L-LAS Series

L-LAS-LT-37-MA/-SL
(Master/Slave)

- Line laser <1 mW, 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 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

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)

Design

Accessories:
(cf. p. 13-15)
C-MOUNT-LT-37
(Mounting plate, adjustable distance Master/Slave)
MOUNT-GAUGE-L-LAS-LT-37-MS
(Adjustment unit)

Mounting possibilities (threaded M5)
## Technical Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Light source</strong></td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Measuring range</strong></td>
<td>MA and SL: each typ. 4 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Start of measuring range</strong></td>
<td>MA and SL: each typ. 35 mm (measured from housing edge, cf. picture beam path)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>End of measuring range</strong></td>
<td>MA and SL: each typ. 39 mm (measured from housing edge, cf. picture beam path)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>MA and SL: each typ. 1 μm (i.e. 2x 1 μm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reproducibility</strong></td>
<td>MA and SL: each typ. ± 1 μm (i.e. 2x ± 1 μm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>MA and SL: each 0.15% FSR (full scale range) (i.e. 2x 0.15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laser line geometry</strong></td>
<td>typ. 0.2 mm x 3 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optical filter</strong></td>
<td>Interference filter, red light filter</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Analog output (1x)</strong></td>
<td>voltage output (0 ... +10V)</td>
<td>current output (4 ... 20mA)</td>
<td></td>
</tr>
<tr>
<td><strong>Digital outputs (3x)</strong> (OUT0, OUT1, OUT2)</td>
<td>pnp bright-switching / nnp dark-switching or pnp dark-switching / nnp bright-switching, adjustable under Windows®, 100 mA, short-circuit proof</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital inputs (2x)</strong> (IN0, IN1)</td>
<td>IN0: External trigger, IN1: Teach/Reset (double function) input voltage +5V/0V, with protective circuit</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voltage supply</strong></td>
<td>+24VDC (± 10%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity setting</strong></td>
<td>adjustable via potentiometer TOL or under Windows® via PC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laser power correction</strong></td>
<td>adjustable under Windows® via PC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>typ. 200 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure rating</strong></td>
<td>electronics: IP54, optics: IP67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature stability</strong></td>
<td>0.01% of measuring range/°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature ranges</strong></td>
<td>operating temperature range: -10°C ... +50°C, storage temperature range: -20°C ... +85°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Housing material</strong></td>
<td>aluminium, anodized in black</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Housing dimensions</strong></td>
<td>each Master and Slave: LwWxH approx. 130 mm x 90.26 mm x 25 mm (without flange connectors)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of connector</strong></td>
<td>L-LAS-LT-37-MA: 8-pole circular fem. connector type Binder 712 (PLC/Power)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-pole circular fem. connector type Binder 707 (PC/RS232)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7-pole circular fem. connector type Binder 712 (connection Master/Slave)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-LAS-LT-37-SL: 8-pole circular fem. connector type Binder 712 (Power)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7-pole circular fem. connector type Binder 712 (connection Master/Slave)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connecting cables</strong></td>
<td>connection to PC (Master): 1x cab-las4/PC (-w) or cab-las4/USB (-w) or SI-RS232/Ethernet-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>connection to PLC (each Master and Slave): 2x cab-las8/SPS or cab-las8/SPS-w</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>connection Master with Slave: 1x cab-las7-male or cab-las7-male-w</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Teach/Reset button</strong></td>
<td>for set point teaching or for reset of maximum values via input IN1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LED display</strong></td>
<td>LED red (+) : Measuring value &gt; upper tolerance threshold</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LED green : Measuring value within tolerance window</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LED red (-) : Measuring value &lt; lower tolerance threshold</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LED yellow : for sensor adjustment (multifunctional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EMC test acc. to</strong></td>
<td>DIN EN 60947-5-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scan frequency</strong></td>
<td>max. 200 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. switching current</strong></td>
<td>100 mA, short-circuit proof</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>RS232, parameterisable under Windows®</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output polarity</strong></td>
<td>bright-/dark-switching, can be switched under Windows®</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Beam Path

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

Housing edge

Start of measuring range typ. 35 mm
Measuring range typ. 4 mm
Start of measuring range typ. 39 mm
System Components

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 for a L-LAS-LT-... MS system
(by way of example L-LAS-LT-55-MS)

Master

8-pole fem. connector
7-pole fem. connector
4-pole fem. connector

Slave

Fem. conn. 7-pole
Fem. conn. 8-pole

PLC

PC

Connecting cable: cab-las7-male

4-pole fem. connector
7-pole fem. connector
8-pole fem. connector

cab-las8/SPS

cab-las4/PC or cab-las4/USB or SI-RS232/Ethernet-4

(not connected)
### Connector Assignment

#### Connection to PLC/Power:

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

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

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

#### Connection to PC:

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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Assignment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+24VDC (+Ub, OUT)</td>
</tr>
<tr>
<td>2</td>
<td>GND (0V)</td>
</tr>
<tr>
<td>3</td>
<td>Rx0</td>
</tr>
<tr>
<td>4</td>
<td>Tx0</td>
</tr>
</tbody>
</table>

**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)

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

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

<table>
<thead>
<tr>
<th>Pin</th>
<th>Assignment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND (0V)</td>
</tr>
<tr>
<td>2</td>
<td>+3.3VDC</td>
</tr>
<tr>
<td>3</td>
<td>SS</td>
</tr>
<tr>
<td>4</td>
<td>MISO</td>
</tr>
<tr>
<td>5</td>
<td>MOSI</td>
</tr>
<tr>
<td>6</td>
<td>SCLK</td>
</tr>
<tr>
<td>7</td>
<td>+3.3VDC</td>
</tr>
</tbody>
</table>

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

**Connection to Power:**

8-pole fem. connector Binder Series 712

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>white</td>
<td>GND (0V)</td>
</tr>
<tr>
<td>2</td>
<td>brown</td>
<td>+24VDC (± 10%)</td>
</tr>
<tr>
<td>3</td>
<td>green</td>
<td>not used</td>
</tr>
<tr>
<td>4</td>
<td>yellow</td>
<td>not used</td>
</tr>
<tr>
<td>5</td>
<td>grey</td>
<td>not used</td>
</tr>
<tr>
<td>6</td>
<td>pink</td>
<td>not used</td>
</tr>
<tr>
<td>7</td>
<td>blue</td>
<td>not used</td>
</tr>
<tr>
<td>8</td>
<td>red</td>
<td>not used</td>
</tr>
</tbody>
</table>

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

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**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 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)

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)

Alternative:
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)
LED Display

- LED red (+) for measuring value > upper tolerance threshold
- LED green for measuring value within tolerance window
- LED red (-) for measuring value < lower tolerance threshold
- Potentiometer for tolerance setting
- TEACH/RESET button for set point teaching or for reset of maximum values (input IN1, pin 4/yellow, 8-pole connector to PLC)

LED yellow for sensor adjustment (multifunctional LED)

LED display is active only at the Master:

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

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.

LASER RADIATION
DO NOT STARE INTO THE BEAM
CLASS II LASER PRODUCT
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:

![L-LAS-LT-MASTER-SLAVE Control-Panel](image)

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 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

<table>
<thead>
<tr>
<th>Adjustment position</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>74</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>33.49</td>
</tr>
<tr>
<td>2.</td>
<td>77</td>
<td>0</td>
<td>7</td>
<td>16</td>
<td>36.49</td>
</tr>
<tr>
<td>3.</td>
<td>80</td>
<td>0</td>
<td>10</td>
<td>22</td>
<td>39.49</td>
</tr>
<tr>
<td>4.</td>
<td>83</td>
<td>5</td>
<td>13</td>
<td>28</td>
<td>42.49</td>
</tr>
<tr>
<td>5.</td>
<td>86</td>
<td>8</td>
<td>16</td>
<td>10</td>
<td>45.49</td>
</tr>
<tr>
<td>6.</td>
<td>89</td>
<td>11</td>
<td>19</td>
<td>16</td>
<td>48.49</td>
</tr>
<tr>
<td>7.</td>
<td>92</td>
<td>14</td>
<td>22</td>
<td>22</td>
<td>51.49</td>
</tr>
<tr>
<td>8.</td>
<td>95</td>
<td>17</td>
<td>25</td>
<td>28</td>
<td>54.49</td>
</tr>
<tr>
<td>9.</td>
<td>98</td>
<td>20</td>
<td>28</td>
<td>10</td>
<td>57.49</td>
</tr>
</tbody>
</table>
Mounting plate
C-MOUNT-LT-37

Adjustable in 1.5mm steps

Max. detectable object
Min. detectable object

Adjustment positions at intervals of 3mm
(symmetrically each 1.5mm).

M5 for cylinder screws
Ø3 for cylinder pins

(All dimensions in mm)
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