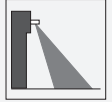


# Active infrared scanner

## DoorScan-DS-4P-1600



- Moving presence sensor for automatic doors
- SIL 2, certified in accordance with DIN 18650/EN 16005
- Exceptional detection reliability
- Reliable operation with all floor coverings
- Complete protection up to the wall without sensor shutoff
- Additional protection of the main and secondary closing edges
- Tool-free module mounting using snap-in mechanism
- Switchable NPN or PNP outputs

Light curtain for individual protection for automatic doors in accordance with DIN 18650/EN 16005, complete system for a door measuring up to 1600 mm wide, NPN output



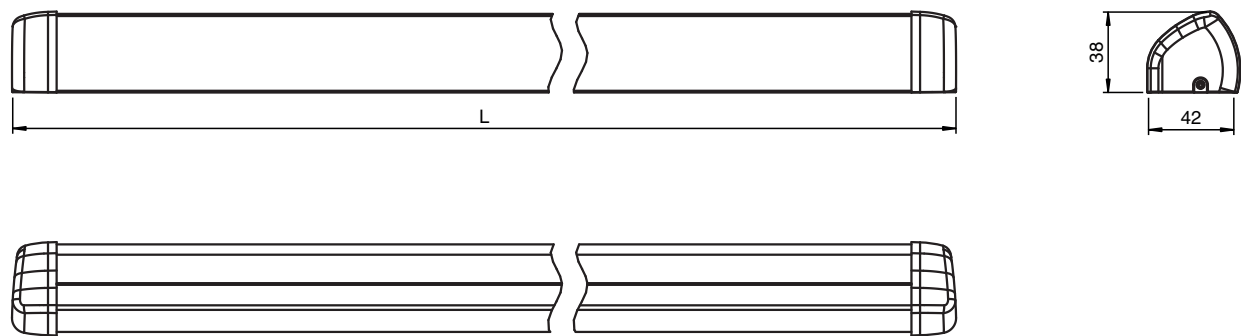
### Function

DoorScan is a presence sensor for automatic revolving doors. It uses active infrared technology to perform background evaluation. The sensor is suitable for mobile or stationary mounting. Because the emitter and receiver module can be repositioned freely, the field of view can also be adjusted to fit the door width. An interface controls both sides of the door and establishes the link to the door controller. DoorScan meets the requirements of DIN 18650 and is a safety system fulfilling PL d in accordance with DIN EN ISO 13849-1 used in conjunction with a secure door controller that generates and evaluates the test signals.

### Application

- Protection mechanism for closing edges on automatic doors
- Anti-collision protection for people/objects in the vicinity of revolving or carousel doors

Dimensions



Technical Data

|                                      |                |                                                                                                                                                                                                        |
|--------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General specifications               |                |                                                                                                                                                                                                        |
| Detection range min.                 |                | 0 ... 1500 mm                                                                                                                                                                                          |
| Detection range max.                 |                | 0 ... 3500 mm (Upright CA test body)                                                                                                                                                                   |
| Sensing range                        |                | 1400 mm at installation height of 2100 mm                                                                                                                                                              |
| Light source                         |                | IRED 850 nm                                                                                                                                                                                            |
| Black-white difference (6 %/90 %)    |                | < 2 % at 2000 mm sensor range                                                                                                                                                                          |
| Number of beams                      |                | 20                                                                                                                                                                                                     |
| Operating mode                       |                | Background evaluation                                                                                                                                                                                  |
| Diameter of the light spot           |                | 8 cm at 2000 mm sensor range                                                                                                                                                                           |
| Functional safety related parameters |                |                                                                                                                                                                                                        |
| Safety Integrity Level (SIL)         |                | SIL 2                                                                                                                                                                                                  |
| Performance level (PL)               |                | PL d                                                                                                                                                                                                   |
| Category                             |                | Cat. 2                                                                                                                                                                                                 |
| MTTF <sub>d</sub>                    |                | 112.7 a                                                                                                                                                                                                |
| Mission Time (T <sub>M</sub> )       |                | 10 a                                                                                                                                                                                                   |
| Indicators/operating means           |                |                                                                                                                                                                                                        |
| Function indicator                   |                | Receiver: Red LED: detection, excess gain, fault code<br>Interface: Red LED: detection, excess gain, fault code<br>Yellow LED: teach status<br>Green LED: blank status<br>Green LED: DIP switch status |
| Control elements                     |                | Teach-In key , DIP switch for selection of operating modes                                                                                                                                             |
| Electrical specifications            |                |                                                                                                                                                                                                        |
| Operating voltage                    | U <sub>B</sub> | 24 V DC +/- 20 %                                                                                                                                                                                       |

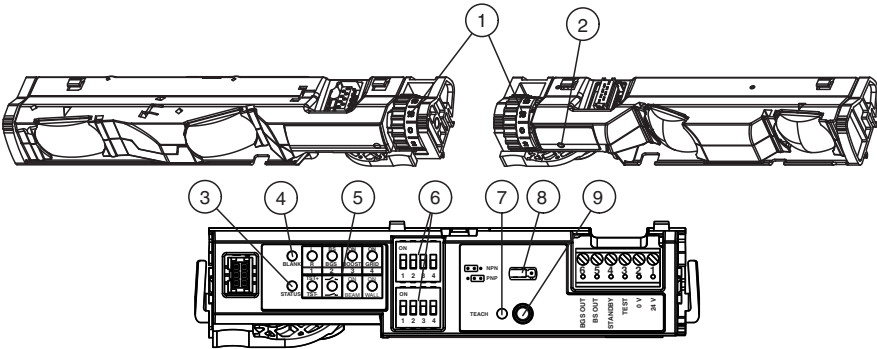
## Technical Data

|                                   |       |                                                                                                                                                                                        |
|-----------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No-load supply current            | $I_0$ | max. 320 mA                                                                                                                                                                            |
| Power consumption                 | $P_0$ | 7.7 W                                                                                                                                                                                  |
| <b>Input</b>                      |       |                                                                                                                                                                                        |
| Test input                        |       | high level $\geq 15$ V low level $\leq 2$ V                                                                                                                                            |
| Control input                     |       | Standby active at $U = 11$ V DC at 30 V DC                                                                                                                                             |
| <b>Output</b>                     |       |                                                                                                                                                                                        |
| Switching type                    |       | light-on                                                                                                                                                                               |
| Signal output                     |       | switchable NPN or PNP , short-circuit protected                                                                                                                                        |
| Switching voltage                 |       | max. 30 V DC                                                                                                                                                                           |
| Switching current                 |       | max. 100 mA                                                                                                                                                                            |
| Response time                     |       | $\leq 52$ ms<br>$\leq 200$ ms in boost operating mode                                                                                                                                  |
| <b>Conformity</b>                 |       |                                                                                                                                                                                        |
| Functional safety                 |       | ISO 13849-1 ; EN 61508 part1-4                                                                                                                                                         |
| Product standard                  |       | EN 12978                                                                                                                                                                               |
| <b>Approvals and certificates</b> |       |                                                                                                                                                                                        |
| CCC approval                      |       | CCC approval / marking not required for products rated $\leq 36$ V                                                                                                                     |
| <b>Ambient conditions</b>         |       |                                                                                                                                                                                        |
| Ambient temperature               |       | -30 ... 60 °C (-22 ... 140 °F)                                                                                                                                                         |
| <b>Mechanical specifications</b>  |       |                                                                                                                                                                                        |
| Housing length L                  |       | 1600 mm                                                                                                                                                                                |
| Mounting height                   |       | max. 3500 mm                                                                                                                                                                           |
| Degree of protection              |       | IP54 (when mounted)                                                                                                                                                                    |
| Connection                        |       | Plug-in terminal with 6-wire connection cable                                                                                                                                          |
| <b>Material</b>                   |       |                                                                                                                                                                                        |
| Housing                           |       | Aluminum / PA                                                                                                                                                                          |
| Optical face                      |       | PC (Polycarbonate)                                                                                                                                                                     |
| Mass                              |       | approx. 2760 g                                                                                                                                                                         |
| Dimensions                        |       | (W x H x D) : 42 mm x 1600 mm x 37 mm                                                                                                                                                  |
| <b>General information</b>        |       |                                                                                                                                                                                        |
| Scope of delivery                 |       | Sensor system for hinge side and leading edge side (4 emitter and receiver modules each, 1 interface module, connecting cable, 2 housing profiles and optical covers each, 4 end caps) |

## Connection Assignment

|   |    |         |
|---|----|---------|
| 1 | BN | 24V     |
| 2 | BU | 0V      |
| 3 | GY | TEST    |
| 4 | PK | STANDBY |
| 5 | BK | BS OUT  |
| 6 | WH | BGS OUT |

Assembly



- 1

Adjusting wheel for inclination angle
- 2

Receiver indicator LED, red
- 3

Status LED, red
- 4

Blank LED, green
- 5

DIP LEDs, green
- 6

DIP switch - rows 1 and 2
- 7

Teach LED, yellow
- 8

Jumper
- 9

Teach button

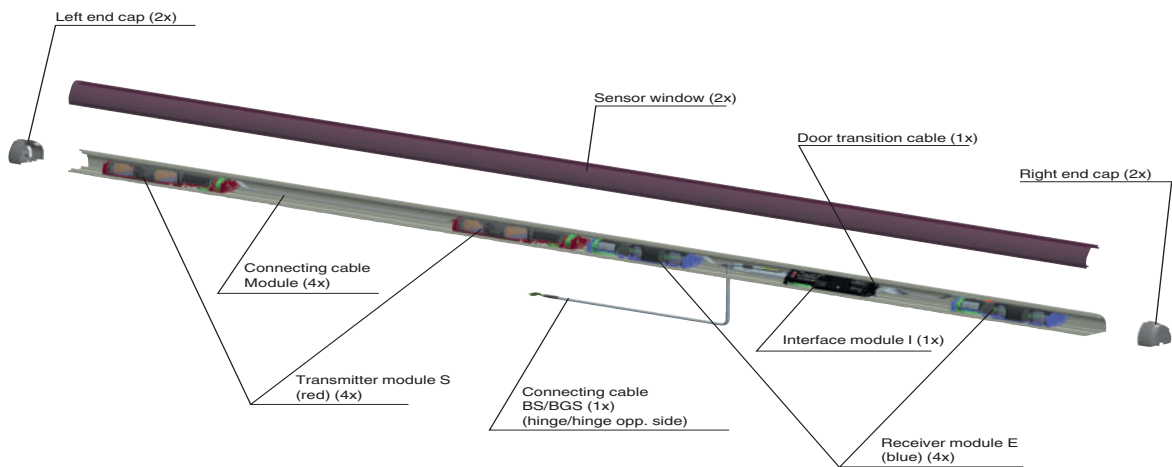
Accessories

|                                                                                     |                                     |                                                                                                                                  |
|-------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|    | <b>DoorScan Transfer Loop</b>       | Door transition cable to door controller for DoorScan® sensor, including cable sheathing and strain relief                       |
|    | <b>DoorScan Weather Cap L1600</b>   | All-weather hood for DoorScan® and TopScan series sensing strips                                                                 |
|   | <b>DoorScan Cable BS/BGS</b>        | Connecting cable for transition from hinge side to leading edge side                                                             |
|  | <b>DoorScan Connection Cable 5p</b> | Connecting cable with 5 plug-in connections for DoorScan®-I/-T/-R modules                                                        |
|  | <b>DoorScan End Caps</b>            | End cap set for DoorScan® sensor profile                                                                                         |
|  | <b>TopScan-S Profile L1400</b>      | Housing profile TopScan-S                                                                                                        |
|  | <b>TopScan-S Cover L1400</b>        | Housing cover TopScan-S                                                                                                          |
|  | <b>DoorScan Relay Module</b>        | Replacement/extension sensor module for installation in the DoorScan® and TopScan sensor profile, multifunction interface module |
|  | <b>DoorScan Adapter</b>             | Adapter module for installation in the DoorScan® and TopScan sensor profile, multifunction interface module                      |
|  | <b>DoorScan Cable Adapter</b>       | Adapter module for installation in the DoorScan® sensor profile, multifunction interface module                                  |

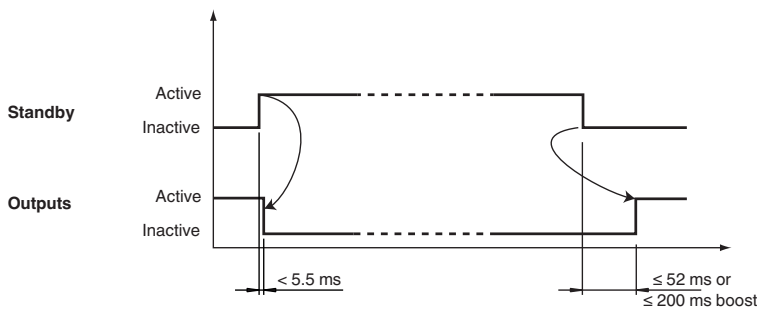
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Additional Information

Layout of the sensor system for a door (hinge/leading edge side)



**Standby**  
When the supply voltage is applied, the sensor is put into standby — the energy consumption is reduced to less than 80% in this state. Once the signal is deactivated, the sensor is immediately ready for operation and enables the signal outputs within 52 ms and/or 200 ms (in boost operating mode) if the detection field is free.



Test input circuit

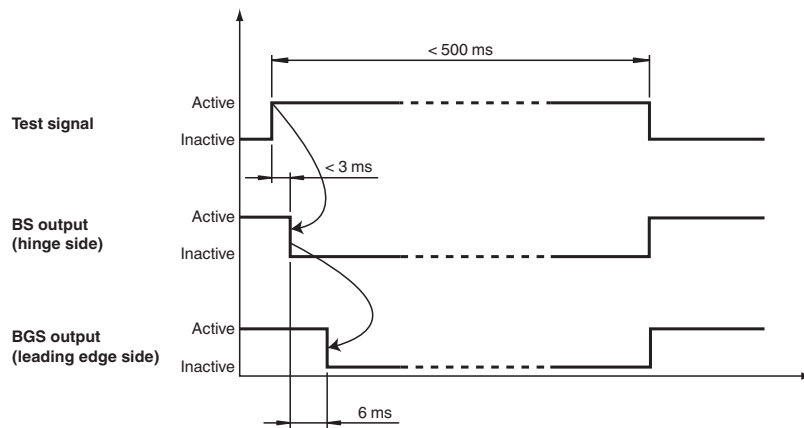
| Test Function | Test inactive |  | Test active |  | Interface<br>DIP switch 1, bottom row |
|---------------|---------------|--|-------------|--|---------------------------------------|
| High active   |               |  |             |  | ON<br>Test at +24 V                   |
| Low active    |               |  |             |  | OFF<br>Test at 0 V                    |
| High inactive |               |  |             |  | OFF<br>Test at 0 V                    |
| Low inactive  |               |  |             |  | ON<br>Test at +24 V                   |

Test signal

The signal outputs enable short circuit detection. In order to do so, the outputs carry out a delayed shutoff from each other (see

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signal curve).



#### Note!

The test signal must be in contact with the test input for at least 9 ms!  
The duration of the test signal must not exceed 0.5 s, otherwise this will deactivate the sensor.

### Operating Modes

#### Boost operating mode

Activation with dark floors, even at high installation heights (increased sensitivity). In these cases, the response time of the sensor is increased from 50 ms to 200 ms. If necessary, the speed of the door must be adjusted to the response time.

#### Grid operating mode

Activation in the event of faults due to grating on the ground. Used where grating and shafts are present in the detection field.

## Function Principle

DoorScan is an active infrared triangulation sensor with background analysis.

The ground is taught in as a reference and the sensor can learn flat walls on the hinge side and door posts on the leading edge side when the door is opened. This means that person detection can be ensured throughout the entire movement of the door.

#### Characteristics

The DoorScan housing comprises an aluminum profile system with a plastic cover, which can be adapted to a door width of up to 1200 mm. A minimum of one and a maximum of three emitter and receiver modules must be fitted on each side of the door. The interface must be installed on one side.

The modules should be arranged approx. 10 cm away from the edge of the door. If more than one emitter/receiver module is installed on each side, the modules must be overlapped (S1, S2, E1, E2).