FALCON

Opening sensor for industrial doors

APPLICATIONS

TECHNOLOGY

Radar

DESCRIPTION

The **FALCON** is a unidirectional motion sensor optimizing the performance of automatic doors. The FALCON detects every type of target and can filter people. Detecting vehicles only allows to reduce the door closing cycle by rejecting cross-traffic. Mounted at 7 m the FALCON has a detection field of 4 x 5 m. At 3.5 m, the FALCON XL detects in an area of 4 x 2 m.

VIDEO

Discover the product video on our youtube channel **BEA Sensors Europe**
https://bit.ly/2MW5knm

Energy-saving

Unidirectional motion detection for an optimum door closing cycle generating energy savings.

Pedestrian filter

Possibility of filtering pedestrians and detecting vehicles only.

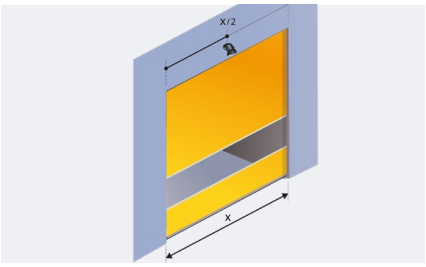
Cross-traffic filter

Possibility of filtering cross-traffic to eliminate unwanted detection.

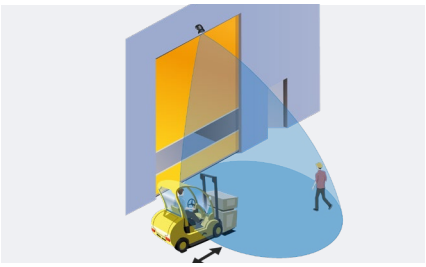
Plug & play

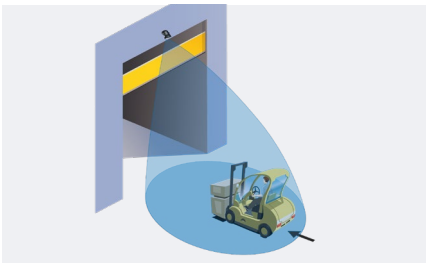
Adjustment of basic functions with push buttons or remote control.

APPLICATIONS



Recommended mounting for best performances


Cross-traffic filtering


Pedestrian filtering and detection of vehicles only

ACCESSORIES

BEA REMOTE CONTROL

Universal remote control for the adjustments of our sensors

UNIVERSAL MOUNTING BA

Universal mounting bracket

LZR®-WIDESCAN RETROFIT ADAPTER

Wiring accessory to replace a CONDOR, FALCON or MILAN with a WIDESCAN for similar functions

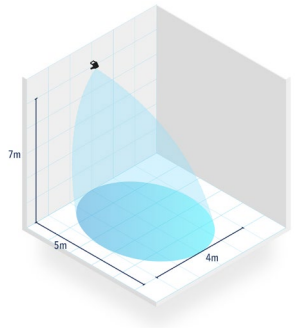
INSTALLATION

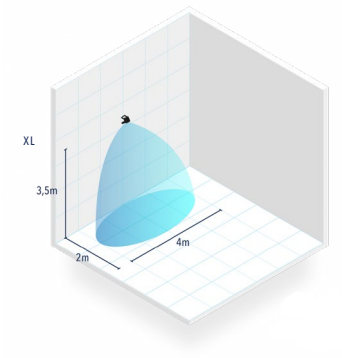
- Simple «plug and play» installation.
- Flexible operation thanks to the remote control and the spotfinder.

VERSIONS

- FALCON: 9-patch antenna for mounting till 7 m.
- FALCON XL: 3-patch antenna for mounting till 3.5 m.

TECHNICAL SPECIFICATIONS





Technology	microwave doppler radar
Transmitter frequency	24.150 GHz
Transmitter radiated power	< 20 dBm EIRP
Transmitter power density	< 5 mW/cm²
Detection mode	motion
Detection zone	**FALCON**: 4 x 5 m ; **FALCON XL**: 4 x 2 m (typical at 30° and field size 9)
Min. detection speed	5 cm/s
Supply voltage	12V to 24V AC ±10%; 12V to 24V DC +30% / -10%
Mains frequency	50 to 60 Hz
Max power consumption	< 2 W
Output	relay (free of potential change-over contact)
Max. contact voltage	42V AC/DC
Max. contact current	1A (resistive)
Max. switching power	30W (DC) / 60VA (AC)
LED-signal	red: detection state, parameter indication; green: value indication
Mounting height	**FALCON**: 3,5 m - 7m **FALCON XL**: 2 m - 3,5 m
Degree of protection	IP65
Temperature range	from -30 °C to + 60 °C
Dimensions	127 mm (L) x 102 mm (H) x 96 mm (W)
Tilt angles	0° to 180° vertical
Materials	ABS and polycarbonate
Weight	400 g
Cable length	10 or 15 m
Norm conformity	EN 300 440-2 V1.4.1, EN 301 489-1 V1.9.2, EN 301 489-3 V1.6.1, EN 62311, EN 62479

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FALCON & FALCON XL
USER'S GUIDE

MOTION SENSORS FOR INDUSTRIAL DOORS

• **FALCON**: for high mounting • **FALCON XL**: for low mounting

TECHNICAL SPECIFICATIONS

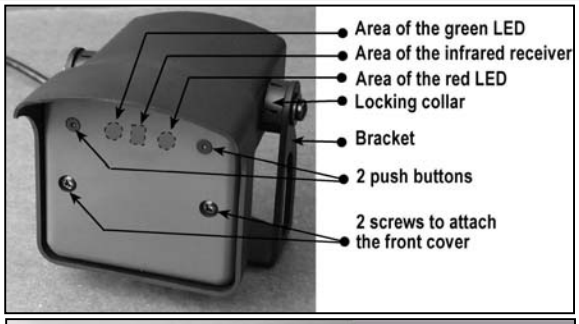
Technology: Microwave and microprocessor
Transmitter frequency: 24.125 GHz
Transmitter radiated power: <20 dBm EIRP
Transmitter power density: < 5 mW/cm²
Mounting height
FALCON: from 11.5 to 23'
FALCON XL: from 6.5 to 11.5'
Tilt angle: 0° to 180° in elevation
Detection zone (typical)
Wide pattern (FALCON XL): 13' (W) x 6.5' (D) for a mounting height of 8.2'
Narrow pattern (FALCON): 13' (W) x 16' (D) for a mounting height of 16'
Detection mode: movement
Minimum detection speed: 2.2 in/s (measured in the sensor axis)
Supply voltage: 12V to 24V AC +/- 10%
12V to 24V DC +30% / -10%
Mains frequency: 50 to 60 Hz
Power consumption: < 2W
Output relay: free of potential changeover contact
Max contact voltage : 42V AC/ DC
Max contact current: 1A (resistive)
Max switching power: 30W (DC) / 60 VA (AC)

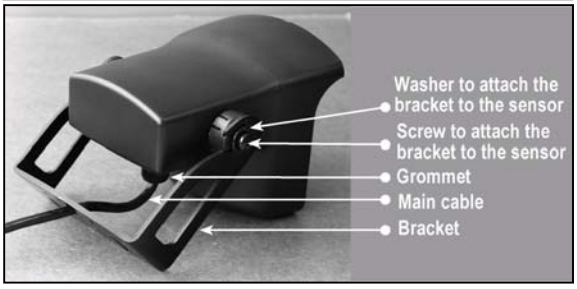
Hold time: 0.5s to 9s (adjustable)
Manual adjustment:
- orientation of sensing field (mechanically)
- multiple functions (by push buttons).

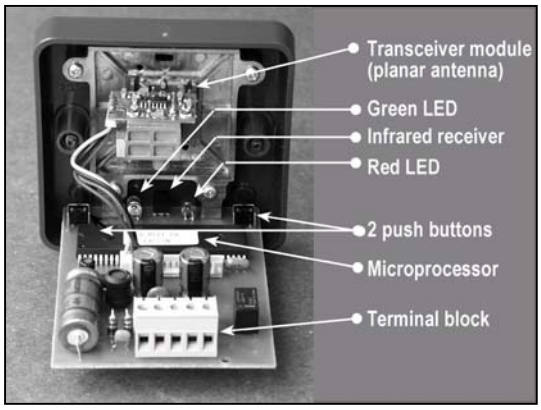
Remote control adjustments:
- Sensitivity.
- Hold time.
- Detection mode.
- Pedestrian and parallel traffic rejection mode.
- Relay configuration.

Temperature range : -22°F to 122°F (-30°C to +60°C)
Degree of protection: IP65
Product conformity:
R&TTE 1999/5/EC
EMC 89/336/EEC
Dimensions : 5 in (D) x 4 in (W) x 3 ¾ (H)
(127mm (D) x 102 mm (W) x 96mm (H))
Weight: 0.88 lbs (400 g)
Housing Material: ABS and Polycarbonate
Bracket Material: black anodized aluminum
Cable length: 33 ft (10 m)
Cable diameter: 1/8" (3 mm) (minimum)
1/4" (6.5 mm) (maximum)

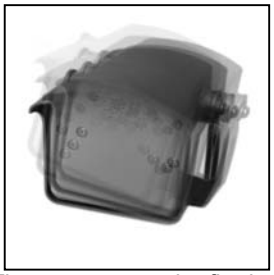
DESCRIPTION OF THE SENSOR



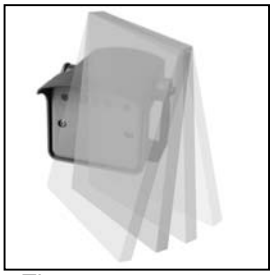




INSTALLATION TIPS

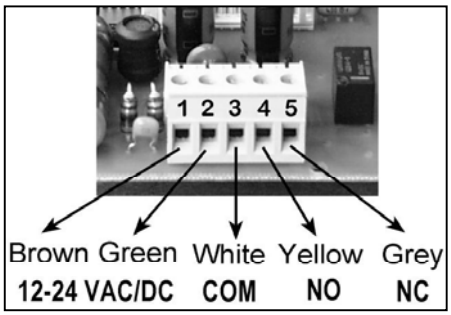

The sensor must be firmly fastened in order not to vibrate.

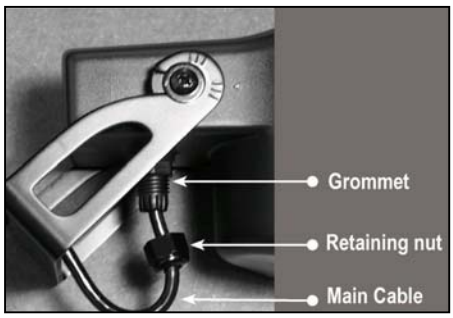

The sensor must not be placed directly behind a panel or any kind of material.


The sensor must not have any object likely to move or vibrate in its sensing field.


The sensor must not have any fluorescent lighting in its sensing field.

WIRING



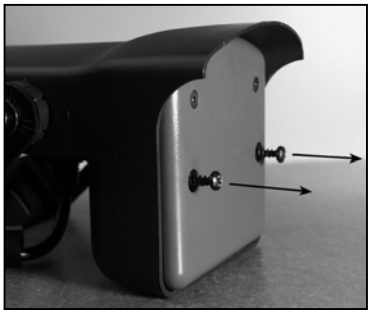


To remove or to insert the cable:

- Unscrew the retaining nut;
- Pass the cable through the grommet and the retaining nut.
- Tighten the retaining nut.

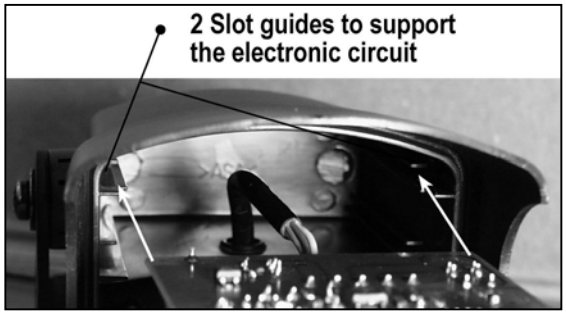
OPENING AND CLOSING THE SENSOR

Opening the sensor



- Loosen the retaining nut until the cable slides easily into the grommet;
- Partially unscrew the 2 front cover screws;
- Pull out the front cover with the 2 front cover screws.

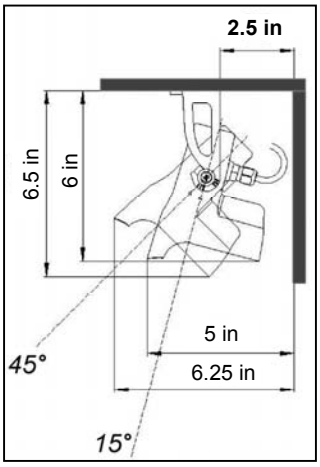
Closing the sensor



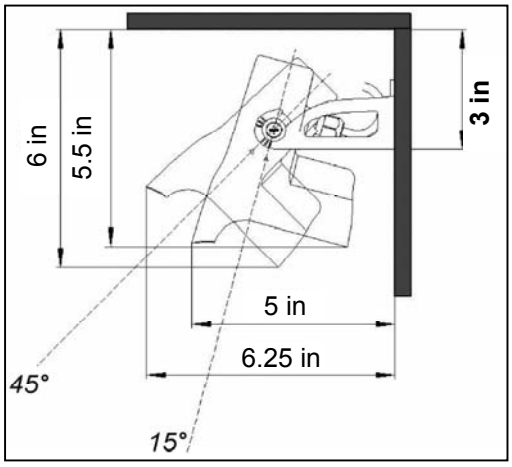
- Connect the quick disconnect terminal block to the main electronic circuit;
- Slide the main electronic circuit into the 2 housing slot guides;
- Gently push the front cover and make sure that the external housing is properly seated (front cover must be flush with housing).
- Screw the 2 front cover screws and tighten the retaining nut.

SENSOR DIMENSIONS AND MOUNTING

Ceiling Mounting

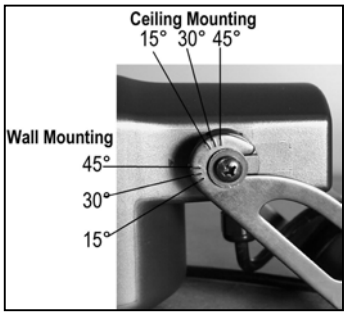


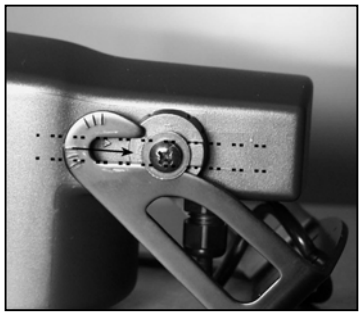
Wall Mounting



Remark: The bold-type values give the minimum distance required to be able to fully adjust the sensor.

BRACKET MOUNTING



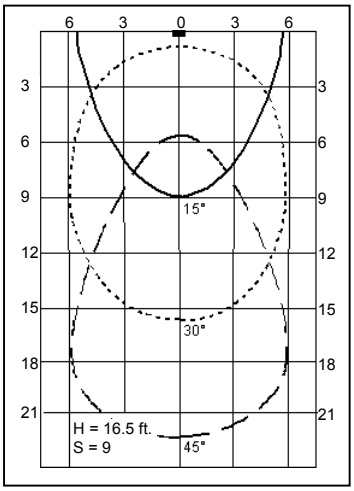


- Check that both locking collar are at the same angle;
- Align the bracket slot to the locking collar guide as shown.

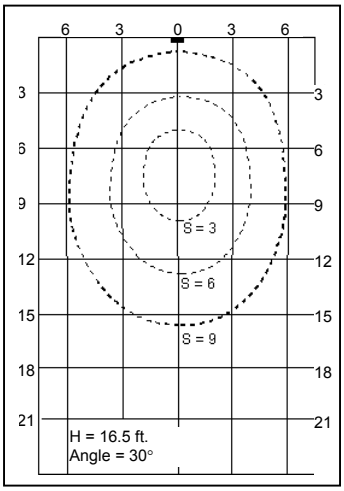
SETTING THE SENSING FIELD DIMENSIONS

FALCON (Mounting height: 16.5 feet)

The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 15°, 30°, 45°
- sensitivity: 9.

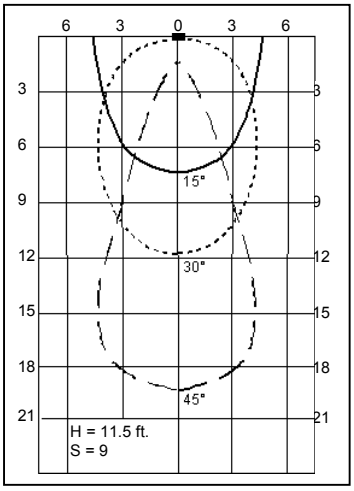


The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 30°
- sensitivity: 9, 6, 3

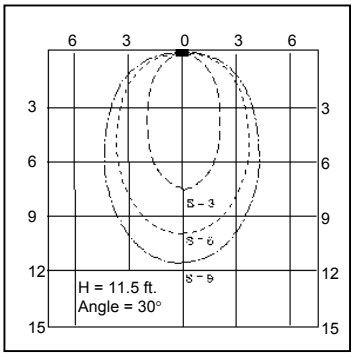


FALCON (Mounting height: 11.5 feet)

The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 15°, 30°, 45° ;
- sensitivity: 9.

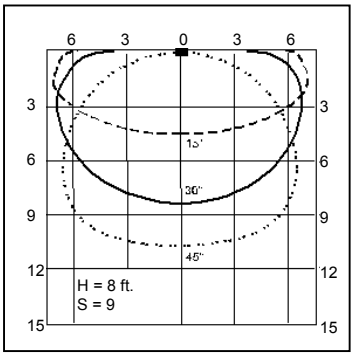


The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 30°
- sensitivity: 9, 6, 3

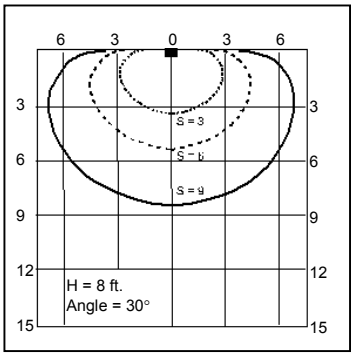


FALCON XL (Mounting height: 8 feet)

The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 15°, 30°, 45° ;
- sensitivity: 9.



The sensing fields here on the right correspond to the following adjustments:
- tilt angle: 30°
- sensitivity: 9, 6, 3



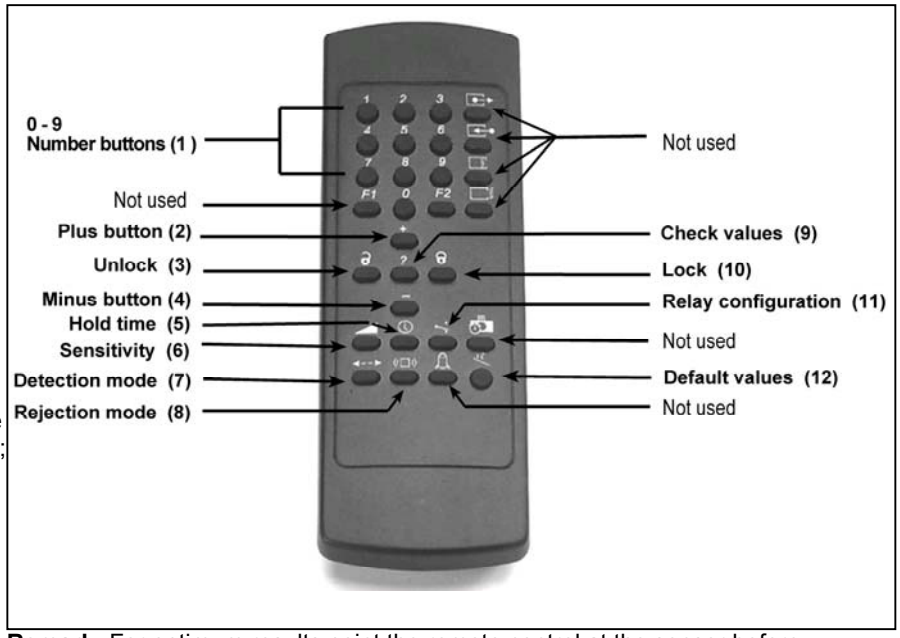
LED SIGNAL

- When the power is turned ON, the red and green LEDs flash for few seconds.
- During a detection the red LED lights on.
- During configuration, the red LED flashes a number of times corresponding to the parameter being changed (see next table). The green LED flashes a number corresponding to its setting.

FUNCTIONS CONFIGURATION WITH REMOTE CONTROL

1. DESCRIPTION OF THE INFRARED REMOTE CONTROL

- Open the battery compartment at the back of the remote control;
- Insert two AAA batteries supplied with the remote control as shown beside;
- Close the batteries compartment.

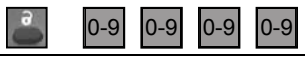
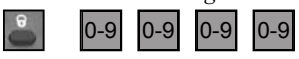


Remark: For optimum results point the remote control at the sensor before pressing its buttons.

2. CONFIGURATION OF THE SENSOR

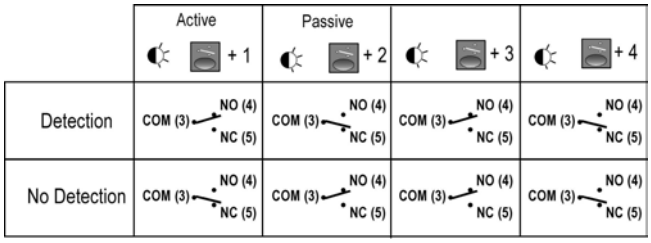
Each setting change using the infrared remote control must start with an unlocking and end with a locking of the sensor. It is important to point out that any parameters changed using the remote control supersede any previous setting.

The table below lists all the parameters, which can be adjusted with the remote control as well as the operations, required to adjust them.

PARAMETER KEY	USER'S ACTIONS	FACTORY SETTING	LED SIGNAL
UNLOCK 	Press the **UNLOCK key (3).** Enter your four-digit access code using **NUMBER keys 0-9 (1)**. During the first sensor adjustment or if the access code is reset to the "0000" value (factory setting) or during the first minute after the power-on, press only the **UNLOCK key (3)** (no code required). *UNLOCK with code*  *UNLOCK without code* 	0000	The red LED flashes quickly waiting for the access code. After entering the correct code or if no code is required, the red LED flashes slowly to indicate that the unlock is successful and the adjustment session has begun. Note: = Adjustment session ON
LOCK 	When all the parameters have been set, press the **LOCK key (10)**. If you wish to enter a new access code, use **NUMBER keys 0-9 (1)** to enter the new four-figure code within 20 seconds. If no access code is entered or if you want to keep the current access code, press the **LOCK key (10)** once more. If no remote control key is pressed within 1 minute, the adjustment session is automatically locked. Pressing the LOCK key (10) twice within the first minute after the power-on reset automatically the access code to 0000 value. *LOCK with code change*  *LOCK without code or Code change* 	0000	The red LED stops flashing to return to its normal function.

During an adjustment session each parameter may be checked or changed at any time in the following way:	
PARAMETER KEY	**USER'S ACTIONS**
CHECK VALUES 	Press the **key (5,6,7,8,11)** corresponding to the parameter to be checked and then press the **CHECK** VALUES key (9). Count the number of times the green LED flashes, which correspond to the value of the checked parameter. No green LED flash corresponds to the value 0. Repeat this operation to check the value of the other parameters if required. Example: SENSITIVITY key (6) – 7 flashes of the green LED: the sensitivity is set at the value 7. *CHECK VALUES*: X
PLUS 	Press the **key (5 or 6)** corresponding to the hold time or sensitivity parameter to be modified and then press the **PLUS key (2)** to increase the value by 1 unit. *PLUS*: X
MINUS 	Press the **key (5 or 6)** corresponding to the hold time or sensitivity parameter to be modified. and then press the **MINUS key (4)** to reduce the value by 1 unit. *MINUS*: X

During a sensor adjustment session all the parameters may be reset to their factory values in the following way:	
PARAMETER KEY	**USER'S ACTIONS**
DEFAULT VALUES 	Press the **DEFAULT VALUES key (12),** then press the **NUMBER key 1**. All the parameters are reset to the factory values (see below). *DEFAULTS VALUES:* 1

PARAMETER KEY	USER'S ACTIONS	FACTORY SETTING	LED SIGNAL
SENSITIVITY 	Press the **SENSITIVITY key (6).** Use the **NUMBER keys 0-9 (1)** to enter the sensitivity required (or adjust this sensitivity using the **PLUS (2)** or **MINUS (4)** keys as explained above) *SENSITIVITY:* 0-9	7	The red LED flashes quickly waiting for the value. Once this has been entered, it flashes slowly again.
HOLD TIME 	Press the **HOLD TIME key (5).** Use the **NUMBER keys 0-9 (1)** to enter the required hold time (0.5 s to 9 s) (or adjust this parameter using the **PLUS (2)** or **MINUS (4)** keys as explained above). *HOLD TIME*: 0-9	0.5 s	The red LED flashes quickly waiting for the value. Once this has been entered, it flashes slowly again.
RELAY CONFIGURATION 	Press the **RELAY CONFIGURATION key (11).** Use the **NUMBER keys 1-4 (1)** to select the required relay configuration: 	1 (Active Output)	The red LED flashes quickly waiting for the value. Once this has been entered, it flashes slowly again.

DETECTION MODE 	Press the **DETECTION MODE key (7).** Use the **NUMBER keys 1-3 (1)** to select the required mode: key 1: bi-directional key 2: unidirectional approach key 3: unidirectional depart Detection mode: 	2 (Unidirectional Approach)	The red LED flashes quickly waiting for the value. Once this has been entered, it flashes slowly again.
REJECTION MODE 	Press the **REJECTION MODE key (8).** **Immunity** is used to avoid detection due to environmental interferences (vibrations, rains, etc). **"Pedestrian/parallel traffic rejection"** provides both rejection of pedestrian and rejection of any parallel traffic at the same time. Use the **NUMBER keys 1- 5 (1)** to enter the required rejection mode: key 1 : detection of all kind of targets in motion key 2 : detection of all kind of targets in motion + interference immunity key 3 : Low "Pedestrian/parallel traffic" rejection + interference immunity key 4 : Mid "Pedestrian/parallel traffic" rejection + interference immunity key 5 : High "Pedestrian/parallel traffic" rejection + interference immunity The discrimination between a pedestrian and the different vehicles depends mainly on the mounting height and the microwave module tilt angle. Be careful that the rejection function increases the response time of the sensor. Use the next table as suggestions and do not hesitate to increase or decrease the rejection level to obtain the required rejection.	1 (No rejection)	The red LED flashes quickly waiting for the value. Once this has been entered, it flashes slowly again.

Recommended key			Tilt angle		
			15°	30°	45°
Mounting height	FALCON	23 ft	3	4	4
		16.5 ft	3	4	4
		11.5 ft	4	4	5
	FALCON XL	10 ft	3	4	4
		7.5 ft	4	4	5

FUNCTIONS CONFIGURATION WITH PUSH BUTTONS

Without remote control all of the parameters can be set using the 2 push buttons.
Note: These two buttons are accessible from the sensor front cover with a small point.

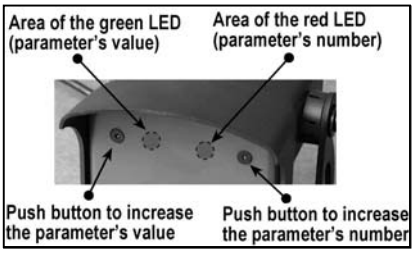
- To adjust the sensor using the buttons:
  Press and hold either push button for 2 seconds (until the LEDs flash) and then release the button
- To end adjusting the sensor using the buttons:
  Press and hold either push button for 2 seconds (until the LEDs stop flashing) and then release the button;
  Note: if no button is pressed within 20 seconds the adjustment session is automatically ended.
- To reset all the parameters to the factory values:
  Press and hold both push buttons simultaneously until the two LEDs switch on for 1 second (after 2 seconds).

During the manual adjustment session the red and green LEDs flash successively and continuously.

- The flashing number of the **red LED** provides the **number of the displayed parameter** (see next table);
- The flashing number of the **green LED** provides the **value of the displayed parameter**;
  Note: no red flashing indicates the zero value.

During the manual adjustment session:

- Each press on the **right button increases the number of the displayed parameter** by one unit;
- Each press on the **left button increases the value of the displayed parameter** by one unit.
  Note: When the maximum value or the highest number of the parameter is reached, this will return to their minimum values.



Parameter Number	Parameter	Values	Factory setting
1	Sensitivity	0 - 9	7
2	Hold time	0 - 9	0
3	Relay configuration	1 - 4	1
4	Detection mode	1 - 3	2
5	Pedestrian rejection mode	1 - 5	1

For example, to change the sensitivity from 7 to 9 and the rejection mode from “detection of all kind of targets in motion” to High “Pedestrian/parallel traffic” rejection.

- Press any button for 2 seconds to enter the adjustment session and then release it.
- The red LED flashes once (parameter 1 = sensitivity) and the green LED flashes 7 times (sensitivity=7).
- Press the left button twice to increase the sensitivity from 7 to 9.
- The red LED still flashes once (parameter 1 = sensitivity) but the green LED flashes 9 times now (sensitivity=9).
- Now press the right button 4 times to move to function 5 (rejection mode) ;
- The red LED flashes 5 times (parameter 5 = rejection mode) and the green LED flashes once (“detection of all kind of targets in motion") ;
- Press the left button 4 times to set the parameter to High “Pedestrian/parallel traffic” rejection.
- The red LED still flashes 5 times (parameter 5 = rejection mode) but the green LED flashes 5 times now (High “Pedestrian/parallel traffic” rejection).
- Press any button during 2 seconds to end the adjustment session and then release it.

TROUBLE-SHOOTING

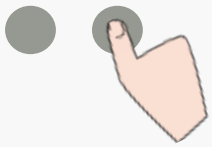
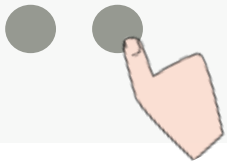
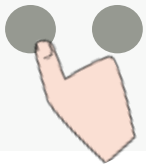
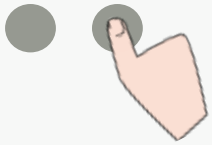
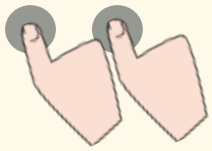
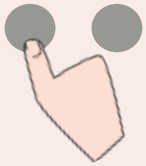
SYMPTOM	***PROBABLE CAUSE***	***CORRECTIVE ACTION***
The door will not open and the red LED does not light up.	The sensor power is off.	Check power supply. Check the supply voltage.
The door opens and closes constantly.	The sensor "sees" the door moving.	Increase the tilt angle and/or reduce the sensitivity.
	When closing the door creates vibrations picked up by the sensor.	Ensure that the sensor is correctly fixed. If the rejection mode is set at level 1, set this parameter to level 2. Reduce the sensitivity. Switch to unidirectional mode.
The door opens and closes after a given time for no apparent reason.	The sensor is picking up unintended traffic motion.	Reduce the sensitivity. Reduce the tilt angle.
The sensor is not capable of activation near the door.	The tilt angle is too large.	Reduce the tilt angle.
The sensor does not respond to the remote control.	The batteries are weak.	Check the batteries insertion. Change the batteries.
	The access code has been changed.	• Press both push buttons simultaneously to reset all the parameters to the factory values. • Or switch off the power supply. Within the first minute after the power on, change the access code.

If after troubleshooting a problem, a satisfactory solution cannot be achieved, please call B.E.A., Inc. for further assistance during Eastern Standard Time at
1-800-523-2462 from 7am - 5pm or 1-800-407-4545 from 5pm - midnight & weekends.

DO NOT leave any problem unresolved. If you must wait for the following workday to call B.E.A., leave the door inoperable until satisfactory repairs can be made. **NEVER** sacrifice the safe operation of the automatic door or gate for an incomplete solution.

CONDOR/MILAN/FALCON

How to use the push buttons?*

	PUSH BUTTONS	ACTION	LED	RESULT
START		**PUSH AND HOLD** the right button until the red LED flashes.	 RED GREEN	The red and green LED are flashing subsequently.
ADJUSTMENT		Pushing on the right button = scrolling through the different **PARAMETERS**.	 RED	The number of red flashes indicates the selected parameter.
		Pushing on the left button = increasing the **VALUE** of the displayed parameter by 1 unit.	 GREEN	The number of green flashes indicates the value of the current parameter (no LED, value = 0).
	Note: when the max. value or the last existing parameter is reached, it will return to its minimum value or first existing parameter.			
STOP		**PUSH AND HOLD** the right button until the LEDs stop flashing.	 OFF or RED	If the red LED lights up, you are standing in the detection field and creating a detection.
	Note: if no button is pushed within 20 seconds, the adjustment session ends automatically.			
FACTORY VALUES		**PUSH AND HOLD** both buttons for a few seconds. Exit and enter the adjustment session to verify.		
SETUP IR-FIELD		**BRIEFLY PUSH** the left button and step out of the detection field.	 RED-GREEN OFF	Both LEDs flash and switch OFF.

CONDOR - MILAN

*It is recommeded to use the remote control for advanced adjustments of these products. The use of push buttons should only be in case of emergency.

CONDOR

	RC-symbol	Parameter n°	Factory value	Available values	
FIELD SIZE		x1	x7	0-9	
DETECTION FILTER		x2	x1	1-5	
DETECTION MODE		x3	x2	1-3	
MAX. DURATION OF PRESENCE DETECTION		x4	x8	0-9	
TARGET SIZE	F2	x5	x1	1-7	
IMMUNITY FILTER IR-FIELD		x6	x2	1-3	
FREQUENCY		x7	x1	1-2	
DETECTION FIELD		x8	x1	1-9	
MOTION CONFIGURATION		x9		0-3	NOT USED
OUTPUT REDIRECTION	F1	x10		0-6	
OUTPUT CONFIGURATION		x11	x1	1-4	NOT USED
MOTION HOLDTIME		x12		0-9	NOT USED

MILAN

	RC-symbol	Parameter n°	Factory value	Available values	
MAX. DURATION OF PRESENCE DETECTION		x1	x8	0-9	
TARGET SIZE	F2	x2	x1	1-7	
IMMUNITY FILTER IR-FIELD		x3	x2	1-3	
FREQUENCY		x4	x1	1-2	
DETECTION FIELD		x5	x1	1-9	
MOTION CONFIGURATION		x6		0-3	NOT USED
OUTPUT CONFIGURATION		x7	x1	1-4	NOT USED
MOTION HOLDTIME		x8		0-9	NOT USED

FALCON

	RC-symbol	Parameter n°	Factory value	Available values
FIELD SIZE		x1	x7	0-9
HOLD-OPEN TIME		x2		0-9
OUTPUT CONFIGURATION		x3	x1	1-2
DETECTION MODE		x4	x2	1-3
DETECTION FILTER		x5	x1	1-6