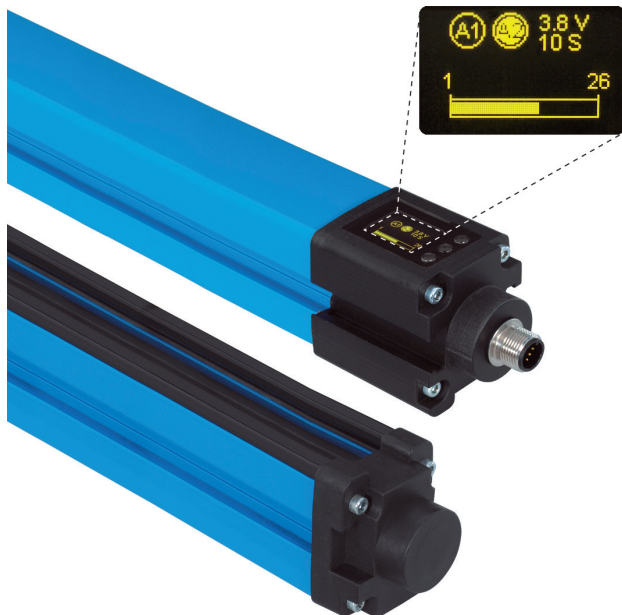


OSEIxxxZ0103 OEEIxxxU0135

Light Curtain for Measuring Tasks



Operating Instructions

Table of contents

1. Proper Use	4
2. Safety Precautions	4
3. EC Declaration of Conformity	4
4. Technical Data	5
4.1. Datasheet	5
4.2. Connection Diagrams	6
4.3. Housing Dimensions	6
4.4. Control Panel	7
4.5. Complementary Products	7
5. Mounting instructions	8
5.1. Mounting	8
5.1.1 Mounting with the BEF-SET-33	8
5.2. Alignment	9
6. Initial Start-Up	10
6.1. Setup	10
6.2. Overview of functions	11
6.3. Menu Structure	12
6.4. Beam Arrangement	13
6.5. Synchronizing Beam	13
6.6. Test Input Function	13
6.7. Error Output Function	14
6.8. Tolerance	14
7. Settings	15
7.1. Run	15
7.2. Pin Function	15
7.3. A1 Switch	16
7.3.1 Teach Beams	16
7.3.2 Teach-In Pattern	16
7.3.3 Two-Step Teach-In	18
7.3.4 Teach-In Range	19
7.4. E/A2	23
7.4.1 E Teach	23
7.4.2 E Setup	23
7.4.3 A2 Switch	23
7.4.4 A2 Error	24

7.5. Analog	24
7.5.1 Position	24
7.5.2 Web Edge	26
7.6. Blanking	28
7.7. E/A Test	29
7.8. Expert Menu	29
7.9. Display Definition	30
7.10. Language	31
7.11. Information	31
7.12. Reset	31
7.13. Password	32
7.14. Start Setup	33
8. IO-Link Parameter and Process data	33
9. Maintenance Instructions	42
10. Proper Disposal	42

1. Proper Use

This wenglor product is used in accordance with the following mode of operation:

Light Curtain for Measuring Tasks

Light grids for measuring tasks function in accordance with the barrier principle. This means that transmitter and receiver are housed separately. These housings are installed in such a way that the beam of light from the transmitter hits the optical receiver. Switching output depends on which and how many beams are interrupted. An analog output provides that information in the form of relevant voltage or power. The transmitters are equipped with a test input for function tests.

2. Safety Precautions

- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Read the operating instructions carefully before using the product.
- Installation, start-up and maintenance of this product has only to be carried out by trained personnel.
- Tampering with or modifying the product is impermissible.
- Protect the product from contamination during initial start-up.
- Not a safety component in accordance with the EU Machinery Directive.

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

Inspection level **III** according to IEC 61000-4-4:2004 + C1:2006 + C2:2007 + A1:2010 in combination with Z0033.

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



RoHS

4. Technical Data

4.1. Datasheet

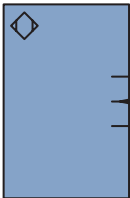
Range	2000 mm	
Opening Angle	10°	
Beam Distance	2 mm	
Supply Voltage	10...30 V DC	
Current Consumption (Ub = 24 V)	< 60 mA	
Temperature Drift	< 10 %	
Temperature Range	-25...60 °C	
Housing	Aluminium	
Reverse Polarity Protection	yes	
Full Encapsulation	yes	
Degree of Protection	IP65	
Connection	M12×1	
Protection Class	III	
Emitter		
Light Source	Infrared Light	
Wave Length	880 nm	
Service Life (T = 25 °C)	100000 h	
Receiver		
max. Ambient Light	10000 Lux	
ON-/OFF-Delay	0...10000 ms	
Switching Output Voltage Drop	< 2,5 V	
Switching Outputs	2	
Switching Output/Switching Current	100 mA	
Residual Current Switching Output	< 50 mA	
Analog Output	0...10 V	
Analog Output	4...20 mA	
Short Circuit Protection	yes	
Overload Protection	yes	
IO-Link Version	1.0	
Password Protection	yes	
Menu language	yes	
Output Function	Configurable as PNP or push-pull NC/NO, switchable IO-Link Analog Output	

	OSEI501Z0103 OEEI501U0135	OSEI102Z0103 OEEI102U0135	OSEI152Z0103 OEEI152U0135	OSEI202Z0103 OEEI202U0135
Order No.				
Measurement Field Height (MFH)	50 mm	100 mm	150 mm	200 mm
Switching Frequency	150 Hz	85 Hz	60 Hz	45 Hz
Response Time	3 ms	6 ms	8 ms	11 ms

4.2. Connection Diagrams

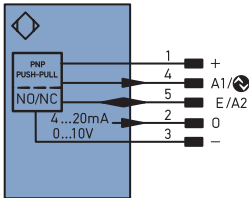
Emitter

703



Receiver

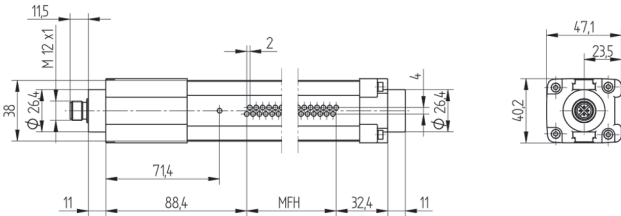
188



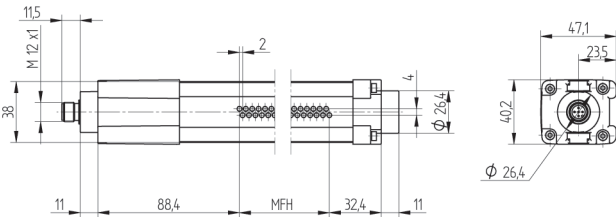
- + Supply Voltage “+”
- Supply Voltage “0 V”
- U Test Input
- A1/A2 Switching Output 1/IO-Link
- E/A2 Input/Output programmable
- O Analog Output

4.3. Housing Dimensions

Emitter

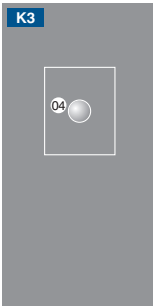


Receiver



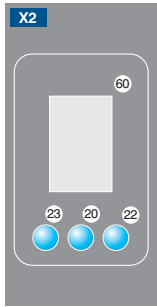
4.4. Control Panel

Emitter



04 = Function Display

Receiver

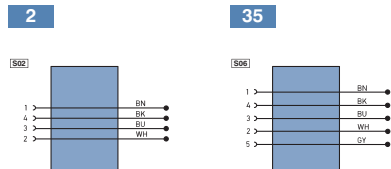


- 22 = Up Button
- 60 = Display
- 23 = Down Button
- 20 = Enter Button

4.5. Complementary Products

wenglor offers Connection Technology providing field wiring means.

Suitable Connection Technology No.



Suitable Mounting Technology No. **700**

IO-Link Master

5. Mounting instructions

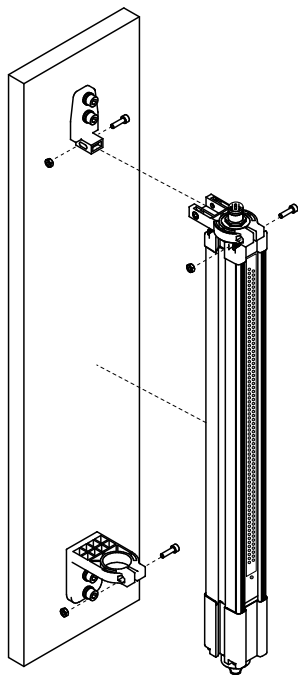
During operation of the Sensors, the corresponding electrical and mechanical regulations, as well as safety regulations must be observed. The Sensor must be protected from mechanical impact. Install the device such that its installation position cannot be inadvertently changed.

5.1. Mounting

The mounting of the Light Curtains is made over the BEF-SET-18 or BEF-SET-33.

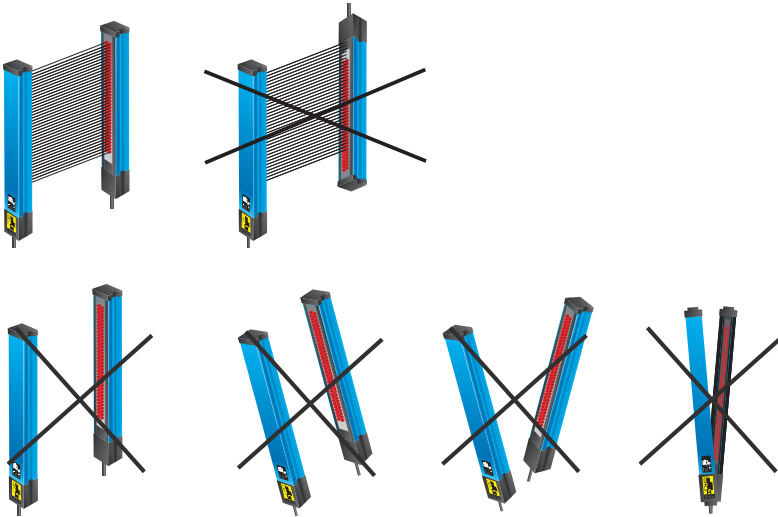
5.1.1 Mounting with the BEF-SET-33

First secure the mounting clamp to the Light Curtain with the screws. The screws should remain accessible after mounting. In this way, the Light Curtain can be adjusted at a later point in time. The Light Curtain is then attached to the machine etc. with the BEF-SET-33. Neither excessively small torques (too little protection against vibration) nor excessively large torques (possible damage to the retainer) may be used during installation. Mounting screws and nuts required for attachment to the machine etc. are not included in the scope of delivery.

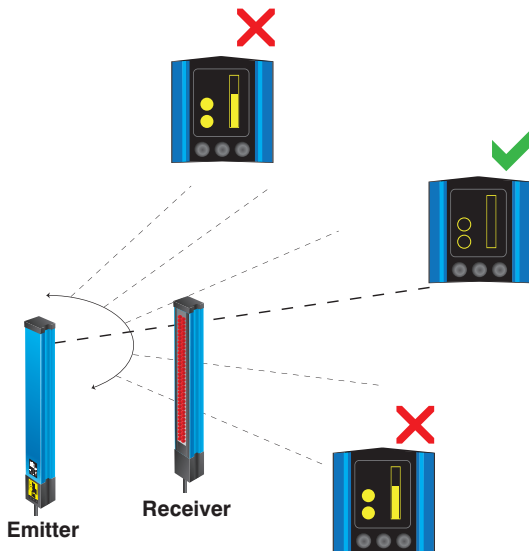


5.2. Alignment

In order to assure flawless functioning of the Light Barrier, the two matched components (emitter and receiver) must be aligned to one another, and mounted parallel at the same height. The electrical plug connectors of both components point in the same direction. It is advisable to mount the Light Barrier for initial start-up such that alignment can still be adjusted to an adequate extent.



Correct alignment is indicated by the bar graph at the display. When all beams are shown as uninterrupted, the Light Barrier is correctly aligned.



6. Initial Start-Up

- Electrically connect the emitter and the receiver in accordance with the wiring diagrams.
- The desired menu language must be selected at initial start-up, and after each reset (see section 7.10).

Switch to the configuration menu by pressing any key.

Note: If no settings are adjusted in the configuration menu for a period of 30 seconds, the Sensor is automatically returned to the display mode.

The Sensor accesses the last used menu view when a key is once again activated. If a setting is configured, it becomes active when the configuration menu is exited.

The keys are used for navigation, and for configuring settings. The functions of the navigation keys vary from menu to menu. The functions of the keys appear in the display as follows:

- ▲ : Navigate up.
- ▼ : Navigate down.
- ⏮ Back: Move up one level within the menu.
- ⏭ Run: Switch to the display mode.

Selection is acknowledged with the enter key.

Important: Do not use any sharp objects to press the keys when configuring settings, because they might otherwise be damaged.

6.1. Setup

After initial start-up, the Light Curtain has to be set up in order to adjust sensitivity.

Note: None of the beams may be interrupted during the entire duration of the set-up procedure.

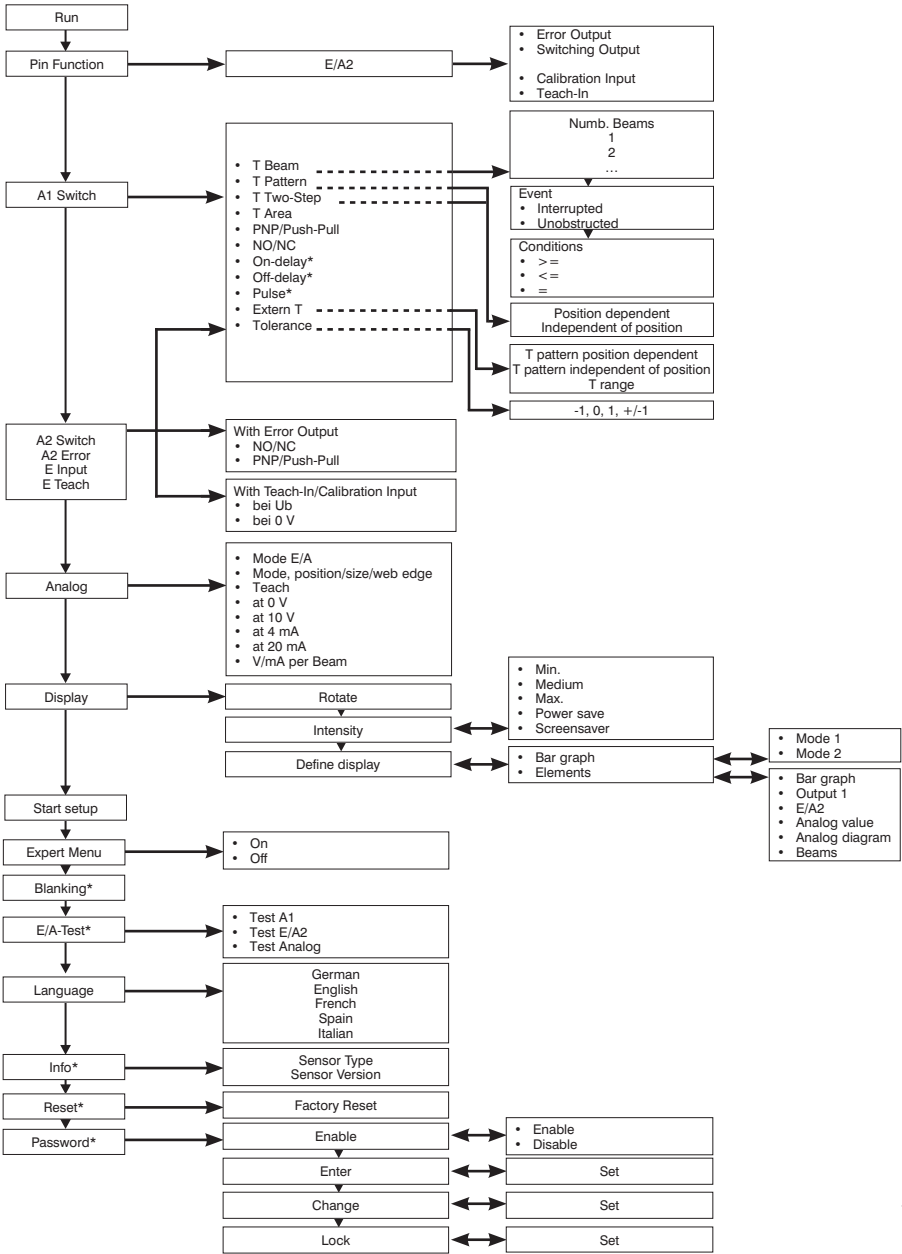
- The “Setup” function is selected in the menu, and the procedure is started by pressing the T key. Alternatively, the setup procedure can be started via the input. However, the input must first be accordingly configured to this end (see section 7.2).
- Progress is indicated at the display.
- After setup has been successfully completed, a message appears and the beams are shown as uninterrupted at the bar graphs in the display. Further settings can now be entered.
- If no message appears, check the following points and repeat the procedure:
 - Check to see whether or not there are any objects in the measuring field or if the beams are obstructed by contamination. Remove any such objects or contamination.
 - Check alignment between the emitter and the receiver – they have to be at the same height and mounted exactly parallel to each other.

6.2. Overview of functions

Description	Function	Page
Run	Switch to display mode	15
Pin Function	Configure function for A1	15
A1 Switch	Configure the output functions of A1	16
E/A2	Configure the input-/output functions of E/A2	15
Analog	Configure function of the analog output	29
Blanking	Blanking Beams	28
E/A-Test	Testing input-/output	29
Expert Menu	Activating/Deactivating the Expert Menu	29
Display	Select display characteristics	30
Language	Select the desired menu language	31
Info	Read out information regarding the Sensor	31
Reset	Return to default settings	31
Password	Protection against unauthorized changes to settings	32
Start Setup	Start setup procedure	33

6.3. Menu Structure

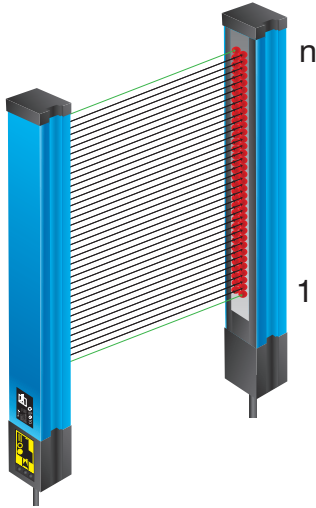
The Sensor's menu is laid out as follows:



* Only visible if expert menu is set to "on".

6.4. Beam Arrangement

The Light Barrier's beams are numbered consecutively (beam 1 is the beam which is closest to the display). The beam numbers included in the following descriptions are consecutive numbers.

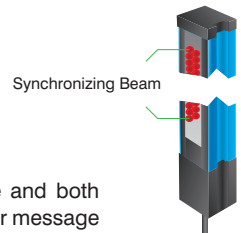


6.5. Synchronizing Beam

The emitter and the receiver are synchronized by means of optical beams. The synchronizing beams are the top and bottom beams. At least one of the synchronizing beams must always be unobstructed (uninterrupted).

Attention!

If both synchronizing beams are interrupted, synchronization does not take place and both switching outputs are activated. Furthermore, the error output is switched and an error message appears at the display.



6.6. Test Input Function

If the test input is open or connected to negative potential, the Sensor functions normally. If positive potential is applied for roughly 3 seconds and then disconnected, the transmitter shuts down all of the beams, one after the other. The Light Curtain is tested by means of the resultant change in switching status at the receiver.

6.7. Error Output Function

Light Curtain for measuring tasks in EI variant:

The error output is activated as soon as synchronization between the emitter and the receiver is interrupted. This occurs in the event that both synchronizing beams (upper and lowermost beams) are interrupted at the same time.

In order to assure that synchronization is not interrupted, at least one of the two synchronizing beams must always be unobstructed.

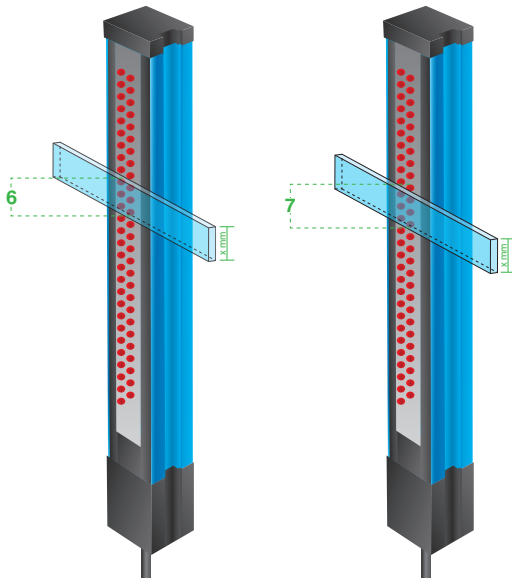
6.8. Tolerance

During the course of dynamic processes, situations arise which cause a certain object to interrupt varying numbers of beams due to its variable position within the measuring field.

In order to assure that taught in objects are reliably detected despite this situation, a tolerance can be assigned to them.

Example:

- The object in figure 1 has been taught in. It moves up within the measuring field. As shown in figure 2, the object would not be detected without the help of the tolerance function, because a different number of beams were interrupted during Teach-In.
- If a tolerance of plus one beam is selected, the object can be up to one beam larger than it was during Teach-In, in order to assure that it is nevertheless detected.



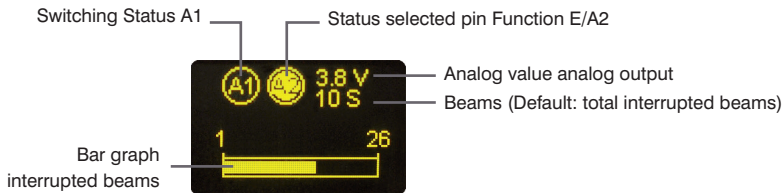
Three different tolerance types can be selected:

- 1: The object may be one beam smaller than the taught in object and is still recognized.
- +1: The object may be one beam larger than the taught in object and is still recognized.
- ±1: The object may be one beam larger or smaller than the taught in object and is still recognized.






7. Settings

7.1. Run

The Sensor is switched to the display mode when the enter key is pressed.



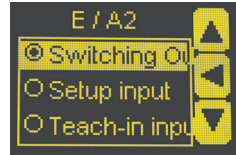
The function selected for this pin appears as a symbol in the display mode:

-  Teach-In for A1
-   Switching Output
-  Setup input
-  Switching Output

7.2. Pin Function

The pin function is used to specify the function assigned to pin E/A2. Various functions can be assigned to this pin.

Note: If a class B IO-Link master is used (at pin 5, GND), the pin function must be set to input (Teach-In input or setup input).

Function	Description
E/A2	Configuration of Pin E/A2
	<p>Pin E/A2 can be configured by pressing the ▲ and ▼ keys</p> <ul style="list-style-type: none">• Switching Output• Setup input• Error Output• Teach-In for A1

7.3. A1 Switch

Switching output 1 is set up here.

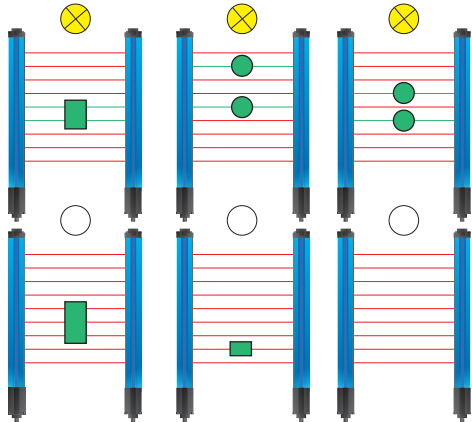
Four different modes are available, making it possible to adapt the Light Barrier's switching output to the respective application by means of predefined functions.

7.3.1 Teach Beams

The number of interrupted or uninterrupted beams which cause the output to switch, as well as the condition under which it switches, are selected via the menu. Only the number of beams is evaluated – the position and arrangement of the beams is not taken into consideration.

Example:
The output should be switched when exactly two beams are interrupted:

Number of beams: 2
Result: Interrupted
Condition: =

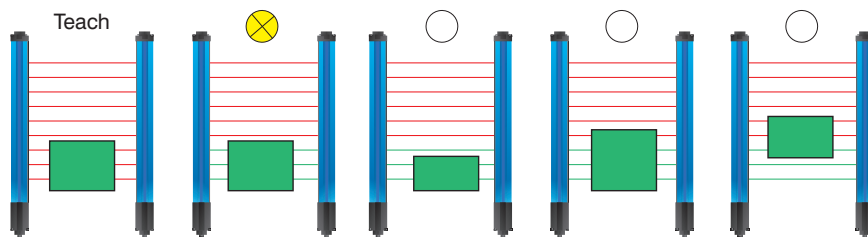


7.3.2 Teach-In Pattern

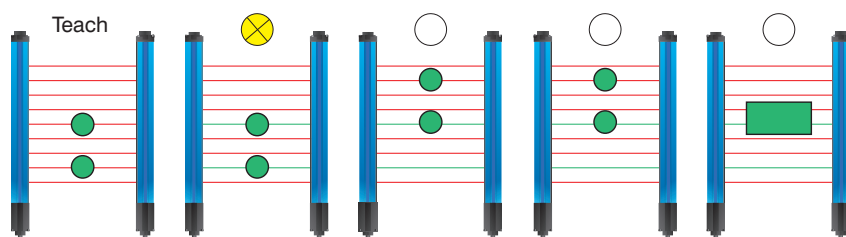
An object with a given beam pattern is taught in. The switching output is switched as soon as the taught in pattern is recognized. Differentiation is made between patterns which are position dependent and independent of position.

Teach-In pattern, position dependent: In order to be recognized and cause the output to be switched, the pattern to be detected must be at exactly the same position within the measuring fields as it was during Teach-In.

Example:

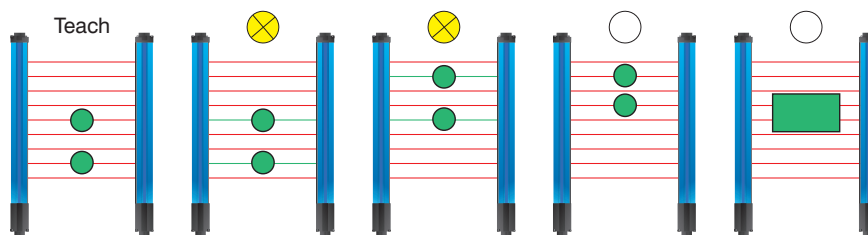


Example:



Teach-In pattern, independent of position: The taught in pattern can be located anywhere within the measuring field and is always recognized, thus causing the output to be switched.

Example:

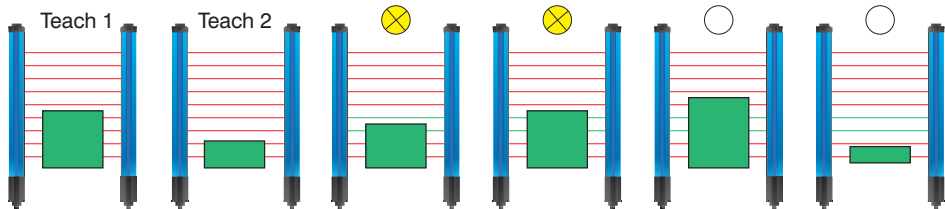


7.3.3 Two-Step Teach-In

Two objects are taught in, one after the other. The switching output is switched as soon as objects are detected within the measuring field whose size is between the sizes of the two taught in objects

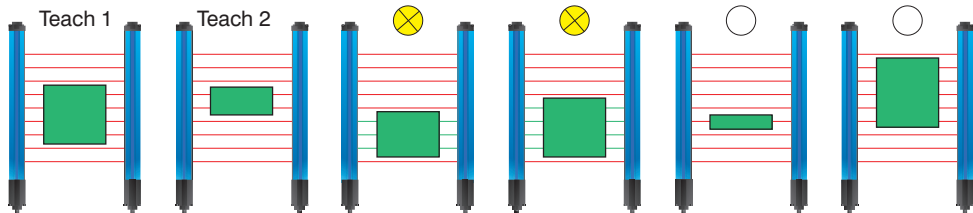
Two-step Teach-In, position dependent: The objects to be detected are always at the same position within the measuring field. The height of the uppermost interrupted beam is evaluated.

Example:

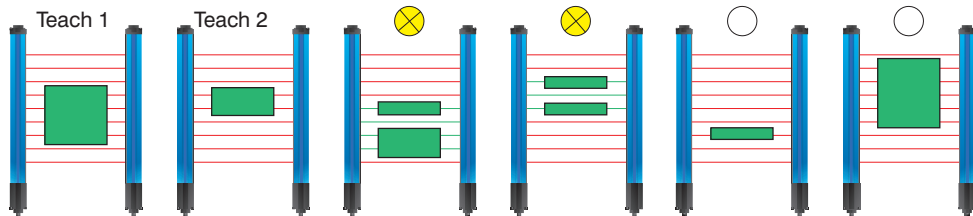


Two-step Teach-In, independent of position: The taught in objects can be located anywhere within the measuring field and are always recognized, thus causing the output to be switched. The size of the objects is evaluated.

Example:



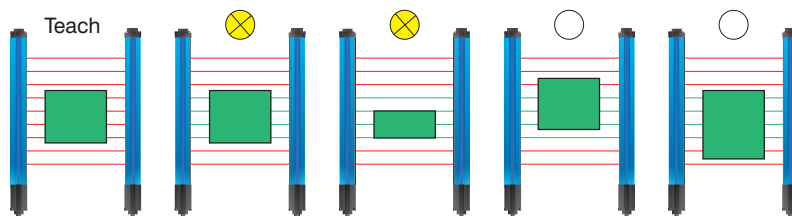
Example:



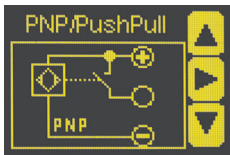



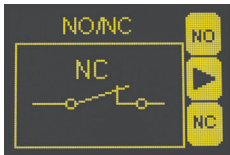
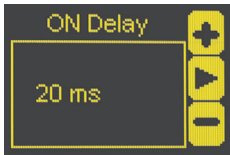
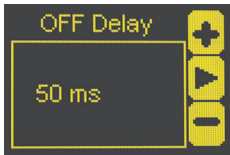
7.3.4 Teach-In Range

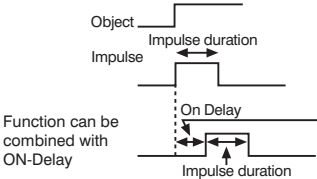
A range is taught in. The switching output is switched as soon as an object is detected within the taught in range, regardless of its size.

Example:



Function	Description
T Beams	
<div><div>Number of beam<div>3<div><div>+</div><div>▼</div><div>▲</div><div>-</div></div></div></div><div>Event<div><div><input checked="" type="radio"/> Interrupted</div><div><input type="radio"/> Free</div><div>◀ Back</div></div><div>Condition<div><div><input checked="" type="radio"/> >=</div><div><input type="radio"/> <=</div><div><input type="radio"/> =</div></div></div></div></div> <div><p>Number of beams: The number of unobstructed or interrupted beams is set with the + or – key.</p><p>Event: The navigation keys are used to select whether interrupted or unobstructed beams will be used for evaluation. This entry is acknowledged with the enter key.</p><p>Condition: The navigation keys are used to specify under which condition the output will be switched. This entry is acknowledged with the enter key.</p><p>>=: In the event that the same or a larger number of beams is interrupted/unobstructed, the output is switched.</p><p><=: In the event that the same or a smaller number of beams is interrupted/unobstructed, the output is switched.</p><p>=: The input is switched when exactly the specified number of beams is interrupted/unobstructed.</p></div>	
T Range	
<div><div>Position depend<div>S<div><div><div>T</div><div>▼</div><div>▲</div></div></div></div><div>T<div><div><div>T</div><div>▼</div><div>▲</div></div></div></div></div></div> <div><p>First of all, the ▼ and ▲ keys are used to select whether detection should be position dependent or independent of position. This entry is acknowledged with the enter key.</p><p>The object to be taught in is positioned within the measuring field.</p><p>The pattern is then taught in by pressing the T key.</p></div>	
T Two-step	
<div><div>Position depend<div>S<div><div><div>T1</div><div>▼</div><div>▲</div></div></div></div><div>T<div><div><div>T2</div><div>▼</div><div>▲</div></div></div></div></div></div> <div><p>First of all, the ▼ and ▲ keys are used to select whether detection should be position dependent or independent of position. This entry is acknowledged with the enter key. The first object to be taught in is positioned within the measuring field. The first object is then taught in by pressing the T1 key. The first object is subsequently removed and the second object is then positioned within the measuring field and taught in by pressing the T2 key.</p></div>	
T Area	
<div><div>T Area<div>S<div><div><div>T</div><div>▼</div><div>▲</div></div></div></div><div>T<div><div><div>T</div><div>▼</div><div>▲</div></div></div></div></div></div> <div><p>The range to be taught in is obstructed within the measuring field.</p><p>The range is then taught in by pressing the T key.</p></div>	

Function	Description
PNP/Push-Pull 	<p>Selecting the Output Type</p> <p>The output is preset to PNP. Pressing the ▼ key sets the output to push-pull. Pressing the ▼ key again sets the output to NPN.</p> <p>The respective circuit diagram indicates how the output is set:</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>PNP</p>  </div> <div style="text-align: center;"> <p>Push-Pull</p>  </div> <div style="text-align: center;"> <p>NPN</p>  </div> </div> <p>Note: NPN only for output 2.</p>
NO/NC 	<p>Selecting the Output Type</p> <p>The normally open or normally closed output function is selected by pressing the NO or the NC key. The respective circuit diagram is displayed.</p>
On-Delay 	<p>Adjusting On-Delay</p> <p>On-delay can be adjusted within a range of 0 to 10000 ms by pressing the + or – key.*</p>
Off-Delay 	<p>Adjusting Off-Delay</p> <p>Off-delay can be adjusted within a range of 0 to 10000 ms by pressing the + or – key.* Off-delay is disabled if a impulse duration has already been selected.</p>

Function	Description
<div>Impulse</div> <div>300 ms</div>	<p>Adjusting Impulse Duration</p> <p>Pulse duration defines how long the output signal remains in the activated state. A impulse length can be selected within a range of 0 to 10000 ms by pressing the + or – key.* After the selected pulse duration has elapsed, the output signal is returned to the deactivated state.</p> 
<div>Extern Teach</div> <div>T pattern</div> <div>T Area</div> <div>Back</div>	<p>External Teach-In</p> <p>Selection as to whether a “position dependent T pattern”, a “T pattern independent of position” or a “T range” range is executed can be selected during external Teach-In with the ▲ and ▼ keys</p>
<div>Tolerance</div> <div>+1 S</div>	<p>Beam Tolerance</p> <p>After pressing the + or – key, selection can be made as to whether or not a tolerance will be activated for the utilized Teach-In mode (see section 6.3).</p> <ul style="list-style-type: none">–1: One beam less than taught in may be interrupted, and the object is still detected.0: The tolerance function is deactivated.+1: One beam more than taught in may be interrupted, and the object is still detected.+/-1: One beam more and/or less than taught in may be interrupted, and the object is still detected.

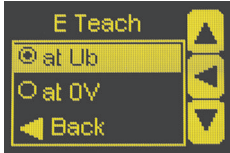
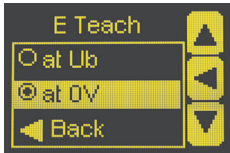
* Press and hold the + or – key in order to scroll quickly through the numbers.

7.4. E/A2

After selecting the pin function, one of the following menus appears.

7.4.1 E Teach

If the input is activated, external Teach-In is executed for A1 Switch. Which Teach-In mode will be used for external Teach-In must be selected under "A1 Switch" – "T External".

Function	Description
With Ub	Use as a Non-Inverted Input
	The output is normally open or connected to "0 V" supply power. The input's function is triggered by applying a voltage of greater than 7 V.
With 0 V	Use as a Non-Inverted Input
	<p>The input is normally connected to supply power of greater than 7 V.</p> <p>The input's function is triggered by disconnecting it or applying a voltage of less than 7 V.</p>

7.4.2 E Setup

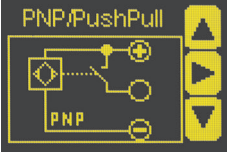
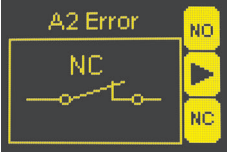
If the input is activated, the Light Barrier is set up automatically. Setup can also be initiated via the menu (see section 7.14). Settings for I Setup are entered in the same way as for I Teach (see section 7.4.1).

7.4.3 A2 Switch

Settings for A2 Switch are entered in the same way as for A1 Switch (see section 7.3).

7.4.4 A2 Error

The error output is switched as soon as an error is detected (see section 6.8).

Function	Description
PNP/Push-Pull	Selecting the Output Type
	The PNP, NPN or push-pull output type can be selected with the help of the ▼ and ▲ keys, and selection is acknowledged by pressing the enter key. The respective circuit diagram is displayed.
NO/NC	
	The error output is set up as normally open or normally closed by pressing the NO or the NC key. The respective circuit diagram is displayed.

7.5. Analog

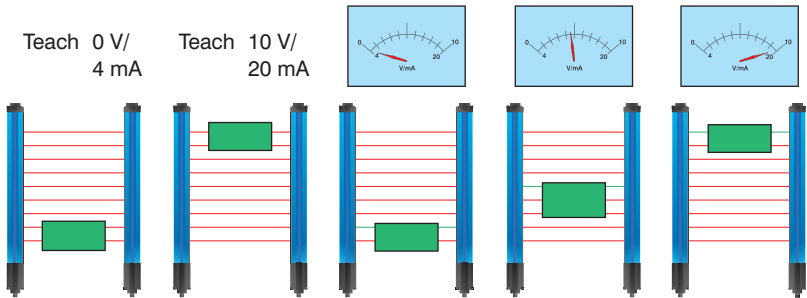
The analog input is set up here. One of the following Teach-In modes can be selected:

7.5.1 Position

Top Position:

The position of the uppermost interrupted beam within the measuring field is read out from the analog output as an appropriate voltage or current signal. The respective positions are taught in for 0 V/4 mA and 10 V/20 mA.

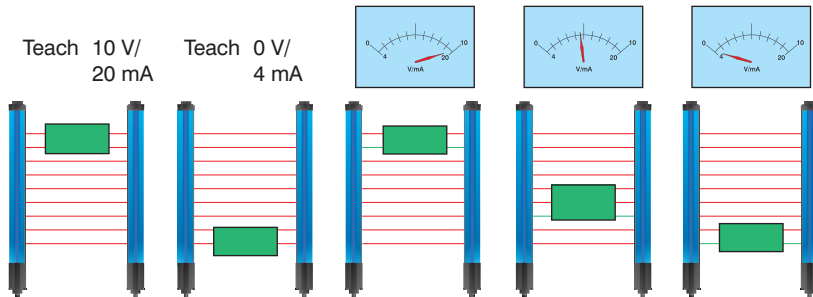
Example:



Bottom Position:

The position of the bottommost interrupted beam within the measuring field is read out from the analog output as an appropriate voltage or current signal. The respective positions are taught in for 0 V/4 mA and 10 V / 20 mA.

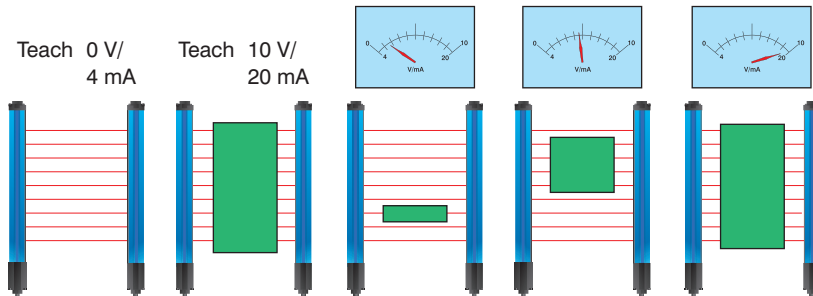
Example:



Size:

The number of interrupted beams within the measuring field is read out from the analog output as an appropriate voltage or current signal. The respective numbers of beams are taught in for 0 V/4 mA and 10 V/20 mA.

Example:

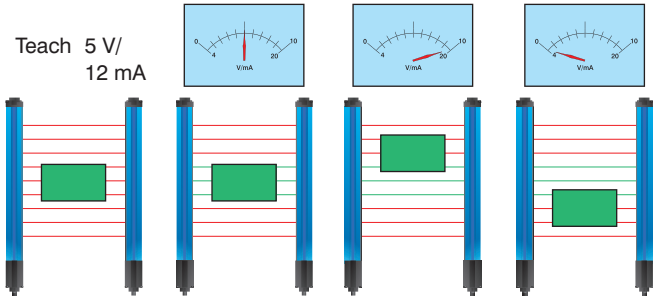


7.5.2 Web Edge

Web Edge, Independent of Position:

An object is taught in at any position within the measuring field. This position then corresponds to 5 V/12 mA at the analog output. If the top position is changed, voltage or current is reduced/increased accordingly, and if the bottom position is changed, voltage or current is increased/reduced accordingly. Change in V/mA per interrupted beam can be readjusted via a menu.

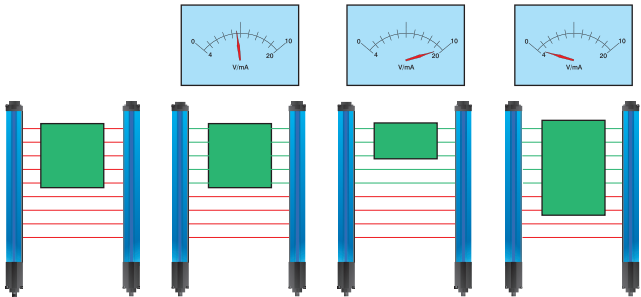
Example:

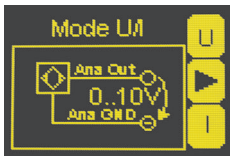

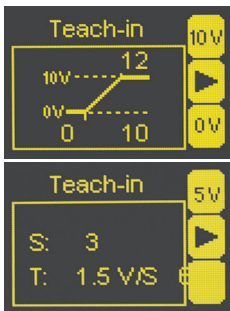
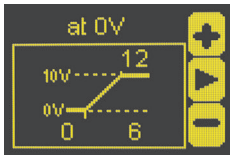
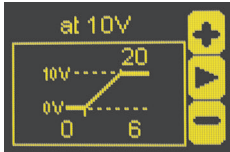


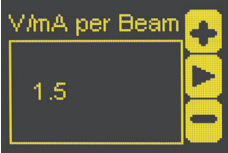
Web Edge, Position Dependent:

An object is taught in which protrudes into the measuring field from the top. This position then corresponds to 5 V/12 mA at the analog output. If the top position is changed, voltage or current is reduced/increased accordingly, and if the bottom position is changed, voltage or current is increased/reduced accordingly. Change in V/mA per interrupted beam can be readjusted via a menu.

Example:

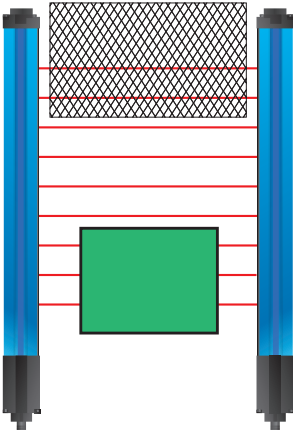


Function	Description
Mode U/I	Analog Output as Current or Voltage Output
	Voltage (0 to 10 V) or current (4 to 20 mA) is selected by pressing the U and I keys. The respective circuit diagram is displayed.
Mode, position/size/path	Select Teach Mode
	The position, size or web edge teach mode is selected by pressing the ▲ and ▼ keys, and acknowledged by pressing the enter key.
Teach-In	Teaching In Voltage or Current Values
	<p>In the position and size teach modes, momentary position/size is assigned to a voltage value of 10 V or a current value of 20 mA by pressing the 10 V or 20 mA key.</p> <p>Momentary position/size is assigned to a voltage value of 0 V or a current value of 4 mA by pressing the 0 V or the 4 mA key.</p> <p>If necessary, the assigned positions/sizes can be readjusted with the help of menu items “At 0 V” or “At 10 V”.</p> <p>In the web edge teach mode, momentary position is assigned to a voltage value of 5 V or a current value of 12 mA by pressing the 5 V or 12 mA key.</p>
with 0 V/4 mA	Position/Size at 0 V/4 mA
	<p>The position/size assigned to either 0 V or 4 mA is readjusted by pressing the + or – key.</p> <p>Note: only possible after position or size Teach-In has been completed.</p>
with 10 V/20 mA	Position/Size at 10 V/20 mA
	<p>The position/size assigned to either 10 V or 20 mA is readjusted by pressing the + or – key.</p> <p>Note: only possible after position or size Teach-In has been completed.</p>

Function	Description
V/mA per Beam	Readjusting V/mA per Beam
	<p>The required change to voltage/current per additionally interrupted beam is readjusted by pressing the + or – key.</p> <p>The desired value must be selected as a negative number in order to negate the change to V/mA per beam.</p> <p>Note: only possible after web edge Teach-In has been completed.</p>


7.6. Blanking

Various applications require that certain objects protrude into the measuring field during the entire duration of operation. In order to accommodate operating conditions of this sort, certain beams (which are always obstructed) can be blanked. Blanked beams are not evaluated and their status is ignored.



Beam numbering (see section 6.4) is not changed by blanking.

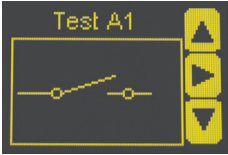
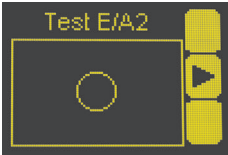
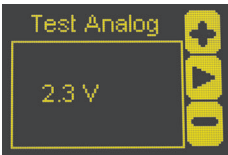
Note:
Only one synchronizing beam may be blanked (obstructed).

Function	Description
Blanking	Blanking Beams
	<p>Momentarily interrupted beams are blanked by pressing the B key. Blanking is canceled by pressing the Off key.</p>

7.7. E/A Test


Inputs and outputs can be tested with this function. The inputs and outputs are changed to this end, independent of their settings.

In this way it can be determined, for example, whether or not the inputs and outputs are correctly connected to a controller.

Function	Description
Test A1	Testing A1 Switch
	The output can be switched on and off, independent of its settings, by pressing the ▲ and ▼ keys.
Test E/A2	Testing E/A2
	E/A2 can be tested depending upon whether it's set up as an input or an output. If E/A2 is setup as an output, the test functions in the same was as for test A1. If E/A2 is set up as an input and if a voltage of greater than 7 V DC is applied, regardless of its settings, the display indicates whether or not the input is activated.
Test Analog	Testing the Analog Output
	By pressing the + or – key, a voltage/current can be selected for the analog output, regardless of its settings.


7.8. Expert Menu

With the help of the expert menu, the menu can be set up such that either all menu items and settings are displayed, or only those which are most important for the user.

Function	Description
Expert Menu	Activating/Deactivating the Expert Menu
	On or Off is selected by pressing the ▲ and ▼ keys, and the selection is acknowledged by pressing the enter key. Off (default): Only the sub-menus and settings which are most important for the user are displayed in the menu. The menu items which are suppressed through the use of this setting are identified with an asterisk (*) in the menu plan. On: All sub-menus and settings are displayed in the menu.


7.9. Display Definition

The display is set up with the help of the display menu.

Function	Description
<div>Rotate</div> <div></div>	<div>Rotating the Display</div> <p>The display is rotated 180° by pressing the enter key. The display can be returned to its original position by pressing the same key once again.</p>

7.10. Language

The desired menu language can be selected in the “Language” menu.

Function	Description
Language	Selecting the Display Language
	<p>The desired display language is selected by pressing the ▲ and ▼ keys, and is acknowledged by pressing the enter key. The desired language appears in the menus as soon as it has been selected.</p> <p><u>Selectable languages:</u></p> <ul style="list-style-type: none"> • Deutsch • English (Default) • Français • Español • Italiano <p>The display language must be selected after initial start-up, and after each reset.</p>

7.11. Information


The following information regarding the Sensor is displayed in the “Info” menu:

- Sensor type
- Sensor version




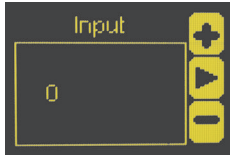

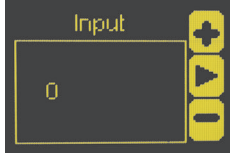
7.12. Reset

Sensor settings can be returned to their default values with the help of the “Reset” menu.

Function	Description
Reset	Default setting
	<p>All of the selected Sensor settings are returned to their default values by pressing the R key.</p>

7.13. Password

The Sensor can be locked by entering a password in the “Password” menu, so that setting can not be readjusted.

Function	Description
Enable	Switching the Password Function On or Off
	“Enable” or “Disable” can be selected with the ▲ and ▼ keys. The password function is thus switched on or off. If the password function is activated, Sensor operation is disabled after supply power has been interrupted. Immediate disabling is also possible with the help of the “Disable” submenu.
Enter	Password Entry for Enabling the Sensor
	The password for enabling the Sensor is selected with the + or – key.* Selection is acknowledged by pressing the enter key. The password is set to “0” upon shipment from the factory.
Change	Changing the Password
	The desired new password is selected with the + or – key.* Selection is acknowledged and the password is changed by pressing the enter key.
Disabling	Disabling the Sensor
	The Sensor is disabled without interrupting supply power. The Sensor is disabled by pressing the enter key, and the password entry window is displayed immediately. The Sensor is switched to the display mode after approximately 30 seconds. A password must be entered in order to continue using the Sensor.

* Press and hold the + or – key in order to scroll quickly through the numbers.

Notes regarding password functions:

If the password function has been activated. The password must be entered each time supply power to the Sensor is interrupted. After pressing a key, the menu is automatically switched to the password entry mode.

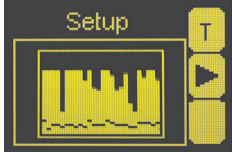
After the password has been correctly entered, the entire menu is enabled and the Sensor can be operated.

- The password function is deactivated upon shipment from the factory.
- The password is set to “0” upon shipment from the factory.
- Passwords can be selected within a range of 0000 to 9999.

It must be assured that the newly selected password is noted before the password is changed. If the password is forgotten, it must be overwritten with a master password. The master password can be requested by e-mail from support@wenglor.com.

7.14. Start Setup

The sensitivity of the receiver to the emitter is set automatically here.

Function	Description
Reset	Default Settings
	The intensity of the individual beams is automatically adjusted and the Light Curtain is set up after pressing the T key. Setup procedure progress is indicated at the display. See also section 6.1 on page 10.

8. IO-Link Parameter and Process data

Addressing via IO-Link

The Index is set to "1" at all times. Thereby the Direct Parameter Page can be reached, where then the several Parameters can be set by the Subindexes.

Subindex "0"	→ read all Parameters	
Subindex "1"	→ Parameter 0	read/write
Subindex "2"	→ Parameter 1	read/write
...

Process bytes

Process bytes 0

Bit 0	Output Status, Output 2	0 = Not Switched 1 = Switched
Bit 1	Analog Output Bit 0	
Bit 2	Analog Output Bit 1	
Bit 3	Analog Output Bit 2	
Bit 4	Analog Output Bit 3	Analog Value As %
Bit 5	Analog Output Bit 4	
Bit 6	Analog Output Bit 5	
Bit 7	Analog Output Bit 6	

Process bytes 1

Bit 0	Output Status, Output 1	0 = Not Switched 1 = Switched
Bit 1	Beams, Bit 0	
Bit 2	Beams, Bit 1	
Bit 3	Beams, Bit 2	
Bit 4	Beams, Bit 3	Function can be Selected with the Beams Function (Parameter 11 Bit 3–5)
Bit 5	Beams, Bit 4	
Bit 6	Beams, Bit 5	
Bit 7	Beams, Bit 6	

Parameter

Main Page

→ General Settings

Parameter 0

Bit 0	Reset to delivery status	1 = Do reset
Bit 1	Display Language	00 = German, 01 = English
Bit 2	Display Language	10 = French, 11 = Spanish
Bit 3	Rotating the Display by 180°	1 = rotate
Bit 4	Display Intensity	00 = Min., 01 = Medium, 10 = Max.
Bit 5	Display Intensity	11 = Screensaver
Bit 6	Lock Sensor	1 = Sensor is locked
Bit 7	Switch to	1 = Configuration page

If Bit 7 in Parameter 0 set to "1", more Configuration Pages can be reached. For this purpose the corresponding address of the Configuration Page (in brackets) is set to parameter 0 Bit 0–6.

Parameter 1

Bit 0	PNP/Push-Pull, Output 1	0 = PNP, 1 = Push-Pull
Bit 1	Output 1 NO/NC	0 = NC, 1 = NO
Bit 2	PNP/Push-Pull, Output 2	0 = PNP, 1 = Push-Pull
Bit 3	Output 2 NO/NC	0 = NC, 1 = NO
Bit 4	Function E/A2 Input	0 = setup input, 1 = Teach-In input
Bit 5	Function E/A2 Output	0 = Switching Output, 1 = Error Output
Bit 6	Input activation	0 = active with Ub, 1 = active with 0 V
Bit 7	E/A2 Input/Output	0 = Output, 1 = Input

Parameter 2

Bit 0	Start Setup	1 = start setup
Bit 1	Start Teach-In, output 1	1 = start Teach-In
Bit 2	Start Teach-In, output 2	1 = start Teach-In
Bit 3	Digital Teach-In Mode	00 = Beams, 01 = Pattern
Bit 4	Digital Teach-In Mode	10 = two-step, 11 = range
Bit 5	Teach step	1 = 2 nd Teach Point/End of Dynamic Teach
Bit 6	Independent of Position/ Position Dependent	0 = Independent of Position, 1 = Position Dependent
Bit 7	Expert Menu	0 = Off, 1 = On

Parameter 3

Bit 0	Analog Mode, Voltage/Current	0 = Voltage, 1 = Current
Bit 1	Start teach analog 0 V/4 mA	1 = start teach
Bit 2	Start teach analog 10 V/20 mA	1 = start teach
Bit 3	Start teach analog 5 V/12 mA	1 = start teach
Bit 4	Analog Teach-In mode	00 = size, 01 = position
Bit 5	Analog Teach mode	10 = web edge
Bit 6	Top/bottom position	0 = top, 1 = bottom
Bit 7	Web Edge, Independent of Position/Position Dependent	0 = Independent of Position, 1 = Position Dependent

Parameter 4	High Byte On-Delay Output 1 in ms
Parameter 5	Low Byte On-Delay Output 1 in ms
Parameter 6	High Byte On-Delay Output 1 in ms
Parameter 7	Low Byte On-Delay Output 1 in ms
Parameter 8	High Byte Impulse Duration Output 1 in ms
Parameter 9	Low Byte Impulse Duration Output 1 in ms
Parameter 10	Number of Beams During Beam Teach-In
Parameter 11	

Bit 0	Event During Beam Teach-In	0 = Interrupted Beams, 1 = Uninterrupted Beams
Bit 1	Beam Teach-In Condition	00 = "=", 01 = ">="
Bit 2	Beam Teach-In Condition	10 = "<="
Bit 3	Beam function	
Bit 4	Beam function	see table
Bit 5	Beam function	

Parameter Value	Function
000	Number (total) of uninterrupted beams
001	Number (total) of interrupted beams
010	First uninterrupted beam (beam number)
011	First interrupted beam (beam number)
100	Last uninterrupted beam (beam number)
101	Last interrupted beam (beam number)
110	Number of consecutive uninterrupted beams*
111	Number of consecutive interrupted beams*

* The number of the largest group of consecutive beams within the measuring field is read out.

Bit 6	External Teach Mode	00 = Pattern, Position Independent
Bit 7	External Teach Mode	01 = Pattern, Position Dependent, 11 = Range

Configuration page (0x80)

→ General Sensor information

Parameter 1	Serial Number, Byte 1
Parameter 2	Serial Number, Byte 2
Parameter 3	Serial Number, Byte 3
Parameter 4	Serial Number, Byte 4
Parameter 5	DeviceID Byte 1
Parameter 6	DeviceID Byte 2
Parameter 7	DeviceID Byte 3
Parameter 8	Revision level
Parameter 9	
Parameter 10	

Configuration page (0x81)

→ Delay times, output 2

Parameter 1	High Byte On-Delay Output 2 in ms
Parameter 2	Low Byte On-Delay Output 2 in ms
Parameter 3	High Byte On-Delay Output 2 in ms
Parameter 4	Low Byte On-Delay Output 2 in ms
Parameter 5	High Byte Impulse Duration Output 2 in ms
Parameter 6	Low Byte Impulse Duration Output 2 in ms
Parameter 7	
Parameter 8	
Parameter 9	
Parameter 10	

Configuration page (0x82) only read

→ Read out settings, output 1

Parameter 1		
Bit 0	Event During Beam Teach output 1	0 = Interrupted Beams, 1 = Uninterrupted Beams
Bit 1	Beam Teach Output 1 Condition	00 = "=", 01 = ">="
Bit 2	Beam Teach Output 1 Condition	10 = "<="
Bit 3	Digital Teach mode Output 1	00 = Beams, 01 = Pattern
Bit 4	Digital Teach mode Output 1	10 = two-step, 11 = range
Bit 5	Independent of position/ position dependent, output 1	0 = independent of position, 1 = position dependent
Bit 6		
Bit 7		
Parameter 2	Number of beams during beam Teach-In, output 1	
Parameter 3	Beginning of range (beam number) for range Teach-In, output 1	
Parameter 4	Range width (number of beams) for range Teach-In, output 1	
Parameter 5	Size of object 1 (first to last interrupted beam) for two-step Teach-In, output 1	
Parameter 6	Size of object 2 (first to last interrupted beam) for two-step Teach-In, output 1	
Parameter 7		
Bit 1	Tolerance, output 1	00 = -1, 01 = 0
Bit 2	Tolerance, output 1	10 = +1, 11 = +/-1
Bit 3		
Bit 4		
Bit 5		
Bit 6		
Bit 7		
Parameter 8		
Parameter 9		
Parameter 10		

Configuration page (0x83)

→ Read out settings for output 2

Parameter 1

Bit 0	Event During Beam Teach output 2	0 = Interrupted Beams, 1 = Uninterrupted Beams
Bit 1	Beam Teach Output 2 Condition	00 = "=", 01 = ">="
Bit 2	Beam Teach Output 2 Condition	10 = "<="
Bit 3	Digital Teach mode Output 2	00 = Beams, 01 = Pattern
Bit 4	Digital Teach mode Output 2	10 = two-step, 11 = range
Bit 5	Independent of position/ position dependent, output 1	0 = independent of position, 1 = position dependent
Bit 6		
Bit 7		

Parameter 2 Number of beams during beam Teach-In, output 2

Parameter 3 Beginning of range (beam number) for range Teach-In, output 2

Parameter 4 Range width (number of beams) for range Teach-In, output 2

Parameter 5 Size of object 1 (first to last interrupted beam) for two-step Teach-In, output 2

Parameter 6 Size of object 2 (first to last interrupted beam) for two-step Teach-In, output 2

Parameter 7

Bit 1	Tolerance output 2	00 = -1, 01 = 0
Bit 2	Tolerance output 2	10 = +1, 11 = +/-1
Bit 3		
Bit 4		
Bit 5		
Bit 6		
Bit 7		

Parameter 8

Parameter 9

Parameter 10

Configuration page (0x84) only read

→ Read out taught in pattern from output 1

Parameter 1 Object size during pattern Teach-In, output 1

Parameter 2 Number of interrupted beams during pattern Teach-In, output 1

Parameter 3 Beam pattern for pattern Teach-In, output 1, beams 1 through 8

Parameter 4 Beam pattern for pattern Teach-In, output 1, beams 9 through 16

Parameter 5 Beam pattern for pattern Teach-In, output 1, beams 17 through 24

Parameter 6 Beam pattern for pattern Teach-In, output 1, beams 25 through 32

Parameter 7 Beam pattern for pattern Teach-In, output 1, beams 33 through 40

Parameter 8 Beam pattern for pattern Teach-In, output 1, beams 41 through 48

Parameter 9 Beam pattern for pattern Teach-In, output 1, beams 49 through 56

Parameter 10 Beam pattern for pattern Teach-In, output 1, beams 57 through 64

Example:

Parameter 1: Object size: 2 beams

Bit 0 = 0
 Bit 1 = 1
 Bit 2 = 0
 Bit 3 = 0
 Bit 4 = 0
 Bit 5 = 0
 Bit 6 = 0
 Bit 7 = 0

Parameter 2: Number of interrupted beams: 2

Bit 0 = 0
 Bit 1 = 1
 Bit 2 = 0
 Bit 3 = 0
 Bit 4 = 0
 Bit 5 = 0
 Bit 6 = 0
 Bit 7 = 0

Parameter 3: Beam pattern

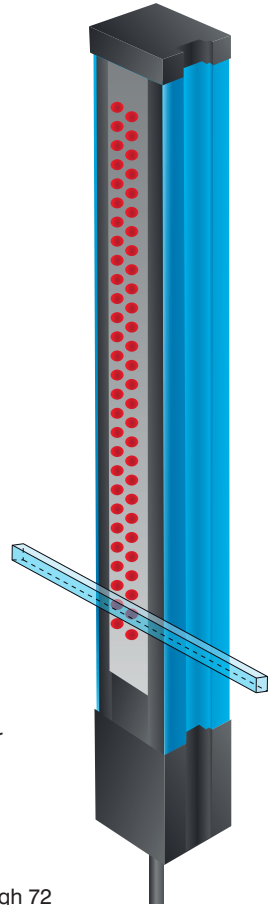
Bit 0 = 0 (1st Beam)
 Bit 1 = 0 (2nd Beam)
 Bit 2 = 1 (3rd Beam)
 Bit 3 = 1 (4th Beam)
 Bit 4 = 0 (5th Beam)
 Bit 5 = 0 (6th Beam)
 Bit 6 = 0 (7th Beam)
 Bit 7 = 0 (8th Beam)

Parameters 4 through 10 + Configuration page 0x85 analogously for further beams.

Configuration page (0x85) only read

→ Read out taught in pattern from output 1

Parameter 1	Beam pattern for pattern Teach-In, output 1, beams 65 through 72
Parameter 2	Beam pattern for pattern Teach-In, output 1, beams 73 through 80
Parameter 3	Beam pattern for pattern Teach-In, output 1, beams 81 through 88
Parameter 4	Beam pattern for pattern Teach-In, output 1, beams 89 through 96
Parameter 5	Beam pattern for pattern Teach-In, output 1, beams 97 through 101
Parameter 6	
Parameter 7	
Parameter 8	
Parameter 9	
Parameter 10	



Configuration page (0x86) only read

→ Read out taught in pattern from output 2

Parameter 1	Object size during pattern Teach-In, output 2
Parameter 2	Number of interrupted beams during pattern Teach-In, output 2
Parameter 3	Beam pattern for pattern Teach-In, output 2, beams 1 through 8
Parameter 4	Beam pattern for pattern Teach-In, output 2, beams 9 through 16
Parameter 5	Beam pattern for pattern Teach-In, output 2, beams 17 through 24
Parameter 6	Beam pattern for pattern Teach-In, output 2, beams 25 through 32
Parameter 7	Beam pattern for pattern Teach-In, output 2, beams 33 through 40
Parameter 8	Beam pattern for pattern Teach-In, output 2, beams 41 through 48
Parameter 9	Beam pattern for pattern Teach-In, output 2, beams 49 through 56
Parameter 10	Beam pattern for pattern Teach-In, output 2, beams 57 through 64

Function as per configuration page 0x84, parameters 1–10

Configuration page (0x87) only read

→ Read out taught in pattern from output 1

Parameter 1	Beam pattern for pattern Teach-In, output 2, beams 65 through 72
Parameter 2	Beam pattern for pattern Teach-In, output 2, beams 73 through 80
Parameter 3	Beam pattern for pattern Teach-In, output 2, beams 81 through 88
Parameter 4	Beam pattern for pattern Teach-In, output 2, beams 89 through 96
Parameter 5	Beam pattern for pattern Teach-In, output 2, beams 97 through 101
Parameter 6	
Parameter 7	
Parameter 8	
Parameter 9	
Parameter 10	

Configuration page (0x88)

→ Read-out analog output settings

Parameter 1

Bit 0	Analog mode, voltage/current	0 = voltage, 1 = current
Bit 1	Analog Teach-In mode	00 = size, 01 = position
Bit 2	Analog Teach-In mode	10 = web edge
Bit 5	Independent of position/ web edge position dependent/independent	0 = independent of position, 1 = position dependent
Bit 4	Top/bottom position	0 = top, 1 = bottom
Bit 5		
Bit 6		
Bit 7		

Parameter 2 V/mA per beam for analog web edge

Parameter 3 Measure size 1 for analog size

Parameter 4 Measure size 2 for analog size

Parameter 5

Parameter 6

Parameter 7

Parameter 8

Parameter 9

Parameter 10

Configuration page (0x89)

→ Read out blanking

Parameter 1	Beam pattern for blanking of beams 1 through 8
Parameter 2	Beam pattern for blanking of beams 9 through 16
Parameter 3	Beam pattern for blanking of beams 17 through 24
Parameter 4	Beam pattern for blanking of beams 25 through 32
Parameter 5	Beam pattern for blanking of beams 33 through 40
Parameter 6	Beam pattern for blanking of beams 41 through 48
Parameter 7	Beam pattern for blanking of beams 49 through 56
Parameter 8	Beam pattern for blanking of beams 57 through 64
Parameter 9	Beam pattern for blanking of beams 65 through 72
Parameter 10	Beam pattern for blanking of beams 73 through 80

Function as per configuration page 0x84, parameters 3–10

Configuration page (0x8A)

→ Read out blanking/configure display

Parameter 1	Beam pattern for blanking of beams 81 through 88	
Parameter 2	Beam pattern for blanking of beams 89 through 96	
Parameter 3	Beam pattern for blanking of beams 97 through 101	
Parameter 4		
Bit 0	Display Intensity	00 = Normal, 10 = Screensaver
Bit 1	Display Intensity	01 = Powersave
Bit 2	Display element: bar graph digital	1 = display
Bit 3	Display element: bar graph analog	1 = display
Bit 4	Display element: Output 1	1 = display
Bit 5	Display element: analog value	1 = display
Bit 6	Display element: E/A2	1 = display
Bit 7	Display element: Beams	1 = display
Parameter 5		
Parameter 6		
Parameter 7		
Parameter 8		
Parameter 9		
Parameter 10		

Configuration page (0x8C)

→ Read out momentary beam pattern

Parameter 1	Momentary beam pattern for beams 1 through 8
Parameter 2	Momentary beam pattern for beams 9 through 16
Parameter 3	Momentary beam pattern for beams 17 through 24
Parameter 4	Momentary beam pattern for beams 25 through 32
Parameter 5	Momentary beam pattern for beams 33 through 40
Parameter 6	Momentary beam pattern for beams 41 through 48
Parameter 7	Momentary beam pattern for beams 49 through 56
Parameter 8	Momentary beam pattern for beams 57 through 64
Parameter 9	Momentary beam pattern for beams 65 through 72
Parameter 10	Momentary beam pattern for beams 73 through 80

Function as per configuration page 0x84, parameters 3–10

Configuration page (0x8D)

→ Read out momentary beam pattern

Parameter 1	Momentary beam pattern for beams 81 through 88
Parameter 2	Momentary beam pattern for beams 89 through 96
Parameter 3	Momentary beam pattern for beams 97 through 101
Parameter 4	
Parameter 5	
Parameter 6	
Parameter 7	
Parameter 8	
Parameter 9	
Parameter 10	

9. Maintenance Instructions

- This wenglor Sensor is maintenance-free.
- It is advisable to clean the lens 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.