

Rosemount™ Tank Gauging System Upgrades



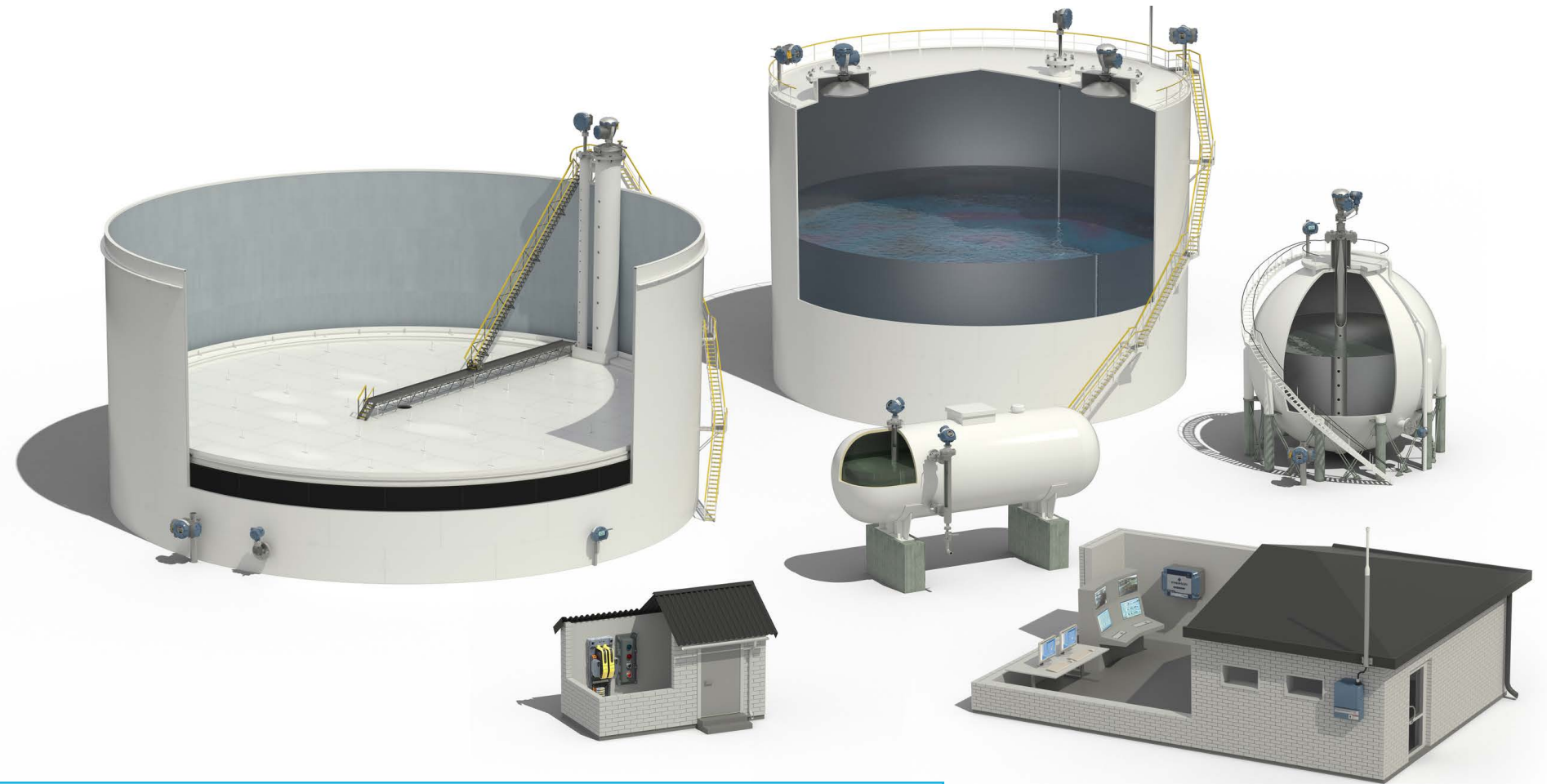


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Simple enhancement of existing tank gauging systems

If you have an ageing tank gauging system incorporating old radars or even servo technology, you may have considered upgrading to a new system to ensure measurement reliability, reduce maintenance and increase safety, but decided the project time and cost was prohibitive. Upgrading your existing tank gauging system with the latest Rosemount hardware and software can help to enhance safety, maximize tank availability and increase operational efficiency. Whether performing a complete system/radar level gauge hardware replacement or partial replacement of radar level gauge electronics, the ability to upgrade at your own pace and retain existing parts and communication infrastructure helps to reduce project complexity and cost.



Key benefits:

- Eliminate sourcing issues for obsolete parts that create the risk of costly shutdowns
- Increase measurement accuracy and reliability for improved inventory management
- Reduce the risk of an overfill with higher SIL rating
- Meet the latest safety regulations by adding an independent safety layer without tank modification
- Improve worker safety and increase tank availability with remote proof-testing
- Get early warnings of roof tilting and avoid tank damage with automated floating roof monitoring

Modern tank gauging technology

Emerson offers a broad range of advanced tank gauging and level measurement technology, including non-contacting radar gauges, temperature transmitters, data collectors and inventory management software.

Rosemount 5900S and 5900C Radar Level Gauges

Highest performance non-contacting level measurement technology for reliable tank gauging and tank monitoring provides certified custody transfer accuracy, better inventory management and reliable loss control data.

- Instrument accuracy ± 0.02 in. (0.5 mm) / ± 0.04 in. (1 mm)
- Certified IEC 61508 SIL 2/SIL 3 capable
- Antennas available for all tank types and suitable for all products, ranging from liquefied gases to light products, heavy fuel oil and bitumen

Rosemount 5408 Level Transmitter

Non-contacting radar level transmitter for tank monitoring applications, engineered for ease-of-use.

- ± 0.08 in. (2 mm) non-contacting measurement for medium accuracy, non-inventory grade, and difficult process applications
- SIL 2 capable version available for overfill prevention applications, with 4-20mA HART® communications for direct connection to safety instrumented system

Rosemount 2410 Tank Hub

Handles the data communication between the field devices and control room, while also providing power to field devices using the FISCO-compliant, intrinsically safe Tankbus.

- Collects and transfers data from one or multiple tanks
- Communication options include Modbus, IEC 62591 (*WirelessHART*® protocol) and emulation of other vendors' protocols
- Enables SIL certified overfill prevention





Rosemount 2460 System Hub

Transfers real-time tank gauging data from field devices to the Rosemount TankMaster Inventory Management Software and the host/distributed control system.

- Ensures fast update rate
- Supports up to 64 tanks
- Provides flexible and configurable connectivity, redundancy and emulation of other vendors' devices.

Temperature, pressure, displays and wireless gateways

Existing temperature sensors, pressure instrumentation, graphical displays and wireless gateways can be retained or upgraded to the latest technology including:

- Rosemount 2240S Multi-input Temperature Transmitter for up to 16 temperature spot elements
- Rosemount 2230 Graphical Field Display can provide local visualization for up to 10 tanks and is designed for installation in hazardous (Ex) locations
- Broad range of pressure measurement technology to suit virtually every application, providing unmatched reliability and improved capabilities
- Emerson Wireless 1410S Gateway with 781S Smart Antenna helps strengthen or add to *WirelessHART*® networks seamlessly; enables flexible remote antenna locations of up to 1300 feet (400 m)

Control room software

Rosemount TankMaster Inventory Management Software collects real-time tank gauging data and automatically calculates volume and mass for inventory and custody transfer.

- Free upgrade to latest version of Rosemount TankMaster software
- Provides operator overview, configuration, set-up and service for Rosemount Tank Gauging Systems
- Option to add Rosemount TankMaster Mobile software for quick and remote access to tank information via standard web browsers, tablets and smartphones

Replacing old gauge technology

Old Rosemount and Saab radar gauges can be replaced by the Rosemount 5900S and Rosemount 5900C Radar Level Gauges, and Rosemount 5408 Non-Contacting Radar Level Transmitters.

Rosemount 5900S

- Suitable for tank gauging with best-in-class accuracy
- The 5900S is ideally suited to replace the Rex, Pro or Saab TankRadar L/2

Rosemount 5900C

- Suitable for less demanding tank gauging applications, tank monitoring in still-pipes, certain LPG installations and floating roof monitoring
- The 5900C is ideally suited to replace the Pro in most applications

Rosemount 5408U

- Suitable for tank monitoring, floating roof monitoring and difficult process applications
- The 5408U is ideally suited to replace the Pro in most applications

Servo and displacer technology has many moving parts that are susceptible to mechanical wear, increasing maintenance requirements and the likelihood of failure. These devices can also be replaced by Rosemount radar level gauges and transmitters.

Accuracy requirements

The level of measurement accuracy required for your specific application will determine the appropriate technology to upgrade to.



Hardware upgrade options

Full hardware upgrades

A complete upgrade of both radar gauge/transmitter and antenna allows you to gain the full benefits of the latest technology, including improved measurement performance and accuracy. Existing wiring infrastructure can be used to minimize project complexity.

Partial hardware upgrades

A partial upgrade involves the replacement of the transmitter head, but retaining the existing antenna. This further reduces time and cost and with no need to open tank connections, avoids interruption to normal operations.



The video player interface features a dark blue background with a white play button icon and the text "Play video" in white. The main title "How to Upgrade from Rosemount™ TankRadar Rex to the Rosemount 5900 Radar Level Gauge" is displayed in large white font. Two radar level gauges are shown: a blue Rosemount TankRadar Rex gauge at the top right and a grey Rosemount 5900 Radar Level Gauge at the bottom right. The video player controls at the bottom include a play button, a volume icon, a progress bar showing 0:05 / 2:35, and the EMERSON logo with a share icon and a full-screen icon.

Retain existing antenna when upgrading radar

If you are replacing the Rosemount TankRadar Rex, Pro or Saab TankRadar L/2, it is possible to perform a partial upgrade, whereby the existing antenna is retained and only the transmitter head is replaced. This helps to save time and cost and reduce complexity. Installation is simple.

A range of upgrade kits are available for the TankRadar Rex with LNG and LPG antenna:

- With new LPG seal
- With/without pressure transmitter
- With different Ex certificates



Upgrading the field communication unit

2160/2165/2175 Field Communication Unit

The FCU 2160 is now in a 'supported phase' (spare parts only available until July 1, 2025). A tank gauging system with Rosemount 5900 Radar Level Gauges can operate with FCUs that utilize software version 3.D1 or later (released November 2002).

Older FCUs need to be upgraded to the 2460 System Hub. FCU 2165 and FCU 2175 are now obsolete and can also be replaced with the 2460 System Hub, which supports most of the emulation protocols available in the FCU 2165 and FCU 2175.



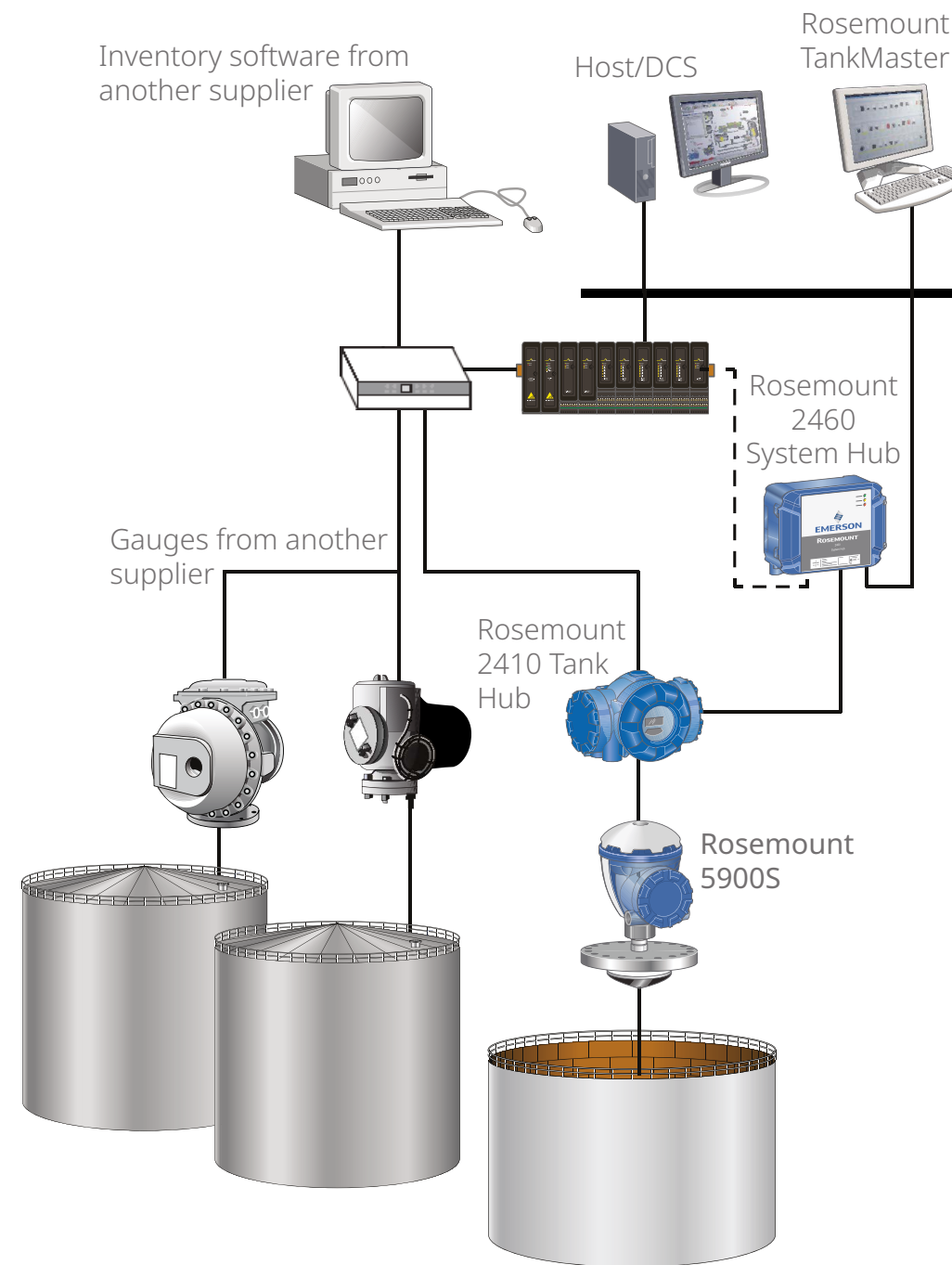
Emulation provides an easy and cost-efficient way of upgrading technology

Replacing a complete tank gauging system can be cost prohibitive and impact operations. Emerson's Rosemount 2410 Tank Hub and Rosemount 2460 System Hub enable new gauges to communicate using vendor specific communication protocols with the existing inventory software system or old gauges to communicate with a new inventory software system. This makes it possible to perform easy and cost-efficient tank gauging upgrades and benefit from the performance and reliability of modern radar gauge technology.

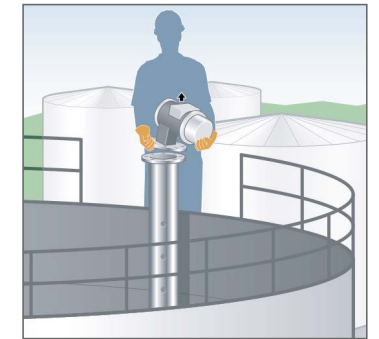
Key benefits:

- Replace old servo or radar gauges, while retaining existing tank management system
- Replace tank management system, while retaining existing field devices
- Improve measurement accuracy and operational safety
- Ability to replace one gauge at a time, with no need for large-scale CAPEX project
- Minimal disruption to operations
- Enable automated floating roof monitoring

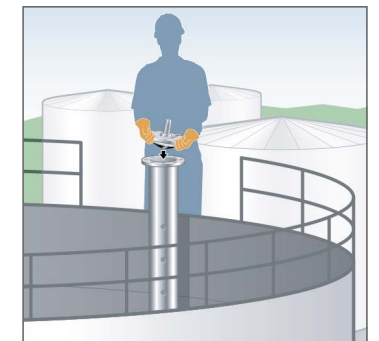
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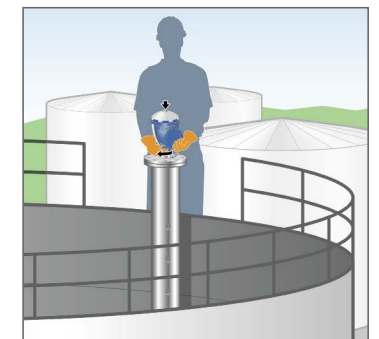
Disconnect existing cabling.



Remove the old gauge.



Mount the antenna.



Install radar and re-connect wiring.

Rosemount TankMaster Inventory Management Software license key

When upgrading Rosemount TankMaster, you may need a new license key. If existing TankMaster is version 5.B0 or previous, the hardware key must be upgraded. If existing TankMaster version is 6.A1 or later, there is no need to upgrade the key and the existing key can be used.

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The screenshot displays the Rosemount TankMaster WinOP1 software interface. The main window shows the 'Tank Inventory - Tank "TK-04"' data. The interface includes a menu bar (File, View, Entry, Setup, Reports, Batches, Tools, Custom, Window, Help) and a toolbar. A 'Groups' sidebar on the left lists tanks TK-01 through TK-18. The main data area is divided into several sections:


- Level:** 12.341 m
- Flow Rate:** 0.0 m3/h
- Avg Temp:** 23.5 °C
- Vap Temp:** 24.6 °C
- Air Temp:** 25.6 °C
- Product:** Diesel
- Vol Table:** 54B - 2004
- Sediment & Water:**
 - S&W: 0.0000 %
 - FWL: 0.000 m
 - FWV: 0.000 m3
- Volumes:**
 - Max Vol: 20200.000 m3
 - Pumpable: 17277.400 m3
 - TOV: 17277.400 m3
 - GOV: 17278.955 m3
 - GSV: 17102.019 m3
 - NSV: 17102.019 m3
 - AVPM: 2922.600 m3
 - Pipeline: 0.000 m3
- Weights:**
 - WIA: 12807.702 ton(m)
 - WIV: 12826.514 ton(m)
- Pressure and Density Data:**
 - Vap Press: 0.000 barG
 - Mid Press: 0.000 barG
 - Liq Press: 1.012 barG
 - Air Dens: 1.22 kg/m3
 - Vap Dens: 1.22 kg/m3
 - Obs Dens: 842.30 kg/m3
 - Ref Dens: 849.90 kg/m3
 - TEC Liq: 0.0007000 /"
 - CTSh: 1.00009
 - VCF: 0.98976

A 3D tank model with a green liquid level is shown below the data, labeled 'Fixed Roof'. A legend at the bottom indicates: '# = Legal value, C = Legal calculation, Yellow = Manual value'. The 'TEC Liq' value is highlighted in yellow. A 'View Group - Group "All Tanks"' window is also visible on the right, showing a list of tanks from TK-01 to TK-18 with their respective levels and volumes.



Rosemount TankMaster Mobile Inventory Management Software

Existing users of Rosemount TankMaster can easily add TankMaster Mobile, which provides instant access, via smartphones, tablets and computers, to all tank and inventory information from anywhere, at any time. This helps to improve operational efficiency, operator productivity and collaboration throughout the supply chain.

 [Play video](#)

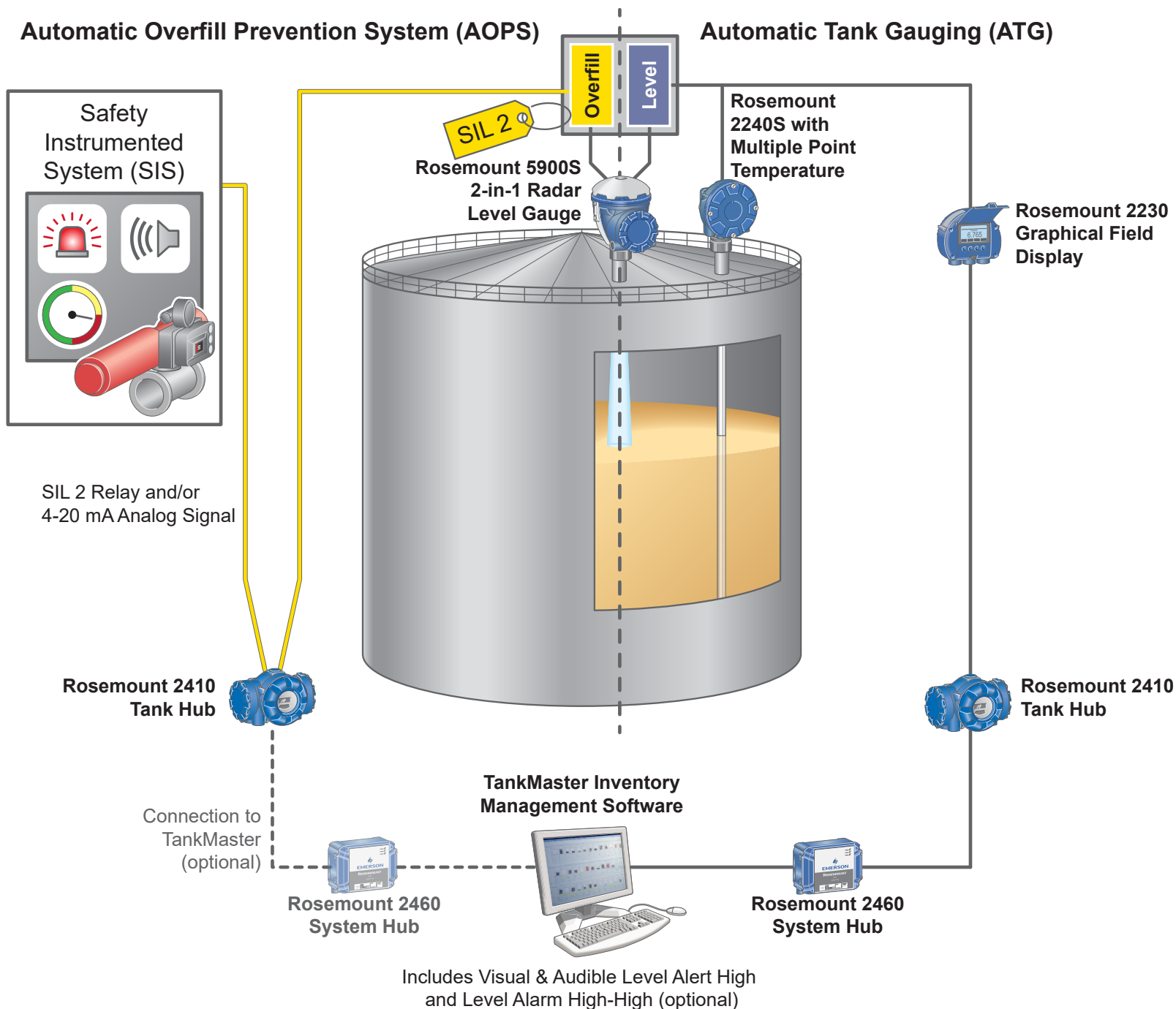
Introducing Rosemount™ TankMaster™ Mobile Inventory Management Software
Insights Delivered. Right Away.

ROSEMOUNT EMERSON

[DEMO](#) 

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Overfill prevention



Robust overfill prevention systems that comply with industry safety standards are essential to reduce risk in process vessels and bulk liquid storage tanks. Emerson has a comprehensive portfolio of certified products, including continuous level measurement and point level detection devices, to support your vision for preventing overfills, and keeping people and the environment safe. A 2-in-1 radar level gauge helps to simplifying installations by enabling both inventory measurements and overfill prevention to be performed by a single device that requires just one tank opening.

Selecting the right overfill prevention solution is not easy. You need to ask a number of questions, including:

- Do you need a continuous level device or point detection?
- What is the media you are measuring?
- What kind of tank is it and what is its size?
- Do I have enough tank openings to add overfill prevention or will the tank require modification?

Our team of experts can advise you and guide you through selecting the solution that best meets your needs.

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Overfill prevention technologies

Continuous Measurement Solutions

Rosemount 5900S Radar Level Gauge

For bulk storage applications. 2-in-1 functionality enables combined basic process control and overfill application in a single device.

Rosemount 5900C Radar Level Gauge

For continuous surveillance in bulk storage applications.

Rosemount 5408/5408:SIS Level Transmitter

Non-contacting radar level transmitter for tank monitoring applications, delivering reliable measurement of both liquid and solid materials. Engineered for ease-of-use.

Rosemount 5300 Level Transmitter – Guided Wave Radar

Market-leading guided wave radar with state-of-the-art reliability and safety features, plus powerful built-in diagnostics.



Point Level Detection Solutions

Rosemount 2140:SIS Level Detector – Vibrating Fork

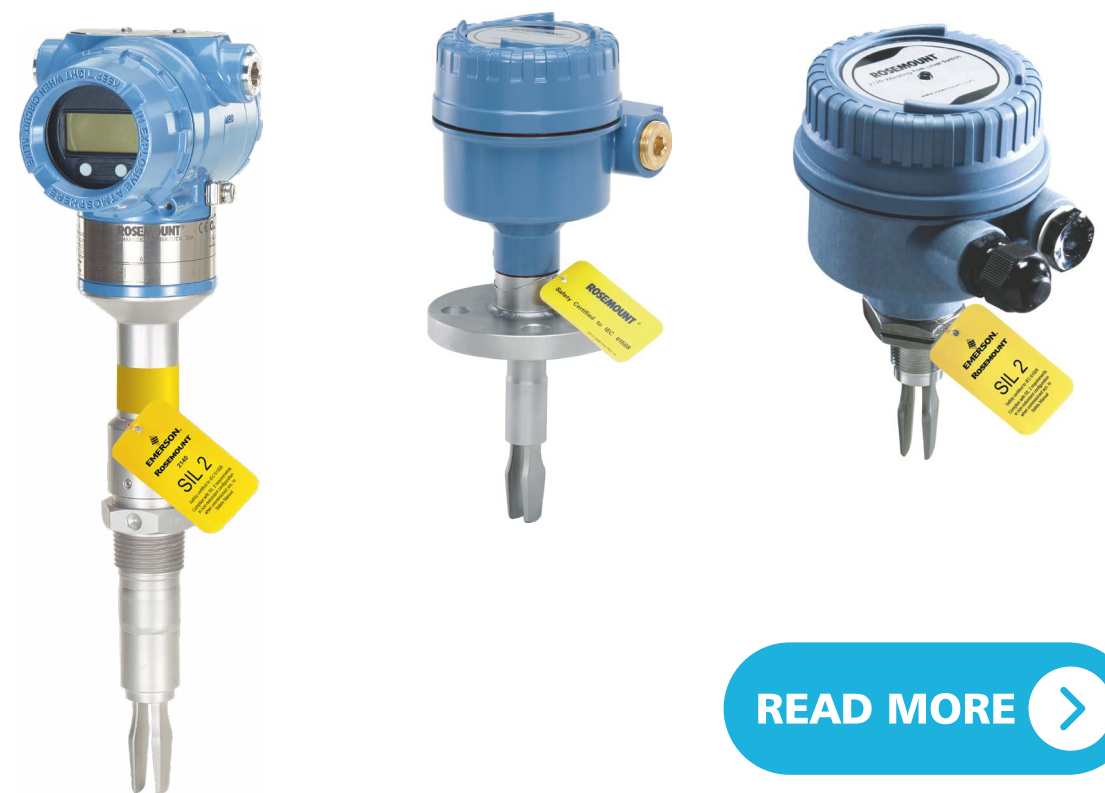
Next generation point level overfill prevention with smart diagnostics and remote functionality.

Rosemount 2130 Level Switch – Vibrating Fork

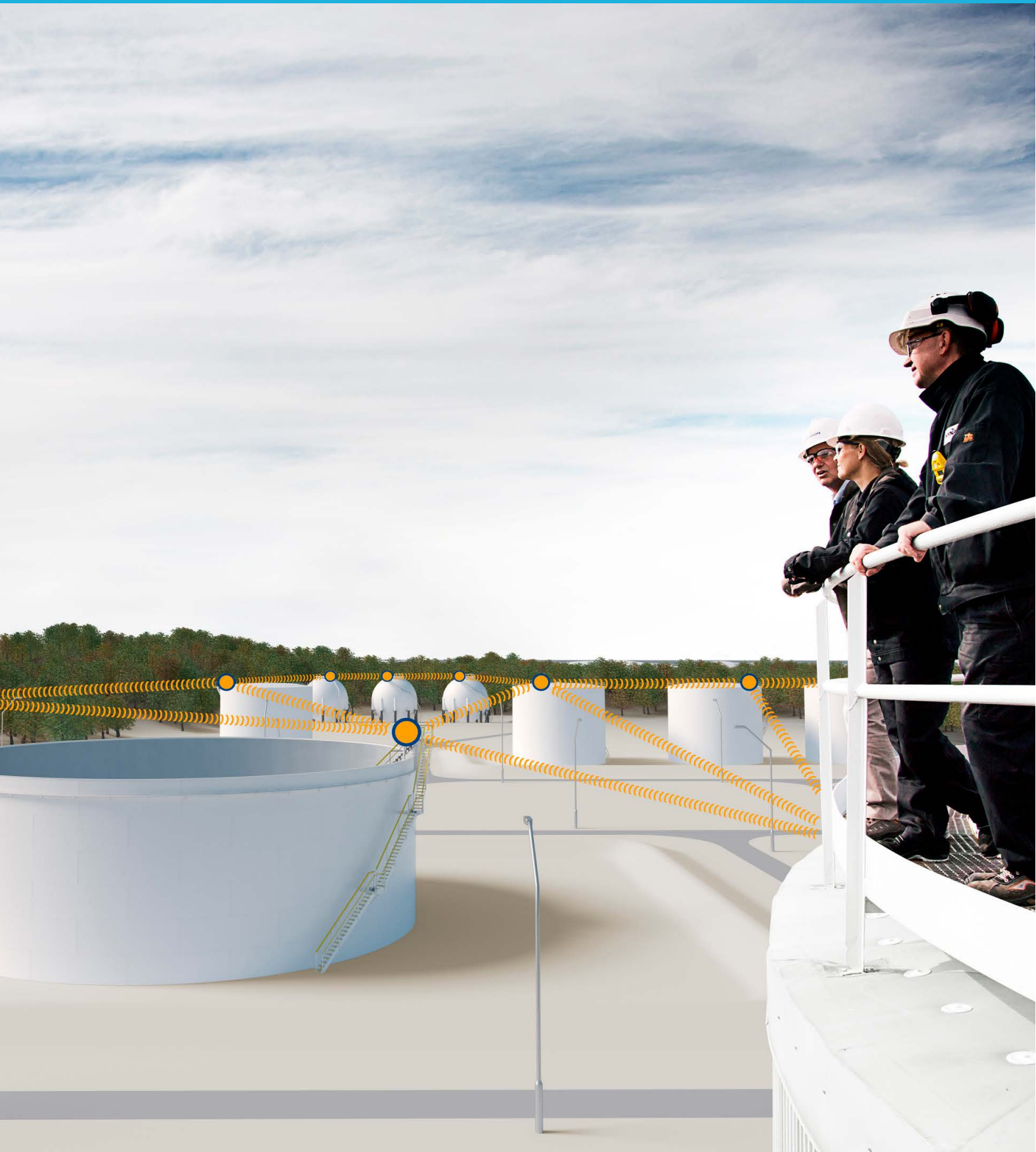
Flexible switch, suitable for more challenging conditions.

Rosemount 2120 Level Switch – Vibrating Fork

Simple, cost-effective and flexible switch, suitable for most liquid types.



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Wireless enables installations in locations previously not possible

Wireless technology is used widely within the process industry and Emerson's *WirelessHART*® networks and wireless tank gauging systems enable applications that were previously not viable, by removing the need for new costly and complex cable infrastructure to be installed.

Key benefits:

- Reduce installation time and costs
- Eliminate the need for new cabling over long distances
- Get online monitoring data from previously unreachable tanks

Suitable for non-SIS overflow protection layers

Although the use of wireless technology is not permitted within safety instrumented systems (SIS), the API 2350 standard related to the safety of large tanks, deems digital wireless networks as an acceptable means of deploying non-SIS overflow protection layers.



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Tank survey

Emerson's engineering and applications team can review your existing tank gauging solution and provide an overview of potential adjustments and improvements to ensure greater system availability, performance and safety.

Commissioning and start-up service

Emerson's lifecycle services provides commissioning and start-up services tailored to Rosemount tank gauging products and systems. Our team will perform standardized procedures that follow best practices aimed at increasing plant performance.

- Experienced and certified technicians will commission Rosemount products
- Mechanical and electrical installation is validated to ensure Rosemount products operate correctly
- Product performance is verified under operating conditions
- Emerson start-up and commissioning services extends the warranty period from one to three years



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