dBi Series Transducers

HART Protocol Ultrasonic Transducers for Level Measurement

Pulsar's new range of self-contained, intelligent non-contacting ultrasonic level measurement transducers make use of HART communications protocol to make plant integration simple. Pulsar's dBi Series Transducers are self-contained and are programmed either via a PC or through a proprietary calibration unit. With a choice of four units with 3,6,10 or 15m range (10, 20, 33 or 49 ft), Pulsar's Intelligent Transducers take installation simplicity, convenience and accuracy to a new level.

HART COMMUNICATION PROTOCOL

pulsar® PROCESS MEASUREMENT

dBi Series Transducers

Intelligent Transducers for Level Measurement

Features

- Self-contained
- Two wire
- Solids or liquids applications
- HART Protocol •

DATEM digital echo processing

- Various mounting options
- ATEX Ex mb IIC T4 Zone 1 standard. Option of ATEX Zone 0 I.S.
- Use standard programming tools or Pulsar's dedicated PC system
- FM/FMC approval

Self-contained non-contacting ultrasonic level measurement featuring HART communications protocol, Pulsar's Intelligent Transducers set new standards in communications and convenience for reliable plant and field-based level measurement systems.

Pulsar's dBi Series Transducers are low-power devices featuring Pulsar's world-leading DATEM echo processing power for robust and reliable measurement from 125mm through to 15m (5 inches to 49 feet) depending on the unit chosen. Integration with plant systems and other equipment is straightforward. dBi Transducers are easy to configure and calibrate using standard PLC/HMI industry protocols, Pulsar's own software or on site multi-drop set up, providing options to program the transducers using either a standard interface or using Pulsar's programming parameters.

Intelligent Transducers feature HART in a range of models, and can be specified in various formats to suit the application, for example flanged, PTFE coated for corrosive applications, fitted with foam face or submergence shield and with threaded noses for easy installation. For solids applications, Intelligent Transducers are compatible with Pulsar's aiming kit for the best possible results and to measure right down to the draw-off point of a bin or silo.

Intelligent Transducers provide on-board conversion for volume with a number of pre-set tank shapes, plus the ability to curve-fit to non-standard shapes. The output from the unit can represent distance, level, space, or volume.

Echo Processing

dBi HART transducers feature Pulsar's world-leading DATEM echo processing software. DATEM, Digital Adaptive Tracking of Echo Movement, allows the system to zero in on the echo from true target and follow it as it moves up and down the vessel, ignoring the stationary echoes from other elements in the measurement path. Stanchions, chains and ladders, that cause many ultrasonic systems to fail, are no barrier to Pulsar equipment, allowing Pulsar Intelligent Transducers to give reliable and accurate measurement in applications where other manufacturers' equipment would not work.

PULSAR HART MODEM

dBi Transducers with HART protocol

HART COMMUNICATION PROTOCOL

Pulsar's dBi Series Intelligent Transducers featuring HART are typically programmed either via one of the several hand-held calibrators available, or via PC interface. Measurement is signalled either via 4-20mA proportional to the measured value or using the HART protocol, modulated tones on the 4-20mA (1200/2200hz). HART equipped transducers are approved to ATEX Zone 1 (Ex mb IIC T4 / Ex mb IIIC T130ºC) without requiring the use of a barrier. ATEX Zone 0 (Ex ia IIC T4 / Ex ia IIIC T130ºC) optional,requires suitable barrier

dBi Transducers with HART are loop powered (3.8 - 22mA), IP68 for outdoor applications, temperature compensated for increased accuracy and make use of the HART Version 7 protocol, with individually addressable transducers. Alternatively, they can be programmed as stand-alone devices using a hand-held calibrator or PC to operate as low-power measuring devices, using HART as the mechanism for data collection. First boot is approximately 8 seconds, if a typical 15 minute boot interval is used, this becomes approximately 3.5 seconds. The dBi Transducers with HART will convert level to volume, with a library of typical tank shapes or a 16-point curve fit.

HART Registration Number: L2-06-1000-153

Programming

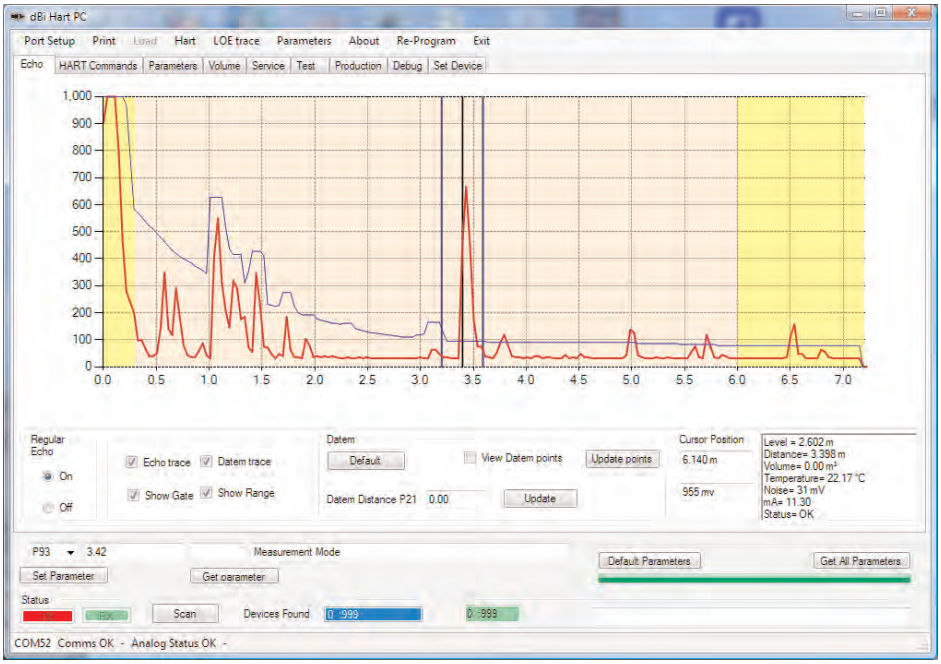
To set up dBi transducers with HART protocol using a PC you require the following:

A HART Modem and 250 ohm resistor: A proprietary HART modem can be used, or Pulsar can supply the Pulsar HART Modem that is fully compatible with dBi transducers. The resistor is placed in series with the power of the transducer to provide resistance during the set-up process.

PC Software:

If you require set-up only: **Pulsar's HART PC Lite** free software is bundled with the dBi transducer or is available for download from www.pulsar-pm.com (click the 'support' tab, then 'downloads' and 'software'), and provides everything required for efficient set-up of the dBi transducer.

For complete control over set-up, installation, echo profile viewing, cloning and troubleshooting purchase Pulsar **PC Suite**, which includes HART PC along with other major Pulsar software packages. PC Suite is available as a free download for evaluation. Purchase a Pulsar 'dongle' to authorise continued usage after the evaluation period (see separate PC Suite literature for more details).



ECHO TRACE SHOWING DATEM SIGNAL PROFILING

Standard Options

The dBi transducer range is available with the same set of options that have made the standard dB series so popular. dBi transducers are available with a host of mounting options: nose threaded or rear threaded, flange-mounted, faced with chemical resistant PTFE, or PVDF bodies, or fitted with a submergence shield. See the Transducer section in the main catalogue for more information or check out the Pulsar Process Measurement website. Pulsar's mounting brackets make installation easy, and the Aiming Kit helps in solids applications to direct the transducer at the draw-off point of the silo or bin.

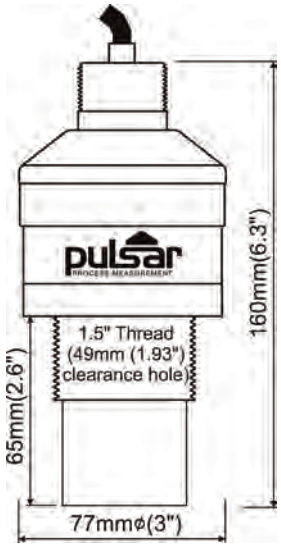
Technical Specification: dBi Transducers

COMMON FEATURES				
Weight:	**dBi3**: 1kg (2.2lbs), **dBi6**: 1.2kg (2.7lbs), **dBi10**, 1.3kg (2.9lbs), **dBi15**: 1.4kg (3.1lbs)			
Dimensions & Mountings:	**dBi3**: 77mm dia x 134mm high (3 x 5.31 inch). Rear thread 1" BSP/NPT			
	dBi6 & dBi10: 86mm dia x 121mm high (3.38 x 4.75 inch). Rear thread 1" BSP/NPT			
	dBi15: 86mm dia x 135mm high (3.38 x 5.32 inch). Rear 1" thread BSP/NPT			
Performance Characteristics: (NB beam angles at -3bB). All beam angles are inclusive but give an effective beam angle of <3°).	**dBi3**:	range 0.125 - 3m (5 inch to 10 feet)	frequency 125kHz	beam angle <10°
		Resolution 1mm (0.04 inch)		
		Accuracy ±0.25% of the measured range or 6mm whichever is greater		
	dBi6:	range 0.3 - 6m (1 foot - 20 feet)	frequency 75kHz	beam angle <10°
		Resolution 2mm (0.08 inch)		
		Accuracy ±0.25% of the measured range or 6mm whichever is greater		
	dBi10:	range 0.3 - 10m (1 foot - 33 feet)	frequency 50kHz	beam angle <10°
		Resolution 3mm (0.12 inch)		
		Accuracy ±0.25% of the measured range or 6mm whichever is greater		
	dBi15:	range 0.5 - 15m (20 inch - 49 feet)	frequency 41kHz	beam angle <8°
		Resolution 5mm (0.2 inch)		
		Accuracy ±0.25% of the measured range or 6mm whichever is greater		
Housing material:	Valox 357 PBT (Polybutylene terephthalate)			
Temperature Compensation:	Internal temperature sensor, +/- 0.5°C/F			
Transducer cable requirements:	Twin screened. Integral cable length 5, 10, 20 or 30m			
Operating temperature range:	-40°C to +80°C process temperature (-40°F to 176°F)			
Ingress Protection:	IP68 to BS EN 60068-2-17:1995 and BS EN 60529 (Nema 6P available)			
dBi TRANSDUCERS WITH HART PROTOCOL:				
Digital communications:	FSK (Frequency Shift Keying) modulation of 1200-2400Hz			
Power :	10-28V dc, 4-20mA Average current 12mA. Typical wake-up power consumption on 15 minute cycle with average current 35µA hour			
Hazardous area approval:	ATEX; Ex mb IIC T4/ IIC T130°C Zone 1 standard, Ex ia IIC T4/ IIIC T130°C Zone 0 optional			
Output:	4-20mA resolution 1µA			

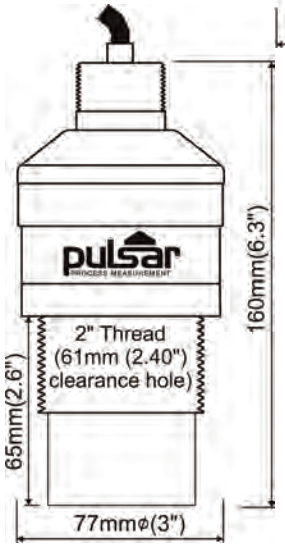
dBi3

dBi6/10

dBi15



dBi3/6 front thread version



dBi10 front thread version

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UK AWARDS/CERTIFICATIONS

UKAS QUALITY MANAGEMENT 011 sira ISO 9001:2008 Cert No.950136-1
UKAS ENVIRONMENTAL MANAGEMENT 011 sira ISO 14001:2004 Cert No.072570-1
THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2009
iDEA 2008 WINNER
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HART COMMUNICATION PROTOCOL

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Pulsar Process Measurement Limited operates a policy of constant development and improvement and reserves the right to amend technical details as necessary

Literature number: dBi-HART/MHA/04a/7-13