



# BLACKBOX 130

Level measurement made simple.

## Compact & low cost intelligent controller.

The Blackbox 130 unit allows users to locally program the unit and give a readout of level. Economical and simple to program and operate, users benefit from extremely accurate and reliable digital echo processing with access to the dB and dBR range of transducers, measuring from 125 mm (4.9 in) right through to 40 m (131.2 ft).

### Keypad & Display

The integrated keypad and display mean that you have complete flexibility in your control application, providing a local display for those applications that require a local indication.

Alternatively, Blackbox provides an economical alternative for simple level measurement or control applications.

### dB Transducer & dBR Radar Compatibility

Blackbox units are compatible with the complete range of dB Transducers and dBR Radar Transducers, giving a range extending from 125 mm to 40 m (4.9 in to 131.2 ft), on solids, powders, or liquids. The unit benefits from DATEM (Digital Adaptive Tracking of Echo Movement) digital echo processing, providing unrivaled performance particularly on difficult applications.

### Calibration

Blackbox units can be set up using Pulsar's Blackbox PC software and optional interface cable, which links the Blackbox RJ11 RS232 port to the PC's serial or USB port. The interface cable is common for all standard Blackbox

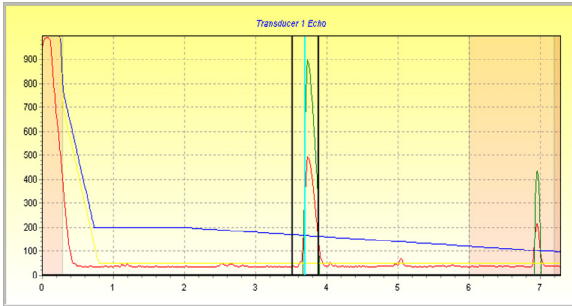


## THE RIGHT METER FOR

- Tank Level Monitoring
- Silo Level Monitoring
- Simple Level Indication
- Stock Control
- Compliance with Health and Safety
- Process Automation

units and is removed after programming, so only a single cable is required for multiple Blackbox controllers.

Blackbox units can also be set up using a handheld programming unit. Simple to operate and with a visual display of parameters entered, the handheld programmer can be used for any number of parameters entered, the handheld programmer can be used for any number of controllers.



DATEM Echo Profile Example.

## DATEM Echo Processing Software

In real everyday level measurement applications, many echoes are returned from many different objects and there's no substitute for a good transducer design that gets the best possible combination of signal strength and noise reduction to help follow the right echo. Firmware must also be able to distinguish between competing echoes and follow the right one.

Pulsar Measurement's advanced Digital Adaptive Tracking of Echo Movement (DATEM) firmware is able to do this in the most demanding conditions. This firmware is on both dB Transducers and dBR Radar Transducers, giving end-users the best possible echo trace, regardless of the technology chosen.

## Blackbox 130 Case Study:

A quarry site in the UK that produces a range of granite roadstone from dust to 63 mm (3 in), conveying the aggregate either as single sizes or a blend via a long conveyor into a bank of ten 300 tonne capacity silos, each of which is 10 m (32.8 ft) deep. Each silo is filled from a central shuttle conveyor discharging to each side, so each can have twin peaks of material, and each discharges to a separate belt conveyor, so can be considered as two separate measurement points. The site needed to control the fitting of the silos automatically and at the same time maintain a highly accurate indication of stock control.

An abrasive material like granite would wear away a contacting sensor very quickly, the non-contacting technology by Pulsar Measurement was an ideal solution. The on-site SCADA system was to handle the display of levels and control of the silo loading, so there was no need for a local display just a reliable signal through Profibus Protocols.

The system of choice for this site was the Blackbox controller accompanied with the dB15 Transducer Series, the Blackbox is compact and easy to install, a useful timesaver for the site was the ability to clone several of the units using the same programming parameters. As the silos were all a similar size, they could all be pre-programmed before installation, which reduced process downtime. The 20 Blackbox units, two for each silo, were mounted in a control cabinet, and each connected to a Pulsar dB15 Transducers mounted on an aiming kit so that it could be directed towards the silo draw-off point. The units were then multiplexed through a Profibus connection to the site SCADA system.



20 Blackbox Units housed in control cabinet.

## Technical Specifications

### PHYSICAL: MOUNTING OPTION SPECIFIC

Mounting Option:	Standard Wall Mount:	Large Wall Mount:
<b>Controller Body Dimensions:</b>	130 mm x 150 mm x 63.5 mm (5.1 in x 5.9 in x 2.5 in)	130 mm x 180 mm x 85 mm (5.1 in x 7.09 in x 3.3 in)
<b>Weight:</b>	Nominal 0.7 kg (1.4 lb)	Nominal 0.8 kg (1.7 lb)
<b>Enclosure Material/Description:</b>		ABS Base with polycarbonate lid, flammability rating UL 94 HB
<b>Cable Entry Detail:</b>	Underside fitted with 3 x M20, nylon cable glands suitable for 6 mm to 12 mm (0.2 in to 0.5 in) cable	Underside fitted with 3 x M20, nylon cable glands suitable for 6 mm to 12 mm (0.2 in to 0.5 in) cable
<b>Transducer Cable Extensions:</b>	2-core screened (2 conductor 20 AWG screened)	
<b>Nominal Separation:</b>	1,000 m (3,280 ft), for greater separation distances please contact us	

### ENVIRONMENTAL

<b>IP Rating:</b>	IP66/67
<b>Max. &amp; Min. Temperature (Electronics):</b>	-20 °C to +55 °C (-4 °F to +131 °F)
<b>Flammable Atmosphere Approval:</b>	All Blackbox units must be mounted in a safe area. Compatible with approved dB Transducers
<b>CE Approval:</b>	See EU Declaration of Conformity in the manual
<b>UL Approval:</b>	UL Listed. UL Listed to Canadian Safety Standards. Certificate Number E257330.

### PERFORMANCE

<b>Accuracy/Repeatability:</b>	0.25% of the measured range or 6 mm (0.2 in), <i>whichever is greater</i>
<b>Resolution:</b>	dBMA3 0.3 mm (0.01 in), dB3 0.5 mm (0.02 in), dB6 and dB10 1 mm (0.04 in), dB15 1.5 mm (0.06 in), dB25 2.5 mm (0.1 in), and dB40 5 mm (0.2 in).
<b>Min. &amp; Max. Range:</b>	Dependent on Transducer. Nominally 125 mm to 40 m (4.9 in to 130 ft)
<b>Echo Processing:</b>	DATM (Digital Adaptive Tracking of Echo Movement)
<b>Rate Response:</b>	Fully Adjustable

### OUTPUTS

<b>Analog Output:</b>	Isolated output of 4-20mA or 0-20mA into 1 k $\Omega$ (user programmable and adjustable) 0.1% resolution
<b>Digital Output:</b>	RS232 for programming and data extraction
<b>Volt Free Contacts, Number, &amp; Rating:</b>	2 form "C" (SPDT) rated at 2 A at 240 V AC
<b>Display:</b>	2 x 12 alpha numeric

### PROGRAMMING

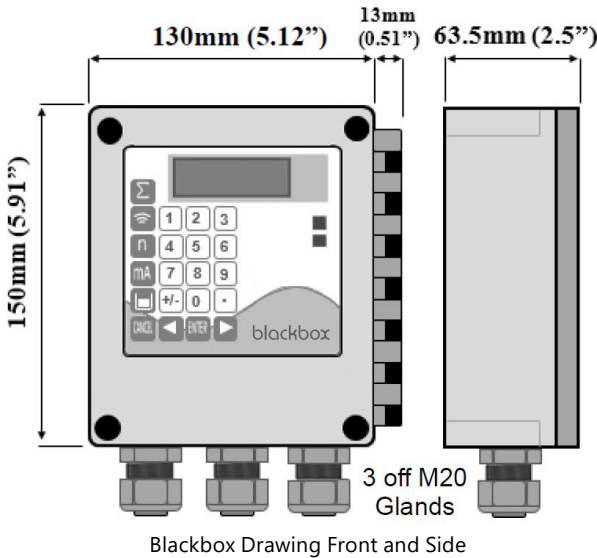
<b>On-board Programming:</b>	Via RS232 using supplied software
<b>PC Programming:</b>	Via RS232 using supplied software
<b>Programming Security:</b>	Via Passcode (user selectable and adjustable)
<b>Programmed Data Integrity:</b>	Via non-volatile RAM
<b>Remote Programming:</b>	Via RS232 using optional handheld calibrator

SUPPLY

Power Supply:	115 V AC +5% / -10% 50/60 Hz, 230 V AC +5% / -10% 50/60 Hz, 10-28 V DC, 10 W maximum power (typically 5 W)
Fuses:	50mA at 230 V AC, 100mA at 115 V AC

REMOTE COMMUNICATIONS

Power Supply:	Power supplied via Blackbox RS232 interface
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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.

For more information, please visit our website:

[www.pulsarmeasurement.com](http://www.pulsarmeasurement.com)



INFO@PULSARMEASUREMENT.COM

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Copyright © 2020 Pulsar Measurement  
Registered Address: 1 Chamberlain Square CS, Birmingham B3 3AX  
Registered No.: 3345604 England & Wales

**United States**  
+1 888-473-9546  
  
**Asia**  
+60 102 591 332

**Canada**  
+1 855-300-9151  
  
**Oceania**  
+61 428 692 274

**United Kingdom**  
+44 (0) 1684 891371  
  
**[pulsarmeasurement.com](http://pulsarmeasurement.com)**