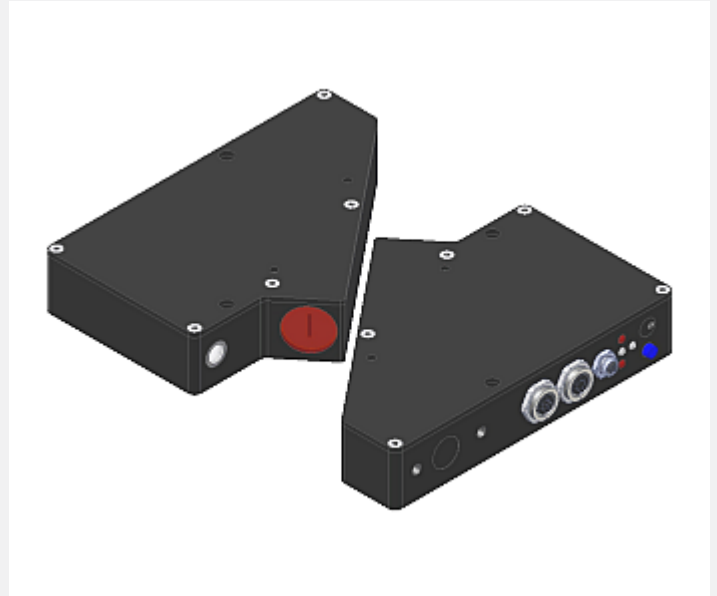


L-LAS Series

▶ L-LAS-LT-37-MA/-SL (Master/Slave)

- Line laser <math><1\text{ mW}</math>, wave length 670 nm, laser class 2
- Visible red laser line, typ. 0.2 mm x 3 mm
- Measuring range Master, Slave: each typ. 4 mm
- Start of measuring range Master/Slave: each at typ. 35 mm
- Resolution Master, Slave: each typ. 1 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 converter 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

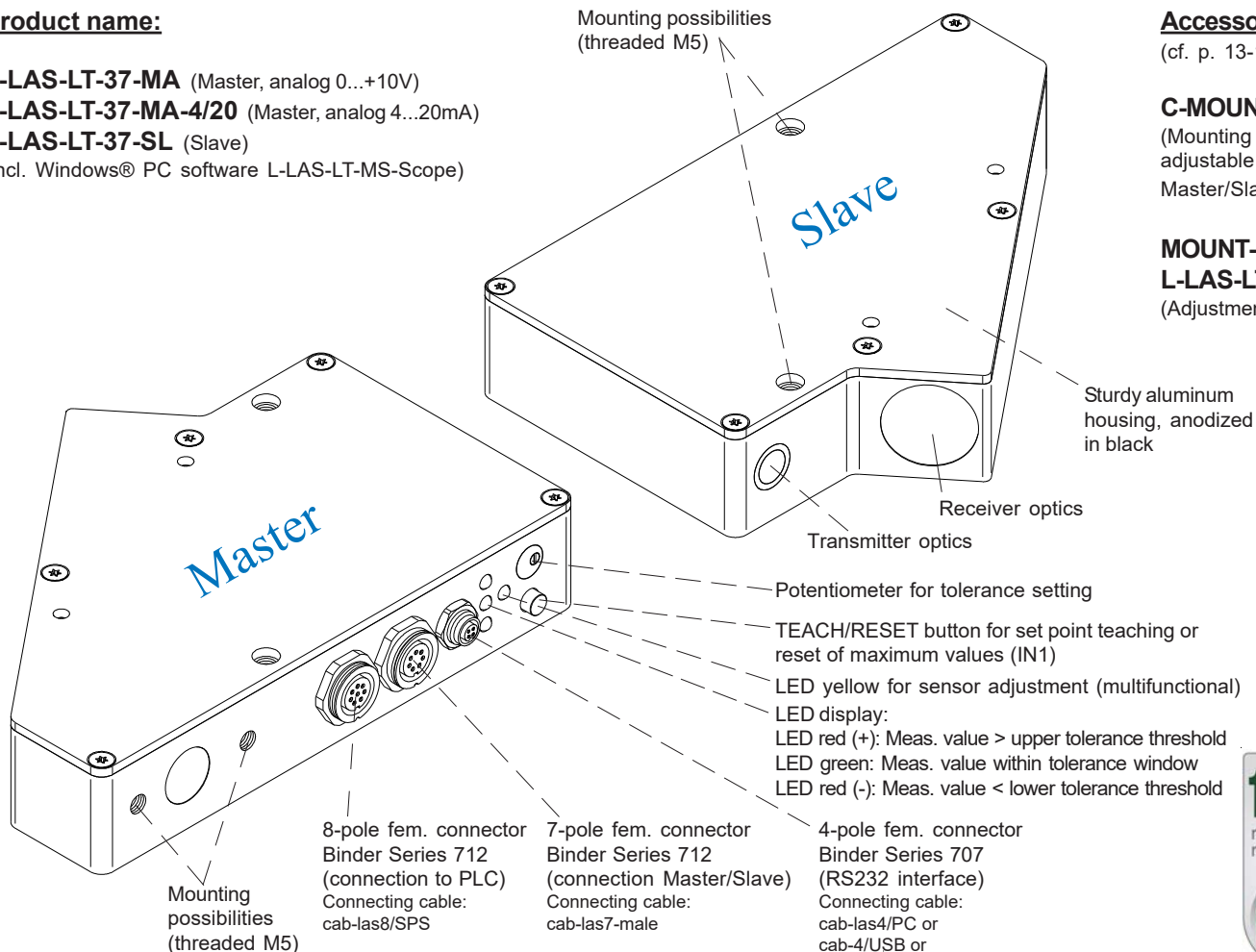


Design

Product name:

- L-LAS-LT-37-MA** (Master, analog 0...+10V)
- L-LAS-LT-37-MA-4/20** (Master, analog 4...20mA)
- L-LAS-LT-37-SL** (Slave)
- (incl. Windows® PC software L-LAS-LT-MS-Scope)

Mounting possibilities
(threaded M5)



Accessories:

(cf. p. 13-15)

C-MOUNT-LT-37

(Mounting plate,
adjustable distance
Master/Slave)

MOUNT-GAUGE-

L-LAS-LT-37-MS
(Adjustment unit)

Sturdy aluminum
housing, anodized
in black

Receiver optics

Transmitter optics

Potentiometer for tolerance setting

TEACH/RESET button for set point teaching or
reset of maximum values (IN1)

LED yellow for sensor adjustment (multifunctional)

LED display:

LED red (+): Meas. value > upper tolerance threshold

LED green: Meas. value within tolerance window

LED red (-): Meas. value < lower tolerance threshold

8-pole fem. connector
Binder Series 712
(connection to PLC)
Connecting cable:
cab-las8/SPS

7-pole fem. connector
Binder Series 712
(connection Master/Slave)
Connecting cable:
cab-las7-male

4-pole fem. connector
Binder Series 707
(RS232 interface)
Connecting cable:
cab-las4/PC or
cab-4/USB or
cab-4/ETH

Mounting
possibilities
(threaded M5)



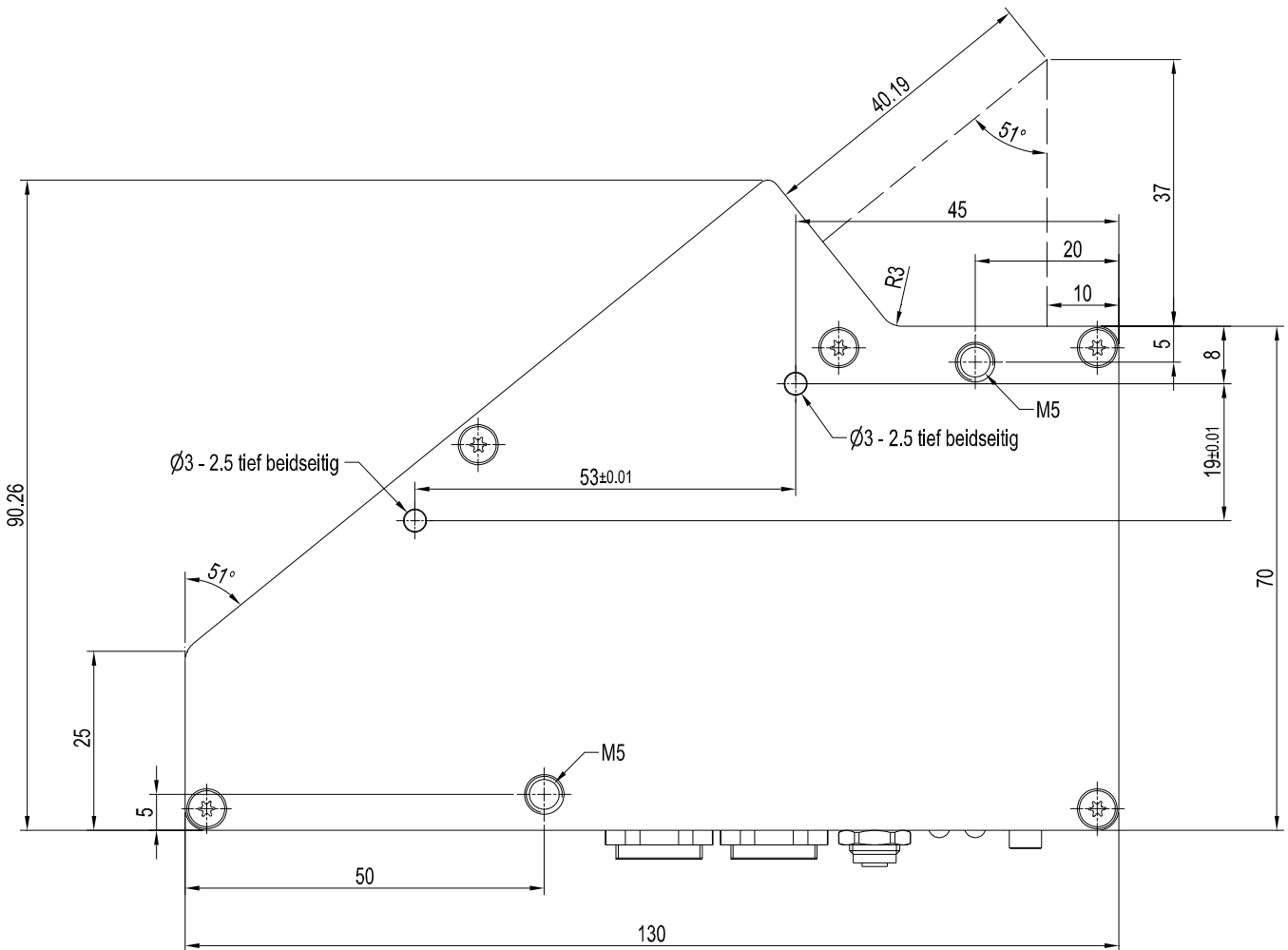
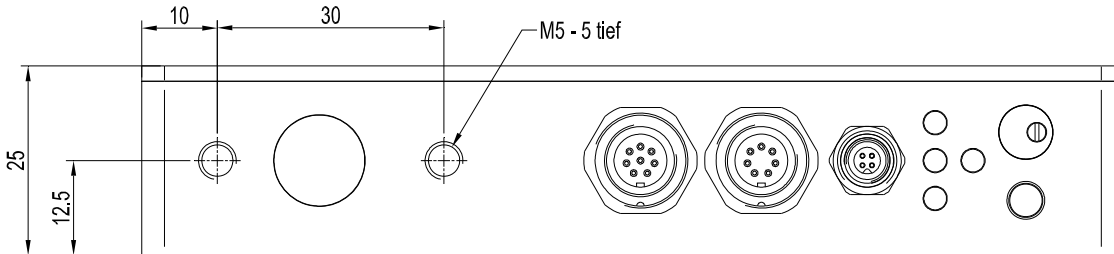


Technical Data

Model	L-LAS-LT-37-MA L-LAS-LT-37-SL	L-LAS-LT-37-MA-4/20 L-LAS-LT-37-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.	
Measuring range	MA and SL: each typ. 4 mm	
Start of measuring range	MA and SL: each typ. 35 mm (measured from housing edge, cf. picture beam path)	
End of measuring range	MA and SL: each typ. 39 mm (measured from housing edge, cf. picture beam path)	
Resolution	MA and SL: each typ. 1 µm (i.e. 2x 1 µm)	
Reproducibility	MA and SL: each typ. ± 1 µm (i.e. 2x ± 1 µm)	
Linearity	MA and SL: each 0.15% FSR (full scale range) (i.e. 2x 0.15%)	
Laser line geometry	typ. 0.2 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, OUT1, 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, IN1)	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. 130 mm x 90.26 mm x 25 mm (without flange connectors)	
Type of connector	L-LAS-LT-37-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-37-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®	

Dimensions

L-LAS-LT-37-MA
 L-LAS-LT-37-MA-4/20
 L-LAS-LT-37-SL

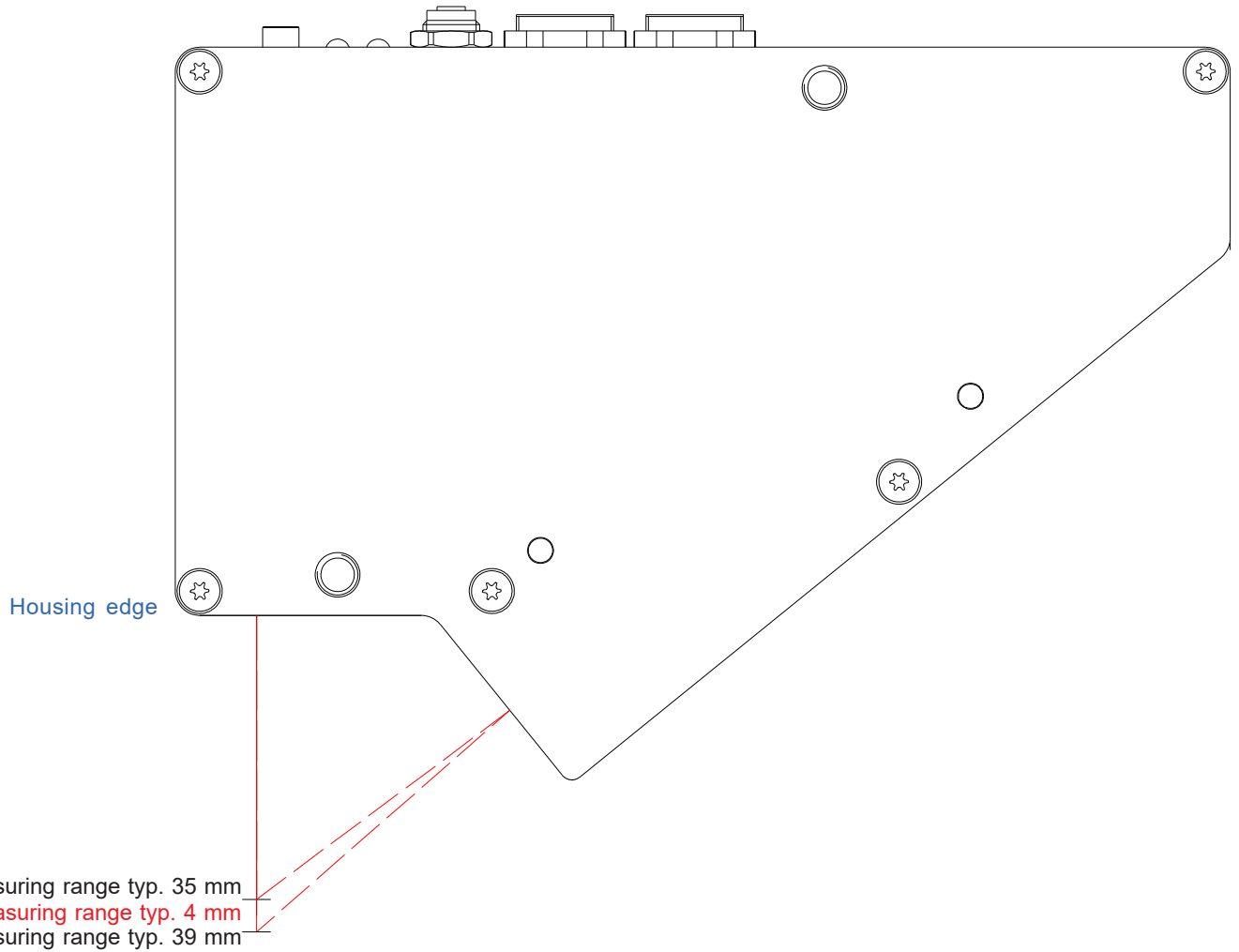


All dimensions in mm



Beam Path

L-LAS-LT-37-MA
L-LAS-LT-37-MA-4/20
L-LAS-LT-37-SL





Components of a complete Master/Slave system L-LAS-LT-37-MS:

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

1x L-LAS-LT-37-MA (Master, incl. Windows® software L-LAS-LT-MS-Scope)

1x L-LAS-LT-37-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-37-MA-4/20 (Master, incl. Windows® software L-LAS-LT-MS-Scope)

1x L-LAS-LT-37-SL (Slave)

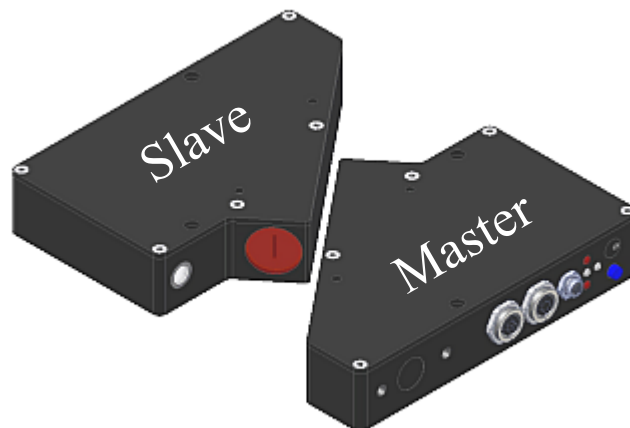
1x cab-las7-male-... (Connecting cable, connection of Master to Slave)

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)

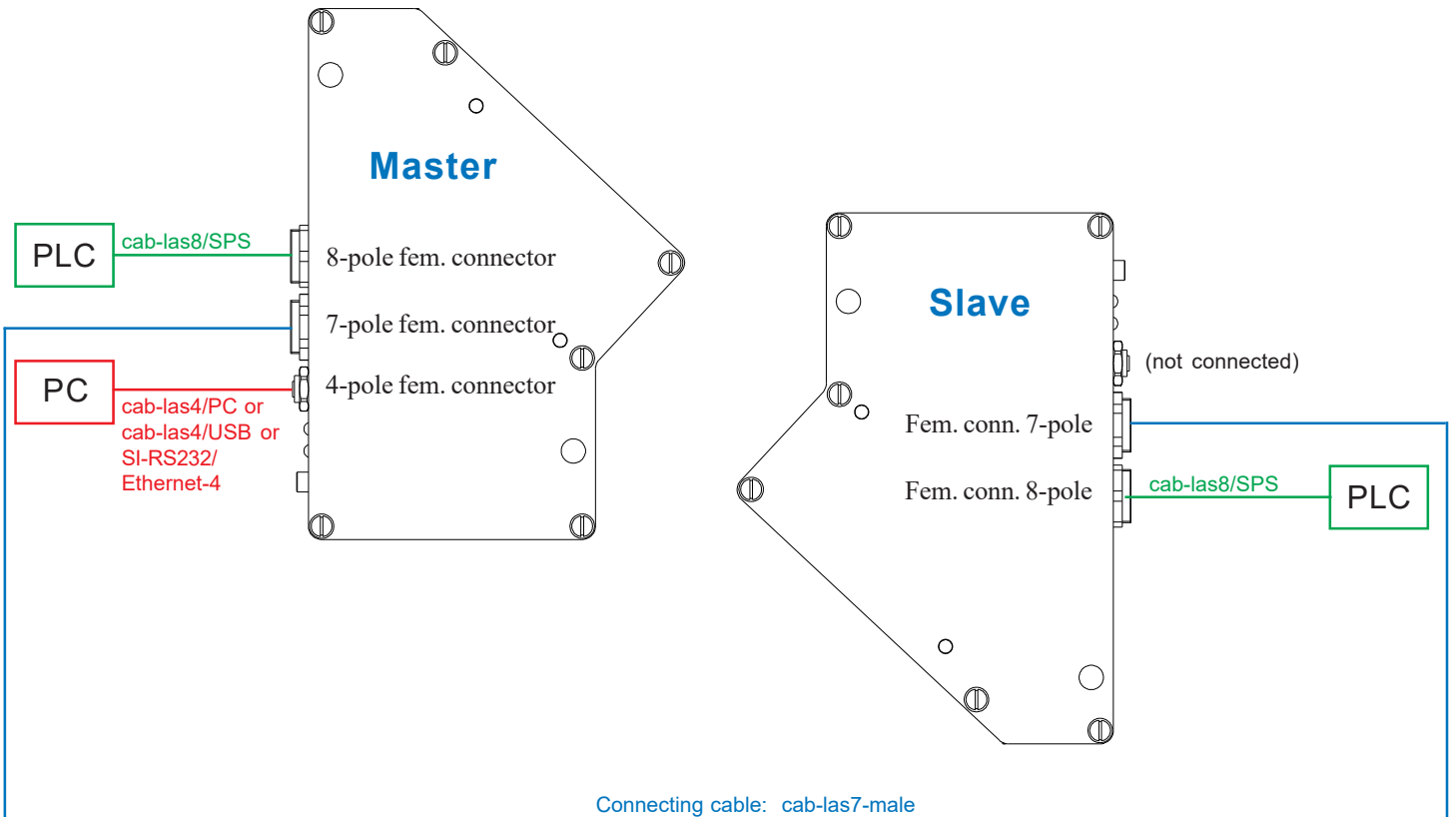
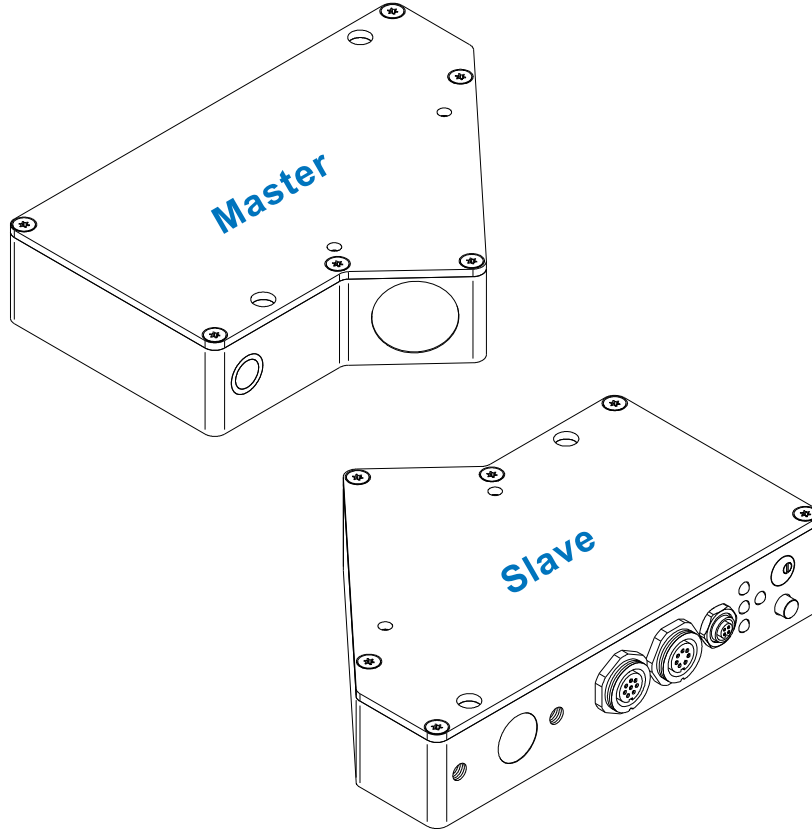
alternative: **1x SI-RS232/Ethernet-4-...** (Connecting cable to PC via Ethernet interface, for Master only)



Connection Scheme

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

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





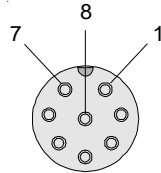
Connector Assignment

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

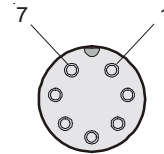
Pin:	Color:	Assignment:
1	white	GND (0V)
2	brown	+24VDC ($\pm 10\%$)
3	green	IN0 (EXT TRIGGER)
4	yellow	IN1 (TEACH / RESET)
5	grey	OUT0 (-)
6	pink	OUT1 (+)
7	blue	OUT2 (OK)
8	red	ANA (voltage 0 ... +10V) (optional: current 4 ... 20mA)



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)

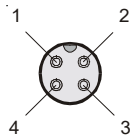
Connecting cable:

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)



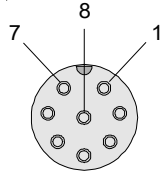


Connector Assignment

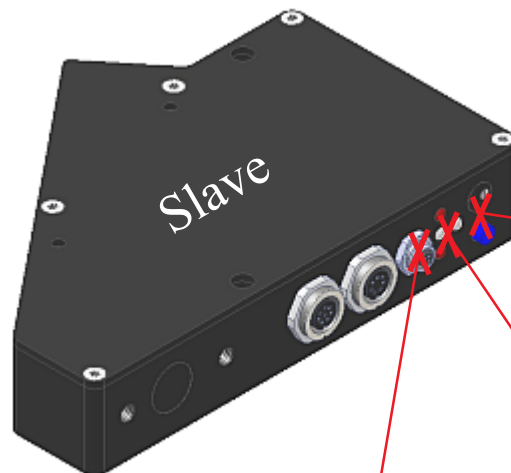
Connector assignment of Slave L-LAS-LT-...-SL:

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)



Potentiometer
and teach button
at the Slave are
inactive.

LED display at the
Slave is inactive.

Attention:
4-pole connector at the Slave is
inactive. Please use the RS232/USB
interface at the Master!

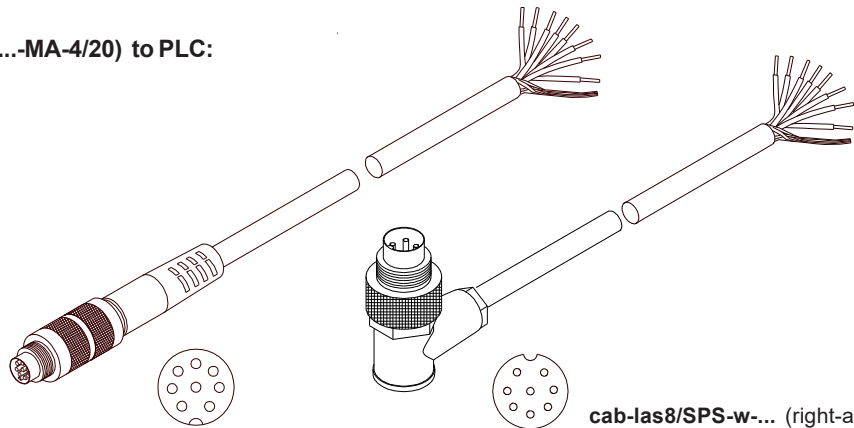


Connecting Cables

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)



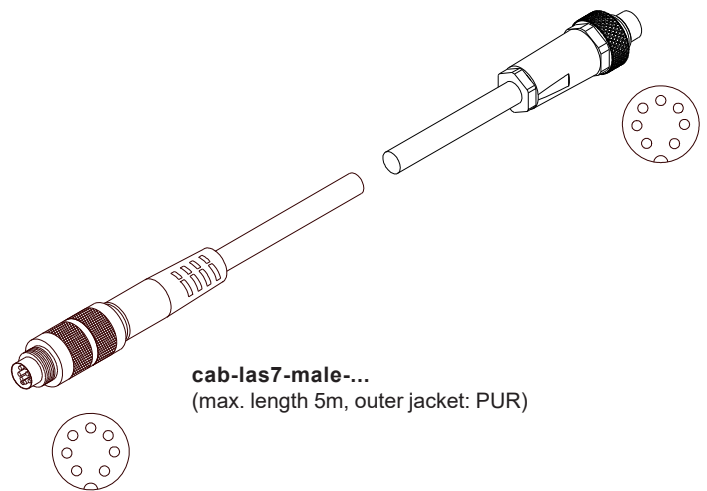
cab-las8/SPS-...
 (max. length 25m, outer jacket: PUR)

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

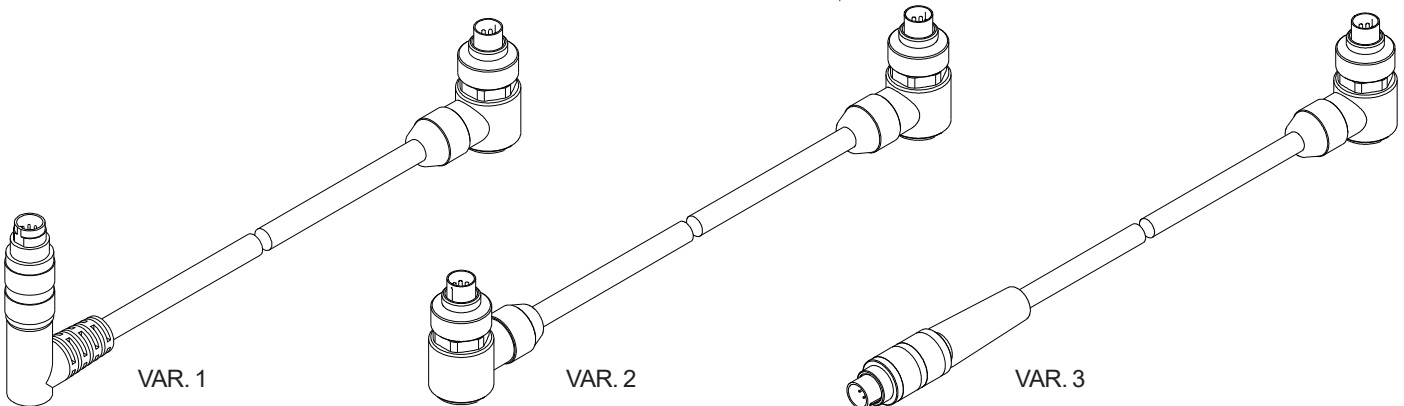
Connection L-LAS-LT-...-MA to L-LAS-LT-...-SL:
 Connection L-LAS-LT-...-MA-4/20 to L-LAS-LT-...-SL:

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-...
 (max. length 5m, outer jacket: PUR)



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)

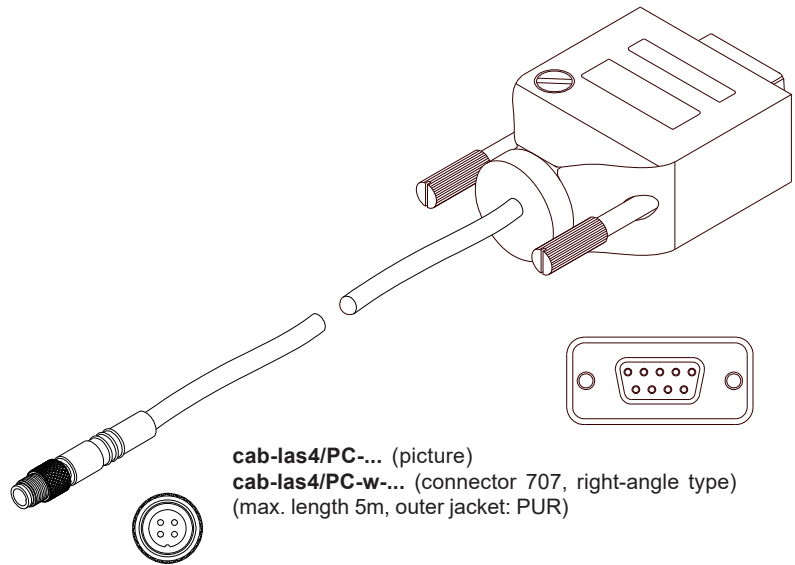


Connecting Cables

Connection L-LAS-LT-...-MA
 Connection L-LAS-LT-...-MA-4/20
 via RS232 interface at the PC:

Available connecting cables:

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



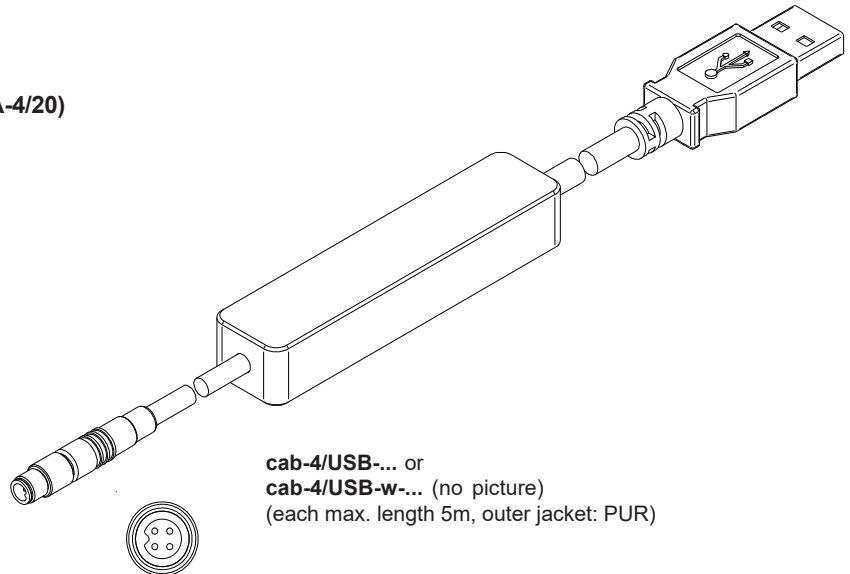
cab-las4/PC-... (picture)
cab-las4/PC-w-... (connector 707, right-angle type)
 (max. length 5m, outer jacket: PUR)

Alternative:

Connection L-LAS-LT-...-MA (or L-LAS-LT-...-MA-4/20)
 via USB interface at the PC:

Connecting cable (incl. driver software):

cab-4/USB-(length) or
cab-4/USB-w-(length) (angle type 90°)
 (standard length 2m)



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

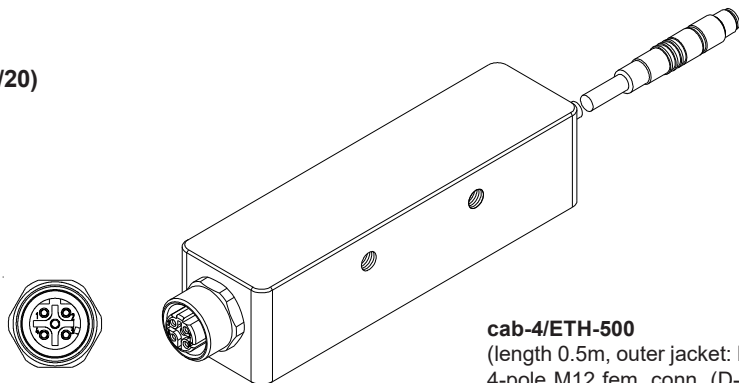
Alternative:

Anschluss L-LAS-LT-...-MA (or L-LAS-LT-...-MA-4/20)
 to local network via Ethernet bus:

Converter (incl. software „SensorFinder“):

cab-4/ETH-500
 (standard length 0.5m)

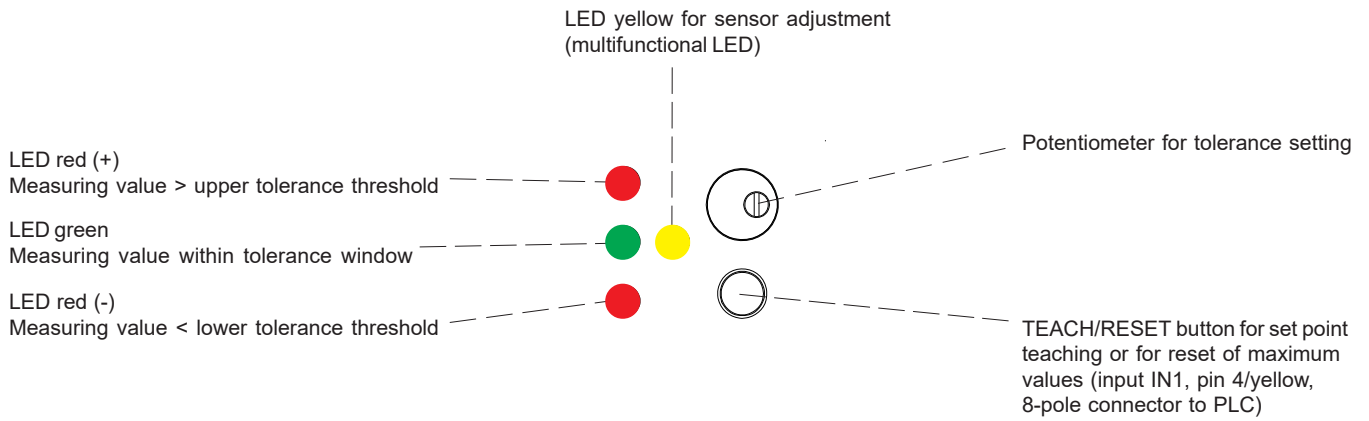
Optional:
 External CAT5 cable, e.g.
cab-eth/M12D-RJ45-flx-(length)



cab-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)



LED Display



LED display is active only at the Master:

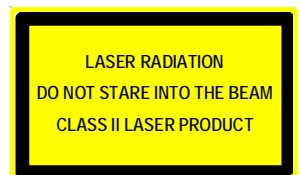
L-LAS-LT-37-MA
L-LAS-LT-37-MA-4/20



Laser Warning

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



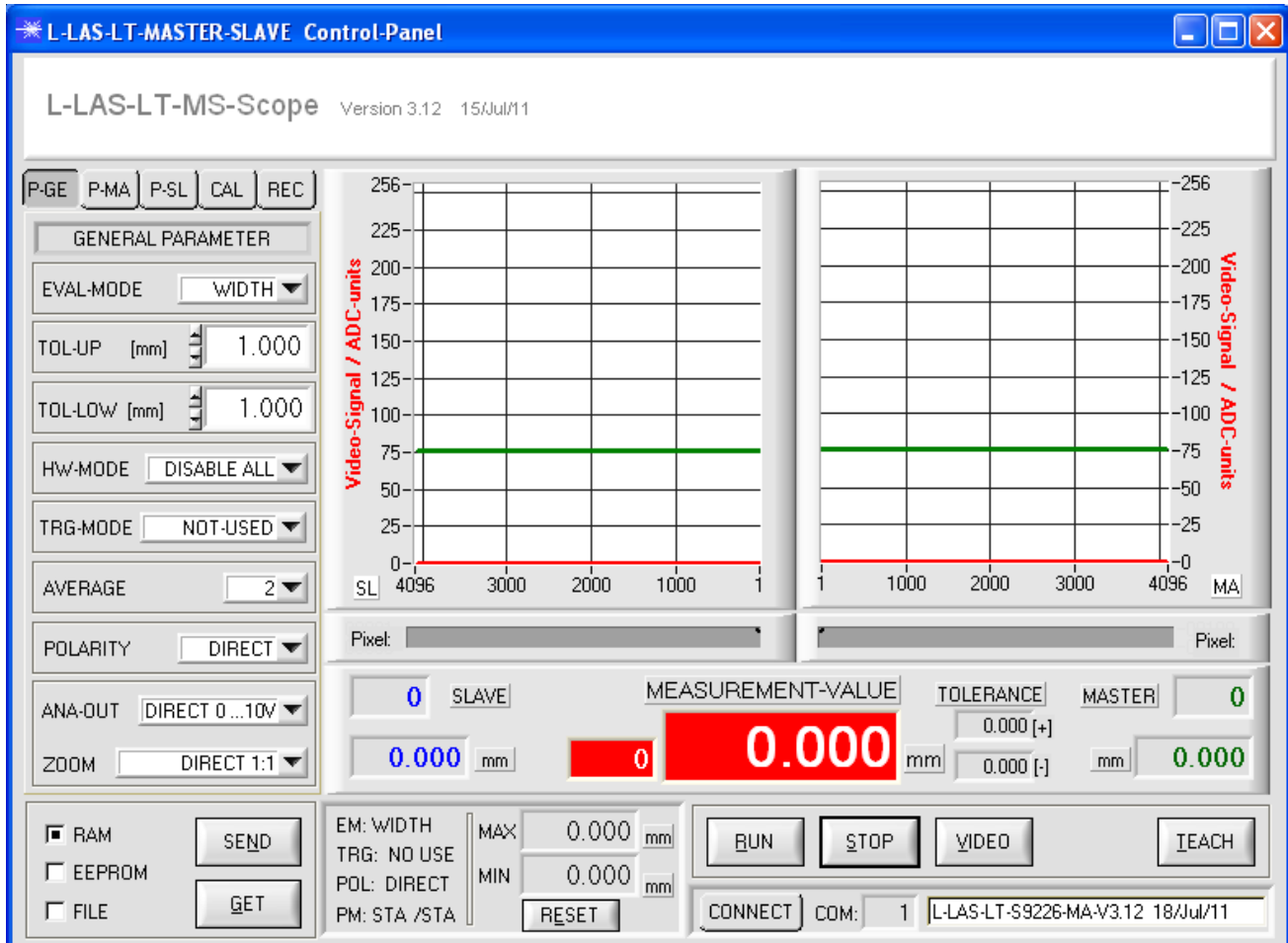


Parameterization

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:



In the case of line sensors with 512, 256, or 128 pixels the parameters related to the pixels will be adapted correspondingly!

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.



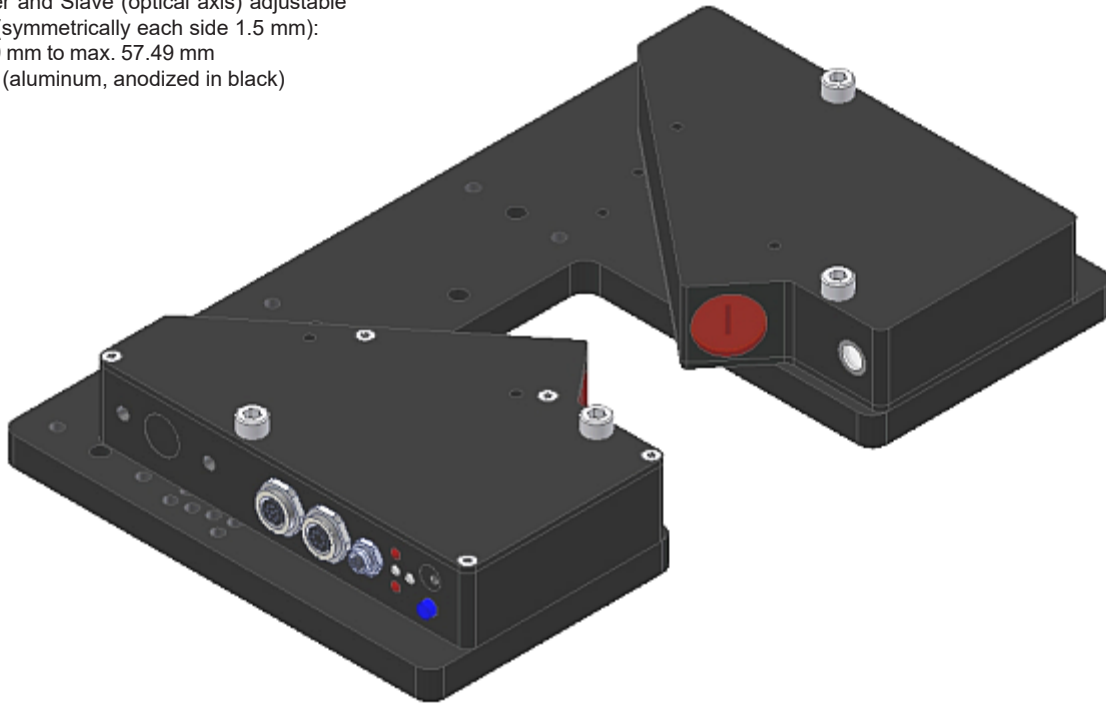
Mounting

Mounting plate C-MOUNT-LT-37

(please order separately)

suitable for Master/Slave line sensor
L-LAS-LT-37-MA (Master) and
L-LAS-LT-37-SL (Slave)

- Distance Master and Slave (optical axis) adjustable in 3 mm steps (symmetrically each side 1.5 mm): from min. 33.49 mm to max. 57.49 mm
- Sturdy material (aluminum, anodized in black)

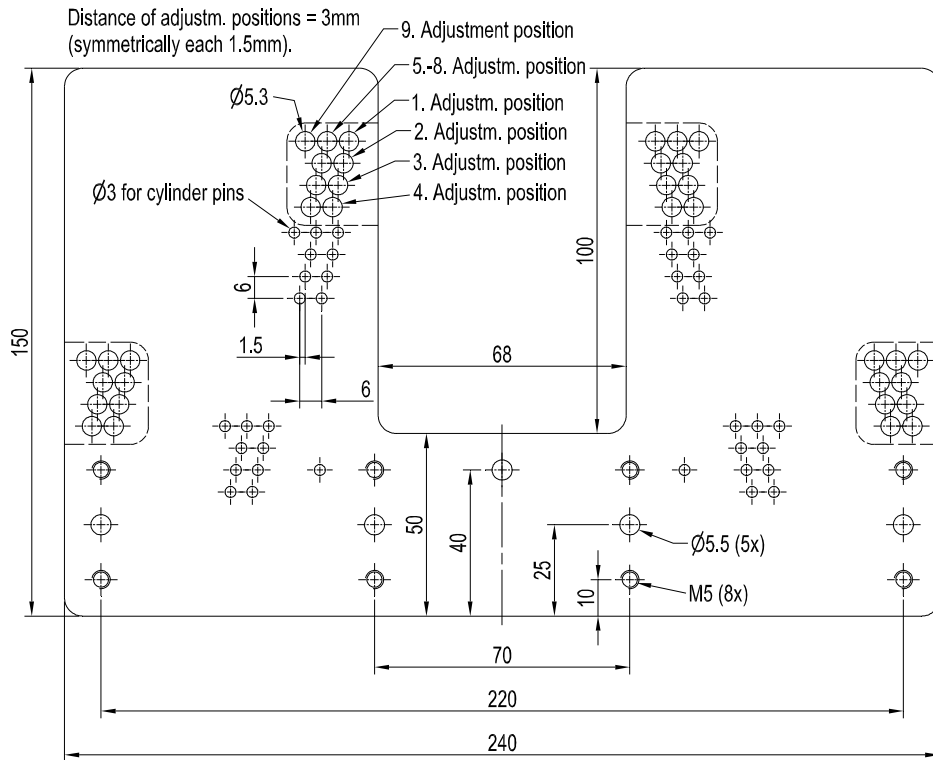
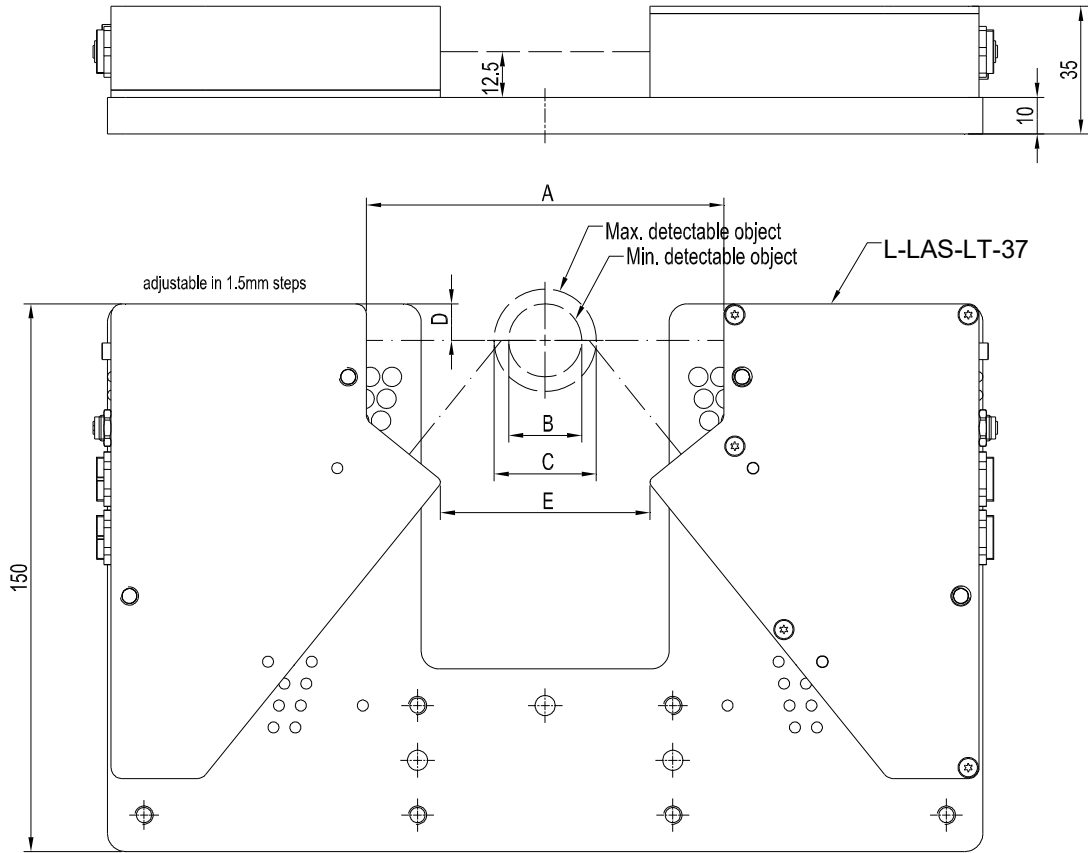


Adjustment positions (cf. drawing on the next page):
E = Distance Master/Slave (optical axis) in mm

Adjustment position	A	B	C	D	E
1.	74	0	4	10	33.49
2.	77	0	7	16	36.49
3.	80	0	10	22	39.49
4.	83	5	13	28	42.49
5.	86	8	16	10	45.49
6.	89	11	19	16	48.49
7.	92	14	22	22	51.49
8.	95	17	25	28	54.49
9.	98	20	28	10	57.49

Mounting

Mounting plate
C-MOUNT-LT-37



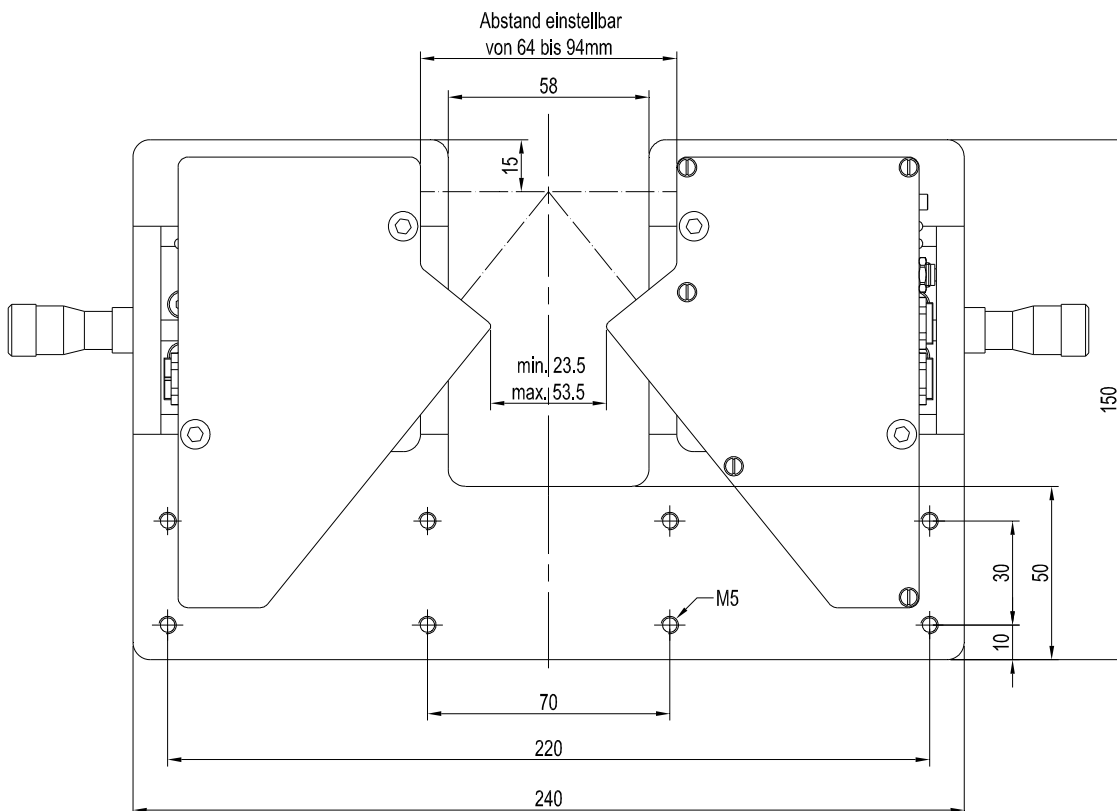
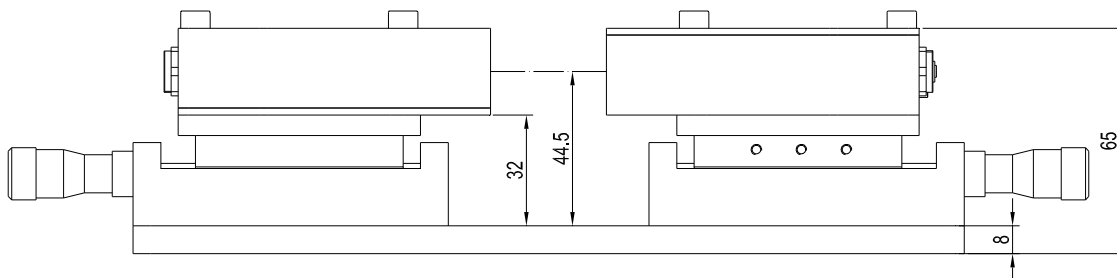
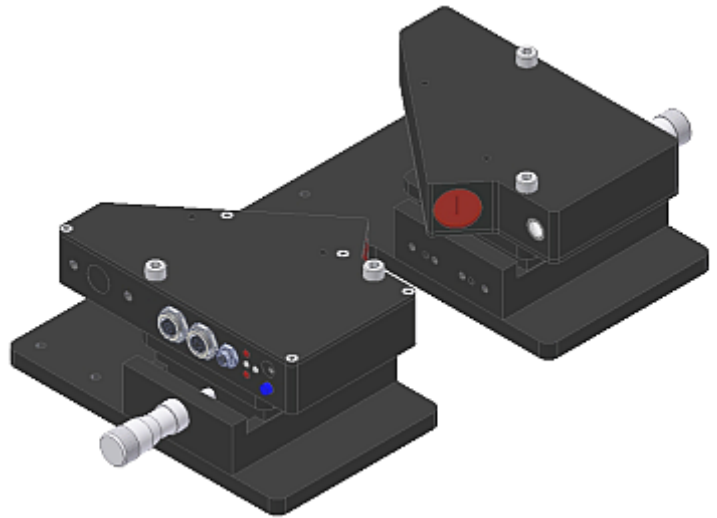
(All dimensions in mm)



Mounting

Adjustment unit (measuring table)
MOUNT-L-LAS-LT-37-MS
 (please order separately)

for optimal adjustment (via micrometer screws)
 of a Master/Slave laser triangulation sensor
L-LAS-LT-37-MA (Master) and
L-LAS-LT-37-SL (Slave)



All dimensions in mm