



## Smart fluid monitoring

# Time domain reflectometry (TDR) system



TDR probes



Processing unit

In service with over 10,000 sensors on a range of aircraft platforms, Meggitt's breakthrough fluid gauging system utilizes high-speed electronics and RF-based technology to accurately measure fluid levels and is compatible with all fluid types.

### Increase dispatch reliability

The dual-function system can measure the fluid level, as well as detect and measure water accumulation, thus increasing reliability. Each TDR sensor is delivered "system-ready" – no calibration is required after it is installed into the aircraft. The system is robust to contaminants and operates with full accuracy in fluids where capacitance probes would fail.

### Reduce maintenance burden

The TDR-based system enables predictive maintenance by detecting and measuring the amount of water present in the fuel. Both digital or analog outputs are available which are compatible with all common avionics system communication protocols.

The advanced digital built-in-test and self-diagnosis features can quickly identify the location of any faulty cable or sensor. This reduces the cost of maintenance and support associated with troubleshooting and replacing failed probes, which is particularly important in a fluid system that might employ as many as 50 discrete sensors.

### Adaptable geometry

The length, number and positioning of the sensors and signal conditioners can be adapted to the needs of your application. We can also design curved and angular configurations that can be mounted in any orientation to accommodate the tank geometry.

Please contact our team to discuss your requirements in further detail.

## Key benefits

- Single sensor measures fluid and water levels
- Not affected by fluid contaminants
- No calibration required on-aircraft
- Built-in-test (BIT) diagnostics with fast and easy fault isolation
- Up to 30% lighter than capacitance-type probes

## Key features

- Accuracy to 0.1 inch (2.5mm)
- Compatible with all aerospace fluids without compensation
- Interfaces with all aircraft communication systems
- No length limitation
- Multiple sensors can be connected to remote processor or electronics integral to the probe

## Applications

- Fuel, lube and hydraulic systems, including biofuels
- Commercial and military aircraft and helicopters
- Space launch vehicles

## Contact

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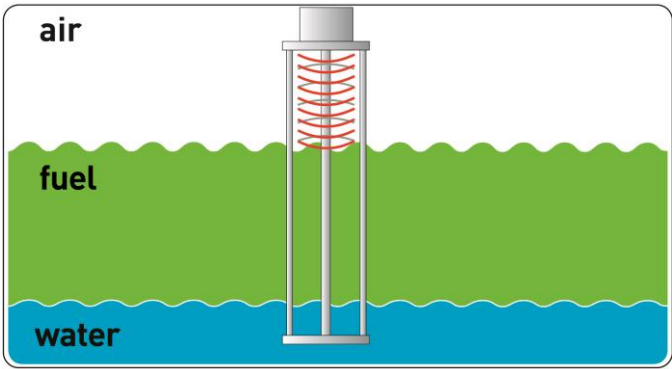
## Meggitt Sensing Systems



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How it works

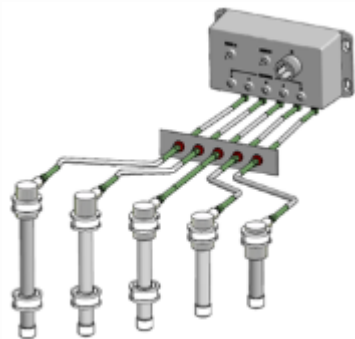


In its simplest form, the TDR system is comprised of a simple wave guide sensor and an electronic controller.

The system sends an RF pulse into the fluid which is reflected off the fluid (oil/air, fuel/air or fuel/water) interfaces. The system detects and measures the time between the returned reflection(s) (also known as “electronic echoes”) from each interface in order to determine the height and quantity of each fluid within the sensor.

Technical performance comparison

	TDR	Capacitance	Float switch
Technology	Radio Frequency (RF)	Capacitance	Reed switch/magnetic float
Accuracy	0.1 inch, independent of length. Not affected by changes in fluid density or dielectric constant.	2% May be affected by changes in fluid density or dielectric constant	2 % May be affected by fluid density (i.e. hot/cold oil)
Water detection	✓	✗	✗
Calibration	✓ None required	✗	✗
Weight	✓✓ up to 30% lighter	✓	✓
Compensation	✓ None required	✗	✗
BIT	✓	✗	✗
Output	1 – 9Vdc CANBUS, ARINC	1 – 9Vdc (active) 20V peak-to-peak (passive)	1.4 to 26.6Vdc



Typical five probe deployment

Note: Due to continuous process improvement, specifications are subject to change without notice

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