

Just imagine what you could expect to gain from radar level measurement. **Then double it.**



The all-new Rosemount 5400 Series Radar Level Transmitter

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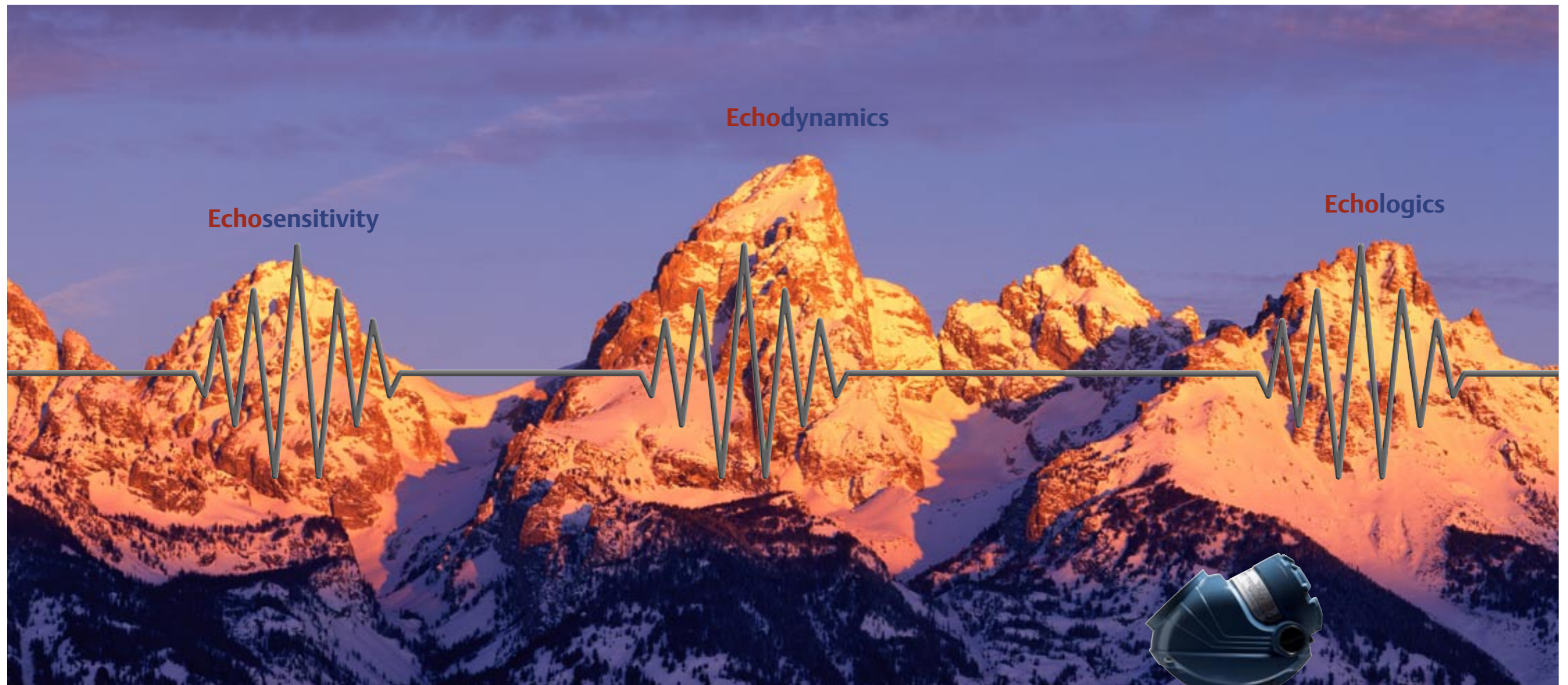
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All-in-one makes all the difference.

Rosemount 5400 is our new premium series 2-wire radar level system for process applications. It delivers everything you could expect from a best-in-class process radar transmitter – superior reliability, state-of-the-art safety features, effortless handling and unlimited connectivity.

Uniquely, it offers peak performance in three areas vital to radar level measurement: echosensitivity – the ability to detect weak radar echoes reliably; echodynamics – the ability to handle weak and strong radar echoes simultaneously; and echologics – the ability to ignore false echoes.

This combination makes the Rosemount 5400 series deliver like no 2-wire radar in history. Because this technology concept has been developed with our customers' bottom line in mind, we simply call it Radar Economics™.



radar **Economics**

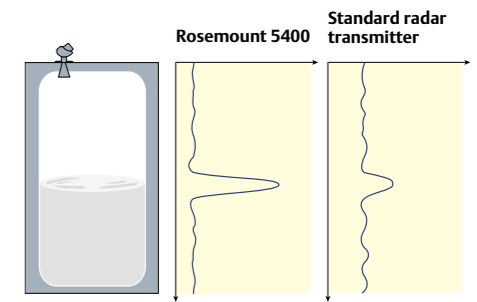
Rosemount 5400

Radar Echonomics™ Innovative measurement technologies for a better bottom line.



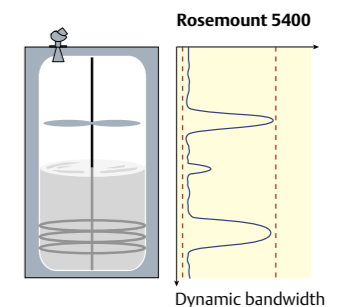
Echosensitivity – the skill to detect weak echoes reliably

Generally, a weak radar echo is difficult to measure reliably. The more the surface of the fluid and the atmosphere in the tank dampen the radar signal, the weaker the echo becomes. A good radar sensor must therefore be able to send a strong signal and have a sensitive receiver. We call this capacity echosensitivity.



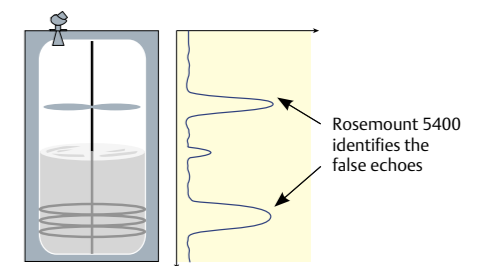
Echodynamics – the ability to handle weak and strong echoes simultaneously

In most process tanks, strong and weak radar echoes coexist. The echo from a turbulent fluid surface being agitated may be significantly weaker than the echo from the agitator. In order to take accurate readings, the radar sensor must pick up both the strong and weak echoes at the same time. We call this capacity echodynamics.



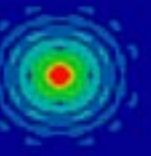
Echologics – the intelligence to tell the true echoes from clutter

A good radar sensor should never confuse the echo from the fluid surface with other echoes, which may be several times stronger. Echologics is the term we use for the capacity to determine which is the 'right' signal. The Rosemount 5400 series can track five different echoes simultaneously while the level in the tank increases or decreases or the tank content changes. As a result, clutter signals from beams, agitators, heating coils and the tank bottom can be identified and ignored.



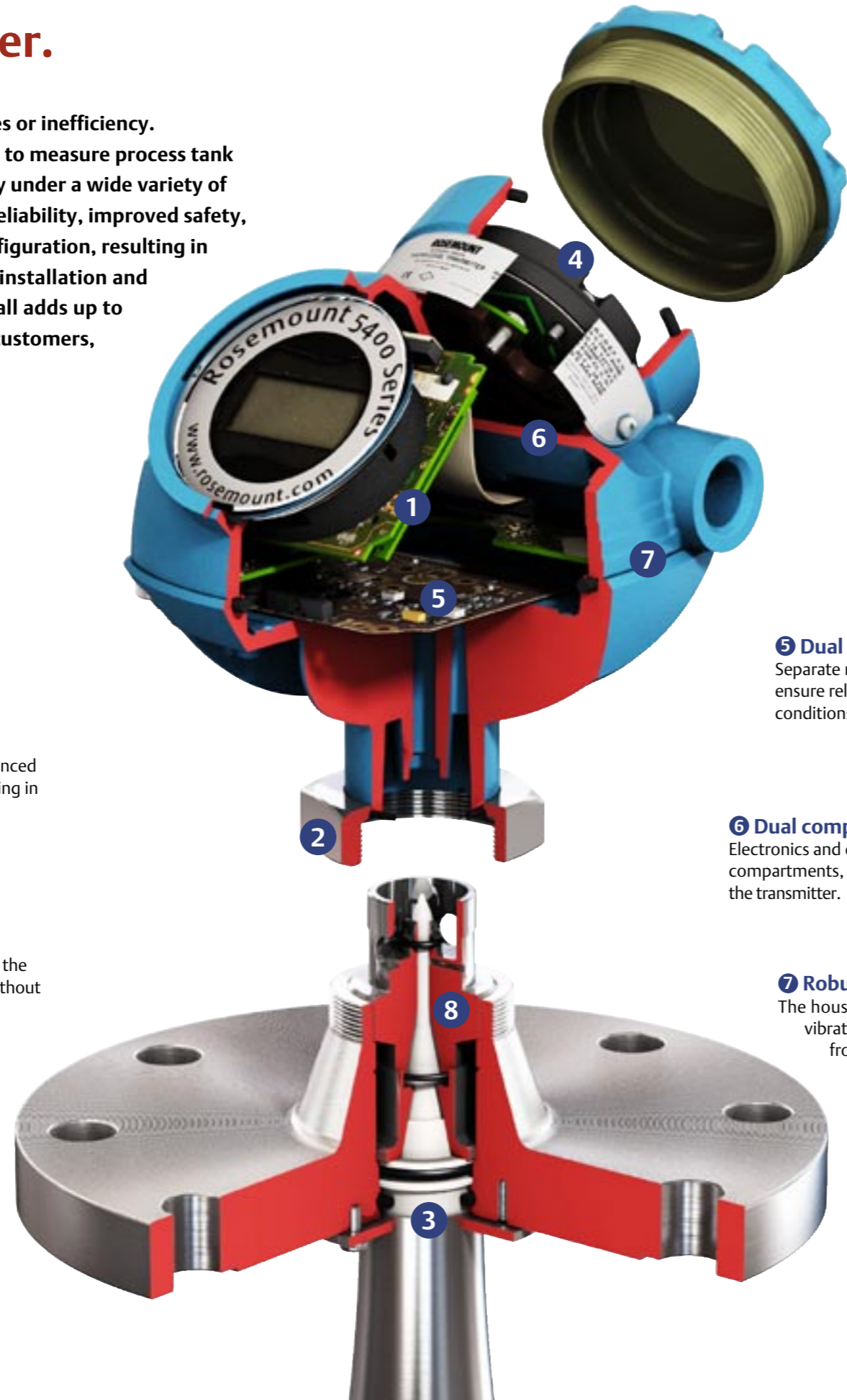
The Rosemount 5400 series is the first non-contact radar level transmitter developed from the ground up to improve profitability in your process plant. It comprises the “Radar Echonomics” approach, adding value to your plant by utilizing the radar signals optimally to secure reliable measurement.

Radar Echonomics builds on a combination of high echosensitivity, balanced echodynamics and smart echologics. These advanced technical solutions create an optimal interplay between electronics, microwave technology and software.



Designed to deliver.

Your company has no room for mistakes or inefficiency. The Rosemount 5400 series is designed to measure process tank levels with the highest level of accuracy under a wide variety of process conditions. It delivers higher reliability, improved safety, and requires less maintenance and configuration, resulting in reduced process downtime and lower installation and operating costs. For your business, it all adds up to better product quality, more satisfied customers, and higher profits.



1 Measure & learn signal processing

A high performance microprocessor enables advanced signal processing and smart echo-tracking, resulting in higher reliability.

2 Interchangeable transmitter head

The transmitter head can easily be removed from the antenna and flange for service or replacement, without opening the tank.

3 Condensation resistant antenna

Larger sealing surface towards the process, making the transmitter less sensitive to condensation and dirt.

4 Isolated transient protection

Dual compartments isolate transient protection from the electronics.



5 Dual port technology

Separate microwave ports for sending and receiving radar signals ensure reliable detection of weak echoes under tough process conditions.

6 Dual compartment housing

Electronics and cable connections are located in separate compartments, providing safer handling when connecting/disconnecting the transmitter.

7 Robust design

The housing and flange feature a robust, shock-resistant and vibration-proof design to protect the electronics and waveguide from mechanical damage.

8 Dual seal design

The dual seal provides additional protection against leakage into safe areas via the electrical conduit system.

Higher reliability

- Dual port technology
- Condensation resistant antenna
- Circular polarization of radar signals
- Dynamic range optimization
- Robust design

Improved safety

- Dual compartment housing
- Dual seal design
- Interchangeable transmitter head without opening the tank

Better serviceability

- Interchangeable transmitter head
- Measure & Learn transmitter software
- No contact with the liquid
- Ergonomic design

Easy system integration

- 2-wire
- 4–20 mA, HART®
- FOUNDATION fieldbus™ (in preparation)
- Supports Plantweb® functionality

No contact. No problem.

The performance of the non-contacting Rosemount 5400 level transmitter makes it suitable for a wide range of process applications. It installs easily into existing openings, which means fast and inexpensive start-up and a quicker return on your investment.

The Rosemount 5401, which uses a low frequency (6 GHz) radar signal, deals well with obstacles such as turbulence, condensation, vapor, dust, contamination and foam.

The Rosemount 5402 uses a high frequency (26 GHz) radar signal, which produces a narrower radar beam resulting in smaller antenna diameters suitable for mounting on valves, taller nozzles or smaller openings. The narrow beam also means that it is easier to avoid unwanted reflections from mechanical obstacles such as agitators and heating coils.

1 Level measurement in storage or buffer tanks

For measurements in a tank with a calm or slightly moving surface, the Rosemount 5400 series transmitter is a good choice, particularly where the tank has a narrow nozzle opening.

2 Level measurement in bridles or pipes

The Rosemount 5400 series transmitter is an excellent choice for level gauging in tanks with bridles or stilling pipes due to the circular polarization of the radar signals.

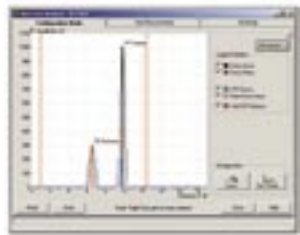
3 Level measurement in reactor tanks

The exceptionally reliable measurement provided by the Rosemount 5400 series transmitter makes it a very suitable choice for tanks with harsh and varying process conditions.



Easy plant integration.

Moving to a better level transmitter couldn't be easier. The Rosemount 5400 series uses the same two wires for both power supply and output signal. Measurement data are transmitted in either an analog 4–20 mA signal with superimposed digital HART® or a FOUNDATION™ fieldbus signal.



The RadarMaster with installation wizard and waveform plot capability provides easy configuration and service. RadarMaster also includes comprehensive disturbance echo handling, logging and online help.

Ultimate setup software

The 'Rosemount RadarMaster™' is a Windows-based PC suite developed to set up and install your Rosemount 5400 transmitter quickly and easily. The RadarMaster software includes an installation wizard, offline/online configuration, extensive online help, spectra plot with "movie mode", and much more. RadarMaster also supports the "Measure & Learn" signal processing, enabling automatic suggestion of threshold and disturbance echo settings, which makes tough applications easy to configure.

Basic configuration can also be performed using a 275/375 Field Communicator, AMS™ Suite, Intelligent Device Manager or Delta V™ (for FOUNDATION™ fieldbus).

Powers PlantWeb®. Turbo-style

A chain is only as strong as its weakest link. The Rosemount 5400 series will constitute one of the strongest links in your process monitoring chain. Reliable level measurement is a prerequisite, but there is more to it than that.

The Rosemount 5400 series supports "PlantWeb Alerts", a system for alarms and warnings common to all PlantWeb Alert equipment. The "Powers PlantWeb" symbol indicates that the Rosemount 5400 series transmitter is an intelligent field device, designed to deliver advanced diagnostics.



Intelligent readouts and alerts

- True level
- Low level alert
- Volume
- High level alert
- Level rate





The look of innovation.

You've noticed it already. The 5400 series doesn't look like other Rosemount transmitters. To accommodate the powerful electronics, we needed a new housing. Still, the build had to be compact and solid, definitely Rosemount.

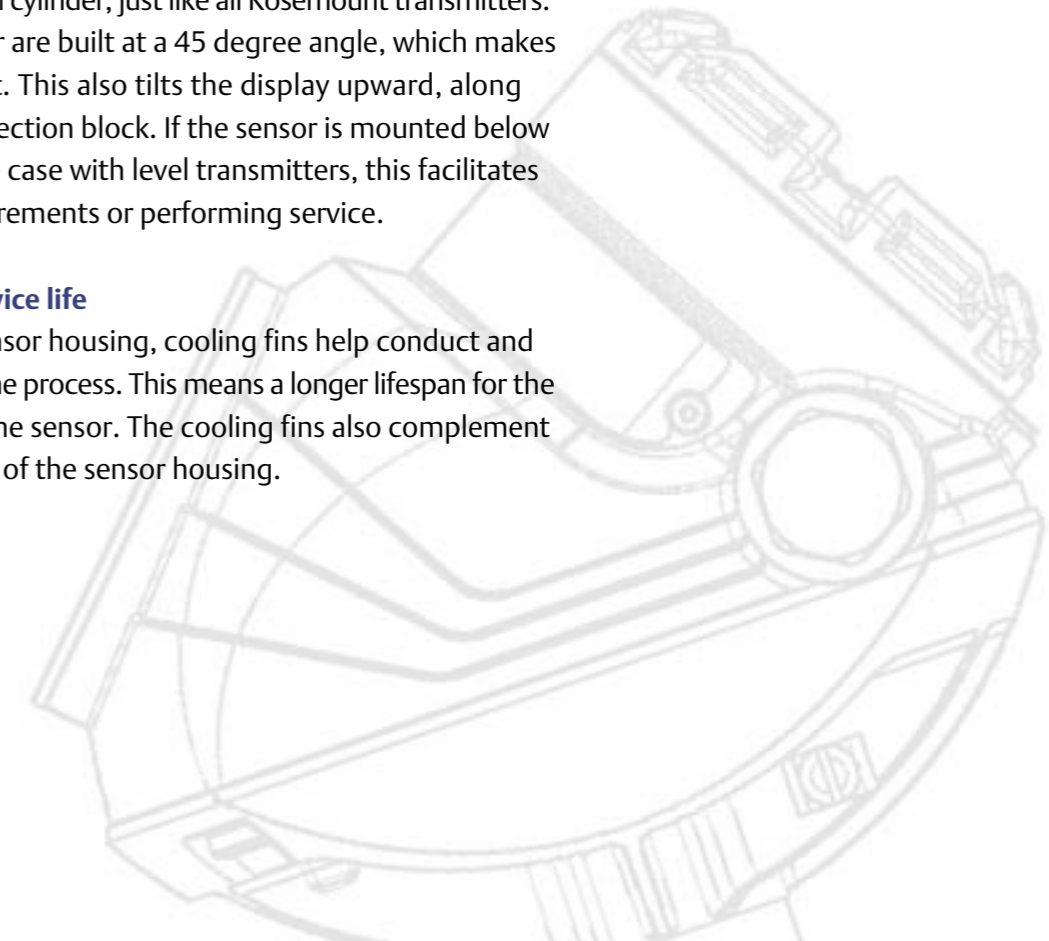
Industrial designers were brought in to create a functional and attractive housing that would withstand a hostile environment. The result is as rock-solid as it looks, but there's more to it than style. This innovation has one single purpose: to improve safety and efficiency for your plant.

A smart design for better ergonomics

The basic form is a horizontal cylinder, just like all Rosemount transmitters. But the ends of the cylinder are built at a 45 degree angle, which makes the cylinder more compact. This also tilts the display upward, along with the cover for the connection block. If the sensor is mounted below eye level, which is often the case with level transmitters, this facilitates installation, reading measurements or performing service.

Cooling fins for longer service life

On the underside of the sensor housing, cooling fins help conduct and dissipate excess heat from the process. This means a longer lifespan for the electronic components in the sensor. The cooling fins also complement the naturally rounded form of the sensor housing.



Taking Radar Economics further:

How to get lower costs and higher revenues with Rosemount 5400.

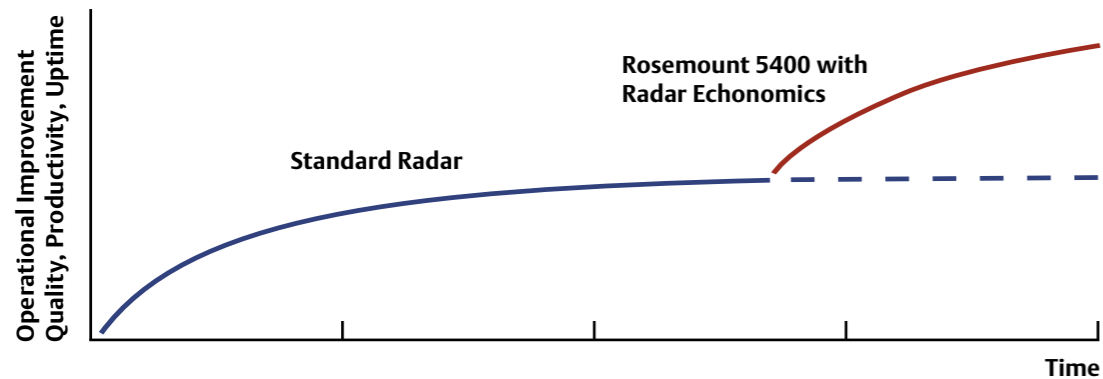
Standard 2-wire radar benefits

- + No moving parts
- + No contact with the liquid
- + Measurement unaffected by temperature, pressure
- + Measurement unaffected by product dielectric, density

Add 5400 Radar Economics benefits

- + Echosensitivity increases measurement reliability even under changing process conditions such as turbulence, vapors, foam and condensation
- + Echologics separates surface echoes from false echoes to increase measurement reliability and reduce commissioning time
- + Echodynamics allows the handling of weak and strong radar echoes simultaneously with equal reliability

= For your business, it all adds up to reduced cost of ownership, increased process availability, more satisfied customers and higher profits. Radar Economics enables best in-class performance — by far.



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 three different measurement principles – non-contacting radar, guided wave radar, and differential pressure – the Rosemount product offering covers a wide range of level measuring applications to fulfill each and every demand.



PRODUCT SUMMARY (See Product Data Sheet (PDS) for complete data.)

Product	Rosemount 5400 Series Radar Level Transmitter.
Measurement Principle	Pulsed, free propagating radar. 5401: ~6 GHz 5402: ~26 GHz
Reference Accuracy	± 0.4 in. (± 10 mm) for 5401 ± 0.1 in. (± 3 mm) for 5402
Resolution	0.04 in. (1 mm)

Display Output Variables

Integral 5-digit display.
Level, Distance, Volume, Level Rate, Signal Strength, Internal Temperature, Analog Out Current and Percent of Range. The display also shows diagnostics and error information.

Configuration Tools

Rosemount RadarMaster, HART® 275/375 Field Communicator, AMS™ Suite.

Output

HART® 4-20 mA current loop.
FOUNDATION™ fieldbus (in preparation).