

Elevator light grid

AL2109-P-1820/25/49/76a/143



- Low-profile, high resolution light grid for monitoring locking edges on elevators and accesses
- In accord with EN81-20 and EN81-70
- Dense monitoring field with up to 135 beams ensures that small objects are detected
- Object detection up to distance of zero
- Automatic beam crossing
- Test input
- Insensitive to reflection and ambient light

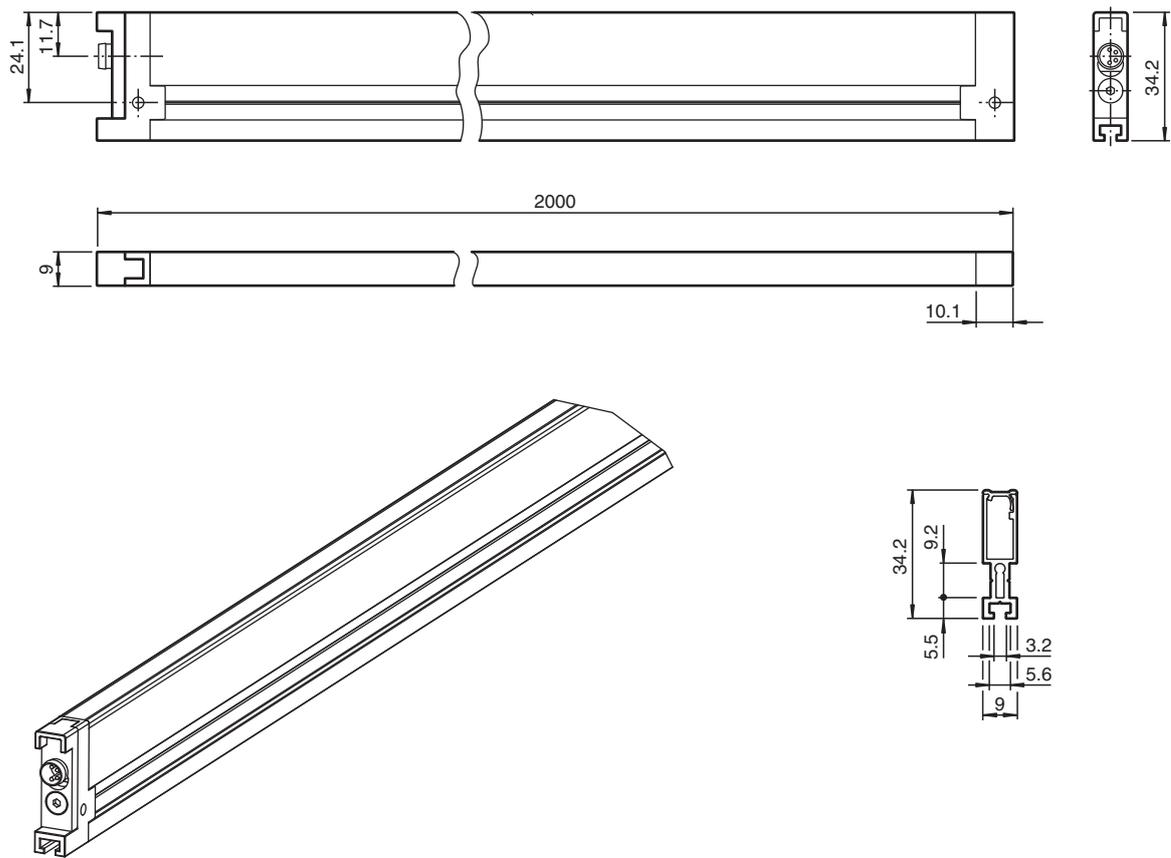
High-resolution light grid for detecting people and objects, set comprising emitter and receiver, field height: 1800 mm, light/dark on, 1 NPN output and 1 PNP output, M8 plug



Function

The AL2109 elevator light grid is used to protect elevator doors or for passenger monitoring and access control. Its special features include its dynamic beam crossover with up to 135 active sensors, object detection down to nearly zero millimeters and an ambient light limit greater than 100,000 Lux. The evaluation electronics and the power supply are completely integrated into the emitter and receiver element, so that no external equipment is necessary for operation. The system offers flexible mounting options and meets the newest standards in accordance with EN 81-20 and EN 81-70.

Dimensions



Technical Data

General specifications

Effective detection range	0 ... 3500 mm
Threshold detection range	3500 mm
Light source	IRED
Light type	modulated infrared light , 950 nm
Field height	1800 mm
Beam crossover	automatic, 3x/5x/7x (depending on distance between transmitter/receiver)
Beam spacing	90 mm
Number of beams	61 ... 135 (dynamic)
Angle of divergence	Emitter: < 20 ° , Receiver: < 6 °
Ambient light limit	> 100000 Lux
Accessories provided	2 connecting cable , length 5 m (15 ft)

Functional safety related parameters

MTTF _d	180 a
Mission Time (T _M)	20 a
Diagnostic Coverage (DC)	0 %

Indicators/operating means

Function indicator	LED red (in receiver): Illuminates after connecting operating power, goes out when an object is detected
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Electrical specifications

Operating voltage	U _B	11 ... 30 V DC
Ripple		10 %
No-load supply current	I ₀	< 180 mA

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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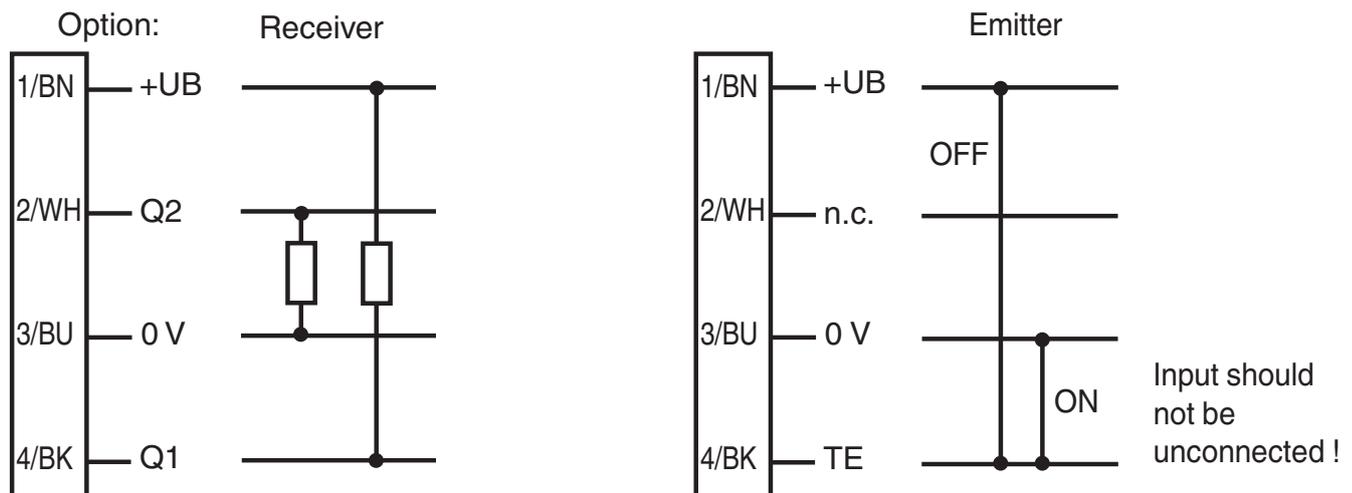
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Technical Data

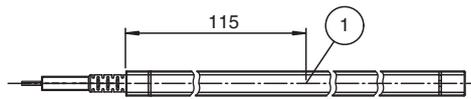
Input	
Test input	Test: Operating voltage , Operating mode 0 V
Output	
Switching type	light on
Signal output	1 PNP and 1 NPN, short-circuit protected
Switching voltage	max. 30 V DC
Switching current	100 mA
Switching frequency	f < 3 Hz
Response time	< 100 ms
Compliance with standards and directives	
Directive conformity	
EMC Directive 2004/108/EC	EN 12015:2014 EN 12016:2013
Standard conformity	
Product standard	EN 60947-5-2:2007 EN 60947-5-2/A1:2012 IEC 60947-5-2 Edition 3.1:2012-09
Standards	EN 81-70:2003-05 EN 81-70/A1:2004-12 EN 81-20:2014; Section 5.3.6.2.2.1 Taking into account object detection in accordance with the data sheet specification for the monitoring field.
Approvals and certificates	
UL approval	E310569 , cULus Listed , class 2 power supply , max. ambient temperature 60 °C
CCC approval	CCC approval / marking not required for products rated ≤36 V
Ambient conditions	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
Storage temperature	-20 ... 65 °C (-4 ... 149 °F)
Mechanical specifications	
Degree of protection	IP54
Connection	M8 x 1 connector, 4-pin
Material	
Housing	aluminum
Optical face	plastic
Mass	2000 g (device)

Connection Assignment



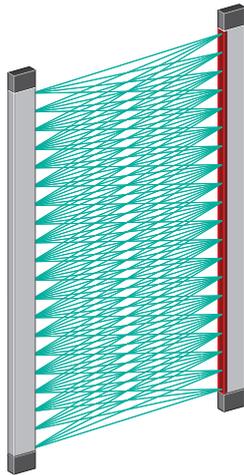
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Assembly



1 LED display

Application



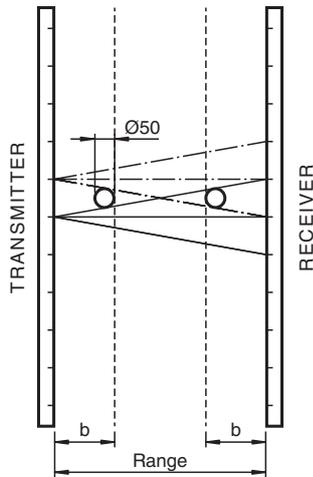
Accessories

	Mounting Set AL2109 back board	Mounting aid
	Mounting Set AL2109 extension	Mounting aid
	Mounting Set AL2109 lateral	Mounting aid
	PS1/31	Power supply/Power supply module

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Monitoring field

Object detection



Range [mm]	b [mm]
100	38
200	64
300	88
400	64
500	76
600	88
700	72
800	80
900	88
1000	96
1500	134
2000	171
2500	209
3000	246
3500	283

Accessories

Other suitable accessories can be found at www.pepperl-fuchs.com

LED Indicators

The red LED in the upper end of the receiver lights up continuously when the operating voltage is applied. The light grid is then ready for operation.

When an object is detected, the red LED goes out until the light beams are unobstructed again.

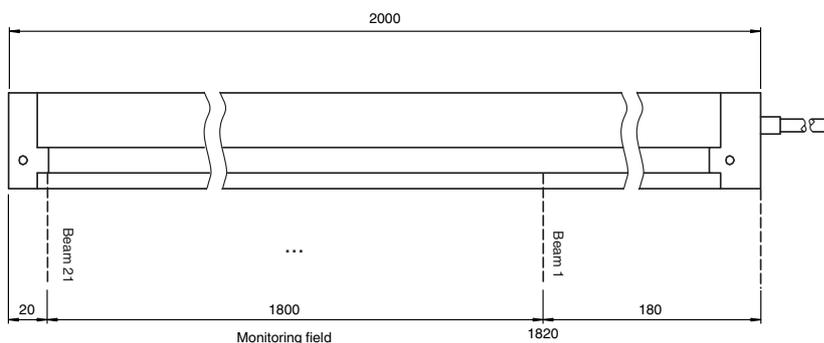
Test input

When +UB is applied to the test input, the light beams used for detection are switched off; in other words, the outputs on the light grid behave as if detecting an object.



To eliminate faults reliably (EMC-related faults, interference), the test input must never be left in an unconnected state! If the test input is not required, it should be connected to 0 V.

Monitoring field



Function Principle

The AL2109 light grid is used for access monitoring on elevators. The device consists of an emitter and receiver unit. The evaluation electronics and power supply are integrated into the devices. No additional external components are required for operation.

By default, the light grid automatically switches between 7-way, 5-way and 3-way crossovers. If the distance is more than 0.8 m between the emitter and receiver, the light grid selects the "7-way crossover" operating mode. Every receiver evaluates the beams of 7 emitters in this mode. 7-way crossover thus increases the resolution to 135 beams.

Application

- Secure and complete monitoring of elevator doors
- Monitoring of access systems and entrances
- Access control