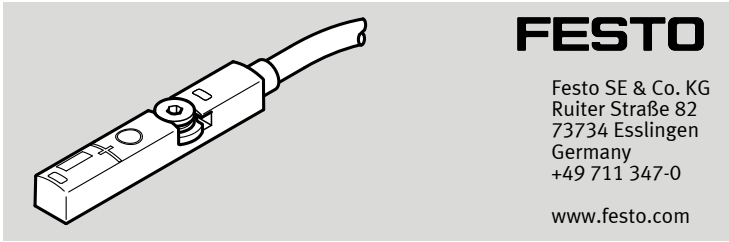


SDAS-MHS
Position transmitter



Instructions | Operating

8126470
2019-12b
[8126472]



Translation of the original instructions
© 2020 all rights reserved to Festo SE & Co. KG

1 About this Document

This document describes the use of the above-mentioned product. For detailed specifications on the product, a complete description, the software for the device (IODD) and the declaration of conformity → www.festo.com.

1.1 Applicable documents

All available documents for the product → www.festo.com/pk.

2 Safety

2.1 General Safety Instructions

- Only use the product in original status without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Take into consideration the ambient conditions at the location of use.
- Observe limit values → 11 Technical data.

Return to Festo

- Consult your regional Festo contact.

2.2 Intended Use

- The position transmitter SDAS-MHS is intended for monitoring the piston stroke.
- Only use the position transmitter for suitable drives from Festo → www.festo.com/catalogue.
- Avoid positioning magnetic objects in close proximity to the position transmitter.

2.3 Training of qualified personnel

Installation, commissioning, maintenance and disassembly should only be conducted by qualified personnel.

2.4 UL/CSA Certification

In combination with the UL inspection mark on the product, the information in this section must also be observed in order to comply with the certification conditions of Underwriters Laboratories Inc. (UL) for USA and Canada.

Approval Information UL/CSA	
Product category code	NRKH/NRKH7
File number	E232949
Considered standards	UL 60947-1, UL 60947-5-2 CSA C22.2 No. 60947-1, CSA C22.2 No. 60947-5-2
UL mark	
UL control number	2MD1

Tab. 1 Approval Information UL/CSA

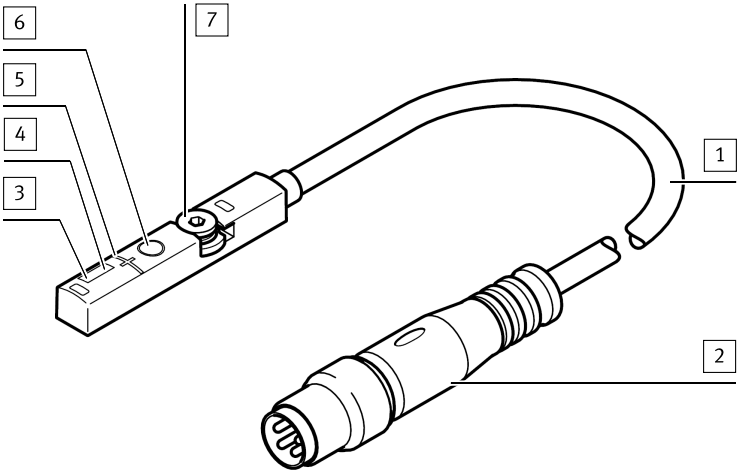
- Technical data and environmental conditions may be subject to change in order to comply with Underwriters Laboratories Inc. (UL) certification requirements for the USA and Canada.
Deviating values → 11.2 Technical Data for UL/CSA Certification.
- Only use power sources which guarantee reliable electrical isolation of the operating voltage in accordance with IEC/EN 60204-1. Observe also the general requirements for PELV power circuits in accordance with IEC/EN 60204-1.
- Only for connection to a NEC/CEC Class 2 supply.
The device shall be supplied from an isolating transformer having a secondary listed fuse rated 1 A.

3 Service

Contact your regional Festo contact person if you have technical questions
→ www.festo.com.

4 Product overview

4.1 Design



- Fig. 1 Design of SDAS-MHS

4.2 Function

The position transmitter detects the magnetic field of the piston magnet and continuously senses the piston movement in the sensing range. The position transmitter can be operated in one of the following operating modes:

- Proximity sensor with 2 programmable switching points (standard operation)
→ 4.2.1 Proximity Sensor Operating Mode.
- Position transmitter with IO-Link communication
→ 4.2.2 Position Transmitter Operating Mode (IO-Link).

i

In the case of active IO-Link communication (IO-Link master required), the SDAS-MHS switches automatically into the position transmitter operating mode.

4.2.1 Proximity Sensor Operating Mode

In the proximity sensor operating mode, 2 switching points can be programmed within the sensing range.

- Operation using capacitive operating key
- Switching logic: normally open (NO)
- Output signal 24 V DC (PNP or NPN)
- Marking on the housing indicates the centre of the sensing range.

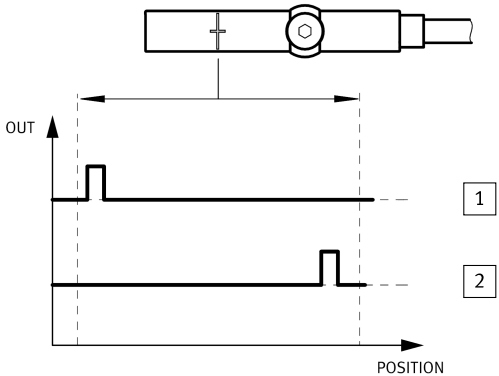
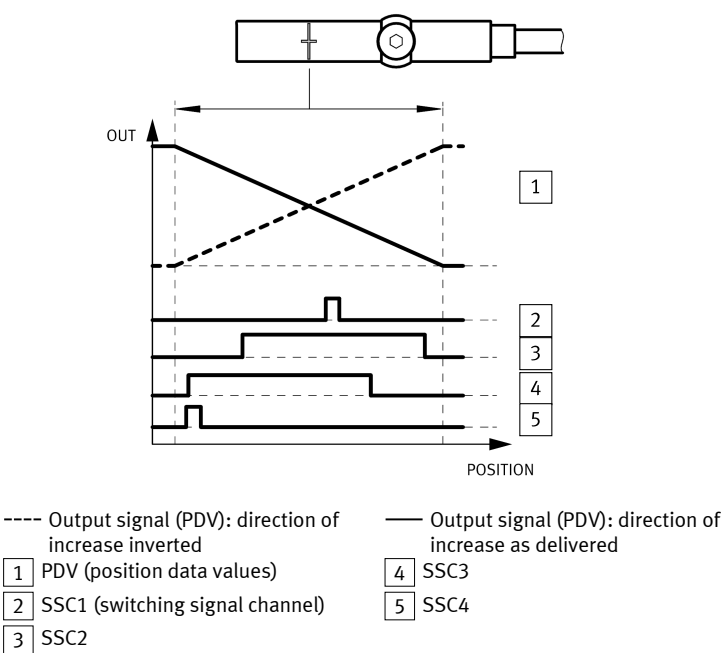


Fig. 2 Application example: Cylinder switch operating mode

4.2.2 Position Transmitter Operating Mode (IO-Link)

In the position transmitter operating mode, programmed switching signals and the continuous position values (digitally coded analogue values) are transferred.

- Programming via IO-Link
- Device description file IODD → www.festo.com/sp.
- Capacitive operating key is deactivated.
- Proximity sensors or window comparators or hysteresis comparators can be programmed individually on 4 switching channels.
- The continuous position values are always transferred in parallel with and independently of the position value output of the switching channels.
- Each channel can be set to be normally closed (NC) or normally open (NO).
- Data transfer is serially and digitally coded in the IO-Link protocol.
- Process data: 12 bit for position data and 4 bit for switching channels → 11 Technical data.
- Unshielded standard cables of up to 20 m in length can be used.
- Parameters and functions in accordance with Smart Sensor profile
- Support for the optional functions “Block parameterisation” and “Data storage”
- The direction of increase of the process data values (PDV) can be inverted. Delivery status: lowest PDV at cable end



5 Electrical Installation

WARNING!

- Risk of injury due to electric shock.**
- For the electrical power supply, use only PELV circuits in accordance with IEC 60204-1/EN 60204-1 (Protective Extra-Low Voltage, PELV).
 - Observe the general requirements of IEC 60204-1/EN60204-1 for PELV circuits.
 - Only use voltage sources that ensure a reliable electric separation from the mains network in accordance with IEC 60204-1/EN 60204-1.

1. Switch off operating voltage.
2. Connect the M8 plug to the connecting cable of the higher-order controller → Fig.5, 4.
 - Tightening torque for the union nut of the plug: max. 0.3 Nm

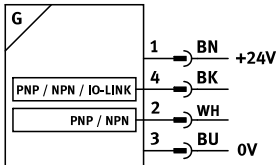


Fig. 4 Circuit diagram

Pin	Wire colour	Allocation	Plug
1	Brown (BN)	Operating voltage +24 V DC	
2	White (WH)	Switching output 2	
3	Blue (BU)	0 V	
4	Black (BK)	Switching output 1	

Tab. 2 Pin Allocation of Plug Connection for Proximity Sensor Operating Mode

Pin	Wire colour	Allocation	Plug
1	Brown (BN)	Operating voltage +24 V DC	
2	White (WH)	Not used	
3	Blue (BU)	0 V	
4	Black (BK)	IO-Link	

Tab. 3 Pin Allocation of Plug Connection for Position Transmitter Operating Mode

6 Mechanical installation

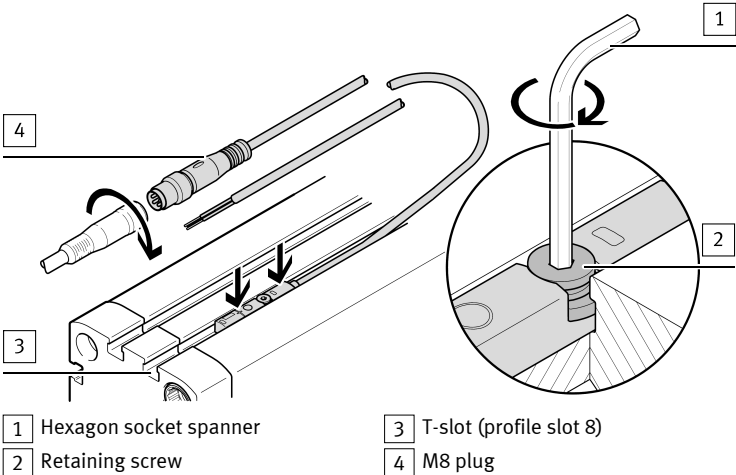


Fig. 5 Mechanical installation

1. Insert the position transmitter into the T-slot of the drive.
2. Move the piston into an end position of the application.
3. Push the position transmitter in the direction of the piston until the red LED goes out.
4. Tighten the hexagon socket-head bolts (spanner size: 1.5 mm).
 - Tightening torque: max. 0.5 Nm

7 Commissioning

- Switch on the operating voltage.
 - ↳ The position transmitter is ready for operation.

7.1 Proximity Sensor Operating Mode

i

The position transmitter is parameterised once it is installed.

- Be mindful of the surface temperature of the capacitive operating key and of the drive.
- Avoid contamination and moisture on the position transmitter.

7.1.1 Activating set-up mode

- Press the capacitive operating key 3 times within 3 s.
 - ↳ Set-up mode active: yellow and red LEDs flash alternately.

i

If programming is not completed within 60 s of starting set-up mode, the SDAS-MHS automatically switches into the operating mode.

7.1.2 Setting Switching Points

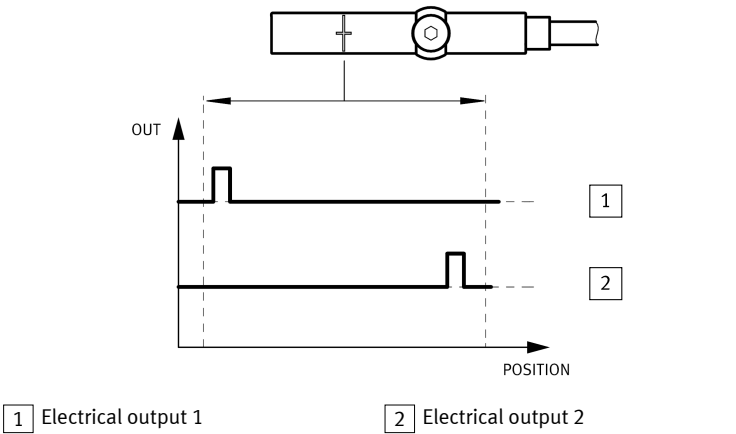


Fig. 6 Application example: Cylinder switch operating mode

1. Move piston to the desired position for switching output 1, within the sensing range.
↳ Red LED OFF
→ Tab. 5 LED Displays in the Proximity Sensor Operating Mode.
2. Activate set-up mode.
3. To assign the position for switching output 1, press the capacitive operating key 1 time.
↳ The yellow LED flashes once.
4. Press the capacitive operating key.
↳ Switching point 1 is established. Operating mode is active.
5. Move piston to the desired position for switching output 2, within the sensing range.
↳ Red LED OFF
→ Tab. 5 LED Displays in the Proximity Sensor Operating Mode.
6. Activate set-up mode.
7. To assign the position for switching output 2, press the capacitive operating key twice.
↳ The yellow LED flashes twice.
8. Press the capacitive operating key.
↳ Switching point 2 is established. Operating mode is active.

7.1.3 Menu structure

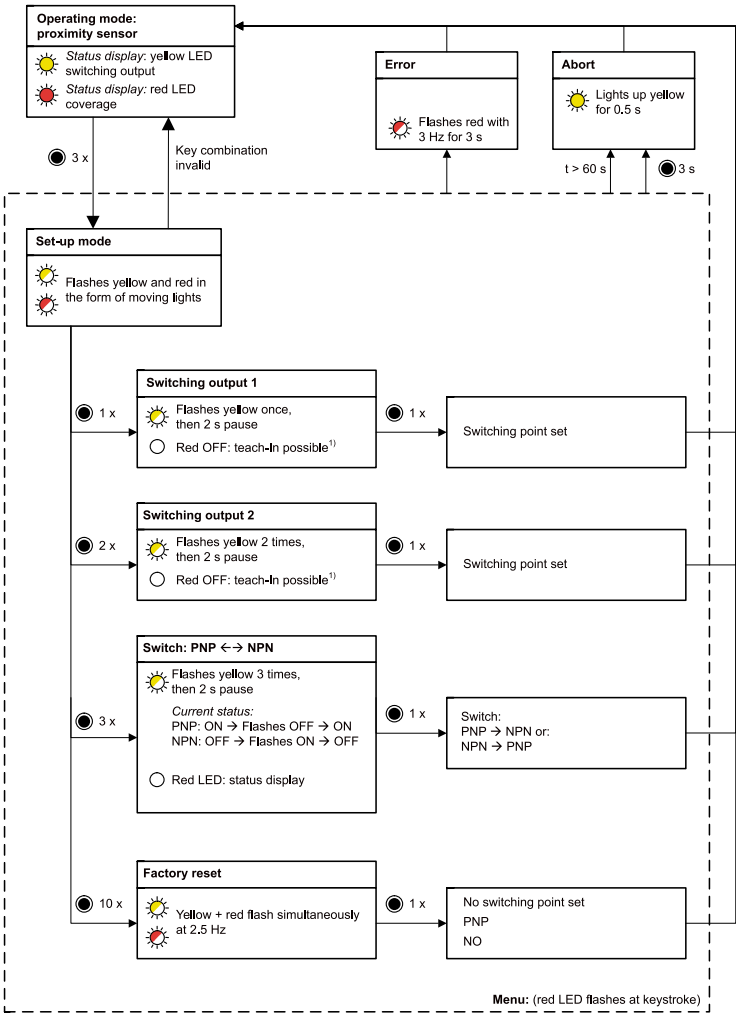


Fig. 7 Settings using the capacitive operating key (menu structure)

LED/operating key	Meaning
 N x	Press the capacitive operating key (in the example: 3 x); max. 1 s pause between 2 consecutive presses
 3 s	Hold the capacitive operating key pressed for at least 3 s.
  	LED illuminated / LED flashing / LED OFF (in the example: yellow LED)
1)	A switching point can only be set when the red LED is OFF. When the red LED is flashing at 1.5 Hz, the magnet is located in the region of the operational reserve. It is not possible to set a switching point. The operational reserve is required for the safe setting of switching points in the edge region. When the red LED is illuminated, the magnet is outside the sensing range. It is not possible to set a switching point.

Tab. 4 Explanation of symbols

7.2 Position Transmitter Operating Mode

- In the position transmitter operating mode, commissioning is carried out in the higher-order controller of the IO-Link master.
1. Load the device description file IODD (→ www.festo.com/sp) into the interpreter of the IO-Link master.
 2. For general information on the IO-Link specification and for the Smart Sensor profile → www.io-link.com.
 3. Connect the position transmitter to the IO-Link master as shown in the circuit diagram
→ Tab. 3 Pin Allocation of Plug Connection for Position Transmitter Operating Mode.
 4. Program the position transmitter. Observe the instructions in the operating instructions for the IO-Link master.



Errors during commissioning are displayed on the user interface of the IO-Link master. Programming is blocked.

8 Operation

8.1 Proximity Sensor Operating Mode



- The position transmitter is parameterised once it is installed.
- Be mindful of the surface temperature of the capacitive operating key and of the drive.
 - Avoid contamination and moisture on the position transmitter.

LED	Meaning
 	Both LEDs OFF: status indicator. – Piston within the sensing range – No switching output set
 	Yellow LED illuminated: switching status indication. – Switching output 1 or switching output 2 is active.
 	Red LED illuminated: status indicator. – Piston outside the sensing range
 	Red LED flashing at 1.5 Hz: status indicator. – Piston is located in the region of the operational reserve.

Tab. 5 LED Displays in the Proximity Sensor Operating Mode

8.2 Position Transmitter Operating Mode

LED	Meaning
 	Yellow LED flashing at 1Hz: ready status. – IO-Link communication is active.
 	Red LED lights up and yellow LED flashes: status indicator. – IO-Link communication is active. – Piston outside the sensing range

Tab. 6 LED Displays in the Position Transmitter Operating Mode

9 Fault Clearance



Errors during IO-Link operation are displayed on the user interface of the IO-Link master. The IO-Link switching output is not blocked.

9.1 Diagnostics via LEDs

LED		Possible cause	Remedy
Yellow	Red		
		Power supply, connecting cable or sensor is faulty/defective (there may not be a fault → Tab. 5 LED Displays in the Proximity Sensor Operating Mode).	– Check power supply. – Check connecting cable, replace if necessary. – Replace device.
		Permanently: Short circuit/overload at the switching output	– Rectify short circuit/overload.
Yellow LED flashing at 3 Hz		For 3 s, after pressing the capacitive operating key: capacitive operating key is blocked.	– Cancel the block on the capacitive operating key using the IO-Link.
		Hardware error	– Switch the power supply off and then on again. – Replace device.
Red LED flashing at 3 Hz			

Tab. 7 Diagnostics via LED display

9.2 General Malfunctions

Fault description	Cause	Remedy
Incorrect or unexpected signals at the output	Drive is not suitable.	Use a suitable drive.
	Device is faulty.	Replace device.
	No power supply or impermissible operating voltage.	Comply with operating voltage range.
	Short circuit or overload at the output	Rectify short circuit/overload.
	Magnetic objects in close proximity to the position transmitter	Avoid positioning magnetic objects in close proximity.
	Sensor/drive rotated by 180° after initial commissioning.	Reset to factory settings (using the operating key or via IO-Link).
	Incorrect or unexpected signals during initial commissioning on grippers or in attachments which are partly ferromagnetic	On initial commissioning, move gripper jaws or pistons within the sensing range (e.g. at both end positions).
Switching output does not switch in accordance with the settings.	Short circuit or overload at the output	Rectify short circuit/overload.
	Device is faulty.	Replace device.
Settings cannot be edited.	Access protection is active.	Unblock operating key (only possible via IO-Link).
Capacitive operating key does not react to input.	Dirt or moisture on the position transmitter	Wipe position transmitter with a dry cloth.

Tab. 8

10 Disassembly

1. Switch off the power supply.
2. Disconnect connections from the position transmitter.
3. Undo the hexagon socket-head bolts → Fig.5.
4. Remove the position transmitter from the T-slot of the drive.

11 Technical data

11.1 Technical Data, General


For the complete technical data → Description of SDAS-MHS.

SDAS-MHS		
Operating voltage	[V DC]	10 ... 30
Ambient temperature	[°C]	−40 ... +80
Degree of protection (to EN 60529)		IP65/IP68

Tab. 9 Technical Data

11.2 Technical Data for UL/CSA Certification

Electrical Data and Ambient Conditions UL/CSA	
Ambient temperature range	−40 ... +70 °C

Tab. 10 Electrical Data and Ambient Conditions UL/CSA