The LT3 uses pulsed time-of-flight technology to achieve unsurpassed performance. The laser pulses one million times per second. The microprocessor records the time required for each pulse to travel to the target and back to the sensor. Every millisecond, it averages one thousand pulse times and outputs a value from the microprocessor.

The sensor’s long range enables it to detect very small features or parts, even when it is mounted well back from the hazards of a process.

This makes the LT3 a powerful tool for error proofing and die protection applications. The bright visible spot makes it easy to set up and align.

The LT3 laser sensor is not affected by wind, temperature or pressure changes and can be used on targets that are not perpendicular to the sensor. With non-shiny surfaces (flat paint, for example), the LT3 can sense targets up to 60° off of perpendicular.
LT3 Series – Diffuse Mode
Long-Range Laser Distance Sensor

Dimensions [mm]

• Cable

• Connector

Wave length
Visible red
Typical beam diameter
Laser protection class
(IEC 60825, EN 60825)

Sensing range
Minimum window size
90 % white card
18 % grey card
6 % black card

Adjustment
Response speed
Window limits
(on sensor or remote TEACH)
Analogue output slope

Supply
Supply voltage
Ripple \(V_{pp}\)
No load current
Delay upon power up
Remote TEACH input

Protection
reverse polarity
transient voltages
short-circuit

Outputs
Digital
Analogue
Current output load
Voltage output load

Material
Housing (window)
Protection class
(IEC 60529, EN 60529)
Temperature range
Temperature drift
Cable

Connector

Indicator LEDs
Green
Yellow
Red

Yellow (speed)
Analogue/Digital models:
Red/green TEACH
Output 1
Output 2
Digital-only models:
Yellow TEACH
Output 1 and 2

Wiring and Accessories
See page 3
LT3 Series
Long-Range Laser Distance Sensor

Resolution/repeatability in mm versus distance in m

<table>
<thead>
<tr>
<th>Max. range [m] 90 % white card</th>
<th>Output function</th>
<th>Analogue output</th>
<th>Connection</th>
<th>Type</th>
<th>Ident number</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 % black, 18 % grey, 90 % white</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diffuse

- Wiring
  - pnp, 2 digital outputs
  - npn, 2 digital outputs
  - pnp, analogue output
  - npn, analogue output

(a) load 1; (b) load 2; (c) output select; (d) laser control: beam enabled, connect to +5...24 VDC; 150 ms (slow), 60 ms (medium) or 51 ms (fast) delay upon enable when sensor is powered; (e) TEACH; (f) shield

(a) 4...20 mA (current) or 0...10 VDC (voltage); (b) digital output; (c) load; (d) laser control: beam enabled, connect to +5...24 VDC; 150 ms (slow), 60 ms (medium) or 51 ms (fast) delay upon enable when sensor is powered; (e) TEACH; (f) shield

Accessories [dimensions in mm]

- Brackets
  - SMBLT31 30 685 05 right-angle, stainless steel protective bracket
  - SMBLT32 30 692 36 protective bracket

- Connector
  - WAK8-2/P00 80 070 25 straight type, 8-pin

Wiring diagrams with labels:
- BN, BU, GN, WH, RD, YE
- 12-24 VDC, +5-24 VDC, 0-1,8 VDC, 5-24 VDC

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- Accessories
- Connectors
- Wiring diagrams
**LT3 Series – Diffuse Mode**

**Long-Range Laser Distance Sensor**

**IMPORTANT SAFETY WARNING!** These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can result in either an energised or de-energised output condition. These products should not be used as sensing devices for personnel safety.

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**Indicator LEDs: analogue and digital outputs**

- **A** Signal LED
- **B** Response speed indicators
- **C** Analogue TEACH LED
- **D** Analogue output programming push button
- **E** POWER ON/OFF LED
- **F** Output LED
- **G** Response speed push button
- **H** Digital TEACH LED
- **I** Digital (switched) output programming push button

**Indicator LEDs: two digital outputs**

- **A** Signal LED
- **B** Response speed indicators
- **C** Digital output 1 TEACH LED
- **D** Digital output 1 programming push button
- **E** POWER ON/OFF LED
- **F** Output LED
- **G** Response speed push button
- **H** Digital output 2 TEACH LED
- **I** Digital output 2 programming push button

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**Digital output response time**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Response Time</th>
<th>Hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast</td>
<td>1 ms ON and OFF</td>
<td>10 mm</td>
</tr>
<tr>
<td>Medium</td>
<td>10 ms ON and OFF</td>
<td>5 mm</td>
</tr>
<tr>
<td>Slow</td>
<td>100 ms ON and OFF</td>
<td>3 mm</td>
</tr>
</tbody>
</table>

**Analogue voltage output response time (−3 dB)**

- **Fast**: 450 Hz (1 ms average/1 ms update rate)
- **Medium**: 45 Hz (10 ms average/2 ms update rate)
- **Slow**: 4.5 Hz (100 ms average/4 ms update rate)

**Linearity**

- ± 30 mm from 0.3 to 1.5 m
- ± 20 mm from 1.5 to 5 m

**Colour sensitivity**

- 90 % white to 18 % grey: < 10 mm
- 90 % white to 6 % black: < 20 mm

Application note: allow 30-minute warm-up for optimal performance.

**Applications:**

**Auto seat range-of-motion**

*Objective:* To accurately measure the range of motion of an auto seat back.

*Sensor models:* LT3 diffuse-mode sensor.

*Operation:* The user needs to verify that each auto seat manufactured in a plant adjusts to the correct, predetermined positions. With the seat positioned in a fixture, the LT3 measures the distance to the back of the seat when it is placed into three angles of recline.

**Log profiling**

*Objective:* Detect and calculate the diameter of each log as it passes on the conveyor belt.

*Sensor models:* Two LT3 diffuse-mode sensors with analogue/digital outputs.

*Operation:* The LT3 sensors are placed above and to one side of the conveyor, approx. 2 m from the log’s surface. Each sensor sends a signal to a PLC, representing the distance from the sensor to the surface of the log. The PLC calculates the log’s diameter, based on the known distances to each sensor.

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![Image of LT3 Series sensor with indicator LEDs and buttons]

**Image**

*Note:* The image shows the LT3 Series sensor with its indicator LEDs and buttons labeled as follows:

- **A** Signal LED
- **B** Response speed indicators
- **C** Analogue TEACH LED
- **D** Analogue output programming push button
- **E** POWER ON/OFF LED
- **F** Output LED
- **G** Response speed push button
- **H** Digital TEACH LED
- **I** Digital (switched) output programming push button