Reflex 2 User's guide

BBC BIRCHER
Smart Access

Motion sensor for automatic doors

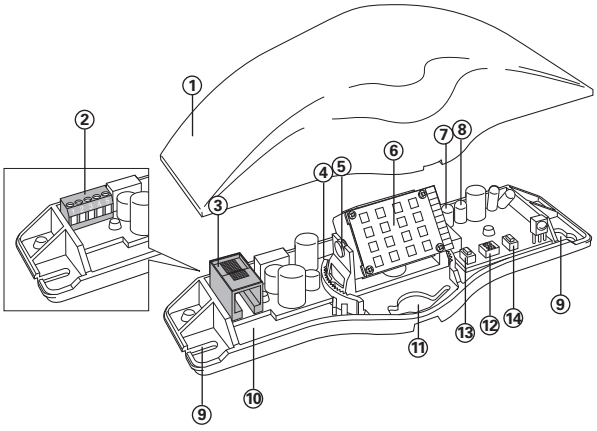
Questions? Call us at 847-952-3730, 8am – 5pm central standard time.

1 Safety Instructions

Read these operating instructions thoroughly before putting the device into operation and keep them for future reference. Not a safety component in accordance with UL 325 or the EU Machinery Directive; must not be used for personal protection or EMERGENCY STOP function. Do not use this product other than for its specified application. Only trained and qualified personnel may install and initialize the device. Product repairs must be performed solely by the manufacturer. Failure to follow these safety precautions may cause damage to sensor or objects, serious personal injury, or death. Always consider the safety functions of your applications as a whole, never just in relation to one individual section of the system. It is the responsibility of the equipment installer to carry out a risk assessment and to install the system, in compliance with applicable local, national and international regulations, safety standards, codes and laws as well as the UL 325, ANSI A156.10 or the Machinery Directive 2006/42/EC, should this apply. The sensor should only be operated from a safety extra low voltage (SELV) system with safe electrical separation according to IEC 61558. The wiring must be protected against mechanical damage. Shut off all power going to the sensor before attempting any wiring procedures. Maintain a clean & safe environment when working in public areas. Constantly be aware of pedestrian traffic around the door area. Always stop pedestrian traffic through the doorway when performing tests that may result in unexpected reactions by the door. Always check placement of all wiring and components before powering up to ensure that moving door parts will not catch any wires and cause damage to equipment. Ensure the commercial door operator has all of its monitored entrapment protection devices installed and operational. This sensor does not replace any entrapment protection devices.

DO NOT LEAVE ANY PROBLEMS UNRESOLVED - NEVER SACRIFICE SAFETY FOR ANY REASON

2 Description of the Sensor

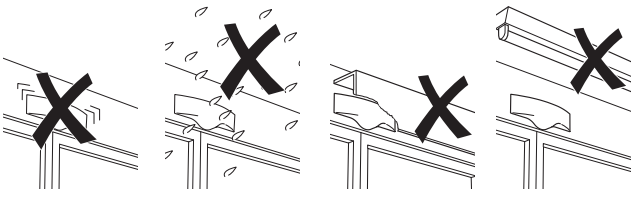


① Cover
② Plug-in screw terminal
③ RJ12 PCB socket
④ Ring for lateral adjustment
⑤ Frontal adjustment
⑥ Radar double field antenna
⑦ Green LED
⑧ Red LED
⑨ Grooves for mounting screws
⑩ Base cover
⑪ Cable feed-through
⑫ DIP switch (for addressing)
⑬ Key [<]
⑭ Key [>]

3 Installation

3.1 Installation instructions

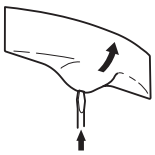
– Mount sensor on a flat stable surface (avoid vibrations)
– Do not expose sensor to rain or snow
– Objects (e.g. plants, flags, fans etc.) must be kept out of sensing field
– Do not place any cover in front of the sensor
– Do not place fluorescent tubes near the detection area



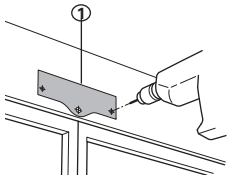
3.2 Opening the housing

BEFORE installation

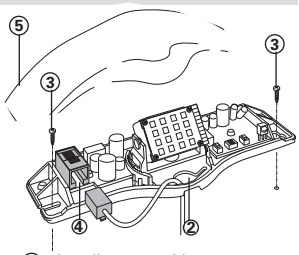
AFTER installation



3.3 Mounting



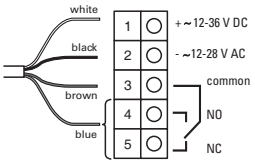
① Place drilling template on wall/ceiling and drill holes
② Route cable through the appropriate opening in the base cover – make sure length is sufficient for wiring



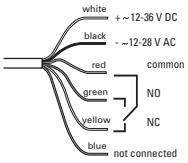
③ Install sensor with screws
④ Connect cable (see chap. 3.4)
⑤ Click cover on base cover

3.4 Electrical connections

Reflex 2 with plug-in screw terminal



Reflex 2 with RJ12 PCB socket



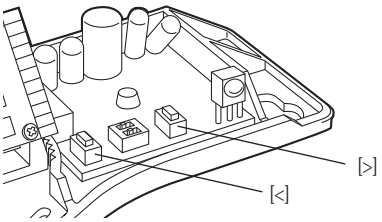
4 Displays on the Sensor

Start-up phase	
Red LED	Lights up during startup for 3 seconds
Green LED	Afterwards, the green LED flashes a few times and indicates the software version (the sensor is already functional and programmable)

Configuration	
Green LED	– Indicates parameter or parameter level through # of flashes (with key configuration) – Flashes briefly: – When key configuration mode is exited – When the sensor has received the command from the remote control

Operation	
LED red	Lights up upon detection
Green LED	Lights up when SMD is active

5 Manual Settings



General procedure

1) Keep [<] and [>] pressed for an equal length of time, every 2 seconds the green LED will flash once
2) # of flashes of the green LED (1–9 times) indicates current parameter level
3) The parameter level can be decreased or increased with [<] and [>] respectively
4) Press [<] and [>] briefly to exit the configuration mode (settings are saved)

Changing the field size: Press [<] and [>] for 2 seconds

Level	1, 2, 3	small
	4, 5, 6*	medium
	7, 8, 9	large

Changing the functionality: Press [<] and [>] for 4 seconds

for Reflex 2 version with direction recognition

Level	1*	detects approaching targets, mounting height standard
	2	detects approaching targets, mounting height high
	3	detects going away targets, mounting height standard
	4	detects going away targets, mounting height high
	5	direction recognition OFF, mounting height standard
	6	direction recognition OFF, mounting height high
	7	approach + MTO, mounting height standard (MTO, see chap. 8)
	8	approach + MTO, mounting height high (MTO, see chap. 8)

for Reflex 2 version without direction recognition

Level	1*	mounting height standard
	2	mounting height high

Changing the field shape: Press [<] and [>] for 6 seconds

Level	1	narrow field
	2*	wide field

Restore factory settings: Press [<] and [>] for 8 seconds

Example

Changing the functionality from level 6 to level 2:

1) Keep [<] and [>] pressed for 4 seconds, the green LED blinks once after 2 seconds, once again after 4 seconds
2) Green LED flashes 6 times, indicating the current parameter level
3) Press the key [<] four times in a row to decrease the parameter level (green LED flashes twice and indicates the new parameter level)
4) Press [<] and [>] at the same time

Note:
If no key is touched for 25 seconds, the configuration mode is automatically exited and the green LED briefly flashes. The settings created up to that point are saved.

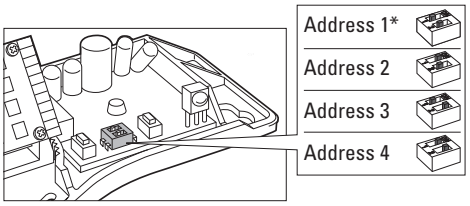
5.1 Sensor parameters status

How to find out the value of each parameter.

Parameter	Step 1	Step 2
Field size	Press [<] briefly	# of flashes of the green LED (1-9 times) indicates the current parameter level
Functionality	Press [>] briefly	
Field geometry	Press [<] and [>] briefly at the same time	

6 Remote Control Settings

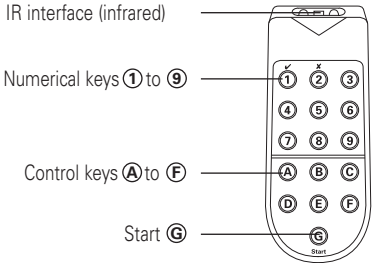
6.1 Sensor addressing



* Factory setting

Each sensor can be assigned an address (1*, 2, 3 or 4). Different addresses are necessary when several sensors are within the range of a remote control.

6.2 Mode of operation



The data transmission to and from the sensor is ensured by an IR interface. The connection between the remote control and the sensor can only be established when the sensor is in configuration mode.

Configuration mode

Activation:
- After connecting the sensor to the power supply *or*
- Briefly disconnect the sensor from the power supply *or*
- Press either key [<] or [>] on the sensor

Exiting:
- Press key Ⓐ + ③ combination *or*
- Automatically after 30 Minimum.

Establishing the connection

Without specific address:
1. Press the Ⓖ start key

With specific address:
1. Cover the IR interface of the remote control with your hand
2. Press the Ⓖ start key > Ⓖ flashes
3. Release the IR interface (remove hand)
4. Press the corresponding numerical key (① to ④)

- **G and one of the keys 1 through 4 light up:** Connection successfully established
- **G flashes:** Connection not established
  > Activate configuration mode (see above)
  > Hold remote control closer to the sensor and point directly at it
  > Check batteries in remote control
- **No keys light up**
  > Check/replace batteries in remote control

Note:
If no button is pushed for 30 seconds, the connection is closed. The settings made up to that point are saved.

6.3 Setting / changing parameters

After the connection has been successfully established, the parameters of the sensor can be changed.

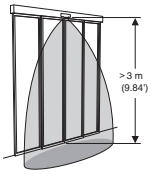
Ⓐ + ① Door open: Keeps the door open manually for 15 Minimum. Afterwards, the door will close if no object is in the detection area.

Ⓐ + ② Door closed: Door closes if no object is in the detection area, afterwards standard operation.

Ⓐ + ③ Exit configuration mode: Configuration mode is ended, door closes when no object is in the detection area, afterwards standard operation.

Recommendation: First, select the enhanced function that is closest to the requirements and then change the parameter levels correspondingly.

Convenience functions

Parameter / Key code		Ⓒ+①* Standard	Ⓒ+② Sidewalk	Ⓒ+③ High-risk	Ⓒ+④ Vestibule	Ⓒ+⑤ Retail	Ⓒ+⑥ High mounting
							
Direction recognition [ES]	Ⓑ	ON, forwards	ON, forwards	OFF	ON, forwards	ON, forwards	ON, forwards
Field size	Ⓓ	6	7	6	6	9	9
Relay hold interval	Ⓕ+①	1 sec	0.8 sec	2 sec	0.2 sec	1.5 sec	1 sec
Output signal	Ⓕ+②	Active	Active	Active	Active	Active	Active
SMD function	Ⓕ+③	Off	Off	Decreasing, 2 s	Off	Decreasing, 2 s	Off
Mounting height	Ⓕ+④	Up to 10 feet	Up to 10 feet	Up to 10 feet	Up to 10 feet	10 - 13 feet	10 - 13 feet
Cross traffic	Ⓕ+⑤	Low	Medium	Off	Low	Off	Medium
Interference suppression	Ⓕ+⑥	Off	Off	Off	Off	Off	Off
SMD field size	Ⓕ+⑦	1	1	5	1	5	1
Field geometry	Ⓕ+⑧	Wide	Narrow	Wide	Narrow	Wide	Wide

Configuration of individual parameters

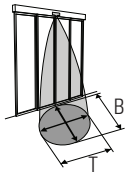
Key code	Parameter	Level	Short description	
Ⓒ	Convenience functions	1*– 6	Predefined settings for standard applications (see table)	
Ⓑ	Direction recognition (only with Reflex 2 ES)	1 2 3* 4	Off Backwards Forward Forwards with MTO (see chap. 8)	
Ⓕ+④	Mounting height	1 2*	High (10-13 feet) Standard (up to 10 feet)	
Ⓕ+⑧	Field geometry	1 2*	Narrow field Wide field	
Ⓓ	Field size	1 – 3 4 – 6* 7 – 9	Small Medium Large	
Ⓕ+①	Relay hold-time	1 2 3	0.2 s 0.5 s 0.8 s	Short
		4* 5 6	1.0 s 1.5 s 2.0 s	Medium
		7 8 9	2.5 s 3.0 s 4.0 s	Long
Ⓕ+②	Output signal	1*	NO: The relay picks up when a detection takes place	
		2	NC: The relay drops out when a detection takes place	
Ⓕ+③	SMD function	1*	Off	
		2 3 4 5	0.5 s 1.0 s 1.5 s 2.0 s	Decreasing sensitivity
		6 7 8	0.5 s 1.0 s 1.5 s	Constant sensitivity
		- 9	2.0 s	(SMD+)
Ⓕ+⑦	SMD field size	1*– 3 4 – 6 7 – 9	Small Medium Large	
Ⓕ+⑤	CTO (cross traffic optimization)	1 2*– 3 4 – 6 7 – 9	Off Low Medium High	
Ⓕ+⑥	Filter for interference suppression	1 2*	On Off	Prevention of false detections from fluorescent tubes.

6.4 Explanation of individual parameters

Field size Ⓓ / field geometry Ⓕ+⑧

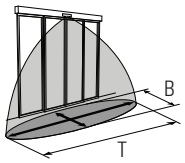
Depending on the field geometry (wide/narrow field), the field size can be set correspondingly.

Narrow field:



Min. 2.30 x 1.97 ft (W x D)
Max. 8.86 x 6.23 ft (W x D)

Wide field:



Min. 3.61 x 1.97 ft (W x D)
Max. 15.42 x 5.58 ft (W x D)

Values measured with mounting height 7.22 feet and tilt angle 35°.

SMD function Ⓕ+③ and SMD+

SMD = Slow motion detection: Very slow movements are detected as soon as the sensor is activated. Only when no more movements are registered during the set monitoring period does the sensor relay the corresponding signal to the door controller. The sensitivity during this monitoring period can be set to decreasing or constant.

SMD+: Triggers the sensor when very slow movements occur. Even objects slower than 2"/s (35° inclination angle) that are not detected with the normal detection area are detected (suited for high-risk facilities). In order to prevent the door from being kept open too long, the SMD+ field is half as large as the detection area.

SMD field size Ⓕ+⑦

The SMD field size is approximately the same as the regular sensing field.
Ⓕ+⑦ +⑤ ≈ Ⓓ+⑤

Cross traffic optimization CTO Ⓕ+⑤

The CTA prevents a door from being inadvertently opened by people who walk by it but do not want to enter.

Optimum sensor settings:
-Narrow field
-Inclination angle 30° – 45°

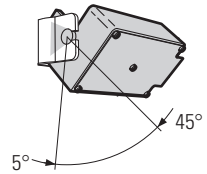
6.5 Status query with remote control

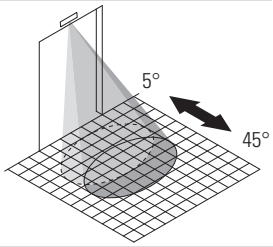
The status query is used to find out what parameters have been set. For this to take place, the connection to the sensor has to be established and the corresponding key code has to be entered. After that, a numerical key lights up indicating the respective parameter level.

* Factory setting

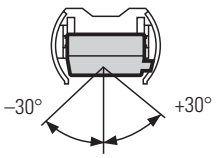
7 Mechanical Settings of the Sensing Field

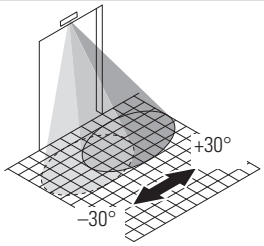
7.1 Frontal adjustment





7.2 Lateral adjustment





8 Trouble shooting

Issue	Possible cause	Solution	Refer to chapter
Door does not close / reverses	– Sensor sees sliding door	– Increase the frontal angle of the radar module	6.1.1
Door does not close / reverses	– Sensor sees swing door	– Install sensor higher and if possible directly above the door hinge – Increase CTA level – Rotate the sensor in the direction of the door opening	 5.2.3 6.1.1
Door opens inadvertently	– Interference source affects microwave field (e.g. fluorescent tubes)	– Activate the interference suppression filter Ⓕ+⑥+①	5.2.3
Door does not open – random non-detection of an individual	– Large group of persons approaching	– Activate the special filter function MTO Ⓑ+④ (Mass Traffic Optimization) – Decrease the CTA level (switch off)	5.2.3
Late detection or non-detection of persons	– Field too small – Installation too high	– Check field size Ⓓ – Activate high mounting height Ⓕ+④+①	5.2.3

9 Technical Data

Technology	Microwave motion detector with planar module technology
Transmitting frequency	24.125 GHz
Transmitting power	< 20 dBm
Operating voltage	12–36 V DC / 12–28 V AC, 50/60 Hz
Operating current	approx. 50 mA @ 24 V DC, 75.2° F
Temperature range	–4° F to + 140° F
Air humidity	max. 95% relative, non-condensing
Mounting height	up to 13.12 ft
Relay output	Potential-free changeover contact
Switching voltage	max. 48 V AC/DC
Switching current	max. 0.5 A AC / max. 1 A DC
Switching capacity	max. 60 VA / max. 30 W
Housing	Cover: PC; Base: ABS Dimensions (W x H x D): 6.93 in x 2.44 in x 2 in
Weight	5.29 ounces (without cable)
Degree of protection	IP54 (IEC 60529)
Minimum detection speed	1.97 in/s (in sensor axis) < 1.97 in/s with SMD+ (inclination angle 35°)
Cable length	9.84 ft

10 Contact

If after troubleshooting a problem, a satisfactory solution cannot be achieved, please call:
BBC Bircher Smart Access at 847-952-3730

from 8am - 5pm central standard time.
You may also visit our website at:

www.bircher.com

DO NOT LEAVE ANY PROBLEMS UNRESOLVED
NEVER SACRIFICE SAFETY FOR ANY REASON

11 Disclaimer

BBC Bircher Smart Access reserves the right to change any information on this document without notice.
For the latest version, please log on to www.bircher.com or call us at 847-952-3730 to request a copy of the current version.

12 FCC Approval

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications made to this equipment not expressly approved by BBC Bircher AG may void the FCC authorization to operate this equipment.

13 EC-Declaration of Conformity

Manufacturer: **BBC Bircher Smart Access,** BBC Bircher AG, Wiesengasse 20, CH-8222 Beringen, www.bircher.com
Importer: **BBC Bircher Smart Access,** BBC Bircher America, Inc. 870 Pratt Ave N, Schaumburg, IL 60193, USA, www.bircher.com
Following directives have been observed: RoHS 2011/65/EU, RED 2014/53/EU

229998T 09/21