

## REFLECT™

Providing the highest confidence in level measurement in the most challenging conditions.

REFLECT™ provides accurate monitoring of liquids and solids in critical measurement applications, ensuring complete peace of mind with a product that requires minimal skills and human intervention, thereby minimizing lifetime cost of ownership. Outperforming products that, up until now, required frequent and costly manual maintenance to validate measurement integrity.

### **FMCW Radar Technology**

Using FMCW Radar Technology, REFLECT™ transmits continuously, constantly varying the frequency of the signal. The frequency of the returning signal is compared to the signal being emitted at that moment, the difference between the two corresponding to the time the signal has taken to return. FMCW technology compared to pulsed radar technology is the most accurate of the two because of its narrower beam angle and in most cases stronger signal.

### **An Ally to Ultrasonic Technology**

The REFLECT™ radar level sensor has been designed to be an ally to the long-standing ultrasonic technology that most of us know and love. Both technologies have their place in the world and at Pulsar Measurement, you have the choice of both, coupled with award-winning customer service and technical knowledge.

### **Ease of Installation**

In 'Installation' mode, REFLECT™ **TILT**™ ensures optimal measurement by using the built-in LEDs to signal when



## THE RIGHT SENSOR FOR

- Applications Needing High Accuracy
- High Electrical or Acoustic Noise Applications
- Turbulent Applications with Foam
- Dosing Plants & IBC's
- Digesters

the sensor is level (in liquid applications) or giving greatest signal strength (in solids applications). In 'Measurement' mode, these lights are used to give early indication of a change in measurement integrity, to give confidence in the accuracy of your data.

REFLECT™ **TILT**™ utilizes a traffic light system - a red light means that something needs to be addressed, an amber is an early warning that something may not be quite right, and a green light signals that the device is working optimally. Installation and use of

your sensor has never been so simple before!

### Making installation a BReez™

To aid installation even further REFLECT™ includes a patent pending adapter that is brand new and unique to Pulsar Measurement. Instead of threading the adapter through lengths and lengths of cable, the BReez adapter simply clamps to the top of the cable and screws into the top of the sensor, making installation 3 times faster than before!

### Accurate, Reliable and Robust

The hermetically sealed Pulsar Measurement REFLECT™ level sensors require no routine servicing, able to withstand the harshest environments whilst maintaining accuracy in the presence of extreme dust, temperature, moisture, pressure, and chemicals. The REFLECT™ level sensors also performs reliably on turbulent surfaces, making it the ideal choice where the applications can be tough.

The sensors also benefit from Pulsar Measurement’s worldwide reputation of accuracy and reliability thanks to the built-in DITEM software. Allowing the sensor to ‘hone-in’ on the true level – giving you the accurate data you need to be able to make decisions about your operations. REFLECT™ is also compatible with HART communication protocol and DTM drivers.



REFLECT™ BReez Adapter and PVDF Front Thread Adapter

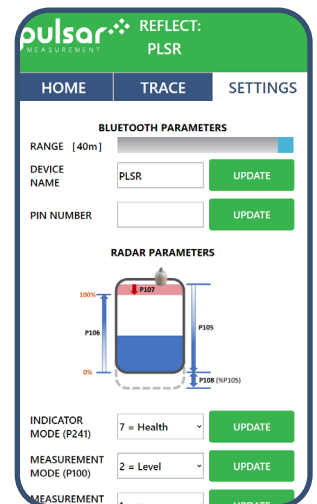
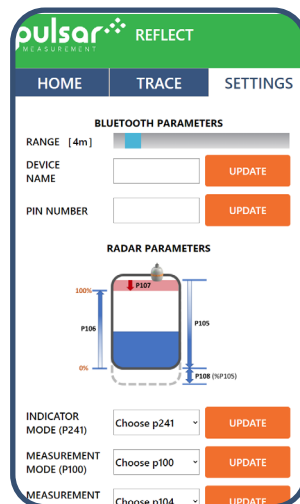
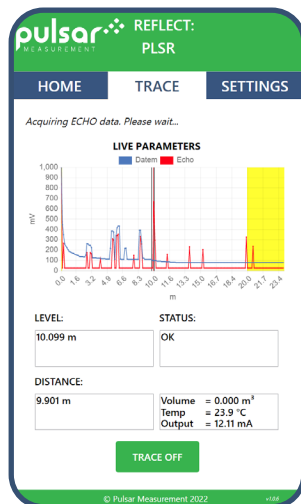
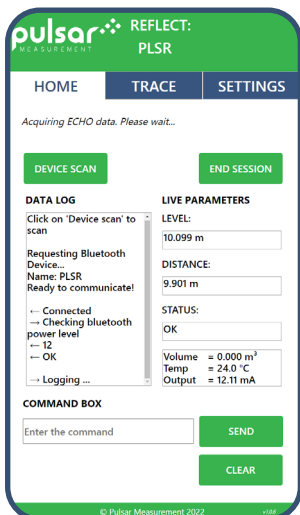
### Bluetooth Enabled

REFLECT™ is not only supplied with Bluetooth built in as standard, but for additional security and confidence that only authorized users can access the device, it’s range is user-definable. Users can easily set the maximum wireless range of each REFLECT™ to be between 4 and 40 m (13.1 - 131.2 ft.), depending on the size of their facility. Users also have the option to disable the Bluetooth function if required.

### Unique and Secure Web-Based App

Pulsar REFLECT™ uses a web-based app, to give an easy and convenient way for you to change parameters, access trend reports and view echo traces. The web-based app is accessible through any browser on any device (PC, Android, or iOS). Once the browser has loaded on your device you won’t need to worry about signal. Using a web-based app also means there are no regular updates to install just scan the QR code and you’re ready to go!

For more information on REFLECT™ contact one of the friendly Pulsar Measurement team today.



# Technical Specifications

## GENERAL SPECIFICATIONS

**Target Market:** Water and Wastewater  
Environmental

**Measurement Parameters:** Level  
Volume

## PHYSICAL SPECIFICATIONS

**Dimensions:** Nominal 135 mm (H) x 102 mm (D) (5.3 in x 4.0 in)

**Weight:** Nominal 1.5 kg (3.3 lbs)

**Frequency:** V-band (63GHz)

**Sensor Body Material:** Valox

**Mounting Connection:** Rear: ATEX/IECEx approved sensors only: 1-inch BSP with BReez™ adapter; cFMus approved sensors only: 1-inch stainless steel NPT with BReez™ adapter  
Front: Optional, 1.5-inch BSP or 1.5-inch NPT

**Enclosure Protection:** IP68 / NEMA 6P

**Vibration Protection:** Fully Potted

**Cable Lengths:** Standard: 5 m, 10 m, 20 m, or 30 m (16.4 ft, 32.8 ft, 65.5 ft, or 98.4 ft)  
Optional: 50 m, or 100 m (164 ft or 328 ft)

## PERFORMANCE

**Measurement Range:** 8 m or 20 m (26.2 ft or 65.6 ft)

**Technology** FMCW

**Beam Angle:** 6°

**Effective Beam Angle (using DATEM)** 3°

**Resolution:** 1 mm (0.039 in)

**Accuracy:** 2 mm (0.079 in)

**Repeatability:** 1 mm (0.039 in)

**Near Blanking:** 75 mm (2.95 in) from drip shield

**First Stable Measurement:** Cold Boot = 10 seconds  
Warm Boot = 5 seconds

**Max Start-up Current:** 20 mA

**Current Consumption:** 3.8-22mA, resolution 1uA

**Input Voltage Range:** 12 - 28 V DC

## ENVIRONMENTAL

<b>Ambient Operating Temperature:</b>	-40 °C to +80 °C (-40 °F to +176 °F)
<b>Humidity:</b>	0 to 99% (non-condensing)
<b>Process Connection Temperature:</b>	-40 °C to +80 °C (-40 °F to +176 °F)
<b>Process Pressure</b>	-1 to +3 bar

## OUTPUT / COMMUNICATION

<b>Connection:</b>	2-wire loop powered
<b>Analog Output:</b>	4-20mA
<b>Local Wireless Communication:</b>	Encrypted Bluetooth with mobile interface (can be disabled)
<b>Digital Communication:</b>	HART with DTM
<b>Wireless Range:</b>	4 m - 40 m (13.1 ft - 31.2 ft) User Configurable
<b>User Indicator:</b>	Quad-color lights with tilt sensor

## APPROVALS

<b>Regulatory Approvals:</b>	FCC, RED, CE, UKCA, IECEx, ATEX, UKEx, cFMus, Giteki
<b>Explosive Atmosphere:</b>	ATEX/IECEx/UKEx: Zones 0, 1, 2: Ex II 1G Exia IIC T4 Ga, Tamb.= -40°C to +80°C. Zones 20, 21, 22: Ex II 1D Exia IIIC T100°C Da, Tamb.= -40°C to +80°C. cFMus: Intrinsically safe for Class I, Div 1, Groups A,B,C,D, T4; Class II, Div 1, Groups E,F,G, T4; Class III, T4
<b>WEEE and ROHS:</b>	Compliant

## ACCESSORIES

<b>BReez™ Adapter:</b>	Greatly increases ease of use 1 supplied as standard, additional quantities sold separately Available in PVDF or PEEK
<b>Front Thread Adapter (PVDF):</b>	Optional addition to standard list price For compatibility with chemical applications



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