



ASK THE EXPERT

Replacing Mechanical Technology with a Radar-Based Tank Gauging System by Utilizing Tank Gauging Emulation



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Tank gauging on storage tanks involves much more than just the instruments on the tank and it encompasses engineering science across many areas of technology. One of those technologies involves using a much more accurate radar-based system to emulate older legacy systems at a lower cost. It also provides the user with a cost-effective way to gradually replace older technology over a period of time without disruption or straining budgets.

Below, Helena Hjortsberg, manager of solutions, Tank Gauging for Emerson, answers some of the most frequently asked questions regarding tank gauging emulation.

What is tank gauging emulation?

A: Tank gauging emulation allows existing “old school” gauges to be replaced with modern radar-based technology without the need to make any changes to the communication or wiring infrastructure.

The integration of the Rosemount 5900S Radar Level Gauge and Rosemount 2410 Tank Hub into the existing tank gauging system will be seamless. It makes it possible to do an easy and cost-efficient system upgrade. The poor performance and high cost of



maintaining old mechanical level gauges no longer need to be accepted. The challenges usually presented by partial or complete upgrades are avoided, enabling the latest radar-based level technology to be installed with minimal disturbance to operations.

Is the term “emulation” used because it copies the operational procedures of the mechanical gauge but doesn’t have a lot of the problems associated with them?

A: Yes. Instead of having an old mechanical gauge that frequently requires spare parts and regular maintenance,

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you can install the 5900 without any more need to open the tank. Due to the fact that it is a non-contacting radar, you don't have to clean it; and any debris that exists will drop off because of the Teflon and the unique drop-off design that we have in the antenna. Also, the operators in the control room will not notice any difference in their daily work other than a more accurate measurement and less downtime, the new gauge and tank hub emulates the old servo like a mirror.

Why is emulation better than the old way of measurement?

A: A lot of tank gauging systems still rely on old mechanical devices using float or servo technology, often providing unreliable measurements. They also have excessively high maintenance costs due to their inclination to failure. Even so, plant managers are often reluctant to replace them with modern and more reliable alternatives because of the high cost and closed infrastructure which is often used. With emulation, it doesn't have to be done all at once.

Users have the ability to replace the aging and malfunctioning level gauges with new ones and connect them to the already existing system. They won't see that we have replaced the instrumentation on the tank, but they will have a much more accurate and reliable measurement.

They can also do this the other way around. In case they need to replace their outdated tank management system, they install the Rosemount TankMaster Inventory Management Software and the Rosemount 2460 System Hub to which they connect their gauges, and communication is seamless.

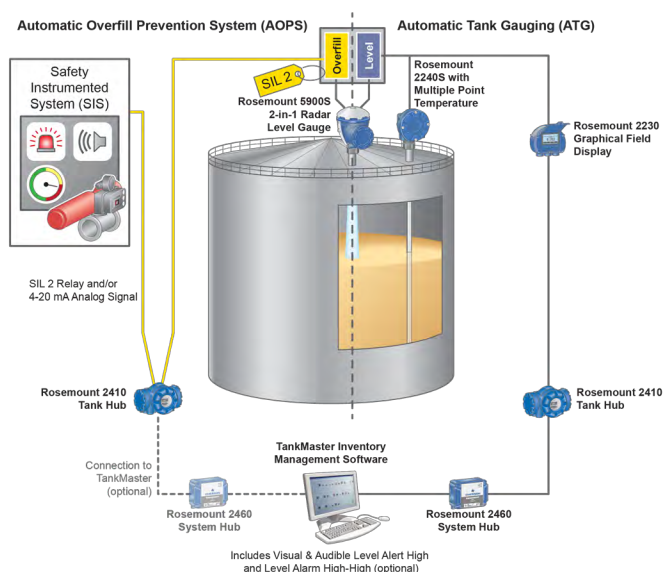


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What are the main benefits of tank gauge emulation?

A: There are many benefits. Replacing or upgrading sections of an existing tank gauging system allows older mechanical equipment, or poorly performing radar level gauges, to be replaced by more advanced radar technology and control room infrastructure. In addition, you get reliable and accurate measurements, compliance with current safety standards and guidelines, diagnostics to help identify potential problems, and low maintenance requirements. Emulation also allows engineers to verify the system's functionality and performance before investing in a new system.



You mentioned cost savings several times; is it cost-efficient?

A: Yes. The fact that there is no need for new field wiring makes installation quick and cost-efficient. Another aspect of cost-efficiency would be that in our 5900S, we have something called two-in-one, which means that you get two radars with one antenna. So, we have two radar gauges working right next to each other but totally electrically separated. This means we could have one level device and one overfill device in one housing. It's all contained in one opening instead of having two separate devices installed in two tank openings. The two-in-one feature was mainly developed for redundancy, but it's also a cost-saver in the long run.

Additionally, it doesn't require a change in software. If you have 150 tanks, all equipped with level gauges, it's a big cost to replace all of them at once. With our system, you can decide to replace five gauges per year or quarter and take small steps by adding them into your system one by one.

If you have 50 tanks with gauges and you just replace 10, can the software in the control room still read data from both the old and the new ones without any conflict?

A: Yes, the control room operators wouldn't even notice that we replaced the level gauge on the tank. They would still see their old tank management system — their old screens — and get the level or volume or whatever parameters they need.

Is the radar system noninvasive?

A: The 5900 radar level gauge is a non-contacting radar, meaning it doesn't have any contact with the product inside the tank. But we also have guided wave radars, mainly used for process level, where the device sends a low energy microwave signal down a probe into the product in the tank.

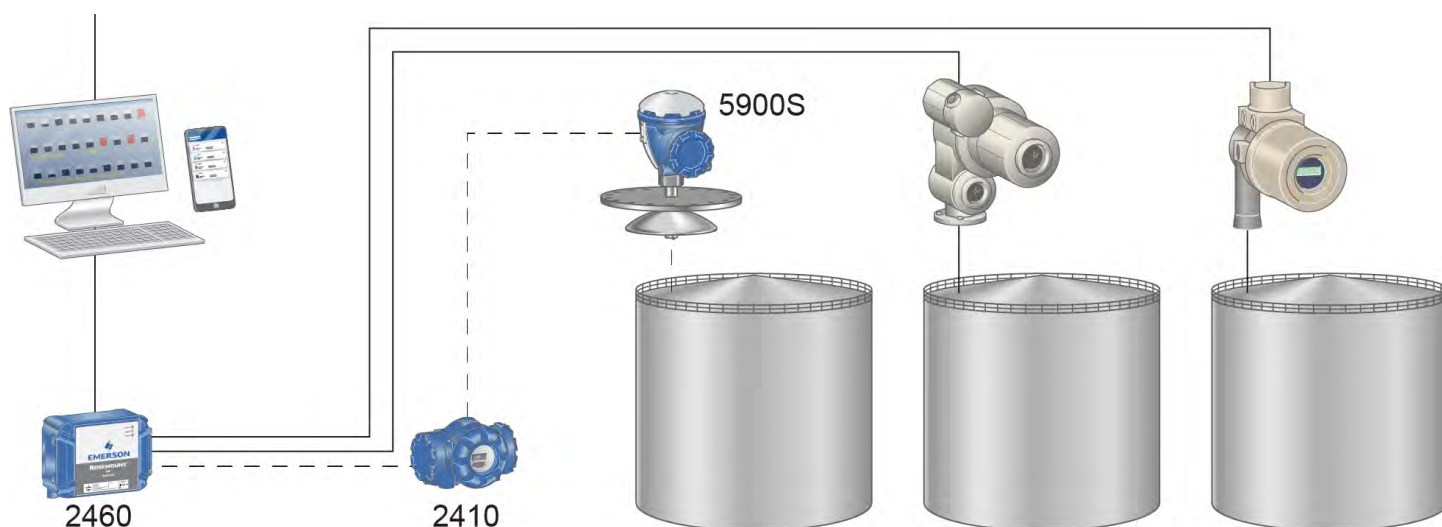
Does installation require a lot of downtime?

A: In general no but it depends, the 5900 radar level gauge is much smaller than many other models and offers the advantage of being easily installed on an existing tank opening. This feature allows for a relatively quick and hassle-free replacement of outdated devices. However, the older servo gauges, apart from being heavy and cumbersome, may require additional time and effort for removal.



How can a potential user find out more about Emerson's tank gauge emulation solution?

A: They can visit our website at <https://www.emerson.com/en-us/automation/measurement-instrumentation/tank-gauging-emulation>.



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