



LZR FLATSCAN S Compact Laser Sensor User Manual

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LZR FLATSCAN S Compact Laser Sensor



Product Information

Specifications

- **Technology:** LASER sensor, time-of-flight measurement
- **Detection mode:** presence
- **Max. detection range:** [insert value]
- **Opening angle:** [insert value]
- **Tilt angles:** [insert value]
- **Emission characteristics:**
 - **Wavelength 905nm;** max. output pulse power 25W (CLASS 1)
 - **Wavelength 635nm;** max. output CW power 0.95mW (CLASS 2) visible spot
- **Angular resolution:** [insert value]
- **LEDs:** 1 tri-colored LED: detection / output status
- **Supply voltage:** [insert value]
- **Power consumption:** 2.3W, peak current: 1A
- **Response time:** max. 50ms (+ output activation delay)
- **Output:**
 - **1 opto (galvanic isolation – polarity free):** max. switching voltage 42 VAC/VDC, max. switching current 100mA
 - **1 relay (free of potential contact):** max. contact voltage 42 VAC/VDC, max. contact current 1A (resistive), max. switching power 30W DC / 60 VAC
- **Dimensions:** [insert value]
- **Color:** black
- **Protection degree:** IP66 (IEC 60529)
- **Temperature range (when powered):** [insert value]
- **Humidity:** [insert value]
- **Vibrations:** < 2G
- **Compliance:** IEC 60825-1, IEC 60950-1, IEC 61000-6-2, IEC 61000-6-3, IEC 60529:2001

Product Usage Instructions

Installation

1. Avoid extreme vibrations during installation.
2. Do not cover the laser window.

3. Avoid moving objects and light sources in the detection field.
4. Avoid the presence of smoke and fog in the detection field.
5. Avoid condensation.
6. Avoid exposure to sudden and extreme temperature changes.
7. Do not use dry or dirty towels or aggressive products to clean the laser window.
8. Keep the sensor permanently powered in environments where the temperature can drop below 14o F.
9. Do not look into the laser emitter or the visible red laser beams.
10. Only trained and qualified personnel are recommended to install and set up the sensor.

Maintenance

- Clean the laser window with compressed air.
- When needed, wipe the laser window only with a soft, clean, damp microfiber cloth.

Safety Tips

- CLASS 1 LASER PRODUCT
- CLASS 2 LASER RADIATION
- DURING INSTALLATION DO NOT STARE INTO BEAM
- IEC 60825-1 CLASS 1 LASER PRODUCT

FAQ

1. Q: What is the maximum detection range of the laser sensor?

A: The maximum detection range of the laser sensor is [insert value].

2. Q: Can the laser sensor be used in environments with extreme temperatures?

A: The laser sensor can be used in environments with extreme temperatures, but it should be kept permanently powered in environments where the temperature can drop below 14o F.

3. Q: How should I clean the laser window of the sensor?

A: The laser window should be cleaned with compressed air. If needed, you can also wipe the laser window with a soft, clean, damp microfiber cloth.

4. Q: Can anyone install and set up the sensor?

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

LZR®-FLATSCAN S

- COMPACT LASER SENSOR FOR INDUSTRIAL
- DOORS, GATES, AND BARRIERS
- **MAX. DETECTION RANGE:** 18' × 18'
- User's Guide for product version 0101 and higher. See product label for serial number.

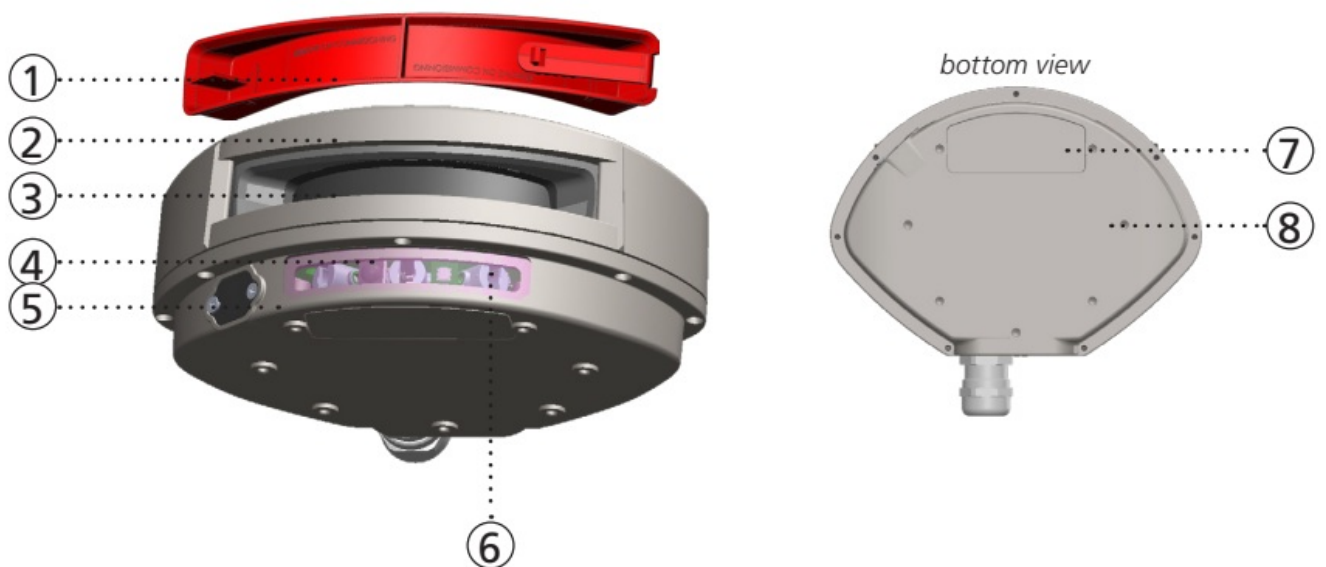
Visit website for available languages of this document.



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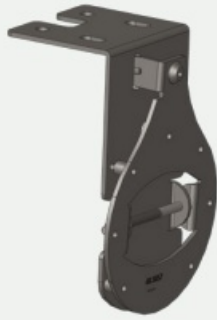
DESCRIPTION

- Flatscan S is a compact, single-curtain, laser sensor with an opening angle of 90°. The sensor provides high-resolution coverage with 400 spots and configurable object size detection according to the given application.
- The laser sensor is CLASS 1 certified device according to IEC 60825-1. The visible laser beams are CLASS 2, and will automatically time out during normal operation.



1. Protective cover (to be removed after mounting)
2. Housing
3. Laser window
4. LED signal
5. USB connector (factory use only)
6. Visible laser beams
7. Internal calibration interface (DO NOT OPEN)
8. Screw hole

SOLD SEPARATELY - REQUIRED FOR INSTALLATION



LZR-FLATSCAN S Mounting Bracket
(10FSSMB)







Universal Remote Control
(10REMOTE)

TECHNICAL SPECIFICATIONS





TECHNOLOGY / PERFORMANCE	
Technology	LASER sensor, time-of-flight measurement
Detection mode	presence
Max. detection range	max. 18' × 18' (13 1/8' @ 5% reflectivity)
Opening angle	90°
Tilt angles	±3° (with bracket)
Emission characteristics	<ul style="list-style-type: none"> wavelength 905nm; max. output pulse power 25W (CLASS 1) wavelength 635nm; max. output CW power 0.95mW (CLASS 2) visible spot
Angular resolution	0.23° (400 spots within 90°)
LEDs	1 tri-colored LED: detection / output status
ELECTRICAL	
Supply voltage	12 – 24 VDC ±15%
Power consumption	≤ 2.3W, peak current: 1A
Response time	max. 50ms (+ output activation delay)
Output	1 opto (galvanic isolation – polarity free)
max. switching voltage	42 VAC/VDC
max. switching current	100mA
	1 relay (free of potential contact)
max. contact voltage	42 VAC/VDC
max. contact current	1A (resistive)
max. switching power	30W DC / 60 VAC
PHYSICAL	
Dimensions	5" (L) × 3 1/2" (H) × 2" (D) (without bracket)
Color	black
Protection degree	IP66 (IEC 60529)
Temperature range (when powered)	-22 – 140 °F (-30 – 60 °C)
Humidity	0 – 95% non-condensing
Vibrations	< 2G
COMPLIANCE	
Compliance	IEC 60825-1, IEC 60950-1, IEC 61000-6-2, IEC 61000-6-3, IEC 60529:2001

LED SIGNALS

COLOR

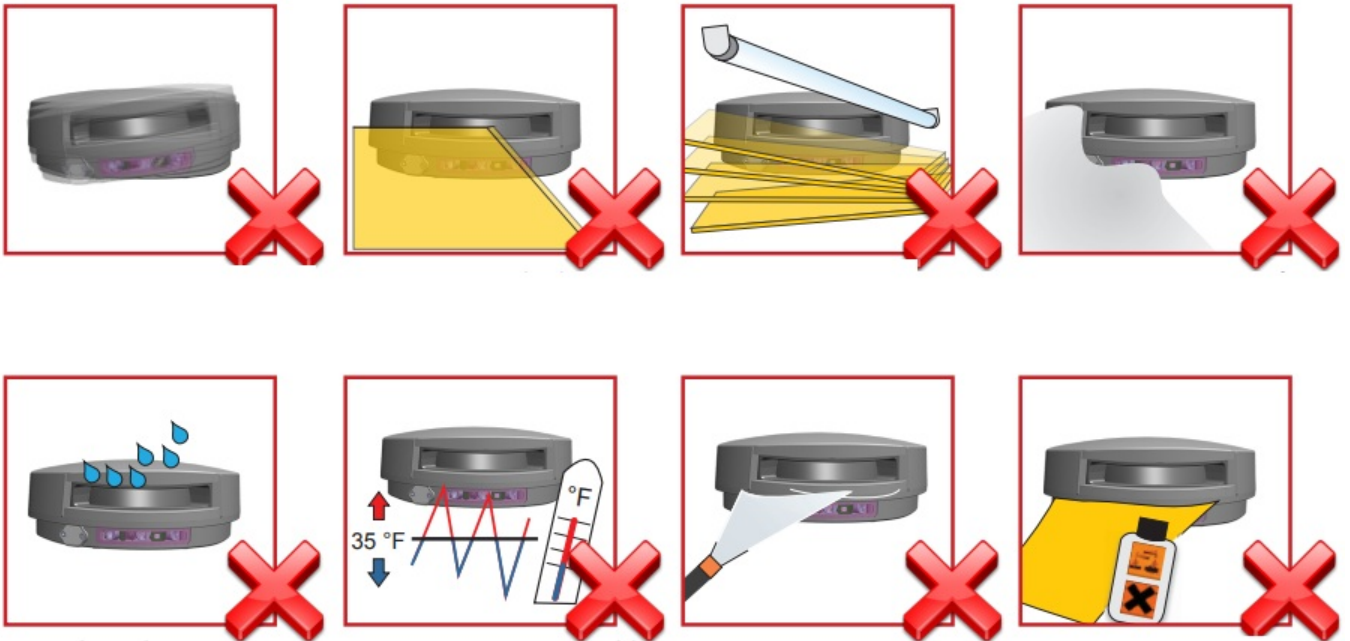
	detection
	power on
	error LED
	no power

BEHAVIOR

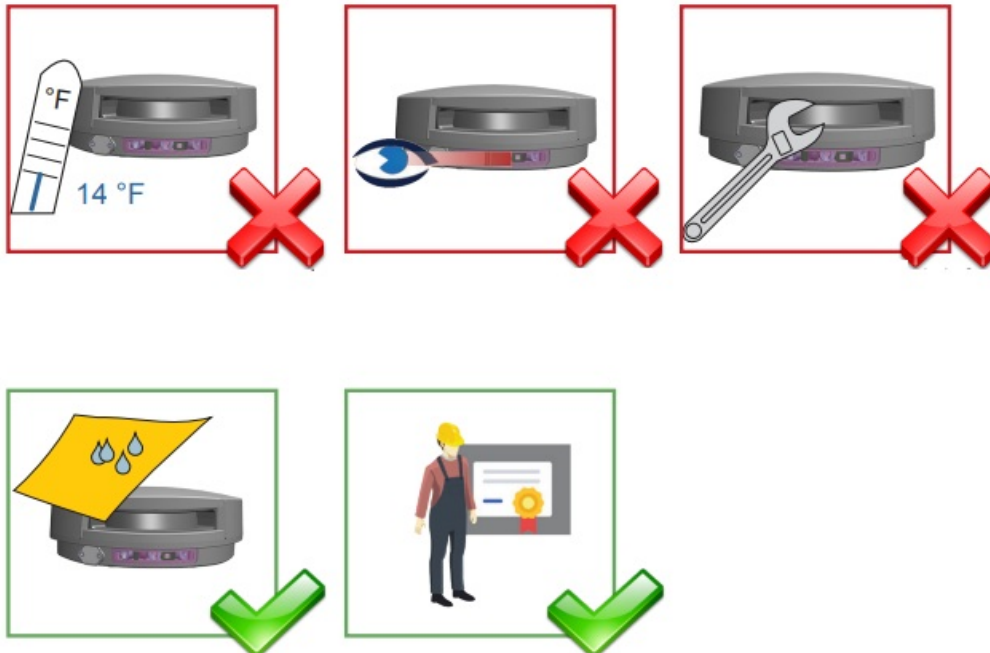
	LED flashes
	LED flashes quick
	LED flashes slowly
	LED is off

INSTALLATION AND MAINTENANCE NOTES

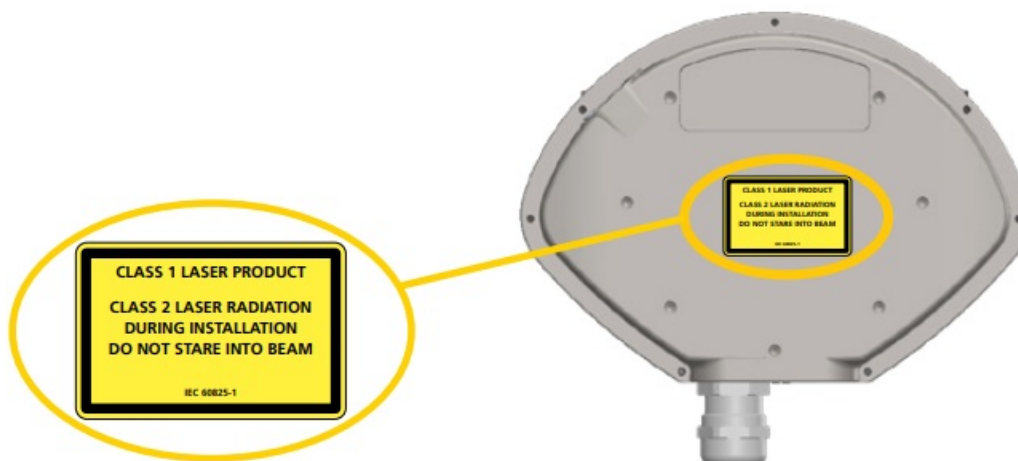
- Avoid extreme vibrations.
- Do not cover the laser window.
- Avoid moving objects and light sources in the detection field.
- Avoid the presence of smoke and fog in the detection field.
- Avoid condensation.
- Avoid exposure to sudden and extreme temperature changes.
- Avoid direct exposure to high pressure cleaning.
- Do not use dry or dirty towels or aggressive products to clean the laser window.



- Keep the sensor permanently powered in environments where the temperature can drop below 14o F.
- Do not look into the laser emitter or the visible red laser beams.
- The warranty is invalid if unauthorized repairs are made or attempted by unauthorized personnel.
- Clean the laser window with compressed air. When needed, wipe the laser window only with a soft, clean, damp microfiber cloth.
- Only trained and qualified personnel are recommended to install and set up the sensor.



SAFETY TIPS



- The device contains IR and visible laser beams.
 - **IR laser:** wavelength 905nm; max. output pulse power 25W
- (Class 1 according to IEC 60825-1)
 - **Visible laser:** wavelength 635nm; max. output CW power 0.95mW
- (Class 2 according to IEC 60825-1)
 - The visible laser beams can be deceived during normal operation. The installer can activate the visible beams if needed.

CAUTION!



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

- Ensure compliance with applicable local, national, and international codes and standards.

SYMBOLS



Caution!
Laser radiation



Attention



Factory values



Note



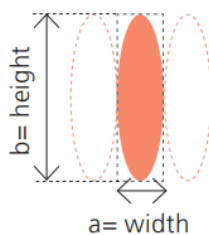
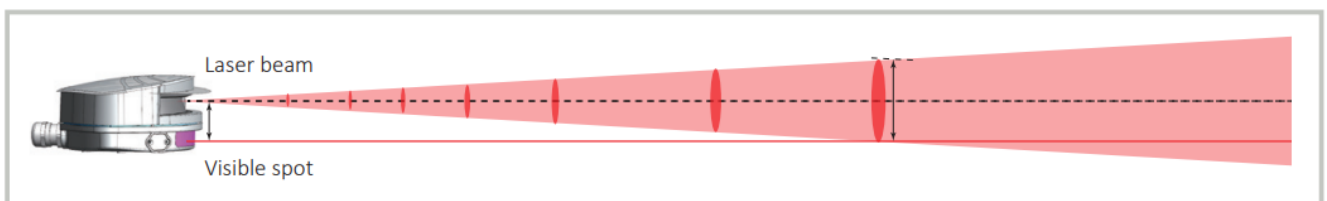
Remote control
sequence



Possible
remote control
adjustments

NOTES ON VISIBLE LASER BEAMS

- Visible laser beams are used for the estimation of curtain coverage during the initial adjustment stage. For precise installation of the sensor, please evaluate your detection field and adjust curtain accordingly (see Detection Field, page 13).
- The shape of the laser spot is oval. The farther the laser spot emits, the more the spot diffuses. Refer to diagram below to calculate the position.
- A visible spot has around $\pm 1/2''$ deviation at 10' distance. Please ensure that the curtain is in the correct position.



Distance (ft)	b (in)	a (in)
3.28	0.49	0.06
6.56	0.98	0.12
9.84	1.48	0.18
13.12	1.97	0.24
16.40	2.46	0.30

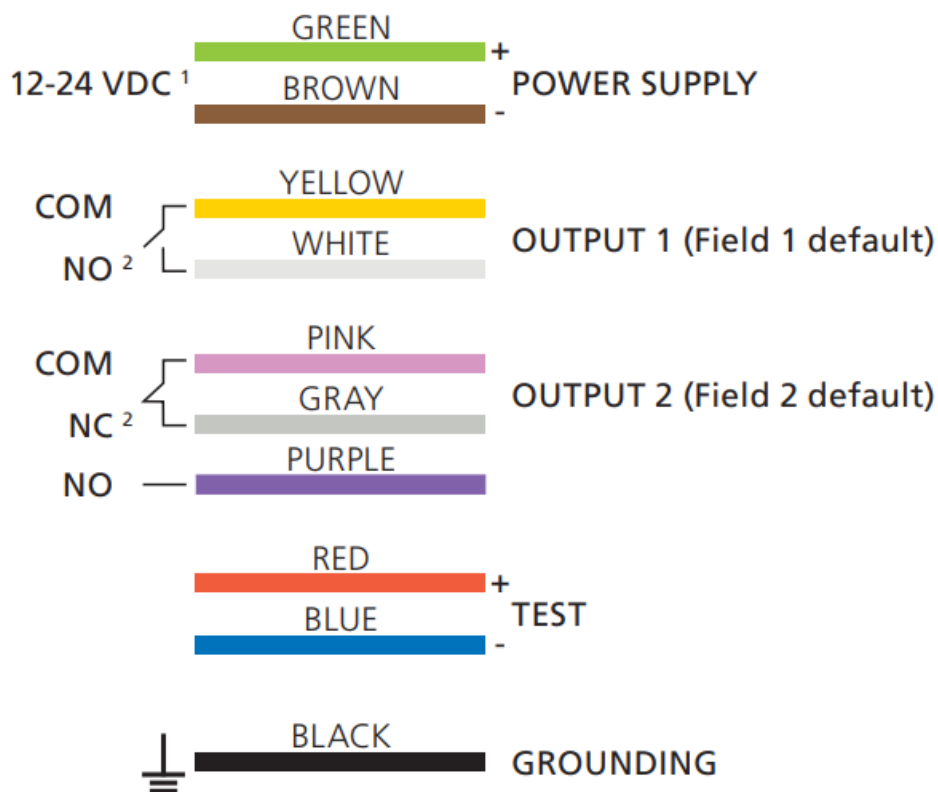
MOUNTING

A mounting bracket is required for FLATSCAN S installation. The instructions in this User's Guide describe the use of FLATSCAN S Mounting Bracket.

- a. Use the sensor mounting screws to secure the sensor to the bracket in the correct position (i.e. laser window at 90°).
- b. Use the Mounting Bracket mounting screws to secure bracket (with sensor) to the desired mounting location.
Note: BEA recommends a mounting height of 14 – 17" for vehicle detection in a horizontal mounting orientation.
- c. If necessary, adjust the angle of the sensor by loosening and tightening the tilt angle screw of the FLATSCAN S Mounting Bracket. Fine-tuning the angle will be done later.
- d. Remove the red, protective cover from the laser window and ensure that nothing is obstructing the window.



WIRING



- If monitoring is not connected, the cable must be wired to the power cable.
- Ensure that the sensor is properly grounded (connected to the earth).

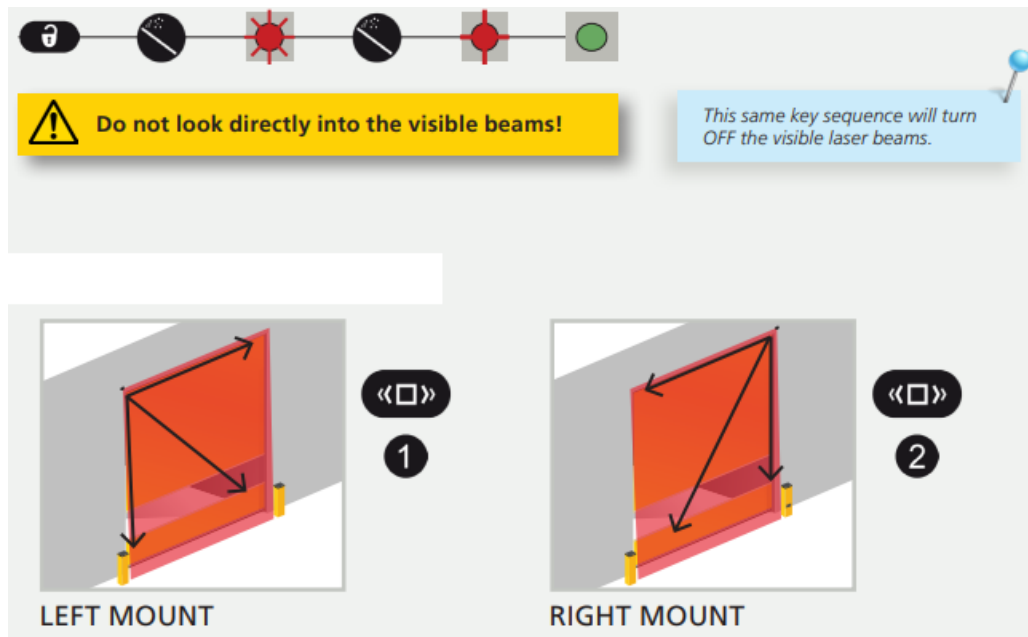
1. If only VAC power is available, a 12V transformer paired with a rectifier must be used. Do not use a 24V transformer and rectifier as this will cause damage to the product.
2. Output status when sensor is operational (can be NO or NC). See page 15, OUTPUT CONFIGURATION.

FIELD POSITIONING

- This section illustrates the field positioning in 3 possible applications (doors, barrier arms, and sliding gates) and the respective field orientations (vertical or horizontal) for each.
- Follow the instructions for your given application.

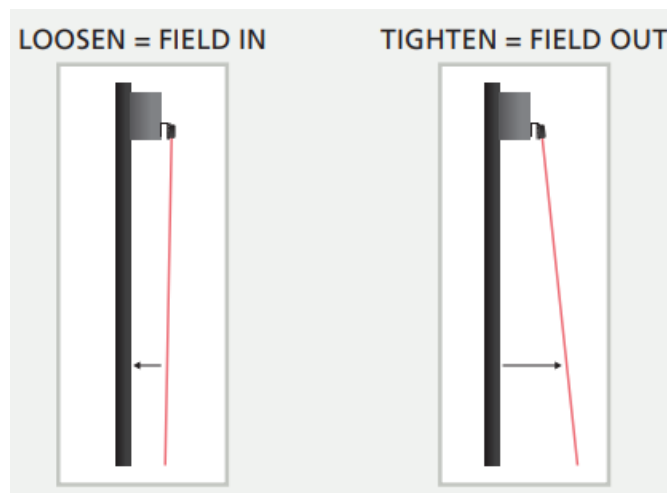
DOORS: Vertical Field

1. Activate visible laser beams.
2. Select mounting side – left or right.



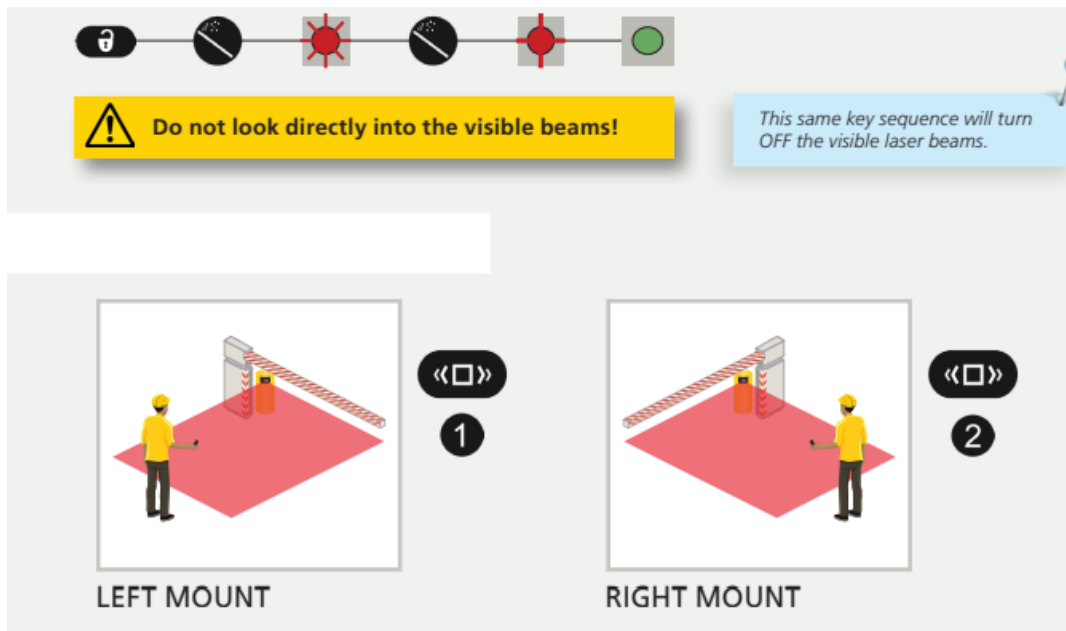
3. If necessary, position the field using the tilt angle screw. Loosen the screw to move the field closer to the door and tighten the screw to move the field away from the door.

NOTE: See page 5 for more information on the visible laser beams.



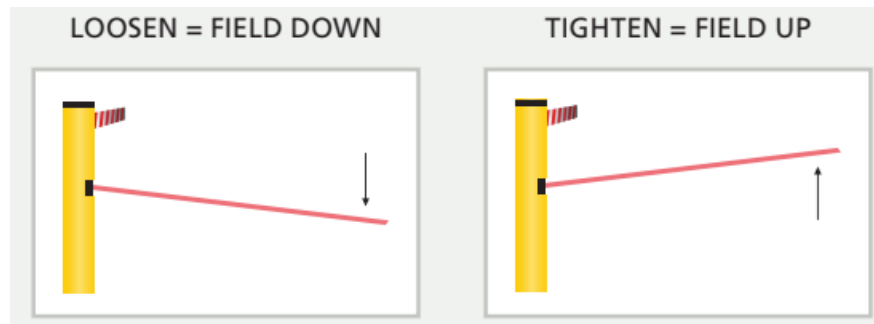
BARRIER ARMS: Horizontal Field

1. Activate visible laser beams.
2. Select mounting side – left or right.



3. If necessary, position the field using the tilt angle screw. Loosen the screw to angle the field down and tighten the screw to angle the field up.

NOTE: See page 5 for more information on the visible laser beams.

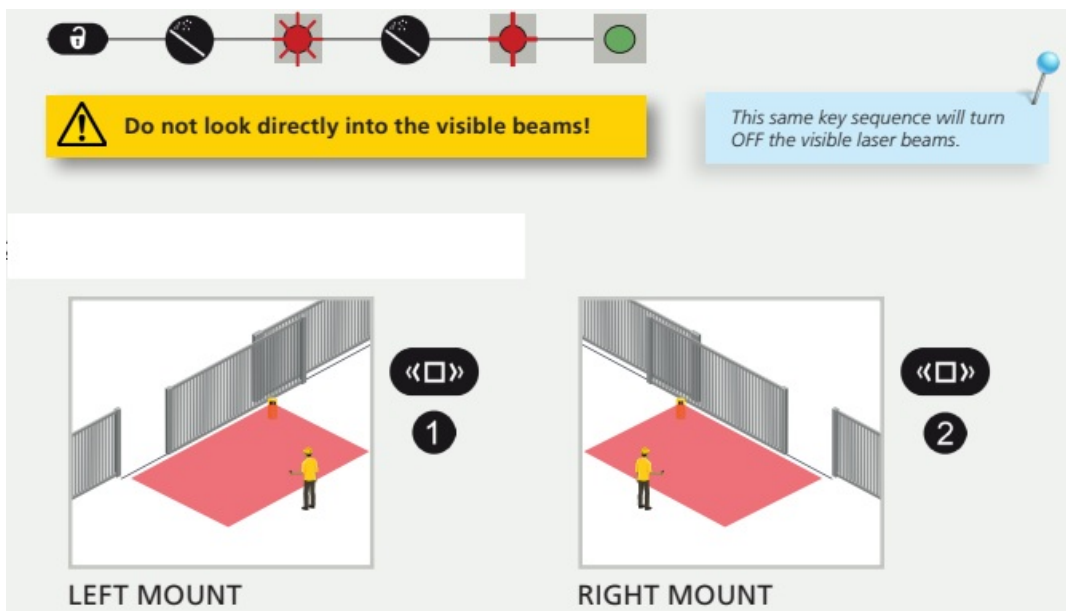


When the approaching area is sloped, be sure that the sensor tilt angle closely matches the slope angle to ensure that the intended target can be detected at the specified distance.



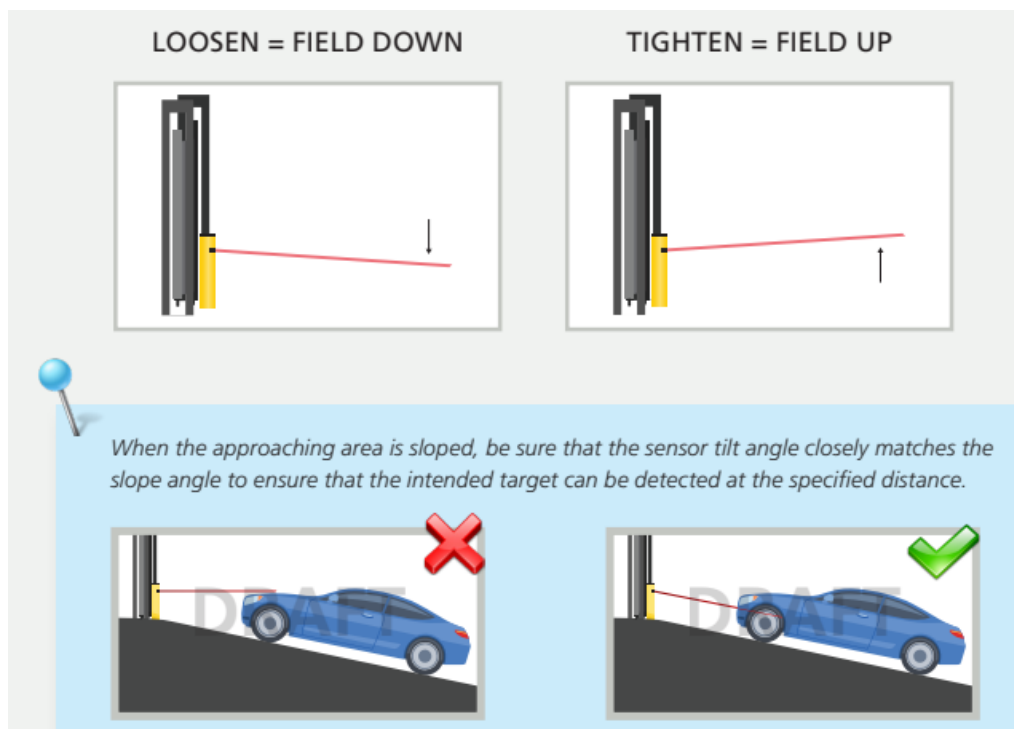
SLIDING GATES: Horizontal Field

1. Activate visible laser beams.
2. Select mounting side – left or right.



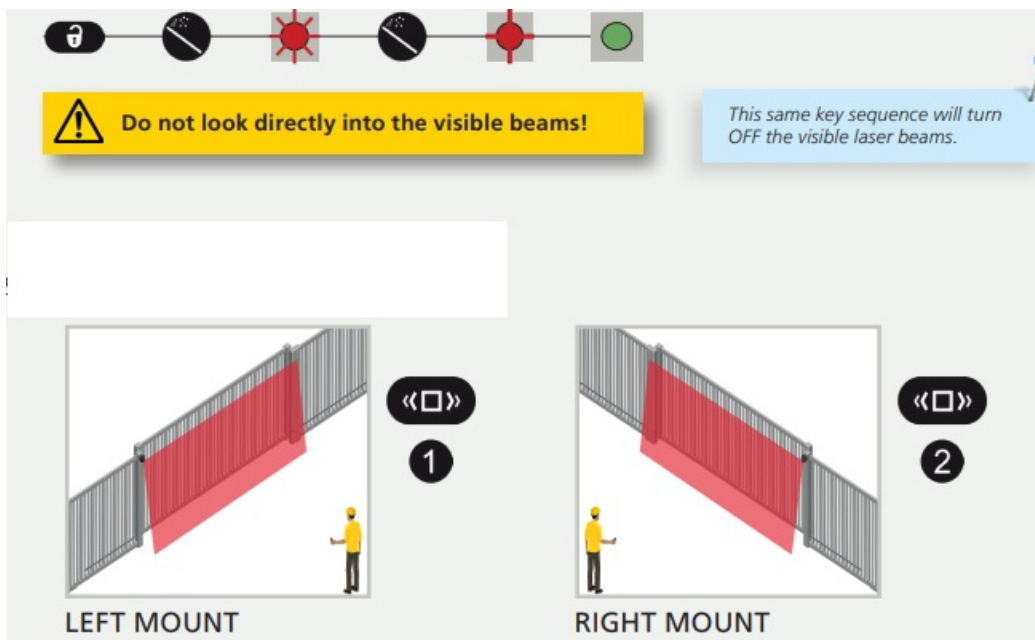
3. If necessary, position the field using the tilt angle screw. Loosen the screw to angle the field down and tighten the screw to angle the field up.

NOTE: See page 5 for more information on the visible laser beams.



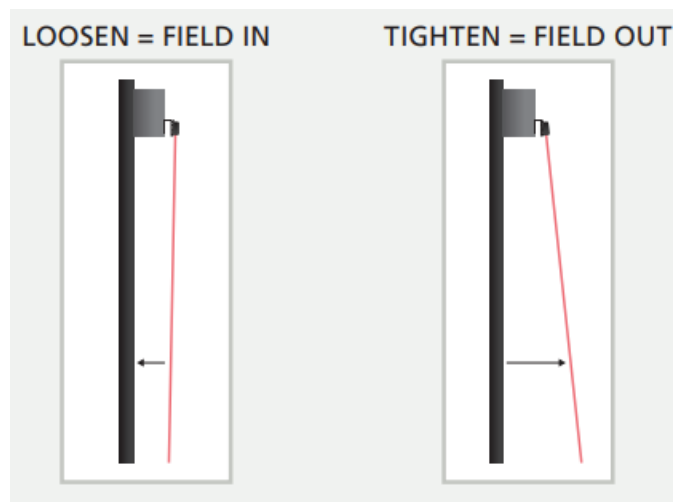
SLIDING GATES: Vertical Field

1. Activate visible laser beams.
2. Select mounting side – left or right.



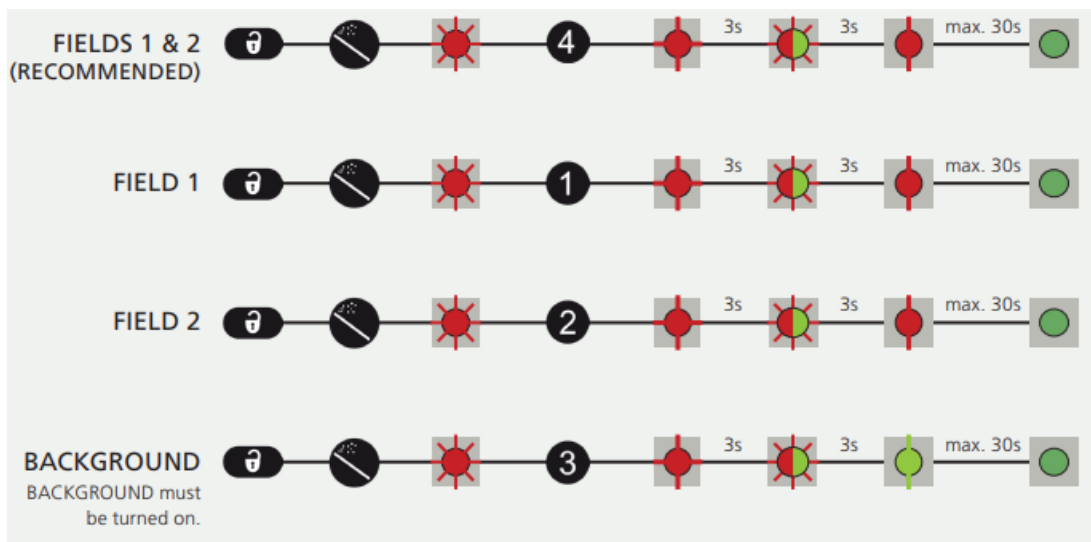
3. If necessary, position the field using the tilt angle screw. Loosen the screw to move the field closer to the door and tighten the screw to move the field away from the gate.

NOTE: See page 5 for more information on the visible laser beams.

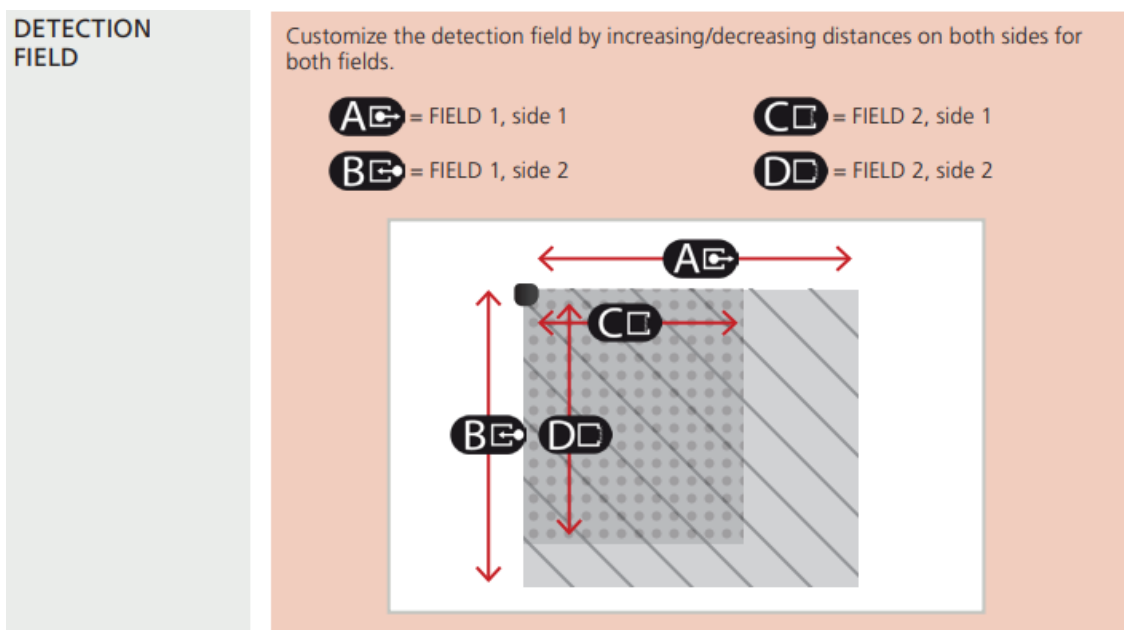


TEACH-IN

- Use the following remote control key sequence to learn the detection area.
- **IMPORTANT:** Be sure to clear the detection field before the teach-in process begins.
- **NOTE:** If the Detection Field size is changed from the default, you must perform the appropriate teach-in for the given field.



REMOTE CONTROL SETTINGS (OPTIONAL)



- The FLATSCAN S sensor is configured to understand metric measurements.
- If necessary, please convert your measurements from imperial to metric by multiplying your imperial measurements by 0.3.



- Please note that the detection range can be guaranteed with 5% reflectivity at 13' diagonal when fog filter value is set to 0, if the fog filter value is not 0, then the guaranteed detection distance will be shortened with 5% reflectivity.

IMMUNITY FILTER

Increasing the immunity filter decreases false detections caused by environment interference such as rain and snow.

1 2 3 4

low > > high

UNCOVERED ZONE

Uncovered zone shortens the detection field size (e.g. to avoid leaves or snow on the ground or to avoid an adjacent wall).

F2 0 1 2 3 4 5 6 7 8 9

2" 4" 6" 8" 10" 12" 14" 16" 18" 20"

Measured in specific conditions and determined by application and installation.

FOG FILTER

Fog filter helps increase sensor performance in areas with fog. As you increase filter, you decrease interference from fog.

e.g. Environments with dense fog should choose higher settings.

0 1 2 3 4 5 6

158" 147" 137" 128" 118" 108" 98"

Note 1: The sensor will automatically launch teach-in with every adjustment. Ensure that the detection field is clear before the teach-in process begins.

Note 2: Measurements are max detection distances with a 5% reflective object.

MINIMUM OBJECT SIZE

Rejects object smaller than the specified object size.

0 1 2 3 4 5 6 7 8 9

off 2" 3" 4" 6" 8" 10" 12" 14" 16"

Based on full field size, not the current field size.

OUTPUT ACTIVATION DELAY

Output triggered when detection lasts longer than the specified time.

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

DETECTION AREA ACTIVATION

Turns on/off detection fields 1 or 2.

0	1	2	9
off	field 1	field 2	field 1 & field 2

DETECTION FIELD REDIRECTION

Redirects outputs of detection fields 1 or 2.

F1	0	1	2	3
OUTPUT 1	field 1	field 2	field 1 or field 2	error alarm*
OUTPUT 2	field 2	field 1	error alarm*	field 1 or field 2

* errors associated with the LED behavior identified in TROUBLESHOOTING

OUTPUT CONFIGURATION (when powered)

	1	2	3	4		N.O.	N.C.
OUTPUT 1	NO	NC	NC	NO	POWERED (no detection)		
					POWERED (detection)		
					NOT POWERED		
OUTPUT 2*	NC	NO	NC	NO	POWERED (no detection)		
					POWERED (detection)		
					NOT POWERED		

* OUTPUT 2 default connection: pink/gray

NO = normally open
NC = normally closed

ANTIMASKING & BACKGROUND

Antimasking: when laser window is covered, the sensor will go into error mode.

Background: sensor movement can cause a compromised background, sending the sensor into error mode

	2	3
antimasking	ON	ON
background*	OFF	ON

* Do not set background to ON when sensor is mounted in a horizontal orientation. If done, this will cause the sensor to go into error mode.

LED ACTIVATION

0	1
LED off	LED on

HOW TO USE THE REMOTE CONTROL

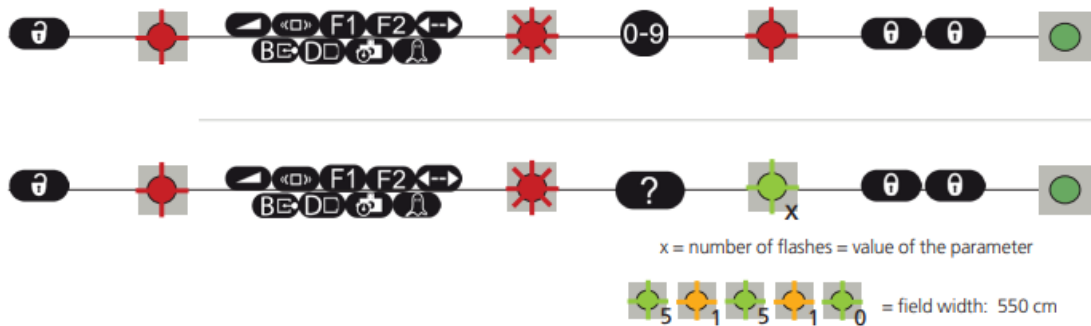
The remote control is most effective within 13 feet of the sensor.



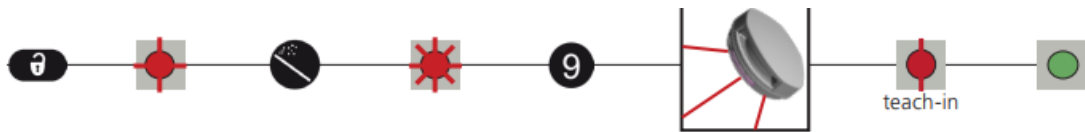
- After unlocking, the red LED flashes and the sensor can be adjusted by remote control.
- If the red LED flashes quickly after unlocking, you need to enter an access code from 1 to 4 digits.
- If you do not know the access code, cycle the power. During 1 minute, you can access the sensor without introducing any access code.
- To end an adjustment session, always lock the sensor.

ADJUSTING ONE OR MORE PARAMETERS

CHECKING A VALUE



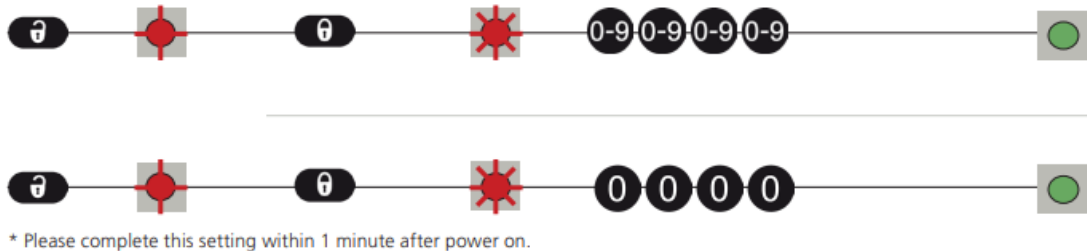
RESTORING TO FACTORY VALUES



SAVING AN ACCESS CODE

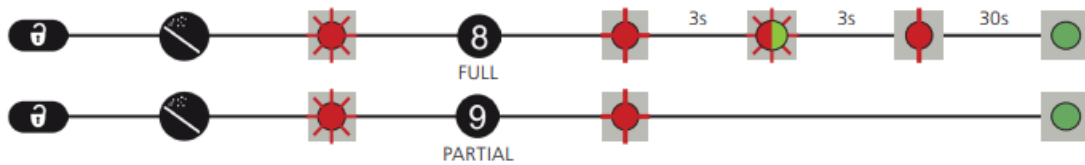
The access code is recommended for sensors installed close to each other and can be established to prevent unauthorized operation

DELETING AN ACCESS CODE







RESTORING TO DEFAULTS

- **Full:** resets all parameters to factory settings
- **Partial:** resets all parameters except detection field, output configuration, and output redirection to factory settings



If unused for 30 minutes, the sensor will time out of the remote control session. Cut and restore power supply. The remote control session is accessible again within 30 minutes.

TROUBLESHOOTING

	The ORANGE LED is on permanently.	The sensor has encountered a memory problem.	Contact BEA Technical Services.
	The ORANGE LED flashes 1x / 2x / 3x every 3 seconds.	The sensor signals an internal fault. <i>If the internal error still exists after 3 resets, the LED will flash 9 times and the sensor will be locked.</i>	Cut and restore power supply. If orange LED flashes again, send the sensor back to manufacturer.
	The ORANGE LED flashes 4x every 3 seconds.	Error for antimasking or boundary.	Check if there's pollution on front window and clean the window if necessary. Check sensor orientation and that background setting is appropriate for the given orientation.
	The ORANGE LED flashes 5x every 3 seconds.	Error occurred during the teach-in process.	Relaunch a teach-in.

BEA, INC. INSTALLATION/SERVICE COMPLIANCE EXPECTATIONS

FOR ALL APPLICATIONS:

- The installation is provided by CUSTOMER or its affiliates. BEA is not affiliated with CUSTOMER or any of its affiliates. BEA has no liability to CUSTOMER or the end user for any and all liability, claims, demands, obligations, actions, losses, costs, damages, fees or expenses (including attorneys' fees and legal costs) arising out of or in connection with product installation, or the end user's use of or inability to use the product, the installation services, product defects or malfunctions, including, but not limited to, any actual or alleged injury, damage, death or other consequence occurring to any person or property as a result, directly or indirectly, of installation, possession, or use of any product or services provided by CUSTOMER or any individual or entity acting for or on behalf of CUSTOMER, whether claimed by reason of breach of warranty, negligence, product defect or otherwise, and regardless of the form in which any such claim is made (collectively, the "Released Matters"). You, on behalf of yourself and each of the Releaser Parties, hereby releases and absolutely and irrevocably discharges each Hippo Party and their respective officers, directors, employees, representatives and agents from and against any Released Matters. You acknowledge and agree that the foregoing is a full and final release of all Released Matters, including those that are unknown, unanticipated or unsuspected or that may hereafter arise as a result of the discovery of new and/or additional facts, and you expressly waive all rights under Section 1542 of the Civil Code of California as well as any similar statutes of any other jurisdictions, which you acknowledge you have read and understood and which provides as follows: A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT

KNOW OR SUSPECT TO EXIST IN HIS FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM

- MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.

FOR DOOR, GATE, OR BARRIER APPLICATIONS:

- 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.



- **Tech Support:** 1-800-407-4545
- **Customer Service:** 1-800-523-2462
- **General Tech Questions:** techservices-us@BEAsensors.com
- www.BEAsensors.com



A **Halma** company

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Documents / Resources



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75.0051.01, FLATSCAN S Compact Laser Sensor, FLATSCAN S, Compact Laser Sensor, Laser Sensor, Sensor

References

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