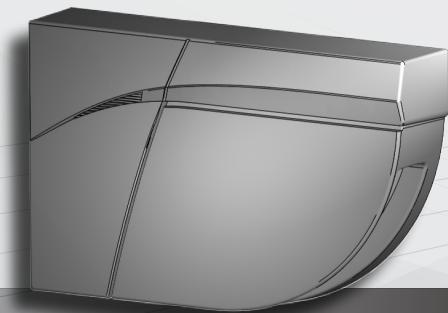




EN



Watch our FLATSCAN SW tutorial online: bea-flatscan.com/tutorial



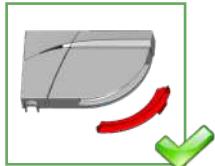
LZR[®]-FLATSCAN SW

SAFETY SENSOR
FOR AUTOMATIC SWING DOORS

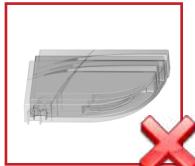
User's Guide for product version 0203 and higher
See product label for serial number



INSTALLATION TIPS



Remove the laser window protection before the teach-in and the commissioning of the sensor.



Avoid vibrations.



Do not cover the laser window.



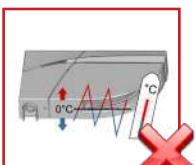
Avoid moving objects and light sources in the detection field.



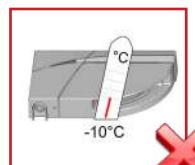
Avoid the presence of smoke and fog in the detection field.



Avoid condensation.



Avoid exposure to sudden and extreme temperature changes.



Keep the sensor permanently powered in environments where the temperature can descend below -10°C.

MAINTENANCE TIPS



Clean the laser window with compressed air. If needed, wipe only with a soft, clean and damp microfibre cloth.



Do not use dry or dirty towels or aggressive products to clean the laser window.



Avoid direct exposure to high pressure cleaning.



The warranty is invalid if unauthorized repairs are made or attempted by unauthorized personnel.

SAFETY TIPS



The door control unit and the door cover profile must be correctly earthed.



Only trained and qualified personnel may install and setup the sensor.



Always test the good functioning of the installation before leaving the premises.



Do not remove the laser window protection when building works are still in progress on site.

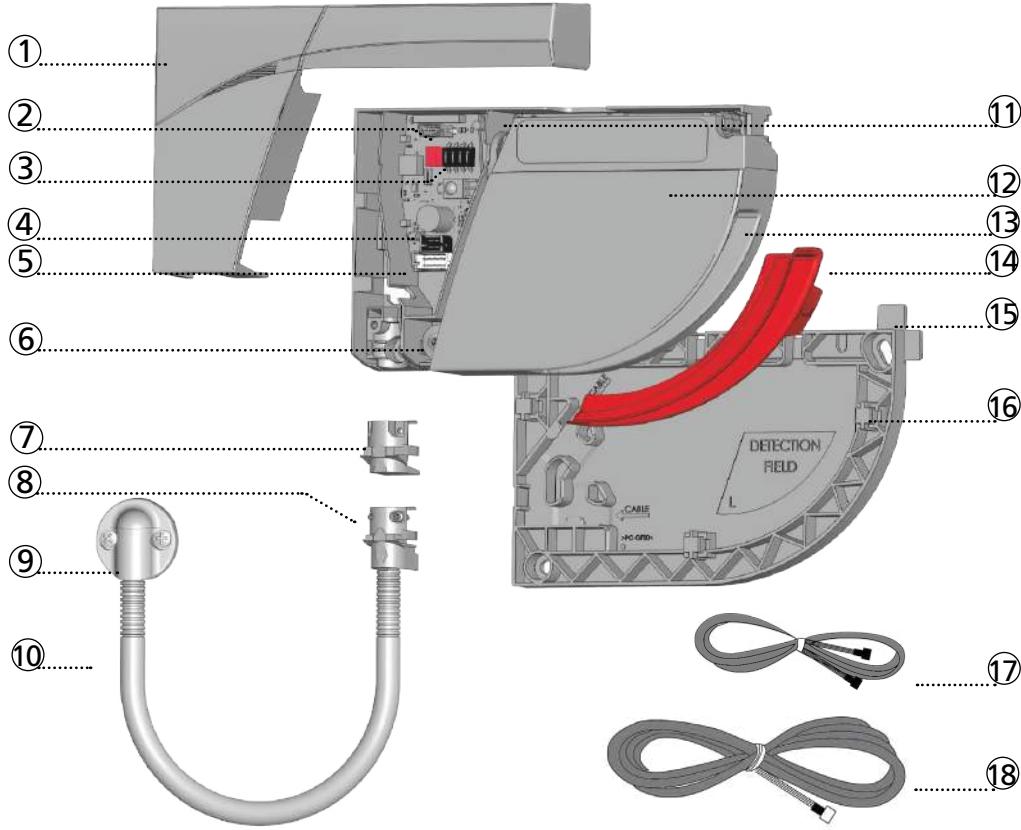


- The device cannot be used for purposes other than its intended use. All other uses cannot be guaranteed by the manufacturer of the sensor.
- The manufacturer of the door system is responsible for carrying out a risk assessment and installing the sensor and the door system in compliance with applicable national and international regulations and standards on door safety.
- The manufacturer of the sensor cannot be held responsible for incorrect installations or inappropriate adjustments of the sensor.

DESCRIPTION



The LZR®-FLATSCAN SW is a safety sensor for automatic swing doors based on laser technology. It secures the moving door wing as well as the hinge area. To do so, a module must be installed in the upper corner of the door wing on both sides of the door.



| | | |
|---------------------------|----------------------------------|-----------------------------|
| 1. cover | 7. plug | 13. laser window |
| 2. push button | 8. clamp | 14. laser window protection |
| 3. DIP-switch | 9. cap and screws (flexible kit) | 15. positioning aids |
| 4. master-slave connector | 10. flexible tube | 16. mounting base |
| 5. main connector | 11. lock screw | 17. master-slave cable |
| 6. angle adjustment screw | 12. laser head | 18. power cable |

LED-SIGNALS



Relay 1



Relay 2



Calculation in progress
Exit the zone and wait



LED flashes



LED flashes
x times



LED flashes
red-green



LED flashes
slowly



LED flashes
quickly

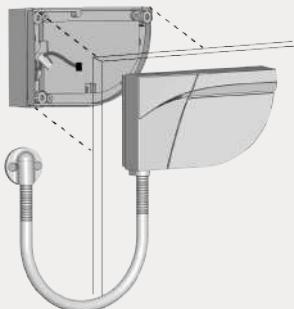
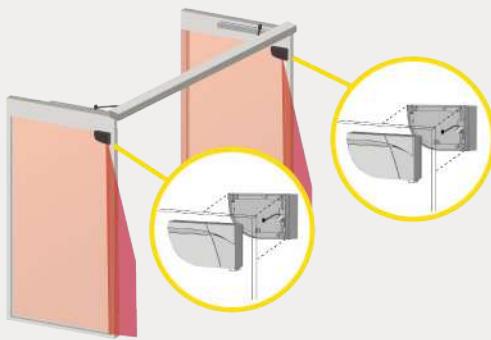


LED is off

1 MOUNTING ON DOOR

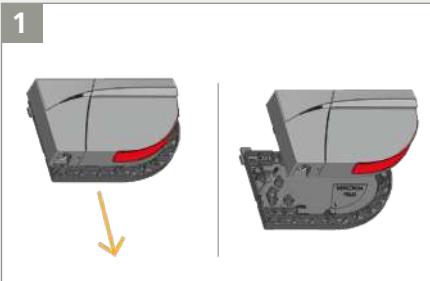


For optimum safety, install 1 module on each door wing side and interconnect them via the master-slave cable.



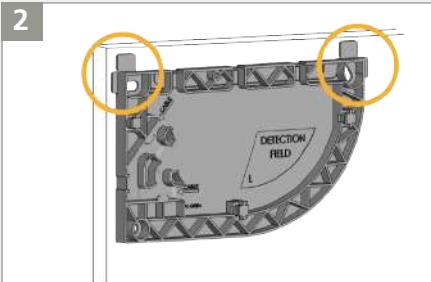
Keep a minimum distance of 15 cm between the FLATSCAN and radar sensors or use the LZR®-FLATSCAN Protective cover to avoid unwanted reactions of the door.

1



Slide the base off the sensor module.

2

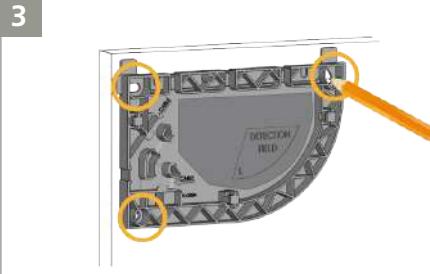


Take the base and put it on the door frame.
The positioning aids help you to align the base correctly.



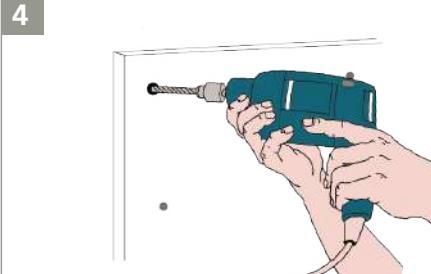
When mounting the base, make sure the sensor will not hinder the door movement.
If the sensor isn't correctly positioned, it could be crushed during the opening of the door.

3

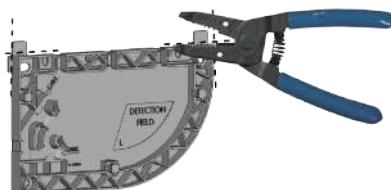


Using a pencil, mark the position of the holes to drill into the door frame. You can also use the inner surface of the base to fasten the screws.

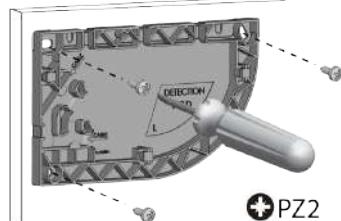
4



Remove the base and pre-drill the holes where marked.

5

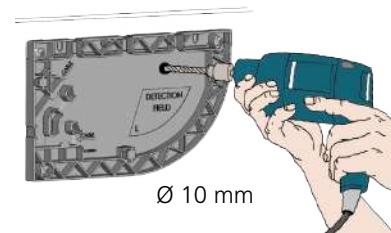
Using a wire cutter, remove the positioning aids from the base.

6

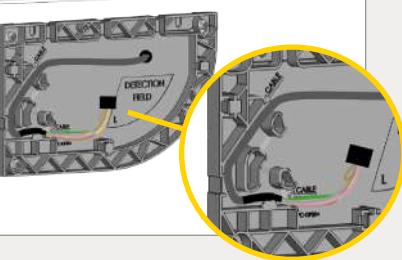
⚠ Fasten the 3 screws using a Pozidrive screwdriver.
The base needs to be fixed firmly!



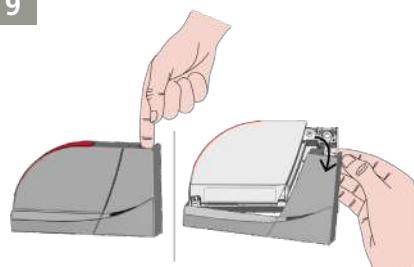
When installing the FLATSCAN on a fire door, use the *LZR®-FLATSCAN Fire Door Accessory (FDA)*.

7

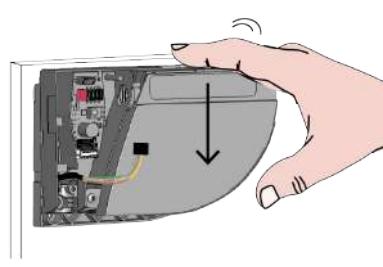
Drill through the 2 bases and the door using a 10 mm bit in order to pass the master-slave cable.
Soften the edges using a sheet of sandpaper.

8

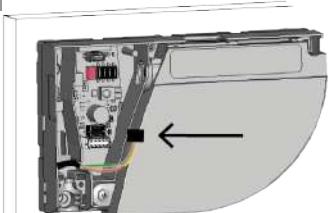
Take the master-slave cable and pass it through the hole. Position the cable in the notch of the base and make sure it is firmly fixed.

9

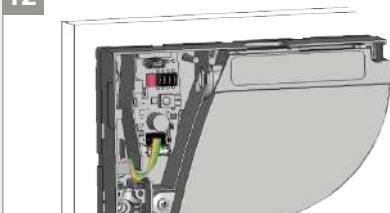
Take the sensor and remove the cover: put your finger in the hole and pull firmly towards you in one movement.

10

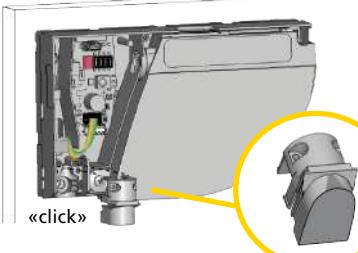
Pass the cable through the hole on the back of the sensor and fasten the sensor on the base by sliding it downwards.

11

Connect the black plug to the black connector.

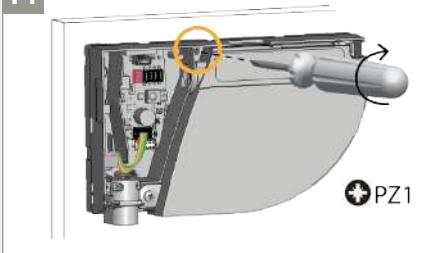
12

Make sure that all wires are safely tucked within the notch to avoid crushing them with the cover.

13

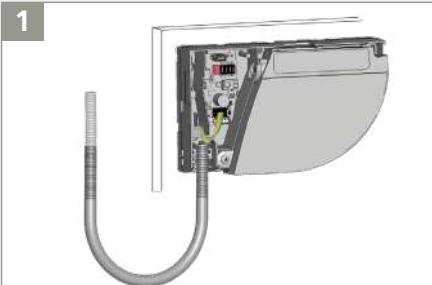
Close the sensor which will not be connected to the door controller using a plug.

 Sensor connected to other module = SLAVE

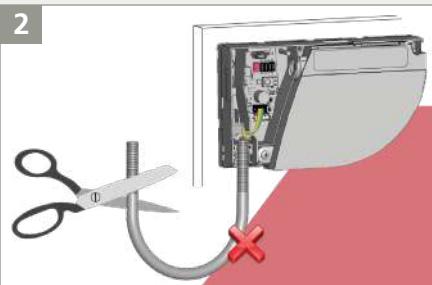
14

 Fasten the lock screw firmly.

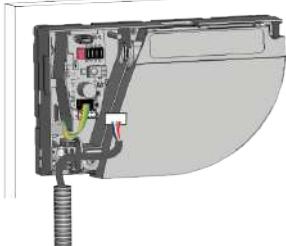
2 WIRING TO DOOR CONTROLLER

1

Take the flexible tube and determine how long it should be in order to reach the door controller.

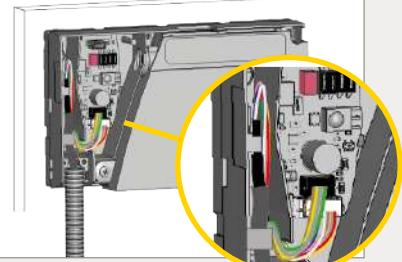
2

Cut the surplus to avoid undesired detections caused by the flexible tube.

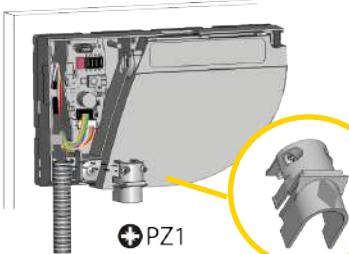
3

Pass the power cable through the flexible tube.
Connect the white plug to the white connector.

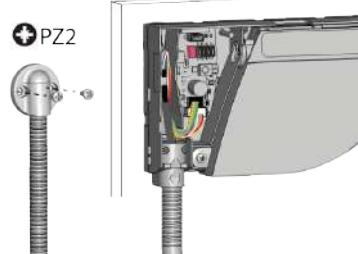
 Sensor connected to door controller = **MASTER**

4

Make a loop with the wires of the power cable and pass them through the notch as indicated.
Use the other part of the cable to block the wires.

5

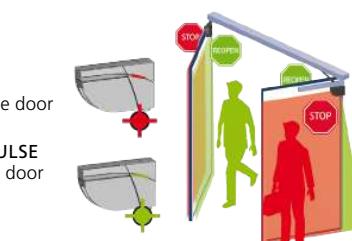
Take the clamp to fix the flexible tube to the sensor.
Fasten the 2 screws firmly in order to avoid pulling out the cable.

6

Tighten the other side of the flexible tube using the cable cap and pass through the rest of the power cable towards the door controller.

7

| | | | |
|------------|--------------|---|-----------------------------------------------|
| 12-24 V DC | GREEN | + | POWER SUPPLY |
| | BROWN | - | |
| * COM | YELLOW | | STOP IMPULSE Opening side of the door |
| NC | WHITE | | |
| * COM | PINK | | REOPENING IMPULSE Closing side of the door |
| NC | GREY | | |
| | RED | | TEST |
| | BLUE | | |
| | YELLOW/BLACK | | |
| | WHITE/BLACK | | |



(These wires are not used for the Flatscan SW, but connecting them to the opening could be useful for a possible future upgrade to the Flatscan 3D SW)

* Output status when sensor is operational.

Cut the power cable to the right length, strip the 10 wires and connect all wires as indicated.

The polarity of the power supply is important.

! For compliance with EN 16005 and DIN 18650, the door controller test output must be connected and able to test the sensor.

3 DIP-SWITCH 1

Make sure the setting of DIP 1 is correct on all modules according to the door side.

ON



RELAY 1: STOP-impuls on the opening side of the door



OFF



RELAY 2: REOPENING-impuls on the closing side of the door



ORANGE



GREEN

After changing a DIP-switch, the orange LED flashes. A LONG push on the push button confirms the settings. Afterwards, a number of green flashes (x) indicates the number of connected modules.

> 3 sec.

4 TEACH-IN

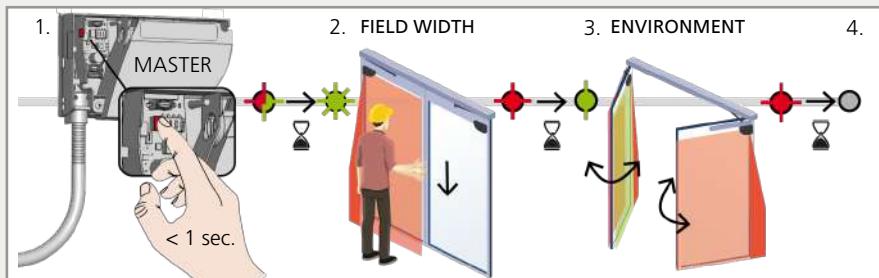


Before launching a teach-in, make sure that:

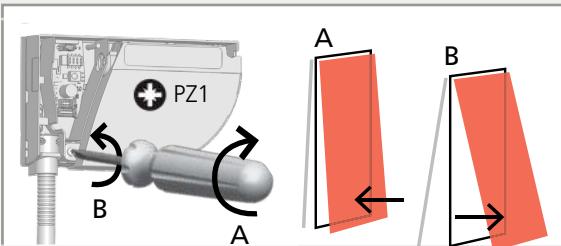
- **glass surfaces near the door are covered**
- the door controller is set up first
- the door is closed (use the service mode if needed, see page 9)
- the door controller is connected to both relay outputs and is fully reacting to them
- the master-slave cable is connected between the modules
- the detection field is free of snow buildups, heavy rain, snowfall, fog or other objects or people
- the laser window protection is removed.

1. To launch a teach-in, press the push button of the master* module briefly. The LED starts to flash red-green quickly. When installing the sensor on a double swing door, repeat this on the second master module.
2. Wait until both sensors flash green. Position yourself in front of the door and stretch out your arm in front of you. Make an up and down movement at closing edge level in order to mark the limit of the detection zones. The LED flashes red while calculating the width of the door wings.
3. Wait until the sensors flash green again. Make sure you are outside of the detection field and activate a door opening so the sensors can learn the environment. During the closing of the door, the sensor flashes red.
4. Once the door is completely closed again and the LED is off, the teach-in is completed.

* A teach-in on the master configures both the master and the slave. A teach-in on the slave only configures the slave. In case the master and slave module are not aligned, first launch a teach-in on the master and then on the slave.



5 TESTING AND ADJUSTING



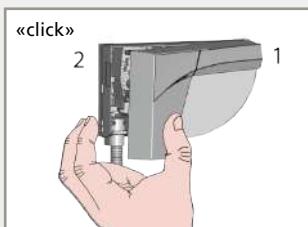
Check the correct positioning of the safety fields by placing an object in the detection field.

If necessary, adjust the tilt angle of the laser curtain by turning the tilt angle adjustment screw (from 2° to 10°).

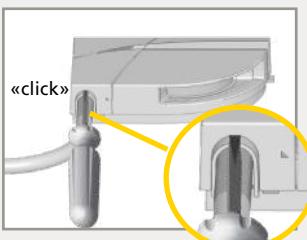


After changing the angle, the sensor position or the environment, always launch a teach-in and test the correct positioning of the detection fields.

6 FINAL STEPS



Close the cover starting on the narrow side (1). Do not hesitate to push.



To open the sensor again, position a screwdriver in the notch and pull upwards until the cover comes loose.

Watch our FLATSCAN SW tutorial online: bea-flatscan.com/tutorial



SERVICE MODE



The service mode deactivates the safety detection during 15 minutes and can be useful during an installation, a mechanical teach-in of the door or maintenance work.

To enter the service mode, push on the button for at least 3 seconds. When the sensor is in service mode, the LED is off. To exit the service mode, push again for at least 3 seconds.

The service mode is deactivated automatically when launching a teach-in.



DIP-SWITCH SETTINGS (OPTIONAL)



In order to adapt these parameters by remote control, set the corresponding DIP switch to ON.

| | ON | OFF | |
|--------------------------|----------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| DIP 2 ENVIRONMENT | standard | critical* | Switch to CRITICAL when external disturbances are likely to cause unwanted detections (min. obj size, immunity and uncovered zone are increased). |
| DIP 3 BACKGROUND | on | off | Switch to OFF when there is no background (glass floor, footbridge...). |
| DIP 4 PINCH ZONE | on | off | Switch to OFF when the hinge area does not need to be secured or when objects place in the environment can |

* Make a risk analysis to check if the environment requires an additional mechanical protection in the hinge area.



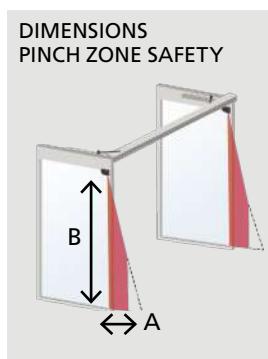
After changing a DIP-switch, the orange LED flashes. A LONG push on the push button confirms the settings. Afterwards, a number of green flashes (x) indicates the number of connected modules.

REMOTE CONTROL SETTINGS (OPTIONAL)



000 001 - 400 cm
no field 001 - 400 cm

A teach-in overwrites these values automatically.

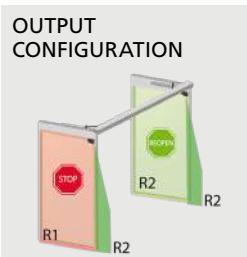


In order to change these settings by remote control, adjust DIP-switch 4 to ON

| | | | | | | |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|----------|--------------|---------------|
| A  |   | 0 0 0 | 0 0 1 | - | 1 0 0 | |
| | | no field | 001 | - | 100* | 040 cm |
| B  |   | 0 0 0 | 0 0 1 | - | 4 0 0 | |
| | | no field | 001 | - | 400 | cm |

* The actual dimensions depend on the mounting height (100 cm at 4 m).

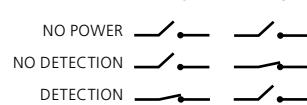
A teach-in overwrites these values automatically



| | 1 | 2 | 3 | 4 | | NO | NC |
|-----------|----|----|----|----|--|--------------|----|
| STOP R1 | NO | NC | NC | NO | | NO POWER | |
| REOPEN R2 | NC | NO | NC | NO | | NO DETECTION | |

NO = normally open

NC = normally closed



IMMUNITY FILTER

In order to change these settings by remote control, adjust DIP-switch 2 to ON

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|-----|---|---|---|---|---|---|---|------|
| | low | > | > | > | > | > | > | > | high |

Increase to filter out external disturbances.

The reaction time increases significantly between value 5 and 9.

UNCOVERED ZONE

In order to change these settings by remote control, adjust DIP-switch 2 to ON

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|----|----|----|----|----|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |

Increase in case of snow, dead leaves, etc.

* measured in specific conditions and dependant on application and installation.

ANTIMASKING & BACKGROUND

In order to change these settings by remote control, adjust DIP-switch 3 to ON

| | 0 | 1 | 2 | 3 |
|-------------|-----|-----|-----|----|
| ANTIMASKING | OFF | OFF | ON | ON |
| BACKGROUND | OFF | ON | OFF | ON |



Antimasking: protective function which detects an unwanted object nearby the laser window masking the vision field.

Background: reference point in the detection field of the sensor.

If no background is present, switch to off.

GENERAL

| | 0 | 8 | 9 |
|------------|---|-----------------------------|-------------------------------------------------------------------------------|
| teach-in | | full reset | partial reset |
| See page 8 | | Factory reset of all values | Factory reset of all values except field dimensions and output configurations |



FACTORY VALUE

HOW TO USE THE REMOTE CONTROL



After unlocking, the red LED flashes and the sensor can be adjusted by remote control.



If the red LED flashes quickly after unlocking, you need to enter an access code from 1 to 4 digits. If you do not know the access code, **cut and restore the power supply**. During 1 minute, you can access the sensor without introducing any access code.



To end an adjustment session, always lock the sensor.



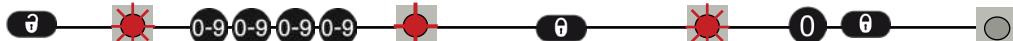
It is recommended to use a different access code for each module in order to avoid changing settings on both modules at the same time.

SAVING AN ACCESS CODE

The access code is recommended for sensors installed close to each other.

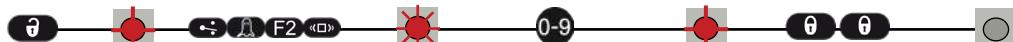


DELETING AN ACCESS CODE



Enter the existing code

ADJUSTING ONE OR MORE PARAMETERS



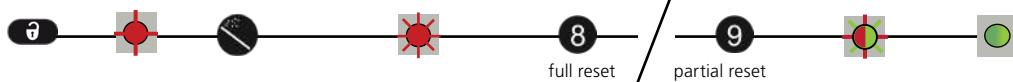
CHECKING A VALUE



x = number of flashes = value of the parameter

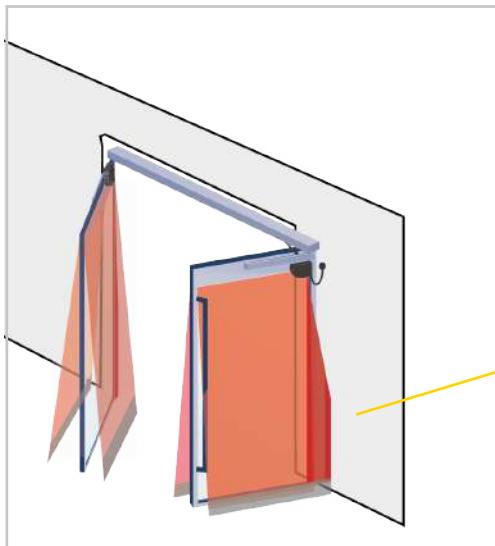
 = field width: 2.35 m

RESTORING TO FACTORY VALUES



full reset

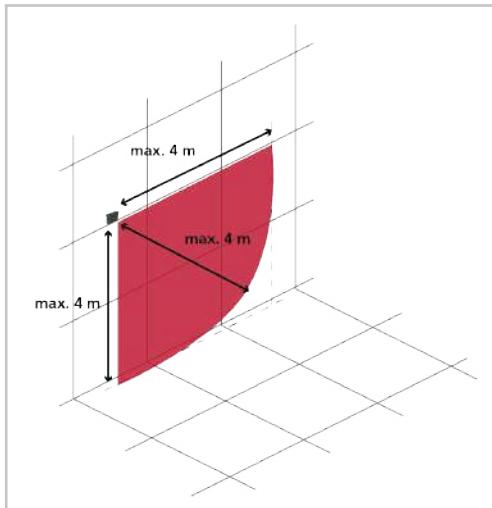
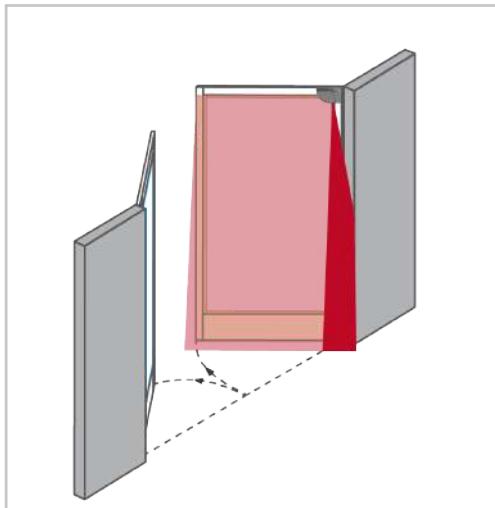
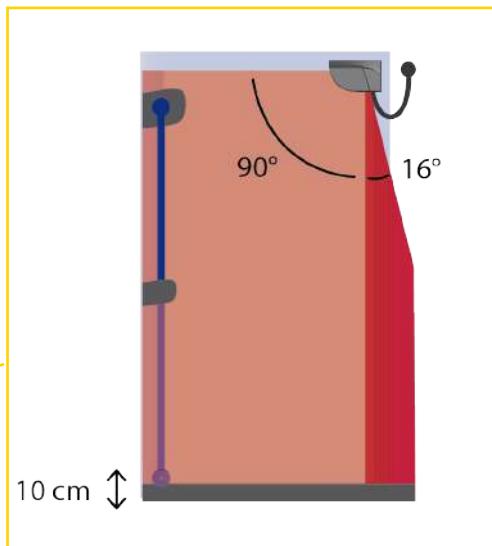
partial reset



■ DOOR WING SAFETY

■ PINCH ZONE SAFETY

■ UNCOVERED ZONE
Adjustable by remote control
factory value: 10 cm



Check the detection fields using our online sizer tool:
<https://eu.beasensors.com/sizer/flatscan/>



TROUBLESHOOTING

| | |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>In case of unwanted reactions of the door, verify whether the problem is caused by the sensor, the door controller or a radar sensor in proximity. To do so, activate the service mode (no safety) and launch a door cycle. If the door cycle is completed successfully, check the sensor. If not, verify the door controller, the wiring or a radar sensor.</p> <p>Keep a minimum distance of 15 cm between the FLATSCAN and radar sensors or use the <i>LZR®-FLATSCAN Protective cover</i> to avoid unwanted reactions of the door.</p> |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| | | | |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | The RED or GREEN LED is ON sporadically or permanently and the door does not react as expected. | Bad teach-in | Launch a new teach-in (closed door). |
|  | | Unwanted detections (due to environment or external conditions) | <p>1 Make sure the flexible cable does not cause detections.</p> <p>2 Verify if the laser window is dirty and clean it with compressed air. Then wipe it carefully with a damp and clean microfibre cloth if necessary (attention: the surface of the laser window is delicate)</p> <p>3 Launch a new teach-in (closed door).</p> <p>4 Switch DIP 2 to off (critical environment).</p> |

| | | | |
|---------------------------------------------------------------------------------|-----------------------------------------|-----------------------|---------------------------------------------------------------------------|
|  | The sensor does not react at power-on. | Inverted power supply | Check wiring (green +, brown -). |
| | | Faulty cable | Replace cable |
| | | Faulty sensor | Replace sensor |
| | The sensor does not react when powered. | Test error | Check voltage between red and blue wires. |
| | | | Press the push button during at least 3 seconds to exit the service mode. |

| | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | It is not possible to adjust a setting by remote control. | Wrong DIP-switch position. | Adjust the required DIP-switches to ON. |
| | The remote control does not react. | The sensor is protected by a password. | Enter the right password. If you forgot the code, cut and restore the power supply to access the sensor without entering a password during 1 minute. |

| | | | |
|-----------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | The ORANGE LED is on permanently. | The sensor encounters a memory problem. | Send the sensor back for a technical check-up. |
|  | The ORANGE LED flashes quickly. | DIP-switch setting awaiting confirmation. | Confirm the DIP-switch setting: long push on the push button. |
|  | The ORANGE LED flashes 1 x every 3 seconds. | The sensor signals an internal fault. | Cut and restore power supply. LED flashes again, replace sensor. |
|  | The ORANGE LED flashes 2 x every 3 seconds. | Power supply is out of limit. | <p>1 Check power supply (voltage, capacity).</p> <p>2 Reduce the cable length or change cable.</p> |
| | | Internal temperature is too high. | Protect the sensor from any heat source (sun, hot air...) |
| | | Communication error between modules | <p>1 Check wiring between master and slave modules.</p> <p>2 Check wiring between interface card and laser head.</p> <p>3 Press the push button during 3 seconds if the MASTER-SLAVE cable is permanently removed.</p> |
|  | The ORANGE LED flashes 3 x every 3 seconds. | The sensor does not see its background. | Switch DIP 3 to off (deactivates background). |
| | | Something close to the sensor is masking part of the detection field. | <p>1 Make sure the laser window is not scratched. If it is, replace sensor.</p> <p>2 Remove all masking elements (insects, spider web, flexible tube, window protection).</p> <p>3 Verify if the laser window is dirty and clean it with compressed air. Then wipe it carefully with a damp and clean microfibre cloth if necessary (attention: the surface of the laser window is delicate)</p> <p>4 Switch antimasking setting to off (attention: no conformity to DIN 18650 or EN 16005).</p> |
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| | | | |
|  | The ORANGE LED flashes 5 x every 3 seconds. | Teach-in error | <p>1 Check whether all teach-in requirements are fulfilled (see page 8) and launch a new teach-in (closed door).</p> <p>2 Adjust the tilt angle of the laser curtain and launch a new teach-in (closed door).</p> <p>3 Adjust the field dimensions by remote control. Push  and activate a door opening (step 3 of teach-in).</p> |
| | | Permanent faulty measurements of door position. | <p>1 Launch a new teach-in (closed door).</p> <p>2 If orange LED flashes again, contact BEA.</p> |
| | | | |
|  | The ORANGE LED flashes 6 x every 3 seconds. | Sporadic faulty measurements of door position. | <p>1 Clear field and wait until the door closes.</p> <p>2 If the door does not close, cut power supply and restore it once the door is fully closed.</p> <p>3 Launch a new teach-in (closed door).</p> |
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TECHNICAL SPECIFICATIONS

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Technology | LASER scanner, time-of-flight measurement |
| Detection mode | Presence |
| Max. detection range | 4 m (diagonal) with reflectivity of 2% (i.e. at W = 1.5m -> max. H = 3.7 m) |
| Opening angle | Door wing safety: 90° / Pinch zone safety: 16° |
| Angular resolution | Door wing safety: 1.3°/ Pinch zone safety: 0.2° |
| Typ. min. object size | |
| Door wing safety | 10 cm @ 4m (in proportion to object distance, DIP 2 = ON) |
| Pinch zone safety | 2 cm @ 4m (in proportion to object distance, DIP 2 = ON) |
| Testbody | 700 mm x 300 mm x 200 mm (testbody CA according to EN 16005 & DIN 18650) |
| Emission characteristics | IR LASER: wavelength 905 nm; max. output pulse power 25 W; Class 1 |
| Supply voltage | 12 - 24 V DC ± 15 % |
| The Equipment must be powered by an approved Class II SELV limited power source. This requirement consists of the need for double insulation between primary voltages and the Equipment supply. | |
| Power consumption | ≤ 2 W |
| Response time | Door wing safety: max. 50 ms / Pinch zone safety: max. 90 ms |
| Output | 2 electronic relays (galvanic isolation - polarity free) 42V AC/DC 100 mA |
| LED-signals | 1 bi-coloured LED: detection/output status |
| Dimensions | 142 mm (L) x 85 mm (H) x 33 mm (D) (mounting base + 7 mm) |
| Material - Colour | PC/ASA - Black - Aluminum - White |
| Tilt angles | +2° to +10° (without mounting base) |
| Protection degree | IP54 (EN 60529) |
| Temperature range | -30°C to +60°C if powered |
| Humidity | 0-95 % non-condensing |
| Vibrations | < 2 G |
| Min. door wing speed | 2°/sec |
| Conformity | EN 12978; EN ISO 13849-1 PI "d"/ CAT2; IEC 60825-1; EN 62061 SIL 2; DIN 18650-1 (testbody CA); EN 16005 (testbody CA) |

Specifications are subject to change without prior notice.
All values measured in specific conditions.



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BEA hereby declares that the LZR®-FLATSCAN SW is in conformity with directives 2014/30/UE (EMC Directive), 2006/42/CE (Machinery Directive) and 2011/65/UE (RoHS Directive).

Notified Body for EC-type inspection: 0044 - TÜV NORD CERT GmbH, Langemarkstr. 20, D-45141 Essen
EC-type examination certificate number: 44 205 13 089619

Angleur, August 2017 Pierre Gardier, authorized representative and responsible for technical documentation
The complete declaration of conformity is available on our website.



This product should be disposed of separately from unsorted municipal waste