Optical data coupler

LS684-DA-EN-9003/F1/146



- Independent of Ethernet protocol
- TCP/IP, PROFINET, PROFIsafe, EtherCAT, FSoE, EtherNet/IP™, Ethernet POWERLINK etc.
- Version for low temperature applications
- No parameterization
- Line indicator for signal strength

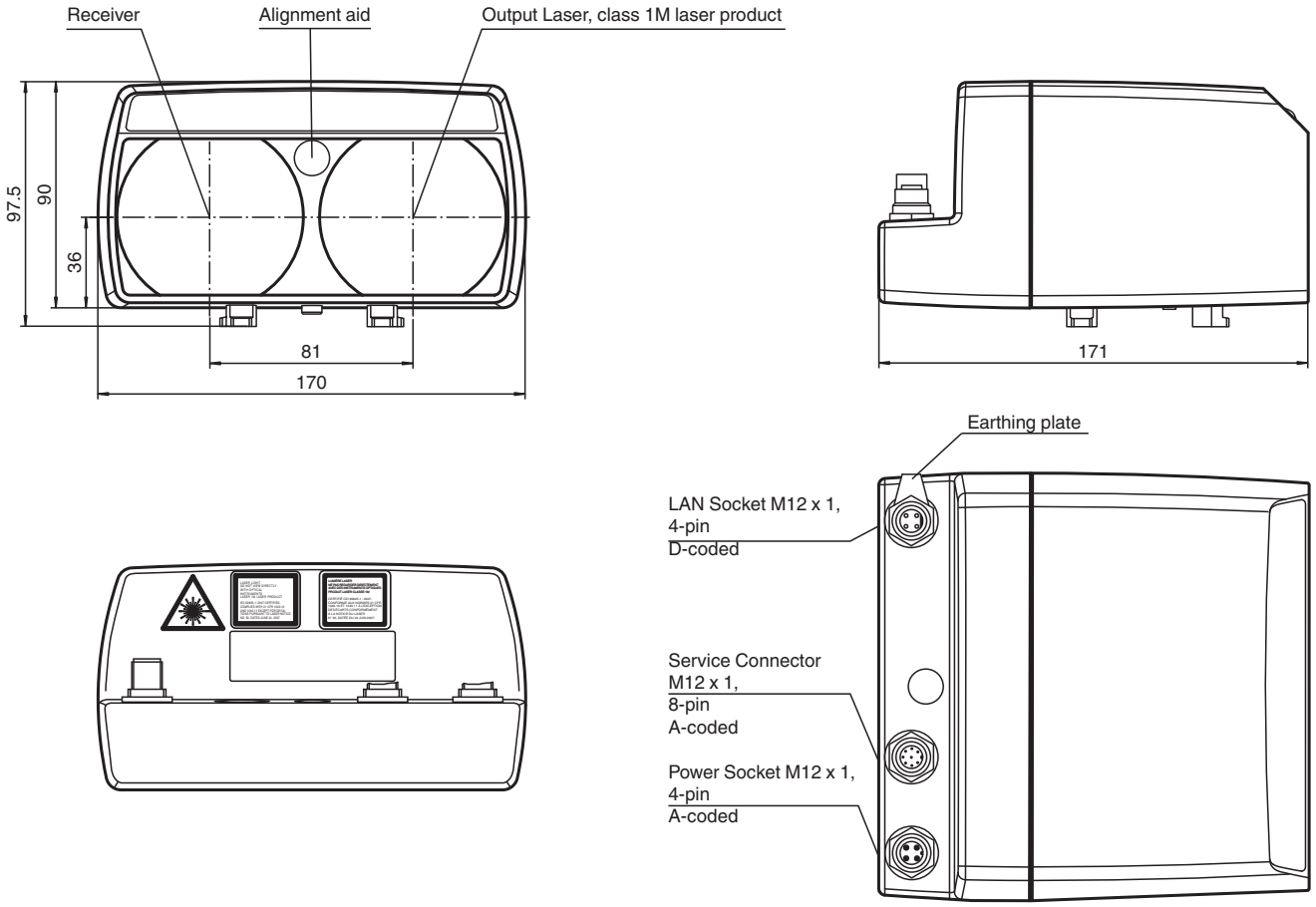
Optical data coupler for fast Ethernet, 150 m detection range, infrared light, 100 Mbit/s data rate, M12 plug

Function

The optical data coupler connects Ethernet modules to remote modules. These can move toward each other along an axis.
The devices are ideal for conditions in high-rack storage.
The physical transfer takes place protocol-free with 100 MBit/s full duplex. The device offers robust optical data transfer in real time for industrial Ethernet networks such as PROFINET IRT and EtherCAT.
The optical data coupler guarantees a consistent turnaround time for synchronous, jitter-free switching operations and control processes at both ends of the transmission range – over any distance and with any driving dynamics.

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Dimensions



Technical Data

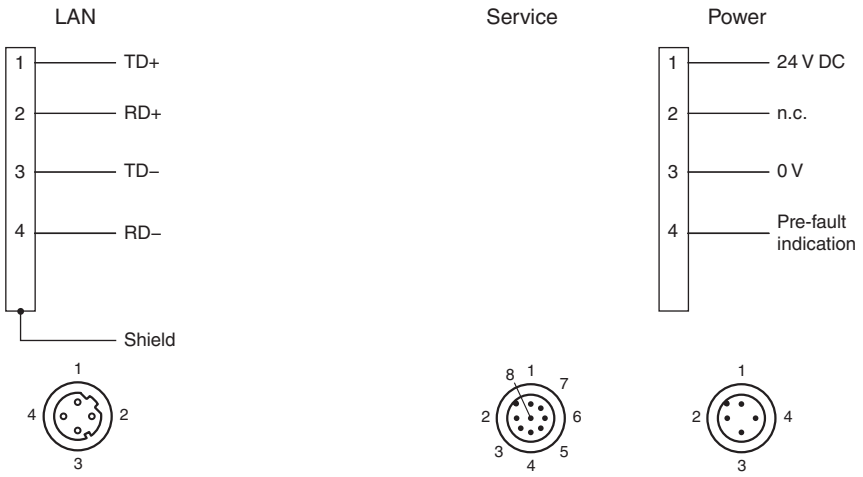
General specifications	
Effective detection range	0 ... 150 m
Threshold detection range	180 m
Light source	laser diode
Light type	modulated infrared light
Laser nominal ratings	
Note	INVISIBLE LASER RADIATION , DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
Laser class	1M
Wave length	785 nm
Beam divergence	15 mrad
Pulse length	8 ns
Repetition rate	62.5 MHz
Maximum optical power output	60 mW
Diameter of the light spot	1.5 m at a distance of 100 m
Opening angle	1 °
Ambient light limit	> 10000 Lux
Functional safety related parameters	
$MTTF_d$	58.6 a
Mission Time (T_M)	10 a
Diagnostic Coverage (DC)	0 %
Indicators/operating means	

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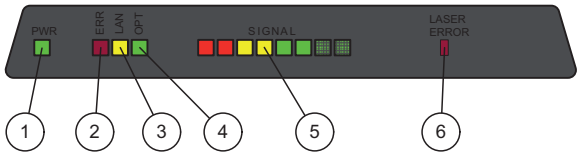
Data flow indicator		LED green: OPTO-Link LED yellow: LAN-Link LED red: ERROR
Function indicator		Signal strength (8 LED: Red, yellow, green)
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
No-load supply current	I_0	200 mA
Data rate		100 MBit/s (Fast Ethernet)
Interface		
Interface type		100 BASE-TX
Output		
Stability alarm output		1 PNP, inactive when falling short of the operating reserve , short-circuit protected, max. 200 mA
Conformity		
Laser safety		EN 60825-1:2014
Approvals and certificates		
UL approval		cULus Listed
FDA approval		IEC 60825-1:2014 Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice 56, dated May 8, 2019.
Ambient conditions		
Ambient temperature		-30 ... 50 °C (-22 ... 122 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Degree of protection		IP65
Material		
Housing		ABS / PC
Optical face		plastic
Mass		700 g
Dimensions		
Height		90 mm
Width		170 mm
Length		171 mm

Connection Assignment



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Assembly



1	Operating indicator	green
2	Failure	red
3	LAN link	yellow
4	Opto link	green
5	Signal quality	
6	Error Laser	red

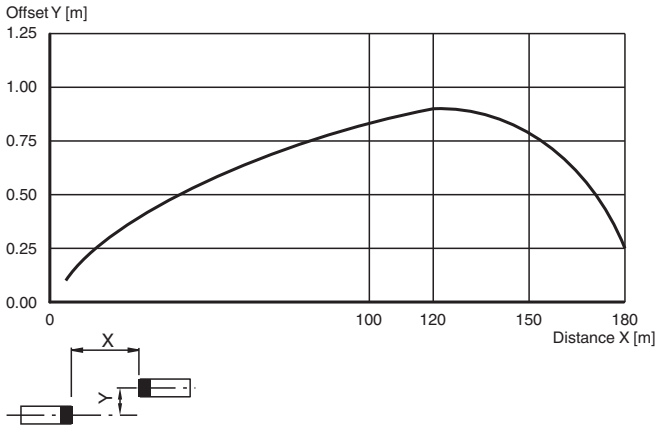
Installation

Function Indicator/Operating Reserve
A red alignment LED, which can be seen from a long way off, is located on the front of the device to serve as an alignment aid. As soon as a receiver detects the emitted light of the device opposite it, the flashing frequency of the alignment aid decreases. If the light goes out, this indicates that the devices are aligned with sufficient operating reserve. For fine adjustment, the optical data coupler features a bar graph display (signal display) for optimum alignment.

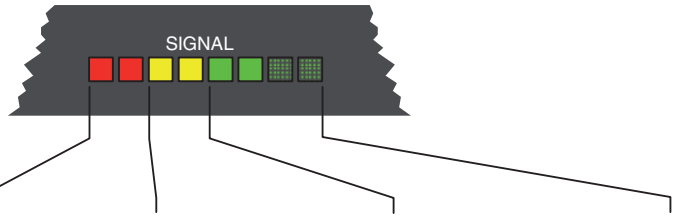
Mounting
The device is mounted using appropriate accessories, e.g., OMH-LS610-01 for wall mounting. The x-y adjuster is delivered preassembled. It is fixed in the required beam direction (±90° rotation possible) on the mounting bracket.

Characteristic Curve

Characteristic response curve



Indication



Signal display	Red area	Yellow area (at least one LED)	Green area (at least one LED)
Status	Weak signal	Sufficient excess gain	Signal with excess gain weak signal output active
Transmission	Blocked	Released	Transmission with excess gain

Function Principle

The LS684-DA-EN is a device for serial data transfer in Ethernet systems. One F1 and one F2 device is needed for each data transfer link. Data is transferred in both directions simultaneously by means of modulated light.

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