

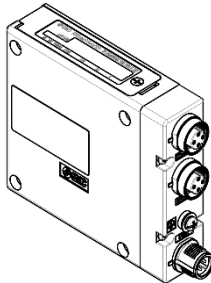


ORIGINAL INSTRUCTIONS

Instruction Manual

Fieldbus device - SI unit for vacuum manifold and EtherNet/IP™

EX260-VEN1



The intended use of this product is to control pneumatic ejectors, sensors and I/O while connected to the EtherNet/IP™ 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.
- 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	0 to +50 °C
Ambient storage temperature	−20 to +60 °C
Ambient humidity	35 to 85%RH (no condensate)
Withstand voltage	500 VAC applied for 1 minute (between FE and terminals)
Insulation resistance	500 VDC, 10 MΩ or more (between FE and terminals)
Operating atmosphere	No corrosive gas
Enclosure	IP65 (IEC 60529)
Dimensions (W x L x H) mm	25.5 x 102.4 x 76.5
Weight	150 g
Max. number of ejectors	16
Max. number of sensors	16

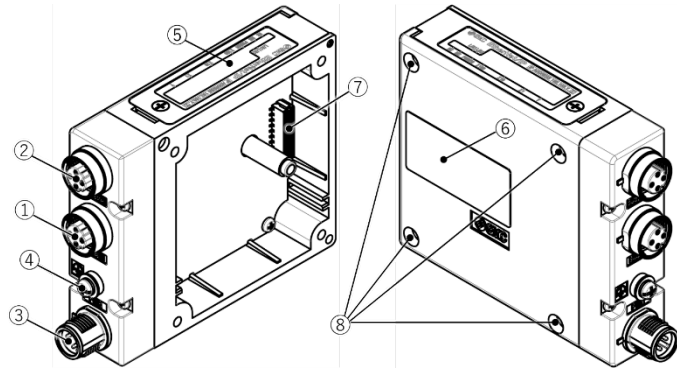
2.2 Electrical specifications

Item	Specifications
For logic / inputs	Operating voltage 24 VDC ±10%
For Outputs	Operating voltage 24 VDC +10% / -5%
	Under voltage detection Approx. 19 VDC
Internal current consumption (PWR)	100 mA max.
Reverse polarity protection	Yes (logic / input and output power supplies)
Isolation	Yes (between logic / input and output power supplies)

2.3 Communication specifications

Item	Specifications
Bus protocol	EtherNet/IP™
Conformance test	Version CT18
Communication medium	Standard Ethernet cable (CAT5 or more) (100BASE-TX)
Communication speed	10 Mbps / 100 Mbps
Communication method	Full duplex / Half duplex
Vendor ID	7h (SMC Corporation)
Device type	2Bh (Generic device)
Product code	103h
Network topology	Linear or Ring
DLR function	Yes
QuickConnect™ function	Yes
Web server function	Yes
Configuration EDS file	ex260_ven_v*.eds (download from the SMC website)

3 Name and function of parts



No	Part	Description
1	Fieldbus connector (BUS IN)	EtherNet/IP™ connection PORT1 (M12 4-pin socket, D-coded)
2	Fieldbus connector (BUS OUT)	EtherNet/IP™ connection PORT 2 (M12 4-pin socket, D-coded)
3	Power supply connector (PWR)	Power supply for logic / sensors and valves (M12 4-pin plug, A-coded)
4	FE terminal	Functional Earth (M3)
5	LED display	To indicate the SI unit and bus status
6	Product information label	To indicate SI Unit product information such as MAC address, Serial No. etc
7	Connector	Communication connections to vacuum manifold
8	Mounting hole	Mounting hole for connection to the vacuum manifold

4 Installation

4.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- For further details on mounting and installation to the vacuum manifold, refer to the vacuum manifold operation manual.
- The SI unit must be connected to a vacuum manifold before it is powered ON.

Caution

- Be sure to turn OFF the power.
- Check there is no foreign matter inside the SI unit.
- Check there is no damage and no foreign matter on the gasket.
- If the SI unit is not assembled correctly, the internal PCBs may be damaged or liquid and/or dust may enter into the unit.
- Tighten the screws with the specified tightening torque.

4.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- 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.

5 Wiring

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

5.1 Communication connector

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

PORT 1, Port type: MDI



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

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

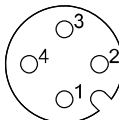
PORT 2, Port type: MDI-X



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

5.2 Power supply connector

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



No.	Designation	Description
1	SI24 V	+24 V for SI unit operation
2	SV24 V	+24 V for solenoid valve
3	SI0 V	0 V for SI unit operation
4	SV0 V	0 V for solenoid valve

- The power supply for the vacuum manifold and SI unit operation are isolated. Be sure to supply power respectively.
Either single source power or two different power supplies can be used.

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 IP65 specification.

5.3 Ground Terminal

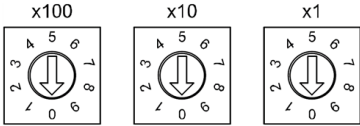
- The SI Unit must be connected to FE (Functional Earth) to divert electromagnetic interference.
- Connect a grounding cable from the FE terminal screw on the SI Unit to the nearest functional earth point. The grounding cable should be as thick and short as possible (tightening torque = 0.3 N•m).
- Resistance to ground should be 100 ohms or less.
- The FE terminal and the metal parts of the fieldbus interface / power supply connector are internally connected.

6 Setting

6.1 Switch Setting

The switches should only be set with the power supply turned OFF.
Open the cover and set the rotary switches and DIP switch with a small flat blade screwdriver.

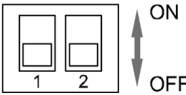
6.1.1 Rotary switch settings



- IP address 4th octet – 192.168.Y.X

Rotary switch setting			IP address	Manual setting of IP address ^{*3}
x100	x10	x1		
0	0	0	Remote control ^{*1}	
0	0	1	192.168.Y.1	
0	0	2	192.168.Y.2	
...	
2	5	4	192.168.Y.254	
2	5	5	DHCP mode ^{*2}	
2	5	6	Not used	
...	
9	9	9	Not used	

6.1.2 DIP switch setting



- IP address 3rd octet and default gateway^{*4} – 192.168.Y.X

Setting 1	IP address	Default gateway	Subnet mask
ON	192.168.1.X	192.168.1.1	255.255.255.0
OFF	192.168.0.X	0.0.0.0	

- Process data size^{*5}

Setting 2	Process data size		Description
	Input	Output	
ON	38 byte	4 byte	Vacuum, release and unit status and pressure value and diagnostic information for each CH are allocated to the input data.
OFF	6 byte	4 byte	Vacuum, release and unit status are assigned to the input data.

6 Setting (continued)

^{*1} : Remote control (set rotary switch for IP address X to 000)
This mode is compatible with the IP address setting software EX9-ZSW-IPC1 and EX9-ZSW-IPC2.
Using EX9-ZSW-IPC1 up to 200 IP addresses can be set while checking the MAC addresses of connected devices.
Using EX9-ZSW-IPC2 up to 200 IP addresses can be set in one batch creating a list of MAC addresses of connected devices.
The IP address setting software and operation manual can be downloaded from the SMC website (URL: <https://www.smcworld.com>).

^{*2} : DHCP mode (set rotary switch for IP address X to 255).
This mode obtains the IP address from a DHCP server.
The acquired IP address is lost when the power is turned off.
When acquiring the IP address from the DHCP server, do so when the communication cable is not connected to the PLC or when the PLC is not turned on.

^{*3} : Manual setting of IP address (set rotary switch for IP address X to 001...254).
Manually set the IP address in the range 192.168.0.1...254 or 192.168.1.1...254.

^{*4} : IP address 3rd octet and default gateway (DIP switch No.1)
DIP switch No.1 combines the manual setting of the IP address 3rd octet and the default gateway setting.
When the switch is OFF, the IP address of the SI Unit becomes 192.168.0.1...254 and the default gateway address is set to no setting (0.0.0.0).
When the switch is ON, the IP address of the SI Unit becomes 192.168.1.1...254 and the default gateway address is set to 192.168.1.1. Because the default gateway set, a router can be used to connect to different network addresses. The SI Unit can also be used without a router.

Note

- When shipped from the factory, the mode is Remote control, with DIP switch No.1 OFF (IP address Y = 0).
- If the stored IP address is unknown in Remote control, turn the power on once in DHCP mode and then return to Remote control again.

The stored IP address will be lost, but a new IP address can be set from the IP address setting software.

^{*5} : Process data size setting (DIP switch No.2)
Sets the input process data of the SI Unit.

6.2 Configuration

In order to configure the SI unit for the EtherNet/IPTM network, the appropriate device master file (EDS file) for the SI unit will be required. Technical documentation giving detailed configuration information and the EDS file can be found on the SMC website (URL: <https://www.smcworld.com>).

6.2.1 EDS and Icon File

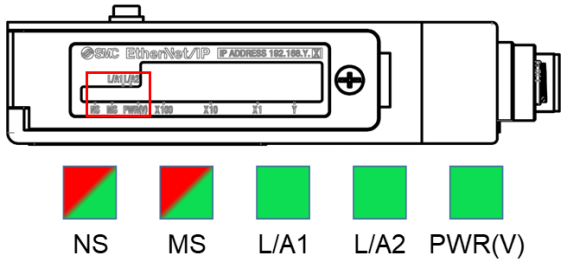
The EDS file and icon files are as follows.

- EDS file : ex260_ven_v*.eds
- Icon file : ex260_ven.ico

Note

- For how to install the EDS file, refer to the configuration software manual.

7 LED Display

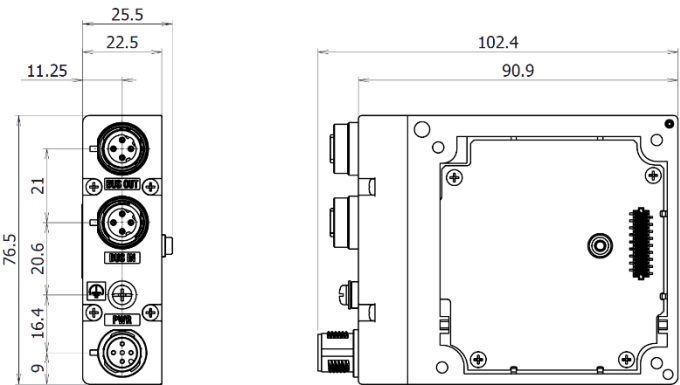


LED	Status	Description
NS	OFF	Power supply for logic / input not present or IP address not set (not powered, no IP address).
	Green ON	EtherNet/IP TM connection established.
	Green flashing (1 Hz)	EtherNet/IP TM connection not established.
	Red flashing (1 Hz)	EtherNet/IP TM connection timeout.
	Red ON	Duplicate IP addresses are detected.
MS	OFF	Power supply for logic/input not present.
	Green ON	Operating normally.
	Green flashing (1 Hz)	One of the following may have occurred: <ul style="list-style-type: none">SI Unit not configured correctly or during configuration.The PLC is idle status.
	Red flashing (1 Hz)	<ul style="list-style-type: none">One of the following may have occurred:<ul style="list-style-type: none">Pressure sensor has a short circuit.Pressure sensor has a failure or a disconnection.Valve protection function is operating.
	Red ON	Unrecoverable internal fault condition.
L/A1	OFF	Port 1 (BUS IN) : No Link / No Activity
	Green ON	Port 1 (BUS IN) : Link / No Activity
	Green flashing	Port 1 (BUS IN) : Link / Activity
L/A2	OFF	Port 2 (BUS OUT) : No Link / No Activity
	Green ON	Port 2 (BUS OUT) : Link / No Activity
	Green flashing	Port 2 (BUS OUT) : Link / Activity
PWR(V)	Green ON	Power supply for output (PWR(V)) is present.
	OFF	Power supply for output (PWR(V)) is low (< approx. 19 VDC) or not present.

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)



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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