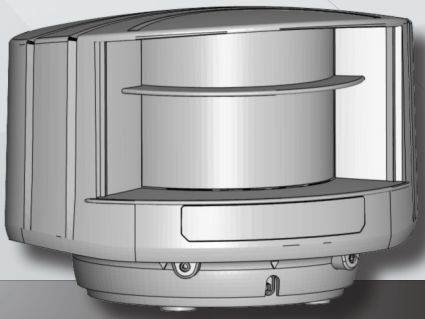
EN



LZR®-H100

LASER SCANNER FOR BARRIERS & GATES

with max. detection range of 32′ × 32′

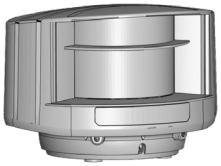
User's Guide

Visit website for available languages of this document.

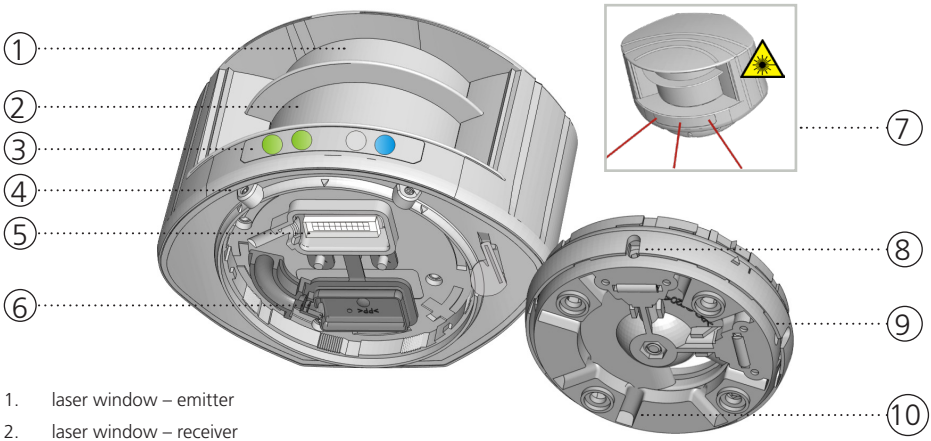
WHAT'S IN THE BOX

SOLD SEPARATELY

BEA's ***Universal Remote Control (10REMOTE)*** *is required for installation and setup.*



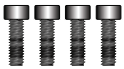
LZR-H100
(10LZRH100)



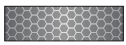
1. laser window – emitter
2. laser window – receiver
3. LEDs (4)
4. position lock screw (2)
5. connector
6. protective cover for connector
7. visible laser beams (3)
8. notches for tilt angle adjustment (2)
9. adjustable bracket (included with sensor)
10. cable conduits (4)

Cable
(35.1242)

Screws
(50.0048)



Reflective Sticker
(41.1916)



User's Guide
(75.5984)

Application Quick Guide
(75.0099)

Application Quick Guide
(75.0100)

Application Quick Guide
(75.0101)

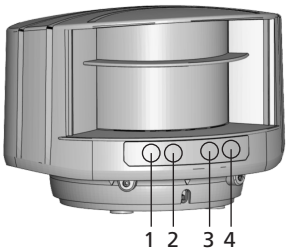
Mounting Template
(42.5004)

SYMBOLS USED IN THIS DOCUMENT

Caution! Laser radiation	Remote control sequence	Possible remote control adjustments	Factory values	LED flashes	LED flashes quickly

UNDERSTANDING THE LED PANEL

WHICH IS WHICH?



1 Motion Field Detection LED
2 Presence Field Detection LED
3 Error LED
4 Power LED

WHAT DO THE COLORS MEAN?

Motion/Presence Field LEDs

- detection — *red*
- no detection — *green*

Error LED

- error — *orange*
- no error — *off*

Power LED

- power — *blue*
- no power — *off*

SOME EXAMPLES

LEDs at power-on
Correct positioning is needed

Power on without monitoring signal
Connect blue/white and blue wires to monitoring (if available) or power supply (see Wiring section, page 10).

no detection

motion + presence detection

motion detection only

presence detection only

ADDITIONAL INFO

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

TECHNICAL SPECIFICATIONS

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

TECHNOLOGY / PERFORMANCE

Technology	laser scanner, time-of-flight measurement (4 laser curtains)
Detection mode	motion and presence
max. detection field	32′ × 32′ (9 ¾ m)
min. detection field (safety)	1′ 8″ (½ m)
Remission factor	> 2%
Angular resolution	0.3516°
Emission characteristics	
IR laser	wavelength 905 nm; output power 0.10mW (CLASS 1)
red visible laser	wavelength 635 nm; output power 0.95mW (CLASS 2)

ELECTRICAL

Supply voltage	10 – 35 VDC
Power consumption	< 5 W
Peak current @ power-on	1.8 A (max. 80 ms @ 35 V)
Response time	
motion detection	typ. 200 ms (adjustable)
presence detection	typ. 20 ms (max. 80 ms)
Output	2 electronic relays (galvanic-isolated – polarity-free)
max. switching voltage	35 VDC / 24 VAC
max. switching current	80 mA (resistive)
switching time	tON = 5 ms; tOFF = 5 ms
output resistance	typ 30 Ω
voltage drop on output	< 0.7 V @ 20 mA
leakage current	< 10 µA
Test input	2 optocouplers (galvanic-isolated – polarity-free)
max. contact voltage	30 VDC (over-voltage protected)
voltage threshold	Log. H: > 8 VDC Log. L: < 3 VDC

PHYSICAL

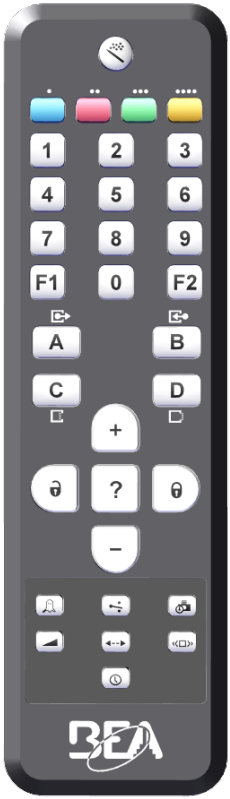
LED signal	1 blue LED: power-on status 1 orange LED: error status 2 bi-colored LEDs: detection/output status (green = no detection, red = detection)
Dimensions	3 ⅝″ × 2 ¾″ × 5″ (W × H × D) mounting bracket: + ½″
Material	PC/ASA
Color	Black
Mounting angles on bracket	-45°, 0°, 45°
Rotation angles on bracket	-5 – 5° (lockable)
Tilt angles on bracket	-3 – 3°
Cable length	33′
Protection degree	NEMA 4 / IP65
Temperature range	powered: -22 – 140 °F (-30 – 60 °C) unpowered: 14 – 140 °F (-10 – 60 °C)
Humidity	0 – 95% non-condensing
Vibrations	< 2G
Pollution on front screen	max. 30%, homogenous

COMPLIANCE

Compliance	2006/95/EC: LVD; 2002/95/EC: RoHS; 2004/108/EC: EMC; IEC 60529:2001; IEC 61000-6-2:2005; IEC 61000-6-3:2006

SOLD SEPARATELY

*BEA's **Universal Remote Control** (10REMOTE) is sold separately and is required for installation and setup of the LZR-H100.*



MAGIC WAND button = sensor programming (teach-in)

color buttons (not used)

number keys (0 – 9)

OUTPUT FUNCTION = selects motion and/or presence for each field

ACTIVE DETECTION CURTAINS = turns individual fields on and off

Motion field width

Motion field depth

Presence field width

Presence field depth

UNLOCK = unlocks sensor for programming (red LED flashes when ready)

QUESTION MARK = check value

LOCK = locks sensor to prevent unwanted changes

Immunity

Output Configuration

Max. Presence Time

Pedestrian Filter

Detection Trajectory

Mounting Side / Reference

Detection Delay

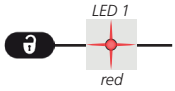
Continue to next page for Commonly Used remote control sequences.

See pages 12, 13 for more information on specific parameters.

The sensor will lock access to the remote control session after 30 minutes of idle time. To regain access, you must cycle the power.

COMMONLY USED REMOTE CONTROL SEQUENCES

The sensor will lock access to the remote control session after 30 minutes of idle time. To regain access, you must cycle the power.

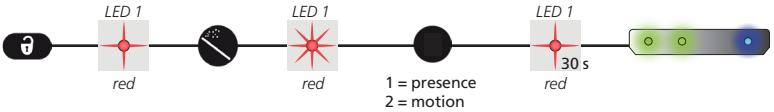


After unlocking, the red LED flashes and the sensor can be adjusted by remote control.

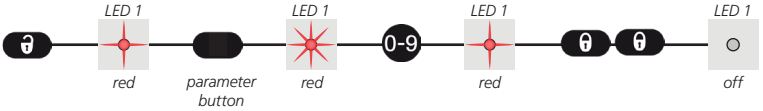
If the red LED flashes quickly after unlocking, you need to enter an access code from 1 to 4 digits.

To end an adjustment session, always lock the sensor.

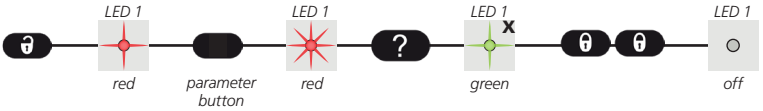
PERFORMING A TEACH-IN



ADJUSTING ONE OR MORE PARAMETERS



CHECKING A VALUE

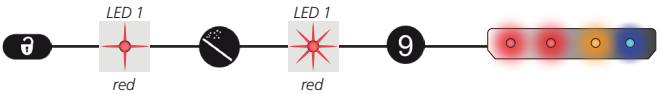


X = number of flashes = value of the parameter

example: 

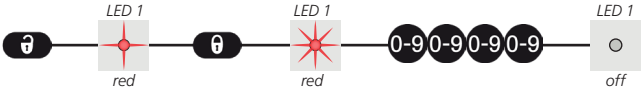
= field width: 4.2 m

RESTORING TO FACTORY VALUES



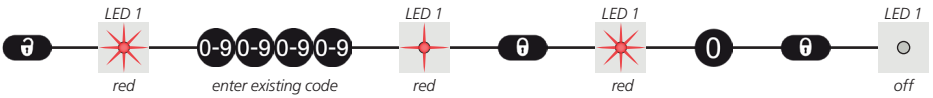
ACCESS CODES

SAVING A CODE



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

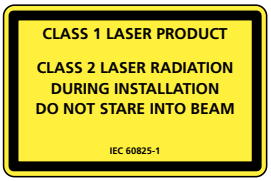
DELETING A CODE



DELETING AN UNKNOWN CODE

Cycle power to the sensor and then use the following sequence within the first minute of power:

SAFETY



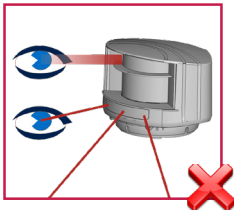
The device emits invisible (IR) and visible laser radiation.

IR laser: wavelength 905nm; output power 0.10mW
(Class 1 according to IEC 60825-1)
Visible laser: wavelength 635nm; output power 0.95mW
(Class 2 according to IEC 60825-1)

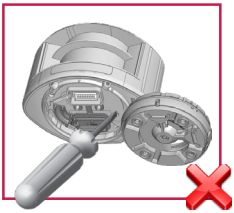
The visible laser beams are inactive during normal operation.
The installer can activate the visible lasers if needed.

Do not look into visible laser beams.

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

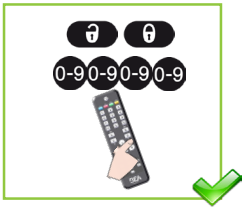


Do not look into the laser emitter or the visible red laser beams.



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

Only trained and qualified personnel are recommended to install and set up the sensor.



After installation, enter an access code by remote control.

This sensor is designed to be used as a motion and presence sensor to cause the opening and/or closing process of a gate or barrier. The installer of the system is responsible for installing the sensor and 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.

BEA, INC. INSTALLATION/SERVICE COMPLIANCE EXPECTATIONS

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

BEA, Inc. 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/device system performance is compliant with local, national, and international regulations, codes, and standards.

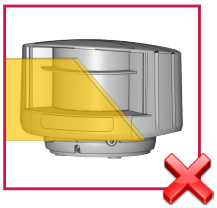
Once installation or service work is complete, a safety inspection of the door/gate shall be performed per the door/gate manufacturer's recommendations and/or per AAADM/ANSI/DASMA guidelines (where applicable) for best industry practices. Safety inspections must be performed during each service call – examples of these safety inspections can be found on an AAADM safety information label (e.g. ANSI/DASMA 102, ANSI/DASMA 107, UL294, UL325, and International Building Code).

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

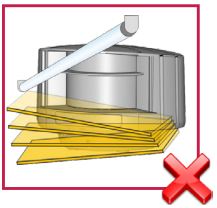
AAADM ANSI DASMA IDA

INSTALLATION TIPS

Avoid extreme vibrations.

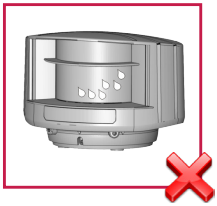


Do not cover the laser windows.

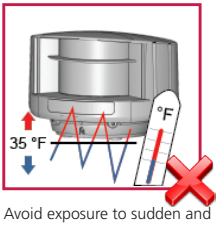


Avoid moving objects and light sources in front of the laser window.

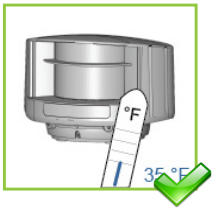
Avoid the presence of smoke and fog in the detection field.



Avoid condensation on the laser windows.

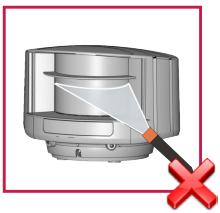


Avoid exposure to sudden and extreme temperature changes.



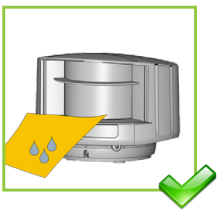
Keep the sensor permanently powered in environments where the temperature can drop below 35 °F.

CLEANING TIPS



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, damp microfiber cloth.

APPLICATION QUICK GUIDES

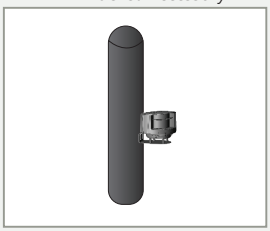
This User's Guide references the Application Quick Guides that contain application-specific instructions for LZR-H100 installation.

Select the correct document for your installation and consult this User's Guide when more explanatory information is needed.

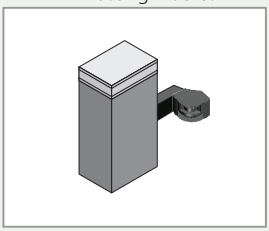
- **75.0099 LZR-H100 on Barrier Arms**
- **75.0100 LZR-H100 on Sliding Gates**
- **75.0101 LZR-H100 on Swing Gates**

1 MOUNTING

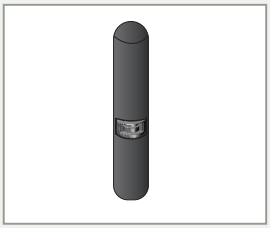
mounted on the LZR Bracket Accessory



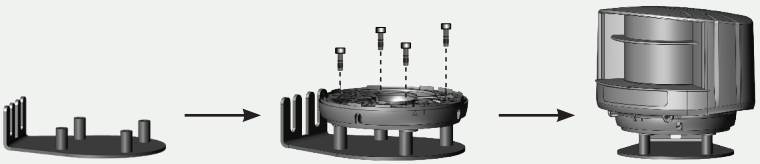
mounted in the LZR Housing Bracket



mounted recessed in a bollard



1. Mount the desired bracket (LBA/LHB, sold separately), unless recessed-mounting inside a bollard.
2. Mount the sensor to the location or previously installed bracket. *Use the provided mounting template if not mounting directly to a bracket.*



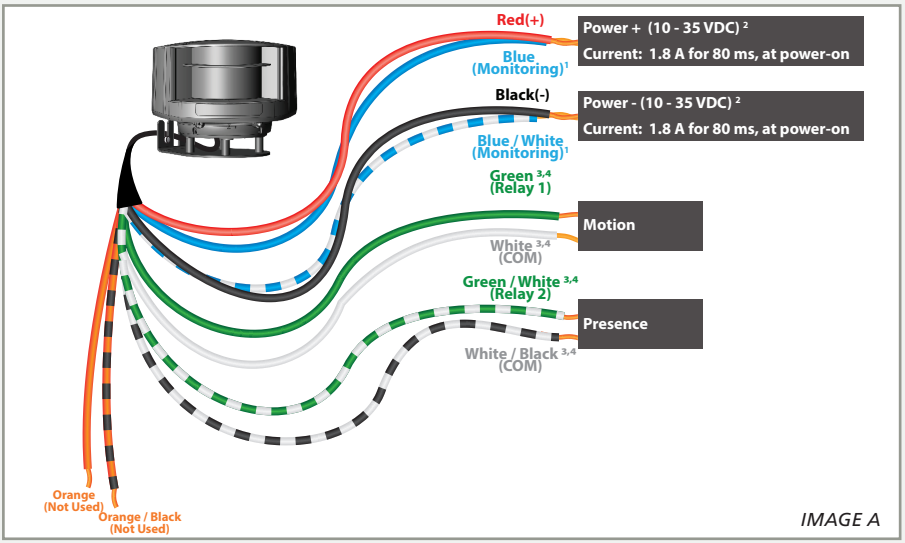
hexagon socket-head screw, DIN 912 M4 × 6mm

See Appendix A for helpful mounting information.

Follow the appropriate Application Quick Guide for more detailed instruction on mounting.

2 WIRING

Wire the sensor to the control according to the appropriate Application Quick Guide.

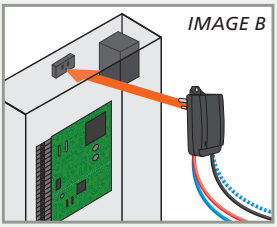


[1] If monitoring is not utilized, apply power to monitoring wires. If power is not applied to these wires, you will see only the power LED illuminated (blue), indicating that the sensor is not wired correctly.

[2] BEA recommends a separate power supply (10PSST242, see IMAGE B) if the VDC and/or current above cannot be confirmed.

[3] If the motion or presence field is not needed for your application, cap off the associated wires.

[4] The sensor is defaulted with motion field output at N.O. and presence field output as N.C. To adjust output logic, see below.



1 MOT = NO, PRES = NC
2 MOT = NC, PRES = NO
3 MOT = NC, PRES = NC
4 MOT = NO, PRES = NO

3 FIELD POSITIONING

1. Activate visible LASER beams and align the 0° and 90° beams accordingly.

   Do not look into visible LASER beams.

2. Program the sensor for mounting side (left or right) + reference choice (with or without).

See Appendix B for helpful field positioning information.

See Appendix C to learn more about "reference".

Follow the appropriate Application Quick Guide for more detailed instruction.

4 FIELD SETUP

Follow the appropriate Application Quick Guide for more detailed instruction on field setup.

PROGRAMMING METRIC DIMENSIONS:

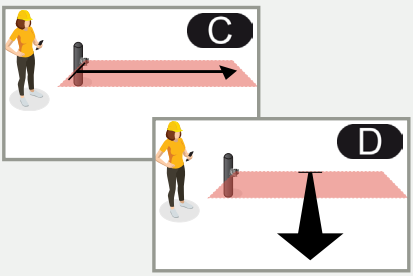
The sensor understands only metric values.

Scan the QR code with your smartphone for a conversion calculator, or see Appendix D (page 20) for a conversion chart.

Additionally, the sensor reads to one decimal point, so you must round to nearest tenth.

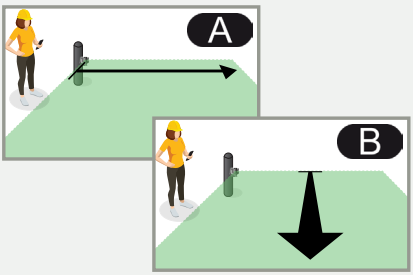
EXAMPLE: You want to set your presence field width to 5 ft wide. The metric conversion is 1.524 meters. What you will enter on the remote control: 🔒 C 1 5

PRESENCE FIELD



1. Perform a teach-in of the presence field.
   Be sure to clear the field after starting the teach-in.
   🔒 — 1
2. Set the presence field dimensions.
   🔒 — C / D — 0-9 0-9 — 🔒 🔒
3. Perform a final teach-in.
   🔒 — 1
4. Walk test after field setup is complete.

MOTION FIELD



1. Perform a teach-in of the motion field.
   Be sure to clear the field after starting the teach-in.
   🔒 — 2
2. Set the motion field dimensions.
   🔒 — A / B — 0-9 0-9 — 🔒 🔒
3. Perform a final teach-in.
   🔒 — 2
4. Walk test after field setup is complete.

INCREMENTAL INCREASE/DECREASE

DImensions can also be adjusted incrementally (10 cm / ~4”), using the remote control.

EXAMPLE: You want to add 4” to the Presence Field width. 🔒 C +

EXAMPLE: You want to add 8” to the Presence Field depth. 🔒 D + D +

5 FEATURES

FACTORY VALUE

Listed below are all customizable LZR-H100 features and their settings.

Follow the appropriate Application Quick Guide for more detailed instruction on fine-tuning for your application.

PEDESTRIAN FILTER FOR MOTION FIELD

Objects smaller than the selected value will be ignored from detection within the motion field.
Select value 3 or higher to reject pedestrians.

1	2	3	4	5	6
off	19"	25"	28"	39"	47"

approximate values

MAX PRESENCE TIME FOR MOTION FIELD

This is the amount of time output 1 remains active after an object stops in the motion field.
Select value 2 or lower to reduce the risk of tailgating.

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 FOR MOTION FIELD

This is the amount of time that detection is delayed in the motion field.
Increase the value in case of heavy rain, snow, or fog 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

DETECTION FIELD REDIRECTION

This feature redirects the detection field from the current output.
Select 1 or 2 to redirect the presence field through output 1.

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

M P

NOTE: When set to 1 or 2, the pedestrian filter is cancelled out.

OUTPUT CONFIGURATION

This feature controls output logic.

	1	2	3	4
RELAY 1 (motion)	N.O.	N.C.	N.C.	N.O.
RELAY 2 (presence)	N.C.	N.O.	N.C.	N.O.

M P

N.O. = normally open
N.C. = normally closed

IMMUNITY FILTER

This feature increases the time an object needs to be seen in the same position to cause a detection.
Set to High for environments with fog.

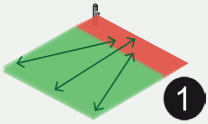
1	2
standard	high

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

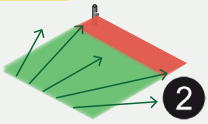
DETECTION DIRECTION FOR MOTION FIELD

This feature selects the expected direction of approaching traffic within the motion field.
Value 3 is recommended for most applications.

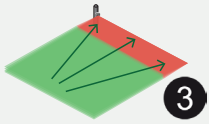
1	2	3	4	5	6	7	8
BIDIR.	UNI 400%	UNI 200%	UNI 100%	UNI 50%	UNI CENTER	UNI RIGHT	UNI LEFT



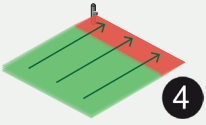
bidirectional detection approaching + departing



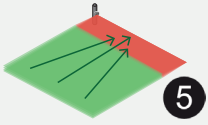
unidirectional detection **approaching in any direction**



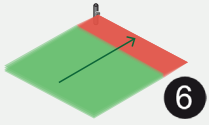
unidirectional detection only approaching **towards the barrier/gate**



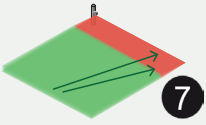
unidirectional detection only approaching **within width of barrier/gate**



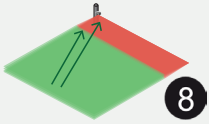
unidirectional detection only approaching **towards central zone of barrier/gate**



unidirectional detection only approaching **towards center of barrier/gate**



unidirectional detection only approaching **towards right side of barrier/gate**



unidirectional detection only approaching **towards left side of barrier/gate**

ACTIVE DETECTION CURTAINS

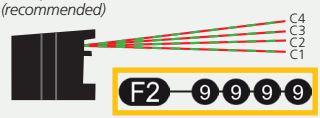
Advanced Users only! *Contact BEA Technical Support for additional questions.*

This feature activates or deactivates individual curtains from detection field.
Set to 0000 to make all detection curtains inactive.
Always use the maximum number of active curtains according to your environment and the objects to be excluded from the detection field.

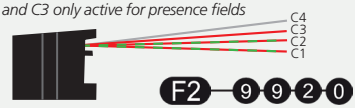
F2	x	x	x	x
CURTAIN	C1	C2	C3	C4

- 0 curtain is inactive on both fields
- 1 curtain is active on motion field
- 2 curtain is active on presence field
- 9 curtain is active on both fields

Example 1: *all curtains are active on both fields (recommended)*



Example 2: *C1 + C2 curtains are active on both fields and C3 only active for presence fields*



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	Monitoring input is not connected	Check wiring. The blue and blue/white cable must be connected to the monitoring 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 object size.
	Directional setting not set correctly	Refer to "Detection Direction for Motion Field" (page 14).
	Sensor mounted facing wrong direction	Refer to Appendix B (page 18) for proper alignment of visible LASER beams.
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.
	Sensor mounted incorrectly	Mount the sensor correctly. Refer to Appendix A (page 17) for proper sensor orientation.
Red LED turns on and off randomly	Environmental disturbances (fog, debris, etc.)	Set Immunity to high.
		Verify the Detection Delay setting.
		Clear the field of any debris.
		Clean the sensor lens.
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.
	No mounting side selected	Set mounting side. See Appendix C (page 19).

continued on next page...

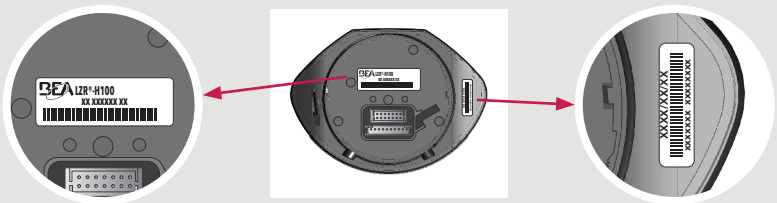
TROUBLESHOOTING (cont.)

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 remote control	Cut and restore power supply. remote control 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 remote control 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.
Gate or barrier arm not responding correctly	Sensor not wired correctly	Verify correct wiring from sensor to operator. Verify Ouput Configuration on sensor is set correctly (see page 12).
Sensor does not unlock	Access code needs entered or an incorrect code was used	Cut and restore power supply. No code is required to unlock during the first minute after powering.

Can't find your answer?
Visit www.beainc.com or scan QR code for Frequently Asked Questions!

Before contacting BEA Technical Support, locate the serial and CAN numbers of your sensor.

You will need to remove the sensor from its mounting location to view the label.

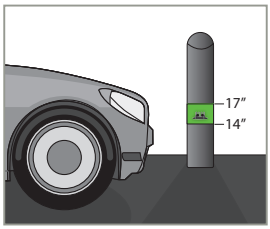


SERIAL NUMBER

CAN NUMBER

APPENDICES

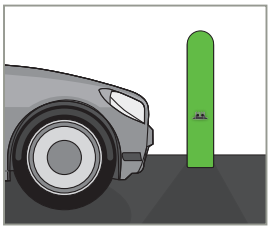
Mounting Height



Install the sensor at average vehicle bumper height (~14 – 17 inches from ground).

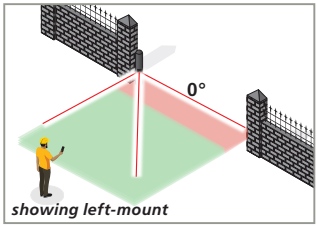
If the barrier/gate is only used by trucks, the mouting height may be increased.

Mounting Location



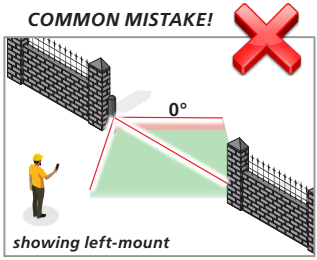
Install the sensor on the side of the post that faces the traffic lane.

Sensor Orientation



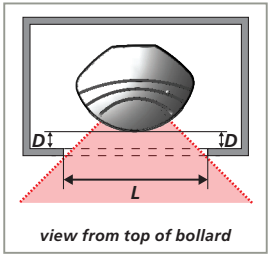
While positioning the sensor, consider beam alignment. The 0° beam will need to be parallel with the opening. Turn on visible beams, if necessary.

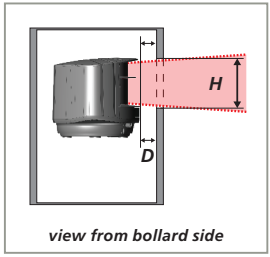
COMMON MISTAKE!



Do not position the sensor directly facing the opening.

Detection Field Clearance





D (in)	L_{min} (in)	H_{min} (in)
2	9.5	2
4	14	2.3
6	19	2.5

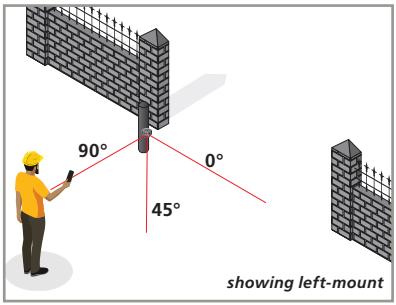
When recessing in a bollard, ensure there is adequate clearance for the detection field.

- no obstructing covers (glass or plastic)
- the opening itself on the bollard is not obstructing the detection field (see image for clearance dimensions)

HORIZONTAL ALIGNMENT

The visible LASER beams help the installer to see where the width and depth perimeters are aligned.

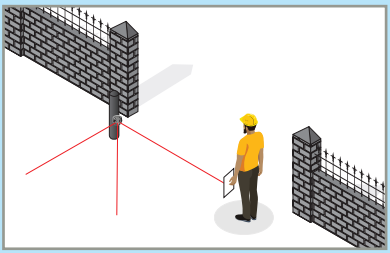
- The 0° beam extends across the opening (barrier arm or gate).
- The 90° beam extends down the traffic lane.
- An additional 45° beam allows the installer to see the diagonal alignment of the field.



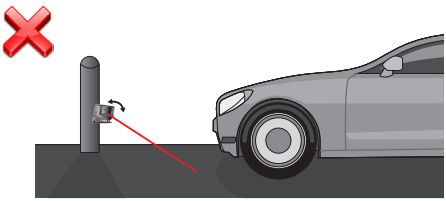
showing left-mount

VISIBLE BEAM ALIGNMENT - TIP!

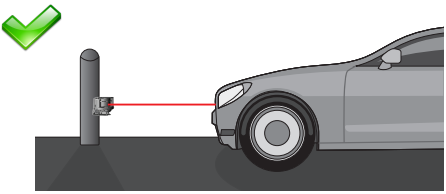
To more clearly track the path of the LASER beam, hold a sheet of paper in the path of the beam, and then walk away from the sensor while ensuring the beam is still showing on the paper.



VERTICAL ALIGNMENT



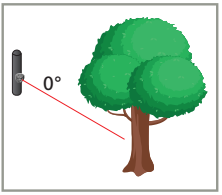
Be sure that the bracket is mounted level and that the sensor's tilt is level with the tilt angle screw. If it is not, it could cause the detection field plane to be vertically misaligned.



When mounted level (and at the correct height - see Appendix A), the detection field should be aligned with the bumper of oncoming traffic.

WHAT IS "REFERENCE"?

"Reference" is a feature in the LZR-H100 that provides a redundant photo-eye function. This feature ensures proper alignment of the presence field.

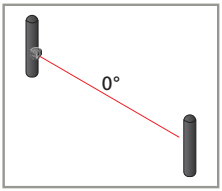


WHY SHOULD I USE "REFERENCE"?

This feature ensures proper positioning and redundant functioning of the presence field.

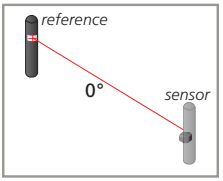
If the sensor's mounting or LASER alignment is disturbed, the reference will provide a permanent signal to the operator to hold open.

IMPORTANT: If there is not an object within 32 feet to receive the 0° beam, do not use the reference feature (see step 2 below, settings 3 and 4). If used (settings 1 and 2), the teach-in will continue to fail.



HOW TO USE "REFERENCE"

1. Adhere the retro-reflective sticker to the desired reference location. This could be a bollard, wall, or even a tree. Be sure that it is aligned with the 0° visible LASER beam (both horizontally and vertically).



STICKER LOCATION CRITERIA

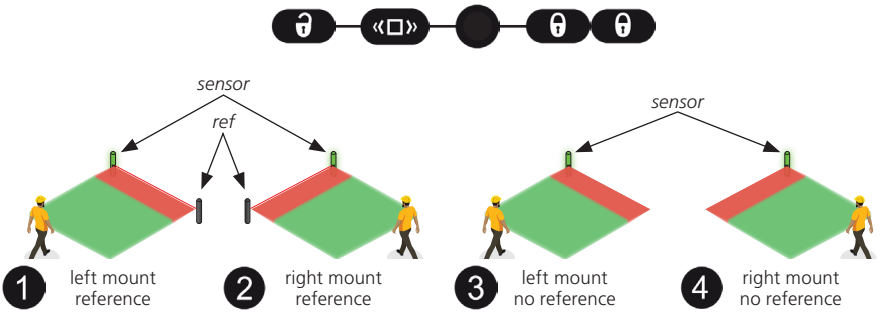
- is at least 6" wide or a flat, reflective surface
- is positioned at the end of the barrier arm / gate opening or beyond
- is positioned to align with the 0° LASER beam
- is secured to the ground and not subject to vibrations

FOR BEST RESULTS

- use the reflective sticker
- place the sticker horizontally on a cylindrical surface of the structure
- center the red spot on the sticker

IMPORTANT: Once determined, the reference sticker should not be changed or moved. Any change to the reference point will cause the sensor's reference to go into permanent detection.

2. Using the remote control, program the sensor for the appropriate Mounting Side / Reference.



** ref = reference*

Imperial measurement	Metric conversion	Value to enter	Remote control input
1’ 8” (min)	0.508 m	0.5	ABCD 0 5
3’	0.9144 m	0.9	ABCD 0 9
5’	1.5240 m	1.5	ABCD 1 5
7’	2.1336 m	2.1	ABCD 2 1
9’	2.7432 m	2.7	ABCD 2 7
11’	3.3528 m	3.4	ABCD 3 4
13’	3.9624 m	4.0	ABCD 4 0
15’	4.5720 m	4.6	ABCD 4 6
17’	5.1816 m	5.2	ABCD 5 2
19’	5.7912 m	5.8	ABCD 5 8
21’	6.4008 m	6.4	ABCD 6 4
23’	7.0104 m	7.0	ABCD 7 0
25’	7.6200 m	7.6	ABCD 7 6
27’	8.2296 m	8.2	ABCD 8 2
29’	8.8392 m	8.8	ABCD 8 8
31’ 6” (max)	9.6012 m	9.6	ABCD 9 6

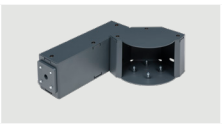
A = motion width
B = motion depth
C = presence width
D = presence depth

ACCESSORIES AND REPLACEMENT PARTS

ACCESSORIES

10LBA

LZR mounting bracket accessory



10LHB

LZR housing bracket

10REMOTE (required)

BEA universal remote control

10PSMDR2024

100 – 240 VAC, 24 VDC power supply

REPLACEMENT PARTS

10LZRH100

LZR-H100 sensor

35.1242

30’ harness, 8-conductor