

# L-LAS Series

## ▶ L-LAS-LT-110-RA-MA/-SL (Master/Slave)

- Operates in an angle of total reflection (thickness/distance measuring)
- Suitable for high-glossy objects (e.g. glass)
- Line laser <1 mW, wave length 670 nm, laser class 2
- Visible red laser line, typ. 1 mm x 3 mm
- Measuring range Master, Slave: each typ. 46 mm
- Start of measuring range Master/Slave: each at typ. 90.5 mm
- Resolution Master, Slave: each typ. 12 µm
- Integrated interference filter and red light filter
- CCD line detector with 1024 pixel, 4096 pixel
- External teach button and potentiometer for tolerance setting
- RS232 interface (USB or Ethernet adaptor available)
- Windows® user interface
- 2 digital inputs, 3 digital outputs
- 1 analog output (voltage 0...+10V, optional current 4...20mA)
- Scan frequency max. 200 Hz
- Switching state indication via 4 LEDs (1x grn, 2x red, 1x yel)
- Optics cover made of scratch-resistant glass



### Design

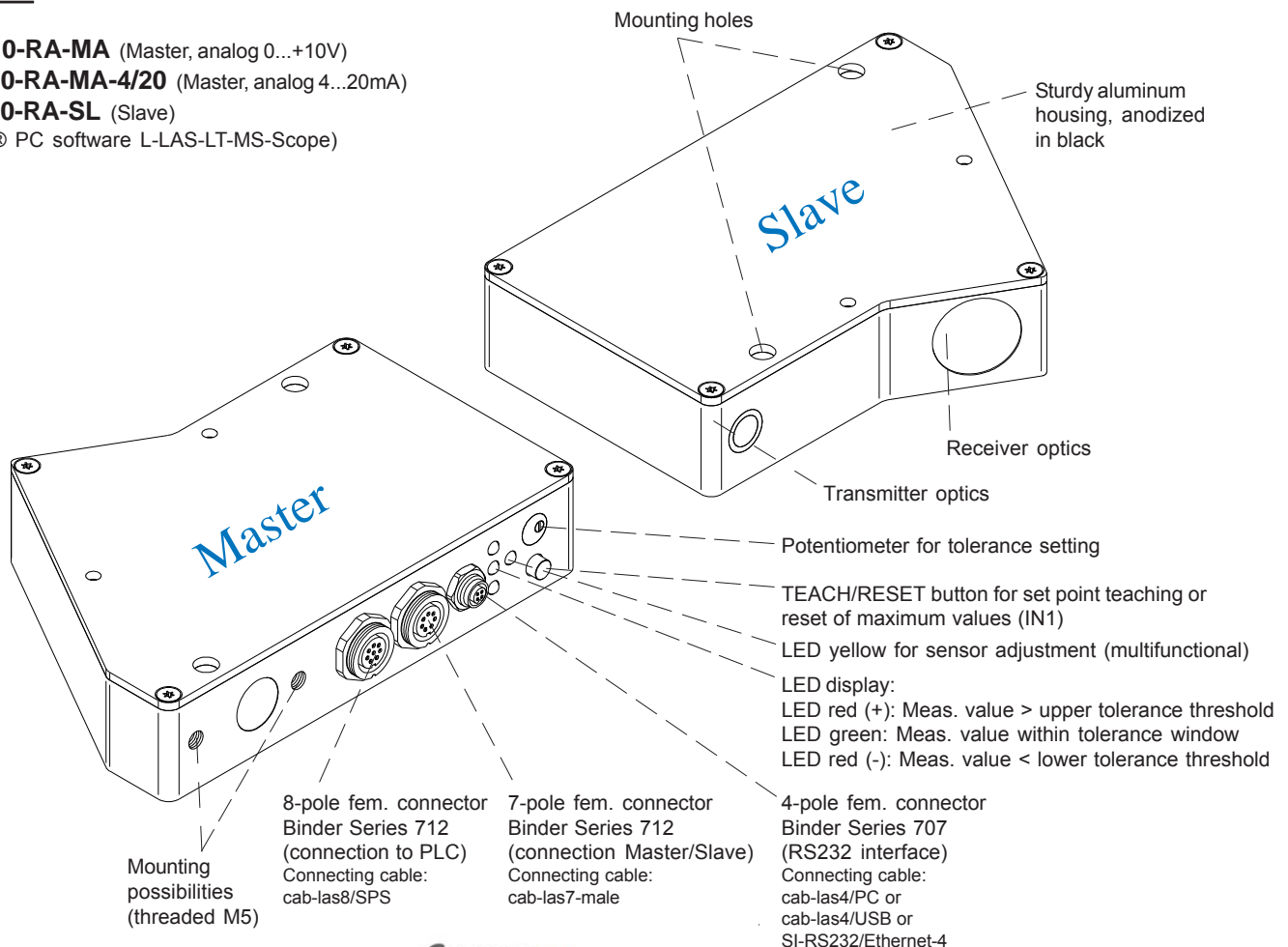
#### Product name:

L-LAS-LT-110-RA-MA (Master, analog 0...+10V)

L-LAS-LT-110-RA-MA-4/20 (Master, analog 4...20mA)

L-LAS-LT-110-RA-SL (Slave)

(incl. Windows® PC software L-LAS-LT-MS-Scope)





**Technical Data**

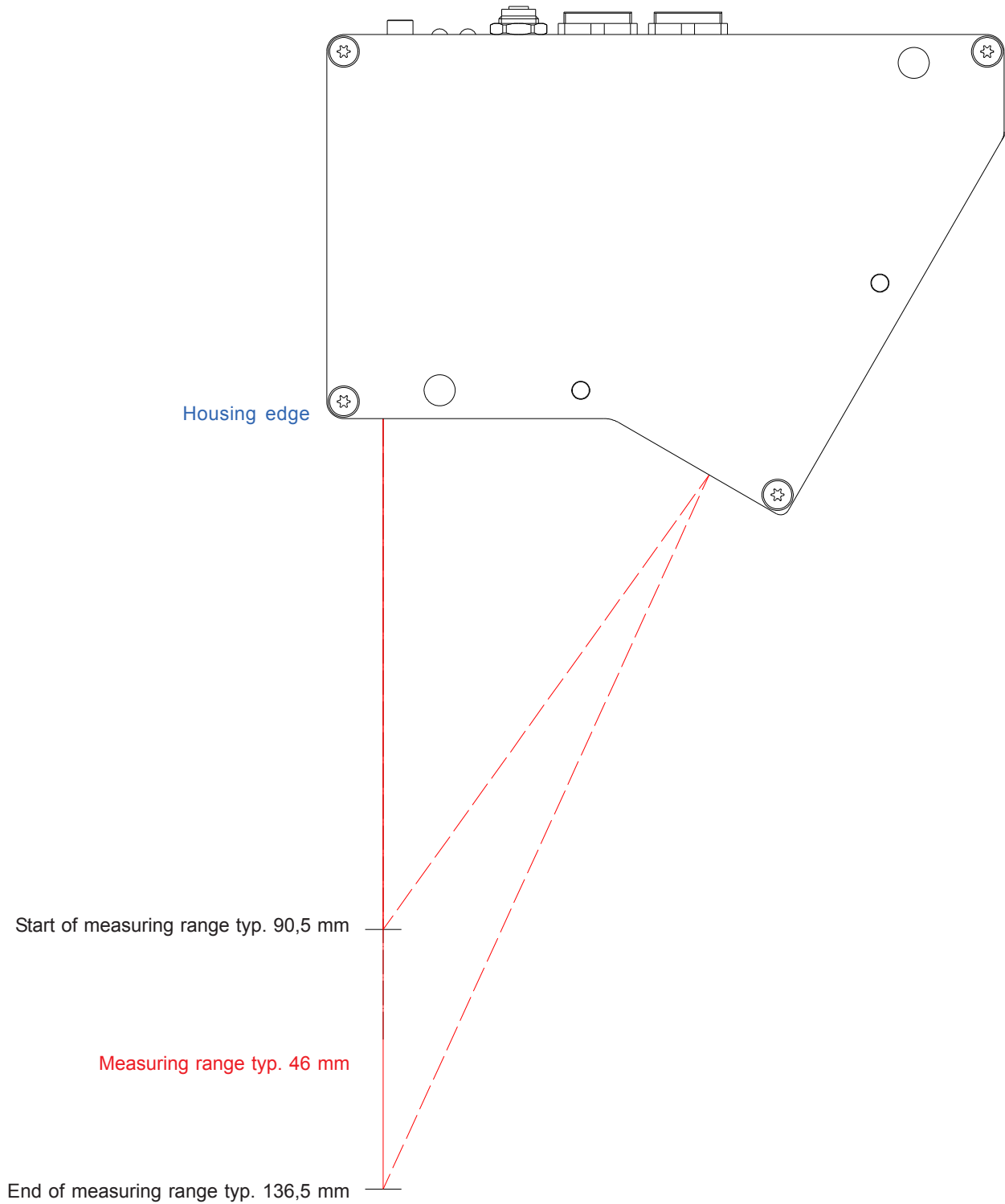
Model	L-LAS-LT-110-RA-MA L-LAS-LT-110-RA-SL	L-LAS-LT-110-RA-MA-4/20 L-LAS-LT-110-RA-SL
Light source	Semi-conductor laser, 670 nm, DC operation, 1 mW max. opt. power, laser class 2 acc. to DIN EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.	
Angle of total reflection	Angle of inclination of the sensor: 15° (please cf. mounting hints)	
Measuring range	MA and SL: each typ. 46 mm	
Start of measuring range End of measuring range	MA and SL: each typ. 90.5 mm (measured from housing edge, cf. picture beam path) MA and SL: each typ. 136.5 mm (measured from housing edge, cf. picture beam path)	
Resolution	MA and SL: each typ. 12 µm (i.e. 2x 12 µm)	
Reproducibility	MA and SL: each typ. ± 12 µm (i.e. 2x ± 12 µm)	
Linearity	MA and SL: each 0.2% FSR (full scale range) (i.e. 2x 0.2%)	
Laser line geometry	typ. 1 mm x 3 mm	
Optical filter	Interference filter, red light filter	
Analog output (1x)	voltage output (0 ... +10V)	current output (4 ... 20mA)
Digital outputs (3x: OUT0..OUT2)	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: External trigger, IN1: Teach/Reset (double function), input voltage +Ub/0V, with protective circuit	
Voltage supply	+24VDC (± 10%)	
Sensitivity setting	adjustable via potentiometer TOL or under Windows® via PC	
Laser power correction	adjustable under Windows® via PC	
Current consumption	typ. 200 mA	
Enclosure rating	electronics: IP54, optics: IP67	
Temperature stability	0.01% of measuring range/°C	
Temperature ranges	operating temperature range: -10°C ... +50°C, storage temperature range: -20°C ... +85°C	
Housing material	aluminium, anodized in black	
Housing dimensions	each Master and Slave: LxWxH approx. 120 mm x 85.06 mm x 25 mm (without flange connectors)	
Type of connector	L-LAS-LT-110-RA-MA: 8-pole circular fem. connector type Binder 712 (PLC/Power) 4-pole circular fem. connector type Binder 707 (PC/RS232) 7-pole circular fem. connector type Binder 712 (connection Master/Slave) L-LAS-LT-110-RA-SL: 8-pole circular fem. connector type Binder 712 (Power) 7-pole circular fem. connector type Binder 712 (connection Master/Slave)	
Connecting cables	connection to PC (Master): 1x cab-las4/PC (-w) or cab-las4/USB (-w) or SI-RS232/Ethernet-4 connection to PLC (each Master and Slave): 2x cab-las8/SPS or cab-las8/SPS-w connection Master with Slave: 1x cab-las7-male or cab-las7-male-w	
Teach/Reset button	for set point teaching or for reset of maximum values via input IN1	
LED display	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)	
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®	





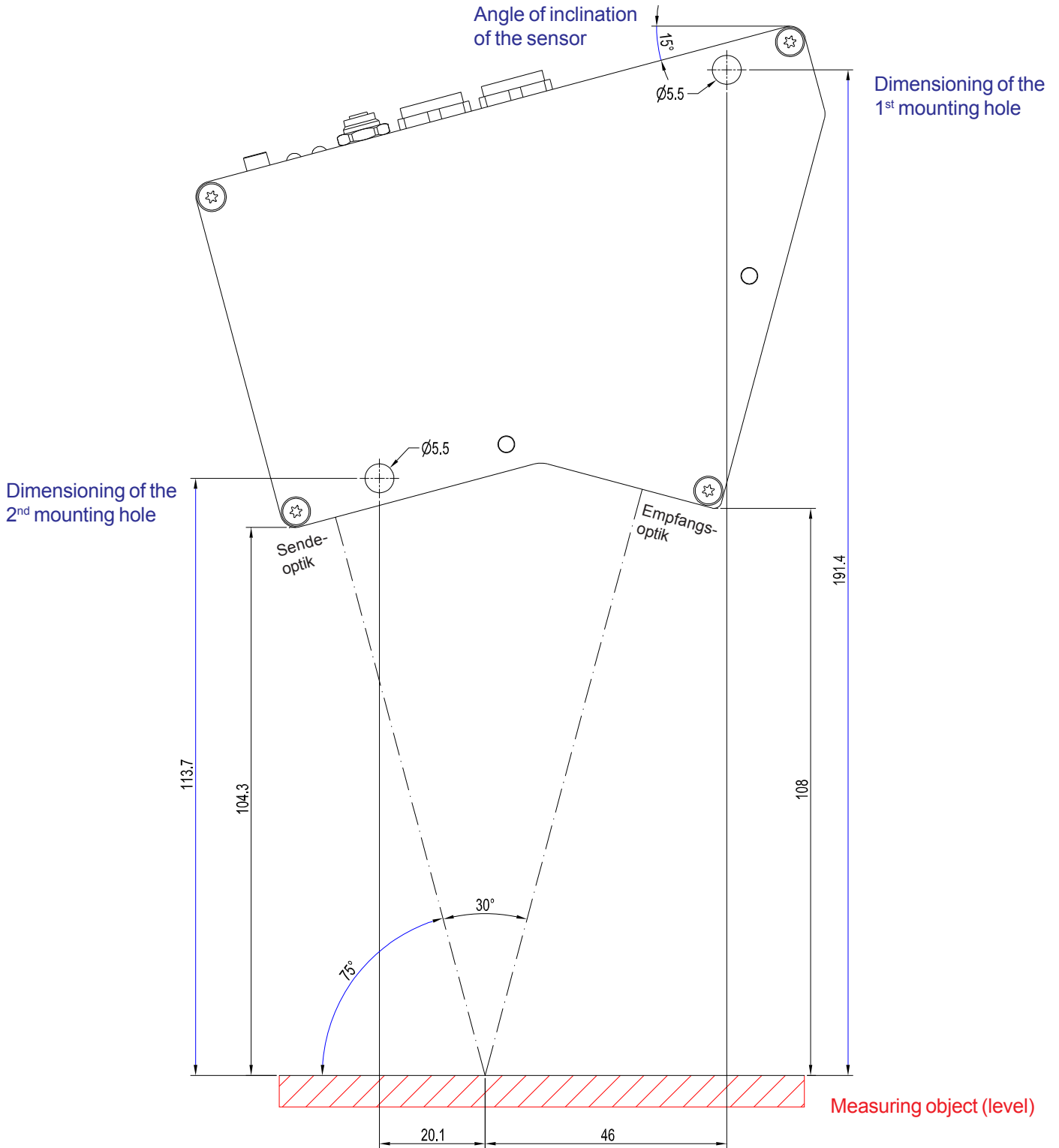
Beam Path

L-LAS-LT-110-RA-MA  
L-LAS-LT-110-RA-MA-4/20  
L-LAS-LT-110-RA-SL



Mounting Hints

Laser line sensors of type L-LAS-LT-...-RA work at high glossy (mirroring) measuring objects in an angle of total reflection. Please pay attention to the following hints for mounting the L-LAS-LT-110-RA sensor:



All dimensions in mm



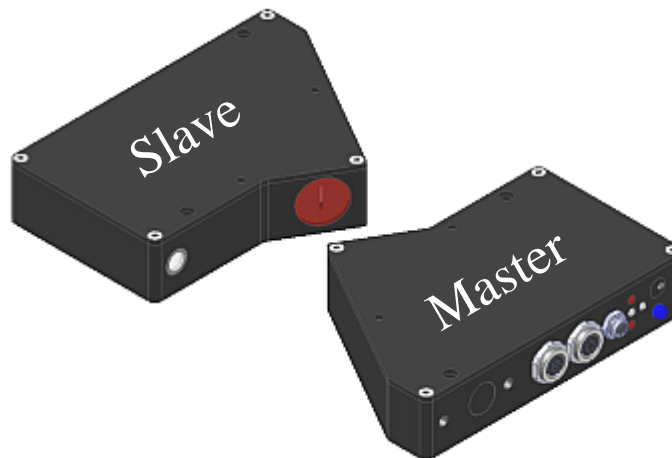
### Components of a complete Master/Slave system L-LAS-LT-110-RA-MS:

#### Standard version with analog voltage output 0...+10V:

- 1x **L-LAS-LT-110-RA-MA** (Master, incl. Windows® software L-LAS-LT-MS-Scope)
- 1x **L-LAS-LT-110-RA-SL** (Slave)
- 1x **cab-las7-male-...** (Connecting cable, connection of Master to Slave)
- 2x **cab-las8/SPS-...** (Connecting cable to PLC, necessary for each Master and Slave)
- 1x **cab-las4/PC-...** (Connecting cable to PC via RS232 interface, necessary for Master only)
- alternative: 1x **cab-las4/USB-...** (Connecting cable to PC via USB interface, necessary for Master only)
- alternative: 1x **SI-RS232/Ethernet-4-...** (Connecting cable to PC via Ethernet interface, for Master only)

#### Standard version with analog current output 4...20mA:

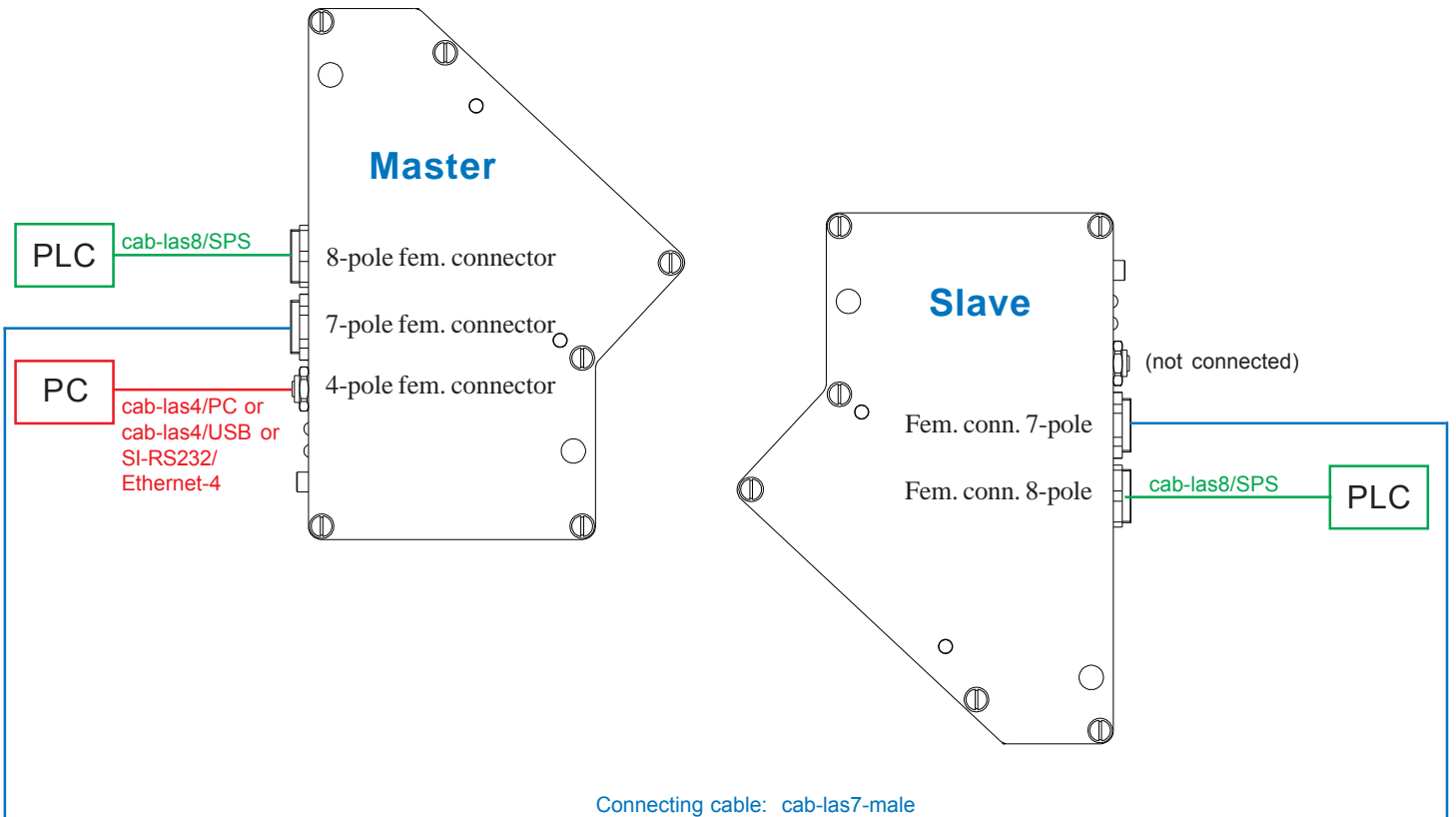
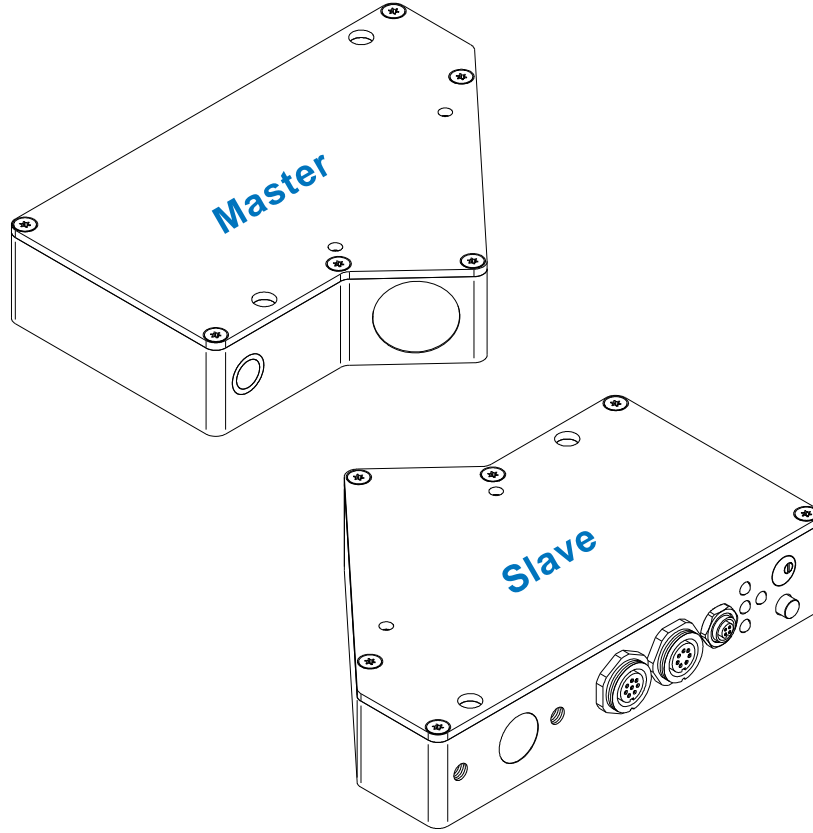
- 1x **L-LAS-LT-110-RA-MA-4/20** (Master, incl. Windows® software L-LAS-LT-MS-Scope)
- 1x **L-LAS-LT-110-RA-SL** (Slave)
- 1x **cab-las7-male-...** (Connecting cable, connection of Master to Slave)
- 2x **cab-las8/SPS-...** (Connecting cable to PLC, necessary for each Master and Slave)
- 1x **cab-las4/PC-...** (Connecting cable to PC via RS232 interface, necessary for Master only)
- alternative: 1x **cab-las4/USB-...** (Connecting cable to PC via USB interface, necessary for Master only)
- alternative: 1x **SI-RS232/Ethernet-4-...** (Connecting cable to PC via Ethernet interface, for Master only)



Connection Scheme

**Connection scheme for a L-LAS-LT-... MS system**

(by way of example L-LAS-LT-55-MS)





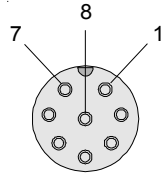
## Connector Assignment

### Connector assignment of Master L-LAS-LT-...-MA or L-LAS-LT-...-MA -4/20:

#### Connection to PLC/Power:

##### 8-pole fem. connector Binder Series 712

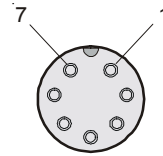
Pin:	Color:	Assignment:
1	white	GND (0V)
2	brown	+24VDC ( $\pm 10\%$ )
3	green	IN0 (EXT TRIGGER)
4	yellow	IN1 (TEACH / RESET)
5	grey	OUT0 (-)
6	pink	OUT1 (+)
7	blue	OUT2 (OK)
8	red	ANA (voltage 0 ... +10V) (optional: current 4 ... 20mA)



#### Connection Master/Slave (SPI):

##### 7-pole fem. connector Binder Series 712

Pin:	Assignment:
1	GND (0V)
2	+3.3VDC
3	SS
4	MISO
5	MOSI
6	SCLK
7	+3.3VDC



#### Connecting cable:

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

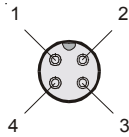
#### Connecting cable:

cab-las7-male-(length)  
cab-las7-male-w-(length) (right-angle type) VAR. 1  
cab-las7-male-w-(length) (right-angle type) VAR. 2  
cab-las7-male-w-(length) (right-angle type) VAR. 3  
(standard length 1m)

### Connection to PC:

#### 4-pole fem. connector Binder Series 707

Pin:	Assignment:
1	+24VDC (+Ub, OUT)
2	GND (0V)
3	Rx0
4	Tx0



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

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

#### **alternative:**

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

Adapter (based on Lantronix XPortModul):  
SI-RS232/Ethernet-4-(length)  
(standard length 2m)





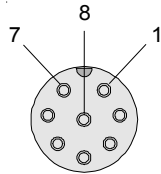


## Connector Assignment

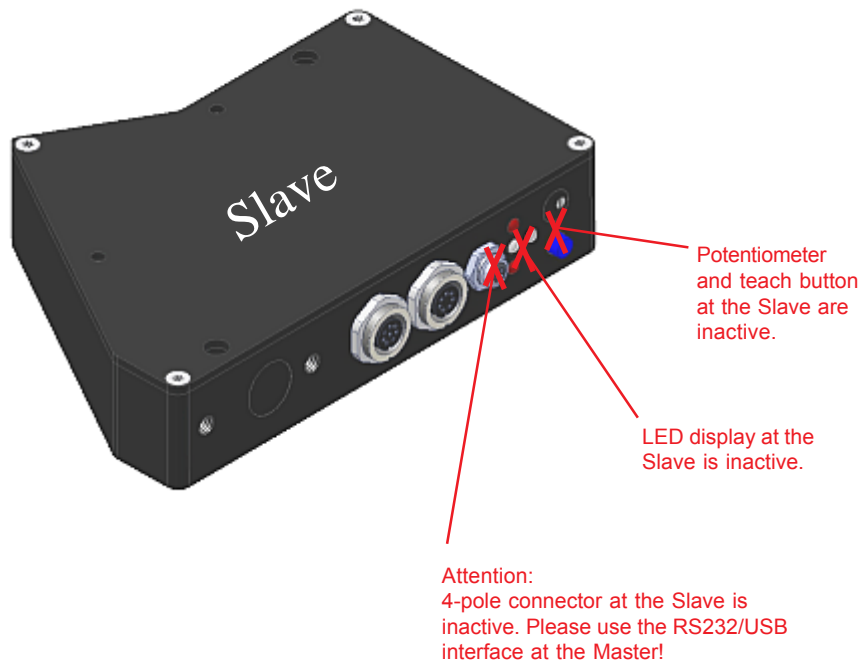
### Connector assignment of Slave L-LAS-LT-...-SL:

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

Pin:	Color:	Assignment:
1	white	GND (0V)
2	brown	+24VDC ( $\pm 10\%$ )
3	green	not used
4	yellow	not used
5	grey	not used
6	pink	not used
7	blue	not used
8	red	not used



Connecting cable:  
cab-las8/SPS-(length) or  
cab-las8/SPS-w-(length) (right-angle type)  
(standard length 2m)



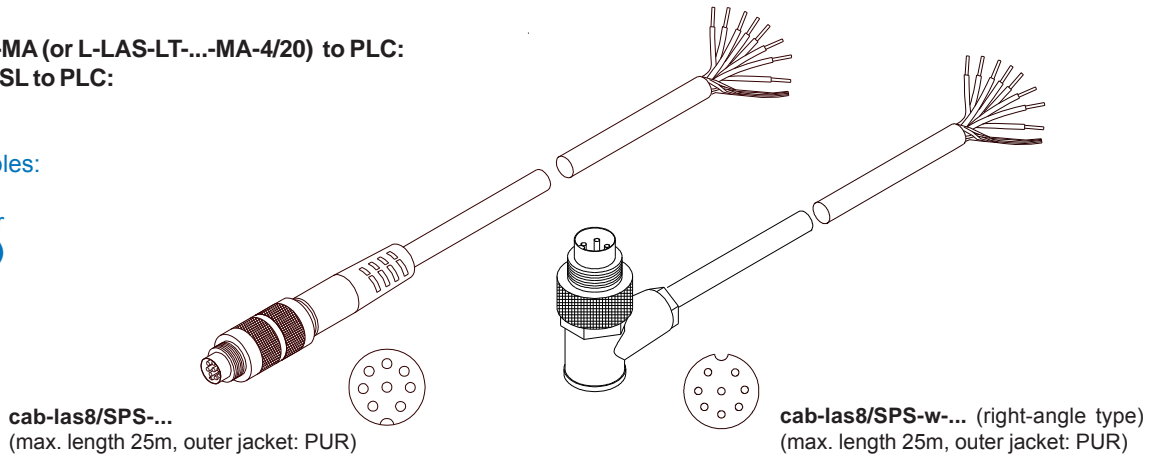


**Connecting Cables**

Connection L-LAS-LT-...-MA (or L-LAS-LT-...-MA-4/20) to PLC:  
 Connection L-LAS-LT-...-SL to PLC:

Available connecting cables:

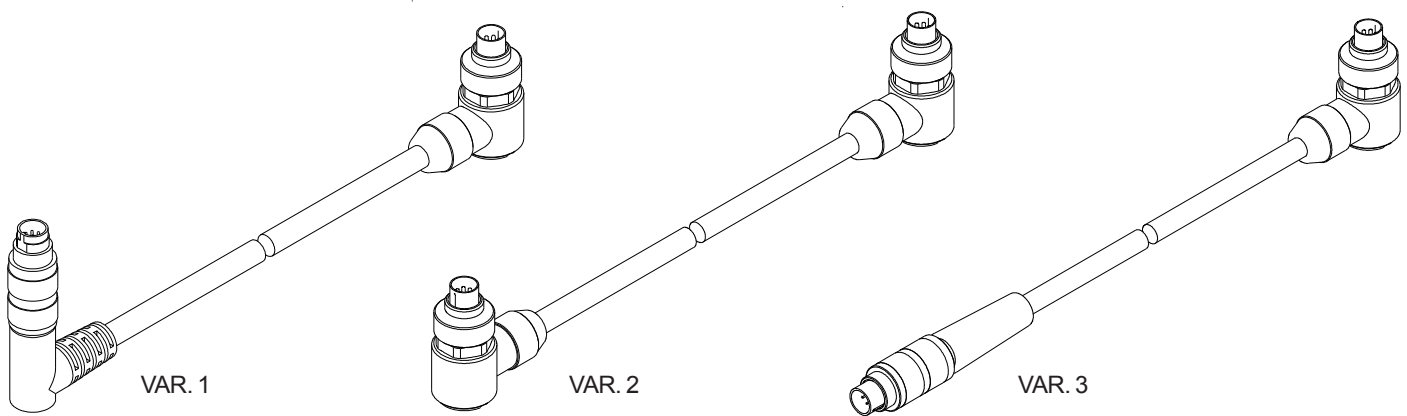
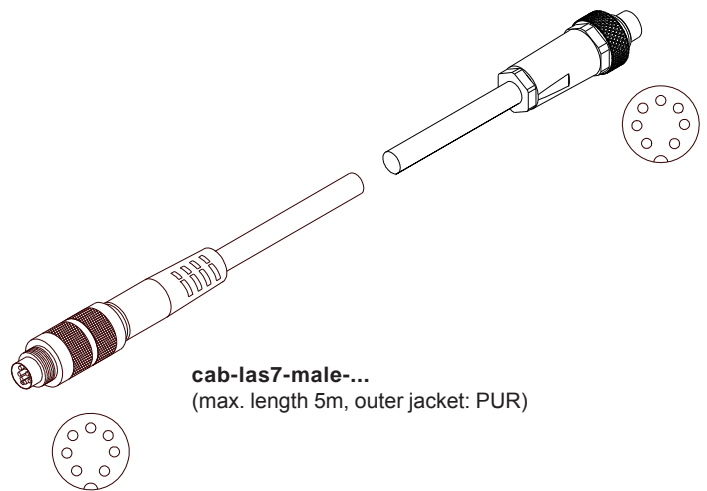
**cab-las8/SPS-(length)** or  
**cab-las8/SPS-w-(length)**  
 (standard length: 2m)



Connection L-LAS-LT-...-MA to L-LAS-LT-...-SL:  
 Connection L-LAS-LT-...-MA-4/20 to L-LAS-LT-...-SL:

Available connecting cables:

**cab-las7-male-(length)**  
**cab-las7-male-w-(length) VAR. 1**  
**cab-las7-male-w-(length) VAR. 2**  
**cab-las7-male-w-(length) VAR. 3**  
 (standard length: 1m)



**cab-las7-male-w-... VAR. 1**  
**(right-angle type)**  
 (max. length 5m, outer jacket: PUR)

**cab-las7-male-w-... VAR. 2**  
**(right-angle type)**  
 (max. length 5m, outer jacket: PUR)

**cab-las7-male-w-... VAR. 3**  
**(right-angle type)**  
 (max. length 5m, outer jacket: PUR)

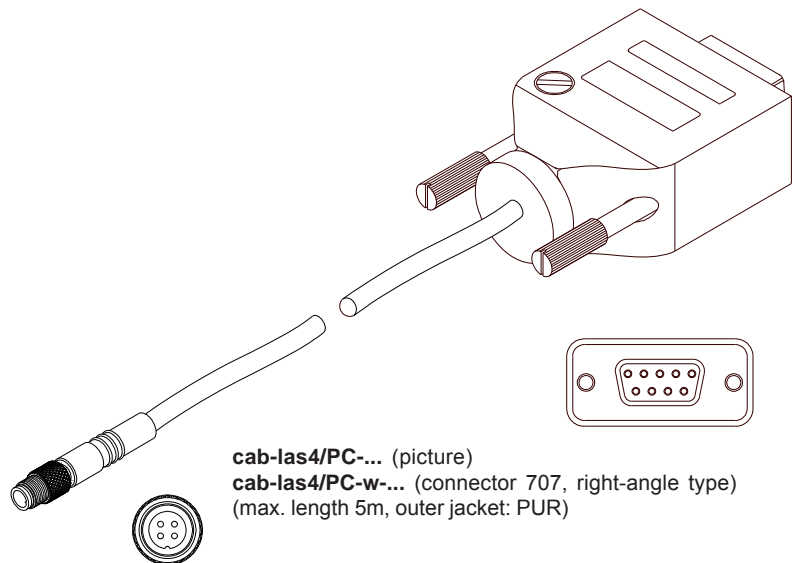


## Connecting Cables

Connection L-LAS-LT-...-MA to PC  
 Connection L-LAS-LT-...-MA-4/20 to PC:  
 via **RS232 interface**

Available connecting cables:

**cab-las4/PC-(length)** or  
**cab-las4/PC-w-(length)**  
 (standard length: 2m)

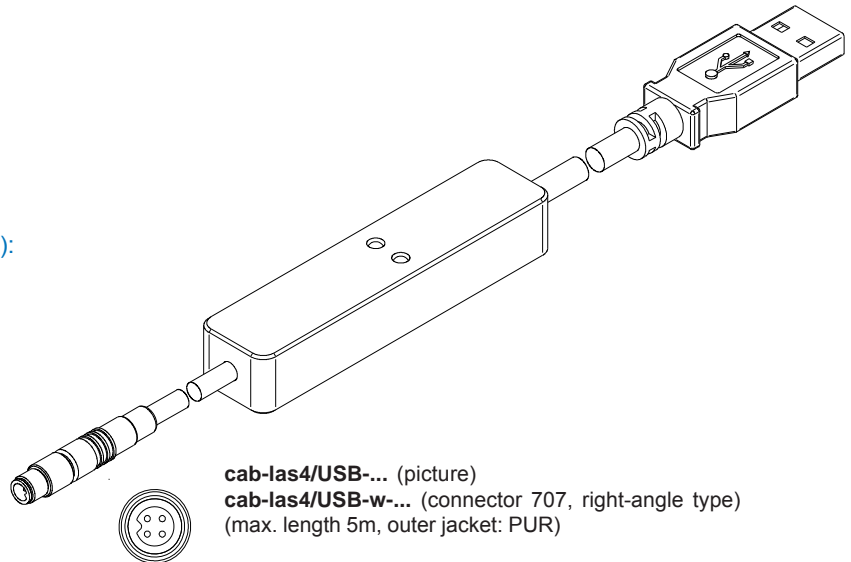


**cab-las4/PC-...** (picture)  
**cab-las4/PC-w-...** (connector 707, right-angle type)  
 (max. length 5m, outer jacket: PUR)

**Alternative:**  
 Connection L-LAS-LT-...-MA to PC  
 Connection L-LAS-LT-...-MA-4/20 to PC:  
 via **USB interface**

Available connecting cables (incl. driver software):

**cab-las4/USB-(length)** or  
**cab-las4/USB-w-(length)**  
 (standard length: 2m)



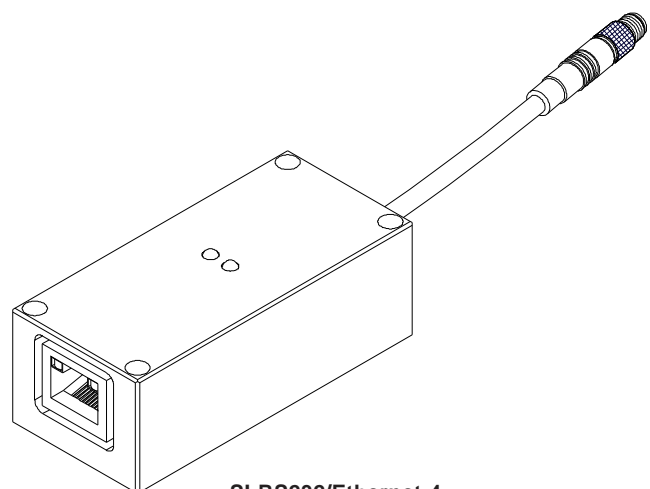
**cab-las4/USB-...** (picture)  
**cab-las4/USB-w-...** (connector 707, right-angle type)  
 (max. length 5m, outer jacket: PUR)

**Alternativee:**

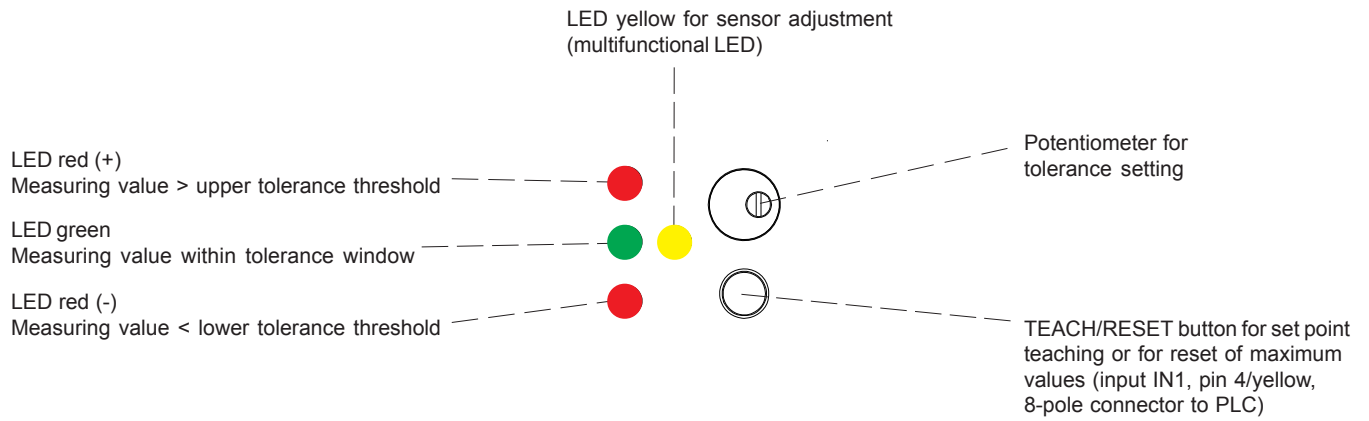
Anschluss L-LAS-LT-...-MA to a local network:  
 Anschluss L-LAS-LT-...-MA-4/20 to a local network:  
 via **Ethernet bus**

Adapter (based on Lantronix XPortModul):

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



**SI-RS232/Ethernet-4-...**  
 (available lengths: 0,5m, 1m, or 2m,  
 outer jacket: PUR)



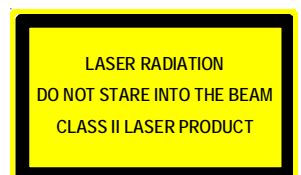
LED display is active only at the Master:

L-LAS-LT-110-RA-MA  
L-LAS-LT-110-RA-MA-4/20



The laser line sensors of L-LAS-LT Series comply with laser class 2 according to EN 60825-1. The use of these laser transmitters therefore requires no additional protective measures.

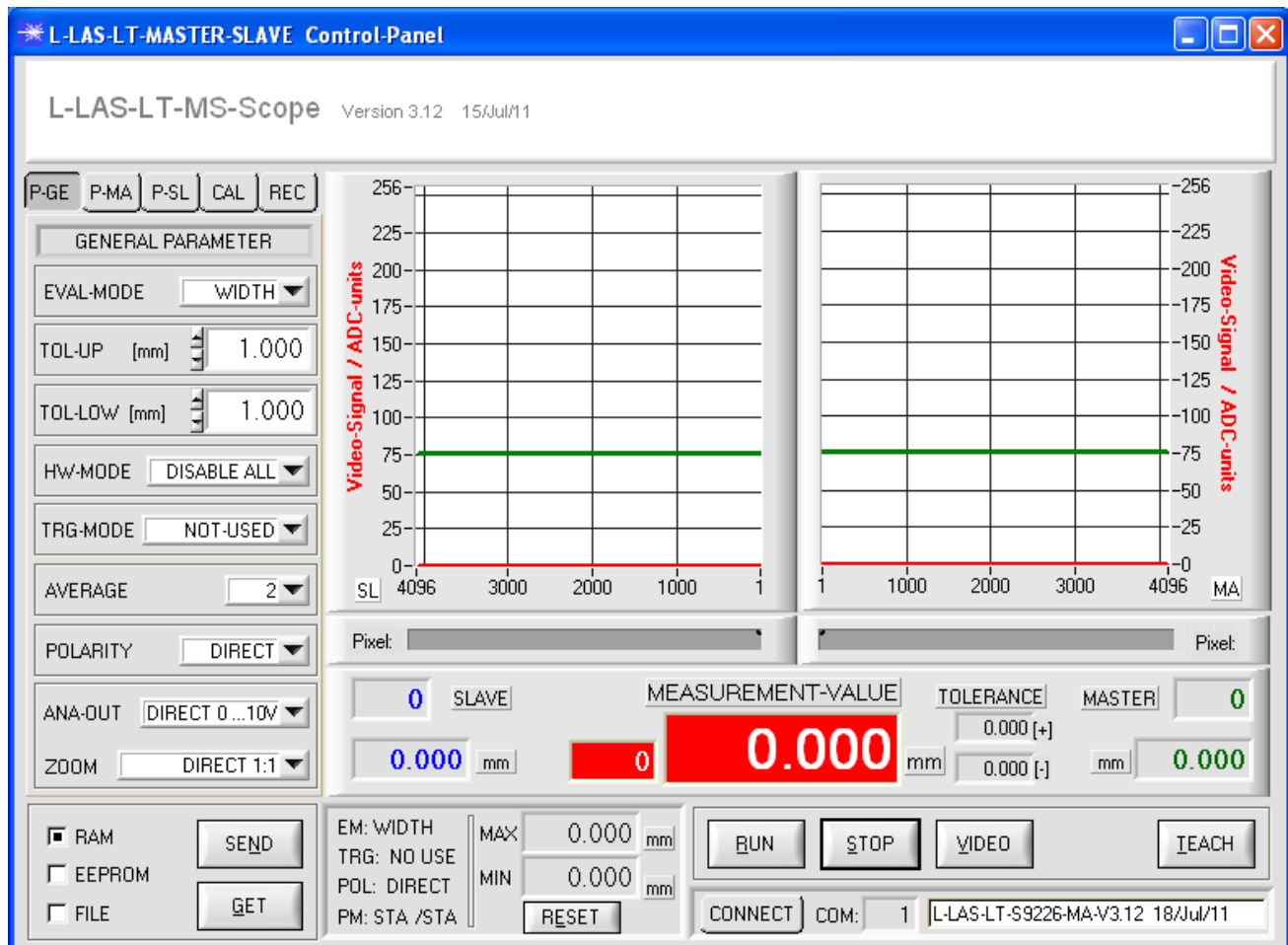
The laser line sensors of L-LAS-LT Series are supplied with a laser warning label.





**Parameterization**
**Windows® software L-LAS-LT-MS-Scope:**

The L-LAS-LT-...-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 USB cable cab-las4/USB or with Ethernet adapter SI-RS232/Ethernet-4). When parameterisation is finished, the PC can be disconnected again.

**Windows® user interface:**

With the help of the L-LAS-LT-MS-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

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