The easy way to automate your tank farm
WHEN IS WIRELESS THE LOGICAL CHOICE?

+ WHEN DISTANCES AND TOPOLOGICAL CONDITIONS ARE CHALLENGING

The attractive investment cost of Smart Wireless compared to wired technologies means you can connect with tanks that were previously isolated, divided by water, roads or other infrastructure-related obstacles.

+ WHEN THE INSTALLATION OR REPLACEMENT OF FIELD WIRING IS A SAFETY CONCERN

Digging for new cables can be complicated and dangerous in a tank farm environment. Smart Wireless tank gauging reduces risk by delivering data to the control room without any unnecessary excavation work and cable installation.

+ WHEN REDUNDANT COMMUNICATION IS REQUIRED

Smart Wireless tank gauging is ideally suited to situations that demand redundant communication. A wireless interface can easily be added to new or already installed wired radar level gauges to provide an additional connection to the host system.
During the operational lifetime of your tank storage facility there are a number of different phases, from expansion and upgrading to general maintenance and repair. With each phase comes change and along with change the need for flexibility.

Smart Wireless tank gauging doesn’t solve all your operational challenges but it certainly works for many of them. The latest solution from Emerson is based on the industry benchmark Rosemount Tank Gauging system together with Smart Wireless technology used by thousands of plants all over the world. You gain full control of your assets and maximize efficiency while reducing capital expenditure.

+ **WHEN YOU WANT TO REDUCE COST AND COMPLEXITY**

Replacing or maintaining cables that are outdated and in poor condition can be expensive. The use of wireless instruments means less installation work and wiring as well as fewer junction boxes and conduits. In addition, no detailed site surveys are required, and you reduce engineering and drawing work.

+ **WHEN EXISTING TANK INSTRUMENTATION NEEDS MODERNIZING**

Existing tank gauging systems using old technology can have their limitations. Our emulation technology enables seamless integration of new tank instrumentation in a control room infrastructure from other vendors. In emulation applications you unleash the full potential of high end radar gauging by adding wireless technology.

+ **WHEN YOU WANT TO AUTOMATE YOUR TANK FARM**

The scalable open architecture of Emerson’s Smart Wireless enables a cost-effective and future-proof basis for your system expansion. You can easily add wireless devices, such as pressure, temperature, level, flow, and vibration instruments, discrete switches, leak detection, valve and regulator position monitors, to automate a broad range of tank farm functions.

+ **WHEN TIME IS CRITICAL**

Expansion, upgrading and maintenance projects take time but Smart Wireless tank gauging is a plug-and-play solution when resources are scarce, deadlines are tight, and you want to minimize downtime and get a quick start-up.
ENHANCE YOUR BULK LIQUID MEASUREMENT

- 3051S Wireless Pressure Transmitter
- 2160 Wireless Switch
- Smart Wireless THUM Adapter
- Smart Wireless Gateway
- 2410 Tank Hub
- 5900S Radar Level Gauge
- 2240S Temperature and Water Level Transmitter
- 565/566 Multiple Spot Temperature Sensor or 765 Multiple Spot Temperature and Water Level Sensor
- 3051S Wireless Pressure Transmitter
- Field Communication Unit
- Wired System
- Host/DCS
- TankMaster Inventory Management Software
A Smart Wireless tank gauging solution designed specifically for your bulk liquid storage plant maximizes safety and operational performance. With unique radar technology and ultra-high temperature precision, you enjoy best-in-class tank gauging. You benefit from accurate inventory, better tank utilization and reliable overfill prevention. Wireless units on your tanks send encrypted secure information back to the control room, providing you with the data accuracy and redundancy you need in today’s fast-paced liquid terminal and logistics environment. With expandable hardware and software systems easily accommodating changes to your infrastructure, you secure efficiency in the short, medium and long term.

+ **TOTAL MEASUREMENT ACCURACY**

Rosemount Tank Gauging technology delivers precise level and temperature data needed for custody transfer, inventory control and safe tank operations. Rosemount Tank Gauging systems suit all kinds of bulk liquid storage applications, pressurized and non-pressurized, fixed or floating roof tanks, with or without still-pipes. This makes the system the perfect choice for refineries, tank terminals, fuel depots, LNG plants and more.

+ **COMPLETE INVENTORY MANAGEMENT**

TankMaster is a powerful and easy-to-use inventory management software package including operator overview, inventory and custody transfer functions. It provides full support for configuration, diagnostics and service. TankMaster enables real-time gross and net volume calculations based on API and ISO standards, batch handling and alarm functions. TankMaster.net is the web version, which makes tank inventory data available on a secure website via the Internet/Intranet.

+ **WIRELESS COMMUNICATION**

The Emerson Smart Wireless solution is based on IEC 62591 (WirelessHART), the open industry standard for wireless field networks. The self-organizing mesh network adjusts to changes in the field and ensures uninterrupted data communication. Each wireless node can relay data around obstacles. Reliability actually increases with network size.
“Installation was quick and easy”

When the cost of replacing old cabling is estimated at one million euros, it’s time to research the alternatives. The Italian company SIOT did exactly that. With thirty-two tanks and the prospect of expensive and time-consuming engineering, SIOT opted for a Smart Wireless tank gauging solution. They made a pilot test on four tanks that turned out to be successful despite the worst weather conditions in years.

Mr. Massimo Diminich, Technical Assets Manager, SIOT/TAL, Italy

“I believe in wireless transmission”

IPLOM discovered that maintenance-free, accurate and reliable level measurements are possible when changing to a Smart Wireless tank gauging solution. Having used an old HTG system (accurate for mass not volume) that was no longer supported, IPLOM needed to improve level measurement performance. Tanks at IPLOM are grouped in clusters, spread over a large area, with dividing infrastructure, such as a highway. Nine tanks were initially fitted with a Smart Wireless tank gauging solution and the refinery plans to gradually equip all tanks in the different locations with wireless radar level gauges – a clear endorsement of its reliability, accuracy and IPLOM’s satisfaction.

Mr. Cristiano Cicardi, Instrument and Maintenance Coordinator, IPLOM Refinery, Busalla/Genova, Italy
Thousands of tanks in terminals all over the world use wireless tank gauging solutions and experience high levels of accuracy, safety and security together with reduced investment costs. Each organization has its own unique set of challenges, so how can you be sure that wireless tank gauging is the right solution for you? Read the following customer cases – they speak for themselves.

“Safety is a must!”

When storing extremely hazardous liquid chemicals, installing new cables involves an element of risk. For the Altintel seaport terminal located near Istanbul the risks were increased in the absence of all necessary infrastructure documentation. All these issues were overcome by using a Smart Wireless tank gauging solution when expanding the plant.

Mr. İbrahim Ünlü, Terminal Manager, Altintel, İzmit/Istanbul, Turkey

“Presentation of all measurement data is centralized”

The ST1 refinery decided to use a wireless network solution for some of their tanks. Their control room is located away from the tanks and from the ideal location of a Gateway, which is in the center of the mesh network. In their case there was no wired connection in between. To avoid going out into the field to monitor the wireless network status, configure and calibrate devices, ST1 added additional wireless capabilities. A wireless Pervasive Field Network (PFN) connection was established from the field to the control room, reducing the need to send technicians out into the field.

Mr. Curt Åkesson, Instrument Engineer, ST1 Refinery, Gothenburg, Sweden
Reduce installation costs by up to 70%

Unlock new or stranded projects when:
- Installation costs are too high
- Communication cabling is missing or of poor quality
- Infrastructure makes installation of new cabling difficult and costly
- Tank areas are isolated

Wireless minimizes installation costs thanks to:
- Minimum engineering time
- Less excavation work
- No installation of new communication cable
- Minimum installation time
- Quick commissioning ➔ Minimum tank operation downtime

Gain more data in emulation applications

The Rosemount Tank Gauging system supports emulation of other vendors’ communication protocols. You can install a Tank Hub with level and temperature devices that integrate seamlessly with the existing infrastructure using the same field wiring and host system.

Add a wireless interface to gain full capacity that:
- Works in parallel with the wired emulation protocol
- Gives more measurement data and advanced diagnostics
- Enables remote radar gauge configuration and calibration functionality
- Offers new and modern protocols to host/DCS system
Our Smart Wireless tank gauging solutions are based on proven and reliable technologies. IEC 62591 (WirelessHART) is an open standard giving you the flexibility to include any device supporting this standard in your wireless network. The Gateway automatically identifies all active nodes. Wired and wireless networks can co-exist in a completely customized tank gauging network solution.

The benefit of this flexibility can be seen in several key areas.

**Get the most out of redundancy in communication**

Wireless and wired communication in combination provide a safe and cost-efficient way to meet requirements for full communication redundancy. Combining wired communication, via a Field Communication Unit, and Smart Wireless, via a Gateway, provides two independent data paths to the host/DCS.

The use of Smart Wireless for the tank gauging data means the existing field cabling can be used for other purposes. For example, when you need to get both tank gauging data and a high level alarm signal back to the control room, but only have one single set of wiring available to the tank. The high level SIL relay signal from the Tank Hub is connected to the existing wiring and the complete tank gauging data is sent via a wireless connection.
+ How secure is the information transferred via a wireless network?
   The system uses WirelessHART technology with digital communication, protected by 128-bit encryption, authentication, verification, anti-jamming and reliable key management.

+ Our tank farm has obstacles that will block the wireless signal. How will that affect system reliability?
   Not at all. There is no need for line-of-sight between the Gateway and each device. All devices act as mesh network nodes, and can relay data. The wireless signals easily find their way around obstacles, fixed or mobile.

+ Am I bound to one operator’s wireless system or can I connect instruments from other suppliers?
   The Smart Wireless technology from Emerson is based on IEC 62591 (WirelessHART), the open communication standard that is used at thousands of plants all over the world. Adopting such a system is a guarantee for interoperability, which means you are not bound to a specific supplier.

+ How does the system perform when there are long distances between tanks?
   The range differs between devices, and is also dependent on the structure of the mesh network. If distances are long, it is possible to use a repeater device. Emerson has a supporting network planning software tool, the easy-to-use AMS Snap-on, which can be used to secure a best-practice, solid network. To be able to have the antenna at the best possible high location of the tank, the THUM Adapter is integrated in a connection box that can be installed away from the Tank Hub.

+ Is Smart Wireless restricted to just tank gauging or can it be used for several applications?
   Emerson has a comprehensive product portfolio based on the WirelessHART protocol. It is an open, future-proof and scalable architecture which can form the basis for your tank farm automation projects. Leak detection and vibration monitoring on pumps and valve positioners are common wireless applications in tank farms.

+ How fast is it between updates and is it fast enough for such operations?
   The update rate is configurable between 1–3600 seconds. The typical value is 16 seconds which is suitable for most tank shapes and filling rates. The flexible range enables adjustment to requirements from other WirelessHART devices joining the same network.

+ Can Smart Wireless tank gauging be used in SIL applications?
   The 5900S Radar Level Gauge together with the 2410 Tank Hub has multiple and independent outputs. The Tank Hub can be equipped with a SIL-certified hardwired relay output for overfill prevention. Simultaneously and independently from the SIL alarm signal, the Tank Hub can also send the tank gauging data wirelessly to TankMaster or a host/DCS via the Gateway. In addition, the 5900S can also be equipped with the 2-in-1 dual radar option for increased independency and redundancy (in SIL 3 applications, 2-in-1 is required).
PRODUCT RANGE OVERVIEW

+ ROSEMOUNT 5900S RADAR LEVEL GAUGE

Get custody transfer accuracy with the 5900S, which measuring to within ± 0.5 mm (0.02 in.). It is available with 2-in-1 (two independent radar gauges), SIL 2 and SIL 3 options. No moving parts makes the gauge reliable, and virtually maintenance free.

+ ROSEMOUNT 2410 TANK HUB

Rosemount 2410 collects and transfers tank data from field devices. It calculates average temperature, observed density and strapping table based volume. It communicates with and feeds power to the field units on one or several tanks. It features several control room communication possibilities, including Modbus, emulation of other vendors’ protocols and IEC 62591 (WirelessHART).

+ SMART WIRELESS THUM ADAPTER

The Smart Wireless THUM™ Adapter can be installed at the best possible tank roof position, away from the Tank Hub to which it is connected. The THUM acts as the wireless data link between the gauge/Tank Hub and a Smart Wireless Gateway in an IEC 62591 (WirelessHART) network.

+ ROSEMOUNT 2240S WITH A MULTIPLE SPOT TEMPERATURE SENSOR

The ultra-stable 2240S, together with a 565/566/765 temperature sensor is approved for demanding custody transfer applications, requiring very accurate temperature measurements. These sensors provide liquid temperature from up to 16 spot elements with an optional integrated sensor to measure water content at the bottom of a tank.

+ SMART WIRELESS GATEWAY

The Smart Wireless Gateway is the IEC 62591 (WirelessHART) network manager that provides an interface between the field devices and the TankMaster inventory software or host/DCS systems. It is available in two versions, 1410 and 1420, depending on network size.

+ ROSEMOUNT 2160 WIRELESS LEVEL SWITCH

The 2160 is used when a separate alarm switch is required to prevent overfill situations in fixed roof tanks. It features continuous instrument health/self-checking of the fork and sensor and has all the features of wired level switches without the complication and cost of wiring.
Emerson Process Management supports customers with innovative technologies and expertise to address your toughest challenges. Rosemount measurement instrumentation and the many other Emerson brands represent the many ways we’re helping you do more and get more from your process.

For more information about Rosemount Tank Gauging and Emerson’s Smart Wireless solution, visit www.Rosemount-tg.com/products/wireless