# L-LAS Series

## L-LAS-TB-F-(16)-100/100-AL

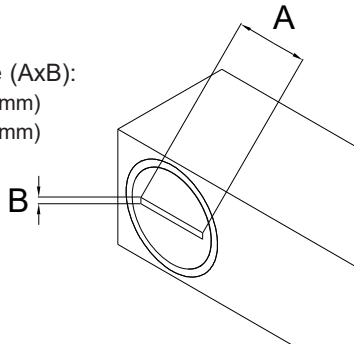
- Line laser <0.39 mW, wave length 670 nm, laser class 1
- Visible laser line, typ. 16 mm x 1 mm
- Measuring range typ. 16 mm
- Resolution typ. 8 µm (depends on selected scan frequency)
- ransmitter/receiver distance 100 mm (fork width)
- Integrated interference filter
- CCD line detector with 256 pixel, 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)
- Switching state indication via 4 two-color LEDs (2x red/grn, 2x yel/grn)
- Sturdy aluminum housing, anodized in black
- Scratch-resistant optics cover made of glass

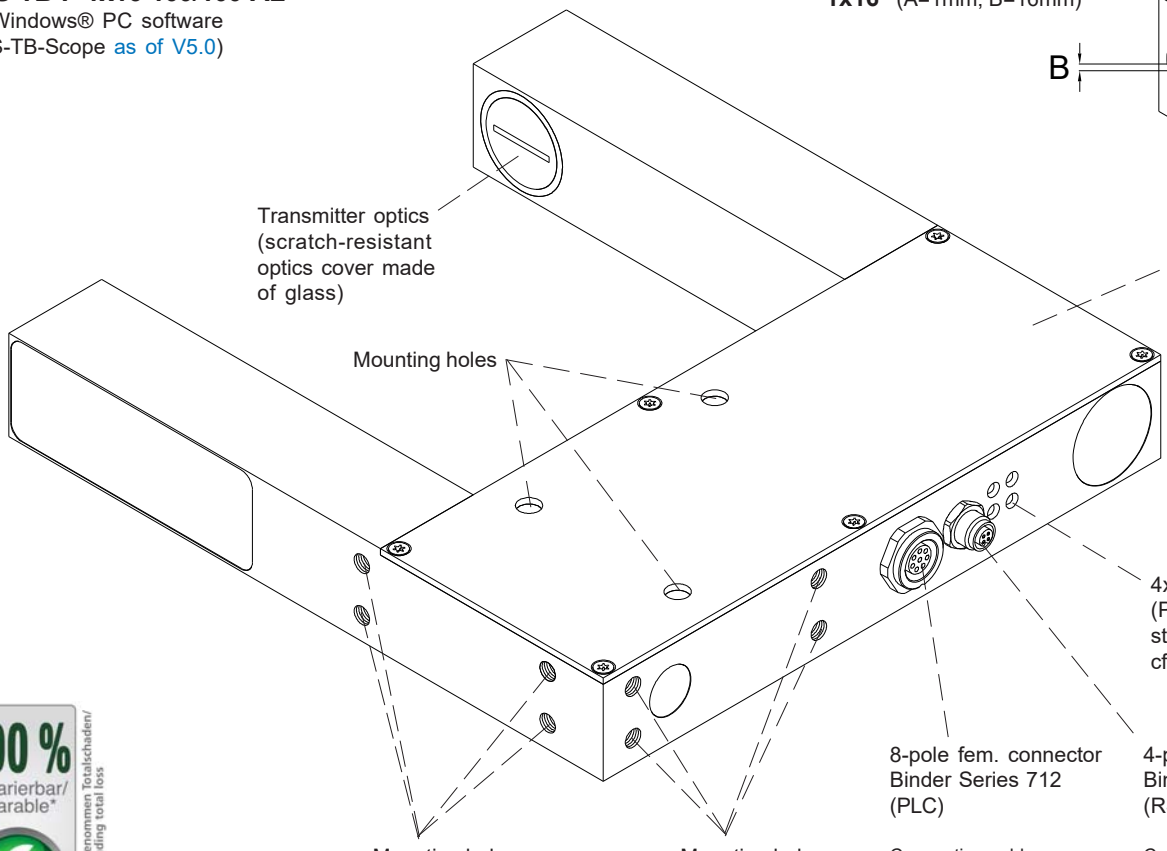
## Design

**Product name:**

**L-LAS-TB-F-16x1-100/100-AL**
**L-LAS-TB-F-1x16-100/100-AL**
(incl. Windows® PC software
L-LAS-TB-Scope as of V5.0)

Position of laser line (AxB):
**16x1** (A=16mm, B=1mm)
**1x16** (A=1mm, B=16mm)



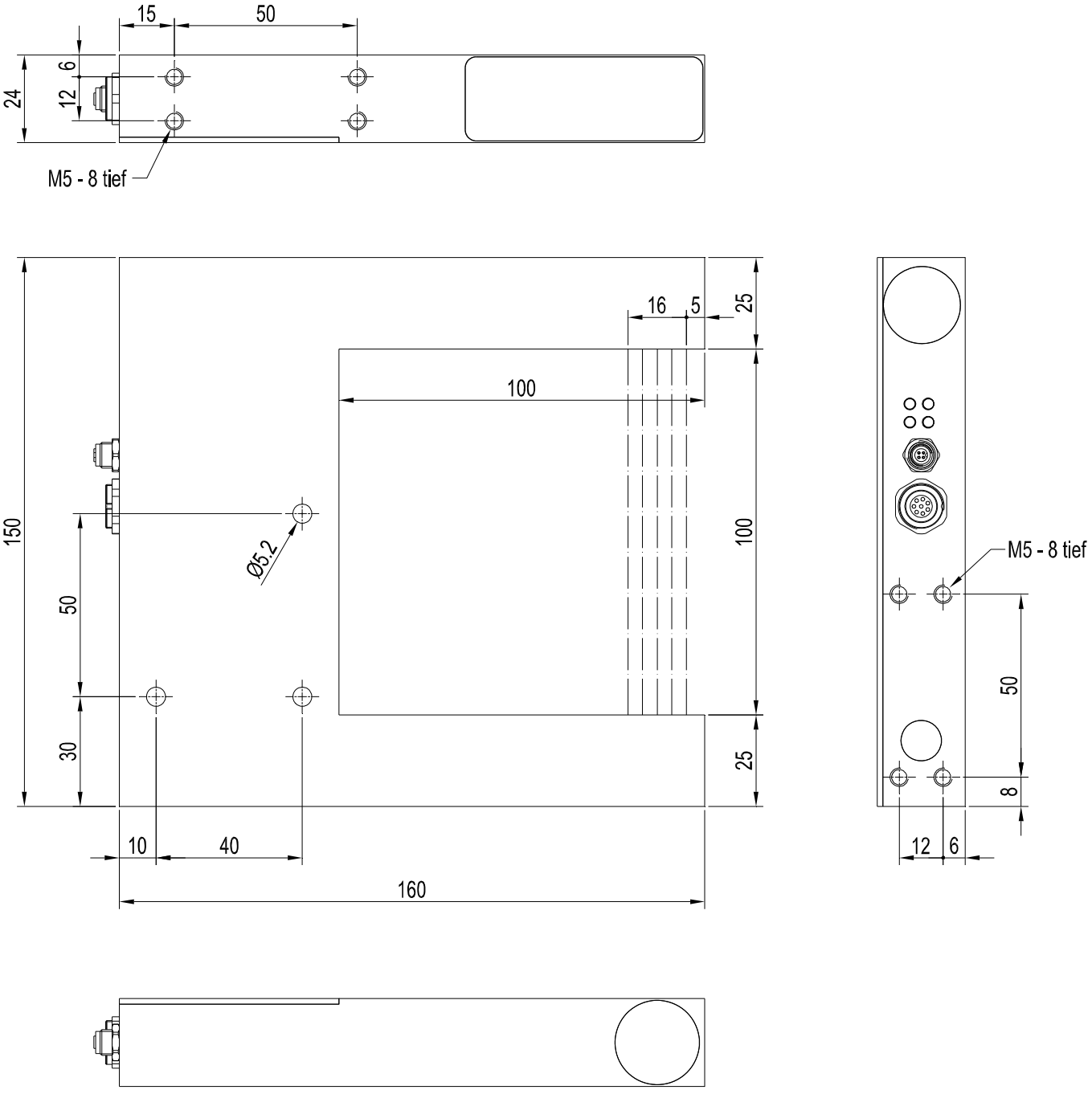




100 % reparierbar/ reparable*
* ausgenommen Totalschaden/ excluding total loss

## Technical Data

| **Model** | **L-LAS-TB-F-16x1-100/100-AL**<br>**L-LAS-TB-F-16x1-100/100-AL** |
|---|---|
| Laser | 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: 100 mm (= fork width) |
| 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 |
| Analog output (1x) | voltage output 0 ... +10V or current output 4 ... 20mA<br>(adjustable under Windows® via PC) |
| Digital outputs (3x)<br>(OUT0, OUT1, OUT2) | OUT0: (-) Measuring value < lower tolerance threshold<br>OUT1: (+) Measuring value > upper tolerance threshold<br>OUT2: (ok) Measuring value within tolerance window<br>pnp bright-switching/npn dark-switching or pnp dark-switching/npn bright-switching,<br>adjustable under Windows®, 100 mA, short-circuit proof |
| Digital inputs (2x)<br>(IN0, IN1) | IN0: Extern trigger, IN1: Teach/Reset (double function)<br>input voltage +Ub/0V, with protective circuit |
| Voltage supply | +24VDC (± 10%) |
| Sensitivity setting | adjustable under Windows® via PC |
| Laser power correction | adjustable under Windows® via PC |
| Current consumption | typ. 120 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 | LxWxH approx. 160 mm x 150 mm x 24 mm (without flange connectors) |
| Connectors | 8-pole circular female connector type Binder 712 (PLC/Power)<br>4-pole M5 circular female connector type Binder 707 (RS232/PC) |
| LED display | LED red (+): measuring value > upper tolerance threshold<br>LED green (ok): measuring value within tolerance window<br>LED red (-): measuring value < lower tolerance threshold<br>LED yellow: multifunctional |
| EMC test acc. to | DIN EN 60947-5-2 CE |
| Scan frequency | Normal Speed mode (high resolution): max. 3,3 kHz<br>Fast Speed mode (half resolution): max. 5 kHz<br>can be switched 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<br>connection to PLC: cab-las8/SPS or cab-las8/SPS-w |
| Output polarity | bright/dark switching, can be switched under Windows® |

## Dimensions



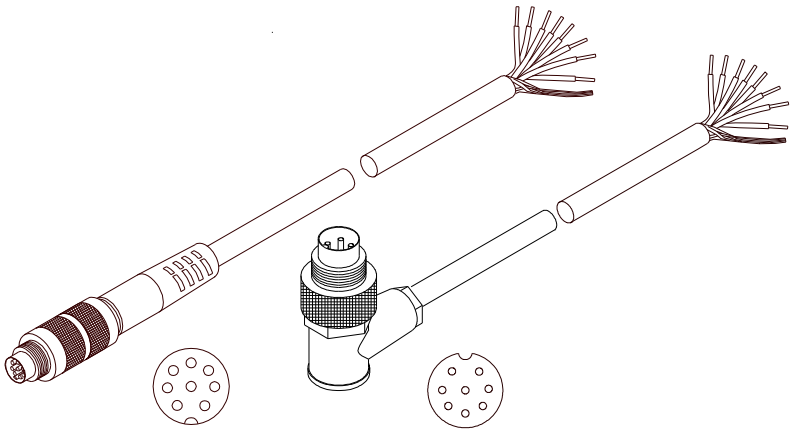

All dimensions in mm

## Connector Assignment

### Connection to PLC:
**8-pole fem. connector Binder Series 712**

| Pin: | Color: | Assignment: |
|---|---|---|
| 1 | white | GND (0V) |
| 2 | brown | +24VDC (± 10%) |
| 3 | green | IN0 (EXT TRIGGER) |
| 4 | yellow | IN1 (TEACH / RESET) |
| 5 | grey | OUT0 (-) |
| 6 | pink | OUT1 (+) |
| 7 | blue | OUT2 (ok) |
| 8 | red | ANA (voltage 0...+10V or current 4...20mA) |

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 to PC:
**4-pole fem. connector Binder Series 707**

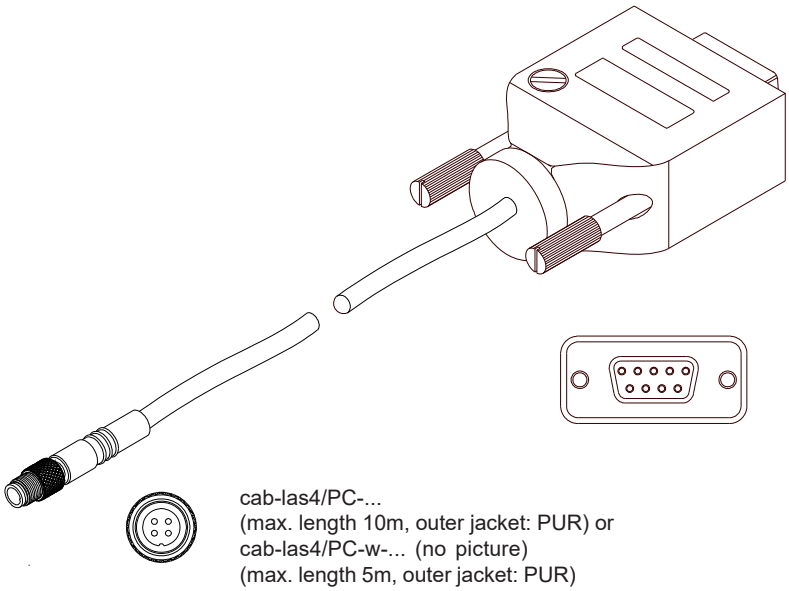
| Pin: | Assignment: |
|---|---|
| 1 | +24VDC (+Ub, OUT) |
| 2 | GND (0V) |
| 3 | RxD |
| 4 | TxD |

***Connection via RS232 interface at the PC:***
Connecting cable:
cab-las4/PC-(length)
cab-las4/PC-w-(length) (angle type 90°)
(standard length 2m)

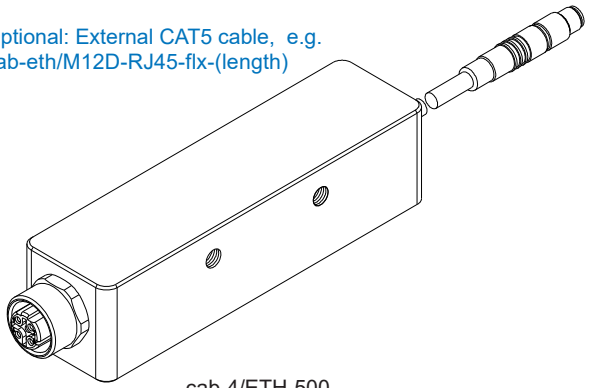
***alternative:***
***Connection via USB interface at the PC:***
USB converter (incl. driver software):
cab-4/USB-(length)
cab-4/USB-w-(length) (angle type 90°)
(standard length 2m)

***alternative:***
***Connection to local network via Ethernet bus:***
Ethernet converter (incl. software „SensorFinder“):
cab-4/ETH-500
(standard length 0.5m)

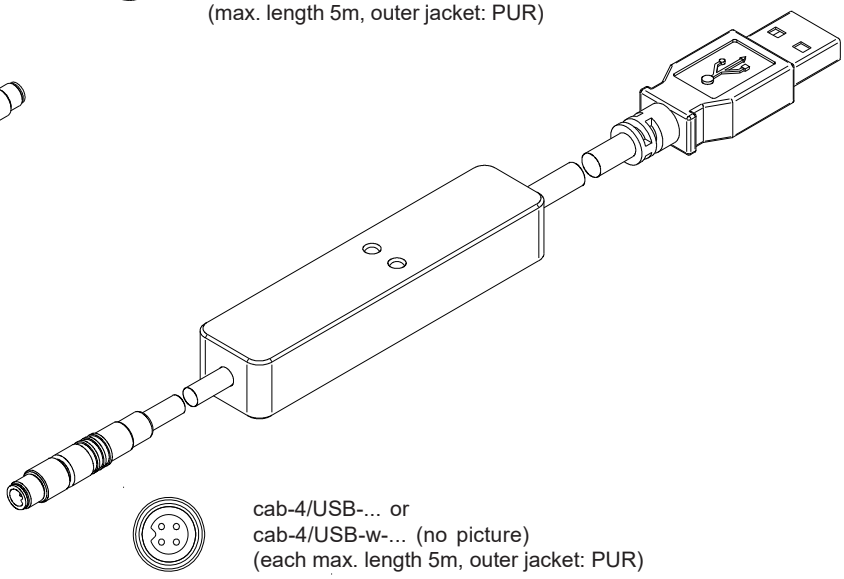
Optional: External CAT5 cable, e.g.
cab-eth/M12D-RJ45-flx-(length)



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



cab-4/ETH-500
(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)



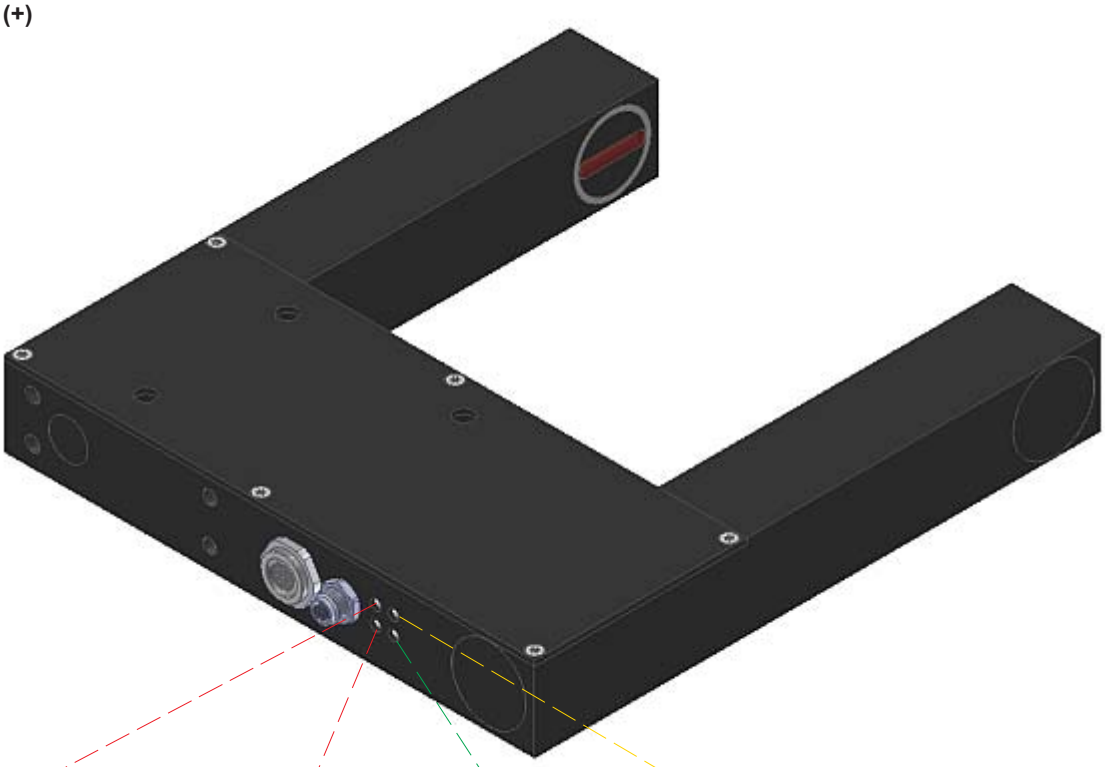
cab-4/USB-... or
cab-4/USB-w-... (no picture)
(each max. length 5m, outer jacket: PUR)

## LED Display

**LED display:**

(ok) ● ● (-)

Power ● ● (+)



**LED red (+):** ●
Measuring value
> upper tolerance threshold
(OUT1)

**LED red (-):** ●
Measuring value
< lower tolerance threshold
(OUT0)Power LED
(multifunctional)

**LED green (ok):** ●
Measuring value within
tolerance window

**LED yellow:** ●
Power LED
(multifunctional)

## 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 60825-1 ED. 3, AS DESCRIBED IN LASER NOTICE NO. 56, DATED MAY 8, 2019.

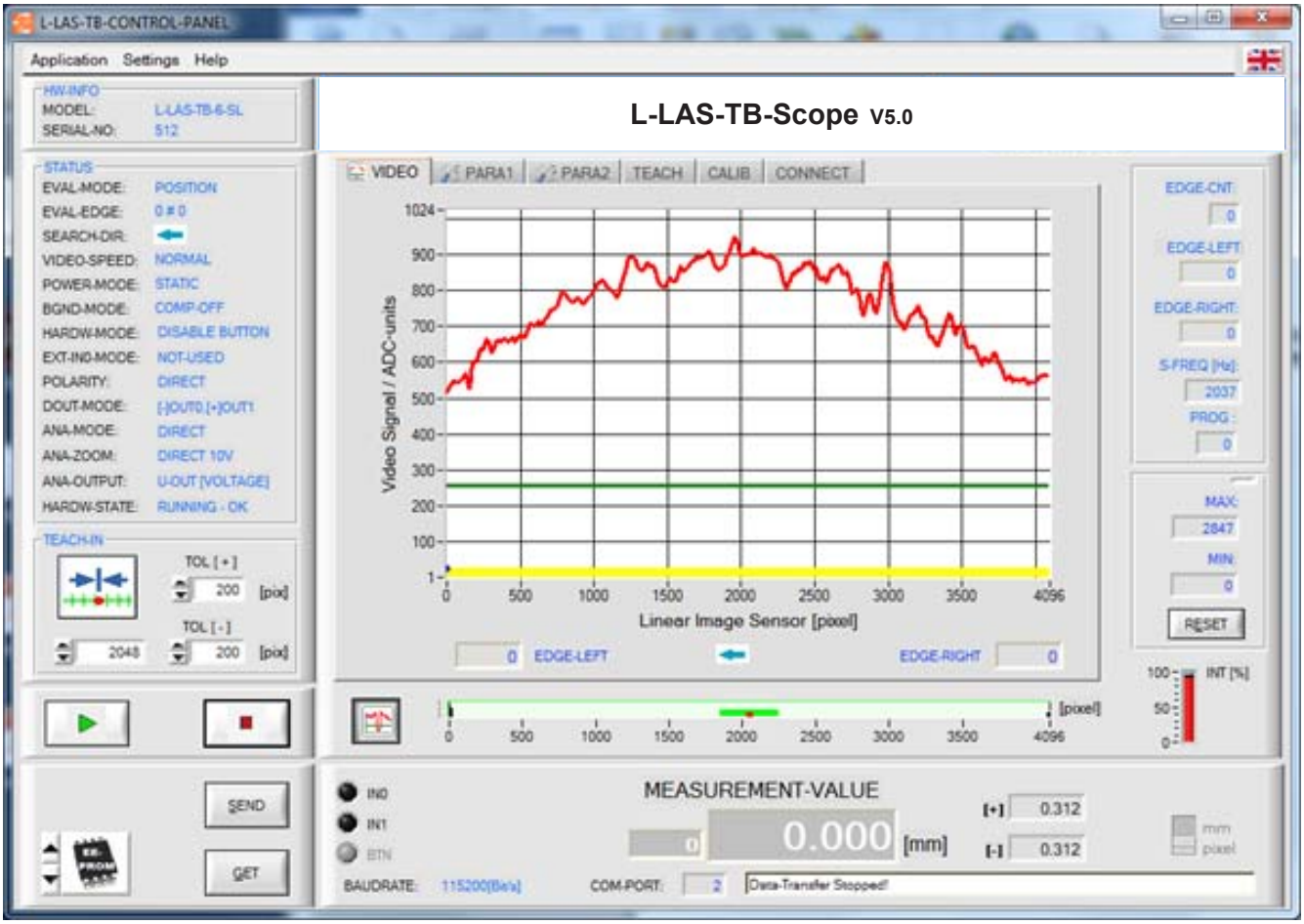
## Parameterization

**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.