Radar MultiView RMV

Operating and installation manual

EN Version 1.5

Radar motion detector for energy efficient opening of automatic door systems

sensotek®
Intelligent Sensor Solutions

Radar MultiView RMV

Operating and installation manual

EN Version 1.5

Order designation: radar motion detector for energy efficient opening of automatic door systems.

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1. Safety instructions

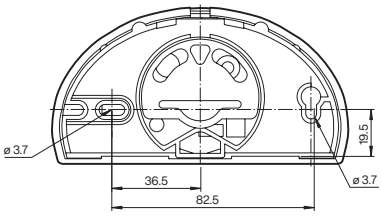
Disconnect the electrical circuit before installing or servicing the device. This device may only be installed and maintained by trained qualified personnel.

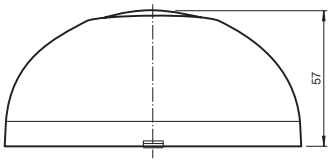
The device may only be operated with safety extra low voltage that complies with the Safety Extra Low Voltage (SELV) requirements in the safety standards based on IEC 60950.

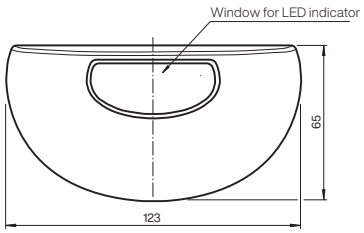
2. Scope of delivery and device description

2.1 Scope of delivery

- Radar MultiView RMV







- Operating manual
- Drilling template
- 2 x screws (tapping screws)
- 1 x wire harness, 4 wire cord, 3.5 m length

2.2 Device description

The intelligent Radar MultiView RMV enables energy efficient opening of automatic doors by precisely determined time and duration of opening based on five input parameters (movement, direction, speed, distance, angle), which are processed inside the intelligent radar unit.
The operating principle is based on radar technology. The Radar MultiView RMV can be operated in all European countries and North America. Proper use also includes observing the mounting and operating instructions. Any other or additional use is considered improper.

Improper use or unauthorized modifications of the product can result in danger to life and limb or damage to the product and other property. Use only original spare parts. The manufacturer/supplier is not liable for any consequential damages. The user himself is responsible for any risk.

Technical Data

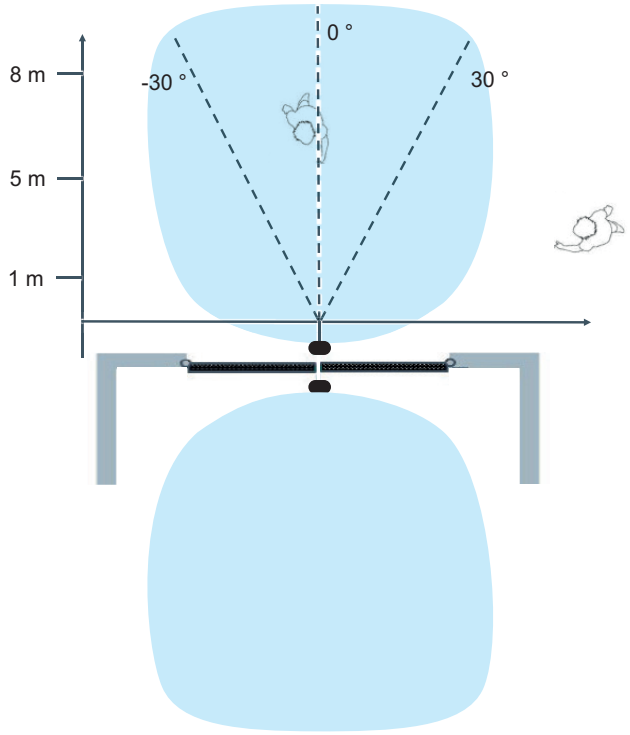
General Specifications	
Detection area	approx. 10 x 10 m (D x W) at 2.2 m mounting height and 30° inclination angle
Function principle	Microwave module
Detection speed	min. 0.1 m/s, max. 10.0 m/s
Setting angle	vertical: 0 … 90° in 10.0° steps
Operating frequency	24.050 GHz – 24.250GHz
Transmitter radiated power (EIRP)	< 20 dBm
Marking	CE
Indicators / Operating elements	
Function indicator	1 x LED (RGB)
Control elements	DIP switches and potentiometer
Electrical specifications	
Operating voltage	12-24VDC +/-15%
Power consumption	< 2.5 W
Output	
Signal output 1	PNP, shortcircuit-proofed
Switching voltage 1	max. 27.5 V DC
Switching current 1	max. 100 mA
Signal output 2	Relay, changeover contact
Switching voltage 2	max. 30 V DC
Switching current 2	max. 1 A
Ambient conditions	
Operating temperature	-20 … 60°C (-4 … 140 °F)
Storage temperature	-30 … 70°C (-22 … 158 °F)
Relative humidity	max. 90% non condensing
Mechanical specifications	
Mounting height	min. 2 m, max. 3.5 m
Degree of protection	IP54
Connection	screw terminals; 3.5 m Connection cable
Material	
Housing	ABS
Mass	120 g
Dimensions	123 mm x 65 mm x 57 mm

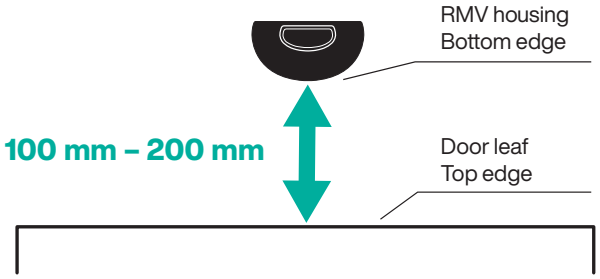
3. Installation

3.1 Installation

The product is preferably mounted above the automatic doors on the hinge/opposite hinge side.

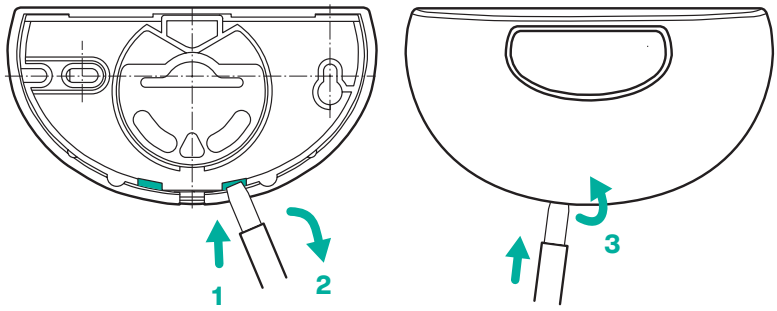
Installation of the Radar MultiView RMV:
The MultiView RMV radar can be installed at a height of approx. 30 cm above the automatic door - in the area between the opposite hinge/hinge side and the center of the single-leaf door or center of the double-leaf door system.

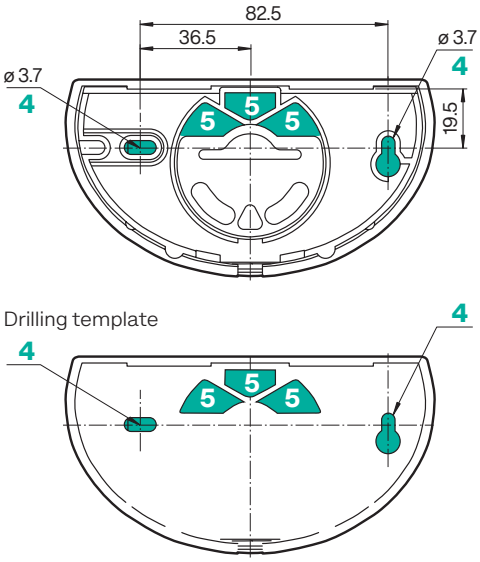




Opening the device:
- Insert the screwdriver into the available opening (1) – at the bottom of the rear side of the housing – and carefully press on the cover (2)
- Fold the cover upwards and pull it away (3)

Fastening the device:
- Fit the drilling template at the appropriate position and drill according to the specified markings (4)
- Pull the cable through the available openings (5)
- Fasten the base plate with the screws supplied with the set





3.2 Wiring

The supplied wire harness must be used for wiring.
The screw terminals are provided for connecting the power supply and the outputs.

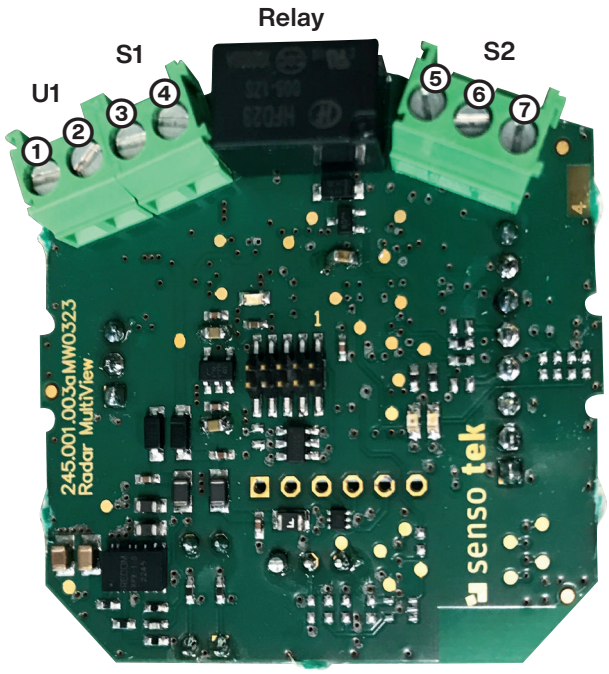
3.2.1 Connectors

Functions of the connectors:

- **U1**: Power supply U_B
  12-24VDC
  ① U_B+
  ② GND

- **S1**: Signal output 1
  ③ PNP
  ④ GND

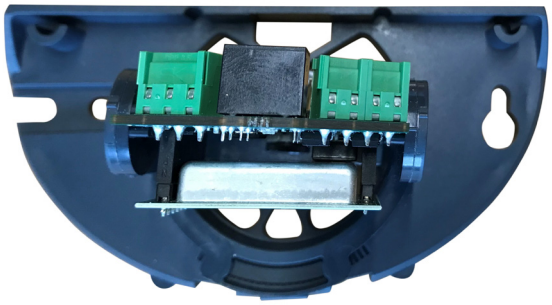
- **S2**: Signal output 2
  ⑤ NO
  ⑥ COM
  ⑦ NC

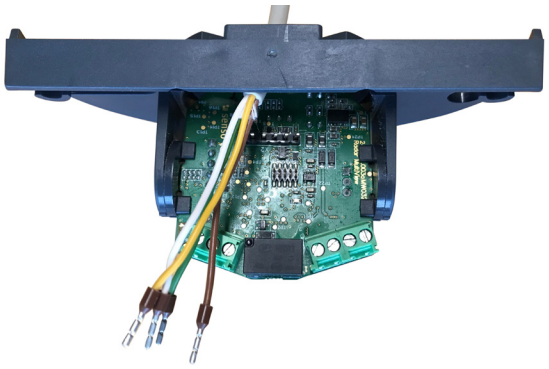


Electrical specifications	
Operating voltage	12-24VDC +/-15%
Power consumption	< 2.5 W
Output	
Signal output 1	PNP, shortcircuit-proofed
Switching voltage 1	max. 27.5 V DC
Switching current 1	max. 100 mA
Signal output 2	Relay, changeover contact
Switching voltage 2	max. 30 V DC
Switching current 2	max. 1 A

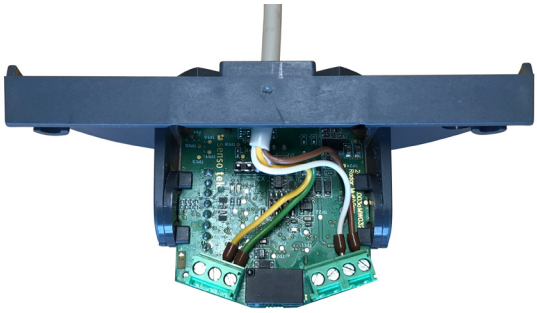
3.2.2 Wiring

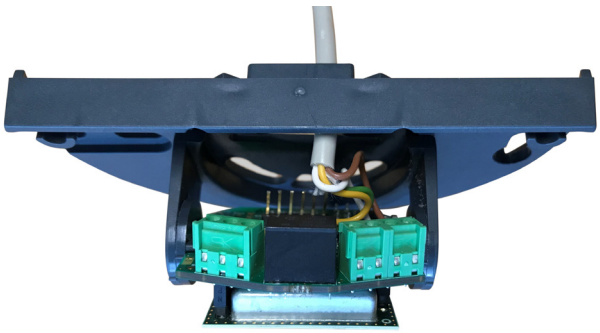
- Turn the tilt angle from the factory setting of 30° to 90°
- Strip the cable approx. 50 mm, strip the wires, apply the wire-end ferrules, insert the cable





- Connect the wires and fix it
- Reset the RMV board to 30° tilt angle

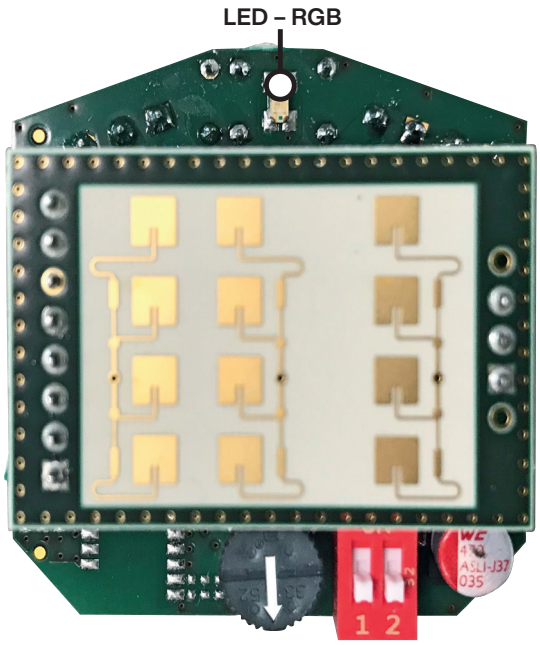




4. Set-up

4.1 Function signaling

- Switch on the unit; it is immediately ready for operation. The RGB-LED flashes green for 10 seconds. The RGB-LED turns off.
- The RGB-LED flashes yellow when a person is approaching the radar. The flashing frequency depends on the speed of the approaching person in the detection area.
- The RGB-LED changes to red when the opening impulse of the radar is activated to start the door drive. It turns off after 1 second.



4.2 Radar function areas

- **Detection area:** It's the field of view of the radar, which is **10 x 10 m** for the Radar MultiView RMV.
- **Activation area:** Depending on the selected application there is an activation area within the detection area, in which **only** the opening function for the door opening is generated.
- **Near area:** depending on the application there is also a near area within the activation area, in which a movement will lead to opening of the door **in any case**.

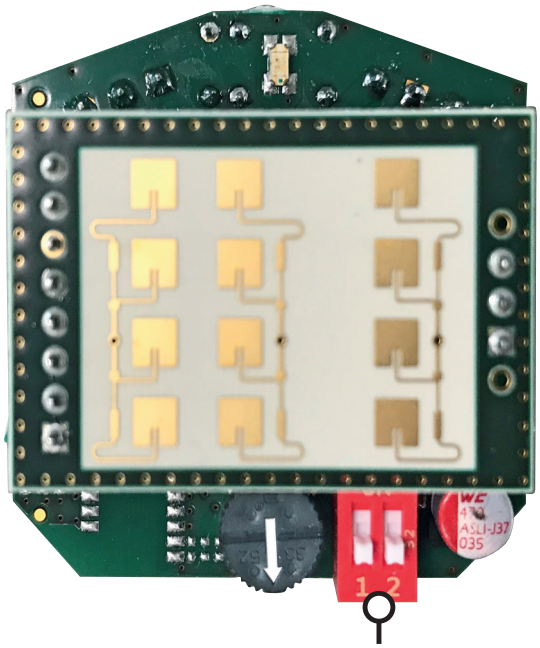
4.3 DIP switch settings

Two DIP switches allow four different settings.

1	2	Use Case	Function of Cross-traffic suppression	Activation area
0	0	1*	Absolutly no opening in cross traffic	B = 10 m x T = 10 m
0	1	2	Opening at near area	B = 10 m x T = 10 m
1	0	3	Normal cross traffic	B = 1.5 m x T = 10 m
1	1	4**	Opening at near area	B = 4 m x T = 5 m

* Normal operation: default settings

** Customizable upon customer request



DIP Switch (2-pol.)

4.3.1 Use case 1

Example for a mounting height of 2.3 m

Cross-traffic suppression in the detection area of 10 x 10 m

1	2	Use Case	Function of Cross-traffic suppression	Activation area
0	0	1*	Absolutly no opening in cross traffic	B = 10 m x T = 10 m

* Default settings

As long as an object/person is moving parallel to the door, the door **never** opens, regardless of the distance to the door.

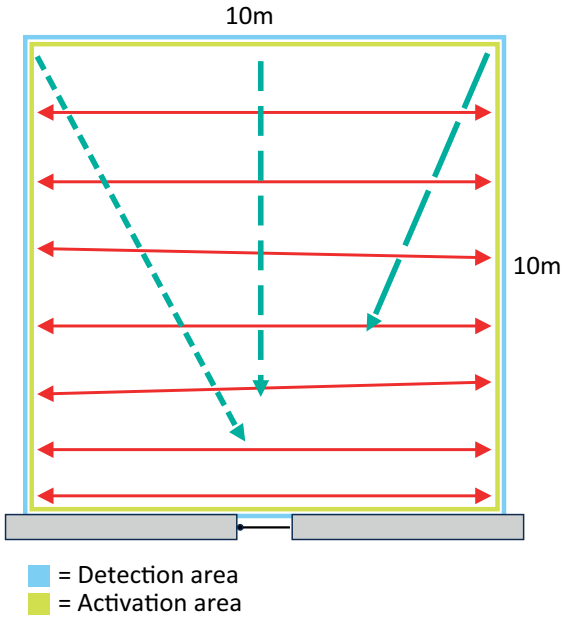
Cross-traffic ≙ angle α 0° to max. +/-3°

If a person approaches the door with a speed v – the functions of the Radar MultiView RMV will remain in order to open the door in the correct way.

≙ Slow speed v

≙ Normal speed v

≙ Fast speed v



Application: This operating mode is particularly suitable for shopping arcades.

4.3.2 Use case 2

Example for a mounting height of 2.3 m

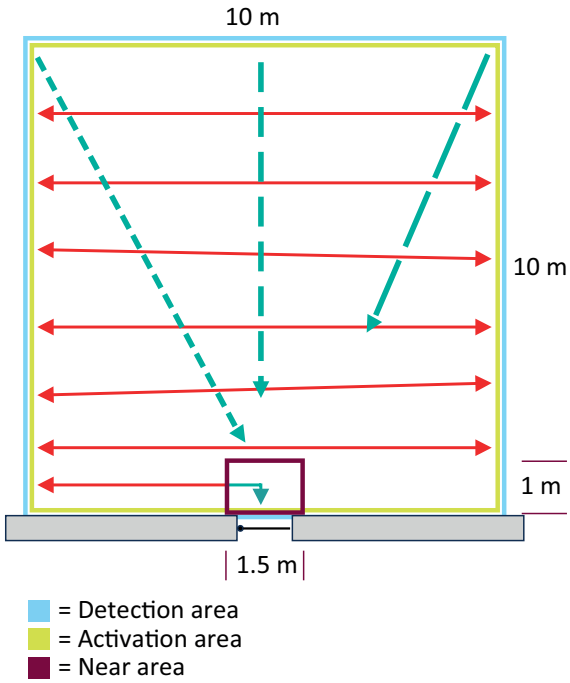
Cross-traffic suppression in the detection area of 10 x 10 m with opening at near area

1	2	Use Case	Function of Cross-traffic suppression	Activation area
0	1	2	Opening at near area	B = 10 m x T = 10 m

Cross-traffic with turning directly towards the door for entering, door opens typically inside, within the detection area of 1.5 m x 1 m triggers the opening.

The door **always** opens in the defined **near area** of 1.5 x 1 m.

The basic functions of the Radar MultiView RMV – depending on angle α and speed v – remain for the perfect door opening.



Application: This operating mode is particularly suitable for shopping arcades with the option of spontaneous entry.

4.3.3 Use case 3

Example for a mounting height of 2.3 m

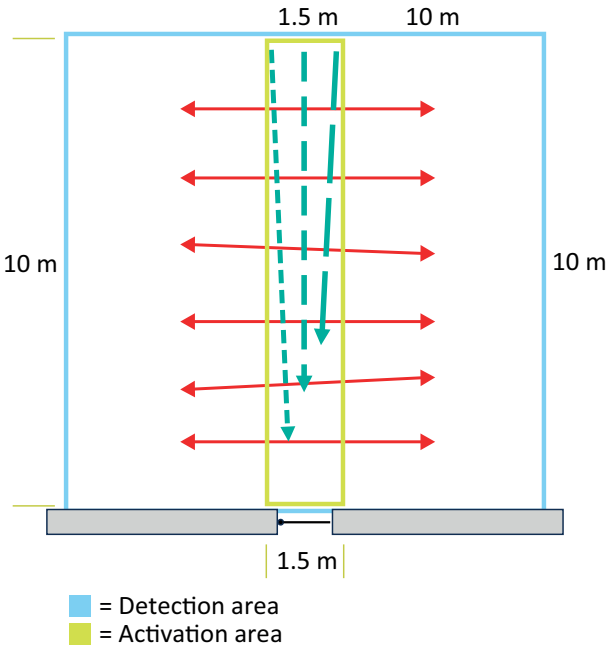
Cross-traffic suppression in the activation area of 1.5 x 10 m

1	2	Use Case	Function of Cross-traffic suppression	Activation area
1	0	3	Normal cross traffic	B = 1,5 m x T = 10 m

The Radar MultiView RMV checks for operation only a pre-set narrow detection area, called activation area.

Due to the Radar MultiView RMV functions – depending on angle α and speed v –the door is opened as required.

Application: This operating mode is particularly suitable for e.g. multiple door arrangements at airports or hallways in hospitals.



4.3.4 Use case 4

Example for a mounting height of 2.3 m

Cross-traffic suppression in the activation area of 4 x 5 m with opening at near area

1	2	Use Case	Function of Cross-traffic suppression	Activation area
1	1	4**	Opening at near area	B = 4 m x T = 5 m

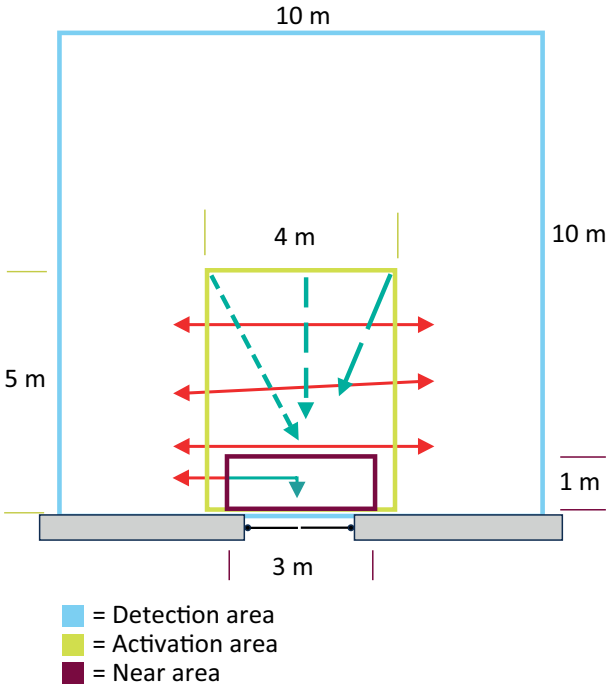
** Customizable upon customer request

The Radar MiltiView RMV radar considers a pre-set wide activation area of 4 x 5 m for its normal operation.

The door **always** opens in the defined **near area** of 3 x 1 m.

Due to the Radar MultiView RMV functions – depending on angel α and speed v – the door is opened as required.

Application: This operating mode is applicable for double-leaf swing doors or single swing doors of any kind. Typical areas of application include e.g. sales areas in the city center or shops beside roads.

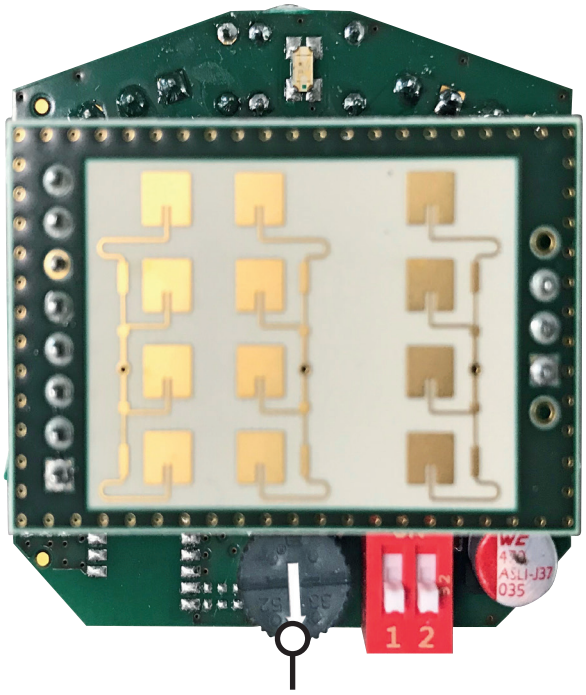


4.4 Adjustment of the radar parameters to the door opening speed

Potentiometer function:
The potentiometer (Pot) shall be used to select the opening speed of the door in degree per second (°/s) by means of 7 settings. This achieves a perfect synchronization between the sensor behavior and the door speed for the best possible opening.

Position/ Pot position	v Opening [°/s]	s till opening 90°
1	45	2.0
2	40	2.3
3	35	2.6
4	30 *	3.0 *
5	25	3.5
6	20	4.5
7	15	6.0

* Default settings



270° Potentiometer can be operated by finger

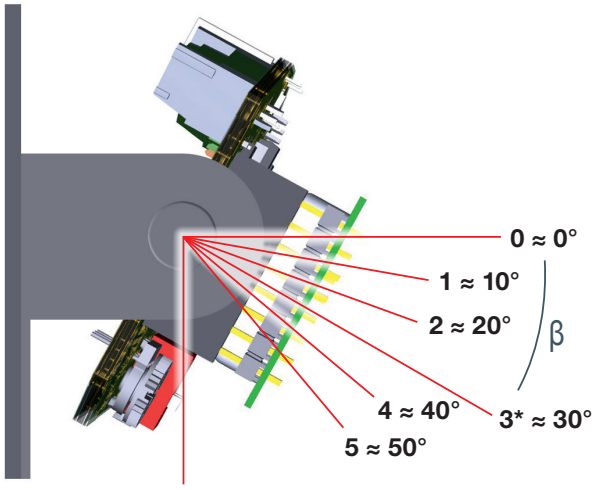
Procedure: the factory setting position 4 – with the arrow pointing downwards in the centre – is in 80% cases the typical speed of all automatic doors; the Radar MultiView RMV can be put into operation with this setting. If the value of the opening speed is known, the potentiometer setting can be changed according to the information in the table from above. If the value of the opening speed is not known, the function sequence shall be tested in practice. If the door opens too slowly or too quickly, the potentiometer shall be slightly adjusted to the left or right until the optimum between the Radar MultiView RMV and the door behaviour is achieved.

4.5 Mechanical alignment of the radar module

Depending on the mounting height, the angle β, the angle of inclination of the radar module, must be adjusted accordingly using the 10º click positions. The installation height is min. 2.0 m and max. 4.0 m**.
Between 2.0 m and 2.3 m the click position must be set to position 3, which corresponds to the typical angle of inclination β of approx. 30º. From 2.5 m to 3.0 m, the click position must be set to position 4. See the table below .

Mounting height	Click position	Tilt angle β
4.0 m	**5****	ca. 50°
3.5 m	**4****	ca. 40°
3.0 m	**4**	ca. 40°
2.5 m*	**3***	ca. 30°
2.0 m	**3**	ca. 30°

* Default settings
** In consultation with the manufacturer
1 click position unit ≙ 10°



All settings are done as described in chapter 4.3 refer to the default setting with the click position setting 3 (approx. 30º, angle β). Different click position settings must be tested individually on site.

5. Operation

With the settings in **Chapter 4. Set-up**, the Radar MultiView RMV is set up and ready for operation without any further adjustments. If during the final test after set-up the door opens a little too early or too late, a fine adjustment for optimization with the potentiometer can be considered.

5.1 Fine adjustment of the opening time

The opening time can be shifted by fine adjustment with the potentiometer, see Chapter 4.4.
Too early: Turn the pot **clockwise**
Too late: Turn the potentiometer **counterclockwise**

5.2 Overview of LED display

LED – RGB	Description
LED flashes green – 10 s	The Radar MultiView RMV was powered on. The LED flashes and the Radar MultiView RMV is ready for operation. After 10 seconds the LED turns off and always remains so until a detection.
LED is off, no flashing	**The sensor is ready for operation**
LED flashes yellow – proportional to the approach speed (v)	The flashing frequency is proportional to the speed of approach in the detection area
LED lights up red	The opening impulse for the door drive is set and turns off after 1 second

6. Maintenance

If the housing is heavily soiled, the radar housing shall be cleaned.

7. Interfering influences – advices for installation

RGB-LED	Description	Actions
LED lights up green	Inadmissible condition	If the green LED does not turn off after 10 s, there is an error → **Replace the device**

8. ESD safety

Device contains sensitive electronic components that are sensitive to electrostatic discharge (ESD). Use appropriate ESD protection such as wristbands to protect the device from damage.

9. Decommissioning

Device may be decommissioned only by trained personnel. Before dismantling, ensure there is no voltage.

10. Disposal

Device must be disposed in accordance with local regulations.
Electronic components must be recycled accroding to local regulations.