pulsar

MEASUREMENT

dBi MODBUS INTELLIGENT TRANSDUCERS

Combining the highest intelligence with minimal complexity in a non-contact level transmitter.

Setting new standards in communications, offering low-power ultrasonic level measurement with capabilities superior to traditional transducers.

The dBi Modbus (dBi-M) series of transducers are the ultimate, low-power, ultrasonic level sensors that benefit from Modbus communication. The series features Pulsar Measurement's world-leading DATEM echo processing for accurate and reliable measurement in the most challenging applications, with a measurement range of 125 mm to 15 m (4.9 in to 49.2 ft) across multiple sensors.

The dBi-M allows users to transmit measurement and calibration data digitally between the sensor and a PLC, SCADA, or data logger. Integrating the dBi-M into your existing network is easy and cost-effective.

The dBi-M is ready for the most challenging remote applications. The IP68 design enables the unit to be fully submerged, perfect for applications where flooding or surcharging can occur. The dBi-M can be connected to a variety of external wireless telemetry devices featuring open protocol Modbus communications. The ultra-low power consumption of the dBi-M will give you the longest

THE RIGHT SENSOR FOR

- Event Duration Management
- Combined Sewer Overflows
- Remote Level Monitoring
- Tank Level Monitoring
- Volume Measurement

deployment time possible, providing data insights for extended periods of time while reducing the need to maintain your data collection system. The dBi-M is a greener solution to remote network monitoring and discharge point monitoring.

Designed to fit low-power and low-overhead needs for remote installations, users are able to multi-drop up to 120 dBi-M transducers with just a single controller. The open protocol allows for the dBi-M to connect to any Modbus-enabled device, saving thousands on installation costs and labor.

Formats to suit your application

The dBi Modbus series transducers are available in a range of different formats, designed to be able to meet the needs of your application. Units are available with flanged or front-thread connections for mounting flexibility, PTFE coating for corrosive applications, fitted with a foam face for solids applications, and submergence shields to prevent the face of the transducer from becoming dirty in applications where submergence is common.

dBi-M3 MicroFlow-i area velocity monitoring

Calibration and functional elements

The dBi-M transducer range has been specified and designed to meet the demanding requirements of today's process level measurement applications for liquids and solids. The units are compatible with RS-485 Modbus communications and can easily be set up using a PC with an RS-485 adapter and the free Pulsar Measurement dBi-M software.

Install the dBi-M transducer level sensors efficiently and with confidence. Calibration can be achieved either by using third-party Modbus RTU communications or via the free Pulsar Measurement dBi-M PC Software. The non-contacting ultrasonic principle ensures the sensor doesn't foul or fail. Use the diagnostic signal Modbus registers to verify performance and application conditions remotely at any time.

dBi-M3 Threaded Nose and PVDF Face

The dBi-M units are based on a PZT ceramic transducer element, and the nominal beam angle for the units is 10° (-3dB). With the embedded proprietary DATEM echo processing software, the dBi-M provides unmatched low-power performance in the most challenging applications like sewer monitoring and pump stations.

Echo Processing

The dBi Modbus transducers feature Pulsar Measurement's unique echo processing software, Digital Adaptive Tracking of Echo Movement (DATEM), which allows the transducer to zero-in on the echo from the true target and follow it as it moves up and down, ignoring the stationary echoes from obstructions in the measurement path. Obstructions like chains, ladders, and pump heads could cause many ultrasonic systems to fail or report the wrong level, but are not a problem for the dBi Modbus transducers. The dBi-M transducers give reliable and accurate measurement in applications where other ultrasonic level sensors don't.

Anatomy of an echo trace
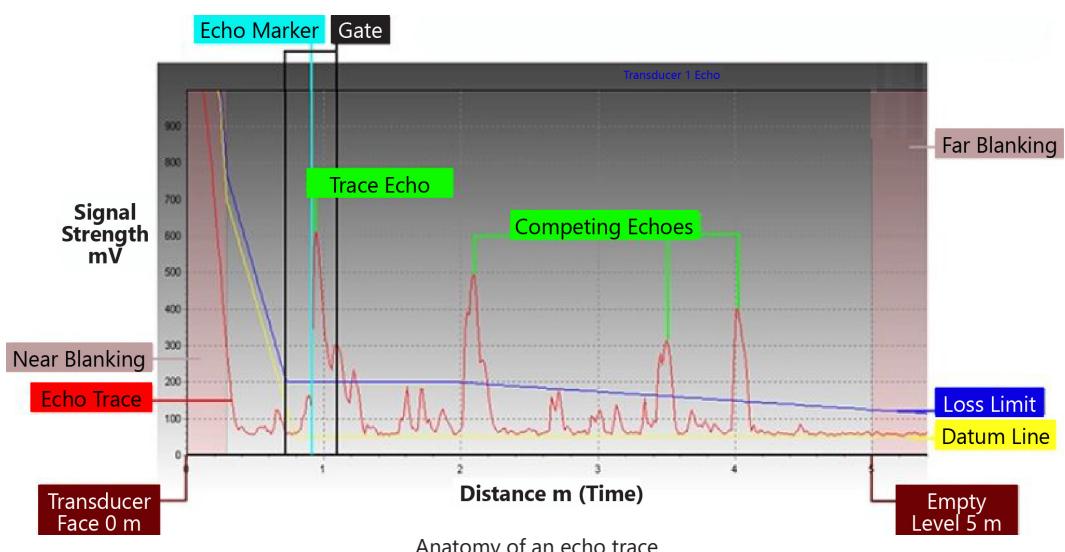
Technical Specifications

PHYSICAL: TRANSDUCER SPECIFIC

	dBi-M3	dBi-M6	dBi-M10	dBi-M15
Sensor Body Dimensions:	77 mm D x 134 mm H (3 in x 5.3 in)	86 mm D x 121 mm H (3.4 in x 4.8 in)	86 mm D x 121 mm H (3.4 in x 4.8 in)	86 mm D x 121 mm H (3.4 in x 4.8 in)
Weight:	1 kg (2.2 lb)	1.2 kg (2.7 lb)	1.3 kg (2.9 lb)	1.4 kg (3.1 lb)
Measurement Range:	125 mm to 3 m (4.9 in to 9.8 ft)	300 mm to 6 m (11.8 in to 19.7 ft)	300 mm to 10.1 m (11.8 in to 32.8 ft)	500 mm to 15 m (19.7 in to 49.2 ft)
Beam Angle:	<10°	<10°	<10°	<8°
Effective Beam Angle (using DATEM)	3°	3°	3°	3°
Accuracy	2 mm (0.08 in)	4 mm (0.2 in)	3 mm (0.1 in) up to 6 m (19.7 ft) range 6 mm (0.2 in) over 6 m (19.7 ft) range	5 mm (0.2 in) up to 10 m (32.8 ft) 10 mm (0.4 in) over 10 m (32.8 ft) range
Resolution:	1 mm (0.04 in)	2 mm (0.08 in)	3 mm (0.1 in)	5 mm (0.2 in)

PHYSICAL: ALL TRANSDUCERS

Sensor Body Material:	Valox 357 PBT
Cable Lengths:	Standard: 5 m, 10 m, 20 m, or 30 m (16.4 ft, 32.8 ft, 65.6 ft, or 98.4 ft) Optional up to 150 m (492.1 ft) maximum (increments of 10 m (32.8 ft) only)
Mounting Connection:	1"BSP or 1"NPT

ENVIRONMENTAL

Enclosure Protection:	IP68 / NEMA 6P
Max. And Min. Temperature (Electonics):	-40 °C to +80 °C (-40 °F to +176 °F), options for front thread and flange mounting

APPROVALS

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CE Approval:	Listed in the Certificate of Conformity within the manual
IECEx, UKEx & ATEX Approvals:	Standard: Zone 0: II 1 G Ex ia IIC T4 Ga, Zone 20: II 1 D Ex ia IIIC T130°C Da, Tamb = -40 °C to +80 °C. Also suitable for zones 1, 2, 21 and 22.
cFMus Approvals:	Standard: Instrinsically Safe for: Class I, Div.1, Group A,B,C & D, T4 Class II, Div.1, Group E,F & G, T4 Class III, T4

PERFORMANCE

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Input Voltage Range:	5-15 V DC
Output:	Modbus RTU via RS-485
Current Consumption:	Average 14 mA, 0.006 mAh per measurement.
Boot Time:	1 second for the first measurement
Temp. Compensation:	Automatic, internal temperature sensor, ± 0.5 °C/°F
Communcations Protocol:	Modbus RTU

TRANSDUCER OPTIONS

	dBi-M3	dBi-M6	dBi-M10	dBi-M15
PVDF:		✓	✓	
Front Threaded / PVDF:	✓	✓	✓	
Submergence Shield:	✓	✓	✓	✓
Flanged DIN / ANSI:		✓	✓	✓
Foam Face:			✓	✓
Sanitary Flange	✓	✓	✓	
Intrinsically Safe of All the Above:	✓	✓	✓	✓
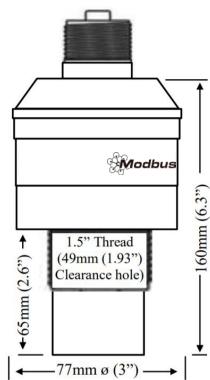
dBi-M3 & dBi-M6 Front Thread
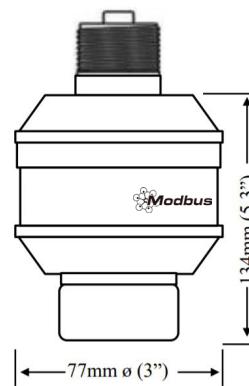
dBi-M3 Rear Thread
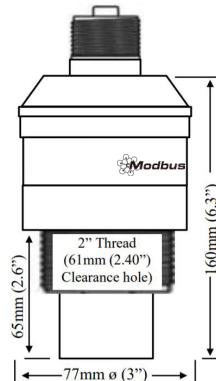
dBi-M10 Front Thread
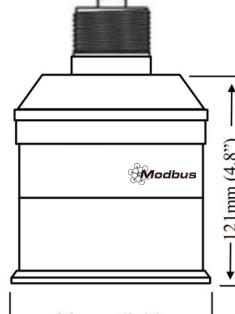
dBi-M6 & dBi-M10 Rear Thread
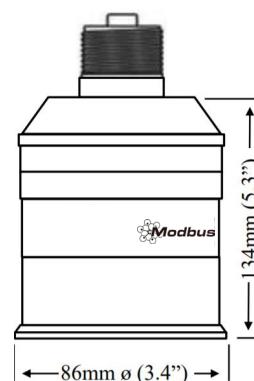
dBi-M15 Rear Thread

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MEASUREMENT

Delivering the Measure of Possibility

United States
+1 888-473-9546

Canada
+1 855-300-9151

Asia
+60 102 591 332

United Kingdom
+44 (0) 1684 891371

pulsarmeasurement.com

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