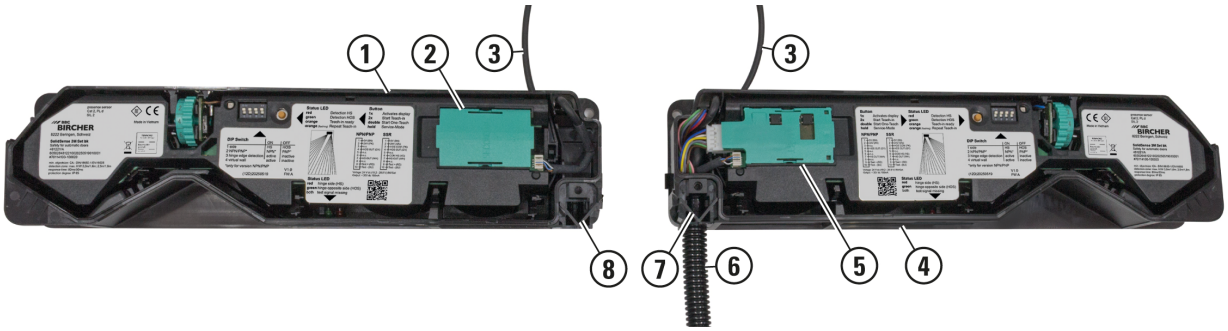
BBC BIRCHER Smart Access

SolidSense

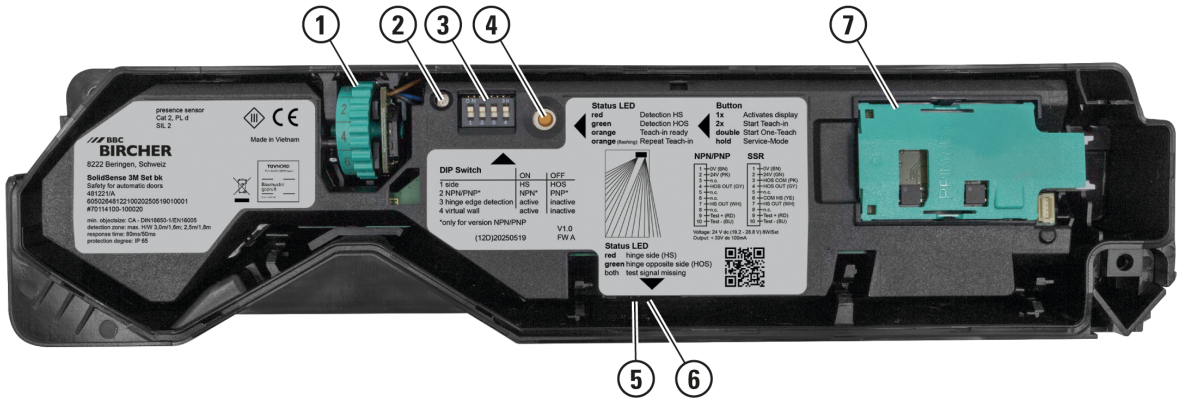
Sensor system for safeguarding swing doors in accordance with DIN 18650 and EN 16005

1 **Description** 2
1.1 Function 2
1.2 Application 2
1.3 Scope of delivery 2
2 ⚠ **Safety instructions** 2
3 **Installation** 3
3.1 Mounting position 3
3.2 Mounting preparation 3
3.3 Mounting 4
3.4 Electrical connection 6
4 **Settings** 6
4.1 Setting the inclination angle 6
4.2 Setting the DIP switch 6
5 **Operation** 7
5.1 Operation 7
5.2 Status messages 7
5.3 Commissioning 8
5.4 Maintenance 9
6 **Faults** 10
6.1 Malfunctions 10
6.2 Interference 10
7 **Technical data** 10
8 **Contact** 11



Set for 1 swing door

1	Sensor, right
2	Blind module for secondary sensor
3	Secondary cable (master-slave connection)
4	Sensor, left
5	IO module for primary sensor
6	Primary cable with corrugated hose (connection cable)
7	Corrugated hose bracket
8	Blind plug for secondary sensor



Display and control elements

1	Inclination angle dial
2	Status LED for operational readiness, red, green, orange
3	DIP switch
4	Teach-in button
5	Signal LED for detection on the hinge opposite side, green
6	Signal LED for detection on the hinge side, red
7	IO module for primary sensor

1 Description

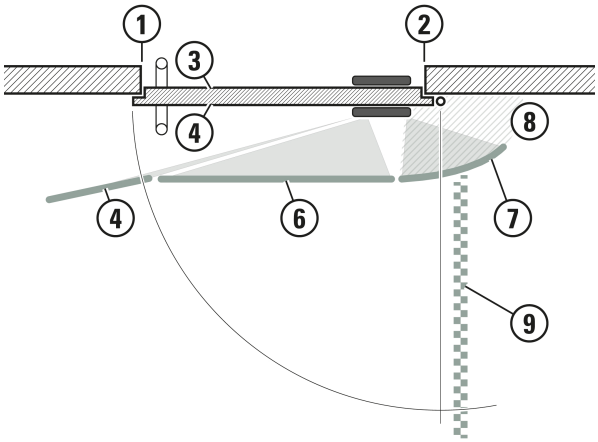
1.1 Function

The sensor system is intended for mounting on an automatic swing door. The sensors are mounted on both sides of the door leaf and connected to the door controller.

The sensor system works with solid-state scanners and uses time-of-flight technology. The sensor modules generate a detection field on both sides of the door leaf and a detection field on the secondary closing edge as anti-trap protection. When people or objects are detected in the detection field, the sensor sends a signal to the door controller. In this way, the door controller can prevent collisions and crushing by stopping or resetting the door movement.

The sensor learns the maximum opening angle of the door leaf and only reacts to objects that can be reached by the door leaf ("virtual wall").

1.2 Application



Swing door plan view

1	Primary closing edge
2	Secondary closing edge
3	Hinge opposite side
4	Hinge side
5	Primary closing edge detection field
6	Door leaf detection field
7	Secondary closing edge detection field
8	Clamping protection zone
9	Virtual wall

1.3 Scope of delivery

Standard package contents



Left sensor



Right sensor



Standard equipment for 1 swing door

2	Sensors with cover	
Screws:		
6	Sheet metal screws for mounting the sensors	(1)
2	Screws for fixing corrugated hose bracket and blind plug	(1)
Cables:		
1	Primary cable, 8-pin, with plug connector on the sensor side	(6)
1	Corrugated hose for primary cable	(3)
1	Wall bracket for corrugated hose with screws	(2)
1	Seal for primary cable IP65	(4)
1	Secondary cable, 4-pin, with plug connector on both sides	(5)
Print inserts:		
1	Drilling template	
1	QuickStart Guide	

2 ⚠ Safety instructions

Read the operating instructions carefully before commissioning the device. Keep the instructions for future use.

Intended use

The manufacturer is only liable for products used as intended. Only use this product for the following purpose:

Sensor system for safeguarding swing doors in accordance with DIN 18650 and EN 16005

Personnel qualification

Only trained and qualified personnel may install and commission the device.

The installer is responsible for installing the device and the connected system in accordance with the regulations and standards.

General safety instructions

It is the responsibility of the equipment manufacturer to carry out a risk assessment and to install the system in compliance with applicable regulations and safety standards.

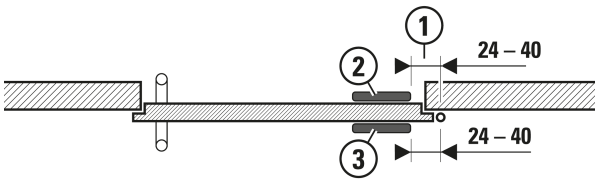
If installation according to standard EN 61558 is required, the sensor may only be operated using safety extra-low voltages (SELV) with safe electrical isolation.

The cables must be laid permanently and protected against mechanical damage.

3 Installation

3.1 Mounting position

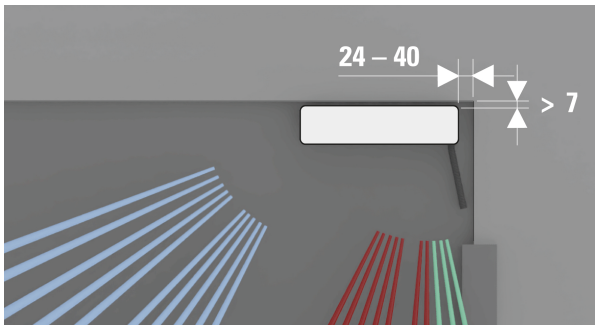
- ▶ Position the two sensors on both sides of the door leaf exactly opposite each other (note the cross-section of the door profile).



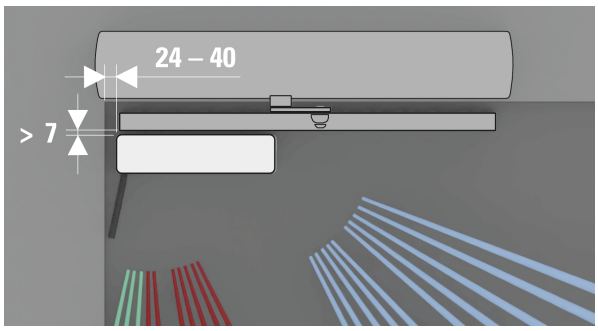
Swing door plan view

1 Secondary closing edge
2 Left sensor
3 Right sensor

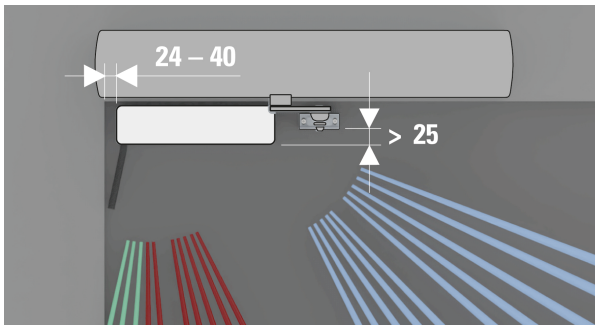
- ▶ Position the two sensors:
  - – **Right sensor** (with cable routed to right) with the help of the template "**right side**" next to the right secondary closing edge
  - – **Left sensor** (with cable routed to left) with the help of the template "**left side**" next to the left secondary closing edge
- ▶ Align the sensors:
  - – **sideways** on the secondary closing edge
  - – **upwards** on the drive side (usually the hinge side) on the dor closer
  - – **upwards** on the side without drive (usually the hinge opposite side) on the upper edge of the door leaf
- ▶ Ensure that the door leaf remains free below the sensors.



View of door side without door closer



View of side with door closer (slide rail)



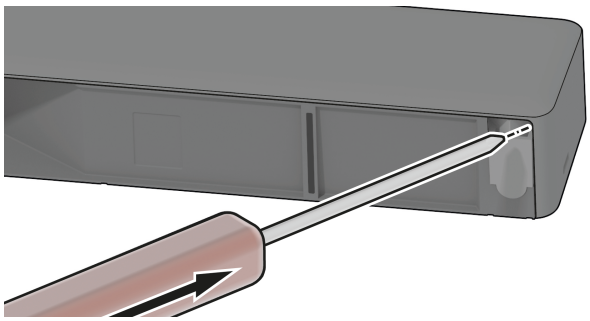
View of side with door closer (scissor linkage)

3.2 Mounting preparation

Voltage

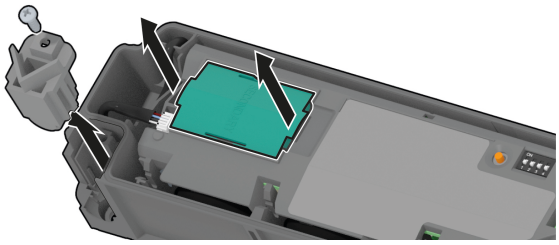
- ▶ Disconnect the power supply to the door controller.

Open sensors



- ▶ Remove the cover from the sensors. To do this, open the locking hooks.

Remove the I/O module and corrugated hose bracket



Remove the following parts from the brackets of the sensors. Keep these parts for mounting:

- Corrugated hose bracket and the blind plug
- I/O module and blind module

CAUTION

Damage to the I/O module

The I/O module can be damaged by using tools.

- Grasp the I/O module at the short edges with your thumb and index finger. Pull the module upwards from the slot.

3.3 Mounting

Position the sensor

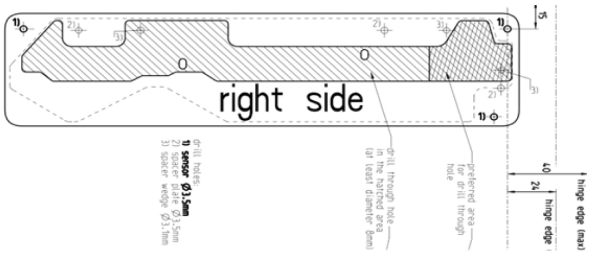
- Fix the drilling templates on both sides of the door leaf according to section 3.1 "Mounting position".

Depending on the design of the door leaf, it may be helpful to use mounting accessories (optional). To mount the sensor with the help of accessories:

- Attach the mounting accessories according to section "Use optional accessories"

To mount the sensor directly on the door leaf:

- Drill 3 attachment points (Ø 3.0 mm) for each of the two sensor housings at the markings.
- Drill a cable passage (Ø 8 mm) through the door leaf in the hatched area.



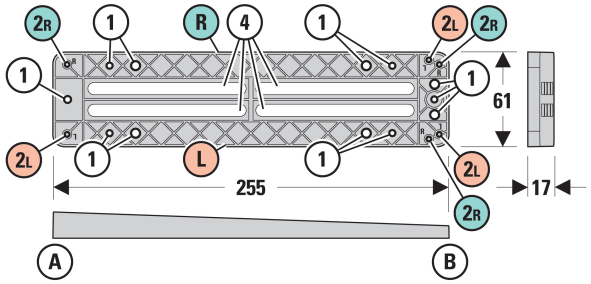
- Remove the drilling templates from the door leaf.

Use optional accessories

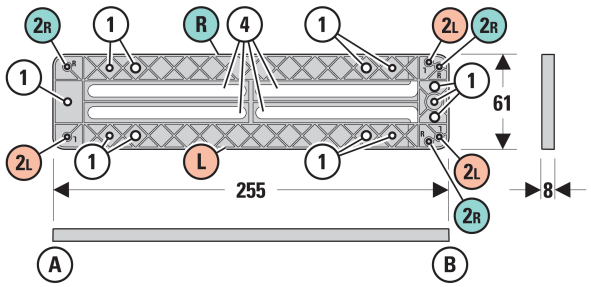
Instead of the sensors, attach the accessories to the door leaf. The sensors are mounted on the accessories.

Note the features and mounting points of the accessories:

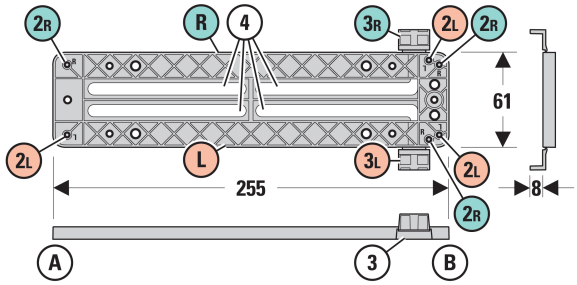
Spacer wedge for doors with pull bar:



Spacer plate for door leaves with projecting edge profiles:



Glass door mounting set for mounting without door leaf holes:



L		Top edge, left side
	R	Top edge, right side
1		Attaching accessories to door leaf **Spacer wedge or spacer plate:** ▶ Drill 3 fastening points per accessory (Ø 3.0 mm) here. ▶ Use the screws from the sensor set to attach the accessories. **Glass door mounting set:** ▶ Use the adhesive strips from the accessory set to attach the accessories.
2_L	2_R	Attaching sensor to accessories ▶ Use the screws from the accessory set to attach the sensors.
3_L	3_R	Cable guide for top edge of door leaf (replaces cable passage). **Glass door mounting set:** ▶ Break off the cable passage at the respective lower edge. You can also lay the cable open and break off all cable guides if they do not fit.
4		Recesses for cable passage. **Spacer wedge or spacer plate:** ▶ Drill a cable passage (Ø 8 mm) through the door leaf in one of the recesses.

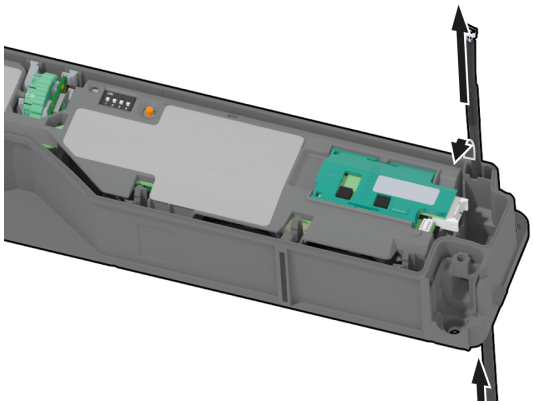
A Align this side towards the main closing edge.
B Align this side towards the secondary closing edge.

Attach sensors and secondary cables

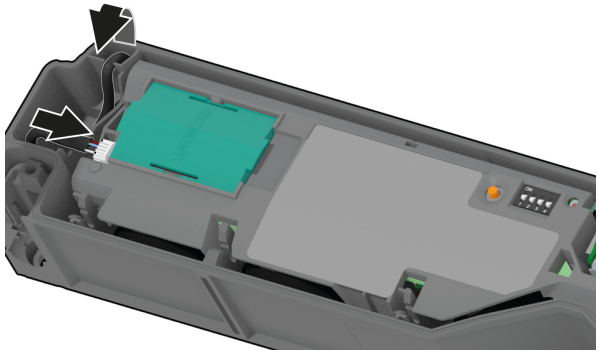
The secondary cable (with 4 conductors and plug connectors at both cable ends) connects the two sensors to each other.

To connect the sensors to each other and attach them to both sides of the door leaf:

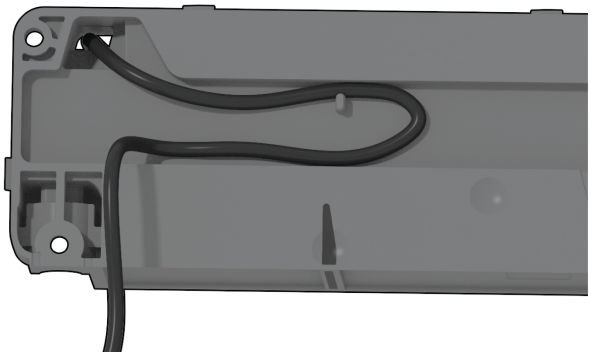
- ▶ Route the secondary cable (with 4 wires and plug connectors at both cable ends) through the cable passage in the door leaf.



- ▶ Guide the two ends of the secondary cable into the sensors at the back.



- ▶ Insert the two cable connectors into the slots.



- ▶ Stow excess cable in the cable depots of the support plates of the sensors.
- ▶ Screw both sensors to the prepared positions on the door leaf.

Prepare primary cable

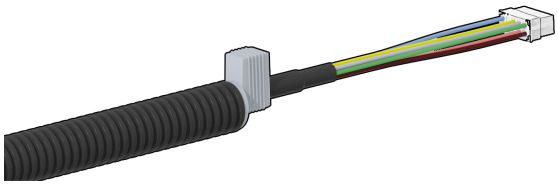
The primary cable (with 8 wires and one connector on the sensor-side cable end) connects the primary sensor to the door controller. The corrugated hose is used for the transition from the sensor to the wall. If required, the corrugated hose end can be provided with a cable seal (IP65):

To meet IP65 requirements (outdoor or jet water protection):

- ▶ Plug the enclosed cable seal onto the primary cable. Push the cable seal forward with the Quarder fitting as far as the plug connector.

So that the corrugated hose does not enter the detection field of the sensor when the door is opened:

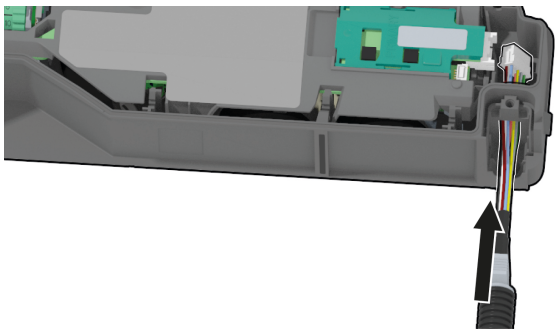
- ▶ Shorten the corrugated hose to the required length.
- ▶ Pull the corrugated hose onto the primary cable.
- ▶ For IP65, plug the corrugated hose onto the cable seal.



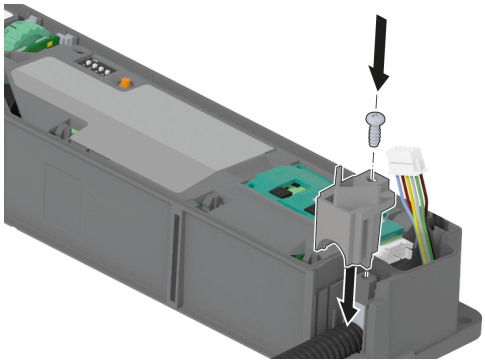
Primary cable equipped for IP65

Attach I/O module and primary cable

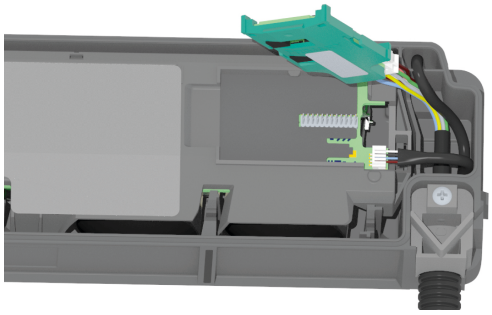
Mount on the door side with the door controller (usually hinge side):



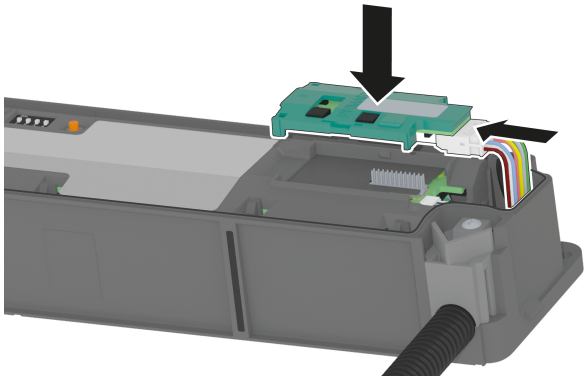
- ▶ Insert the primary cable into the sensor from below.



- ▶ Attach the corrugated hose to the sensor with the corrugated hose bracket and a 3 × 8 mm screw.



▶ Insert the connector of the primary cable into the socket of the IO module.

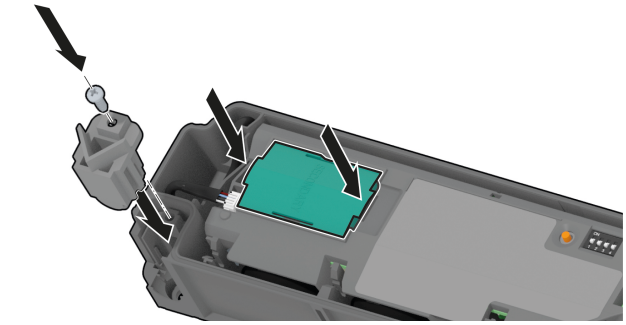


▶ Insert the IO module into the module slot of the sensor.

▶ Attach the corrugated hose to the wall with the wall bracket and lay the primary cable to the door controller.

The sensor with IO module and the primary cable with corrugated hose is now the **primary sensor**. The remaining sensor acts as a **secondary sensor**.

Attach blind module and blind plug

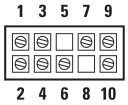


▶ Screw the blind plug to the secondary sensor with 1 screw 3 × 8 mm.

▶ Insert the blind module into the module slot of the secondary sensor.

3.4 Electrical connection

▶ Connect the primary cable to the door controller:



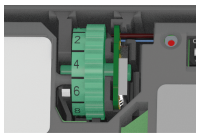
Pin		
1	brown	0 V
2	green	24 V
3	pink	COMMON hinge opposite side
4	gray	OUT hinge opposite side
5		
6	yellow	COMMON hinge side
7	white	OUT hinge side
8		
9	red	Test+
10	blue	Test-

4 Settings

4.1 Setting the inclination angle

The inclination angle setting is required for each sensor.

▶ Adjust the angle adjustment to the following scale value based on the mounting height:



Mounting height (cm)	Scale value
190 to 220	Factory setting 6
250	4
300	3
350	2

4.2 Setting the DIP switch

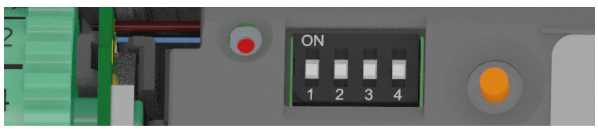
DIP switches can be set on the primary sensor. DIP switches on the secondary sensor have no function. Ex works, all DIP switches are **ON** (up).

DIP position 1: Switch position **ON** means that the primary sensor is mounted on the hinge side. The hinge side is the door side with hinge. The door opens to the hinge side.

▶ If the primary sensor is mounted on the hinge opposite side, set DIP position 1 to **OFF** (down).

Overview of additional DIP switch settings:

DIP	Function	ON	OFF
1	Primary sensor	Hinge side	Opposite side
2	Output	NPN	PNP
3	Sec. closing edge	active	inactive
4	Virtual wall	active	inactive



Effect of the DIP switch position OFF (down) on the positions:

1 The sensor on the hinge side is operated as a secondary sensor. The sensor on the hinge opposite side is connected as the primary sensor.
2 For IO module with semiconductor output, this is converted to PNP. For IO module with solid-state relay, DIP position 2 has no function.
3 Protection of the secondary closing edge is disabled.
4 Virtual wall function is disabled. Operation without protective field adjustment on the basis of the door opening angle.

ATTENTION

- For swing doors, securing the secondary closing edge (DIP 3 **ON**) requires the virtual wall function (DIP 4 **ON**).
- The active virtual wall function (DIP 4 **ON**) requires a teach-in run, see section 5.3.

ATTENTION

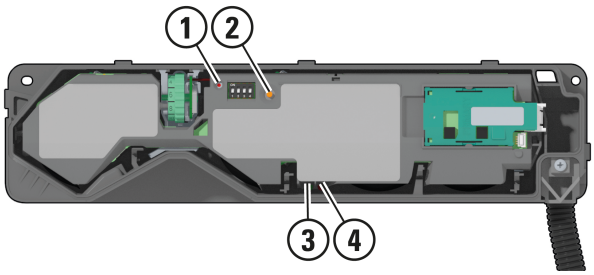
If you change a DIP switch position after commissioning:

▶ Teach the door system in again according to section 5.3.

5 Operation

5.1 Operation

Operating elements



Button and indicator lights

1 Status LED for operational readiness, red, green, orange (Double LED: appears orange when red and green are lit at the same time)
2 Teach-in button
3 Signal LED for detection on the hinge opposite side, green
4 Signal LED for detection on the hinge side, red

Teach-in button

Confirmation	Function
Press	activates the view
Press a second time	starts the teach-in process (5.3.1 "Teaching in the system")
Press twice	starts angle teach-in process (5.3.2 "Teaching in the angle")
Press for 3 to 10 s	starts 10 minutes maintenance mode (5.4.1 "Maintenance mode")
Press for more than 10 s	starts frequency selection mode (6.2 "Interference")

5.2 Status messages

With the factory settings, the device requires a few seconds after starting to activate the status display.

Status LED	Signal LED	
red, green, orange	red	green
off	off	off

System is taught-in and ready for operation, no detection.

Status LED	Signal LED	
red, green, orange	red	green
off	on	off

System is taught-in and ready for operation, detection on the hinge side.

Status LED	Signal LED	
red, green, orange	red	green
off	off	on

System is taught-in and ready for operation, detection on the hinge opposite side.

Status LED	Signal LED	
red, green, orange	red	green
off	1/s	off

Signal LED flashes in case of weak signal.

▶ Clean the sensor on the hinge side, see "Maintenance".

Status LED	Signal LED	
red, green, orange	red	green
off	off	1/s

Signal LED flashes in case of weak signal.

▶ Clean the sensor on the hinge opposite side, see "Maintenance".

Status LED	Signal LED	
red, green, orange	red	green
off	on and	on

In case of faulty test connection, both signal LEDs are permanently lit.

▶ See "Electrical connection".

Status LED	Signal LED	
is lit orange	red	green
	off	off

Factory settings are active or teach-in button has been pressed once. See sections

▶ "Commissioning", 5.3.1 "Teaching in the system".

Status LED	Signal LED	
flashes orange 1 time per second	red	green
	off	off

Teach-in button pressed twice, angle teach-in process active.

▶ See section 5.3.2 "Teaching in the angle".

Status LED	Signal LED	
flashes orange 8 times per second (flickers)	off	off

DIP switch or inclination angle has been changed or teach-in error.

▶ Start the teach-in process again, see "Teaching in the system".

Status LED	Signal LED	
flashes red several times every 3 seconds	off	off

Indication of functional problem.

▶ See 6.1 "Malfunctions".

Status LED	Signal LED	
flashes orange twice every 3 seconds	off	off

Maintenance mode has been activated.

▶ See "Maintenance mode".

5.3 Commissioning

Prepare the situation

- ▶ Remove the protective film from the optics. Clean the optics.
- ▶ Switch on the power supply to the door controller. Ensure that the door drive is ready for operation.
- ▶ Close the door.
- ▶ Remove people and moving objects from the sensor field.

5.3.1 Teaching in the system

	Status LED	Signal LED red	Signal LED green
1)	red, green, orange	red	green
	off	off	off

Status at initial commissioning: The device starts.

▶ Wait a few seconds until the status LED is lit orange.

Status after commissioning: The device is ready for operation.

▶ If you want to teach the device in again, e.g. after changes in the door area, press the teach-in button once. This activates the display.

	Status LED	Signal LED red	Signal LED green
2)		red	green
	is lit orange	off	off

The factory settings are active or the teach-in button has been pressed. The device has to be taught in again.

▶ To start the teach-in process, press the teach-in button once.

	Status LED	Signal LED red	Signal LED green
3)		red	green
	flashes red and green 2 times per second	on	on

The teach-in process has started.

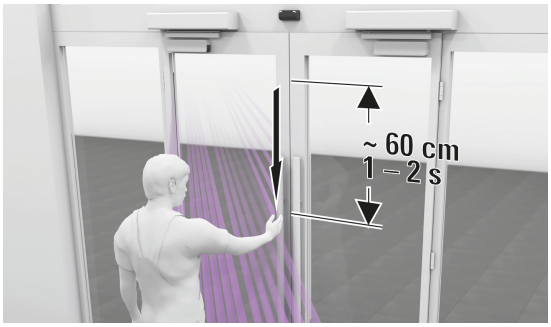
▶ **Within 10 seconds:** Remove persons and objects from the detection field. After 10 seconds, the device determines the distance to the ground.

	Status LED	Signal LED red	Signal LED green
4)		red	green
	flashes green 2 times per second	on	on

The device is ready to detect the main closing edge.

▶ **Within 10 seconds:** Perform gesture capture. Interrupt the beams along the main closing edge with a slow movement of your flat hand over a section of approximately 60 cm.

If the door width is successfully detected, the status LED flashes red twice, then continues to green.



	Status LED	Signal LED red	Signal LED green
5)		red	green
	flashes green 2 times per second	on	on

If DIP switch position 4 is **ON**, the device awaits the teach-in run.

▶ Trigger a door opening.

		red	green
	flashes green 2 times per second	off	on



		red	green
	flashes red 2 times per second	off	off

The status LED will continue to flash green during opening and red during closing.

▶ Wait until the teach-in run ends and the door is closed.

6) **Process successful**

red, green, orange	red	green
off	off	off

The device is taught-in and ready for operation.

Process conditionally successful

	red	green
flashes orange, alternating between short and long, for 20 seconds after teach-in Signal LED is lit red if there is a problem on the hinge side, green on the hinge opposite side	on or	on

The device is taught-in. The beam path may be disrupted.

▶ Check whether the following corrections are necessary:
- – Removal of interfering objects from the door leaf
- – Shortening the corrugated hose
- – Adjustment of the angle

▶ If necessary, repeat the teach-in process.

Process unsuccessful

	red	green
flashes orange 8 times per second (flickers)	off	off

Error during teach-in.

▶ Repeat the system teach-in process.

5.3.2 Teaching in the angle

If you need to readjust the angles of inclination of the detection fields on the taught-in system, you can carry out a shortened teach-in process. Teaching in the floor and gesture control are omitted.

	Status LED	Signal LED	
1)	red, green, orange	red	green
	off	on	on

Status: Status after commissioning: The device is ready for operation.

▶ To adjust the angle of inclination of the detection fields, press the teach-in button twice.

2)		red	green
	flashes orange 1 time per second	off	off

Status: The angle teach-in process was started. The detection fields on the secondary closing edge are inactive.

▶ Adjust the angle of inclination of the detection field on one or both sides of the door using the dial.
▶ Test the setting by closing and opening the door.
▶ To apply the new settings, press the teach-in button once.

3)		red	green
	flashes green 2 times per second	on	on

If DIP switch position 4 is **ON**, the device awaits the teach-in run.

▶ Trigger a door opening.

		red	green
	flashes green 2 times per second	off	on



		red	green
	flashes red 2 times per second	off	off

The status LED will continue to flash green during opening and red during closing.

▶ Wait until the teach-in run ends and the door is closed.

4) Finish angle teach-in process

Process successful

red, green, orange	red	green
off	off	off

The device is taught-in and ready for operation.

Process unsuccessful

	red	green
flashes orange 8 times per second (flickers)	off	off

Error during teach-in.

▶ Repeat the system teach-in process.
▶ See section "Teaching in the system".

5.3.3 Completing the commissioning

Test the door system

▶ Place the cover on the two sensors. Make sure that the locking hooks engage all the way around.
▶ Test the operational readiness. Ensure that the door system provides adequate protection.
▶ Document the settings of the sensors and testing of the door system after each installation, commissioning and modification. Provide the operator of the door system with an acceptance report for their records. Use the following template for the acceptance report.

Acceptance report template

Sensor system	Type:		
	Serial number:		
	Installation site:		
	Initial installation:	□ yes	□ no
Primary sensor	hinge side:	□ yes	□ no
	DIP switch 1:	□ on	□ off
	Angle adjustment:	(1 – 14)	
Secondary sensor	Angle adjustment:	(1 – 14)	
Special considerations:			
Door system testing successful:		□ yes	□ no
Installation company:			
Name of installer:			
Date:	Signature:		

5.4 Maintenance

Monthly

▶ Clean the front window with a soft, damp cloth.

5.4.1 Maintenance mode

The protective function of the sensors can be switched off for 10 minutes for maintenance purposes.

Start maintenance mode

▶ Press and hold the teach-in button of the primary sensor for 3 seconds.
  – After 3 seconds, the status LED flashes green once.
  – Release the teach-in button.

  The maintenance mode starts when the teach-in button is released.

End maintenance mode

Maintenance mode closes:

- automatically after 10 minutes
- when starting the teach-in process
- prematurely by pressing the teach-in button again for 3 seconds

Status LED
 flashes green once after 3 seconds Maintenance mode starts
 flashes 2 times every 3 seconds Maintenance mode active (10 minutes)

6 Faults

6.1 Malfunctions

If the door system malfunctions, remove the covers from the sensors and observe the LED messages.

Status LED	Switch LED	
	red	green
Switch LEDs on the primary sensor are lit continuously at the same time	on	on
Test input connected incorrectly. ▶ Correct the connection of the test input according to section 3.4 "Electrical connection"		
	red	green
Switch LED flashes red once per second if there is a problem on the hinge side, green on the hinge opposite side	1/s or 1/s	
Signal sensor too weak. ▶ Clean the front window with a soft, damp cloth.		
	red	green
Flashing red 3 times every 3 seconds	off	off
Gyroscope defective. ▶ Replace the IO module, teach the device in again, see section "Commissioning".		
	red	green
Flashing red 3 times every 4 seconds	off	off
Hardware defective. ▶ a) Replace the connection cable. b) Replace the device.		

6.2 Interference

Avoid sensor interference

Adjacent door systems can cause interference between the sensor systems. To avoid such interference, 3 frequency modes are available.

Select frequency mode

Interference-free setting:

- one **single** frequency mode for 2 sensor systems of one double-leaf door
- **different** frequency modes for sensor systems of adjacent door systems

Display and set frequency mode

▶ Always press and hold the teach-in button of the primary sensor.

- After every 3 seconds, the status LED flashes green once.
- After 10 seconds, the status LED signals the set frequency mode 1, 2 or 3.
- Every 5 seconds, the device switches to the next frequency mode.

By releasing the teach-in button, the sensor system remains in the last displayed frequency mode.

Status LED
 flashes green a total of 3 times in the first 10 seconds Start frequency selection
 flashes orange once every 2 seconds Mode 1 selected
 flashes orange twice every 2 seconds Mode 2 selected
 flashes orange 3 times every 2 seconds Mode 3 selected

7 Technical data

Technology	Solid-state scanner with time-of-flight technology
Infrared light wavelength	850 nm
Mounting height H for door width 800 – 1800 mm	1500 – 2500 mm
Mounting height H for door width 800 – 1600 mm	1500 – 3000 mm
Top edge of detection area	H – 0.35 m
Bottom edge of detection area	min. 0.34 m (at H = 2.00 m) max. 0.65 m (at H = 3.00 m)
Performance level	PL d (cat. 2)
Compliance	DIN 18650, EN 16005, EN 12978, ISO 13849-1, EN 61508 Part 1 – 4

Electrical data

Operating voltage	24 V DC ±20 %
Operating current	max. 200 mA per module
Power consumption	4.8 W per module
Test input	High level 15 – 30 V DC Low level ≤ 2 V DC
Response time (with mounting height H)	≤ 50 ms if H ≤ 2500 mm ≤ 80 ms if H > 2500 mm
Output	Solid-state relay, NC max. 30 V DC, max. 60 mA
Connection type (standard)	2.5 m cable, 8-pin, plug connector on the device side

Mechanical data

Housing and light output material	PC (polycarbonate)
Housing color	black, silver, white
Dimensions (H × W × D)	61 × 255 × 39 mm
Weight (set)	approx. 280 g per module
Protection class	IP65

Ambient conditions

Ambient temperature	min. –30 °C, max. +60 °C
Relative humidity	max. 95 %, non-condensing

Disposal

The product contains electrical or electronic components. Do not dispose of the product with household waste.

Notice on conformity

BBC Bircher AG declares that this product conforms with the following guidelines and directives of the EU:

MD 2006/42/EC RED 2014/53/EU
RoHS 2011/65/EU

EC type-examination certificate:
44 205 13095722 0044 TÜV NORD

For the detailed Declaration of Conformity, follow the QR code or link below.

Technical documentation

You will find all documents on the manufacturer website
www.bircher.com

8 Contact

If you have any questions about the device, please contact us:

✉ service@bircher.com ✆ +41 52 687 1366

BBC Bircher Smart Access

BBC Bircher AG, Wiesengasse 20, CH-8222 Beringen
www.bircher.com