Световые решетки

Технические характеристики

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70
Казахстан +7(727) 345-47-04
Беларусь +(375) 257-127-884
Узбекистан +998(71)205-18-59
Киргизия +996(312)96-26-47

эл.почта: phb@nt-rt.ru || сайт: https://pepperl-fuchs.nt-rt.ru/

Light grid

LGM17

- Measuring automation light grid with switching output
- Optical resolution 17 mm
- Super-fast object detection, even with 3-way beam crossover
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Temperature range to -30 °C
- Output of a measured value, can be selected from a number of measuring functions

Measuring automation light grid with beam spacing of 17 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

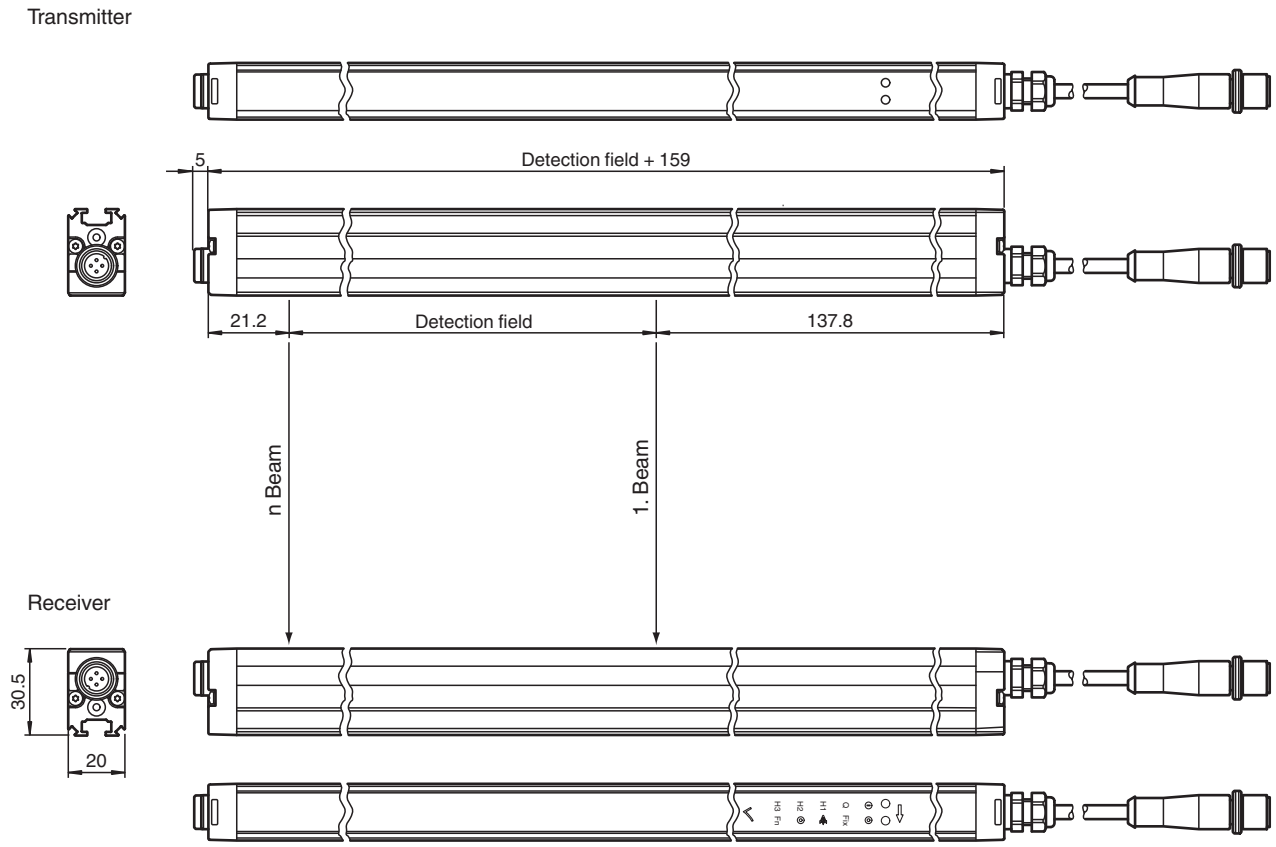
Function

Automation light grids in the LGM Series are designed to measure small to large objects. The slimline light grids are modular in design and are available with various beam gaps and field heights. The entire signal evaluation process is carried out within the device. The lightweight systems can be integrated elegantly into their surroundings, from both a technical and a visual perspective. As a result, machines and plants operating in temperature ranges between -30 °C ... +60 °C can be designed to more compact dimensions.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications		
Effective detection range		Standard : 0.3 ... 6 m
Threshold detection range		7.5 m
Light source		IRED
Light type		modulated infrared light , 850 nm
Field height		see Table 1, max. 3200 mm
Beam crossover		Factory setting: three beam crossing, deactivateable
Beam blanking		adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing		16.67 mm
Number of beams		see Table 1, max. 193
Operating mode		Emitter: Emitter power adjustable in two ranges
Optical resolution		without beam crossover: 17 mm with beam crossover: 8.5 mm with in 25% and 75% of the range
Opening angle		10 °
Ambient light limit		> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters		
$MTTF_d$		25 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Technical Data

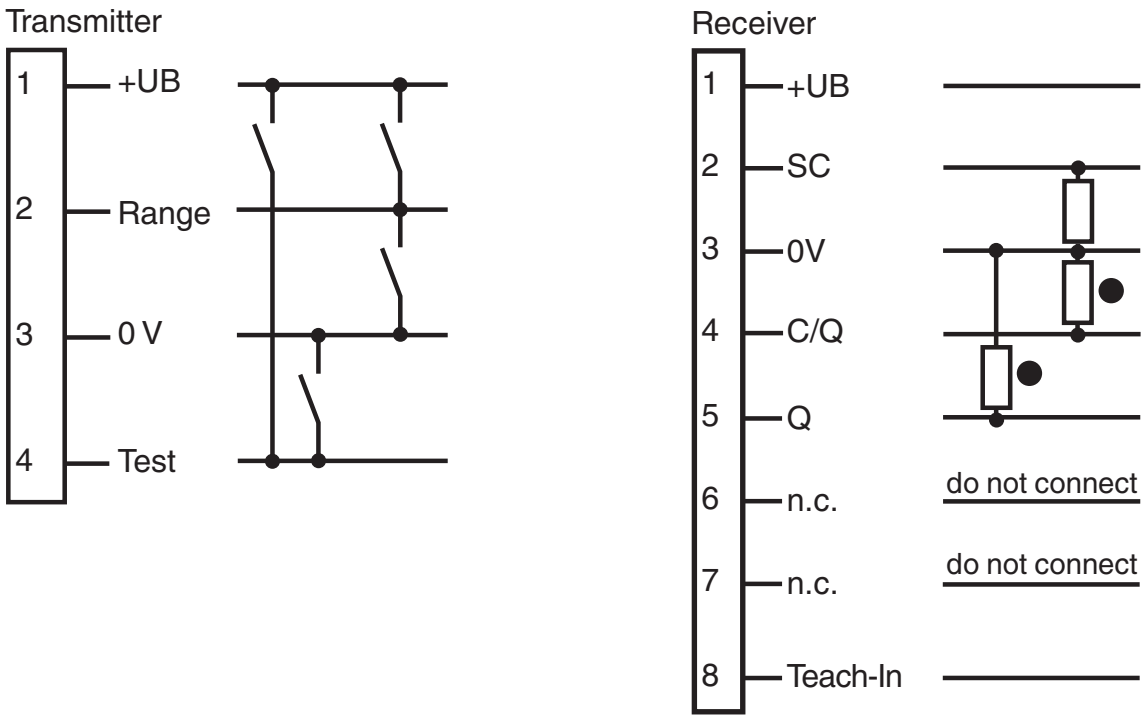
Operation indicator		LED green: constantly on - power-on double pulse flashing (0.8 Hz) - undervoltage flashing (4 Hz) - short circuit flashing with short interruptions (1 Hz) - IO-Link mode
Status indicator		Emitter: LED yellow constantly on - high emitter power constantly off - low emitter power flashing (8 Hz) - error message Receiver: LED yellow: constantly on - object detected constantly off - no object detected flashing (4 Hz) - below stability control limit flashing (8 Hz) - error message
Control elements		Receiver: 2 touch buttons for programming
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 3 s
Interface		
Interface type		IO-Link (pin 4)
IO-Link revision		1.0
Device ID		1050369 ... 1050400 (0x100701 ... 0x100720)
COM-Mode		COM2 (38.4 kBit/s)
Min. cycle time		2.3 ms
Process data width		16 bit
SIO mode support		yes
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m with +UB or 0 V on pin 2 (emitter) Teach-In input for parameterization on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Command interface: Pin 4 IO-Link interface C or used as switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) Switch output: Pin 5 switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) synchronized with pin 4
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 129 Hz
Response time		see Table 1, max. 16 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

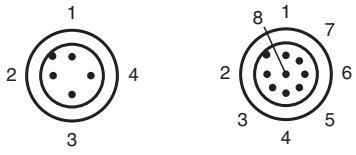
Technical Data

Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3360 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized
Optical face		Plastic pane , Polycarbonate
Mass		see Table 1, max. 1750 g (per profile)
Cable length		max. 30 m

Connection Assignment

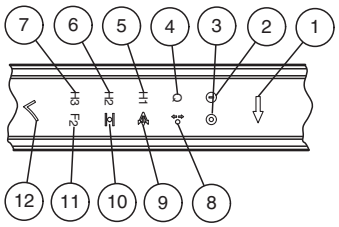


Connection Assignment



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Assembly

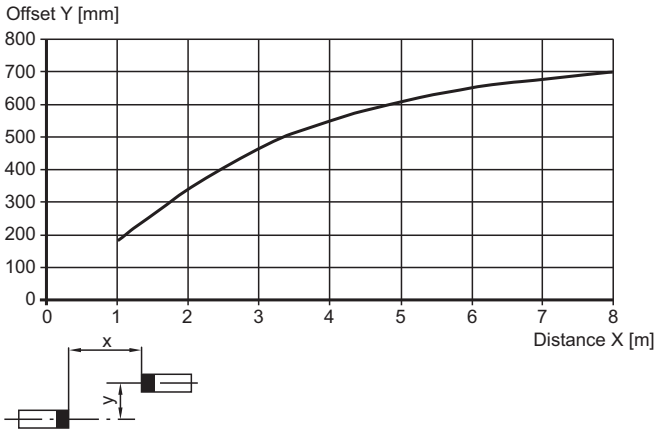


1	Menu button	yellow	7	not used	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	not used	yellow	11	2nd level	yellow
6	not used	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command and measurement of the object is triggered when an object enters or is already present in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system is programmed using the integrated touch field or the IO-Link interface.

Output of the analog measured value is included in the IO-Link protocol. Users can choose from a vast selection of integrated measurement protocols.

The most important measurement protocols are:

- Lowest position of the object
- Highest position of the object
- Height of the object
- Height of the object as the total height of all partial objects
- Height of the largest partial object
- Mid-position of the largest partial object
- Lowest position of the largest partial object
- Highest position of the largest partial object
- ...

Parameterization

IO-Link
The sensor parameters are device-specific and are described in the standardized IO Device Description file (IODD). The IODD can be read into different engineering tools using IODD support from different system providers. The sensor can then be configured or diagnosed using the relevant tool and a user interface generated from the IODD.

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Accessories

	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**OMH-SLCT-06**	Swivel Bracket
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**PACTware 4.1**	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Accessories

	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency, and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] Without object parameterization		Switch-on delay Q [ms] - With object parameterization - Updated measured value		Maximum switching frequency [Hz]	Maximum time delay before availability t_v [s]
	typ.	max.	typ.	max.		
100	3	4	5	7	129	0.8
200	3	5	5	7	118	0.9
300	3	5	6	8	109	1.0
400	3	5	6	9	101	1.0
500	3	6	6	10	94	1.1
600	3	6	7	10	88	1.2
700	4	7	7	11	82	1.3
800	4	7	7	12	78	1.3
900	4	7	8	13	73	1.4
1000	4	8	8	13	70	1.5
1100	4	8	9	14	66	1.5
1200	5	8	9	15	63	1.6
1300	5	9	9	16	60	1.7
1400	5	9	10	16	58	1.8
1500	5	10	10	17	56	1.8
1600	5	10	10	18	53	1.9
1700	6	10	11	19	51	2.0
1800	6	11	11	19	49	2.0
1900	6	11	12	20	48	2.1
2000	6	11	12	21	46	2.2
2100	6	12	12	22	45	2.3
2200	6	12	13	22	43	2.3
2300	7	13	13	23	42	2.4
2400	7	13	13	24	41	2.5
2500	7	13	14	25	40	2.5
2600	7	14	14	25	38	2.6
2700	7	14	15	26	37	2.7
2800	8	14	15	27	36	2.8
2900	8	15	15	27	35	2.8
3000	8	15	16	28	35	2.9
3100	8	16	16	29	34	3.0
3200	8	16	16	30	33	3.0

Number of beams, housing length, and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
100	7	260	200
200	13	360	250

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
300	19	460	300
400	25	560	350
500	31	660	400
600	37	760	450
700	43	860	500
800	49	960	550
900	55	1060	600
1000	61	1160	650
1100	67	1260	700
1200	73	1360	750
1300	79	1460	800
1400	85	1560	850
1500	91	1660	900
1600	97	1760	950
1700	103	1860	1000
1800	109	1960	1050
1900	115	2060	1100
2000	121	2160	1150
2100	127	2260	1200
2200	133	2360	1250
2300	139	2460	1300
2400	145	2560	1350
2500	151	2660	1400
2600	157	2760	1450
2700	163	2860	1500
2800	169	2960	1550
2900	175	3060	1600
3000	181	3160	1650
3100	187	3260	1700
3200	193	3360	1750

Design and Function

Safety information

The device must be operated only at low protective voltage where there is safe electrical isolation. Modifications and repairs must be carried out only by your supplier!

The system must be maintained and inspected on a regular basis.

A soft, clean cloth may be used to clean the system. Do not use any aggressive or abrasive cleaning agents that will corrode the surfaces. The device must not be subjected to severe impacts or vibrations.

Commissioning

Prerequisites

- The transmitter unit and receiver unit have been mounted and aligned correctly.
- The electrical connection has been established as per the information in the connection diagram.
- The signal output responds to object measurement.
- If at least one beam of light is interrupted, the output remains active for as long as the object is detected.

Troubleshooting

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

- Measure operating voltage
- Check cabling.
- Check transmitter and receiver unit for dirt. Clean if necessary.

Function indicators

A green LED for indicating the operating status "Power ON" and a yellow status indication LED are fitted on the connection side of the profiles, behind the lens cover.

Transmitter Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated. Yellow LED to indicate status is flashing	Energy-saving mode
Yellow LED to indicate status is not illuminated	Transmission power of transmitter is low
Yellow LED to indicate status is permanently illuminated	Transmission power of transmitter is high
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state
Yellow LED to indicate status — brief change in light emitted	Test input is activated

Receiver Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated	Energy-saving mode
Green LED to display operating status is flashing at brief intervals	IO-Link mode active. Possible to parameterize the device only via IO-Link
Green LED to display operating status is flashing (4 Hz)	Fault status: short circuit at the outputs
Yellow LED to indicate status is permanently illuminated	Detection field interrupted
Yellow LED to indicate status is not illuminated	Detection field is clear.
Yellow LED to indicate status is flashing (approx. 4 Hz)	Insufficient stability control
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state: fault during signal measurement

Resolution and Beam Gap

The optical resolution of the light grid corresponds to the size of the object that can be detected.

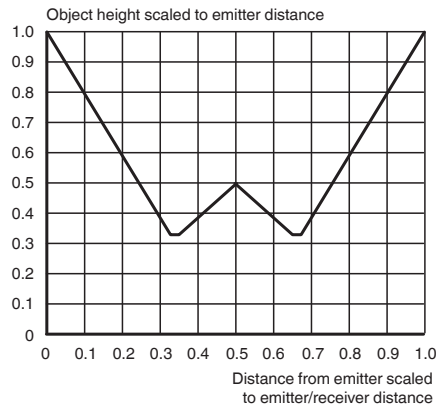
The values specified in the technical data under "Optical Resolution" apply if signal tracking for the threshold value is activated. Where the system is parameterized via the touch field menu (level 2, "Signal Tracking"), the value is automatically set to 60 %. It is not possible to set other values. To parameterize the system via IO-Link, a threshold value of at least 60 % must be entered. Signal tracking for the threshold value is deactivated by default, increasing the optical resolution by a maximum of 4 mm. By selecting 3-way crossover of the light beams, the resolution of the light grid is refined.

The switching outputs respond to any instance in which the beam is interrupted by an object. Selective object detection can also be parameterized using predefined or taught-in objects. Up to 2 beam areas can be suppressed (blanking).

The devices are supplied without object detection programmed, with signal tracking of the threshold value deactivated, and with a beam path with a 3-way crossover.

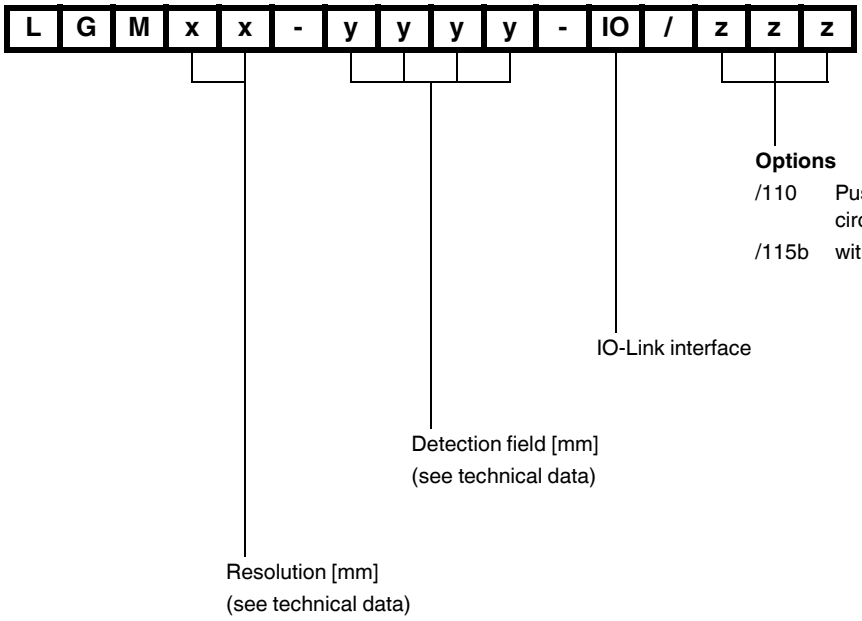
Resolution of the Crossed Beam Arrangement

If 3-way beam crossover is programmed, the resolution is refined. In the case of 3-way crossover, this means that the increased resolution is offered once 25 % of the transmitter unit range or receiver unit range has been covered. It is therefore necessary to ensure that all objects pass the transmitter or receiver with such a gap.



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251332_eng.pdf

Type Code


L G M x x - y y y y - IO / z z z
Options
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGS8

- Automation light grid
- Optical resolution 8 mm
- Super-fast object detection, even with 3-way beam crossover
- Software-free adjustment of height monitoring
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Optional temperature range to -30 °C

Automation light grid with beam spacing of 8 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

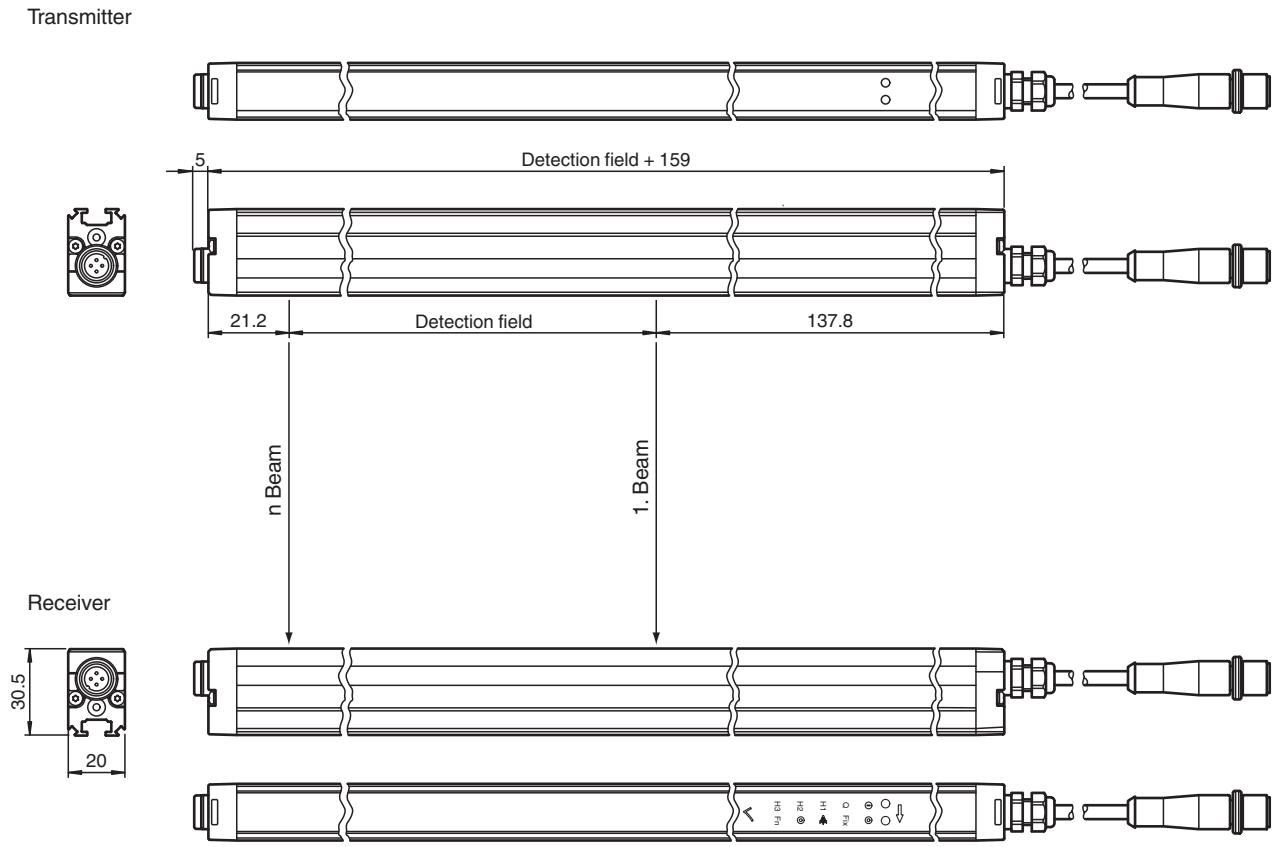
Function

The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications	
Effective detection range	Standard : 0.3 ... 6 m Option /35: 0.5 ... 8 m
Threshold detection range	Standard : 7.5 m Option /35: 10 m
Light source	IRED
Light type	modulated infrared light , 850 nm
Field height	see Table 1, max. 2100 mm
Beam crossover	Factory setting: three beam crossing, deactivateable
Beam blanking	adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing	8.33 mm
Number of beams	see Table 1, max. 253
Operating mode	Emitter: Emitter power adjustable in two ranges
Optical resolution	without beam crossover: 8 mm with beam crossover: 4 mm with in 25% and 75% of the range
Opening angle	10 °
Ambient light limit	> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters	
$MTTF_d$	21 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	60 %
Indicators/operating means	
Operation indicator	Power on: LED green, statically lit , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Technical Data

Function indicator		Emitter: Yellow LED, illuminates at high emitting power, off at low emitting power Receiver: Yellow LED: illuminates when an object is detected flashes when falling short of the operating reserve (4 Hz) Error message: Yellow LED flashes (8 Hz) in emitter and receiver
Control elements		Receiver: 2 touch buttons for programming
Parameterization indicator		IO link communication: green LED goes out briefly (1 Hz)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 3.8 s
Interface		
Interface type		IO-Link
Protocol		IO-Link V1.0
Mode		COM2 (38.4 kBit/s)
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m (or 2 m in case of option /35) with +UB or 0 V on pin 2 (emitter) Teach-In input for programming on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Switching output (detection field C/Q) 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected on pin 4 (receiver), Height monitoring (H1, H2. H3) 3 push-pull (4 in 1) outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver)
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 118 Hz
Response time		see Table 1, max. 20 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		Standard : -10 ... 60 °C (14 ... 140 °F) Option /146: -30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 2260 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized

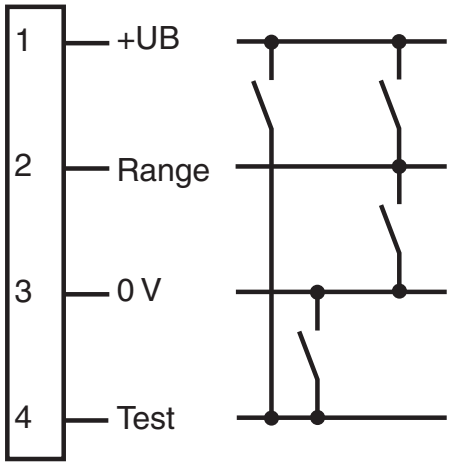
Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Technical Data

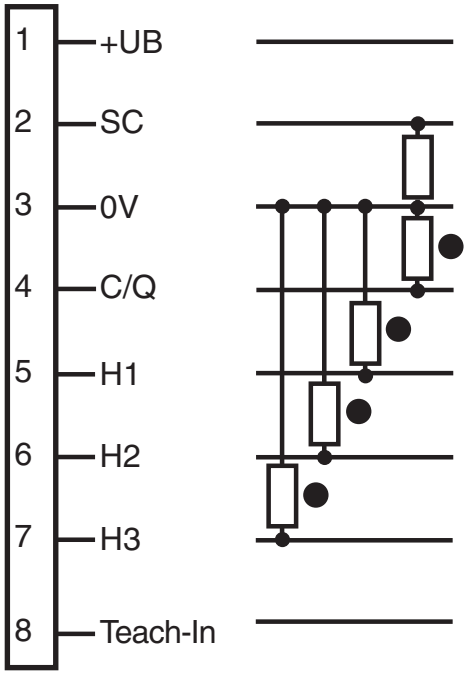
Optical face	Plastic pane , Polycarbonate
Mass	see Table 1, max. 1200 g (per profile)
Cable length	max. 30 m

Connection Assignment

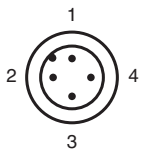
Transmitter

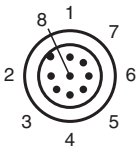


Receiver

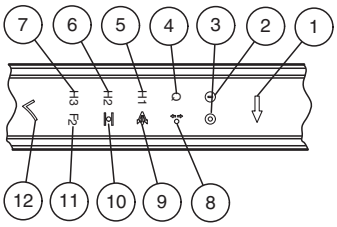


Connection Assignment





Assembly



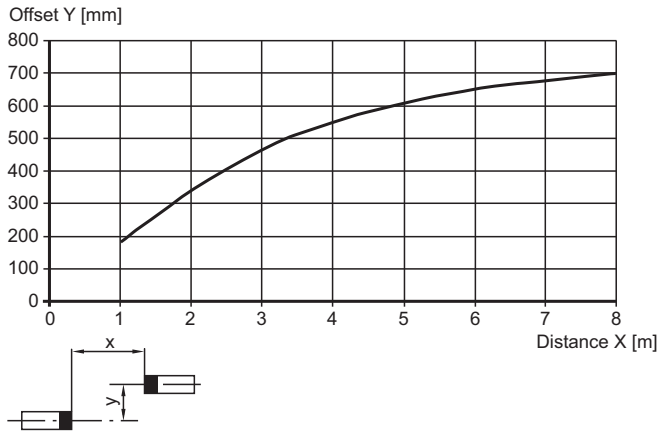
1	Menu button	yellow	7	Height checking 3	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	Height checking 1	yellow	11	2nd level	yellow
6	Height checking 2	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command is initiated by the entry or existence of a body/object in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system also has 3 switch outputs for height checking.

The system is programmed using the integrated touch field or the IO-Link interface.

Accessories

	**OMH-SLCT-06**	Swivel Bracket
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Accessories

	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	PACTware 4.1	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs
	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] without object parameterization		Switch-on delay Q [ms] with object parameterization, HQn outputs		Max. switching frequency [Hz]	Max. time delay before availability t_v [s]
	typ.	max.	typ.	max.		
100	3	5	5	7	118	0.9
200	3	5	6	9	101	1.0
300	3	6	7	10	88	1.2
400	4	7	7	12	78	1.3
500	4	8	8	13	70	1.5
600	5	8	9	15	63	1.6
700	5	9	10	16	58	1.8
800	5	10	10	18	53	1.9
900	6	11	11	19	49	2.0
1000	6	11	12	21	46	2.2
1100	6	12	13	22	43	2.3
1200	7	13	13	24	41	2.5
1300	7	14	14	25	38	2.6
1400	8	14	15	27	36	2.8
1500	8	15	16	28	35	2.9
1600	8	16	16	30	33	3.0
1700	9	17	17	31	31	3.2
1800	9	17	18	33	30	3.3
1900	9	18	19	34	29	3.5
2000	10	19	19	36	28	3.6
2100	10	20	20	37	27	3.8

Number of beams, housing length and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
100	13	260	200
200	25	360	250
300	37	460	300
400	49	560	350
500	61	660	400
600	73	760	450
700	85	860	500
800	97	960	550
900	109	1060	600
1000	121	1160	650
1100	133	1260	700
1200	145	1360	750
1300	157	1460	800

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
1400	169	1560	850
1500	181	1660	900
1600	193	1760	950
1700	205	1860	1000
1800	217	1960	1050
1900	229	2060	1100
2000	241	2160	1150
2100	253	2260	1200

Design and function

Safety information

The device must only be operated with Safety Extra Low Voltage (SELV) with safe electrical disconnection. Intervention and repairs must only be carried out by your suppliers.
The system must be serviced and checked regularly.
A clean, soft cloth can be used for cleaning. Aggressive, abrasive cleaning agents that damage the surface must be avoided. The device must not be subjected to hard knocks or vibration.

Commissioning

Prerequisites

- The transmitter and receiver must be installed and aligned correctly.
- The electrical connection must be established according to the connection diagram.
- The signal output must respond to object detection.
- If at least one light beam is interrupted, the output remains active as long as the object is detected.

Fault location

- Measure operating voltage
- Check the cabling.
- Check the transmitter and receiver for dirt and clean if necessary.

Function displays

Behind the optics cover on the connection side of the profiles there is a green Power ON operating indicator LED and a yellow status display LED.

Transmitter

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark and yellow status indicator flashes	Power save mode
Yellow status indicator LED is dark	Transmitter with low transmitting power
Yellow status indicator LED lights up statically	Transmitter with high transmitting power
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition
Yellow status indicator LED light changes for short time	Test input is activated

Receiver

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark	Power save mode
Green operating indicator LED flashes with brief interruption	IO-Link mode active, parameterisation only possible via IO-Link
Green operating indicator LED flashes (4 Hz)	Error condition: Short circuit at the outputs
Yellow status indicator LED lights up statically	Detection field interrupted
Yellow status indicator LED is dark	Detection field is enabled.
Yellow status indicator LED flashes (approx. 4 Hz)	Insufficient function reserve
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition: Incorrect signal measurement

Resolution and beam clearance

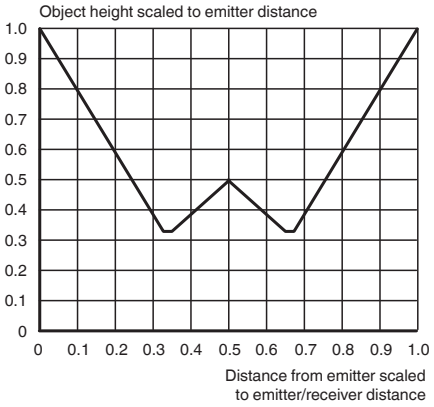
The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

The devices are delivered without programmed height checking. The beam is crossed three times.

Resolution of the crossed beam arrangement

If three-way crossing of the beams is programmed, the resolution increases. For a three-way crossing, this means that the increased resolution is offered after 25 % of the transmitter range or receiver range. It must therefore be ensured that all objects pass transmitters or receivers with this clearance.



Type Code

L	G	S	x	x	x	-	y	y	y	y	-	IO	/	z	z	z

Options

/35	extended detection range 8 m
/110	Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b	with 0.2 m fixed cable and M12 connector
/146	extended temperature range -30 °C

IO-Link interface

Detection field [mm]
(see technical data)

Resolution [mm]
(see technical data)

Release date: 2023-03-28 Date of issue: 2023-03-28 Filename: 232504_eng.pdf

Light grid

LGS17

- Automation light grid
- Optical resolution 17 mm
- Super-fast object detection, even with 3-way beam crossover
- Software-free adjustment of height monitoring
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Optional temperature range to -30 °C

Automation light grid with beam spacing of 17 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

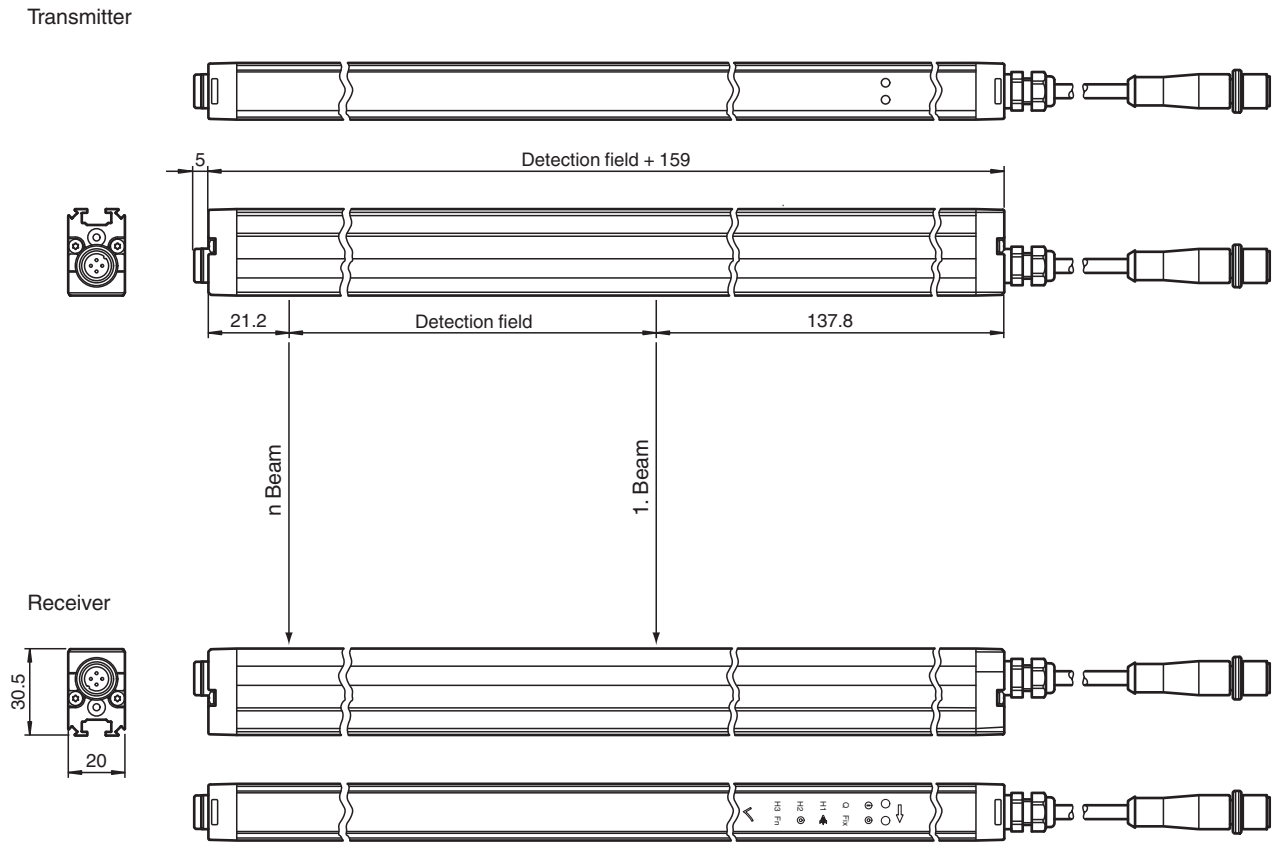
Function

The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications	
Effective detection range	Standard : 0.3 ... 6 m Option /35: 0.5 ... 8 m
Threshold detection range	Standard : 7.5 m Option /35: 10 m
Light source	IRED
Light type	modulated infrared light , 850 nm
Field height	see Table 1, max. 3200 mm
Beam crossover	Factory setting: three beam crossing, deactivateable
Beam blanking	adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing	16.67 mm
Number of beams	see Table 1, max. 193
Operating mode	Emitter: Emitter power adjustable in two ranges
Optical resolution	without beam crossover: 17 mm with beam crossover: 8.5 mm with in 25% and 75% of the range
Opening angle	10 °
Ambient light limit	> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters	
$MTTF_d$	25 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	60 %
Indicators/operating means	
Operation indicator	Power on: LED green, statically lit , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Technical Data

Function indicator		Emitter: Yellow LED, illuminates at high emitting power, off at low emitting power Receiver: Yellow LED: illuminates when an object is detected flashes when falling short of the operating reserve (4 Hz) Error message: Yellow LED flashes (8 Hz) in emitter and receiver
Control elements		Receiver: 2 touch buttons for programming
Parameterization indicator		IO link communication: green LED goes out briefly (1 Hz)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 3 s
Interface		
Interface type		IO-Link
Protocol		IO-Link V1.0
Mode		COM2 (38.4 kBit/s)
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m (or 2 m in case of option /35) with +UB or 0 V on pin 2 (emitter) Teach-In input for programming on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Switching output (detection field C/Q) 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected on pin 4 (receiver), Height monitoring (H1, H2. H3) 3 push-pull (4 in 1) outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver)
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 129 Hz
Response time		see Table 1, max. 16 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		Standard : -10 ... 60 °C (14 ... 140 °F) Option /146: -30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3360 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized

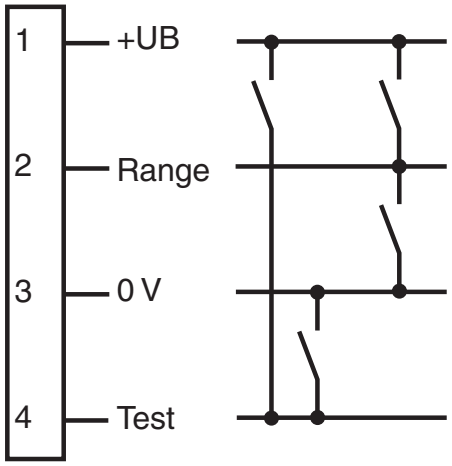
Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Technical Data

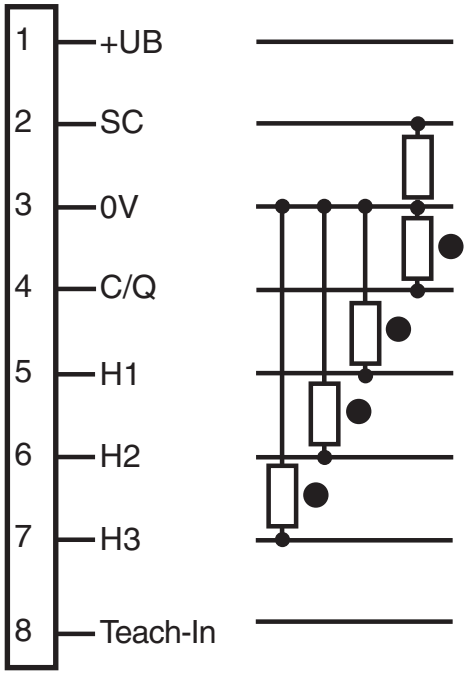
Optical face	Plastic pane , Polycarbonate
Mass	see Table 1, max. 1750 g (per profile)
Cable length	max. 30 m

Connection Assignment

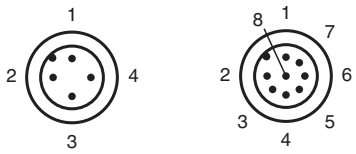
Transmitter



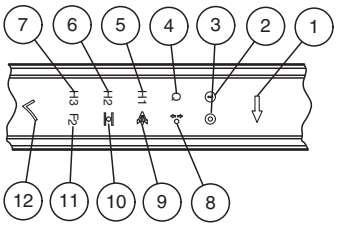
Receiver



Connection Assignment



Assembly



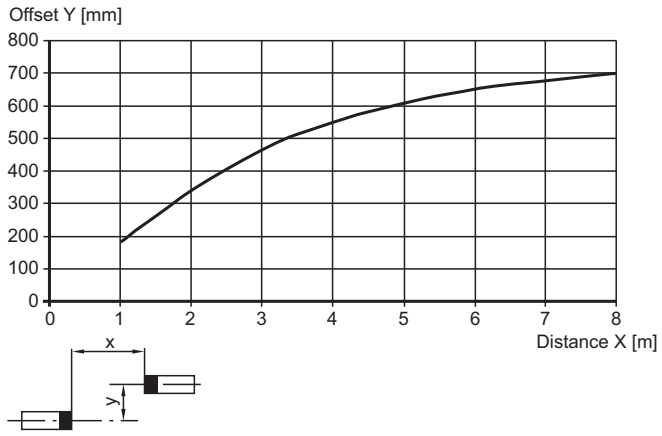
1	Menu button	yellow	7	Height checking 3	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	Height checking 1	yellow	11	2nd level	yellow
6	Height checking 2	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command is initiated by the entry or existence of a body/object in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system also has 3 switch outputs for height checking.

The system is programmed using the integrated touch field or the IO-Link interface.

Accessories

	**OMH-SLCT-06**	Swivel Bracket
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Accessories

	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**PACTware 4.1**	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs
	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] without object parameterization		Switch-on delay Q [ms] with object parameterization, HQn outputs		Max. switching frequency [Hz]	Max. time delay before availability t_V [s]
	typ.	max.	typ.	max.		
100	3	4	5	7	129	0.8
200	3	5	5	7	118	0.9
300	3	5	6	8	109	1.0
400	3	5	6	9	101	1.0
500	3	6	6	10	94	1.1
600	3	6	7	10	88	1.2
700	4	7	7	11	82	1.3
800	4	7	7	12	78	1.3
900	4	7	8	13	73	1.4
1000	4	8	8	13	70	1.5
1100	4	8	9	14	66	1.5
1200	5	8	9	15	63	1.6
1300	5	9	9	16	60	1.7
1400	5	9	10	16	58	1.8
1500	5	10	10	17	56	1.8
1600	5	10	10	18	53	1.9
1700	6	10	11	19	51	2.0
1800	6	11	11	19	49	2.0
1900	6	11	12	20	48	2.1
2000	6	11	12	21	46	2.2
2100	6	12	12	22	45	2.3
2200	6	12	13	22	43	2.3
2300	7	13	13	23	42	2.4
2400	7	13	13	24	41	2.5
2500	7	13	14	25	40	2.5
2600	7	14	14	25	38	2.6
2700	7	14	15	26	37	2.7
2800	8	14	15	27	36	2.8
2900	8	15	15	27	35	2.8
3000	8	15	16	28	35	2.9
3100	8	16	16	29	34	3.0
3200	8	16	16	30	33	3.0

Number of beams, housing length and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
100	7	260	200
200	13	360	250

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
300	19	460	300
400	25	560	350
500	31	660	400
600	37	760	450
700	43	860	500
800	49	960	550
900	55	1060	600
1000	61	1160	650
1100	67	1260	700
1200	73	1360	750
1300	79	1460	800
1400	85	1560	850
1500	91	1660	900
1600	97	1760	950
1700	103	1860	1000
1800	109	1960	1050
1900	115	2060	1100
2000	121	2160	1150
2100	127	2260	1200
2200	133	2360	1250
2300	139	2460	1300
2400	145	2560	1350
2500	151	2660	1400
2600	157	2760	1450
2700	163	2860	1500
2800	169	2960	1550
2900	175	3060	1600
3000	181	3160	1650
3100	187	3260	1700
3200	193	3360	1750

Design and function

Safety information

The device must only be operated with Safety Extra Low Voltage (SELV) with safe electrical disconnection. Intervention and repairs must only be carried out by your suppliers.
The system must be serviced and checked regularly.
A clean, soft cloth can be used for cleaning. Aggressive, abrasive cleaning agents that damage the surface must be avoided. The device must not be subjected to hard knocks or vibration.

Commissioning

Prerequisites

- The transmitter and receiver must be installed and aligned correctly.
- The electrical connection must be established according to the connection diagram.
- The signal output must respond to object detection.
- If at least one light beam is interrupted, the output remains active as long as the object is detected.

Fault location

- Measure operating voltage

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf

- Check the cabling.
- Check the transmitter and receiver for dirt and clean if necessary.

Function displays

Behind the optics cover on the connection side of the profiles there is a green Power ON operating indicator LED and a yellow status display LED.

Transmitter

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark and yellow status indicator flashes	Power save mode
Yellow status indicator LED is dark	Transmitter with low transmitting power
Yellow status indicator LED lights up statically	Transmitter with high transmitting power
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition
Yellow status indicator LED light changes for short time	Test input is activated

Receiver

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark	Power save mode
Green operating indicator LED flashes with brief interruption	IO-Link mode active, parameterisation only possible via IO-Link
Green operating indicator LED flashes (4 Hz)	Error condition: Short circuit at the outputs
Yellow status indicator LED lights up statically	Detection field interrupted
Yellow status indicator LED is dark	Detection field is enabled.
Yellow status indicator LED flashes (approx. 4 Hz)	Insufficient function reserve
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition: Incorrect signal measurement

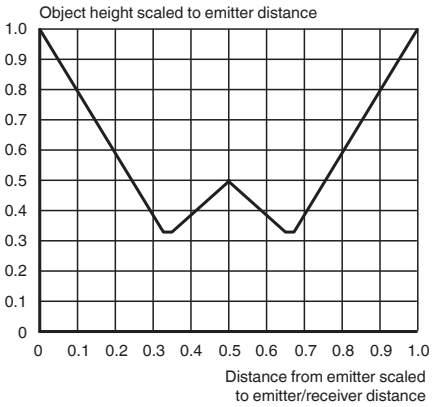
Resolution and beam clearance

The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

The devices are delivered without programmed height checking. The beam is crossed three times.

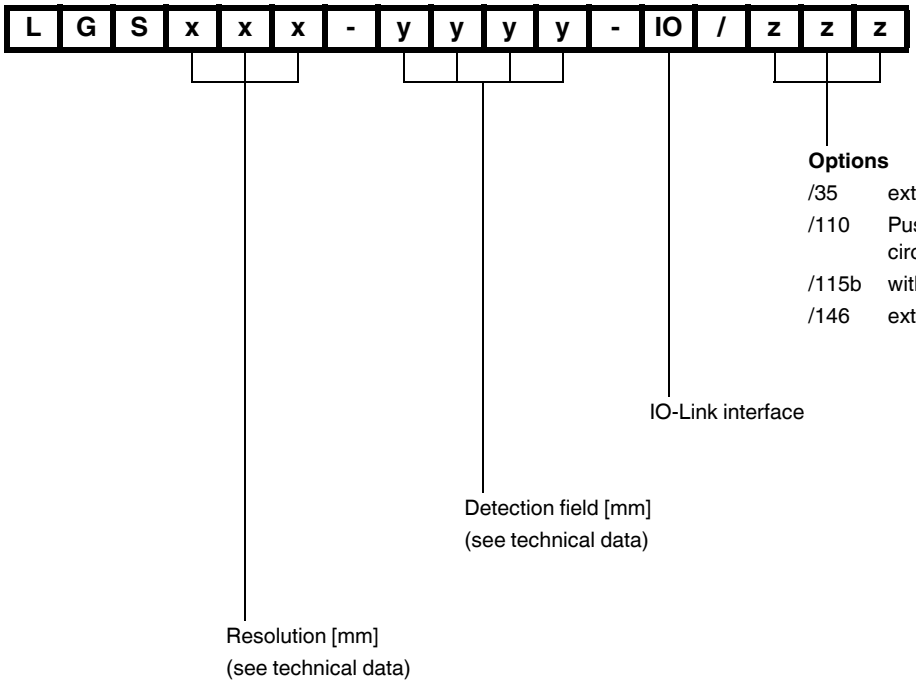
Resolution of the crossed beam arrangement

If three-way crossing of the beams is programmed, the resolution increases. For a three-way crossing, this means that the increased resolution is offered after 25 % of the transmitter range or receiver range. It must therefore be ensured that all objects pass transmitters or receivers with this clearance.



Type Code

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232505_eng.pdf


L G S x x x - y y y y - IO / z z z
Options
/35 extended detection range 8 m
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
/146 extended temperature range -30 °C
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGS25

- Automation light grid
- Optical resolution 25 mm
- Super-fast object detection, even with 3-way beam crossover
- Software-free adjustment of height monitoring
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Optional temperature range to -30 °C

Automation light grid with beam spacing of 25 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

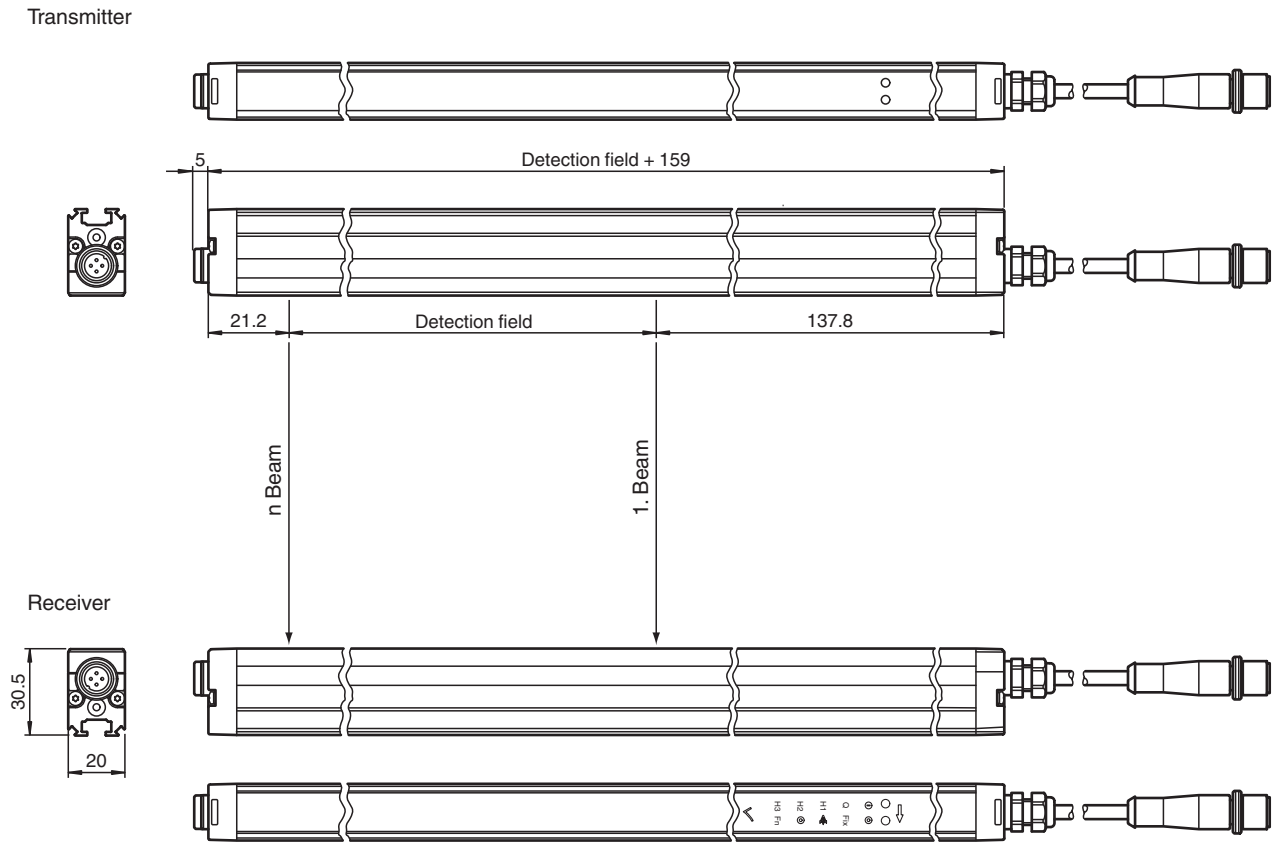
Function

The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications		
Effective detection range		Standard : 0.3 ... 6 m Option /35: 0.5 ... 8 m
Threshold detection range		Standard : 7.5 m Option /35: 10 m
Light source		IRED
Light type		modulated infrared light , 850 nm
Field height		see Table 1, max. 3200 mm
Beam crossover		Factory setting: three beam crossing, deactivateable
Beam blanking		adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing		25 mm
Number of beams		see Table 1, max. 129
Operating mode		Emitter: Emitter power adjustable in two ranges
Optical resolution		without beam crossover: 25 mm with beam crossover: 12.5 mm with in 25% and 75% of the range
Opening angle		10 °
Ambient light limit		> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters		
$MTTF_d$		34 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		
Operation indicator		Power on: LED green, statically lit , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Technical Data

Function indicator		Emitter: Yellow LED, illuminates at high emitting power, off at low emitting power Receiver: Yellow LED: illuminates when an object is detected flashes when falling short of the operating reserve (4 Hz) Error message: Yellow LED flashes (8 Hz) in emitter and receiver
Control elements		Receiver: 2 touch buttons for programming
Parameterization indicator		IO link communication: green LED goes out briefly (1 Hz)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 2.3 s
Interface		
Interface type		IO-Link
Protocol		IO-Link V1.0
Mode		COM2 (38.4 kBit/s)
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m (or 2 m in case of option /35) with +UB or 0 V on pin 2 (emitter) Teach-In input for programming on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Switching output (detection field C/Q) 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected on pin 4 (receiver), Height monitoring (H1, H2. H3) 3 push-pull (4 in 1) outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver)
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 135 Hz
Response time		see Table 1, max. 12 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		Standard : -10 ... 60 °C (14 ... 140 °F) Option /146: -30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3360 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized

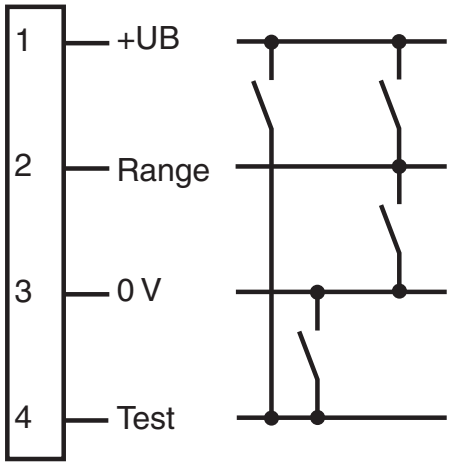
Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Technical Data

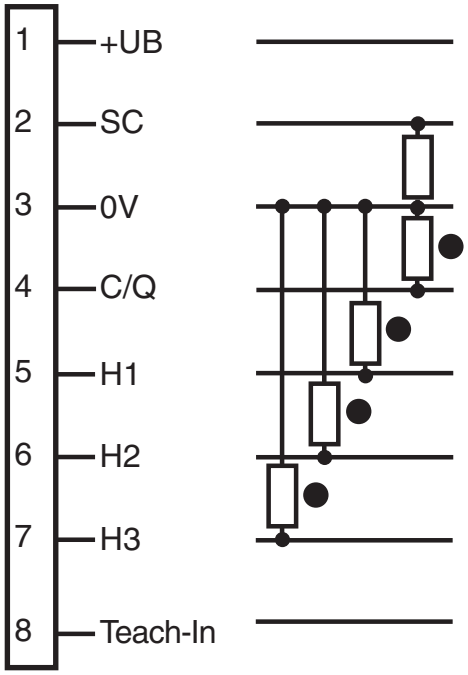
Optical face	Plastic pane , Polycarbonate
Mass	see Table 1, max. 1750 g (per profile)
Cable length	max. 30 m

Connection Assignment

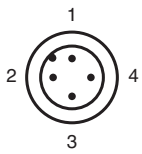
Transmitter

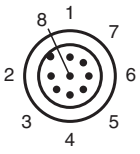


Receiver

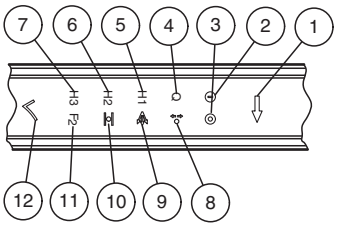


Connection Assignment





Assembly



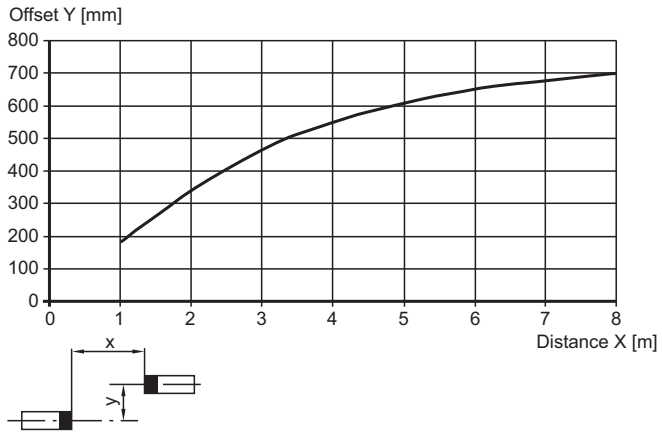
1	Menu button	yellow	7	Height checking 3	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	Height checking 1	yellow	11	2nd level	yellow
6	Height checking 2	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command is initiated by the entry or existence of a body/object in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system also has 3 switch outputs for height checking.

The system is programmed using the integrated touch field or the IO-Link interface.

Accessories

	**OMH-SLCT-06**	Swivel Bracket
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Accessories

	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	PACTware 4.1	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs
	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] without object parameterization		Switch-on delay Q [ms] with object parameterization, HQn outputs		Max. switching frequency [Hz]	Max. time delay before availability t_v [s]
	typ.	max.	typ.	max.		
100	2	4	5	6	134	0.8
200	3	5	5	7	125	0.9
300	3	5	5	7	118	0.9
400	3	5	5	8	112	0.9
500	3	5	6	8	106	1.0
600	3	5	6	9	101	1.0
700	3	6	6	9	96	1.
800	3	6	6	10	92	1.1
900	3	6	7	10	88	1.2
1000	4	6	7	11	84	1.2
1100	4	7	7	11	81	1.3
1200	4	7	7	12	78	1.3
1300	4	7	8	12	75	1.4
1400	4	7	8	13	72	1.4
1500	4	8	8	13	70	1.5
1600	4	8	8	14	67	1.5
1700	4	8	9	14	65	1.6
1800	5	8	9	15	63	1.6
1900	5	9	9	15	61	1.7
2000	5	9	9	16	60	1.7
2100	5	9	10	16	58	1.8
2200	5	9	10	17	56	1.8
2300	5	10	10	17	55	1.9
2400	5	10	10	18	53	1.9
2500	5	10	11	18	52	1.9
2600	6	10	11	19	51	2.0
2700	6	11	11	19	49	2.0
2800	6	11	11	20	48	2.1
2900	6	11	12	20	47	2.1
3000	6	11	12	21	46	2.2
3100	6	12	12	21	45	2.2
3200	6	12	12	22	44	2.3

Number of beams, housing length and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
100	5	260	200
200	9	360	250

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
300	13	460	300
400	17	560	350
500	21	660	400
600	25	760	450
700	29	860	500
800	33	960	550
900	37	1060	600
1000	41	1160	650
1100	45	1260	700
1200	49	1360	750
1300	53	1460	800
1400	57	1560	850
1500	61	1660	900
1600	65	1760	950
1700	69	1860	1000
1800	73	1960	1050
1900	77	2060	1100
2000	81	2160	1150
2100	85	2260	1200
2200	89	2360	1250
2300	93	2460	1300
2400	97	2560	1350
2500	101	2660	1400
2600	105	2760	1450
2700	109	2860	1500
2800	113	2960	1550
2900	117	3060	1600
3000	121	3160	1650
3100	125	3260	1700
3200	129	3360	1750

Design and function

Safety information

The device must only be operated with Safety Extra Low Voltage (SELV) with safe electrical disconnection. Intervention and repairs must only be carried out by your suppliers.
The system must be serviced and checked regularly.
A clean, soft cloth can be used for cleaning. Aggressive, abrasive cleaning agents that damage the surface must be avoided. The device must not be subjected to hard knocks or vibration.

Commissioning

Prerequisites

- The transmitter and receiver must be installed and aligned correctly.
- The electrical connection must be established according to the connection diagram.
- The signal output must respond to object detection.
- If at least one light beam is interrupted, the output remains active as long as the object is detected.

Fault location

- Measure operating voltage

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf

- Check the cabling.
- Check the transmitter and receiver for dirt and clean if necessary.

Function displays

Behind the optics cover on the connection side of the profiles there is a green Power ON operating indicator LED and a yellow status display LED.

Transmitter

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark and yellow status indicator flashes	Power save mode
Yellow status indicator LED is dark	Transmitter with low transmitting power
Yellow status indicator LED lights up statically	Transmitter with high transmitting power
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition
Yellow status indicator LED light changes for short time	Test input is activated

Receiver

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark	Power save mode
Green operating indicator LED flashes with brief interruption	IO-Link mode active, parameterisation only possible via IO-Link
Green operating indicator LED flashes (4 Hz)	Error condition: Short circuit at the outputs
Yellow status indicator LED lights up statically	Detection field interrupted
Yellow status indicator LED is dark	Detection field is enabled.
Yellow status indicator LED flashes (approx. 4 Hz)	Insufficient function reserve
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition: Incorrect signal measurement

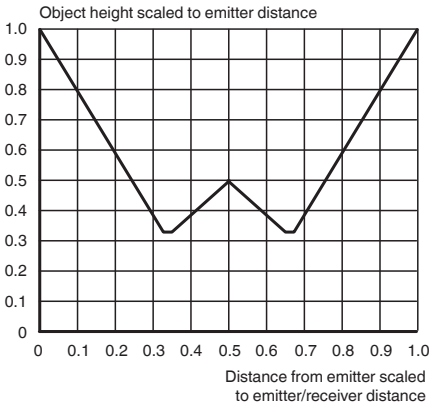
Resolution and beam clearance

The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

The devices are delivered without programmed height checking. The beam is crossed three times.

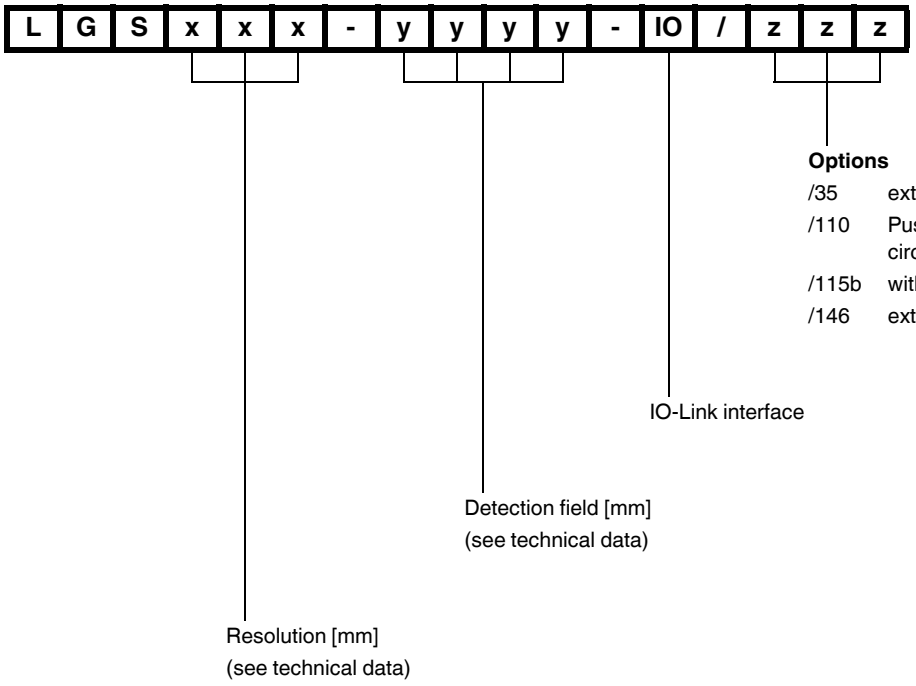
Resolution of the crossed beam arrangement

If three-way crossing of the beams is programmed, the resolution increases. For a three-way crossing, this means that the increased resolution is offered after 25 % of the transmitter range or receiver range. It must therefore be ensured that all objects pass transmitters or receivers with this clearance.



Type Code

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232506_eng.pdf


L G S x x x - y y y y - IO / z z z
Options
/35 extended detection range 8 m
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
/146 extended temperature range -30 °C
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGS50

- Automation light grid
- Optical resolution 50 mm
- Super-fast object detection, even with 3-way beam crossover
- Software-free adjustment of height monitoring
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Optional temperature range to -30 °C

Automation light grid with beam spacing of 50 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

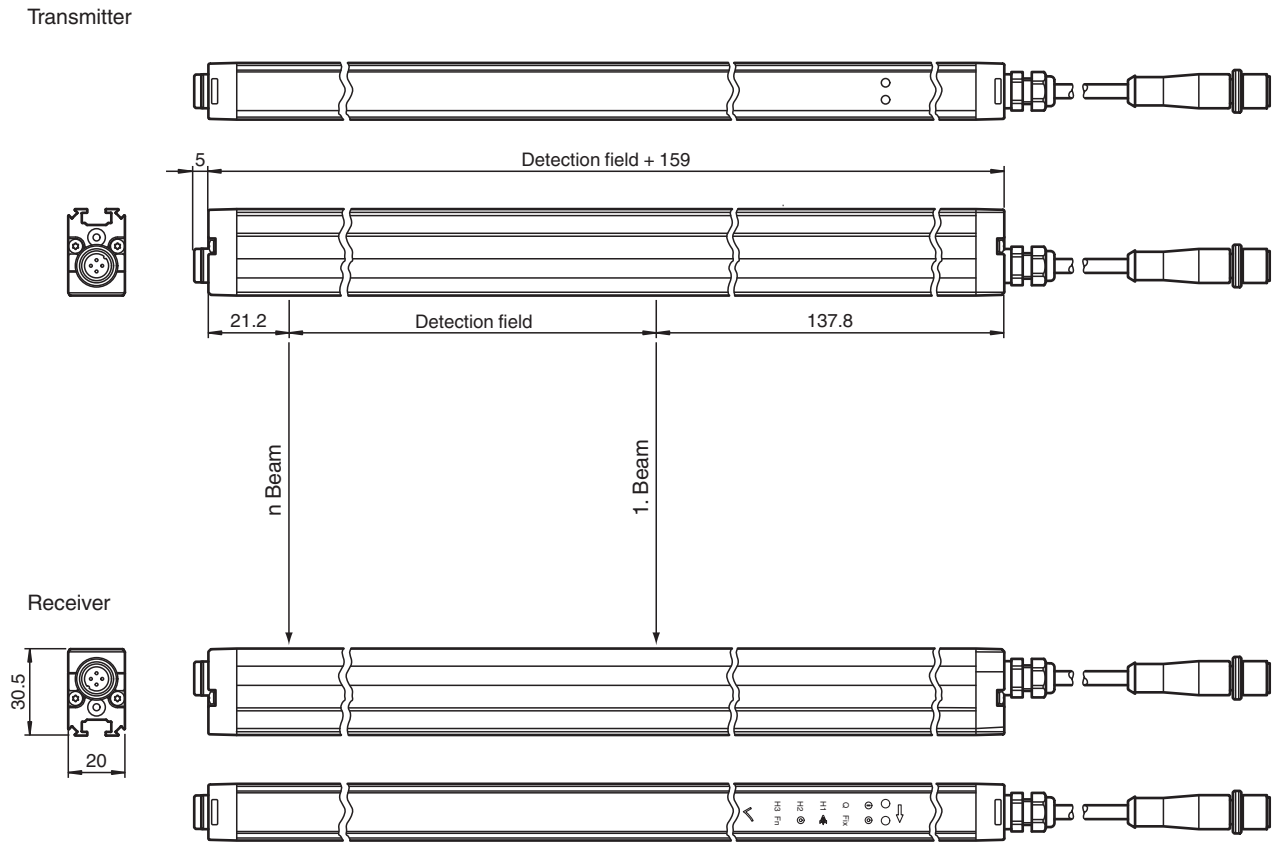
Function

The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications	
Effective detection range	Standard : 0.3 ... 6 m Option /35: 0.5 ... 8 m
Threshold detection range	Standard : 7.5 m Option /35: 10 m
Light source	IRED
Light type	modulated infrared light , 850 nm
Field height	see Table 1, max. 3000 mm
Beam crossover	Factory setting: three beam crossing, deactivateable
Beam blanking	adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing	50 mm
Number of beams	see Table 1, max. 61
Operating mode	Emitter: Emitter power adjustable in two ranges
Optical resolution	without beam crossover: 50 mm with beam crossover: 25 mm with in 25% and 75% of the range
Opening angle	10 °
Ambient light limit	> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters	
$MTTF_d$	56 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	60 %
Indicators/operating means	
Operation indicator	Power on: LED green, statically lit , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Technical Data

Function indicator		Emitter: Yellow LED, illuminates at high emitting power, off at low emitting power Receiver: Yellow LED: illuminates when an object is detected flashes when falling short of the operating reserve (4 Hz) Error message: Yellow LED flashes (8 Hz) in emitter and receiver
Control elements		Receiver: 2 touch buttons for programming
Parameterization indicator		IO link communication: green LED goes out briefly (1 Hz)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 1.5 s
Interface		
Interface type		IO-Link
Protocol		IO-Link V1.0
Mode		COM2 (38.4 kBit/s)
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m (or 2 m in case of option /35) with +UB or 0 V on pin 2 (emitter) Teach-In input for programming on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Switching output (detection field C/Q) 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected on pin 4 (receiver), Height monitoring (H1, H2. H3) 3 push-pull (4 in 1) outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver)
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 129 Hz
Response time		see Table 1, max. 8 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		Standard : -10 ... 60 °C (14 ... 140 °F) Option /146: -30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3160 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized

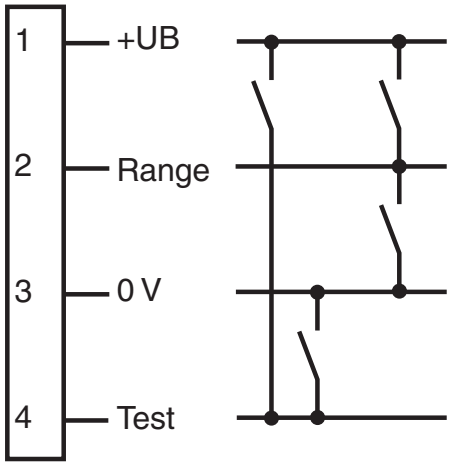
Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Technical Data

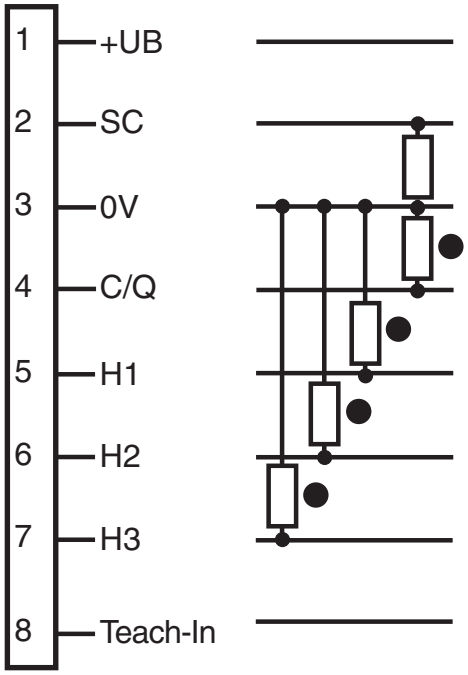
Optical face	Plastic pane , Polycarbonate
Mass	see Table 1, max. 1650 g (per profile)
Cable length	max. 30 m

Connection Assignment

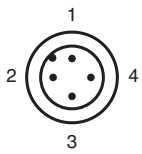
Transmitter

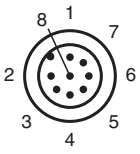


Receiver

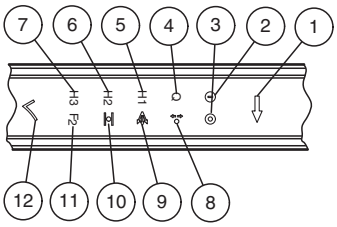


Connection Assignment





Assembly



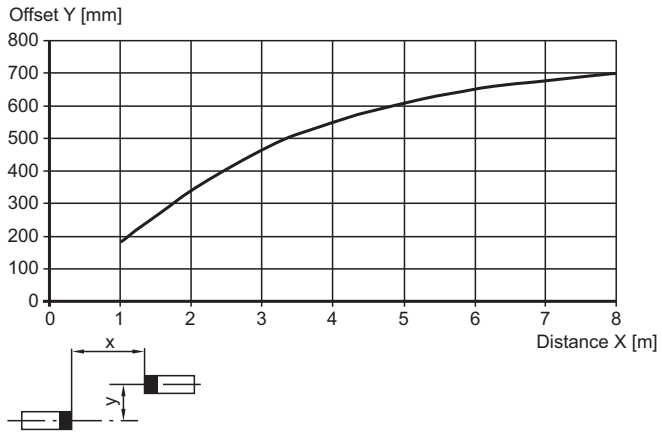
1	Menu button	yellow	7	Height checking 3	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	Height checking 1	yellow	11	2nd level	yellow
6	Height checking 2	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command is initiated by the entry or existence of a body/object in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system also has 3 switch outputs for height checking.

The system is programmed using the integrated touch field or the IO-Link interface.

Accessories

	**OMH-SLCT-06**	Swivel Bracket
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Accessories

	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	PACTware 4.1	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs
	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] without object parameterization		Switch-on delay Q [ms] with object parameterization, HQn outputs		Max. switching frequency [Hz]	Max. time delay before availability t_v [s]
	typ.	max.	typ.	max.		
300	3	4	5	7	129	0.8
600	3	5	5	7	118	0.9
900	3	5	6	8	109	1.0
1200	3	5	6	9	101	1.0
1500	3	6	6	10	94	1.1
1800	3	6	7	10	88	1.2
2100	4	7	7	11	82	1.3
2400	4	7	7	12	78	1.3
2700	4	7	8	13	73	1.4
3000	4	8	8	13	70	1.5

Number of beams, housing length and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
300	7	460	300
600	13	760	450
900	19	1060	600
1200	25	1360	750
1500	31	1660	900
1800	37	1960	1050
2100	43	2260	1200
2400	49	2560	1350
2700	55	2860	1500
3000	61	3160	1650

Design and function

Safety information

The device must only be operated with Safety Extra Low Voltage (SELV) with safe electrical disconnection. Intervention and repairs must only be carried out by your suppliers.
The system must be serviced and checked regularly.
A clean, soft cloth can be used for cleaning. Aggressive, abrasive cleaning agents that damage the surface must be avoided. The device must not be subjected to hard knocks or vibration.

Commissioning

Prerequisites

- The transmitter and receiver must be installed and aligned correctly.
- The electrical connection must be established according to the connection diagram.
- The signal output must respond to object detection.
- If at least one light beam is interrupted, the output remains active as long as the object is detected.

Fault location

- Measure operating voltage
- Check the cabling.
- Check the transmitter and receiver for dirt and clean if necessary.

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf

Function displays

Behind the optics cover on the connection side of the profiles there is a green Power ON operating indicator LED and a yellow status display LED.

Transmitter

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark and yellow status indicator flashes	Power save mode
Yellow status indicator LED is dark	Transmitter with low transmitting power
Yellow status indicator LED lights up statically	Transmitter with high transmitting power
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition
Yellow status indicator LED light changes for short time	Test input is activated

Receiver

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark	Power save mode
Green operating indicator LED flashes with brief interruption	IO-Link mode active, parameterisation only possible via IO-Link
Green operating indicator LED flashes (4 Hz)	Error condition: Short circuit at the outputs
Yellow status indicator LED lights up statically	Detection field interrupted
Yellow status indicator LED is dark	Detection field is enabled.
Yellow status indicator LED flashes (approx. 4 Hz)	Insufficient function reserve
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition: Incorrect signal measurement

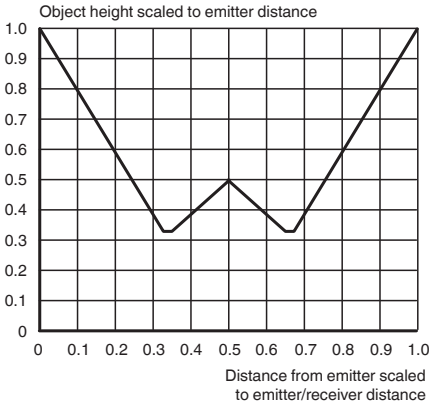
Resolution and beam clearance

The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

The devices are delivered without programmed height checking. The beam is crossed three times.

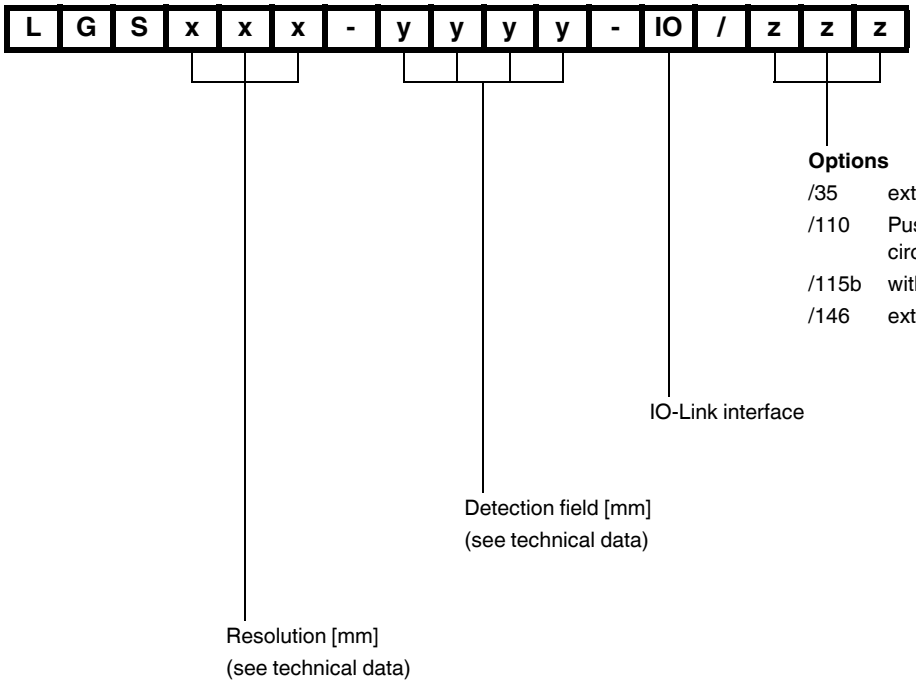
Resolution of the crossed beam arrangement

If three-way crossing of the beams is programmed, the resolution increases. For a three-way crossing, this means that the increased resolution is offered after 25 % of the transmitter range or receiver range. It must therefore be ensured that all objects pass transmitters or receivers with this clearance.



Type Code

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232507_eng.pdf


L G S x x x - y y y y - IO / z z z
Options
/35 extended detection range 8 m
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
/146 extended temperature range -30 °C
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGS100

- Automation light grid
- Optical resolution 100 mm
- Super-fast object detection, even with 3-way beam crossover
- Software-free adjustment of height monitoring
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Optional temperature range to -30 °C

Automation light grid with beam spacing of 100 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

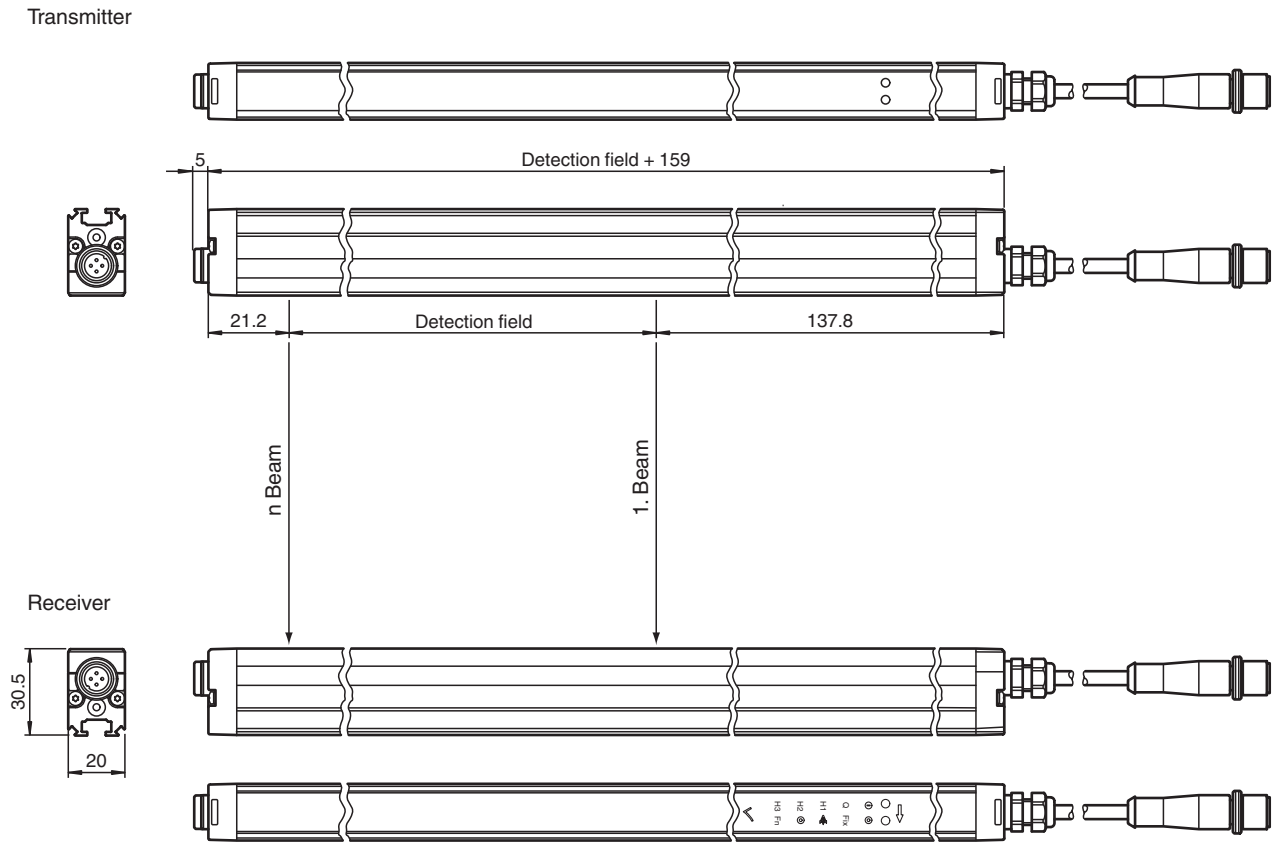
Function

The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications	
Effective detection range	Standard : 0.3 ... 6 m Option /35: 0.5 ... 8 m When beam crossover is activated, the detection range starts at 0.6 m
Threshold detection range	Standard : 7.5 m Option /35: 10 m
Light source	IRED
Light type	modulated infrared light , 850 nm
Field height	see Table 1, max. 3000 mm
Beam crossover	Factory setting: three beam crossing, deactivateable
Beam blanking	adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing	100 mm
Number of beams	see Table 1, max. 31
Operating mode	Emitter: Emitter power adjustable in two ranges
Optical resolution	without beam crossover: 100 mm with beam crossover: 50 mm with in 25% and 75% of the range
Opening angle	10 °
Ambient light limit	> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters	
$MTTF_d$	78 a
Mission Time (T_M)	20 a
Diagnostic Coverage (DC)	60 %
Indicators/operating means	

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Technical Data

Operation indicator		Power on: LED green, statically lit , Undervoltage indicator: Green LED, pulsing (approx. 0.8 Hz) , short-circuit : LED green flashing (approx. 4 Hz)
Function indicator		Emitter: Yellow LED, illuminates at high emitting power, off at low emitting power Receiver: Yellow LED: illuminates when an object is detected flashes when falling short of the operating reserve (4 Hz) Error message: Yellow LED flashes (8 Hz) in emitter and receiver
Control elements		Receiver: 2 touch buttons for programming
Parameterization indicator		IO link communication: green LED goes out briefly (1 Hz)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 1.1 s
Interface		
Interface type		IO-Link
Protocol		IO-Link V1.0
Mode		COM2 (38.4 kBit/s)
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m (or 2 m in case of option /35) with +UB or 0 V on pin 2 (emitter) Teach-In input for programming on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Switching output (detection field C/Q) 1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected on pin 4 (receiver), Height monitoring (H1, H2. H3) 3 push-pull (4 in 1) outputs, short-circuit proof, reverse polarity protected on pin 5, pin 6, pin 7 (receiver)
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 135 Hz
Response time		see Table 1, max. 6 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		Standard : -10 ... 60 °C (14 ... 140 °F) Option /146: -30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		
Conductor cross section		min. 0.25 mm^2
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3160 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length

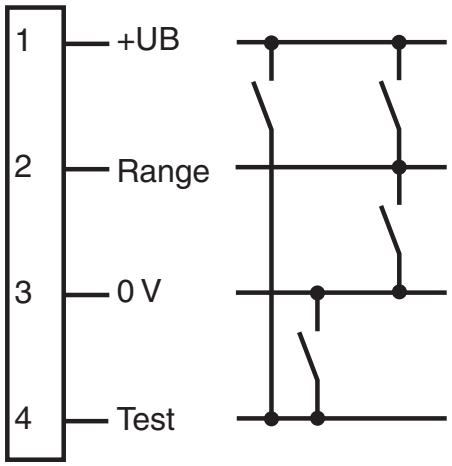
Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Technical Data

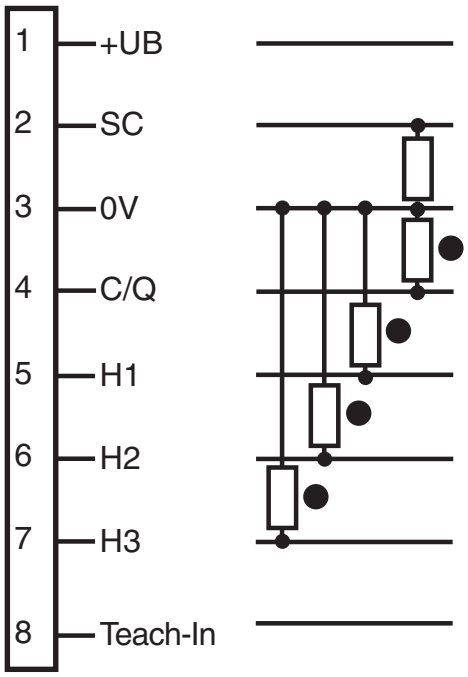
Material		
Housing		extruded aluminum section , Silver anodized
Optical face		Plastic pane , Polycarbonate
Mass		see Table 1, max. 1650 g (per profile)
Cable length		max. 30 m

Connection Assignment

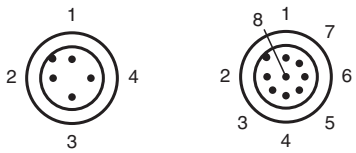
Transmitter



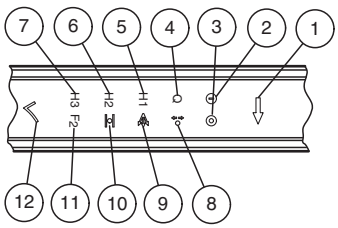
Receiver



Connection Assignment



Assembly



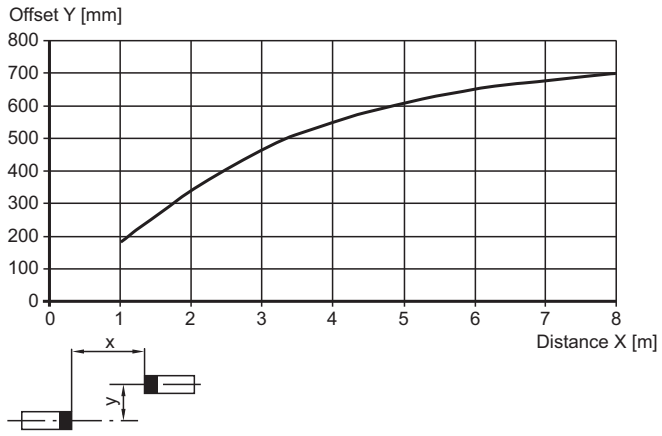
1	Menu button	yellow	7	Height checking 3	yellow
2	Operating indicator	green	8	Object floating	yellow
3	Status display	yellow	9	Crossing	yellow
4	Q object	yellow	10	Peripheral beam tolerance	yellow
5	Height checking 1	yellow	11	2nd level	yellow
6	Height checking 2	yellow	12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command is initiated by the entry or existence of a body/object in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system also has 3 switch outputs for height checking.

The system is programmed using the integrated touch field or the IO-Link interface.

Accessories

	**OMH-SLCT-06**	Swivel Bracket
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Accessories

	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**PACTware 4.1**	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs
	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] without object parameterization		Switch-on delay Q [ms] with object parameterization, HQn outputs		Max. switching frequency [Hz]	Max. time delay before availability tv [s]
	typ.	max.	typ.	max.		
300	2	4	5	6	136	0.8
600	3	4	5	7	129	0.8
900	3	5	5	7	123	0.9
1200	3	5	5	7	118	0.9
1500	3	5	5	8	113	0.9
1800	3	5	6	8	109	1.0
2100	3	5	6	9	104	1,0
2400	3	5	6	9	101	1.0
2700	3	6	6	9	97	1.1
3000	3	6	6	10	94	1.1

Number of beams, housing length and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of the transmitter/receiver unit [g]
300	4	460	300
600	7	760	450
900	10	1060	600
1200	13	1360	750
1500	16	1660	900
1800	19	1960	1050
2100	22	2260	1200
2400	25	2560	1350
2700	28	2860	1500
3000	31	3160	1650

Design and function

Safety information

The device must only be operated with Safety Extra Low Voltage (SELV) with safe electrical disconnection. Intervention and repairs must only be carried out by your suppliers.
The system must be serviced and checked regularly.
A clean, soft cloth can be used for cleaning. Aggressive, abrasive cleaning agents that damage the surface must be avoided. The device must not be subjected to hard knocks or vibration.

Commissioning

Prerequisites

- The transmitter and receiver must be installed and aligned correctly.
- The electrical connection must be established according to the connection diagram.
- The signal output must respond to object detection.
- If at least one light beam is interrupted, the output remains active as long as the object is detected.

Fault location

- Measure operating voltage
- Check the cabling.
- Check the transmitter and receiver for dirt and clean if necessary.

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf

Function displays

Behind the optics cover on the connection side of the profiles there is a green Power ON operating indicator LED and a yellow status display LED.

Transmitter

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark and yellow status indicator flashes	Power save mode
Yellow status indicator LED is dark	Transmitter with low transmitting power
Yellow status indicator LED lights up statically	Transmitter with high transmitting power
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition
Yellow status indicator LED light changes for short time	Test input is activated

Receiver

Function	Diagnostic description
Green operating indicator LED lights up statically	Power on
Green operating indicator LED is dark	Power save mode
Green operating indicator LED flashes with brief interruption	IO-Link mode active, parameterisation only possible via IO-Link
Green operating indicator LED flashes (4 Hz)	Error condition: Short circuit at the outputs
Yellow status indicator LED lights up statically	Detection field interrupted
Yellow status indicator LED is dark	Detection field is enabled.
Yellow status indicator LED flashes (approx. 4 Hz)	Insufficient function reserve
Yellow status indicator LED flashes quickly (approx. 8 Hz)	Error condition: Incorrect signal measurement

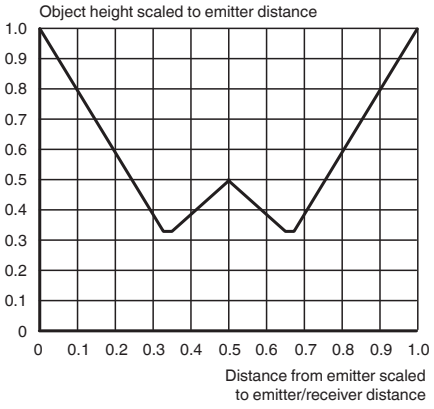
Resolution and beam clearance

The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

The devices are delivered without programmed height checking. The beam is crossed three times.

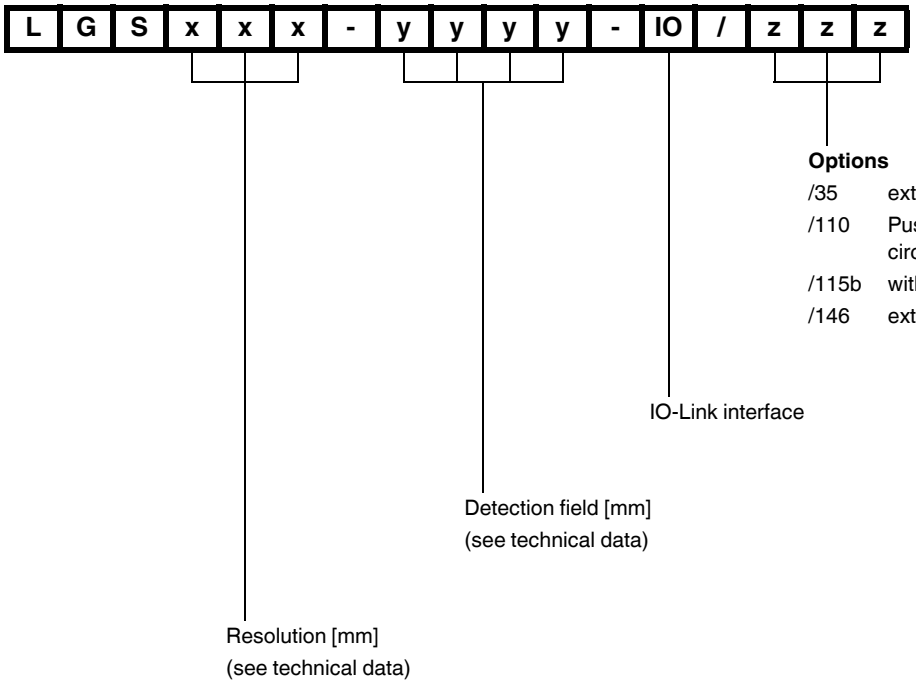
Resolution of the crossed beam arrangement

If three-way crossing of the beams is programmed, the resolution increases. For a three-way crossing, this means that the increased resolution is offered after 25 % of the transmitter range or receiver range. It must therefore be ensured that all objects pass transmitters or receivers with this clearance.



Type Code

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 232508_eng.pdf


L G S x x x - y y y y - IO / z z z
Options
/35 extended detection range 8 m
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
/146 extended temperature range -30 °C
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGM8

- Measuring automation light grid with switching output
- Optical resolution 8 mm
- Super-fast object detection, even with 3-way beam crossover
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Temperature range to -30 °C
- Output of a measured value, can be selected from a number of measuring functions

Measuring automation light grid with beam spacing of 8 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

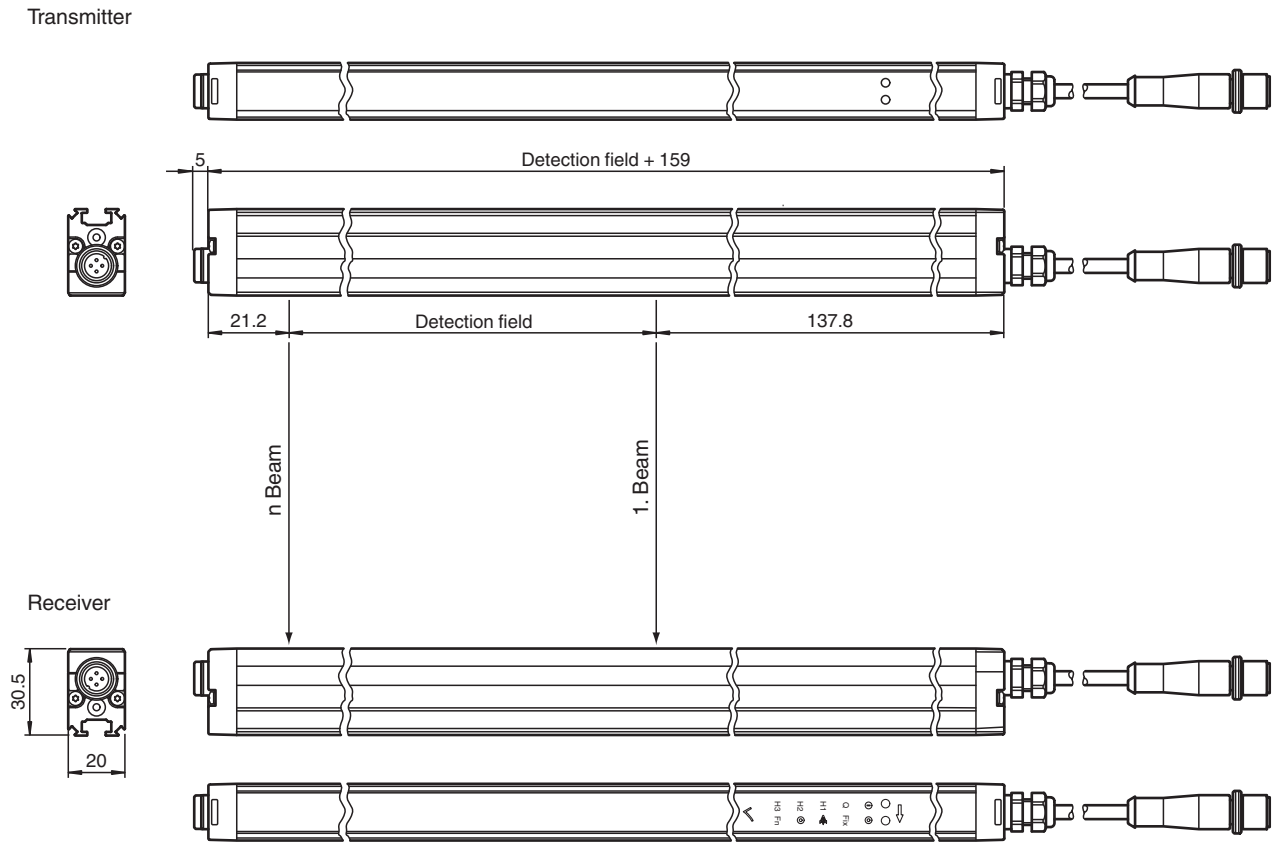
Function

Automation light grids in the LGM Series are designed to measure small to large objects. The slimline light grids are modular in design and are available with various beam gaps and field heights. The entire signal evaluation process is carried out within the device. The lightweight systems can be integrated elegantly into their surroundings, from both a technical and a visual perspective. As a result, machines and plants operating in temperature ranges between -30 °C ... +60 °C can be designed to more compact dimensions.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications		
Effective detection range		Standard : 0.3 ... 6 m
Threshold detection range		7.5 m
Light source		IRED
Light type		modulated infrared light , 850 nm
Field height		see Table 1, max. 2100 mm
Beam crossover		Factory setting: three beam crossing, deactivateable
Beam blanking		adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing		8.33 mm
Number of beams		see Table 1, max. 253
Operating mode		Emitter: Emitter power adjustable in two ranges
Optical resolution		without beam crossover: 8 mm with beam crossover: 4 mm with in 25% and 75% of the range
Opening angle		10 °
Ambient light limit		> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters		
$MTTF_d$		21 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

Technical Data

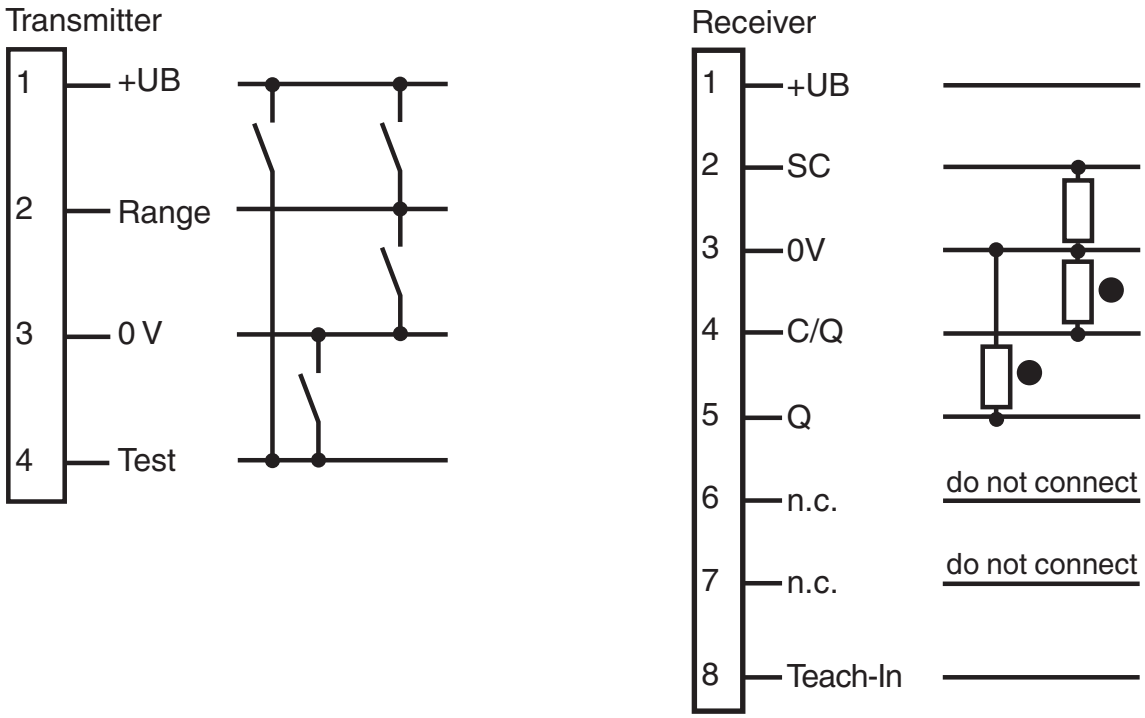
Operation indicator		LED green: constantly on - power-on double pulse flashing (0.8 Hz) - undervoltage flashing (4 Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Status indicator		Emitter: LED yellow constantly on - high emitter power constantly off - low emitter power flashing (8 Hz) - error message Receiver: LED yellow: constantly on - object detected constantly off - no object detected flashing (4 Hz) - below stability control limit flashing (8 Hz) - error message
Control elements		Receiver: 2 touch buttons for programming
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 3.8 s
Interface		
Interface type		IO-Link (pin 4)
IO-Link revision		1.0
Device ID		1050369 ... 1050389 (0x100701 ... 0x100715)
COM-Mode		COM2 (38.4 kBit/s)
Min. cycle time		2.3 ms
Process data width		16 bit
SIO mode support		yes
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m with +UB or 0 V on pin 2 (emitter) Teach-In input for parameterization on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Command interface: Pin 4 IO-Link interface C or used as switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) Switch output: Pin 5 switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) synchronized with pin 4
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 118 Hz
Response time		see Table 1, max. 20 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

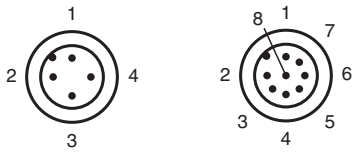
Technical Data

Conductor cross section		min. 0.25 mm²
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized
Optical face		Plastic pane , Polycarbonate
Mass		see Table 1, max. 1200 g (per profile)
Dimensions		
Width		20 mm
Depth		30.5 mm
Length		2260 mm see Table 1, max.
Cable length		max. 30 m

Connection Assignment

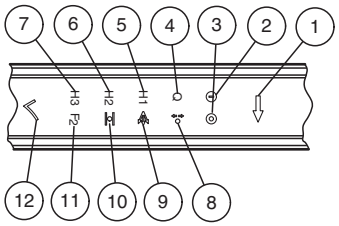


Connection Assignment



Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

Assembly



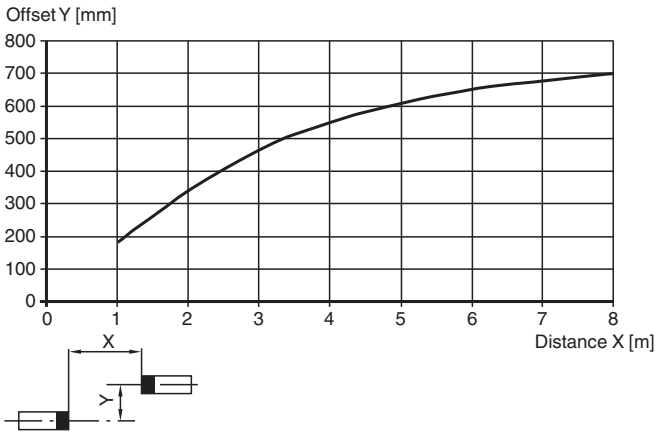
1	Menu button	yellow
2	Operating indicator	green
3	Status display	yellow
4	Q object	yellow
5	not used	yellow
6	not used	yellow

7	not used	yellow
8	Object floating	yellow
9	Crossing	yellow
10	Peripheral beam tolerance	yellow
11	2nd level	yellow
12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command and measurement of the object is triggered when an object enters or is already present in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system is programmed using the integrated touch field or the IO-Link interface.

Output of the analog measured value is included in the IO-Link protocol. Users can choose from a vast selection of integrated measurement protocols.

The most important measurement protocols are:

- Lowest position of the object
- Highest position of the object
- Height of the object
- Height of the object as the total height of all partial objects
- Height of the largest partial object
- Mid-position of the largest partial object
- Lowest position of the largest partial object
- Highest position of the largest partial object
- ...

Parameterization

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency, and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] Without object parameterization		Switch-on delay Q [ms] - With object parameterization - Updated measured value		Maximum switching frequency [Hz]	Maximum time delay before availability t_v [s]
	typ.	max.	typ.	max.		
100	3	5	5	7	118	0.9
200	3	5	6	9	101	1.0
300	3	6	7	10	88	1.2
400	4	7	7	12	78	1.3
500	4	8	8	13	70	1.5
600	5	8	9	15	63	1.6
700	5	9	10	16	58	1.8
800	5	10	10	18	53	1.9
900	6	11	11	19	49	2.0
1000	6	11	12	21	46	2.2
1100	6	12	13	22	43	2.3
1200	7	13	13	24	41	2.5
1300	7	14	14	25	38	2.6
1400	8	14	15	27	36	2.8
1500	8	15	16	28	35	2.9
1600	8	16	16	30	33	3.0
1700	9	17	17	31	31	3.2
1800	9	17	18	33	30	3.3
1900	9	18	19	34	29	3.5
2000	10	19	19	36	28	3.6
2100	10	20	20	37	27	3.8

Number of beams, housing length, and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
100	13	260	200
200	25	360	250
300	37	460	300
400	49	560	350
500	61	660	400
600	73	760	450
700	85	860	500
800	97	960	550
900	109	1060	600
1000	121	1160	650
1100	133	1260	700
1200	145	1360	750
1300	157	1460	800

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
1400	169	1560	850
1500	181	1660	900
1600	193	1760	950
1700	205	1860	1000
1800	217	1960	1050
1900	229	2060	1100
2000	241	2160	1150
2100	253	2260	1200

Design and Function

Safety information

The device must be operated only at low protective voltage where there is safe electrical isolation. Modifications and repairs must be carried out only by your supplier!

The system must be maintained and inspected on a regular basis.

A soft, clean cloth may be used to clean the system. Do not use any aggressive or abrasive cleaning agents that will corrode the surfaces. The device must not be subjected to severe impacts or vibrations.

Commissioning

Prerequisites

- The transmitter unit and receiver unit have been mounted and aligned correctly.
- The electrical connection has been established as per the information in the connection diagram.
- The signal output responds to object measurement.
- If at least one beam of light is interrupted, the output remains active for as long as the object is detected.

Troubleshooting

- Measure operating voltage
- Check cabling.
- Check transmitter and receiver unit for dirt. Clean if necessary.

Function indicators

A green LED for indicating the operating status "Power ON" and a yellow status indication LED are fitted on the connection side of the profiles, behind the lens cover.

Transmitter Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated. Yellow LED to indicate status is flashing	Energy-saving mode
Yellow LED to indicate status is not illuminated	Transmission power of transmitter is low
Yellow LED to indicate status is permanently illuminated	Transmission power of transmitter is high
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state
Yellow LED to indicate status — brief change in light emitted	Test input is activated

Receiver Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated	Energy-saving mode
Green LED to display operating status is flashing at brief intervals	IO-Link mode active. Possible to parameterize the device only via IO-Link
Green LED to display operating status is flashing (4 Hz)	Fault status: short circuit at the outputs
Yellow LED to indicate status is permanently illuminated	Detection field interrupted
Yellow LED to indicate status is not illuminated	Detection field is clear.
Yellow LED to indicate status is flashing (approx. 4 Hz)	Insufficient stability control
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state: fault during signal measurement

Resolution and Beam Gap

The optical resolution of the light grid corresponds to the size of the object that can be detected.

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

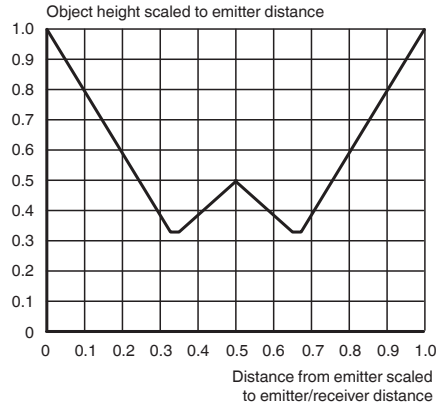
The values specified in the technical data under "Optical Resolution" apply if signal tracking for the threshold value is activated. Where the system is parameterized via the touch field menu (level 2, "Signal Tracking"), the value is automatically set to 60 %. It is not possible to set other values. To parameterize the system via IO-Link, a threshold value of at least 60 % must be entered. Signal tracking for the threshold value is deactivated by default, increasing the optical resolution by a maximum of 4 mm. By selecting 3-way crossover of the light beams, the resolution of the light grid is refined.

The switching outputs respond to any instance in which the beam is interrupted by an object. Selective object detection can also be parameterized using predefined or taught-in objects. Up to 2 beam areas can be suppressed (blanking).

The devices are supplied without object detection programmed, with signal tracking of the threshold value deactivated, and with a beam path with a 3-way crossover.

Resolution of the Crossed Beam Arrangement

If 3-way beam crossover is programmed, the resolution is refined. In the case of 3-way crossover, this means that the increased resolution is offered once 25 % of the transmitter unit range or receiver unit range has been covered. It is therefore necessary to ensure that all objects pass the transmitter or receiver with such a gap.



Type Code

L	G	M	x	x	-	y	y	y	y	-	IO	/	z	z	z

Options

/110	Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b	with 0.2 m fixed cable and M12 connector

IO-Link interface

Detection field [mm]
(see technical data)

Resolution [mm]
(see technical data)

Release date: 2024-03-13 Date of issue: 2024-03-13 Filename: 251331_eng.pdf

Light grid

LGM25

- Measuring automation light grid with switching output
- Optical resolution 25 mm
- Super-fast object detection, even with 3-way beam crossover
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Temperature range to -30 °C
- Output of a measured value, can be selected from a number of measuring functions

Measuring automation light grid with beam spacing of 25 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

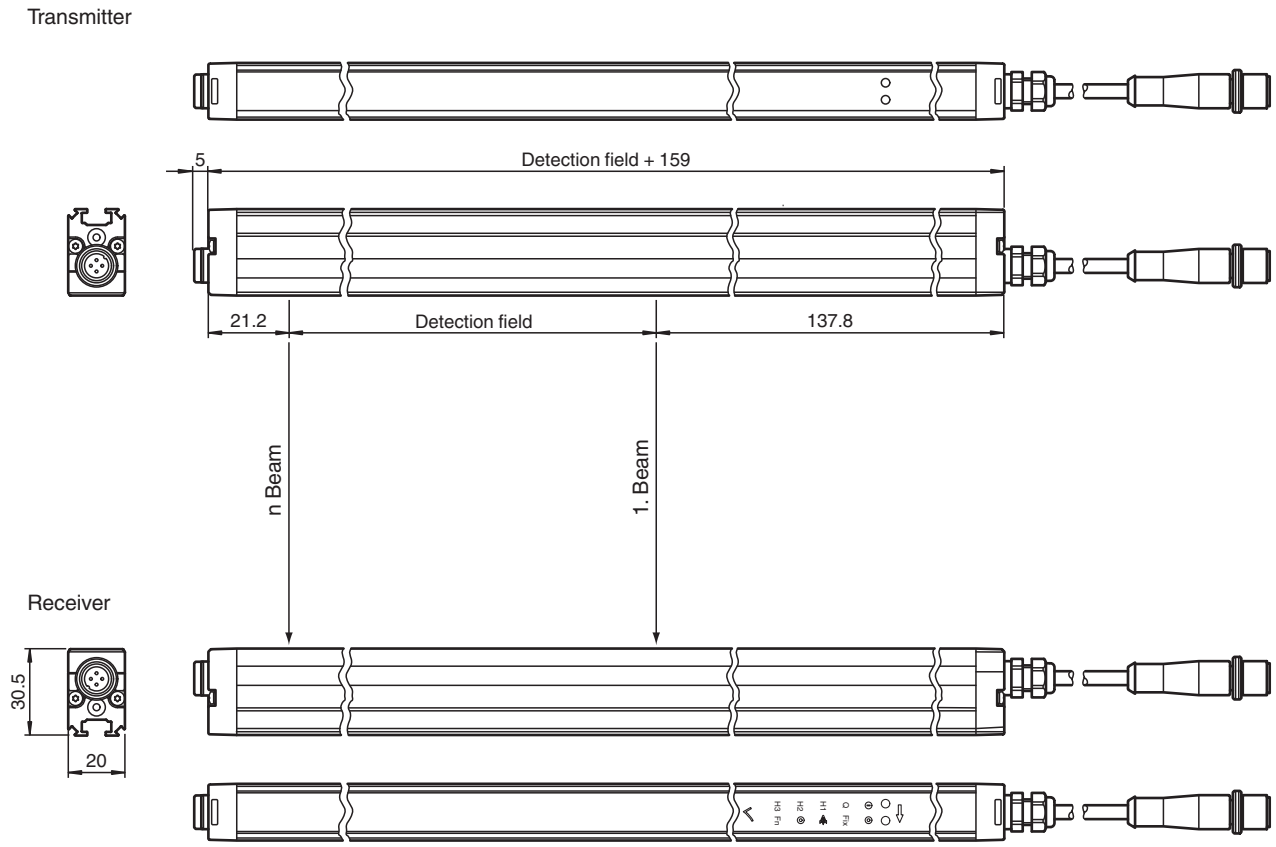
Function

Automation light grids in the LGM Series are designed to measure small to large objects. The slimline light grids are modular in design and are available with various beam gaps and field heights. The entire signal evaluation process is carried out within the device. The lightweight systems can be integrated elegantly into their surroundings, from both a technical and a visual perspective. As a result, machines and plants operating in temperature ranges between -30 °C ... +60 °C can be designed to more compact dimensions.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications		
Effective detection range		Standard : 0.3 ... 6 m
Threshold detection range		7.5 m
Light source		IRED
Light type		modulated infrared light , 850 nm
Field height		see Table 1, max. 3200 mm
Beam crossover		Factory setting: three beam crossing, deactivateable
Beam blanking		adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing		25 mm
Number of beams		see Table 1, max. 129
Operating mode		Emitter: Emitter power adjustable in two ranges
Optical resolution		without beam crossover: 25 mm with beam crossover: 12.5 mm with in 25% and 75% of the range
Opening angle		10 °
Ambient light limit		> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters		
$MTTF_d$		34 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Technical Data

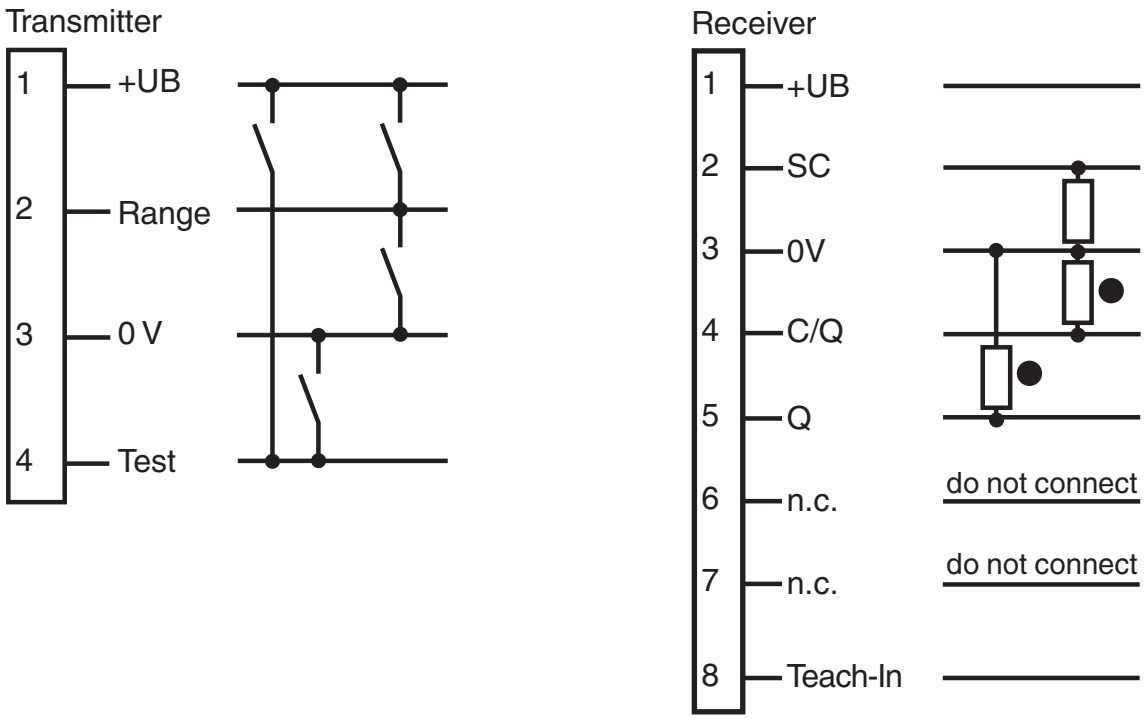
Operation indicator		LED green: constantly on - power-on double pulse flashing (0.8 Hz) - undervoltage flashing (4 Hz) - short circuit flashing with short interruptions (1 Hz) - IO-Link mode
Status indicator		Emitter: LED yellow constantly on - high emitter power constantly off - low emitter power flashing (8 Hz) - error message Receiver: LED yellow: constantly on - object detected constantly off - no object detected flashing (4 Hz) - below stability control limit flashing (8 Hz) - error message
Control elements		Receiver: 2 touch buttons for programming
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 2.3 s
Interface		
Interface type		IO-Link (pin 4)
IO-Link revision		1.0
Device ID		1050369 ... 1050400 (0x100701 ... 0x100720)
COM-Mode		COM2 (38.4 kBit/s)
Min. cycle time		2.3 ms
Process data width		16 bit
SIO mode support		yes
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m with +UB or 0 V on pin 2 (emitter) Teach-In input for parameterization on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Command interface: Pin 4 IO-Link interface C or used as switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) Switch output: Pin 5 switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) synchronized with pin 4
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 135 Hz
Response time		see Table 1, max. 12 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

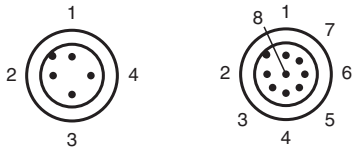
Technical Data

Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3360 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized
Optical face		Plastic pane , Polycarbonate
Mass		see Table 1, max. 1750 g (per profile)
Cable length		max. 30 m

Connection Assignment

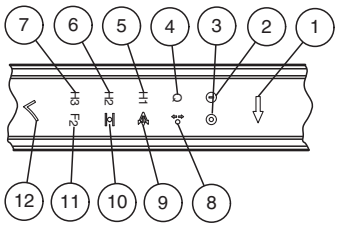


Connection Assignment



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Assembly

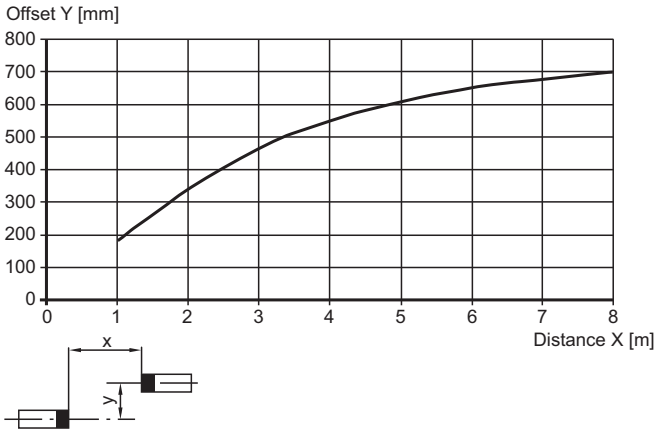


1	Menu button	yellow		7	not used	yellow
2	Operating indicator	green		8	Object floating	yellow
3	Status display	yellow		9	Crossing	yellow
4	Q object	yellow		10	Peripheral beam tolerance	yellow
5	not used	yellow		11	2nd level	yellow
6	not used	yellow		12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command and measurement of the object is triggered when an object enters or is already present in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system is programmed using the integrated touch field or the IO-Link interface.

Output of the analog measured value is included in the IO-Link protocol. Users can choose from a vast selection of integrated measurement protocols.

The most important measurement protocols are:

- Lowest position of the object
- Highest position of the object
- Height of the object
- Height of the object as the total height of all partial objects
- Height of the largest partial object
- Mid-position of the largest partial object
- Lowest position of the largest partial object
- Highest position of the largest partial object
- ...

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Accessories

	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-06**	Swivel Bracket
	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	PACTware 4.1	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Accessories

	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency, and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] Without object parameterization		Switch-on delay Q [ms] - With object parameterization - Updated measured value		Maximum switching frequency [Hz]	Maximum time delay before availability t_v [s]
	typ.	max.	typ.	max.		
100	2	4	5	6	134	0.8
200	3	5	5	7	125	0.9
300	3	5	5	7	118	0.9
400	3	5	5	8	112	0.9
500	3	5	6	8	106	1.0
600	3	5	6	9	101	1.0
700	3	6	6	9	96	1.1
800	3	6	6	10	92	1.1
900	3	6	7	10	88	1.2
1000	4	6	7	11	84	1.2
1100	4	7	7	11	81	1.3
1200	4	7	7	12	78	1.3
1300	4	7	8	12	75	1.4
1400	4	7	8	13	72	1.4
1500	4	8	8	13	70	1.5
1600	4	8	8	14	67	1.5
1700	4	8	9	14	65	1.6
1800	5	8	9	15	63	1.6
1900	5	9	9	15	61	1.7
2000	5	9	9	16	60	1.7
2100	5	9	10	16	58	1.8
2200	5	9	10	17	56	1.8
2300	5	10	10	17	55	1.9
2400	5	10	10	18	53	1.9
2500	5	10	11	18	52	1.9
2600	6	10	11	19	51	2.0
2700	6	11	11	19	49	2.0
2800	6	11	11	20	48	2.1
2900	6	11	12	20	47	2.1
3000	6	11	12	21	46	2.2
3100	6	12	12	21	45	2.2
3200	6	12	12	22	44	2.3

Number of beams, housing length, and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
100	5	260	200
200	9	360	250

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
300	13	460	300
400	17	560	350
500	21	660	400
600	25	760	450
700	29	860	500
800	33	960	550
900	37	1060	600
1000	41	1160	650
1100	45	1260	700
1200	49	1360	750
1300	53	1460	800
1400	57	1560	850
1500	61	1660	900
1600	65	1760	950
1700	69	1860	1000
1800	73	1960	1050
1900	77	2060	1100
2000	81	2160	1150
2100	85	2260	1200
2200	89	2360	1250
2300	93	2460	1300
2400	97	2560	1350
2500	101	2660	1400
2600	105	2760	1450
2700	109	2860	1500
2800	113	2960	1550
2900	117	3060	1600
3000	121	3160	1650
3100	125	3260	1700
3200	129	3360	1750

Design and Function

Safety information

The device must be operated only at low protective voltage where there is safe electrical isolation. Modifications and repairs must be carried out only by your supplier!

The system must be maintained and inspected on a regular basis.

A soft, clean cloth may be used to clean the system. Do not use any aggressive or abrasive cleaning agents that will corrode the surfaces. The device must not be subjected to severe impacts or vibrations.

Commissioning

Prerequisites

- The transmitter unit and receiver unit have been mounted and aligned correctly.
- The electrical connection has been established as per the information in the connection diagram.
- The signal output responds to object measurement.
- If at least one beam of light is interrupted, the output remains active for as long as the object is detected.

Troubleshooting

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf

- Measure operating voltage
- Check cabling.
- Check transmitter and receiver unit for dirt. Clean if necessary.

Function indicators

A green LED for indicating the operating status "Power ON" and a yellow status indication LED are fitted on the connection side of the profiles, behind the lens cover.

Transmitter Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated. Yellow LED to indicate status is flashing	Energy-saving mode
Yellow LED to indicate status is not illuminated	Transmission power of transmitter is low
Yellow LED to indicate status is permanently illuminated	Transmission power of transmitter is high
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state
Yellow LED to indicate status — brief change in light emitted	Test input is activated

Receiver Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated	Energy-saving mode
Green LED to display operating status is flashing at brief intervals	IO-Link mode active. Possible to parameterize the device only via IO-Link
Green LED to display operating status is flashing (4 Hz)	Fault status: short circuit at the outputs
Yellow LED to indicate status is permanently illuminated	Detection field interrupted
Yellow LED to indicate status is not illuminated	Detection field is clear.
Yellow LED to indicate status is flashing (approx. 4 Hz)	Insufficient stability control
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state: fault during signal measurement

Resolution and Beam Gap

The optical resolution of the light grid corresponds to the size of the object that can be detected.

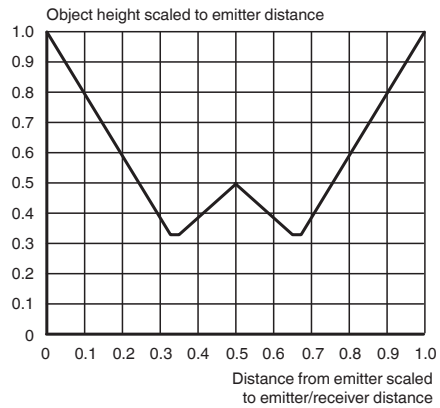
The values specified in the technical data under "Optical Resolution" apply if signal tracking for the threshold value is activated. Where the system is parameterized via the touch field menu (level 2, "Signal Tracking"), the value is automatically set to 60 %. It is not possible to set other values. To parameterize the system via IO-Link, a threshold value of at least 60 % must be entered. Signal tracking for the threshold value is deactivated by default, increasing the optical resolution by a maximum of 4 mm. By selecting 3-way crossover of the light beams, the resolution of the light grid is refined.

The switching outputs respond to any instance in which the beam is interrupted by an object. Selective object detection can also be parameterized using predefined or taught-in objects. Up to 2 beam areas can be suppressed (blanking).

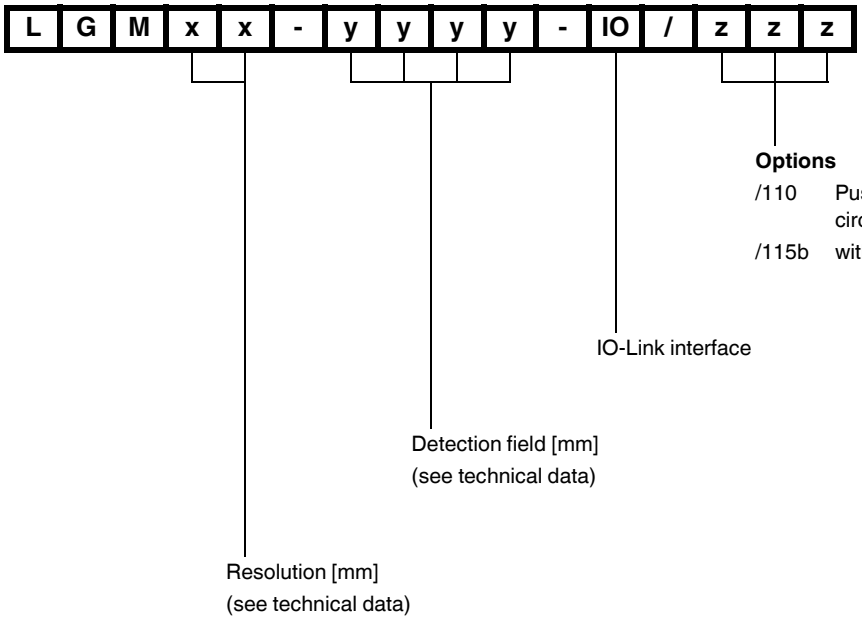
The devices are supplied without object detection programmed, with signal tracking of the threshold value deactivated, and with a beam path with a 3-way crossover.

Resolution of the Crossed Beam Arrangement

If 3-way beam crossover is programmed, the resolution is refined. In the case of 3-way crossover, this means that the increased resolution is offered once 25 % of the transmitter unit range or receiver unit range has been covered. It is therefore necessary to ensure that all objects pass the transmitter or receiver with such a gap.



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251333_eng.pdf


L G M x x - y y y y - IO / z z z
Options
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)

Light grid

LGM50

- Measuring automation light grid with switching output
- Optical resolution 50 mm
- Super-fast object detection, even with 3-way beam crossover
- Object identification using integrated object recognition
- IO-Link interface for service and process data
- Temperature range to -30 °C
- Output of a measured value, can be selected from a number of measuring functions

Measuring automation light grid with beam spacing of 50 mm, IO-Link interface, push-pull output, fixed cable with M12 plug

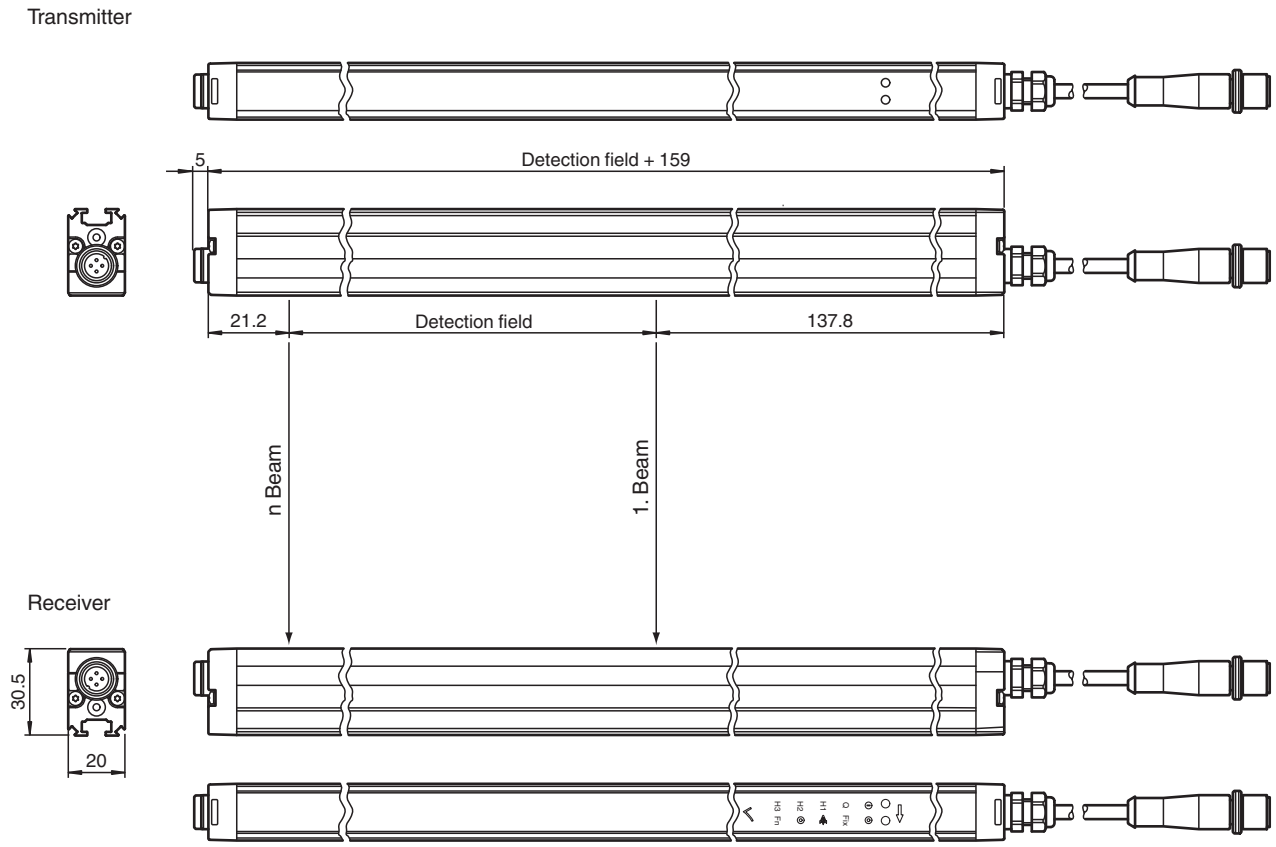
Function

Automation light grids in the LGM Series are designed to measure small to large objects. The slimline light grids are modular in design and are available with various beam gaps and field heights. The entire signal evaluation process is carried out within the device. The lightweight systems can be integrated elegantly into their surroundings, from both a technical and a visual perspective. As a result, machines and plants operating in temperature ranges between -30 °C ... +60 °C can be designed to more compact dimensions.

Application

- Detection of objects over large areas
- Detecting and counting irregular objects
- Measuring and sorting objects of different heights (height checking)
- Presence and overhang control in material handling systems
- Web sag monitoring
- Position or shape monitoring (object identification)

Dimensions



Technical Data

General specifications		
Effective detection range		Standard : 0.3 ... 6 m
Threshold detection range		7.5 m
Light source		IRED
Light type		modulated infrared light , 850 nm
Field height		see Table 1, max. 3000 mm
Beam crossover		Factory setting: three beam crossing, deactivateable
Beam blanking		adjustable max. 2 fixed suppressible beam areas (blanking)
Beam spacing		50 mm
Number of beams		see Table 1, max. 61
Operating mode		Emitter: Emitter power adjustable in two ranges
Optical resolution		without beam crossover: 50 mm with beam crossover: 25 mm with in 25% and 75% of the range
Opening angle		10 °
Ambient light limit		> 50000 Lux (if external light source is outside the opening angle)
Functional safety related parameters		
$MTTF_d$		56 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		60 %
Indicators/operating means		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

Technical Data

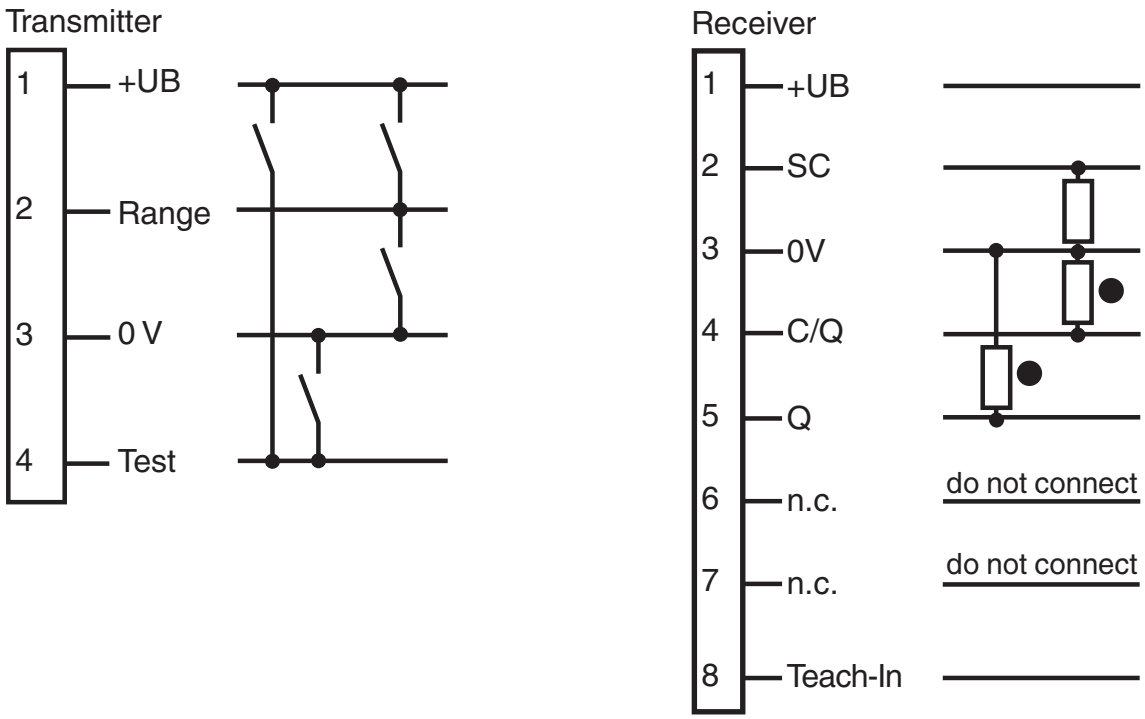
Operation indicator		LED green: constantly on - power-on double pulse flashing (0.8 Hz) - undervoltage flashing (4 Hz) - short circuit flashing with short interruptions (1 Hz) - IO-Link mode
Status indicator		Emitter: LED yellow constantly on - high emitter power constantly off - low emitter power flashing (8 Hz) - error message Receiver: LED yellow: constantly on - object detected constantly off - no object detected flashing (4 Hz) - below stability control limit flashing (8 Hz) - error message
Control elements		Receiver: 2 touch buttons for programming
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	Emitter ≤: 50 mA Receiver: ≤ 150 mA (without outputs)
Time delay before availability	t_v	see Table 1, max. 1.5 s
Interface		
Interface type		IO-Link (pin 4)
IO-Link revision		1.0
Device ID		1050371 ... 1050398 (0x100703 ... 0x10071E)
COM-Mode		COM2 (38.4 kBit/s)
Min. cycle time		2.3 ms
Process data width		16 bit
SIO mode support		yes
Input		
Test input		Emitter switch-off with +UB or 0 V at pin 4 (emitter)
Function input		Range input activation from 1.6 m with +UB or 0 V on pin 2 (emitter) Teach-In input for parameterization on pin 8 (receiver)
Output		
Stability alarm output		Stability Control (SC) 1 PNP, short-circuit protected, reverse polarity protected on pin 2 (receiver)
Switching type		Factory setting: dark on , Switchable to light-on mode
Signal output		Command interface: Pin 4 IO-Link interface C or used as switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) Switch output: Pin 5 switching output Q; 1 short-circuit proof reverse polarity protected push-pull output (receiver) synchronized with pin 4
Switching threshold		Factory setting: The signal tracking for the threshold value is deactivated, increasing the optical resolution by a maximum of 4 mm; switchable to active signal tracking
Switching voltage		max. 30 V DC
Switching current		max. 100 mA
Voltage drop	U_d	≤ 2 V DC
Switching frequency	f	see Table 1, max. 129 Hz
Response time		see Table 1, max. 8 ms
Timer function		Off-delay programmable from 0 ... 1.25 s in 5 ms steps (adjustment via IO-Link only)
Conformity		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Approvals and certificates		
Protection class		III (IEC 61140)
UL approval		cULus Listed
CCC approval		CCC approval / marking not required for products rated ≤36 V
Ambient conditions		
Ambient temperature		-30 ... 60 °C (-22 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Mechanical specifications		

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

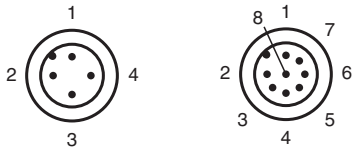
Technical Data

Conductor cross section		min. 0.25 mm²
Housing width		20 mm
Housing depth		30.5 mm
Housing length L		see Table 1, max. 3160 mm
Degree of protection		IP67
Connection		Emitter: connecting cable with 4-pin, M12 x 1 connector , 330 mm total length Receiver: connecting cable with 8-pin, M12 x 1 connector , 350 mm total length
Material		
Housing		extruded aluminum section , Silver anodized
Optical face		Plastic pane , Polycarbonate
Mass		see Table 1, max. 1650 g (per profile)
Cable length		max. 30 m

Connection Assignment

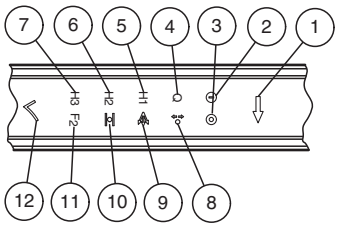


Connection Assignment



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

Assembly

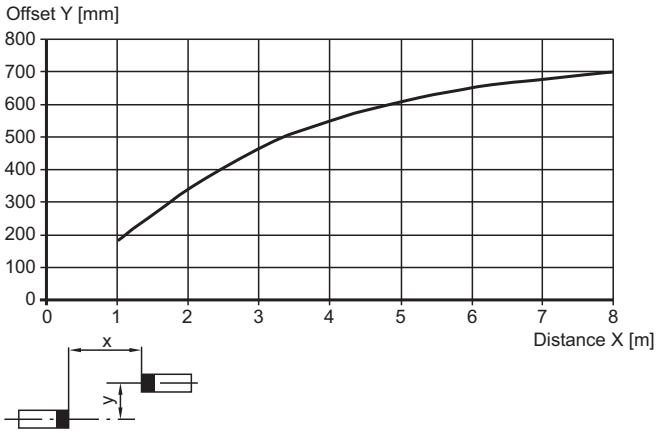


1	Menu button	yellow		7	not used	yellow
2	Operating indicator	green		8	Object floating	yellow
3	Status display	yellow		9	Crossing	yellow
4	Q object	yellow		10	Peripheral beam tolerance	yellow
5	not used	yellow		11	2nd level	yellow
6	not used	yellow		12	OK button	yellow

2nd level: Beam collimation, inverse mode, light-on/dark-on switching, reset factory setting, signal tracking

Characteristic Curve

Characteristic response curve



System Description

The light grid consists of a emitter and a receiver, between which is the area to be monitored.

The switching command and measurement of the object is triggered when an object enters or is already present in the monitoring field.

The modular system design supports a wide range of distances for the lines of light. Optimum implementation of the light grids for specific application requirements is thus possible.

The system is programmed using the integrated touch field or the IO-Link interface.

Output of the analog measured value is included in the IO-Link protocol. Users can choose from a vast selection of integrated measurement protocols.

The most important measurement protocols are:

- Lowest position of the object
- Highest position of the object
- Height of the object
- Height of the object as the total height of all partial objects
- Height of the largest partial object
- Mid-position of the largest partial object
- Lowest position of the largest partial object
- Highest position of the largest partial object
- ...

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

Accessories

	**V19-G-EMV-BK0,3M-PVC-V19-G**	Double-ended cordset, M12 to M12, with EMC filter, 8-pin, PVC cable
	**OMH-SLCT-01**	Quick clamp and adjustment system
	**OMH-SLCT-06**	Swivel Bracket
	**OMH-LGS-01**	Attachment aid for light grid series LGS/LGM
	**OMH-SLCT-03**	Mounting bracket including adjustment
	**OMH-SLCT-04**	Mounting bracket including adjustment (with loose bearing)
	**OMH-SLCT-05**	Mounting bracket including adjustment
	**AA SLCT-01**	Profile alignment aid; simplified alignment of the SLCS and SLCT safety light curtains
	**V1-G-BK2M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK5M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK10M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V1-G-BK15M-PUR-U**	Female cordset single-ended M12 straight A-coded, 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**V19-G-BK10M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK5M-PUR-IEC**	Female cordset, M12, 8-pin, PUR-cable
	**V19-G-BK2M-PUR-U-V1-G**	Cordset M12 socket straight A-coded 8-pin to M12 plug straight A-coded 4-pin, PUR cable black, UL approved, drag chain suitable, torsion resistant
	**PACTware 4.1**	FDT Framework
	**V1-G-BK0,6M-PUR-U-V1-G-LGS25T**	Cordset, LGS25 light grids to ICE modules/WIS 2, M12 to M12, PUR cable, 4-pin
	**ICE2-8IOL-G65L-V1D**	EtherNet/IP IO-Link master with 8 inputs/outputs
	**ICE3-8IOL-G65L-V1D**	PROFINET IO IO-Link master with 8 inputs/outputs

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

Accessories

	**ICE1-8IOL-G30L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE1-8IOL-G60L-V1D**	Ethernet IO-Link module with 8 inputs/outputs
	**ICE2-8IOL-K45P-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	**ICE2-8IOL-K45S-RJ45**	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**ICE3-8IOL-K45P-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	**ICE3-8IOL-K45S-RJ45**	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	**IO-Link-Master02-USB**	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

Technical Features

Table 1:

Switch-on delay, maximum switching frequency, and maximum time delay before availability:

Field height [mm]	Switch-on delay Q [ms] Without object parameterization		Switch-on delay Q [ms] - With object parameterization - Updated measured value		Maximum switching frequency [Hz]	Maximum time delay before availability t_v [s]
	typ.	max.	typ.	max.		
300	3	4	5	7	129	0.8
600	3	5	5	7	118	0.9
900	3	5	6	8	109	1.0
1200	3	5	6	9	101	1.0
1500	3	6	6	10	94	1.1
1800	3	6	7	10	88	1.2
2100	4	7	7	11	82	1.3
2400	4	7	7	12	78	1.3
2700	4	7	8	13	73	1.4
3000	4	8	8	13	70	1.5

Number of beams, housing length, and weight:

Field height [mm]	Number of beams	Overall length of the transmitter/receiver unit [mm]	Weight of transmitter/receiver unit [g]
300	7	460	300
600	13	760	450
900	19	1060	600
1200	25	1360	750
1500	31	1660	900
1800	37	1960	1050
2100	43	2260	1200
2400	49	2560	1350
2700	55	2860	1500
3000	61	3160	1650

Design and Function

Safety information

The device must be operated only at low protective voltage where there is safe electrical isolation. Modifications and repairs must be carried out only by your supplier!

The system must be maintained and inspected on a regular basis.

A soft, clean cloth may be used to clean the system. Do not use any aggressive or abrasive cleaning agents that will corrode the surfaces. The device must not be subjected to severe impacts or vibrations.

Commissioning

Prerequisites

- The transmitter unit and receiver unit have been mounted and aligned correctly.
- The electrical connection has been established as per the information in the connection diagram.
- The signal output responds to object measurement.
- If at least one beam of light is interrupted, the output remains active for as long as the object is detected.

Troubleshooting

- Measure operating voltage
- Check cabling.

Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf

- Check transmitter and receiver unit for dirt. Clean if necessary.

Function indicators

A green LED for indicating the operating status "Power ON" and a yellow status indication LED are fitted on the connection side of the profiles, behind the lens cover.

Transmitter Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated. Yellow LED to indicate status is flashing	Energy-saving mode
Yellow LED to indicate status is not illuminated	Transmission power of transmitter is low
Yellow LED to indicate status is permanently illuminated	Transmission power of transmitter is high
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state
Yellow LED to indicate status — brief change in light emitted	Test input is activated

Receiver Unit

Function	Description of Diagnosis
Green LED to display operating status permanently illuminated	Power On
Green LED to display operating status is not illuminated	Energy-saving mode
Green LED to display operating status is flashing at brief intervals	IO-Link mode active. Possible to parameterize the device only via IO-Link
Green LED to display operating status is flashing (4 Hz)	Fault status: short circuit at the outputs
Yellow LED to indicate status is permanently illuminated	Detection field interrupted
Yellow LED to indicate status is not illuminated	Detection field is clear.
Yellow LED to indicate status is flashing (approx. 4 Hz)	Insufficient stability control
Yellow LED to indicate status is flashing rapidly (approx. 8 Hz)	Fault state: fault during signal measurement

Resolution and Beam Gap

The optical resolution of the light grid corresponds to the size of the object that can be detected.

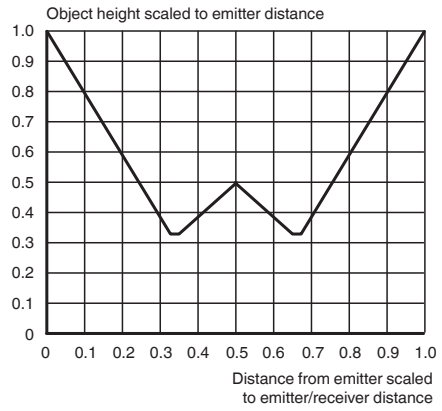
The values specified in the technical data under "Optical Resolution" apply if signal tracking for the threshold value is activated. Where the system is parameterized via the touch field menu (level 2, "Signal Tracking"), the value is automatically set to 60 %. It is not possible to set other values. To parameterize the system via IO-Link, a threshold value of at least 60 % must be entered. Signal tracking for the threshold value is deactivated by default, increasing the optical resolution by a maximum of 4 mm. By selecting 3-way crossover of the light beams, the resolution of the light grid is refined.

The switching outputs respond to any instance in which the beam is interrupted by an object. Selective object detection can also be parameterized using predefined or taught-in objects. Up to 2 beam areas can be suppressed (blanking).

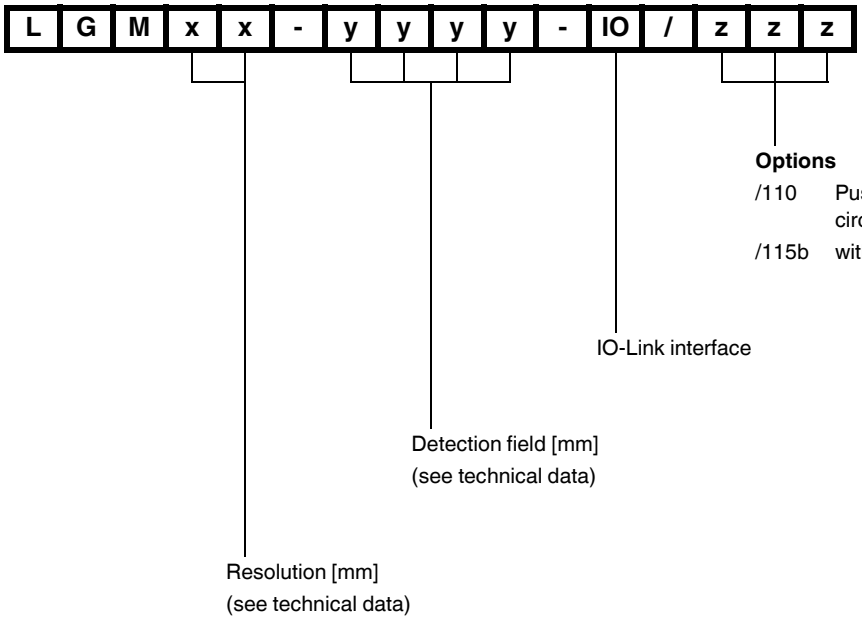
The devices are supplied without object detection programmed, with signal tracking of the threshold value deactivated, and with a beam path with a 3-way crossover.

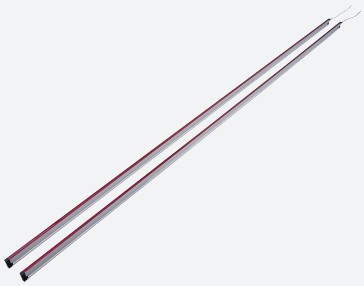
Resolution of the Crossed Beam Arrangement

If 3-way beam crossover is programmed, the resolution is refined. In the case of 3-way crossover, this means that the increased resolution is offered once 25 % of the transmitter unit range or receiver unit range has been covered. It is therefore necessary to ensure that all objects pass the transmitter or receiver with such a gap.



Release date: 2023-04-04 Date of issue: 2023-04-04 Filename: 251334_eng.pdf


L G M x x - y y y y - IO / z z z
Options
/110 Push-pull output, switch output 0.1 A, short-circuit protected, reverse polarity protection
/115b with 0.2 m fixed cable and M12 connector
IO-Link interface
Detection field [mm]
(see technical data)
Resolution [mm]
(see technical data)



Elevator light grid

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

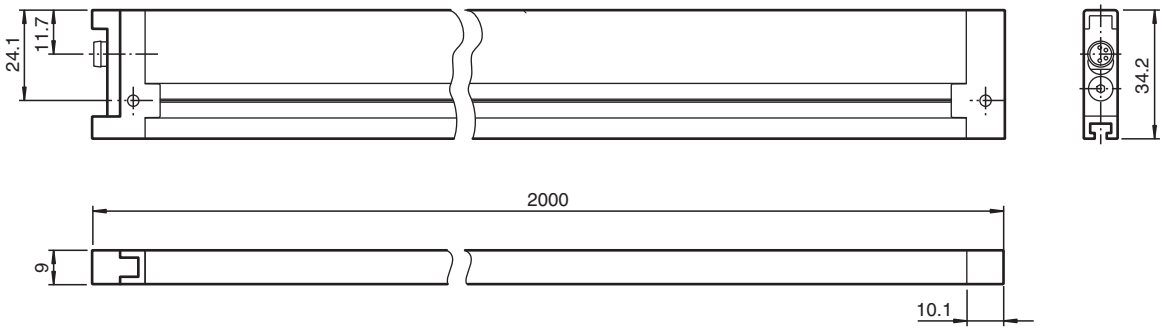
- Low-profile, high resolution light grid for monitoring locking edges on elevators and accesses
- In accord with EN81-20 and EN81-70
- Dense monitoring field with up to 135 beams ensures that small objects are detected
- Object detection up to distance of zero
- Automatic beam crossing
- Test input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

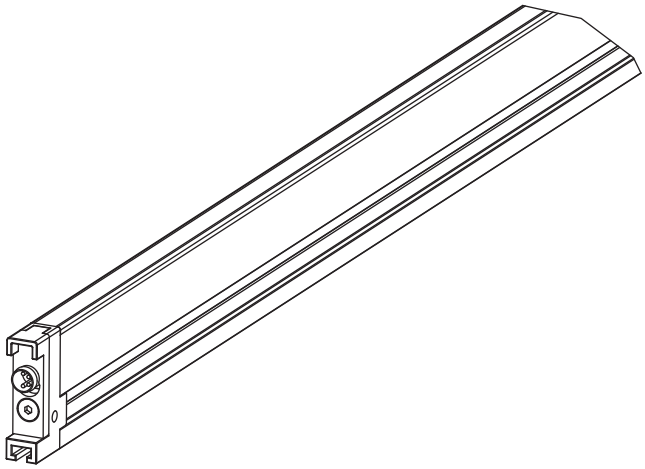
High-resolution light grid for detecting people and objects, set comprising emitter and receiver, field height: 1800 mm, light/dark on, 1 NPN output and 1 PNP output, M8 plug

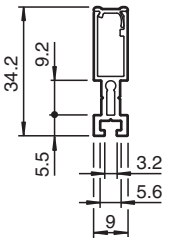
Function

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

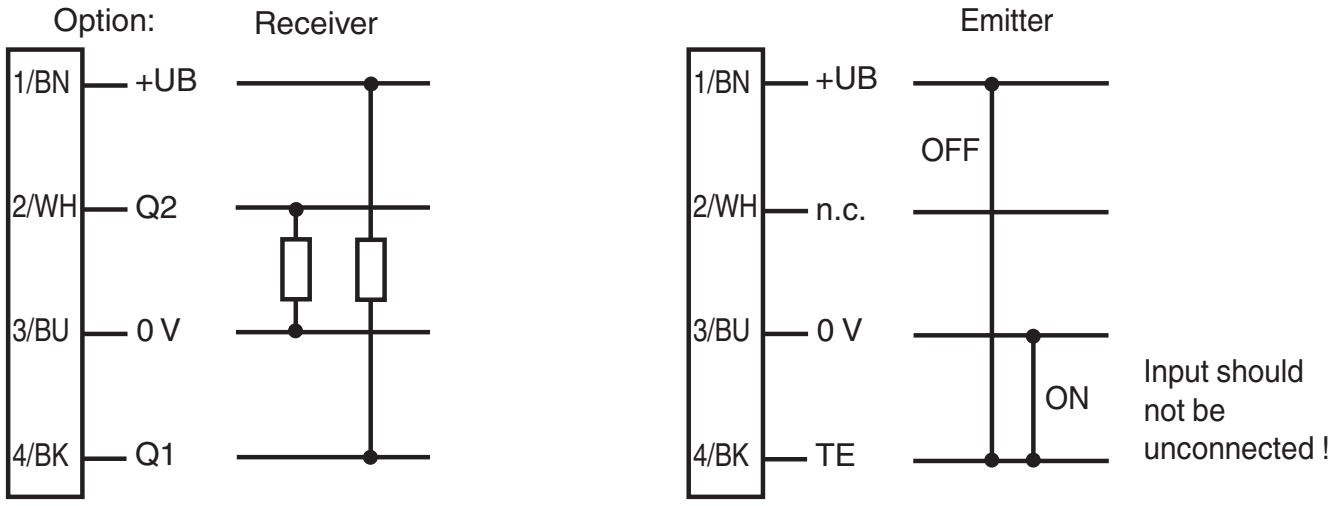
General specifications		
Effective detection range		0 ... 3500 mm
Threshold detection range		3500 mm
Light source		IRED
Light type		modulated infrared light , 950 nm
Field height		1800 mm
Beam crossover		automatic, 3x/5x/7x (depending on distance between transmitter/receiver)
Beam spacing		90 mm
Number 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
Electrical specifications		
Operating voltage	U_B	11 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	< 180 mA

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 284796_eng.pdf

Technical Data

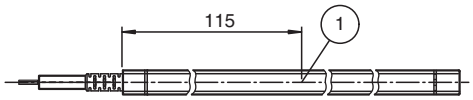
Input		
Test input		Test: Operating voltage , Operating mode 0 V
Output		
Switching type		light on
Signal output		1 PNP and 1 NPN, short-circuit protected
Switching voltage		max. 30 V DC
Switching current		100 mA
Switching frequency	f	< 3 Hz
Response time		< 100 ms
Compliance with standards and directives		
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



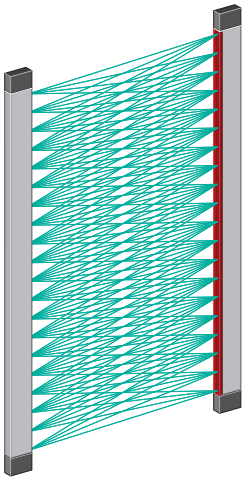
Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 284796_eng.pdf

Assembly



1	LED display

Application



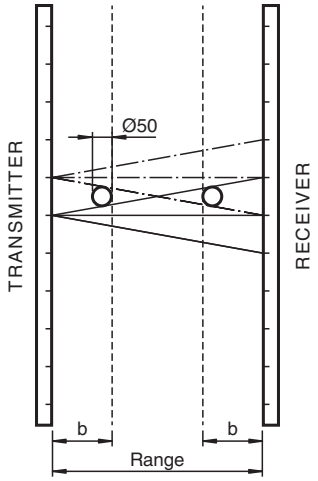
Accessories

	**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

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 284796_eng.pdf

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

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.

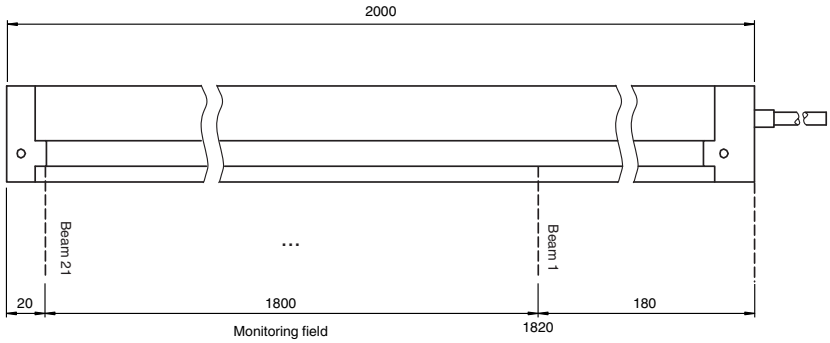
When an object is detected, the red LED goes out until the light beams are unobstructed again.

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

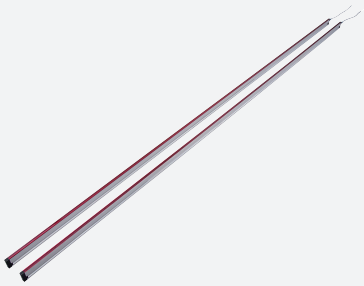
The AL2109 light grid is used for access monitoring on elevators. The device consists of an emitter and receiver unit. The evaluation electronics and power supply are integrated into the devices. No additional external components are required for operation.

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 284796_eng.pdf

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



Elevator light grid

AL2109-P-1820/40b/49/143

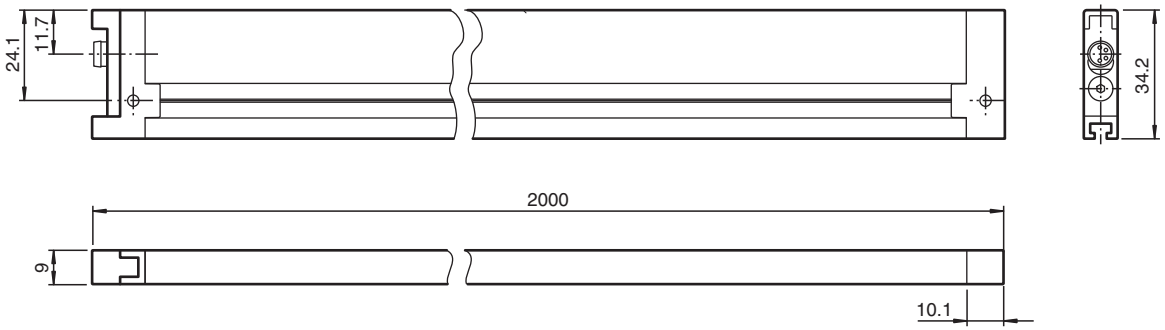
- Low-profile, high resolution light grid for monitoring locking edges on elevators and accesses
- Thru-beam light grid with integrated controller
- In accord with EN81-70 and EN12015/16
- Dense monitoring field with up to 135 beams ensures that small objects are detected
- Object detection up to distance of zero
- Automatic beam crossing and beam suppression
- Insensitive to reflection and ambient light

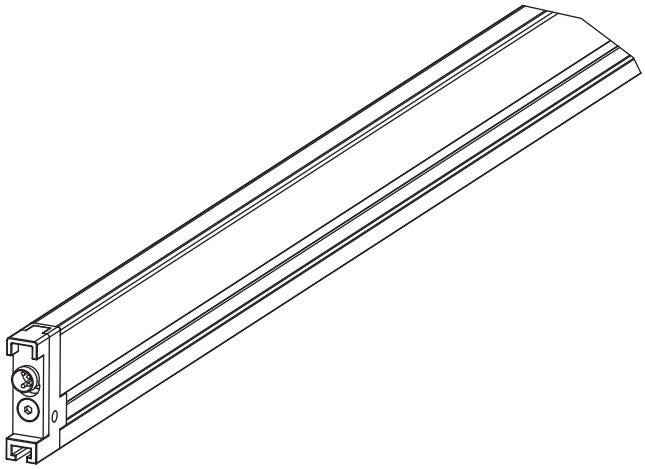
High-resolution light grid for detecting people and objects, set comprising emitter and receiver, field height: 1800 mm, light/dark on, 1 NPN output and 1 PNP output, M8 plug

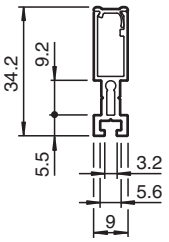
Function

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 81-70 and EN 12016.

Dimensions







Technical Data

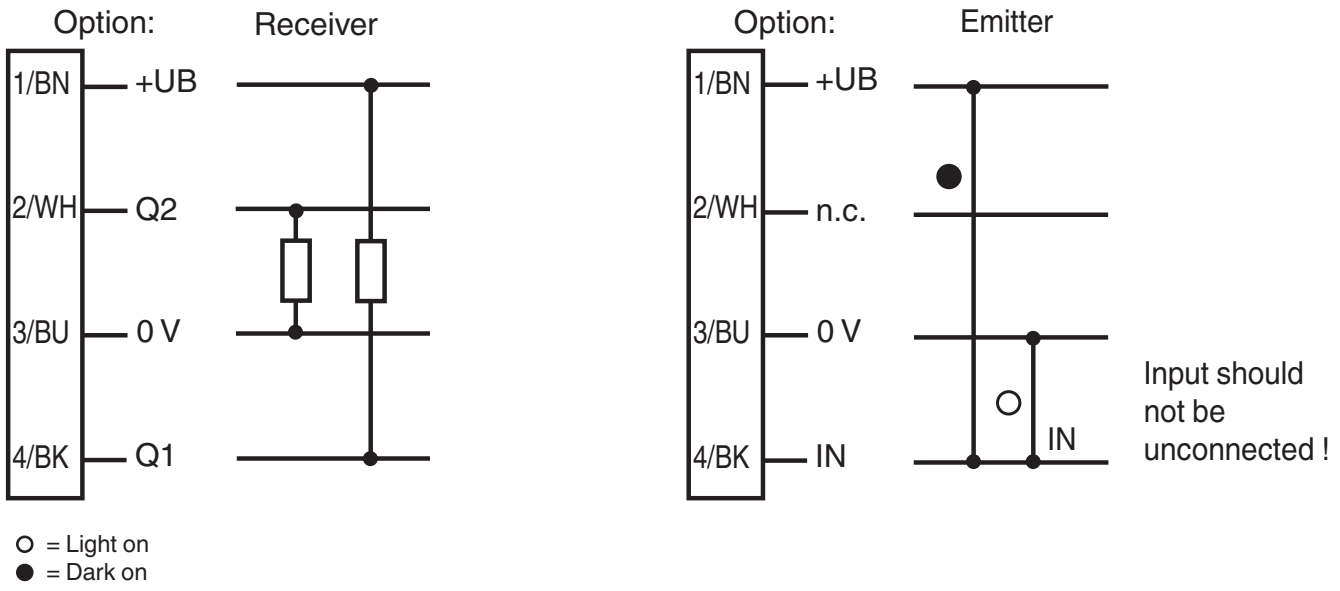
General specifications		
Effective detection range		0 ... 3500 mm
Threshold detection range		3500 mm
Light source		IRED
Light type		modulated infrared light , 950 nm
Field height		1800 mm
Beam crossover		automatic, 3x/5x/7x (depending on distance between transmitter/receiver)
Beam blanking		Defective beams are faded out after 60 s. Deactivation of the light grid upon failure of 2 adjacent beams or more than 50 % of all beams
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, out when object is detected, flashes in case of permanent interruption of 2 neighbouring beams
Electrical specifications		
Operating voltage	U_B	11 ... 30 V DC

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 184861_eng.pdf

Technical Data

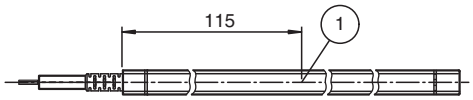
Ripple		10 %
No-load supply current	I_0	< 180 mA
Output		
Switching type		light/dark on selectable programmable
Signal output		1 PNP and 1 NPN, short-circuit protected
Switching voltage		max. 30 V DC
Switching current		100 mA
Switching frequency	f	< 3 Hz
Response time		< 100 ms
Compliance with standards 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 81-1+A3:2009-12; Chapter 7.5.2.1.1.3 Taking into account object detection in accordance with the data sheet specification for the monitoring field.
Approvals and certificates		
CE conformity		yes
UL approval		cULus Listed
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



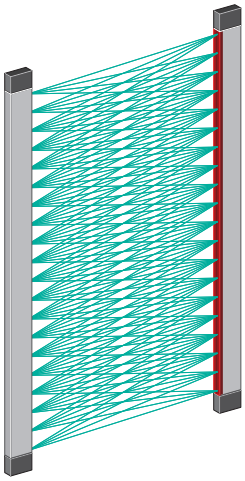
Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 184861_eng.pdf

Assembly



1	LED display

Application



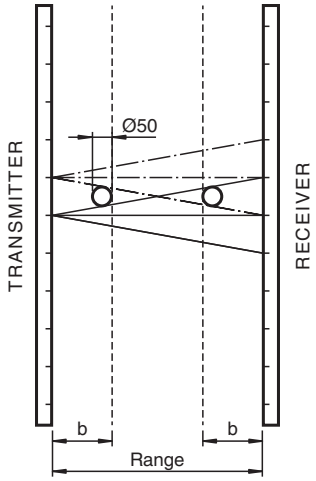
Accessories

	**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

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 184861_eng.pdf

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

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.

The AL2109 elevator light grid features a beam suppression system. If one of the 21 emitters or receivers is covered on a sustained basis (e.g. by dirt or other contaminants), the beam in question is removed from the evaluation after 60 seconds, and the light grid remains ready for operation. The light grid is deactivated if 2 adjacent beams or more than half of all the beams fail; in this case, the red LED flashes.

Operating Modes

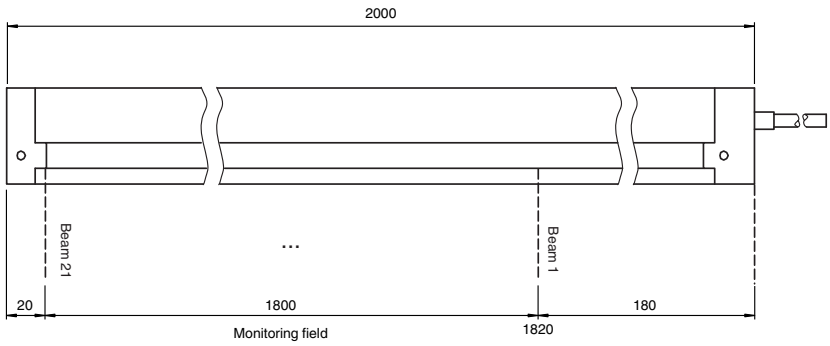
Light/dark ON:

Light ON means that the outputs are active if none of the light beams are broken. In dark ON mode, the outputs are active in every instance of an object being detected. This function can be selected via the light/dark ON input (IN) on the emitter. Do not leave the input in a non-wired state.

+UB on switching input IN: dark ON

0V on switching input IN: light ON

Monitoring field



Function Principle

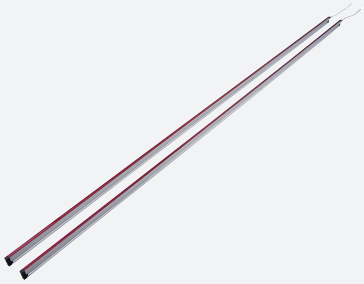
Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 184861_eng.pdf

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



Elevator light grid

AL2109-P-1820-3403/40b/49/143

- Low-profile, high resolution light grid for monitoring locking edges on elevators and accesses
- Thru-beam light grid with integrated controller
- In accord with EN81-70 and EN12015/16
- Dense monitoring field with up to 135 beams ensures that small objects are detected
- Object detection up to distance of zero
- Automatic beam crossing
- Insensitive to reflection and ambient light

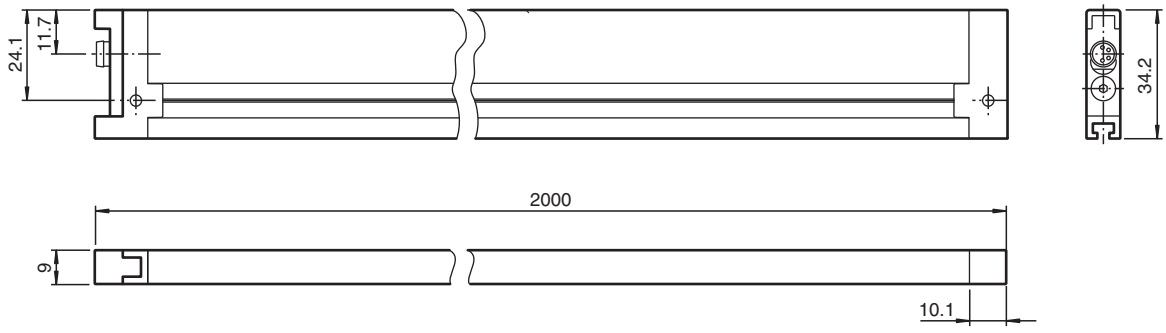
High resolution light grid for detecting people and objects

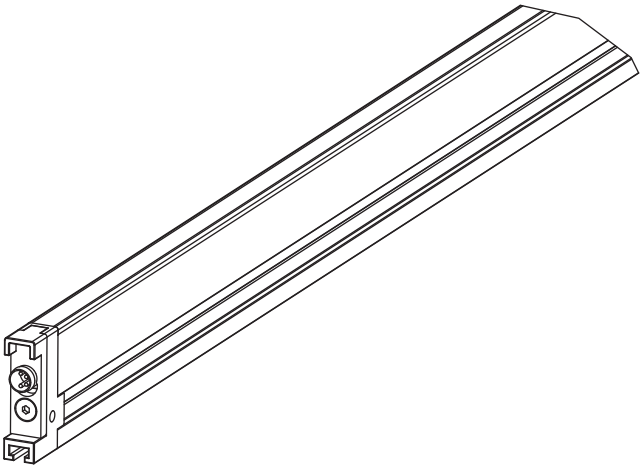
CE

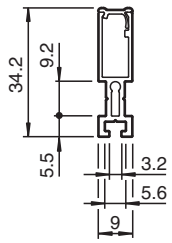
Function

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 81-70 and EN 12016.

Dimensions







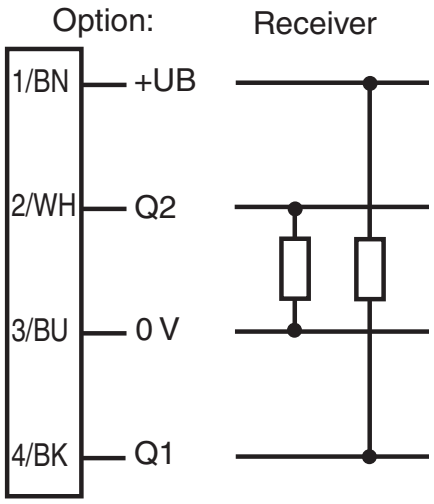
Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 190514_eng.pdf

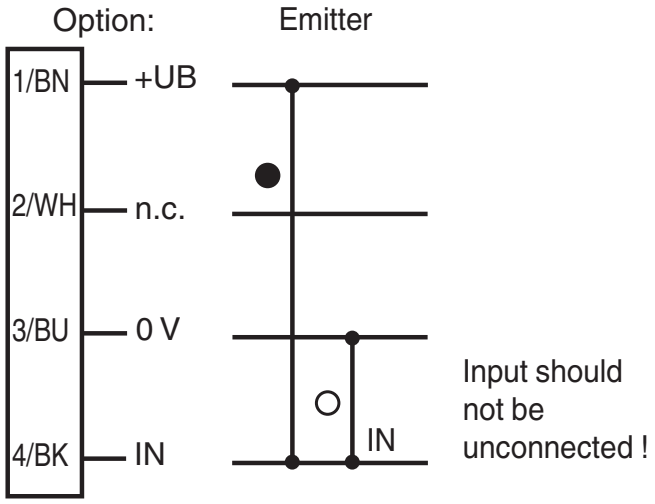
Technical Data

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 with M12 connector, approx. 300 mm
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, out when object is detected,
Electrical specifications		
Operating voltage	U_B	11 ... 30 V DC
Ripple		10 %
No-load supply current	I_0	< 180 mA
Output		
Switching type		light/dark on selectable programmable
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+A1:2012 IEC 60947-5-2:2007 + A1:2012
Standards		EN 81-70:2003/A1:2004; Section 5.2.4 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		
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)

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 190514_eng.pdf

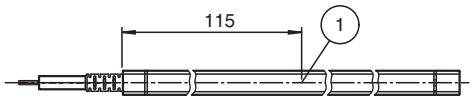
Connection Assignment





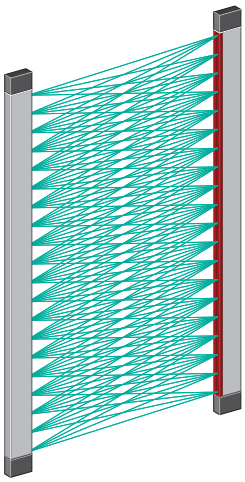
○ = Light on
● = Dark on

Assembly



1	LED display

Application



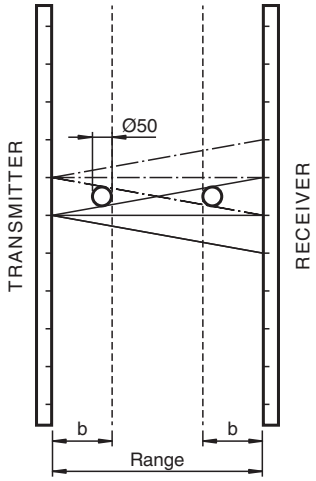
Accessories

	**Mounting Set AL2109 back board**	Mounting aid
	**Mounting Set AL2109 extension**	Mounting aid
	**Mounting Set AL2109 lateral**	Mounting aid

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 190514_eng.pdf

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

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.

Operating Modes

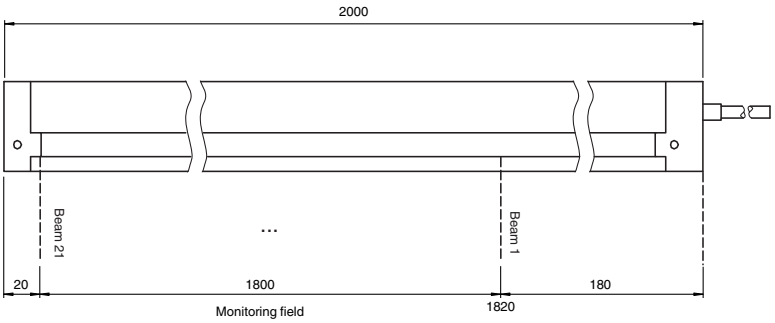
Light/dark ON:

Light ON means that the outputs are active if none of the light beams are broken. In dark ON mode, the outputs are active in every instance of an object being detected. This function can be selected via the light/dark ON input (IN) on the emitter. Do not leave the input in a non-wired state.

+UB on switching input IN: dark ON

0V on switching input IN: light ON

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.

Release date: 2020-10-08 Date of issue: 2020-10-08 Filename: 190514_eng.pdf

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

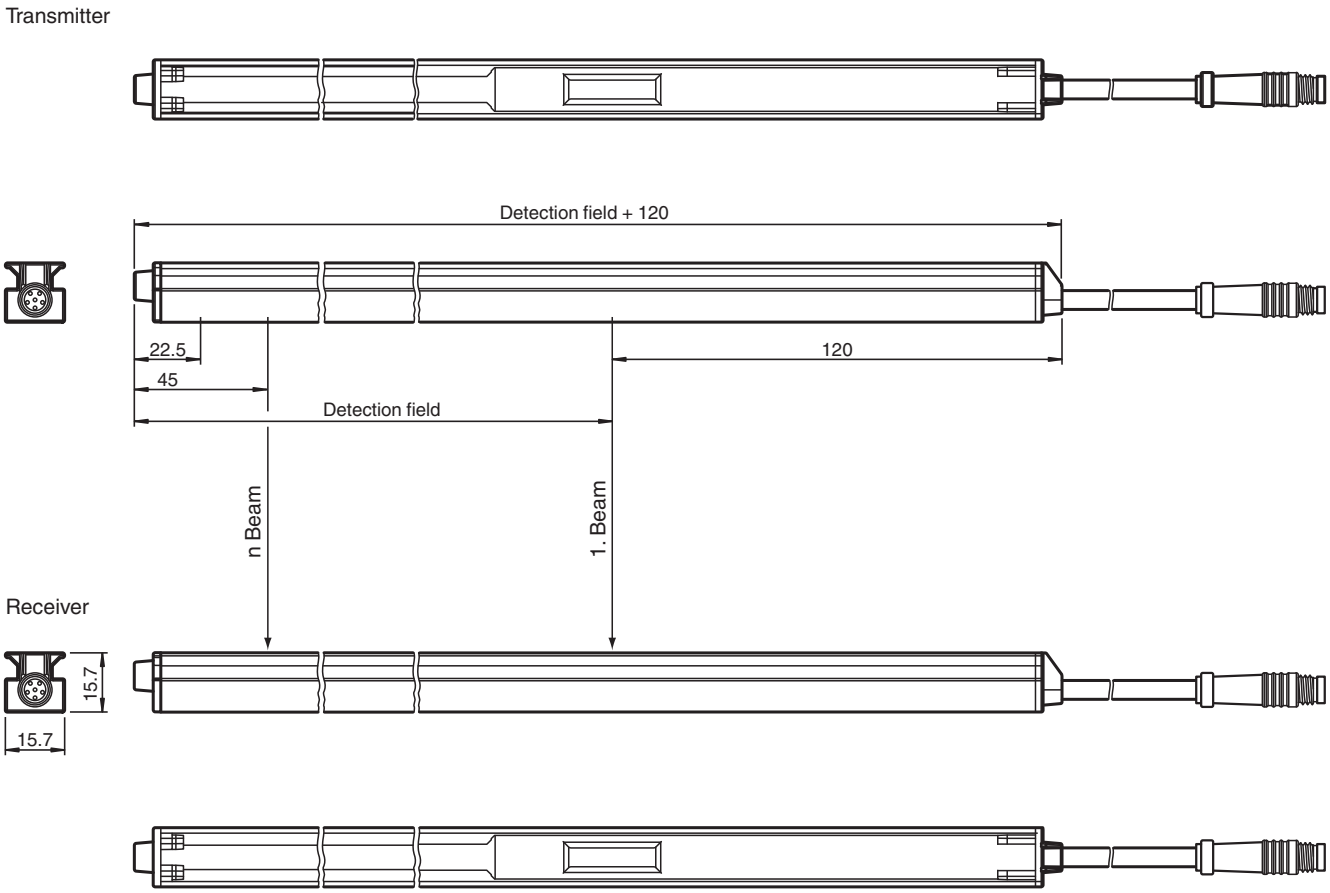
Safety light grid

LG01B-2520-56A-0-OS-C0-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- OSE Output

OSE safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-01 Filename: 64318740_eng.pdf

Technical Data

Number of protective field beams		56
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 mm
Protection field height		2520 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		high-active
Output		
Output type		OSE
Switching type		light-on
Signal output		950 Hz , transistor output loadable with max. 20 mA, short-circuit protected
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849 , EN 12978 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable in M8 plug 4-pin Length: 130 mm
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1612 g
Dimensions		
Height		2640 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-01 Filename: 64318740_eng.pdf

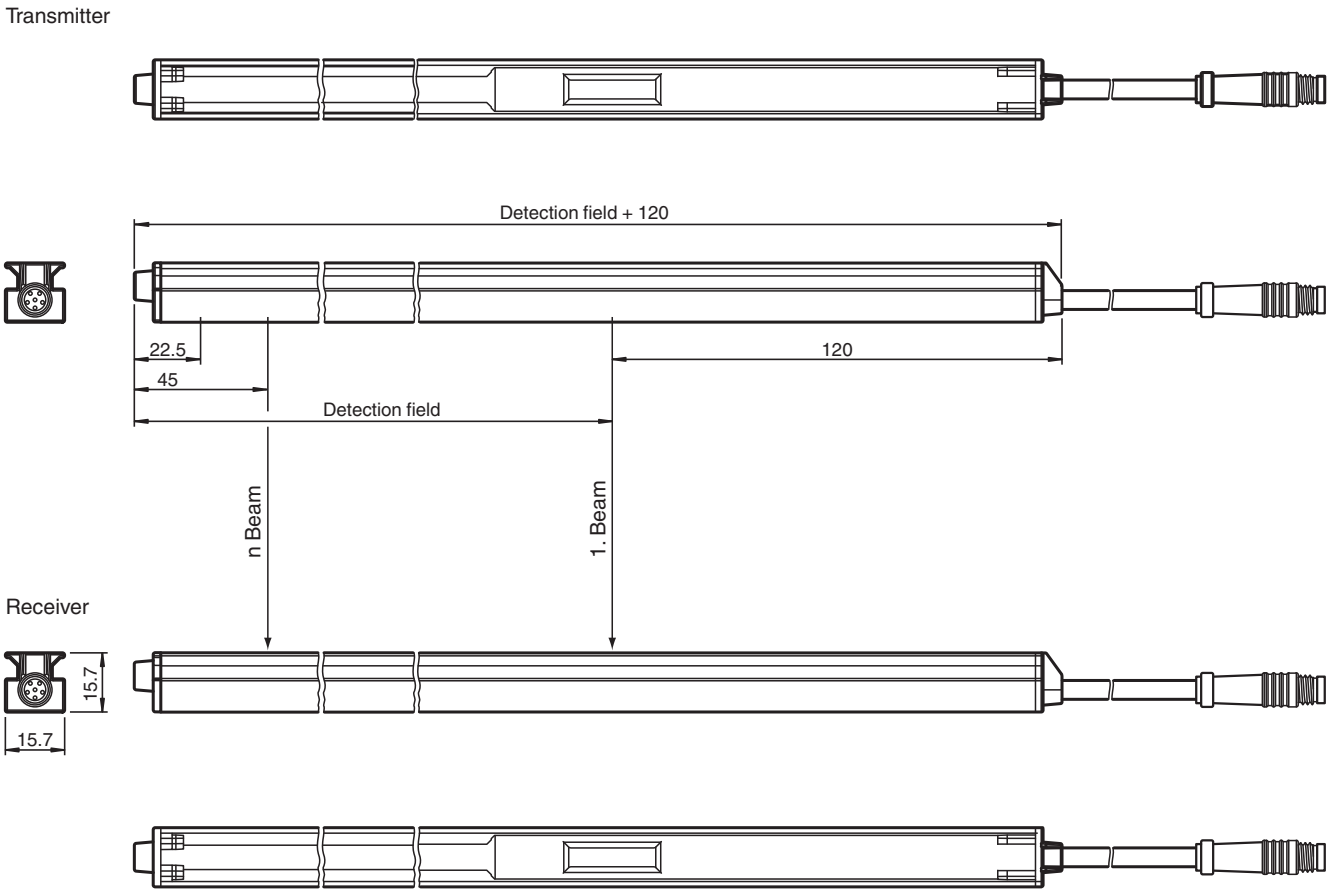
Safety light grid

LG01B-2520-23C-0-OS-C0-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- OSE Output

OSE safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-01 Filename: 64318786_eng.pdf

Technical Data

Number of protective field beams		23
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 ... 200 mm
Protection field height		2520 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		high-active
Output		
Output type		OSE
Switching type		light-on
Signal output		950 Hz , transistor output loadable with max. 20 mA, short-circuit protected
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849 , EN 12978 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable in M8 plug 4-pin Length: 130 mm
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1860 g
Dimensions		
Height		2640 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-01 Filename: 64318786_eng.pdf

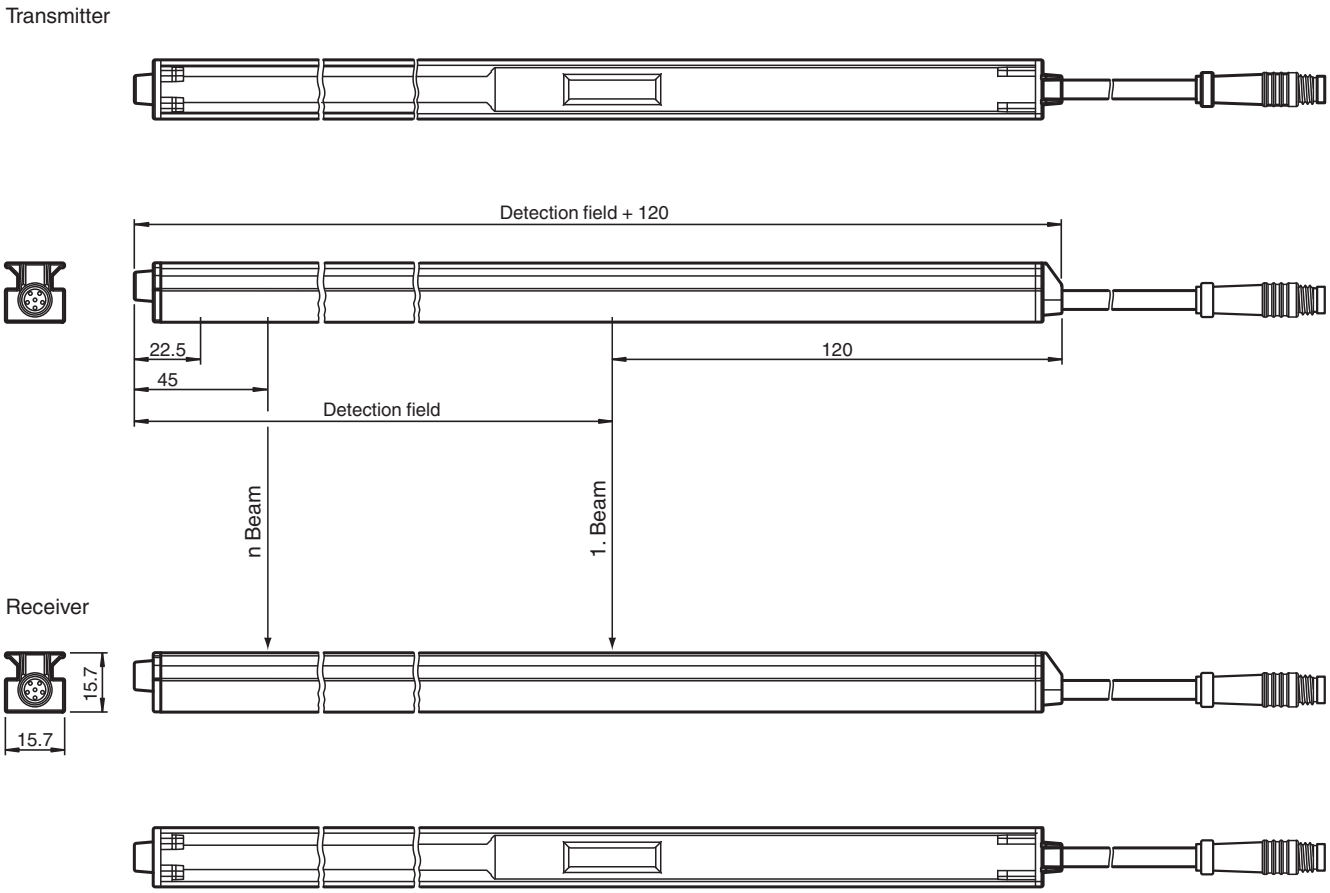
Safety light grid

LG01B-2520-56A-1-P1-C0-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- PNP output

PNP safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64318795_eng.pdf

Technical Data

Number of protective field beams		56
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 mm
Protection field height		2520 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		low active or Open cable end
Output		
Output type		PNP
Switching type		light-on
Signal output		100 mA , short-circuit proof, reverse polarity protected
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849 , EN 12978 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable in M8 plug 4-pin Length: 130 mm
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1612 g
Dimensions		
Height		2640 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64318795_eng.pdf

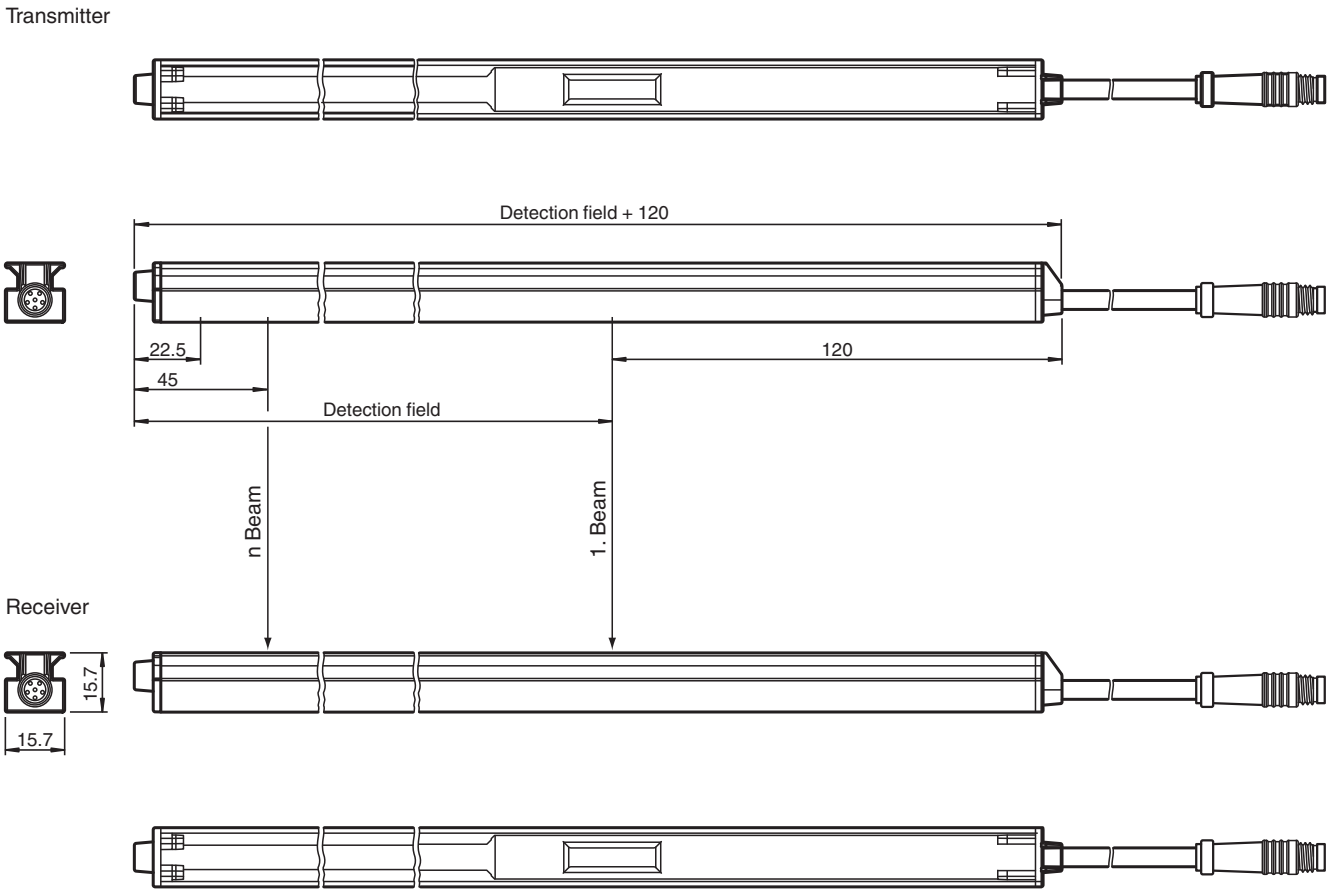
Safety light grid

LG01B-2520-23C-1-P1-C0-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- PNP output

PNP safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64318847_eng.pdf

Technical Data

Number of protective field beams		23
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 ... 200 mm
Protection field height		2520 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		low active or Open cable end
Output		
Output type		PNP
Switching type		light-on
Signal output		100 mA , short-circuit proof, reverse polarity protected
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849 , EN 12978 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable in M8 plug 4-pin Length: 130 mm
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1612 g
Dimensions		
Height		2640 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64318847_eng.pdf

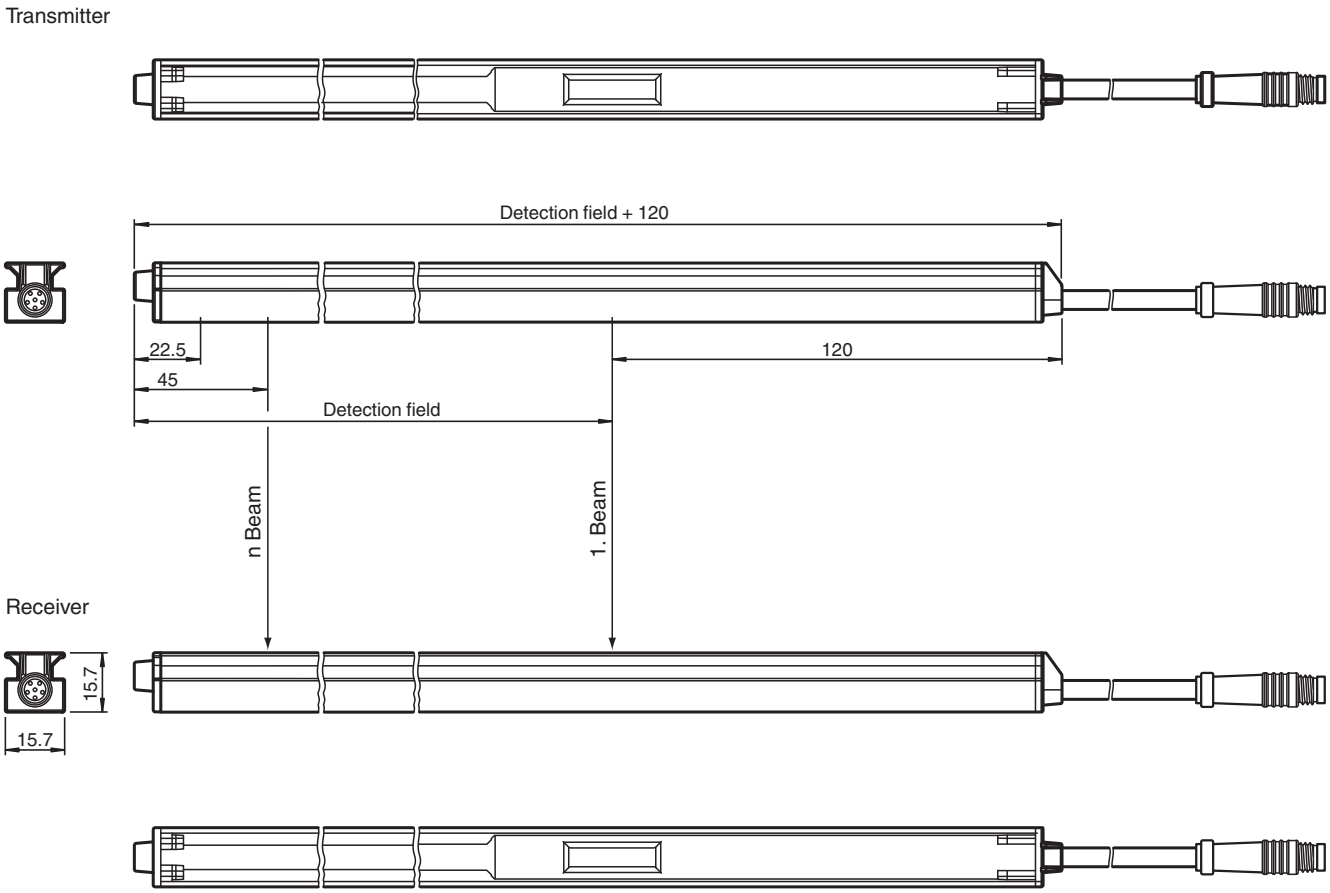
Safety light grid

LG01B-2520-56A-5-R1-C3-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- Relay output

SSR safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64319617_eng.pdf

Technical Data

Number of protective field beams		56
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 mm
Protection field height		2520 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		high active or low active
Output		
Output type		relay
Switching type		light-on
Signal output		100 mA , short-circuit protected , potential-free
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849 , EN 12978 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable with M8 plug, 6-pin
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1612 g
Dimensions		
Height		2640 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64319617_eng.pdf

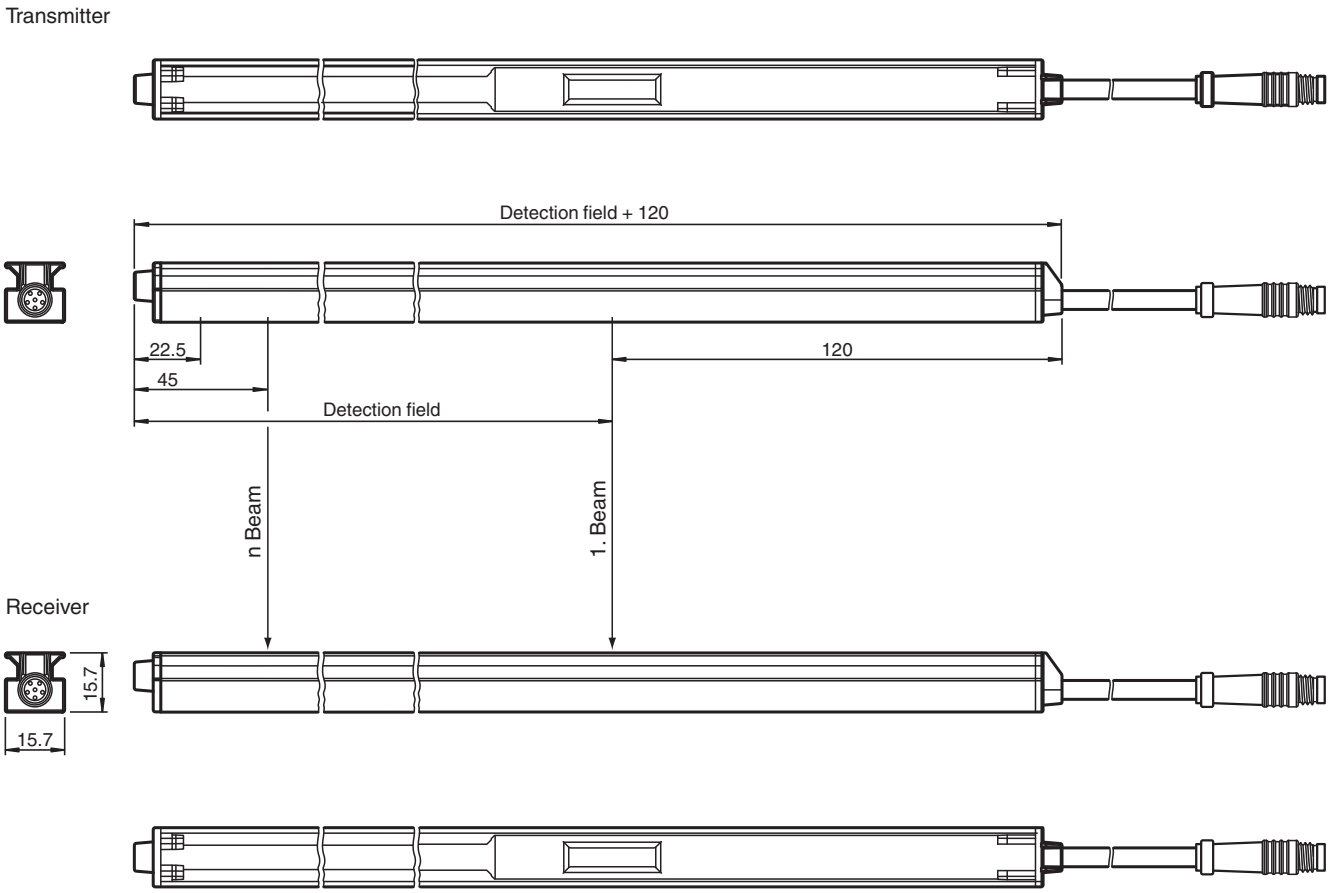
Safety light grid

LG01B-1620-18C-5-R1-C3-F05-S15

- Cost-optimized series for standard tasks
- High degree of protection (IP67)
- Direct assembly
- Relay output

SSR safety light grid

Dimensions



Technical Data

General specifications		
Effective detection range		1.6 ... 10 m
Threshold detection range		14 m

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64325010_eng.pdf

Technical Data

Number of protective field beams		18
Light source		IRED
Light type		infrared
Tests		
Marking		CE
Target size		50 ... 200 mm
Protection field height		1620 mm
Opening angle		eff. 5 °
Optical face		frontal
Ambient light limit		100000 Lux
Indicators/operating means		
Operation indicator		Emitter: LED green Receiver: LED green
Function indicator		Emitter: yellow LED Receiver: LED red: lit when the light beam is interrupted LED green: lights up when light beam is free
Stability alarm indicator		available
Electrical specifications		
Operating voltage	U_B	10 ... 30 V DC
Operating current	I_B	Emitter: approx. 30 mA (24 V) receiver: approx. 20 mA (24 V)
Power consumption	P_0	approx. 1.2 W
Input		
Test input		high active or low active
Output		
Output type		relay
Switching type		light-on
Signal output		100 mA , short-circuit protected , potential-free
Energized/De-energized delay		< 800 ms
Response time		≤ 100 ms
Conformity		
Product standard		EN ISO 13849:2015 , EN 12978:2003+A1:2009 , EN 61000-6-2, EN 61000-6-3
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-30 ... 70 °C (-22 ... 158 °F)
Relative humidity		max. 95 %, not condensing
Mechanical specifications		
Degree of protection		IP67 according to EN 60529
Connection		fixed cable in M8 plug 6-pin Length: 130 mm
Material		
Housing		black anodized aluminum Epoxy resin molded
Mass		approx. 1072 g
Dimensions		
Height		1740 mm
Width		16 mm
Depth		16 mm

Release date: 2024-07-01 Date of issue: 2024-07-08 Filename: 64325010_eng.pdf

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70
Казахстан +7(727) 345-47-04
Беларусь +(375) 257-127-884
Узбекистан +998(71)205-18-59
Киргизия +996(312)96-26-47

эл.почта: phb@nt-rt.ru || сайт: https://pepperl-fuchs.nt-rt.ru/