

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



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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. Introduction

1.1 Content of the document

This document contains information that you need for the use of your product in the relevant phases of the product life cycle. This may include:

- Product identification
- Delivery, transportation and storage
- Assembly and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Disassembly
- Disposal

The documentation consists of the following parts:

- Available document
- Data sheet

In addition, the documentation may consist of the following parts, if applicable:

- Certificate of conformity
- Certificates

1.2 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.



Danger! 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.

1.3 Symbols used

This document contains symbols to identify warnings and informative notes.

1.3.1 Warnings

You will always find warnings when your actions could be dangerous.

It is essential that you observe these warnings for your personal safety and to avoid damage to property.

Depending on the risk level, the warnings are displayed in descending order as follows:



Danger!

This symbol warns you of an imminent danger.

Failure to observe this warning may result in personal injury or even death.



Warning!

This symbol warns you of a possible fault or danger.

Failure to observe this warning may result in personal injury or serious damage to property



Caution!

This symbol warns you of a possible fault.

If you ignore this warning, the product or connected systems and installations may be disrupted or fail completely.

1.3.2 Informative notes



Note:

This symbol indicates important information.

1.4 EC Declaration of Conformity

EC Declaration of Conformity - Extract

The product RMV-D2 is compliant with Directive 2014/53/EU, equipment class 1 and the harmonized standards

EN 62311,

EN 62368-1,

EN 300440 V2.2.1,

EN 301489-1 V2.2.3,

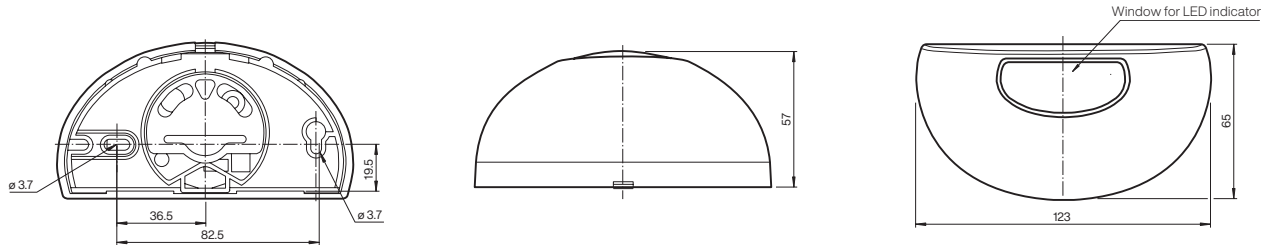
EN 301489-3 V2.1.1,

The complete declaration of conformity can be downloaded at www.sensotek.com

2. Scope of delivery and device description

2.1 Scope of delivery

- Radar MultiView RMV-D2



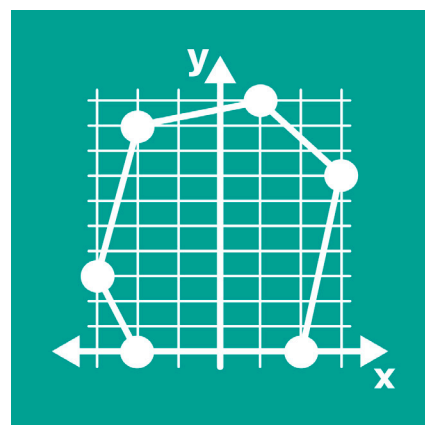
- 2 x screws (tapping screws)
- 1 x wire harness, 4 wire cord, 3.5 m length
- 1 x Drilling template
- QR Code in the housing of the RMV-D2; for establishing the connection to the web server; see chapter 4.4.1
- Password for initial login in the RMV-D2 housing; for logging in to the web server; see chapter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

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.

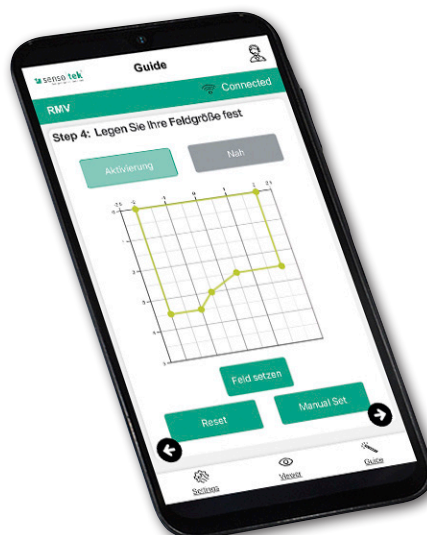
Activation areas are the key to perfectly functioning doors or gates. On the one hand, only desired movement events in a defined activation area triggers the door or gate and, on the other hand, actions of moving objects outside the activation field are suppressed.



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.



Warning! 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 2-D-Radar with 3 operating areas: Detection area: determined by the mounting height Activation area: adjustable to application via Web-Interface Near area: adjustable to application via Web-Interface
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
Transmitter radiated power (EIRP)	< 20 dBm
Radar radiation angle	34° x 80°
Minimum sensing range Width x depth	f (H, a) indication via Interface
Cross-traffic suppression	Adjustable: on (100%, no triggering), middle (50%), off (0%)
Opening speed of the door	Adjustable in [m/s]
Parameter setting	WLAN (OTA)
Integrated temperature	°C / °F / °K, output via interface
Approvals and certificates	CE; UL

Indicators / Operating elements

Function indicator	1 x LED (rgb)
Control elements	None

Electrical specifications

Operating voltage	AC: 8 ... 35 V AC +/- 10% DC: 8 ... 45 V DC +/- 10%
Power consumption	< 2.5 W

Technical Data

Radiated frequencies

BLE (Bluetooth®) Transmission power	2.402 GHz ... 2.480 GHz < 10 mW
WLAN Transmission power	2.412 GHz ... 2.472 GHz < 100 mW
Radar Transmission power	24.050 GHz ... 24.250 GHz < 10 mW

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

	Short circuit protected, normally open/closed (NO/NC) and event (see below) configurable via Web-Interface
Signal output	Solid-state relay
Switching voltage	Up to 60 V AC/VDC
Switching current	Max. 0.5 A
Holding time	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
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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 set via WEB-Interface
Operating ranges	Detection area of up to 10 x 10m, depending on mounting height and setting angle Activation area: configurable inside the detection area as a polygon with max. 8 points. Near area: configurable inside the detection area as a polygon with max. 8 points.

3. Installation

3.1 Installation

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

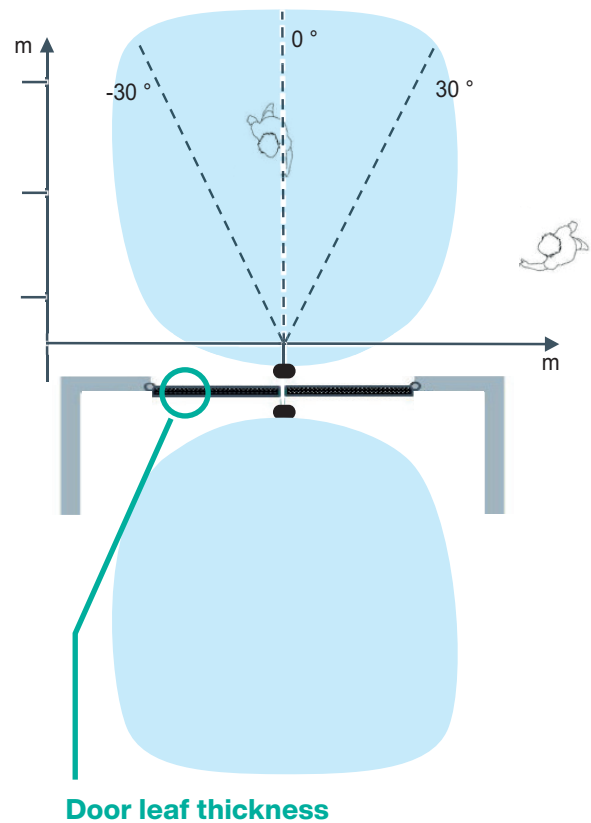
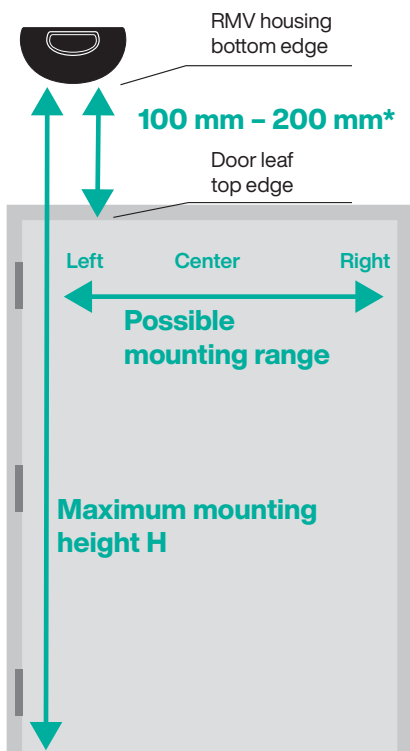
Installation of the Radar MultiView RMV-D2:

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 (see technical data) is measured from the floor and is not allowed to be exceeded.



*The mounting height of the RMV-D2 radar sensor varies depending on the door leaf thickness:

Door leaf thickness	up to approx. 40 mm	40 – 80 mm	80 – 100 mm
Mounting height Top edge of door leaf – bottom edge of sensor housing	100 – 250 mm	250 – 350 mm	300 – 400 mm

3.1.1 Opening the device:

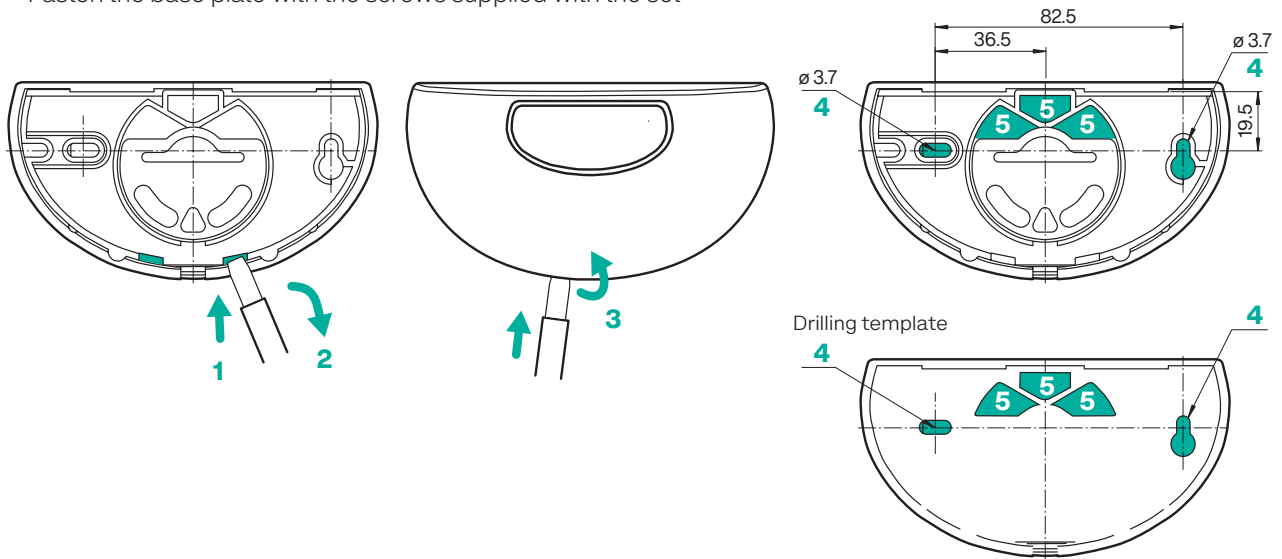
- Insert the screwdriver into the available opening (1) – at the bottom of the rear side of the housing – and carefully press on the cover (2)
- Fold the cover upwards and pull it away (3)



Note: The QR Code for connecting a mobile device with the RMV configuration tool is stuck 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.

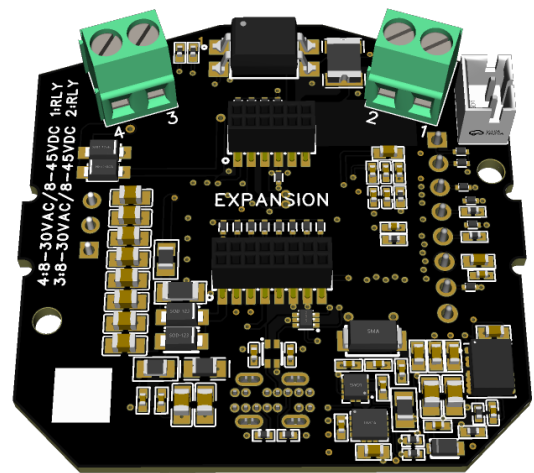
The screw terminals are provided for connecting the power supply and the outputs.

3.2.1 Connectors

Functions of the connectors

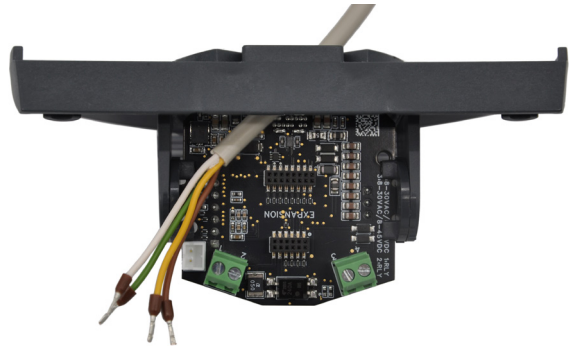
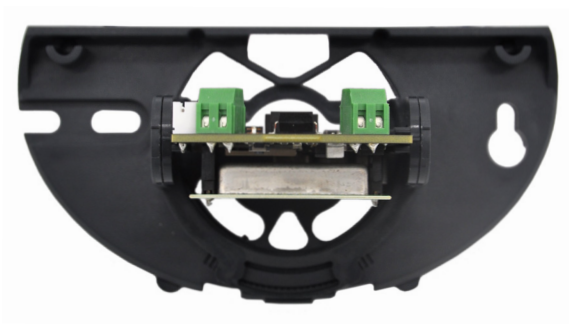
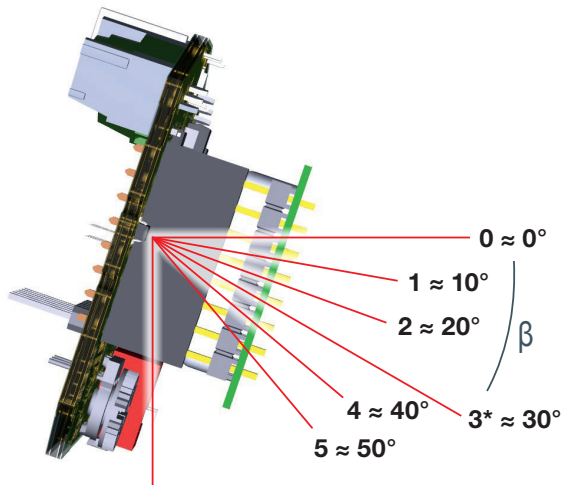
U1	S1
Power supply U_B 8 – 35 V AC / 8 – 45 V DC	Signal output 1
① NO / NC	③ UB+
② COM	④ GND

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

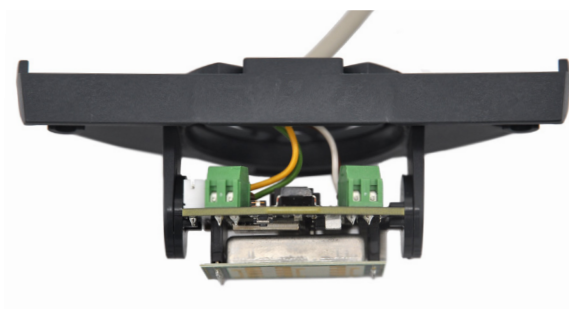
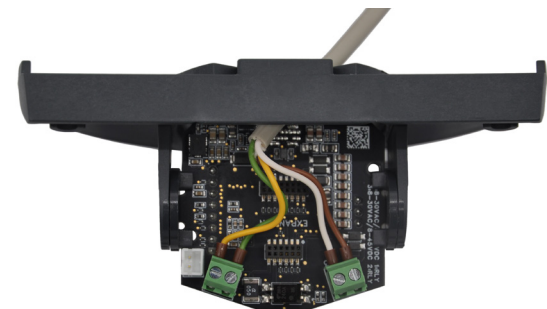


3.2.2 Wiring

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

LED – RGB	Description
LED flashes green (10 seconds after Power-Up)	Start process
LED is off, does not light up	The sensor is ready for operation
LED flashes yellow	Motion detected (any direction)
LED lights up red	Opening impulse set
LED flashes red purple	Activation of the WLAN (ready for connection)
LED flashes blue	Parameterization via web active: Data connection is established
LED flashes white	Error display



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.



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 RMV-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.

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. Alternative WLAN connection setup:

A1. Press the "WLAN/BO" button for **five seconds** RGB LED flashes purple.

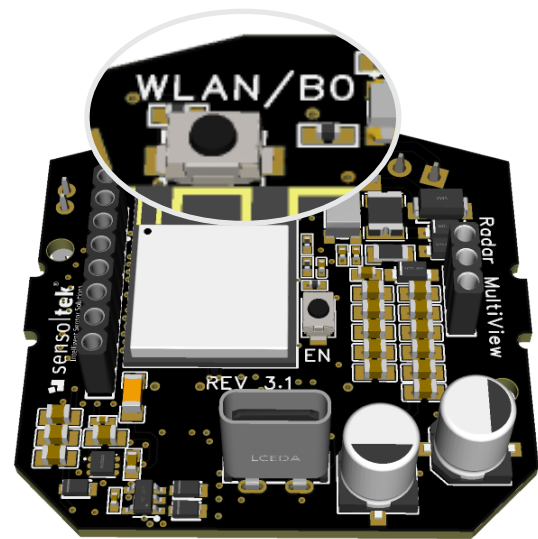
OR

A2. **Switch off the voltage**, wait 10 seconds →
Switch the voltage back on, wait until the green LED stops flashing

B. Smartphone: Deactivate **mobile data**

Laptop: Disconnect **LAN/Internet connection** →

Scan the QR code again to reestablish the WLAN connection



If the language selection does not appear:

C. Open web browser → Enter and confirm the address: <https://rmv.local> → **first menu: "Language selection"**



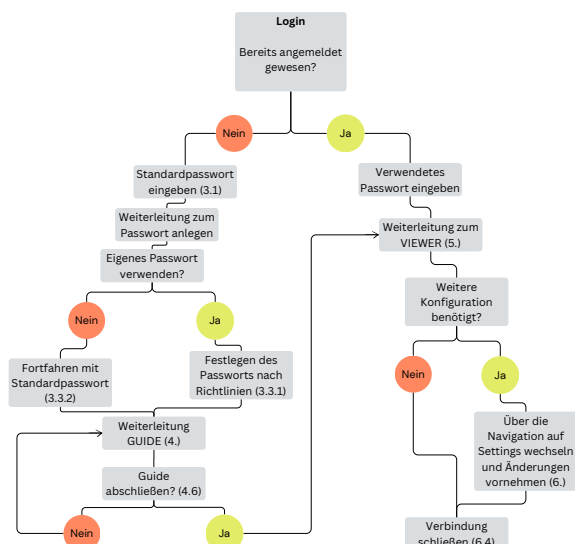
Note: If there is no interaction for a **max. of 15 minutes**, the WLAN connection is interrupted for data protection legal reasons. → **Retrieve alternative WLAN connection setup (A. – C.)** → first menu: "Language selection" appears

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



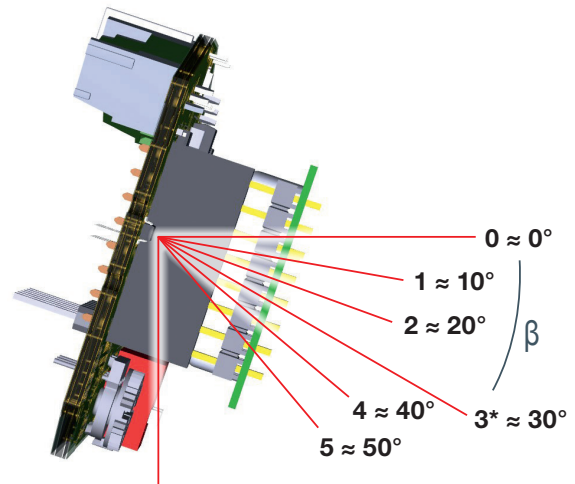
Note: If you no longer have the login password, click on "Forgot password". You will be guided from here.



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.



Caution! After changing the angle, always check the activation range and, if necessary, the close-up range, as these are automatically adjusted under circumstances.

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.



Caution! Do not adjust the mounting angle of the radar (see 4.5)! If the mounting angle of the radar is adjusted, the setting of the ranges may need to be adjusted using the configuration tool.

6. Maintenance

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

7. ESD safety



Warning! 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



Note: Device may be decommissioned only by trained personnel. Before dismantling, ensure that the supply voltage has been turned off.

9. Disposal



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