Rosemount 3300 Series

Guided Wave Radar Level & Interface Transmitter

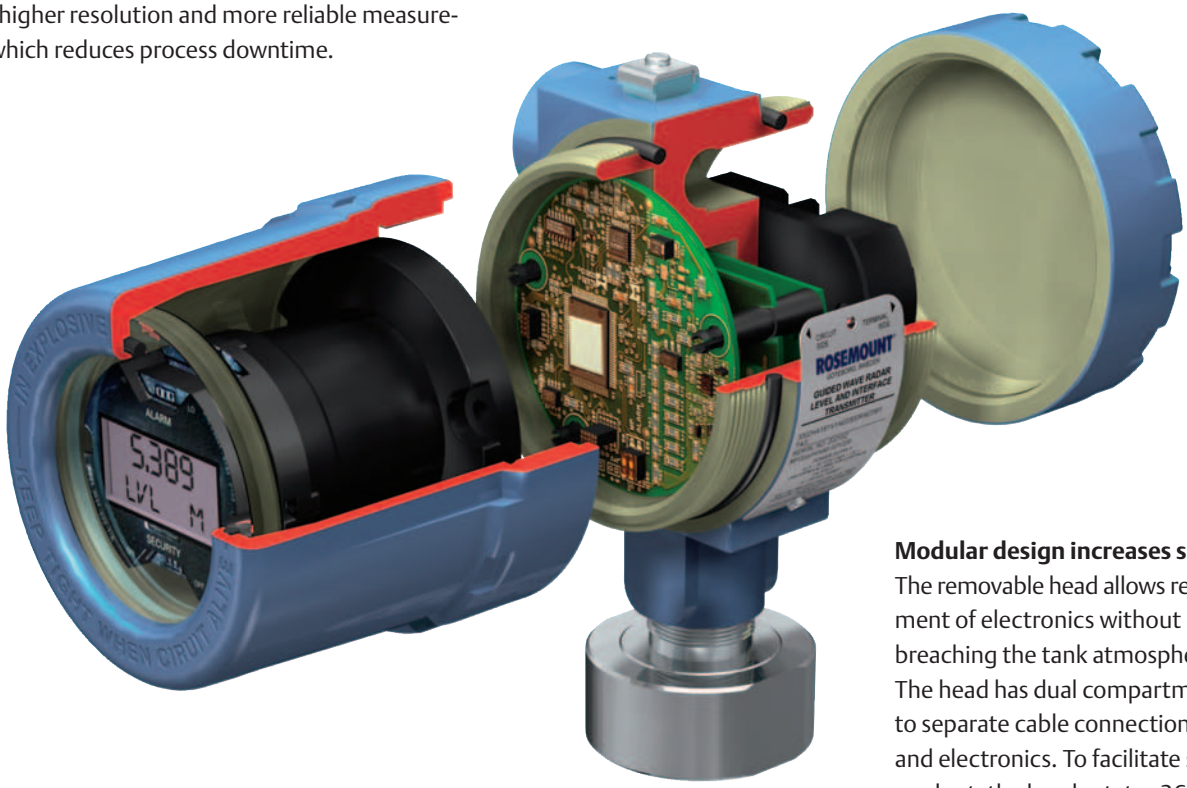
Reliable and effortless measurement in demanding applications

ROSEMOUNT®

EMERSON™
Process Management

High reliability increases uptime
Efficient digital sampling, advanced signal processing, and a high-capacity, energy efficient micro controller result in higher resolution and more reliable measurements, which reduces process downtime.

Loop powered, Intrinsically Safe, and Explosion Proof



Modular design increases safety
The removable head allows replacement of electronics without breaching the tank atmosphere. The head has dual compartments to separate cable connections and electronics. To facilitate safe readout, the head rotates 360°.

Reduced cost with MultiVariable™ process output
The transmitter simultaneously measures level, interface level, volume, distance to level, distance to interface, and thickness of upper layer on the same two wires. This results in fewer process penetrations and reduces installation and wiring costs.

Guided Wave probes for all applications
Handles difficult tank geometries with interfering obstacles, long nozzles, and small fittings or flanges. Virtually unaffected by dust, turbulence, and vapor. Robust enough for very high temperatures and pressures and corrosive environments. Probes can easily be cut to fit individual tanks.

Loop powered radar transmitters for measuring both level and interface

The Rosemount 3300 Series is designed to provide reliable and cost-effective measurement in a number of applications where other types of loop-powered transmitters cannot be used. Guided Wave Radar technology, combined with advanced signal processing and sensitivity, ensures that the 3300 delivers both level and interface measurement data from the same transmitter.

The two-wire connection ensures simple and inexpensive installation. Configuration is easy with a 375 Field Communicator or the PC setup software, Radar Configuration Tools (RCT), including installation wizard and waveform plot.

As with all Rosemount products, the 3300 Guided Wave Radar Level and Interface Transmitter is built to ensure the productivity and safety of your manufacturing process.

Reduced Maintenance

- No mechanical moving parts that require maintenance
- Head can be removed while tank is in service for easier repair or upgrades
- RCT provides easy troubleshooting
- Adjustments without opening tank
- No re-calibration required

Application Flexibility

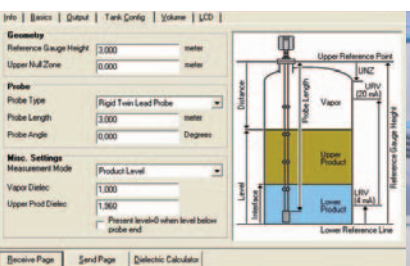
- Handles changing density, dielectrics, conductivity, temperature, pressure, pH, and viscosity
- Handles small tanks, difficult tank geometry, interfering obstacles
- Virtually unaffected by dust, vapor, and turbulence
- MultiVariable, Level and Interface
- Guided wave probes for all applications, including very high pressures and temperatures
- Suitable for a wide variety of industries

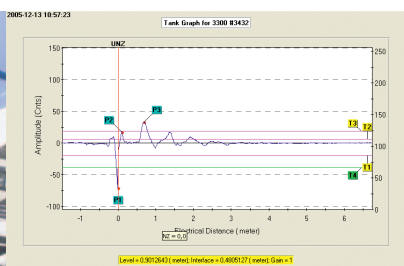
Easy Installation

- Top-down measurement
- Installation while tank is in service
- Loop powered
- Easy swap, matching existing tank connection
- Cut-to-fit probes
- Pre-configured or user-friendly configuration with RCT

Superior Reliability

- Over 10,000 units installed (2005)
- Field demonstrated MTBF over 170 years
- Advanced signal processing, including Dynamic Gain Optimization™, for reliable measurement in demanding applications
- Virtually unaffected by process conditions





Built to provide exact level data in demanding process conditions

Rosemount 3300 Series transmitters are based on Time Domain Reflectometry (TDR) technology. TDR measures level by low-power nano-second microwave pulses that are guided down a probe suspended in the process media. When a radar pulse reaches media with a different dielectric constant, part of the energy is reflected back to the transmitter.

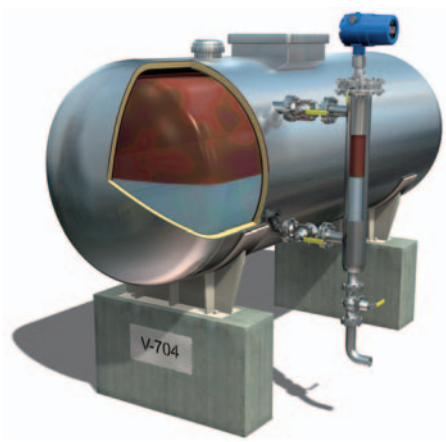
The time difference between the transmitted (reference) and the reflected pulse is converted into a distance value from which the total level or interface level is calculated. Because guided radar pulses are virtually unaffected by tank content and tank atmosphere, temperature or pressure, tank shape and internal tank equipment, the level measurement is very precise.

Level measurement in small tanks and tanks with obstacles, turbulence, or vapor

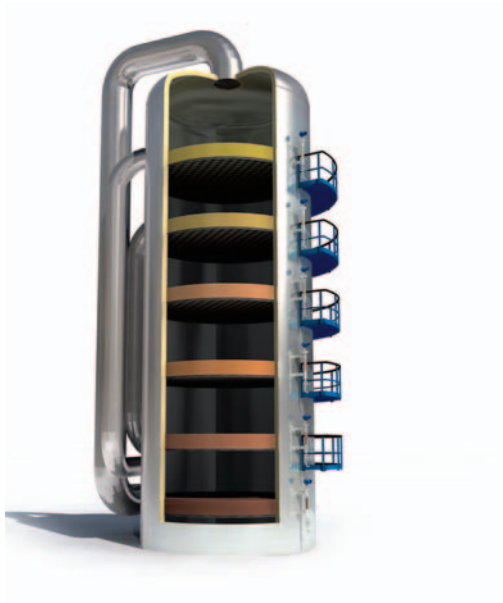
The Rosemount 3300 Series delivers reliable level data where other radar transmitters fail. The high signal/noise ratio in the transmitter, and the fact that the radar pulse is focused along the probe, helps eliminate echo interference problems. This means that a 3300 Series transmitter equipped with a suitable probe will provide reliable measurements in process vessels containing baffles and heating coils. Turbulent liquids or vapors have no affect on the level data.

Level gauging in bridles

Guided Wave Radar is also the best choice for bridle measuring. The Rosemount 3300 Series transmitters work in bridles with pipe inlets, varying diameter, and other configurations. As both level and interface can be measured with the same probe, only a single bridle is required for dual level measurement.



High pressure and temperature applications



The Rosemount 3300 Series, with its robust high pressure and temperature process solution, can manage pressures up to 5000 psig (345 bar) and temperatures up to 752° F (400° C). Applications include refinery distillation columns, liquified gases and freons, power plants, industrial utility heater vessels, gas-oil production separators and compressor tanks.

Level gauging in liquified gases and ammonia tanks

Liquified gas as LPG and liquid Chlorine and other pressurized applications demand maintenance-free measurement equipment. Since the transmitter head can be serviced without breaching the tank atmosphere, the Rosemount 3300 Series is perfect for pressurized and volatile applications where the tank opening must be minimized. Because the 3300's DC pulse operates with minimum signal attenuation in heavy vapors, the 3300 Series is the best choice for the measurement of liquid ammonia.

Interface level measurement

The Rosemount 3302 is the first multivariable loop-powered transmitter to deliver multilevel measurement. The advanced signal processing feature, including Dynamic Gain Optimization™, enables the measurement of both top surface and interface level in tanks containing different liquids, such as oil and water. A single transmitter will serve both applications, which decreases the number of tank penetrations required. This is a valuable feature in applications such as pressurized tanks, separators and underground tanks with limited space for penetrations.

Measurement of solids in silos

The Rosemount 3301, although designed for liquids, may also be used in many solids applications. Measurement ranges, product dielectric constants, and tensile loads should be taken into account. Therefore, please contact your local Emerson representative with details for advice on the suitability of the 3301 for such applications.

A variety of probes to suit any application

Several probe versions are used together with the same transmitter head: Twin, Single, and Coaxial leads in Standard (Std), High Pressure (HP), or High Temperature and Pressure versions (HTHP), as well as in different materials: SST, Hastelloy, Monel, or PTFE covered SST.

In order to stabilize the probe against lateral forces, a weight can be hung at the probe end or the probe can be guided to the tank bottom (tie-down) using suitable anchoring. All probes are delivered with a customer-specified length, but can be cut to fit on site, if necessary.

Coaxial

The optimal solution for level and interface measurement in all clean liquids such as solvents, alcohols, water-based liquids, LPG, and liquid ammonia. Recommended for liquids with low dielectric constants and applications with turbulence, high flow, foam, liquid, or vapor spray near the probe (the coax acts as a stilling well). The coaxial probe is available in Std, HP, and HTHP versions and in SST, Hastelloys or Monel material.

Twin lead

For liquid applications such as oil products, solvents, water-based liquids, etc. Also suitable for interface measurements. Handles media that is more viscous than the coaxial probe. Avoid sticky media where there is risk of product bridging between probes. The twin leads are available in Std version and in SST material.

Single lead

The single lead probes are the most tolerant against coating and deposits.

The rigid single lead is recommended for smaller tanks with viscous liquids, slurries, beers/spirits, water based liquids, and hygienic applications in the food & beverage or pharmaceutical industries. Available in Std, HP, and HTHP versions and in SST, Hastelloy, Monel, or PTFE covered SST material.

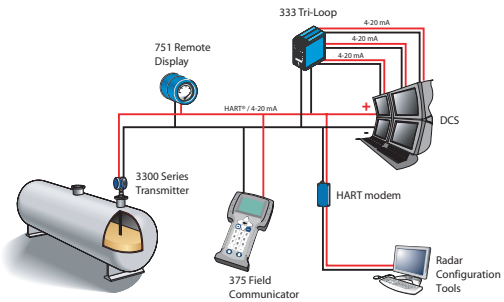
The flexible single lead is especially suitable for measuring solids, granulates, and powders like grain, sand, carbon black, etc. It also measures viscous products like syrup and honey as well as water-based liquids. Available in Std version and in SST or PTFE covered SST material.

Easy plant integration

The transmitter can be easily mounted on a suitable opening at the top of the tank, vessel or silo. The transmitter is easily configured via your choice of the standard Rosemount options: Radar Configuration Tools, 375 Field Communicator or AMS™ Suite: Intelligent Device Manager. The transmitter can also be pre-configured before delivery.

User-friendly configuration

The Radar Configuration Tools is a user-friendly, Windows-based PC software package with installation wizard, waveform plot, autoconnect, dielectric calculator, logging, and online help. This provides easy configuration and service.



Inputs/outputs

The loop-powered Rosemount 3300 Series uses the same two wires for both power supply and output signal. A level or interface value is transmitted as an analog 4–20 mA signal with a superimposed digital HART® signal. A Tri-Loop™ HART® to analog converter can be connected to attain three additional analog outputs.

The 3300 Series transmitter is part of Emerson's broad range of intelligent, digital field devices that power the PlantWeb® digital plant architecture to improve plant efficiency by 2% and more through delivering asset optimization, process automation, and management execution. Further cost savings, increased plant availability, and enhanced safety and environmental compliance are achieved when the level transmitters are integrated into the PlantWeb architecture.

POWERS PlantWeb®

Summary specification

Product	Model 3301 for Level of liquids and some solids Model 3302 for Level and Interface in liquids
Process connection	Threaded or flanged
Probe materials	SST, Monel, Hastelloy, or PTFE covered SST
Process temperature	Std version up to 300° F (150° C), HTHP/HP version up to 752° F (400° C). See PDS for complete data
Process pressure	Std version up to 580 psig (40 bar), HTHP/HP version up to 5000 psig (345 bar). See PDS for complete data
Power supply	Loop-powered (2-wire), 11–42 VDC (11-30 VDC in I.S. applications, 16–42 VDC in Explosion Proof /Flame Proof applications.)
Output	Analog 4-20 mA, HART®
Reference accuracy	± 0.2 inch (5 mm) for probes ≤ 16 ft (5 m) ± 0.1 % x measured distance for probes >16 ft (5 m)

Complete specifications are provided in the Product Data Sheet, ref no. 00813-0100-4811. Specifications are subject to change without prior notice.

A COMPLETE PRODUCT RANGE FOR PROCESS LEVEL MEASUREMENT

ROSEMOUNT LEVEL MEASUREMENT TRANSMITTERS FROM EMERSON ARE DESIGNED TO CUT COSTS AND INCREASE SAFETY BY GIVING PRECISE AND RELIABLE LEVEL DATA UNDER MOST PROCESS CONDITIONS. BASED ON FOUR DIFFERENT MEASUREMENT PRINCIPLES – NON-CONTACTING RADAR, GUIDED WAVE RADAR, VIBRATING FORK LEVEL SWITCH AND DIFFERENTIAL PRESSURE – THE ROSEMOUNT PRODUCT OFFERING COVERS A WIDE RANGE OF LEVEL MEASURING TECHNOLOGIES TO FULFILL EASY AND DEMANDING APPLICATIONS.

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