

New and extremely experienced
Radar and ultrasonic level measurement



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PROBE

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SIEMENS

Global network of innovation

SITRANS Probe

2-wire ultrasonic and radar level transmitters

SITRANS® Probe LU and SITRANS Probe LR set the new standard for ultrasonic and radar continuous level measurement. These transmitters offer you superior reliability for level, volume, and flow applications in the water and wastewater, food, chemical, and hydrocarbon processing industries.

SITRANS Probe is the award-winning Milltronics® The Probe® taken to a higher level with innovative transducer and antenna designs, communications capability, and nineteen patents. The result is greater accuracy and reliability for your continuous level measurement applications.

Superior signal-to-noise ratio for reliable level monitoring

A high signal-to-noise ratio is critical for reliable level measurement. SITRANS Probe features high signal amplitudes and low noise levels resulting in superior quality echoes, even in turbulent or long range applications.

High signal-to-noise ratio enhances the performance of Siemens Milltronics patented echo-processing technologies such as Sonic Intelligence® and Auto False-Echo Suppression. Sonic Intelligence differentiates between true echo from material and false echoes from obstructions or electrical noise; and the Auto False-Echo Suppression feature ignores false echoes from vessel obstructions for accurate and repeatable level measurement.



Over 190,000 award-winning Milltronics Probes serve satisfied customers worldwide in many applications. Now, Siemens Milltronics has taken The Probe to a higher level, combining experience with nineteen patented technologies to give you the ultimate reliability in level measurement.

SITRANS Probe LU

New generation ultrasonic Probe

SITRANS Probe LU is a 2-wire, loop powered ultrasonic transmitter for level/volume/flow monitoring of liquids and slurries in storage vessels, in simple process vessels, and in open channels. SITRANS Probe LU is ideal for applications in the water and wastewater industry, and for food and chemical storage applications.

We have taken the Milltronics Probe and applied new revolutionary features – including the latest microprocessor and communications technologies. The Low Noise transmitter and Noise Shield result in an excellent signal-to-noise ratio providing higher accuracy and reliability:



- Less interference from electrical noise
- Stronger echo
- Longer range
- Short blanking distance, even with long ranges
- Self cleaning with higher sensor activity

SITRANS Probe LU offers you a choice of ETFE and PVDF transducers to suit the chemical condition of your application. Both transducers have built-in temperature sensors to compensate for varying process temperatures in your application.

SITRANS Probe is easy to install

- 2-wire, loop powered, HART®
- Simple, low-cost installation with a choice of threaded process connections
- M20 cable glands or 1/2" NPT conduit connections are provided
- Rotating head aligns with conduit for easy wiring and adjusts for optimal visibility

SITRANS Probe is easy to set up

- Built-in alpha-numeric display – visible through transparent lid
- Remote configuration and diagnostics with SIMATIC® PDM
- HART communication
- Program without opening the lid, even in hazardous areas, using the standard Siemens Milltronics patented infrared hand-held programmer
- Set up with as few as two parameters, and no echo profile necessary at start-up
- Volume conversion for the eight most common tanks shapes including custom linearization table





SITRANS Probe is easily programmed with SIMATIC Process Device Manager (PDM), the ideal software tool for configuration, parameter setting, record keeping, and diagnostics, including trending and echo profiles. PDM offers communications via HART, PROFIBUS, and other protocols.

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SITRANS Probe LR

Radar version of the award-winning Probe

SITRANS Probe LR is a 2-wire, 5.8 GHz (6.3 GHz in North America) radar transmitter for level/volume monitoring of liquids and slurries in storage and simple process vessels. SITRANS Probe LR is ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as tank farms, chemical storage, and digesters.

- Low frequency of 5.8 GHz (6.3 GHz in North America) offers high immunity against condensation or deposits, making it ideal for liquid storage applications
- Very high signal-to-noise ratio, comparable to 4-wire devices
- The patented uni-construction polypropylene rod antenna has integrated threaded connection and is hermetically sealed for superior chemical resistance; only one material to consider for chemical compatibility
- The internal integrated shield eliminates vessel nozzle noise; the shield is available in lengths of 100 mm and 250 mm (4" and 10")



Application Choice for SITRANS Probe

Specifications	LU	LR
Range 0.25 m to 2 m (10" to 6.5 ft)	✓✓	✓
Range 0.3 m to 12 m (12" to 40 ft)	✓	✓
Range to 20 m (65 ft)	N/A	✓
Narrow shot with obstructions	✓✓	N/R
Plastic still-pipe	✓	N/R
Steel still-pipe	✓	✓✓
Flow	✓	N/A
Volume	✓	✓
Temperature gradients	N/R	✓
Pressure ambient	✓	✓
Pressure vacuum to ambient	N/A	✓
Pressure ambient to 3 bar	N/A	✓
Vapors	N/R*	✓
Foam	N/R**	N/R**
Turbulence (Agitation)	✓	✓
CO ₂ Gas	N/R	✓

✓ suitable for this application * accuracy will be affected N/A not applicable
 ✓✓ preferred instrument for this application ** dense foam usually detected N/R not recommended

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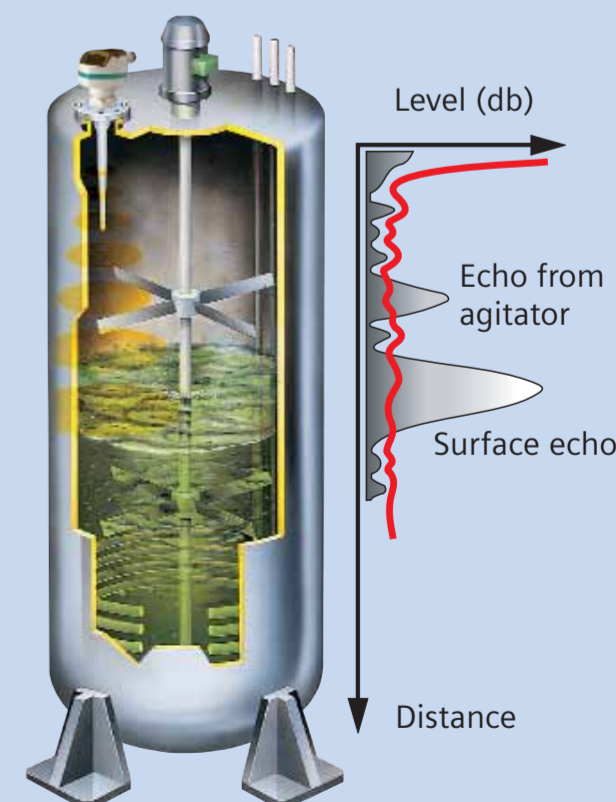
Signal processing with field experience

SITRANS Probe LU and SITRANS Probe LR come with extensive field experience. Siemens Milltronics developed the signal processing technology of these level transmitters based on the experience of a million instruments in industrial applications.

With this experience, we understand the importance of reliability, and we know what it takes to make a trusted and accurate level instrument for demanding applications. That's why our engineers invented Sonic Intelligence and that's why SITRANS Probe carries nineteen patents. It's also the reason SITRANS Probe LU and SITRANS Probe LR have a superior signal-to-noise ratio. With a SITRANS Probe from Siemens Milltronics you get the experience of a million applications in one instrument.

Sonic Intelligence

Our patented Sonic Intelligence signal processing technology was developed using knowledge gathered by our field service engineers from real bins and tank applications. SITRANS level instruments offer the unique advantage of this technology. Sonic Intelligence differentiates between true echoes from the material and false echoes from obstructions or electrical noise. This sophisticated software is continuously updated and supported by field data gathered from more than 500,000 ultrasonic and radar level applications. This in-depth knowledge and experience is built into the software's advanced algorithms to provide intelligent processing of echo profiles. The result is repeatable, fast, and reliable measurement you can trust.



Technical specifications

	SITRANS Probe LU (ultrasonic technology)	SITRANS Probe LR (radar technology)
POWER		
	<ul style="list-style-type: none"> ■ Nominal 24 Vdc with max. 550 ■ Maximum 30 Vdc ■ 4 to 20 mA 	<ul style="list-style-type: none"> ■ Nominal 24 Vdc with max. 550 ■ Maximum 30 Vdc ■ 4 to 20 mA
PERFORMANCE*		
Measurement range	<ul style="list-style-type: none"> ■ 6 m (20 ft) model 0.25 to 6 m (10" to 20 ft) ■ 12 m (40 ft) model 0.25 to 12 m (10" to 40 ft) 	<ul style="list-style-type: none"> ■ 0.3 to 20 m (1.0 to 65 ft)
Accuracy	± the greater of 0.15% of range or ± 6 mm (0.25")	± the greater of 0.1% of range or 10 mm (0.4")
Repeatability	≤ 3 mm	≤ 5 mm
Frequency	54 KHz (ultrasonic)	5.8 GHz (North American 6.3 GHz) (microwave)
Dielectric constant	Not Applicable	$\epsilon_r > 3$ (for $\epsilon_r < 3$, use stillpipe)
Update time	≤ 5 seconds	≤ 1 second
INTERFACE		
Display (local)	Built-in alpha-numeric display – visible through transparent lid	Built-in alpha-numeric display – visible through transparent lid
Communication	<ul style="list-style-type: none"> ■ HART ■ SIMATIC PDM ■ Patented infrared hand-held programmer 	<ul style="list-style-type: none"> ■ HART ■ SIMATIC PDM ■ Patented infrared hand-held programmer
MECHANICAL		
Enclosure	<ul style="list-style-type: none"> ■ PBT (Polybutylene Terephthalate) ■ Lid construction: hard coated PEI (Polyether Imide) ■ Cable inlet: 2 x M20 conduit gland or 2 x 1/2" NPT thread ■ Ingress protection: Type 4X/NEMA 4X, Type 6/NEMA 6/IP68 enclosure 	<ul style="list-style-type: none"> ■ PBT (Polybutylene Terephthalate) ■ Lid construction: hard coated PEI (Polyether Imide) ■ Cable inlet: 2 x M20 conduit gland or 2 x 1/2" NPT thread ■ Ingress protection: Type 4X/NEMA 4X, Type 6/NEMA 6/IP68 enclosure
Process connections	<ul style="list-style-type: none"> ■ Threaded connection: 2" NPT, BSP, or G/PF ■ Flange connection: 3" (80 mm) universal flange ■ Other connection: FMS 200 mounting bracket or customer supplied mount 	<ul style="list-style-type: none"> ■ Threaded connection: 1 1/2" NPT, BSP, or G/PF
Sensor	<ul style="list-style-type: none"> ■ Transducer Options: ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride) 	<ul style="list-style-type: none"> ■ Antenna material: polypropylene rod, hermetically sealed construction
PROCESS CONDITIONS		
Ambient temperature	-40° to 80°C (-40 to 176°F)	-40° to 80°C (-40° to 176°F)
Process temperature	-40° to 85°C (-40 to 180°F)	-40° to 80°C (-40° to 176°F)
Pressure (vessel)	Vented to atmosphere	Vacuum to 3 Bar
APPROVALS		
	General purpose or intrinsically safe, CE, CSA _{USC} , FM, ATEX	General purpose or intrinsically safe, CE, CSA _{USC} , FM, ATEX, Industry Canada, FCC, R&TTE

* Reference conditions
 Specifications are subject to change without notice.
 HART is a registered trademark of HART Communication Foundation.
 SIMATIC PDM and SITRANS are registered trademarks of Siemens AG.
 Milltronics, Sonic Intelligence, and The Probe are registered trademarks of
 Siemens Milltronics Process Instruments Inc.
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SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume, and flow monitoring of liquids in storage vessels and simple process vessels, as well as in open channels. The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry and chemical storage vessels.

The range of SITRANS Probe LU is 6 or 12 meters (20 or 40 feet). Using Auto False-Echo suppression for fixed obstruction avoidance, as well as an improved signal-to-noise ratio, and improved accuracy of 0.15% of range or 6 mm (0.25"), the Probe LU provides unmatched reliability.

SITRANS Probe LU includes Sonic Intelligence® signal processing from the field-proven Milltronics Probe, and incorporates new echo processing features and the latest micro-processor and communications technology.

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.



Product Features

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple startup
- Programming using infrared intrinsically safe handheld programmer, SIMATIC PDM, or HART® Communicator
- Communication using HART®
- ETFE or PVDF transducers for chemical compatibility
- Patented Sonic Intelligence signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression for fixed obstruction avoidance

Technical Specifications

Power

- nominal 24 V DC with max. 550 Ohm.
- maximum 30 V DC
- 4 to 20 mA

Output

- mA
 - range: 4 to 20 mA
 - accuracy: ±0.02 mA
 - span: proportional or inversely proportional

Performance*

- frequency: 54 KHz
- measurement range
 - 6 m (20 ft) model: 0.25 to 6 m (10" to 20 ft.)
 - 12 m (40 ft) model: 0.25 to 12 m (10" to 40 ft.)
- blanking distance: 0.25 m (10")
- accuracy: ± the greater of 0.15% of range or ±6 mm (0.25")
- repeatability: ≤ 3 mm (0.12")
- resolution: ≤ 3 mm (0.12")
- update time at 4 mA: ≤ 5 s
- beam angle: 10° at -3 dB boundary
- temperature compensation: built-in to compensate over temperature range
- memory: non-volatile EEPROM, no battery required

Interface

- HART: standard, integral to analog output
- configuration using Siemens SIMATIC PDM (PC) or HART handheld communicator, or Siemens Milltronics infrared hand programmer

Programmer (optional infrared keypad)

- approval: ATEX Ex II 1 G, EEx ia IIC T4, SIRA certificate 01ATEX2147
- ambient temperature: -20 to 40 °C (-5 to 104 °F)
- interface: proprietary infrared pulse signal
- power: 3 V lithium battery (non-replaceable)

Mechanical

Enclosure (electronic):

- construction: PBT (Polybutylene Terephthalate)
- conduit entry: 2 M20 conduit glands or 2 x ½" NPT thread
- ingress protection: Type 4X / NEMA 4X, Type 6 / NEMA 6, IP67

Transducer (2 options)

- ETFE (Ethylene Tetrafluoroethylene), or
- PVDF (Polyvinylidene Fluoride)

Process Connections:

- threaded connection: 2" NPT, BSP, or G/PF
- flange connections: 3" (80 mm) universal flange
- other connection: FMS 200 mounting bracket or customer supplied mount

Weight

- 2.1 kg (4.6 lb)

Environmental

- location: indoor/outdoor
- altitude: 5000 m (16404 ft.) max.
- ambient temperature: -40 to 80 °C (-40 to 176 °F)
- relative humidity: suitable for outdoor (Type 4X/NEMA 4X, Type 6 / NEMA 6 / IP67 / IP68 enclosure)
- installation category: I
- pollution degree: 4
- pressure rating: ambient

Process

- temperature at flange or threads: -40 to 85 °C (-40 to 185 °F)
- pressure (vessel): ambient, vented to atmosphere

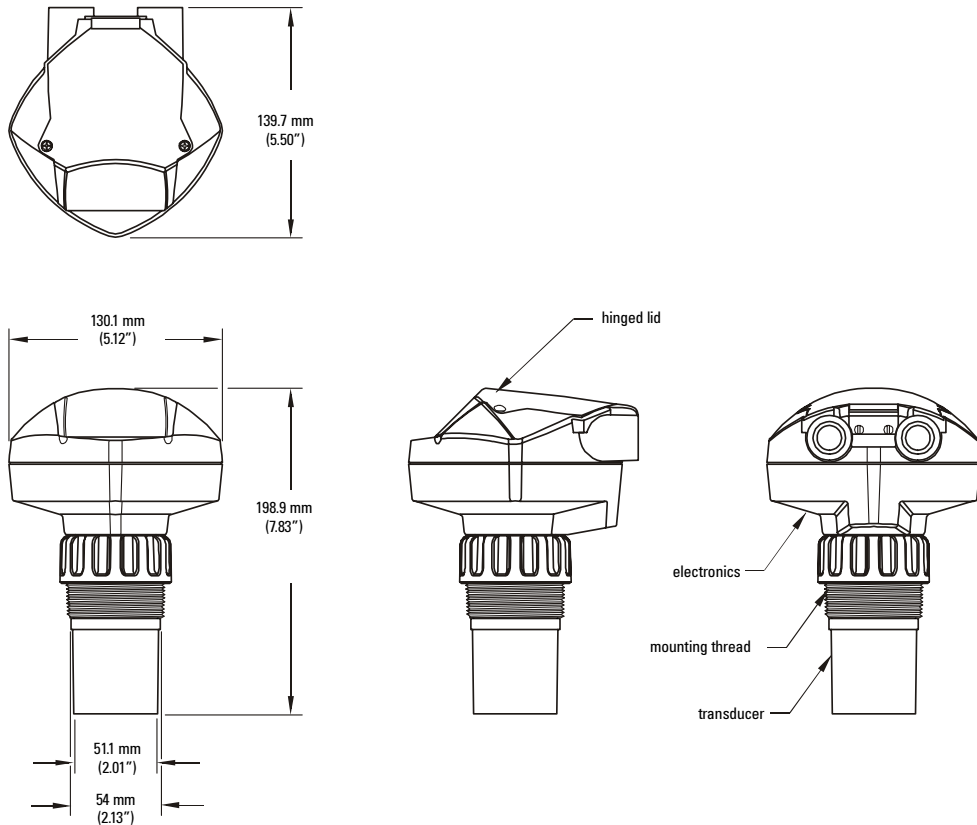
Approvals

- general: CSA_{US/C}, FM, CE
- hazardous:
 - Europe: ATEX II 1G EEx ia IIC T4
 - USA: FM Class 1, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups E, F, G; Class III;
 - Canada: CSA Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Group G; Class III

* Under reference conditions
HART is a registered trademark of the Hart Communications Foundation.
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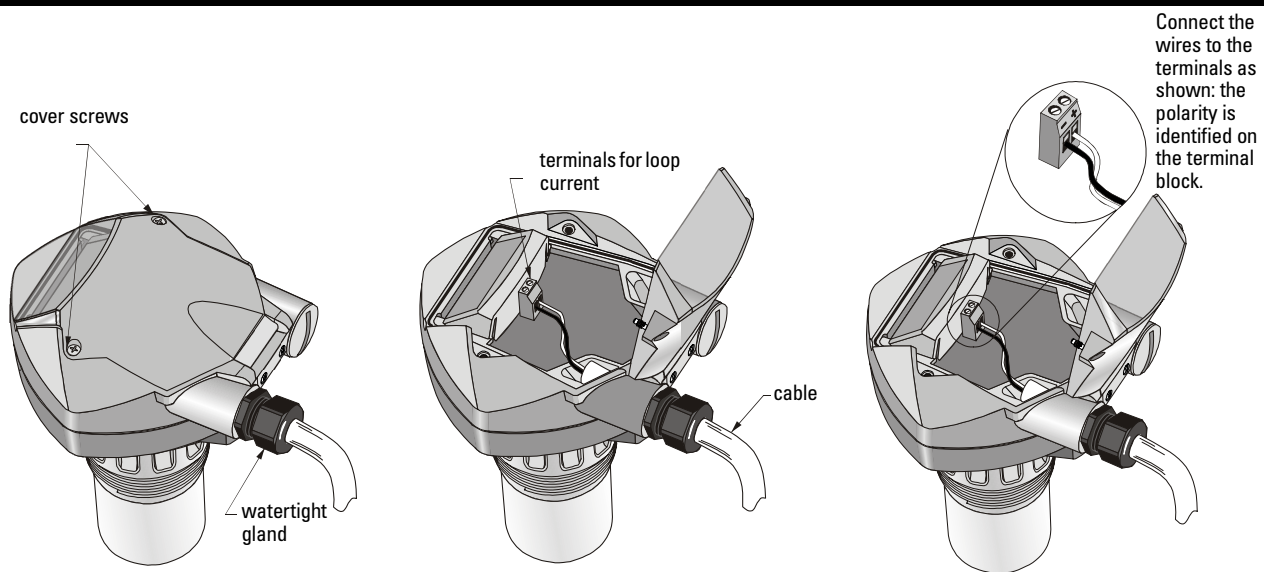
SITRANS Probe LU

Dimensions



Note: Above model is shown without M20 conduit glands or ½" NPT conduit connectors.

Wiring



Notes

- Model above is shown with M20 conduit glands. ½" NPT threaded connection is also available.
- DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
- all field wiring must have insulation suitable for rated input voltages.
- use shielded twisted pair cable (wire gauge 14-22)
- separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.