



# Installation & Maintenance Manual

## Fieldbus device (SI unit)

### EX260 Series for PROFIBUS DP



#### Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

<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.

This product is class A equipment that is intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.

#### Warning

- 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. Verify the specifications before use.
- 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 regularly for proper operation. Otherwise malfunction can result, causing an accident.
- The following instructions must be followed during maintenance:
  - Turn off the power supply.
  - Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance. Otherwise an injury can result.

#### Caution

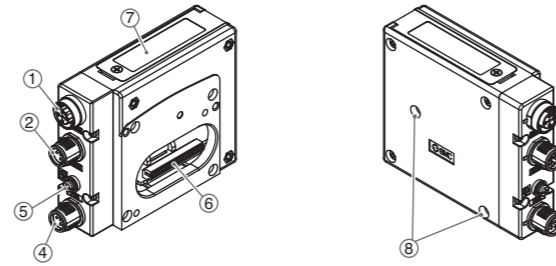
- After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the safety and noise resistance of the Fieldbus system. Individual grounding should be provided close to the product with a short cable.

#### NOTE

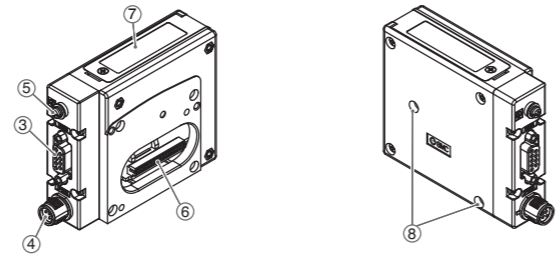
- When conformity to UL is necessary the SI unit must be used with a UL 1310 Class2 power supply.

#### Summary of Product element

<EX260-SPR1/-SPR2/-SPR3/-SPR4>



<EX260-SPR5/-SPR6/-SPR7/-SPR8>



No.	Element	Description
1	Fieldbus interface connector (BUS OUT)	PROFIBUS DP connection (M12 5-pole socket, B-coded)
2	Fieldbus interface connector (BUS IN)	PROFIBUS DP connection (M12 5-pole plug, B-coded)
3	Fieldbus interface connector	PROFIBUS DP connection (D-sub 9-pole socket)
4	Power supply connector	Power supply with load voltage for valves and operating voltage for SI unit (M12 5-pole plug, A-coded)
5	Ground terminal	Functional earth (M3 screw)

6	Output connector	Output signal interface for valve manifold
7	LED and switch	Bus status-specific and SI unit-specific LEDs Switches for setting of node address and operating mode
8	Mounting hole	Mounting hole for connection to the valve manifold

#### Accessories

Hexagon socket head cap screw	2 pcs. M3x30 screw for connection to the valve manifold
Seal cap*	1 pc. seal cap for unused fieldbus interface connector (BUS OUT)

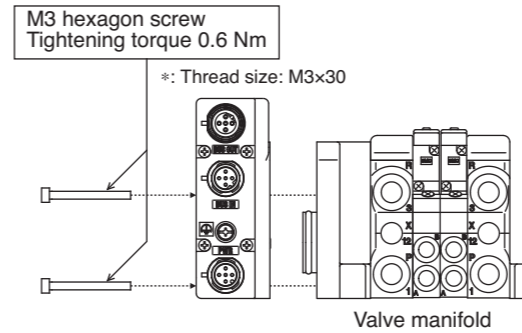
Note: Seal cap will be required only for EX260-SPR1/-SPR2/-SPR3/-SPR4.

#### Installation

##### General instructions on installation and maintenance

Connect valve manifold to the SI unit. Connectable valve manifolds are the same as for EX250 series SI unit. Refer to the EX250 series valve manifold section in the valve catalogue for valve manifold dimensions.

##### Assembly and disassembly of the SI unit



##### 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 Nm)

##### Precautions for maintenance

- 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 being stuck to the gasket.
- Be sure to tighten the screws with the specified torque. If the SI unit is not assembled properly, inside PCBs may be damaged or liquid and/or dust may enter into the unit.

#### Installation (Continued)

##### Connecting cables

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

##### Fieldbus interface connector layout

<EX260-SPR1/-SPR2/-SPR3/-SPR4>

##### BUS OUT: M12 5-pole socket B-coded

No.	Designation	Description
1	-	Unused
2	RXD/TXD-N	Receive/transmit data, negative
3	-	Unused
4	RXD/TXD-P	Receive/transmit data, positive
5	-	Unused

##### BUS IN: M12 5-pole plug B-coded

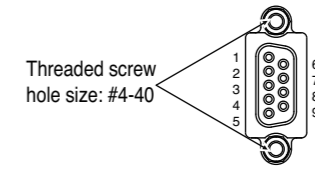
No.	Designation	Description
1	-	Unused
2	RXD/TXD-N	Receive/transmit data, negative
3	-	Unused
4	RXD/TXD-P	Receive/transmit data, positive
5	-	Unused

#### Installation (Continued)

<EX260-SPR5/-SPR6/-SPR7/-SPR8>

BUS: D-sub 9-pole socket

No.	Designation	Description
1	-	Unused
2	-	Unused
3	RXD/TXD-P	Receive/transmit data, positive
4	-	Unused
5	DGND	Data ground (reference potential to VP)
6	VP	Power supply plus (P5V)
7	-	Unused
8	RXD/TXD-N	Receive/transmit data, negative
9	-	Unused



##### Power supply connector layout

PWR: M12 5-pole plug A-coded

No.	Designation	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 operation
4	SI0 V	0 V for SI unit operation
5	-	Unused

##### Ground terminal

Connect the ground terminal to ground. Resistance to ground should be 100 ohms or less.

#### Setting

##### PROFIBUS DP address setting and Fail safe setting (SETTINGS)

<PROFIBUS DP address setting (ADDRESS)>  
The PROFIBUS DP address is binary coded and can be set from 1 to 125 using the 8-element switch.  
Note: Factory default setting is Address 1.

<Fail safe setting (OUTPUT STATE)>  
Set the reaction of outputs to the communication error.  
CLEAR: Clear all outputs.  
HOLD: Hold the last state before communication error.  
Note: Factory default setting is CLEAR.



Note: Be sure to switch off the power supply before setting the switches.

0: OFF, 1: ON

Switch No.	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
ADDRESS	1	64	32	16	8	4	2	1
	2	0	0	0	0	0	0	1
	3	0	0	0	0	0	1	1
	4	0	0	0	0	1	0	0
	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:
OUTPUT STATE	CLEAR	0	-					
	HOLD	1	-					

## Setting (Continued)

### Terminator

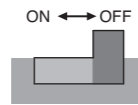
A bus termination is required at both ends of the PROFIBUS DP bus segment.

<EX260-SPR1/-SPR2/-SPR3/-SPR4>

The bus termination switch is built-in to EX260-SPR1/-SPR2/-SPR3/-SPR4.

Switch it ON if the SI unit is at the end of the fieldbus segment.

Note: Factory default setting is OFF.



<EX260-SPR5/-SPR6/-SPR7/-SPR8>

EX260-SPR5/-SPR6/-SPR7/-SPR8 do not have a built-in termination resistor.

Termination is required on the outside of the SI unit. A termination switch built-in to the PROFIBUS DP D-sub connector may be used.

### Configuration

In order to configure the SI unit in the PROFIBUS DP network, the appropriate device master file (GSD file) for the SI unit will be required.

The current GSD file can be found on the SMC website

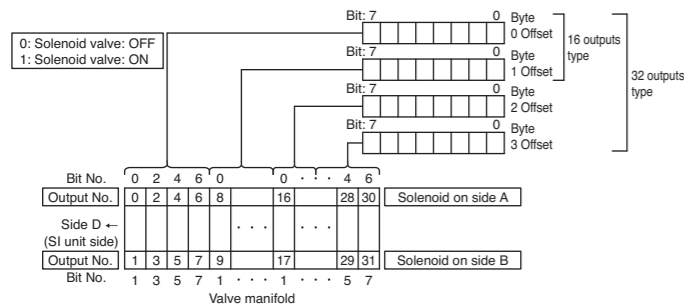
(URL <http://www.smcworld.com>)

GSD file

	Part number	GSD file
1	EX260-SPR1/-SPR2	Smc_1430.gsd
2	EX260-SPR3/-SPR4	Smc_1431.gsd
3	EX260-SPR5/-SPR6	Smc_1432.gsd
4	EX260-SPR7/-SPR8	Smc_1433.gsd

### Output number assignment

The output number refers to the solenoid position on the manifold and starts at zero.



### Diagnostic information

The EX260 SI unit can support 8 bytes of diagnostic information, 6 bytes standard diagnostic information and 2 bytes SI unit-related diagnostic information.

Diagnostic information can be requested by the DP master from the SI unit, and such system fault states can be indicated by the SF LED.

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

## LED indication



LED	Description
SF	System fault
BF	BUS fault
PWR	Turns ON in green when SI unit operating voltage is supplied
PWR(V)	Turns ON in green when load voltage for the valve is supplied Turns OFF when load voltage for the valve is not supplied or outside tolerance range (19 V or less)

<Indication of communication status>

SF status	BF status	Description
<input type="checkbox"/> OFF	<input type="checkbox"/> OFF	No fault. Communication connection to the master is established
<input type="checkbox"/> OFF	<input type="checkbox"/> Red ON	SI unit can not detect a transmission rate and the connection to the DP master has failed
<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> Red flashing	SI unit has detected the transmission rate, but is not addressed by the DP master
<input type="checkbox"/> Red ON	<input type="checkbox"/> OFF	SI unit-related diagnostic error is detected (load power for the valve is not supplied or outside tolerance range)
<input type="checkbox"/> Red ON	<input type="checkbox"/> Red ON	SI unit PROFIBUS DP address outside range
<input type="checkbox"/> Red ON	<input checked="" type="checkbox"/> Red flashing	The configuration data sent from the DP master to the SI unit does not agree with the SI unit configuration

## Troubleshooting

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

## Specifications

Connected load: 24 VDC Solenoid valve with light and surge voltage suppressor of 1.5 W or less (manufactured by SMC)  
Current consumption of power supply for SI unit operation: 0.1 A max.  
Ambient temperature for operation: -10 to 50 °C  
Ambient temperature for storage: -20 to 60 °C  
Pollution degree 2: (UL508)

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

## Outline Dimensions

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

## Accessories

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

## Contacts

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## SMC Corporation

URL <http://www.smcworld.com> (Global) <http://www.smceu.com> (Europe)

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