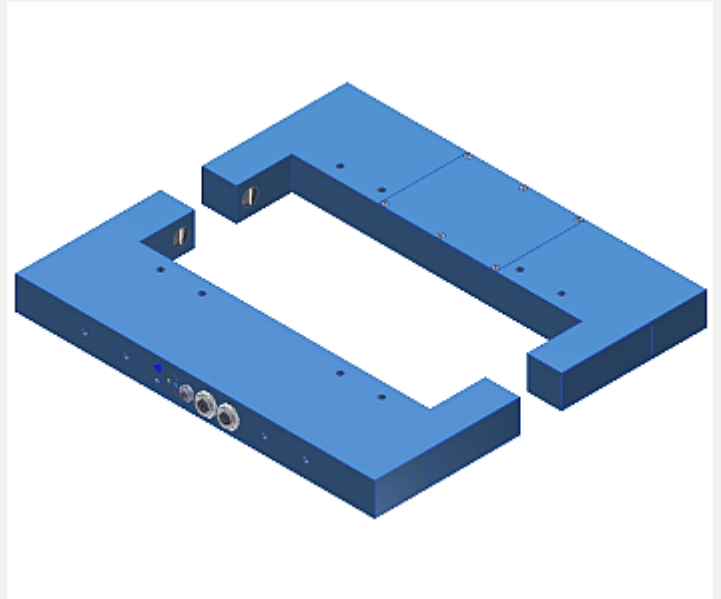


L-LAS Series

► L-LAS-TB-F-(8)-200/40-MA /-SL (Master/Slave)

- Line laser 670 nm, < 0.4 mW, class 1 laser product
- Visible red laser line, typ. 9.5 mm x 1.5 mm
- Meas. range Master + Slave each typ. 8 mm (i.e. 2x 8 mm)
- Resolution Master + Slave each typ. 2 µm (i.e. 2x 2 µm)
- Transmitter/receiver distance 200 mm
- Integrated interference filter
- CCD line detector with 1024 pixel, 4096 subpixel
- External teach button and potentiometer for tolerance setting
- RS232 interface (USB or Ethernet adapter is available)
- 2 digital inputs, 3 digital outputs
- 1 analog output 0...+10V (optional: current output 4...20mA)
- Switching state indication via 4 LEDs (1x grn, 2x red, 1x yel)



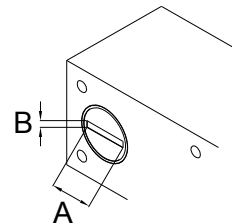
Design

Product name:

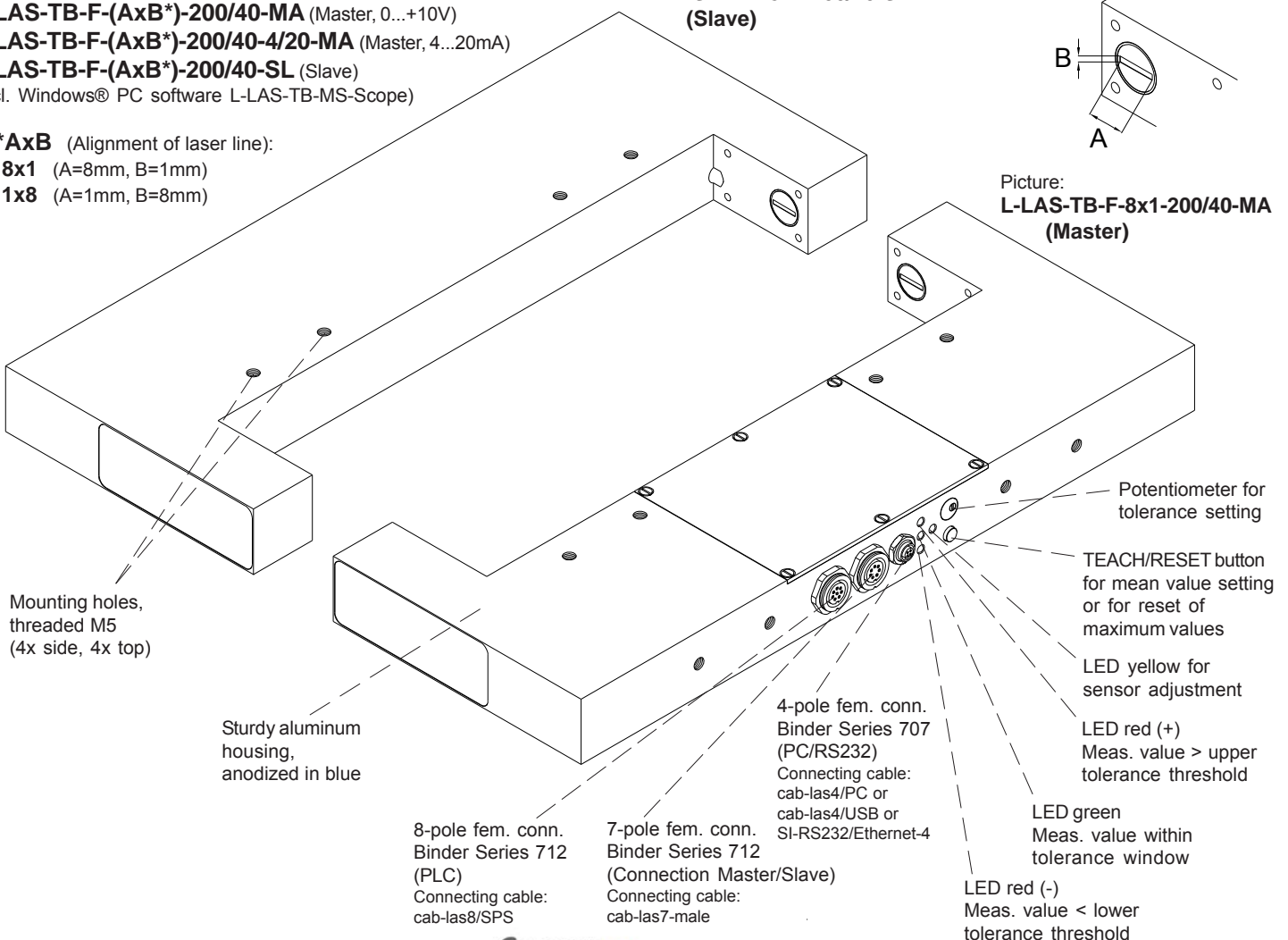
- L-LAS-TB-F-(AxB*)-200/40-MA** (Master, 0...+10V)
 - L-LAS-TB-F-(AxB*)-200/40-4/20-MA** (Master, 4...20mA)
 - L-LAS-TB-F-(AxB*)-200/40-SL** (Slave)
- (incl. Windows® PC software L-LAS-TB-MS-Scope)

- ***AxB** (Alignment of laser line):
8x1 (A=8mm, B=1mm)
1x8 (A=1mm, B=8mm)

Picture:
L-LAS-TB-F-8x1-200/40-SL
(Slave)



Picture:
L-LAS-TB-F-8x1-200/40-MA
(Master)





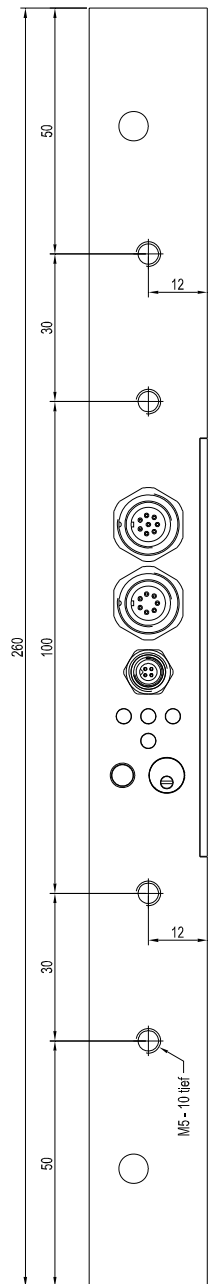
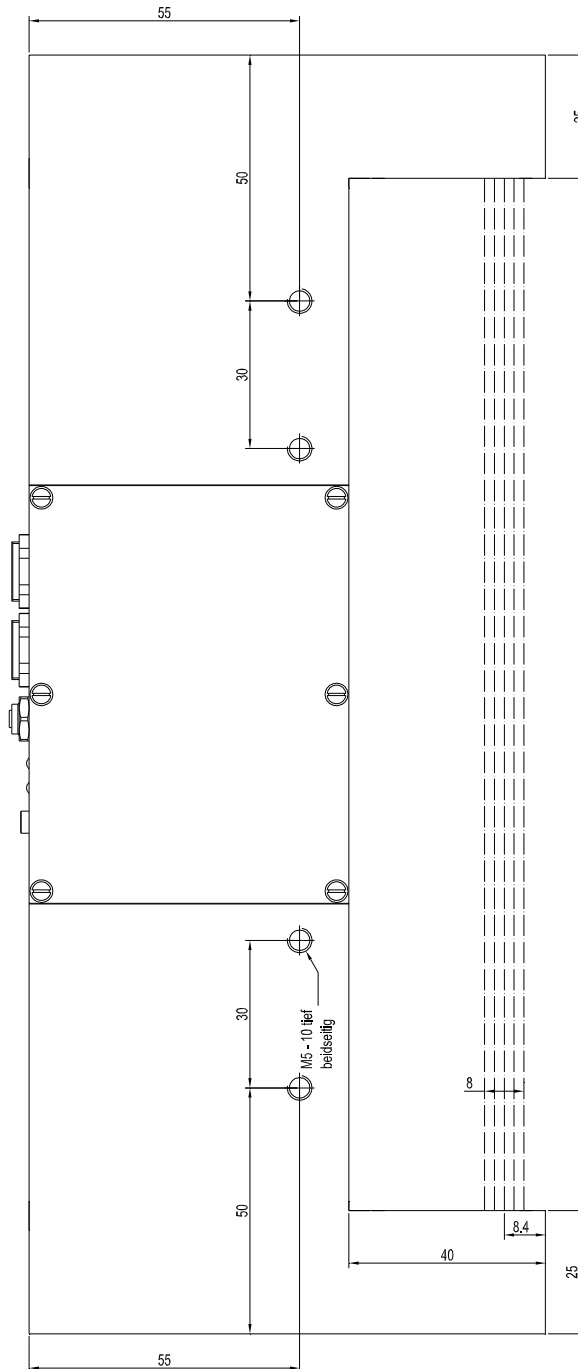
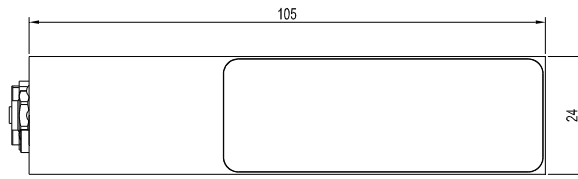
Technical Data

Type	L-LAS-TB-F-(8)-200/40-MA L-LAS-TB-F-(8)-200/40-SL	L-LAS-TB-F-(8)-200/40-4/20-MA L-LAS-TB-F-(8)-200/40-SL
Laser	Semi-conductor laser, 670 nm, DC operation, 0.4 mW max. opt. power, class 1 laser product acc. to DIN EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.	
Transmitter/receiver distance	200 mm (= fork width)	
Measuring range	MA and SL: each typ. 8 mm (i.e. 2x 8 mm)	
Resolution	MA and SL: each typ. 2 µm (i.e. 2x 2 µm)	
Reproducibility	MA and SL: each typ. ± 2 µm (i.e. 2x ± 2 µm)	
Linearity	typ. 0.1% of full scale range (FSR)	
Optical filter	Interference filter	
Analog output (ANA)	Voltage output 0 ... +10V	Current output 4 ... 20mA
Digital outputs (OUT0, OUT1, OUT2)	pnp bright-switching (pnp n.c.)/nnp dark-switching (nnp n.o.) or pnp dark-switching (pnp n.o.)/nnp bright-switching (nnp n.c.), 100 mA, short-circuit-proof	
Digital inputs (IN0, IN1)	IN0: External trigger IN1: Teach/Reset (double function) Input voltage: +Ub/0V, with protective circuit	
Voltage supply	+24VDC (± 10%)	
Sensitivity setting	by means of potentiometer TOL or under Windows® at PC	
Laser power adjustment	adjustable under Windows® at PC	
Current consumption	typ. 300 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 blue	
Housing dimensions	MA and SL: each LxWxH approx. 260 mm x 105 mm x 24 mm (without flange connectors)	
Connectors	L-LAS-TB-F-(8)-200/40-MA: 8-pole fem. connector type Binder 712 (PLC/Power) 4-pole fem. connector type Binder 707 (PC/RS232) 7-pole fem. connector type Binder 712 (connection Master/Slave) L-LAS-TB-F-(8)-200/40-SL: 7-pole fem. connector type Binder 712 (connection Master/Slave)	
Connecting cables	Connection to PC: cab-las4/PC or cab-las4/PC-w or cab-las4/USB or SI-RS232/Ethernet-4 Connection to PLC: cab-las8/SPS or cab-las8/SPS-w Connection Master/Slave: cab-las7-male	
Teach/Reset button	for mean value setting or for reset of maximum values	
LED indication	LED red (+) : Measuring value > upper tolerance threshold LED green : Measuring value within tolerance window LED red (-) : Measuring value < lower tolerance threshold LED yellow: for sensor adjustment (multifunctional LED)	
EMC test acc. to	DIN EN 60947-5-2	
Scan frequency	max. 200 Hz	
Max. switching current	100 mA, short-circuit proof	
Interface	RS232, parameterisable under Windows®	
Output polarity	Bright-/dark-switching, can be switched under Windows®	



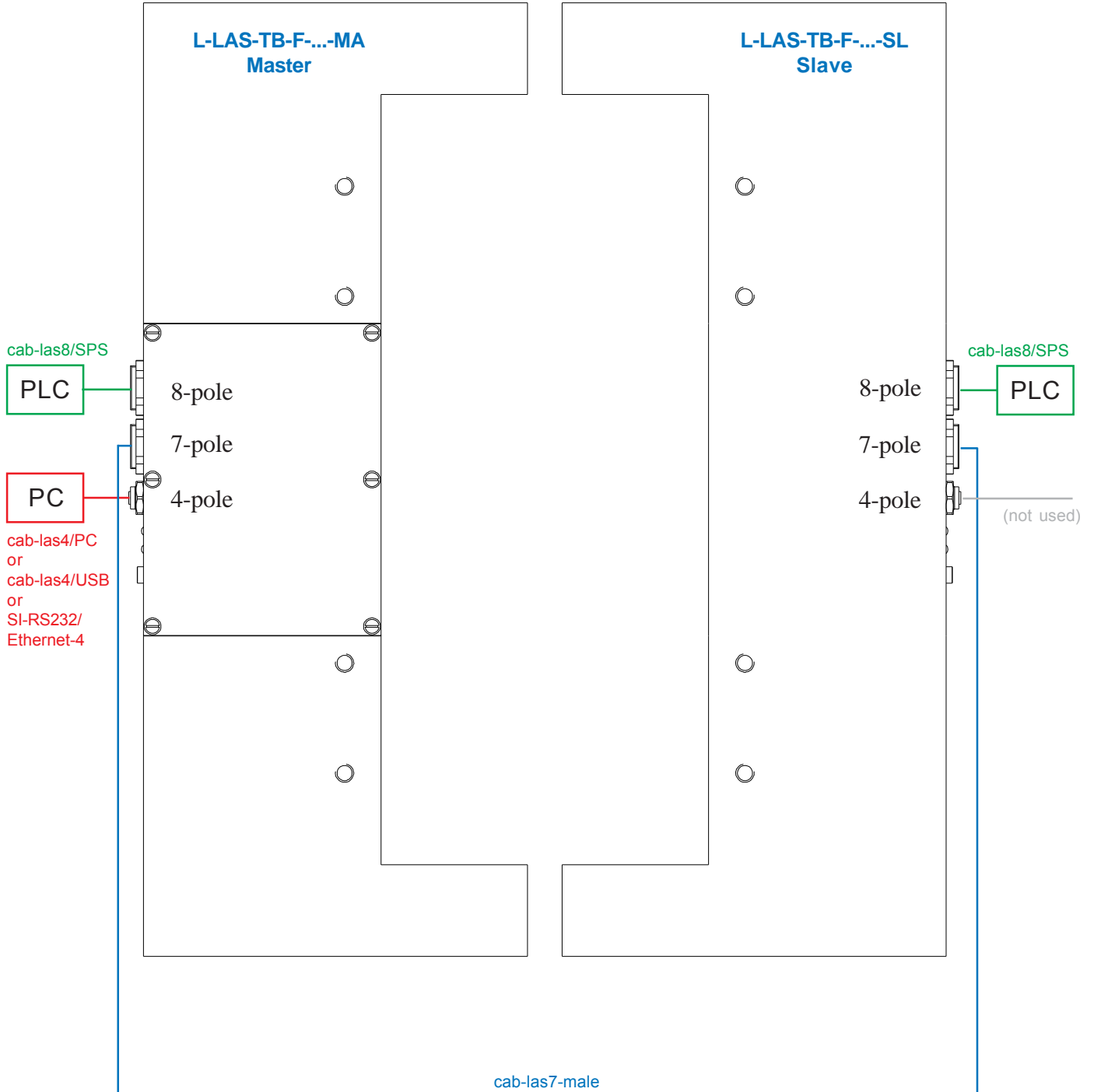
Dimensions

- L-LAS-TB-F-8x1-200/40-MA
- L-LAS-TB-F-8x1-200/40-SL
- L-LAS-TB-F-1x8-200/40-MA
- L-LAS-TB-F-1x8-200/40-SL
- L-LAS-TB-F-8x1-200/40-4/20-MA
- L-LAS-TB-F-1x8-200/40-4/20-MA



All dimensions in mm

Connecting Diagram





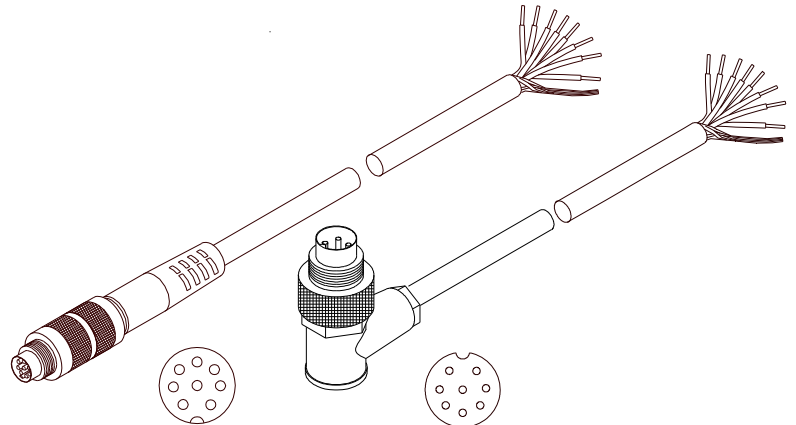
Connector Assignment

**Connection Master and Slave 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 (0 ... +10V)

**in case of version -4/20:
ANA (4 ... 20mA)**



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

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

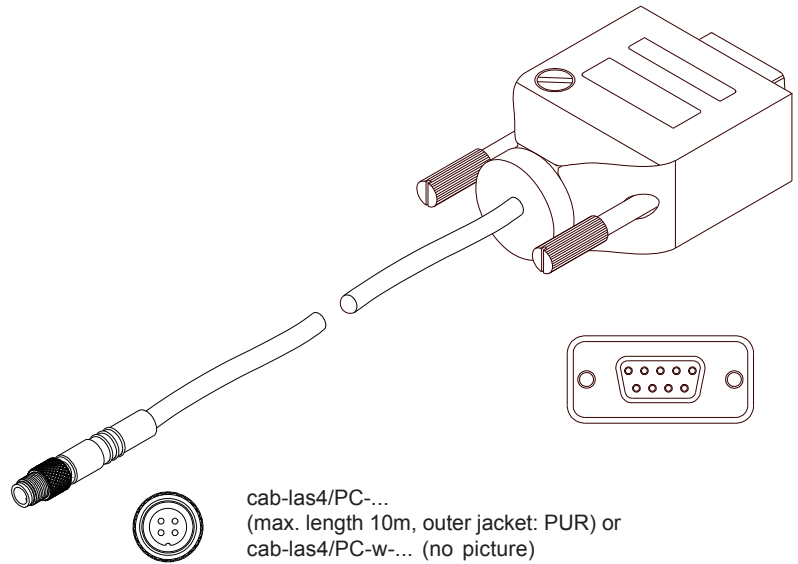
Connecting cable:

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

**Connection Master 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:

Connecting cable (incl. driver software):

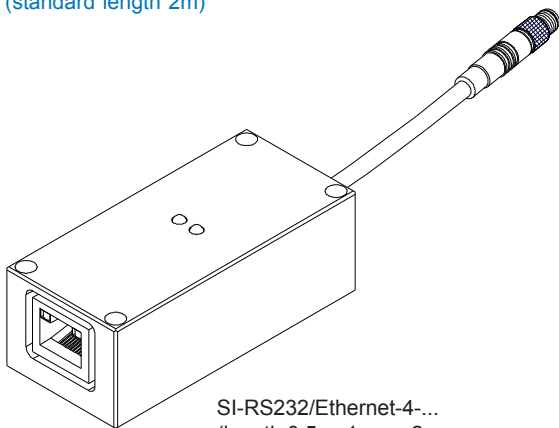
- cab-las4/USB-(length)
- cab-las4/USB-w-(length) (angle type 90°)
- (standard length 2m)

alternative:

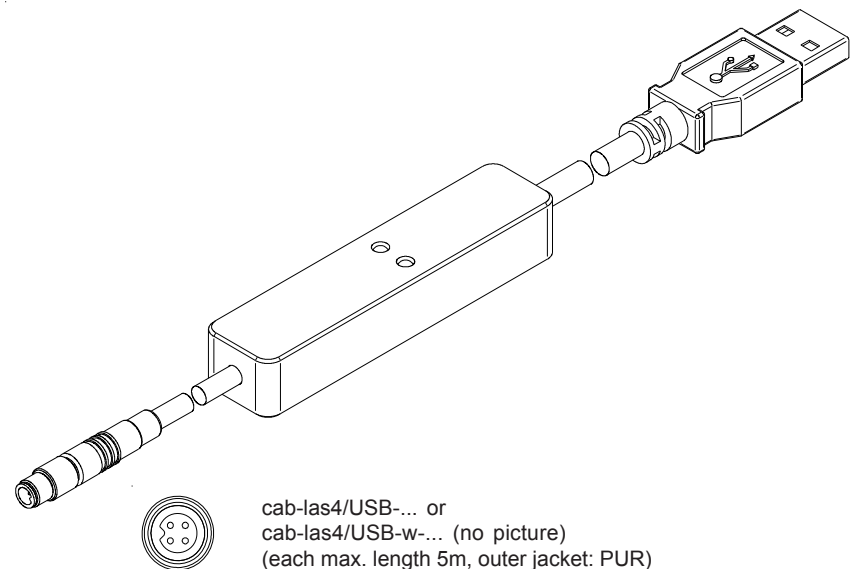
Connection to local network via Ethernet bus:

Adapter (based on Lantronix XPortModul):

- SI-RS232/Ethernet-4-(length)
- (standard length 2m)



SI-RS232/Ethernet-4-...
(length 0.5m, 1m, or 2m,
outer jacket: PUR)



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



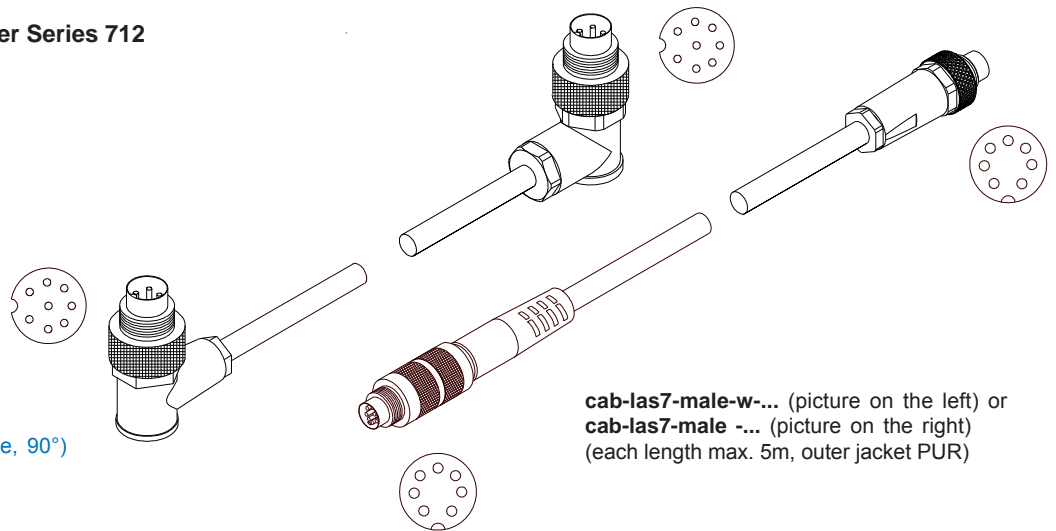
Connector Assignment

Connection Master and Slave: 2x 7-pole fem. connector Binder Series 712

Pin: Assignment:

1	0V (GND)
2	+5VDC
3	START
4	CLOCK
5	PWM LED
6	I-CONTROL
7	VIDEO

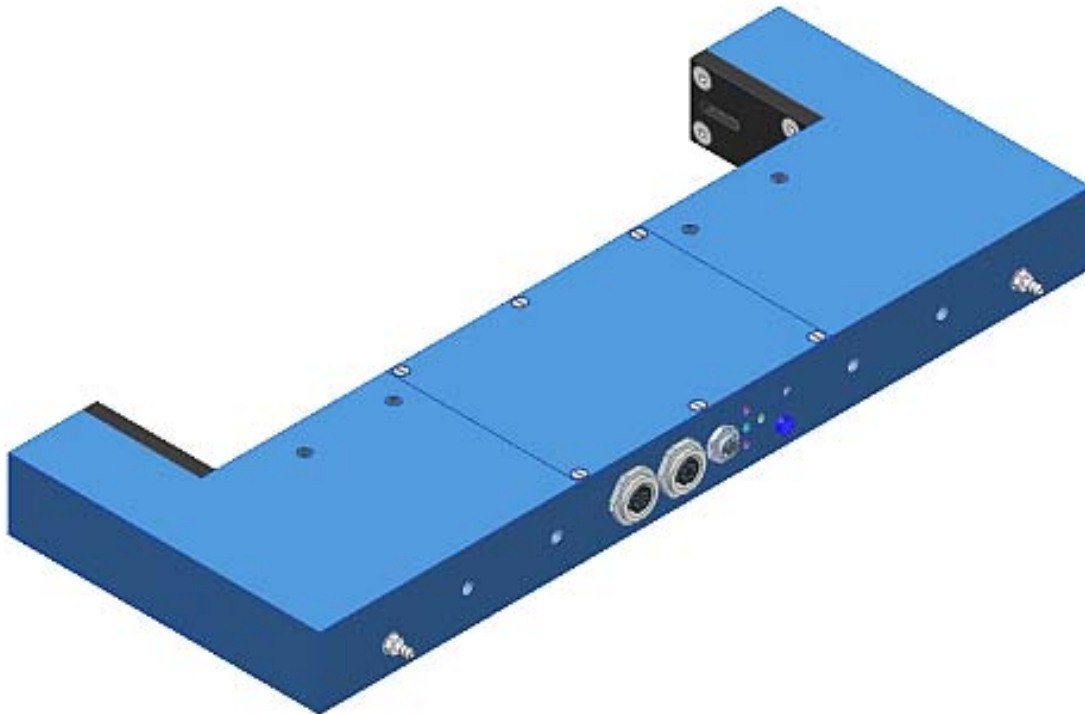
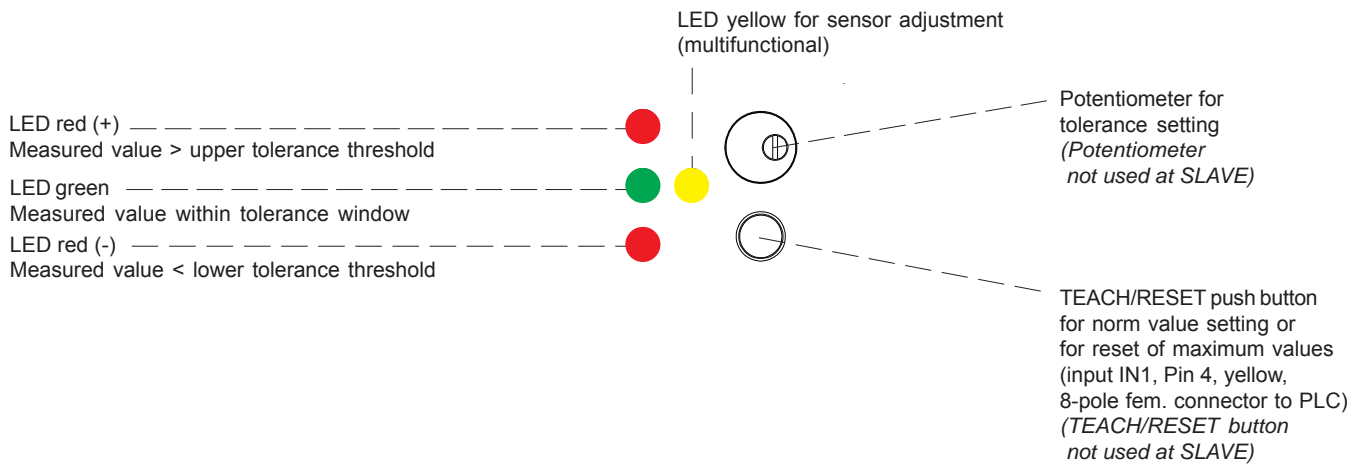
Connecting cable:
 cab-las7-male-(length)
 cab-las7-male-w-(length) (angle type, 90°)
 (standard length: 2m)



cab-las7-male-w-... (picture on the left) or
cab-las7-male -... (picture on the right)
 (each length max. 5m, outer jacket PUR)



LED Display



Laser Warning

The laser transmitter of L-LAS-TB Series comply with laser class 1 according to EN 60825-1. The accessible laser radiation is harmless under reasonably foreseeable conditions. The reasonably foreseeable conditions are kept during correct operation. The use of these laser transmitters therefore requires no additional protective measures.

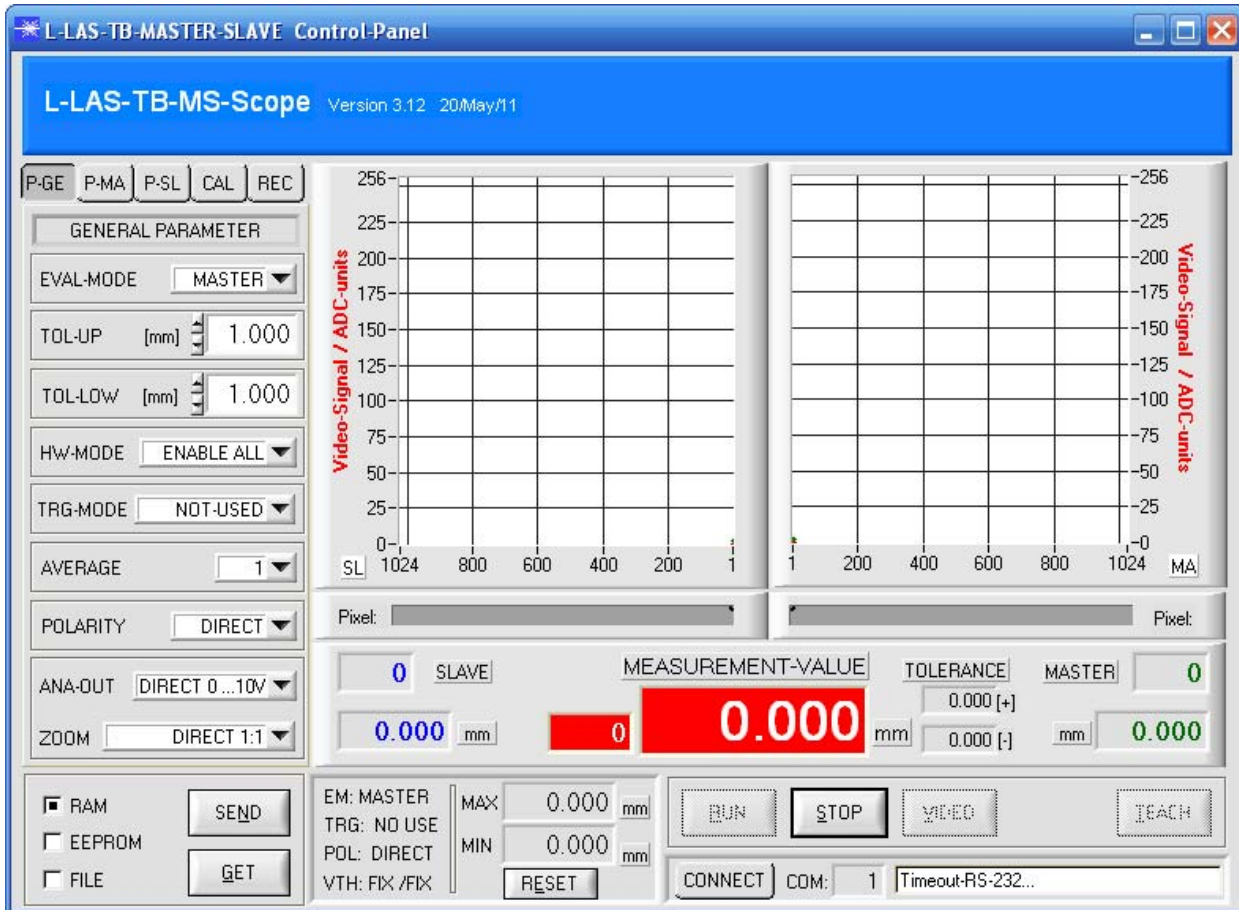
The laser line sensors of L-LAS-TB Series are supplied with a laser warning label type „CLASS 1 LASER PRODUCT“.





Parameterization
Windows® software L-LAS-TB-MS-Scope:

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

Windows® user interface:

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

- Visualization of the measuring data in numerical and graphic form
- Setting of laser power for the respective laser transmitter
- Polarity adjustment of digital outputs OUT0, OUT1, and OUT2
- Different evaluation modes to choose from
- Setting of norm value and tolerance band width
- Storage of parameters in the RAM, EEPROM store at the electronic control unit or to a configuration file at the hard disk of the PC



Application Example

Tape thickness measurement of packing tapes on galettes

In addition to the thickness of the tapes, the tape width also must be checked. This measurement includes both the average thickness, and local defects such as tears or thick spots.

Laser-triangulation sensors (L-LAS-LT-...) that operate in reflected-light mode cannot be used because of the structure on the tape surface.

With a transmitted-light measuring system (L-LAS-TB-...), however, this structure on the tape surface is no problem, because here measurement is performed tangentially to the tape surface.

In order to eliminate errors caused by an unbalance of the galette, a reference sensor is used here to measure the galette height. This means that a master/slave L-LAS-TB-F-1x8-200/40-MS is used here. A typical measuring accuracy of 2 μm can be reached with this system.

For only band thickness measurement on a roll, also a single system L-LAS-TB-F-1x8-200/40 can be used (with difference forming: beforehand-without-foil / afterwards-with-foil).

L-LAS-TB-F-1x8-200/40-MA

L-LAS-TB-F-1x8-200/40-SL

