

Fieldbus device Operation Manual



EX260 Series for PROFIBUS DP

Thank you for purchasing an SMC EX260 Series Fieldbus device (Hereinafter referred to as "SI unit"). Please read this manual carefully before operating the product and make sure you understand its capabilities and limitations. Please keep this manual handy for future reference.

To obtain more detailed information about operating this product, please refer to the SMC website (URL <http://www.smcworld.com>) or contact SMC directly.

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), Japan Industrial Standards (JIS) and other safety regulations.

- Caution:** CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
- Warning:** WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
- Danger:** DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Operator

- ◆ This operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- ◆ Read and understand this operation manual carefully before assembling, operating or providing maintenance to the product.

Safety Instructions

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

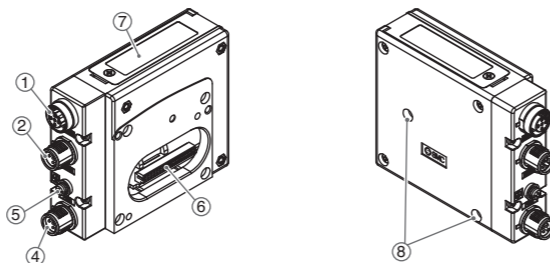
- After maintenance is complete, perform appropriate functional inspections. Stop operation if the equipment does not function properly. Safety cannot be assured in the case of unexpected malfunction.
- Provide grounding to assure the safety and noise resistance of the Fieldbus system. Individual grounding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

NOTE

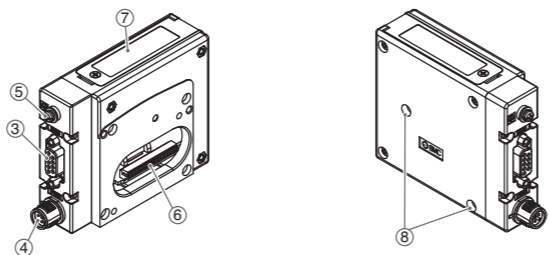
- When conformity to UL is necessary the SI unit must be used with a UL 1310 Class2 power supply.

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)

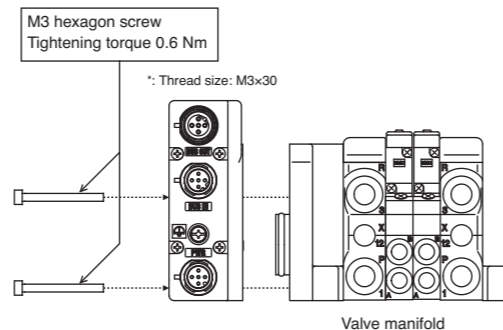
Note: Seal cap will be required only for EX260-SPR1/-SPR2/-SPR3/-SPR4.

Installation

General instructions on installation and maintenance

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

Assembly and disassembly of the SI unit



Replacement of the SI unit

- Remove the M3 hexagon screw 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

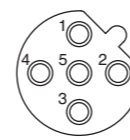
- Be sure to switch off the power.
 - Check there is no foreign matter inside the SI unit.
 - Check there is no damage and no foreign matter being stuck to the gasket.
 - Be sure to tighten the screw with the specified torque.
- If the SI unit is not assembled properly, inside PCBs may be damaged or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

Connecting cables

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

Fieldbus interface connector layout

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



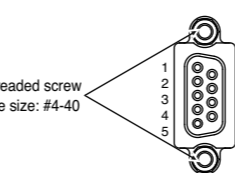
BUS OUT: M12 5-pole Socket B-coded

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

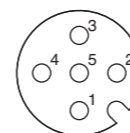
<EX260-SPR5/-SPR6/-SPR7/-SPR8>



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 the 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)>
Set the PROFIBUS DP address of the SI unit in binary coded form with 8-element switch. Address range is 1 to 125.
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 last state right before communication error.
Note: Factory default setting is CLEAR.

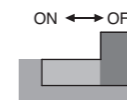


Note: Be sure to switch off the power supply when set on the switch.

Switch No.	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
1	64	32	16	8	4	2	1	
2	0	0	0	0	0	0	0	1
3	0	0	0	0	0	1	1	
4	0	0	0	0	0	1	0	0
...
125	1	1	1	1	1	0	1	

Terminator

A bus termination is required at both ends of 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. You may use the termination switch built-in to PROFIBUS DP D-sub connector.

Configuration

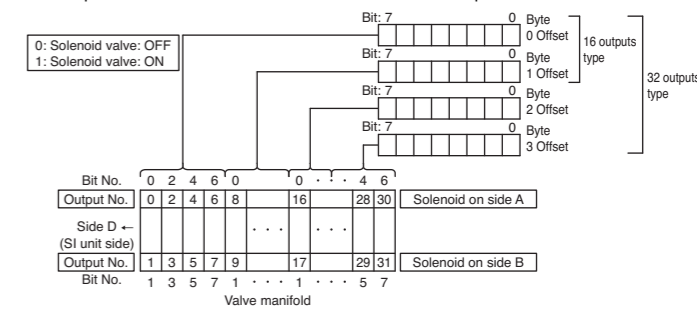
In order to configure the SI unit in the PROFIBUS DP network, you will require the appropriate following Device master file (GSD) for the SI unit.
Current GSD file can be found on the SMC website (URL <http://www.smcworld.com>).

GSD file

No.	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

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



Diagnostic information

The EX260 SI unit can support total 8 bytes diagnostic information, six bytes standard diagnostic information and two bytes SI unit-related diagnostic information. Diagnostic information can be requested by the DP master from the SI unit, and such system fault state can be displayed on the SF LED.
The technical document states detail 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

The technical document states detail 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)

The technical document states detail specification information can be found on the SMC website (URL <http://www.smcworld.com>)

Outline Dimensions

The technical document states detail outline dimensions information can be found on the SMC website (URL <http://www.smcworld.com>)

Accessories

The technical document states detail accessories information can be found on the SMC website (URL <http://www.smcworld.com>)

SMC Corporation URL <http://www.smcworld.com>

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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