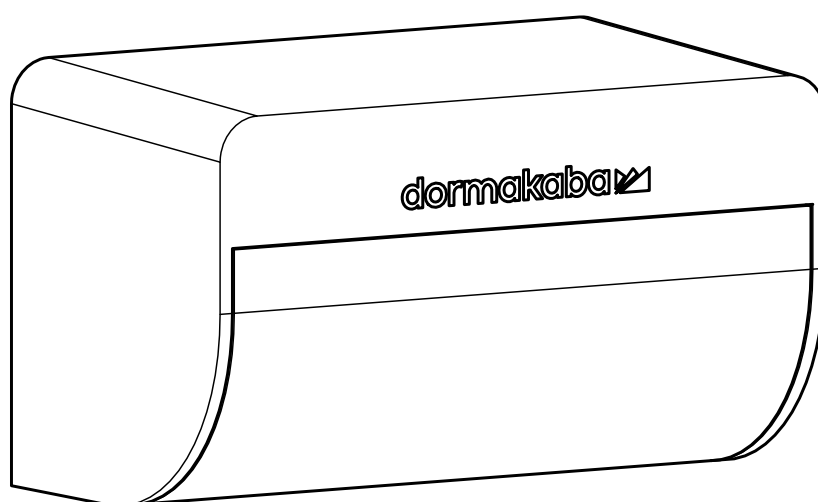


# Radar sensor M A01

Assembly Instruction



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# 1 Information about this document

## 1.1 Contents and purpose

This document describes the mounting and commissioning of the radar sensors M A01 with ED connection board CAN for the ED 100/250 operators of swing doors and the integration of the sensors and operators into the EntriWorX EcoSystem.



The figures serve to provide a general understanding and may differ from the product model that is actually delivered.

## 1.2 Target group

The document is aimed at qualified electricians.

## 1.3 Other applicable documents

- ED 100/250 mounting and commissioning instructions
- dormakaba Handheld device user manual
- Operating and mounting instructions for the components used for the door

## 1.4 Abbreviations

Components	Functionality
ED 100/250	Electromechanical operators ED 100/250 for the automatic opening and closing of swing doors
Sensor M A01	Radar sensor M A01 for detecting the area in front of the door
S	Passive door leaf
G	Active door leaf

## 1.5 Symbols used

### 1.5.1 Hazard category



#### NOTICE

Means a potentially harmful situation where the product or something in its environment could be damaged or result in malfunction.

### 1.5.2 Symbols



Sequence of action steps

Reference to another document



Components may be damaged by electrostatic discharge.

# 2 Security

## 2.1 Intended use

The sensor is designed exclusively for use with ED 100 or ED 250 operators (firmware V2.9.000) for swing doors from dormakaba.

## 2.2 Personnel qualification

The activities described in this document may only be carried out by professionals.

'Specialist personnel' refers to people who have suitable technical training and experience with the equipment's technology. Specialist personnel are expected to use their training and experience to recognize dangers for themselves and others when conducting the activities to reduce the impact of these to a minimum. It is the responsibility of the specialist personnel to ensure compliance with the conditions stated by the manufacturer, as well as applicable regulations and standards, when conducting this work.

## 2.3 ESD protection measures



#### NOTICE

**Electrostatic discharge hazard for electronic components.**

Improper handling of electronic circuit boards or components can cause damage that can lead to complete failure of the device or to sporadic errors.

1. When installing and repairing the product, the general ESD protective measures must be observed.
2. Wear an ESD wristband when handling electronic components. Connect the wristband to a ground contact point. This safely and effectively dissipates static charges from the body.
3. Only touch the printed circuit boards by the edges. Do not touch the circuit board and connectors.
4. Place removed components on an anti-static surface or in an anti-static shielded container.
5. Avoid contact between printed circuit boards and clothing. The wristband only protects the circuit boards from electrostatic discharge voltage on the body. Electrostatic discharge damage to clothing can still occur.
6. Only transport and ship removed modules in electrostatically shielding, conductive protective bags.

## 3 Product description

Sensor M A01 is a radar sensor that is mounted on the hinge side and the opposite side to the hinge in the middle of the door. The ED connection board CAN installed in the ED operator evaluates the measurement data from the sensor for controlling the door operators. The sensor detects movements of people. The control unit then determines the opening time of the door based on the person passing through. The door remains open for subsequent people passing through. The sensor specifically detects cross traffic. The control unit can hide this cross-traffic and keep the door closed. The sensor increases comfort for people passing through and reduces air exchange between both sides of the door to a minimum to save energy.

### 3.1 EC declaration of conformity



This chapter is only an extract from the full declaration of conformity.

dormakaba Deutschland GmbH  
DORMA Platz 1  
58256 Ennepetal  
Germany

hereby declares that the product described complies with the provisions of the listed EC Directive(s) and that the standards and/or technical specifications referred to below have been applied.

#### Directives:

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

The technical documentation is available from the Product Compliance Manager at: [product-compliance.dach@dormakaba.com](mailto:product-compliance.dach@dormakaba.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

### 3.2 UKCA Declaration of Conformity



This chapter is only an extract from the full declaration of conformity.

dormakaba Deutschland GmbH  
DORMA Platz 1  
58256 Ennepetal  
Germany

hereby declares that the product described complies with the provisions of the listed EC 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 from the Product Compliance Manager at: [product-compliance.dach@dormakaba.com](mailto:product-compliance.dach@dormakaba.com)

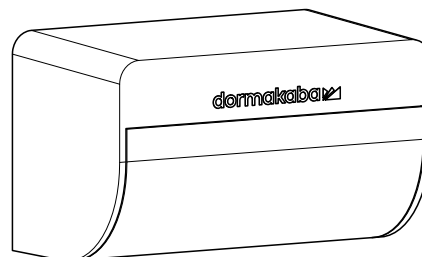
#### Harmonized European standard, national rule:

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

### 3.3 Parts included



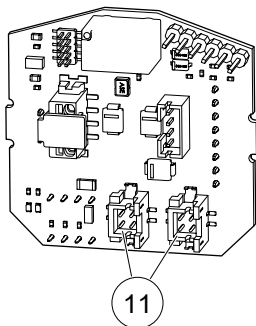
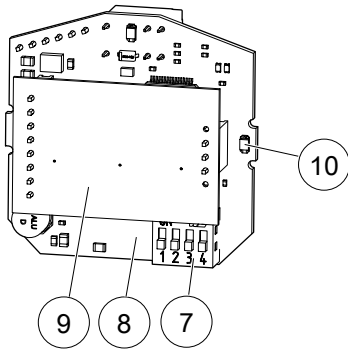
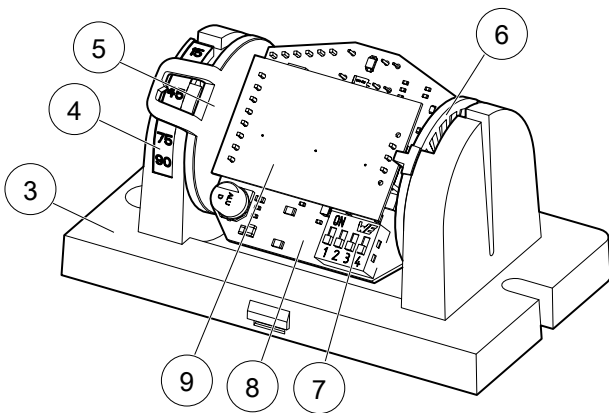
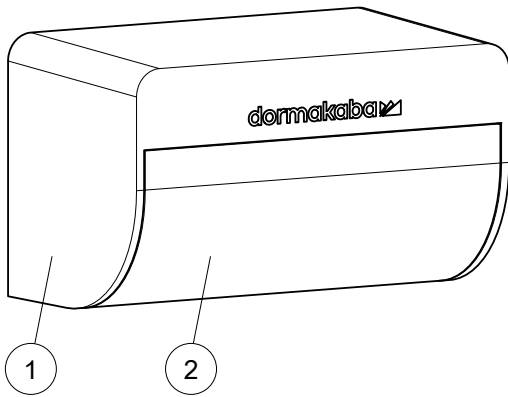
The ED100/250 operator control unit needs firmware version V2.9.000 or higher to operate the radar sensor.



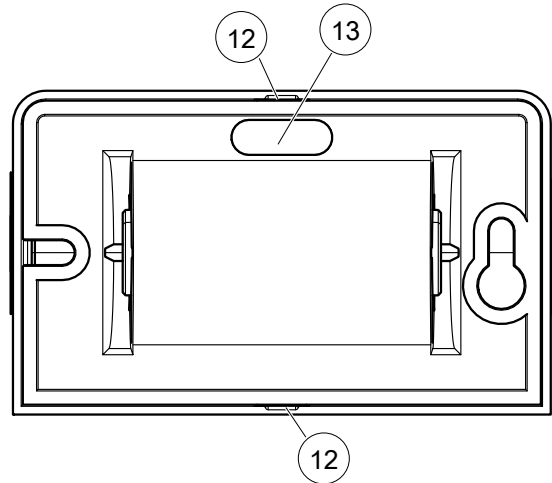
- CAN connection cable for sensor M A01 with open cable end
- Mounting kit for sensor M A01

### 3.4 Structure of the sensor

The radar sensor consists of the following components:



Position	Component
1	Hood
2	Front panel
3	Base plate
4	Chevron label
5	Locking disc
6	Light guide locking disc
7	DIP switch
8	Radar board
9	Radar module
10	Status LED function display
11	CAN socket



Position	Meaning	Note
12	Recess	Place a screwdriver in the recess to lift the hood off the base.
13	Long slot	Guide the CAN connection cable through the long slot.

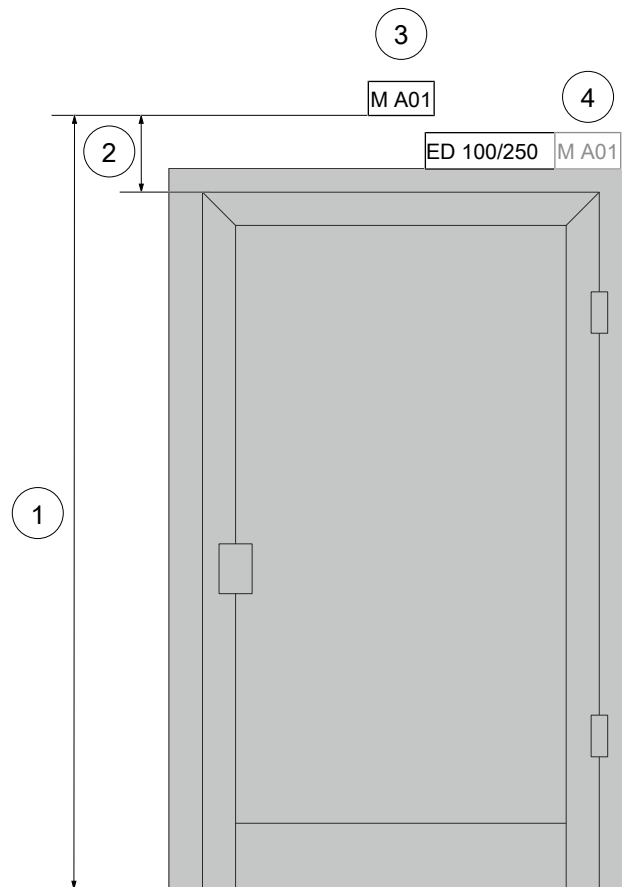
## 4 Mounting

### 4.1 Determine mounting positions

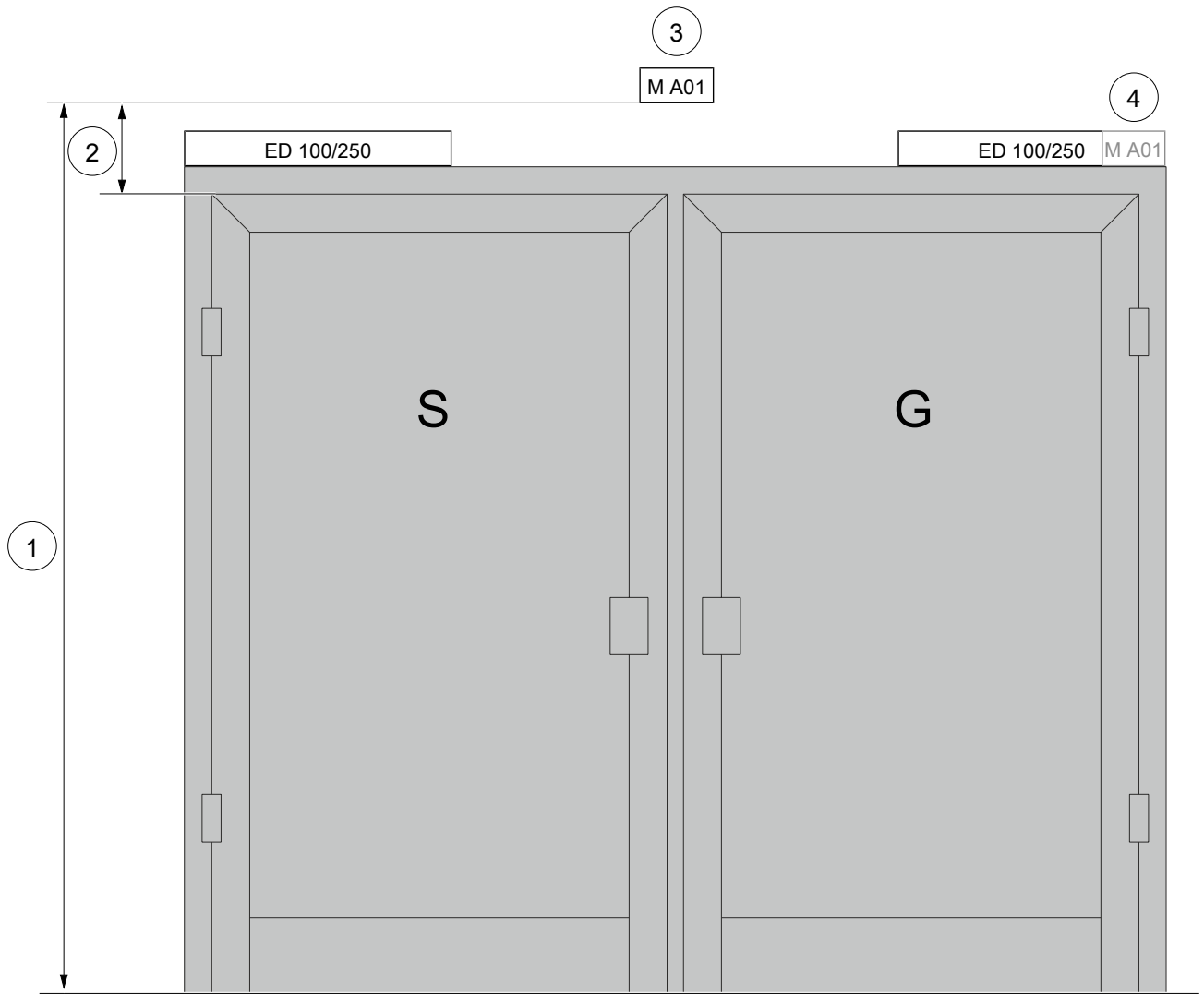
1. Determine the mounting positions on the hinge side and the opposite side to the hinge centrally above the door.
2. Comply with the installation heights according to the table.
3. Avoid letting the ED operator shadow the sensor.

	Parameter	Value
1	Installation height from the floor	2.0 m to 4.0 m
2	Installation height above the door leaf upper edge, with central mounting above the door ( <b>recommended</b> )	0.2 m to 0.5 m
3	Mounting positions ( <b>recommended</b> )	<ul style="list-style-type: none"> <li>• Displacement of a maximum of 0.8 m from the center to the right and left is permitted</li> <li>• for 1-leaf doors: optimum position exactly in the <b>center</b> above the door leaf</li> <li>• for 2-leaf doors: optimal position exactly in <b>the center</b> above both door leaves,</li> </ul>
4	Optional mounting positions	<ul style="list-style-type: none"> <li>• Mounting at operator height above the hinges is optionally permitted (applies to 1- and 2-leaf doors). Preferably on the active door leaf (G) for 2-leaf doors.</li> </ul>

### 4.2 Mounting the sensor above a 1-leaf door



### 4.3 Mounting the sensor above a 2-leaf door



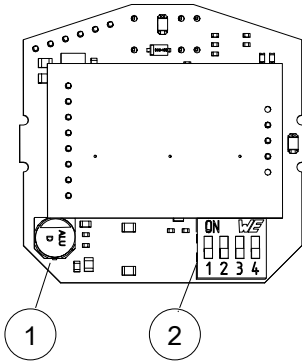
- S Passive door leaf
- G Active door leaf

## 4.4 DIP switch setting



dormakaba recommends setting the DIP switch before the sensor is mounted on the wall.

If the position of the DIP switches is changed, carry out a CAN reset (Cr) (set Cr = 1).



Component	
1	Radar board
2	4-pin DIP switch

- ✓ **NOTICE! Observe ESD protective measures**, see "ESD (electrostatic discharge) protective measures".
- 1. Set the DIP switch (2) on the radar circuit board (1) to the ON or OFF positions. See table below.
- 2. Make the settings for DIP switches 1 and 2 according to the position of the sensor on the door.
- 3. For the last participant of the series circuit, set the DIP switch 4 to ON during operation

or

for parallel connection, set DIP switch 4 to ON for both participants during operation.

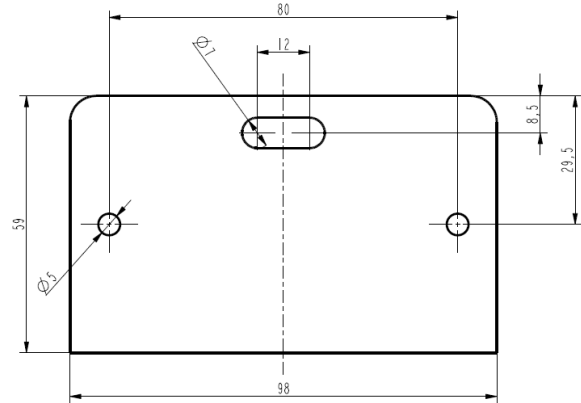
DIP	ON	OFF
1	Outside detector	Inside detector
2	Opposite side to the hinge	Hinge side
3	Option	Option
4	Terminating resistor for CAN active	Terminating resistor for CAN inactive

(see Mounting information for the doors [▶ 4.6](#))

## 4.5 Set the hole pattern for the sensor

Observe the installation heights according to the information in the tables, see "Mounting the sensor above a 1-leaf door [▶ 4.2](#)" and "Mounting the sensor above a 2-leaf door [▶ 4.3](#)".

Set the hole pattern for wall mounting of each radar sensor according to the graphic.





## 4.6 Mounting information for the doors

### Defining the active door leaf operator

- For 2-leaf doors, define the door with the active door leaf operator.
- Install the ED connection board CAN in the active door leaf operator.



For doors with closing sequence control, the door with the active door leaf operator is the door that opens first.  
The active door leaf operator controls the subordinate passive door leaf operator and thus the opening and closing of the 2-leaf door.

- Connect the CAN connection cables of the radar sensors to the ED connection board CAN in the active door leaf operator.

### Wall opening for CAN connection cable

- Route the CAN connection cables of both radar sensors to the ED connection board CAN.
- Connect the wires of both sensors in parallel or in series (from sensor to sensor).

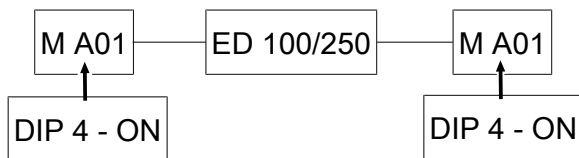


Fig. 1: Parallel connection

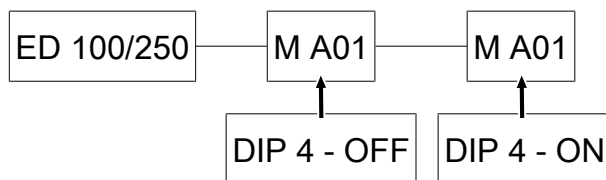


Fig. 2: Series connection

- Make a wall opening at a suitable point if this is necessary.

## 4.7 Install individual components

### 4.7.1 Mounting the radar sensors



dormakaba recommends setting the DIP switches before the sensor is mounted on the wall.  
The action steps in this manual refer to operation with 2 sensors.



### NOTICE

#### Functional failure of a radar sensor

The radar module and the radar circuit board are permanently connected as a unit at the factory.  
Never disconnect the radar module from the radar board.

- ✓ Drill holes for attaching each sensor are set above the door according to the hole pattern, see "Set the hole pattern for the sensor [▶ 4.5]".
  - ✓ Wall bushing for the CAN connection cable from the outside detector to the active door leaf operator has been laid.
  - ✓ **NOTICE! Observe ESD protective measures**, see "ESD (electrostatic discharge) protective measures".
- Lift the hood (1) with the front panel (2) off the base plate (3) using a screwdriver in the recesses (12) on the back, see "Structure of the sensor [▶ 3.4]".
  - Set the DIP switches (7) on the radar circuit board (8) by hand, see "Structure of the sensor [▶ 3.4]" and "DIP switch setting [▶ 4.4]".
  - Swivel the locking discs (5) and (6) by hand to a 90° position, see "Structure of the sensor [▶ 3.4]".  
⇒ The back of the radar board is accessible.
  - Plug the CAN plug of the connection cable into a CAN socket (11). Observe the CAN connector coding, see "Structure of the sensor [▶ 3.4]".
  - Set the tilt angle of the sensor by hand in 15° steps according to the table below.
  - Guide the CAN connection cable through the elongated hole (13) in the base plate (3), see "Structure of the sensor [▶ 3.4]".
  - Lay the CAN connection cable with the open cable ends to the ED CAN connection board in the ED operator.
  - Screw the opened assembly in the hole pattern of the base plate (3) over the defined door side, see "Structure of the sensor [▶ 3.4]".
  - If there is a second sensor on the outside of the door, repeat steps 1 to 8.  
⇒ Each sensor is mounted and adjusted.

#### The tilt angle depends on the mounting height

Tilt angle	Mounting heights				
	2.0	2.5	3.0	3.5	4.0
30°	x	x			
45°			x	x	x

(x = Recommended combination)



For intermediate heights, use the tilt angle from the next higher or lower mounting height in the table.

In special cases it is possible to deviate from the recommended angle setting (e.g. wall in the detection area).

### 4.7.2 Connecting the CAN connection cable

- ✓ The CAN connection cables of the sensors are plugged into a CAN socket (11) on the back of each radar circuit board (8), see "Structure of the sensor [▶ 3.4]".
  - ✓ Each open cable end with the individual wires is routed to the ED connection board CAN and pulled out through the middle opening in the ED connection board CAN.
  - ✓ Tool: Wire stripper
1. Strip the individual wires approx. 5-6 mm.
  2. Twist or crimp the same individual wires of each sensor and connect them to the connection terminals (5), see "Structure of the ED connection board CAN".
  3. Observe the assignment of the connection terminals according to the table.



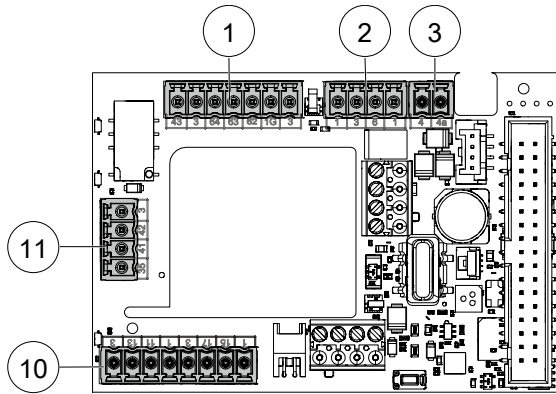
Single wires must be electrically isolated from each other.

Observe the alignment of the board.

The terminal name can be found on the board.  
Unplug the plug for this.

Color code	Function	Connection terminals
White	+24V DC	
Green	CAN-H	
Yellow	CAN L	
Brown	GND	

## 5 Connection



	Number	Assignment	
1	43	Locking feedback	
	3	GND	
	64	NC	
	63	NO	
	62	COM	
	1G	+ 24 V switched depending on the smoke detector	
2	3	GND	
	1	+ 24 V	
	3	GND	
	6	Fire protection upgrade card 18k or RM ED	
3	1		
	4	Shutdown drive function	
10	4a	GND	
	1	+ 24 V	
	15	Signal input safety sensor hinge side	
	17	Test output	
	3	GND	
	1	+ 24 V	
	11	11	Signal input safety sensor opposite side to the hinge
		13	Test output
3		GND	
35		Signal input night/bank	
11	41	Signal input impulse outside	
	42	Signal input pulse inside	
	3	GND	

# 6 Commissioning

## 6.1 Capturing cross traffic for door opening

### Parameter designation on the ED user interface

- Io = Inside detector cross-traffic mode
- Ao = Outside detector cross-traffic mode

### Parameter designation plain text in the handheld device

- MA01 IM QV = Inside detector cross-traffic mode
- MA01 AM QV = Outside detector cross-traffic mode



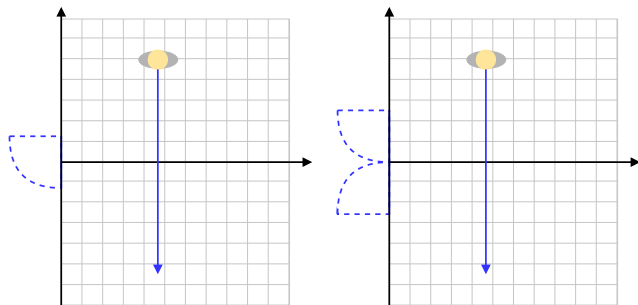
By default, the control unit hides cross traffic and keeps the door closed.

Note the positions of the inside detector and/or outside detector.

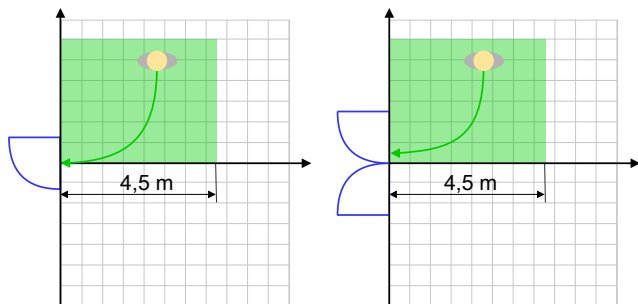


Observe the spatial, structural situation. People primarily approach the door from one or both sides. They almost always go through the door. In these cases select a parameter value of 1, 2 or 3 to detect cross traffic for door opening. These parameter values result in the door opening earlier.

### Preset default value is "0"

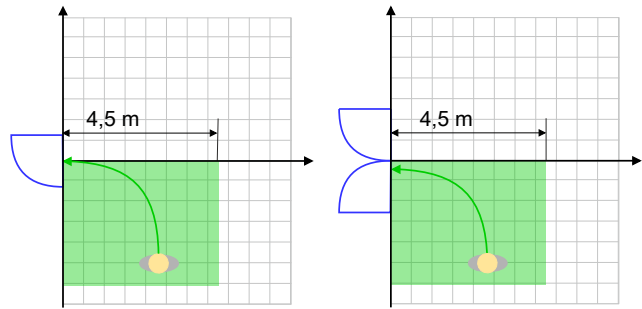


### Set to "1".



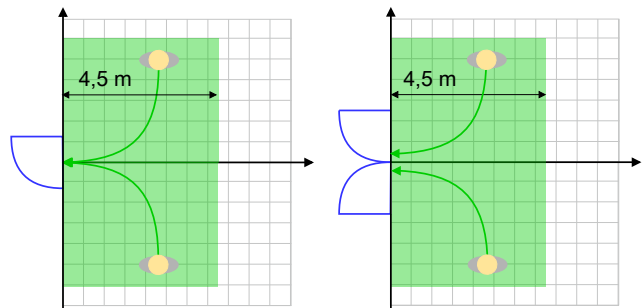
With a **parameter value of 1**, cross traffic is detected **from the right** in order to open the door. This applies to the area marked in green.

### Set to "2".



With a **parameter value of 2**, cross traffic is detected **from the left** in order to open the door. This applies to the area marked in green.

### Set to "3".



With a **parameter value of 3**, cross traffic **from the right and left** is detected in order to open the door. This applies to the area marked in green.

## 6.2 Setting ED parameters for operation with radar sensors

Set the parameters via the handheld device or via the ED's user interface. The parameters can be found in the "Special functions" menu in the handheld device.

### dd parameter

With the CAN reset, the hold-open time is automatically set to "0" if at least 1 radar sensor M A01 is connected. If desired, the parameter can be changed after the CAN reset.

### Ih and Ah parameters

Set the mounting heights Ih and Ah.

### IT and AT parameters

If the parameters are selected smaller, note the negative influence on the suppression of cross-traffic. The door opening behavior is generally more sensitive.

### So ED parameter

The So door opening speed parameter affects the general opening time of the door. If the door opens slowly, it opens sooner. If it opens faster, it opens later.

Parameter (handheld plain text)	Display	Min. value	Max. value	Default	Remarks
Inside detector mounting height (MA01 IM Height)		20	40	25	Mounting height of the inside detector in dm
External detector mounting height (MA01 AM height)		20	40	25	Mounting height of the external detector in dm
Inside detector cross-traffic mode (MA01 IM QV)		0	3	0	0 - Hide cross traffic left and right (default) 1 - Capture cross traffic on the right 2 - Capture cross traffic on the left 3 - Capture both sides
Outside detector cross-traffic mode (MA01 AM QV)		0	3	0	0 - Hide cross traffic left and right (default) 1 - Capture cross traffic on the right 2 - Capture cross traffic on the left 3 - Capture both sides
Inside detector door opening time (MA01 IM Timing)		0	6	3	0 - very early 1 - early 2 - a little earlier 3 - default 4 - a little later 5 - late 6 - very late
Outside detector door opening time (MA01 AM Timing)		0	6	3	0 - very early 1 - early 2 - a little earlier 3 - default 4 - a little later 5 - late 6 - very late
CAN reset		0	1	0	1 - Can reset

The CAN reset parameter is not available in the handheld device, but must be triggered via the ED's user interface.

Trigger the "Cr -> CAN reset" parameter in the following situations and set the value to "1":

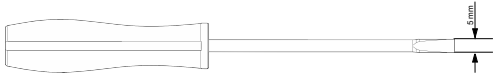
- If the initial commissioning is performed after all devices have been connected.
- When a device has been added to the bus.
- If a device on the bus has been replaced.
- If the DIP switches on the sensor(s) have been adjusted.
- If the control unit no longer recognizes the CAN devices.

The CAN reset parameter resets itself to the value "0".

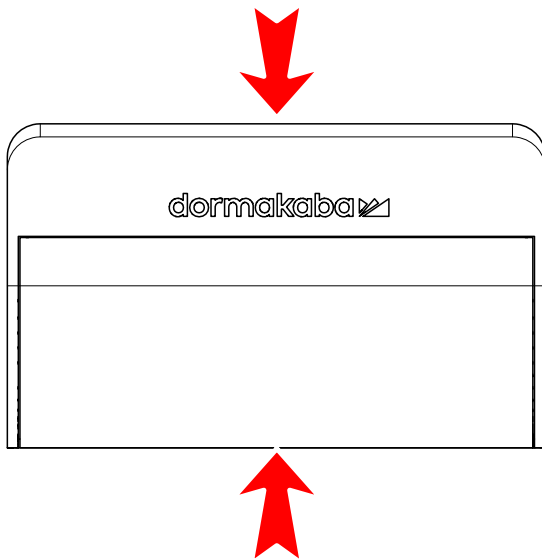
## 7 Troubleshooting

### 7.1 Open sensor on the wall

- To correct the DIP switches, see DIP switch setting [▶ 4.4](#)].
- To correct the tilt angle in the sensor, see Mounting the radar sensors [▶ 4.7.1](#)].
- To open the sensor due to a specific error code.
- ✓ Tool: Screwdriver with a slot width of 5 mm



1. Place the screwdriver carefully at the marked points between the wall and the hood (1), see "Structure of the sensor [▶ 3.4](#)]".
2. Using the screwdriver, gently pry off the hood at both positions.
3. Change the positions until the hood can be lifted off the base plate (3), see "Structure of the sensor [▶ 3.4](#)]".



### 7.2 Evaluate errors and rectify faults



The error number is indicated by the **number of flashes** . The message with the highest priority is displayed.

Process data between the ED control unit and the radar sensor are not exchanged.

The RGB LED function display 6 (see "Structure of the ED connection board CAN") on the ED connection board CAN shows the following errors.

#### Error no. 1

<b>Name</b>	TMS communication error
<b>Description</b>	The communication between the ED control unit and the ED connection board CAN is interrupted.
<b>Fix</b>	Check the C1 parameter setting on the ED control unit, check the connection cable between the ED control unit and the ED connection board CAN. If necessary, Actuate Power on on the ED drive.

#### Error no. 2

<b>Name</b>	CAN initialization error
<b>Description</b>	An error occurred when assigning the address for the radar sensor via the CAN protocol because the expected responses were not received. This affects the bus communication with the radar sensor.
<b>Fix</b>	Check the CAN connection cable and the bus termination, i.e. the DIP switch must be at position 4 set to <b>ON</b> /"CAN terminating resistor active". Execute CAN reset.

#### Error no. 3

<b>Name</b>	Unknown CAN bus participant error
<b>Description</b>	Unknown CAN devices were detected during device assignment or the maximum defined number of participants was exceeded. This affects the bus communication with the radar sensor.
<b>Fix</b>	Check connected devices for correctness and, if necessary, remove them from the bus. Execute CAN reset.

#### Error no. 4

<b>Name</b>	Device assignment error
<b>Description</b>	Device positions appear twice in the device assignment. This affects the bus communication with the radar sensor.
<b>Fix</b>	Check the setting of the DIP switches on the radar sensors. Execute CAN reset.

#### Error no. 5

<b>Name</b>	Missing device error
<b>Description</b>	A trained device (radar sensor) is no longer available after switching on the system. This affects the bus communication with the radar sensor.
<b>Fix</b>	Check the CAN connection cable and the device. Actuate Power on on the ED drive.

**Error no. 6**

<b>Name</b>	CAN communication error
<b>Description</b>	The communication between the radar sensor and the ED connection board CAN is interrupted.
<b>Fix</b>	Check the CAN connection cable. If necessary, Actuate Power on on the ED drive.

**Error no. 7**

<b>Name</b>	Radar sensor error
<b>Description</b>	A device (radar sensor) sends an emergency message due to an internal error. This affects the bus communication with the radar sensor.
<b>Fix</b>	Actuate Power on on the ED drive.

**Also see about this**

 Mounting information for the doors [▶ 9]

## 8 Disassembly and disposal

Disassembly is carried out in reverse order of the manual.



The product must not be disposed of in domestic waste. Dispose of the product in an environmentally friendly manner at the collection points set up for this purpose. Refer to the statutory regulations for your country.

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