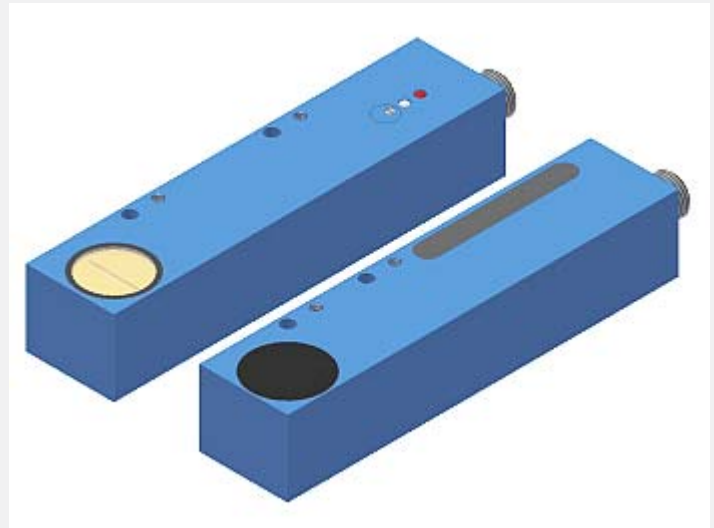


D-LAS Series

► D-LAS-24/90-...

- Collimated laser beam (<0.4 mW, 670 nm), **laser class 1**
- Measuring range up to 16 mm
- Analog output 0V...+10V
- Switching output (npn- and pnp compatible)
- Switching state indication by means of yellow-green LED
- Dirt accumulation indication by means of red LED
- Gain adjustable via 3- revolutions potentiometer
- Optics cover made of glass
- Sturdy aluminum housing
- Available with dynamic output (pulse length 10 ms)



Design

Product name:

- Transmitter:** D-LAS-24/90-(aperture)*-T
Receiver: D-LAS-24/90-Q-(aperture)*-R
 D-LAS-24/90-Qinv-(aperture)*-R
 D-LAS-24/90-TC-Q-(aperture)*-R
 D-LAS-24/90-TC-Qinv-(aperture)*-R
 D-LAS-24/90-D-Q-(aperture)*-R
 D-LAS-24/90-D-Qinv-(aperture)*-R
 D-LAS-24/90-DTC-Q-(aperture)*-R
 D-LAS-24/90-DTC-Qinv-(aperture)*-R

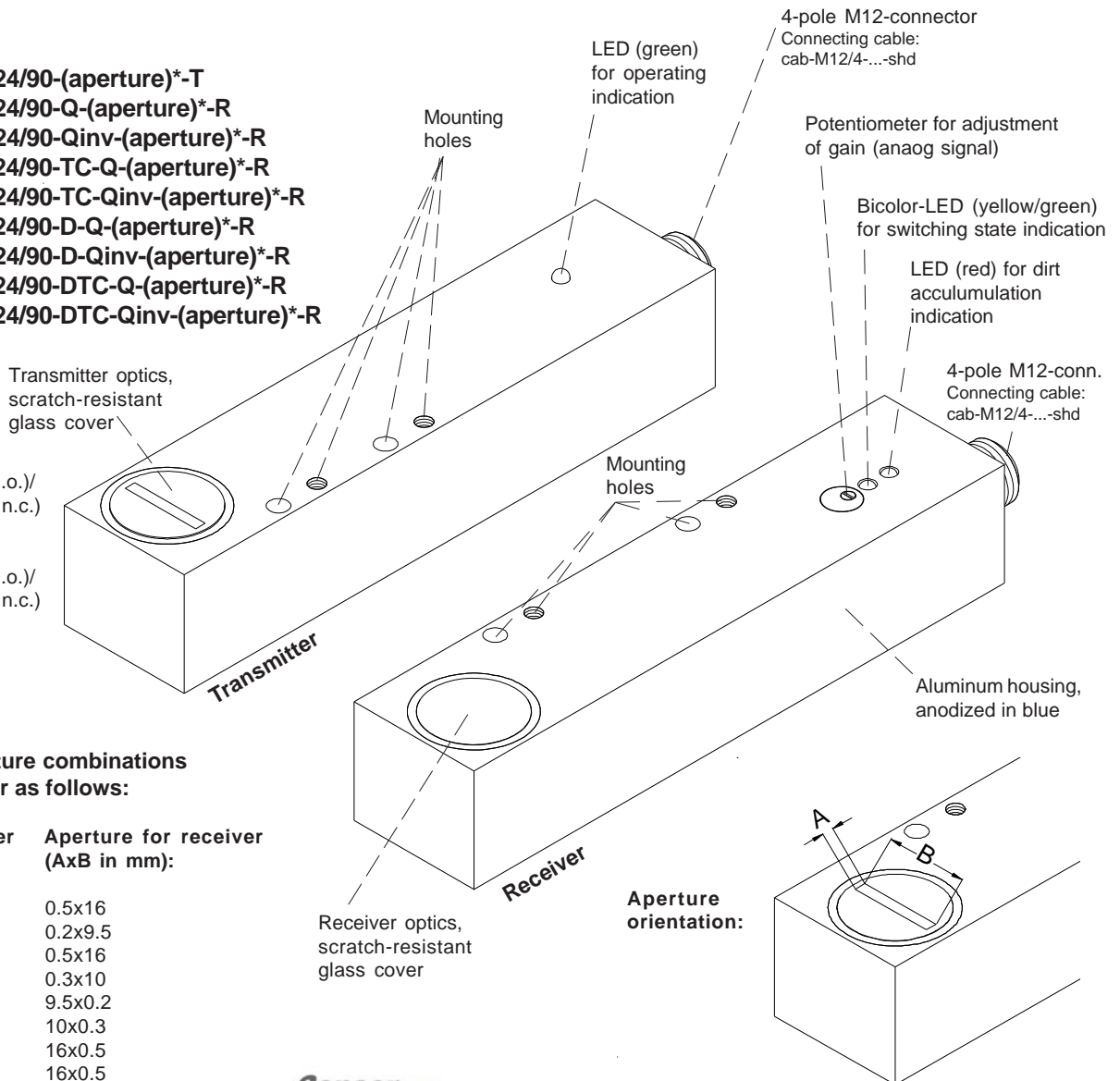
Q = Switching output:
 npn dark-switching (npn n.o.)/
 pnp bright-switching (pnp n.c.)

Qinv = Switching output:
 pnp dark-switching (pnp n.o.)/
 npn bright-switching (npn n.c.)

D = Dynamic output with
 pulse length 10 ms
 TC = Threshold correction

***We recommend aperture combinations for transmitter/receiver as follows:**

Aperture for transmitter (AxB in mm):		Aperture for receiver (AxB in mm):	
1x16	and	0.5x16	
1.5x9.5	and	0.2x9.5	
2x16	and	0.5x16	
2x10	and	0.3x10	
9.5x1.5	and	9.5x0.2	
10x2	and	10x0.3	
16x1	and	16x0.5	
16x2	and	16x0.5	



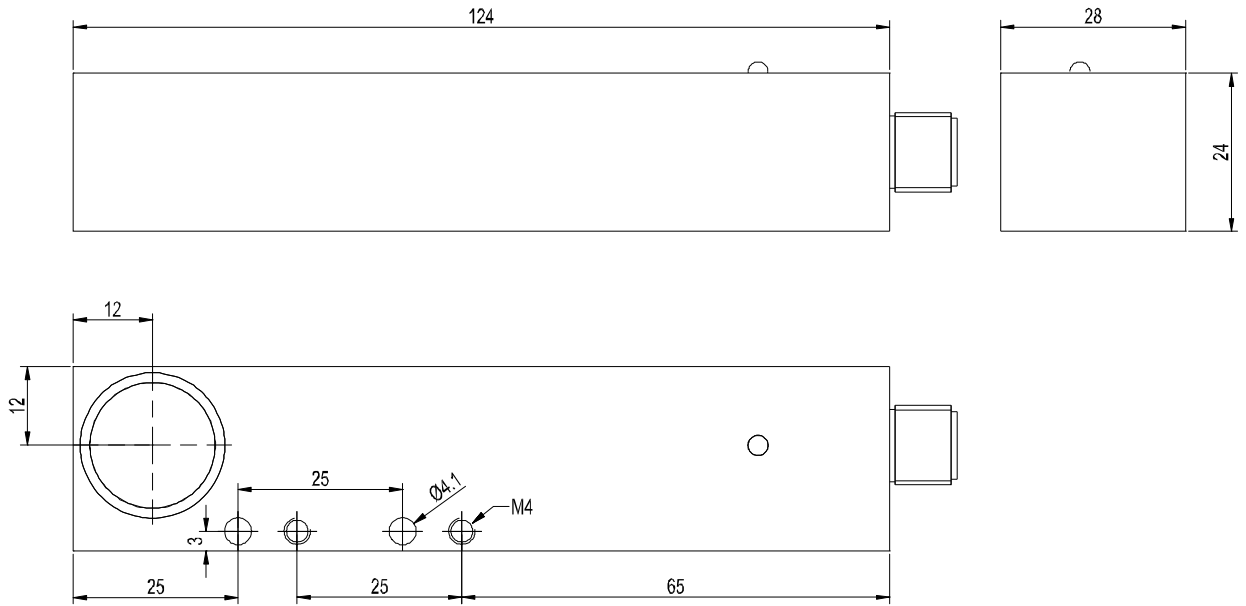


Technical Data

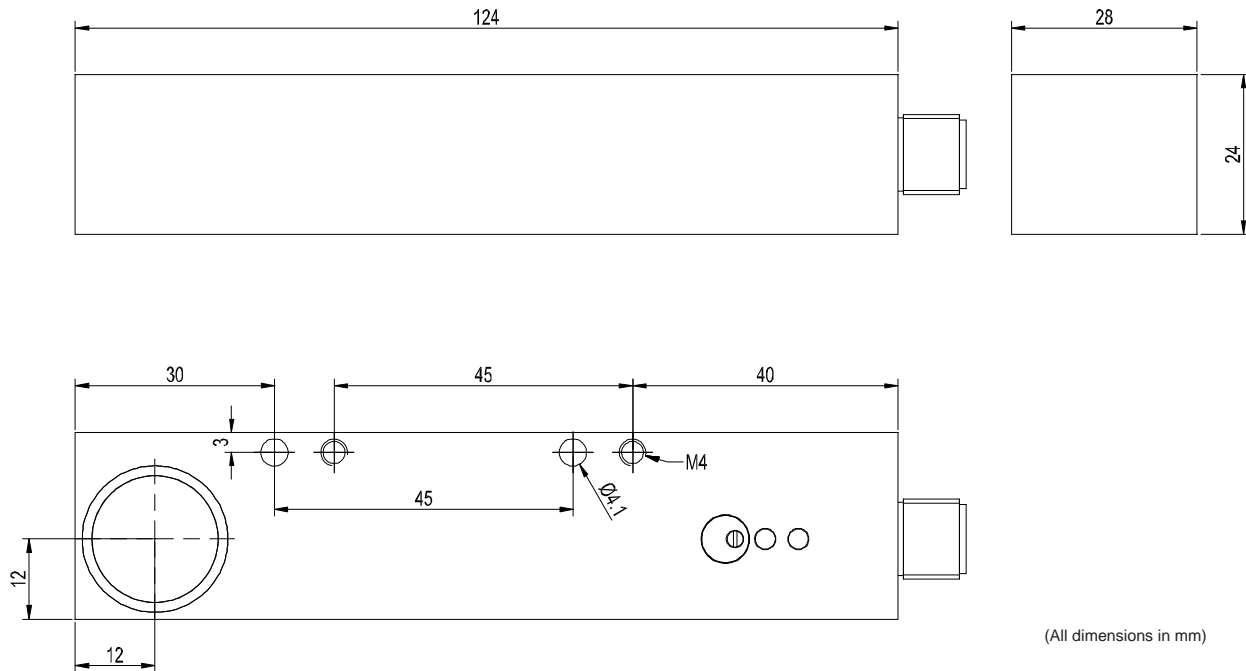
Type	D-LAS-24/90-...
Laser	Solid state laser, 670 nm, AC operation, 0.4 mW max. optical output, laser class 1 acc. to DIN EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.
Max. range	typ. 5 m (depends on the aperture used)
Min. detectable object	With aperture size up to 10 mm: Analog typ. 1% of aperture size, digital typ. 0.5% of aperture size, with aperture size 16 mm: Analog typ. 0.5% of aperture size, digital typ. 0.2% of aperture size
Reproducibility	With aperture size up to 10 mm: Analog typ. 1% of aperture size, digital typ. 0.5% of aperture size, with aperture size 16 mm: Analog typ. 0.5% of aperture size, digital typ. 0.2% of aperture size, with threshold correction "TC": typ. 0.1% of aperture size
Optical filter	Interference filter + polarisation filter
Threshold correction	with type "TC"
Voltage supply	+24VDC ($\pm 10\%$), protected against polarity reversal, overload protected
Alternating current/ direct current supply	AC operation (100 kHz)
Ambient light	up to 5000 Lux (depends on the aperture used)
Sensitivity	Switching threshold lies at 50% (5V), with-type "TC" at 97%
Gain (analog signal)	adjustable via integrated potentiometer (3 revolutions)
Current consumption	Transmitter: typ. 60 mA Receiver: typ. 30 mA
Aperture size (mm)	Transmitter: 16x2, 16x1, 10x2, 9.5x1.5 Receiver: 16x0.5, 10x0.3, 9.5x0.2
Current control input I-CONTROL	0V...+5V: laser power decreases linearly with increasing voltage (max. modulation frequency: 2 kHz) +5V...+32V: laser OFF
Analog output	0V...+10V (typ. 100 kHz band width)
Digital output	Q (npn dark-switching / pnp bright-switching) or Qinv (pnp dark-switching / npn bright-switching) additionally available: Dynamic output (type D) with pulse length 10 ms
Enclosure rating	IP67
Operating temperature range	-20°C ... +50°C
Storage temperature range	-20°C ... +85°C
Housing material	Aluminum, anodized in blue
Housing dimensions	Transmitter respectively receiver: approx. 124 mm x 28 mm x 24 mm
Type of connector	M12, 4-pole
Max. switching current	100 mA, short-circuit protected
EMC test acc. to	DIN EN 60947-5-2
Switching state indication	via integrated yellow/green LED (receiver housing)
Dirt accumulation indication	via integrated red LED (receiver housing)
Operating indication	via integrated green LED (transmitter housing)
Switching frequency	typ. 25 kHz
Linearity	depends on the aperture: with 16mm-aperture: typ. 2%, with 10mm-aperture: typ. 1%, with 5mm-aperture: typ. 0.3%

Dimensions

D-LAS-24/90-...-T
(transmitter):



D-LAS-24/90-...-R
(receiver):



(All dimensions in mm)

Laser Information

The laser transmitters of D-LAS series comply with laser class 1 according to EN 60825-1. Under reasonably foreseeable conditions a class 1 laser is safe. The reasonably foreseeable conditions are kept during specified normal operation. The use of these laser transmitters therefore requires no additional protective measures.

The laser transmitters of D-LAS series are supplied with an information label „CLASS 1 Laser Product“.

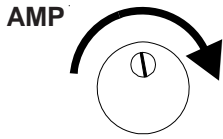
CLASS 1 Laser Product
IEC 60825-1: 2008-05
THIS LASER PRODUCT COMPLIES
WITH 21 CFR 1040 AS APPLICABLE





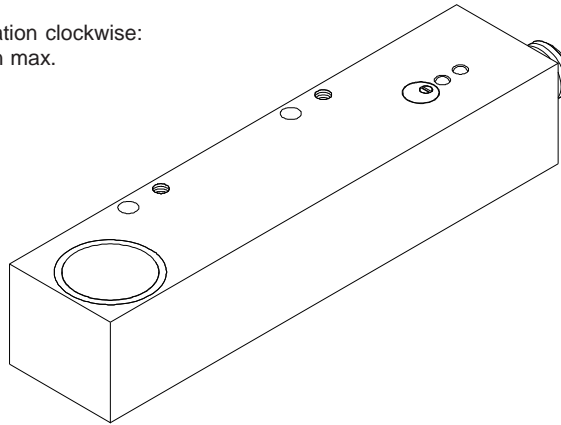
Setting

Adjustment of potentiometer (gain factor):



Rotation clockwise:
Gain max.

Receiver
D-LAS-24/90-R



Switching state indication (Bi-Color-LED):



LED yellow:
Analog voltage < switching threshold
(Crossing the threshold from a higher level to a lower level causes a change of the switching state at the digital output --> LED is switching from green to yellow)



LED green:
Analog voltage > switching threshold

Dirt accumulation indication:



LED red:
Sensor dirty

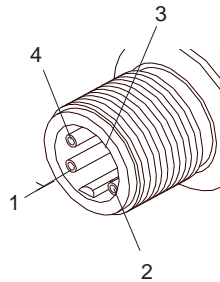


Connector Assignment

Receiver D-LAS-24/90-...-R:
(4-pin M12-connector, shielded)

Type Q (npn dark-switching / pnp bright-switching):

Pin No.:	Color:	Assignment:
1	brn	+24VDC (± 10%)
2	wht	ANALOG (0V...+10V)
3	blu	GND (0V)
4	blk	OUTPUT (in case of type D: pulse length 10 ms)
Shield		Housing



Transmitter D-LAS-24/90-...-T:
(4-pin M12-connector, shielded)

Pin No.:	Color:	Assignment:
1	brn	+24VDC (± 10%)
2	wht	I-CONTROL (0...+24V)
3	blu	GND (0V)
4	blk	GND (0V)
Shield		Housing

Type Qinv (pnp dark-switching / npn bright-switching):

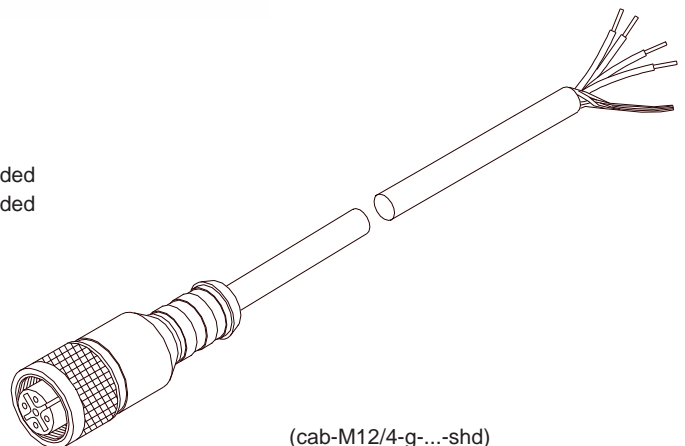
Pin No.:	Color:	Assignment:
1	brn	+24VDC (± 10%)
2	wht	ANALOG (0V...+10V)
3	blu	GND (0V)
4	blk	OUTPUT INV (in case of type D: pulse length 10 ms)
Shield		Housing



Connecting Cables

Available connecting cables:

cab-M12/4-g-2m-shd	Length: 2m	Outer jacket: PUR	shielded
cab-M12/4-g-5m-shd	Length: 5m	Outer jacket: PUR	shielded
cab-M12/4-w-2m-shd	Length: 2m	Outer jacket: PUR	angle-type, shielded
cab-M12/4-w-5m-shd	Length: 5m	Outer jacket: PUR	angle-type, shielded



(cab-M12/4-g-...-shd)