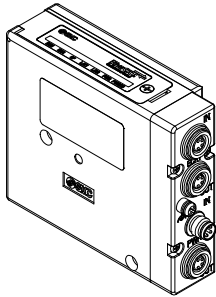




ORIGINAL INSTRUCTIONS

Instruction Manual
Fieldbus device - SI unit for Ejector system
integrated valve manifold and EtherCAT®
EX260-PEC1



The intended use of this product is to control pneumatic valves, ejectors and I/O while connected to the EtherCAT® communication protocol.

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 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

- This document is an instruction manual for a SI (Serial Interface) Unit which controls an ejector system integrated valve manifold (JSY series). The SI Unit is an EtherCAT® compatible device. EtherCAT® is the registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
- The SI Unit controls the manifold which has 5 pressure sensors maximum, and 24 valve outputs maximum.
- For details of the valve manifold refer to the instruction manual for the ejector system integrated valve manifold.

2 Specifications (continued)

2.1 General specifications

Item	Specifications
Ambient temperature range	-10 to +50 °C
Ambient humidity range	35 to 85%RH (No condensate)
Ambient storage temperature	-20 to +60 °C
Withstand voltage	500 VAC for 1 minute (between FE and accessible terminal).
Insulation resistance	500 VDC, 50 MΩ or more (between FE and accessible terminal).
Enclosure rating	IP67 (when connected with JSY1000 manifolds, it is IP40)
Dimensions (W x L x H)	34.2 x 97.2 x 76.5 mm
Weight	200 g or less

2.2 Electrical specifications

Item		Specifications
PWR	Operating voltage	24 VDC +20% / -15%
	Current consumption	100 mA or less (at 24 VDC) (including manifold consumption)
	Under-voltage detection	approx. 18 VDC
PWR(V)	Operating voltage ^{*)}	24 VDC +20% / -15%
	Under-voltage detection	approx. 18 VDC
	Voltage drops ^{*)}	1.2 VDC or less (at 24 VDC)
Protection against reverse polarity		Yes (PWR and PWR(V))
Loop through current		4 A (between power connectors)
Galvanic Isolation		Yes (PWR and PWR(V))

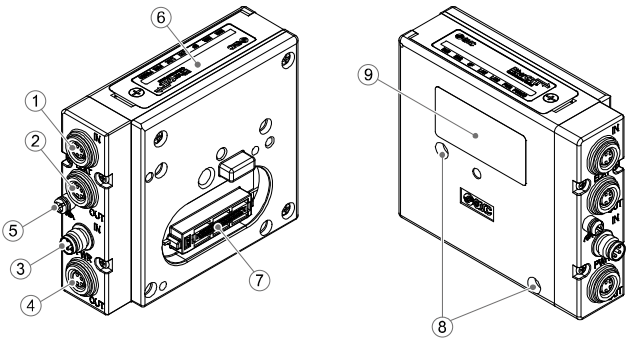
^{*)} SI Unit power supply voltage specification.
Supply power according to the solenoid valve used.

Item		Specifications
Applicable valve series		JSY series: Ejector system integrated valve manifold compatible
Pressure sensor (input)	Number of Inputs	5 maximum
	Load	Digital pressure sensor with built-in manifold
Valve (output)	Number of Outputs	24 maximum
	Load	Solenoid valve with voltage suppressor of 24 VDC, 0.5 W or less (SMC)
	Output type	Source / PNP (negative common)
	Over current protection/detection	Yes (per 1 output)

2.3 Fieldbus specifications

Item	Specifications
Bus protocol	EtherCAT®
Communication speed	100 Mbps
FoE	Supported
CoE	Supported for parameter setting and diagnostics etc.
Configuration (ESI) file	SMC_EX260-PECx_V10.xml
Vendor ID	0x00000114
Product code	0x0100004A

3 Name and function of parts



No	Part	Description
1	Communication connector 1 (ECAT IN)	EtherCAT® connection (M8 4-pin socket, A-coded).
2	Communication connector 2 (ECAT OUT)	EtherCAT® connection (M8 4-pin socket, A-coded).
3	Power connector 1 (PWR IN)	Power supply for logic / sensors and valves (M8 4-pin plug A-coded).
4	Power connector 2 (PWR OUT)	Power supply for logic / sensors and valves (M8 4-pin socket A-coded).
5	FE terminal	Functional earth terminal (M3 screw).
6	LED display	LED display to indicate SI unit status.
7	Valve manifold connection	Connection for valve manifold.
8	Mounting hole	Mounting hole for connection to the valve manifold.
9	Product label	Information label to indicate SI unit details

3.1 Accessories

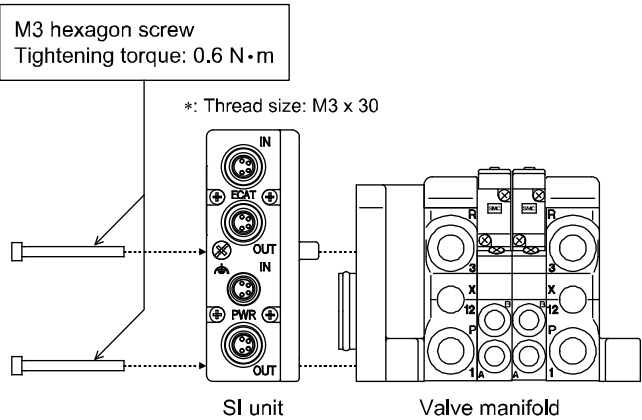
No	Part	Description
1	Hexagon socket head cap screw	M3 x 30 screw for connection to the valve manifold (2 pcs.)
2	Seal cap	M8 seal cap for unused communication and power connectors (SMC part number EX9-AWES) 2 pcs. supplied.

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 Installation (continued)

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)

4.3 Assembly Precautions

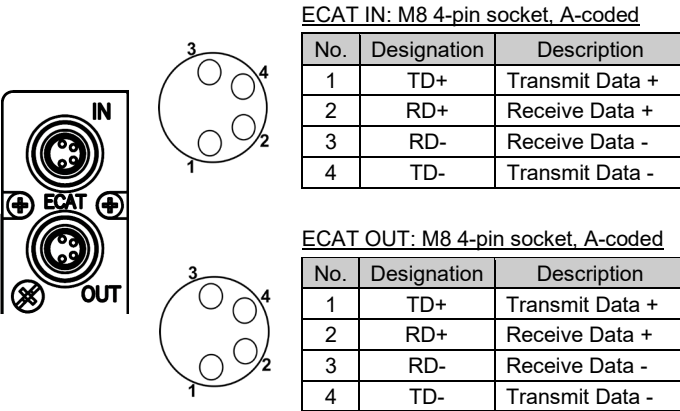
- Be sure to switch off the power.
- Check there is no foreign matter inside the SI unit.
- Check there is no damage and no foreign matter stuck to the gasket.
- Be sure to tighten the screws with the specified torque.
- If the SI unit is not assembled properly, the internal PCBs may be damaged or liquid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

5 Wiring

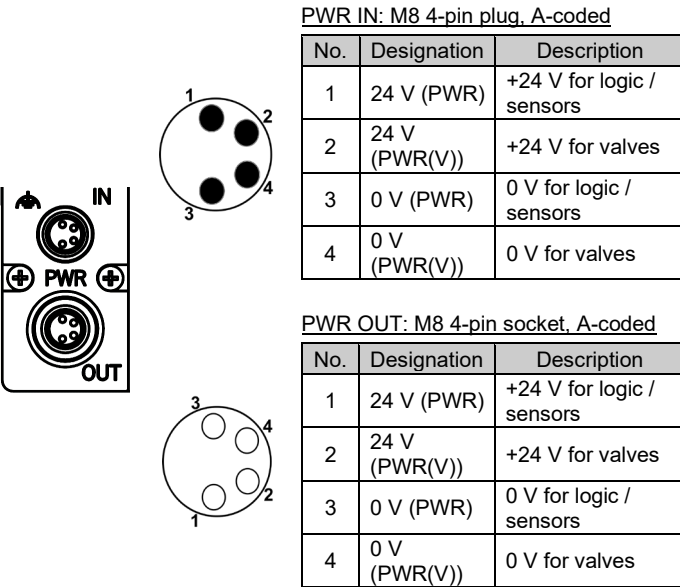
5.1 Connecting Cables

Select the appropriate cables to mate with the connectors mounted on the SI unit. Recommended connector tightening torque is 0.2 N•m.

○ Communication connector



○ Power connector



Warning

- Pay attention not to confuse the communication connector with the power connector. Incorrect connection may result in SI unit failure. Check the marking on the product.
- Be sure to fit an M8 seal cap (EX9-AWES) on any unused connectors. Proper use of the seal cap enables the enclosure to maintain IP67 specification.
- The power-supply for logic / sensors and power-supply for valves are isolated. Be sure to supply power respectively.
The product can be used either with two different power supplies or a single source power supply.

5 Wiring (continued)

5.2 FE 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 reasonably possible.
- The FE terminal and the metal parts of the communication / power connector are internally connected.
- The recommended tightening torque for the FE terminal is 0.3 N•m.

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.

6 Setting

6.1 Configuration

- Auto-increment addressing can be used to address each slave device according to its physical position in the communication ring and does not require local manual address setting.
- 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 the master's software.

ESI file	SMC_EX260-PECx_V10.xml
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- Technical documentation giving detailed configuration information and the ESI file can be found on the SMC website (URL: <https://www.smcworld.com>).

6.2 Energy saving parameter

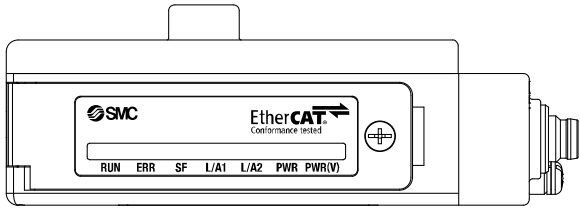
- This setting assigns and sets the output (ejector) that carries out the energy saving operation from the Slots.
- If the energy-saving operation is not required, set to Disable.
- If set to Disable, the pressure value of that sensor is not involved in the energy saving operation.
- The default setting is set to Disable.
- The first OUT No. of the set value is the supply valve.
Example: Energy saving of sensor No.2 is set to OUT5-6
Depending on the pressure value of sensor No.2 (2nd from the SI Unit), OUT5 is operated with energy saving as a supply valve. (OUT6 is to be a release valve).

Content	Set value
Energy saving of sensor No.1	Disable, OUT0-1, OUT1-2, OUT2-3, ... OUT22-23
Energy saving of sensor No.2	
Energy saving of sensor No.3	
Energy saving of sensor No.4	
Energy saving of sensor No.5	

7 How to Order

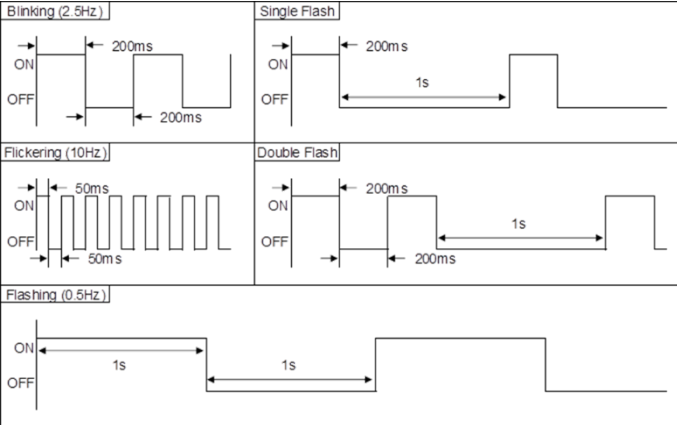
Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for How to order information.

8 LED Display

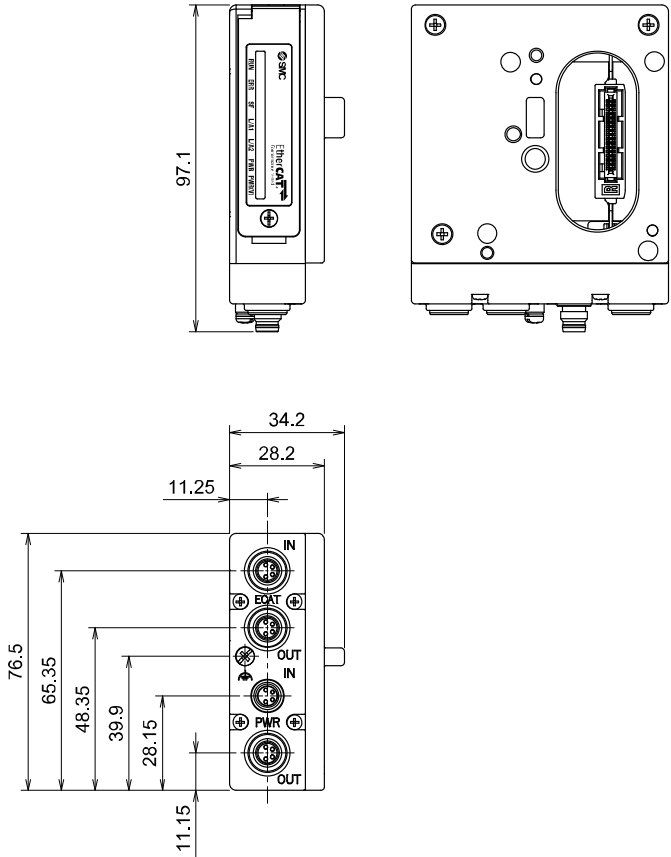


LED	Indication	Description
RUN	OFF	Init
	Green Blinking (2.5 Hz)	Pre-Operational
	Green Single Flash	Safe-Operational
	Green Flickering (10 Hz)	Bootstrap
	Green ON	Operational
ERR	Red Double Flash	Application Watchdog Timeout
	OFF	No Error
SF	Red ON	One of the following may have occurred. <ul style="list-style-type: none">• Valve has a short circuit.• The number of connected sensors is less than the setting.
	Green Flashing (0.5 Hz)	One of the following may have occurred. <ul style="list-style-type: none">• Valve protection is operating.• Output count exceeded the limit value.• The Energy saving parameter has an error.• The Pressure parameter value does not meet the conditions.
	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 logic / sensors (PWR) is not present.
	Green Flashing (0.5 Hz)	Power supply for logic / sensors (PWR) is present but is low. (< approx. 18 VDC)
	Green ON	Power supply for logic / sensors (PWR) is present.
PWR (V)	OFF	Power supply for valves (PWR(V)) is low (< approx. 18 VDC) or is not present.
	Green ON	Power supply for valves (PWR(V)) is present.

8.1 Flashing pattern



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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