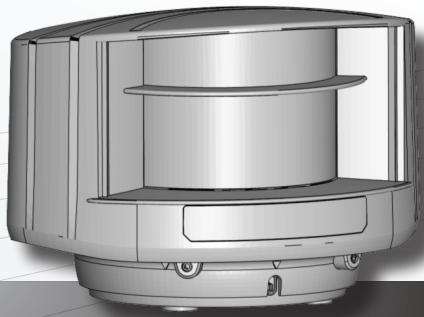
EN



LZR®-H100

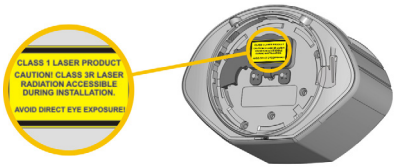
LASER SCANNER FOR BARRIERS & GATES

with max. detection range of 32′ × 32′

Visit website for available languages of this document.

User's Guide

SAFETY

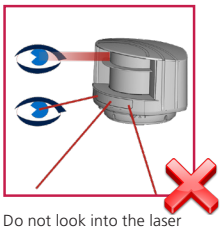


The device contains IR and visible laser diodes.

IR laser: wavelength 905nm; max. output pulse power 75W
(Class 1 according to IEC 60825-1)
Visible laser: wavelength 650nm; max. output CW power 3mW
(Class 3R according to IEC 60825-1)

The visible laser beams are inactive during normal functioning.
The installer can activate the visible lasers if needed.

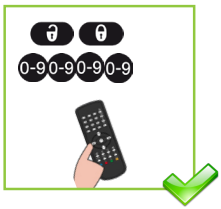
CAUTION!
Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Do not look into the laser emitter or the visible red laser beams.

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

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



After installation, enter an access code by remote control.

This sensor is designed to be used as a movement and presence sensor to control the opening and the closing process of a gate or a barrier. The installer of the system is responsible for installing the sensor and the system in compliance with applicable national and international standards on safety. The manufacturer of the sensor cannot be held responsible for incorrect installations or inappropriate adjustments of the sensor.

This device is not intended for use in with any automatically activated doors. US Pat. No. 7,084,388, which is not owned by BEA, covers automatic doors comprising, among other things, a scanning detector. The LZR-H100 is not sold with consent, implied or otherwise, for use with automatically activated doors, as set forth in the aforementioned patent.

INSTALLATION & MAINTENANCE

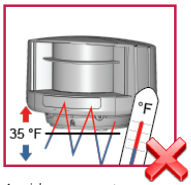
Avoid extreme vibrations.

Do not cover the laser windows.

Avoid moving objects and light sources in front of the laser window.

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

Avoid condensation on the laser windows.

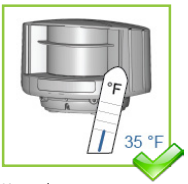


Avoid exposure to sudden and extreme temperature changes.

Avoid direct exposure to high pressure cleaning.

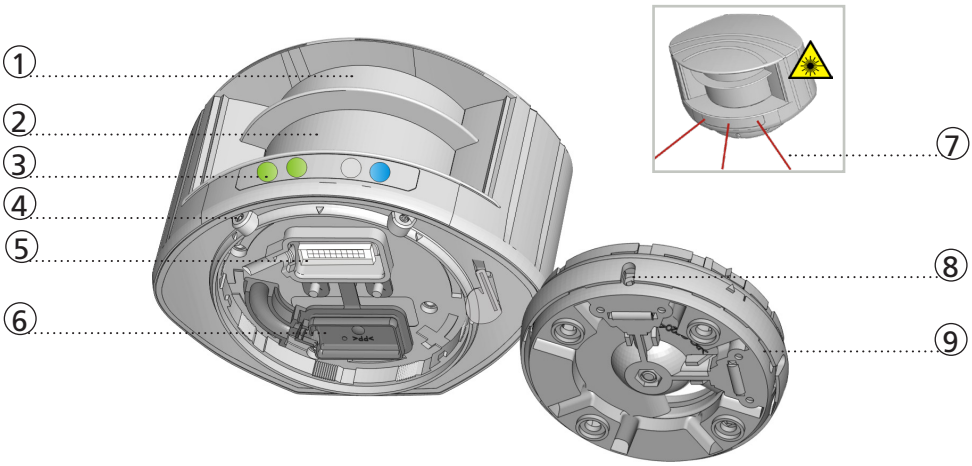
Do not use aggressive products to clean the laser windows.

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



Keep the sensor permanently powered in environments where the temperature can drop below 35 °F.

DESCRIPTION



1. laser window – emission
2. laser window – reception
3. LED signals
4. screws for position lock
5. connector
6. protection cover
7. visible laser beams
8. notch for tilt angle adjustment
9. adjustable bracket

LED-SIGNALS

LED-signal at power-on

R1: Relay 1 - detection in opening field R2: Relay 2 - detection in safety field	detection	no detection
E: Error status	error	no error
P: Power status	power	no power

= LED is on = LED flashes = LED flashes quickly = LED is off

All 4 LEDs can be switched off and on again by remote control.
This can be useful in cases where the sensor should not draw any attention.

SYMBOLS

Caution!
Laser radiation

Important

Good to know

Factory values

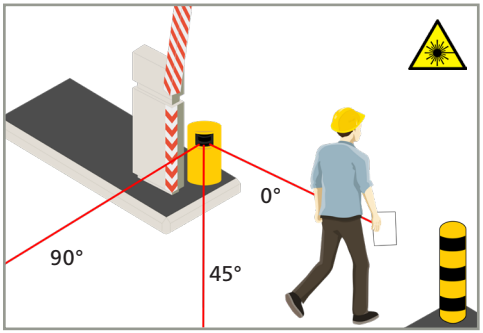
Important remote control sequence

Possible remote control adjustments

BASIC PRINCIPLES

It is important to understand some basic principles before installing the sensor.

VISIBLE RED LASER BEAMS

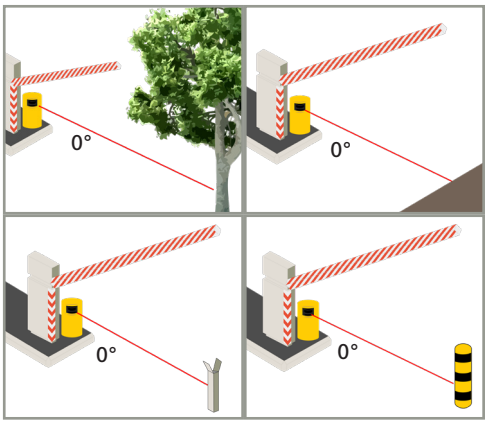


The sensor and detection field position are very important for the good functioning of the barrier.

In order to position the sensor correctly, use the 3 visible red laser beams.

The visible laser beams are also used to determine the reference of the sensor in order to ensure the safety of the barrier.

REFERENCE



The sensor has to learn a reference when the safety field is the only protection against contact between the vehicle and the boom.

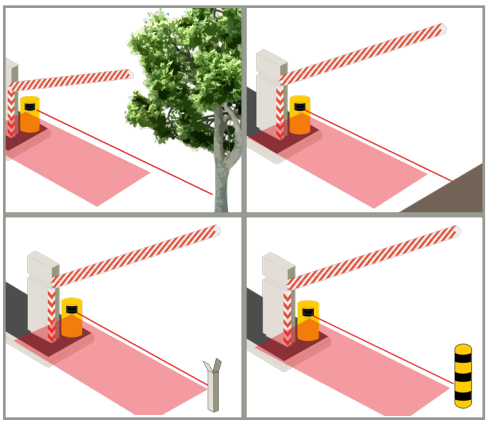
The reference can be adjusted on any type of object already present on site (wall, tree, barrier boom support) or on a post.

Always make sure the object on which the reference is adjusted:

- is positioned in the continuity of the 0° laser beam
- is positioned min. at the end of the barrier or farther away than the end of the barrier
- has a surface of at least 6 inches
- is firmly fixed to floor and not subject to vibrations

Use reflective sticker when the distance between sensor and reference is higher than 16.5 feet.

SAFETY FIELD



If the safety field is the only protection against contact with the barrier, the safety field of the sensor must be situated directly below the barrier.

This is only possible when the sensor is positioned correctly and the reference has been learned.

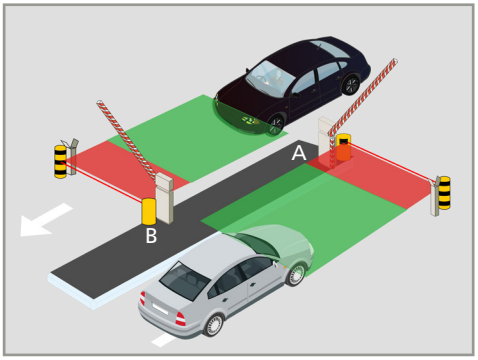
If the reference is situated at the end of the barrier, the detection field width is the same as the reference distance.
If the reference is farther away, you need to adjust the detection field width to the width of the barrier.

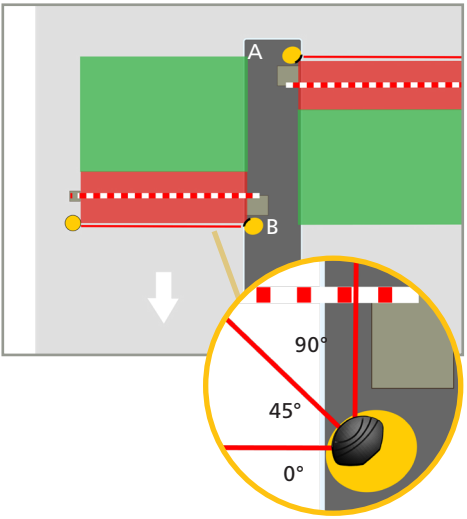
In order to maximize safety for mixed traffic (vehicles and trucks), an additional vertical detection zone is recommended (LZR-I30).

APPLICATION REQUIREMENTS

These requirements ensure optimal safety of the barrier in order to protect against contact with the barrier.

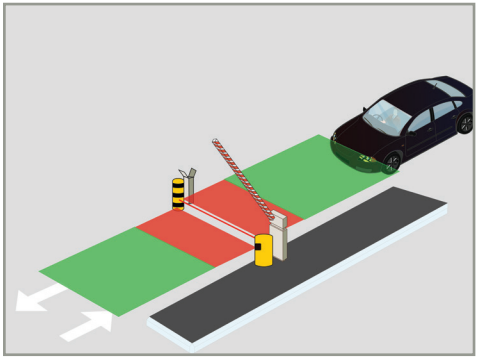
DOUBLE ACCESS LANE

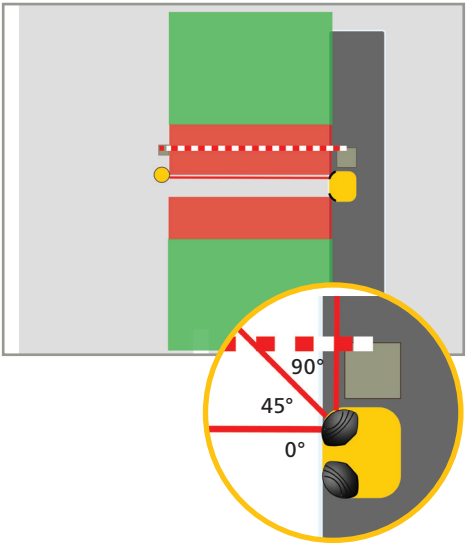




- 2 LZR-H100
- 2 references, 1 for each sensor

SINGLE ACCESS LANE



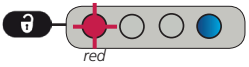


- 2 LZR-H100
- 1 reference

SAFETY FIELD

OPENING FIELD

HOW TO USE THE REMOTE CONTROL

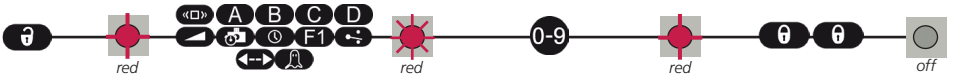


After unlocking, the first LED flashes red and the sensor can be adjusted by remote control.

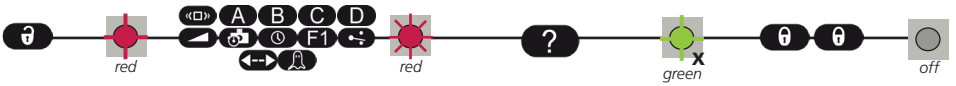
If the red LED flashes quickly after unlocking, you need to enter an access code from 1 to 4 digits.

To end an adjustment session, always lock the sensor.

ADJUSTING ONE OR MORE PARAMETERS



CHECKING A VALUE



= field width: 4.2 m

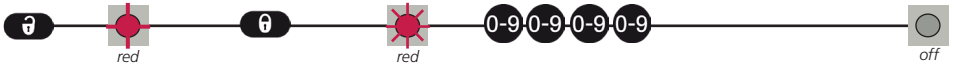
= field width is defined by teach-in

X = NUMBER OF FLASHES = VALUE OF THE PARAMETER

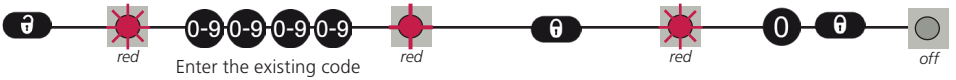
RESTORING TO FACTORY VALUES

SAVING AN ACCESS CODE

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

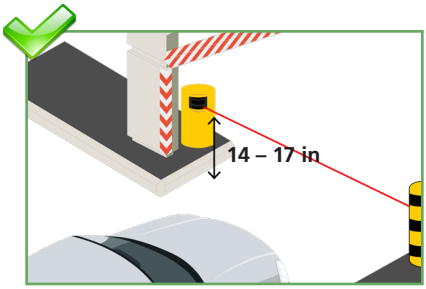


DELETING AN ACCESS CODE

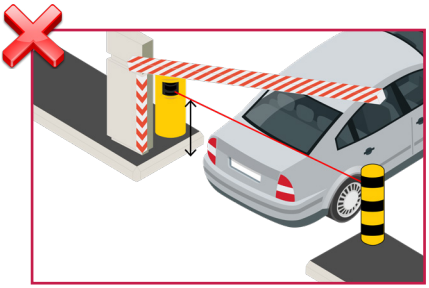


DELETING AN UNKNOWN ACCESS CODE

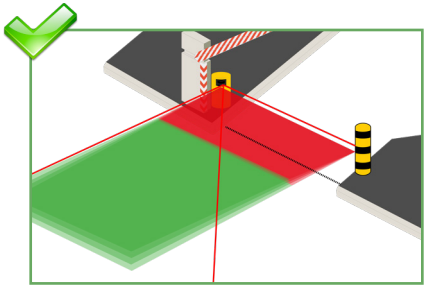
RECOMMENDED MOUNTING



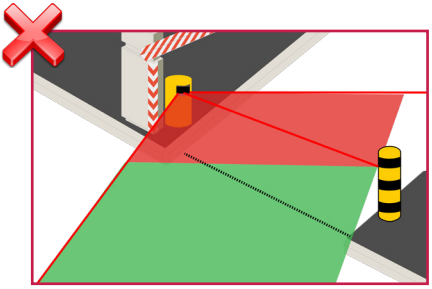
Install the sensor at a mounting height between 14 – 17 inches. If the barrier is only used by trucks, the mouting height may be increased.



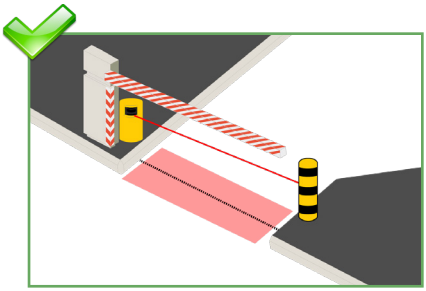
If the reference beam is too low or too high, contact with the barrier may occur.



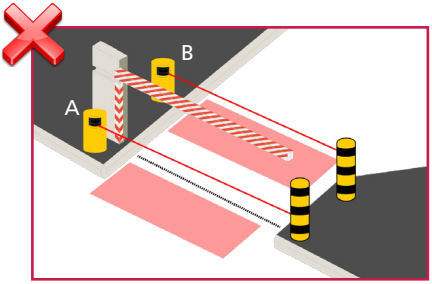
Ensure that the detection field is parallel to the barrier.



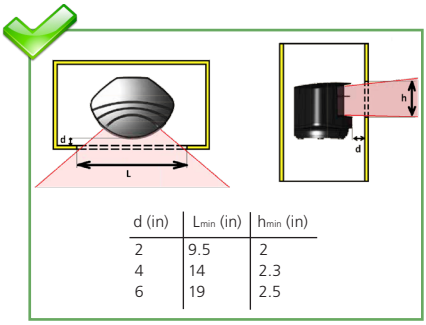
Do not position the detection field as shown.



When using the safety, place the sensor just behind the barrier to ensure that the safety field protects the area around the barrier.

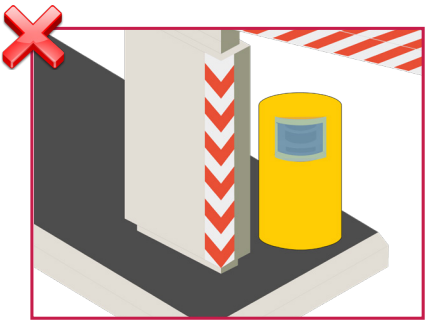


When using the safety, do not place the sensor before the barrier (A) or more than 15 inches after the barrier (B). The area around the barrier is not safe.



d (in)	L_{min} (in)	h_{min} (in)
2	9.5	2
4	14	2.3
6	19	2.5

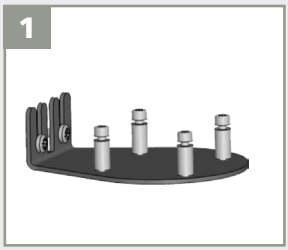
Ensure there are no obstructions in front of the sensor!



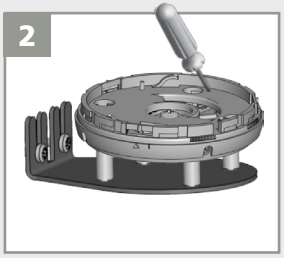
Do not cover the front face of the sensor with glass or plastic.

1 MOUNTING & WIRING

Carefully read the application requirements and tips before mounting the sensor.
Mounting position of the sensor is crucial for proper functioning of the barrier.



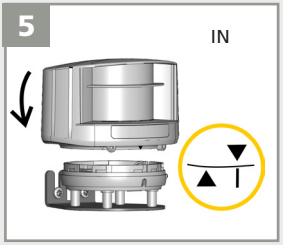
Use a mounting post or a mounting accessory (e.g. LBA accessory) to secure the sensor to the pole.



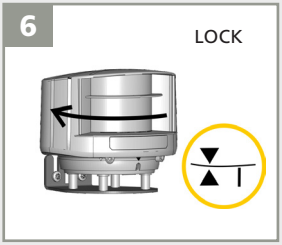
Position the bracket and secure using the 4 screws to avoid vibrations.

Open the protection cover, plug the connector and position the cable in the slit.

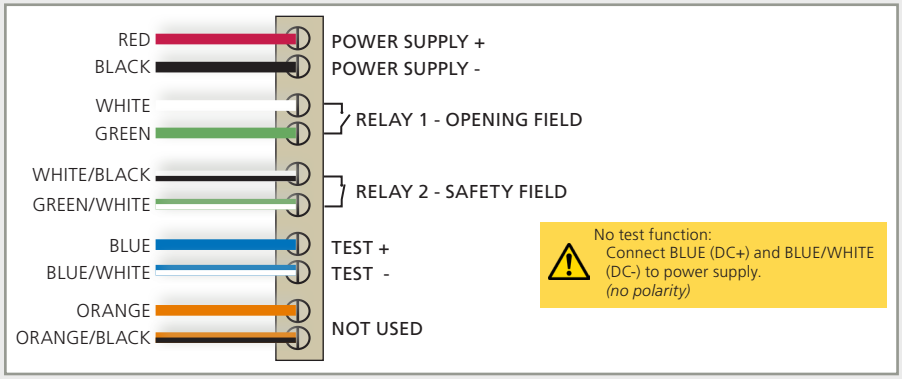
Firmly close the protection cover.



Position the housing on the bracket.



Turn the sensor until the two triangles are aligned.



LED signal at power-on:
Correct positioning is needed

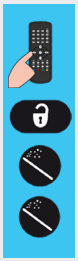
Power on without test signal:
Connect blue/white and blue wires to test or power supply.

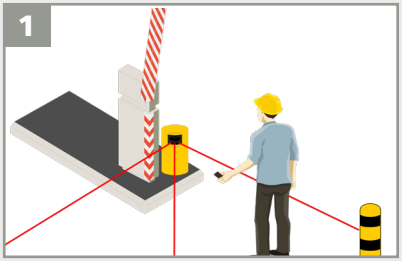
No detection

Safety and opening detection

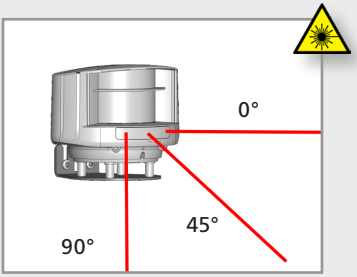
2 FIELD POSITIONING

The detection field and reference position are very important for proper functioning of the barrier.



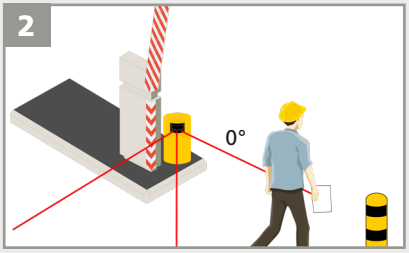


Activate the visible laser beams by remote control to position the sensor correctly.

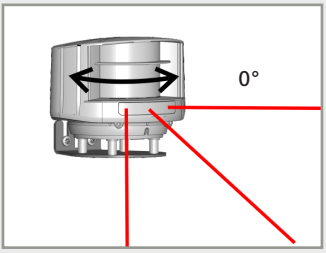


To turn off the beams, use the same sequence. After 15 minutes, the beams turn off automatically.

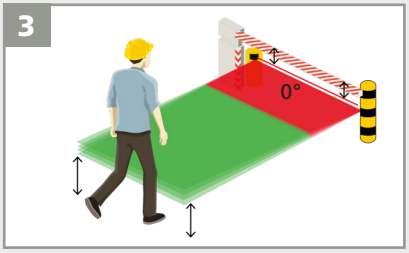
REFERENCE



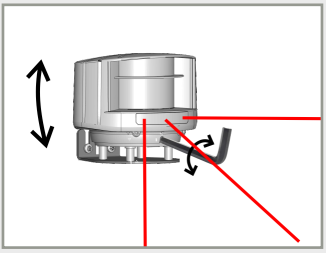
Use a sheet of white paper to verify that the laser beam is positioned at 0°.
The reference point can be adjusted on any object at the end of the barrier or farther away. Its surface should be at least 6 inches wide and it must be secured.
Use the reflective sticker when the distance between sensor and reference is higher than 16 feet (see page 4).



Turn the sensor slightly on its axis to adjust the lateral angle of the sensor to place the 0° laser spot on the reference.

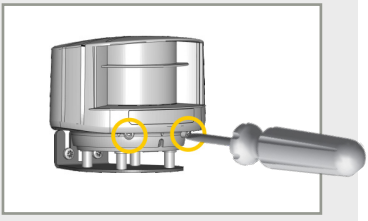


- The 0° spot must be parallel to the barrier.
- The beginning of the opening field should be approximately 15 inches above the ground.



Adjust the tilt angle of the detection field with the hex key if necessary.

To finish, lock the sensor position.



3 MOUNTING SIDE & REFERENCE

Select the correct mounting side with or without reference.

WITH REFERENCE
(RECOMMENDED)

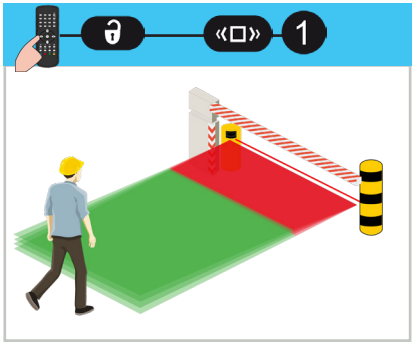
The safety field secures the area around the barrier and protects against contact with the barrier.

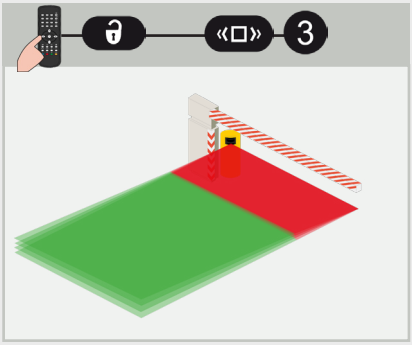
WITHOUT REFERENCE

The safety field detects the presence of a car, but the area around the barrier is not secured.

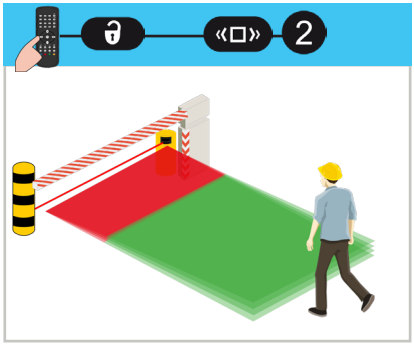
For best detection performance, use teh sensor with the reference point.

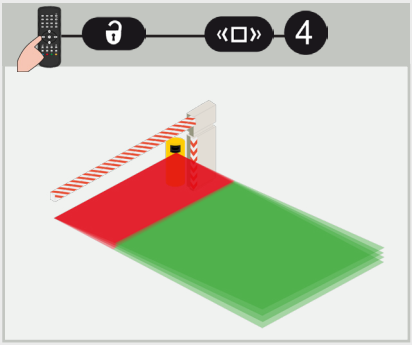
LEFT





RIGHT





By default, the sensor automatically adjusts the width of the safety field based on the reference.

4 SAFETY FIELD

FIELD DIMENSIONS

Before launching a teach-in, the field dimensions can be adjusted by remote control.
Dimensions must be entered using the metric system - convert if necessary.
Value C must be adapted to the width of the barrier:

- when the reference point is farther away than the desired detection field width
- when a mounting side **without reference** has been selected

WIDTH

		MIN		MAX
C ↔	0 0	0 5	-	9 6
	auto-set to reference*	0.5 m		9.6 m

* without reference, the width will be automatically set to 9.9 m

DEPTH

	MIN		MAX	
D ↕	0 5	-	9 6	
	0.5 m		9.6 m	2.0 m

EX: 🔒 D 1 5 for a field depth of 1.5 m

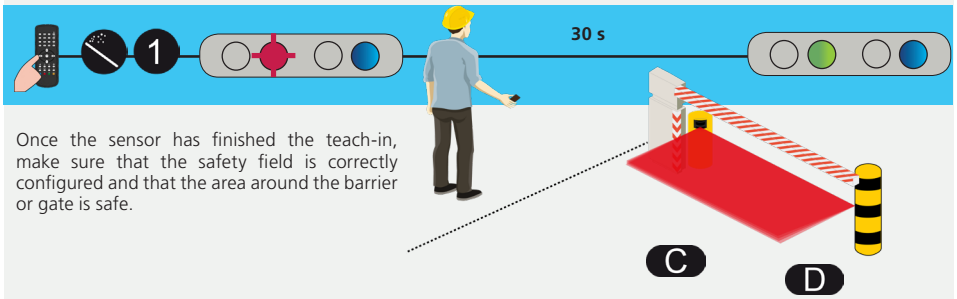
You can also increase or decrease the field by 10 cm: C + / - D + / -

TEACH-IN

Launch a teach-in by remote control. You have 3 seconds to step out of the detection field.
Then wait for the sensor to learn its environment (30 seconds).

During the teach-in, the detection field must be free of snow buildups, heavy rain, snowfall, fog or other moving objects.

If you walk along the detection area while the teach-in function is active, the sensor memorizes the outline of the walk path and stores this as a new detection field. The shortest distance measured by each laser beam is stored by the sensor and determines the field limit.



Once the sensor has finished the teach-in, make sure that the safety field is correctly configured and that the area around the barrier or gate is safe.

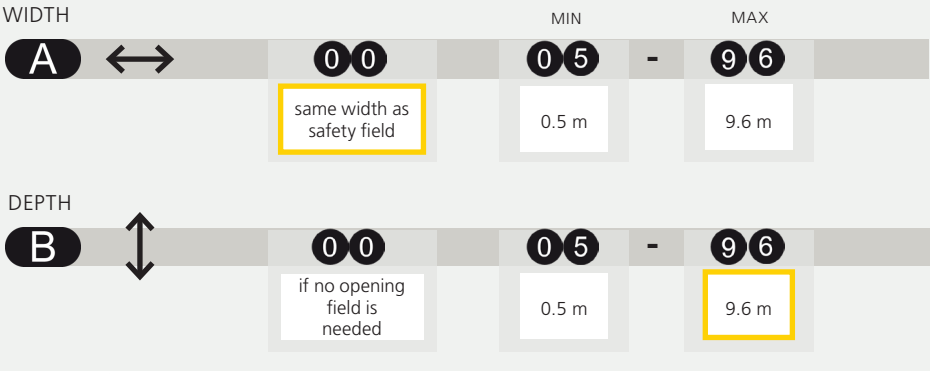
⚠ **Always launch a new teach-in after adjusting the field dimensions.**

If the safety field is the only protection against contact with the boom, the safety field of the sensor must be situated right under the boom. This is only possible when the sensor is positioned correctly and the reference has been learned.
The safety field is necessary for the correct functioning of the installation. If the safety field is badly adjusted, the manufacturer of the sensor cannot be held responsible for inappropriate functioning of the installation.
Always verify the correct functioning of the safety field before leaving the premisses.

5 OPENING FIELD

FIELD DIMENSIONS

Before launching a teach-in, the field dimensions can be adjusted by remote control.
Dimensions must be entered using the metric system - convert if necessary.



EX: 

for a field depth of 5 m

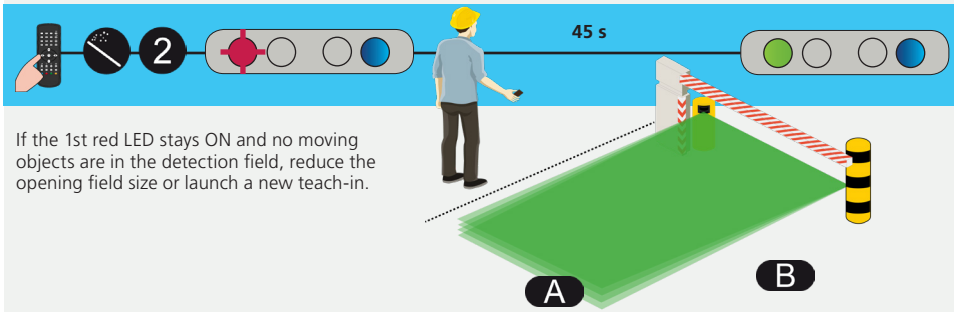
You can also increase or decrease the field by 10 cm: 

TEACH-IN

Launch a teach-in by remote control. You have 3 seconds to step out of the detection field.
Then wait for the sensor to learn its environment (45 seconds).

During the teach-in, the detection field must be free of snow buildups, heavy rain, snowfall, fog or other moving objects.

If you walk along the detection area while the teach-in function is active, the sensor memorizes the outline of the walk path and stores this as a new detection field. The shortest distance measured by each laser beam is stored by the sensor and determines the field limit.



If the 1st red LED stays ON and no moving objects are in the detection field, reduce the opening field size or launch a new teach-in.

⚠ **Always launch a new teach-in after adjusting the field dimensions.**

REMOTE CONTROL ADJUSTMENTS (OPTIONAL)

PEDESTRIAN FILTER

opening field

Select value 3 or higher to reject pedestrians. All objects wider than the chosen setting will be detected.

1	2	3	4	5	6	
off	50	65	72	100	120	cm

approximate values

MAX. PRESENCE TIME

opening field

STANDSTILL IN OPENING FIELD:

Select the amount of time R1 should stay active after an object becomes still in the opening field.

0	1	2	3	4	5	6	7	8	9
off	5 sec	10 sec	30 sec	1 min	2 min	5 min	10 min	2 hour	∞

DETECTION DELAY

opening field

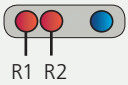
ENVIRONMENT FILTER:

Increase value in case of heavy rain, snow, or moving objects in the environment.

0	1	2	3	4	5	6	7	8	9	
off	100	200	300	400	500	600	700	800	900	ms

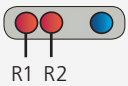
approximate values

OUTPUT FUNCTION



F1	0	1	2
RELAY 1	motion	motion or presence	motion + presence
RELAY 2	presence	presence	presence

OUTPUT CONFIGURATION



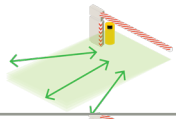
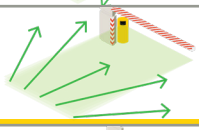
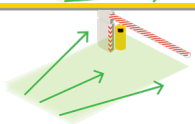
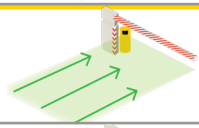
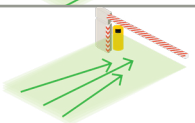
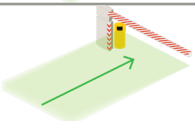
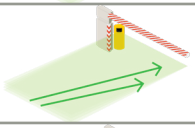
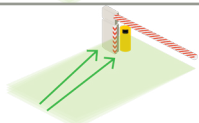
	1	2	3	4
RELAY 1	A – NO	P – NC	P – NC	A – NO
RELAY 2	P – NC	A – NO	P – NC	A – NO

FACTORY VALUE

REMOTE CONTROL ADJUSTMENTS (OPTIONAL)

DETECTION TRAJECTORY

opening field

BIDIRECTIONAL	bidirectional detection approaching + departing		1
UNI 400%	unidirectional detection only approaching **in any direction**		2
UNI 200%	unidirectional detection only approaching **towards the barrier/gate**		3
UNI 100%	unidirectional detection only approaching **within width of barrier/ gate**		4
UNI 50%	unidirectional detection only approaching **towards central zone of barrier/gate**		5
UNI CENTER	unidirectional detection only approaching **towards centre of barrier/gate**		6
UNI RIGHT	unidirectional detection only approaching **towards right side**		7
UNI LEFT	unidirectional detection only approaching **towards left side**		8

IMMUNITY

1	2
standard	high

NOTE: Select "high" if fog is causing unwanted detections.

MAGIC WAND

1	2	9	
teach-in safety field	teach-in opening field	factory values	visible laser beams

TROUBLESHOOTING

No blue LED	No power	Check cable and connection.
	Polarity of power supply is inverted	Check the polarity of the power supply.
	All LEDs have been deactivated by remote control	Activate LEDs using remote control.
Only blue LED is on	Test input is not connected	Check wiring. The blue and blue/white cable must be connected to the test input or the power supply.
Detection LED remains green	Detection field too small or deactivated	Check size of fields.
		Launch a teach-in.
	Object size is too small	Decrease minimum onject size.
Detection LED remains red	Someone/Something is in the detection field	Step out of the field and/or remove the any object(s) from the field.
	Field is touching floor/wall/door – this leads to detection	Activate the 3 red beams and check if the position of the sensor is correct. If not, adjust the hex screws.
		Verify the field size.
		Launch a teach-in.
Orange LED flashing and detection LEDs are red	No background (reference point) is found	Check position of sensor.
		Check the mounting side setting. If no reference point is found, set the mounting side to value 3 to 5.
		Launch a new teach-in.
	Sensor is masked	Verify and clean the front screens with a damp cloth.
Orange LED is on Both detection LEDs are orange	Power supply voltage exceeds acceptable limits	Check power supply voltage.
	Sensor exceeds temperature limits	Verify the temperature of the environment. Protect the sensor from sunlight using a cover, if necessary.
	Internal error	Wait a few seconds. If the LED remains ON, reset the power supply. If the LED turns on again, replace the sensor.
Sensor does not respond to the remote control	30 minutes after last use, sensor locks access to RC	Cut and restore power supply. RC is accessible again for 30 minutes.
	Remote control batteries not installed properly or are dead	Check battery orientation or replace the batteries.
	Remote control not pointed correctly	Point the remote control towards the sensor, but with a slight angle. The RC should not be pointed in a right angle in front of the sensor.
	Reflective object is close to the sensor	Avoid highly reflective material in proximity to the sensor.
Sensor does not unlock	Access code needs entered or an incorrect code was used	Cycle power supply. No code is required to unlock during the first minute after powering.

TECHNICAL SPECIFICATIONS

Technology	LASER scanner, time-of-flight measurement (4 laser curtains)
Detection mode	motion and presence
Max. detection field	32' × 32'
Remission factor	>2%
Angular resolution	0.3516°
Emission characteristics **IR laser:** **Red visible laser:**	 wavelength 905 nm; max. output pulse power 75 W (CLASS 1) wavelength 650 nm; max. output CW power 3 mW (CLASS 3R)
Supply voltage	10 – 35 VDC @ sensor side
Power consumption	<5 W
Peak current at power-on:	1.8 A (max. 80 ms @ 35 V)
Cable length:	33'
Response time Motion detection: Presence detection:	 typ. 200 ms (adjustable) typ. 20 ms (max. 80 ms)
Output: Max. switching voltage: Max. switching current: Switching time: Output resistance: Voltage drop on output: Leakage current:	2 electronic relays (galvanic isolated – polarity free) 35 VDC / 24 VAC 80 mA (resistive) t_{ON}=5 ms; t_{OFF}=5 ms typ 30 Ω <0.7 V @ 20 mA <10 µA
Test input: Max. contact voltage: Voltage threshold:	1 optocoupler (galvanic isolated - polarity free) 30 VDC (over-voltage protected) Log. H: >8 VDC Log. L: <3 VDC
LED-signal:	1 blue LED: power-on status 1 orange LED: error status 2 bi-colored LEDs: detection/output status (green = no detection, red = detection)
Dimensions:	3 ⅝"× 2 ¾"× 5"(W × H × D) mounting bracket: + ½"
Material / Colour:	PC/ASA, black
Mounting angles on bracket:	-45°, 0°, 45°
Rotation angles on bracket:	-5 – 5° (lockable)
Tilt angles on bracket:	-3 – 3°
Protection degree:	IP65
Temperature range:	powered: -22 – 140 °F unpowered: 14 – 140 °F
Humidity:	0 – 95% non-condensing
Vibrations:	<2 G
Pollution on front screens:	max. 30%; homogenous
Norm conformity:	IEC 61000-6-2; IEC 61000-6-3; IEC 60950-1; IEC 60825-1 ISO 13849-1 (PI "d" CAT 2); IEC 62061 (SIL 2); IEC 61496-1 (Type 2)

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

BEA INSTALLATION/SERVICE COMPLIANCE EXPECTATIONS

BEA, the sensor manufacturer, cannot be held responsible for incorrect installations or inappropriate adjustments of the sensor/device; therefore, BEA does not guarantee any use of the sensor outside of its intended purpose.

BEA strongly recommends that installation and service technicians be AAADM-certified for pedestrian doors, IDA-certified for doors/gates, and factory-trained for the type of door/gate system.

Installers and service personnel are responsible for executing a risk assessment following each installation/service performed, ensuring that the sensor system installation is compliant with local, national, and international regulations, codes, and standards.

Once installation or service work is complete, a safety inspection of the door/gate shall be performed per the door/gate manufacturer recommendations and/or per AAADM/ANSI/DASMA guidelines (where applicable) for best industry practices. Safety inspections must be performed during each service call – examples of these safety inspections can be found on an AAADM safety information label (e.g. ANSI/DASMA 102, ANSI/DASMA 107).

Verify that all appropriate industry signage and warning labels are in place.

AADM ANSI DASMA DHI IDA