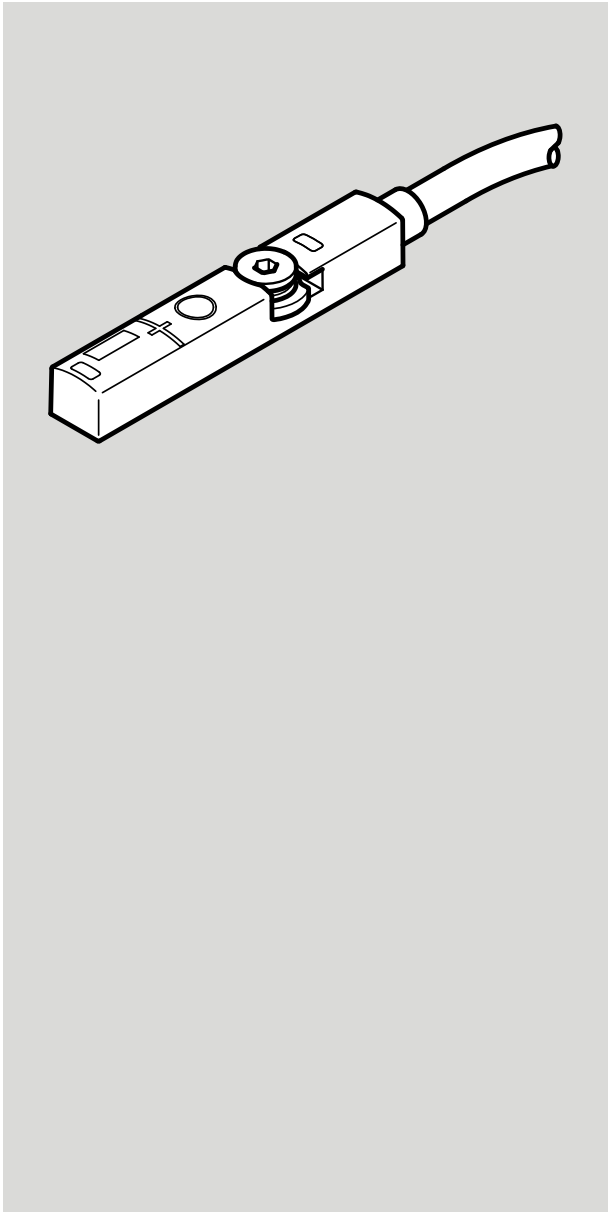


SDAS-MHS
Position transmitter



FESTO

Description | Function,
Operating



8126480
2020-03a
[8126482]

Translation of the original instructions

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1 About this document

This document describes the use of the above-mentioned product.

1.1 Applicable Documents



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

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 → 10 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	 US LISTED
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 → 10.2 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 Product overview

3.1 Design

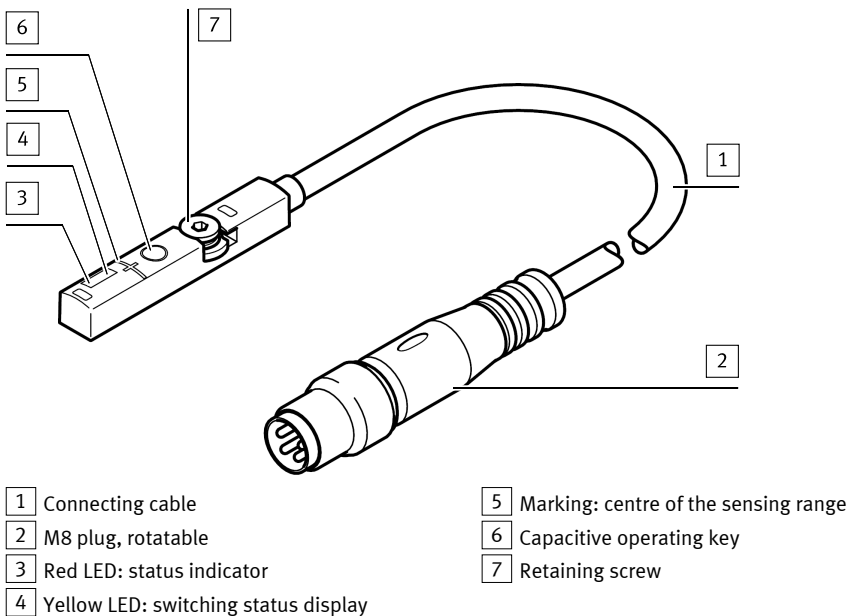


Fig. 1 Design of SDAS-MHS

3.2 Characteristics

Characteristic	Value	Description
Position transmitter	SDAS-	
Sensor version	M	Insertable in slot
Sensor principle	HS-	Hall sensor
Measuring range	M40-	Typically up to 40 mm
Nominal operating voltage	1	24 V DC
Display	L-	LED
Electrical output 1	PNLK-	PNP or NPN or IO-Link
Electrical output 2	PN-	PNP or NPN
Cable characteristic	E-	Suitable for use with energy chains/robots
Cable length	0.3-	0.3 m
	2.5-	2.5 m
Outgoing circuit	–	Axial
Electrical connection	LE	Open end
	M8	M8 plug

Tab. 2 Overview of variants

4 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:

- Cylinder switch with 2 programmable switching points (standard operation)
→ 4.1 Cylinder switch operating mode.
- Position transmitter with IO-Link communication
→ 4.2 Position transmitter operating mode (IO-Link).

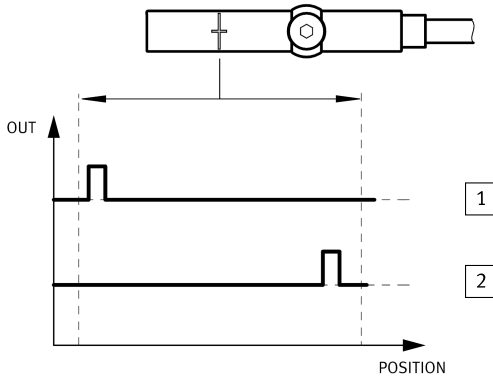
i

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

4.1 Cylinder switch operating mode

In the cylinder switch 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.



1 Electrical output 1

2 Electrical output 2

Fig. 2 Application example: Cylinder switch operating mode

4.1.1 Cylinder switch function

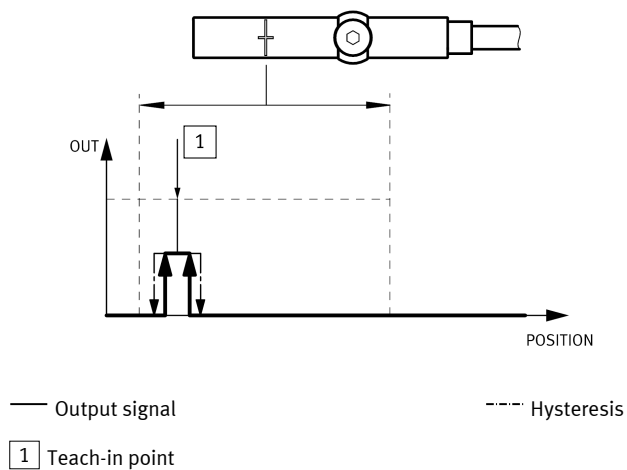


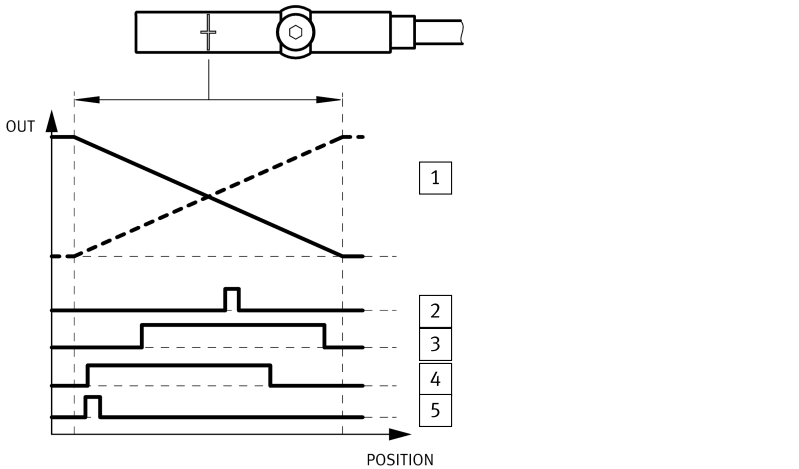
Fig. 3 Cylinder switch function

- The teach-in point is located in the centre of the switching window.
- The switching window and hysteresis are preset and cannot be changed.

4.2 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.
- Cylinder switches 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 transmission is serially and digitally coded in the IO-Link protocol.
- Process data: 12 bit for position data and 4 bit for switching channels → 10 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. As delivered: lowest PDV at cable end



----- Output signal (PDV): direction of increase inverted

1 PDV (position data values)

2 SSC1 (switching signal channel)

3 SSC2

— Output signal (PDV): direction of increase as delivered

4 SSC3

5 SSC4

Fig. 4 Application example: Position transmitter operating mode

4.2.1 Cylinder switch function

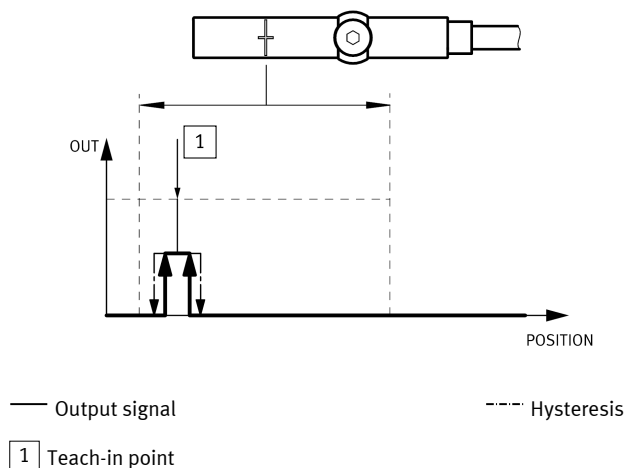


Fig. 5 Cylinder switch function

- The teach-in point is located in the centre of the switching window.
- The switching window and hysteresis are preset and cannot be changed.

4.2.2 Window comparator

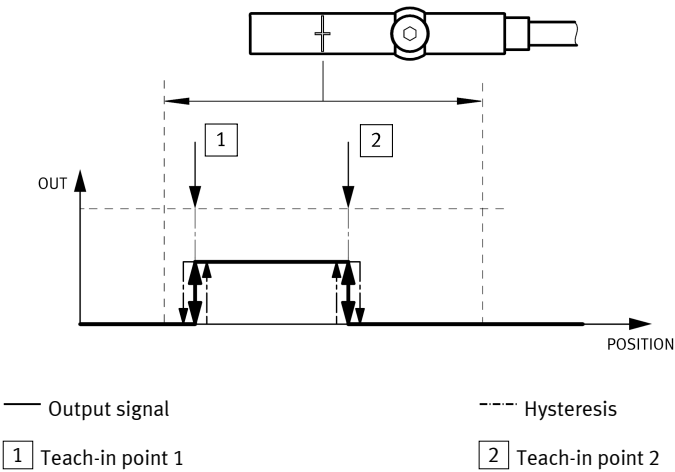
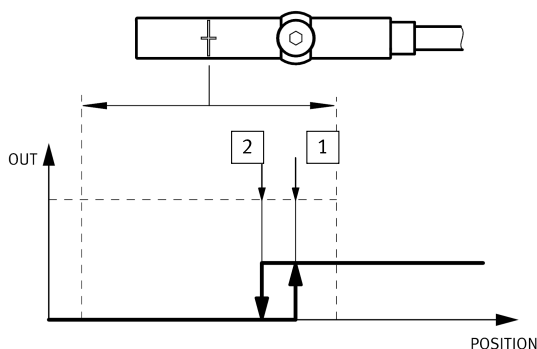


Fig. 6 Window comparator

The teach-in points are linked to the window comparator function.

- The window width is determined by the position of the teach-in points.
- The hysteresis is preset and cannot be changed.

4.2.3 Hysteresis comparator



1 Teach-in point 1

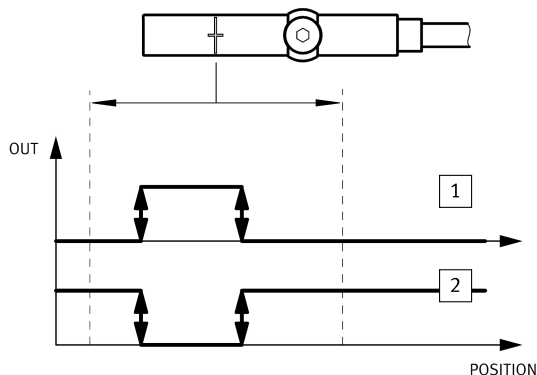
2 Teach-in point 2

Fig. 7 Hysteresis comparator

The teach-in points are linked to the hysteresis comparator function.

- Teach-in point 1 is the switch-on point, teach-in point 2 is the reset point.
- The distance between teach-in point 1 and teach-in point 2 determines the size of the hysteresis.

4.2.4 Switching logic, normally open (NO) and normally closed (NC)



1 Normally open (NO)

2 Normally closed (NC)

Fig. 8 Inverting the SSC

The switching logic normally open (NO) is set as standard. The function of the SSC is inverted by selecting the switching logic normally closed (NC).

4.3 Additional information on the operating modes

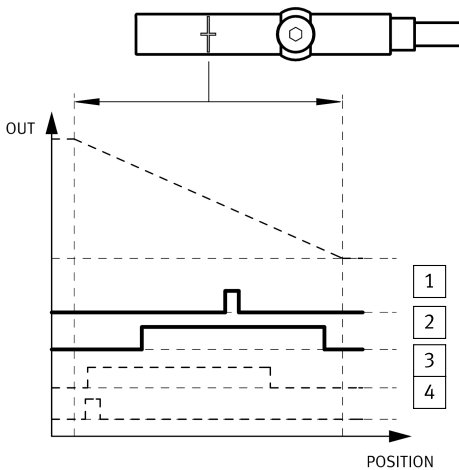
The binary data channels SSC1 and SSC2 for the position transmitter operating mode correspond to the electrical switching outputs 1 and 2 for the cylinder switch operating mode.

Parameterising SSC1 and SSC2 via IO-Link makes it possible to use the window comparator and hysteresis comparator switching functions and the switching logic (NO/NC) in cylinder switch operating mode too. Conversely, the switching points set in cylinder switch operating mode are directly available in the position transmitter operating mode.

The switching logic for SSC1 set in the position transmitter operating mode applies to SSC1 and SSC2 in the cylinder switch operating mode, regardless of what has been set for SSC2.

An LED is available to display both switching outputs:

- Switching logic NC: the output signal for both switching outputs is AND-gated on the LED display.
- Switching logic NO: the output signal for both switching outputs is OR-gated on the LED display.



1 SSC1 = Switching output 1

2 SSC2 = Switching output 2

3 SSC3

4 SSC4

Fig. 9 Relationship of position transmitter and cylinder switch operating modes

Position transmitter	Cylinder switch	Switching logic in cylinder switch operating mode
SSC 1 ↔	Switching output 1	As set for SSC1 [or NO: factory setting]
SSC 2 ↔	Switching output 2	As set for SSC1 [or NO: factory setting]
SSC 3	Ignored; settings remain in memory	Ignored; setting remains in memory
SSC 4	Ignored; settings remain in memory	Ignored; setting remains in memory

Tab. 3 Relationship between the operating modes

5 Fitting

5.1 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.

- Switch off operating voltage.
- Connect the M8 plug to the connecting cable of the higher-order controller → Fig.11, [4].
 - Tightening torque for the union nut of the plug: max. 0.3 Nm

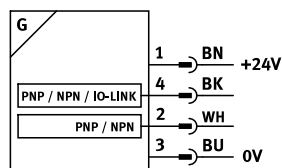
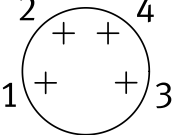
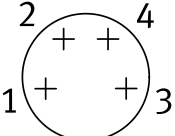


Fig. 10 Circuit diagram

Pin	Wire colour	Allocation	Plug
1	Brown (BN)	Operating voltage +24 V DC	M8x1, 4-pin 
2	White (WH)	Switching output 2	
3	Blue (BU)	0 V	
4	Black (BK)	Switching output 1	

Tab. 4 Pin Allocation of Plug Connection for Proximity Sensor Operating Mode

Pin	Wire colour	Allocation	Plug
1	Brown (BN)	Operating voltage +24 V DC	M8x1, 4-pin 
2	White (WH)	Not used	
3	Blue (BU)	0 V	
4	Black (BK)	IO-Link	

Tab. 5 Pin Allocation of Plug Connection for Position Transmitter Operating Mode

5.2 Mechanical installation

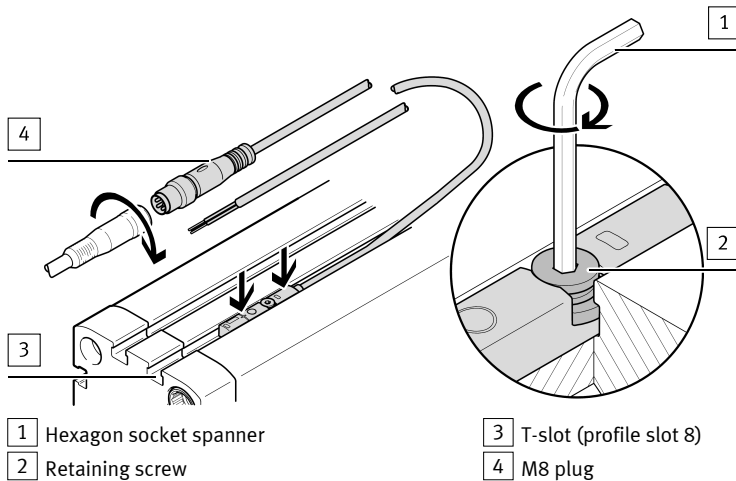


Fig. 11 Mechanical installation

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

6 Commissioning

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

6.1 Cylinder switch 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.

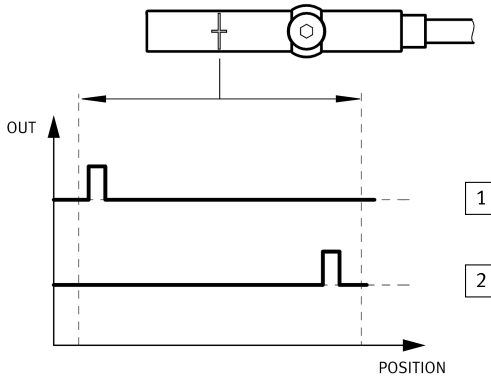
6.1.1 Activating set-up mode

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



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

6.1.2 Set switching points



1 Electrical output 1

2 Electrical output 2

Fig. 12 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. 7 LED displays in the cylinder switch 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 1 time.
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. 7 LED displays in the cylinder switch operating mode.
6. Activate set-up mode.
7. To assign the position for switching output 2, press the capacitive operating key 2 time.
 ↳ The yellow LED flashes 2 times.
8. Press the capacitive operating key.
 ↳ Switching point 2 is established. Operating mode is active.

6.1.3 Changing the configuration of the switching outputs

The switching outputs are configured as PNP as standard. Carry out the following steps to change the configuration of the switching outputs:

1. Activate set-up mode.
2. To switch into the change-over mode, press the capacitive operating key 3 times.
 - ↵ The yellow LED indicates the current configuration (flashes 3x/2 s pause).
 - PNP: ON › Flashes › ON
 - NPN: OFF › Flashes › OFF
3. To change the configuration, press the capacitive operating key 1 time.
 - ↵ Change to configuration is stored. Device is ready for operation.

6.1.4 Menu structure

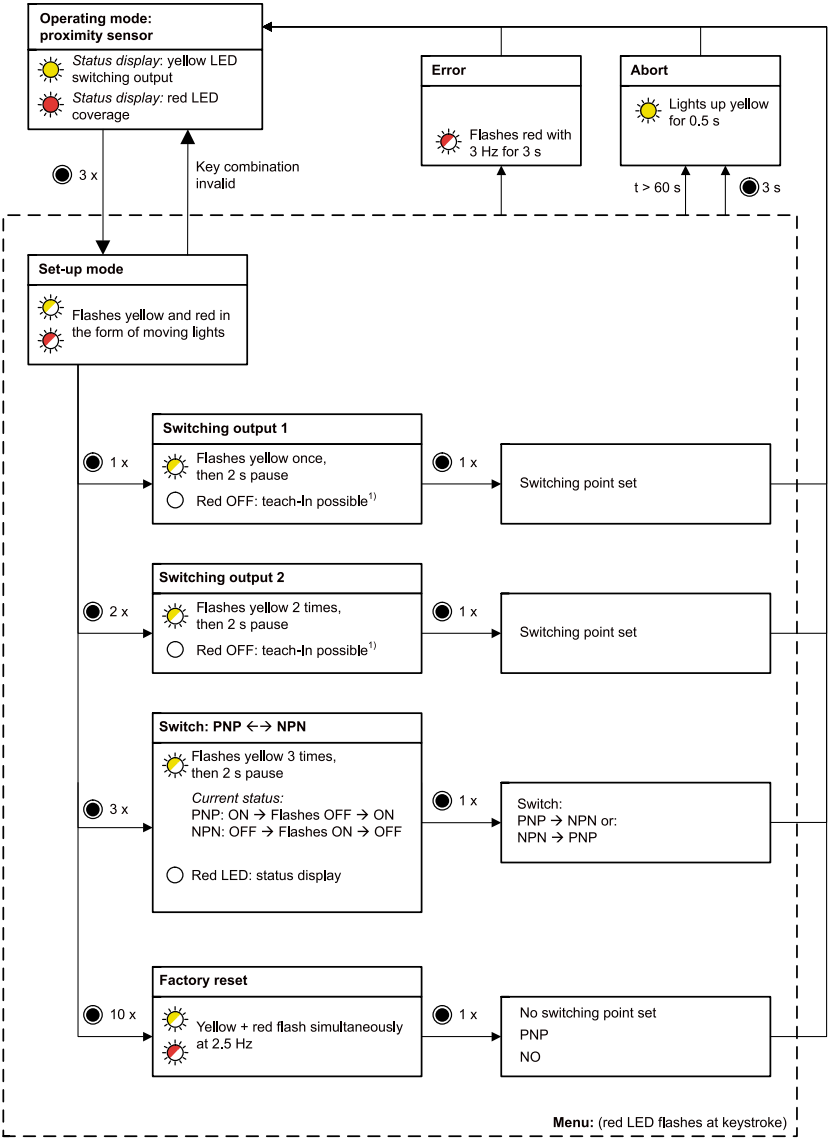


Fig. 13 Settings using the capacitive operating key (menu structure)

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. 6 Explanation of symbols

6.2 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. 5 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.

7 Operation

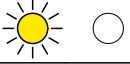
7.1 Cylinder switch operating mode



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.
-

7.1.1 LED display

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

Tab. 7 LED displays in the cylinder switch operating mode

7.1.2 Reset to factory setting

Parameter	Factory setting
Switching points	None
Switching outputs	PNP

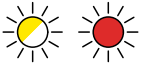
Tab. 8 Factory settings SDAS-MHS

Requirement: set-up mode is active.

1. Press the capacitive operating key 10 times.
🔗 Yellow and red LEDs flash at 2.5 Hz.
2. Press the capacitive operating key.
🔗 Position transmitter is reset to factory settings. Operating mode is active.

7.2 Position transmitter operating mode

7.2.1 LED display

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

Tab. 9 LED displays in the position transmitter operating mode

7.2.2 Reset to factory setting

Parameter	Factory setting
SSC channels	Not programmed
PDV	Minimum on the cable side

Tab. 10 Factory settings SDAS-MHS
The factory settings are reset via IO-Link.

8 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.

8.1 Diagnostics via LED

LED display		Possible cause	Remedy
Yellow	Red		
		Power supply, connecting cable or sensor is faulty/defective (there may not be a fault → Tab. 7 LED displays in the cylinder switch operating mode).	– Check power supply. – Check connecting cable, replace if necessary. – Replace device.
		Permanently: Short circuit/overload at the switching output	– Eliminate 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.

Tab. 11 Diagnostics via LED display

8.2 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	Eliminate 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	Eliminate 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. 12

9 Disassembly

1. Switch off the power supply.
2. Disconnect connections from the position transmitter.
3. Undo the hexagon socket-head bolts → Fig.11.
4. Remove the position transmitter from the T-slot of the drive.

10 Technical data

10.1 General information

SDAS-MHS		
Sensors – General		
Sensing range	[mm]	max. 52
Ambient temperature	[°C]	–40 ... +80
Typical sampling interval	[ms]	2
Typical signal running time	[ms]	< 4
Max. speed of travel	[m/s]	3
Path resolution	[mm]	max. 0.02
Repetition accuracy	[mm]	0.2
Typical linearity error	[mm]	± 1
Electronics – General		
Operating voltage DC	[V]	10 ... 30
Electronics – Switching output		
Switching output		2x PNP or 2x NPN, adjustable
Typical hysteresis of switching output	[mm]	≤ 0.25 ± 0.05
Max. output current	[mA]	50 ¹⁾
Electromechanics		
Cable length	[m]	SDAS-MHS- ... -0.3-M8: 0.3 SDAS-MHS- ... -2.5-LE: 2.5
Conductor nominal cross section	[mm²]	0.1
Ambient temperature with flexible cable installation	[°C]	–20 ... +70
Mechanics		
Max. tightening torque	[Nm]	0.6
Information on materials – housing		PA-reinforced high-alloy stainless steel

SDAS-MHS	
Immission/emission	
Degree of protection (in accordance with EN 60529)	IP65/IP68

1) per switching output
Tab. 13 Technical data

10.2 Technical Data for UL/CSA Certification

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

Tab. 14 Electrical Data and Ambient Conditions UL/CSA

10.3 IO-Link

SDAS-MHS	
Protocol version	Device V 1.1
Profile	Smart sensor profile
Function classes	0x8000: Identification 0x8001: Switching signal channel (SSC) 0x8002: Process data variable (PDV) 0x8003: Diagnostics 0x8004: Teach channel
Communication mode	COM2
Process data width IN	2 bytes
Port class	A, 4-pin
Device-ID	0x00000C

Tab. 15 Physical layer

Process data Record: 2 Byte						
Bit	15	...	4	3	2	1 0
Process data	Process Data Variable (PDV) → Tab. 17 PDV (Process Data Variable): position signal.			SSC4 ¹⁾	SSC3 ¹⁾	SSC2 ¹⁾ SSC1 ¹⁾
Data	Position			switch 4	switch 3	switch 2 switch 1
Type	Unsigned Integer			BooleanT		

1) Switching signal channel

Tab. 16 Process data content

PDV (Dec)	PDV (Hex)	Description
0	0x000	outside the sensing range (Out of Range)
1	0x001	inside the sensing range, valid position signal
...	...	
3999	0xF9F	
4000	0xFA0	Outside the sensing range (Out of Range)
4080	0xFF0	PDV Error
4095	0xFFF	Out of Range

Tab. 17 PDV (Process Data Variable): position signal

SSC (Switching Signal Channel): switching function

Index	Sub-Index	Access	Parameter Name	Values	Data type
0x0002 (2)	0	W	Standard Command	See table above	UInt8
0x000C (12)	0	R/W	Device Access Locks	0: unlocked (default) 1: locked Bit 1: Data Storage Access Bit 3: Local User Interface (Button)	UInt16
0x0010 (16)	0	R	Vendor Name	Festo	String 64 Byte
0x0011 (17)	0	R	Vendor Text	http://www.festo.com	String 64 Byte

Index	Sub-Index	Access	Parameter Name	Values	Data type
0x0012 (18)	0	R	Product Name	SDAS-MHS-M40-1L-PNLK-PN-E-0.3-M8	String 64 Byte
0x0013 (19)	0	R	Product ID	8063974	String 64 Byte
0x0014 (20)	0	R	Product Text	Position-Transmitter	String 64 Byte
0x0016 (22)	0	R	Hardware Revision	REVxy	String 64 Byte
0x0017 (23)	0	R	Firmware Revision	REVxy	String 64 Byte
0x0018 (24)	0	R/W	Application Specific Tag	Value is freely defined by user	String 32 Byte
0x0028 (40)	0	R	Process Data Input	See PDV	Record 2 Byte

Tab. 18 Service data

Index	Sub-Index	Access	Parameter Name	Values	Data type	Comment
0x003C (60)	01	RW	Setpoint 1	216 ... 3784	IntT16	SSC1
	02	RW	Setpoint 2	216 ... 3784	IntT16	
0x003D (61)	01	RW	Switchpoint logic	0 = NO, normally open 1 = NC, normally closed	UIntT8	
	02	RW	Switchpoint mode	0 = Deactivated 134 = Cylinder switch 133 = Window comparator 3 = Hysteresis comparator	UIntT8	
	03	RW	Hysteresis	30	UIntT16	

Index	Sub-Index	Access	Parameter Name	Values	Data type	Comment
0x003E (62)	01	RW	Setpoint 1	216 ... 3784	IntT16	SSC2
	02	RW	Setpoint 2	216 ... 3784	IntT16	
0x003F (63)	01	RW	Switchpoint logic	0 = NO, normally open 1 = NC, normally closed	UIntT8	
	02	RW	Switchpoint mode	0 = Deactivated 134 = Cylinder switch 133 = Window comparator 3 = Hysteresis comparator	UIntT8	
	03	RW	Hysteresis	30	UIntT16	
0x4000 (16384)	01	RW	Setpoint 1	216 ... 3784	IntT16	SSC3
	02	RW	Setpoint 2	216 ... 3784	IntT16	
0x4001 (16385)	01	RW	Switchpoint logic	0 = NO, normally open 1 = NC, normally closed	UIntT8	
	02	RW	Switchpoint mode	0 = Deactivated 134 = Cylinder switch 133 = Window comparator 3 = Hysteresis comparator	UIntT8	
	03	RW	Hysteresis	30	UIntT16	

Index	Sub-Index	Access	Parameter Name	Values	Data type	Comment
0x4002 (16386)	01	RW	Setpoint 1	216 ... 3784	IntT16	SSC4
	02	RW	Setpoint 2	216 ... 3784	IntT16	
0x4003 (16387)	01	RW	Switchpoint logic	0 = NO, normally open 1 = NC, normally closed	UIntT8	
	02	RW	Switchpoint mode	0 = Deactivated 134 = Cylinder switch 133 = Window comparator 3 = Hysteresis comparator	UIntT8	
	03	RW	Hysteresis	30	UIntT16	

Tab. 19 Configuration by parameter input

Inverting the process data

Index	Sub-Index	Access	Parameter Name	Allowed Values	Data type
0x3100 (12544)	0	RW	Invert the direction of the position value	0 = PDV standard: Minimum value at cable side 1 = PDV inverted: Maximum value at cable side	UIntT8

Tab. 20 Inverting the process data

Error and warning messages via IO-Link

Code	Type	Name	Description
0x4210 (16912)	Warning	Overtemperature	
0x5000 (20480)	Error	Device hardware fault	Device Exchange
0x5111 (20753)	Warning	Primary supply voltage under-run	Check tolerance
0x6320 (25376)	Error	Parameter error	Check data sheet and values
0xFF91 (65425)	Notification	Data Storage Upload Request	

Tab. 21 Events

Code	Additional Code	Name	Description
0x80 (128)	0x00 (0)	Device application error - no details	Service has been refused by the device application and no detailed information of the incident is available
	0x11 (17)	Index not available	Access occurs to a not existing index
	0x12 (18)	Subindex not available	Access occurs to a not existing subindex
	0x20 (32)	Service temporarily not available	Parameter is not accessible due to the current state of the device application
	0x21 (33)	Service temporarily not available - local control	Parameter is not accessible due to an ongoing local operation at the device
	0x22 (34)	Service temporarily not available - device control	Parameter is not accessible due to a remote triggered state of the device application
	0x23 (35)	Access denied	Write access on a read-only parameter

Code	Additional Code	Name	Description
0x80 (128)	0x30 (48)	Parameter value out of range	Written parameter value is outside its permitted value range
	0x31 (49)	Parameter value above limit	Written parameter value is above its specified value range
	0x32 (50)	Parameter value below limit	Written parameter value is below its specified value range
	0x33 (51)	Parameter length overrun	Written parameter length is above its predefined length
	0x34 (52)	Parameter length underrun	Written parameter length is below its predefined length
	0x35 (53)	Function not available	Written command is not supported by the device application
	0x36 (54)	Function temporarily unavailable	Written command is not available due to the current state of the device application
	0x40 (64)	Invalid parameter set	Written single parameter collides with other actual parameter settings
	0x41 (65)	Inconsistent parameter set	Parameter inconsistencies were found at the end of block parameter transfer, device plausibility check failed
	0x82 (130)	Application not ready	Read or write service is refused due to a temporarily unavailable application

Code	Additional Code	Name	Description
0x81 (129)	0x01 (1)	Error: Index not readable	
	0x02 (2)	Parameter write access is locked	
	0x10 (16)	Position OutOfRange	Magnet Position is out of range
	0x11 (17)	Position OutOfTeach	Teach Area is between 216 and 3784 digits

Tab. 22 Error Types

Resetting the position transmitter to factory setting

Index	Sub-Index	Access	Parameter Name	Values	Data type
0x0002 (2)	0	W	Standard Command	130 = Restore Factory Settings	UInt8

Tab. 23 Factory setting

I-Port

Index	Sub-Index	Name	Access	Length (Byte)	Default Value
0x0040	0x00	Device attributes	R/W	1	0x00 ¹⁾
0x0041	0x00	Extended parameters	R/W	2	0x0000 ¹⁾
0x0042	0x00	Diagnosis parameter	R	2	0x0000 ¹⁾
0x0043	0x00	Device specific parameters	R/W	8	→ Tab. 25 I-Port: Device specific parameters ²⁾
0x00FE	0x00	I-Port Revision	R/W	2	0x0101 ¹⁾

1) only default value possible

2) For permitted value ranges for individual parameters see BDA or IODD.

Tab. 24 I-Port: overview of parameters

Byte	1	2	3	4	5	6	7	8
IO-Link index	0x003C				0x003D			
Subindex	1		2		1	2	3	
Function	SP1		SP2		Logic	Mode	HY	
Byte	high	low	high	low	–	–	high	low
Default values	0x00	0xAF	0x00	0xAF	0x00	0x00	0x00	0x05

Tab. 25 I-Port: Device specific parameters

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