# **L-LAS** Series

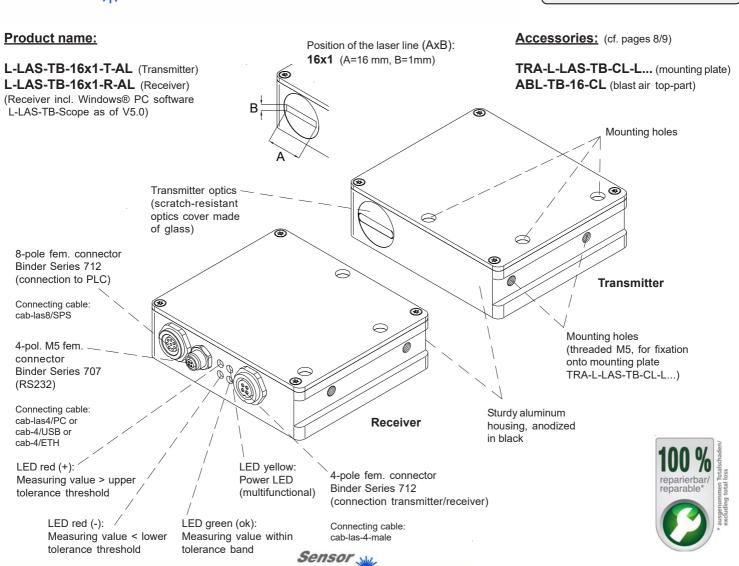
# L-LAS-TB-16x1-T-AL L-LAS-TB-16x1-R-AL

- Line laser <0.39 mW, wave length 670 nm, laser class 1
- Visible laser line, typ. 16 mm x 1 mm
- Measuring range typ. 16 mm
- Resolution up to 8 µm (depends on selected scan frequency)
- Working distance up to 2000 mm
- Integrated interference filter
- CCD line detector with 256 pixel, 2048 subpixel (8-fold)
- RS232 interface (USB or Ethernet converter is available)
- 2 digital inputs, 3 digital outputs (HIGH/LOW/GO)
- Analog output adjustable via software (0 ... +10V or 4 ... 20mA)
- Max. scan frequency selectable via software (3,3 kHz or 5 kHz)
- Multi-edge evaluation of the video signal
- Switching state indication via 4 two-color LEDs (2x red/grn, 2x yel/grn)





#### Design



Instruments





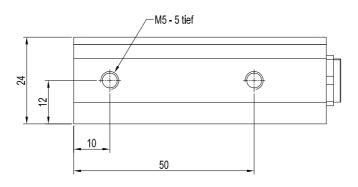
Model	L-LAS-TB-16x1-T-AL L-LAS-TB-16x1-R-AL			
_aser	Semiconductor laser, 670 nm, DC operation, < 0.39 mW max. opt. power, laser class 1 acc. to DIN EN 60825-1. The use of these laser sensors therefore requires no additional protective measures.			
Working distance	distance transmitter/receiver: up to 2000 mm			
Measuring range	typ. 16 mm			
Resolution	typ. 8 μm (Normal Speed mode), typ. 16 μm (Fast Speed mode)			
Reproducibility	typ. ± 8 µm (Normal Speed mode), typ. ± 16 µm (Fast Speed mode)			
Linearity	typ. 0.2% FSR (full scale range)			
Optical filter	Interference filter RG645			
Analog output (1x)	voltage output 0 +10V or current output 4 20mA (adjustable under Windows® via PC)			
Digital outputs (3x) (OUT0, OUT1, OUT2)	OUT0: (-) Measuring value < lower tolerance threshold OUT1: (+) Measuring value > upper tolerance threshold OUT2: (ok) Measuring value within tolerance window pnp bright-switching/npn dark-switching or pnp dark-switching/npn bright-switching, adjustable under Windows®, 100 mA, short-circuit proof			
Digital inputs (2x) (IN0, IN1)	IN0: Extern trigger, IN1: Teach/Reset (double function) input voltage +Ub/0V, with protective circuit			
Voltage supply	+24VDC (± 10%)			
Sensitivity setting	under Windows® via PC			
Laser power correction	adjustable under Windows® via PC			
Current consumption	typ. 200 mA			
Enclosure rating	electronics: IP54, optics: IP67			
Operating temperature range	-10°C +50°C			
Storage temperature range	-20°C +85°C			
Housing material	aluminum, anodized in black			
Housing dimensions	Transmitter: LxWxH approx. 80 mm x 70 mm x 24 mm (without flange connectors) Receiver: LxWxH approx. 80 mm x 70 mm x 24 mm (without flange connectors)			
Connectors receiver	8-pole circular female connector type Binder 712 (PLC/Power) 4-pole M5 circular female connector type Binder 707 (RS232/PC) 4-pole circular female connector type Binder 712 (connection to transmitter)			
Connector transmitter	4-pole circular female connector type Binder 712 (connection to receiver)			
LED display	LED red (+): measuring value > upper tolerance threshold LED green (ok): measuring value within tolerance window LED red (-): measuring value < lower tolerance threshold LED yellow: multifunctional			
EMC test acc. to	DIN EN 60947-5-2			
Scan frequency	Normal Speed mode (high resolution): max. 3,3 kHz Fast Speed mode (half resolution): max. 5 kHz adjustable under Windows®			
Max. switching current	100 mA, short-circuit proof			
Interface	RS232, parameterisable under Windows®			
Connecting cables	Connection to PC: cab-las4/PC or cab-4/USB or cab-4/ETH Connection to PLC: cab-las8/SPS or cab-las8/SPS-w Connecting cable transmitter/receiver: cab-las4-male			
Output polarity	Bright/dark switching, can be switched under Windows®			

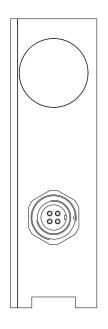


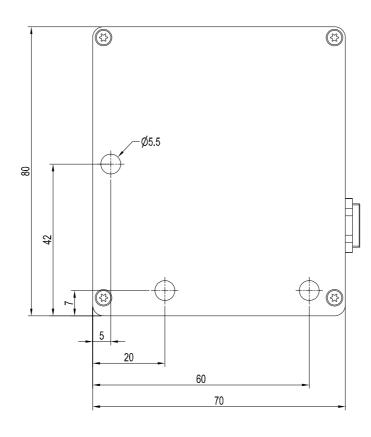


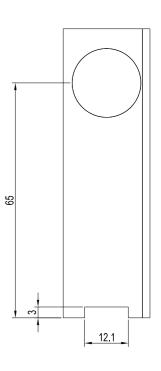
# **Dimensions**

# L-LAS-TB-16x1-T-AL (Transmitter)











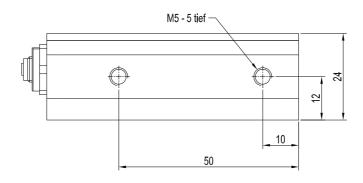
All dimensions in mm

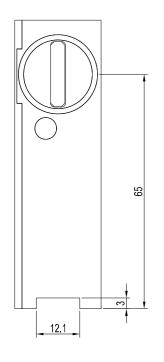


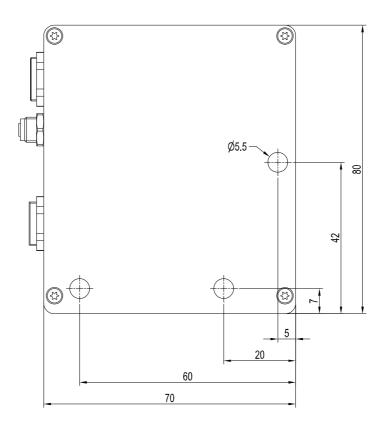


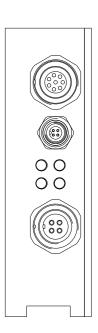
# **Dimensions**

## L-LAS-TB-16x1-R-AL (Receiver)











All dimensions in mm





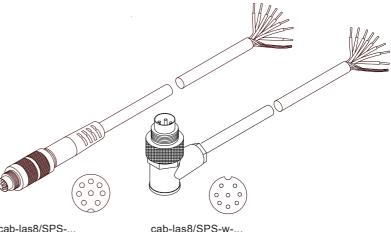
# **Connector Assignment**

## Connection L-LAS-TB-16x1-R-AL (Receiver) to PL( 8-pole fem. connector Binder Series 712

Pin: Color: Assignment: GND (0V) white 1 2 brown +24VDC (± 10%) IN0 (EXT TRIGGÉR) 3 areen IN1 (TEACH/RESET) 4 yellow OUTO (-) 5 grey 6 OUT1(+) pink OUT2 (ok) blue 8 ANA (voltage 0...+10V or current 4...20mA) red

Connecting cable:

cab-las8/SPS-(length) or cab-las8/SPS-w-(length) (angle type 90°) (standard length 2m)



cab-las8/SPS-... (max. length 25m, outer jacket: PUR) cab-las8/SPS-w-.. (max. length 25m, outer jacket: PUR)

#### Connection L-LAS-TB-16x1-R-AL (Receiver) to PC: 4-pole fem. connector Binder Series 707

Pin: Assignment:

+24VDC (+Ub, OUT)

GND (0V) 2 3 RxD TxD

4

#### Connection via RS232 interface at the PC:

Connecting cable: cab-las4/PC-(length) cab-las4/PC-w-(length) (angle type 90°) (standard length 2m)

#### alternative:

#### Connection via USB interface at the PC:

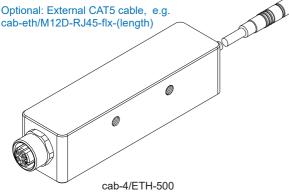
USB converter (incl. driver software): cab-4/USB-(length) cab-4/USB-w-(length) (angle type 90°) (standard length 2m)

#### alternative:

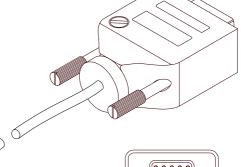
#### Connection to local network via Ethernet bus:

Ethernet converter (incl. software "SensorFinder"): cab-4/ETH-500 (standard length 0.5m)



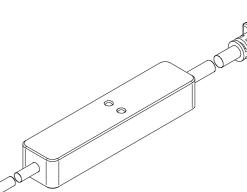


(length 0.5m, outer jacket: PUR) 4-pole M12 fem. conn. (D-coded) for connection of an external CAT5 cable, e.g. cab-eth/M12D-RJ45-flx-(length)





cab-las4/PC-... (max. length 10m, outer jacket: PUR) or cab-las4/PC-w-... (no picture) (max. length 5m, outer jacket: PUR)





cab-4/USB-... or cab-4/USB-w-... (no picture) (each max. length 5m, outer jacket: PUR)





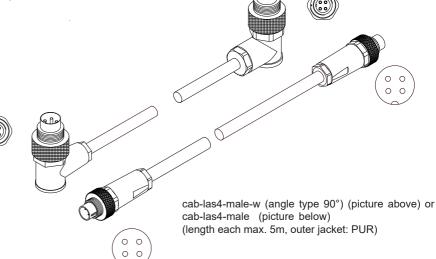
# **Connector Assignment**

# Connection L-LAS-TB-16x1-T-AL (Transmitter) with L-LAS-TB-6x1-R-AL (Receiver) 4-pole female connector Binder Series 712

Pin: Assignment:

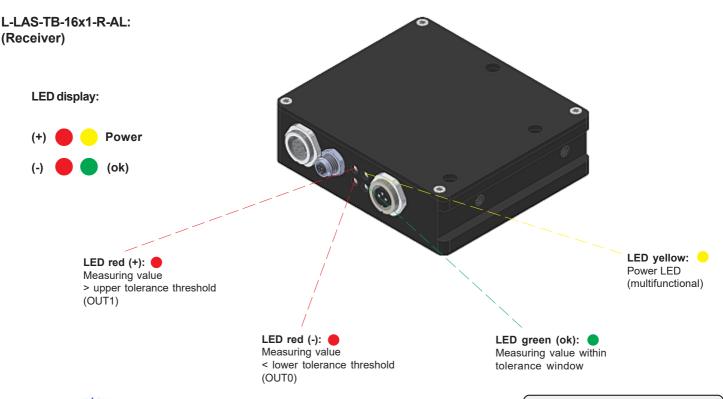
- 1 +5VDC
- 2 0V (GND)
- 3 I-CONTROL (0V ... +5V)
- 4 not connected

Connecting cable: cab-las4-male-(length) cab-las4-male-w-(length) (angle type 90°) (standard length 2m)





# **LED Display**





#### **Laser Information**

The laser transmitters of L-LAS-TB 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 L-LAS-TB series series are supplied with an information label "CLASS 1 Laser Product".



Class 1 Laser Product IEC 60825-1: 2014 P<0.39 mW; λ=670 nm

COMPLIES WITH 21 CFR 1040.10 AND 1040.11 EXCEPT FOR CONFORMANCE WITH IEC 60825-ED. 3, AS DESCRIBED IN LASER NOTICE NO. 56, DATED MAY 8, 2019.





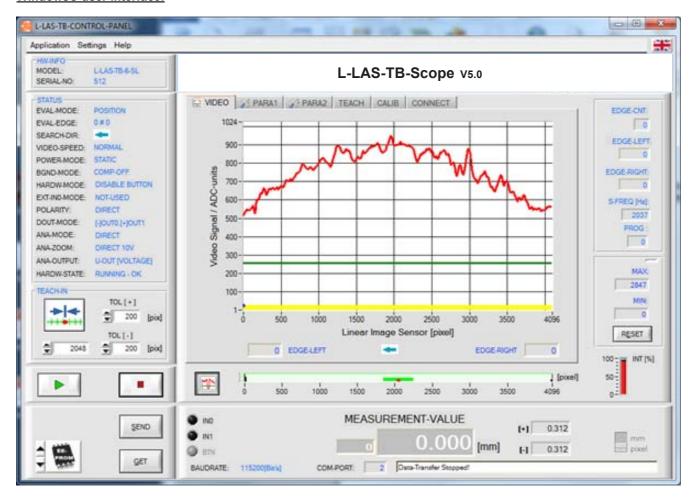
#### **Parameterization**

#### Windows® user interface:

(The current software version is available for download on our website.)

The L-LAS-TB-...-AL sensor can be easily parameterised with the Windows® user interface L-LAS-TB-Scope (as of V5.0). For this purpose the sensor is connected to the PC with the serial interface cable cab-las4/PC (or cab-4/USB or cab-4/ETH). When parameterisation is finished, the PC can be disconnected again.

#### Windows® user interface:



With the help of the L-LAS-TB-Scope software the following settings can be made at the sensor:

- Setting of laser power and type of automatic power correction
- Polarity of digital outputs
- Different evaluation modes
- Start of the teach process by software button
- Setting of tolerance ranges for monitoring the measured value
- Selection of scan frequency

Furthermore, various numerical and graphical measured quantities can be visualized with the L-LAS-TB-Scope software. For example, the raw data of the CCD line sensor can be displayed graphically and numerically.



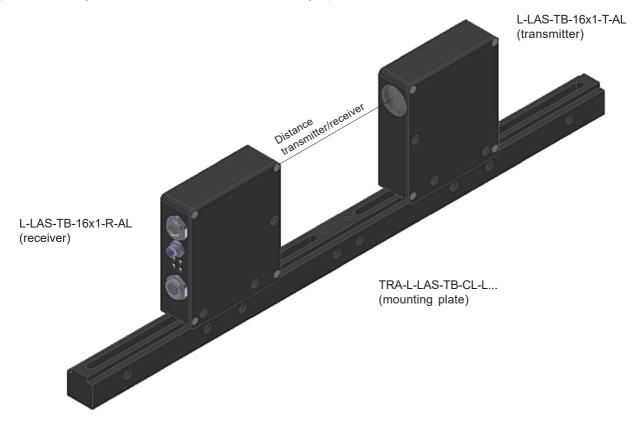


# **Mounting**

#### Mounting plate for L-LAS-TB-16x1-T-AL and L-LAS-TB-16x1-R-AL:

(please order separately)

TRA-L-LAS-TB-CL-L200 (total length 200 mm, max. transmitter/receiver distance cf. chart below)
TRA-L-LAS-TB-CL-L400 (total length 400 mm, max. transmitter/receiver distance cf. chart below)
TRA-L-LAS-TB-CL-L600 (total length 600 mm, max. transmitter/receiver distance cf. chart below)
TRA-L-LAS-TB-CL-L800 (total length 800 mm, max. transmitter/receiver distance cf. chart below)
(Aluminum housing, anodized in black, also available in other lengths)



Max. distance T/R in case of use of mounting plate:	TRA-L-LAS-TB-CL-	TRA-L-LAS-TB-CL-	TRA-L-LAS-TB-CL-	TRA-L-LAS-TB-CL-
	L200	L400	L600	L800
L-LAS-TB-6-T-AL	max. distance T/R:	max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-6-R-AL	95 mm	295 mm	495 mm	695 mm
L-LAS-TB-16x1-T-AL	max. distance T/R:	max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-16x1-R-AL	60 mm	260 mm	460 mm	660 mm
L-LAS-TB-28-T-AL		max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-28-R-AL		222 mm	422 mm	622 mm
L-LAS-TB-50-T-AL		max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-50-R-AL		205 mm	405 mm	605 mm
L-LAS-TB-75-T-AL		max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-75-R-AL		200 mm	400 mm	600 mm
L-LAS-TB-100-T-AL		max. distance T/R:	max. distance T/R:	max. distance T/R:
L-LAS-TB-100-R-AL		160 mm	360 mm	560 mm



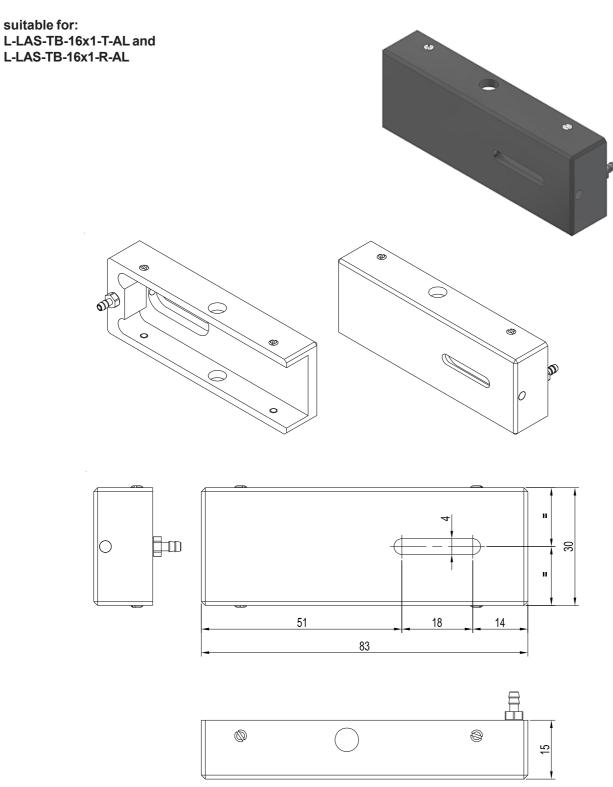


## **Accessories**

#### Blast air top part:

#### ABL-TB-16-CL

(Plastic housing, black, please order separately for each transmitter and receiver)



All dimensions in mm

