Radar MultiView RMV RMV-D2

Operating and installation manual

EN Version 1.0

Measuring radar motion detector for energy efficient opening of automatic door systems

senso|tek®
Intelligent Sensor Solutions

Radar MultiView RMV | RMV-D2

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

Art.Nr. 10001471

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1. Safety instructions

Personnel qualifications

The activities described in this document may only be carried out by qualified personnel.
Persons designated as "professionals" have appropriate technical training and experience with the technology and use. Professionals using their skills to identify and minimize risks to themselves and others when carrying out actions. The conditions specified by the manufacturer and applicable standards and regulations must be observed by the professional when carrying out actions.

Disconnect the electrical circuit before installing or servicing the device.
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.

EC Declaration of Conformity – Extract

Sensotek GmbH
Stuttgarter Str. 119
73061 Ebersbach (Fils), Germany
hereby declares that the product described is in accordance with the provisions of the listed EC directives and that the standards and/or technical specifications have been applied, referred to below.

Directives

2014/53/EU Radio equipment
2011/65/EU RoHS

The technical documentation is available at info@uk.sensotek.com

Harmonized European standard, national rule:

EN 300 440 V2.2.1:2018
EN 301 489-1 V 2.2.3:2019
EN 301 489-3 V 2.1.1:2019
EN 62368-1:2014+AC:2015
EN IEC 63000:2018

UKCA Declaration of Conformity – Extract

Sensotek GmbH
Stuttgarter Str. 119
73061 Ebersbach (Fils), Germany
hereby declares that the product described is in compliance with the provisions of the listed directive(s) and that the standards and/or technical specifications referred to below have been applied.

Directives:
Radio Equipment Regulations 2017
RoHS, The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Regulation 2012

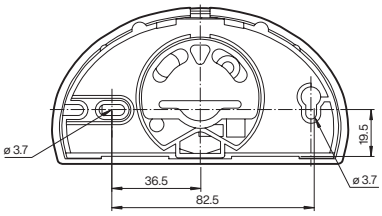
The technical documentation is available at info@uk.sensotek.com

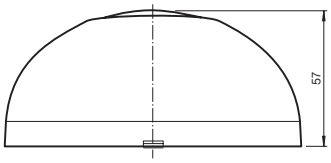
Harmonized European standard, national rule:
EN 300 440 V2.2.1:2018
EN 301 489-1 V 2.2.3:2019
EN 301 489-3 V 2.1.1:2019
EN 62368-1:2014+AC:2015
EN IEC 63000:2018

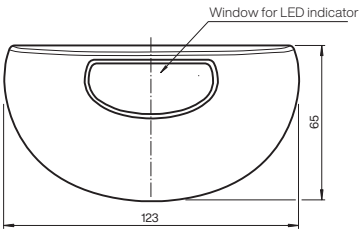
2. Scope of delivery and device description

2.1 Scope of delivery

- Radar MultiView RMV-D2





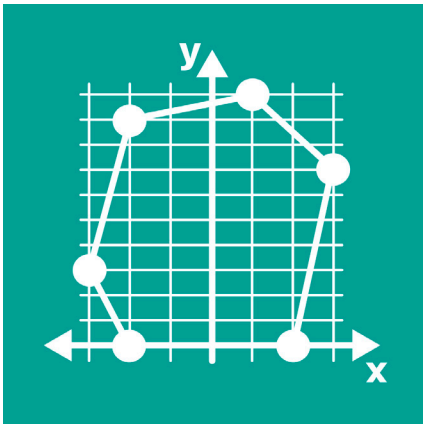


- Operating manual
- QR Code and SSID in the cover of the RMV-D2; for establishing the connection to the web server; see chapter 4.4.1
- Password for initial login in the RMV-D2 cover; for logging in to the web server; see chapter 4.4.2
- Drilling template
- 2 x screws (tapping screws)
- 1 x wire harness, 4 wire cord, 3.5 m length

2.2 Device description

The intelligent measuring 2-D-Radar MultiView RMV/D2 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.

Two separate areas can be individually defined according to customer requirements: the **activation area** and the **near area**. The activation area can be defined with a maximum of 8 points in the form of a polygon.

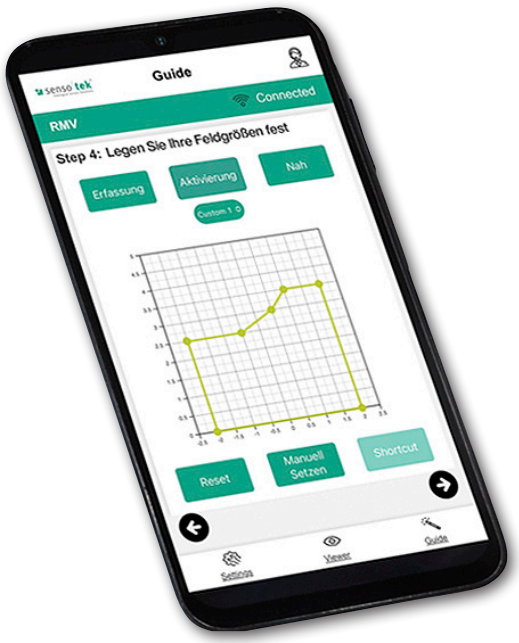


Activation areas are the key to prefectly functioning doors or gates. On the one hand, only desired movement events in a defined activation area triggers the door or gate and, on the other hand, actions of moving objects outside the activation field are suppressed.

Sensors are **parameterized** via an in the sensor integrated web server using any smartphone or tablet.

Installation is mainly reduced to simply mounting the devices on the hinge and opposite hinge side above the door. With the integrated web server, subsequent optimization can be carried out securely without requiring a ladder. This means that installation can be completed in just a few steps.

The **cloning function** enables quick set-up of several identical installation points.



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	
Function principle	Measuring Radar with 3 operating ranges: Sensing range: determined by the mounting height Activation area: adjustable to application via software parameters Close area: adjustable to application via software parameters
Mounting position	Above the door, in the middle, left or right; integrated mounting aid with IMU for all 3 spatial angles
Mounting height	min. 2 m; max. 4 m
Detection speed	min. 0.1 m/s, max. 8.0 m/s
Setting angle	vertical: -90° ... +90°
Operating frequencies	24.150 GHz; can be switched to 24.050 GHz and 24.250 GHz; enables the operation of 3 radar units mounted close to each other
Radar radiation angle	34° x 80°
Minimum sensing range **Width x depth**	f (H, α) indication via Interface
Cross-traffic suppression	adjustable: on (100%, no triggering), middle (50%), off (0%)
Opening speed of the door	adjustable in [m/s]
Transmitter radiated power (EIRP)	< 20 dBm
Parameter setting	via radio, WLAN (OTA), USB
Integrated temperature	°C / °F / °K, output via interface
Aprovals and certificates	CE; UL
Indicators / Operating elements	
Function indicator	1 x LED (rgb) Brightness: adjustable Ready for operation: LED flashes green - 10 s Ready for operation: LED is off, does not light up Approach: LED flashes yellow Output set: LED lights up red Parameterization: LED lights up blue, data connection established Error display: LED lights up white, flashing pattern
Control elements	none
Electrical specifications	
Operating voltage	AC: 8 ... 35 V AC +/- 10% DC: 8 ... 45 V DC +/- 10%
Power consumption	< 2.5 W
Connections	
USB C	1 x USB C female connector on board
Screw terminal	1 x voltage, 1 x relay
Extension	1 x internal connector
Connection cable set	
USB cable	2 m (not included in delivery)
cable, 4 pin plug	4 m (included in delivery)
Output	all short circuit protected, normally open/closed (NO/NC), configureable via events
Signal output 1	solid-state relay
Switching voltage 1	up to 60 V AC/VDC
Switching current 1	max. 0.5 A
Holding time 1	adjustable in [s]
Events	Events can be assigned to outputs via parameter setting. Triggering in people, fast opening, turtle opening, counting of people at the door, temperature control.
Digital interface	
ESP-NOW	Short range protocol, max. 25 m

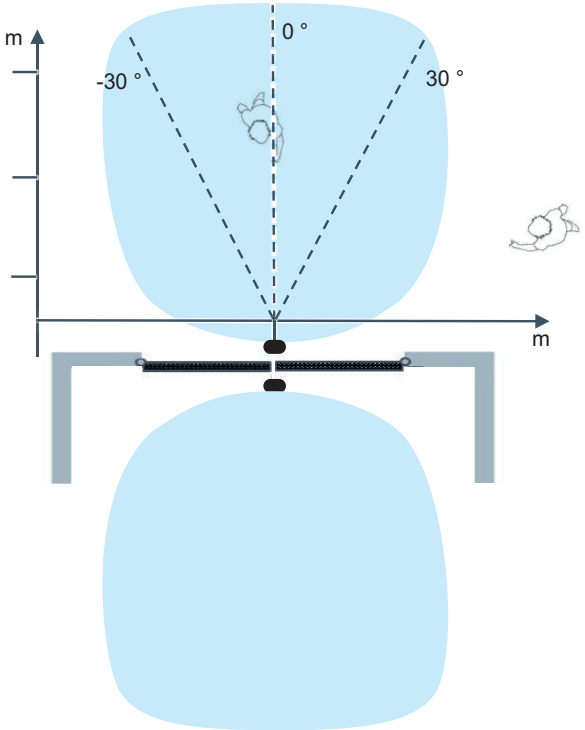
Technical Data	
Ambient conditions	
Special features	Resistance against weather and vibrations
Operating temperature	-40 ... 80° C (-40 … 176° F)
Storage temperature	-40 ... 80° C (-40 … 176° F)
Relative humidity	max. 90% non condensing
Mechanical specifications	
Degree of protection	IP54
Housing	ABS, black
Mass	650 g
Dimensions	123 mm x 65 mm x 57 mm
Parameter setting	
Method	all parameters can be sit via WEB-Interface and USB
Operating ranges	Activation area: which is inside the sensing range and can be defined as a polygon with max. 8 points. Near area: which is also inside the sensing range and can be defined as well with max. 8 points. The close area focus the door to open in any case.

3. Installation

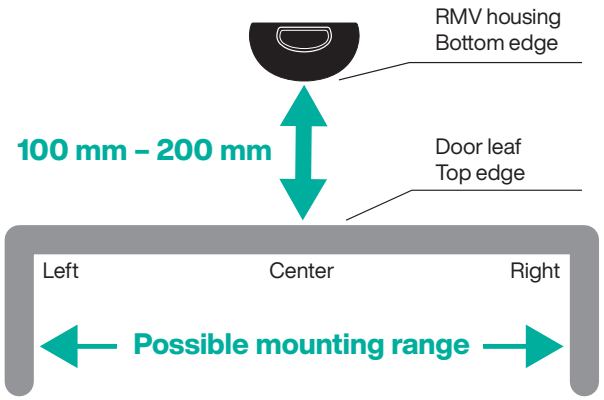
3.1 Installation

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

Installation of the Radar MultiView RMV-D2:
The Radar MultiView RMV-D2 can be installed at a height of approx. 100 mm – 200 mm above the automatic door – in the middle or at any other position along the door leaf.
See ➞ Possible mounting area



Note: The maximum installation height H is measured from the floor and is not allowed to be exceeded.



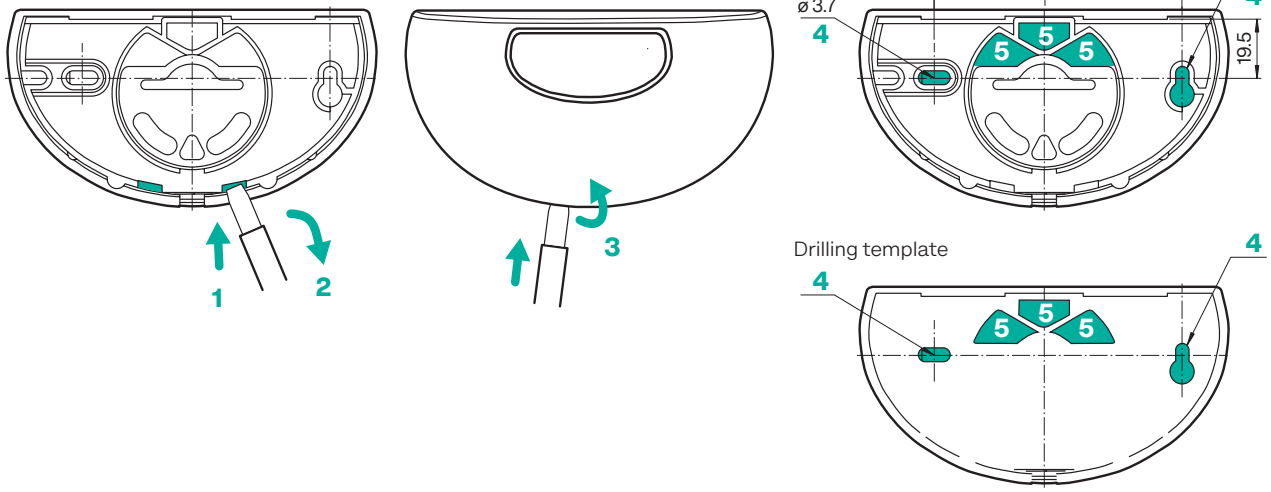
3.1.1 Opening the device:

- 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)

Note: The QR Code and the SSID for connecting a mobile device with the RMV configuration tool is sticked in the cover..

3.1.2 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

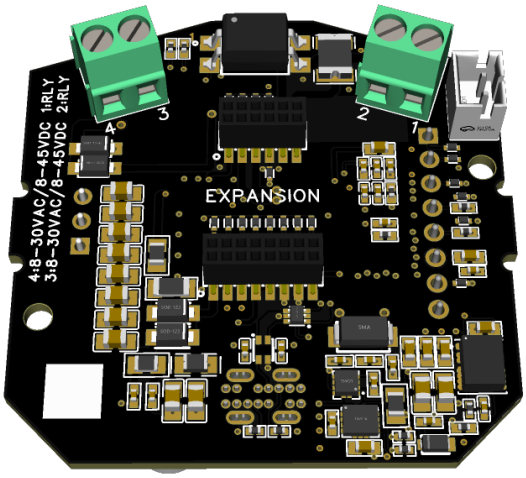
The supplied wire harness must be used for wiring.
The screw terminals are provided for connecting the power supply and the outputs.

3.2.1 Connectors

Functions of the connectors

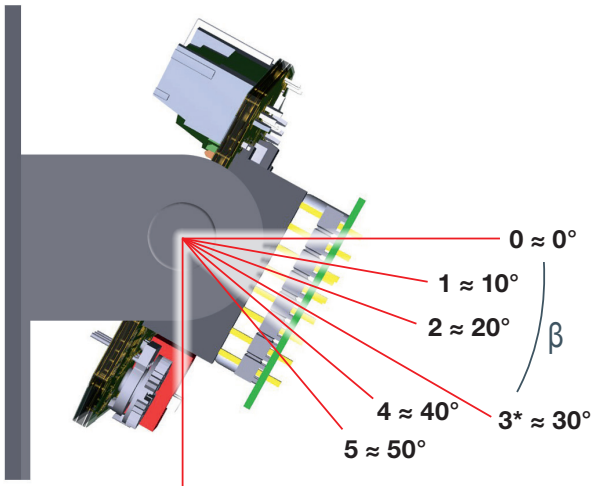
U1	S1
Power supply UB 8 – 35 V AC / 8 – 45 V DC	Signal output 1
① UB+ ② GND	③ NO / NC ④ COM

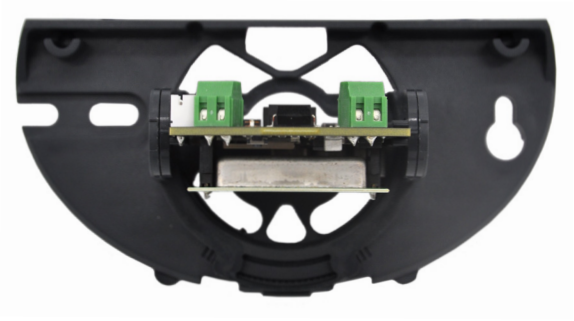
Electrical specifications	
Operating voltage	AC: 8 ... 35 V AC +/- 10% DC: 8 ... 45 V DC +/- 10%
Power consumption	< 2,5 W
Output	
Signal output	Solid-state relay
Switching voltage	Up to 60 V AC/VDC
Switching current	Max. 0.5 A

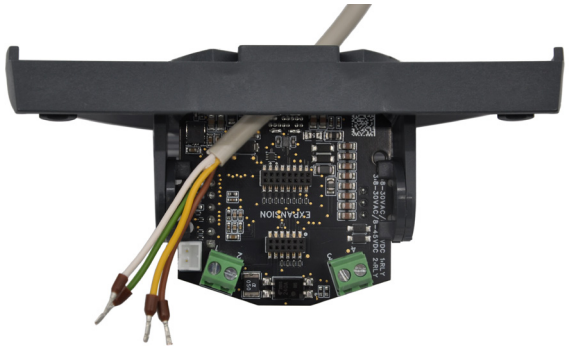


3.2.2 Wiring

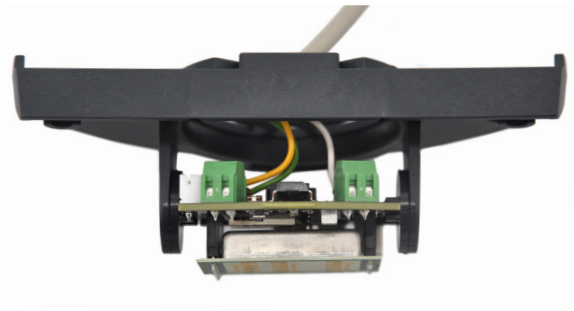
Angle definition







- 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. The further information refers to this setting. Based on the physically manually set angle and the installation height, the real detection range is determined in the configuration tool and displayed for further settings.

4. Set-up

4.1 Function signaling

- Switch on the unit; i. e. apply voltage
- Wait until the green RGB LED stops flashing after about 10 seconds
- 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 the end of the opening impulse.
- The RGB LED lights up blue when the web server is connected to the smartphone or tablet.
- The RGB LED lights up white, error display (see error table)

4.2 Radar function areas

- **Detection area:** It is the possible field of view of the radar with its antenna.

  Note: The maximum detection range is mainly determined by the installation height and the inclination angle.

- **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 Parameterization via the sensor's own web portal

The radar is operated using the configuration tool of the web server integrated in the radar in conjunction with a mobile device. The connection between the web server and the mobile device is established by scanning the QR Code shown in the cover or by entering the SSID printed in the cover in the web browser.

Note: The RMV-D2 does not work without parameterization via the web server, because the installation height must be entered via the web browser, for example, so that the RMD-D2 can determine its maximum detection range.

The configuration tool explains how to carry out the parameterization step by step.

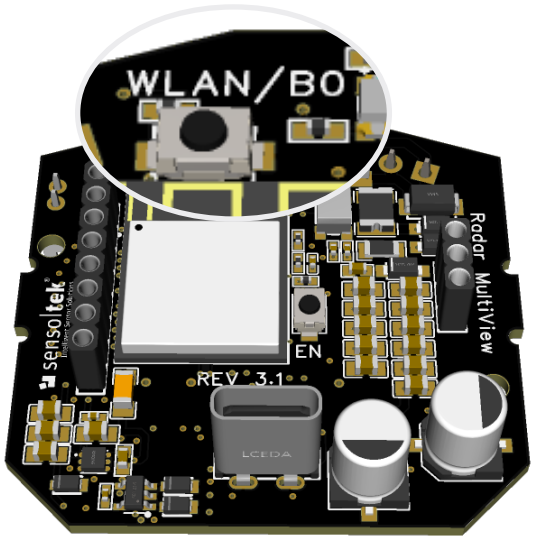
4.4 Commissioning the radar

- The Radar RMV-D2 must be mechanically mounted above the door. (see chapter 3)

- All cabling must be completed as per chapter 3.2. Check: After connecting voltage wires, the green RGB LED lights up for 10 seconds.

- Connecting to WLAN:

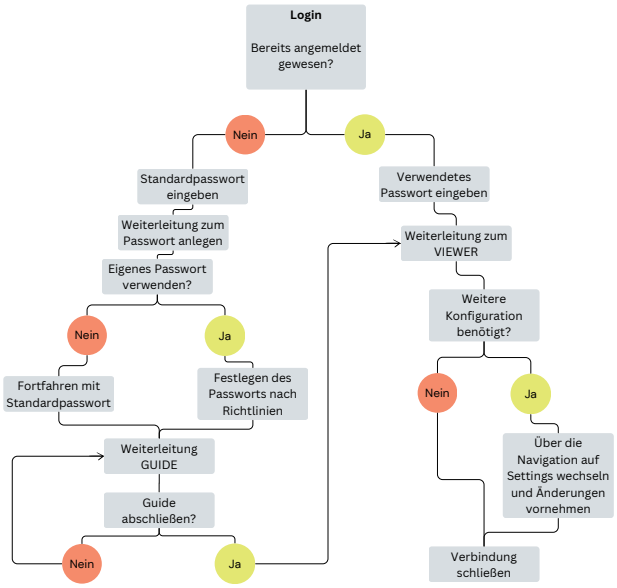
Note 1: The Radar WLAN is active for five minutes after applying voltage to the RMV-D2. RGB LED lights up blue.
Note 2: To activate WLAN, the "WLAN/BO" button must be pressed for five seconds until the RGB LED flashes purple.



4.4.1 Connecting the radar and mobile device

1. Automatically:
Scan the QR Code in the cover of the RMV-D2 with the camera of the mobile device. The mobile device, tablet/ smartphone immediately connects to the RMV-D2. The first menu is displayed: "Language selection".

2. Manually:
The SSID is noted in the cover of the RVM-D2. This must be selected from the list in the WLAN settings of the mobile device. Then enter the password printed on the cover. The tablet/smartphone connects to the RMV-D2. Open the web browser and enter "rmv.local" or alternatively "192.168.4.1". The RMV-D2 website is then loaded and is visible on the mobile device.



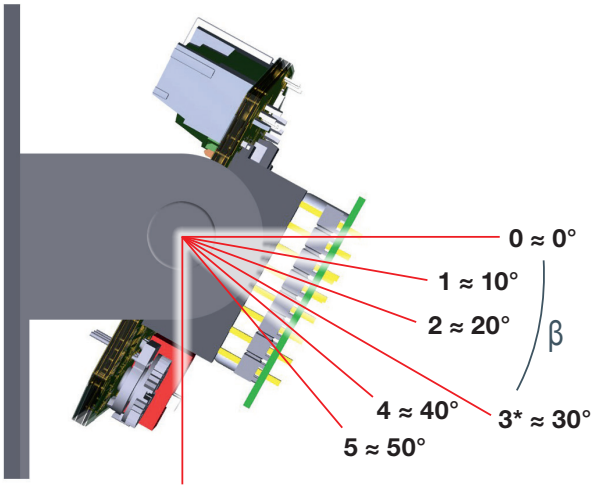
4.4.2 Settings on the web browser interface

1. Select language
2. Enter the password specified in the cover of the RMV-D2 radar
3. Assign a new password
4. Follow the device's instructions

Note: If you no longer have the login password, click on “Forgot password”. You will be guided from here.

4.5 Angle setting

The angle setting has a significant impact on the detection range. The standard value should be an angle of inclination of approx. 30° (locking lug 3) when installing. The exact value can be set in conjunction with the user interface.
If the detection range shown in the configuration tool does not suit the application situation, the angle must be corrected accordingly using the locking lugs on the circuit board holder.



5. Operation

Once the configuration is complete, 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 via the configuration tool.

5.1 Overview of LED display

LED – RGB	Description
LED flashes green – 10 seconds	Operational readiness
LED is off, no flashing	**The sensor is ready for operation**
LED flashes yellow	Approach detected in detection range
LED lights up red	Opening impulse set
LED lights up blue	Data connection is established
LED lights up white	Error display
LED lights up red purple	Activation of the WLAN

6. Maintenance

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

7. 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.

8. Decommissioning

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

9. Disposal

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