



Radar vs Ultrasonic Tank Level Monitoring: Which Technology Is Right for Your Application?

Choosing the right tank level monitoring technology can improve inventory visibility, operational efficiency and confidence in remote measurements. Radar and ultrasonic sensors are two widely used non-contact options, but each responds differently to the product, tank and operating environment.

This guide explains how radar and ultrasonic level monitoring work, compares their strengths and helps you identify the better fit for your application.

How ultrasonic tank level monitoring works

An ultrasonic sensor sends high-frequency sound waves towards the liquid surface. It measures the time taken for the echo to return and uses that time-of-flight measurement to calculate the distance between the sensor and the liquid. The tank level can then be determined from the configured tank dimensions.

Key advantages of ultrasonic monitoring

- Cost-effective for many common monitoring applications
- Simple, non-contact installation
- Low power consumption
- Well suited to water, wastewater, oil and agricultural applications
- A practical choice for large deployments where unit economics are important
- Typical ultrasonic applications
 - Water and wastewater tanks
 - Agricultural storage
 - Diesel and heating oil tanks
 - Waste oil tanks
 - General industrial liquid storage

Rochester Sensors example: The TEK 811 Cellular Ultrasonic Monitor combines ultrasonic measurement with cellular connectivity for remote liquid level monitoring.

How radar tank level monitoring works

A radar level sensor sends electromagnetic waves towards the liquid surface. It measures the returned signal to determine the distance to the product. Because radar does not depend on sound travelling through the air space above the liquid, it is generally

less influenced by temperature changes and is often more resilient where vapour or condensation is present.

Key advantages of radar level sensor monitoring

- High measurement confidence in demanding applications
- Generally less affected by temperature change, vapour and condensation
- Suitable for challenging industrial environments
- Can be installed invasively in metal or plastic tanks
- Can be installed non-invasively on suitable plastic or poly tanks
- Important: radar still requires a suitable mounting position and a clear measurement path. Internal obstructions, poor alignment and unsuitable mounting conditions can affect performance.
- Typical radar applications
- Chemical and additive storage
- Lubricants and oils
- IBC and tote monitoring
- Industrial liquid storage
- Mobile assets
- Applications where operating conditions are variable or demanding.

Rochester Sensors example: The TEK 880 Cellular Radar Monitor combines radar measurement, cellular communications and Bluetooth-enabled setup. It supports invasive installation and non-invasive installation on suitable plastic tanks.

Five questions to ask before choosing

- What liquid or material is being measured?
- What are the tank material, height, geometry and internal features?
- Are vapour, condensation, foam or significant temperature changes expected?
- Is invasive installation possible, or is a non-invasive option required?
- What accuracy, reporting frequency, connectivity and budget are required?

Frequently asked questions

Is radar more accurate than ultrasonic?

Radar can provide more consistent measurement in demanding environments because it is generally less influenced by temperature, vapour and condensation. The best-performing option still depends on the liquid, tank, installation and required measurement range.

Can radar measure through a tank wall?

On suitable non-metallic tanks, radar can support non-invasive measurement through

the tank wall. Tank material, wall thickness, mounting location and site conditions must be assessed before installation.

Which technology offers the best overall performance?

There is no universal winner. The right choice depends on the product, tank construction, environment, required measurement confidence, communications and commercial objectives.

Rochester Sensors Europe recommendation

For many common tank monitoring applications, ultrasonic technology offers a reliable and cost-effective solution. Where conditions are more demanding, or where measurement resilience is a priority, radar may provide the stronger long-term fit.

Rochester Sensors Europe offers radar, ultrasonic and pressure-based monitoring solutions with a range of communication options. The best result comes from matching the sensing technology, installation method and connectivity to the specific tank and operating environment.