Model Number

LGS100

Light grid

with fixed cable with 4-pin, M12 x 1 connector, and fixed cable with 8-pin, M12 x 1, connector

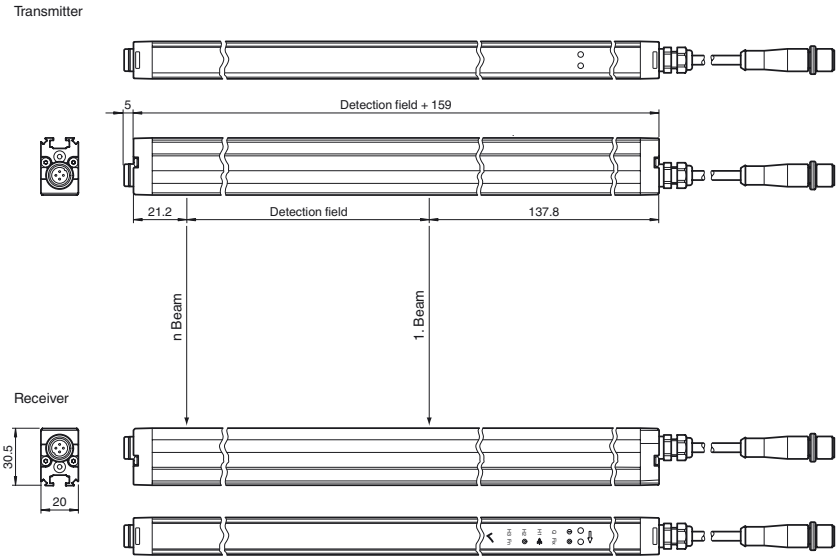
Features

- 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

Product information

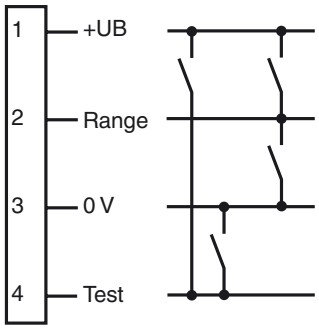
The LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings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

Dimensions

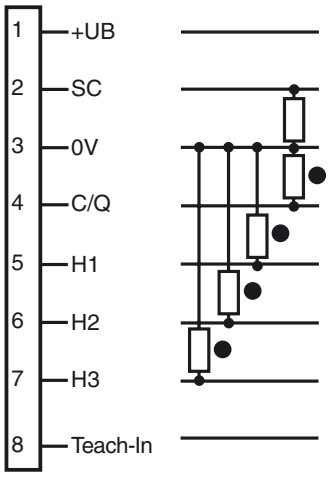


Electrical connection

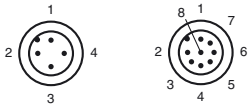
Transmitter



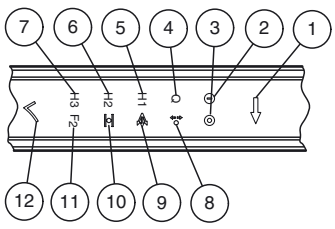
Receiver



Pinout



Indicators/operating means



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

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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
Angle of divergence		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		
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 stability control (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		COM 2 (38.4 kBaud)
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		
Pre-fault indication 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		Switch 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
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)

Accessories

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-06
Swivel Bracket

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, M12, 4-pin, PUR cable

V1-G-BK5M-PUR-U
Female cordset, M12, 4-pin, PUR cable

V1-G-BK10M-PUR-U
Female cordset, M12, 4-pin, PUR cable

V1-G-BK15M-PUR-U
Female cordset, M12, 4-pin, PUR cable

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
Connection cable, M12 to M12, 8/4-pin, PUR cable

IO-Link-Master02-USB
IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

IO-Link-Master-USB DTM
Communication DTM for use of IO-Link-Master

PACTware 4.1
FDT Framework

IODD Interpreter DTM
Software for the integration of IODDs in a frame application (e. g. PACTware)

LGS IODD
IODD for communication with LGS-IO-Link sensors

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

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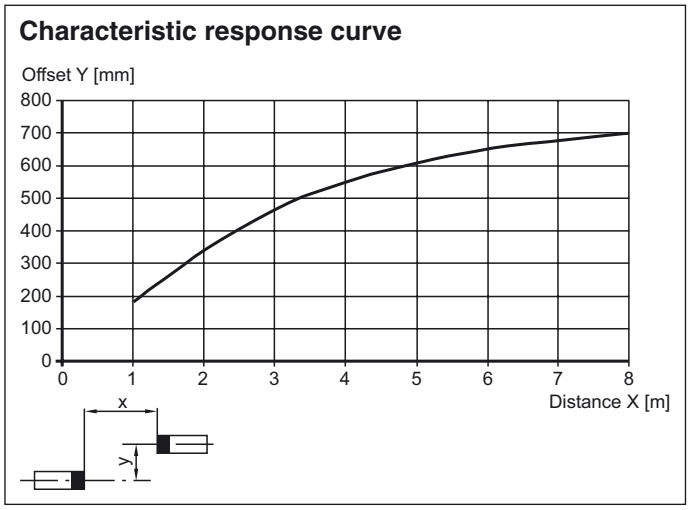
Mechanical specifications	
Housing width	20 mm
Housing depth	30.5 mm
Housing length L	see Table 1, max. 3160 mm
Degree of protection	IP67
Connection	Emitter: 200 mm connecting cable with 4-pin, M12x1 connector Receiver: 200 mm connecting cable with 8-pin, M12 x 1 connector Cable cross section min. 0.25 mm^2 Max. cable length 30 m
Material	
Housing	extruded aluminum section , Silver anodized
Optical face	Plastic pane , Polycarbonate
Mass	see Table 1, max. 1650 g (per profile)

Approvals and certificates	
Protection class	III (IEC 61140)
UL approval	cULus Listed
CCC approval	CCC approval / marking not required for products rated ≤36 V

Operating principle

The light grid consists of a transmitter and a receiver, between which is the area to be monitored. The switch 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 LGS series 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.

Curves/Diagrams



Additional information

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	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

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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.

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

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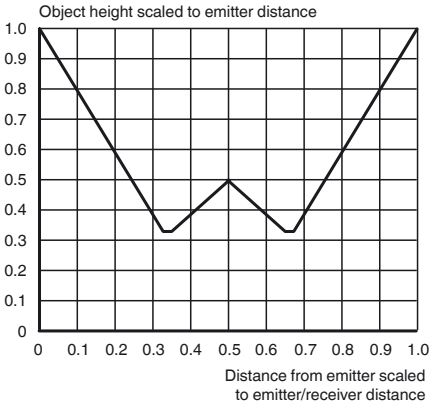
The mechanical beam clearance determines the smallest detectable object size. Crossing the light beams increases the resolution of the light grid.

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.



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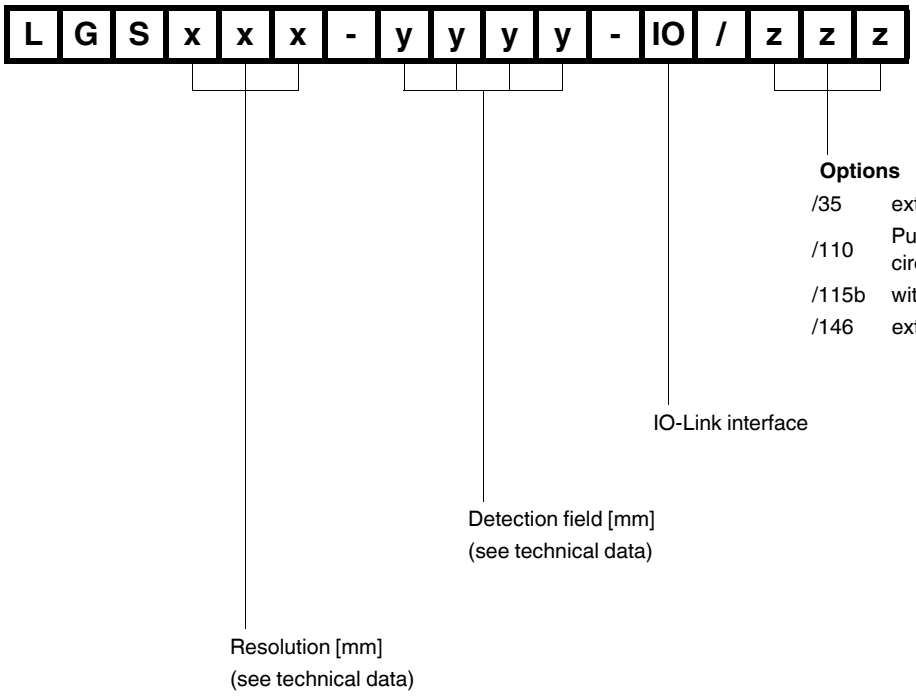
Model number



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