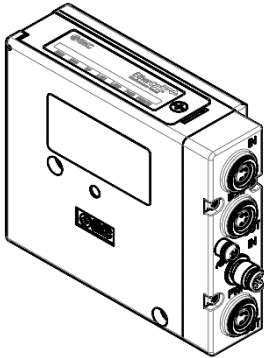




ORIGINAL INSTRUCTIONS

Instruction Manual
Fieldbus device - SI Unit for EtherCAT®
EX260-MEC1



The intended use of this SI Unit is for the control of pneumatic valves and I/O while connected to the EtherCAT® 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)*¹⁾, and other safety regulations.

¹⁾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	34.2 x 98.7 x 76.5

2.2 Electrical specifications

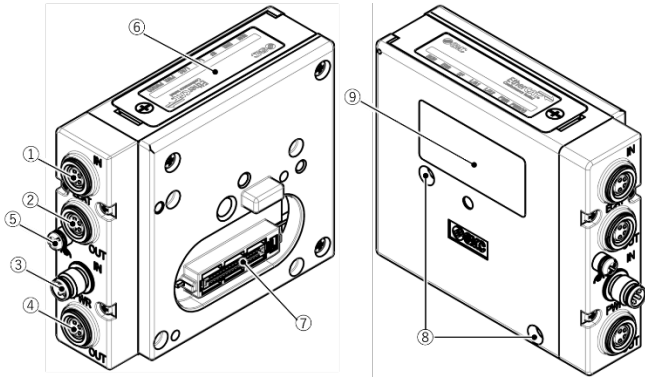
Item		Specifications
PWR For logic	Operating voltage	24 VDC +20% / -15%
	Under voltage detection	Less than 18 VDC approx.
	Internal current consumption	150 mA max. (at 24 VDC)
PWR(V) for valves *1	Operating voltage	24 VDC +20% / -15%
	Voltage drop to valve supply	1.2 V max. at 24 VDC
Protection against polarity reversal		Yes (PWR and PWR(V))
Loop through current between power connectors (max.)		4 A
Galvanic isolation		Yes (between PWR and PWR(V))
Solenoid valve specification	Applicable valve series	JSY 64 station compatible manifold series
	Maximum number of valve outputs	128
	Load	Solenoid valve with voltage suppressor of 24 VDC, 0.4 W max. (SMC)
	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 Fieldbus specifications

Item	Specifications
Bus protocol	EtherCAT®
Version	Conformance Test Record V2.3.0
Communication speed	100 Mbps
FoE	Supported
CoE	Supported for parameter setting and diagnostics etc.
Synchronization Modes	Free Run, SM Synchronous, DC Synchronous
Configuration (ESI) file	SMC_EX260-MECx_V10.xml
Vendor ID	0x00000114
Product Code	0x0100004E

3 Name and function of parts



No	Part	Description
1	Fieldbus connector (ECAT IN)	EtherCAT® connection (M8 4 pin socket A-coded).
2	Fieldbus connector (ECAT OUT)	EtherCAT® connection (M8 4 pin socket A-coded).
3	Power connector (PWR IN)	Power supply for control and valves (M8 4 pin plug A-coded).
4	Power connector (PWR OUT)	Power supply for control and valves (M8 4 pin socket A-coded).
5	FE terminal	Functional earth. (M3 screw).
6	LED display	LED display to indicate the SI Unit status.
7	Valve manifold connection	Connection for the valve manifold.
8	Mounting hole	Mounting hole for connection to the valve manifold. Refer to operation manual for valve for details on installation, mounting.
9	Product information label	Information label to indicate the SI Unit details such as software version or 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 (2 pcs.) for M8 unused connector.

4 Installation

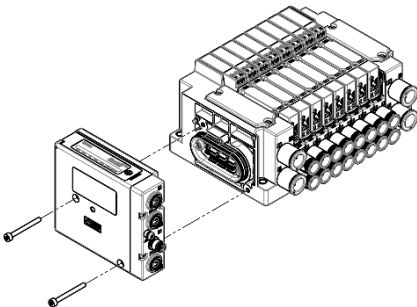
4.1 Installation

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 correctly, the internal PCBs may be damaged or liquid and/or dust may enter 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

The SI Unit has 2 EtherCAT® communication connectors. Select the appropriate cables to mate with the EtherCAT® connectors mounted on the SI Unit.

ECAT IN / OUT: M8 4-pin socket, A-coded

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

Warning

Pay attention not to confuse the communication connectors with the power connectors. Incorrect connection may result in SI Unit failure. Check the printed characters on the product.

5.2 Power connectors

- Select the appropriate cables to mate with the power supply connectors mounted on the SI Unit.

PWR IN: M8 4-pin plug, A-coded

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

PWR OUT: M8 4-pin socket, A-coded

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

- The power supply for control and the valves are isolated. Be sure to supply power respectively. Either single source power or two different power supplies can be used.
- The recommended tightening torque for both communication connectors and power connectors is 0.2 N•m.
- Power supply PWR for control and PWR(V) for valves should be protected by an external fuse.

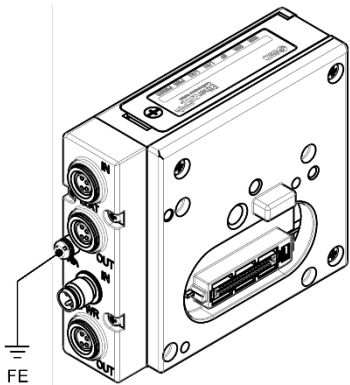
Warning

- Be sure to fit a seal cap (EX9-AWES) on any unused M8 connectors. Proper use of the seal cap enables the enclosure to maintain IP67 specification.

5 Wiring (continued)

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 = 0.3 N•m).
- Resistance to ground should be 100 ohms or less.



6 Setting

6.1 Configuration

To configure the SI Unit with your EtherCAT® master's software, the dedicated ESI (EtherCAT® Slave Information) file is required. The ESI file contains all necessary information to configure the SI Unit on your master's software.
The ESI file name is as follows.

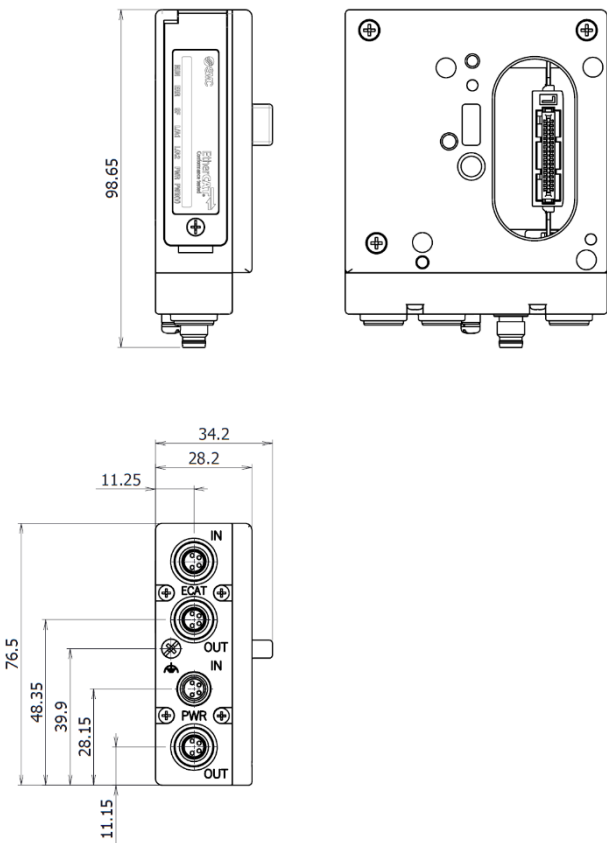
- ESI file : SMC_EX260-MECx_V10.xml

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

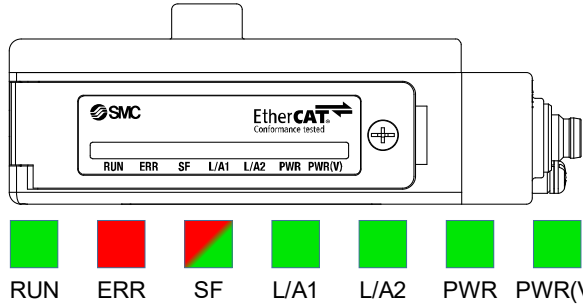
7 How to Order

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

8 Outline Dimensions (mm)

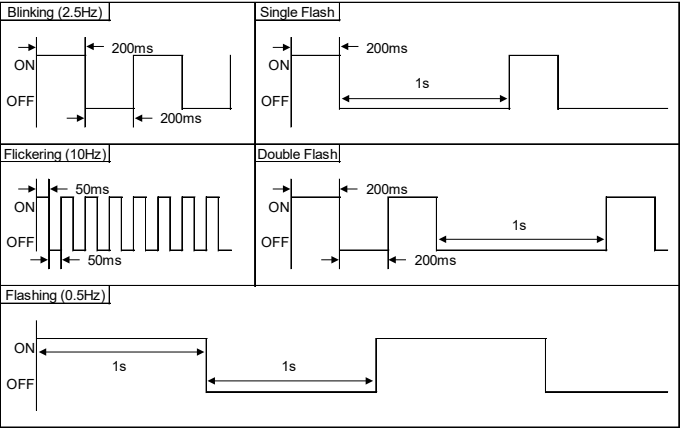


9 LED Display



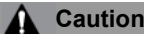
LED	Indication	Description
RUN	OFF	Init
	Green Blinking (2.5 Hz)	Pre-Operational
	Green Single Flash	Safe-Operational
	Green Flickering (10 Hz)	Bootstrap
	Green ON	Operational
ERR	Red Double Flash	EtherCAT Watchdog Timeout
	Red Blinking (2.5 Hz)	Invalid Configuration
	OFF	No Error
SF	Red ON	One of the following may have occurred. <ul style="list-style-type: none">• Valve coil has a short circuit.• The valve manifold is not connected correctly. (The SI Unit detected number of valve stations 0 or more than 64).• The valve station in the manifold has decreased during operation.
	Green Flashing (0.5 Hz)	One of the following may have occurred. <ul style="list-style-type: none">• Output count exceeds the limit value.• The valve station in the manifold has increased during operation.
	OFF	No Error
L/A1	OFF	Port1: No Link / No Activity
	Green ON	Port1: Link / No Activity
	Green Flickering (10 Hz)	Port1: Link / Activity
L/A2	OFF	Port2: No Link / No Activity
	Green ON	Port2: Link / No Activity
	Green Flickering (10 Hz)	Port2: Link / Activity
PWR	OFF	Power supply for control (PWR) is not present.
	Green Flashing (0.5 Hz)	Power supply for control (PWR) is present but is low. (< approx. 18 VDC)
	Green ON	Power supply for control (PWR) is present.
PWR(V)	OFF	Power supply for valves (PWR(V)) is not present.
	Green ON	Power supply for valves (PWR(V)) is present.

9.1 LED flashing pattern



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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