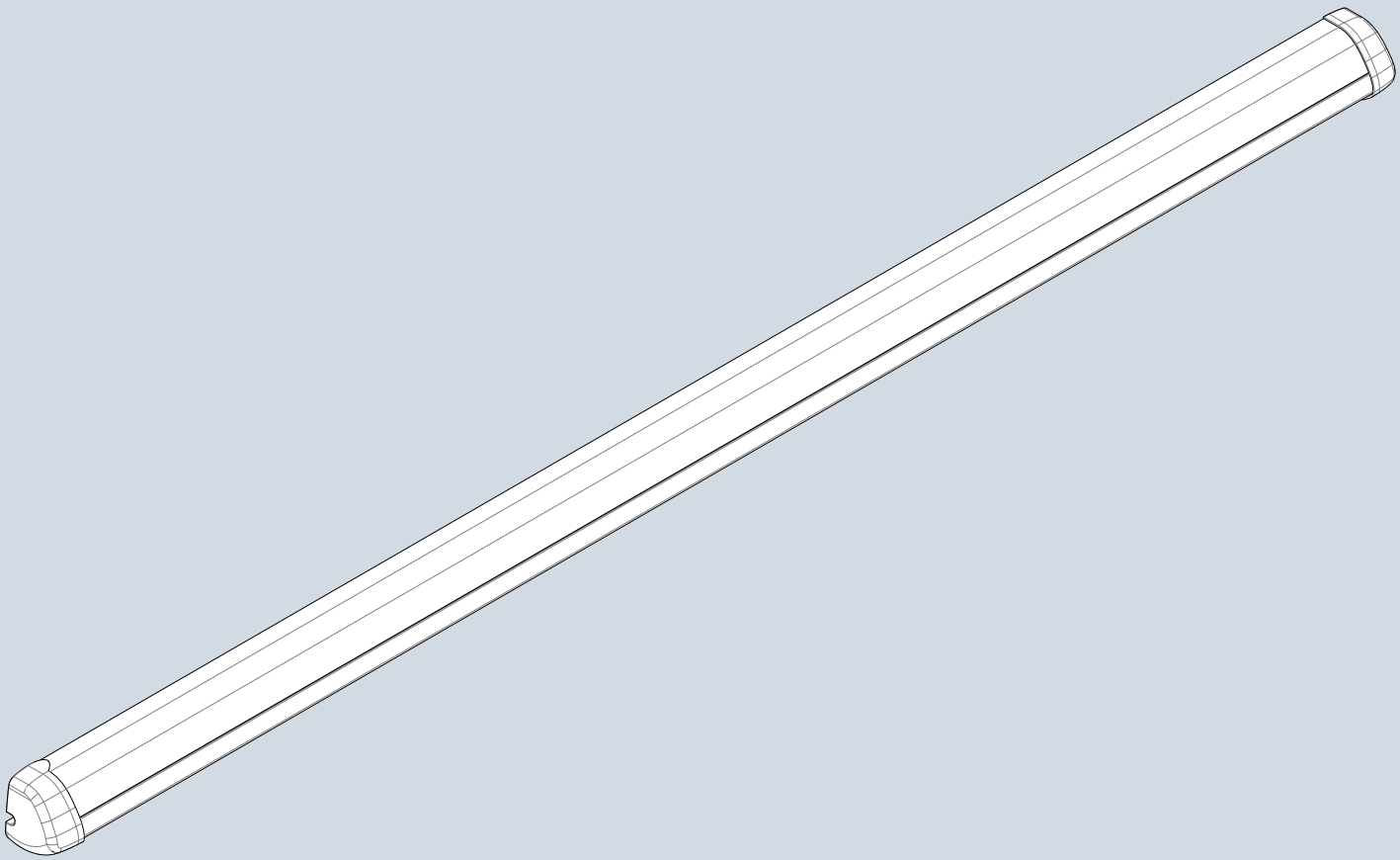
DoorScan

Active infrared sensor for person detection on automatic doors with a width of up to 1600 mm

Original Operating Instructions



www.pepperl-fuchs.com

PEPPERL+FUCHS

Safety

Symbols Used

Safety-Relevant Symbols

DANGER!

This symbol indicates a dangerous situation. If ignored, the consequences range from serious personal injury to death.

WARNING!

This symbol indicates a dangerous situation. If ignored, the consequences may range from serious personal injury to death.

CAUTION!

This symbol indicates a dangerous situation. If ignored, the consequences range from light to moderate personal injury.

Informative Symbols

ATTENTION

This symbol indicates a dangerous situation. If ignored, it will result in property damage.

INFORMATION

More information

Handling instructions

This symbol denotes handling instructions.

Intended Use

The DoorScan is used as a protection mechanism for closing edges on automatic door systems and as anticollision protection for people/objects in the vicinity of moving swing doors and revolving doors.

General Safety Information

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the system operator.

Installation and commissioning of all devices must be performed only by personnel specially trained for that purpose.

Protection of operating personnel and the system is not ensured if the product is not used in accordance with its intended use.

The laws and regulations applicable to usage or the intended purpose must be observed. Devices are approved only for proper usage in accordance with the intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

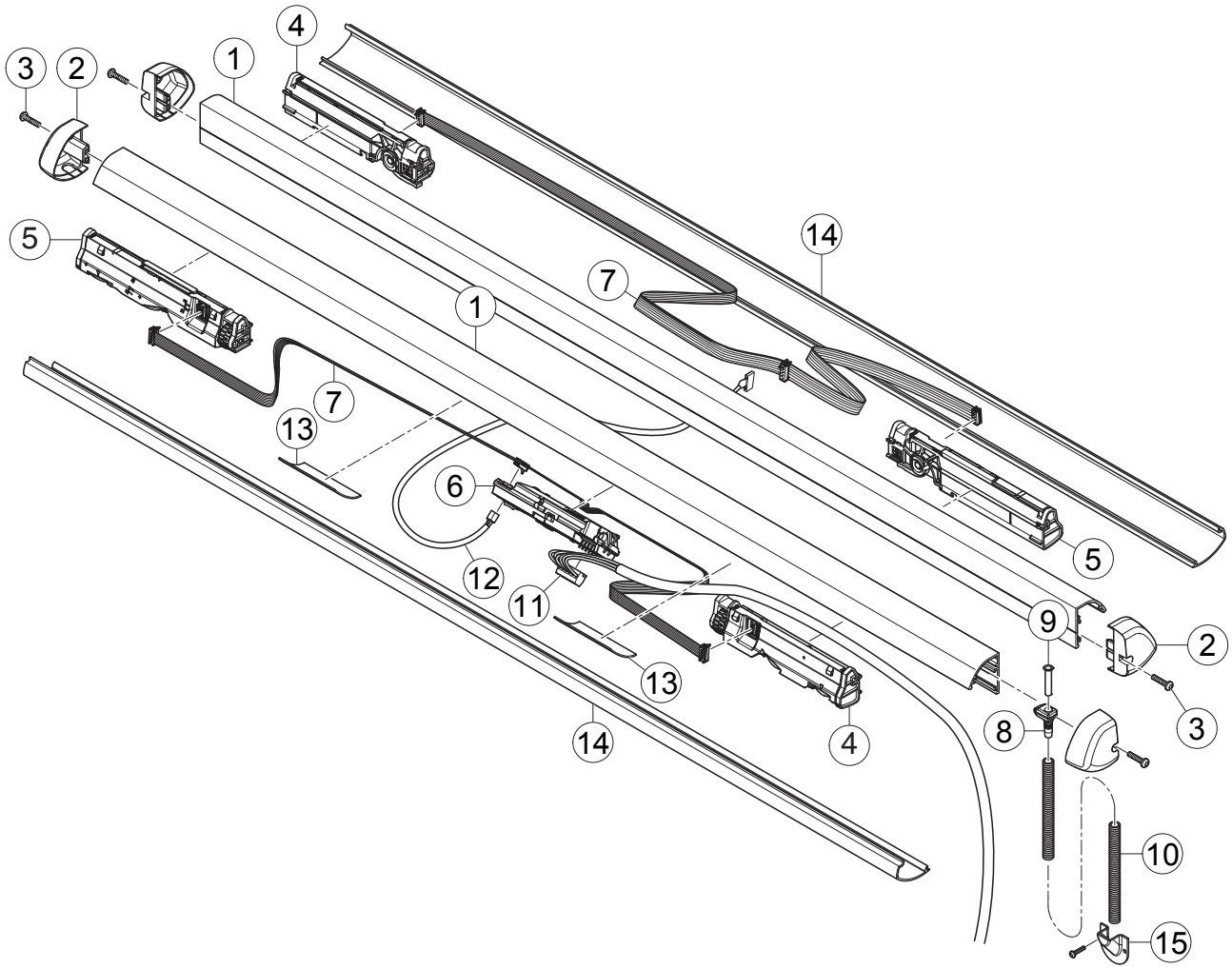
Opening or modifying the device yourself is dangerous and will void any warranty and absolve the manufacturer from any liability. If serious faults occur in the device, switch the device off. Make sure that the device cannot be switched on accidentally. If the device needs to be repaired, return it to Pepperl+Fuchs.

Additional documents relating to this device, such as the data sheet, declarations of conformity, certificates, etc. are an integral part of this document. They must be taken note of before using this device or carrying out any work on it.

These documents can be found at www.pepperl-fuchs.com. Alternatively, you can contact your local Pepperl+Fuchs representative.

268299/DOCT-3681B

Included in Delivery



No.	Designation	Units
①	Sensing strip	2
② ③	End caps with screws	4
④	Receiver module; blue, always positioned on the right	2
⑤	Emitter module; red, always positioned on the left	2
⑥	Interface module	1
⑦	Double-ended cordset for module ribbon cable	2
⑧	Flange connector for corrugated hose	1
⑨	Sleeve	1
⑩	Corrugated hose	1
⑪	Door transition cable to door controller with screw terminal	1
⑫	Double-ended cordset for transition from door hinge side to hinge opposite side	1
⑬	Cable bracket	4
⑭	Sensor cover	2
⑮	Wall bracket	1
	Operating instructions	

The number of parts may vary depending on the version in question.

268299/DOCT-3681B

Table of Contents

Technical Data

General

Characteristic	Description
Functional principle	Active infrared scanner with background evaluation
Mounting height	1500 mm to 3500 mm for upright CA reference object
Light source	IRED, 850 nm
Operating voltage	24 VDC +/-20 %
Switching mode	Light ON
Switching voltage/current	npn/30 VDC/max. 100 mA, pnp/max. 100 mA
Current consumption	Max. 200 mA
Response time	52 ms/200 ms in boost operating mode
Ambient temperature	-30 °C ... 60 °C
Relative humidity	25 % ... 95 %, noncondensing
Degree of protection	IP54 in accordance with EN 60529
Connection	Plug-in terminal with 6-wire connection cable
Material	Sensing strip: Aluminum End cap: PA Sensor cover: PC

Default Settings

Function	Setting
DIP switches	Row 1: Switches 1-4 down (OFF) Row 2: Switch 1 down (OFF) Switch 2 down (OFF) Switch 3 up (ON) Switch 4 up (ON)
Adjustment wheel	Position 0

268299/DOCT-3681B

Functional Safety Data

Characteristic	Classification
Safety integrity level	SIL 2
Performance level (at 40°C)	PL d
Category	Cat. 2
$MTTF_d$	112.7 a
Life time (T_M)	10 a

Accessories

Weather protection covers

For protection against the effects of weather (can be cut to required lengths)

DoorScan Weather Cap L1200	Weather protection cover, length 1200 mm
DoorScan Weather Cap L1600	Weather protection cover, length 1600 mm

End cap sets

DoorScan End Caps	Standard end cap set (left/right)

Additional sensor modules

for individual configuration

DoorScan-I	Interface module
DoorScan-R	Receiver module
DoorScan-T	Emitter module

Connection

DoorScan Connection Cable 5p	Double-ended cordset for module ribbon cable with five plug-in connections
DoorScan Transfer Loop	Door transition cable to door controller
DoorScan Cable BS/BGS	Double-ended cordset for transition from door hinge side to hinge opposite side
DoorScan Adapter	Adapter for connecting cables, e.g., to glass doors, existing cables

Expansion

DoorScan Profile L3000 5pcs	Aluminum profile
DoorScan Cover L3000 5pcs	Cover/profile cover for aluminum profile
DoorScan Interface Set	Expansion set for installation on glass doors

Device Versions

The module interface, emitter, and receiver may be provided in different versions. These versions are known as device versions and are specified on the type label. Different device versions can be combined with one another. If receivers with different device versions are used in combination, all receivers perform the functions of the lowest device version. The same rule applies to the emitter modules.

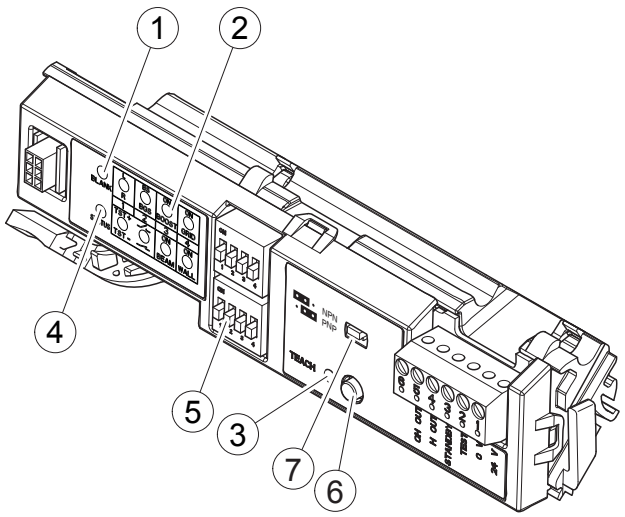
Certain functions are available only from a particular device version. If the requirements for the device version are higher than V.01, these function requirements are specified for the corresponding modules.

Functions without a specified device version apply to all modules from V.01 onward.

268299/DOCT-3681B

Display and Control Elements

Interface



①

Blank LED (green)	Status
Illuminated	Blanking active
Not illuminated	Blanking not active or only partially active

②

DIP LED (green)	Status
Illuminated *	DIP position ON
Not illuminated	DIP position OFF
Flashing slowly (1 Hz)	Setting changed

* LEDs switch off after some time

③

Teach LED (yellow)	Status
Illuminated	Teach mode ready
Flashing slowly (1 Hz)	Teach-in surface
Flashing quickly (2 Hz)	Teach-in blanking (door opening and closing motion)
Flickering (8 Hz)	Teach-in required
Not illuminated	Sensor ready for operation

④

Status LED (red)	Status
Illuminated	Detection or standby mode active
Flashing	Fault indication
Not illuminated	No detection

⑤

DIP switches	Status
	See „Set DIP switch rows 1 and 2“ on page 16

⑥

Teach button	Status
	See „Teach-in process“ on page 14

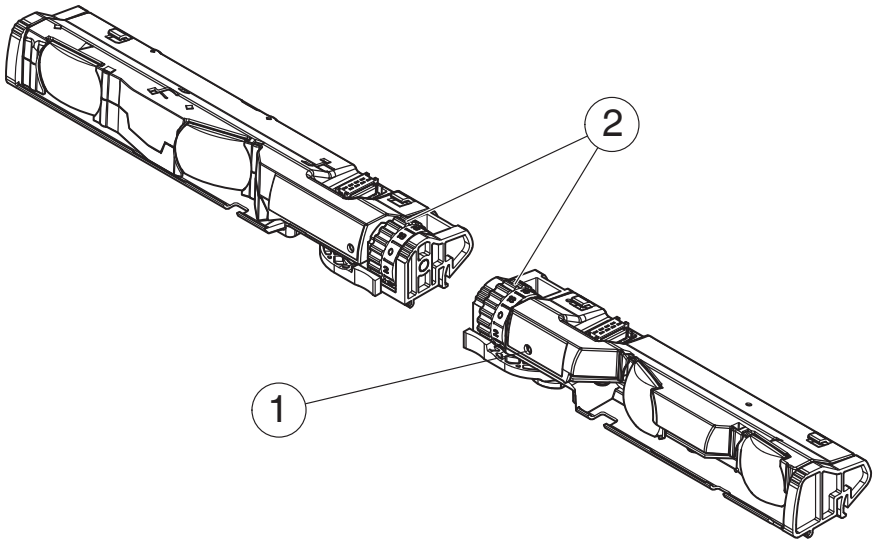
⑦

NPN/PNP plug-in jumper	
	See „Select Output Configuration“ on page 15

268299/DOCT-3681B

PEPPERL+FUCHS

Emitter & Receiver



①

Status LED (red)	Status
Illuminated	Detection
Flashing	Fault indication
Not illuminated	No detection

②

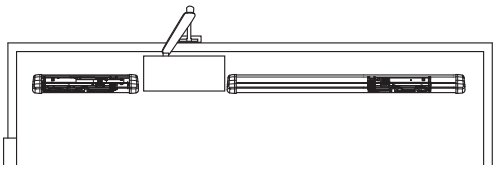
Inclination angle adjustment wheel	Status
	See „Set the Inclination Angle“ on page 15

Application Notes

Special Doors (e.g., Glass Doors)

If it is not possible to feed a cable through the door, install an interface on both sides of the door. This requires an additional interface and another DoorScan Transfer Loop (see Accessories).

Small Door Frames with Normal and Rack-and-Pinion Door Closers



Emitter and receiver can be operated in separate sensor strips when used with narrow door frames with normal and rack-and-pin door closers.

Doors with Door Jamb

On doors with a wide door jamb, the emitter must be a sufficient distance from the door jamb. Alternatively, for receiver modules from device version V.02 onward, you can set the DIP switch 3 in row 2 to the OFF position. At the standard mounting height of 1900 mm-2100 mm, the distance is approx. 170 mm. At larger mounting heights, the distance increases to approx. 200 mm.

As a rule, you can position the receiver 100 mm away from the closing edge.

Faults Due to Multiple Sensors Interfering with One Another

For swinging doors that converge, e.g., with adjacent doors, unwanted stop signals can occur due to mutual interference if the measuring spots overlap. Overlap of the measuring spots can be minimized by moving each of the sensors. On double swinging doors, the sensors on the two swinging doors will not interfere with one another. It is not possible for multiple sensor systems to cause any danger by interfering with one another.

Vertical handles (available for receiver modules from device version V.02 onward)

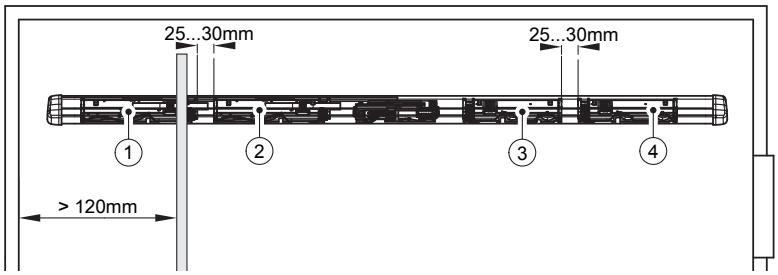
268299/DOCT-3681B

- The sensing strip goes behind the handle
- The handle is less than 300 mm away from the leading edge

INFORMATION

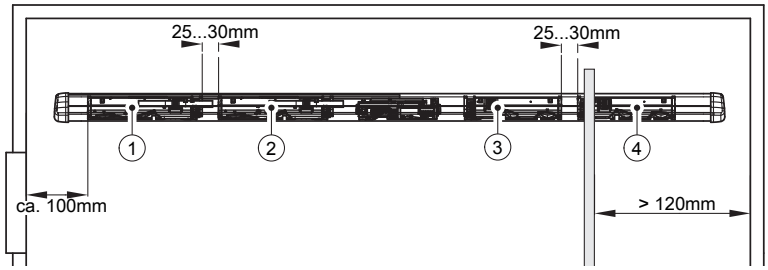
For standard protection according to DIN 18650/EN 16005, for each side of the door you need one emitter module, one receiver module, and one double-ended cordset module (ribbon cable) --> (see Accessories).

Handle on the Left



(1)
Position emitter 1 as far to the left as possible
(2)
Emitter 2 must not be positioned behind the handle
(3)
Receiver 1
(4)
Receiver 2

Handle on the Right



(1)
Emitter 2
(2)
Emitter 1
(3)
Receiver 2 must not be positioned behind the handle
(4)
Position receiver 1 as far to the right as possible

If a Teach-in is not possible in either case, increase the inclination angle or move the first emitter. However, the door may then no longer be protected in accordance with DIN 18650/EN 16005.

INFORMATION

You can find more tips and tricks for application-related settings online at www.pepperl-fuchs.com

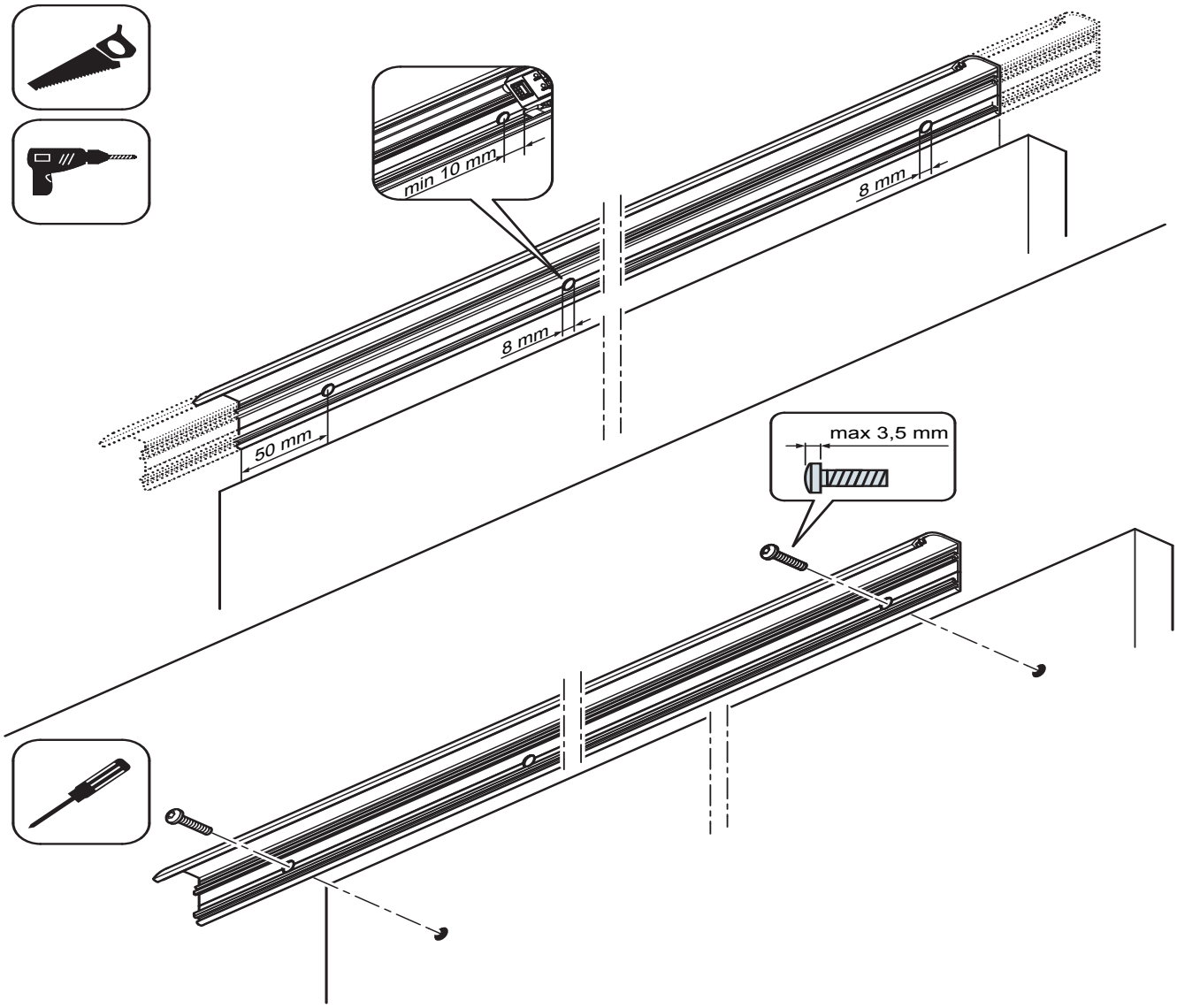
268299/DOCT-3681B

Mounting

Mounting the Sensing Strips

INFORMATION

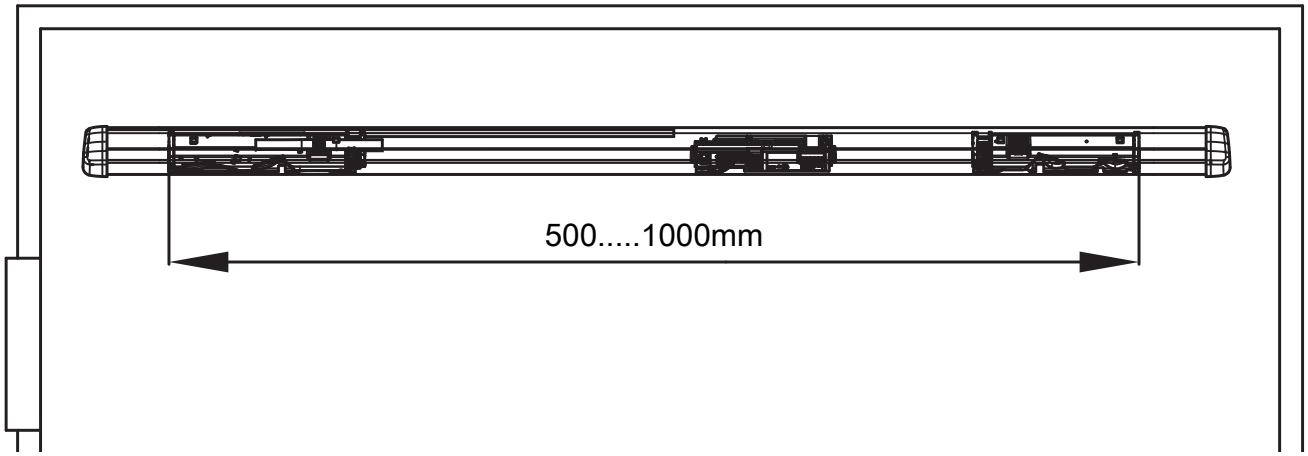
Mount the sensing strips on both sides of the door.



Connect and Install the Sensor Modules

ATTENTION

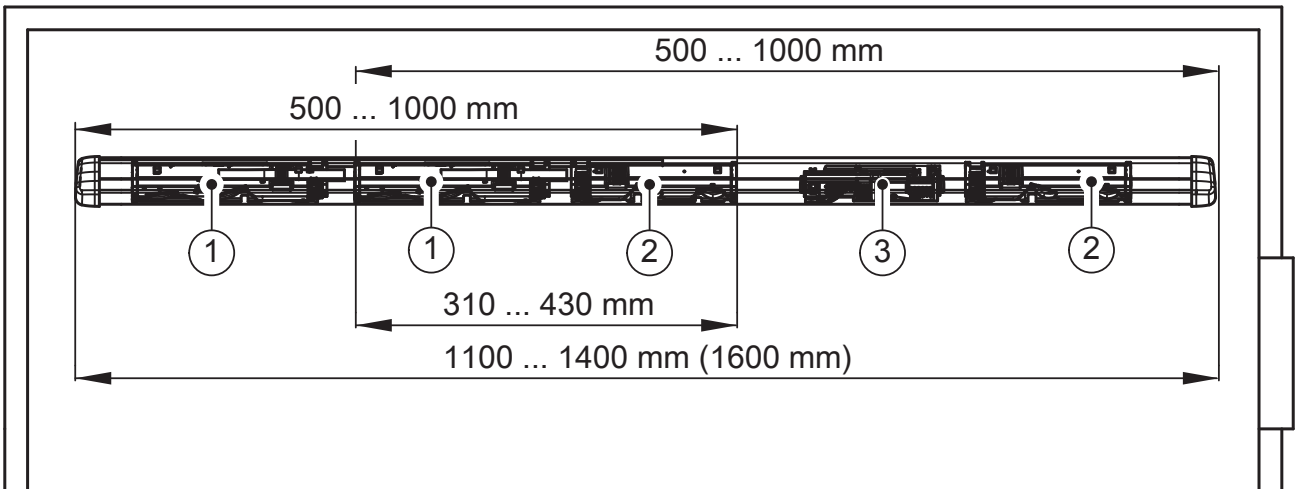
Install the sensor modules only on the corrugated sides. Do not exert any pressure on black plastic bodies or lenses as this may cause damage.



DoorScan with a width of 1200 mm

On both sides of the door, always position the emitter ① (RED) on the left and the receiver ② (BLUE) on the right in the sensing strip.

For the double-ended cordset for the door hinge side/hinge opposite side, drill a clearance hole with a minimum diameter of 8 mm from the interface to the sensor in the door and profile. Do not position the



DoorScan with a width of 1600 mm

clearance hole near the end caps or behind the modules.

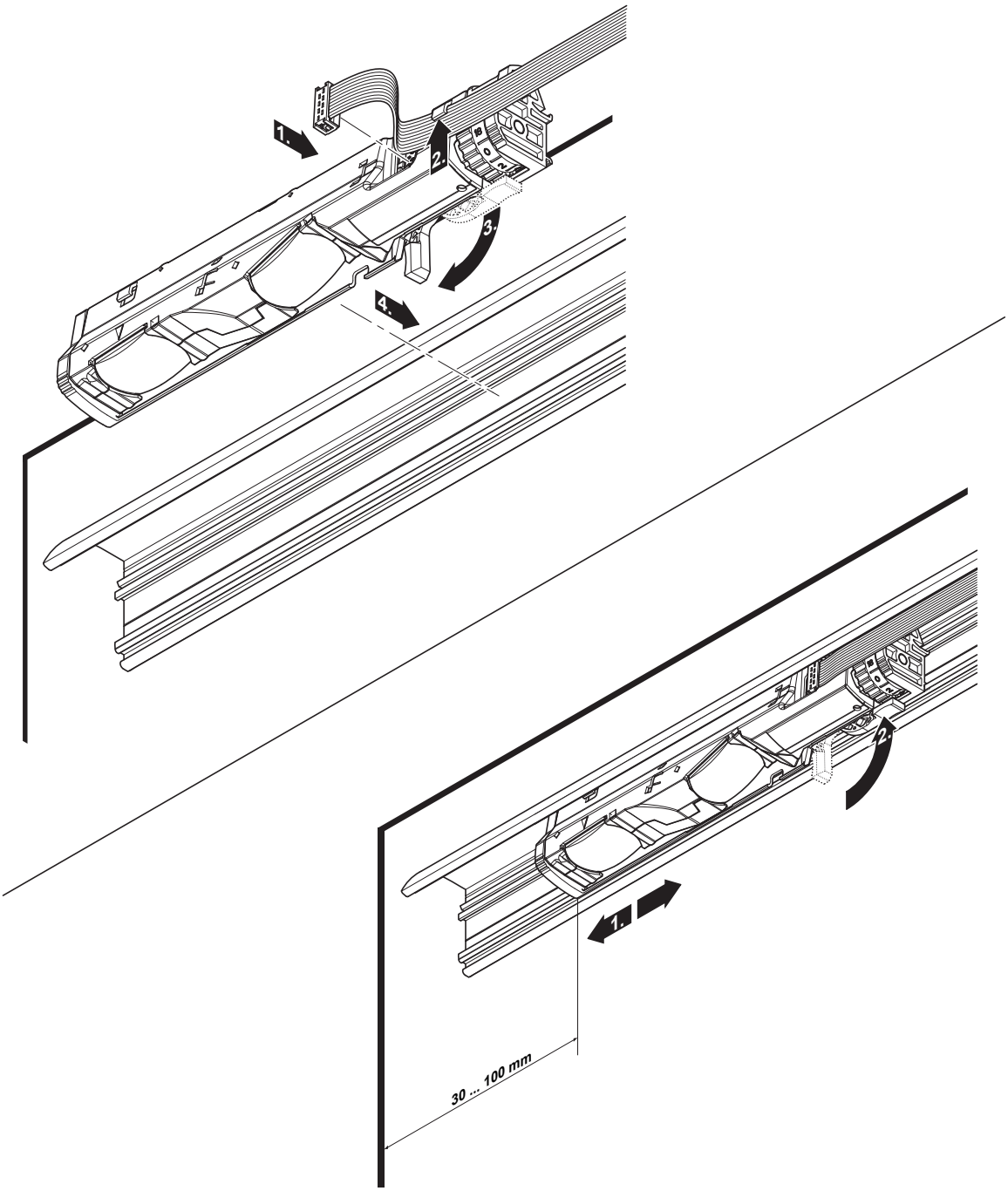
Position the interface ③ (GREEN) between the two modules. The best position is close to the clearance hole so that the door hinge side and the hinge opposite side can be connected.

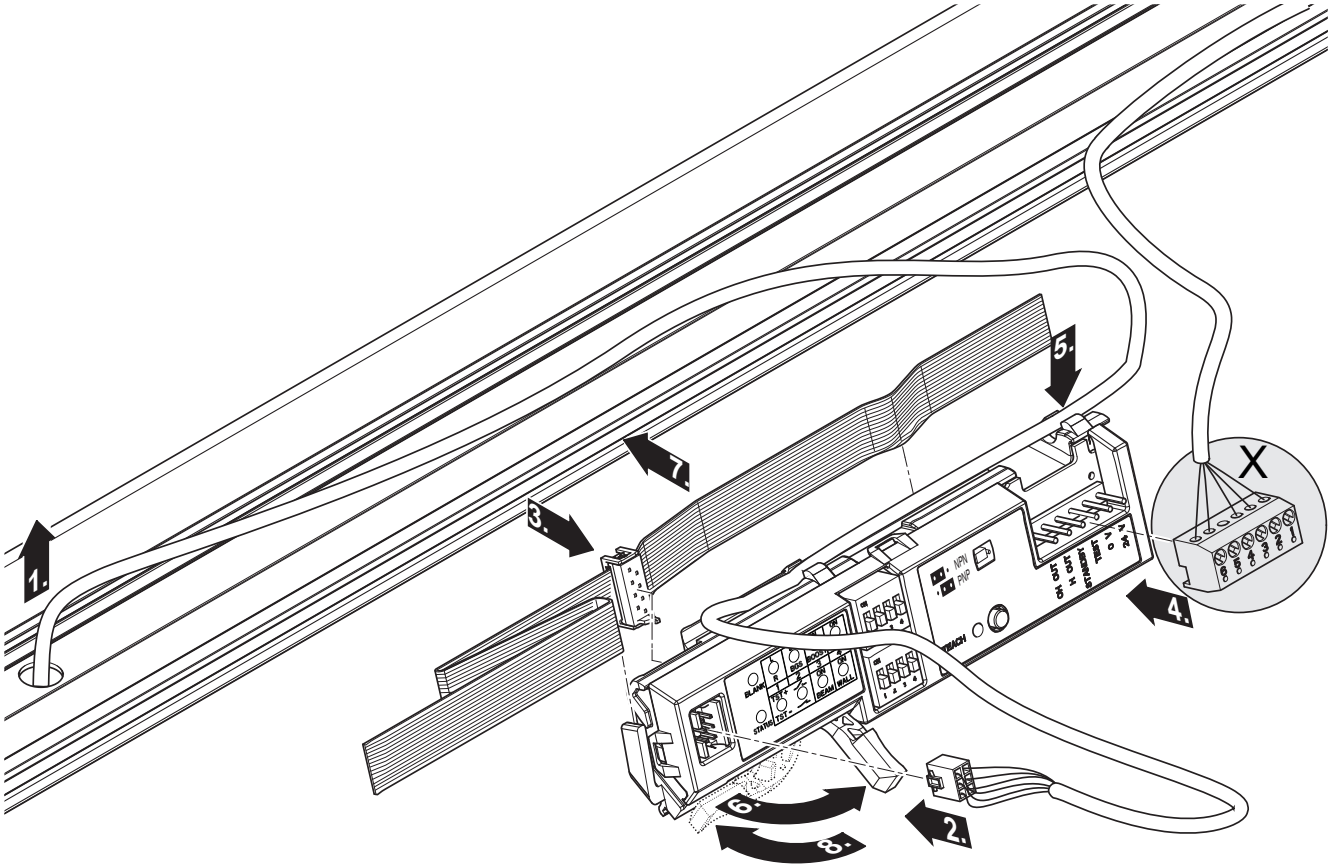
The dimensions given are intended for a mounting height of 2.10 m.

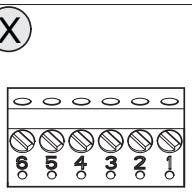
268299/DOCT-3681B

INFORMATION

If you have set up the emitter and receiver module correctly, then it will be possible to move the module easily and close the lever without excess force.







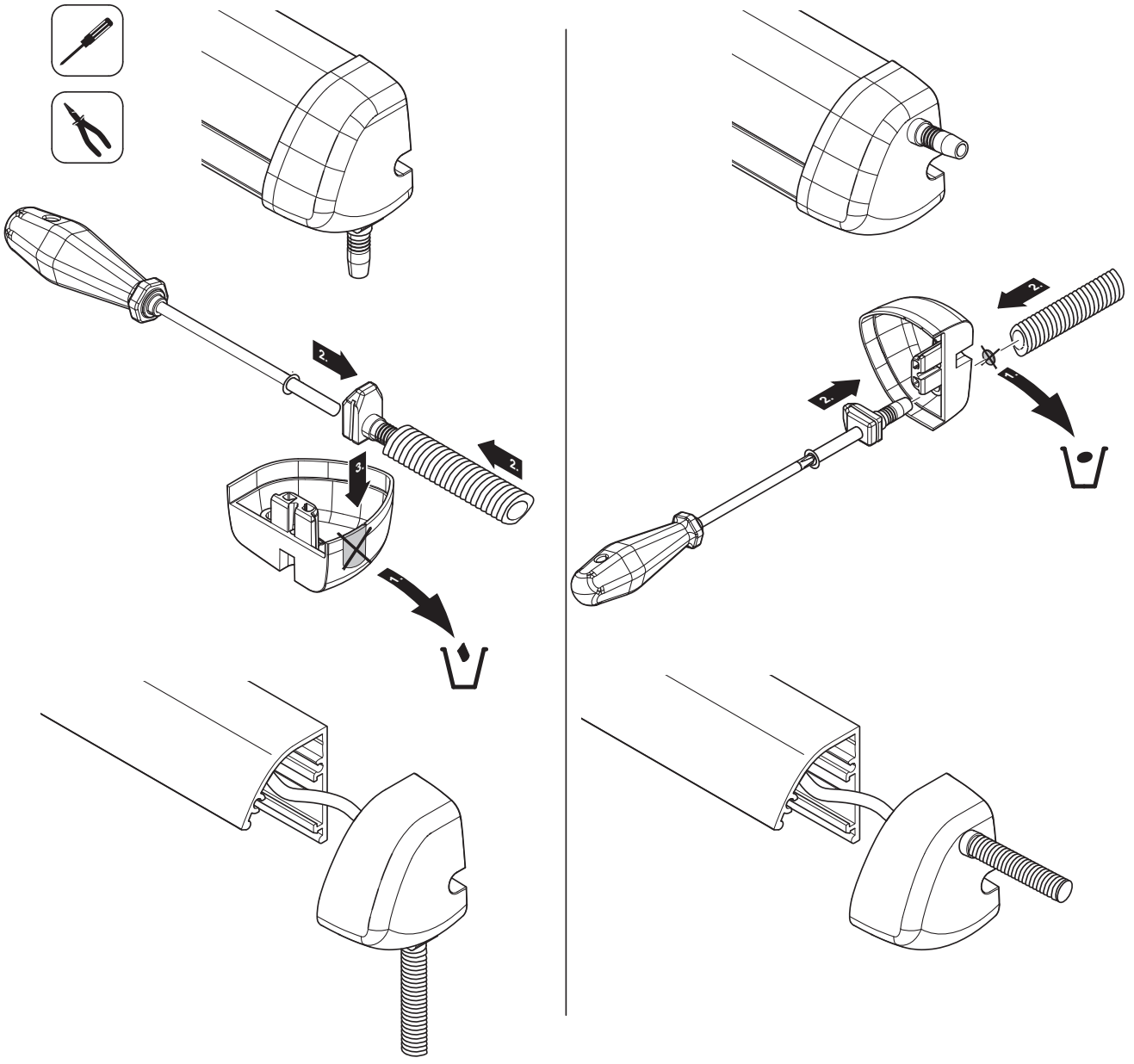
①	24 V	> brown (BN)
②	0 V	> blue (BU)
③	TEST	> grey (GY)
④	STANDBY	> pink (PK)
⑤	BS OUT	> black (BK)
⑥	BGS OUT	> white (WH)

268299/DOCT-3681B

Connection for Door Controller

INFORMATION

Choose the appropriate end cap depending on the cable outlet.



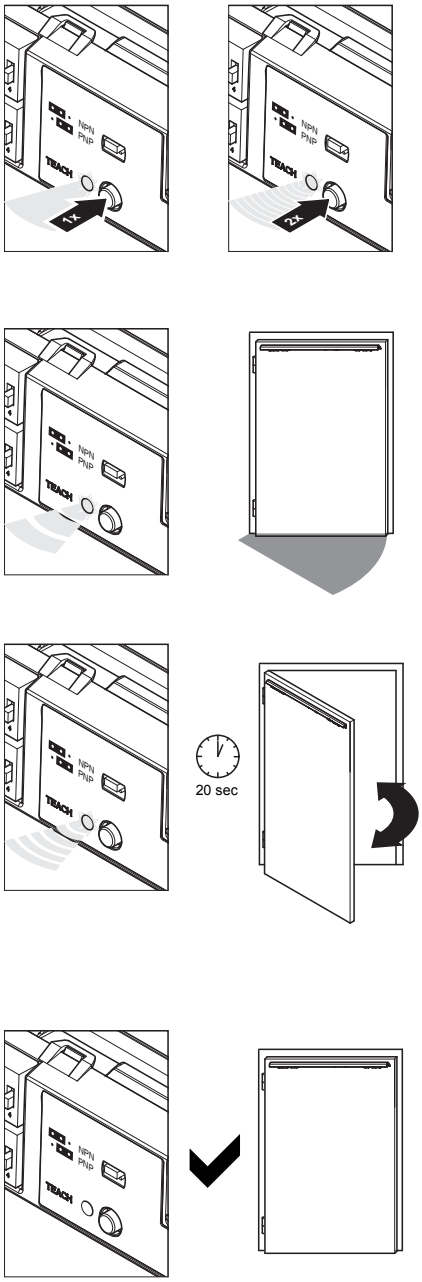
Commissioning (Teach-in and Blanking)

During Teach-in, the sensor first learns the floor surface and then, during a subsequent door opening and closing procedure, the detection area. If the sensor detects walls in the detection area during the door opening and closing procedure, these are also taught into the sensor and suppressed (blanking), in order to enable full door opening during subsequent operation. Following successful blanking, the sensor function is guaranteed up to a full opening of the door. If the wall structure contains elements that are unsuitable for blanking, the sensor permits blanking until these elements are detected. Elements that are unsuitable for blanking include heating units, protrusions, or pillars.

INFORMATION

For Teach-in, remove all objects from the door area that are not part of the usual environment, and step out of the detection area of the sensor.

If no wall suppression is required, set the DIP switch 4 in row 2 to the OFF position. Otherwise, leave it in the ON position.



Teach-in process

1. Teach LED (YELLOW) on the interface is illuminated or flickering: Sensor is ready for Teach-in.
2. Press the Teach button (RED):
   1x if LED is illuminated /
   2x if LED is flickering
   Teach LED is flashing slowly:
   Surface/floor is taught-in.
   Teach LED is flashing quickly:
   Teach-in of the surface/floor is complete.
   Teach-in of the environment begins.

INFORMATION

In the event of a flashing red status LED, see "Fault Indications" on the following page.

3. Start a complete door opening and closing procedure at standard speed inside of 20 seconds(with buttons or remote control).During the door opening and closing procedure, the environment and any wall are taught in.
4. Teach LED is off.
   If there is no wall in the door area, the Blank LED is off.
   If there is a wall in the door area:
   - The Blank LED is illuminated: The wall was taught in fully
   - The Blank LED is off: The wall was not taught in fully. In this case, if the door does not open fully, set the wall suppression on the drive.

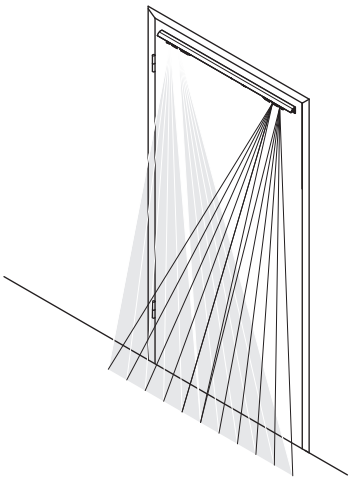
The sensor is ready for operation.

268299/DOCT-3681B

Adjusting the sensor

INFORMATION

Attach the end caps but do not tighten them yet.



DoorScan Detection Area

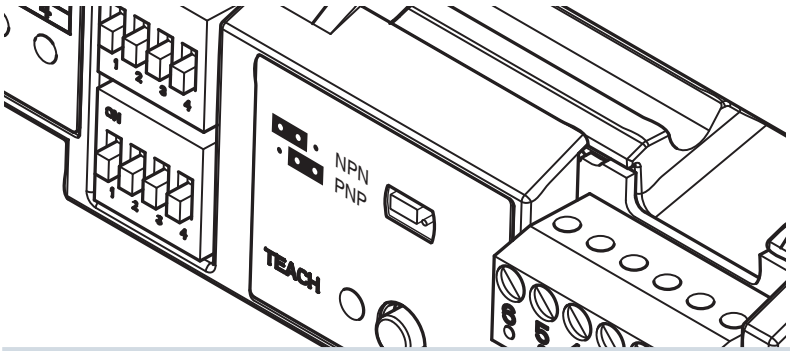
The sensor uses the active-infrared principle and forms a continuous detection field that is almost rectangular on each side of the door. If a person or object interrupts one or more of the light beams, the sensor's switching function is triggered.

The detection field is composed of ten beams. It adapts automatically to the door width, and the sensor disables any unnecessary beams. The slightly inclined position of the outer beams makes the leading edges and hinge edges of the doors more secure.

The sensor system has a modular construction and can be adapted to a wide range of door widths and ambient conditions.

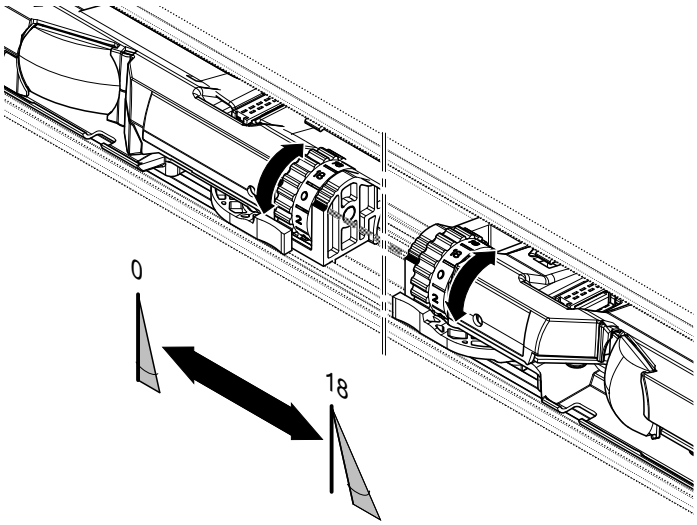
When used with horizontal handles, the detection area must be located in front of the handle.

Select Output Configuration



You can configure the outputs to NPN or PNP if you connect the plug-in jumper on the interface module as shown in the schematic diagram on the housing.

Set the Inclination Angle



Recommended settings in accordance with DIN 18650/EN 16005:

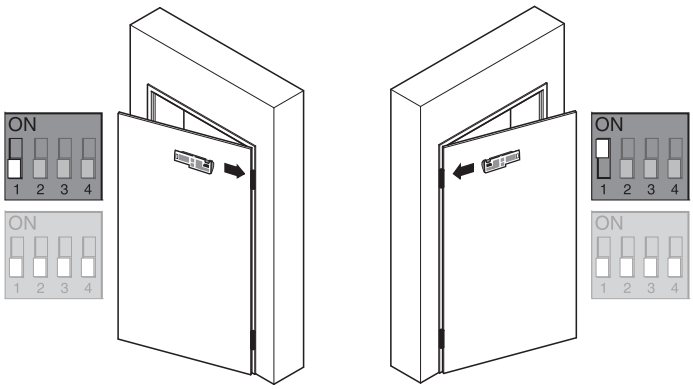
- Position 8 for 1900 mm ... 2200 mm mounting height
- Position 6 for 2500 mm mounting height
- Position 5 for 3000 mm mounting height
- Position 4 for 3500 mm mounting height
- Position 0*

* Factory default setting

268299/DOCT-3681B

Set DIP switch rows 1 and 2

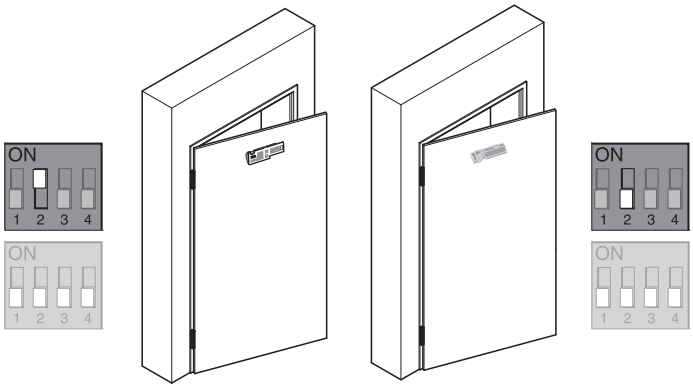
Row 1



DIP 1 (L/R)

Hinge edge right* or left to interface

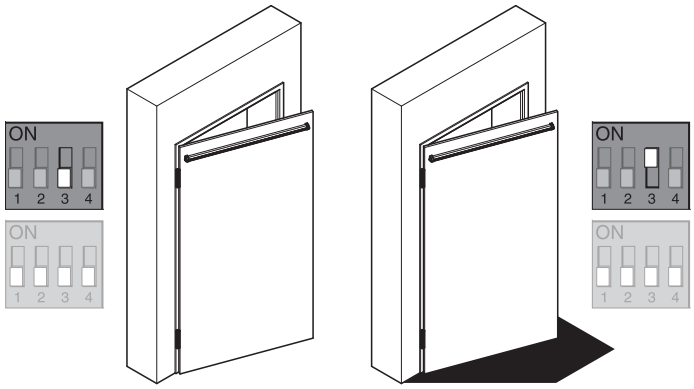
* Factory default setting



DIP 2 (BS/BGS)

Interface on the door hinge side or hinge opposite side*

* Factory default setting

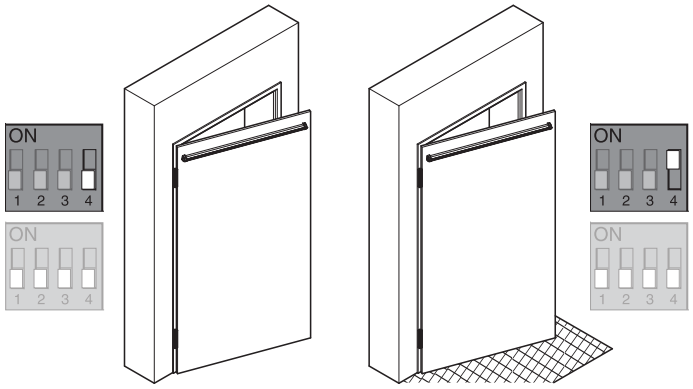


DIP 3 (Boost Mode)

Increased sensitivity no* or yes

* Factory default setting

Boost mode = increased sensitivity: optional setting Used, e.g., for large mounting heights, dark floors, or chrome floor mats. The response time increases to 200 ms.



DIP 4 (GRID Mode)

Deep metal foot grid no* or yes

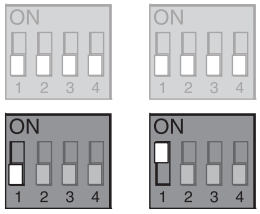
* Factory default setting

GRID mode = used with deep metal foot grid: optional setting Teach-in process: Cover the metal foot grid (cardboard/paper/carpet) so that all beams of the emitter module point at the cover.

If you switch off wall suppression with DIP switch 4 in row 2, metal foot grid mode becomes more robust. This applies to the use of receiver modules from device version V.03 onward.

268299/DOCT-3681B

Row 2

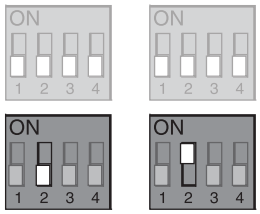


DIP 1 (TST+/TST-)

DIP 1 off: test signal polarity, test at 0 V*

DIP 1 on: test signal polarity, test at 24 V

* Factory default setting

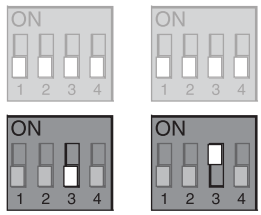


DIP 2 (_/‾_ / _‾_)

DIP 2 off: test triggered by applying the potential corresponding to DIP 1*

DIP 2 on: test triggered by interrupting the test connection.*

* Factory default setting



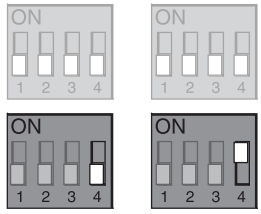
DIP 3 (BEAM)

DIP 3 off: outer beams normal

DIP 3 on: outer beams at an angle*

For receiver modules from device version V.02 onward, you can switch off beams extending beyond the emitter modules manually to avoid detection of deep door jambs.

* Factory default setting



DIP 4 (WALL)

DIP 4 off: automatic wall suppression not active

DIP 4 on: automatic wall suppression active*

If the door panel does not open against a wall, you can switch off wall suppression to speed up the commissioning process. Metal foot grid mode is improved if receiver modules are used from device version V.03 onward.

* Factory default setting

INFORMATION

In active GRID mode, signal tracking is switched off and the detection height is set to approx. 200 mm.

GRID mode must be switched on if ramps or steps are in the monitoring area.

1. Set DIP switch row 1 and 2 on the interface as described.You can combine individual options.When switching a DIP switch, the corresponding LED in the LED area flashes. If the LED is flashing, this means the changes have not been saved.
2. To save the settings, you must carry out a Teach-in process. Press the Teach button (RED) twice.
3. If you have changed only the polarity of the test signal or the test trigger, no additional Teach-in process is required. In this case, press the Teach button (RED) once to save.

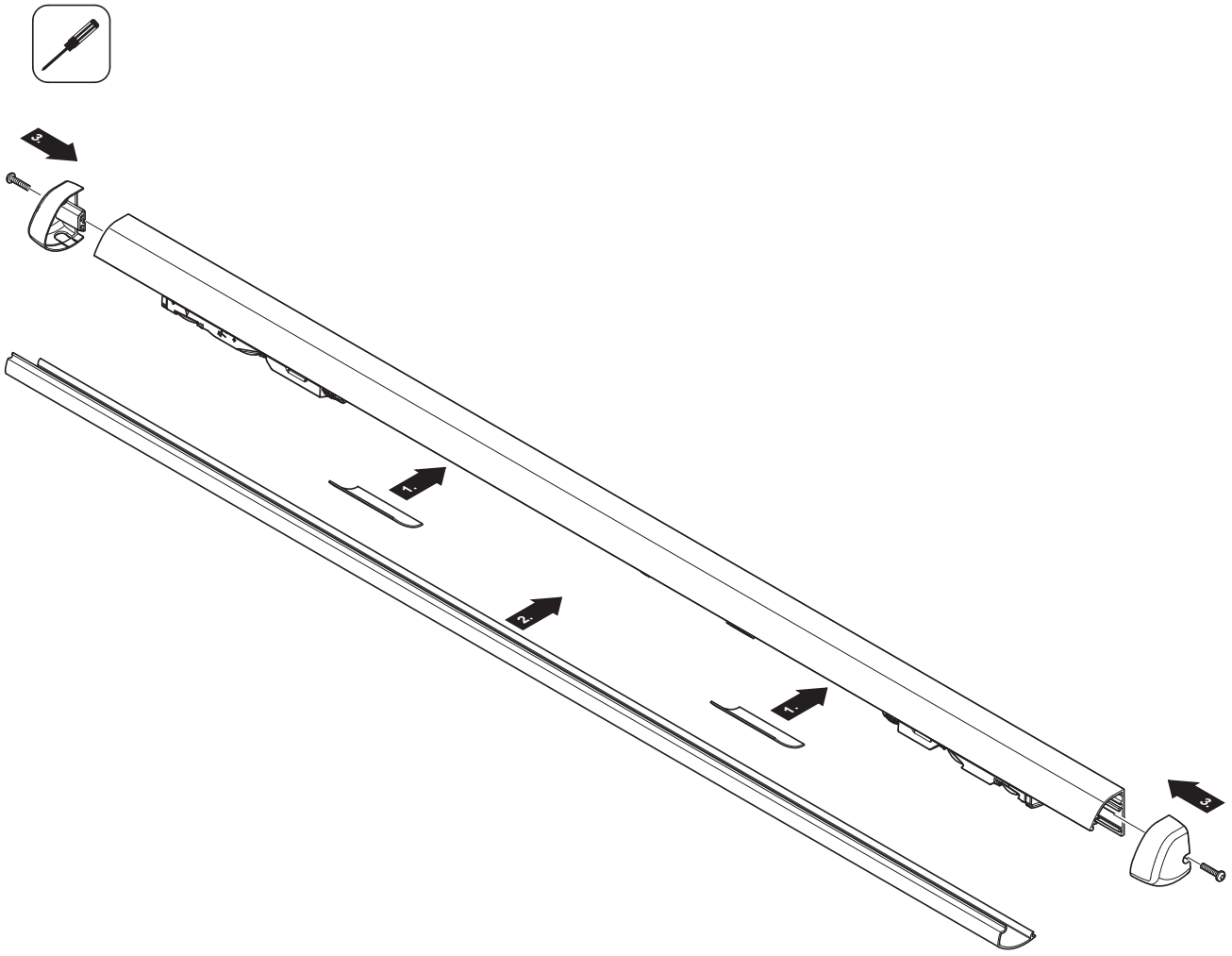
INFORMATION

After saving, you can display the settings any time by pressing the Teach button once.

Close the Sensor

INFORMATION

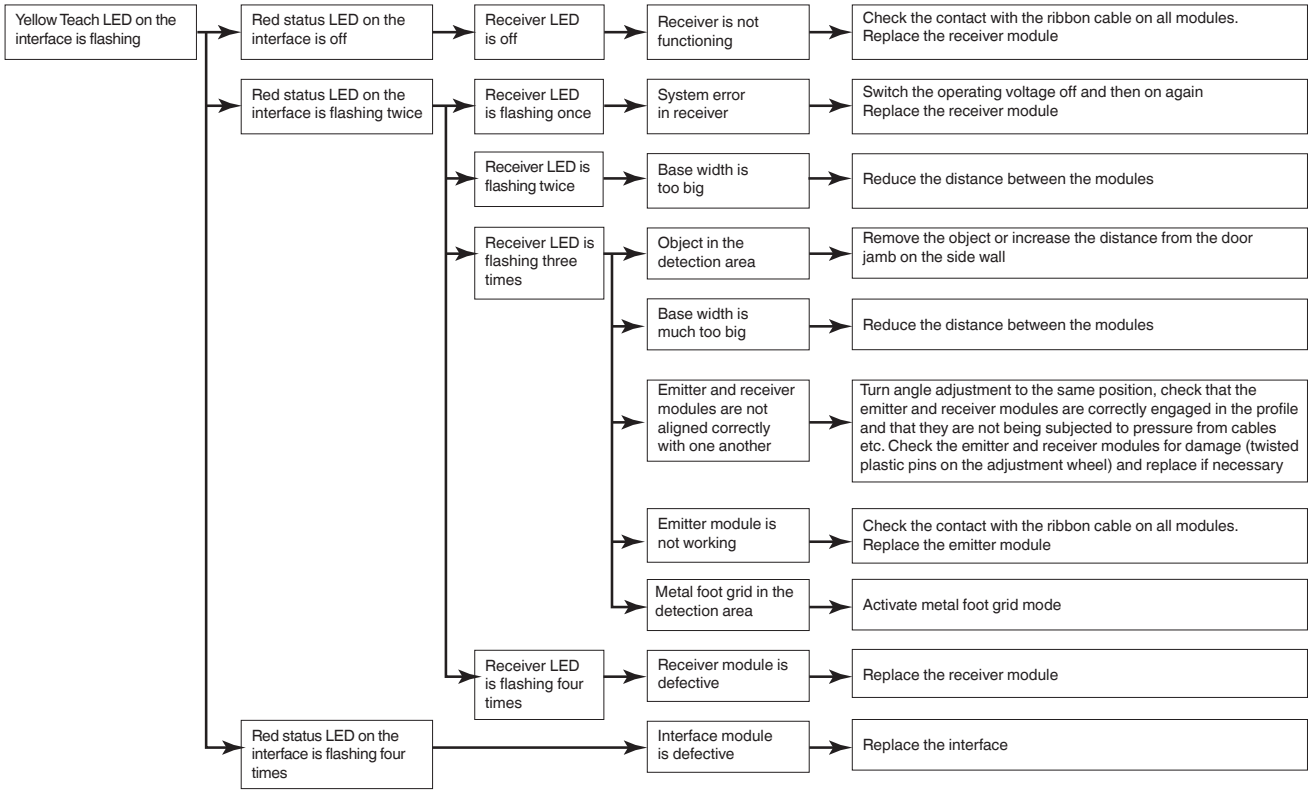
Before closing the sensor, check that the detection area is effective.



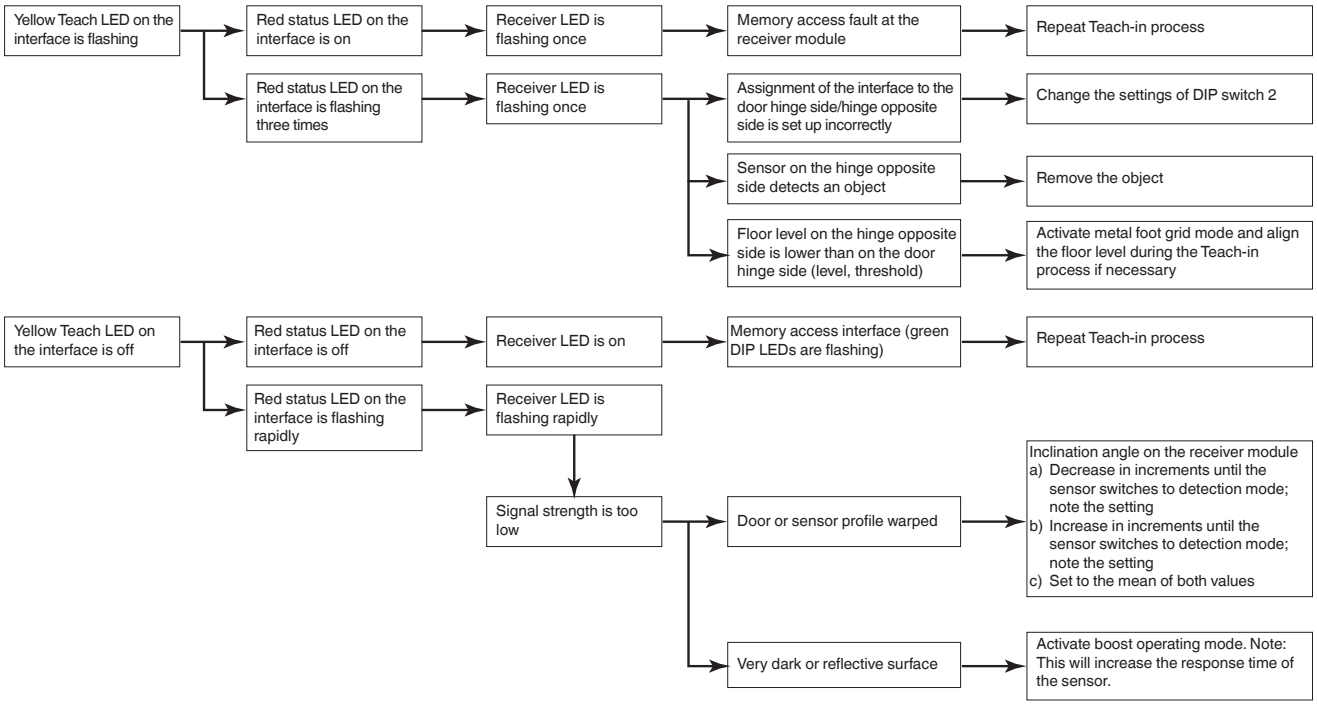
268299/DOCT-3681B

Fault Indications

Fault after floor Teach-in

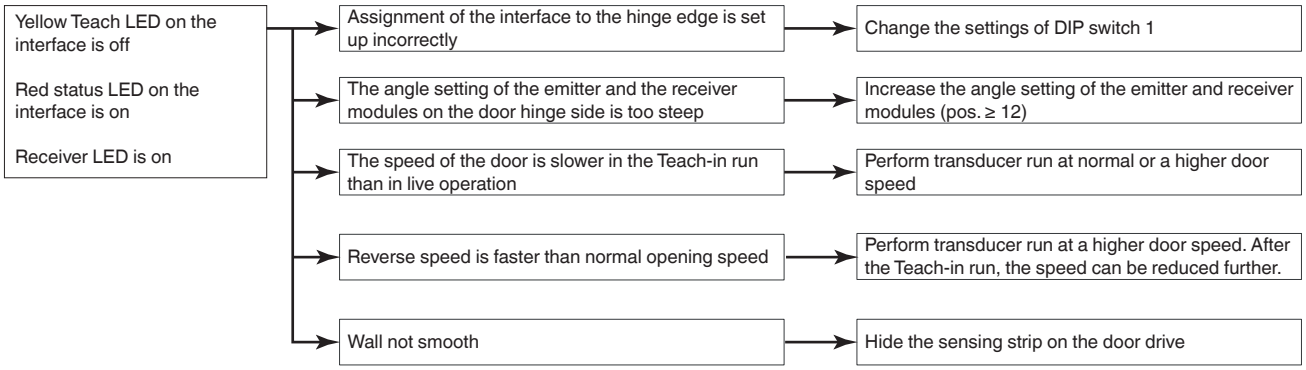


Fault after wall Teach-in

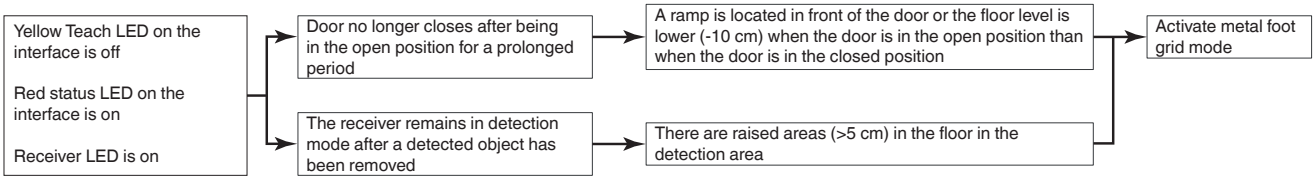


268299/DOCT-3681B

Wall is detected despite Teach-in run



Fault during operation



Fault after connecting operating voltage

268299/DOCT-3681B

Declaration of Conformity

EU-Declaration of conformity
EU-Konformitätserklärung

en/de

Pepperl+Fuchs SE
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / *Nr.*: DOC-0115F
Date / *Datum*: 2022-11-22

PEPPERL+FUCHS

Declaration of conformity / *Konformitätserklärung*

We, Pepperl+Fuchs SE declare under our sole responsibility that the **products** listed below are in conformity with the listed **European Directives** and **standards**.

*Die Pepperl+Fuchs SE erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten **Produkte** den genannten **Europäischen Richtlinien** und **Normen** entsprechen.*

Products / *Produkte*

Product / *Produkt*	**Description** / *Beschreibung*
DoorScan-OS-1P-1200	Sensor for presence detection at automatic doors/ *Anwesenheitssensor für automatische Türen*
DoorScan-DS-2P-1200	Sensor for presence detection at automatic doors/ *Anwesenheitssensor für automatische Türen*
DoorScan-DS-4P-1600	Sensor for presence detection at automatic doors/ *Anwesenheitssensor für automatische Türen*
DoorScan-I	Sensor module, interface / *Sensormodul Interface*
DoorScan-R	Sensor module, receiver / *Sensormodul Empfänger*
DoorScan-T	Sensor module, transmitter / *Sensormodul Sender*
DoorScan Relay Module	Accessory DGE / *Zubehör TTA*

Directives and Standards / *Richtlinien und Normen*

EU-Directive *EU-Richtlinie*	**Standards** *Normen*
2014/30/EU (EMC) (L96/79-106)	EN 61000-6-3:2007/A1:2011/AC:2012 EN 61000-6-2:2005 EN 61000-6-2:2005/AC:2005
2006/42/EC (MD) (L157/24-86)	EN 12978:2003+A1:2009 EN ISO 13849-1:2015 EN 16005:2012+AC:2015
RoHS 2011/65/EU (L174/88-110)	EN IEC 63000:2018-12

Supplemental Standards *Sonstige Normen*	**Remarks** *Bemerkungen*
EN 61508-1:2010 DIN 18650-1:2010 BS 7036-0:2014	Part 1-7 Chapter 10.1.2

Affixed CE Marking / *Angebrachte CE-Kennzeichnung*

CE

Signatures / *Unterschriften*

Berlin, 2022-11-22

ppa. Hinrik Weber
Factory Automation –
Director Innovation Unit Opto

i.V. Dr. Lutz Lohmann
Factory Automation –
Manager Development Opto KOS

ANNEX 2006/42/EC (MD)

Authorised to compile the technical file/
Bevollmächtigt zur Zusammenstellung der technischen Unterlagen

Pepperl+Fuchs SE
Lilienthalstraße 200
68307 Mannheim
Germany

The EC-Type-Examination and the marking of the equipment was performed in accordance with the following standards:
Die EG-Baumusterprüfung und die Kennzeichnung des Betriebsmittels wurden nach den folgenden Normen durchgeführt:
EN 12978:2003 +A1:2009
DIN 18650-1:2010
EN ISO 13849-1:2015
EN 61508:2010 Part 1-7
EN 16005:2012+AC:2015

Certificates / *Zertifikate*

Products / *Produkte*	**All products listed above** / *Alle oben gelisteten Produkte*
Certificate *Zertifikat*	Issuer ID *Aussteller ID*
44 205 13 095719	0044

Key for Issuer ID / *Schlüssel zur Aussteller ID*

ID	**Aussteller**
0044	TÜV NORD CERT GmbH Am TÜV 1 45307 Essen

268299/DOCT-3681B

Your automation, our passion.

Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

Pepperl+Fuchs Quality
Download our latest policy here:

www.pepperl-fuchs.com/quality

PEPPERL+FUCHS

www.pepperl-fuchs.com
Subject to modifications · © Pepperl+Fuchs
Printed in Germany · Part. No. 268299/DOCT-3681B