



IO-Link accompanying document for

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

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1 Contents of the IO-Link accompanying document

This IO-Link accompanying document guides the user during start-up and parameterisation of the ultrasonic sensor. It does **not** replace the operating manual enclosed with the ultrasonic sensor. The safety notes and descriptions of installation and start-up contained in the operating manual require compliance.

2 IO-Link in detail

IO-Link is a fieldbus-independent, manufacturer-independent and neutral communication standard which enables seamless communication through all levels of the system architecture down to the sensor.

The IO-Link interface provides direct access to process, service and diagnostic data. The sensor can be parameterised during operation.

Structure of an IO-Link system

An IO-Link system consists of IO-Link devices – usually sensors, actuators or combinations thereof – and a standard 3-wire sensor/actuator cable and an IO-Link master.

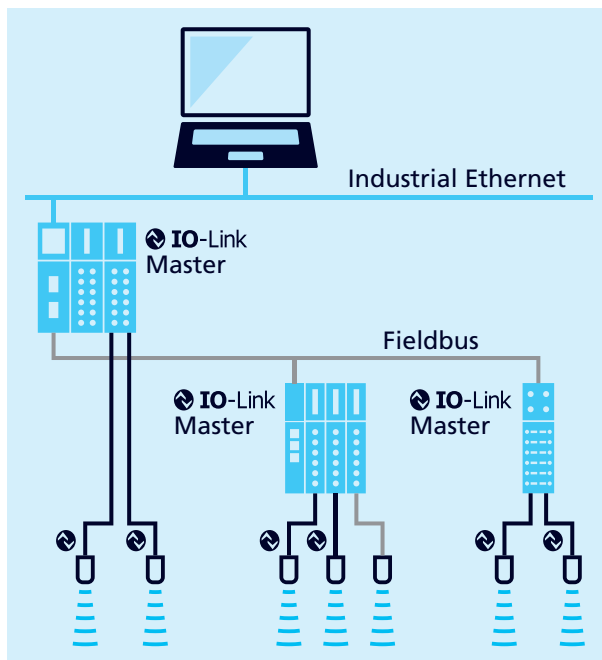


Fig. 1: Structure of an IO-Link system

IODD description file

Each IO-Link-capable sensor has a device-specific description file, the IODD (IO Device Description). The IODD contains parameters in a standardised form and can describe several sensor versions. The parameters included are:

- › Communication properties
- › Device parameters with permissible and pre-set values
- › Identification, process and diagnostic data
- › Device data
- › Text description
- › Product image
- › Manufacturer's logo

The current IODD library and information on start-up and parameterisation can be downloaded here: [microsonic.de/Service/IO-Link IODD Library](http://microsonic.de/Service/IO-Link%20IODD%20Library).

3 Description of the sensor

Ultrasonic proximity switch with one push-pull switching output and IO-Link

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

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 made of FKM. The pms sensor offers a non-contact measurement of the distance to an object present within the sensor’s detection zone. The switching output is set conditional upon the adjusted switching distance. The pms sensor is IO-Link-capable in accordance with IO-Link specification V1.1 and supports Smart Sensor Profile like Digital Measuring Sensor. The sensor can be monitored and parameterised via IO-Link.



Fig. 2: pms ultrasonic proximity switch

4 IO-Link data of the sensor

The pms sensors are IO-Link-capable in accordance with specification 1.1. The sensor has an IO-Link communication interface on pin 4 (see Fig. 3).

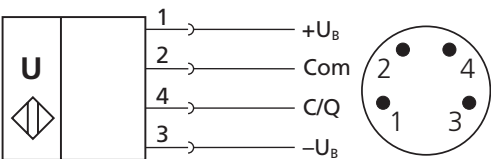


Fig. 3: Connection diagram of the pms sensor

Device Profile

| | |
|--------|-------------------------|
| 0x0001 | Generic Profiled Sensor |
| 0x000A | Measuring Sensor |

Function class

| | |
|--------|---|
| 0x8000 | Device Identification |
| 0x8001 | Switching Signal Channel |
| 0x8003 | Device Diagnosis |
| 0x8004 | Teach Channel |
| 0x800A | Measurement Data Channel, (standard resolution) |

Physical layer

| | |
|----------------------|--------------------|
| Vendor Name | microsonic GmbH |
| Vendor ID | 419 (0x01a3) |
| IO-Link Revision | 1.1.2 |
| Transmission Rate | 38400 bit/s (COM2) |
| Process data length | 32 Bit PDI |
| IO-Link port type | A (<200 mA) |
| SIO mode | Yes |
| Smart Sensor Profile | Yes |
| Block Parameter | Yes |
| Data Storage | Yes |

Table 1: IO-Link sensor data

| | pms-15 | pms-25 | pms-35 | pms-100 |
|---------------|---------------|---------------|---------------|---------------|
| Device ID | 29 (0x00001d) | 30 (0x00001e) | 31 (0x00001f) | 32 (0x000020) |
| Product Name | pms-15/CF/A1 | pms-25/CF/A1 | pms-35/CF/A1 | pms-100/CF/A1 |
| Product ID | 35000 | 35100 | 35200 | 35300 |
| MinCycle Time | 8 ms | 8 ms | 16 ms | 20 ms |

4.1 Process data

The process data is cyclically transmitted data. The process data length of the pms sensors is 4 bytes.

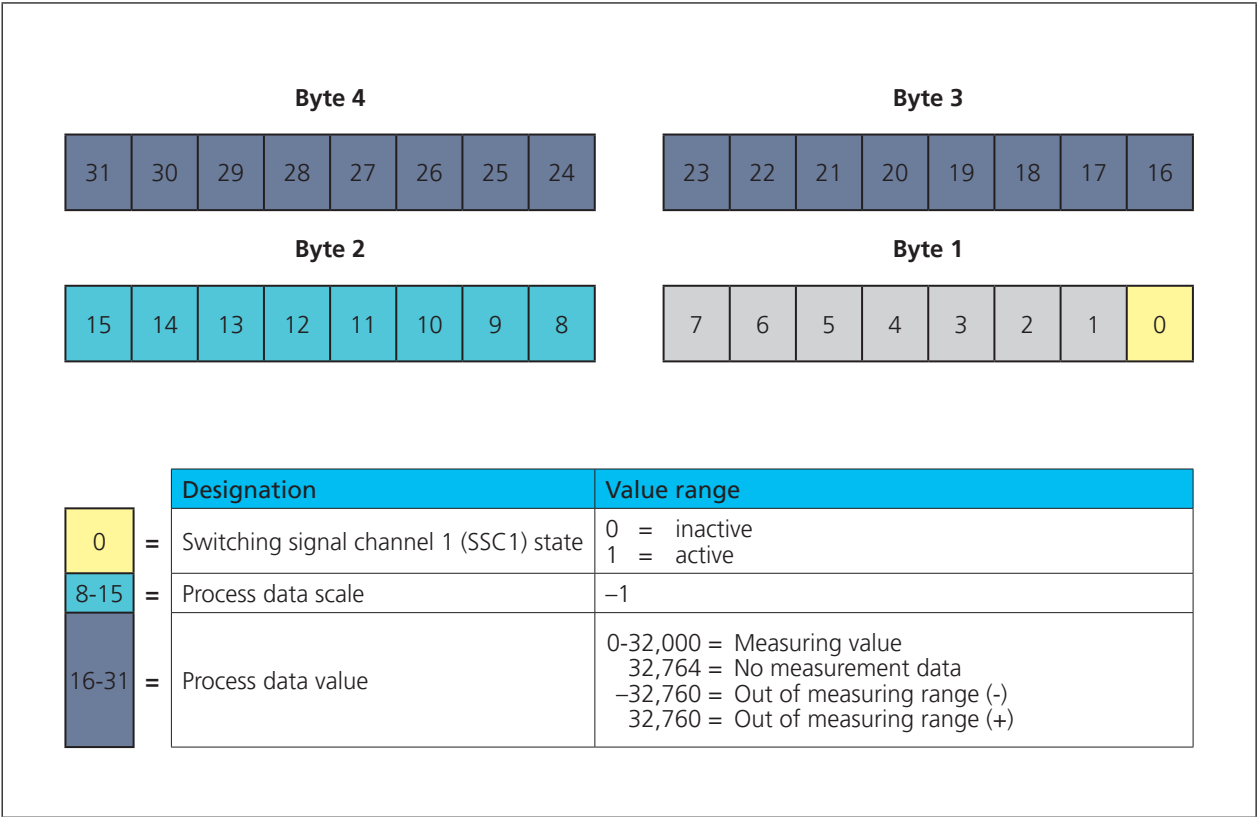


Fig. 4: Process data structure

4.2 Measurement data channel description

Lower limit

The »lower limit« is the smallest measured value that the sensor can output.

Upper limit

The »upper limit« is the largest measured value that the sensor can output.

Unit code

The measured value has no dimension. The unit code is based on the official IO-Link unit code: 1013 = [mm]

Scale

The scaling of the process data. The specified measured value of the sensor is calculated from

Process data value x 10^(scale) x [unit code]

= measuring value in mm

Example: 642 x 10⁽⁻¹⁾ x [mm] = 64.2 mm

Table 2: IO-Link parameters – Measurement data channel description

| Index | Sub-index | Designation | Format | Access | Factory setting | Resolution |
|-------|-----------|--------------------------------------|--------|--------|--|--------------------------------------|
| 16512 | 0 | Measurement data channel description | Record | | | |
| | 1 | Lower limit | Int32 | RO | pms-15 = 184 pms-25 = 270 pms-35 = 640 pms-100 = 1,090 | 0.1 mm 0.1 mm 0.1 mm 0.1 mm |
| | 2 | Upper limit | Int32 | RO | pms-15 = 2,500 pms-25 = 3,500 pms-35 = 6,000 pms-100 = 13,000 | 0.1 mm 0.1 mm 0.1 mm 0.1 mm |
| | 3 | Unit code | Int16 | RO | pms-15 = 1013 pms-25 = 1013 pms-35 = 1013 pms-100 = 1013 | |
| | 4 | Scale | Int8 | RO | pms-15 = -1 pms-25 = -1 pms-35 = -1 pms-100 = -1 | |

4.3 Switching signal channel

The pms sensor has a switching signal channel (SSC1). The switching signal channel (see Table 3) contains the values for the switching points SP1 and SP2, the setting of the

switching output logic, the definition of the switching mode (see Chapter 5) and the values for the hysteresis.

Table 3: IO-Link parameters – SSC1: Switching signal channel 1 - pin 4 (push-pull)

| Switching signal channel | | SSC1 | | | |
|--------------------------|-------|-----------|--|--|--------------------------------------|
| Designation | Index | Sub-index | Factory setting | Value range | Resolution |
| SP1 | 60 | 1 | pms-15 = 1,500 pms-25 = 2,500 pms-35 = 3,500 pms-100 = 10,000 | 200...2,500 300...3,500 700...6,000 1,200...13,000 | 0.1 mm 0.1 mm 0.1 mm 0.1 mm |
| SP2 | 60 | 2 | pms-15 = 1,700 pms-25 = 2,800 pms-35 = 4,000 pms-100 = 12,000 | 200...2,500 300...3,500 700...6,000 1,200...13,000 | 0.1 mm 0.1 mm 0.1 mm 0.1 mm |
| Logic | 61 | 1 | 0 | 0 = High active 1 = Low active | |
| Mode | 61 | 2 | 1 | 0 = Deactivated 1 = Single point (SP1: switching point) 2 = Window (SP1, SP2: window mode) 3 = Two point (SP1, SP2: hysteresis mode) 128 = Single point + set point offset (SP1: switching point + offset) 129 = Window ± set point offset (SP1: Two way reflective barrier) | |
| Hysteresis | 61 | 3 | pms-15 = 20 pms-25 = 30 pms-35 = 50 pms-100 = 200 | 10...2,300 10...3,200 10...5,300 10...11,800 | 0.1 mm 0.1 mm 0.1 mm 0.1 mm |

5 Switching mode and operating modes

Various switching modes can be set via the IO-Link parameter »Mode«. The corresponding switching mode results from the application. The following section lists the available operating modes or switching modes.

Note: If the switching mode is deactivated, the switching output remains in the inactive state regardless of the measured distance value.

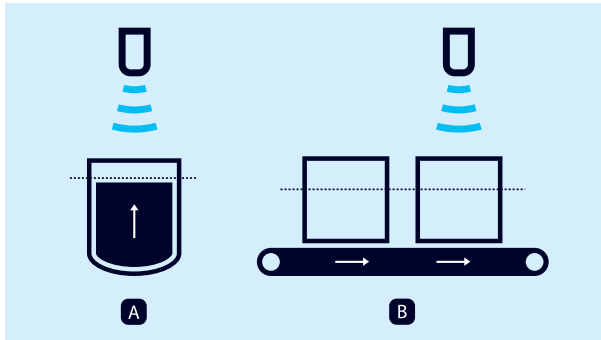


Fig. 5: Switching point mode of the sensor, Method A and B

Operating mode: Switching point (Method A)

- › Switching mode: Single point
- › Parameter: Index 61 Subindex 2 = 1, see chap. 4.3

The switching output is set if the distance measured to an object is smaller than the set switching point (see Fig. 6). The actual distance to the object during Teach-in is also the switching point. A typical application is filling level measurement, where the ultrasonic sensor detects the filling level vertically from above during the filling process (see Fig. 5, left). In this case, the taught-in switching point can correspond to the maximum filling level, for example.

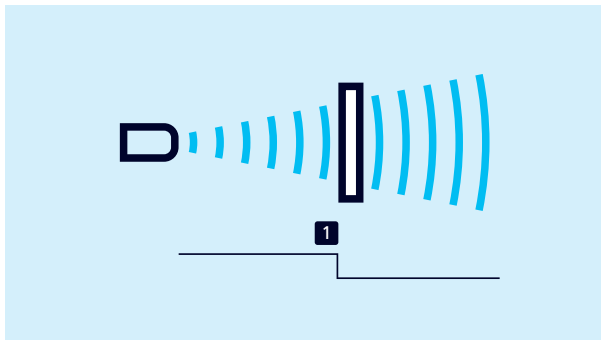


Fig. 6: Switching point (Method A), single point

Operating mode: Switching point (Method B)

- › Switching mode: Single point + set point offset
 - › Parameter: Index 61 Subindex 2 = 128, see chap. 4.3
- The switching output is set if the distance measured to an object is smaller than the set switching point plus an offset (see Fig. 7).

This method is recommended for objects that enter the detection zone from the side (see Fig. 5, right). A switching point 8 % greater than the actual distance to the object is set. This ensures a stable switching behaviour with minor height fluctuations of the objects.

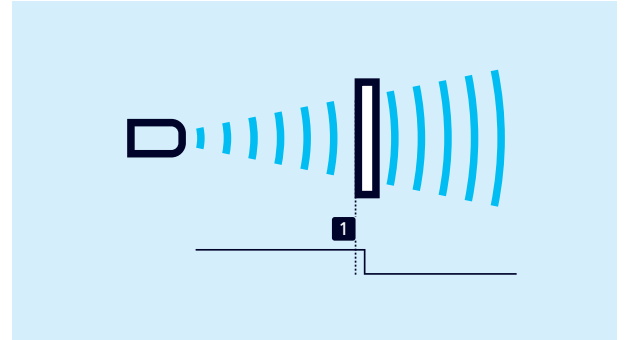


Fig. 7: Switching point (Method B), single point + set point offset

Operating mode: Window mode

- › Switching mode: Window
- › Parameter: Index 61 Subindex 2 = 2, see chap. 4.3

The switching output is set if the object is within a window defined by two window limits. This can be used, for example, to monitor the correct bottle size in a drinks crate. Bottles that are too high and too low are sorted out (see Fig. 8).

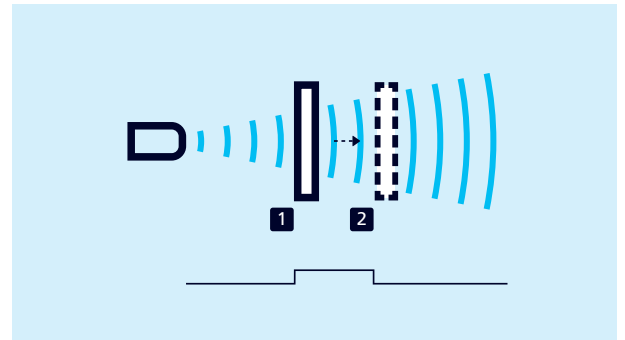


Fig. 8: Window mode, window

Operating mode: Two way reflective barrier

- › Switching mode: Window ± set point offset
- › Parameter: Index 61 subindex 2 = 129, see chap. 4.3

The output is set when the object is located between the sensor and a fixed reflector.

To this end, the ultrasonic sensor is set in window mode so that a fixed reflector lies inside the window. The switching output is changed as soon as an object is detected in front of the reflector. This operating mode is recommended for materials that are difficult to detect, such as foam, and for scanning objects with irregular surfaces (see Fig. 9).

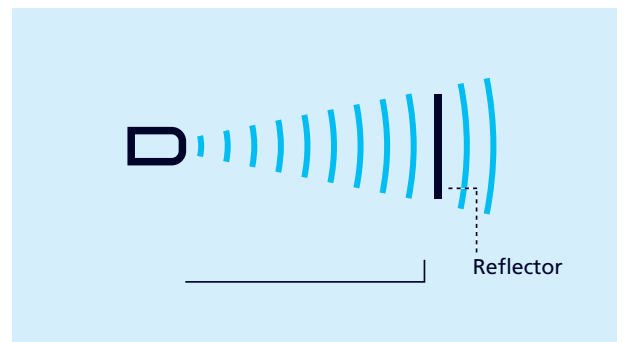


Fig. 9: Two way reflective barrier, window ± set point offset

Operating mode: Hysteresis mode

- › Switching mode: Two-point
 - › Parameter: Index 61 Subindex 2 = 3, see chap. 4.3
- The state of the switching output changes when the object reaches switching point 1 and changes back to the previous state when the object reaches switching point 2 (see Fig. 10). Two-point control can be realised using this operating mode. A typical application is filling level control, e.g. in a tank with a maximum level (switching point 1) and a minimum level (switching point 2).

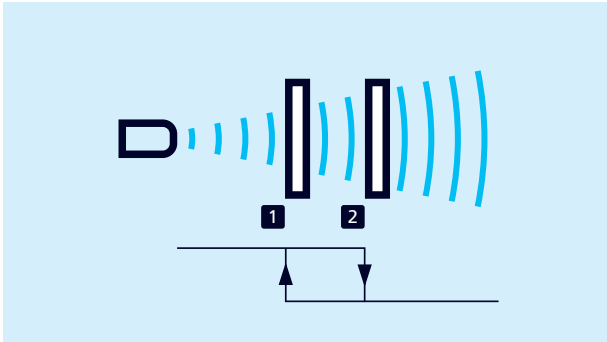


Fig. 10: Hysteresis mode, two point

6 Setting the sensor with Teach-in

Various Teach-in methods are available to set the switching points for the selected operating mode or switching mode. Teach-in is possible on-site on the sensor and via IO-Link.

6.1 Teach-in via pin 2 on the Sensor

- The sensor can be set via pin 2 (Com) using Teach-in. The following operating modes are available for on-site operation:
- › Setting the switching point - Method A/Method B
 - › Window mode
 - › Two way reflective barrier
 - ➔ Follow the instructions in the sensor operating manual for the Teach-in procedures.

6.2 Teach-in parameters via IO-Link

The following section lists the parameters relevant for Teach-in operations via IO-Link. Details about the parameters can be found in the parameter overview in chapter 8.

Table 4: IO-Link parameters – Teach-in

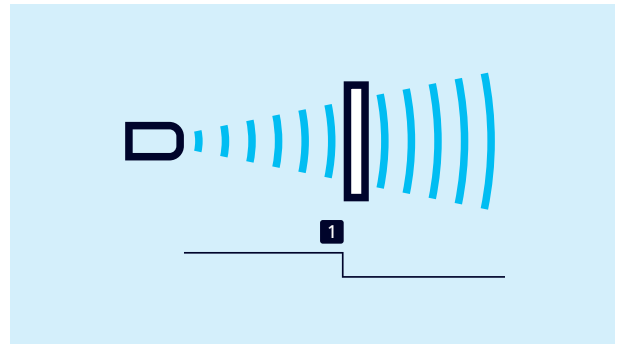
| Index | Designation | Description |
|-------|----------------------------------|--|
| 2 | System Command | Execution of the single value Teach-in for SP1 or SP2: 65 = SP1 single value Teach-in 66 = SP2 single value Teach-in |
| 58 | Teach-in channel | Selection of the target channel for the Teach-in procedure: 0 = SSC1: Pin 4 (Push-Pull) (default) |
| 59 | Bit 0-3: Teach-in status | The Teach-in status shows the status of the current Teach-in procedure: 0 = Idle 1 = SP1 success 2 = SP2 success 7 = Error |
| | Bit 4: SP1 TP1 Bit 6: SP2 TP1 | Teach-in Flags show the result of the last SP1/SP2 single value teach-in: 0 = false 1 = true |

6.2.1 Teach-in via IO-Link



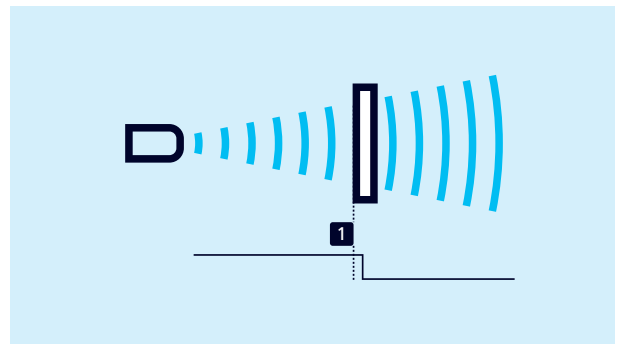
Setting the single point (switching point - Method A)

1. Position the object at the desired distance in front of the sensor.
 2. Write the value 1 in parameter index 61 subindex 2 (SSC1 configuration, mode).
 3. Write the value 65 in parameter index 2 (System Command).
 4. Optional: Read parameter »Teach-in status« (index 59).
- ◆ If the Teach-in of the switching output SSC1 is successful, the value = 1.



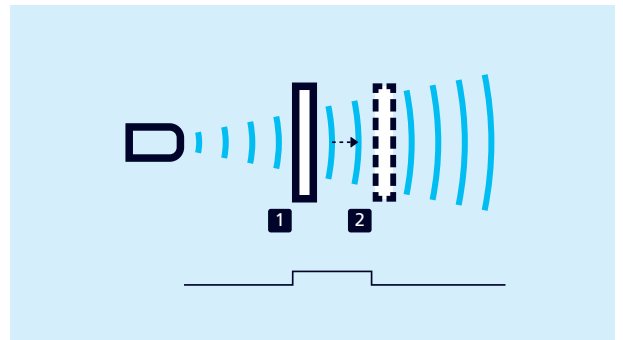
Setting single point + offset (switching point - Method B)

1. Position the object at the desired distance in front of the sensor.
 2. Write the value 128 in parameter index 61 subindex 2 (SSC1 configuration, mode).
 3. Write the value 65 in parameter index 2 (System Command).
 4. Optional: Read parameter »Teach-in status« (index 59).
- ◆ If the Teach-in of the switching output SSC1 is successful, the value = 1.



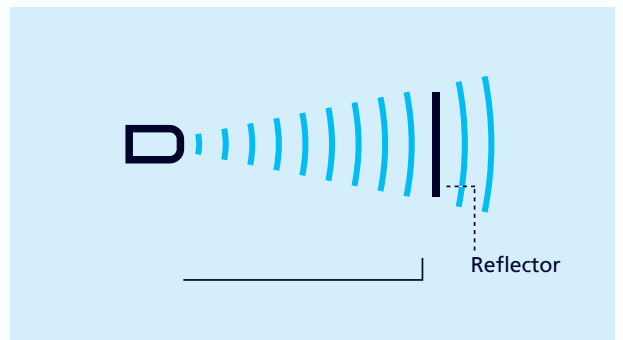
Setting the window (window mode)

1. Position object at position 1.
 2. Write the value 2 in parameter index 61 subindex 2 (SSC1 configuration, mode).
 3. Write the value 65 in parameter index 2 (System Command).
 4. Position object at position 2.
 5. Write the value 66 in parameter index 2 (System Command).
 6. Optional: Read parameter »Teach-in status« (index 59).
- ◆ If the Teach-in of the switching output SSC1 is successful, the value = 2.



Setting window ± offset (two-way reflective barrier)

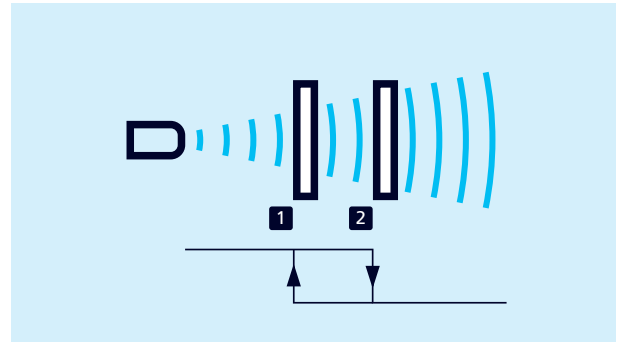
1. Position the reflector at the desired distance in front of the sensor.
 2. Write the value 129 in parameter index 61 subindex 2 (SSC1 configuration, mode).
 3. Write the value 65 in parameter index 2 (System Command).
 4. Optional: Read parameter »Teach-in status« (index 59).
- ◆ If the Teach-in of the switching output SSC1 is successful, the value = 1.





Setting hysteresis mode

1. Position object at position 1.
 2. Write the value 3 in parameter index 61 subindex 2 (SSC1 configuration, mode).
 3. Write the value 65 in parameter index 2 (System Command).
 4. Position object at position 2.
 5. Write the value 66 in parameter index 2 (System Command).
 6. Optional: Read parameter »Teach-in status« (index 59).
- ◆ If the Teach-in of the switching output SSC1 is successful, the value = 2.



7 Further settings via IO-Link

7.1 Filter

The results of the cyclically performed measurements of the ultrasonic sensor are not sent directly to the output, but pass through internal software filters that have the task of filtering out measured value outliers and smoothing and damping the measurement course.

The following filter types are available:

- › F00: no filter
- › F01: standard filter
- › F02: averaging filter
- › F03: foreground filter
- › F04: background filter

In addition, the filter strength can be set from P00 (weak filter effect) to P09 (strong filter effect). Most applications can be solved with the standard filter F01. For sensors with an analogue output, the mean value filter F02 is enabled as default filter in order to obtain a smoothed output signal.

Changes to the filter settings require experience and are usually not necessary for standard applications. Should you have any questions about filter settings, we recommend that you contact **microsonic.**

Table 5: IO-Link parameters – Filter settings

| Index | Sub-index | Designation | Format | Access | Factory setting | Value range |
|-------|-----------|-------------|--------|--------|-----------------|---|
| 256 | 0 | Filter | Record | | | |
| | 1 | Type | UInt8 | RW | 1 | 0 = F00: no filter 1 = F01: standard filter 2 = F02: averaging filter 3 = F03: foreground filter 4 = F04: background filter |
| | 2 | Strength | UInt8 | RW | 0 | 0 = P00: weak filter 1 = P01 ... 8 = P08 9 = P09: strong filter |

7.2 Temperature compensation

The sensor has an internal temperature compensation, which compensates for the temperature dependence of the sound velocity in the air. The internally measured temperature is evaluated on the factory side.

Table 6: IO-Link parameters – Temperature compensation

| Index | Sub-index | Designation | Format | Access | Factory setting | Value range |
|-------|-----------|--------------------------|--------|--------|-----------------|----------------------------|
| 300 | 0 | Temperature compensation | Record | | | |
| | 1 | Source of temperature | Int8 | RW | 1 | 0 = Inactive 1 = Active |

7.3 Returning to factory setting

If the value 130 is written in index 2, all parameters of the sensor are reset to the factory setting.

Table 7: System Command – Restore Factory Settings

| Index | Designation | Format | Access | Factory setting | Value range |
|-------|----------------|--------|--------|-----------------|--------------------------------|
| 2 | System Command | UInt8 | WO | | 130 = Restore Factory Settings |

7.4 Device Access Locks

The device access locks are specified IO-Link functions. The »Device access locks« parameter enables the control of the device behaviour. Device functions can be deactivated superordinately and globally via defined bits in this parameter.

Parameter Write Access

If this bit is set, write access to application parameters and some IO-Link-specific parameters is blocked.

Local Parameterisation

If this bit is set, parameterisation via pin 2 on the device is blocked.

Table 8: IO-Link parameters – Device Access Locks

| Index | Designation | Format | Access | Factory setting | Value range |
|-------|-------------------------------|---------|--------|-----------------|----------------------------|
| 12 | Device Access Locks | Record | RW | 0 | |
| | Bit 0: Parameter Write Access | Boolean | RW | 0 | 0 = Unlocked 1 = Locked |
| | Bit 2: Local Parameterisation | Boolean | RW | 0 | 0 = Unlocked 1 = Locked |

7.5 Identification

Vendor Name

The manufacturer's name contains the name of the manufacturer.

Vendor Text

The manufacturer's text contains the manufacturer's claim.

Product Name

The product name contains the designation of the sensor used.

Product ID

The product ID contains the article number of the sensor used.

Product Text

The product text describes the sensor used.

Serial Number

The serial number is determined by the manufacturer.

Firmware Revision

The firmware revision shows the firmware version of the application used by the manufacturer.

Application-specific Tag

The Application-specific Tag can be used to store explanatory information about the sensor's application.

Table 9: IO-Link parameters – Identification

| Index | Designation | Format | Access | Factory setting |
|-------|--------------------------|--------|--------|---|
| 16 | Vendor Name | String | RO | microsonic GmbH |
| 17 | Vendor Text | String | RO | Unser Herz schallt ultra. |
| 18 | Product Name | String | RO | pms-15/CF/A1 pms-25/CF/A1 pms-35/CF/A1 pms-100/CF/A1 |
| 19 | Product ID | String | RO | pms-15 = 35000 pms-25 = 35100 pms-35 = 35200 pms-100 = 35300 |
| 20 | Product Text | String | RO | Ultrasonic sensor |
| 21 | Serial Number | String | RO | |
| 23 | Firmware Revision | String | RO | |
| 24 | Application-specific Tag | String | RW | *** |

7.6 Device status

Error Count

The Error Count is incremented as soon as an error is detected in the sensor. The counter is set to 0 every time the operating voltage is switched on.

Detailed Device Status

The Detailed Device Status lists all active error messages and warnings until they are revoked by the sensor as soon as the reason has been rectified.

Device Status

If no events can be read or the sensor is switched from SIO mode into IO-Link mode and the sensor is still to be monitored, we recommend querying this variable cyclically. The Device Status shows the entire status of the sensor depending on the problem that has occurred.

Table 10: IO-Link parameters – Device Status

| Index | Format | Designation | Access | Factory setting | Value range |
|-------|--------|------------------------|--------|-----------------|---|
| 32 | UInt16 | Error Count | RO | 0 | 0...65,535 |
| 36 | UInt8 | Device Status | RO | 0 | 0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure |
| 37 | Array | Detailed Device Status | RO | 0 | |

7.7 Events

Events are sent from the sensor to the master. This is performed asynchronously via the ISDU channel. The master acknowledges these events in the sensor and stores them in the master memory. There, a PLC can read the events. Several events can be pending in the sensor at the same time. Events are divided into three types:

- **Notifications** are displays of general information or non-critical states of the sensor. They are issued upon every re-occurrence of the sensor state.

- **Warnings** indicate a possible functional restriction of the sensor. These events remain until the reason for the functional restriction has been rectified.
- **Error** events indicate an inoperative sensor. These displays remain pending until the reason for the functional restriction has been rectified.

Table 11: IO-Link Events

| Code | | Type | Name | Meaning/measure |
|---------|--------|--------------|------------------------------|---|
| dezimal | hex | | | |
| 16384 | 0x4000 | Error | Temperature fault | Overload |
| 16912 | 0x4210 | Warning | Device temperature over-run | The maximum permissible sensor temperature was exceeded. |
| 16928 | 0x4220 | Warning | Device temperature under-run | The minimum permissible sensor temperature was undercut. |
| 20736 | 0x5100 | Error | General power supply fault | Check the supply voltage. |
| 30480 | 0x7710 | Error | Short circuit | Check the installation |
| 36000 | 0x8ca0 | Notification | Teach-in error | A Teach-in procedure was not successful. |
| 36001 | 0x8ca1 | Notification | Teach-in success | A Teach-in procedure was successful. |
| 36002 | 0x8ca2 | Notification | CycleTime error | A CycleTime error is triggered if the CycleTime does not correspond to the permitted configuration. |

7.8 Data storage

The sensors support data storage in accordance with IO-Link specification 1.1.2. Data storage allows the master to store the entire parameter set of the sensor. If the sensor is replaced, the master writes the data back into the replacement device. Data storage is completely controlled by the master and is a function of the IO-Link to be configured in the master. No further settings need to be made in the sensor for data storage.

Note

The configuration of the IO-Link master is decisive for the handling of the parameter set when storing data.

- **Comply with the specifications of the documentation and configuration of the IO-Link master!**

7.9 Block parameterisation

Block parameterisation is a specified IO-Link function. We recommend using this function if several parameters are to be changed simultaneously.

Each individual parameter write access is implemented directly in the sensor. This also includes a consistency test against other parameters and immediate transfer to the application if the check is successful. If parameters are transferred in an unfavourable sequence, the consistency test may fail.

With block parameterisation on the other hand, all parameters are first written and then the consistency test is carried out for all transferred parameters. The parameters are only saved in the sensor if this consistency test was successful. This block parameterisation applies analogously to the reading of parameters.

Table 12: System Command – Block parameterisation

| Index | Designation | Format | Access | Factory setting | Value range |
|-------|----------------|--------|--------|-----------------|--|
| 2 | System Command | UInt8 | WO | | 1 = ParamUploadStart 2 = ParamUploadEnd 3 = ParamDownloadStart 4 = ParamDownloadEnd 5 = ParamDownloadStore 6 = ParamBreak |

7.10 Parameter access and error codes

The master issues cyclical requests for the sensor to communicate. The measured value is sent from the sensor to the master with each communication. Part of this communication is the Indexed Service Data Unit channel (ISDU channel). This is used to write data or read data of the sensor acyclically.

This means that writing or reading a parameter can take several communication cycles.

Each communication of the master via the ISDU channel is answered by the sensor. The sensor first processes a transferred parameter when it has been transferred completely. Parameters, diagnostic data, events and commands are sent via this ISDU channel.

If the sensor detects errors during parameter access, it reports these with corresponding error codes.

Table 13: IO-Link error codes

| Error code | | Meaning/measure |
|------------|--------|--|
| dezimal | hex | |
| 0 | 0x0000 | No error |
| 32768 | 0x8000 | Application error in the device - no details |
| 32785 | 0x8011 | Index not available |
| 32786 | 0x8012 | Subindex not available |
| 32800 | 0x8020 | Service currently not available |
| 32801 | 0x8021 | The parameter cannot be accessed at the moment, as the device is currently in a local operating mode. |
| 32802 | 0x8022 | The parameter cannot be accessed at the moment because the device is currently in a remote operating mode. |
| 32803 | 0x8023 | Access denied |
| 32816 | 0x8030 | Parameter value outside the valid range |
| 32817 | 0x8031 | Parameter value above the permissible limit |
| 32818 | 0x8032 | Parameter value below the permissible limit |
| 32819 | 0x8033 | Parameter length too small |
| 32820 | 0x8034 | Written parameter length is smaller than allowed |
| 32821 | 0x8035 | Function not available |
| 32822 | 0x8036 | Function currently not available |
| 32832 | 0x8040 | Invalid parameter set |
| 32833 | 0x8041 | Inconsistent parameter set |
| 32898 | 0x8082 | Application not ready |

8 Appendix: Overview IO-Link data

| Index | Sub-index | Designation | Format | Access | Factory setting | Value range |
|-------|-----------|---|---------|--------|---|--|
| 2 | | System Command | UInt8 | WO | | 1 = ParamUploadStart 2 = ParamUploadEnd 3 = ParamDownloadStart 4 = ParamDownloadEnd 5 = ParamDownloadStore 6 = ParamBreak 65 = SP1 single value teach-in 66 = SP2 single value teach-in 130 = Restore Factory Settings |
| 12 | | Device Access Locks | Record | RW | | |
| | | Bit 0: Parameter Write Access | Boolean | RW | 0 | 0 = Unlocked 1 = Locked |
| | | Bit 2: Local Parameterisation | Boolean | RW | 0 | 0 = Unlocked 1 = Locked |
| 16 | | Vendor Name | String | RO | microsonic GmbH | |
| 17 | | Vendor Text | String | RO | Unser Herz schallt ultra. | |
| 18 | | Product Name | String | RO | pms-15/CF/A1 pms-25/CF/A1 pms-35/CF/A1 pms-100/CF/A1 | |
| 19 | | Product ID | String | RO | pms-15 = 35000 pms-25 = 35100 pms-35 = 35200 pms-100 = 35300 | |
| 20 | | Product Text | String | RO | Ultrasonic sensor | |
| 21 | | Serial Number | String | RO | | |
| 23 | | Firmware Revision | String | RO | | |
| 24 | | Application-specific Tag | String | RW | *** | |
| 32 | | Error Count | UInt16 | RO | 0 | 0...65,535 |
| 36 | | Device Status | UInt8 | RO | 0 | 0 = Device is OK 1 = Maintenance required 2 = Out of specification 3 = Functional check 4 = Failure |
| 37 | | Detailed Device Status | Array | RO | | |
| 40 | | Process data | Record | RO | | |
| | | Bit 0: Switching signal channel 1 state | Boolean | | | |
| | | Bit 8-15: Process data scale | Int8 | | | |
| | | Bit 16-31: Process data value | Int16 | | | |
| 58 | | Teach-in channel | UInt8 | RW | 0 | 0 = SSC1: Pin 4 (Push-Pull) (default) |
| 59 | | Bit 0-3: Teach-in status | UInt4 | RO | 0 | 0 = Idle 1 = SP1 success 2 = SP2 success 7 = Error |
| | | Bit 4: SP1 TP1 | Boolean | RO | 0 | 0 = false 1 = true |
| | | Bit 6: SP2 TP1 | Boolean | RO | 0 | 0 = false 1 = true |

| Index | Sub-index | Designation | Format | Access | Factory setting | Value range |
|-------|-----------|--------------------------------------|--------|--------|--|--|
| 60 | 0 | SSC1 parameter | Record | | | |
| | 1 | SP1 | Int16 | RW | pms-15 = 1,500 pms-25 = 2,500 pms-35 = 3,500 pms-100 = 10,000 | 200...2,500, resolution 0.1 mm 300...3,500, resolution 0.1 mm 700...6,000, resolution 0.1 mm 1,200...13,000, resolution 0.1 mm |
| | 2 | SP2 | Int16 | RW | pms-15 = 1,700 pms-25 = 2,800 pms-35 = 4,000 pms-100 = 12,000 | 200...2,500, resolution 0.1 mm 300...3,500, resolution 0.1 mm 700...6,000, resolution 0.1 mm 1,200...13,000, resolution 0.1 mm |
| 61 | 0 | SSC1 configuration | Record | | | |
| | 1 | Logic | UInt8 | RW | 0 | 0 = High active 1 = Low active |
| | 2 | Mode | UInt8 | RW | 1 | 0 = Deactivated 1 = Single point (SP1: switching point) 2 = Window (SP1, SP2: window mode) 3 = Two point (SP1, SP2: hysteresis mode) 128 = Single point + set point offset (SP1: switching point + offset) 129 = Window ± set point offset (SP1: Two way reflective barrier) |
| | 3 | Hysteresis | Int16 | RW | pms-15 = 20 pms-25 = 30 pms-35 = 50 pms-100 = 200 | 10...2,300, resolution 0.1 mm 10...3,200, resolution 0.1 mm 10...5,300, resolution 0.1 mm 10...11,800, resolution 0.1 mm |
| 256 | 0 | Filter | Record | | | |
| | 1 | Type | UInt8 | RW | 1 | 0 = F00: no filter 1 = F01: standard filter 2 = F02: averaging filter 3 = F03: foreground filter 4 = F04: background filter |
| | 2 | Strength | UInt8 | RW | 0 | 0 = P00: weak filter 1 = P01 2 = P02 3 = P03 4 = P04 5 = P05 6 = P06 7 = P07 8 = P08 9 = P09: strong filter |
| 300 | 0 | Temperature compensation | Record | | | |
| | 1 | Source of temperature | Int8 | RW | 1 | 0 = Inactive 1 = Active |
| 16512 | 0 | Measurement data channel description | Record | | | |
| | 1 | Lower limit | Int32 | RO | pms-15 = 184 pms-25 = 270 pms-35 = 640 pms-100 = 1,090 | resolution 0.1 mm resolution 0.1 mm resolution 0.1 mm resolution 0.1 mm |
| | 2 | Upper limit | Int32 | RO | pms-15 = 2,500 pms-25 = 3,500 pms-35 = 6,000 pms-100 = 13,000 | resolution 0.1 mm resolution 0.1 mm resolution 0.1 mm resolution 0.1 mm |
| | 3 | Unit code | Int16 | RO | pms-15 = 1013 pms-25 = 1013 pms-35 = 1013 pms-100 = 1013 | |
| | 4 | Scale | Int8 | RO | pms-15 = -1 pms-25 = -1 pms-35 = -1 pms-100 = -1 | |