



ORIGINAL INSTRUCTIONS

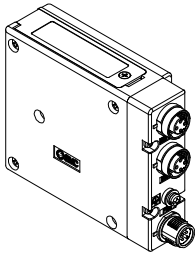
Instruction Manual

Fieldbus device - SI unit for POWERLINK

EX260-SPL1 / -SPL3



Refer to Declaration of  
Conformity for relevant  
Directives



The intended use of this product is to control pneumatic valves and I/O while connected to the POWERLINK 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) <sup>(1)</sup>, and other safety regulations.

<sup>(1)</sup> 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.

	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	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.
- Do not disassemble, modify (including changing the printed circuit board) or repair.**  
An injury or failure can result.
- Do not operate the product outside of the specifications.**  
Do not use for flammable or harmful fluids.  
Fire, malfunction or damage to the product can result.
- Do not operate in an atmosphere containing flammable or explosive gases.**  
Fire or an explosion can result.  
This product is not designed to be explosion proof.
- If using the product in an interlocking circuit:**  
Provide a double interlocking system, for example a mechanical system.
- Check the product for correct operation.**  
Otherwise malfunction can result, causing an accident.

**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.
- When conformity to UL is required the SI unit must be used with a UL1310 Class 2 power supply.**

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	IP67
Weight	200 g or less
Standard	UL/CSA, CE marked

2.2 Electrical specifications

Item		Specifications
Power supply voltage range / Current consumption	Controller power supply	21.6 to 26.4 VDC 0.1 A max.
	Solenoid valve power supply	22.8 to 26.4 VDC 2.0 A or less (according to the solenoid valve specification)
Solenoid valve specification	Output type	PNP (negative common) / source
	Connected load	Solenoid valve (with surge voltage suppressor) 24 VDC and 1.5 W or less (manufactured by SMC)
	Insulation	Power supply for SI unit – Power supply for solenoid valve
	Residual voltage	0.4 VDC or less

2.3 Communication specifications

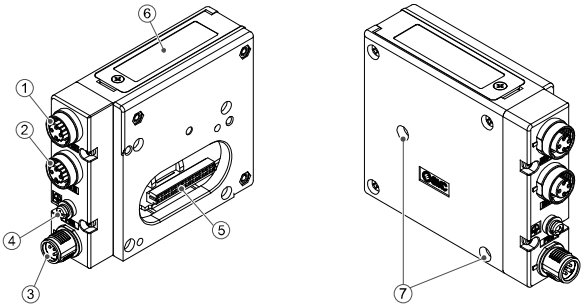
Item		Specifications
Protocol	Ethernet POWERLINK	
Transmission medium	Standard Ethernet cable (CAT5 or more) (100BASE-TX)	
Transmission speed	100 Mbps	
Transmission method	Half duplex	
Node ID setting method	Rotary switch: from 1 to 239	
Number of outputs	EX260-SPL1	32 outputs
	EX260-SPL3	16 outputs
Vendor ID	FFFF0007 hex	

2.4 Applicable Valve series

Valve Series	
SY series	SY3000, SY5000, SY7000
VQC series	VQC1000, VQC2000, VQC4000, VQC5000
SV series	SV1000, SV2000, SV3000 (10 type tie-rod base)
S0700 series	S0700

3 Name and Function of Individual Parts

EX260-SPL1 / -SPL3



No.	Element	Description
1	Fieldbus interface connector (BUS OUT)	POWERLINK connection PORT 2. (M12 4-pin socket, D-coded)
2	Fieldbus interface connector (BUS IN)	POWERLINK connection PORT 1. (M12 4-pin socket, D-coded)
3	Power supply connector	Power supply with load voltage for valves and operating voltage for SI unit (M12 5-pin plug, A-coded).
4	Ground terminal	Functional earth. (M3 screw)
5	Output connector	Output signal interface for valve manifold.
6	LED display and Switch cover	LED display to indicate the status of the SI unit and switch setting.
7	Mounting hole	Mounting hole for connection to the valve manifold.

- Accessories

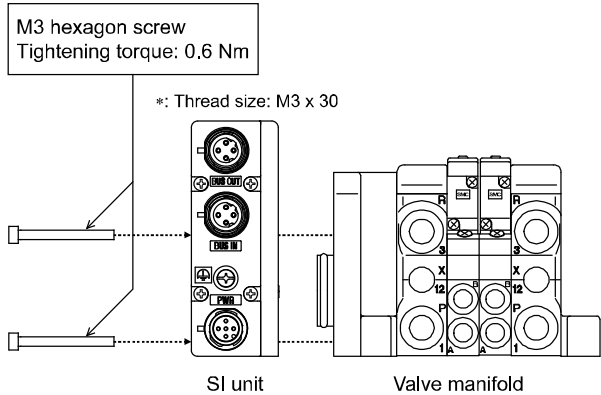
Hexagon socket head cap screw	M3 x 30 screw for connection to the valve manifold (2 pcs).
Seal cap	Seal cap for unused fieldbus interface connector (BUS OUT).

4 Installation

4.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.
- Assembly of the SI unit to the Valve manifold.



**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 properly, the internal PCBs may be damaged or liquid and/or dust may enter into the unit.
- Tighten the screws with the specified tightening torque (0.6 Nm).

4 Installation (continued)

4.2 Environment

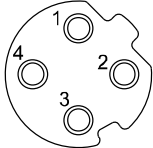
**Warning**

- 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

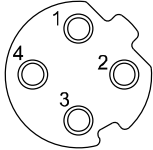
5.1 Fieldbus Interface Connector

BUS OUT / Port2: M12 4-pin socket, D-coded (SPEEDCON)



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

BUS IN / Port1: M12 4-pin socket, D-coded (SPEEDCON)

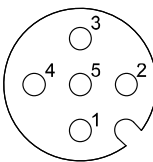


No.	Signal	Description
1	TD+	Transmit Data +
2	RD+	Receive Data +
3	TD-	Transmit Data -
4	RD-	Receive Data -

- Connect the "BUS IN" connector to the upstream device (PLC etc.) and connect the "BUS OUT" connector to the downstream device.
- Fit a seal cap, part number EX9-AWTS, on any unused Fieldbus connectors (BUS OUT).

5.2 Power Supply Connector

PWR: M12 5-pin plug, A-coded (SPEEDCON)



No.	Signal	Description
1	SV24 V	+24 V for solenoid valve
2	SV0 V	0 V for solenoid valve
3	SI24 V	+24 V for SI unit
4	SI0 V	0 V for SI unit
5	-	Not 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 1/2 rotation. A standard M12 connector can be connected to a SPEEDCON connector.

- Select the appropriate cables to mate with the connectors on the SI unit. Cable accessory details can be found in the product operation manual on the SMC website (URL: <http://www.smcworld.com>).
- If a field-wireable connector is used for the power supply connection, and the SI unit is installed directly to a valve manifold, the cable connector outer diameter should be φ16 mm or less.

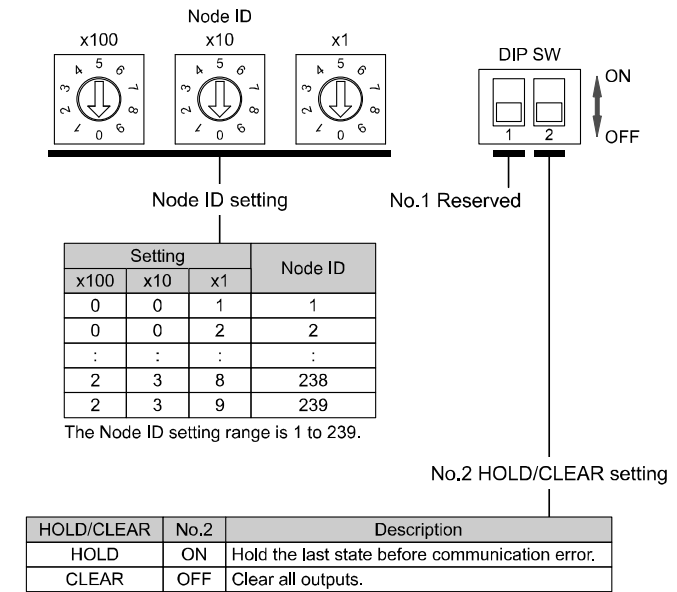
5.3 Ground Connection

- 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.

6 Settings

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.



6.2 Configuration

An applicable XDD file is required to configure the SI unit in the POWERLINK network. The latest XDD file can be download from the SMC website (URL: <http://www.smcworld.com>).

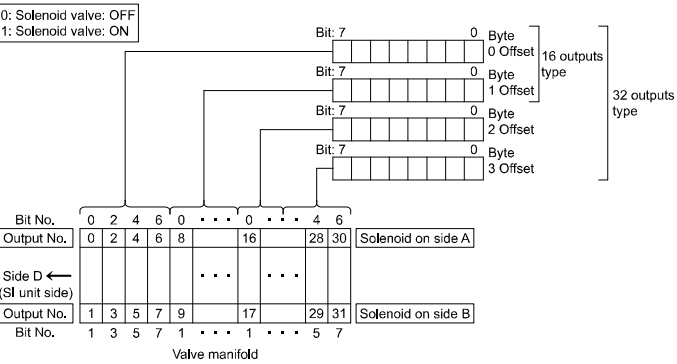
XDD file

	Model number	XDD file
1	EX260-SPL1	FFFF0007_EX260-SPL1.xdd
2	EX260-SPL3	FFFF0007_EX260-SPL3.xdd

The network configuration procedure uses the B&R Automation Studio software which is described in the product Operation Manual available on the SMC website (URL: <http://www.smcworld.com>).

6.3 Output Number Assignment

Output numbering refers to the solenoid position on the manifold and starts at zero.



7 LED Indication

LED	Status	Description
S/E	<input type="checkbox"/> OFF	SI unit operating voltage is not supplied.
	<input checked="" type="checkbox"/> Green flashing	POWERLINK communication has not been established. Fast flashing (50 ms): Basic Ethernet state Single flash (200 ms / OFF 1 s): Pre-Operational 1 Double flash (200 ms / OFF 1s): Pre-Operational 2 Triple flash (200 ms / OFF 1s): Ready to operate Slow flashing (200 ms): Stopped
	<input checked="" type="checkbox"/> Green ON	POWERLINK communication has been established.
	<input checked="" type="checkbox"/> Red ON	POWERLINK communication has been separated or Node ID set outside range.
ST	<input type="checkbox"/> OFF	SI unit operating voltage is not supplied.
	<input checked="" type="checkbox"/> Green ON	Operating normally.
	<input checked="" type="checkbox"/> Red ON	SI unit has failed.
L/A1	<input type="checkbox"/> OFF	BUS IN side: No Link, No Activity
	<input checked="" type="checkbox"/> Green ON	BUS IN side: Link, No Activity
	<input checked="" type="checkbox"/> Green flashing	BUS IN side: Link, Activity
L/A2	<input type="checkbox"/> OFF	BUS OUT side: No Link, No Activity
	<input checked="" type="checkbox"/> Green ON	BUS OUT side: Link, No Activity
	<input checked="" type="checkbox"/> Green flashing	BUS OUT side: Link, Activity
PWR (V)	<input checked="" type="checkbox"/> Green ON	Load voltage for the valve is supplied.
	<input type="checkbox"/> OFF	Load voltage for the valve is not supplied or is outside tolerance range (19 V or less).

8 How to Order

Refer to the product catalogue for the 'How to Order' details.

9 Outline Dimensions (mm)

Refer to the Operation manual for Outline dimensions available on the SMC website (URL: <http://www.smcworld.com>).

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

8.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

12 Contacts

Refer to Declaration of Conformity and [www.smcworld.com](http://www.smcworld.com) for contacts.

SMC Corporation

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Template DKP50047-F-085H