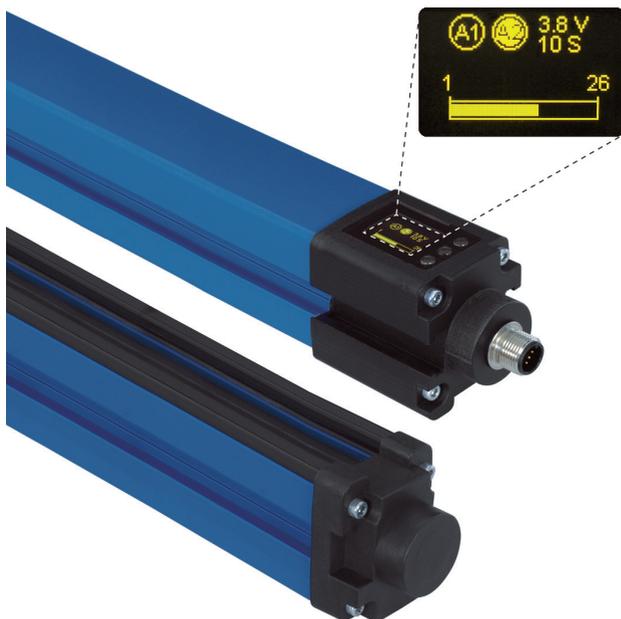


OSEIxxxZ0103

OEEIxxxU0135

Light Curtain for Measuring Tasks



Operating Instructions

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1. Proper Use

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

Light curtains for measuring tasks operate according to the barrier principle, so the transmitter and receiver are integrated in separate housings. The switch output switches and an analog output reads out corresponding voltage or current depending on how many and which light beams are interrupted. The function of the transmitter can be tested using a test input.

Light curtains for measuring tasks can be adjusted intuitively and easily via the menu-driven graphic display. A bar graph makes intermittent rays visible, making alignment, commissioning and troubleshooting much easier.

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. EU Declaration of Conformity

The EU declaration of conformity can be found on our website at www.wenglor.com in download area.



4. Technical Data

4.1. Datasheet

Range	2000 mm
Opening Angle	10°
Beam Distance	2 mm
Supply Voltage	10...30 V DC
Current Consumption (U _b = 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

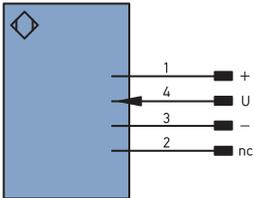
Output Function	Configurable as PNP or push-pull NC/NO, switchable IO-Link Analog Output
-----------------	---

	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

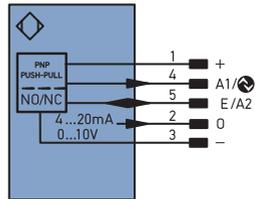
Emitter

1018



Receiver

188

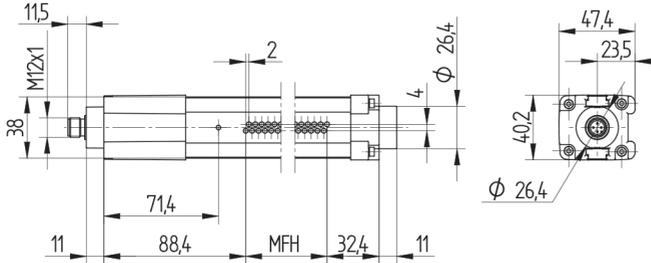


- + Supply Voltage "+"
- Supply Voltage "0 V"
- U Test Input
- A1/ Switching Output 1/IO-Link
- E/A2 Input/Output programmable
- O Analog Output
- nc not connected

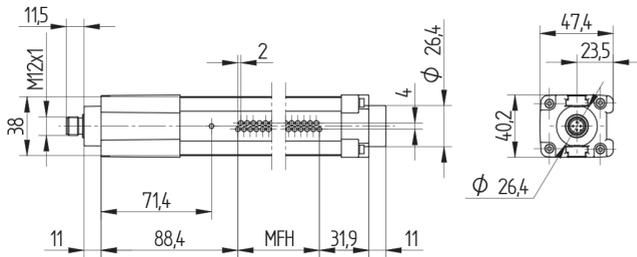
4.3. Housing Dimensions

Emitter

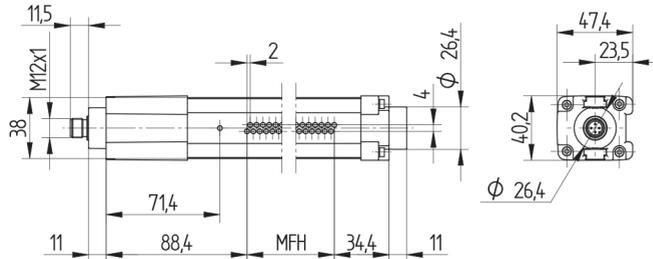
OSEI501Z0103



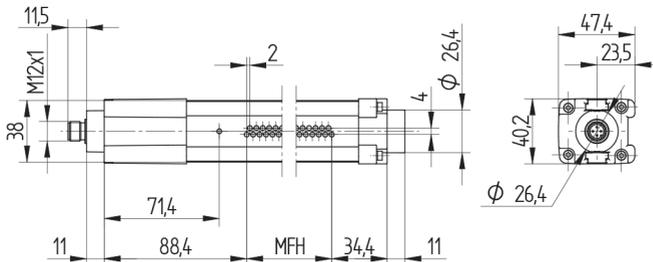
OSEI102Z0103



OSEI152Z0103

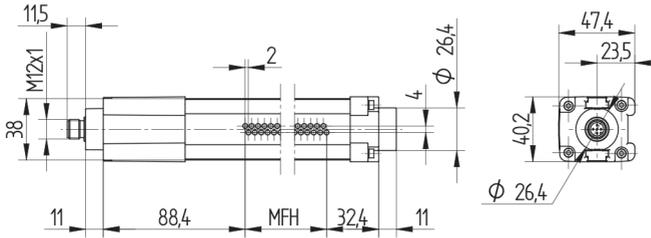


OSEI202Z0103

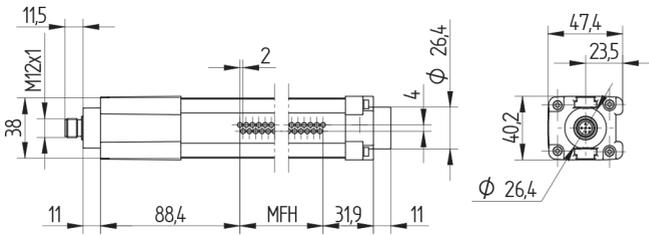


Receiver

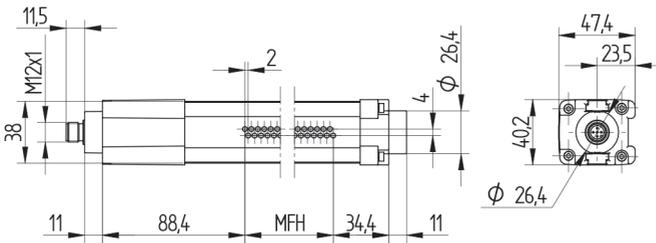
OEEI501U0135



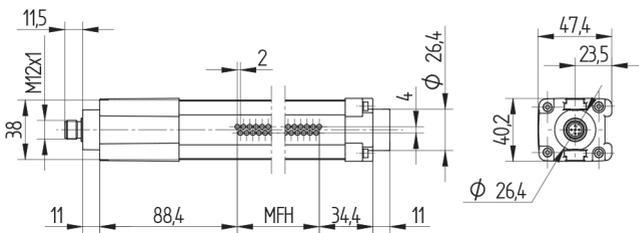
OEEI102U0135



OEEI152U0135

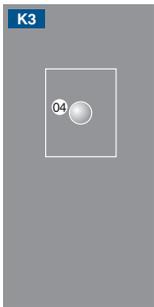


OEEI202U0135



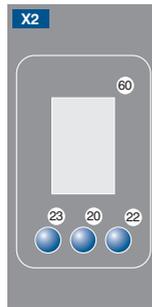
4.4. Control Panel

Emitter



04 = Function Display

Receiver



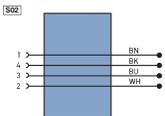
22 = Up Button
 60 = Display
 23 = Down Button
 20 = Enter Button

4.5. Complementary Products

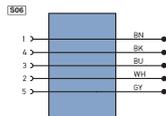
wenglor offers Connection Technology for field wiring.

Suitable Connection Technology No.

2



35



Suitable Mounting Technology No.

700

IO-Link Master

5. Mounting instructions

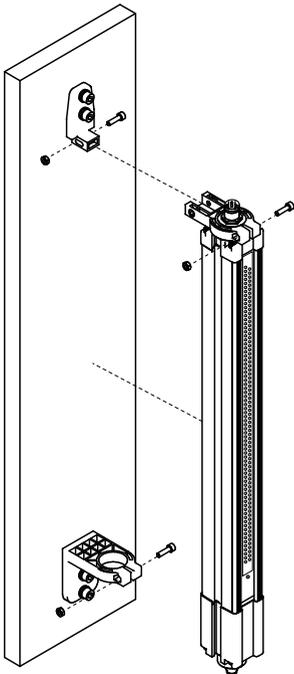
During operation of the Sensors, the corresponding electrical and mechanical regulations, as well as safety regulations must be observed. The Sensor must be protected from mechanical impact. Install the device such that its installation position cannot be inadvertently changed. Use of the Z0033 accessory is recommended in order to improve EMC immunity.

5.1. Mounting

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

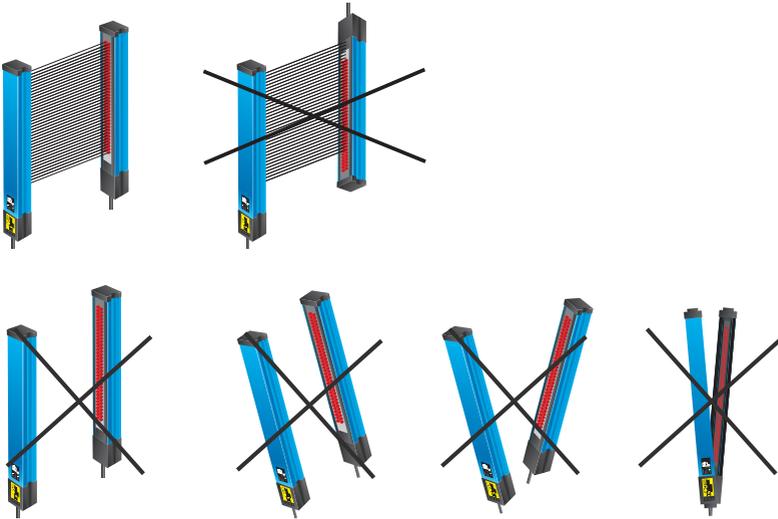
5.1.1 Mounting with the BEF-SET-33

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.

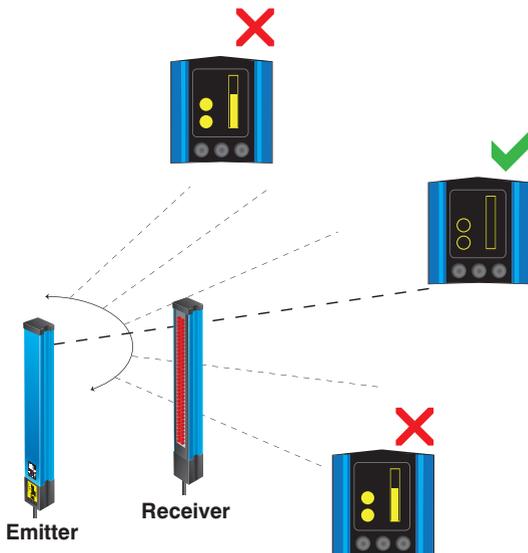


5.2. Alignment

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 7.11).

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.

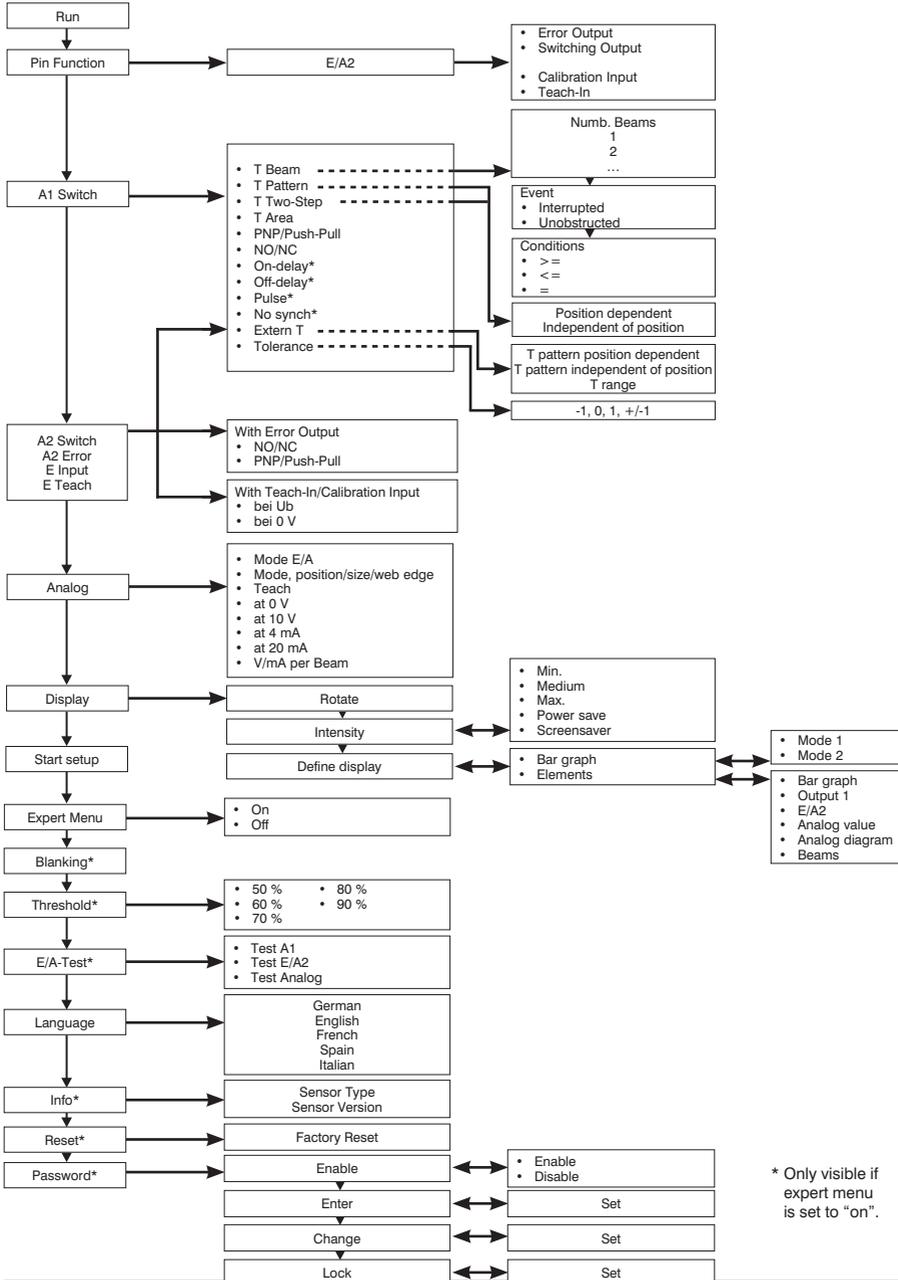
- The “Setup” function is selected in the menu, and the procedure is started by pressing the T key. Alternatively, the setup procedure can be started via the input. However, the input must first be accordingly configured to this end (see section 7.2).
- Progress is indicated at the display.
- After setup 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	18
Pin Function	Configure function for A1	18
A1 Switch	Configure the output functions of A1	19
E/A2	Configure the input-/output functions of E/A2	18
Analog	Configure function of the analog output	31
Blanking	Blanking Beams	30
E/A-Test	Testing input-/output	31
Expert Menu	Activating/Deactivating the Expert Menu	32
Display	Select display characteristics	32
Language	Select the desired menu language	33
Info	Read out information regarding the Sensor	33
Reset	Return to default settings	33
Password	Protection against unauthorized changes to settings	34
Start Setup	Start setup procedure	35

6.3. Menu Structure

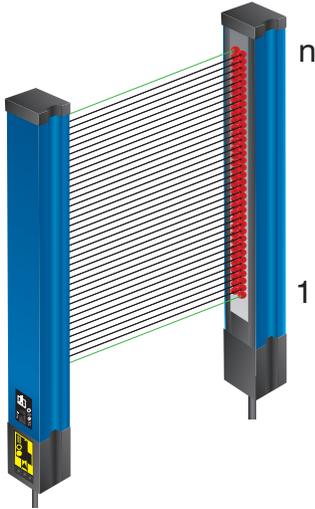
The Sensor's menu is laid out as follows:



* 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.

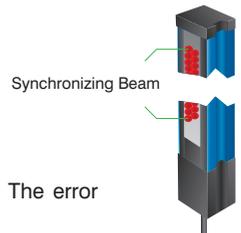


6.5. Synchronizing Beam

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. The error output is switched and an error message appears at the display.



NOTE!

With the no synch function, the behavior of the outputs can be selected in case of both synchronization beams are interrupted.

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.



NOTE!

With the no synch function, the behavior of the outputs can be selected in case of both synchronization beams are interrupted.

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.

Image 1

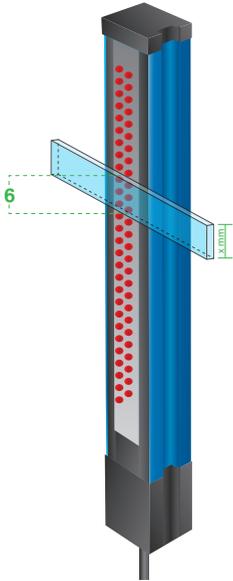
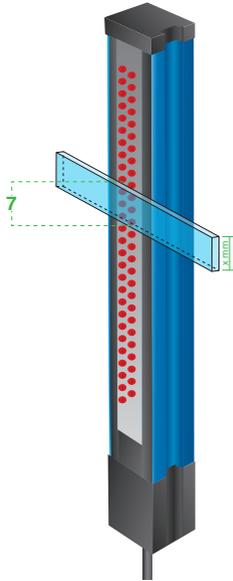


Image 2



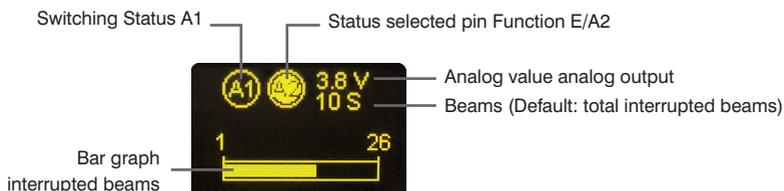
Three different tolerance types can be selected:

- 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
	Pin E/A2 can be configured by pressing the ▲ and ▼ keys <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.

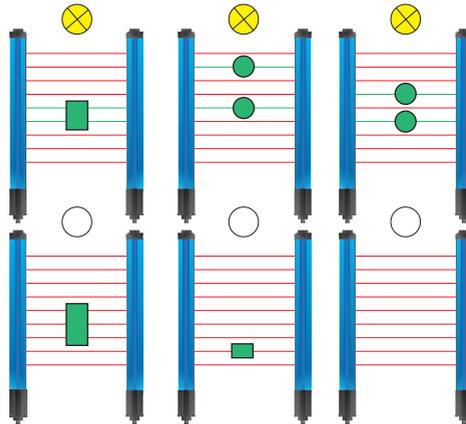
Example:

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

Number of beams: 2

Result: Interrupted

Condition: =

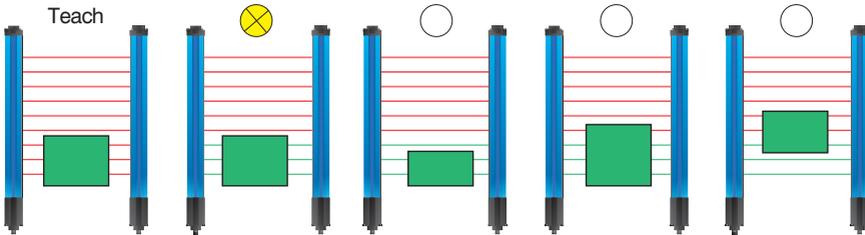


7.3.2 Teach-In Pattern

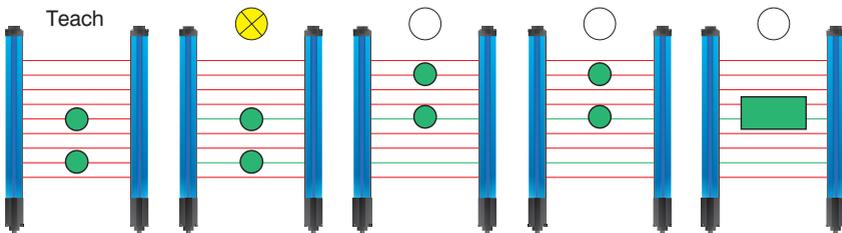
An object with a given beam pattern is taught in. The switching output is switched as soon as the taught in pattern is recognized. Differentiation is made between patterns which are position dependent and independent of position.

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:

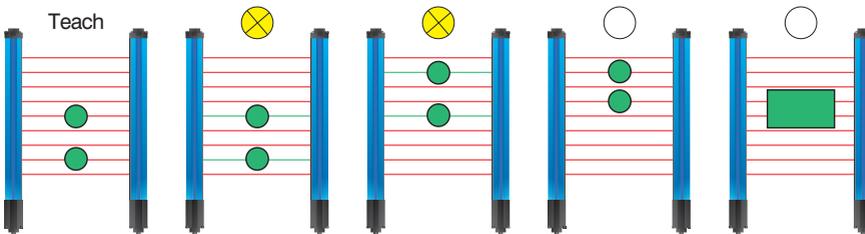


Example:



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:

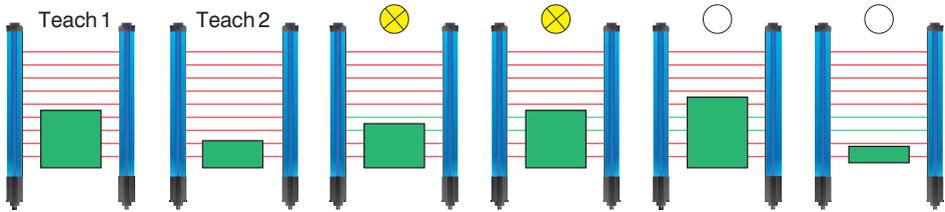


7.3.3 Two-Step Teach-In

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

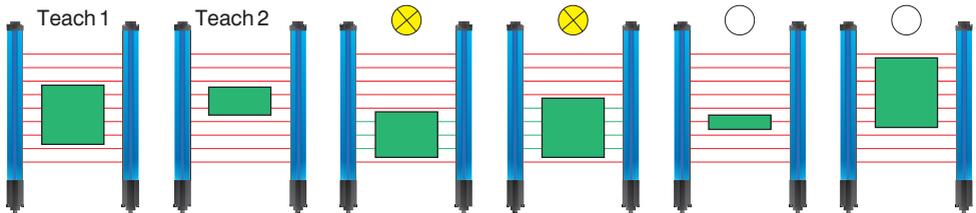
Two-step Teach-In, position dependent: The objects to be detected are always at the same position within the measuring field. The height of the uppermost interrupted beam is evaluated.

Example:

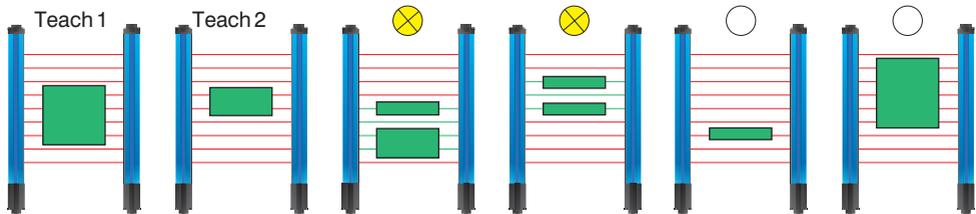


Two-step Teach-In, independent of position: The taught in objects can be located anywhere within the measuring field and are always recognized, thus causing the output to be switched. The size of the objects is evaluated.

Example:



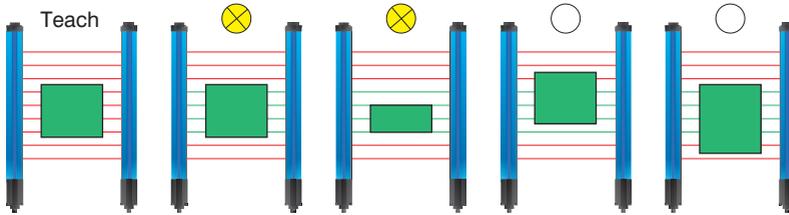
Example:



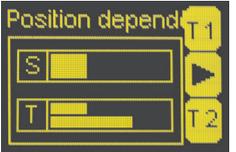
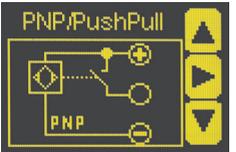
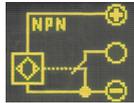
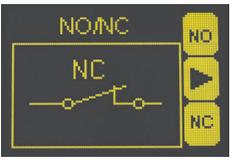
7.3.4 Teach-In Range

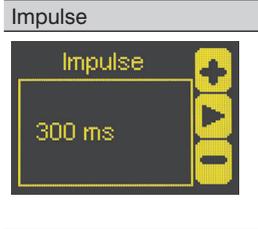
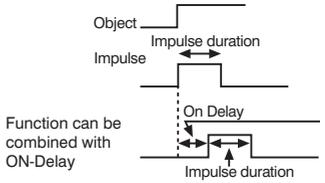
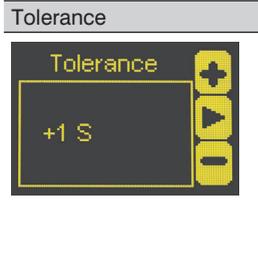
A range is taught in. The switching output is switched as soon as an object is detected within the taught in range, regardless of its size.

Example:



Function	Description
T Beams	
<p>Number of beam <input type="text" value="3"/></p> <p>Event</p> <p><input checked="" type="radio"/> Interrupted</p> <p><input type="radio"/> Free</p> <p>Back</p> <p>Condition</p> <p><input checked="" type="radio"/> >=</p> <p><input type="radio"/> <=</p> <p><input type="radio"/> =</p>	<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>
T Range	
<p>Position depend <input type="text" value="T"/></p> <p>S <input type="text" value=""/></p> <p>T <input type="text" value=""/></p>	<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>
T Two-step	

	<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>
	<p>The range to be taught in is obstructed within the measuring field. The range is then taught in by pressing the T key.</p>
<p>Function</p>	<p>Description</p>
<p>PNP/Push-Pull</p>	<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>
<p>NO/NC</p>	<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>
<p>On-Delay</p>	<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>
<p>Off-Delay</p>	<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
	<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> 
	<p>No synchronization</p> <p>Output performance can be specified in the event that both synchronizing beams are obstructed.</p> <p>Off: The “No synch” function is deactivated as a default setting. If both synchronization beams are obstructed, the output retains the same status which prevailed before obstruction occurred.</p> <p>Detect: When both synchronization beams are obstructed, the output interprets this status as an object. If this function is activated, objects which protrude above the Light Curtain’s measuring field height can also be reliably detected.</p> <p>No detection: When both synchronization beams are obstructed, the output does not detect an object.</p>
	<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>
	<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> <p>–1: One beam less than taught in may be interrupted, and the object is still detected.</p> <p>0: The tolerance function is deactivated.</p> <p>+1: One beam more than taught in may be interrupted, and the object is still detected.</p> <p>+/-1: One beam more and/or less than taught in may be interrupted, and the object is still detected.</p>

* 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

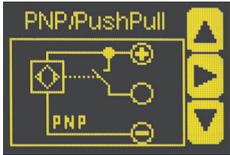
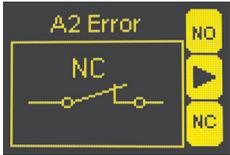
If the input is activated, the Light Barrier is set up automatically. Setup can also be initiated via the menu (see section 7.15). Settings for I Setup are entered in the same way as for I Teach (see section 7.4.1).

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

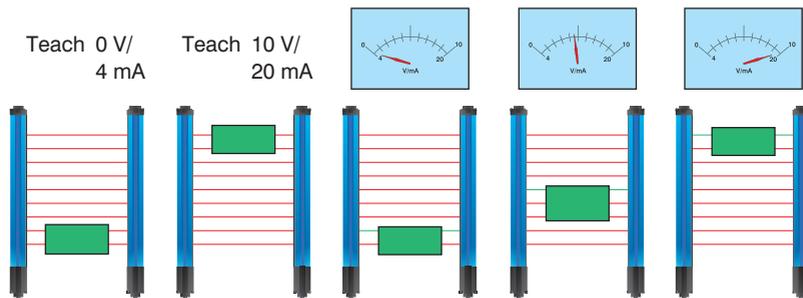
The analog input is set up here. One of the following Teach-In modes can be selected:

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.

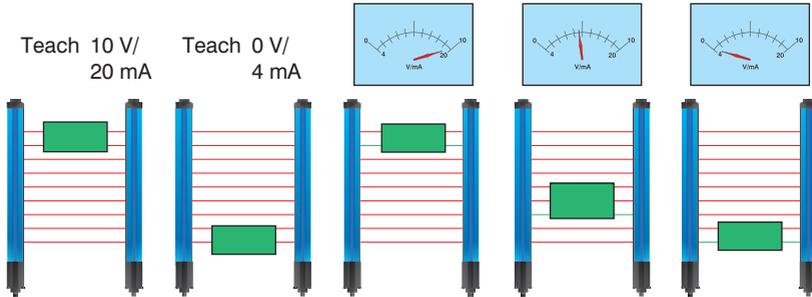
Example:



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.

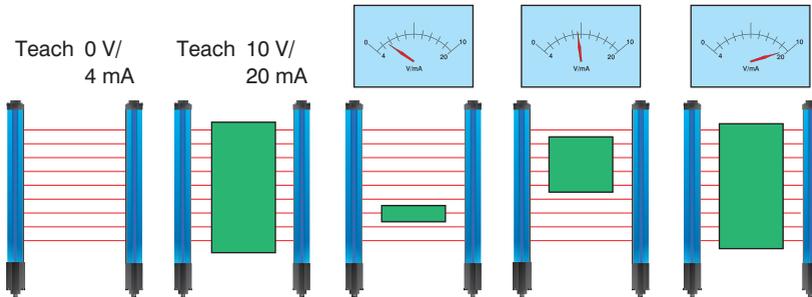
Example:



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:

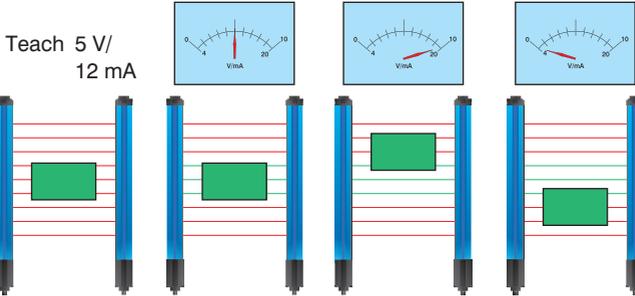


7.5.2 Web Edge

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.

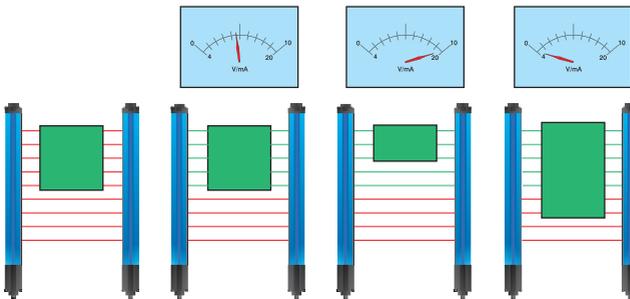
Example:

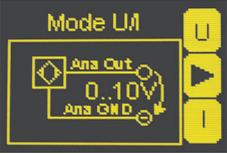
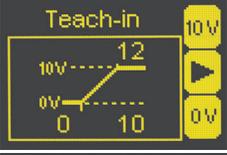
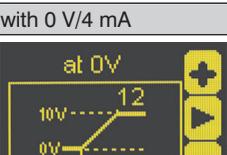
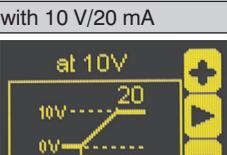
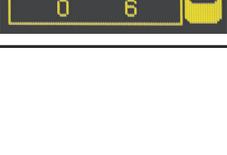


Web Edge, Position Dependent:

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:

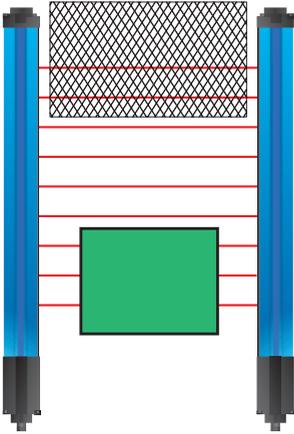


Function	Description
Mode U/I	Analog Output as Current or Voltage Output
	Voltage (0 to 10 V) or current (4 to 20 mA) is selected by pressing the U and I keys. The respective circuit diagram is displayed.
Mode, position/size/path	Select Teach Mode
	The position, size or web edge teach mode is selected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

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

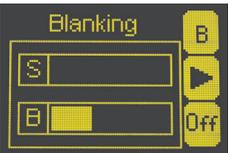
Various applications require that certain objects protrude into the measuring field during the entire duration of operation. In order to accommodate operating conditions of this sort, certain beams (which are always obstructed) can be blanked. Blanked beams are not evaluated and their status is ignored.



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

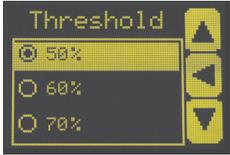
Note:

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. Threshold

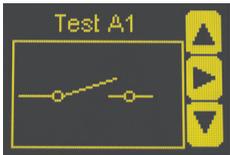
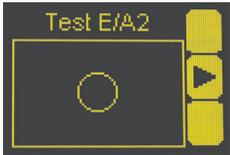
It is possible to adjust the threshold of the receiver. A higher threshold value enables to detect transparent objects.

Function	Description
Threshold	Threshold
	50 % (default) 60 % 70 % 80 % 90 %

7.8. 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 \blacktriangle and \blacktriangledown 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 way 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.

7.9. 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
	<p>On or Off is selected by pressing the \blacktriangle and \blacktriangledown keys, and the selection is acknowledged by pressing the enter key.</p> <p>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.</p> <p>On: All sub-menus and settings are displayed in the menu.</p>

7.10. Display Definition

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

Function	Description
Rotate	Rotating the Display
	<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>
Intensity	Adjusting Display Brightness
	<p>After pressing the \blacktriangleright and \blacktriangleleft keys, the menu appears immediately with the selected brightness setting (min, medium or max). In setting power save the display turns off after 60 seconds. In setting screensaver, the display inverts every 60 seconds. The brightness is set to normal during these settings. Selection is acknowledged by pressing the enter key.</p>
Display def.	Display Definition
	<p>The elements which will appear in the display mode can be selected with the \blacktriangle and \blacktriangledown keys and acknowledged by pressing the enter key.</p> <p>Displayable elements include:</p> <ul style="list-style-type: none"> • BarGraph (default)* • Output 1 (default) • E/A2 • Analog value (default) • Analog diagram • Beams (number, first, last, interrupted) <p>* The bar graph is displayed larger or smaller depending upon the number of selected elements.</p>

7.11. 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>

7.12. Information

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

- Sensor type
- Sensor version



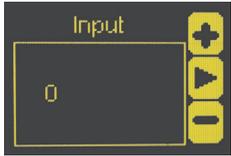
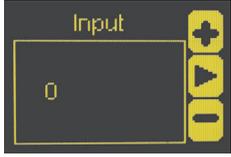
7.13. Reset

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>

7.14. Password

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

Function	Description
	<p>Switching the Password Function On or Off</p> <p>“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.</p>
	<p>Password Entry for Enabling the Sensor</p> <p>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.</p>
	<p>Changing the Password</p> <p>The desired new password is selected with the + or – key.* Selection is acknowledged and the password is changed by pressing the enter key.</p>
	<p>Disabling the Sensor</p> <p>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.</p>

* 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.

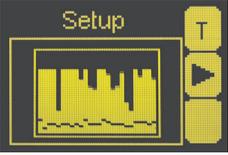
After the password has been correctly entered, the entire menu is enabled and the Sensor can be operated.

- 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.

7.15. 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 12.

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	
Bit 5	Beams, Bit 4	(Parameter 11 Bit 3–5)	
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

Is 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		
Bit 0	No synch output 1	00 = Off, 01 = Detect
Bit 1	No synch output 1	10 = No detection
Bit 2	No synch output 2	00 = Off, 01 = Detect
Bit 3	No synch output 2	10 = No detection
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

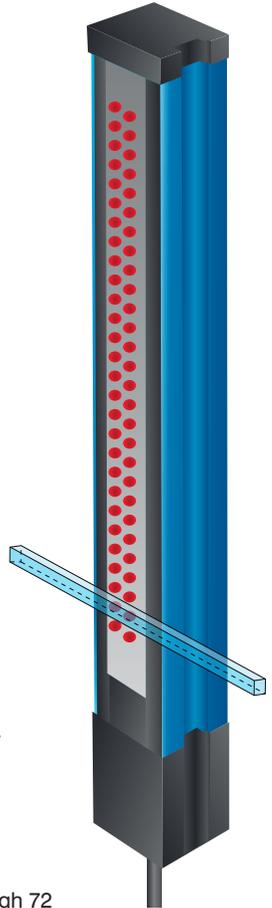
- Bit 0 = 0 (1st Beam)
- Bit 1 = 0 (2nd Beam)
- Bit 2 = 1 (3rd Beam)
- Bit 3 = 1 (4th Beam)
- Bit 4 = 0 (5th Beam)
- Bit 5 = 0 (6th Beam)
- Bit 6 = 0 (7th Beam)
- Bit 7 = 0 (8th Beam)

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		
Bit 0	Threshold	000 = 50%, 001 = 60%
Bit 1	Threshold	010 = 70 %, 011 = 80%
Bit 2	Threshold	100 = 90%
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.