BU Measurement and Analytics, June 2016

Laser Level Measurement Products
Introducing the New LLT100
Introducing the LLT100
Lasers for level: Now everything is possible

- The LLT100 revolutionizes the level measurement industry
- Replaces open-path radar
- LLT100 will change the way you perform level measurement. It is measurement made easy
Introducing the LLT100
A wide array of applications

- Continuous, non-contact level measurement in many industries:
  - Bulk materials, mining, oil & gas, chemicals, food & beverages

- Used for
  - Inventory measurement
  - Process automation
  - Positioning

- Simple installation and use: Measurement made easy
LLT100: A true alternative to open path radar
Comparable features, simpler to use, lower total cost

<table>
<thead>
<tr>
<th>Features</th>
<th>LLT100</th>
<th>OPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non contact measurement</td>
<td></td>
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<tr>
<td>Liquids and solids materials</td>
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<tr>
<td>Hart communication</td>
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<tr>
<td>Pressure rated interface</td>
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<tr>
<td>Hygienic interface</td>
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<td>Explosion proof</td>
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<td><strong>Simple to use</strong></td>
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<td></td>
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<tr>
<td><strong>Low cost of ownership</strong></td>
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LLT100 Laser Level Transmitter

Features

- Rotating display with touch through the glass
- Eye safe, laser class 1
- Powered from the loop, HART output
- Industrial enclosure, IP67 and explosion proof class 1, division 1 (zone 1)
- Universal flanges and high pressure flanges available
LLT100 Laser Level Transmitter

Features

- Small diameter
  2 inch (5cm) interface

- Emitter lens

- Receiver lens

- Heated window to avoid condensation

- up to 100 m (330 ft.) for solids
- up to 30 m (100 ft.) level for liquids
- up to 200 m (660 ft.) for positioning
LLT100 Laser Level Transmitter
Base Model

Ideal for measuring the level of solids and liquids at normal pressures

Flange fits ASME150 and DN 50 PN 16 bolt patterns

Affordable cost and versatile
LLT100 Laser Level Transmitter
High Pressure Models

Same performance as the base model

Pressure rated flanges:
  - 2” Class 150
  - 2” Class 300
  - DN 50 PN16
  - DN 50 PN40

Ideal for
  - Pressure rated applications
  - Hazardous areas
  - For zone rated areas, forming a barrier between zone 0 and zone 1
LLT100 Laser Level Transmitter
Product Variations - Hygienic Model

Ideal for food and beverage applications

4” triclover clamp interface with hygienic certifications

Narrow laser beam not affected by agitators, mixers, narrow spaces
Features & capabilities
Communication protocol: HART

Easy setup allows fast startup
Answer 10 questions for fast startup

Device setup
Calibrate level for non-vertical laser beam
Must input two known points
Linearization: transform level in volume or other value
20 points table

Display
Configure display layout

Process alarms
Up to 4 threshold alarms
Features & capabilities

Level vs ullage

Output can be:
- 4-20 mA,
- Level (m/ft),
- Ullage (m/ft)
- Volume, flow, etc. with linearization
- % of full vessel (display only)
## Features & capabilities

### Measurement modes

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong></td>
<td>• Standard measurement mode that will fit most solid applications as well as opaque liquid applications.</td>
</tr>
<tr>
<td><strong>Liquid</strong></td>
<td>• Measurement mode designed for transparent liquid applications.</td>
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<td></td>
<td>• Features a special bottom-of-the-tank detection algorithm.</td>
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<tr>
<td></td>
<td>• Allows measuring very low liquid levels</td>
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<tr>
<td><strong>Positioning</strong></td>
<td>• Positioning applications</td>
</tr>
<tr>
<td></td>
<td>• Special calibration designed to work in applications in which the target is a retro-reflector panel</td>
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<tr>
<td><strong>Dust &amp; Vapor</strong></td>
<td>• Measurement mode that features a better reliability in dust and vapor conditions.</td>
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<tr>
<td></td>
<td>• To maximize precision, we suggest to use standard or clear liquid mode if neither dust nor vapor is present in the process.</td>
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LLT100 Laser Level Transmitter
Certifications and Approvals

- Hazardous area (FM, ATEX, CSA, IECEx)
  - Safe for gas, flame proof (Class 1/ Division 1 (zone 1))
  - Safe for dust, dust exclusion (Zone 21)
  - Laser beam is intrinsically safe for use into Zone 0, when product is in Zone 1
    - Must use fused glass flanges
- Method of protection is “flame proof enclosure”
- OP IS – intrinsically safe for laser emission
- Canadian Registration Number (CRN)
- Hygienic certification (3A)
LLT100 Laser Level Transmitter

Accessories

- Embedded user interface
- Heated lens (4 wires)
- Dust tube
- Purge ring
- Cooling tube (increase max. process temp. to 300°C/570°F)
- Variants with different product flanges at the bottom
- Flange adapters
- Pointing/alignment device
- External relays (qty 2)
- Rotating bracket
- Swivel flange
- Cable glands
LLT100 Laser Level Transmitter
Product Benefits

- Low cost of ownership
- Easy and fast to configure
- Reliable measurement not affected by structures and surrounding
- Precise measurement over wide range of materials and temperature
- Single product works for a wide range of application
## LLT100 applications

<table>
<thead>
<tr>
<th>Applications</th>
<th>LLT100 benefits</th>
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<tr>
<td>Liquid polymers</td>
<td>Reliable detection of low dielectric liquids</td>
</tr>
<tr>
<td>Digester vessels</td>
<td>Easy installation in complex environment because of the narrow beam</td>
</tr>
<tr>
<td>Level of chemicals in columns</td>
<td>Laser unaffected by column, easy installation with basic configuration at low cost</td>
</tr>
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LLT100 applications

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<th>Applications</th>
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<td>Food processing</td>
<td>Easy installation even in presence of mixers and complex environment because of the narrow beam</td>
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</table>
Summary
Take Home Message

Laser technology has unique advantages

- Measures any solid at any angle
- Non-contact, maintenance free, no vessel mapping
- Narrow beam
- Easy installation, configuration
- One device addresses wide array of applications

LLT100 works in wide array of industries

- Oil & gas, chemicals
- Hygienic applications: Food & beverage, pharma
- Open path radar replacement market
- All liquid applications
Power and productivity for a better world™