

# UMS123U035 UMS303U035 UMS603U035

High-Performance Distance Sensor



Operating Instructions

## Table of contents

<b>1. Proper Use</b>	<b>4</b>
<b>2. Safety Precautions</b>	<b>4</b>
<b>3. EC Declaration of Conformity</b>	<b>4</b>
<b>4. Product Characteristics</b>	<b>5</b>
4.1. Connection Diagram	5
4.2. Housing dimensions	5
4.3. Complementary Products (see catalog)	6
4.4. Control Panel	6
4.5. Sonic cone Diagram	7
4.5.1. Measurement a diameter of 27 mm	7
4.5.2. Measurement on a 100 × 100 mm plate	8
4.6. Technical Data	9
<b>5. Mounting instructions</b>	<b>10</b>
<b>6. Initial Operation</b>	<b>10</b>
6.1. Delivery condition	11
6.2. Overview of functions	11
6.3. Menu structure	12
<b>7. Settings</b>	<b>14</b>
7.1. Causes for the appearance of the error message (display)	14
7.2. Run	14
7.3. Pin function	15
7.4. A1/A2 switching	15
7.5. E/A2	18
7.5.1. A2 switching	18
7.5.2. A2 error	18
7.5.3. E input	19
7.6. Analog	19
7.7. Offset	20
7.8. Offset adjustment	22
7.9. Setting the operating mode	23
7.10. Setting Multiplex	24
7.11. Setting the detection mode	24
7.12. Setting the filter	25

7.13. Selecting the sonic cone	25
7.14. Setting the sensitivity	25
7.15. Display	26
7.16. Language	26
7.17. Information	27
7.18. Reset	27
7.19. Password	27
7.20. E/A test (testing inputs/outputs)	28
<b>8. IO-Link</b>	<b>29</b>
<b>9. Maintenance Instructions</b>	<b>29</b>
<b>10. Proper Disposal</b>	<b>29</b>
<b>11. Exclusion of liability</b>	<b>29</b>

## 1. Proper Use

This wenglor product has to be used according to the following functional principle:

High-performance distance sensors impress with their high accuracy at both short and long distances. The sensors are adjusted externally or via the IO-Link interface using Teach-In and an OLED display.

If several high-performance distance sensors are in operation in the immediate vicinity, you can choose between synchronous and multiplex mode. In synchronous mode, all synchronized sensors send out ultrasound pulses simultaneously. As a result, object detection is possible over a wider area. In multiplex mode, the sensors send their ultrasonic pulses alternately, so that sensors which are mounted side by side do not interact with each other.

The detection mode is especially useful in preventing measurement results from being influenced by interfering objects: the ultrasonic sensor distinguishes between the best, closest and broadest signal and can select the appropriate signal for the application.

Adjusting the threshold value allows the sensitivity of the ultrasonic sensor to be determined. The higher the chosen threshold, the less sensitive the sensor is to interfering sound waves. This function can be combined with detection mode.

## 2. Safety Precautions

- This operating instruction is part of the product and must be kept during its entire service life.
- Read this operating instruction carefully before using the product.
- Installation, start-up and maintenance of this product has only to be carried out by trained personal.
- Tampering with or modifying the product is not permissible.
- Protect the product against contamination during start-up.
- Not a safety component in accordance with the EU Machinery Directive.

### General information on the product

These ultrasonic sensors analyse the sound reflected by the object. They detect almost any object and are particularly suitable for level control of liquids and bulk goods or for the detection of transparent objects. The sensor detects objects irrespective of their material, aggregate state, color or transparency. The OLED display allows for easy menu-controlled setting of the sensors. Via the IO-Link interface, comfortable parameterization and fast diagnosis are possible.

## 3. EC Declaration of Conformity

The products are developed, constructed and manufactured according to the directive 2004/108/EC. The following international standards and specifications apply:

**EN 60947-5-2:2007+A1:2012**

Low-voltage switchgear and controlgear, Part 5-2: Control circuit devices and switching elements – Proximity switches

Any additional standards which are applicable for the given application must be observed.

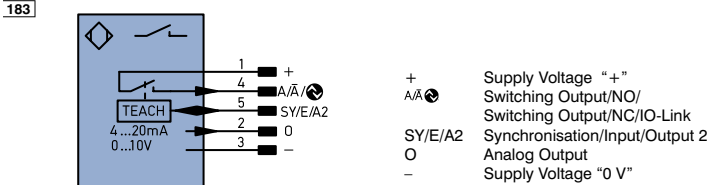


**RoHS**



## 4. Product Characteristics

### 4.1. Connection Diagram



+	Supply Voltage +	nc	not connected
-	Supply Voltage 0 V	U	Test Input
~	Supply Voltage (AC Voltage)	Ū	Test Input inverted
A	Switching Output (NO)	W	Trigger Input
Ā	Switching Output (NC)	O	Analog Output
V	Contamination/Error Output (NO)	O-	Ground for the Analog Output
Ȳ	Contamination/Error Output (NC)	BZ	Block Discharge
E	Input (analog or digital)	Aw	Valve Output
T	Teach Input	a	Valve Control Output +
Z	Time Delay (activation)	b	Valve Control Output 0 V
S	Shielding	SY	Synchronization
RxD	Interface Receive Path	E+	Receiver-Line
TxD	Interface Send Path	S+	Emitter-Line
RDY	Ready	±	Grounding
GND	Ground	ShR	Switching Distance Reduction
CL	Clock	Rx+/-	Ethernet Receive Path
E/A	Output/Input programmable	Tx+/-	Ethernet Send Path
IO-Link		Rba	Interfaces-Bus A(+)/B(-)
PoE	Power over Ethernet	La	Emitted Light disengageable
IN	Safety Input	Mag	Magnet activation
SSSD	Safety Output	RES	Input confirmation
Signal	Signal Output	EDM	Contact Monitoring

Wire Colors according to  
DIN IEC 757

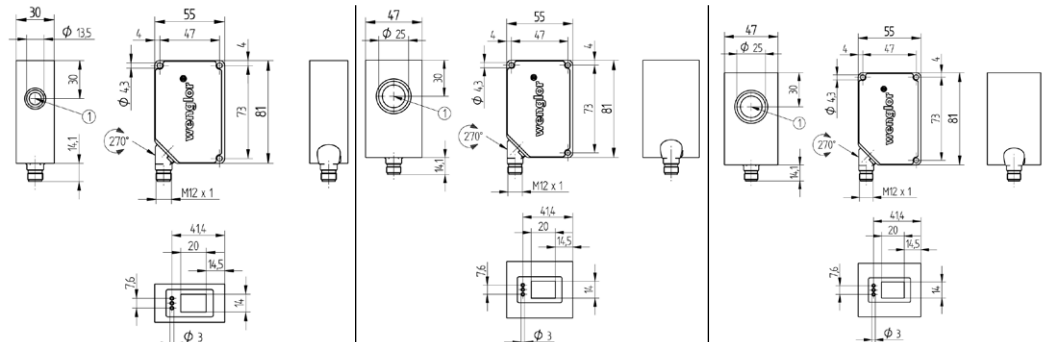
BK	Black
BN	Brown
RD	Red
OG	Orange
YE	Yellow
GN	Green
BU	Blue
VT	Violet
GY	Grey
WH	White
PK	Pink
GNYE	Green Yellow

### 4.2. Housing dimensions

UMS123U035

UMS303U035

UMS603U035



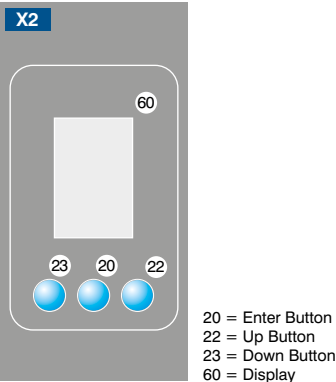
1 = Sensing Face

4.3. Complementary Products (see catalog)

wenglor offers Connection Technology for field wiring.

Suiting Mounting Technology No.	340
Suiting Connection Technology No.	<div>35</div> <div>S06</div> <div><div><div>1</div><div>4</div><div>3</div><div>2</div><div>5</div></div><div><div>BN</div><div>BK</div><div>BU</div><div>WH</div><div>GY</div></div></div>
IO-Link Master	
PNP-NPN Converter BG2V1P-N-2M	

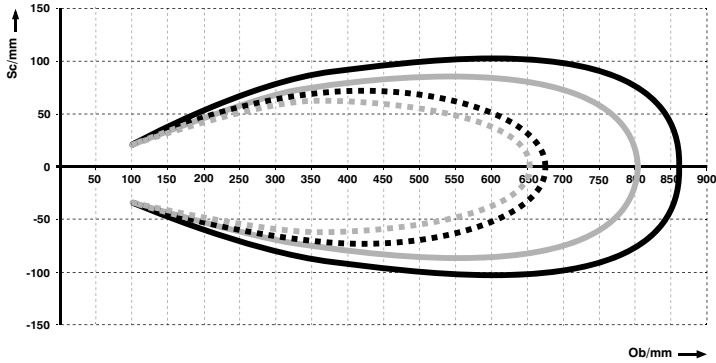
4.4. Control Panel



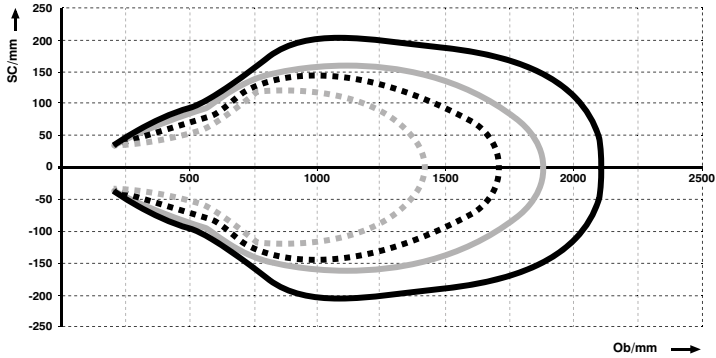
## 4.5. Sonic cone Diagram

### 4.5.1. Measurement a diameter of 27 mm

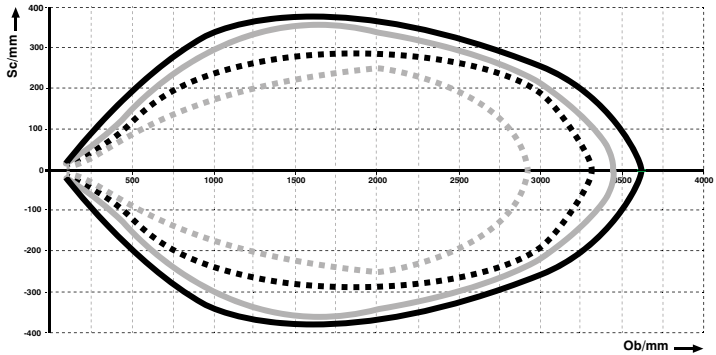
UMS123U035



UMS303U035

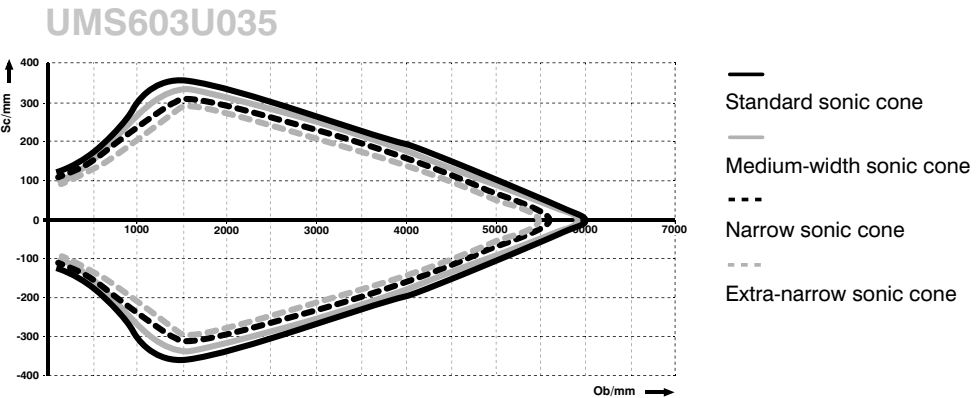
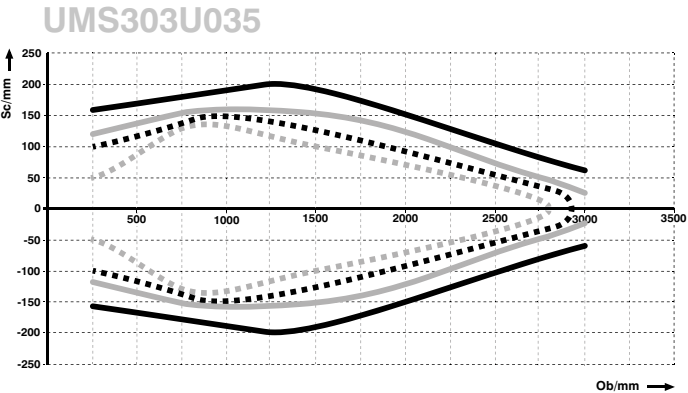
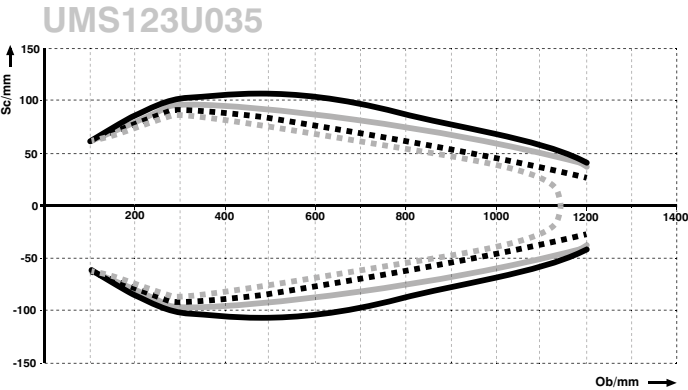


UMS603U035



- Standard sonic cone
- Medium-width sonic cone
- - - Narrow sonic cone
- - - Extra-narrow sonic cone

4.5.2. Measurement on a 100 × 100 mm plate





## 4.6. Technical Data

Ultrasonic	UMS123U035	UMS303U035	UMS603U035
Working Range	100...1200 mm	200...3000 mm	300...6000 mm
Measuring Range	1100 mm	2800 mm	5700 mm
Reproducibility maximum	1 mm	2 mm	5 mm
Linearity Deviation	4 mm	4 mm	20 mm
Resolution	0.1 mm	0.3 mm	1 mm
Ultrasonic Frequency	225 kHz	120 kHz	75 kHz
Opening Angle	< 12°	< 14°	< 14°
Switching Hysteresis	5 mm	15 mm	30 mm
Current Consumption (U <sub>b</sub> = 24 V)	< 30 mA	< 50 mA	< 50 mA
Switching Frequency	7 Hz	3 Hz	1.5 Hz
Response Time	< 72 ms	< 167 ms	< 334 ms
Service Life (T <sub>u</sub> = 25 °C)	100000 h		
Supply Voltage	18...30 V DC		
Temperature Range	-25...60 °C		
Switching Outputs	2		
Switching Output Voltage Drop	< 2.5 V		
PNP Switching Output/Switching Current	100 mA		
Analog Output	0...10 V		
Analog Output	4...20 mA		
Synchronisation	yes		
Multiplex Mode	yes		
Short Circuit Protection	yes		
Reverse Polarity Protection	yes		
Overload Protection	yes		
IO-Link Version	1.0		
Interface	IO-Link		
Adjustment	Teach-In		
Housing	Plastic		
Degree of Protection	IP67		
Connection	M12 × 1		
Protection Class	III		
Selectable menu language	✓		
Password protection	✓		
Error Output	✓		
PNP NO/NC switchable	✓		
IO-Link	✓		
Analog output	✓		

The warm-up phase takes approx. 30 minutes. At the beginning of this time, the linearity deviation and the reproducibility may deviate. During the warm-up phase, the values improve in the form of an exponential function until the technical data are achieved. The sensor works with an internal temperature compensation in order to compensate air temperature fluctuations. Via the IO link interface, you can also specify externally determined temperature values.

Set filter	Reproducibility in mm		
	UMS123U035	UMS303U035	UMS603U035
Filter 0 (default)	3	5	7
Filter 1	3	5	7
Filter 2	3	5	7
Filter 3	2	4	6
Filter 4	2	4	6
Filter 5	2	4	6
Filter 6	1	2	5
Filter 7	1	2	5

## 5. Mounting instructions

During mounting and operation of the sensors, the corresponding electrical and mechanical regulations, as well as safety regulations must be observed. The sensor must be protected from mechanical impact. The product has to be mounted so that the mounting position can not be changed.

- Make sure that the sensor is mounted in a mechanically secure fashion.
- If the object has smooth surfaces, the angle between the axis of the sound waves and the surface of the object should be  $90^{\circ} \pm 3^{\circ}$ . The angle can be considerably larger in the case of rough object surfaces.
- There may not be any objects underneath the working range.
- The active surface of the sensor may not contact any other machine parts.

## 6. Initial Operation

An IO-Link master with port Class A must be used, as for port Class A pin 5 is not connected. Connect the sensor to 18...30 V DC.

After the first commissioning and every reset, the menu language has to be selected (see “7.16. Language” on page 26)

You can change into the configuration menu by pressing any button.

Notice: If no setting is made in the configuration setting for a duration of 20 s, the sensor automatically jumps back into the display view.

By pushing the button once again, the sensor jumps back in to the menu view used last. If a selection is made, the setting will be accepted when the configuration menu is exited.

Navigation and setting are effected by the push of a button. The function of the navigation keys changes in the different menus. The function of the keys is shown in the display as follows:

- ▲ : Upward navigation.
- ▼ : Downward navigation.
- ◀ | ▶ : The Enter key is used to confirm the selection.
- ◀ Back: One level up.
- ◀◀ Run: Change to the display mode:

**Important:** In order to prevent damage of the keys please don't use sharp objects for setting.

## 6.1. Delivery condition

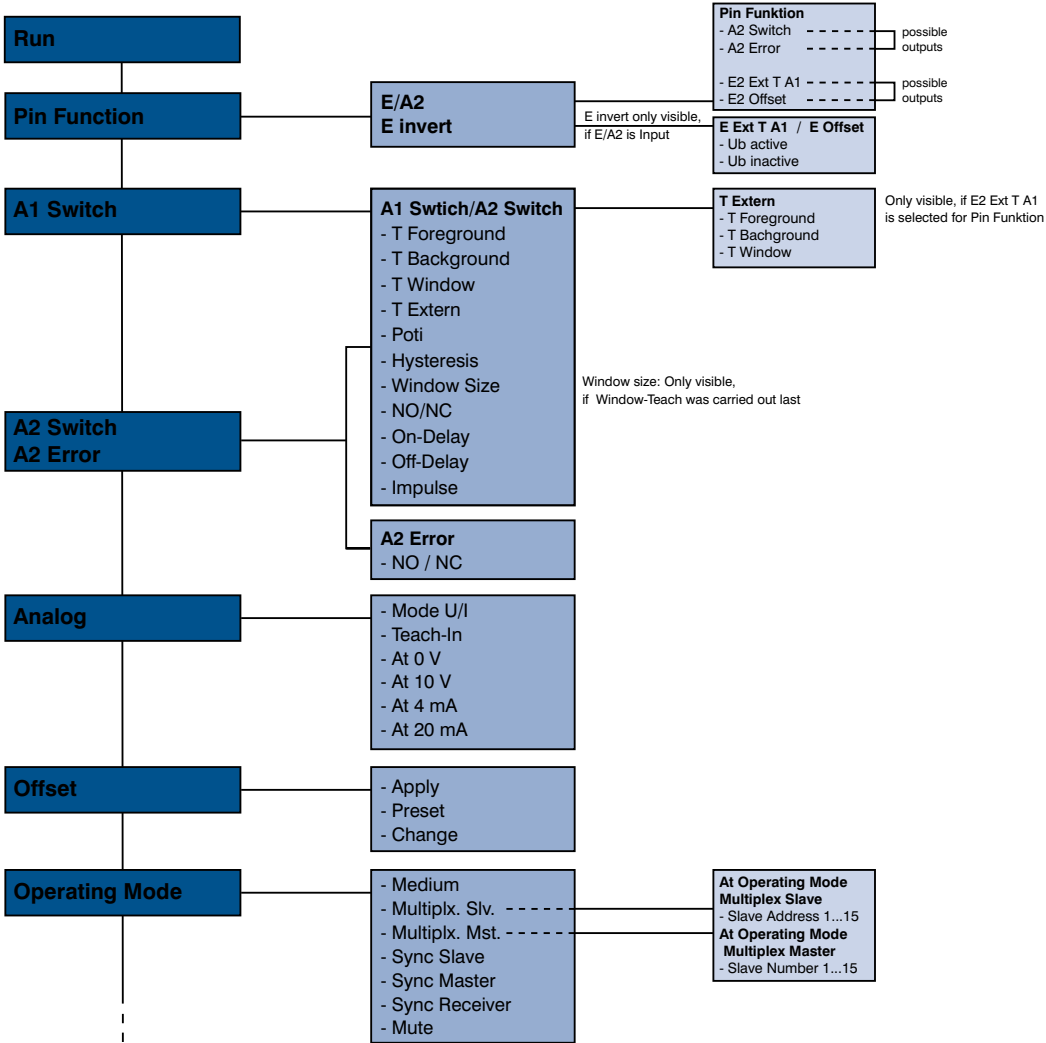
		UMS123U035	UMS303U035	UMS603U035
Pin Function	A1	Switching Output	Switching Output	Switching Output
	E/A2	Error Output	Error Output	Error Output
Outputs	Switching Hysteresis	5 mm	15 mm	30 mm
	Window Width	25 mm	50 mm	100 mm
	NO/NC	NO	NO	NO
	On-Delay	0 ms	0 ms	0 ms
	Off-Delay	0 ms	0 ms	0 ms
	Impulse	0 ms	0 ms	0 ms
Analog	U/I	I	I	I
	4 mA	100 mm	200 mm	300 mm
	20 mA	1200 mm	3000 mm	6000 mm
Offset	Preset Offset	0 mm	0 mm	0 mm
Operating Mode		Medium	Medium	Medium
Detection Mode		Best signal	Best signal	Best signal
Filter		0	0	0
Cudgel		Standard	Standard	Standard
Sensitivity	Threshold	0	0	0
Display	Mode	Digital	Digital	Digital
	Intensity	Screensaver	Screensaver	Screensaver
Language		English	English	English
Password	Activate	Off	Off	Off

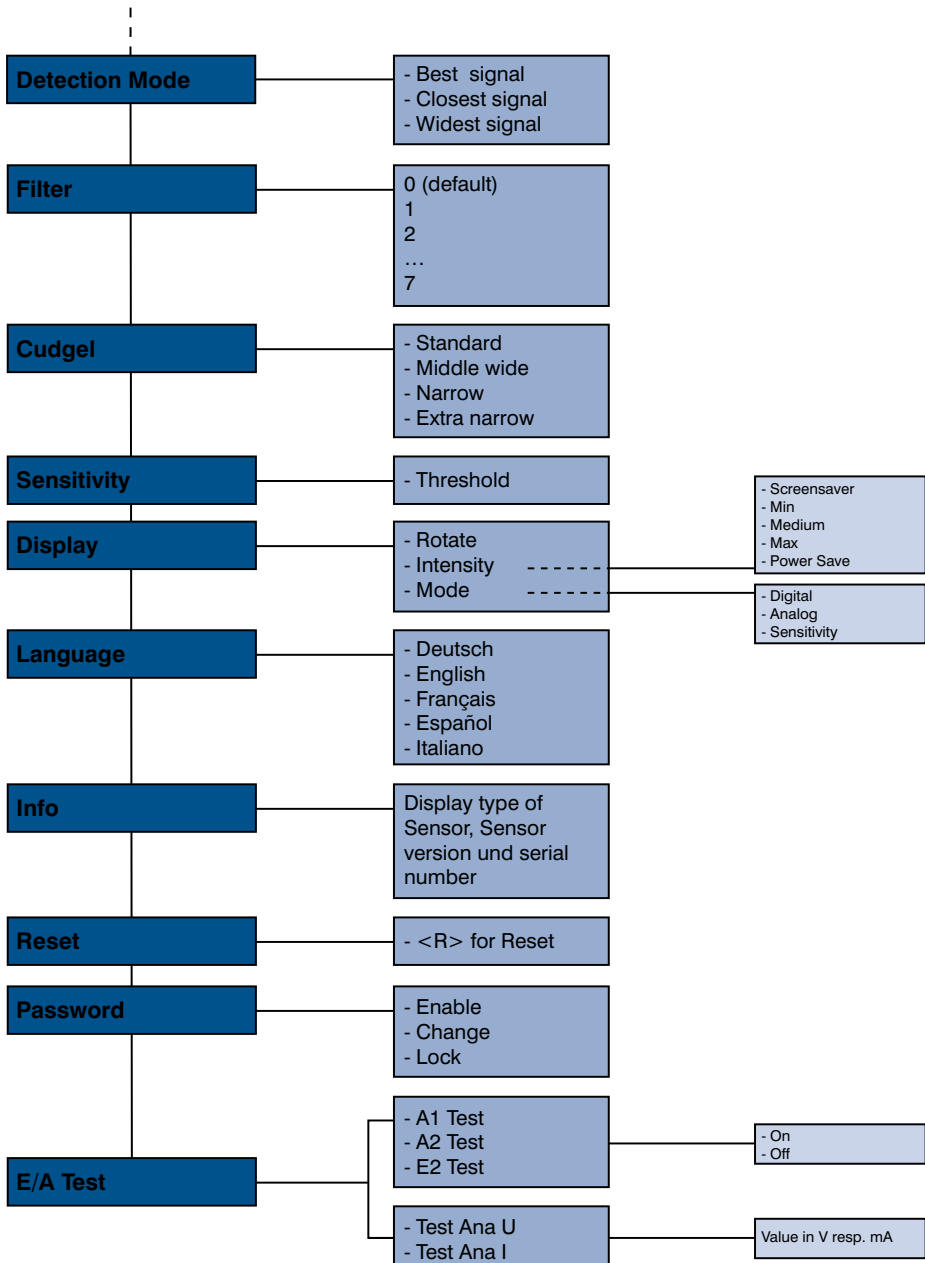
## 6.2. Overview of functions

Denomination	Function	Page
Run	Change to display mode	14
Pin function	Setting the function of E/A2	15
A1/A2 switch	Setting the output function	15
E/A2 Switch/Error	Setting the input and output functions of A2	18
Analog	Setting the analog output	19
Offset	Setting an offset	20
Operating Mode	Selecting an operating mode (Synchronisation/Multiplex)	23
Setting Multiplex	Address/number of Multiplex participants	24
Detection Mode	Signal selection	24
Filter	Making filter settings	25
Cudgel	Selection of the sonic cone	25
Sensitivity	Setting the sensitivity	25
Display	Selection of the display properties	26
Language	Selection of the menu language	26
Information	Output of sensor information	27
Reset	Resetting the settings/delivery condition	27
Password	Protection against unauthorized changes in the settings	27
E/A test	Testing input/output	28

6.3. Menu structure

The sensor configuration menu is set-up as follows:





A2 test and/or E2 test is only visible after prior selection of the corresponding Pin function.

## 7. Settings

### 7.1. Causes for the appearance of the error message (display)



- Too little ultrasound is reflected back
- There are very small or hardly reflecting (sound absorbing) objects in the working range
- Incorrect assembly
- Object outside the working range
- Strong ultrasound sources in the sound axis
- Strong air turbulences

### 7.2. Run

The sensor will change into the display mode if the **Enter key** is pressed.




The set function of the pins is shown as symbol in the “Display” menu:


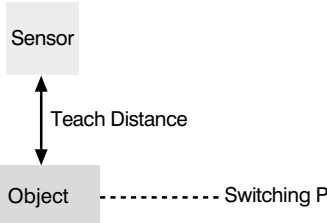
(T-1)	Teach input for A1
(A1) (A2)	Switching output
(IN)	Input for applying the offset
(F)	Error output

### 7.3. Pin function

The **Pin function** is used to define the function of the **E/A2 pin**. The pin may perform different functions.

Function	Description
E/A2	Configuration of pin E/A2
	<p>By pushing the ▲ and ▼ keys, pin E/A2 can be configured as</p> <div style="display: flex; justify-content: space-around;"> <div> <input type="radio"/> switching output  <input type="radio"/> error output         </div> <div> <input type="radio"/> input for applying the offset  <input type="radio"/> Teach input for A1         </div> </div>
I invert	Invert input
	E invert only visible if E/A2 = input.

### 7.4. A1/A2 switching

Function	Description
T Foreground	Foreground Teach-In
	<p>By pushing the <b>T key</b>, the distance to the object is taught in:</p> <ul style="list-style-type: none"> <li>Align sensor to object.</li> <li>Push T shortly.</li> </ul> <p>→ The switching distance to the object is set.</p> <ul style="list-style-type: none"> <li>In the Poti menu item, re-adjust the switching distance, if necessary.</li> </ul> <p>Teach-In is performed while the sonic cone is aligned to the object. The switching distance is then automatically set to a distance which is slightly greater than the clearance between the sensor and the object. The sensor is thus activated for all objects whose distance to the sensor is equal to or less than the distance to the object used for the Teach-In procedure.</p> <div style="text-align: center;">  </div>

<div data-bbox="56 183 280 343"><div>A1 Switch</div><div>T Background</div><div>301mm</div><div>○ 2339 mm</div><div>T</div></div>	<div data-bbox="302 151 1080 183">Background Teach-In</div> <p>By pushing the <b>T key</b>, the distance to the background is taught in so that it can be hidden.</p> <ul style="list-style-type: none"><li>• Align sensor to background (e.g. conveyor belt)</li><li>• Push the <b>T key</b> shortly</li></ul> <p>→ The background is hidden</p> <p>Teach-In is performed while the sonic cone is aligned to the background. The switching distance is then automatically set to a distance which is slightly less than the clearance between the sensor and the background. The sensor is thus activated whenever an object is located between the background and the sensor.</p> <div data-bbox="302 478 649 678"></div>
<div data-bbox="56 718 280 877"><div>A1 Switch</div><div>T Window</div><div>301mm</div><div>○ 1328 mm</div><div>T</div></div>	<div data-bbox="302 683 1080 715">Window Teach-In</div> <p>By pushing the <b>T key</b>, a tolerance window is taught in.</p> <ul style="list-style-type: none"><li>• Align sensor to the object</li><li>• Push the <b>T key</b> shortly</li></ul> <p>→ A tolerance window is put around the measured distance. The value for the window width and for the hysteresis can be adjusted (see “Window width”). If the object is within the window width, the sensor is switched. During teaching of the window, the lower and upper switching threshold are alternately displayed.</p> <p>In case of the Window Teach-In there are two switching points. The difference between the two switching points is referred to as a window. The size of the window is referred to as window width. The sensor is activated when an object is positioned within the window.</p> <div data-bbox="302 1037 761 1236"></div>
<div data-bbox="56 1300 280 1460"><div>A1 Switch</div><div>⊙ T Foregrnd</div><div>○ T Backgrnd</div><div>○ T Window</div><div>▲</div><div>▶</div><div>▼</div></div>	<div data-bbox="302 1246 1080 1278">External teaching</div> <p>By pushing the ▼ and ▲ key, you can select whether during External teaching, a “T Foreground”, “T Background” or “T Window” is carried out. This menu item is only visible if under <b>Pin Function</b>, the Teach input for A1 is selected.</p>
<div data-bbox="39 1501 296 1501">Poti</div>	<div data-bbox="302 1501 1080 1501">Readjustment of the switching distance</div>



<div><div>A1 Switch</div><div>Poti</div><div>301mm</div><div>O 1323 mm</div></div>	<p>By pushing the + and/or – key, the switching distance can be re-adjusted*.</p>												
Hysteresis	<p>Setting the switching hysteresis</p> <p>By pushing the + and/or – key, the value for the hysteresis is set*.</p> <table><thead><tr><th></th><th>UMS123U035</th><th>UMS303U035</th><th>UMS603U035</th></tr></thead><tbody><tr><td>Minimum value: XY</td><td>5 mm</td><td>15 mm</td><td>30 mm</td></tr><tr><td>Maximum value: XY</td><td>105 mm</td><td>315 mm</td><td>630 mm</td></tr></tbody></table>		UMS123U035	UMS303U035	UMS603U035	Minimum value: XY	5 mm	15 mm	30 mm	Maximum value: XY	105 mm	315 mm	630 mm
	UMS123U035	UMS303U035	UMS603U035										
Minimum value: XY	5 mm	15 mm	30 mm										
Maximum value: XY	105 mm	315 mm	630 mm										
Window width	<p>(can only be adjusted after Window teaching)</p> <p>By pushing the + and/or – key, the window width is determined*.</p> <table><thead><tr><th></th><th>UMS123U035</th><th>UMS303U035</th><th>UMS603U035</th></tr></thead><tbody><tr><td>Minimum value: XY</td><td>0 mm</td><td>0 mm</td><td>0 mm</td></tr><tr><td>Maximum value: XY</td><td>200 mm</td><td>600 mm</td><td>1200 mm</td></tr></tbody></table>		UMS123U035	UMS303U035	UMS603U035	Minimum value: XY	0 mm	0 mm	0 mm	Maximum value: XY	200 mm	600 mm	1200 mm
	UMS123U035	UMS303U035	UMS603U035										
Minimum value: XY	0 mm	0 mm	0 mm										
Maximum value: XY	200 mm	600 mm	1200 mm										
NC/NO	<p>Setting the output function</p> <p>By pushing the <b>NO</b> (normally open) or <b>NC</b> (normally closed) button, the output is set as NO or NC contact. The relevant switching pattern is displayed.</p> <p>NO: The output closes as soon as an object reaches the switching point. NC: The output opens as soon as an object reaches the switching point.</p>												
On-Delay	<p>Setting the On-Delay</p> <p>By pushing the + and/or – key, a pick-up delay from 0 ms to 10000 ms is set*.</p> <p>The On-Delay is an adjustable extension of the response time.</p> <div><div>Object</div><div>Output</div><div>On-Delay</div></div>												

\* Keep the + or – key pressed to achieve larger jumps in value

Off-Delay	<div><div>A1 Switch Off-Delay 0ms</div><div><div>+</div><div>▲</div><div>▼</div><div>-</div></div></div>	<div>Setting the Off-Delay</div> <p>By pushing the + and/or – key, a Off-Delay from 0 ms to 10000 ms is set*.</p> <p>The Off-Delay is an adjustable extension of the drop-out time.</p> <div><div>Object</div><div>Output</div><div>Off-Delay</div></div> <p>If an impulse length has been set, no Off-Delay can be set. In this case, the notice "Impulse" will appear in the control panel!</p>
Impulse	<div><div>A1 Switch Impulse 0ms</div><div><div>+</div><div>▲</div><div>▼</div><div>-</div></div></div>	<div>Setting the impulse length</div> <p>The impulse length defines how long the output signal is in the switched condition.</p> <p>By pushing the + and/or – key, an impulse length from 0 ms to 10000 ms is set*. After the set impulse time, the output signal changes back into the not switched condition.</p> <div><div>Object</div><div>Impulse</div><div>On Delay</div><div>Impulse duration</div></div> <p>Function can be combined with On-Delay.</p>

\* Keep the + or – key pressed to achieve larger jumps in value

7.5. E/A2

Depending on the setting of the Pin function, one of the following menus is visible.

7.5.1. A2 switching

The settings for A2 switching are made in the same way as for A1 switching (see “7.4. A1/A2 switching” on page 15).



7.5.2. A2 error

If in the **Pin function** menu (see “7.3. Pin function” on page 15), **output 2** is selected as error output, the point **A2 error** will appear in the menu tree. This can be configured using the **NO/NC** function. **Output 2** will switch as soon as an error is detected.

Function	Description
NO/NC	Error output configuration
<div><div>A2 Error NO</div><div><div>NO</div><div>NC</div></div></div>	<p>By pushing the <b>NO</b> or <b>NC</b> key, the error output is defined as NO or NC contact.</p>

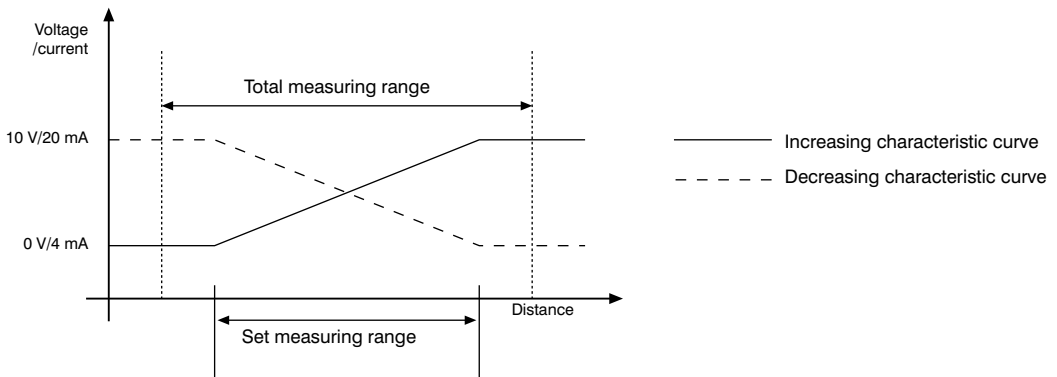
### 7.5.3. E input





If **Pin E/A2** (see “7.3. Pin function” on page 15) is used as **External teaching A1** or **Offset** input, the input can be set as inverted or non-inverted input.

Function	Description
active with Ub	Use as non-inverted input
	<p>The input is normally connected to 0 V supply voltage.</p> <p>The functionality of the input is initiated as soon as a voltage &gt; 7 V is applied.</p>
inactive with Ub	Use as inverted input
	<p>The input is normally connected to &gt; 7 V supply voltage.</p> <p>The functionality of the input is initiated as soon as a voltage &lt; 7 V is applied.</p>

## 7.6. Analog

The measuring range of the analog output can be freely selected within the specified working range with increasing or falling characteristic curve. The width of the selected measuring range for the analog value must amount to at least 10 % of the maximum possible measuring range. For example, the selected measuring range of the UMS123U035 must be set to at least 110 mm.







Function	Description
U/I mode	Analog output as voltage or current output
	By pushing the <b>U</b> or <b>I</b> key, the analog output is set as voltage or current output. The corresponding symbol is shown in the display.
Teaching U/I	Teaching the distance belonging to the upper and/or lower voltage value
	By pushing the <b>10 V</b> or <b>20 mA</b> key, the current distance is assigned to the voltage value 10 V or the current value 20 mA. By pushing the <b>0 V</b> or <b>4 mA</b> key, the current distance is assigned to the voltage value 0 V or the current value 4 mA. In the menu item under <b>0 V/4 mA</b> or under <b>10 V/20 mA</b> , the assigned distances can be re-adjusted, if necessary.
under 0 V/4 mA	Distance under 0 V/4 mA
	By pushing the <b>+</b> and/or <b>-</b> key, the distance assigned to the value 0 V or 4 mA is re-adjusted.
under 10 V/20 mA	Distance under 10 V/20 mA
	By pushing the <b>+</b> and/or <b>-</b> key, the distance assigned to the value 10 V or 20 mA is re-adjusted.

7.7. Offset

The **Offset** function is used to change the current measured value to a certain value. In this connection, the switching thresholds and the analog measuring range are changed as well.  
The offset can optionally be applied via the menu, externally via **Pin E/A2** or via the IO-Link interface.

### Via menu

Function	Description
Apply* 	Acceptance of the value set in "Specification" as distance.  By pushing the <b>T key</b> , the offset value set in the <b>Specification</b> menu item is accepted as displayed distance. By pushing the <b>Z key</b> , the <b>Offset</b> function is reset and the real distance is displayed.
Specification* 	Offset value teaching  By pushing the <b>T key</b> , the current distance is accepted as specified offset. By pushing the <b>Z key</b> , the specified offset value is set to 0 (the offset is activated in the <b>Apply</b> menu item).
Change 	Gradually changing the set offset value  By pushing the + or – key, the specified offset set in the <b>Specification</b> menu item can be gradually changed upwards or downwards.
	* Line 3 shows in each case the currently set specified offset (0 mm). Line 4 shows the current distance (1310 mm).

### Via pin E/A2

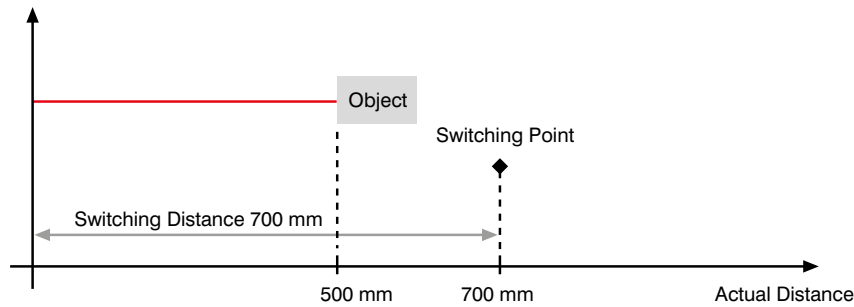
Via **Pin E/A2**, the offset adjustment can be completed by means of an external trigger sensor (corresponds to menu **Offset → Apply → T**). In this connection, **E/A2** has to be configured as input by the **Offset** setting (see "7.8. Offset adjustment" on page 22).

In order to apply the offset adjustment, a voltage > 7 V has to be applied at the input pin in order to trigger a positive edge. The value set in the **Specification** menu item will be accepted as current distance.

7.8. Offset adjustment

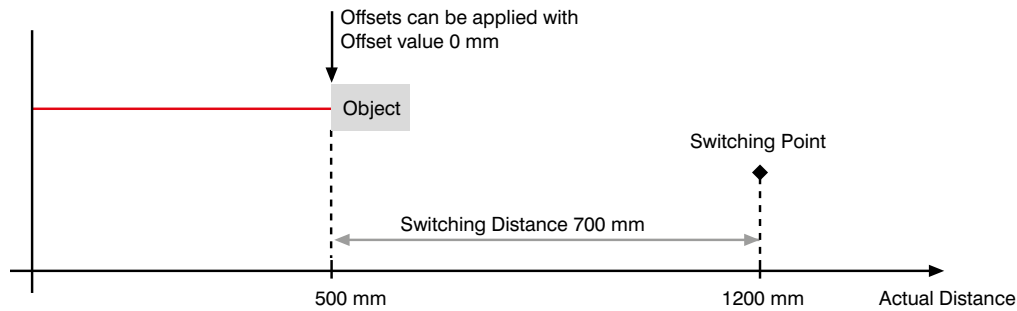
Without offset:

In the diagram, the sensor measures a distance of 500 mm. The switching point is 200 mm further away, at 700 mm.

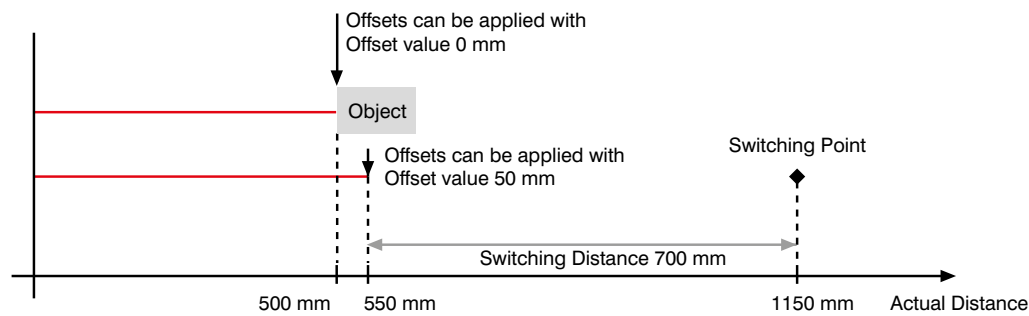


With offset:


In the diagram, the sensor measures a distance of 500 mm. After application of the offset with offset value 0 mm, the measured value at 500 mm becomes the measured value 0 mm. This offsets the real distance of the switching point.



In the diagram, the sensor measures a distance of 500 mm. The switching point is 200 mm away, at 700 mm. After application of the offset, the switching point is moved to 1200 mm. If an offset specification of 50 mm is set, the measured value 0 is moved from 500 mm to 450 mm. The switching point is then located at 1150 mm.


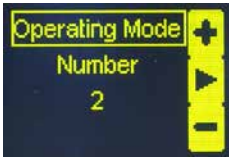


## 7.9. Setting the operating mode

Function	Description
Medium	Setting the operating mode
	The sensor is in normal mode.
Synchronous Slave	
	The sensor is in Synchronous Slave mode. Via pin 5, the master simultaneously sends signals to all slaves so that a larger detection area over several sensors can be covered.
Synchronous Master	
	The sensor is in Synchronous Master mode. Via pin 5, it automatically sends impulses to the connected slave participants so that ultrasonic impulses are transmitted at the same time.
Synchronous Receiver	
	The sensor is in Synchronous Receiver mode. Via pin 5, the master provides the slave with the information when it transmits ultrasonic signals. The sensor can only receive ultrasonic impulses, it does, however, not transmit such impulses itself. This can be used to detect objects deflecting the sound of the sender so that it can no longer receive reflected sound waves. One or several sensors positioned as synchronous receivers allow for the reception of such sound waves. Operation as one-way barrier is also possible. Here, however, the synchronous receiver will only display half the measured value.
Multiplex Slave	
	The sensor is in Multiplex Slave mode. Via pin 5, the master sends temporarily delayed signals to the slaves so that they transmit subsequently clocked ultrasonic impulses. In this way, mutual influencing can be excluded.
Multiplex Master	
	The sensor is in Multiplex Master mode. Via pin 5, it automatically sends impulses to the connected slave participants. The more slave participants are operated, the slower the measured value acquisition gets.
Mute	
	The ultrasonic sender of the sensor is switched off.


7.10. Setting Multiplex

This function is used to set the Multiplex mode. If the **Multiplex Slave** or **Multiplex Master** operating mode is selected under operating mode, this menu item for the setting of the slave address or specification of the number of multiplex participants will appear.

Function	Description
Address	Setting the Multiplex Slave address
	If the operating mode is set to <b>Multiplex Slave</b> , a uniform participant address between 1 and 15 has to be selected for every multiplex slave. The multiplex slaves will then be addressed by the multiplex master in this order. Use the + and – key to enter the multiplex participant address.
Number	Setting the number of multiplex participants
	If the operating mode is set to <b>Multiplex Master</b> , you have to enter the number of connected multiplex slaves. The + and – key is used to set the number of multiplex participants between 1 and 15.

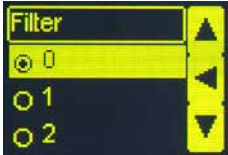
7.11. Setting the detection mode

The **detection mode** can be used to select which signal available in the measuring range is to be used for the analysis.


Function	Description
Detection mode	Setting the detection mode
	By pushing the ▲ and ▼ key, the desired detection mode is selected and confirmed by means of the Enter key ◀ . Best signal:           The signal with the highest signal strength will be used Closest signal:       The signal which is reflected by an object which is within the measuring range and closest to the sensor will be used. Furthest signal:      The signal which is reflected by an object which is within the measuring range and furthest away from the sensor will be used.



## 7.12. Setting the filter


Function	Description
Filter	Setting the filter
	<p>By pushing the ▲ and/or ▼ key, you switch between filter 0 (lowest) and filter 7 (highest).</p> <p>By means of the filter function, several measurements are used in order to protect the measurement result against influencing and interfering signals.</p> <p><b>Notice:</b> Increasing the filter reduces the max. switching frequency in a proportional manner.</p>

## 7.13. Selecting the sonic cone



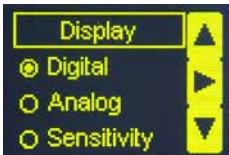
Function	Description
Cudgel	Selection of the sonic cone
	<p>By pushing the ▲ and ▼ key, the desired sonic cone is selected and by means of the Enter key ↵, the selection is confirmed.</p> <ul style="list-style-type: none"> <li>• Narrow</li> <li>• Middle wide</li> <li>• Standard</li> <li>• Extra narrow</li> </ul>

## 7.14. Setting the sensitivity

This function is used to set the sensitivity of the sensor to objects.


Function	Description
Sensitivity	The sensitivity is set
	<p>The threshold value can be set between 000 and 1000 and determines the sensitivity of the sensor. The higher the threshold is selected the more insensitive the sensor gets to the influence of interfering objects in the measuring field. In this way, influencing reflections of objects can be reduced. The threshold value can moreover be combined with the detection mode (see “7.11. Setting the detection mode” on page 24).</p>

7.15. Display

Function	Description
Rotation	Rotating the display
	By pushing the <b>Enter key</b> , the display screen is rotated by 180°. By pushing the key once again, the rotation is cancelled.
Intensity	Setting the display brightness
	By pushing the ▲ and ▼ keys, the menu immediately appears in the selected brightness (min, normal, max). In the energy saving setting, the display will be switched off after 30 sec. In the screensaver mode, the pixels invert in a 40-second cycle in order to prevent early aging of the display. By pushing the Enter key, the selection is confirmed.
Mode	Selection of the display mode
	By pushing the ▲ and ▼ keys, the display mode is selected and set by pushing the Enter key. The selectable modes are: <ul style="list-style-type: none"><li>• Digital: Display of the distance and the switching conditions of the digital inputs/outputs.</li><li>• Analog: Display of the distance and the analog value of the analog output.</li><li>• Sensitivity: Display of the distance and the amplitude value</li></ul>

7.16. Language

In the **Language** menu the desired menu language is set.

Function	Description
Language	Setting the menu language
	By pushing the ▲ and ▼ keys the desired menu language is selected and confirmed by means of the Enter key. After selection, the menu is immediately shown in the selected language.  The following languages can be selected: <ul style="list-style-type: none"><li>• Deutsch</li><li>• English</li><li>• Français</li><li>• Español</li><li>• Italiano</li></ul> In the first commissioning and after every reset, you must first of all set the language.


## 7.17. Information

In the menu, the following information on the sensor is displayed:

- Sensor type
- Sensor version
- Serial number




## 7.18. Reset

In the **Reset** menu, the sensor can be reset in the delivery condition.

Function	Description
Reset	Delivery condition
	By pushing R key, the sensor settings made are reset into the delivery condition.

## 7.19. Password

The password prevents unintentional adjustment of the set data.

Function	Description
Activate	Activating or deactivating the password functionality
	Using the ▲ and ▼ keys, you can choose between activated or deactivated password protection. If the password protection is active, operation of the sensor is locked after the power supply has been interrupted and it will only be released after successful password entry.
Change	Password entry for unlocking
	By means of the + and – key, you can select a password between 1 and 9999. Pushing the Enter key confirms the entry.
Lock	Sensor locking
	Sensor <b>lock</b> results in the immediate locking of the operation if <b>Activate password</b> is set to <b>on</b> .

**Information on the password functionality:**

With activated password functionality, the password has to be entered after every sensor current interruption. After the push of a button, the menu immediately jumps into the password entry mode.

After correct password entry, the entire menu is released and the sensor can be operated.

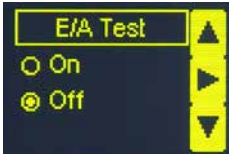
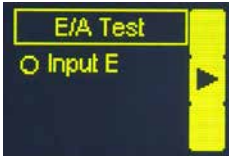
- In the delivery condition, the password functionality is deactivated.

It has to be ensured that the newly determined password is noted down before any change. Any forgotten password can only be overwritten by a general password. Any forgotten password can only be overwritten by a general password.

**7.20. E/A test (testing inputs/outputs)**

This function changes the outputs in a manual form irrespective of the current measured value of the sensor. This allows you to check whether outputs e.g. at a control are correctly connected or whether there is a failure in the cable changing the analog value. You can also check whether voltage is applied to the input pin.

The test is automatically ended if you exit the test menu.

Function	Description
Test A1/A2	The A1/o2 switching output is tested.
	By pushing the ▲ and ▼ keys, the output can be switched on and off irrespective of the settings. This allows you to check whether the outputs e.g. at a control are correctly connected.
Test analog U/I	The analog output is tested
	By pushing the + and – keys, a voltage/a current value can be set at the analog output irrespective of the settings. This allows you to check whether the analog output e.g. at a control is correctly connected.
Test input	The input is tested.
	If a voltage > 7 V DC is applied at the input irrespective of the settings, it is displayed whether the input is activated or not. This allows you to check whether the input e.g. at a control is correctly connected.

## 8. IO-Link

Process and parameter data can be found in the interface protocol under:  
[www.wenglor.com](http://www.wenglor.com) → Download → Interface protocols

### Process bytes

Output status is the status of the switching and error output.

The result is the distance value in 1/10 mm for UMS123U035 or in mm for UMS303U035 and UMS603U035.

## 9. Maintenance Instructions

- This wenglor sensor is maintenance-free.
- It is advisable to clean the transducer and the display, and to check the plug connections at regular intervals.
- Do not clean with solvents or cleansers which could damage the device.

## 10. Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

## 11. Exclusion of liability

wenglor sensoric gmbh, hereafter called wenglor for short, points out that notes and information in this operating manual may be subject to constant development and technical changes. This operating manual does not represent a promise by wenglor with regard to the described processes or specific product characteristics.

wenglor accepts no liability with regard to printing errors or other inaccuracies contained in this operating manual, unless wenglor can be shown to have known about the errors at the time the operating manual was made. In addition, wenglor hereby informs users that this operating manual is only a general description of technical processes, whose implementation may not make sense in this form in every individual case.

The information in this operating manual can be changed without advance announcement. No part of this document may be copied, reproduced or translated into another language without the prior written permission of wenglor sensoric gmbh, regardless of the manner or with what means this takes place.

Liability – regardless of the legal foundation – is excluded to the extent this is legally permissible. In particular, no liability is accepted for material and legal defects of the software and hardware as well as the related documentation and information – especially with regard to their correctness, freedom from error, freedom from industrial rights and copyrights of third parties, completeness and/or usability – except in the case of intentional damage or malice.