LEVEL WITH US to Effectively Minimize Process Upsets

Level Technologies for Every Application

Continuous Level Monitoring
- Bubbler Systems
- Capacitance
- Guided Wave Radar
- Hydrostatic Pressure
- Load Cells (Level by Weight)
- Magnetic Floats
- Nuclear
- Radar
- Submersible
- Ultrasonic

Point Level Detection
- Capacitance
- Ultrasonic
- Rotary Paddle
- Vibratory Fork
- Float Switches

Learning Level
Free level technology webinars.
Lecture and hands-on sessions taught by our factory-trained product specialists.
Visit www.lesman.com/train/

Level DETECTED
Our radar brings your best level detection and monitoring systems into view!

25 GHz pulse radar for liquids and slurries in general service and process applications

Encapsulated 25 GHz pulse radar for liquids and slurries in harsh environments, corrosive media, or hygienic applications

Loop-powered guided wave radar for liquids and solids in tanks from 0.14 inches to 164 feet

78 GHz FMWC radar for bulk solids — unaffected by dust, vapor, pressure, or temperature

See our radar level offering on pages 4–19.

Need help? Call Lesman inside sales at 800-953-7626.
What’s the Right Level Technology for Your Application?

Need help figuring out which level measurement instrumentation to use in your process? Start with the reference charts below.

Find your media type, process conditions, and tank design to help narrow down your choices. Depending on your application, there may be more than one technology for you.

<table>
<thead>
<tr>
<th>Continuous Level Technologies</th>
<th>Armored Site Gauge</th>
<th>Bubbler</th>
<th>Capacitance</th>
<th>Guided Wave Radar</th>
<th>Hydrostatic Pressure</th>
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<th>Servo Gauges</th>
<th>Ultrasonic</th>
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<td>Liquids — Clean</td>
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<td>Liquids — Shifting Specific Gravity</td>
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<td>Dielectric &lt;2</td>
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Process Environment

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| Process Pressure > 50 PSI   | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |
| Vacuum Pressure             | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |
| Vapors                     | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |
| Foam                       | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |
| Turbulence                 | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |

Tank Design and Structural Properties

| Agitators                   | — | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |
| Obstructions                | — | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ | ▲ ▲ ▲ ▲ ▲ | ▲ | ▲ | ▲ | ▲ |

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<tr>
<th>Point Level Technologies</th>
<th>Capacitance</th>
<th>Floats</th>
<th>Rotary Paddle</th>
<th>Ultrasonic</th>
<th>Vibratory Fork</th>
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Process Environment

| Process Temperature > 350°F | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |
| Process Pressure > 50 PSI  | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |
| Vacuum                    | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |
| Vapors                    | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |
| Foam                      | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |
| Turbulence                | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ |

Tank Design and Structural Properties

| Agitators | ▲ | ▲ | ▲ | ▲ | ▲ |
| Obstructions | ▲ | ▲ | ▲ | ▲ | ▲ |

Due to manufacturer agreements, not all products are available in all geographic areas and markets. Prices in this catalog are current at the publication date, and are subject to change without notice.

Not sure what you need? Fill out an application datasheet at Lesman.com/datasheets/ and send it to Lesman for an engineering review.
### Continuous Level — Capacitance
- **Siemens SITRANS LC300 Capacitance Continuous Level Transmitters**: $1020.00 40
- **Siemens SITRANS LC500 Capacitance Continuous Level Transmitters**: Call 41

### Continuous Level — Guided Wave Radar
- **Honeywell SmartLine SLG700 Guided Wave Radar Level Transmitter**: $2145.00 16
- **Siemens SITRANS LG200 Guided Wave Radar System**: Call 18

### Continuous Level — Hydrostatic Pressure
- **Lesman Turnkey Level Bubbler Systems**: $5978.00 34
- **Honeywell SmartLine STF700 Flange Mount Smart Transmitter for Liquid Level**: $1982.00 32
- **Siemens SITRANS LH100 Submersible Transmitter for Liquid Level**: $738.00 31
- **WIKA LH-10 and LS-10 Submersible Transmitter for Liquid Level**: $497.81 30

### Continuous Level — Load Cells for Level by Weight
- **Sartorius Contego® Hygienic Weighing System**: Call 38
- **Sartorius PanCake® Load Cells for Level by Weight**: Call 36
- **Sartorius Maxim 5 Process Vessel Weighing Controller**: Call 39

### Continuous Level — Magnetic Site Gauge
- **WIKA WMI Magnetic Level Indicators**: Call 35

### Continuous Level — Nuclear
- **Ronan FlexDetector Scintillating Radiometric Detector for Liquid and Solids Level**: Call 39

### Continuous Level — Radar
- **Siemens SITRANS LR250 Radar for Continuous Liquid Storage Levels**: $1928.00 8
- **Siemens SITRANS LR260 Radar for Dry Bulk Solids Level**: $2424.00 14
- **Siemens SITRANS LR460 Long Range FM Radar for Bulk Solids**: $4122.00 15
- **Siemens SITRANS LR560 78GHz Long Range FM Radar for Bulk Solids**: $4122.00 12
- **Siemens SITRANS Probe LR/LR200 Radar for Continuous Liquid Storage**: $1122.00 6

### Continuous Level — Ultrasonic
- **Siemens HydroRanger 200 HMI Water Monitoring and Control System**: $1150.00 25
- **Siemens MultiRangerHMI Ultrasonic Continuous Level Transceivers**: $1124.00 24
- **Siemens SITRANS LU Long Range Ultrasonic Transceivers**: Call 26
- **Siemens SITRANS LU150 Ultrasonic Liquid Level Transmitter**: $698.00 20
- **Siemens SITRANS LUT400 Ultrasonic Level Controller**: $1023.00 22
- **Siemens SITRANS Probe LU Ultrasonic Transmitter for Liquid Level**: $1109.00 21
- **Siemens Echomax Ultrasonic Level Transducers and Accessories**: $556.00 28

### Terminal Inventory Control and Tank Gauging
- **Honeywell Enraf 854ATG/854XTG Servo Gauges**: Call 42
- **Honeywell Enraf SmartRadar Flexline Precision Tank Gauging System**: Call 44
- **Honeywell Enraf SmartRadar 970 Series for Storage Tank Measurements**: Call 46

### Point Level — Capacitance
- **Siemens CLS100 Two-Wire Capacitance Point Level Switch**: $243.00 51
- **Siemens CLS200 Capacitance Point Level Detection Switches**: $576.00 52
- **Siemens CLS300 Capacitance Point Level Switch for Harsh Environments**: $810.00 54
- **Siemens CLS500 Capacitance Point Level Switch for Extreme Conditions**: $864.00 56

### Point Level — Floats
- **Mechanical Bottle and Float-Type Level Switches**: $37.00 47

### Point Level — Paddle and Fork
- **Siemens LPS200 Rotating Paddle Switch for Bulk Solids**: $377.00 48
- **Siemens LVS200 Vibrating Fork Switch for Bulk Solids**: $588.00 49

### Point Level — Ultrasonic
- **Siemens ULS200 Ultrasonic Point Level Detection Switch**: $988.00 50
Radar Technology Cures Your Level Headaches

Ask yourself...

Do steam and vapors affect the accuracy and dependability of your existing level device?

Do you work with tanks or silos with coned bottoms? Have they caused problems getting reliable low level readings?

Is your current contacting level technology undependable, unreliable, or maintenance-intensive?

Have you considered non-contact technology, but rejected it because of excessive blanking distance requirements?

Have you tried radar, but experienced unexplained “loss of echo” errors?

Have you tried radar technology, but couldn’t get it “tuned” to ignore false echoes caused by obstructions in the vessel?

Are you using radar technology now, but need to call a factory guy to set it up or retune it when operating conditions change?

When was the last time you installed a new radar unit? How long did it take? Have you ever had it configured and working in less than four minutes?

Did you know that for less than $1000, you can buy a radar unit that works in liquids for vessels up to 66 feet?

Siemens Radar Technology Has the Answers!

✔ Reliable liquid and bulk solid level measurements, unaffected by steam and vapor
✔ Narrow beam angle radars that provide strong level signals, even in tanks and silos with coned bottoms
✔ Dependable, low-maintenance non-contact level technology
✔ Short blanking distances — 2” from the horn!
✔ Dynamic TVT thresholds that adjust depending on the signal strength, reducing “loss of echo” errors
✔ Self-learning algorithms, like automatic false echo suppression, ignore echoes caused by in-tank obstructions
✔ Process Intelligence Quick Start, easy menus, and step-by-step tuning, so you can configure the unit in as few as two parameters and less than five minutes — and reprogram the unit without a factory guy, if your needs change
✔ Models for any application, from simple liquid storage tank monitoring to harsh environments, bulk solids, and tall tanks — with prices starting under $1000!

Siemens Process Intelligence Provides Error-Free Results

Multiple signals, indirect path signals, weak signals, and false echoes from internal obstructions all contribute to the headaches of measuring level in tanks and silos. Your instrument has to learn how to ignore all of the noise and lock onto the correct echo signal for the material.

Process Intelligence software differentiates between true echoes from the material and false echoes generated by obstructions or electrical noise. It includes sophisticated algorithms, multiple-shot averaging, and automatic false-echo suppression for advanced echo selection.

For fast startup, the Process Intelligence Quick Start menu and Siemens’ self-learning technology allows easy setup in minutes.

Siemens LG200 Guided Wave Radar

- Horizontal cylinders
- Measuring in side pipes or bypass
- Liquid interfaces
- Applications with steam or ammonia
- Processes with turbulence inside the tank
- Medium range solids
- See pages 18 and 19 for details
- See www.Lesman.com/datasheets/ for the LG200 application datasheet (Required with any LG200 order.)

Automatic False Echo Suppression

A false echo can be a silo seam, structural member, material buildup, or other interference, resulting in a low echo confidence. Siemens self-learning algorithm detects false echoes and instructs the radar to ignore them. All Process Intelligence algorithms can be fine-tuned using a handheld programmer or SIMATIC PDM software and your laptop PC.
# Comparing Radar Instruments for Liquid Level

<table>
<thead>
<tr>
<th><strong>SITRANS Probe LR</strong></th>
<th>SITRANS LR200</th>
<th>SITRANS LR250</th>
<th>SITRANS LR250 FEA</th>
<th>SITRANS LR250 HEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-wire loop powered pulse radar level transmitters for liquids</td>
<td>Two-wire pulse radar level transmitters for liquids and slurries</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Function</strong></th>
<th>Bulk storage in simple process vessels and tank farms.</th>
<th>For general storage and process vessels.</th>
<th>For corrosive or aggressive chemical processes.</th>
<th>For hygienic or sanitary processes.</th>
</tr>
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<tbody>
<tr>
<td><strong>Range</strong></td>
<td>66 feet (20 meters)</td>
<td></td>
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</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>6.3 GHz</td>
<td>25 GHz</td>
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<tr>
<td><strong>Process Temperature</strong></td>
<td>-40° to 176° F</td>
<td>-40° to 392° F</td>
<td>-40° to 320° F (using FKM O-ring)</td>
<td>-40° to 338° F</td>
</tr>
<tr>
<td><strong>Process Pressure</strong></td>
<td>To 43.5 PSI</td>
<td>To 580 PSI</td>
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<tr>
<td><strong>Dielectric Constant</strong></td>
<td>&gt;3 (for &lt;3 use waveguide antenna or stillpipe)</td>
<td>&gt;1.6, antenna and application-independent</td>
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<tr>
<td><strong>Accuracy</strong></td>
<td>± Greater of 0.1% range or 10mm</td>
<td></td>
<td>±0.02 mA</td>
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<tr>
<td><strong>Output</strong></td>
<td>4-20 mA, HART*</td>
<td>4-20 mA, HART or Profibus PA, NAMUR NE 21, NE 43</td>
<td>4-20 mA, HART, Profibus PA, Foundation Fieldbus NAMUR NE 21, NE 43</td>
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</tr>
<tr>
<td><strong>Communications</strong></td>
<td>HART, SIMATIC PDM for configuration and diagnostics</td>
<td>HART or Profibus PA, SIMATIC PDM for configuration and diagnostics</td>
<td>HART or Profibus PA, SIMATIC PDM for configuration and diagnostics</td>
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<tr>
<td><strong>Process Connections</strong></td>
<td>1.5&quot; NPT, BSP, or G (polypropylene), flanges, sanitary</td>
<td>1.5&quot; or 2&quot; NPT; 2&quot;, 3&quot;, or 4&quot; ANSI flange connections</td>
<td>2&quot; to 6&quot; ANSI flange connections</td>
<td>2&quot;, 3&quot;, 4&quot; sanitary/hygienic flanged, threaded, clamp, or union connections</td>
</tr>
<tr>
<td><strong>Antenna</strong></td>
<td>Hermetically sealed polypropylene rod</td>
<td>Hermetically sealed polypropylene or PTFE Teflon® rod. Optional horn and sliding waveguide</td>
<td>316L stainless steel or PVDF antenna, 1.5&quot;, 2&quot;, 3&quot;, 4&quot; horns, with optional 4&quot; horn extension</td>
<td>316L stainless steel with PTFE lens</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Multi-segment alphanumeric liquid crystal with bar graph (representing level)</td>
<td>Graphical user interface including quick-start wizard and echo profile display</td>
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<tr>
<td><strong>Enclosure</strong></td>
<td>PBT polymer, polyether imide lid; Type 4X/NEMA 4X, Type 6/IP66</td>
<td>Aluminum, polyester powder-coated; Type 4X/NEMA 4X, NEMA 6, IP67</td>
<td>Polyester powder-coated aluminum; Ingress protection: Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68</td>
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<tr>
<td><strong>Approvals</strong></td>
<td>CE, CSA, FM, ATEX</td>
<td>CE, CSA, FM, ATEX</td>
<td>CE, CSA, FM, ATEX</td>
<td>CE, CSA, FM, ATEX, EHEDG, 3-A Sanitary</td>
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<td><strong>See page</strong></td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>10</td>
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</table>

*Siemens requires a completed radar application datasheet with most radar instrumentation orders. [See www.Lesman.com/datasheets/](http://www.Lesman.com/datasheets/)*
SITRANS Probe LR and LR200 for Bulk Liquid Storage Levels

Features

- Two-wire loop-powered radars offer low-cost installation.
- Great for bulk liquid storage in simple process vessels and tank farms.
- Low frequency of 6.3 GHz offers high immunity against condensation or deposits.
- Very high signal-to-noise ratio for reliable performance to ranges to 66 feet. Ample signal to withstand condensation, turbulence, or low dielectrics.
- Initial setup and configuration can be completed with as few as two parameters — with no need for an echo profile.
- Program using intrinsically safe handheld programmer, Simatic PDM software and a PC, or HART® handheld communicator. You don’t have to open the cover — exposing the terminals to the elements and corrosion.
- Built-in display has a primary reading, an auxiliary reading and a level bargraph.
- Rotating head swivels to line up with conduit or wiring connections. After installation, just rotate the head to the desired position for easy display viewing. After orientation, the head can be locked into place for permanent use.
- “Uni-construction” polypropylene rod antenna. The threads and rod antenna are made of the same material, and hermetically sealed to prevent chemical ingress. The internal shield ensures that no nozzle noise is introduced by the installation.
- Flange adapter version offers optional process connections and antennae.
- Sonic Intelligence signal-processing software includes Auto False-Echo Suppression for automatic detection and suppression of echoes from tank obstructions.
- Rugged, encapsulated enclosure is submersible and corrosion resistant. The potted design provides an extremely high level of shock and vibration resistance.

Specifications

- Range: 66 ft. (20 m)
- Frequency: 6.3 GHz
- Dielectric Constant: >3 (for <3 use waveguide antenna or stillpipe)
- Accuracy: ± greater of 0.1% range or 10 mm; Repeat-ability: ± 5 mm
- Analog Output: 4 to 20 mA ±0.02 mA accuracy max. 550Ω @ 24 VDC
- Local Display: Multi-segment alphanumeric liquid crystal with bar graph (representing level)
- Communications: HART®, Infrared handheld programmer, SIMATIC PDM
- Process Connections: 1.5” NPT, BSP, or G (polypropylene), flanges, sanitary
- Vessel Pressure: Up to 40 bar (600 PSI) process connections type-dependent
- Power: 4 to 20 mA loop powered
- Temperature: Ambient: -40° to 176° F (-40° to 80° C); Process: -40° to 392° F (-40° to 200° C) process conn. type-dependent
- Approvals: CE, CSAUS/CS, FM, ATEX, Industry Canada, FCC, R&TTE, 3A
- Antenna: Hermetically sealed polypropylene rod. Standard: 100 mm (4”) shield for max. 100 mm (4”) nozzle; Optional: 250 mm (10”) long shield; Rod: Teflon® (PTFE); Other antenna types available; Purge optional
- Enclosure: Probe LR: PBT polymer, hard-coated polyether imide lid; Type 4X/NEMA 4X, Type 6/IP68; LR200: Aluminum, polyester powder-coated; Type 4X/NEMA 4X, NEMA 6, IP67 protection

Dimensions

Dielectric constants table available at www.Lesman.com/train/
Ordering Instructions
Find the table for the model you need. Make one selection from each table section. Complete catalog numbers will look like:

- 7ML5430-______10, 7ML5422-______0,
- 7ML5424-______0, or 7ML5425-______0.

Siemens requires that customers include a completed application datasheet with all LR200 orders. Download it from www.Lesman.com/datasheets/.

Please submit orders to: Siemens Industry Inc., c/o Lesman Instrument Company

Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

---

**Note:** It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.

---

### SITRANS LR200 Uni-Construction Rod Antenna

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR200 Uni-Construction PP Rod Antenna</td>
<td>7ML5422-10</td>
<td>$1437.00</td>
</tr>
</tbody>
</table>

**Description:**
- Polypropylene, Integral 100 mm Shield, 1.5” NPT

**Approvals:**
- FM General Purpose
- FM Class I, II, Div 1, Grp A–G, Intrinsic Safe

**Output:**
- Hart Communications and 4-20 mA

---

### SITRANS LR200 Horn Antenna, Flange Connection

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR200 with Flange Adapter Horn Antenna</td>
<td>7ML5425-10</td>
<td>$1931.00</td>
</tr>
</tbody>
</table>

**Description:**
- 316L Stainless Steel, PTFE Cone Emitter

**Process Connect.**
- 4” ANSI 150 Lb, FF Flange

**Seal:**
- Nitride (Sliding Waveguide Systems)

**Output:**
- Hart Communications and 4-20 mA

---

### SITRANS LR200 Rod Antenna, Flange Connection

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR200 Flange Adapter, PTFE Teflon Rod Antenna</td>
<td>7ML5423-10</td>
<td>$1391.00</td>
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</table>

**Process Conn. (316 SS):**
- 2” ANSI 150 Lb, FF Flange
- 3” ANSI 150 Lb, FF Flange
- 4” ANSI 150 Lb, FF Flange
- 1.5” NPT Threaded
- 2” Threaded

**Antenna Extension:**
- None
- 50 mm PTFE Extension
- 100 mm PTFE Extension
- 100 mm 316 SS Shield (Note 1)
- 150 mm 316 SS Shield (Note 1)
- 200 mm 316 SS Shield (Note 1)
- 250 mm 316 SS Shield (Note 1)

**Process Seal:**
- Integral Gasket (Note 2)
- FKM O-Ring (Note 2)

**Output:**
- Hart Communications and 4-20 mA

**Approvals:**
- FM General Purpose
- FM/IS: Class I, II, Div 1, Grp A–G
- FM Class I, II, Div 1, Grp A–G

**Rating:**
- Per Pressure/Temp Curves in Manual
- 0.5 bar (7.5 PSI) Maximum

---

Also available with 300# flanges. Call for details.

---

### Notes and Restrictions — All Models

1. Requires flange connection >2", threaded connection larger than 1.5”
2. For flanged connections only. FKM O-ring for threaded connections or shielded antenna extension models.
3. All approvals include radio FCC 6.3 GHz; Unit only rated FM intrinsically safe when used with a suitable barrier. Approval J not valid with Profibus PA output.
4. Available only with Horn Size Options C, D, or E

---

### Accessories — All Models

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe LR IS/HART® Handheld Programmer</td>
<td>7ML1930-18B</td>
<td>$170.00</td>
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<tr>
<td>IS/Infrared Profibus Handheld Programmer</td>
<td>7ML5830-2AJ</td>
<td>170.00</td>
</tr>
<tr>
<td>USB HART® Modem for Simatic PDM/PC</td>
<td>7MF4997-1DB</td>
<td>706.00</td>
</tr>
<tr>
<td>SIMATIC PDM v9.1 Software Utility for Configuring, Commissioning, and Diagnostics; (Profibus, HART®, 4 Tags)</td>
<td>6E57658-3AB68-0YA5</td>
<td>805.00</td>
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</tbody>
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---

Ready to buy a Probe LR or LR200? Complete a radar application datasheet from www.Lesman.com/datasheets/, and send it to Lesman with your order. Not sure which unit is right for you? Use the datasheet to request an engineering review.

Learn more at Lesman.com
Making Radar Work for Liquid and Slurry Level Monitoring

Siemens’ SITRANS LR250 two-wire 25 GHz radar level transmitter measures liquids and slurries in vessels up to 20 m (66 ft).

The LR250 is the easiest to install and quickest to configure on the market today. With its narrow beam and small antenna, SITRANS LR250 can be installed practically anywhere on your vessel.

The small horns (1.5” to 4”) allow for installation in existing openings, and the concentrated high-frequency beam ensures minimal interference from the vessel walls.

The Quick-Start Wizard guides you through programming the transmitter using a few key parameters, so the LR250 can be measuring in minutes. The transmitter can be programmed using the intrinsically safe handheld programmer, or remotely via HART® — without opening the transmitter lid and exposing the electronics to aggressive atmospheres.

Process Intelligence evaluates dynamic echo signals. It applies algorithms (based on field data collected from more than a million level measurement applications) to raw echoes, to produce accurate and reliable measurement readings. It can automatically ignore obstructions, and is the processor behind the advanced diagnostic tools, the Quick-Start Wizard, and automatic false-echo suppression. Sonic Intelligence significantly improves measurement accuracy in low level vessels and low dielectric media.

Features
- 25 GHz high frequency for small horn antennas for easy mounting in nozzles
- Short blanking distance for improved minimum measuring range to 50 mm from the end of the horn — provides high accuracy of low and high levels, even with low dielectric media
- Small horn (1.5” to 4”) and narrow beam angle allows installation practically anywhere in your vessel
- Now available with a 2" threaded PVDF antenna. Great for measuring acids, alkalis, and other corrosive chemicals!
- Graphical local user interface – displays echo profiles and diagnostic information, makes operation simple
- Fast and easy to configure – Quick-Start Wizard guides you during setup
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Process Intelligence – Advanced signal processing for improved measurement reliability, and automatic false echo suppression of fixed obstructions
- Operational in minutes — infrared handheld programmer for local operation or SIMATIC PDM via HART® — without exposing the electronics to the environment

Specifications
Frequency: 25 GHz (k-band)
Measurement Range: Minimum: 2” from the end of the horn; Maximum: 65 feet (20 m), depending on horn size
Non-repeatability: 0.2” (5 mm)
Dielectric Constant: >1.6, horn and application dependent
Output: 4 to 20 mA; Accuracy: ±0.02 mA
Failsafe: Programmable as high, low, or hold (loss of echo); NE 43 programmable
Power: 24 VDC nominal, 30 VDC max.
Display: Local graphic interface with Quick Start Wizard and echo profiles
Programming: SIMATIC PDM or Intrinsically safe infrared handheld
Communication: HART®; PROFIBUS PA optional (Profile 3.0, Class B)

Process Conditions
Temperature: Ambient: -40° to 176° F; Process: -40° to 302° F at process connection with FKM O-ring
Pressure: 580 psi max., depending on temperature and process connection

Design
Enclosure: Die-cast aluminum, polyester powder-coated; Ingress Protection: Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68; Cable Inlet: Two 1/2” NPT inlets; Process Connections: 1.5” or 2” NPT
Horn Antenna: Material: 316L Stainless steel; Sizes: 1.5”, 2”, 3”, or 4” nominal (40, 48, 75, or 95 mm); 4”(100 mm) optional horn extension; Threaded PVDF antenna for corrosive media

Approvals
General: CSAs/c, CE, FM, NE 21, NE 43, C-Tick
### Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR250 Two-Wire 25GHz Pulse Radar</td>
<td>7ML5431-</td>
<td>$1928.00</td>
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<tr>
<td>Process Connect</td>
<td>316L SS, PTFE Emitter, FKM Seal</td>
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<tr>
<td></td>
<td>316L SS, PTFE Emitter, FFKM Seal</td>
<td>1</td>
</tr>
<tr>
<td>Process Connect Type</td>
<td>1.5&quot; NPT Taper (ANSI/ASME B1.20.1) [1]</td>
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<td>2&quot; NPT Taper (ANSI/ASME B1.20.1)</td>
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<td></td>
<td>2&quot; ASME, 150 Lb</td>
<td>BD</td>
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<tr>
<td></td>
<td>3&quot; ASME, 150 Lb</td>
<td>BE</td>
</tr>
<tr>
<td></td>
<td>4&quot; ASME, 150 Lb</td>
<td>BF</td>
</tr>
<tr>
<td>Communication 4-20 mA, HART (Startup at &lt;3.6 mA)</td>
<td>PROFIBUS PA</td>
<td>20-</td>
</tr>
<tr>
<td>Enclosure Aluminum, Epoxy Paint, 2 x 1/2&quot; NPT Inlets</td>
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<td>0.00</td>
</tr>
<tr>
<td>Antenna 1.5&quot; Horn</td>
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<td></td>
<td>2&quot; Horn (Fits ASME Nozzles)</td>
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<td>3&quot; Horn (Fits ASME Nozzles)</td>
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<tr>
<td></td>
<td>4&quot; Horn (Fits ASME Nozzles)</td>
<td>D</td>
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<tr>
<td></td>
<td>1.5&quot; Horn with 100 mm Extension</td>
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<tr>
<td></td>
<td>2&quot; Horn with 100 mm Extension</td>
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<td>3&quot; Horn with 100 mm Extension</td>
<td>G</td>
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<td></td>
<td>4&quot; Horn with 100 mm Extension</td>
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<td>Approvals General Purpose CE, CSA, FM, FCC</td>
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<td>Intrinsically Safe CSA/FM, FCC [2]</td>
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<td>Non-Incendive CSA/FM, FCC</td>
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<td>Pressure 7.5 PSI (0.5 bar) Max. Pressure Rating</td>
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<tr>
<td>Accessories Handheld Programmer, IS HART Modern, USB</td>
<td>7ML1930-18K</td>
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</tr>
<tr>
<td></td>
<td>7MF4997-1DB</td>
<td>706.00</td>
</tr>
</tbody>
</table>

### Notes

1. For 1.5" horn antennae only.
2. Intrinsic safety barrier required.
3. No IS barrier required. Available only with HART communications option.
4. For HART models with general purpose or intrinsically safe approvals only.

---

**Ordering Instructions**

Make one selection from each table section below. A complete catalog number will look like this: 7ML5431-_ _ _ _ 0 - _ _ _ _

Don’t forget to order a handheld programmer and a manual. A quick-start guide included with each unit.


---

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR250 Two-Wire 25GHz Pulse Radar</td>
<td>7ML5431-</td>
<td>$1928.00</td>
</tr>
<tr>
<td>Connect 2&quot; NPT Threaded PVDF Antenna</td>
<td>4PA</td>
<td>0.00</td>
</tr>
<tr>
<td>Communication 4-20 mA, HART (Startup at &lt;3.6 mA)</td>
<td>PROFIBUS PA</td>
<td>20-</td>
</tr>
<tr>
<td>Enclosure Aluminum, Epoxy Paint, 2 x 1/2&quot; NPT Inlets</td>
<td>OR</td>
<td>0.00</td>
</tr>
<tr>
<td>Approvals General Purpose CE, CSA, FM, FCC</td>
<td>A</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Intrinsically Safe CSA/FM, FCC [2]</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Non-Incendive CSA/FM, FCC</td>
<td>D</td>
</tr>
<tr>
<td>Pressure Rating per Pressure/Temperature Curves</td>
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<td>0.00</td>
</tr>
<tr>
<td>Accessories Handheld Programmer, IS HART Modern, USB</td>
<td>7ML1930-18K</td>
<td>170.00</td>
</tr>
<tr>
<td></td>
<td>7MF4997-1DB</td>
<td>706.00</td>
</tr>
</tbody>
</table>

**SIMATIC PDM v9.1 Software Utility for Configuring, Commissioning, and Diagnostics (PROFIBUS, HART*, 4 Tags)**

6E57658-3AB68-0YA5 805.00
## SITRANS LR250 Encapsulated Radar Transmitters

### Features
- 25 GHz high frequency
- Short blanking distance for improved minimum measuring range to 50 mm from the end of the horn — provides high accuracy of low and high levels, even with low dielectric media
- Graphical local interface displays echo profiles and diagnostics
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Advanced signal processing for reliable measurement and automatic false echo suppression of fixed obstructions
- Infrared handheld programmer for local operation or SIMATIC PDM via HART® for remote programming

### Specifications

- **Frequency:** 25 GHz (k-band)
- **Measurement Range:** Minimum: 2” from the end of the horn; Maximum: 65 feet (20 m), depending on horn size
- **Non-repeatability:** 0.2” (5 mm)
- **Dielectric Constant:** >1.6, antenna dependent
- **Analog Output:** 4 to 20 mA; Accuracy: ±0.02 mA
- **FailSafe:** Programmable, High, low, or hold (loss of echo); NAMUR NE43
- **Measured Error:** 0.118”(3mm) max. at >500 mm from sensor reference point; 1”(25mm) max. at <500 mm from sensor reference point
- **Temperature Range:** Process: -40” to 338°F at process connection; Ambient: -40” to 176°F; Influence of ambient temperature: < 0.003 %/K
- **Digital Output:** HART version 5.1, Profibus PA 3.01, Foundation Fieldbus H1
- **Display:** Local graphic interface with Quick Start Wizard and echo profiles
- **Programming:** Intrinsically Safe Siemens handheld programmer, Infrared receiver; handheld HART communicator (375/475), PC with SIMATIC PDM, Emerson AMS, Siemens SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
- **Power Supply:** 4-20 mA/HART: Nominal 24 VDC (max. 30 V DC) with max. 550Ω; PROFIBUS PA: 15 mA; FOUNDATION Fieldbus: 20.0 mA

### Design

- **Enclosure:** Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 polyester powder-coated aluminum, with two x 1/2” NPT cable inlets
- **Process Connections:** FEA version: Flanged connection, raised face; 2”, 3”, 4”, 6” Class 150 ANSI Flange; HEA version: 2”, 3”, 4” Sanitary Clamp according to ISO 2852, DN 50/80/100 Aseptic/ Hygienic threaded, flanged, clamped, or union connections, Type F (50 mm) and Type N (68 mm) Tuchenhagen Varivent; Hygienic lens surface finish: (Ra) 0.8 μm
- **Antenna:** 316L stainless steel (1.4435 or 1.4404) and TFM 1600 PTFE Lens

### Approvals

- **General:** CSA, CE, FM, NF, RCM
- **Radio:** FCC, Industry Canada and Europe ETSI EN 302-372, RCM
- **Hazardous Areas:** Explosion Proof/ Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A-D; Class II, Div. 1, Groups E-G; Class III T4; CE: CSA/FM Class I, Div. 1, Groups A-D; Class II, Div. 1, Groups E-G; Class III T4; Non-Incendive: CSA/FM Class I, Div. 2, Groups A-D T5; INMETRO, NEPSI, IECEx/ATEX, GOST
- **Hygienic/Sanitary:** HEA version only; EHEDG EL Class I, EL Aseptic Class I
- **Functional Safety:** SIL-2 suitable in accordance with IEC 61508/61511

### Ordering Instructions

Select one option from each table section below. A complete catalog number looks like this: 7ML5432 - _ _ _ _ - 0A_0.

Siemens requires a completed radar application datasheet with all LR250 orders. Find it at www.Lesman.com/dataheets/ and include with your order.

### Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LR250 Flanged Encapsulated Antenna Radar</td>
<td>7ML5432-</td>
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<td>2” Class 150 ANSI Flange</td>
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<td>3” Class 150 ANSI Flange</td>
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<td>4” Class 150 ANSI Flange</td>
<td>0BH _ _</td>
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<tr>
<td>6” Class 150 ANSI Flange</td>
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<tr>
<td>Communicati-</td>
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<tr>
<td>Profibus PA</td>
<td>_ _ _ _ _ _ _ _</td>
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<tr>
<td>4-20 mA HART (Startup at &lt;3.6 mA)</td>
<td>_ _ _ _ _ _ _ _</td>
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<td>Foundation Fieldbus</td>
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<td>Approvals</td>
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<td>Process Connection</td>
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<tr>
<td>Profibus PA</td>
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<tr>
<td>4-20 mA HART (Startup at &lt;3.6 mA)</td>
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</table>

See page 9 model selection guide for handheld programmers.
In a coal-fired power plant, the coal is transported from the yard to the silos on a conveyor system.

The process of dumping coal from the conveyed buckets into the silo creates a lot of dust.

One Lesman power plant customer had been using laser transmitters to detect the level of coal in their silos. But since the laser didn’t discriminate between the dust and the true level of the coal, they were experiencing false high levels, which forced unnecessary process shutdowns. They’d then have to override the system to get it back online.

Eager to end their shutdown issues, the customer considered switching to load cells, which are very accurate at measuring volume, but very costly. They would have needed to cut all the steel support members for their coal tanks, at a cost of nearly $100,000 per tank.

The customer agreed to put a Siemens LR560 radar unit on trial, and it worked flawlessly right away, providing true level readings regardless of the dusty environment.

At a cost of only $3,300 per silo, the customer was able to save roughly $750,000 and a significant amount of downtime for accurate level readings and the end of their forced shutdown issues.

**LR560 ignores dust, reports true level**

A local flour processing plant has more than 30 different storage tanks: outdoor holding tanks for when the grain comes off the rail cars, and indoor tanks for holding the wheat flour after processing.

When they first installed their level detection system 15 years ago, ultrasonics were the only available solution. Radar level systems for dry solids didn’t exist.

Their problem was the dust buildup on the ultrasonic transducer, which was mounted at the floor. When the sensors stopped seeing level, they’d come by and kick the transducer to knock the flour buildup off.

One Lesman power plant customer had been using laser transmitters to detect the level of coal in their silos. But since the laser didn’t discriminate between the dust and the true level of the coal, they were experiencing false high levels, which forced unnecessary process shutdowns. They’d then have to override the system to get it back online.

Eager to end their shutdown issues, the customer considered switching to load cells, which are very accurate at measuring volume, but very costly. They would have needed to cut all the steel support members for their coal tanks, at a cost of nearly $100,000 per tank.

The customer agreed to put a Siemens LR560 radar unit on trial, and it worked flawlessly right away, providing true level readings regardless of the dusty environment.

At a cost of only $3,300 per silo, the customer was able to save roughly $750,000 and a significant amount of downtime for accurate level readings and the end of their forced shutdown issues.

**Sensor design cures material buildup headaches**

A local flour processing plant has more than 30 different storage tanks: outdoor holding tanks for when the grain comes off the rail cars, and indoor tanks for holding the wheat flour after processing.

When they first installed their level detection system 15 years ago, ultrasonics were the only available solution. Radar level systems for dry solids didn’t exist.

Their problem was the dust buildup on the ultrasonic transducer, which was mounted at the floor. When the sensors stopped seeing level, they’d come by and kick the transducer to knock the flour buildup off. The sensor would start working again, and all was fine... till the next time.

When they first installed their level detection system 15 years ago, ultrasonics were the only available solution. Radar level systems for dry solids didn’t exist.

Their problem was the dust buildup on the ultrasonic transducer, which was mounted at the floor. When the sensors stopped seeing level, they’d come by and kick the transducer to knock the flour buildup off. The sensor would start working again, and all was fine... till the next time.

The Siemens LR560’s lens antenna was designed specifically to resist material buildup, and includes a built-in air purge to keep the sensor face clean at all times.

After a one-week demonstration, the customer bought 10 LR560s for their processing plant, and has since recommended the devices to their end-user customers who were having similar level monitoring issues.

---

**Table:**

<table>
<thead>
<tr>
<th>Method</th>
<th>LR260</th>
<th>LR460</th>
<th>LR560</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>98 feet (30 m)</td>
<td>328 feet (100 m)</td>
<td>329 feet (100 m)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>Nominal 24 VDC, 30 VDC max, 4-20 mA</td>
<td>100-230 VAC ±15%, 50/60 Hz, 6W (12A) or 24 VDC ±25/-20% 6W optional</td>
<td>Nominal 24 VDCor 9 to 32 VDC(PROFIBUS)</td>
</tr>
<tr>
<td><strong>Media Dielectric Constant</strong></td>
<td>er &gt;1.6</td>
<td>er &gt;1.4</td>
<td>er &gt;2.0</td>
</tr>
<tr>
<td><strong>Analog Output</strong></td>
<td>4-20 mA loop powered</td>
<td>4-20 mA optically isolated</td>
<td>4-20 mA</td>
</tr>
<tr>
<td><strong>Local Display</strong></td>
<td>Graphic LCD with bargraph and echo profile</td>
<td>Alphanumeric LCD</td>
<td>Graphic LCD, with bar graph for level</td>
</tr>
<tr>
<td><strong>Communications and Programming</strong></td>
<td>HART®, Profibus PA, SIMATIC PDM, Intrinsically safe handheld programmer, local operation</td>
<td>HART®, Profibus PA, SIMATIC PDM, Intrinsically safe handheld programmer, local operation</td>
<td>HART® communicator 375/475, SIMATIC PDM, AMS, PACTware, Infrared receiver</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Polyester powder-coated aluminum Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 Two 1/2” NPT cable inlets</td>
<td>Polyester powder-coated aluminum Type 4X/NEMA 4X, Type 6/NEMA 6, IP67 Two 1/2” NPT cable inlets</td>
<td>Type 4X/NEMA 4X, Type 6/NEMA 6, IP68 with lid closed, 316L/1.4404 stainless steel</td>
</tr>
<tr>
<td><strong>Process Connections</strong></td>
<td>Universal: 2”, 3”, 4”, or 6” with integral EasyAimer</td>
<td>Universal: 3”, 4”, 6” with integral EasyAimer</td>
<td>Universal: 3”, 4”, 6” with integral EasyAimer</td>
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<tr>
<td><strong>Horn Antenna</strong></td>
<td>2”, 3”, or 4” diameter horn, optional dust cover, optional 1/8” NPT purge connection</td>
<td>3” or 4” diameter horn, optional dust cover, optional 1/8” NPT purge connection</td>
<td>None required</td>
</tr>
<tr>
<td><strong>Process Conditions</strong></td>
<td>Ambient: -40° to 176° F; Process: -40° to 392° F</td>
<td>Ambient: -40° to 149° F; Process: -40° to 392° F</td>
<td>Ambient: -40° to 176° F; Process: -40° to 392° F</td>
</tr>
<tr>
<td><strong>See Page</strong></td>
<td>14</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>
SITRANS LR560 78GHz Radar for Bulk Solids

Features

- 78GHz frequency allows for a narrow 4° beam angle
- Virtually unaffected by dust, vapor, pressure, or temperature
- Installs almost anywhere on top of a silo, and can even measure cone area
- Short wavelength for excellent reflection, even on highly sloped surfaces
- Lens antenna with built-in air purge resists material and dust build-up
- 2.5" antenna fits into almost any tank opening or nozzle
- Quick-Start Wizard gets the transmitter up and operational in minutes
- Local display interface for pushbutton programming diagnostics

Extreme dust? No problem. Siemens two-wire, loop-powered SITRANS LR560 is a state-of-the-art transmitter for continuous solids level measurement. The LR560 is the first radar transmitter on the market to operate at the 78 GHz frequency. It has an exceptionally narrow 4° beam, short wavelength and a unique non-clogging lens antenna.

The narrow beam angle means the transmitter can be installed practically anywhere on the top of a silo and still achieve accurate readings. Its small size and 2.5” lens antenna allow the unit to be installed on any existing nozzle or tank opening. To set the LR560 on a correct angle, you can easily add an aiming flange.

The traditional problems of noisy signals due to the standpipe or nozzle are now eliminated. Wider beam angles typical of lower frequency radars can have difficulty measuring the cone area of a silo. They tend to see the sides of the silo and miss the true level reading in the cone area. Not so with the LR560. Since the narrow beam can be aimed into the cone, the LR560 can measure it effectively.

The other critical aspect of a 78 GHz radar is its short wavelength. All solids have an angle of repose that causes the transmit signal to split into two returning paths, one direct and one indirect, leading to complicated signal and measurement drift. The high frequency of 78 GHz minimizes this issue. The short wavelength yields exceptional reflection from sloped solids, even without aiming, and less skip. Less skip means more signal and better reliability.

The SITRANS LR560 is the first radar to have a lens antenna, designed from the start to be highly resistant to material buildup. It comes standard with an air purge which blows directly across the lens face in a circular path. Most LR560s in dry solid applications will require little to no maintenance or cleaning.

Do you prefer buttons for programming or an infrared handheld? With the LR560, you can use either one. A quick-start booklet comes with the unit, and can be stored in the transmitter lid for use in the field, though most users don’t require the paper guide. The graphical Quick-Start Wizard on the display makes the LR560 easy to program.

You also have the option of configuring the transmitter and viewing echo profiles using Siemens SIMATIC PDM, PACTware, or Emerson AMS software. SITRANS LR560 models are available with HART®, PROFIBUS PA, or Foundation™ Fieldbus protocols.

It’s available in two versions: one for 40 meters and process temperatures to 212° F, one for 100 meters and 392° F. Designed for rugged field use, the LR560 is approved for hazardous conditions. The stainless steel enclosure is rated IP68, and the encapsulated electronics cup is easily replaceable.

Need a backup level alarm for overfill protection? Call Lesman for point level solutions.
Specifications

Measurement Principle: 78 GHz FMCW radar level
Detectable Distance: 15.75” to 131 feet (400 mm to 40 m) or 15.75” to 328 feet (400 mm to 100 m) from reference point
Output: Analog: 4 to 20 mA; Communications: HART standard, PROFIBUS PA or Foundation Fieldbus; Fail-safe: Programmable as high, low or hold, Loss of Echo, NAMUR NE43 programmable
Accuracy: Greater than 1” or ±0.25% range from minimum detectable distance to full range
Ambient Operating Temperature: -40° to 176° F
Media Conditions: -40° to 176° F
Process Temperature: -40° to 176° F
Degree of protection: Type 4X/NEMA 4X, Type 6/NEMA 6, IP68 with lid closed
Display: Graphic LCD, with bargraph representing level
Process connections: 3”, 4”, or 6” universal flat-faced flanges in 304 or 316L/SS, M20x1.5” conduit entry, or 1/2” NPT via adapter;
Enclosure: Dielectric constant >2.0
Process connections: 3”, 4”, or 6” polyurethane
Universe flat flange with integral aimer rated to 248° F when used

No power? No problem!

Power your SITRANS LR560 radar level transmitter from a wireless radio's battery on a scheduled, periodic, or intermittent basis for true wireless performance. With it, you can sample 3x per hour with a 3 month battery life.

The Banner D5 is a 150 mW node radio in a metal enclosure with a dome antenna. It is intrinsically safe for use in Div 1 locations.

D5 Performance Node Radio.....20178.....$1549.00

Visit Lesman.com for more on Banner wireless I/O systems.
SITRANS LR260 Loop-Powered Radar for Dry Bulk Solids

Features
- Small antenna, narrow beam, flexible mounting locations, short and long ranges, excellent reflection properties on solids and low dielectric media
- Built-in Easy Aimer flange for optimal signal reflection
- Quick-Start Wizard guides you through basic function setup. Enhanced EDD with Quick-Start Wizard for SIMATIC PDM
- Patented Process Intelligence differentiates between true media echoes and false echoes generated by obstructions
- Diagnostic messaging defines which errors are important and directs the error codes where they are needed
- Built-in timers with automated alerts let you schedule routine cleaning or replace activities

Specifications
Measuring Principle: 25 GHz K-band pulse radar
Detectable Distance: 0.05 m (2") minimum from end of horn
Measuring Range: 2” horn: 10 m (32.8 ft) max.; 3” horn: 20 m (65.6 ft) max.;
4” horn: 30 m (98.4 ft) max.
Media Dielectric Constant: er >1.6, antenna and application dependent
Accuracy: 25 mm (1") from minimum detectable distance to 30 mm (11.8”); Remainder of range: Greater of 10 mm (0.39") or 0.1% span. Accuracy includes hysteresis and non-repeatability
Operating Conditions: Ambient temperature: -40° to 176° F; Process temperature: -40° to 392° F;
Process pressure: 43.51 PSI (3 bar) pressure rating in Bar; 7.25 PSIG max (0.5 bar) standard, 43.5
Media Pressure: 43.51 PSI (3 bar) pressure rating in Bar
Pollution degree: 4
Installation category: PSIG (3 bar) optional with 176° F max temperature;
Process connections: 2”, 3”, 4”, and 6” universal flanges
Enclosure: Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68 rated, polyester powder-coated aluminum; Two 1/2” NPT conduit entries; 304 SS flange and
Load: 3.6–23 mA or last value; 230–600 Ω
Load: 3.6–23 mA or last value; 230–600 Ω
Multiwire, Line length: ≤1500 m
Power your SITRANS LR260 with a wireless radio. See page 63.

Ordering Instructions
Make a selection from each table section below. A complete catalog number will look like this: 7ML5424-0_ _ _0 - _ _ _0.
Don’t forget to order a handheld programmer and a manual. (One quick-start guide is included with each unit.)

Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
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<tbody>
<tr>
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<td>$2424.00</td>
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<td>Connect.</td>
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<tr>
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<td>7.25 PSI (0.5 bar) maximum</td>
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<td>Accessories</td>
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<tr>
<td>Handheld Programmer, IS</td>
<td>7ML5830-2AJ</td>
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<td>HART* Modem, USB</td>
<td>7MF4997-1DB</td>
<td>706.00</td>
</tr>
<tr>
<td>PTFE Dust Cover for 3” horn</td>
<td>7ML1930-1BL</td>
<td>165.00</td>
</tr>
<tr>
<td>PTFE Dust Cover for 4” horn</td>
<td>7ML1930-1BM</td>
<td>165.00</td>
</tr>
</tbody>
</table>

Note: It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.

[1] Not available with Purge Connection option.
SIEMENS

SITRANS LR460 Radar for Bulk Solids Level

Features

- 24 GHz FMCW four-wire radar provides excellent reflection from solids
- Process Intelligence for advanced echo processing and quick, easy adjustment
- Extremely high signal-to-noise ratio yields high performance
- 328 ft (100m) range for long-range and difficult applications
- Built-in Easy Aimer for optimizing signal on sloped surfaces
- Self-guided Quick-Start Wizard for fast setup — in just eight parameters
- Program using infrared intrinsically safe handheld programmer or HART handheld device and SIMATIC PDM
- Dynamic TVT threshold automatically adjusts echo detection sensitivity depending on echo strength

Specifications

Frequency: 24.2 to 25.2 GHz FMCW radar
Range: 1.15 to 328 feet (0.35 to 100 m)
Medium: Dielectric constant ε<1.4
Accuracy: Non-Linearity: Greater of 1" (25 mm) or 0.25% span; Non-Repeatability: ≤ 0.4" (10 mm)
Analog Output: Optically isolated 4 to 20 mA, 600 Ω max load; FailSafe: MA signal programmable as high, low or hold (loss-of-echo)
Digital Output: Relay, NC or NO function, max. 50 VDC, 200 mA, rating 5 W
Communication: HART, PROFIBUS PA
Vessel Pressure: 7.25 psi (0.5 bar) max.
Temperature: Ambient for enclosure: -40° to 149° F; Process: -40° to 392° F
Enclosure: Diecast aluminum, IP67/Type 4X/NEMA 4X/Type 6/NEMA 6/Cable Inlet: Two 1/2" NPT; Location: Indoor/outdoor; Installation category: II; Pollution Degree: 4; Optional: PTFE dust cap, 1/8" NPT air purge connection
Universal Flanges, 316L stainless steel, flat faced, with integral Easy Aimer; 3", 4" or 6" (80 mm, 100 mm, or 150 mm) mates with flange EN 1092-1, ASME B16.5, or JIS B2238 bolt pattern
Power Supply: 100 to 230 VAC, 6 W (12 VA) or 24 VDC, 6 W (optional)
Programming: Intrinsically safe handheld programmer, ATEx II 1G Ex ia, IIC T4, CSA/Eni Class I, Div. 1, Groups A-D T6 @ max. ambient temperature 104° F (40° C); HART Handheld: HART Communicator 375; PC Software: SIMATIC PDM
Local Display: Alphanumeric LCD for readout and entry
Approvals: General: CSAUs/C, CE, FM; Radio: European Radio (R&TTE), Industry Canada, FCC; Hazardous Areas: CSA/Eni Class II, Div. 1, Groups E-G, Class III; ATEX II 1D, 1/2 D, 2D T85° C

What Makes the LR460 Unique?

- Four-Wire Power, 24 GHz FMCW Radar Technology: High frequency radar provides a narrow beam angle, reducing side-wall path interference and false signals from internal obstructions in tall silos. Combined with four-wire power, this results in extremely high signal-to-noise ratio, ensuring exceptional performance in long-range applications.
- Process Intelligence Echo Processing: Differentiates between true echoes from the material and false echoes generated by obstructions. Dynamic threshold adjusts automatically to changing conditions in the vessel. The result is repeatable, fast and reliable measurement, even through severe dust.
- Digital Communications: HART®, PROFIBUS PA; Connectivity with commonly used communication buses makes for flexible networking with a DCS or PLC.
- Infrared Handheld Programmer: No need to open the device for programming. Programmer is rated intrinsically safe for use in hazardous environments. Make changes without interrupting your process or exposing electronics to the environment.
- Enhanced Electronic Device Description (EDD) with Quick-Start Wizard: One of the first instruments to have an Enhanced EDD file that can be used in configuration software, like SIMATIC PDM and Emerson AMS. A number of new advanced features are built in, including, easy-to-use graphical Quick-Start Wizard and the ability to save echo profiles. The Quick-Start Wizard is also available via the infrared handheld programmer.

Ordering Instructions

Make a selection from each table section below. A complete catalog number will look like this: 7ML5424-0_ _ _0 - _ _ _0. Don’t forget to order a handheld programmer and a manual. (One quick-start guide included with each unit.)

Model Selection Guide

Please submit orders to: Siemens Industry Inc, c/o Lesman Instrument Company

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>Sitrans LR460 Four-Wire 24GHz FMCW Radar</td>
<td>7ML5426-</td>
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<tr>
<td>Universal Flat Faced 6&quot; (150 mm)</td>
<td>0C _ _ _</td>
<td>404.00</td>
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<td>0.00</td>
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<td>4&quot; Horn, Fits 4&quot; Nozzles</td>
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<td>Profinet PA</td>
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<td>24 VDC, Two 1/2&quot; NPT Cable Inlets</td>
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<td>CSA/Eni Class II, Div. 1, Gr E-G, Class III</td>
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<tr>
<td>Handheld Programmer, IS</td>
<td>7ML830-2AJ</td>
<td>170.00</td>
</tr>
<tr>
<td>HART® Modem, USB</td>
<td>7MF4997-1DB</td>
<td>706.00</td>
</tr>
<tr>
<td>PTFE Dust Cover for 3&quot; Horn</td>
<td>7ML1930-1BL</td>
<td>165.00</td>
</tr>
<tr>
<td>PTFE Dust Cover for 4&quot; Horn</td>
<td>7ML1930-1BM</td>
<td>165.00</td>
</tr>
</tbody>
</table>

Note: It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.
SmartLine SLG700 Guided Wave Radar Level Transmitter

**Features**

- 0.4 to 50 m range
- Two-wire, loop-powered 4-20 mA transmitter with HART or Foundation Fieldbus communications
- Accuracy greater of ±3 mm or 0.03% of measured distance
- Integral dual seal design for safety based on ANSI/NFPA 70-202 and ANSI/ISA 12.27.01
- Automatic temperature compensation
- Comprehensive on-board diagnostic capabilities
- External zero, span, and configuration
- Modular dual-compartment design with polarity-insensitive electrical connections
- Compliant to SIL 2/3 requirements

Honeywell’s new SLG700 guided wave radar level transmitters feature high performance Time Domain Reflectometry (TDR) level measurement technology. They provide high accuracy and stability for level and interface applications.

SmartLine level transmitters feature the same powerful features with the other transmitters in the SmartLine family: modular design, polarity insensitive electrical connections, transmitter messaging, tamper notification, and integration with Experion® PKS.

**Display Options**

The SmartLine SLG series level transmitter’s modular design includes a basic alphanumeric LCD display or a unique advanced graphics LCD display, either of which can be added in the field.

**Basic Alphanumeric LCD Display Features**

- 0°, 90°, 180° and 270° position adjustments
- Ft, in, m, cm, or mm for level measurement units and corresponding units supported for volume and level rate
- Two lines, 16 characters alphanumeric display

**Advanced Graphics LCD Display Features**

- 0°, 90°, 180° and 270° position adjustments
- Standard measurement units available (Custom units applicable only for Foundation Fieldbus)
- Eight display screens with 3 formats are possible
- 128 by 64 dot matrix graphics display
- Large PV, bargraph and trend graph format supported. Echo stem plots with distance-to-product and distance-to-interface, configurable screen rotation timing.

The local SmartLine Level display provides measurement values for the flange location, interface level, and Ullage level. The complete Echo curve is visible through your choice of user interface.

**Diagnostics**

SmartLine transmitters all offer digitally accessible diagnostics that aid in providing advanced warning of possible failure events minimizing unplanned shutdowns, providing lower overall operational costs.

A new online SmartLine Application and Validation Tool (AVT) addresses one of the most common issues involved in ordering and implementing level transmitters — the proper specification of the correct level transmitter for your application.

The AVT intelligently guides you through the engineering process and electronically captures and documents your choices and inputs. The AVT output also serves as input to the Honeywell order management system, to ensure correct input of the transmitter model, resulting in a transmitter with configuration parameters that exactly match your targeted tank application. Errors are eliminated and the engineering effort is preserved from start to finish.

Try it yourself at [https://levelconfig.honeywellsmartline.com/](https://levelconfig.honeywellsmartline.com/)

**Modular Design**

To help contain maintenance and inventory costs, all SLG series transmitters are modular in design, giving you the ability to change electronic modules without affecting overall performance or approval body certifications.

Electronic modules may be swapped without losing in-tolerance performance characteristics. With no performance effects, Honeywell’s unique modularity results in lower inventory needs and lower overall operating costs.

**Configuration Tools**

SmartLine offers the ability to configure the transmitter and display via three externally accessible buttons. Zero or span capabilities are also available via these buttons, no display necessary.

SmartLine transmitters feature two-way communication and configuration capability between the operator and the transmitter via Honeywell’s field-rated Multiple Communication Configurator (MCT404).

SmartLine Level uses the standard unified DTM technology to access device parameters through the new Field Service Tool. Novice users are offered a guided experience to set up device parameters, while expert users can easily access the parameters desired through the well organized parameter pages. The Field Service Tool runs on any PC and avoids the need for a handheld configurator.

Honeywell’s Field Device Manager (FDM) Software and FDM Express are available for managing HART and FOUNDATION Fieldbus device configurations.

**Specifications**

- **Measuring Range:** Liquids 164 feet (50 m)
- **Dielectric Constant:** 1.4 minimum
- **Measuring Principle:** Time Domain Reflectometry (TDR)
- **Measurements Performed:** Level, volume, interface
- **Process Storage Tank Types:** Vertical and horizontal cylinders, rectangular tanks, spheres, stilling / bypass wells
- **Available Probe Types:** Rod, wire, coax
Display: Basic: 2 lines by 16 characters LCD; Advanced: 128 x 64 pixels LCD; Output Units: Level: ft, in, m, cm, or mm; Volume: ft³, in³, US gal, Imp gal, barrels, yd³, m³, liters; Rate: ft/s, m/s, in/min, m/h, ft/min, in/sec

Output Process Variables: Level, percentage level, distance to level, level rate, volume, vapor thickness, vapor thickness %, vapor volume, distance to interface, interface level, interface level rate, % interface level, upper layer thickness, lower volume, upper volume

Maximum Allowable Working Pressure: 580 PSI

Supply Voltage, Current, and Load Resistance (HART): Voltage at HART terminal is 13.5–42.0 VDC (IS versions limited to 30 VDC) 0–1440Ω

Analog Output: Two-wire, 4–20 mA (HART transmitters only)

Analog Output Failure Modes: Honeywell standard: 3.8–20.8 mA normal limits, ≤3.6 mA and ≥21.0 mA failure mode; NAMUR NE43 compliance: 3.8–20.5 mA normal limits, ≤3.6 mA and ≥21.0 mA failure mode

Span: 15.75” to 164 feet (0.4 to 50 m)

Accuracy: Greater of 0.03% of level or ±0.12”; Repeatability: ±0.04”

Resolution: ±0.04”

Ambient Temperature Effect: Greater of ±0.2mm/°K or ±30 ppm/°K of measured value

Damping Time Constant HART: Adjustable from 0 to 60 seconds in 0.1 increments; Default Value: 2 seconds

Electromagnetic Compatibility: IEC61326 (All transmitters), NAMUR NE21 (HART and 4-20mA)

Lightning Protection: Leakage Current: 10 uA max @ 42.0 VDC 93 C

Construction: Wetted materials: SS 316L; C-276 (future), PTFE (future); O-Ring seals: Kalrez, Viton, EPDM, Buna-N; Electronic housing: NEMA 4X, IP66, IP67 Pure polyester powder-coated low (future); Kalrez 6375 (-20° to 200°C); EPDM (-40° to 120°C)

Seal Material: Viton/Fluorocarbon Elastomer (-30° to 150°C)

Probe Length: Metric Units, Length in 100mm Increments

Approvals and Certification

International Approvals: ATEX, IECEx, SAEC, InMETRO, NEPSI

CSA: Explosion Proof with intrinsically safe output: Class I, Div 1, Gr A-D; Class II, Zone 1; Dust Ignition proof: Class I, Division 1, Gr E-G; T4; class II Zone 21; Intrinsically safe: Class I, II, III, Div 1, Gr A-G, T4, Class 1 Zone 0; Nonincendive with intrinsically safe output: Class I, Div 2, Gr A-D; T4, Class 1 Zone 0; Nonincendive: Class I, II, III, Div 1, Groups A-G, T4, Class 1 Zone, Nonincendive: NI-IS Class I, II, III, Div 2, Groups A-G, T4, Class 1 Zone 2; Enclosure: Type 4X/IP66/IP67

FM: (With intrinsically safe probe) Explosion proof; XP-IS Class I, Div 1, Gr A-D, T4, Class 1 Zone 0; Dust Ignition proof: DIP-IX Class II, Div 1, Gr E-G, T4, Zone 21, Probe: Zone 20; Intrinsically safe: IS Class I, II, III, Div 1, Groups A-G, T4, Class 1 Zone, Nonincendive: NI-IS Class I, II, III, Div 2, Groups A-G, T4, Class 1 Zone 2; Enclosure: Type 4X/IP66/IP67


Certifications Available: NACE MR0175, MR0103, ISO15156; Steam Boiler Certification; Pressure Equipment Directive (PED); CE Mark; CRN Registration

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### Model Selection Guide

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<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
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<td>Calibration Test &amp; Cert of Conformance (F3399)</td>
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<td>FMEDA (SIL 2/3) Certification (FC33337)</td>
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SITRANS LG200 Guided Wave Radar

Features

- Measures level, interface, or both
- Versatile, reliable, accurate measurement to 0.12” — even with aggressive vapors, high temperatures and pressure, dust, steam, or material buildup
- Standard 4-20 mA output and HART® communication on all models
- Intrinsically safe, explosion-proof, and non-incendive approvals
- Unaffected by change in density and dielectric properties — Accurately measures materials with a dielectric range of 1.4 and higher. Can even measure light hydrocarbons
- No on-site setup required — unit comes pre-configured for your application
- LG240 hygienic rod and cable models for food, pharmaceutical, or corrosive liquids
- LG250 rod, cable, and coaxial models for liquid level and interface in storage, processing, and raw materials plus difficult ammonia applications
- LG260 solids rod and cable model for measuring level in mid-range applications, including grains, plastics, cement, or other powders or granules
- LG270 rod, cable, and coaxial model for extreme temperature or pressure applications, chemical HPI and energy industries, LPG gas tanks, steam boilers, and distillation columns

Tight spaces and harsh conditions are no match for Siemens level solutions

Near the end of the production process in a US paper mill, a pulp dryer uses steam to dry cellulose pulp into a sheet. Steam condenses in the dryer, giving up latent heat and converts to condensate. The condensate is pulled from the dryer drums into a tank and returned to the boiler.

Treating and purifying boiler feedwater is expensive, so every drop of condensate that can be returned to the boiler for reuse saves having to treat additional water. This process requires effective controls to collect the condensate and return it to the boiler.

In the paper mill, condensate tanks are in cramped quarters, with site glasses mounted to the side of the tanks. Because of the dangers of working around hot water and steam, when a site glass breaks or leaks, it's hard to repair. The plant also used differential pressure cells mounted behind the tank to measure tank levels. For repairs, the tank had to be shut off, losing any condensate. Broken valves also made it tough to isolate the transmitters from the tanks. Because of the hot steam hazard, routine calibration was skipped.

Siemens recommended using the SITRANS LG Guided Wave Radar transmitter, mounted in a magnetic level gauge, to measure level in their condensate tanks. The level gauge has a closed chamber bolted to the side of the tank, and a displacer/float indicates the level of the condensate. In the second chamber, the LG reads the condensate level. The transmitter then sends a 4-20 mA signal back to the Siemens DCS system to control the condensate pump.

The SITRANS LG solved several problems at once. The magnetic level gauge eliminated the dangers of broken glass and exposing workers to steam and hot water. The transmitter was installed at the front of the tank, so it's easier to access and can be checked via HART. Plus, the combination of the magnetic level gauge and the guided wave radar provides redundant level measurement, for accurate readings.

16 Different Probes Make LG200 Fit Almost Any Level Application

<table>
<thead>
<tr>
<th>Probe Type</th>
<th>Application</th>
<th>Probe Type</th>
<th>Application</th>
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<tbody>
<tr>
<td>Coaxial probes</td>
<td></td>
<td>Single rod probes</td>
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</tr>
<tr>
<td>General purpose</td>
<td>Liquids with dielectric as low as 1.4</td>
<td>Rigid</td>
<td>Liquids and slurries with a dielectric ≥ 1.9 (&gt;10 if away from tank wall)</td>
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<tr>
<td>High pressure</td>
<td>5000 psig</td>
<td>Flexible for liquids</td>
<td>Applications with severe coating and buildup, ranges up to 75 ft</td>
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<tr>
<td>High pressure, high temperature</td>
<td>750° F at 2000 psig</td>
<td>Non-stick</td>
<td>High viscosity liquids</td>
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<tr>
<td>Steam</td>
<td>Saturated steam environments</td>
<td>Sanitary (3A approved)</td>
<td>Food and beverages, pharmaceutical, semiconductors</td>
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<tr>
<td>Interface</td>
<td>Measures both upper liquid level and interface level</td>
<td>Corrosion</td>
<td>Aggressive media</td>
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<tr>
<td>Overfill</td>
<td>Measures 100% full point of a tank</td>
<td>High pressure, high temperature</td>
<td>Viscous materials</td>
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<tr>
<td></td>
<td></td>
<td>Flexible for solids</td>
<td>Bulk solids ranges up to 75 ft</td>
</tr>
</tbody>
</table>

Dielectric constants table available at www.lesman.com/train/
Applications in Key Industries

Condensed Specifications

Measurement Range: Up to 75 ft

Linearity: Coaxial/Twin rod probes: Greater of <0.1% of probe length or 0.1"; Single rod probes: Greater of <0.3% of probe length or 0.3"; Interface models: <0.5"

Measured Error: Coaxial/Twin rod probes: Greater of ±0.1% of probe length or 0.1"; Single rod probes: Greater of ±0.5% of probe length or 12.7 mm (0.5’’); Interface models: Upper layer: ±1”; Interface layer: ± 1” (clean distinct interface required)

Resolution: ±0.1"

Repeatability/Hysteresis: <0.1"

Output: 4 to 20 mA with HART digital signal

Communication: HART®

Programming: Button menu-driven data entry and system security; Local: Three button, menu driven data entry with security; Remote: SIMATIC PDM via HART®

Power: 11 to 36 V DC

Enclosure: Type 4/NEMA 4/IP65 epoxy-coated aluminum, two 1/2” NPT cable inlets

Process Conditions (Probe Dependent): Ambient temperature: -40° to 176° F; Process temperature: -320° to 800° F; Vessel pressure: Full vacuum to 6250 PSIG

Approvals: CSAus/c, CE, FM, 3A for general service; CSA, FM, ATEX for hazardous areas

SITRANS LG200 is compatible with Windows-based SIMATIC PDM software for configuration and management.

Call Lesman for software and communication accessories.
SITRANS LU150 Ultrasonic Continuous Level Transmitter

Features

- Reliable level readings from 0.8 to 16 feet
- For liquids and slurries in open or closed vessels
- 4-20 mA output
- Non-contacting
- One-piece design
- Built-in temperature compensation
- Uses Siemens patented Sonic Intelligence to discriminate between true and false echoes
- Easy to install, program, and maintain
- 2” NPT, BSP, G, and 4” Tri-Clamp connections
- Replaces “The Probe”

Siemens’ new SITRANS LU150 is a short-range, non-contacting ultrasonic level measurement transmitter that combines the sensor and electronics into a one-piece, sealed unit. It has a rugged, fully encapsulated IP68-rated PVDF sensor that is resistant to corrosion, chemicals, and extreme shock.

Designed primarily for environmental, water/wastewater, and energy management applications, the LU150 is ideal for continuous level measurement of liquids and slurries in open or closed vessels.

With only two wires, installation is straightforward, and the unit’s two-button interface makes it both simple to configure and easy to use.

The LU150 includes Siemens Sonic Intelligence echo processing algorithms, which use a filter to differentiate the true material level echoes from the false ones that can result from acoustic or electrical noises, as well as from agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature-compensated and converted into distance for display, analog output.

Specifications

- Measuring Principle: 54 kHz non-contacting ultrasonic level
- Range: 0.8 to 16.4 feet (0.25 to 5 meters)
- Beam Angle: 12°
- Accuracy: Measurement error 0.25 % range (in air); 0.125" resolution (3 mm); Built-in temperature compensation
- Output: 4–20 mA. Max. load 600Ω in the loop at 24 VDC
- Power Supply: 12-30 VDC. 0.1 A surge; Max. power consumption 0.75 W (25 mA at 24 VDC)

Echo Processing: Siemens patented Sonic Intelligence

Ambient Temperature: -22° to 140°F; Metallic mounting: -4° to 140°F

Materials: IP68/NEMA 6/Type 6 PBT electronic enclosure, PVDF copolymer transducer

Process Connection: 2” NPT, 2” BSP, 2” G, and 4” Tri-clamp; Cable entry connections: M20x1.5 or 1/2” NPT

Approvals: CE, cCSAus

Replaces the Milltronics Probe

This SITRANS LU150 is in stock, ready to ship to you within 24 hours!

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<tr>
<th>Description</th>
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<th>Price</th>
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<td>G 2” BSPP</td>
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Accessories

- Printed English User Manual
- Sanitary 4” Mounting Clamp
- Stainless Steel Tag
- Universal Box Bracket Mounting Kit
- Universal Mounting Adapter for 3” Flange, 2” NPT

Please submit orders to: Siemens Industry Inc, c/o Lesman Instrument Company.
Siemens SITRANS Probe LU for Ultrasonic Level Measurement

**Features**
- Continuous level measurement up to 40 feet (12 meters)
- Easy installation and simple startup — set two parameters and go!
- Patented Sonic Intelligence signal processing
- Auto False-Echo Suppression for fixed obstruction avoidance
- Short blanking distance, even on long range applications
- Programming using Siemens' infrared intrinsically safe handheld programmer, HART® communicator, or Siemens SIMATIC PDM software and a laptop PC
- ETFE or PVDF transducers for chemical compatibility
- Built-in alphanumeric display — visible through the transparent lid

SITRANS Probe LU is a two-wire, loop-powered ultrasonic transmitter for level, volume, and flow monitoring of liquids in storage tanks and simple process vessels, as well as in open channels. The Probe LU is ideal for level monitoring in the water/wastewater industry and for overseeing chemical storage vessels.

Siemens took the time-tested Milltronics Probe and applied new revolutionary features — including the latest microprocessor and communication technologies. The low noise transmitter and noise shield result in an excellent signal-to-noise ratio, providing higher accuracy and reliability.

You can choose a SITRANS Probe LU with either an ETFE or a PVDF transducer to suit the chemical conditions of your application. Both have built-in temperature sensors, to compensate for the varying process temperatures in your application.

Using the handheld infrared programmer, you can set up the unit or change configurations without ever opening the lid — even in hazardous areas.

**Specifications**
- Measuring Range: 10” to 20’ (6m) or 10” to 40’ (12m);
- Blanking distance: 10”
- Measuring Range: 10” to 20’ (6m) or 10” to 40’ (12m);
- Accuracy: Greater of ±0.15% range or ±0.25; Resolution: ±3 mm (0.12);
- Frequency: 54 KHz (ultrasonic)
- Update Time: <3 seconds
- Output: 4-20 mA; Accuracy: ±0.02 mA
- Temperature: Ambient: -40 to 176° F (-40 to 80° C); Process temperature at Flange or threads: -40 to 185° F (-40 to 85° C)
- Temperature Compensation: Built in to compensate over full range
- Power: Nominal 24 VDC, max. 550Ω; 30 VDC max.; 4 to 20 mA
- Enclosure: PBT polymer, hard-coated polyether imide lid; Type 4X/NEMA 4X, Type 6/IP68 protection
- Sensor: EFTE (Tefzel) or PVDF (Kynar®)
- Process Connection: Threaded: 2” NPT, BSP, or G/PF; Flange: 3” universal
- Cable Inlets: Two 1/2” NPT threads
- Design: Rotating head aligns with conduit, adjusts for optimal visibility
- Local Display: Alphanumeric display, visible through the transparent lid
- Communication: HART® standard, integral to analog output; Configuration using Siemens SIMATIC PDM (PC) or HART handheld communicator, or Siemens infrared hand programmer
- Approvals: ATEX Ex II 1 G, Ex ia IIC T4, SIRA certificate 01ATEX2147; ATEX hazardous area ii II 1 G Ex ia IIC T4; FM Class I, Div. 1, Groups A-D (barrier required); Class II, Div. 1, Groups E-G; Class III; CSA Class I, Div. 1, Groups A-D (barrier required); Class II, Div. 1, Group G; Class III

**Ordering Instructions**
Make one selection from each table section below. A complete catalog number looks like this: 7ML5221 - _ _ _ _ _ _

**Model Selection Guide**

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<td>Profibus PA</td>
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<td>_ _ _ _ 5 _ _ _ _</td>
<td>213.00</td>
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</tbody>
</table>

**No power? No problem!**
Power your SITRANS LR560 radar level transmitter from an intrinsically safe wireless radio's battery on a scheduled, periodic, intermittent basis for true wireless performance. With it, you can sample 3x per hour with a 3 month battery life. D5 Performance Node Radio ..........20178 ..........$1549.00

---

**Note:** It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.
### SITRANS LUT400 Ultrasonic Controller

- SITRANS LUT400’s ± 0.04” accuracy gives you confidence in your measurements
- Improved Sonic Intelligence for better performance in noisy environments
- Enhanced diagnostics — echo profile and trend view on the display
- Graphical Quick-Start Wizards guide you through setup
- Local user interface with four-button programming, menu-driven parameters, and Wizard support for key applications
- Integrated datalogger — record historic performance and alarm events
- Universal 4-20 mA analog output with sourcing/sinking reduces ground loops!
- Energy-saving algorithms and real time clock help you reduce pump operation costs by avoiding peak energy periods
- Communications convenience — HART® communications with access via the local user interface, SIMATIC PDM, Emerson handhelds, and web-browser
- Case design includes wall, pipe, and DIN rail mounting configurations with removable terminal strips for hassle-free wiring

### Comparing Features of SITRANS LUT400 Models

- **LUT420 level controller:** Level or volume measurement of liquids, slurries, and solids, as well as basic pump control and basic data logging capability.
- **LUT430 level, volume, pump, and flow controller:** Includes all features of the LUT420 plus advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability.
- **LUT440 High Accuracy OCM:** Siemens’ fully featured, highest accuracy model. Includes all features of the LUT430, plus the industry’s best accuracy (±0.04”), advanced control functionality, and enhanced flow logging capability.

<table>
<thead>
<tr>
<th>Category</th>
<th>Feature</th>
<th>LUT420</th>
<th>LUT430</th>
<th>LUT440</th>
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<td>Volume conversion</td>
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<td>Open channel flow measurement</td>
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<td><strong>Specifications</strong></td>
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<td>Standard accuracy: ± 1 mm +0.17% of measured distance</td>
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<td>Mounting options: wall or panel, pipe, DIN-rail</td>
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<td><strong>Datalogging and communications</strong></td>
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<td>4–20 mA output (active and passive)</td>
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<td></td>
<td>Integrated datalogger for measurement value and alarms</td>
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<td></td>
<td>Integrated datalogger for fixed rate flow logging</td>
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<td>Integrated datalogger for variable rate flow logging</td>
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<td>Daily logging for min/max/avg flow, totalized volume, and min/max temperature</td>
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<td><strong>Flow monitoring</strong></td>
<td>9 digit daily and running flow totalizers</td>
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<td>High and low flowrate alarms</td>
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<td>External totalizer and sampler control</td>
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<td>Submergence detection</td>
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<td>Pump run-on functionality</td>
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<td>Pump start and power resumption delays</td>
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<td>Discrete input pump interlocks</td>
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<tr>
<td></td>
<td>Time to spill calculation</td>
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</table>
A “So What” review of Siemens SITRANS LUT400 Controller

Part of my job as technical specialist at Lesman is to make sense of new products, and figure out what’s going to matter most to our customers.

Sometimes it’s much-needed new functionality, or better configuration tools, easier mounting, or switching to the most current form of data storage. In the case of Siemens’ LUT400, it’s all that and more.

Siemens’ Milltronics ultrasonic transceivers, like the HydroRanger, MultiRanger, and OCM-III have been around for years with no notable improvements. Instead of updating these devices, Siemens has done a complete redesign with the SITRANS LUT400.

Here are my initial thoughts on this new player in the ultrasonic game.

The pros:
• Three models: One for level, one for pump control, and one for open channel flow monitoring (replacing the retired Milltronics OCM-III).
• No more handheld programmer or 1970s-era “Pxxx” parameters to decode during configuration and programming updates. There are Quick-Start Wizards for configuration, and English-named settings. Not a P-code in sight! There’s also HART® communications for configuration and monitoring through SIMATIC PDM.
• New LCD display gives you more information. Includes not just numeric values, but an echo profile and trend view on the screen, so it’s better for all the visual folks.
• USB connection and a built-in web server for setup, maintenance, diagnostics, communication, and security.

The cons (temporarily...):
• It’s a single channel device, so it can only handle one transducer. You can’t do differential level with this unit. But, it is the first one Siemens has released. I’m confident the multi-channel units will follow.
• Other than HART, no digital communication. The LUT400 doesn’t do Modbus, Proflbus, or Remote I/O. Again, this will be coming, in time.
• It only has three relays, so if you need more for pump control, you’ll need to use a different device.

If your application requires any of these features, check out Siemens HydroRanger HMI or MultiRanger HMI, (pages 24 and 25). They’ll be your best solutions for these requirements.

Read more of Dan’s tips at blog.lesman.com.

A complete LUT400 system includes:
1. LUT400 series controller
2. Echomax transducer (page 28–29)
3. TS3 temperature sensor (optional for added accuracy)
4. Point level solution for storage tank overfill protection (recommended good engineering practice per API 2350 standard).

Specifications
Range: 1 to 200 ft, depending on transducer
Accuracy: ±1 mm (0.04”) plus 0.17% distance
Resolution: Greater of 0.1% measured range or 0.08”
Temperature: Ambient: -4° to 122° F; Process: -40° to 302° F
Communications: HART®, USB
Interface: Back-lit LCD; Removable display, operational up to 16 ft from enclosure base
Programming: Four local push buttons, SIMATIC PDM Emerson AMST, web browser (IE), Field Device Tool (DT), Field Communicator 375/475 (FC375/FC475)
Output: One Form C SPDT relay, two Form A SPST relays; One 4–20 mA output (active or passive)
Input: Two discrete inputs (0-50 VDC max switching level) with 24 VDC bias for contact level device and/or pump interlock; One TS3 temperature sensor input optional
Enclosure: Wall/Pipe/DIN Rail mount; 1/2 DIN; Type 4X/ NEMA 4X/IP65, panel mount display IP 54 (Type 3/NEMA 3/ IP54); Polycarbonate
Approvals: General purpose: CE, CSAUS/C, FM, UL Listed, C-TICK; Hazardous location: CSA Class I, II, III, Div 2 (Groups A–G), CE, ATEX 3D, IECEx, C-TICK

Universal 4-20 mA analog output helps reduce ground loop issues.
Completely redesigned case! It’s a 1/2 DIN, out-of-the-box ready for DIN-rail, wall-, and pipe-mounting. Conduit knockouts are built in, so you don’t have to drill the case, and snap-off/snap-on terminal wiring connectors mean you can wire the unit without contortions! They even included quarter-turn door screws for easy access. If you want to panel-mount the LUT400, you can. There’s a remote display that connects via cable to the electronics box.
Improved signal-to-noise and echo processing algorithms (Siemens calls it Sonic Intelligence) for accuracy and performance. Still compatible with the current Echomax ultrasonic transducers, so if you’re upgrading, you only upgrade the transceiver/controller. You can use your existing sensors.

Ordering Instructions
Select one option from each table section below. A complete catalog number looks like this: 7ML5050-_____–____–Z

Model Selection Guides

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
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<tbody>
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<td>$1023.00</td>
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<td>SITRANS LUT430 Level, pump, flow controller</td>
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<td>Enclosure</td>
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<td>Display</td>
<td>With remote panel display</td>
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<td>Options</td>
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<td>10 to 32 VDC</td>
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<td>3-Pack Cable Glands and Retaining Nuts</td>
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<td>HART Modern, USB</td>
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<tr>
<td>LUT400 Sunshield, 304 Stainless Steel</td>
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Need even better accuracy? Add a TS-3 temperature sensor. Call for pricing.
MultiRanger HMI Ultrasonic Level Transceiver System

**Specifications**
- **Measuring Range:** 1 to 50 feet (0.3 to 15 m) depending on transducer
- **Measuring Points:** 1 or 2
- **Accuracy:** Greater of 0.25% range or 0.24” (6 mm)
- **Resolution:** Greater of 0.1% range or 0.08” (2 mm)
- **Temperature Compensation:** -58° to 302°F; Integral temperature sensor or External TS-3 temperature sensor; Programmable fixed temperature values
- **Input:** Analog: 0/4–20 mA, from alternate device, scalable; Discrete: 10–50 VDC switching level; Logical 0 ≤ 0.5 VDC, Logical 1 = 10 to 50 VDC Max. 3 mA
- **Compatible Transducers:** ST-H and EchoMax series XPS-10, XPS-15/15F, and XRS-5
- **Output:** Relays: Rating 5A @ 250 VAC, non-inductive; Analog: 0/4–20 mA, 75Ω, isolated, 0.1% of range
- **Display:** 2.36” x 1.57” LCD, 240 x 160 pixels resolution
- **Communication:** RS 232 with Modbus RTU or ASCII via RJ-11 connector; RS 485 with Modbus RTU or ASCII via terminal strips; Optional: SmartLinx cards for PROFIBUS DPV1, DeviceNet
- **Power:** AC version: 100 to 230 VAC ±15%, 50/60 Hz, 36 VA (17 W); DC version: 12 to 30 VDC (20 W)
- **Electrical Connection:** Transducer and mA output signal: 2-core copper conductor, twisted, shielded, 22 to 18 AWG, Belden8760 or equivalent is acceptable; Separation between transducer and transceiver: 365 m (1 200 ft) max
- **Enclosure:** Wall mount: IP65/Type 4X/NEMA 4X; Panel mount: IP54/Type 3/NEMA 3
- **Certificates and Approvals:** CE, RCM2, FM, CSAUS/C, UL, CSA Class I, Div. 2, Groups A-D, Class II, Div. 2, Groups F and G, Class III (wall mount only)

**Features**
- Single or dual point level monitoring
- Level, volume, open channel flow measurement, differential control, extended pump control, and alarms
- HMI display with four-button programming, menu-driven parameters, and graphical Wizard support
- Digital input for back-up level override from point level device
- Auto False-Echo Suppression algorithms for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- Communication using built-in Modbus RTU via RS 485
- Removable terminal blocks for easy wiring

Siemens’ new MultiRanger 200 HMI is a versatile short- to medium-range ultrasonic single and multi-vessel level monitor/ controller. It can be used with water, municipal waste, acids, woodchips, or on materials with high angles of repose.

MultiRanger 200 HMI will monitor open channel flow and features advanced relay alarming and pump control functions and volume conversion.

MultiRanger 200 HMI features Sonic Intelligence advanced echo-processing software for increased reading reliability. It offers true dual-point monitoring, digital communications with built-in Modbus RTU via RS 485, plus compatibility with SIMATIC PDM for PC configuration and setup.

A complete continuous level measurement system includes:
1. Ultrasonic transceiver
2. Transducer (compatible with ST-H, XPS-5, XPS-10, XPS-15/15F)
3. Additional cable lengths, as necessary
4. Handheld programmer/calibrator
5. Optional flanges, aiming kits, software, and communications, as needed
6. Point level solution for storage tank overfill protection (recommend good engineering practice per API 2350 standard)

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
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<tbody>
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<td>7ML5033</td>
<td>$1124.00</td>
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<td>MultiRanger 200: Level, Volume, and Flow</td>
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<td>4-Button HMI, Panel Mount</td>
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<td>Input</td>
<td>Voltage</td>
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<td>12 to 30 VDC</td>
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<td>Software</td>
<td>Single Point System</td>
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<td>Dual Point System</td>
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<td>SmartLinx Profibus-DP V1 Module</td>
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<td>Output</td>
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<td>6 Relays: 4 Form A, 2 Form C (250 VAC)</td>
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<td>1 Relay: Form A, 250 VAC (MultiRanger 100)</td>
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</table>

**Need help finding the right level system for your process?**
Visit www.Lesman.com/datasheets/ for the Siemens ultrasonic level data sheet. Complete the form and fax it to Lesman. We’ll have an engineer review your process and specify the best instrument to meet your needs.
HydroRanger 200 HMI Water Monitoring and Control System

**Features**
- Single or dual point level monitoring
- Local programming, menu-driven parameters, and Quick-Start Wizard support — set up in less than a minute
- Sonic Intelligence echo processing and Auto False-Echo Suppression to avoid fixed obstructions
- Modbus RTU and Profibus DPV1 digital communications
- Redesigned enclosure with a protected wiring compartment, removable terminal blocks, and an updated faceplate
- Submergence shield option senses flooding or overfill conditions

For nearly thirty years, Siemens’ HydroRanger 200 has been the industry standard for level measurement in monitoring and pumping wet wells, weirs, and flumes, inventory management, truck load-outs, and open channel monitoring.

The new HydroRanger 200 HMI is an ultrasonic level controller for up to six pumps and provides control, differential control, and open channel flow monitoring. It offers single-point monitoring with all models or dual-point monitoring with the six-relay model.

HydroRanger 200 HMI uses continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 50 feet deep. It is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent.

The six-relay HydroRanger 200 HMI will monitor open channel flow and features advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM for PC configuration and setup. It also features digital communications with built-in Modbus RTU via RS-485.

**Specifications**
**Measuring Principle:** Ultrasonic level
**Range:** 1 to 50 feet (0.3 to 15 meters), transducer and material dependent
**Measuring Points:** 1 or 2
**Input:** Analog: 0-20 mA or 4-20 mA, from alternate device, scalable (six-relay model); Discrete: 10-50 VDC switching level; Logical 0 <= 0.5 VDC or 1 = 10-50 VDC, 3 mA max.
**Transducer:** 44 kHz; Compatible transducers: ST-H, EchoMax XPS-10, XPS-15/15F, and XRS-5; 1200 ft (365 meters) max. between transducer and transceiver
**Relays:** Rating 5 A at 250 VAC, non-inductive; Six-relay model: 4 SPST Form A, 2 SPDT Form C
**Analog Output:** 0/4-20 mA, Max. load 750Ω, isolated, Resolution: 0.1 % range
**Accuracy:** Greater of 0.24° (6 mm) or 0.25% of maximum range
**Resolution:** Greater of 0.1% of measuring range or 0.08° (2 mm)
**Temperature Compensation:** -58° to 302°F; Integral temperature sensor in transducer or optional TS-3 external sensor; Programmable fixed temperature values
**Display:** 2.36" x 1.57", 240x160 pixel resolution
**Communication:** RS-232 with Modbus RTU or ASCII via RJ-11 connector; RS-485 with Modbus RTU or ASCII via terminal blocks; Optional: SmartLinx cards for PROFIBUS DPV1 or DeviceNet
**Enclosure:** Polycarbonate; Wall mount IP65/Type 4X/NEMA 4X, Panel mount IP54/Type 3/NEMA 3
**Cable:** Transducer and mA output signal two-core copper conductor, twisted, shielded, 300 VRRMS, 18 AWG, Belden 8 760 or equivalent is acceptable
**Power Supply:** AC:100-230VAC±15%, 50/60 Hz, 36 VA (17 W); DC: 12-30 V DC (20 W)
**Approvals:** CE, RCM, FM/CSA, UL listed, CSA us/c Class I, Div 1, Groups A-D, Class II, Div 2, Groups F, G, Class III (wall mount only); MCERTS Class 2 approved for Open Channel Flow

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
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<tbody>
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<td>100 to 230 VAC</td>
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<tr>
<td>12 to 30 VDC</td>
<td>B _ _ _</td>
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**Note:** It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.
SITRANS LU Long Range Ultrasonic Level Transmitters

Features
- Single point or dual point long range level monitoring in tanks up to 200 feet
- Accuracy to 0.25% target range
- Easy to install and program using infrared keypad
- Backlit LCD displays level, space, distance, or volume; Shows icons for vessel filling/emptying and bargraph for quick view of changing levels
- Automatic level-to-volume conversion for standard or custom tank shapes
- Single 0- or 4-20 mA analog output plus four SPDT alarm control relays
- Compatible with Dolphin Plus programming software and SmartLinx communication interface modules

The SITRANS LU01 system reliably monitors static or dynamically changing level of liquids, slurries, or solids in single-tank processes involving high temperatures, harsh chemicals, caustics, steaming solids, and fine powders.

The SITRANS LU02 adds the flexibility of a multi-frequency capability. One monitor can be used to scan liquids, solids or both, in two bins of differing size, shape, and configuration. The electronics are so powerful it is possible to place the unit up to 1200 feet from its transducers.

The SITRANS LU02 is shipped from the factory pre-calibrated for typical liquid and solid applications without the need for detailed setup. Select a single parameter to switch between liquid and solid materials, enter the bin dimensions and the control unit is up and running.

A complete level transmitter system includes:
- Transceiver
- Ultrasonic transducer (see pages 28 and 29)
- Additional cable lengths
- Handheld programmer/calibrator
- Optional flanges, as necessary
- Aiming kits, software, communications, as needed
- Point level solution for storage tank overfill protection (recommended good engineering practice per API 2350 standard)

Specifications
- Range: From 1 to 200 feet max.
- Compatible Transducers: Echomax XPS 10,15, 30, 40; XCT 8, 12; XLS 30, 60; XLT 30, 60; Ultrason STH
- Accuracy: 0.25% of target range subject to application.
- Resolution: Greater than 0.1% of target range or 0.08°.
- Display: Graphic 2" x 5" LCD for measurement readings, operating status; Reading: Level, space or distance in cm, mm, ft., in., % or any other units as programmed. Volume in desired units; Operating Status: Level bargraph, alarm, data communication, filling/emptying, temperature, rate of change
- Temperature: Ambient: -5° to 122° F; Compensation: -58° to 302° F. Error: 0.09% of range with compensation. 0.31% per ° F deviation from programmed temperature.
- Single mA Output: 0-20 or 4-20 mA, scalable 0.1% resolution 350Ω max. load (common ground) or 750Ω max. load (floating common) or 600Ω isolated (LIS-1 required).
- Relay Outputs: Four alarm/control relays; one form C SPDT contact per relay, rated 5A at 250 VAC, non-inductive.
- Enclosure: Type 4X/NEMA 4X/IP65 polycarbonate enclosure. 11.2"W x 8.2"H x 3.6"D.
- Cable: Transducer: RG-62U Coaxial for extensions to 1,200 ft. TS:3-Belden 8760 2 wire shielded/twisted, 18 AWG or equivalent, good to 1,200 ft.
- Programming: Removable magnetic base programmer communicating through an infrared interface or Dolphin interface.
- Programmer: Power: 9V (ANSI/NEDA 1604, PP3 or equivalent); Keypad: 20 keys, tactile feedback; Interface: Noninvasive, infrared.
- Approval: CE, CSA (NRTL/C)

Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
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Need help finding the right level system for your process? See www.Lesman.com/datasheets/ for the Siemens ultrasonic level datasheet. Complete the form and fax it to Lesman. We’ll have an engineer review your process and specify the best instrument to meet your needs.

Need to add SmartLinx communications? Call us!
Multichannel Ultrasonic Level Transmitter

**Specifications**

- **Range:** 1 to 200 feet, depending on transducer; **Span:** 196 ft max., 2" min.
- **Channels:** Max. 10 active channels per LU10 unit.
- **Accuracy:** Greater of 0.25% range or 0.24"; **Resolution:** Greater of 0.1% range or 0.08".
- **Temperatures:** Operating: -5° to 140° F; Electronics: -5° to 122° F; Process: -40° to 300° F;
- **Compensation:** Common temp sensor input
- **Volume Conversion:** User-selected units for eight common tank shapes.
- **Display:** 2" x 5" graphic LCD. Two 4-digit 0.7" numeric displays. AO10/SAM20 Display: 1 power/comms status LED; 20 relay status LEDs (SAM-20).
- **Analog Outputs:** Programming only, no on-board output. AO-10 Output Module: 10 analog outputs. Isolated 0/4–20 mA into 75Ω max., 0.1% resolution.
- **Relay Outputs:** Programming only, no on-board relays.
- **Power:** 100/115/200/230 VAC ±15%, jumper selective; 50/60Hz, 15VA.
- **Enclosure:** NEMA 4X polycarbonate, stainless steel screws
- **Cable:** 18 AWG shielded twisted pair for extensions to 333 ft. max., use RG-62 A/U coaxial for extensions to 1200 ft.; Interconnection Cable: Belden 8760, 1 pair shielded/twisted, 18 GA.
- **Transducer:** 44 kHz, 315V peak pulses of max. 1 mSec duration typical; 22 kHz, 150V peak pulses of max. 1.7 mSec. duration typical; or 13 kHz, 150V peak pulses of max. 1.7 mSec. duration typical; Max. repetition rate: 200 mSec/transmit.
- **Data Link:** Transmit only; Single ±20 mA bi-polar current loop @ 4800 baud. 10,000 feet max loop. Loading: 3 peripheral devices max.
- **Memory:** 10 minutes minimum data retention.

**Features**

- Ten-point level monitoring in tanks to 200 feet
- Accuracy to 0.25% target range
- Easy to program using infrared keypad
- Program the backlit LCD display for level, space, distance, or volume; Icons for vessel filling/emptying and bargraph for quick viewing of changing levels
- Automatic level-to-volume conversion for standard or custom tank shapes
- On-board analog and relay for programming only. Add AO-10 for additional 0/4-20 mA outputs
- Compatible with Dolphin Plus programming software and SmartLinx interface modules

The SITRANS LU10 controls and measures efficiently in multiple tank applications. It has been field-proven in extremely high temperatures, as well as steamy, dusty, and corrosive environments.

If your processes demand reliable level measurement data in one to 10 vessels of any shape or size, in any liquid or bulk solid, and in any environment, a single SITRANS LU10 has the flexibility to get the job done.

The SITRANS LU10 is shipped from the factory pre-calibrated for typical liquid and solid applications without the need for detailed setup. Select a single parameter to switch between liquid and solid materials, enter the bin dimensions and the control unit is up and running.

You can view program values during setup and operation, so you don’t have to shut down the process or switch between display modes to interrogate.

**Model Selection Guide**

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<thead>
<tr>
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**Note:** It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.

**Product Lifespan Announcement!**

**This model has been retired by Siemens and is no longer available for purchase.**

Please see the MultiRanger 100/200 HMI and the LUT400 series for suitable replacements.

**Need to add SmartLinx communications? Call us!**
### Echomax Ultrasonic Level Transducers

#### Features
- Two-way dynamic impedance matching provides high output and sensitive echo capture
- Unique unidriver construction gives highest temperature operation available in any ultrasonic system: 300°F (150°C)
- Uniformity as close as one foot, so you can depend on short-range reliability
- Reliable in liquids and solids from 1 to 200 feet
- No moving parts to cause downtime
- Simple, economical installation
- Mounting location is more flexible, so obstacles can be avoided
- Chemically resistant
- Hermetically sealed models immune to dust, steam, turbulence, corrosives
- Aiming is less critical
- 1” NPT conduit connection with NEMA 4 ingress protection (except XRS-5, which has IP68 rating)
- Models available with CSA, FM, CE, 3A, and FDA approvals

#### Transducers Compatible with All Siemens Continuous Ultrasonic Transmitter Systems

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<th>Measuring Distance</th>
<th>Temperature Range</th>
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#### Transducers Compatible Only with Siemens LU (AiRanger) Series Ultrasonic Transmitters

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<th>Series</th>
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*Please submit orders to: Siemens Industry Inc, c/o Lesman Instrument Company*
**FMS Mounting Brackets**

Siemens mounting brackets make installing Echomax ultrasonic transducers quick and easy. These rugged high-quality mounting brackets are made of 304 stainless steel, and are suitable for use in both indoor and outdoor installations. They adjust to fit almost any application, saving you the time and expense of building custom brackets. Each kit contains all necessary mounting parts.

### FMS Series Mounting Brackets Compatible With

- Probe (FMS-200 Only)
- ULS200 (FMS-200 Only)
- XPS-15
- XPS-10
- XPS-15F
- XRS-5
- ST-H

### Mounting Brackets for Ultrasonic Sensors

**FMS-200 Universal Box Bracket**
- Allows any unit with a threaded 1" or 2" connection to be mounted 8" to 12" out from a wall or beam. Box design also acts as a sun shield.

**Kit Includes**
- Two 1" mounting nuts
- One 2" mounting nut

**Order**
- 7ML1830-1BK
- $148.00

**FMS-210 Wall Mount Channel Bracket**
- Lets any transducer with a threaded 1" connection be mounted 5" to 19" out from a wall or beam.

**Kit Includes**
- Four 1/4" lock washers
- Two 1" mounting nuts
- Two 2" mounting nuts
- Four M6x12 bolts

**Order**
- 7ML1830-1BL
- $215.00

**FMS-220 Extended Channel Bracket**
- Allows any transducer with a threaded 1" connection to be mounted 13" to 39" out from a wall or beam.

**Kit Includes**
- Four 1/4" lock washers
- Two 1" mounting nuts
- Four M6x12 bolts
- Two M6x30 bolts

**Order**
- 7ML1830-1BM
- $370.00

**FMS-310 Floor Mount Channel Bracket**
- Lets any transducer with a threaded 1" connection be mounted from 19" high and 22" out past the mounting.

**Kit Includes**
- Four 1/4" lock washers
- Two 1" mounting nuts
- Four M6x12 bolts
- One M8x50 bolt

**Order**
- 7ML1830-1BN
- $355.00

**FMS-320 Floor Mount Extended Channel Bracket**
- Allows any transducer with a threaded 1" connection to be mounted from 19" high and from 16" to 43" out past the mount.

**Kit Includes**
- Four 1/4" lock washers
- Two 1" mounting nuts
- Six M6x12 bolts
- Two M6x30 bolts
- One M8x50 bolt

**Order**
- 7ML1830-1BP
- $509.00

**FMS-350 Floor Mount Bridge Channel Bracket**
- Lets any transducer with a threaded 1" connection be mounted from 19" high, anywhere along a 65" beam. Great for open channel flow applications. Provides a stable mount for the transducer above a flume or weir.

**Kit Includes**
- Four 1/4" lock washers
- Two 1" mounting nuts
- Twelve M6x12 bolts
- Three M6x30 bolts
- Two M8x50 bolts

**Order**
- 7ML1830-1BQ
- $836.00

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**Aluminum Easy Aimer Kits**

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*For use with XPS-30 or XPS-40 transducers only.*
WIKA® LH-10/LS-10 Submersible Liquid Level Transmitters

Features
- Standard ranges available from stock
- Rated IP68 for permanent submersion
- 4-20 mA two-wire output signal
- Vented polyurethane cable withstands 220 pounds of strain
- Custom cable lengths available on LS-10. LH-10 comes with integral 40’ cable.

WIKALS-10 liquid level transmitter is designed for economical and reliable performance in a variety of level measurement applications. The LS-10 provides a 4-20mA signal output and an accuracy of 0.25% span.

The high performance LH-10 provides 0.125% accuracy. The LH-10 includes a dual cable entry design that prevents ingress of moisture into the electronics, even if the cable is damaged.

Both models feature watertight vented cable that can withstand more than 220 pounds of strain. This means the transmitters can be supported without the need for additional cabling.

Both the LS-10 and LH-10 can be ordered with the LevelGuard™ (below) for protection in difficult environments.

Need an FM approved intrinsically safe submersible transmitter? Call Lesman for the WIKA IL-10.

LH-10/LS-10 Submersible Liquid Level Transmitters

Dimensions

Model Selection Guide

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Maximum Pressure*</th>
<th>Burst** Pressure</th>
<th>Catalog Number</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH-10: 0.125% Accuracy, 316 SS, Polyurethane, Polyamid wetted parts, G1/2B pressure connection, 4-20 mA output. Integral 40’ vented polyurethane cable.</td>
<td></td>
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<tr>
<td>0-50”WC</td>
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<td>145 PSI</td>
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</table>

LS-10: 0.25% Accuracy, 316 SS, Polyurethane, Polyamid wetted parts, G1/2B pressure connection, 4-20 mA output.
Select cable length below and append to catalog number.

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>Maximum Pressure*</th>
<th>Catalog Number</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0-150”WC</td>
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<td>0-250”WC</td>
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<td>0-25 PSI</td>
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<td>0-30 PSI</td>
<td>140 PSI</td>
<td>170 PSI</td>
<td>4262841</td>
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<td>0-50 PSI</td>
<td>240 PSI</td>
<td>290 PSI</td>
<td>4262850</td>
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<tr>
<td>0-100 PSI</td>
<td>500 PSI</td>
<td>600 PSI</td>
<td>4262868</td>
</tr>
</tbody>
</table>

Cable Lengths

| 5' | 4347868 | 0.00 |
| 10' | 4347876 | 8.11 |
| 15’ | 4347885 | 16.22 |
| 20’ | 4347893 | 24.34 |
| Vented Polyurethane | 25’ | 4347906 | 32.46 |
| Cable (Append to) | 30’ | 4347915 | 40.56 |
| Transmitter Model | 40’ | 4347931 | 56.78 |
| Number | 50’ | 4347957 | 73.01 |
| e.g., 4262850/4360903( | 60’ | 4347974 | 89.23 |
| 70’ | 4347990 | 105.46 |
| 75’ | 4348006 | 113.57 |
| 100’ | 4348040 | 154.13 |

Accessories

| Stainless Steel LevelGuard™ | 50077091 | 296.40 |
| Desiccant Drying Cartridge | 9836700 | 22.26 |
| Vent Tube Filter | 7193131 | Call |
| Cable Clamp | 2074257 | 33.34 |
| Additional Weight | 1524399 | 113.57 |
| Cable Junction Box | 2459686 | 119.13 |

Great for dirty media applications and turbulent processes!

Ordering an LS-10? Don’t forget to order a desiccant drying cartridge to prevent moisture build up inside the vent tube.

Notes
- Maximum pressure, causing no permanent changes in specifications but may lead to adjustable zero/span shifts.
- Burst pressure, leading to destruction of transmitter.

Need a cable longer than 100 feet? Call for pricing and availability.
SITRANS LH100 Submersible Liquid Level Transmitter

Features

- 0.3% accuracy
- Transmitter for hydrostatic depth measurement
- Piezoresistive flush-mounted sensor
- Stainless steel sensor and enclosure
- 4-20 mA two-wire output
- Easy installation with junction box or cable hanger
- Replaces the retired SITRANS P MPS submersible transmitter

Siemens’ SITRANS LH100 pressure transmitter is a submersible sensor for hydrostatic liquid level measurement in tanks, containers, channels, dams, unpressurized/open vessels and wells.

On one side of the sensor, the diaphragm is exposed to the hydrostatic pressure, which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to a Wheatstone resistance bridge in the sensor. The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

Specifications

Measuring Range | Maximum Working Pressure
--- | ---
0–3 m (0–9 ft) H2O | 1.5 bar (21.8 psi) 15 m (45 ft) H2O
0–4 m (0–12 ft) H2O | 1.5 bar (21.8 psi) 15 m (45 ft) H2O
0–5 m (0–15 ft) H2O | 1.5 bar (21.8 psi) 15 m (45 ft) H2O
0–6 m (0–18 ft) H2O | 1.5 bar (21.8 psi) 15 m (45 ft) H2O
0–10 m (0–30 ft) H2O | 3.0 bar (43.5 psi) 30 m (90 ft) H2O
0–20 m (0–60 ft) H2O | 6.0 bar (87.0 psi) 60 m (180 ft) H2O

Zero/Span: Ambient Temperature Influence: 0–3 m (0–9 ft) H2O: 0.5%/10 K full scale; 4–6 m (12–18 ft) H2O: 0.45%/10 K full scale; 0.3%/10 K full scale; Long-Term Stability: 0–3 m (0–9 ft) H2O: 0.5%/full scale/year; 4–6 m (12–18 ft) H2O: 0.25% full scale/year; 0–3 m (0–9 ft) H2O: 0.2% full-scale/year

Ambient Operating Temperature: 14° to 176° F (-10° to 80° C)

Material: Seal Diaphragm: Al2O3 ceramic, ≥96%; Sensor/Casing: Teflon-coated 31SS housing; Teflon/Buna N diaphragm; Polyethylene cable, vent tube, shielded 18 AWG conductors

Power Supply: Terminal voltage on pressure transmitter: 10–33 VDC; Power Supply: Terminal voltage on pressure transmitter: 10–33 VDC

Explosion Protection: Intrinsically safe IECEx SEV 14.0003, SEV 14ATEX 0109; Identification: II 1 G Ex ia IIC T4 Ga

Electrical Connection: 2x 3-way (28–18 AWG); Cable Entry: 2x Pg9

Cable Hanger: For mounting the transmitter; Galvanized steel, polyamide

Local Level Indication in Feet and Inches

PD6801 Level Meter

- Display level in feet and inches — no translations needed!
- 20–segment tank level indicator
- Lower display for tag, volume, or percent
- Open collector alarm output
- Displays with wide viewing angle; Mountable at 0°, 90°, 180°, and 270°
- 4–20 mA input loop-powered
- Programmable 1/8" or 1/16” tall digital display with SafeTouch® through-glass button programming
- Loop or external DC-powered backlight standard
- HART® protocol transparent
- Explosion-proof, IP68, NEMA 4X die-cast aluminum enclosure; FM, CSA, CE, ATEX, IEC approvals

Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM-Approved Level Meter, 0.7” Display, Backlit</td>
<td>PD6801-0K1</td>
<td>$899.00</td>
</tr>
</tbody>
</table>

Intrinsically Safe Loop-Powered Submersible Level Transmitter

- 2–5/8” Teflon-coated Buna-N diaphragm
- FM/CSA intrinsically safe, Class I, Div. 1, Group A-D rated with approved barrier
- 4-20 mA output, 0.25% full scale accuracy, 0.2% full scale/year long-term stability

Temperature Range: -40° to 185° F

Max Overpressure Range: 1.5 PSI & 30 PSI 2X full scale; 15 PSI & 30 PSI 2X full scale

Materials: Teflon-coated 31SS housing; Teflon/Buna N diaphragm; Polyethylene cable, vent tube, shielded 18 AWG conductors

Power Required: 9-30 VDC (7500Ω load @ 24VDC)

Call for pressure ranges. Prices start at $1000.00

Zero/Span: Ambient Temperature Influence: 0–3 m (0–9 ft) H2O: 0.5%/10 K full scale; 4–6 m (12–18 ft) H2O: 0.45%/10 K full scale; 0.3%/10 K full scale; Long-Term Stability: 0–3 m (0–9 ft) H2O: 0.5%/full scale/year; 4–6 m (12–18 ft) H2O: 0.25% full scale/year; 0–3 m (0–9 ft) H2O: 0.2% full-scale/year

Model Selection Guide

Please submit orders to: Siemens Industry Inc, c/o Lesman Instrument Company.
SmartLine STF700 Flange-Mount Liquid Level Transmitter

**Features:**
- Accuracies up to 0.05% standard
- Stability up to 0.015% URL per year for ten years
- Automatic static pressure and temperature compensation
- Rangeability up to 100:1
- Response times as fast as 90 mSec
- Multiple local display capabilities
- External zero, span, and configuration capability
- Modular design
- World-class overpressure protection
- Polarity insensitive electrical connections
- Integral dual seal design for highest safety per ANSI/NFPA 70-202 and ANSI/ISA 12.27.0
- Comprehensive on-board diagnostic capabilities
- Communications Options: Honeywell Digitally Enhanced (DE), HART® v7.0, FOUNDATION™ Fieldbus
- Full compliance to SIL 2/3 requirements
- Available with 15 year warranty

**Dimensions**

SmartLine family pressure transmitters are designed around a high performance piezo-resistive sensor; One sensor integrates multiple sensors, linking process pressure measurement with on-board static pressure (DP models) and temperature compensation measurements. This allows the ST700 to replace most competitive transmitters available today.

**Indication/Display Option:** Honeywell’s ST700 modular design accommodates a basic alphanumeric LCD display.

**LCD Display Features:**
- Can be added or removed in the field
- 16 most-common engineering measurement units
- 2 Lines 16 Characters alphanumeric display
- Position display at 0°, 90°,180°, and 270° for easy reading
- Square root output indication (√)

**Diagnostics:** SmartLine transmitters offer digitally accessible diagnostics that help provide advanced warning of possible failure events, minimizing shutdowns, and providing lower operational costs.

**Configuration Tools**

**Integral Three-Button Configuration Option:** SmartLine offers the ability to configure the transmitter and display via three externally accessible buttons. Zero/span capabilities are also optionally available via these buttons with or without selection of the display option.

**Handheld Configuration:** SmartLine transmitters feature two-way communication and configuration capability between the operator and the transmitter via Honeywell’s field-rated Multiple Communication Configurator (MCT404). The MCT404 is capable of field configuring DE and HART devices and can be ordered for use in intrinsically safe environments. Honeywell transmitters are designed and tested for compliance with the offered communication protocols and are designed to operate with any validated hand held configuration device.

**PC Configuration:** Honeywell’s SCT3000 Configuration Toolkit provides an easy way to configure Digitally Enhanced (DE) instruments using a personal computer as the configuration interface. Field Device Manager (FDM) Software and FDM Express are also available for managing HART and Fieldbus device configurations.

**Modular Design:** ST700 transmitters are modular in design, so you can replace meter bodies, add indicators or change electronic modules without affecting performance or approval body certifications. Each meter body is uniquely characterized to provide in-tolerance performance over a range of variations in temperature and pressure.

**Modular Features:**
- Meter body replacement
- Exchange/replace electronics/comms modules
- Add or remove integral indicator
- Add or remove lightning protection (terminal connection)
**Specifications**

- **Reference Accuracy:** 0.05% span
- **Stability (%URL/year for five years):** STF728: 0.020%; STF72F: 0.020%; STF732: 0.040%
- **Temperature:** Ambient: -40° to 185° F; Meter Body: -40° to 275° F
- **Humidity:** 0 to 100% RH
- **Maximum Allowable Working Pressure (MAWP):** 4500 PSI for temperatures -40° to 275° F
- **Output Failure:** Two-wire, 4 to 20 mA (HART and DE)
- **Analog Output:** Maximum Allowable Working Pressure (MAWP): 4500 PSI for temperatures -40° to 275° F
- **Supply Voltage:** 12±5% of nominal voltage setpoint. Supply voltage options include: 24VAC, 110VAC, 230VAC, 24VDC, 50VDC, 100VDC, 125VDC, 250VDC, 30VDC, and 48VDC.
- **Humidity:** 0 to 100% RH
- **Damping Time Constant:** Default: 0.48 seconds
- **Response Time (Delay + Time Constant):** Default: 0.50 seconds
- **Voltage Effect:** 0.005% span per volt
- **Vibration Effect:** Less than ±0.1% URL without damping. Per IEC60770-1 field or pipeline, high vibration level
- **Electromagnetic Compatibility:** IEC 61326-3-1
- **Agency Approvals:** FM/CSA, TÜV Nord Sys, IECEx, ATEX, and SASO.

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Availability</th>
<th>Price</th>
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</thead>
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<tr>
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<td>Process Connections</td>
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<td>Gasket Ring</td>
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<tr>
<td>Paper Manuals</td>
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</tbody>
</table>

**Note:** It is considered good engineering practice to provide redundant disparate level technologies for overfill protection of storage tanks (per API 2350 standard). Call Lesman for point level solutions to complement your continuous level transmitter choice.
Using a Pressure Transmitter as a Bubbler for Liquid Level

**Air Bubbler Theory**

1. A constant flow of pressurized air is applied to the tube
2. A pressure transducer monitors the air pressure in the tube
3. The pressure in the tube equals the pressure at the tank’s bottom
4. The liquid level equals the pressure inside the tube divided by the liquid’s density
5. As long as the material density remains constant, the pressure is proportional to the liquid level in the tank

**Advantages**

- Not affected by foam or turbulence
- Can be used in small diameter pipes
- Easy to understand/proven technology
- Large installed base

**Common Applications**

- Determine head through a flume or weir
- Level in a lift station
- Tank level when foam is present
- Can be used with atmospheres other than air

A bubbler system is an inexpensive but accurate means of measuring the fluid level in open or vented containers, especially those in harsh environments such as cooling tower sumps, swimming pools, reservoirs, vented fuel tanks, drain sumps, or air washers.

A complete system consists of a source of compressed air, air flow restrictor, sensing tube, and pressure transmitter. The only component exposed to the elements is the sensing tube. All others can be remotely located in a protected area.

Air bubbler systems contain no moving parts, making them suitable for measuring the level of water, viscous fluids, liquids with large quantities of suspended solids, slurries, sewage, drainage water, and sludge. Since the only part of the bubbler that touches media is the air flow tube, it can be used for applications where you don’t want the liquid to contact a sensor. And, since bubblers can be used in small diameter pipes, they allow for installations in tanks where other systems won’t fit.

In the past, if you wanted a bubbler, you needed to buy all the components and assemble the bubbler system yourself. Now, you can do it the easy way and let Lesman build a bubbler for you. Your Lesman bubbler system comes pre-configured, wired, and ready to drop directly into your application.

All you need to do is identify your application depth below and decide whether you need an air purge to help keep your air flow tube clean.

**Model Selection Guide**

To build a complete model number, choose one option from each section below. Be sure to include your maximum level and label in your order.

**Example:** LSB100-020 \( Y = 75 \text{ Ft} \)
Panel Label: North Side Sump, Capacity 7200 Gal

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesman Bubbler System (See included items list at left.)</td>
<td>LSB100-020</td>
<td>$5978.00</td>
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<td><strong>Range</strong> Specify Level: (XXX), units (% , In, Ft, Gal)</td>
<td>Y = ___ ___</td>
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<tr>
<td><strong>Panel Label</strong> Specify Label: Up to 40 characters</td>
<td></td>
<td>0.00</td>
</tr>
</tbody>
</table>

For custom requirements, call the Lesman bubbler system specialists at 800-953-7626.
WMI Magnetic Indicator for Liquid Level Storage

Features
- Dependable liquid and interface level indication for years with minimal maintenance required
- Liquid and interface specific gravities as low as 0.35
- Bright, bold-scale, two-color indicator for easy reading up to 200 feet away
- Measuring lengths from 6” to 20 feet standard, longer lengths available
- Temperatures from 320° to 1000°F; Pressures from full vacuum to 5000 PSI
- Options: Magnetostrictive or reed chain transmitter output, dry contact or reed switch output, built-in thermocouple or RTD, WIKA pressure gauges
- Can be combined with WIKA WLC chamber for redundant level measurement

WIKA WMI magnetic level indicator is primarily used for visual indication of liquid levels. The WMI chamber is mounted parallel to the tank application. It can mount horizontally with side connections to a tank, or vertically to be mounted on top of or below a tank. The liquid level in the chamber will match the movement of the liquid level of the tank.

A float, built specifically for your level application, is contained in a chamber that connects directly to the process to be measured. The float is engineered to ensure buoyancy based on the specific gravity, temperature, and pressure of the liquid being measured. Each float is weighted so the liquid level is equal to the position at which the magnet is mounted in the float. The magnet assembly provides maximum strength balanced with minimum weight in an effort to reduce float and chamber size and length.

As the liquid level changes in the chamber, the float rises and falls with the liquid level. The force or flux of the float’s magnet assembly affects the visual indicator mounted outside of the float chamber. The indicator includes a series of magnetized wafers or flags that react to the magnet included in the float, to provide accurate, dependable visual level indication.

WMI Indicator chambers are constructed out of nonmagnetic materials, most commonly stainless steel. All steel chambers will be designed and constructed in accordance with ASME B31.1, B31.3, or to meet NACE, if required. Level gauge chambers are built per your specifications to fit existing process connections or for new construction.

Specifications
Indicator: Red and white / yellow and black flags; Ruler in feet/ inches, metric, %, or special (no charge for custom rulers)
Indicator Length: 6” to 20 feet or more; Center to center length: Similar or different from indicator, upper or lower mounting
Construction: 304L, 314L, 317, 329, and 347 stainless steel (per AMSE B31.1, B31.3 or NACE requirements); Hastelloy B or C; Alloy 20; Inconel 625; 254 SMO; PVC; Teflon
Mounting: Horizontally with side connections to tank, or vertically on top of tank
Chamber/Flange Rating: From 150# to 2500#
Process Connections: ANSI flanges, NPTM or NPTF threads, O-lets, welded ends; Sizes: 1/2” to 8” standard
Available Outlets: Extruded, saddled, or welded T
Side Connection: Size: Ranges from no connection, 1/2” to 8” or more; Flange; Weld neck with raised face, Slip on with raised face, Weld neck RTJ; Lap joint; O-let; Soc-o-let, Thread-o-let, Weld-o-let; Other; Threaded coupling, socket weld coupling, socket weld nipple, threaded nipple, butt weld connection;

Vent and Drain Size: Ranges from no vent or drain connection, 1/2” to 8” or more
Vent or Drain Connections: Flat or Dome Cap: NPT, Hex plug, Threaded coupling, Socket weld coupling, Nipple for butt welding, Threaded male nipple, Welded flange; Weld Neck or Slip-On Flange: No mating flange for direct process connection, mating flange with NPT hex plug, socket weld coupling, nipple for butt welding, threaded male nipple, welded flange or valve; Other connections options can be engineered per application

Additional Options: Cryogenic and high temperature chamber and flange insulations from -300° to 999° F, steam tracing, electrical heat tracing, gussets for reinforced flange supports, liquid gas chamber construction

Need help designing the perfect indicator for your tank? Download and complete a WIKA WMI application datasheet from www.Lesman.com/datasheets/.

See Lesman’s latest solutions for plant safety, pressure, temperature, level, or flow measurement, combustion and flame safeguard control, and industrial wireless, starting on page 57.
Load Cells for Level by Weight

Features
- Easy mounting
- Only 25/35 mm installation height
- Hermetically welded seal IP68 equivalent to NEMA 6
- Stainless steel construction
- Direct 4 to 20 mA output (LA)
- CENELEC Ex-version available (LE)
- Level control for liquid and bulk materials

This is the perfect solution to all your level control requirements: Sartorius' revolutionary PanCake® technology for level-by-weight applications. This system is extremely durable for the utmost precision in most applications. It works independent of material properties and the surrounding environment. Retrofitting is fast and easy. PanCake technology is tried and tested in many installations, and is available at an affordable price.

Conventional level control instrumentation can lead to errors of 5% and more. In extreme cases this could result in interruption of the associated process. New PanCake level-by-weight technology gives extremely accurate readings better than 1% in "real-life" applications over a complete range of capacities up to more than 35,000 pounds.

Exceptionally price competitive, the PanCake system offers not only great technical advantages, it also offers exceptional value for the money. Compared to ultrasonic or radar systems, savings of up to 50% are possible.

The extremely reliable, tough and durable design of sensors and the use of high quality materials lead to unequaled reliability, even under harsh industrial conditions. Maintenance or recalibration is rarely needed, except in case of mechanical changes to the tank.

The high quality sensor maintains calibration for years, without drift or creep. The stainless steel housing is hermetically sealed by welding and complies to the highest rating (IP68) for 10,000 hours at 1.5 m (5'), equivalent to NEMA 6.

PanCake Capabilities

The model LA provides 4 to 20 mA output for direct connection to process instrumentation or PLCs/DCS. Models L and LE featuring mV/V output are connected via Sartorius transmitters and indicators. Usually only one PanCake is required (three legs). If two are used (four legs) you still require only one input channel in your PLC or Process Indicator by simply switching the two outputs in parallel.

Specifications

Load Cell Construction: Hermetically sealed, welded stainless steel construction, filled with Polyurethane

Material: 500kg; 10t: 1.4021 (DIN), 420 S 37 (B.S.); 16t: 1.4542 (DIN), S 604/S 622 (B.S.), 17 to 4 pH (Int.)

Protection: IP68, IEC 529, equivalent to NEMA 6. The load cell can be submerged in water to a depth of 1.5 m for 10,000 hours.

Cable: Robust, flexible, screened; Sheath: Thermopl, Elastomer; Color: gray (LE: blue, LA/LAC: green); Diameter: 5mm, wires 4 x 0.35 mm²; Length: 5 m; Bending radius: ≤ 50 mm

Certificate of Conformity: EEx ia IIC T6 (PTB Nr. Ex-00.E.2040, II 2G EEx ia II T6 (PBTB 00 ATEX 2039)

Technical Data

<table>
<thead>
<tr>
<th></th>
<th>L</th>
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<th>LE</th>
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<td>Minimum Dead Load</td>
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<td>-30° to 95° C (Usable)</td>
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<td>Nominal Deflection</td>
<td>Up to 2t &lt;0.1/16t &lt;0.2 mm</td>
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</table>

Visit our website to learn more about Sartorius load cells, scales, and precision batching systems.
Why Use a Load Cell for Level?

Easy Start Up... Better Performance... Low Maintenance

Calibration without weights — Competitors calibration of 50,000 lb vessel normally takes 4 to 6 hours. There are usually no weights available. Sartorius calibration time is less than 20 minutes.

No shimming or corner adjustments — Sartorius PanCake only takes 5 minutes, by hand rotating the load cell to determine whether or not there is a load. Only a minimal 1% of the load is required.

No resistors or trim pots in the junction box — Resistors and potentiometers tend to be temperature and moisture sensitive. This can affect system accuracy.

Matched load cells — All Sartorius load cells are totally matched and can be replaced without the need for re-calibration.

No influence from the effect of mixers (moving center of gravity) — Due to matched load cells and unique mounting design.

No side load effects due to temperature expansion of the vessel — Side forces are taken by the mounting kits which have freedom for temperature expansion.

Load cells have lighting protection — Special strain gauge design in combination with our junction box makes it possible.

Stainless steel and hermetically sealed — The load cells can be submerged in water under 5 feet for 10,000 hours.

Special load cell cable for harsh environments — No PVC insulation, PTFE is used for high chemical resistance and a Kevlar fiber for “Pull Protection.”

High Ω load cell design — 650 to 1200 Ω input resistance for minimizing the effect of cabling on accuracy and higher signal under intrinsically safe conditions.

NOW limited LIFETIME WARRANTY on most STAR Line load cells

Load cells remain within all specifications up to a usable load of 150 to 200% of nominal

All controls are designed with a built-in test function and can be “calibrated without weights.”

We offer a wide range of weighing and batching solutions, from simple indication to complex batching systems.

Sartorius Accuracy Class is calculated using these criteria: Hysteresis, linearity, temperature effects on zero and span, repeatability, and creep.

These compression load cells are available with several accuracies:

PR6201 (Left): 0.25% to 0.5%; 0.04% to 0.05%; or 0.015%
PR6211 (Center): 0.04% to 0.05%
PR6241 (Right): 0.04% to 0.05%; 0.015%; or 0.008%

Looking for a high accuracy load cell? Call Lesman!
**Contego® Hygienic Weighing System**

**Features**
- For production, mixing, charging, and storage vessels where cleaning is critical
- For containers with total load of 100kg to 2t
- 6.6” diameter for installation in tight spaces
- Head and base plates made of AISI 316L stainless steel for corrosion-resistance and hygienic connections
- Accuracy classes D1 (±0.04%) and C3 (±0.015%)
  - EHEDG-certified, FDA-compliant silicone cover, Weights and Measures approval to IOML R60

Food and pharmaceutical industries are known for high standards regarding hygiene in the production process. Many sensitive areas, from delivery to packaging and distribution are located next to one another, making it particularly challenging to combine precise measurement results with compliance to hygiene requirements.

The most critical requirements are those regarding components of machines and systems that come directly into contact with the product. They must have a high level of corrosion resistance, must not give off any chemical substances and will ideally have surfaces that have been optimized for ease of cleaning.

Depending on the contamination type (flour, cocoa, egg white, fat), system components must withstand cleaning methods like compressed air, suction, fluids or water, or steam blasting. High-quality materials, like stainless steel or highly resistant plastics offer effective protection against dust and moisture.

For small- to medium-size process vessels with total loads of 100kg to 8t or anywhere hygienic standards are important, Sartorius’ Contego combines a load cell and mounting kit into a single hygienic system.

The stainless steel construction protects the central components from corrosion and the FDA-compliant silicone sleeve offers the highest level of hygienic security. The small diameter unit fits in tight spaces, and a built-in jack-up function makes it easy to lift and lower the process vessel during maintenance, without the need for additional tools.

The Contego module is easily installed under the foot of the container, so a separate structure isn’t necessary. The head and base plates are made of stainless steel AISI 316L (1.4404). They protect all central components against corrosion and offer an extremely hygienic and stable solution for attaching to the container and base element.

An integrated jack-up function provides simple and correct lifting or lowering of the container during maintenance work, without the need for additional tools. As a special element for stabilizing the container, Contego has an integrated lift-off protector and a constrainer. These ensure reliable stability of the container during operation. If the floor is sealed with silicone, an optional adapter plate is directly cast to prevent the risk of accumulating dirt.

The FDA-compliant silicone casing is also approved for the pharmaceutical industry, and offers the highest levels of hygienic security. It’s securely connected to the head and base plates through a special geometric seal to avoid the formation of gaps that can cause contamination. This protective casing also has high chemical resistance to most cleaning agents.

Overall, the advantage of this weighing solution lies in its impressive hygienic properties, combined with significant cost savings in planning, design and operation. The Contego is available in two versions, with the cable outlet on the side or on the top, and has an appropriately hygienic cable connection. Both load cell models are naturally available as an explosion-proof version suitable for use in potentially explosive areas. An intrinsically safe load cell supply can be integrated for use in potentially explosive areas.

**Specifications**

**Load Cell Construction:** S-shaped version for torque-free load application. Pure stainless steel, hermetically sealed and filled with protective gas.

**Material:** Load cell: 1.4542 (AISI 630, 17-4PH) Mounting parts: 1.4404 (AISI 316L) Bellow: Silicone

**Ingress Protection:** Load cell: IP68 in accordance with IEC 60529: 1.5 m water column/10,000h. Weighing module: IP69K, according to DIN 40050: water under high pressure, steam cleaning

**Cable:** Robust, flexible, screened, Cable 4 + 0.35 mm²; Sheath: TPE thermoplastic elastomer; Diameter: 5 mm; Length: 5 m; Bending Radius: Fixed installation: >25 mm; Flexible installation: >75 mm

**Certificates of Conformity:** Ex Marking: II 1G EEx ia IIC T6, II 1D IP65 85°C

**Registration number:** PT02 ATEX 2059, TÜV 03 ATEX 2301x. **Usable for explosion hazard subgroups IIA, IIB and III.** IIC on request.

**Technical Data**

<table>
<thead>
<tr>
<th>Metrological</th>
<th>D1</th>
<th>C3</th>
<th>% E&lt;sub&gt;max&lt;/sub&gt;</th>
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<tbody>
<tr>
<td>Accuracy Class</td>
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<td>0.015</td>
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<tr>
<td>Minimum LC Verification</td>
<td>5,000</td>
<td>14,000</td>
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<tr>
<td>Deadload Output Return</td>
<td>1,000</td>
<td>3,000</td>
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<tr>
<td>Tolerance on Rated Output</td>
<td>&lt; 0.25</td>
<td>&lt; 0.07</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;</td>
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<tr>
<td>Repeatability Error</td>
<td>&lt; 0.01</td>
<td>&lt; 0.015</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;</td>
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<tr>
<td>Creep (30 Minute Duration)</td>
<td>&lt; 0.03</td>
<td>&lt; 0.01</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;</td>
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<tr>
<td>Linearity</td>
<td>&lt; 0.03</td>
<td>&lt; 0.01</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;</td>
</tr>
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<td>Hysteresis</td>
<td>&lt; 0.04</td>
<td>&lt; 0.015</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;</td>
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<tr>
<td>Temperature Effect on Smin</td>
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<td>&lt; 0.01</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;/10 K</td>
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<td>&lt; 0.01</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;/10 K</td>
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<tr>
<td>Ambient Pressure Impact</td>
<td>≤ 0.005</td>
<td>≤ 0.0025</td>
<td>% C&lt;sub&gt;n&lt;/sub&gt;/kPa</td>
</tr>
</tbody>
</table>

**Nominal Deflection:** < 0.5 mm

**Minimal Dead Load:** 0

**Usable Load:** 150% E<sub>max</sub>

**Destructive Load:** > 300% E<sub>max</sub>

**Zero Output Signal:** < 1.0 % C<sub>n</sub>

**Rated Output:** 2 mV/V

**Supply Voltage:** 4–24 V

**Ambient Temperature Range:** -40°–203°F

**Permissible Eccentricity:** 5 mm

**Vibration Resistance:** 20 g, 100 h, 10–150 Hz

**Mechanical**
- **Permissible Horizontal Force:** 7 kN; **Destructive force:** > 30 kN max.
- **Permissible Vertical Load:** 1.5 t max. without load cell
- **Permissible Lift-Off Force:** 8 kN max.
- **Permissible Load for Jack-Up:** 1.5 t max.
Sartorius Intec’s Maxxis 5 combines accuracy, connectivity and functionality to provide a flexible process controller for vessel weighing applications.

The freely programmable process controller, designed for applications as diverse as Phase, Batching, Filling, IBC, Counting and Truck Weighing. Extensive connectivity options and compatibility with all analog load cells and the digital Pendee® load cells as well as platform scales and many more weighing solutions.

Equipped with an internal web server, the Maxxis 5 can be controlled via any standard web browser, or a remote display with VNC capabilities. Additionally, a wide range of interface options, USB connections and an Ethernet Port ensure the Maxxis 5 is able to connect with any existing infrastructure.

Designed for harsh environments, the Maxxis 5 is made of high-quality stainless steel with a wide surface area and bright backlight display to ensure inputting and readout accuracies in the toughest conditions. Automatic back-ups save data to SD cards providing full transparency and traceability, while specifically tailored reports and service reports track overload and user changes and deliver this data direct to users.

Maxxis 5 BASIC Functionality

The Maxxis 5 with BASIC application is equipped with interchange and weighing functions. Communication to a host PC or PLC combines both weighing and terminal control into a single unit. Up to four separate scales can be connected to a Maxxis 5 process controller:

- Two analog scales can be connected using analog inputs
- Two additional scales can be connected via different interfaces
- Three configurable limits per scale with conditions and actions
- Configurable digital inputs and outputs for using weighing information for actions like refilling the scale
- Values and signals can be read from, and written to the Maxxis 5 BASIC controller via OPC, over Ethernet, or via ModbusTCP. A PLC can integrate with the controller via a fieldbus, analog or serial communication.

The TITO color graphics display shows weight values of up to seven digits with decimal points and plus or minus signs. The displayed weight is shown as a bar graph in relation to the maximum capacity, for easy recognition of the content.

- Available mass units are t, kg, g, mg, lb and oz
- Includes preset tare values for selected weighing procedures
- Three different levels of user security rights, so critical calibration and setup information is saved and protected

Check Weighing can be used for easy +|0|- control. The integrated bar graph will show a product’s weight in relation to pre-defined limits in yellow, green and red colors for easy readability.

The tilt correction allows for the minute adjustment of weighing information in line with other values, like the accurate adjustment of analog inputs. Tilt correction is not available in W&M approved applications.

The Maxxis 5 can be used as either an efficient remote terminal or as a remote controlled operation-dialog via a color display and a keypad. This means that messages can be displayed from a higher-level system, operation dialogs can be conducted, and texts or values can be edited.

Learn more at Lessan.com
SITRANS LC300 Capacitance Continuous Level Detector

Features
- Shear- and abrasion-resistant probe
- Accurate level measurement
- Two-wire loop-powered isolated 4-20 mA
- Integrated local display and push-button calibration
- Current signaling per NAMUR NE 43
- Patented Active Shield capacitance technology
- Adjustable range: level, damping and diagnostics
- Corrosion-resistant construction and wetted parts
- 82 ft. (25 m) maximum insertion length; Sanitary rod optional

Specifications
Media: Liquids, bulk solids, slurries with a 1.5 minimum dielectric constant
Range: 0-3300 pF; minimum span 3.3 pF
Measurement Frequency: 600 kHz maximum
Accuracy: <0.5% of actual measurement value
Temperature Stability: 0.25% of actual capacitance value
Nonlinearity/Reproducibility: <0.4%/full scale and actual value
Current Signaling: According to NAMUR NE 43, signal 3.8 to 20.5 mA, fault ≤3.6 or ≥21 mA
Output Current Loop: Continuous signal 4 to 20 mA/20 to 4 mA
Probe Diameter: Rod Version: 0.75” with or without PFA jacket; Rod/Cable: 0.24” without PFA jacket, 0.35” with
Probe Lengths: Rod: 14” to 40”; Cable/Rope: 20” to 985”
Active Shield Length: Rod: 3.94”, Cable/Cable: 4.92”
Maximum Tensile Force: 1900kg (4188lbs); Horizontal: 30Nm (rod version)
E.S.D Probe Protection (kV): Protected to 55kV continuous discharge
Wetted Parts: AISI 316L/PFA/PEEK™
User Interface: Display local LCD, 4 digits capable of displaying numbers 0 to 9 and limited alpha characters
Wiring Connections: Display local LCD, 4 digits capable of displaying numbers 0 to 9 and limited alpha characters
Process Connection: Threaded: 3/4” to 1” NPT; Flanges: 1” to 4” ANSI
Enclosure: Aluminum and epoxy coated construction; NEMA 4/Type 4/IP65; 2x 1/2”NPT cable inlets
Process Conditions: -14.6 to 511 PSIG; -40° to 185°F
Supply Voltage: 9-32 VDC any polarity, 2-wire loop (9V @ 22mA)

Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
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<tbody>
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<td>SITRANS LC300, rod version</td>
<td>7ML5670</td>
<td>$1020.00</td>
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<td>SITRANS LC300, PFA coated</td>
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<td>cable version</td>
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</table>

Ready to buy an LC300? Complete a Siemens capacitance level datasheet and include it with your order. Download from www.Lesman.com/datasheets/.
SITRANS LC500 Capacitance Continuous Level Detector

**Features**
- Two-wire analog 4-20/20-4 mA current loop output
- Measurement range of 3300 pF for high accuracy
- Rod probe versions to 5.5m (18 Ft), and cable probe versions to 35m (115 Ft)
- Patented spring package and cone construction in the process gland
- Smart transmitter with built-in HART® communications — Fully potted integral transmitter is impervious to condensation, dust, and vibration
- Integrated local display and optional handheld communicator for easy on-site or remote commissioning and inspection
- One-point calibration for setup without shutting down production
- Pre-detection without using a PLC, allowing for corrections and moderations of the process before the trip point
- Output time delay and damping function for clearly defined, reliable readings of turbulent processes, like fraction levels in distillation column trays
- Local and remote diagnostics comply with NAMUR NE 43, showing all the relevant variables at the same instant
- Integrated zener safety barrier for intrinsically safe conditions

**Specifications—Transmitter**
- Measurement range: 0 to 3300 pF with 3.3 pF minimum span
- Measurement frequency: 420 kHz @ Cx=0 pF
- Accuracy: ±0.1% actual value
- Safety: ESD protected to 55 kV; Current signaling according to NAMUR NE 43; Galvanically isolated inputs/outputs; Polarity-insensitive current loop; Fully potted; Integrated safety barrier
- Diagnostics: Primary variable (PV) out of limits; System failure measurement circuit; Deviation between A/D and D/A converter values; Check sum; Watchdog; Self-checking facility
- Outputs (current loop): Galvanically isolated 4-20/20-4 mA; two-state functionality 4-20 or 20-4 mA, on or off; Solid state switch 40VDC/28VAC /100 mA
- Supply power: max. 33 VDC (30 VDC for IS) min. 12 VDC @ 3.6 mA min. 9.5 VDC @ 22 mA
- Loop current: 3.6 to 22 mA / 22 to 3.6 mA (2-wire current loop)

**User interface:** 4-1/2 digit LCD; Integrated local display; Rotary switch; 16 menu items divided between two menu levels: 0 to 9, and A to F; Pushbuttons

**Communications:** HART® protocol; Profibus-PA (optional)

**Environmental:** Location: Indoor/outdoor; Altitude: 2000m (6562 Ft) max.; Ambient temperature: -40° to 185° F for standard and ATEX XP T5 to T1, -40° to 158° F for ATEX T6; Relative humidity: Suitable for outdoors (Type 4X/NEMA 4X/IP65 enclosure); Installation category: II; Pollution degree: 4

**Process conditions:** Temperature rating: -328° to 392° F standard, up to 752° F optional; Pressure rating: FV to 2920 psi standard, up to 7665 psi optional

**Approvals:** CE: Complies with requirements of ECC per EN 55011 and EN 61326; Dust-Ignition Proof: FM/CSA (CL. I, Div. 2, Grps. A–D T4/CL. II, III Div. 1 Grps. E–G T4); ATEX II 3 GD (Ex e IIC T6...T4); Intrinsically Safe: FM/CSA (CL. I, Div. 1, Groups A–D T4);ATEX II 1 G (Ex ia IIC T6...T4); Explosion-proof: FM/CSA/CL. I, Div.1, Groups A–D T4);ATEX II 1/2 GD (Ex d [ia] IIC T6...T1); Marine: Lloyd’s Register

**Standard Combinations of LC500 Probes**

<table>
<thead>
<tr>
<th>Features</th>
<th>Series S</th>
<th>Series D</th>
<th>Series SD</th>
<th>Series DD</th>
<th>Series HP</th>
<th>Interface</th>
<th>Sanitary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Connection</td>
<td>Threaded</td>
<td>Flanged</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Types</td>
<td>Tri-Clamp</td>
<td>Sanitary</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Process Connection Materials</td>
<td>Stainless Steel AISI 316L</td>
<td>Carbon Steel C22.8 N</td>
<td>Duplex Steel</td>
<td>Hastelloy</td>
<td>B2 or C22</td>
<td>Monel 400</td>
<td>Tantalum</td>
</tr>
<tr>
<td>Probe Insulations</td>
<td>PFA</td>
<td>PE2</td>
<td>Ceramic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length Parameters</td>
<td>Max Rod Length</td>
<td>1378&quot;</td>
<td>2900 PSI</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Cable Length</td>
<td>1378&quot;</td>
<td>2175 PSI</td>
<td>73 PSI</td>
<td>145 PSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Pressure</td>
<td>2175 PSI</td>
<td>392 F</td>
<td>212 F</td>
<td>392 F</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Temperature</td>
<td>2175 PSI</td>
<td>392 F</td>
<td>212 F</td>
<td>392 F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SITRANS LC500 Capacitance Continuous Level Detector**

1 Flange made of AISI-316L SS with a 0.19" welded Hastelloy plate. 2 For general purpose applications only. 3 Depends on range.
Inventory Control by Servo Gauging

Safety, reliability, and efficiency are universal concerns in the world of tank and intermediate storage. As prices and performance demands increase, the concept of total cost of ownership grows in importance. Honeywell Enraf servo tank gauges offer optimized operations, enhanced safety, and a high degree of accuracy and reliability.

Honeywell Enraf servo systems deliver optimized measurement performance in any environment. Characteristic features are robust design and modular construction which let you add precisely those functionalities that your specific operating environment demands.

All Honeywell Enraf instruments and systems combine the latest technology with decades of experience reflected in user-friendly programmability for fast and simple startup.

Industry Approvals

Honeywell Enraf systems are approved worldwide by national weights and measures authorities and by customs and excise services. Honeywell Enraf servo tank gauging systems have set the standard for officially certified automatic tank gauging systems such as those approved by the American Petroleum Institute and International Standardization Organization for the installation and operation of automatic tank gauging systems, and the International Organization of Legal Metrology and the Netherlands Metrology Institute for the performance requirements relating to those systems.

Honeywell Enraf tank gauging systems receive type approval in conformity with national legislation and in accordance with the OIML recommendations. The automatic gauging systems and their accuracy are tested both before and after installation to ensure reliability, reproducibility, sensitivity and integrity of the instruments.

These instruments easily exceed the requirements for overfill protection equipment and therefore are approved to be used in any kind of safety system.

Reliable Measurement Principle

Honeywell Enraf servo tank gauging systems are based on a proven measurement concept. Level measurement is performed by a displacer, a strong and flexible measuring wire, a measuring drum, force transducer and servo motor.

The weight of the displacer ensures that the wire is constantly tensioned, even on turbulent liquid surfaces, avoiding measurement errors caused by displacer drift.

The level measurement is performed by lowering the displacer on the measurement wire down into the liquid. It will be partly immersed because the displacer has a greater density than the liquid. In accordance with Archimedes' principle, the weight of the displacer will diminish by the weight of displaced product. The weight of the displacer less the weight of displaced product — the apparent weight — then serves as unit of measurement to determine the displacer position, and measure the level of the liquid.

A highly accurate and advanced force transducer continuously measures the apparent weight of the displacer. That apparent weight can be simply programmed by software settings. In the equilibrium state, the weight of the partly immersed displacer will be in balance with the programmed weight as measured by the force transducer.

When the storage tank is emptied, as the liquid level starts to fall, the upward force on the displacer will decrease. The force transducer will actuate the servo controller so the measuring drum unwinds, allowing the displacer to descend until it again becomes partly immersed in the liquid and its apparent weight corresponds to the programmed weight.

Measuring Interface Levels

Besides measuring the liquid level, Honeywell Enraf’s 854 XTG and 854 ATG gauges can also be used for measuring the interface level between two liquids. For this purpose, the servo motor, actuated by an interface command, lowers the displacer to the point where its apparent weight corresponds to the programmed interface setpoint of the second liquid. This functionality is particularly useful to determine the sediment level or the interface level between water and tank liquid or between two liquids.

Intelligent Software

Honeywell Enraf servogauges are fully microprocessor controlled tank level gauges. All instrument functions are driven by means of intelligent software, which filters out possible imperfections thereby optimizing measurement accuracy.

In addition, the software compensates for hydrostatic deformation of the tank. This method, without a standpipe, ensures an extremely high degree of accuracy.

Simple Installation and Fast Startup

Honeywell Enraf servo gauging systems are designed for easy installation. Electrical cabling and mechanical installation are quick and simple to perform. The systems are attached by a 2” mounting flange.

In order to simplify the startup, calibration and servicing procedures as much as possible, the portable Honeywell Enraf terminal can be interfaced with an optical infrared port. This device enables these jobs to be performed quickly, while bypassing the central system.
## Comparing Honeywell Enraf Servo Gauges

<table>
<thead>
<tr>
<th>Description</th>
<th>Servo Gauge 854 ATG</th>
<th>Servo gauge 854 XTG</th>
</tr>
</thead>
<tbody>
<tr>
<td>As tank gauging has evolved, the series 854 ATG servo level gauge has become an industrial standard all over the world. Very reliable, versatile and accurate automatic tank gauge with a minimum of moving parts, meeting all international standards, regulations and recommendations.</td>
<td>Honeywell Enraf offers the 854XTGH servo gauge as a superior alternative to mechanical float and tape gauges or other low-cost level measuring devices. The 854XTG servo gauge offers the proven accuracies and performances of the 854 ATG, without the local display.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measuring Range</th>
<th>Standard: 0–88 ft (0–27 m); Optional: 0–121 ft (37 m), 0–115 ft (0-35 m) with measuring wire up to 492 ft (150 m)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Level: ±0.016&quot; (4 mm)</th>
<th>Level: ±0.04&quot; (1 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density:</td>
<td>± 0.19 Lb/ft³ (3 Kg/m³)</td>
<td>Density: ± 0.31 Lb/ft³ (5 Kg/m³)</td>
</tr>
<tr>
<td>Interface:</td>
<td>±0.08&quot; (2 mm)</td>
<td>Interface: ±0.08&quot; (2 mm)</td>
</tr>
<tr>
<td>Temperature:</td>
<td>±0.18° F (0.1° C)</td>
<td>Temperature: ±0.18° F (0.1° C)</td>
</tr>
<tr>
<td>Sensitivity/Repeatability:</td>
<td>±0.004&quot; (0.1 mm)</td>
<td>Sensitivity/Repeatability: ±0.004&quot; (0.1 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wave Integration</th>
<th>Programmable, three setpoints, between 0.5 s and 10 s</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Operating Pressure</th>
<th>M/C versions: Up to 90 PSI (6 bar)</th>
<th>Up to 90 PSI (6 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H version: Up to 600 PSI (40 bar) in accordance to PED</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient Temperature</th>
<th>-40° to 149° F (-40° to 65° C)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Protection Class</th>
<th>NEMA 4/IP65 according to EN 60529</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Safety Rating</th>
<th>FM: Class I, Div 1, Groups B-D in accordance to ANSI/NFPA 70</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX: II 1/2 G EEx d IIB T6, EEx de IIB T6, EEx d [ia/ib] IIB T6 or EEx de [ia/ib] IIB T6</td>
<td></td>
</tr>
<tr>
<td>FM: Class I, Div 1, Groups B-D in accordance to ANSI/NFPA 70</td>
<td></td>
</tr>
<tr>
<td>ATEX: II 1/2 G EEx d IIB T6, or EEx d [ia/ib] IIB T6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials</th>
<th>Housing: Chromatized-finish cast aluminum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum Compartment:</td>
<td>M Version: Cast aluminum; C/H Versions: Stainless steel</td>
</tr>
<tr>
<td>O-Rings:</td>
<td>Drum cover Silicone FEP or NBR 70</td>
</tr>
<tr>
<td>Housing: Chromatized-finish cast aluminum</td>
<td></td>
</tr>
<tr>
<td>Measuring Drum/Shaft: Stainless steel</td>
<td></td>
</tr>
<tr>
<td>O-Rings:</td>
<td>Drum cover Silicone FEP or NBR 70</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>110/130/220 V (+10% to -20%) and 230 V (±15%), optional 65 V (+10% to -20%), also suitable for 240 V (+10% to -20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Variation:</td>
<td>50/60 Hz (+10%); Power Ratings: 25 VA, Imax=2A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications</th>
<th>Infrared transmission to portable Enraf terminal (PET), serial, ASCII coded, Bio-Phase Mark (BPM) modulated; Standard Enraf fieldbus (GPU) protocol; Two-wire twisted pair cabling, &gt;1500V isolating voltage; Lightning protection via isolating transformers; &gt;150 dB common mode rejection</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Two SPDT 3-Amp alarm relay outputs; Density measurement; 4-20 mA level output (accuracy to ±0.1% full scale); Input boards for spot RTD, VITO probes for average temperature and/or water measurement, HART® devices (e.g., transmitters); Modbus RS-232 or RS-485 data transmission</th>
</tr>
</thead>
</table>

To order a Honeywell Enraf servo gauging system, fill out the application datasheet from www.Lesman.com/datasheets/ and send it to Lesman for engineering review.
SmartRadar FlexLine for Precision Tank Gauging

The ever increasing requirements on tank gauging systems are placing a premium on flexibility, expandability and quality. Quick installation, seamless communication, reliable measuring under all conditions, trouble-free service and operation are concepts that are now being taken for granted. But how often does one tank level measuring system satisfy these requirements effectively and combine security, reliability and unprecedented levels of accuracy?

Honeywell Enraf’s SmartRadar FlexLine tank gauging system successfully addresses all these requirements and guarantees cost control, smooth operation, environmental management and security.

SmartRadar FlexLine is a complete set of products and accessories for tank gauging that use cutting-edge radar and state-of-the-art signal processing technologies. Advanced digital signal processing technology, optimum connectivity and compact planar antennae make the SmartRadar FlexLine series the ultimate measuring system for tank gauging and custody transfer applications. It’s an ideal solution for stock management and administration, customs transfer, quality control, processing and operation.

The SmartRadar FlexLine measuring system is airtight, and the integrated display is intrinsically safe. All basic functions are instantly available through the flip-top display. The display can show basic parameters and 24-hour trends. In addition to the standard display, an extra display can easily be connected to the SmartRadar FlexLine.

SmartRadar FlexLine tank gauging systems come in three versions:
- FlexLine XP for the strictest custody transfer requirements
- FlexLine HP for standard custody transfer
- FlexLine AP for transit and intermediate storage tanks

Complete digital signal processing technology

The SmartRadar FlexLine measuring system uses digital signal processing technology that eliminates the need for regular verification and calibration required by analog components.

Digital signal processing ensures that the highest levels of measuring quality and accuracy are attained from the date of installation, and maintained over long periods even under extreme conditions.

SmartRadar FlexLine’s digital signal processing technology also offers advanced diagnostics, including storage of vital component trend information. Diagnostics take place at parameter level, and the electronics are continually monitored at component level. The diagnostic monitoring functions support a proactive maintenance strategy and contribute to a further simplification of remote service.

Enhanced signal processing capabilities

Honeywell Enraf’s latest Enhanced Performance Signal (EPS) Processing makes it possible, even under the most difficult circumstances, to measure the level with extreme precision.

Enhanced functions include correction of the amplification factor, automatic amplification monitoring, zone-identification and ullage-correction. So, not only can the FlexLine be installed close to the tank wall, but objects and other elements that cause disturbances (like sealants) do not influence signal processing quality. Even a deviation in the diameter of the still-pipe length or clogging is compensated by EPS technology.

Maximizing tank measurement area

Traditional tank gauging systems require a minimum innage of 30 to 50 cm (12” to 20”) for accurate measurement. The SmartRadar FlexLine possesses an accuracy down to levels of just 10 cm (4”). This high degree of accuracy also applies to measuring level in close proximity to the radar antenna. Traditional systems require ullage of 0.5 to 1 m (20” to 40”), SmartRadar FlexLine requires only 30 cm (12”).

Open Communication

SmartRadar FlexLine systems are equipped with a broad set of communications protocols, including Honeywell Enraf’s field-proven Bi-Phase Mark (BPM) communications, the de facto standard for field communication in tank terminals.

A comprehensive array of input/output (I/O) options also includes SPDT alarm outputs. Field equipment, like pressure transmitters, HART® instrumentation and VITO probes for temperature or spot measuring can be easily connected to the SmartRadar FlexLine.

Antennae for every field of application

In order to satisfy every application, the SmartRadar FlexLine series offers a wide range of antennae including traditional horn and rod antennae and flat or planar antennae for long term stability and excellent measuring performances.

The practical advantages of these multi-feeder antennae are their small size, the perfect control of the microwave indicator and the measurement of the antenna contamination. The ability to automatically recognize
Honeywell Enraf

Three SmartRadar FlexLine Models to Fit Your Application

**SmartRadar FlexLine XP**: Weights and Measures-Approved for Custody Transfer

With an accuracy of ±0.4 mm (±0.016"), the FlexLine Xtreme Performance is the top of the range. FlexLine XL complies with all essential standards for tank level measurements, including API, ISO, OIML and NMi. The XL tank gauging system, with a measuring range up to 75 m (246 ft), lends itself to Weights-and-Measures regulated customs transfer.

**SmartRadar FlexLine HP**: API-Compliant for Custody Transfer

SmartRadar FlexLine High Performance offers all the necessary functions for tank gauging in large bulk storage tanks. The accuracy of ±1 mm (±0.04") makes the FlexLine HP ideal for custody transfer. It has a measuring range of 75 m (246 ft) and satisfies all essential standards for tank level measuring, including API, ISO, and IML.

**SmartRadar FlexLine AP**: API-Compliant for Intermediate Storage

With an accuracy of ±3 mm (±0.12"), the SmartRadar FlexLine Advanced Performance is the right choice for transit and shipment tanks. The AP system satisfies OIML R85 and API’s recommended practices. Depending on the antenna type, the measuring range of the FlexLine AP is 75 m (246 ft).

Condensed Specifications

- **Measuring Range**: Up to 75 m (246 ft); Resolution: 0.1 mm (0.001 ft)
- **Accuracy**: FlexLine XP: ±0.4 mm (±0.016"); FlexLine HP: ±1 mm (±0.04"); FlexLine AP: ±3 mm (±0.12")
- **Measuring Method**: FMCW Synthesized Pulse Reflectometer, X-band (9.538 GHz) R&TTE FCC compliant
- **Ambient Temperature**: -40° to 149° F (-40° to 65° C)
- **Safety Approvals**: ATEX, CD, IECEx, OIML, CB Scheme, FM, CSA, FCC, API, NMi, TÜV certified Overfill Protection
- **Explosion Proof**: FM/CSA: Class I, Div 1, Groups C–D according to ANSI/ NFPA 70; ATEX: II 1/2 G Ex d IIB T6 or Ex d II 1G Ex de IIB T6 or Ex de [ia] IIB T6 or Ex de II 1G Ex de [ia] IIB T6; IEC: EX ZONE 0/1, Ex d IIB T6 or Ex d [ia] IIB T6 or Ex de IIB T6 or Ex de [ia] IIB T6
- **Materials**: IP66/IP67, NEMA 4X hard anodized aluminum alloy housing, NBR 70 O-rings and 3/4" NPT cable entries
- **Power Supply**: Autoselect 65–240 VAC (+10% to -15%)
- **Expansion Modules**: Five module slots available.
- **Power Consumption**: max typical (23W with options)
- ** Expanded Description**: Interfaces for VITO temperature/water sensor, HART calculation, and SPDT alarm contact outputs
- **To order a Honeywell Enraf precision tank gauging system, fill out the application datasheet from www.Lesman.com/datasheets/ and send it to Lesman for engineering review.°C

antenna contamination is essential toward trusting the maximum reliability of the measuring equipment at all times.

The antennae are further enhanced by the absence of mechanical alignment equipment, standard on parabola or horn antennae. The result is a reflection signal that ensures a higher degree of accuracy.

Planar antennae can be used on tanks for level measuring free space or measuring on still pipes. A special hinged antenna allows assembly through a 6" opening, so you can measure close to the tank wall without losing reliability and accuracy. Honeywell Enraf’s tank separator enables easy installation of all antennae.

SmartRadar components and accessories also include antennae for applications in open spaces, still pipes and in areas of high pressure and high temperatures.

**Antenna Types**

- **Free space antennae**: Planar free space antennae can be mounted on a roof nozzle or manhole for most applications.
- **Still pipe antennae**: For stilling well applications. Performs reliably, even on rusty and contaminated stilling wells. No cone adapters needed.
- **Free space wide array linear planar (WALP) antennae**: For applications where the antenna position is close to the tank shell. The hinged construction of the T06 enables mounting through a standard 6" nozzle.
  - **Measuring Range**: 131 feet (40 m)
  - **Temperature Range**: -60° to 212° F (-40° to 100° C)
  - **Operating Pressure**: To 87 PSI (6 Bar)
  - **Wetted Parts**: AISI 316 stainless steel and FEP
- **High temperature antennae**: For free space applications at high temperatures and aggressive chemical elements.
  - **Measuring Range**: 59 feet (18 m)
  - **Temperature Range**: -40° to 446° F (-40° to 230° C)
  - **Operating Pressure**: To 87 PSI (6 Bar)
  - **Wetted Parts**: AISI 316 stainless steel, and reinforced TFM
- **High pressure cone antennae**: For use in spheres and bullet tanks at high pressures. The reference pin function allows safe verification without opening the tank. The tank separation provides an approved and safe process seal. A 1" or 4" optional full bore ball valve can also be included.
  - **Measuring Range**: 131 feet (40 m)
  - **Temperature Range**: -330° to 482° F (-200° to 250° C)
  - **Operating Pressure**: To 580 PSI (40 Bar)
  - **Wetted Parts**: AISI 316 stainless steel, PTFE, and CF8M for optional ball valve

**Explosion Protection**: ATEX, CD, IECEx, OIML, CB Scheme, FM, CSA, FCC, API, NMi, TÜV certified Overfill Protection

**Materials**: IP66/IP67, NEMA 4X hard anodized aluminum alloy housing, NBR 70 O-rings and 3/4" NPT cable entries

**Power Supply**: Autoselect 65–240 VAC (+10% to -15%) 50/60 Hz, or 24–65 VDC (+10% to -15%), Rated 15W max typical (23W with options)

**Expansion Modules**: Five module slots available. Interfaces for VITO temperature/water sensor, HART communications, HART communications with density calculation, and SPDT alarm contact outputs

To order a Honeywell Enraf precision tank gauging system, fill out the application datasheet from www.Lesman.com/datasheets/ and send it to Lesman for engineering review.
Honeywell Enraf SmartRadar for Storage Tank Measurement

### SmartRadar 970 ATi
High precision radar for custody transfer tank level gauging under Weights and Measures regulations

- **Accuracy:** ±0.016“ (±0.4 mm)
- **Signal Processing:** Advanced digital signal processing (ADSP)
- **Output:** Modbus or GPU via RS-232C or RS-485, 4-20 mA with HART®, (analog signal accuracy 0.1% full scale), Foundation Fieldbus
- **Input:** VITO probes for average temperature, HART devices (e.g., pressure transmitters)
- **Range:** 0-131 ft (0-40 m)
- **Resolution:** 0.004“ (0.1 mm)

### SmartRadar 971 LTi
Advanced radar for tank level gauging with custody transfer accuracy

- **Accuracy:** ±0.04“ (±1 mm)
- **Signal Processing:** Advanced digital signal processing (ADSP)
- **Output:** Standard Modbus via RS-232C or RS-485, 4-20 mA with HART, (accuracy of analog level signal 0.1% full scale)
- **Input:** VITO probes for average temperature or water bottom measurement, HART devices
- **Range:** —

### SmartRadar 973 LT
For radar tank gauging in intermediate liquid storage applications

- **Accuracy:** ±0.12“ (±3 mm)
- **Signal Processing:** Digital signal processing (DSP)
- **Output:** RS-232C or RS-485 for indoor use or radio modem connection, 4-20 mA with HART, (analog signal accuracy 0.1% full scale)
- **Input:** —
- **Range:** —

---

**Compatible Antenna Types**

- **Planar free space antenna:** Can be mounted on a roof nozzle or manhole for most applications.
- **Still pipe antenae:** For stilling well applications. Performs reliably, even on rusty and contaminated stilling wells. No cone adapters needed.
- **Free space wide array linear planar (WALP) antenna:** For applications where the antenna position is close to the tank shell. The hinged construction of the T06 enables mounting through a standard 6” nozzle.

- **Measuring Range:** 131 feet (40 m)
- **Temperature Range:** -40° to 212° F (-40° to 100° C)
- **Operating Pressure:** To 87 PSI (6 Bar)
- **Wetted Parts:** AISI 316 stainless steel and FEP

- **High temperature antenna:** For free space applications at high temperatures and aggressive chemical elements.

- **Measuring Range:** 59 feet (18 m)
- **Temperature Range:** -40° to 446° F (-40° to 230° C)
- **Operating Pressure:** To 87 PSI (6 Bar)
- **Wetted Parts:** AISI 316 stainless steel, reinforced TFM

- **High pressure cone antenna:** For use in spheres and bullet tanks at high pressures. The reference pin function allows safe verification without opening the tank. The tank separation provides an approved and safe process seal. A 1” or 4” optional full bore ball valve can also be included.

- **Measuring Range:** 131 feet (40 m)
- **Temperature Range:** -330° to 482° F (-200° to 250° C)
- **Operating Pressure:** To 580 PSI (40 Bar)
- **Wetted Parts:** AISI 316 stainless steel, PTFE, and CF8M for optional ball valve

---

To order a Honeywell Enraf tank gauging system, fill out the application datasheet from www.Lesman.com/datasheets/ and send it to Lesman for engineering review.
Stop Nuisance Switching

Liquids sloshing around can cause a float to bob up and down rapidly, if the liquid surface is in contact with the float. This creates nuisance switching, an off/on condition that wears on your patience and your reed switch. A slosh shield creates a pocket of calm liquid, so the switch can operate as designed.

**Construction:** Wetted materials: Stainless steel, beryllium copper, nickel, Buna-N. Slosh shield: Lucite

**Environment:**
- **Operating temperature:** -40° to 140° F
- **Liquid specific gravity:** 0.55 min.
- **Pressure:** 150 PSI max.

**Switch:** SPST, 20 VA

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**Chemical-Resistant Level Switch**

- Ideal for tanks with inaccessible tops or bottoms
- Normally open or normally closed switch contact
- Polypropylene housing with NEMA 6 protection rating provides great chemical resistance
- Maintenance-free, easy to install

**Specifications**
- **Maximum Operating Conditions:**
  - **Temperature:** 175° F
  - **Pressure:** 145 PSIG
  - **Fluid Density:** 0.6 g/ml
- **Materials:** Float, housing: Polypropylene; Fittings: 1/2" NPT or bulkhead; Orientation: Horizontal ±30°; Cable: 3 ft. PVC, AWG 20/2
- **Reed Switch:** Gas encapsulated; Normally open or normally closed operation; Voltage: 250 VAC max.; Current: 1.5A max.; Power: 50 watts max.

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Material</th>
<th>Maximum Pressure</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene</td>
<td>30 PSIG</td>
<td>NSP-5101</td>
<td>$243.00</td>
</tr>
<tr>
<td>Teflon</td>
<td>15 PSIG</td>
<td>NTP-6101</td>
<td>888.00</td>
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<tr>
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</tbody>
</table>

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**Heavy Duty Float Switch**

- **Temperatures to 480° F, Pressures to 360 PSIG**
- **High capacity 10 Amp switch**
- **All 316 stainless steel wetted parts**
- **All-metal design ideal for harsh environments**

**Specifications**
- **Operating Conditions:**
  - **Media temperature:** 480° F
  - **Pressure:** 360 PSIG max

**Process Medium:** Specific gravity 0.7 minimum

**Construction:** NEMA 4/IP65 epoxy-coated aluminum housing, 316SS wetted materials with square flange or 2" NPT fitting; optional 1/2" NPT conduit

**Switch:** SPDT microswitch, 10 Amp @ 250 VAC, 0.6 Amp @ 220 VDC, 3/4" switch hysteresis

---

**Tethered Float Switches for Liquid Level**

- For all liquid types
- SPDT mercury switch
- Polyethylene, Teflon, or 316 Ti stainless steel float
- Temperatures to 320° F, Pressures to 30 PSIG

**Need a float switch in polypropylene? Call us.**

**Model Selection Guide**

<table>
<thead>
<tr>
<th>Material</th>
<th>Maximum Pressure</th>
<th>Catalog Number</th>
<th>Price</th>
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<tbody>
<tr>
<td>Polyethylene</td>
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<td>316 SS</td>
<td>220 PSIG</td>
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</tr>
</tbody>
</table>

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**Microwave Level Switch**

- **Good to 212° F (to 302° F for 30 minutes for CIP applications)**
- **EHEDG approved for use in food applications**
- **For conductive and non-conductive media**
- **Level measurement, even with foam or deposits**

**Specifications**
- **Operating Conditions:**
  - **Process temperature:** 32° to 212° F (302° F for 30 minutes for Clean-in-Place use)
  - **Ambient temperature:** 150° F max.
  - **Working pressure:** 145 PSI

**Construction:** Stainless steel head and thread supports, PEEK coupler, hygienic weld-in sleeves, IP67 protection rating

**Connections:**
- Process: G1/2, M12x1.5; Cable: M16x15 threaded connection
- Output: Open collector, PNP, 50 mA

**Power Supply:**
- 18-36 VDC, <50 mA without load

**Dielectric Constant:** >20

---

**Call Lesman for pricing and delivery.**
**SITRANS LPS200 Rotary Paddle Switch for Bulk Solids**

Siemens SITRANS LPS200 rotary paddle switch detects full, empty, or demand conditions on materials like grain, feed, cement, plastic granulate, and wood chips. The LPS paddle switch can handle bulk densities as low as 100 g/l with the standard measuring vane, or 35 g/l with the hinged vane.

A low revolution geared motor with slip clutch drives a rotating vane that senses the presence of material at the LPS mounted level. As material comes into contact with the rotating paddle, rotation stops, which changes the microswitch state. When the paddle is no longer covered, rotation resumes and the relay reverts to its normal condition.

The LPS200 comes in a variety of configurations, including compact, extended, and cable extension. The LPS200 standard vane is effective in most applications, or it can be configured with a hinged vane for increased sensitivity for light materials.

**Specifications**

- **Temperature**: -4°F to 176°F (-20°C to 80°C); Optional: -4°F to 662°F (-20°C to 350°C)
- **Pressure**: 7 PSI (0.5 bar) max.; Optional: 145 PSI (10 bar)
- **Minimum Material Density**: Standard Vane: Down to 100 g/l; Hinged Vane: Down to 15 g/l; (depends on shaft/vane coverage)
- **Power**: Jumper selectable; 115 VAC, 1 Rev/Min; Switch Selectable, 1 Rev/Min; Switch Selectable, 5 Rev/Min
- **Alarm Output**: Relay 5A at 250 VAC, noninductive
- **Material**: Enclosure: Epoxy coated aluminum, Type 4/NEMA 4/IP65; Process connection: 1-1/4” NPT, stainless steel; Conduit entry: 2 x 1/2” NPT, 7.25 PSI max pressure
- **Dimensions**: Length 1000, 900, 800, 700, and 600 mm; 500, 400, and 300 mm
- **Agency Approvals**: CSA/FM General Purpose approval

**How It Works:**

- Motorized paddle rotates in free air
- Material contact stops rotation
- Transferred torque activates switch
- Clutch avoids gear failure/replacement

**Accessories**

- **Description**: SITRANS LPS200 Instruction Manual
  - **Catalog Number**: 7ML1998-5FS62
  - **Price**: $41.00
- **Description**: Replacement Vane, Boot Shape, 35 x 106 mm
  - **Catalog Number**: 7ML1830-1KH
  - **Price**: $37.00
- **Description**: Hinged Vane, 65 x 210 mm
  - **Catalog Number**: 7ML1830-1KJ
  - **Price**: $76.00
- **Description**: Rigid Extension Kit: Spring coupling, rigid tube extension, and required pins.
  - **Catalog Number**:
    - **Length**: 500, 400, and 300 mm
      - **Catalog Number**: 7ML5711-0AA
      - **Price**: $50.00
    - **Length**: 500, 400, and 300 mm
      - **Catalog Number**: 7ML5711-1AA
      - **Price**: $76.00
    - **Length**: 500, 400, and 300 mm
      - **Catalog Number**: 7ML5711-2AA
      - **Price**: $127.00

**Model Selection Guide**

**Description**

- **Process Temperature**
  - Up to 176°F (80°C)
  - Up to 302°F (150°C)
  - Up to 482°F (250°C)
  - Up to 662°F (350°C)

- **Power**
  - 115 VAC, 1 Rev/Min
  - Switch Selectable, 1 Rev/Min
  - Switch Selectable, 5 Rev/Min
  - Connection: Aluminum, 303 Stainless Steel
  - Extension Length: 3.94” (100 mm) with Boot-Shaped Vane
  - Agency Approvals: CSA/FM Dust Ignition Proof

- **Catalog Number**
  - 7ML5725-1
  - 7ML5725-2
  - 7ML5725-3
  - 7ML5725-4
  - 7ML5725-5

- **Price**
  - $377.00
  - $541.00
  - $635.00
  - $758.00
  - $83.00
  - $96.00

**Quick Ship Models**

- **Compact LPS200**, aluminum, 115 VAC power, 1 rev/min, 1.25” NPT thread, 7.25 PSI max pressure, 3.94” extension, 1.38” x 4.17” boot shaped vane, CSA/FM General Approval  
  - **Catalog Number**: 7ML5725-5EE11-2AC0  
  - **Price**: $298.00

- **Compact LPS200**, stainless steel, switch-selectable power, 1 rev/min, 1.25” NPT thread, 7.25 PSI max pressure, 5.91” extension, 1.38” x 4.17” boot shaped vane, CSA/FM Dust Ignition Proof Approval  
  - **Catalog Number**: 7ML5725-6JZ2AE12-2AA0  
  - **Price**: $446.00

- **Extended design LPS200**, 303 stainless steel, switch-selectable power, 1 rev/min, 1.25” NPT thread, 7.25 PSI max pressure, 8.77” extension, 1.38” x 4.17” boot shaped vane, CSA/FM Dust Ignition Proof Approval  
  - **Catalog Number**: 7ML5726-5EZ2AC12-2BA1  
  - **Price**: $482.00
SITRANS LVS200 Vibrating Fork Switch for Bulk Solids

The SITRANS LVS200 is an electromechanical vibratory switch for level detection of powder and granular solids.

The SITRANS LVS200 is an excellent solution for low bulk density, low humidity/adhesion, and free flowing applications. This unit is ideal for new installations or for replacing:

- Diaphragm-based switches subject to rupture
- Problematic rotating paddle switches
- Electrostatic discharge sensitive switches
- Material dielectric sensitive switches
- Switches that require special application configuration

The standard LVS200 detects high or low levels of dry bulk solids in bins, silos, or hoppers. The liquid/solid interface version can also detect settled solids within liquids or solids in confined spaces, like feed pipes. It is designed to ignore liquids in order to detect the interface between a solid and a liquid. A pipe extension version is available with either the standard or liquid/solid interface electronics and fork, separated by a customer-supplied 1” pipe.

The LVS has a compact design, and can be top- or side-mounted. The vibrating fork design ensures the lines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings.

Specifications

- **Material Density:** 20 g/l (1.3 lb/ft³) min.; Liquid/Solid interface version: 60 g/l (3 lb/ft³)
- **Process Temperature:** -40° to 320° F (-40° to 150° C); CSA Class II, Group G: -40° to 284° F (-40° to 140° C), CSA temperature code T3B
- **Pressure:** 145 PSI maximum
- **Sensitivity:** High or low, switch selectable
- **Measuring Frequency:** 125 Hz; Liquid/Solid interface version: 350 Hz
- **Power:** 19-230 VAC, ±10%, 50-60 Hz, 8 VA or 19-55 VDC, ±10%, 1.5 W
- **Alarm Output:** Relay delay: Approx. 1 second from loss of vibration; Approx. 1 to 2 seconds from resumption of vibration; Relay failsafe: High or low, switch selectable; Relay 8A at 250 VAC, noninductive
- **Material:** Enclosure: Epoxy coated aluminum, NEMA 4/Type 4/IP65; Process connection: 1.5” NPT; Sensor: Stainless steel; Conduit entry: 1/2” NPT
- **Approvals:** FM/CSA Class II, Div. 1, Groups E-G; Class III; ATEX II 1/2 D (Dust Explosion Proof); CE

- **High resistance to mechanical forces**
- **Suitable for low density materials: standard version 20 g/l (1.3 PCF), liquids/solids interface version 60 g/l (3 PCF)**
- **Extension lengths to 4000 mm (157”)**
- **Low frequency, low energy operation**
- **Best self-cleaning properties**
- **Won't burrow into the material**
- **High or low level alarm in solids — Simple failsafe high/low selection**

Vibrating Fork Technology

As soon as you apply power, the LVS200 forks vibrate. The forks are very active and sensitive at the tip — not at the base — to help resist detecting material buildup between the forks.

A dual crystal pack is directly coupled to the vibrating legs to generate high amplitude, low frequency (125 Hz) vibration, providing optimum self-cleaning characteristics during operation.

A third passive crystal senses the fork vibration. Relays activate when fork vibration is damped by material contact, and the resulting signal falls below the sensitivity threshold.

The forks vibrate at a high amplitude, but with low energy. This ensures reliable detection of even the lightest material, and avoids the tendency to burrow and lose contact.

Factory sensitivity setting fits most applications, especially for light materials. For higher density materials, operating sensitivity can be switched lower to avoid some material adhesion.

Ordering Instructions

Make one selection from each table section below. Check the availability column to be sure the unit you need is available. A finished catalog number looks like this: 7ML5731-7AB11-1AA0

Model Selection Guide

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Basic LVS200, 19-230 VAC/19-55 VDC, one relay output (SPDT)</td>
<td>7ML5731-1</td>
<td>$534.00</td>
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<tr>
<td>19-230 VAC, 19-55 VDC, two relay outputs (DPDT)</td>
<td>7ML5731-2</td>
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<td>Connection</td>
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<tr>
<td>Process</td>
<td>Connection</td>
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<td>3&quot; ASME Flange 150 Lb</td>
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<td>7ML1830-1JS</td>
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Note 1: For extensions other than 230 mm standard length (Code 31), add the following to your model number: Y01: Insertion Length ______ mm

Ordering Instructions

Make one selection from each table section below. Check the availability column to be sure the unit you need is available. A finished catalog number looks like this: 7ML5731-7AB11-1AA0

Model Selection Guide

Please submit orders to: Siemens Industry Inc, c/o Lesman Instrument Company.

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<td>$305.00</td>
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<tr>
<td>2&quot; NPT Sliding Sleeve</td>
<td>7ML1830-1JS</td>
<td>295.00</td>
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</tbody>
</table>

Note 1: For extensions other than 230 mm standard length (Code 31), add the following to your model number: Y01: Insertion Length ______ mm

Call for remote enclosure and cable lengths to 4000 mm.
Pointek ULS200: Ultrasonic Point Level Detection Sensor

Features
- Non-contacting point level detection for bulk solids (0.8 to 9.8 ft.), liquids and slurries (0.8 to 16.4 ft.)
- Type 6, NEMA 6/IP67 polycarbonate or aluminum enclosure
- Built-in temperature compensation
- Two-button setup, simple cable-entry wiring, and a self-cleaning sensor
- AC or DC power supply
- Sanitary version available, with an industry standard flange

Specifications
- Detection Range: Liquids: 0.8 to 16.4 ft. Solids: 0.8 to 9.8 ft.
- Operating Modes: High, low, high-high, high-low, low-low level indication
- Repeatability: 0.25% of full range
- Resolution: 0.1”
- Echo Processing: Patented Sonic Intelligence® software
- Memory: Nonvolatile EEPROM
- Operating Pressure: 30 PSI
- Beam Angle: 10° at 3db boundary
- Ambient/Process Temperature: -40° to 140° F.
- Outputs: AC Version: Two Form C SPDT contacts, rated 5A at 250 VAC noninductive, DC Version: Two nonpolarized transistor switches rated 48 VDC, 100 mA max. or two Form C SPDT contacts, rated 5A at 48 VDC
- LCD Display: Displays three 0.35”digits for programming distance between sensor face and material. Multi-segment graphic for operation status.
- Programming: Two keys
- Power Supply: 18 to 30 VDC, 3W max. or 100 to 230 VAC max.
- Terminal Block Wiring: 14 gauge solid/16 gauge stranded max.
- Cable Entry (2 connections): Polycarbonate enclosure: PG 13.5 or 1/2" NPT. Aluminum enclosure: 1/2" NPT or PG 13.5
- Sensor Mounting: Threaded: 2” NPT, 2” BSP or PF2.
- Sensor: ETFE or PVDF
- Environmental: Location: Indoor/outdoor; Altitude: 6562 ft. max.; Installation category: II; Pollution degree: 4

In Case of Emergency...
You can use your Pointek ULS200 as a high-level emergency shutoff switch!

It’s a good engineering practice to have a backup high-level switch that uses a different technology than your continuous level devices.

Look at all the ULS200 offers...
- Two independent settings that allow for high- and low-level switch points from a single unit
- Noncontacting, self-cleaning sensor, made of Tefzel® or Kynar-Flex®
- Polycarbonate or epoxy enclosure available

The perfect point level backup device for your capacitance applications.

Note: The ultrasonic Pointek ULS200 is intended to be a primary measurement and control device. For overfill or level safe protection, Siemens advises using Pointek contacting technology, like the CLS200 on pages 52 to 53.

Ordering Instructions
Select one option from each table following. A complete catalog number looks like this: 7ML1510 - ______

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<th>Description</th>
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</table>
Pointek CLS100 Capacitance Point Level Switch

**Features**

- Very short (4”) insertion length
- Suitable for use with both conductive and nonconductive process media
- Accurate, repeatable switchpoint due to advanced tip-sensing technology
- Extremely high chemical resistance
- Level detection independent of tank wall or pipe system
- Simple setup procedure, verification with built-in LEDs
- Precision 20-turn potentiometer for adjustable sensitivity
- Two level outputs: Two-wire current loop detection and solid-state transistor relay
- Low maintenance costs — no moving parts
- Can be connected directly to most PLCs
- Intrinsically safe and dust/ignition-proof models

**Specifications**

**Models:** Standard, intrinsically safe

**Modes of Operation:** High/low

**Switchpoint Repeatability:** 0.08”

**Operating Frequency:** 5.5 MHz

**Dielectric Constant:** 1.5 min.

**Temperature Range:** -40° to 257° F

**Pressure (Vessel) Range:** 0 absolute to 2500 kPa (25 bar or 365 PSI) gauge

**Adjustment Potentiometer:** 20-turn

**Current Output:** 0/4-20 mA loop supplied; Current Reversible: By polarity change power supply; Load: 600 Ω max. @ 24 VDC

**Solid-State Switch:** Output: Galvanically isolated, 100 mA max. load current; Switch voltage: 28 VAC/40 VDC max.

**Integrated Enclosure:** Housing (Electronics)/Connection: AISI 316L stainless steel; Ingress Protection: Type 4X/NEMA 4X/IP65; Connection: 4 conductor, 22 AWG, shielded, 3.3 ft. black polyester cable

**Signal Indicators:** LEDs for adjustment control, output status, and power

**Power:** Standard Model: 10-33 VDC; Intrinsically Safe Model: 10-30 VDC

**Sensor Probe:** PVDF Kynar®, 4” insertion, 3/4” NPT process connection

**Approvals:** Standard Model: CE/KEMA/FM. CSA approvals (Class II, III, Div. 1, Groups E, F, G), Intrinsically Safe Model: CE/CENELEC/FM. CSA approvals (Class I, Div. 1, Groups A-D)

**SensGuard Chemical-Resistant Probe Cover**

**Pressure Range:** Full vacuum to 365 PSI (FV to 25 bar)

**Temperature Range:** -40° to 257° F (-40° to 125° C)

**Construction:** Polyphenylene Sulfide, fiberglass filled

**Process Connections:** External: 3/4” NPT; Internal: 3/4” NPT

**Insert Length:** 2.75”

**Flexural Strength:** 315 lbs.

**CLS100 Through the “Site Glass”**

CLS100 has been field-tested in many applications. It’s sensitive enough to measure levels accurately through tank windows and site glasses made of plastic, glass, or fiberglass.

It works with a heavy material buildup on the sensor (like chocolate or dust), and even in sludge interfaces. Want a demo? Call us!

**Ordering Instructions**

Select one option from each table section below. A completed catalog number looks like this: 7ML5501 - _ _ _ _ _

**Catalog Price**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price Each</th>
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<tbody>
<tr>
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**Version Options**

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<th>Options</th>
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<td>ABS Enclosure, 1/2” NPT Conduit</td>
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<tr>
<td>Integrated Cable, Kynar Probe Body</td>
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**Order Numbers**

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**Pressure Rating (ANSI B16.5)**

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**Model Selection Guide**

Please submit orders to: Siemens Industry Inc., c/o Lesman Instrument Company.
Pointek CLS200: Capacitance Point Level Detection Sensors

SIEMENS

Pointek CLS capacitance point level detection switches...
- Work accurately without a reference electrode
- Detect a single, high, or low level for liquids, solids, slurries, or foam (material with a dielectric constant >1.5)
- Work in vessels of any shape, made of conductive or nonconductive material
- Operate in temperatures to 257°F
- Accept voltage from 12 to 250 VAC/DC, without jumpers

How is our capacitance offering different?
- Compact design and 3.9" insertion length, so you can use more of your tank for product
- Adjustable insertion lengths: Slide coupling lets you put more probe into the process
- Mounting options: 3/4", 1", 1.5" NPT, 3A sanitary, and flanges
- Electronics tested to 4G vibration levels in three dimensions
- Flame-, explosion-, and dust/ignition-proof approvals

Choose from standard, rigid, sanitary or cable sensors. While the base unit remains constant, each model can have a different process connection, extension, or approval. Both standard and extended length units are designed for clean-in-place (CIP) applications in the food industry.

Standard Models: Suitable for use in virtually any point level detection application. With a minimum insertion length of just 4 inches compared with 14 inches on competitive products, the standard model can be easily installed in small diameter pipes. In tank applications, content capacity can be maximized.

Sanitary Models: Meet industry requirements for temperatures exceeding 212°F. The process connection is a sanitary standard tri-clamp. Wetted parts of 316L stainless steel and PVDF (Kynar®) are 3A compliant and food-grade safe.

Extended Models: Available in both cable and rigid versions. When it is not possible to penetrate the tank wall near the bottom, Pointek CLS cable versions provide excellent application flexibility through the use of cable extension, protected by a PVDF jacket. Effective in both liquids and solids, these versatile units can also be used for level detection and for interface detection (e.g. oil/water) in large storage tanks. Cable can be supplied at lengths up to 115 feet to meet specific application requirements.

Rigid versions have short or extended rod lengths up to 18 feet. An adjustable sliding process mount is available.

Options
- Thermal Isolator (Thermopart): In applications where the ambient temperature of the transmitter can exceed 185°F due to hot processes. The isolator extension raises the enclosure approximately 4" above the process fitting.

Process Connections: Process connection sizes range from 3/4" to 1.5 NPT and 1" to 3" sanitary flange.

Adjustable Sliding Process Mount: For applications where the exact level sensing point is in doubt, a sliding process sealing gland is available to provide exact adjustment of the sensor's position.

See what makes Pointek different.

**NEMA 4/IP65 Aluminum Enclosure**
- The cast aluminum enclosure is epoxy coated to provide additional chemical resistance. Remove the lid to gain access to wiring, dip switch settings, and LED functions.

**Alarm/Control Functions and Failsafe Operation**
- The SPDT relay provides normally open and normally closed contacts. You can use the fail-safe relay operation for alarm purposes to alarm on material detection or instrument power interruption.
- The solid-state relay (300 VDC or 250 VAC) is polarity insensitive for simplified wiring, and galvanically isolated for circuit protection.
- You can add a relay across the power source to generate a two-wire output based on the drawn power supply current.

**Material Sensitivity Adjustment Reduces Spare Parts**
- When you're detecting a sticky conductive material, you can easily adjust the level detection switchpoint using either the range selection switch or potentiometer.

**No Relay Chatter!**
- An adjustable output delay prevents chatter when material is at the critical detection level. It is adjusted by a single potentiometer and applied to both the SPDT relay and transistor outputs.
- It can also be applied when entering or leaving alarm. The delay can be temporarily disabled to confirm output operation, without readjusting the delay setting.

**LED Indicators**
- The Power On, Sensor Status, and Output Status LED indicators provide a simple way to verify performance during installation.
- Power On confirms that power is supplied to the unit. Sensor Status indicates that material has been detected. Output Status shows the change in output state.
Common Specifications

Supply Voltage: 12 to 260 VAC/DC, any polarity, galvanically isolated
Power Consumption: 2VA/2 Watts
Signal Indicators: 3 LEDs provide adjustment, output status, and power
Adjustment: Potentiometers: 2, for adjustment of time delay and sensitivity; Switches: 1 SPST dip switch for time delay select. Failsafe high/low, and time delay test/adjust, high low sensitivity
Temperature Range: -40° to 185° F operation and storage
Materials: Process Connection: 316L Stainless Steel; Probe: PPS (Ryton); Enclosure: Epoxy Coated Aluminum (NEMA 4X, 7/9, IP65)
Switch Point Repeatability: 0.08°; Hysteresis: 0.08°
Dielectric Constant: 1.5 minimum
Operating Frequency: 5 MHz maximum
Cable Entry: 1/2" NPT; Cable Gland: PG 13.5 (available)

Output Functions

Relay Contact: Form C SPDT, NC or NO contact selectable
Contact Load: 10 mA/50 VDC min, 50A/30 VDC max; 8A/250 VAC max.
Solid-State Switch: Galvanically isolated, with sensor failure detection
Safety: Non-polarity sensitive (no wiring errors)
Switch Voltage: 250 VAC/300 VDC max.; Voltage Drop: <1 Volt
Load: 2 Watt max. Load Current: 100 mA max.
Time Delay: (On/Off) 1-60 seconds
Approvals: General Purpose; Dust/Ignition-Proof worth IS Probe: CSA/FM Class II, Div. 1, Group E-G, Class III T4; Explosion-Proof: CSA Class I, Div. 1, Groups A-D

Standard Model

Process Connections: 3/4" NPT
Maximum Length: 4"
Resistance: 365 PSI maximum
Sanitary Model

Process Connections: 1", 1.5" or 2" Tri-Clamp
Maximum Length: 4"
Resistance: 365 PSI maximum

Extended Rigid Model

Process Connections: 3/4" NPT
Maximum Length: 216"
Resistance: 365 PSI maximum

Extended Cable Model

Process Connections: 3/4" NPT
Maximum Length: 1,378"

Use the CLS in More Applications than Ever Before

With the Sensguard abrasive- and chemical-resistant cover for the CLS standard probe.

- NPT threaded process connection sizes
- Handles pressure ranges from full vacuum to 365 PSIG, temperatures from -40° to 257° F

Ordering Instructions

Select one option from each table section below. A complete catalog number looks like this: 7ML5630-

Model Selection Guide

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<tr>
<td>Threaded, 1&quot; NPT</td>
<td>0B</td>
</tr>
<tr>
<td>Threaded, 1.25&quot; NPT</td>
<td>0C</td>
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<tr>
<td>Threaded, 1.5&quot; NPT</td>
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<tr>
<td>1&quot; ASME, 150 Lb Welded Flange</td>
<td>1A</td>
</tr>
<tr>
<td>1.5&quot; ASME, 150 Lb Welded Flange</td>
<td>1B</td>
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<tr>
<td>2&quot; ASME, 150 Lb Welded Flange</td>
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<td>3&quot; ASME, 150 Lb Welded Flange</td>
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</tr>
<tr>
<td>4&quot; ASME, 150 Lb Welded Flange</td>
<td>1E</td>
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</tbody>
</table>

Standard Insertion Lengths (No Y01 code needed.) Length from flange face.

| Standard Compact (Threaded 120 mm, Flanged 98 mm)         | A      |
| Standard Extended Rod 250 mm 9.84"                       | B      |
| Standard Extended Rod 350 mm 13.78"                      | C      |
| Standard Extended Rod 500 mm 19.69"                      | D      |
| Standard Extended Rod 750 mm 29.53"                      | E      |
| Standard Extended Rod 1000 mm 39.37"                     | F      |
| Standard Extended Rod 1250 mm 49.21"                     | G      |
| Standard Extended Rod 1350 mm 53.15"                     | H      |
| Standard Extended Rod 1500 mm 59.06"                     | I      |
| Standard Extended Rod 1750 mm 68.09"                     | J      |
| Standard Extended Rod 2000 mm 78.74"                     | K      |

Probes

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<tr>
<td>316L SS with PVDF Probe Body</td>
<td>$347.00</td>
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<table>
<thead>
<tr>
<th>Approvals</th>
<th>Price</th>
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<tbody>
<tr>
<td>CSA/FM/CE General Service</td>
<td>$58.00</td>
</tr>
<tr>
<td>CSA/FM Dust-Ignition Proof, IS Probe</td>
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<tr>
<td>CSA/FM Explosion Proof, IS Probe</td>
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Enclosure

<table>
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<th>Enclosure</th>
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<tr>
<td>IP68 Rating</td>
<td>$51.00</td>
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</table>

Welded Flange Process Connections also available in ASME 300 and 600 lb versions. Call for pricing.

Need a custom probe length? Call Lesman. Custom extended rods available up to 18.04’ (5500 mm).

Need a custom probe length? Call Lesman. Custom extended rods available up to 18.04’ (5500 mm).
Pointek CLS300: Capacitance Point Level Detection Sensors

Features

- One design fits all, even in harsh and heavy duty environments; suitable for high pressures and high temperatures in liquids, solids, slurries, and interfaces
- All wetted parts made of stainless steel and PFA, Teflon, or ceramics for high-chemical resistance
- High-sensitivity probe provides accurate level detection without the effects of conductive material buildup. Works equally well in wood chips or tomato sauce!
- Patented LC500 active technology for reliable point level detection, unaffected by vapor concentration, product deposits, dust, and condensation
- Simple threshold/air calibration for rapid, cost-effective setup with LED verification
- Universal galvanically isolated power supply and one universal transmitter provide low cost of ownership and minimal requirements for stocking spare parts
- Multiple switch outputs provide relay, solid state (transistor), or two-wire point detection with one design, including time delays for on/off

The Pointek CLS300 offers accurate, reliable level detection even in harsh, heavy duty industrial applications with high pressures and high temperatures.

It’s effective in liquids, solids, slurries, interfaces, and applications involving viscous (conductive and nonconductive) materials. The fully potted transmitter is unaffected by condensation, dust, or vibration.

All metal parts are made of stainless steel, with a PFA Teflon shield section for high chemical resistance. For higher temperature applications, ceramics can be supplied. Materials with low or high dielectric properties are accurately detected, and the unique active shield helps in ignoring the effects of build-up.

Its unique modular design provides for a wide range of configurations, process connections, extensions, and approvals to meet the precise temperature and pressure requirements of specific applications. The modular design makes it easy to specify and reduces stocking requirements. A wide range of probe configurations is available, including rod and cable/rope models.

The Technology Behind the Performance

The Pointek CLS300 is based on the patented, field-proven LC500 level measurement technology. It combines active shield technology with a wide input range, temperature stability, and inverse frequency operation. The active shield is electrically isolated from an active measurement section. The active measurement section becomes the frequency-determining component for the triangular wave oscillator in the transmitter.

When the capacitance increases or decreases with the level of material, the measuring frequency changes inversely. The same signal is also connected to the active shield portion of the probe, effectively eliminating the electrical potential difference between the shield and the measurement section. The probe will not be affected by changes in vapor concentration, dust, or condensation.

The CLS300 will provide accurate level detection even in highly conductive materials with build-up on the probe.
**Specifications**

- **Dielectric Constant:** 1.5 minimum
- **Temperature Range:** 40° to 398° F; High-temperature version: -40° to 752° F
- **Pressure Range:** 511 PSIG
- **Probe Lengths:** Rod version: 14” to 40”; Rope/cable version: 20” to 985”
- **Tensile Force:** 4,188 lbs. max.
- **Wetted Parts:** AISI 316L/PFA/Peek; High-temperature version: AISI 316L/Al2O3 (99.7%)
- **Enclosure:** Epoxy coated, NEMA 4/Type 4/IP65 with NPT
- **Relay Contact (with Signal Failure Detection):**
  - **Output Functions**
  - **Protected to 55 kV continuous discharge**
  - **E.S.D. Protection (kV):** Protected to 55 kV continuous discharge
- **Power Supply and Transmitter**
  - **Supply Voltage:** 12-250 VAC/VDC any polarity galvanically isolated
  - **Power Consumption:** 2 VA/2 Watt
  - **Wiring Connections:** Max. 0.009”; Temperature range: -40° to 185° F
  - **Signal Indicators:** 3 LEDs for adjustment control, output status and power
- **Adjustment Potentiometers:** 2 PCS, for time delay and sensitivity
  - **Adjustment Switches:** 5 PST dip switch for time delay select, high/low sensitivity
- **Sensitivity:** 1% max. change in actual capacitance value
- **Temperature Drift:** 0.2% max. of actual capacitance value
- **Measurement Frequency:** 600 kHz max.
- **E.S.D. Protection (kV):** Protected to 55 kV continuous discharge

**Output Functions**

- **Relay Contact (with Signal Failure Detection):** Form C SPDT (selectable NC or NO contact); Max. contact load: DC: 5A/30 VDC; AC: 8A/250 VAC (cos φ = 1); Max. switching capacity: DC: 5A/30 VDC; AC: 8A/250 VAC (cos φ = 1); Time delay (on and/or off): 1-60 seconds
- **Solid-State Switch (with Signal Failure Detection):** Output: Galvanically isolated; Safety: Non-polarity sensitive transmitter; Max. load: 2 Watt; Max. switch voltage: 250 VAC/300 VDC; Max. load current: 100 mA; Voltage drop: Below 1 Volt typical at 50 mA; Time delay (on and/off): 1-60 seconds
- **Two-Wire Switch:** With customer-supplied external trip devices

### Technical Tips Blog

On the Lesman blog, our technical team covers everything from industry standards and basic technical tips to the tricks that will save you hours in the field making that one instrument work as expected.

**Field problems solved, and “So What?” reviews**

When our technicians run into a situation in the field, they write a quick post for the blog, so you can learn from their experiences, like where to properly install an ultrasonic transducer for best level measurement results, or what to do if you misplace your Siemens handheld programmer.

Our “So What” reviews hit the heart of what matters most to you: How new products improve configuration, make installation and maintenance easier, and help solve common problems.

Get all the tips delivered straight to your PC, phone, or tablet. Subscribe at blog.Lesman.com! Click [Sign me up!].
Pointek CLS500 Point Level Switch for Extreme Conditions

Features
- Wide range of applications in high pressure and temperature, chemically aggressive, and other extreme process environments
- Viscous, conductive and non-conductive liquids, solids, slurries, and interfaces
- Integrated local display for service and commissioning or remote adjustable programming and control via HART®
- Two-wire analog mA output with two-state functionality (4–20 mA or 20–4 mA)
- Adjustable hysteresis on/off for solid-state output and for current signal; Damping function
- Signal current compliant to NAMUR NE 43
- Full range of local/remote diagnostics
- Pre-detection of trip point for high safety requirements
- Polarity-insensitive current loop
- General purpose, dust/ignition-proof, explosion-proof, and intrinsically safe approved models

Siemens Pointek CLS500 is a two-wire capacitance point level switch for detecting interface solids, liquids, slurries, and viscous materials in critical conditions of extreme pressure. It uses a unique, frequency-based measurement system and patented Active-Shield technology to deliver highly accurate, repeatable results.

Measurement is unaffected by moisture, vapors, foam, temperature and pressure variations, or material build-up around the mounting glands.

The CLS500 combines a sophisticated, easy-to-adjust transmitter (MSP-2002-1) with a measurement electrode and process seal designed to accommodate numerous configurations. The advanced electronics and integrated local display provide for one-point calibration without interrupting the process, and the probe shield design eliminates the need for frequent recalibration.

Pointek CLS500 can be used as a pump controller, by connecting the 2-state mA output and/or the solid state switch to a relay, and activating a pump via an auxiliary power circuit.

Specifications
- Measurement Range: 0 to 330 pF; Span: Minimum 1 pF
- Measurement Frequency: 420 kHz
- Accuracy: Deviation <0.1% of actual measurement value; Non-Linearity and Reproducibility: 0.1% full scale and actual measurement respectively
- Temperature Stability: Greater of 0.15 pF (0 pF) or <0.25% (typical <0.1%) actual measurement value over full temperature range
- Process Connection: NPT thread; ANSI, DIN flat-faced flanges
- Process Material: AISI 316 L standard; C 22.8 N, Monel 400, Hastelloy C22, Duplex optional
- Safety: Current signaling according to NAMUR NE 43; 3.6 or 22 mA, probe input ESD protected to 55 kV, inputs/outputs fully galvanically isolated, polarity-insensitive current loop, fully potted, integrated safety barrier
- Diagnostics: Includes fault alarm when primary variable (PV) out of limits, system failure in measurement circuit, deviation between A/D and D/A converter, checksum, watch dog and self-checking facility probe
- Probe Length: Rod version: Up to 1000 mm (216”) with 16 or 24 mm diameter probe; Diameter: 16 mm (0.63”) or 24 mm (0.95”) rod
- Probe Installation: PFA, Enamel
- Function Rotary Switch: Positions 0 to 9, A to F
- Remote Communication: HART® Foundation
- Pressure Rating: FV to 50 bar (725 PSI), up to 525 bar (7665 PSI) optional
- Enclosure: Aluminum, epoxy coated Type 4X/NEMA 4X/IP65; 2 x 1/2” NPT cable entry
- Temperature Rating: -328° to 392° F, up to 752° F optional
- Supply Voltage: 12 to 33 VDC (30 VDC for IS model)
- Loop Current: 3.6 to 22 mA / 22 to 3.6 mA (2-wire current loop)
- Environmental: Location: indoor/outdoor; Altitude: 2000 m maximum; Ambient Temperature: -40° to 185° F standard and for T5 to T1 ATEX explosion proof, -40° to 158° F for T6; Installation category: II; Pollution degree: 4

Ordering Instructions
Make one selection from each table below. A complete catalog number looks like this: 7ML5601-__-__-__-__-__-__-__-__

Model Selection Guide

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</table>
Products to Make Your Plant Safer

Reliable Solid State Technology Replaces Your Old Mechanical Switches

- Transmitter-only, switch-only and hybrid transmitter-switch models available — Switch-only model drops in to replace mechanical switches for upgrades with no re-wiring costs
- Digital process display — know what’s happening in your process at a glance
- NAMUR standard and HART*-enabled transmitter 4-20 mA output + programmable switch for process monitoring, alarm, and shutdown
- Programmable setpoint and deadband provides accurate and fast cycling for rotating equipment
- Configurable IAW™ self-diagnostics make sure the instrument is functioning properly by communicating with the control system using a dedicated discrete output
- Plugged port detection: Detects clogged pressure sensors to help avoid potentially dangerous process conditions
- Trip counter records trips for up to two relays, nuisance trip filtering eliminates unwanted trips and unnecessary alarms
- Programmable trip delay holds off the trip decision for tenths of seconds to several minutes
- Worldwide hazardous location approvals

Honeywell HC900 SIL2 Safety Control Systems

- Process control and safety on one platform — reduces operator training, hardware, and inventory costs
- Certified for use in SIL2 applications
- Redundant CPU, power supply, communications, and network
- Complies with CSA/FM Class I, Div 2, ATEX, ABS, UL and CE
- Single HMI or operator interface with enhanced diagnostics to view process and safety control operations
- Integrates burner management system solutions, process controllers, flame scanners, SIL2 transmitters, and safety shutoff valves
- Integrates with Experion HS software for HMI and SCADA, and HC900 OPC server for real-time access between HC900 and OPC-enabled applications — historians, HMIs, and SCADA

UE Safety Transmitter for SIL 2 Safety Systems

Simplify installation, improve productivity, and eliminate nuisance trips.

- Certified for use in SIL 2 safety systems as a single sensor (HFT=0), FMEDA report available
- Self-contained sensor, logic solver, and final element (ability to control externally) for a complete safety system capable of SIL 2 without additional SIF components; Safety relay output (SRO) as a final element
- Hazardous location approvals for Class I, Div 1-2 (Zones 1, 2)
- Industry-leading safe failure fraction (SFF) and a high risk-reduction factor (RRF)
- Large digital display provides process variable, status, self-diagnostics and field programming information
- 4-20 mA analog output with field scaling capability
- 100% programmable high-capacity safety relay (switch setpoint and deadband)
- Effectively replaces a gauge, a transmitter, and a switch to reduce potential leak paths
**Flow Measurement Products**

**SIEMENS SITRANS FC430 Coriolis Mass Flowmeters**

- Install anywhere, fit multiple units into tight spaces; Sizes available from 1.2” to 3”
- 0.1% accuracy, 0.05% repeatability
- 4-20 mA analog output with HART® 7.2
- HemiShape flow manifold for low pressure loss; Avoids cavitation and separation of fragile fluids
- Remote FCS400 model's digital sensor link guarantees high-speed data transfer, even at distances up to 200 meters
- Flange, pipe thread, hygienic thread and hygienic clamp connections available
- MicroSD card stores user and factory settings, calibration data and certificates
- IEC Ex, ATEX, and FM hazardous area approved
- Can be validated for SIL2 or SIL3 operation
- Ideal for hygienic use (EHEDG/3A approved)

**Why Do So Many Engineers Choose MAGFLO?**

- Mag 5100W doesn’t need grounding rings.
- One transmitter fits all sensor tubes, so one universal spare covers all applications.
- Easy transmitter configuration with the keypad — contractors and technicians love them!
- Owners can schedule on-site verification service from Siemens, or do their own verification with a MAGFLO Verificator unit.
- SensorPROM makes replacement server a quick swap-out.
- With the universal communication modules, it’s easy to get data onto the plant network.
- They can produce a traceable record of reliability, with calibration data and verification test results.

**Honeywell SMV800 SmartLine Multivariable Transmitters**

- For use with air, gases, steam, and liquids
- Measures differential pressure across a primary flow element (averaging pitot tube, venturi, flow nozzle, orifice plate, V-Cone®, wafer cone, or wedge); static process pressure from a single sensor; and process temperature from thermocouple or RTD inputs
- Calculates mass or volume, compensated for static pressure, temperature, viscosity, discharge coefficient, gas or thermal expansion factor, and velocity of approach factor
- Accuracy up to ±0.04% for differential pressure, up to ±0.0375% for static pressure, and up to 0.1°C for temperature with mass flow accuracy up to ±0.6%
- Rangeability up to 400:1
- Compensated flow response up to 2x/second
- Modular design and universal transmitter wiring
- Built-in fail-safe feature for flow measurement
- HART 7/DE protocol support plus digital integration with Honeywell control systems

**Now!**

Honeywell SMV800 SmartLine Transmitters

**New!**

Replaces retired Honeywell SMV3000

**Need pharmaceutical-grade electropolishing? Call for details.**
Measuring Process Pressure

New Honeywell SmartLine Improves Transmitter Performance!

- Fully modular! Alphanumeric display can be added or removed in the field, no need to remove the transmitter from service to swap modules or replace parts
- Stabilities to ±0.01% upper range limit per year for 5 or 10 years (series-dependent)
- Standard accuracies improved to ±0.0375%
- Speed of response three times faster than retired ST3000 series transmitters — As fast as 80 mSec
- Display PV, bargraphs, trend lines, and text messages for diagnostics and maintenance
- Automatic static pressure and temperature compensation
- Maximum turndown ratio to 400:1
- External zero, span, and configuration capability
- World class overpressure protection
- Compliant to SIL 2/3 requirements
- Honeywell DE, HART v7.0 and Foundation Fieldbus communications

Visually In Stock at Lesman, Ready to Ship Within 24 Hours!

SmartLine Gauge Pressure Smart Transmitters

All models shown here feature in-line mount and 0.05% span accuracy, digital display with external zero/span/configuration buttons, 4-20 mA and HART® output, and FM explosion-proof approved enclosures for use in Class I, Div 1 environments.

5 to 500 PSI range...................... STG74L-E1G000-1-A-AHC-11S-A-10A0-00-0000 ............. 2,137.00

30 to 3000 PSI range ................. STG77L-E1G000-1-A-AHC-11S-A-10A0-00-0000 ............. 2,302.00

This model features dual-head gauge mount and 0.05% span accuracy, digital display with external zero/span/configuration buttons, 4-20 mA and HART® output, and FM explosion-proof approved enclosures for use in Class I, Div 1 environments. It has carbon steel bolts and nuts, dual-ended head with standard side/end vent and plug with glass-filled PTFE gasket.

5 to 500 PSI range...................... STG740-E1GC6A-1-A-AHC-11C-A-10A0-00-0000 .........$2,379.00

This model features dual-head gauge mount and 0.05% span accuracy, basic digital display, 4-20 mA and Honeywell DE output, and FM explosion-proof approved enclosure for use in Class I, Div 1 environments. It has no zero/span/configuration buttons.

5 to 500 PSI range...................... STG740-E1DC1A-1-A-ADB-11S-A-10A0-00-0000 .........$2,469.00

SmartLine Differential Pressure Smart Transmitters

All models shown here achieve 0.05% span accuracy (0.0375% span for draft range) and include digital display with external zero/span/configuration buttons, 4-20 mA and HART® output, and FM explosion-proof approved enclosures for use in Class I, Div 1 environments.

4" to 400" WC range ................. STD720-E1HC6AS-1-A-AHC-11S-A-10A0-00-0000 ............. $2,406.00

This model features dual-head gauge mount and 0.05% span accuracy, basic digital display, 4-20 mA and Honeywell DE output, and FM explosion-proof approved enclosure for use in Class I, Div 1 environments. It has no local digital display or external zero/span/configuration buttons.

4" to 400" WC range ................. STD720-E1HC6AS-1-A-CD0-11S-A-10A0-00-0000 ............. $2,388.00

Learn more at www.Lesman.com
Temperature Measurement Systems

Temperature Sensors from WIKA/Gayesco

**Tubeskin Sensors for Furnace Applications**
- Increase furnace tube life, safeguard heater operations, and increase production
- Withstand harsh firebox environments for prolonged periods — at least of one complete turnaround cycle
- Fast, easy installation and quick replacement gets you back online faster after unplanned downtimes
- Detect early overheating caused by coke formations
- Monitor temperature and provide alarms where high temperatures are reducing remnant life or exceeding maximum allowable limits

**Multipoint Sensors for Refining and Petrochemical Use**
- For hydroprocessing units, column, fractionators, and contactors, continuous catalytic reformers, and fluid catalytic cracking units
- Flex-R® flexible multipoint thermometry: Standard flanged assemblies, specialty connections (like Radial Tap and Radial Tap Next Gen), and hybrid solutions
- Linear multipoints: Flexible, drawn, and stuffed
- Pipewell multipoints: Tube bimetallic designs, heat transfer block, free-hanging, and spring-loaded

**Custom temperature assemblies without the custom prices.**

If you can design, describe or draw the temperature assembly you need, we can supply it — without the premium charges for “special” orders. All Lesman thermocouples and RTDs are made to your exact specifications. And, since we start from scratch with your design, you don’t have to worry about any add-on charges for modifications to the manufacturer’s product.

Visit www.lesman.com/datasheets/ for our temperature sensor datasheet. You answer a series of questions to specify all the parts you need. We’ll quote you a price, and let you know when you can expect delivery. It’s that simple!

- RTDs for general service applications
- 3A sanitary RTDs for the food and pharmaceutical industries, including clean-in-place and HTST application assemblies
- RTDs with threaded thermowells
- RTD and transmitter assemblies
- Thermocouple and well assemblies for general service applications
- Thermocouple assemblies with quick-disconnect plugs
- Industrial thermocouples with termination heads
- Metal protection tube thermocouples
- MgO insulated thermocouples

**Thermocouples don’t last forever.** In most industrial applications, they fail at a predictable interval, one that’s affected by temperature, exposure to corrosive gases or liquids, and environmental conditions.

Talk to your Lesman account manager about implementing a replacement and calibration program to meet ISO compliance standards, reduce downtime, increase process quality, and decrease the risk and frequency of accidents.

**Recommended T/C Replacement Schedule**

<table>
<thead>
<tr>
<th>T/C Type</th>
<th>Temperature</th>
<th>Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>J or K</td>
<td>400° F and Below</td>
<td>Every 5 Years or More</td>
</tr>
<tr>
<td>K</td>
<td>900° to 1200° F</td>
<td>Every 1 or 2 Years</td>
</tr>
<tr>
<td>K</td>
<td>1200° to 1800° F</td>
<td>Every 6 to 12 Months</td>
</tr>
<tr>
<td>K</td>
<td>1800° to 2200° F</td>
<td>Every 3 Months</td>
</tr>
<tr>
<td>R, S, or B</td>
<td>1800° and Above</td>
<td>Only as Needed</td>
</tr>
</tbody>
</table>

**Build the custom sensors you need.**

**Configuration datasheet available online at www.Lesman.com/datasheets/**
Flame Safety and Combustion Control

Slate Integrated Combustion Management System from Honeywell

Honeywell Slate combines configurable flame safety and programmable logic into a single DIN-rail mounted platform. It’s designed for single and multi-burner control in makeup air, process heating, kilns, ovens, paint booths, and commercial or industrial boiler applications.

Slate includes these plug-in modules:
- Base unit and burner control
- Flame amplifier
- Fuel-air ratio control
- Analog and digital I/O
- Limit control
- Alarm annunciator

Upgrade to Honeywell 7800 enhanced burner controls

Honeywell 7800 series burner controls are available for programming and on/off primary control, with selectable pre-purge timing, air flow checks, valve proving, shutter drive, and programmable post purge. Enhanced 7800 models offer several added features at a lower price:
- Expanded cycle counter
- Standard run/test switch
- Jumper for intermittent or interrupted pilot
- Valve proving functionality
- Pre-ignition interlock (for proof of closure)

Safety Shutoff Valves from Lesman Stock!

- Provides closure in less than one second
- Rotatable top assemblies in 90° increments
- Comes standard with visual position indication
- Manual reset or automatic reset operators
- FM, CSA, UL, and CE approved; Available for non-incendive Class I, Div 2 areas; Full assessment to IEC 61508 as SIL 3 capable; Meets FCI 70-2 standard for Class VI seat leakage

Model Selection Guide

Maxon 5000 Series: Normally closed automatic gas shutoff valve, cast iron body. Six-second timing. Trim: 400 series stainless steel seat, hardened ductile iron disc, PEEK follower ring, BUNA N o-rings/bumper, 115 VAC, 60 Hz, NEMA 4 enclosure.

<table>
<thead>
<tr>
<th>Process Conn.</th>
<th>Valve Size</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread</td>
<td>3”</td>
<td>300SMA11-AA11-BB21A0</td>
<td>$2,579.20</td>
</tr>
<tr>
<td>Flange</td>
<td>4”</td>
<td>400CMA11-BA11-BB21A0</td>
<td>3,315.00</td>
</tr>
<tr>
<td>Thread</td>
<td>1.5”</td>
<td>150SMA11-AA11-BB22A0</td>
<td>2,059.70</td>
</tr>
<tr>
<td>Flange</td>
<td>2”</td>
<td>200SMA11-AA11-BB22A0</td>
<td>2,388.90</td>
</tr>
<tr>
<td>Flange</td>
<td>2.5”</td>
<td>250CMA11-AA11-BB22A0</td>
<td>3,392.20</td>
</tr>
<tr>
<td>Flange</td>
<td>3”</td>
<td>300CMA11-AA11-BB22A0</td>
<td>3,578.40</td>
</tr>
<tr>
<td>Thread</td>
<td>4”</td>
<td>400CMA11-BA11-BB22A0</td>
<td>4,239.80</td>
</tr>
</tbody>
</table>

Flame detectors for every application!

Honeywell
- Flame rods and thermocouples for gas-fired intermittent or standing pilot-type burners
- Rectification and ultraviolet detectors for coal, gas, or oil-fired intermittent or interrupted pilots
- Compatible with 7800 series burner controls and amplifiers

Iris Systems
- Infrared or ultraviolet detectors for single burner applications
- Infrared, UV, or combination detectors for multi-burner and multi-fuel applications
- Ultraviolet detector for flare stack monitoring

Fireye
- Ultraviolet, infrared, or combination detectors with 4–20 mA and relay outputs
- Flame scanners with built-in amplifiers for accurate flame detection and discrimination
- Insight II UV/IR integrated scanner, UL certified to SIL3

See our combustion system offering at Lesman.com.

Kromschroder Burner Controls

If Kromschroder is your preferred brand for flame safeguard control systems and valve train components, Lesman can help. Call us for:
- Automatic burner controls for gas burners and industrial forced-draught burners
- Flame relays for multi-burner control applications
- Ultraviolet flame detectors
- Safety shutoff solenoid valves
- Actuated butterfly valves for gas flow control
- Pressure switches for gas applications
Lesman’s Process Valve Offering

From basic hand-operated ball valves to control valves with integrated positioners, and everything in between. Lesman has the process valving you need.

Quick Delivery on Sliding Gate Pneumatic Control Valves

- Sliding gate offers shorter stroke length than globe or cage designs for faster response to input signal changes, tighter control and metering accuracy
- Wafer design virtually eliminates body wear issues caused by steam, flashing, and cavitation
- Straight-through flow reduces turbulence, noise, and erosion
- Up to 600 Cv linear on 8” valves
- Turndown ratio capability 100:1
- Side-mount HART® positioner

Cv = 0.00001

When you’re working with ultra-low flow rates, we have your valve!

LowFlow Series 708 control valves are the perfect solution for pilot plant applications and more, with Cv ranges from 0.00001 to 4.0.

Need a butterfly valve?

Resilient seated
High performance
Manual or automated

Get 2” to 24” valves from factory stock!
(Larger sizes also available.)

Process valves and accessories for hygienic and sanitary applications

- FDA and USP-compliant control valves and regulators
- Ball valves and check valves
- Sight glasses, sample chillers, and steam traps

Regulators Reduce Control Loop Costs

Properly used, regulators could replace control valves in at least 25% of all control loops.

Learn more at Lesman.com
We Make Wireless Work!

**ISA100.11a Compliant Wireless Mesh Networks!**

- Collect and use information previously inaccessible due to high wiring cost or hazardous locations
- Battery-powered transmitter models available for analog and discrete inputs, universal multiple I/O, temperature, pressure, and corrosion monitoring, plus units for valve positioning, wireless gauge reading, and more
- Monitor processes that have no access to power, that are hard to reach, require frequent reconfiguration, or where manual readings were done in the past
- Improve process efficiency
- Wireless Device Manager, a network appliance with integrated web server, so you can monitor and manage all your wireless network devices from your desktop, using a standard web browser
- Field device access point provides wireless coverage for up to 80 field transmitters, available for Class I, Div 1, or Class I, Div 2 areas
- Add legacy HART® wired field devices with OneWireless adapter

**Industrial Wireless I/O Networks**

- Battery, solar, or line powered wireless field I/O devices — with 1-watt RF power for long shots
- Pre-mapped electrician’s I/O radio kits
- Intrinsically safe field I/O devices for Class I, Div 1, and ATEX Zone 0 environments
- Performance 150 mW field nodes that provides loop power to Honeywell and Siemens wired 4–20 mA pressure and level transmitters

**Wireless power for your level transmitter!**

Banner Engineering’s DX80 Performance D5 node radio powers a loop powered 4–20 mA transmitter from the radio’s battery on a scheduled, periodic, or intermittent basis for true wireless performance. An ultrasonic unit can sample 3x per hour with a 3 month battery life.

The D5 is a 150 mW node radio in the metal enclosure and comes with a dome antenna. It is intrinsically safe when used with an approved I/S transmitter, certified for use in Class I, Div 1, Groups A–D; Class II, Div 1, Groups E–G; Class III, Div 1; Zone 0 (Group IIC) and Zone 20 (Group II) locations.

For more on Banner wireless I/O systems, visit www.Lesman.com.

**DX80 D5 Performance Node Radio**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalog Number</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX80 D5 1.20mW node radio, internal battery</td>
<td>20178</td>
<td>$1549.00</td>
</tr>
<tr>
<td>Direct mounting hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2” NPT SS Hex nipple for close coupling</td>
<td>122558</td>
<td>6.50</td>
</tr>
<tr>
<td>3/4”x 1/2” NPT SS reducer for threaded port</td>
<td>1105512x8</td>
<td>5.95</td>
</tr>
<tr>
<td>For remote antenna connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2” NPT feedthrough, RPSMA-F connector</td>
<td>11835</td>
<td>69.00</td>
</tr>
<tr>
<td>3/4” NPT feedthrough, RPSMA-F connector</td>
<td>11834</td>
<td>65.00</td>
</tr>
<tr>
<td>18” 5 dBi antenna, RPSMA-M connector</td>
<td>HG905RD-RSP</td>
<td>49.00</td>
</tr>
<tr>
<td>18” 5 dBi antenna, RPSMA-M swivel connector</td>
<td>17721</td>
<td>63.00</td>
</tr>
<tr>
<td>0.5 m (20&quot;) RPSMA x N-male adapter cable</td>
<td>77486</td>
<td>42.00</td>
</tr>
</tbody>
</table>

**Wireless Ethernet Radios**

- 900 MHz, 2.4 GHz, and 5 GHz frequencies

**WirelessHART Gateway for connecting WirelessHART field instruments to your existing Ethernet plant network**

- Field transmitters for pressure and temperature monitoring
- Adapters to connect legacy wired HART field units to a wireless network

Unlock Stranded HART® Diagnostics!

- Connect HART devices to an ISA100.11a-compliant Honeywell OneWireless network
- Transmit diagnostics and process variable data
- FM, CSA, IEC, and ATEX approvals
Got Buildup?

No problem! Siemens CLS capacitance point level sensors work even with buildup on the probe.

Learn more on page 52.

We Measure Level Anywhere

Xtreme Accuracy

Honeywell Enraf

SmartRadar FlexLine for W&M and API-Compliant Custody Transfer

See page 44.

Find your ideal level measurement solution inside.