

Why Radar Accuracy Index (RAI) matters when evaluating radar level sensors

Consideration when choosing radar level sensors for industrial use

Benefits at a glance

- High-precision 80 GHz
- In-situ accuracy verification (RAI)
- Reduced maintenance
- Fast commissioning
- Digital connectivity
- Reliable in foam/vapor
- Hazardous-area approvals
- Long-term stability



Summary Selecting the right radar level sensors for industrial applications requires understanding how frequency, process conditions, vessel geometry and digital capabilities influence measurement reliability. While 80 GHz radar technology provides superior accuracy in complex and foam-prone

environments, long-term performance depends on the instrument's ability to verify its own accuracy over time.

Endress+Hauser's Micropilot FMR6xB radar portfolio incorporates both 80 GHz performance and Radar Accuracy Index (RAI) to ensure continuous, traceable verification of

measurement accuracy, making it an optimal choice for facilities seeking dependable, maintenance-efficient level measurement.

Challenge Industrial environments introduce measurement challenges, including foam formation, vapor layers, temperature deviations, pressure swings and internal obstructions that can weaken or distort radar echoes.

Choosing the wrong radar frequency or antenna configuration can lead to inaccurate readings, nuisance alarms or unstable level control. Many sites also struggle with the maintenance challenges tied to periodic calibration: removing devices from service, exposing staff to hazardous tanks and risking damage to the instrument and wiring.

The ability to verify performance in situ with no loss of signal to the control system would provide operators with high confidence in measurement accuracy, especially in demanding applications.

Solution Endress+Hauser's Micropilot FMR6xB series, including the Micropilot FMR60, FMR62B and FMR63B, provides a purpose-built solution for reliably selecting and deploying radar level sensors in challenging industrial applications. These 80 GHz frequency-modulated continuous wave (FMCW) radars offer narrow beam angles for precise targeting, strong performance in foam or vapor and high accuracy in low-dielectric media. They support a wide range of mounting options, communication protocols (HART, Ethernet-APL, IO-Link, Bluetooth) and hazardous-area certifications, ensuring they fit virtually any tank or process requirement (figure 1). What sets the FMR6xB portfolio apart is its incorporation of RAI.

RAI uses dual quartz oscillators to continuously compare the device's live frequency signature to its factory fingerprint, providing an in-situ, ISO-compliant verification of measurement accuracy (figure 2). This means operators can trust the device without removing it from service or

relying on external calibration rigs, dramatically reducing downtime and maintenance effort while delivering documented measurement integrity.

Results Choosing radar level sensors from the Micropilot FMR6xB portfolio allows industrial facilities to achieve long-term measurement reliability with minimal operational disruption. The advanced 80 GHz radar platform enables stable level readings even in difficult environments with foam, vapor, build-up or turbulence.

RAI gives operators continuous confidence that the device remains accurate, supporting extended calibration intervals and reducing the need for tank entry or equipment removal. The result is better process consistency, fewer alarms and upsets improved chemical efficiency, safer operations and lower lifecycle costs. By combining cutting-edge radar performance with continuous verification, Micropilot FMR6xB provides a future-proof technology for modern industrial level measurement.

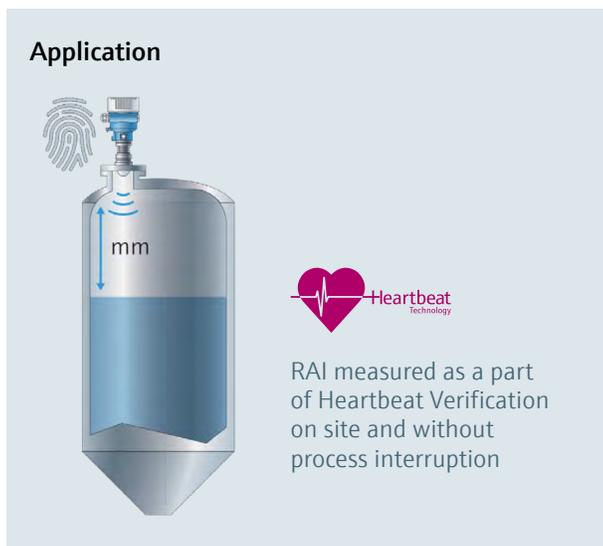


Figure 1

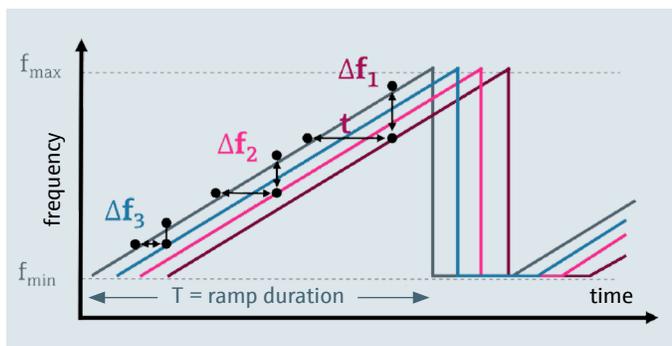


Figure 2



Learn more about the FMR6xB





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