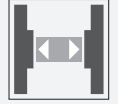


# Optical data coupler LS684-DA-EN/F2/146



- Independent of Ethernet protocol
- Optimized for real-time Ethernet such as PROFINET IRT and EtherCAT
- TCP/IP, PROFINET, PROFI-safe, 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, red light, 100 Mbit/s data rate, M12 plug



ETHERNET



EtherNet/IP™



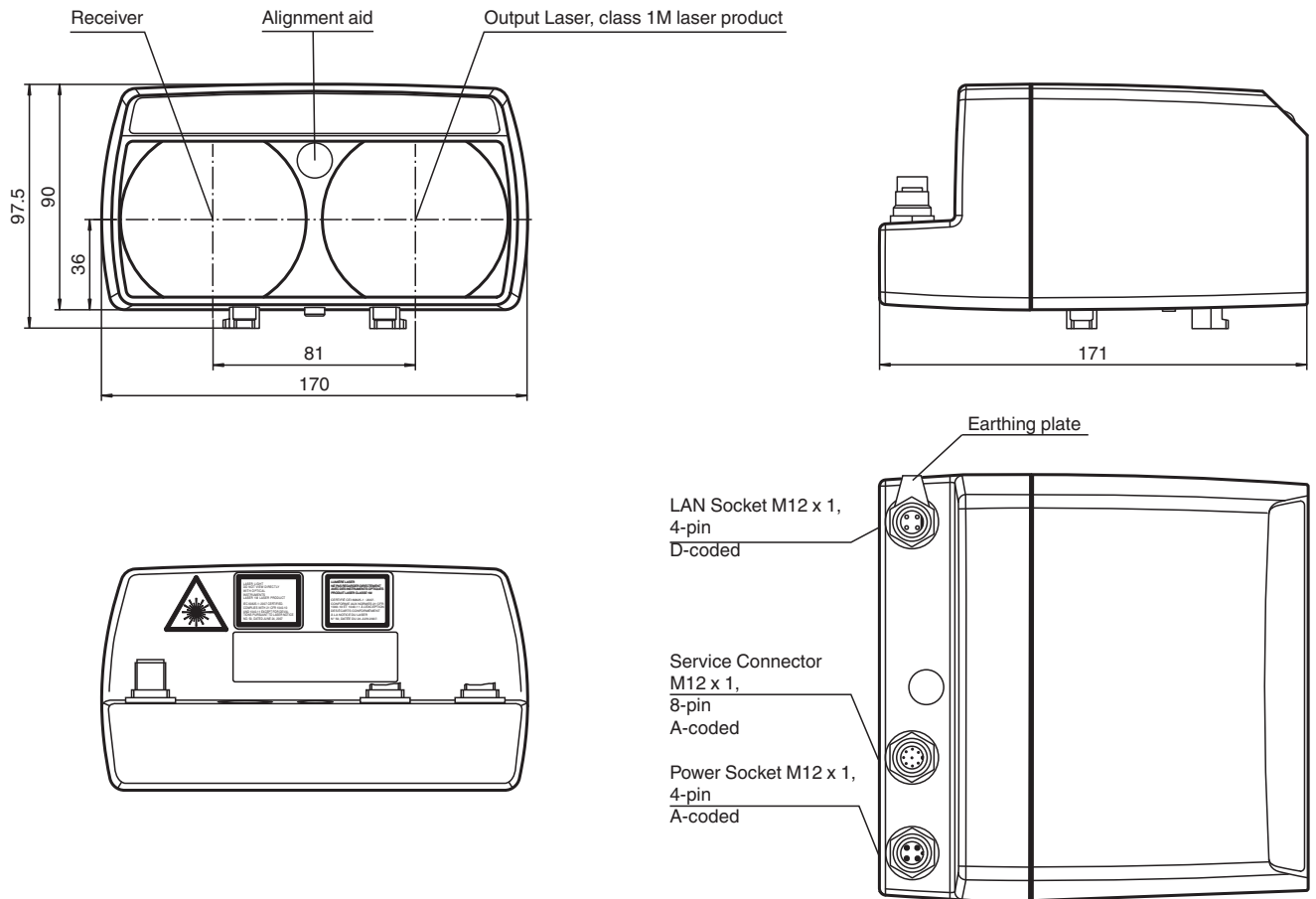
## Function

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.

## Dimensions



## Technical Data

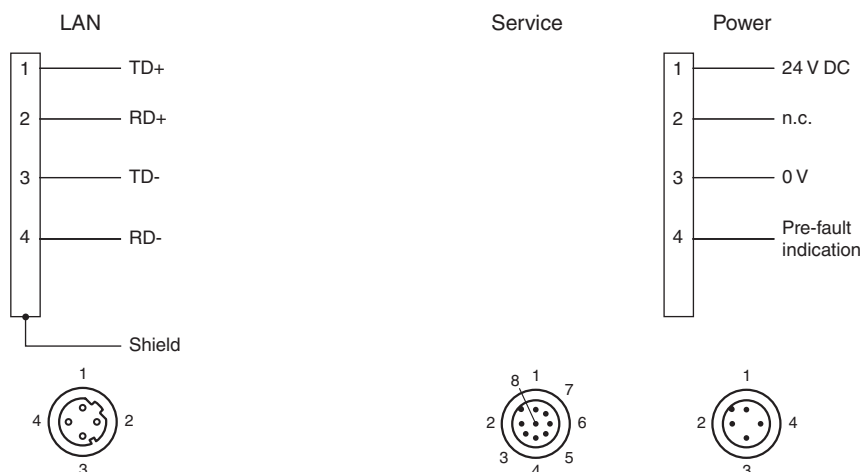
### General specifications

Effective detection range	0 ... 150 m
Threshold detection range	180 m
Light source	laser diode
Light type	modulated visible red light
Laser nominal ratings	
Note	VISIBLE LASER RADIATION , DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS
Laser class	1M
Wave length	660 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
<b>Functional safety related parameters</b>	
MTTF <sub>d</sub>	58.6 a
Mission Time (T <sub>M</sub> )	10 a
Diagnostic Coverage (DC)	0 %
<b>Indicators/operating means</b>	

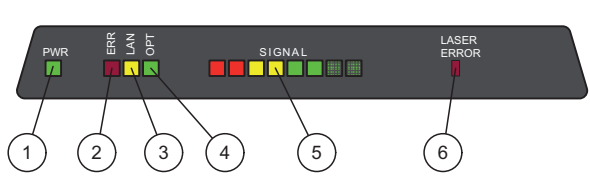
## Technical Data

Data flow indicator		LED green: OPTO-Link LED yellow: LAN-Link LED red: ERROR
Function indicator		Signal strength (8 LED: Red, yellow, green)
<b>Electrical specifications</b>		
Operating voltage	$U_B$	18 ... 30 V DC
No-load supply current	$I_0$	200 mA
Data rate		100 MBit/s (Fast Ethernet)
Signal delay		2.9 $\mu$ s (across the entire effective operating distance)
<b>Interface</b>		
Interface type		100 BASE-TX
<b>Output</b>		
Stability alarm output		1 PNP, inactive when falling short of the stability control , short-circuit protected, max. 200 mA
<b>Conformity</b>		
Laser safety		EN 60825-1:2007
<b>Approvals and certificates</b>		
UL approval		cULus Listed
FDA approval		IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
<b>Ambient conditions</b>		
Ambient temperature		-30 ... 50 °C (-22 ... 122 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP65
Material		
Housing		ABS / PC
Optical face		plastic
Mass		700 g

## Connection Assignment

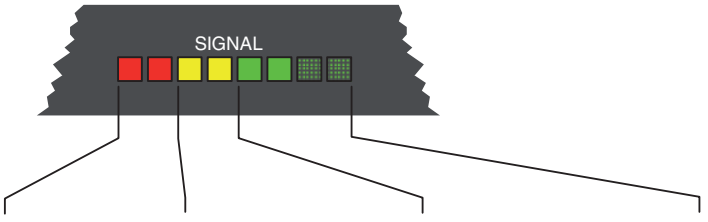


## Assembly



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

## 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

## Installation

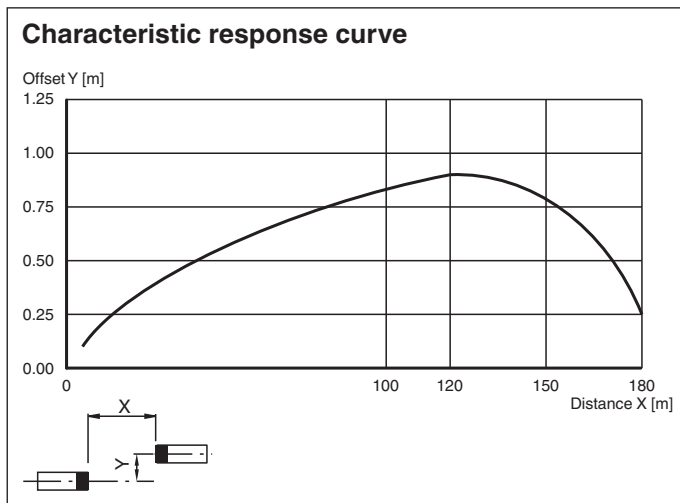
**Function Indicator/Operating Reserve**

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**

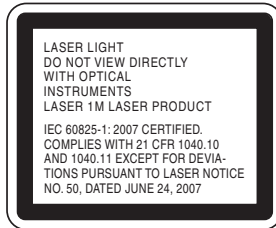
The device is mounted using appropriate accessories, e.g., OMH-LS610-01 for wall mounting. The x-y adjuster is delivered preassembled. It is fixed in the required beam direction ( $\pm 90^\circ$  rotation possible) on the mounting bracket.

## Characteristic Curve



Release date: 2023-07-24 Date of issue: 2023-07-24 Filename: 309510\_eng.pdf

## Safety Information



## Safety Information





### Laser Class 1M Information

- The irradiation can lead to irritation especially in a dark environment. Do not point at people!
- Caution: laser light, do not observe laser light with optical instruments such as magnifying glasses, microscopes, telescopes or binoculars.
- Maintenance and repairs should only be carried out by authorized service personnel!
- Attach the device so that the warning is clearly visible and readable.
- Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## 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.

## Accessories

	OMH-LS610-01	Mounting bracket for optical data coupler
	OMH-LS610-01	Mounting bracket for optical data coupler
	OMH-LS610-02	Direct mounting set consisting of 4 x M4 threaded inserts
	OMH-LS610-03	Mounting bracket with deviation mirror for optical data coupler