

## Product description

The pms sensor has a stainless steel housing and is designed for applications with hygienic requirements. The ultrasonic transducer surface of the pms sensors is laminated with a PTFE film. The transducer itself is sealed against the housing by a joint ring.

The pms sensor with D12 adapter shaft can be fitted in a mounting clip which meets hygiene standards like the sensor screw connection BF-pms/A1.

The special housing design ensures that any cleaning fluids are able to run off completely, regardless of the installation situation.

The pms sensor is ECOLAB certified. The pms sensor variant D12 adapter shaft offers a non-contact measure-

ment of the distance to an object present within the sensors's detection zone. The switched output is set conditional upon the adjusted detect distance.

For sensor setting, the accessory LinkControl adapter LCA-2 is recommended in combination with LinkControl software for Windows®. Alternatively, the sensor can also be set by Teach-in via pin 2.

The pms sensors are IO-Link-capable in accordance with IO-Link specification V1.1.

## Safety Notes

- Read the operating instructions prior to start-up.
- Connection, installation and adjustment works should be carried out by expert personnel only.

- No safety component in accordance with the EU Machine Directive.

## Proper Use

pms ultrasonic sensors are used for non-contact detection of objects. The sensor must be mounted in an EHEDG-approved mounzing clip, such as the sensor screw connection BF-pms/A1 for a EHEDG-compliant use.

## Installation

- Assemble the sensor and its hygienic D12 sensor screw connection BF-pms/A1 or an equivalent sensor mounting clip at the instation location.
- Pull sensor cable through the sensor gland, connect it to the M8

sensor plug.

- Push the sensor with its shaft into the sensor screw connection BF-pms/A1 and adjust (see figure 4-6). Tighten with lock nut (maximum tightening torque 12 Nm).

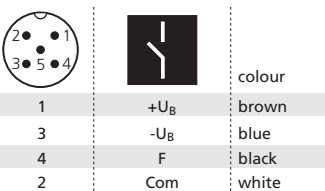


Fig. 1: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cables

## Start-up

- Connect the power supply.
- Carry out sensor adjustment with

LinkControl or alternatively Teach-in procedure in accordance with the diagram.

## Factory Setting

- Detect point operation
- Switched output on NOC
- Detect distance at operating range
- Filter at F01
- Filter strength at P00

## Operating Modes

Three operating modes are available for the switched output:

- Operation with one detect point  
The switched output is set when the object falls below the set detect point.
- Window mode  
The switched output is set when the object is within the set window.
- Two-way reflective barrier  
The switched output is set when the object is between sensor and fixed reflector.

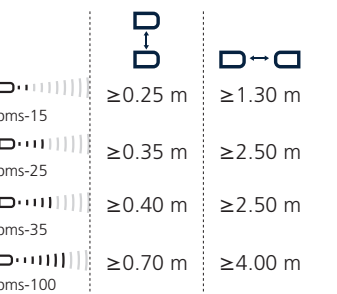


Fig. 2: Assembly distances

## Maintenance

microsonic sensors are maintenance-free. For cleaning in areas with hygienic requirements, access to the sensor must be guaranteed from all sides. Cleaning is permitted up to a cleaning temperature of 85°C. Do not use a high-pressure cleaner to clean the sensor.

## Notes

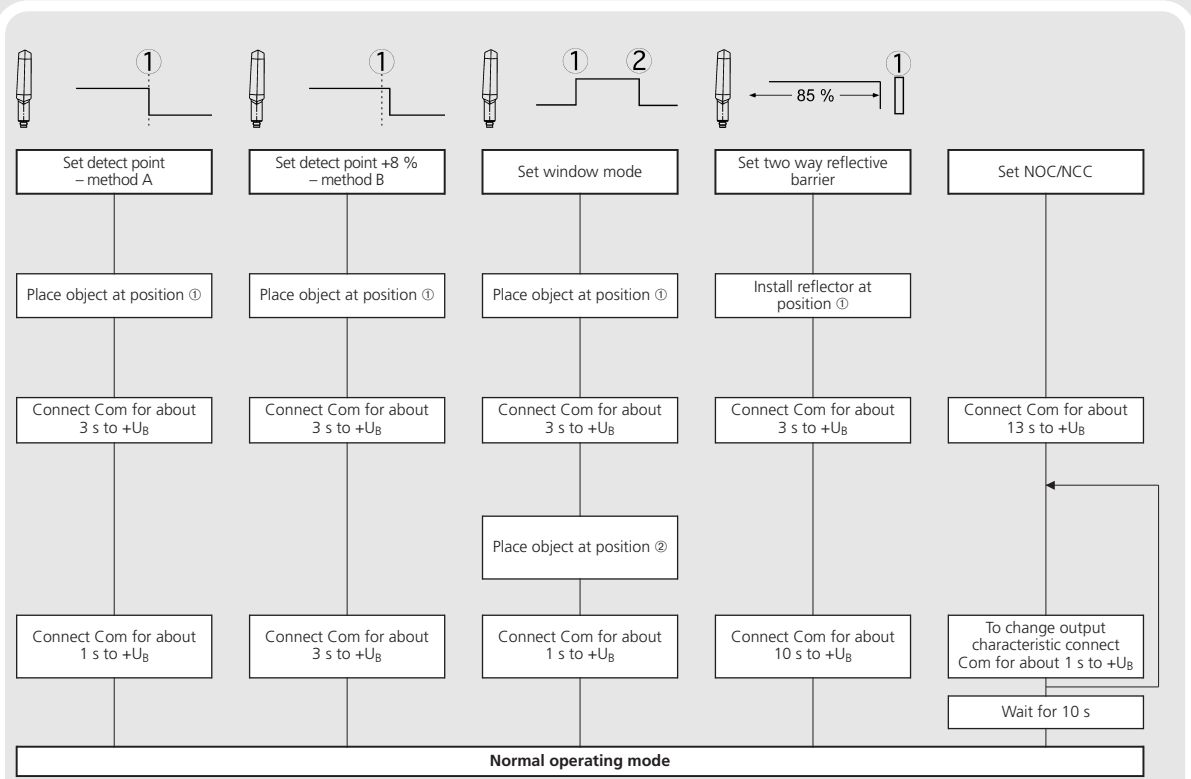
- The sensors of the pms family have a blind zone, within which a distance measurement is not possible.
- If several pms sensors are operated in a small space, the minimum mounting for parallel or opposite

## Operating Instructions

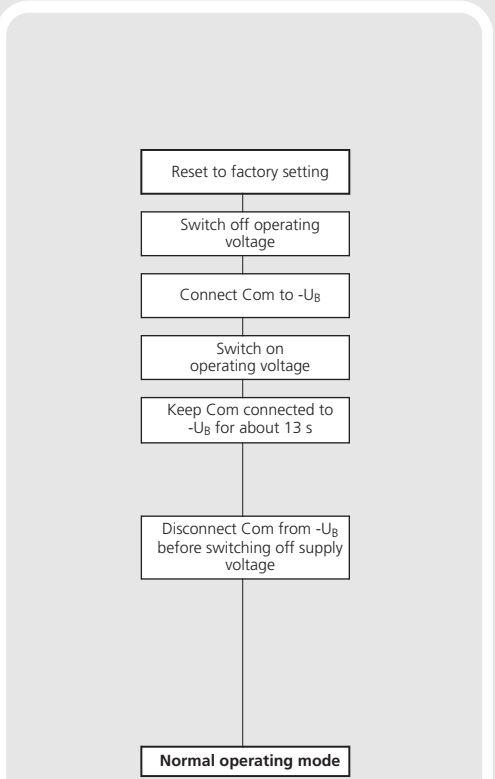
### Ultrasonic proximity switch with one switched output

- pms+15/CF/A1
- pms+25/CF/A1
- pms+35/CF/A1
- pms+100/CF/A1

## Sensor adjustment with Teach-in procedure

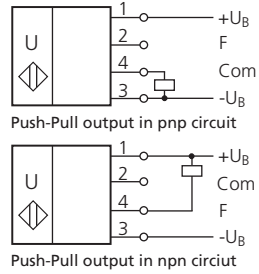


Set switched output



Further Settings

## Technical data

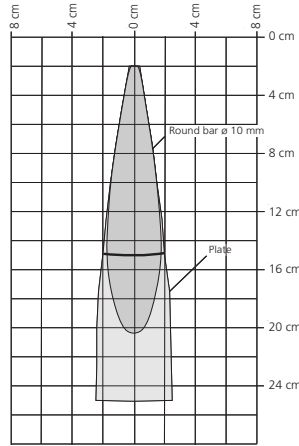


**blind zone**  
**operating range**  
**maximum range**  
**angle of beam spread**  
**transducer frequency**  
**resolution**  
**reproducibility**

20 mm  
 150 mm  
 250 mm  
 see detection zone  
 380 kHz  
 0.069 mm  
 ± 0.15 %

### detection zones

for different objects:  
 The dark grey areas represent the zone where it is easy to recognise the normal reflector (round bar). This indicates the typical operating range of the sensors. The light grey areas represent the zone where a very large reflector – for instance a plate – can still be recognized. The requirement here is for an optimum alignment to the sensor. It is not possible to evaluate ultrasonic reflections outside this area.



**accuracy**  
**operating voltage  $U_B$**   
**voltage ripple**  
**no-load current consumption**  
**housing**  
**ECOLAB**  
**class of protection per EN 60 529**  
**norm conformity**

± 1 % (temperature drift internally compensated)  
 10 - 30 V DC, reverse polarity protection (Class 2)  
 ± 10 %  
 < 40 mA  
 stainless steel 1.4404/316L;  
 ultrasonic transducer: PTFE, FKM  
 yes  
 IP 67  
 EN 60947-5-2

### type of connection controls

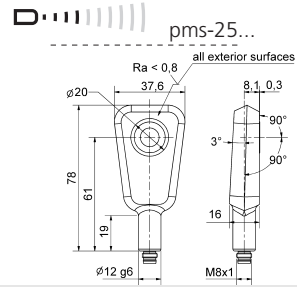
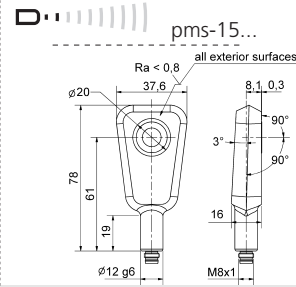
**programmable**  
**operating temperature**  
**storage temperature**  
**switched output**

4-pin M8 initiator plug  
 Teach-in via pin 2 (Com)  
 Teach-in, LinkControl  
 -25°C to +70°C  
 -40°C to +85°C  
 Push-Pull,  $U_B$ -3 V,  $-U_B$ +3 V,  $I_{max}$  = 100 mA  
 switchable NOC/NCC, short-circuit-proof

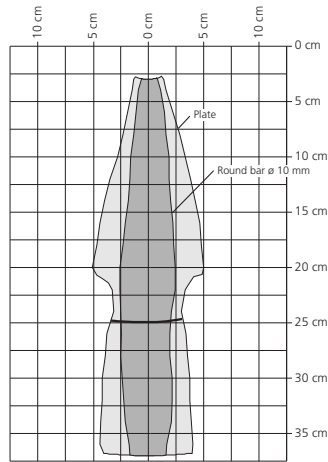
**switching hysteresis**<sup>1)</sup>  
**switching frequency**<sup>1)</sup>  
**response time**<sup>1)</sup>  
**time delay before availability**<sup>1)</sup>  
**weight**

2 mm  
 25 Hz  
 32 ms  
 < 300 ms  
 30 g

**order no.** pms-15/CF/A1



30 mm  
 250 mm  
 350 mm  
 see detection zone  
 320 kHz  
 0.069 mm  
 ± 0.15 %



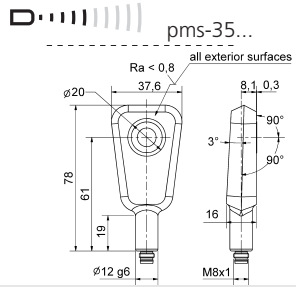
± 1 % (temperature drift internally compensated)  
 10 - 30 V DC, reverse polarity protection (Class 2)  
 ± 10 %  
 < 40 mA  
 stainless steel 1.4404/316L;  
 ultrasonic transducer: PTFE, FKM  
 yes  
 IP 67  
 EN 60947-5-2

### type of connection controls

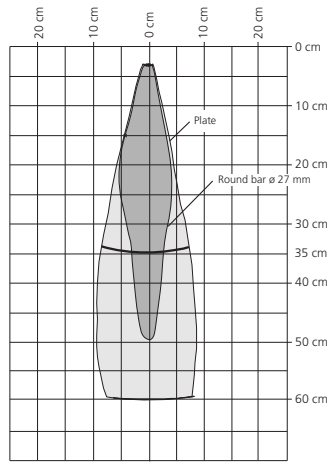
4-pin M8 initiator plug  
 Teach-in via pin 2 (Com)  
 Teach-in, LinkControl  
 -25°C to +70°C  
 -40°C to +85°C  
 Push-Pull,  $U_B$ -3 V,  $-U_B$ +3 V,  $I_{max}$  = 100 mA  
 switchable NOC/NCC, short-circuit-proof

3 mm  
 25 Hz  
 32 ms  
 < 300 ms  
 30 g

**order no.** pms-25/CF/A1



65 mm  
 350 mm  
 600 mm  
 see detection zone  
 400 kHz  
 0.069 mm  
 ± 0.15 %



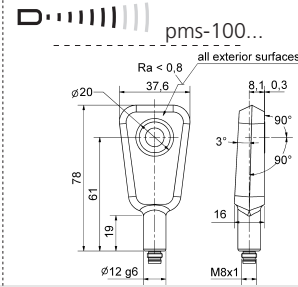
± 1 % (temperature drift internally compensated)  
 10 - 30 V DC, reverse polarity protection (Class 2)  
 ± 10 %  
 < 40 mA  
 stainless steel 1.4404/316L;  
 ultrasonic transducer: PTFE, FKM  
 yes  
 IP 67  
 EN 60947-5-2

### type of connection controls

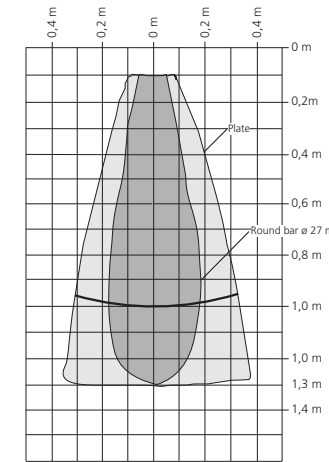
4-pin M8 initiator plug  
 Teach-in via pin 2 (Com)  
 Teach-in, LinkControl  
 -25°C to +70°C  
 -40°C to +85°C  
 Push-Pull,  $U_B$ -3 V,  $-U_B$ +3 V,  $I_{max}$  = 100 mA  
 switchable NOC/NCC, short-circuit-proof

5 mm  
 12 Hz  
 64 ms  
 < 300 ms  
 30 g

**order no.** pms-35/CF/A1



120 mm  
 1,000 mm  
 1,300 mm  
 see detection zone  
 200 kHz  
 0.069 mm  
 ± 0.15 %



± 1 % (temperature drift internally compensated)  
 10 - 30 V DC, reverse polarity protection (Class 2)  
 ± 10 %  
 < 40 mA  
 stainless steel 1.4404/316L;  
 ultrasonic transducer: PTFE, FKM  
 yes  
 IP 67  
 EN 60947-5-2

### type of connection controls

4-pin M8 initiator plug  
 Teach-in via pin 2 (Com)  
 Teach-in, LinkControl  
 -25°C to +70°C  
 -40°C to +85°C  
 Push-Pull,  $U_B$ -3 V,  $-U_B$ +3 V,  $I_{max}$  = 100 mA  
 switchable NOC/NCC, short-circuit-proof

20 mm  
 10 Hz  
 80 ms  
 < 300 ms  
 30 g

**order no.** pms-100/CF/A1

arrangement of the sensors shown in figure 2 must be maintained.

- The pms sensors are equipped with an internal temperature compensation. Due to the sensors self heating, the temperature compensation reaches its optimum working-point after approx. 45 seconds of operation.
- In the »Set detect point – method A« Teach-in procedure the actual distance to the object is taught to the sensor as the detect point. If the object moves towards the sensor (e.g. with level control) then the taught distance is the level at which the sensor has to switch the output.
- If the object to be scanned moves into the detection area from the side, the »Set detect point +8 % – method B« Teach-in procedure should be used. In this way the switching distance is set 8 % further than the actual measured distance to the object. This ensures a reliable switching distance even if the height of the objects varies slightly.

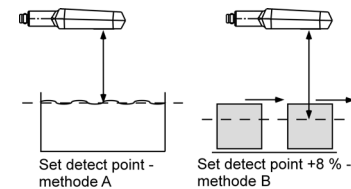


Fig. 4: Setting the detect point for different directions of movement of the object

- The sensor can be reset to its factory setting (see »Further settings«).
- For Teach-in procedure when using the LinkControl adapter (optional accessory) the additional adapter 5G/M12-4G/M12/M8 is needed.
- If the sensor is cleaned wet during operation, all surfaces must be inclined at least 3° from the horizontal alignment so that the cleaning agents can run off completely (see figure 3).

1) Can be programmed with LinkControl

- The D12 adapter shaft of the pms sensor has to stick out at least 6 mm from the screw connection (see figure 5).
- The sealing ring has to fill space between D12 sensor shaft and cap nut. Sealing ring should not be pressed out excessively from the shaft gland.

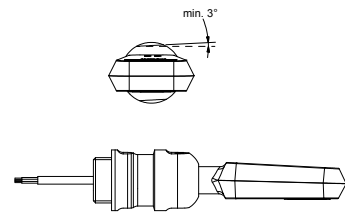


Fig. 3: pms sensor D12-adapter shaft with sensor screw connection BF-pms/A1, all surfaces must be inclined at least 3°.

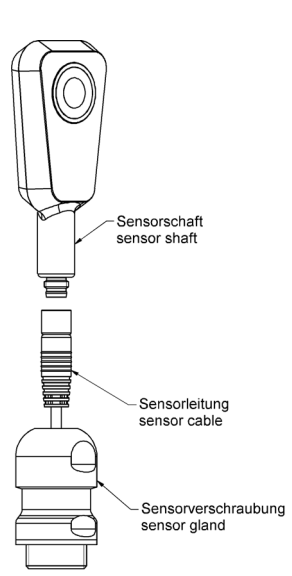


Fig. 4: Mounting of pms sensor with sensor screw connection BF-pms/A1

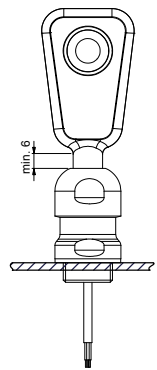


Fig. 5: Mounting of pms sensor with sensor screw connection BF-pms/A1

**Mounting accessory**

- D12 sensor screw connection BF-pms/A1

**Accessory for programming**

- LinkControl adapter LCA-2
- Adapter 5G/M12-4G/M12/M8

**IO-Link mode**

The pms sensors are IO-Link-capable in accordance with IO-Link specification V1.1.

**Note**

In IO-Link mode LinkControl and synchronization via pin 2 are not available.

**Smart Sensor Profile**

Die pms sensors support the Smart Sensor Profile. The following profiles and function classes are integrated:

- 0x000A - Device Profil: Digital measuring sensors
- 0x8000 - Device Identification
- 0x8001 - Multichannel: two setpoint switching sensor
- 0x8003 - Device Diagnosis
- 0x8004 - Teach Channel
- 0x800A - Measurement Data Channel (standard resolution)

**Synchronisation in IO-Link Mode**

In IO-Link mode each sensor is synchronized on the protocol of the IO-Link master. In multiple sensor opera-

tion the sensors are synchronous if the master protocols are synchronous.

**System Commands**

With 3 system commands the following settings may be carried out:

- Teach-in SP1
- Teach-in SP2
- Reset sensor to factory settings

**SSC1 Configuration**

The pms sensor has 5 modes:

- Single point (SP1: switching point) The switched output is activated when the distance to an object is under that of the present single point SP1.
- Window (SP1, SP2: window mode) The switched output is set when the object is within the set window (SP1, SP2).
- Two point (SP1, SP2: hysteresis mode) In hysteresis mode, SP1 and SP2 assume the function of the single point and return single point.

- Single point +8 % (SP1 switching point +8 %) The switched output is set when the distance measured to an object is smaller than the set switching point SP1 +8%.
- Window ±8 % (SP1 two way reflective barrier) The switched output is set when the object is between sensor and fixed reflector (with SP1 ±8 %).

**IODD File**

The latest IODD file you will find on the internet under [www.microsonic.de/en/IODD](http://www.microsonic.de/en/IODD).

For further informations on IO-Link see [www.io-link.com](http://www.io-link.com).



2014/30/EU

IO-Link data		pms-15...					pms-25...					pms-35...					pms-100...				
<b>Physical layer</b>	<b>SIO mode support</b>	yes					yes					yes					yes				
	<b>min cycle time</b>	8 ms					8 ms					16 ms					20 ms				
	<b>baud rate</b>	COM 2 (38.400 Bd)					COM 2 (38.400 Bd)					COM 2 (38.400 Bd)					COM 2 (38.400 Bd)				
	<b>format of process data</b>	Frametype 2_V, 4 Byte					Frametype 2_V, 4 Byte					Frametype 2_V, 4 Byte					Frametype 2_V, 4 Byte				
	<b>content of process data</b>	Bit 0: state of switched output, Bit 8-15: scale (Int. 8), Bit 16-31: measured value (Int. 16) with 0,1 mm resolution					Bit 0: state of switched output, Bit 8-15: scale (Int. 8), Bit 16-31: measured value (Int. 16) with 0,1 mm resolution					Bit 0: state of switched output, Bit 8-15: scale (Int. 8), Bit 16-31: measured value (Int. 16) with 0,1 mm resolution					Bit 0: state of switched output, Bit 8-15: scale (Int. 8), Bit 16-31: measured value (Int. 16) with 0,1 mm resolution				
<b>Identification features</b>	<b>Vendor name</b>	microsonic GmbH					microsonic GmbH					microsonic GmbH					microsonic GmbH				
	<b>Vendor ID</b>	419 (0x01A3)					419 (0x01A3)					419 (0x01A3)					419 (0x01A3)				
	<b>Product name</b>	pms-15/CF/A1					pms-25/CF/A1					pms-35/CF/A1					pms-100/CF/A1				
	<b>Product ID</b>	35000					35100					35200					35300				
	<b>Device ID</b>	29 (0x00001D)					30 (0x00001E)					31 (0x00001F)					32 (0x000020)				
<b>SSC1 configuration</b>	<b>Parameter</b>	<b>index</b>	<b>subindex</b>	<b>format</b>	<b>access</b>	<b>range</b>	<b>index</b>	<b>subindex</b>	<b>format</b>	<b>access</b>	<b>range</b>	<b>index</b>	<b>subindex</b>	<b>format</b>	<b>access</b>	<b>range</b>	<b>index</b>	<b>subindex</b>	<b>format</b>	<b>access</b>	<b>range</b>
	<b>SP1 (Setpoint 1)</b>	60	1	UINT16	R/W	20 - 250 <sup>1)</sup>	60	1	UINT16	R/W	30 - 350 <sup>1)</sup>	60	1	UINT16	R/W	65 - 600 <sup>1)</sup>	60	1	UINT16	R/W	120 - 1300 <sup>1)</sup>
	<b>SP2 (Setpoint 2)</b>	60	2	UINT16	R/W	20 - 250 <sup>1)</sup>	60	2	UINT16	R/W	30 - 350 <sup>1)</sup>	60	2	UINT16	R/W	65 - 600 <sup>1)</sup>	60	2	UINT16	R/W	120 - 1300 <sup>1)</sup>
	<b>Hysteresis</b>	61	3	INT8	R/W	0,1 - 230 <sup>1)</sup>	61	3	UINT8	R/W	0,1 - 320 <sup>1)</sup>	61	3	UINT8	R/W	0,1 - 535 <sup>1)</sup>	61	3	UINT8	R/W	0,1 - 1180 <sup>1)</sup>
<b>SSC1 configuration</b>	<b>Logic Mode</b>	<b>index</b>	<b>subindex</b>	<b>format</b>	<b>access</b>	<b>range</b>															
		61	1	UINT16	R/W	0: High active, 1: Low active															
		61	2	UINT8	R/W	1: single point (SP1: switching point), 2: window (SP1, SP2: window mode), 3: two point (SP1, SP2: hysteresis mode), 128: single point +8 % (SP1: switching point +8 %), 129: window ±8 % (SP1: two way reflective barrier)															
<b>Teach-in</b>	<b>Teach-in channel</b>	58		UINT8	R/W	0: SSC1 : Pin 4 (Push-Pull)															
	<b>Teach-in status</b>	59		UINT8	RO	Bit 0-3: 0: idle, 1: SP1 success, 2: SP2 success, 7: error; Bit 4: SP1 TP1; Bit 6: SP2 TP1															
	<b>SP1 single value teach-in</b>	2		UINT8	WO	65: The value 65 must be written to index 2 to trigger the command.															
	<b>SP2 single value teach-in</b>	2		UINT8	WO	66: The value 66 must be written to index 2 to trigger the command.															
<b>Filter</b>	<b>Type</b>	256		UINT8	R/W	0-4: F00 (no filter), F01 (standard filter), F02 (averaging filter), F03 (foreground filter), F04 (background filter)															
	<b>Strength</b>	256		UINT8	R/W	0-9: P00 - P09; For each measurement filter a filter strength between 0, weak filter effect, and 9, strong filter effect, can be chosen.															
<b>Temperature compensation</b>	<b>Mode</b>	300	1	UINT8	R/W	0: off, 1: on															
<b>Factory settings</b>	<b>FactorySettings</b>	2		UINT8	WO	130: The value 130 must be written to index 2 to trigger the command.															
	<b>DeviceaccessLocks</b>	12		UINT16	R/W	Bit 0: parameter (write) access lock; Bit 2: local user interface lock															

1) Distance value, e.g. setpoints, are give with a resolutin of 0,1 mm. The values in the tables are decimal.

