

SIEMENS

SITRANS LR 300: High Performance Radar for Level Measurement



Reliable Measurement In Extreme Conditions

SITRANS LR 300 delivers high performance level measurement at an affordable price for the chemical, petrochemical and pharmaceutical processing industries.

This sophisticated radar instrument uses advanced microwave pulse technology to provide reliable continuous level measurement in liquids or slurries, even in extreme process conditions. With its low frequency and high signal transmission speed, it is virtually unaffected by:

- Temperature or pressure extremes
- Steam
- Dense foam
- Vapors
- Condensation
- Dust
- Aggressive chemicals
- Encrustation
- Turbulence
- Agitation



It uses non-contacting technology, with a high resistance PTFE (Teflon®) rod antenna that is chemically immune and resistant to material build-up. It features patented Sonic Intelligence® signal-processing technology for superior reliability.

The instrument is compact, rugged and easy to install – simply position the unit on a nozzle, bolt it in place and connect it to the power supply. It can be fully operational by entering as few as three parameters. There's no need to fill or empty the vessel for calibration or commissioning. Its reliability makes it low maintenance.

The modular design features a full line of process connections, horns and waveguide antenna options to accommodate virtually any tank or application.

Reliability

SITRANS LR 300 is one of the Siemens Milltronics family of high performance level detection and monitoring instruments. Siemens Milltronics is a leading manufacturer of sophisticated process control instruments, offering the process industries a broad range of technology choices and product flexibility.



The SITRANS LR System at Work

SITRANS LR 300 provides reliable level measurement for a wide range of applications, and the choice of flanges and threaded connections facilitates mounting on virtually any tank or vessel. It is the right choice for sophisticated monitoring applications with communications requirements, or for tanks containing baffles, heating coils or other obstructions. A few application examples are outlined here:

Chemical Process or Reactor Tanks

The SITRANS LR 300 effectively monitors chemicals in simple storage containers or in challenging reactor vessels where the environment and material change rapidly from one extreme to another. The high signal-to-noise ratio delivers reliable performance in these dynamic conditions. The SITRANS LR 300 offers enhanced reliability over 2-wire systems that often lack the power to process and respond quickly, especially on low dielectric materials. Sonic Intelligence advanced echo processing and Auto False-Echo Suppression features produce reliable readings even in tanks with agitators and heating coils. The PTFE rod antenna withstands high temperatures and resists chemical attack and build-up. A purged (self cleaning) option is available for slurry applications where severe build-up is expected.

Bitumen or Hot Mix Asphalt Tanks

The SITRANS LR 300 system is proven tough even in the harsh environment of a bitumen or hot mix asphalt tank. The rugged construction and chemical resistant PTFE rod antenna withstand harsh conditions. It's low maintenance, without the nuisance of broken floats or stuck cables typical of mechanical systems.

Anaerobic Digester Tanks

The level in an anaerobic digester is a critical measurement. If the top foam level gets too high, it can enter the gas collection pipeline and lead to costly maintenance. With its unique sliding waveguide, SITRANS LR 300 lets you raise the device for installation or inspection without releasing harmful gas into the atmosphere. The waveguide carries the radar signal from the instrument to the horn antenna, bypassing the spool and valve components. The pipe has a clamping seal on top of the mounting flange which seals the low pressure digester gases after installation.

Advanced features of the SITRANS LR 300:

- Sonic Intelligence® echo processing for superior reliability
- Auto False-Echo Suppression is simple with the handheld programmer
- High signal-to-noise ratio for superior performance in dynamic conditions
- 32-point linearization (strapping table) ensures accuracy on non-standard tanks
- Modbus and HART® communications built in; optional Profibus-PA
- Choice of epoxy-painted aluminum or stainless steel enclosure
- Process connections, horns and waveguide antenna options to suit any tank or application
- Patented infrared handheld programmer is certified intrinsically safe for use in hazardous areas
- Patented universal ac/dc power supply simplifies power requirements and is immune to spikes, surges and brownouts
- Standard and explosion-proof versions
- Easy to install and maintain

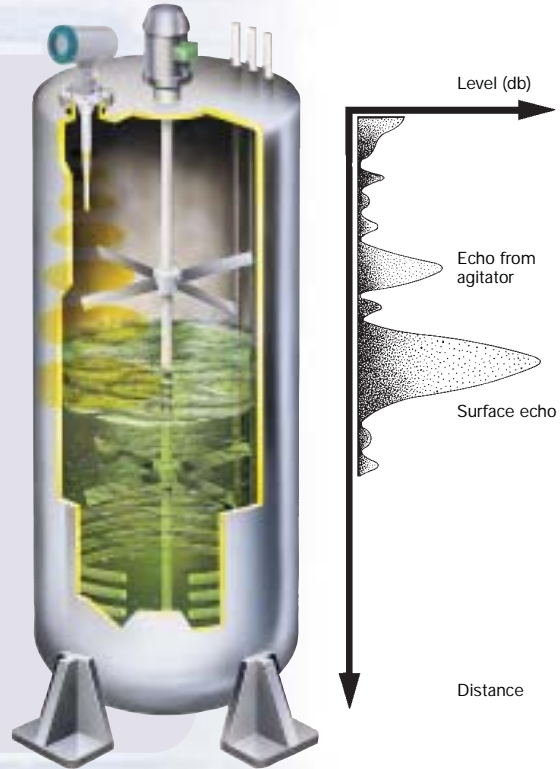


High Performance Radar Technology

Microwaves are electromagnetic waves that require no carrier medium. They are virtually unaffected by the process atmosphere (pressure, temperature or vacuum).

SITRANS LR 300 operates at a 5.8 GHz frequency (6.3 GHz U.S.A.) and a high signal transmission speed (at the speed of light). This low frequency is well suited for process tanks. It provides the highest immunity against antenna deposit and the largest possible signal amplitude on agitated surfaces.

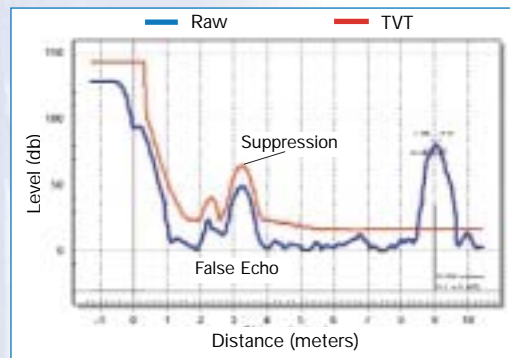
The SITRANS LR 300 consists of a transmitter/receiver, an antenna (rod, horn or wave guide) and a signal processor. Siemens Milltronics microwave pulse technology continuously measures material levels without contacting the process.



Sonic Intelligence® Advantage

Only Siemens Milltronics products feature patented Sonic Intelligence signal-processing technology that is field-proven in more than 500,000 applications worldwide. This advanced echo-processing technique ensures consistently reliable data even in harsh environments, foam and

turbulence that can make other devices inoperable. The software differentiates between true echoes from the material being measured and false echoes generated by obstructions or electrical noise. The result is repeatable, fast and reliable measurement.



Auto False-Echo Suppression: An added feature of SITRANS LR 300 is Auto False-Echo Suppression, an echo-processing technique that automatically detects and suppresses false echoes from tank obstructions. Unlike other radar devices that require a laptop, SITRANS LR 300 lets you implement this feature using just a few keys on the Siemens Milltronics handheld programmer.



Modular Design for Maximum Application Flexibility

Antenna Configurations



Flat faced flange connection.



Threaded process connection for vessels without a nozzle.



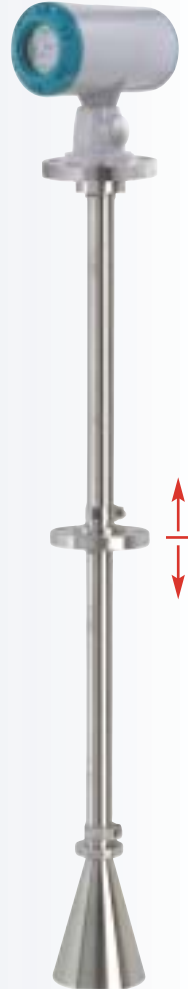
PTFE rod antenna with a stainless steel shield eliminates nozzle interference. Various lengths available.



Horn with waveguide extension. Used for high temperature isolation, long nozzles, and clearing tank obstructions.



Waveguide antenna for low dielectric products. Custom lengths available.



Sliding waveguide antenna, typically for digester applications that include an isolation valve between the instrument and the vessel.

Infrared IS Programmer: SITRANS LR 300 is the only radar unit available with a patented infrared handheld programmer that is certified as intrinsically safe for use in hazardous areas.

Sanitary Models



4" sanitary horn connection for food applications.



Sanitary rod connection for food applications. 2", 3", or 4" sizes available.



Sanitary clamps and ferrules (shown above respectively) are available for the sanitary connection types.



SITRANS LR 300 comes in a stainless steel version for use in the food, pharmaceutical, and marine markets.

Technical Specifications*

Operations	SITRANS LR 300
Measuring Principle	Pulse-based microwave
Modes of Operation	Level, space, distance, volume
Detection Range	20 m (66 ft.) maximum, liquids and slurries
Accuracy	± 0.15%
Repeatability	2 to 10 mm
Frequency	5.8 GHz (U.S.A. 6.3 GHz)
Signal Processing	Sonic Intelligence
Electrical	
Power Supply	Universal ac/dc (24 V–230 V)
Interface	
Analog Output	HART/mA standard, optional Profibus-PA
Digital I/O	RS-485 Modbus or Dolphin
Display	Local display, backlit
Housing	
Enclosure	Aluminum, epoxy coated; optional stainless steel
Ingress Protection	NEMA 6, IP67, NEMA 4x
Antenna	
Types	PTFE rod/stainless steel horn antenna and waveguides
Process Connections	Flat faced flanges, threaded connections, sanitary connections
Programming	Infrared handheld programmer Dolphin Plus (RS-485) HART Siemens Simatic PDM
Auto False Echo Suppression	Adjustable to 20 m (65.6 ft.)
Process**	
Material Dielectric	$\epsilon_r > 1.8$. For $\epsilon_r < 3$, contact nearest Siemens Milltronics representative
Pressure (vessel)	-100 kPa to 4000 kPa (-1 to 40 bar)
Temperature (process)	-40 to 200°C (-40 to 392°F)
Temperature (ambient)	-40 to 60°C (-40 to 140°F)
Available Approvals	
Radio	Europe, FCC, Industry Canada
Hazardous/Non-Hazardous	CE, CSA, FM, ATEX
Sanitary	3A

* For more detailed specifications visit our website at www.siemens-milltronics.com.

** Pressure and temperature limitations are dependent on process connection method and antenna material. Contact Siemens Milltronics for de-rating curves.

Specifications subject to change without notice.

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