
| ST(M) PWR PWR(V) PWR(V) Red ON | Power supply voltage for outputs is abnormal. |
| ST(M) PWR PWR(V) ST(M) Green flashing | A unit other than the SI unit is detected. |
| ST(M) PWR PWR(V) ST(M) Red flashing | <ul style="list-style-type: none">The valve ON/OFF counter has exceeded the set value.The valve is short circuited or disconnected. |
| ST(M) PWR PWR(V) ST(M) Red/Green flashing alternately | <ul style="list-style-type: none">Connection error between units.Configuration memory error has occurred. |

- Communication status

| LED | | Description |
|--|----------------|--|
| <div>SF BF</div> <div></div> <div>OFF</div> | | Communication with the PLC has been established, or the power supply for control and input is OFF. |
| <div>SF BF</div> <div></div> <div>Red SF LED ON</div> | | Communication with the PLC has been established, but a diagnostic error has occurred. |
| <div>SF BF</div> <div></div> <div>Red BF LED flashing</div> | | Configuration data of the PLC and EX600 are not consistent. |
| <div>SF BF</div> <div></div> <div>Red BF LED ON</div> | | <ul style="list-style-type: none">• Power supply for the PLC is OFF.• Cable not connected between PLC and SI unit.• The PLC or SI unit is faulty.• The PLC configuration data and the SI unit device name are not consistent. |
| <div>SF BF</div> <div></div> <div>Green SF LED flashing</div> | | The SI unit received a Node flashing test command. |
| L/A IN | OFF | BUS IN side: No Link, No Activity |
| | Green ON | BUS IN side: Link, No Activity |
| | Green flashing | BUS IN side: Link, Activity |
| L/A OUT | OFF | BUS OUT side: No Link, Activity |
| | Green ON | BUS OUT side: Link, No Activity |
| | Green flashing | BUS OUT side: Link, Activity |

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 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.

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