

Robust measurement

The antenna design is the most important factor to provide a robust and durable measurement in demanding tank environments.

The antenna radar lobe is closely related to the antenna diameter. The larger antenna diameter, the better sensitivity and a more narrow radar beam.

A narrow radar beam is necessary in order to pass between steel balks, pipes, ladders or other obstacles in a tank. Obstacles can cause reflections disturbing the level measurement.

Rosemount TankRadar parabolic antennas enhance the focus of the radar beam to the surface of the cargo. This is referred to as large antenna aperture or gain, which enables detection of a weak surface echo.

Oil has a weak reflection (low dielectric constant). About 3% of the power is reflected, compared with for instance metal, that has a strong reflection. Consequently it is difficult to distinguish disturbing echoes from the echo reflected from the oil.

Environmental factors like dirty tank atmosphere, waves in tank, cargo build-up and trim/heel, increase the importance of a high sensitivity, as these factors further affect the ability to capture the signal.

Providing accurate and reliable level measurement, means choosing design parameters that minimize effects of environmental influence over time.

For other applications, such as draft measurement and level measurement in slop tanks/very narrow tanks, other antenna solutions may be needed.



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Cargo Monitoring System for tankers

Benefits

- FMCW radar gauges for any type of tanker and cargo
- Durable antenna design with high gain antenna capturing all relevant signal reflections from the liquid surface
- 3-in-1 solution for level, independent high-level and overfill alarm
- 2-in-1 solution for redundant radar level measurement
- Cost-effective solution with sensor bus for vapor pressure and temperature
- Service & Communication Display to carry out service, data logging, backup and diagnostics for fast recovery of system functionality
- Cargo report from Workstation for ship-to-ship transfer
- Easy integration and communication with other onboard systems

Description

Rosemount CMS is a cargo monitoring and alarm handling system designed for the marine industry meeting requirements and demands on loading and offloading functionality.

The foundation of the system is the Rosemount TankRadar gauges for level measurement, using FMCW radar technology.

Rosemount CMS has a high degree of safety built into the system. The sensor technology with non-contact measurement, offers online and reliable readouts.

Rosemount CMS meets the requirements of all major international marine classification societies.

2-in-1 & 3-in-1 technology

Rosemount CMS can be equipped with a second or third independent measuring channel in one deck penetration. The independent channels can be used for redundancy or high-level and overfill alarm.



The parabolic antenna in Rosemount TankRadar is a proven solution for a measurement less affected by cargo build-ups and condensation.

The right gauge for the right application

Rosemount TankRadar portfolio	
TGU51	Large Parabolic antenna for deep tanks, on-board tankers of Suezmax and VLCC size
TGU55	Still-Pipe Antenna for measurement in narrow tanks with complex in-tank structures
TGU56	Still-Pipe Antenna for draft measurement
TGU57	Insulated Parabolic Antenna for bitumen and other cargos with high temperatures
TGU58	Small Parabolic Antenna for tankers up to and including Aframax

For more information and technical data, please see the Product Data Sheet for each specific Tank Gauge Unit. www.EmersonProcess.com/mtm



Rosemount CMS - A range of solutions for excellent cargo monitoring control

Rosemount CMS monitors tank conditions at any time with reliable, accurate and timely readouts. The system offers a complete range of level, temperature and pressure measurement instruments for all types of liquid cargo applications.

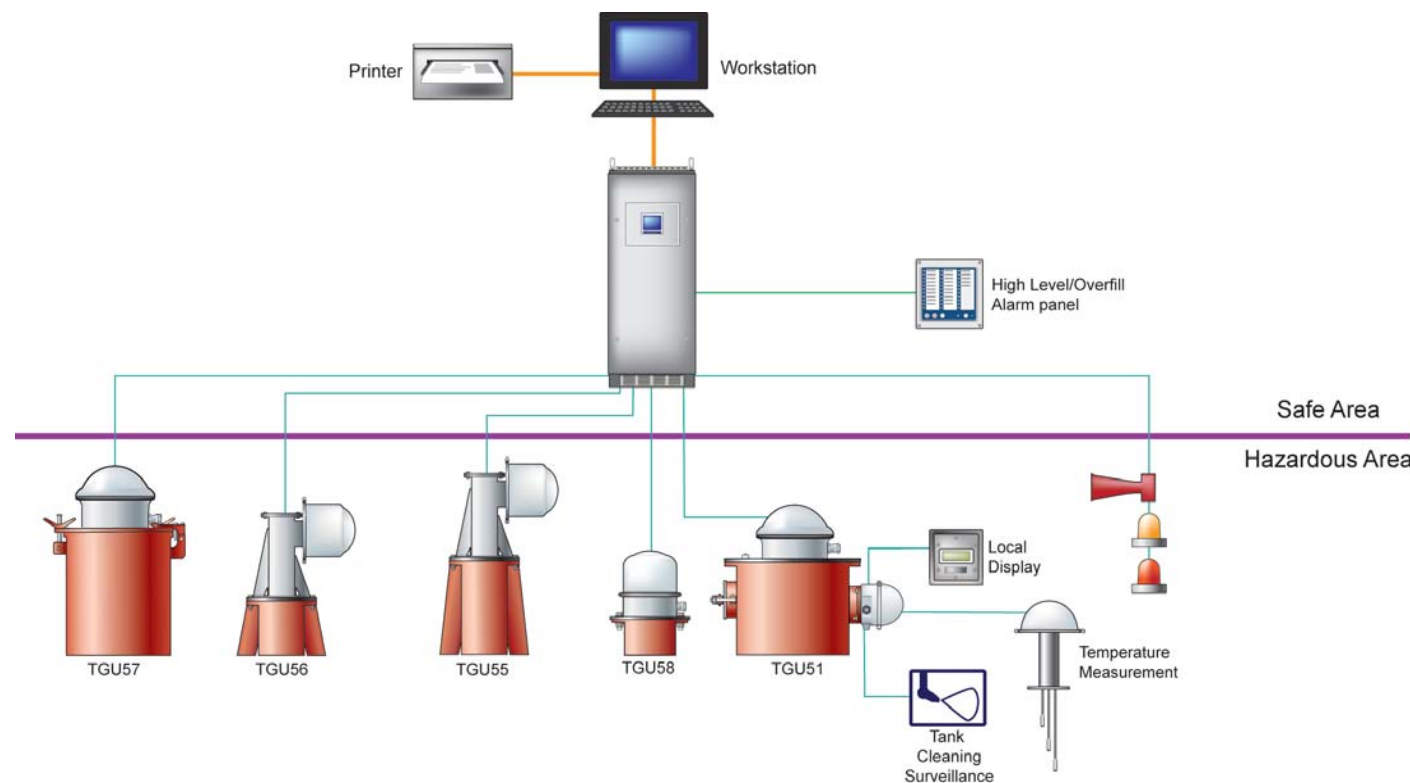
The Cargo Monitoring System can be integrated to the loading computer and into ship's automation system, or provided as a stand-alone system.





In the Workstation, mimics for tank values, piping and pumps are presented in a customized and conveniently accessible view.

The information can be presented in customized groups or interactive graphics, tailored to system configuration:

- Cargo/slop tank ullage, temperature and vapor pressure with loading and offloading rate per tank
- Ballast, fuel oil and fresh water tank levels
- Ship's draft measurement and trim and heel indication

- Redundant level measurement (2-in-1 solution)
- Volume and weight, calculated by online load calculator or stripping table
- Alarm monitoring of values with fixed and adjustable alarm limits
- Logging of values and trends
- Printed reports
- Control of pumps and valves
- Variety of protocols for communication with other on-board systems
- Ship-to-ship cargo reports
- Tank cleaning surveillance



<p>Temperature</p>	<p>Pt100 elements temperature sensors, placed in the tank at desired positions. The position of the sensor is clearly indicated in the Workstation</p> <p>During loading, an indication in the mimic shows if the spot temperature is included in the average temperature calculation.</p>	
<p>Vapor pressure</p>	<p>The tank environment can be very harsh, thus design, location, and material selection are important design parameters, especially when handling corrosive cargo. The material facing tank atmosphere is alloy C276. The vapor pressure sensor meets SOLAS requirements on secondary means.</p> <p>Zero adjustment procedure can easily be executed, to verify accurate readings prior to loading.</p>	
<p>Service & Communication Display</p>	<p>The Service & Communication Display is located in the Supply & Communication Unit, offering a window for the crew into the system for tank data monitoring. From the display, advanced analyses and diagnostic functions can be performed to quickly resolve problems, or in order to quickly transfer information to our Service Engineers for remote assistance.</p> <p>The most important functions are:</p> <ul style="list-style-type: none"> • Monitoring of ullage, temperature and vapor pressure • Identification of source to problem • Advanced diagnostics and data logging to optimise radar gauge performance • Quick and easy exchange of tank gauge electronics 	
<p>Local readout on deck</p>	<p>The Local Display Unit can be placed close to the radar gauge. Available display information is ullage, temperature and vapor pressure. The radar signal is send directly from the gauge and values are presented on the display at all times.</p>	
<p>Tank cleaning surveillance</p>	<p>From the Workstation it is possible to monitor that all cleaning machines are running. When the cleaning operation is finished, an alarm indication is sent to the operator, optimizing cleaning time and minimizing use of hot water or other cleaning media.</p> <p>Features:</p> <ul style="list-style-type: none"> • Operating status of tank cleaning machines • Start/stop Alarm • Accumulated running time • Pre wash data logging • Reports 	