Laser level measurement sensor • LTI
The Intercontrol LTI is a non-contact instrument for automatically measuring the level of bulk, granular solid materials in silos and other storage vessels. Based on laser technology with its characteristic narrow beam and low divergence, the LTI can measure directly to a surface without interference from internal structure and with complete immunity to surface angle or material dielectric.

Product features

- integral alignment flange
- integral dust protection
- measures vertical level
- measures to the bottom of a silo
- narrow beam with low divergence
- in-field configuration and aiming accessory
- can be configured without filling or emptying the vessel
- air purge to keep lenses free from dust

The LTI sensor features an integral flange and swivel joint which is adjustable through an angle of ±10° making it easy to aim to the very bottom of a silo. Internal sensors compensate for this tilt angle by converting the measured distance from a “slant range” into a “vertical level”. The unit can measure all clearly visible surfaces irrespective of texture, granularity, slope or colour. A still-air barrier prevents dust particles from reaching the optics and keeps the lenses clean for long periods. The LTI has a USB port that can be used to input configuration and settings. This port also supplies power to the instrument in the event that field power is not available. An optional field programmer with text and graphical readouts makes it easy to visualize results, input range values and align the instrument.

Applications

The LTI accurately measures to the surface of mineral ores, grains, fibrous materials, synthetic plastics and numerous other materials that are stored in bulk, pellet or granular forms. By taking advantage of its long measuring
range and narrow beam, the LTI can reach the bottom of tall silos or measure through narrow apertures into feed chutes, bunkers and hoppers.

Installation

The LTI is normally attached to a process connection at the top of a silo or mounted on a bracket above the material to be measured. To aim the LTI at the right point on the surface or down to the bottom of a silo, loosen the clamp ring on the adjustable flange and rock the body of the instrument to the correct angle. A virtual aiming laser is available as an animated graphic on the field programming accessory. Tighten the clamp ring to re-seal the process. The LTI nominally uses 24 V DC field power and produces a 4...20 mA current output which is powered from the same source. Internal testing verifies the continuity of the current output and the status can be viewed on a terminal device using the USB port or on one of the graphic screens of the field programmer. If field power is not available, the USB interface can still be used to test, align and put settings into the instrument making use of power that is supplied through the port.

Operation

The LTI continuously outputs a current on the NAMUR compliant 4...20 mA channel, that is proportional to the level of the material being measured. Accurate determination of this level is the result of multiple sensing technologies feeding into a mathematical algorithm. At the heart of this algorithm is the conversion of timed laser pulses into a “slant range” followed by a secondary correction for the aiming angle of the laser beam. The resulting vertical measurement is transformed into the final level by using the absolute distances input as the 4...20 mA end points.
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**Technical data**

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<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
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<td>Sensing range</td>
<td>0.3 ... 50m</td>
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<tr>
<td>Resolution</td>
<td>10mm</td>
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<td>Accuracy</td>
<td>1 standard deviation = 2.5 cm at 20°C</td>
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<td>Update rate</td>
<td>5 readings per second</td>
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<td>Analog</td>
<td>4...20 mA NAMUR compliant self-powered &amp; non-isolated</td>
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<td>Power supply</td>
<td>24 V DC nominal (12...28 V DC)</td>
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<td>Communication</td>
<td>USB 115200 baud 8-N-1</td>
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<td>Process connection</td>
<td>Flange</td>
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<td>Pressure</td>
<td>Atmospheric</td>
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<td>Operating temperature</td>
<td>-20°C...+60°C</td>
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<td>Electrical connection</td>
<td>M16 x 1.5</td>
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<td>Enclosure rating</td>
<td>IP 66</td>
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<td>Air purge hole</td>
<td>1/8” BSP option</td>
</tr>
</tbody>
</table>

**Materials:**

- **Housing material**: Anodized aluminium
- **Lens material**: Impact resistant acrylic
- **Beam divergence**: < 1° to half power points
- **Laser safety classification**: Class 1M
- **Caution**: Do not view laser directly with optical instruments

**Dimensions (mm)**

- **Cable gland M16x1.5**: 70.0
- **Earth screws**: 63.5
- **1/8” BSP air purge**: 131.5

**Electrical connections**

- 24 V DC power supply
- COM
- Load
- 4...20 mA
- Earth
- Power indicator
- USB connector

**Process connection**

- Flange

**Communication**

- USB 115200 baud 8-N-1

**Pressure**

- Atmospheric

**Operating temperature**

- -20°C...+60°C

**Electrical connection**

- M16 x 1.5

**Enclosure rating**

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**Level control**

**Positioning**

**Blocked-chute detection**

**Break, tear & slack monitoring**

**Build-up monitoring**

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