SPECIALIST FLOW TRANSDUCERS

Technical Specifications:

The dB3 with Double Sun Shields and dBMACH3 transducers have been designed specifically for open channel flow measurement.

PHYSICAL: MODEL OPTION SPECIFIC

Model Option:	dBMACH3	dB3 with Double Sun Shields
Sensor Body Dimensions	180 mm D (sunshield) x 205 mm H (7.08 in x 8.1 in)	180 mm D (sunshield) x 115 mm H (7.08 in x 4.5 in)
Weight	Nominal 1.1 kg (2.4 lb)	Nominal 1.1 kg (2.4 lb)
Max. and Min. Temperature (Electronics)	Standard: -30 °C to +90 °C (-22 °F to +194 °F) ATEX: -30 °C to +75 °C (-22 °F to +167 °F)	Standard: -40 °C to +90 °C (-40 °F to +194 °F) ATEX: -40 °C to +75 °C (-40 °F to +167 °F)
Measurement Range	0 mm to 2.4 m (0 in to 7.9 ft)	125 mm to 3 m (4.9 in to 9.8 ft)
Accuracy	±1 mm (0.039 in)	0.25% or 6 mm (0.2 in) whichever is greater
Resolution	±0.5 mm (0.019 in)	0.01% or 2 mm (0.08 in) whichever is greater
MCERTS Certified	Not Applicable	Class 1 (0.193%) when used with FlowCERT Lite

PHYSICAL: BOTH TRANSDUCERS

Sensor Body Material	Valox 357 U and syntactic foam face
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 ft) maximum (increments of 10 m / 32.8 ft only)
Maximum Separation	500 m (1,640 ft)
Mounting Connection	BSP or 1" NPT

ENVIRONMENTAL

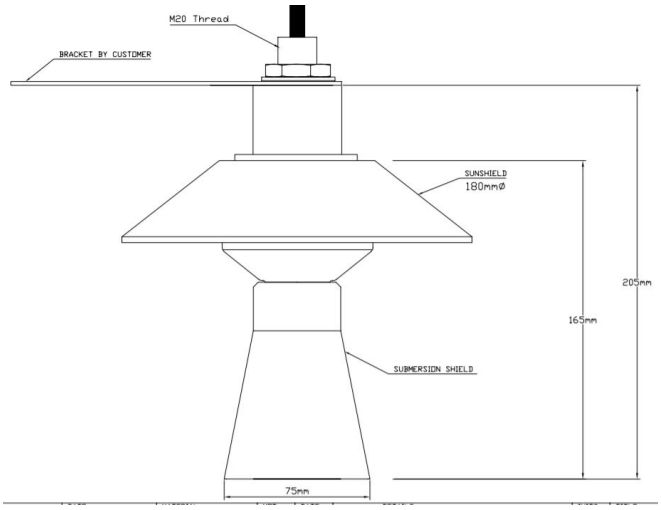
Enclosure Protection	IP68 / NEMA 6P

APPROVALS

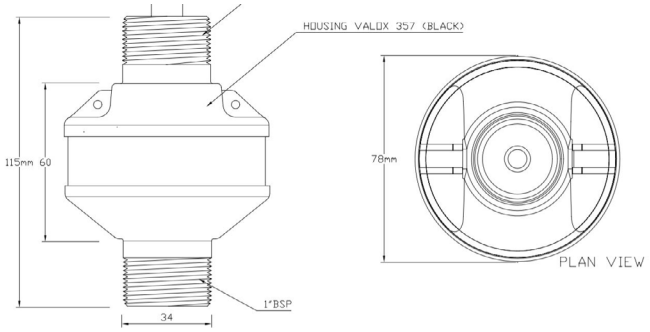
CE Approval	2014/30/EU - EMC & 2014/34/EU ATEX Directives. Standards applied: EN 60079-0:2012+A11:2013/ EN 60079-11:2012 / EN 60079-18:2009 / EN 60079-26:2007 / EN 61326-1:2013
ATEX Approval	Standard ATEX EEx m II T6 or optional EEx ia IIC T6. FM/FMC approval.

PERFORMANCE

Frequency	125kHz
Beam Angle	<10°



dBMACH3 Transducer Drawing



dB3 Transducer Drawning (not including Sun Shields)

Delivering the Measure of Possibility

Pulsar Measurement offers worldwide professional support for all of our products, and our network of global partners all offer full support and training. Our facilities in Malvern, UK and Largo, USA are home to technical support teams who are always available to answer your call or attend your site when required. Our global presence, with direct offices in the UK, USA, Canada, and Malaysia, allows us to create close relationships with our customers and provide service, support, training, and information throughout the lifetime of your product.

By taking a step forward in echo processing technology, Pulsar Measurement addresses applications previously thought to be beyond the scope of ultrasonic measurement. This technology improves signal processing at the transducer head which has made it possible to increase resistance to electrical noise, enabling the transducer to 'zone in' on the true echo.

For more information, please visit our website:

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Rev 4.0

ULTRA 4

Non-contacting, ultrasonic, level control & flow measurement.

Offering On-Screen Trend Monitoring in a Compact, Cost-Effective Package

Ultra 4 offers the sophistication and advanced features of the rest of the Ultra range in a compact, cost-effective package and useful features that make it even easier to set up and fine-tune.

Offering as the name suggests, four-alarm or control relays (3 x SPCO isolated and 1 x SPNO solid-state) and a multi-functional display while losing none of the easy setup and configuration that has made the Ultra range of controllers the natural choice for non-contacting measurement worldwide.

Features & Benefits

Like the rest of Pulsar Measurement's 'transducer plus controller' ranges, Ultra 4 is compatible with both dB Ultrasonic and dBR Radar transducers. The unit can be either wall or fascia mounted, allowing it to be used in a wide range of applications all over the world.

Communications & Data Logging

Ultra 4 includes Profibus and Modbus RTU digital communication options, enabling high accuracy, non-contacting measurement with communications in one multifunctional controller.

The convenience of an on-board micro SD card slot for extended data logging makes storing, accessing, and analyzing data that little bit easier.

Three Different Device Settings in One Convenient Controller

The Ultra 4 from Pulsar Measurement can dedicate the functionality of the unit to any of three specific duties e.g. level or volume measurement, pump control, or flow measurement.

THE RIGHT METER FOR

- Pump Control
- Open Channel Flow & Level
- Chemical Dosing
- IBC Tank Level
- Storage Tank Levels
- CSO & Sewer Network Monitoring

Despite its high specification and ability to combine these measurements, the Ultra 4 has been designed so that blending these functions does not lead to complicated calibration and a compromise to the product specification.

Functional Qualities

The controller sends a transmit pulse to the transducer, which emits an ultrasonic pulse or radar signal — as this controller is compatible with BOTH radar and ultrasonic, it doesn't matter which transducer you choose. This signal is perpendicular to the transducer face and the returned echo is sent back to the Ultra 4. The time taken

Ultra 4 Fascia Unit

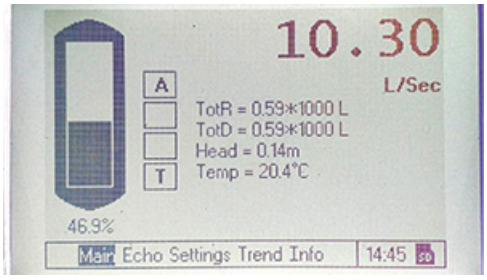
to receive the echo is measured and the distance from the transducer face to the surface being monitored is calculated.

The unit can measure from zero to 40 m (131.2 ft) from the face of the transducer to the surface being monitored, dependent on your application and your chosen transducer.

Relays

The relays can be programmed to activate alarms, pump starters, or other control equipment. There is an isolated 4-20mA output that can be connected to a recorder or PLC, to monitor, depending on your chosen application. Level, space, distance, OCM head, OCM flow, or volume can be set up independently from that shown on the display. There is an RS232 port so that the Ultra 4 can be operated remotely by a PC or other equipment.

Four user-definable relays are available with individual set points and intelligent performance logging software features ensure that you have maximum control versatility over your application.



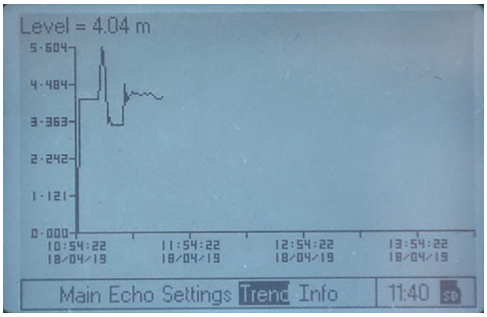
Ultra 4 Main Screen and Bar Graph

Ultra 4 Programming

The Ultra 4 can be programmed either by the built-in keypad (comes as standard on all wall and fascia units), via the SD card slot, or by PC via the RJ11 Serial Interface. All parameters are stored in non-volatile memory, so are retained in the event of a power interruption. A second backup copy of all parameters can also be retained in the Ultra 4 memory, in case an alternative set of parameters needs to be stored.

The Main Screen

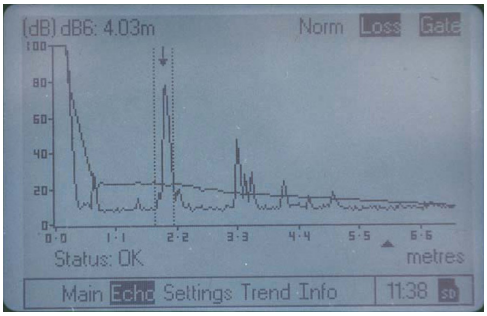
Ultra 4 allows the onboard relays to be configured to a choice of 4 behaviors.



The bar graph to the left-hand side of the screen indicates level, as well as a percentage, is shown underneath.

Trend Screen

The trend screen shows you at a glance how levels have varied over time. The unit is supplied with an 8GB Micro SD Card to increase its data logging capacity, giving you complete visuals on stock and level measurement.



Echo Screen

This screen displays the echo profile without the need to plug it into an external device. Pulsar Measurement's unique DATEM software is without equal in identifying and isolating the target, but the echo profile can help in fine-tuning and improving your measurement.

Digital Adaptive Tracking of Echo Movement (DATEM)

The system of Ultra 4 utilizes the unique DATEM software, a proven digital mapping technique developed especially for the Pulsar Measurement Ultra range of controllers. This gives the system unequaled ability when identifying the 'true target level' in the face of competing echoes from pipes, pumps, or other obstructions. Couple with the powerful, long-range abilities of the dB transducer range, the Ultra 4 lives up to its reputation as the most reliable ultrasonic level measurement system available.

The Ultra 4 ultrasonic level controllers have been designed to provide maintenance-free fit-and-forget performance.

Technical Specifications

PHYSICAL: MOUNTING OPTION SPECIFIC

Mounting Option:	Standard Wall Mount:	Fascia Mount:
Controller Body Dimensions:	150 mm x 130 mm x 63.5 mm (5.9 in x 5.1 in x 2.5 in)	160 mm x 180 mm x 63 mm (6.3 in x 7.1 in x 2.5 in)
Weight:	Nominal 700 g (1.5 lb)	Nominal 700 g (1.5 lb)
Enclosure Material / Description:	Polycarbonate, flame resistant to UL94-V0	Polycarbonate, flame resistant to UL94-V0
Cable Entry Detail:	3 x M20 glands	
Transducer Cable Extensions:	3-core Screened	
Maximum Separation:	1,000 m (3,280 ft), 500 m (1,640 ft) for dBR16 & dBR8	

ENVIRONMENTAL

IP Rating:	IP67/NEMA 4X (Standard), IP64 (Fascia)
Max. & Min. Temperature (Electronics):	-20 °C to +45 °C (-4 °F to +113 °F)
Flammable Atmosphere Approval:	Safe area compatible with approved sensors / transducers. See sensor / transducer spec sheet
UV Rating:	UL746C F1
CE Approval:	See EU Declaration of Conformity
UL Approval:	UL 61010-1. cULus listed. Certificate number E257330.

PERFORMANCE

Accuracy:	±0.25% of the measured range or 6 mm (0.2 in), whichever is greater. ±2 mm (0.01 in) for dBR16 mmWAVE RADAR
Resolution:	±0.1% of the measured range or 2 mm (0.08 in), whichever is greater
Max Range:	Dependent on application and transducer (maximum 40 m (131.2 ft) dB40)
Min Range:	Dependent on application and transducer (minimum zero dBMACH 3)
Rate Response:	Fully Adjustable

PROGRAMMING

Onboard Programming:	By integral keypad
PC Programming:	Via Integral RJ11 port on the unit, or via SD Card slot
Programming Security:	Via passcode (user selectable and adjustable)
Programmed Storage:	Via non-volatile memory
Data Logging & Removable Storage:	Via Micro SD card slot or internal 10-day totalizer logs (flow only)
SD Card Memory (Included):	8 GB

ECHO PROCESSING

Description:	DATEM (Digital Adaptive Tracking of Echo Movement)
Technologies:	Ultrasonic and FMCW RADAR

OUTPUTS

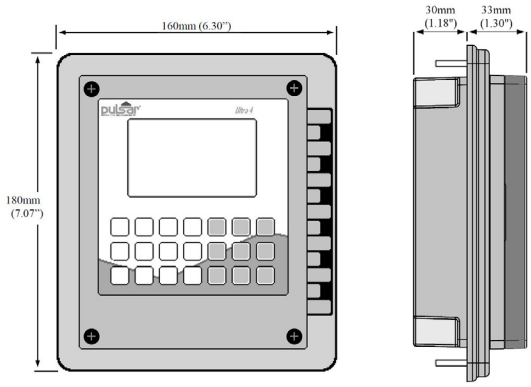
Analog Output:	Isolated (floating output (to 150 V) of 4-20mA or 0-20mA into 1 kΩ (user-programmable and adjustable)
Digital Output:	Half-Duplex RS232
Volt-free Contacts, Number, & Rating:	3 x SPCO isolated relays, rated at 5A at 250 V AC and 1 Solid-state SPNO isolated relay, rated 30 V at 100 mA, suitable for pulse counter applications
Display:	Monochrome graphical dot-matrix, 160 x 240 pixels. Fully programmable display options with an integral keypad with menu navigation keys. Program / run / test mode indicators

SUPPLY

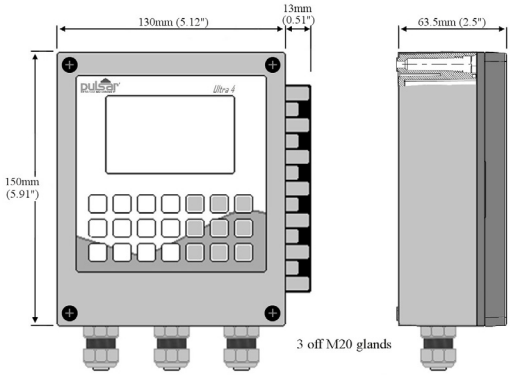
Power Supply:	100-240 V AC 50/60 Hz. DC 10-28 V
Power Consumption:	AC = 20 VA MAX, DC = 10 W max
Fuses, Mains:	1A 'T' 20 mm (0.8 in) ceramic 1500A breaking
Fuses, Transducer:	100 mA barrier type, 4000A breaking

COMMUNICATIONS (OPTIONAL)

Modbus RTU / ASCII:	Isolated RS485
Profibus DPV1:	Isolated RS485



Ultra 4 fascia mount drawing front and side



Ultra 4 wall mount drawing front and side

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Rev 7.0