dBi Series Transducers

Intelligent Transducers for Level Measurement

Features

- Self-contained
- Solids or liquids applications
- HART or Profibus PA
- DATEM digital echo processing
- Various mounting options
- Standards-compliant
- Use standard programming tools or Pulsar's dedicated PC system

Self-contained non-contacting ultrasonic level measurement featuring a choice of HART or Profibus PA communications protocols, 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, self-contained devices that feature Pulsar's world-leading DATEM echo processing power giving robust and reliable measurement from 150mm through to 18m depending on the unit chosen. Integration with plant systems and other equipment is straightforward. dBi Transducers support ESD, EDDL, FDT/DTM (available on request), making it easy to configure and calibrate the devices using standard PLC/HMI industry protocols, Pulsar's proprietary 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 are available in each format in a range of distance versions:

dBi3	**150mm to 3m, for solids and liquids**
dBi6	**300mm to 6m, for solids and liquids**
dBi10	**300mm to 10m, for solids, powders and liquids**
dBi15	**500mm to 18m, narrow beam for solids, powders and liquids**

Transducers can be specified in various formats to suit the application, for example flanged, PVDF 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. Therefore, the output from the unit can represent distance, level, space, or volume.

Echo Processing

Both Transducer types 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.

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.

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 7.2 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.

Programming

dBi Transducers with HART protocol can be set up in one of three ways:

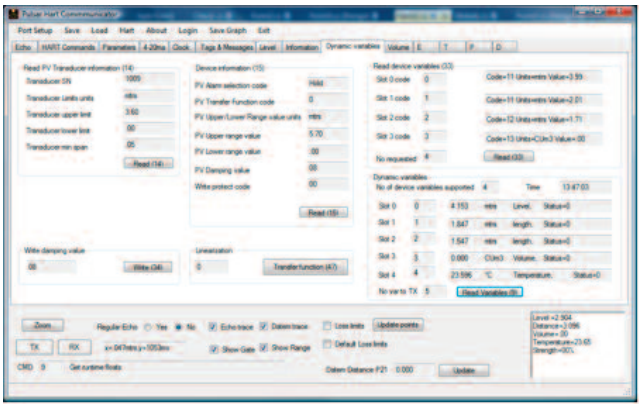
Using standard HART communication systems: The operating manual identifies the operating parameters and addressing protocols. Use a standard HART modem to interface with a PC or one of the many hand-held HART programming units available.

Using Pulsar standard operating software: Pulsar issues standard programming software that allows you to simply program the unit from a PC via a HART modem, The standard software provides access to the dBi transducer and allows programming through 'standard' level measurement parameters such as span and empty distance, which are then translated to HART commands.

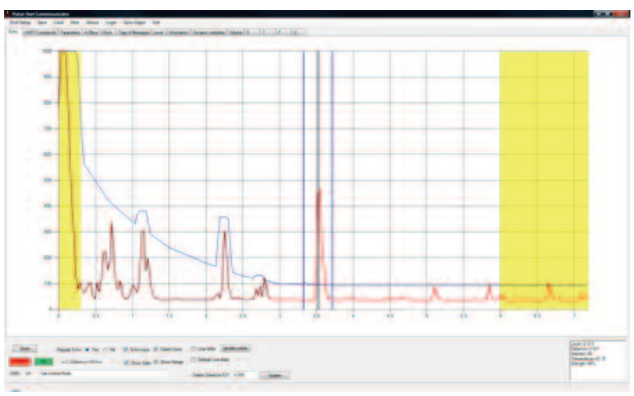
Using Pulsar HART Communicator software: Optional HART Communicator software provides all the above, plus the facility to view and log echo profiles, perform advanced set-up and clone a number of units to the same parameters, for example in tank farm applications.

Pulsar HART Modem.
Any proprietary HART modem can be used.

dBi 6 HART transducer featuring PVDF chemical resistant face



Basic unit set-up using Pulsar HART Communicator



Echo trace showing DATEM signal profiling

dBi Transducers with Profibus PA protocol

Pulsar use the high data speeds available with Profibus PA and DPV1 to provide full digital communications from a DATEM-enabled transducer. Complying fully with communications standards IEC 61158 and Profibus PA profile 3.0.2, dBi Series Transducers with Profibus provide very high resolution to give millimetre accuracy and a rapid response time of approximately 1 second.

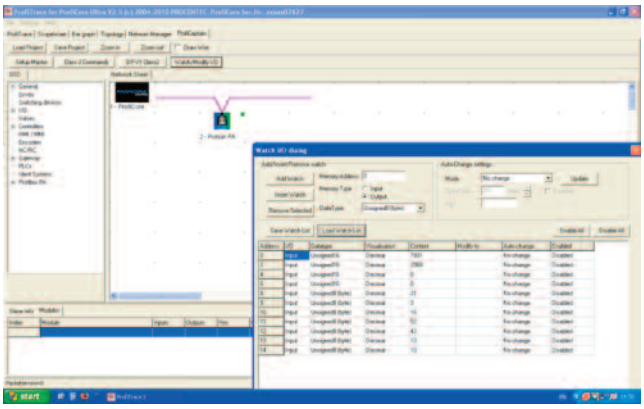
Pulsar's dBi Transducers use Profibus PA Profile 3.0.2 with a low power consumption. Flxed current at 20mA. Fully potted to IP68 for outdoor applications. dBi Transducers with Profibus PA are temperature compensated for increased accuracy and offer volume conversion to a variety of standard tank shapes or 16-point curve fit. Supports GSD, EDDL and FDT/DTM drivers.

Programming

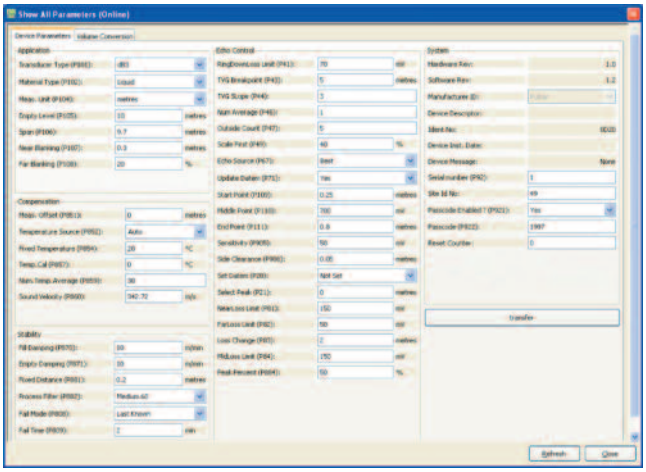
dBi Transducers with Profibus PA can be set up as follows:

Using PLC/HMI with Profibus network that: Supplies a) ESD Version 3.0 with pre-defined parameter blocks in cyclic or non-cyclic modes; b) supplies EDDL to provide full support for acquiring/logging of echo traces, diagnostics and full maintenance I&M functions according to IEC 61804-3 standards; c) supplies (on request) FDT/DTM direct to HMI software to provide enhanced diagnostic/commissioning capabilities.

Using Pulsar PC Software: Using Pulsar proprietary PC software with USB powered PA modem. The transducer can be operated and is fully functional from a laptop or desktop PC without an additional power supply, further aiding ease of set-up.



ProfiTrace and I/O dialogue



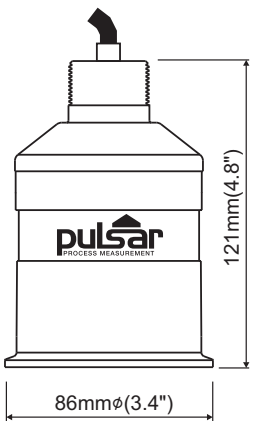
All parameters visible at a glance

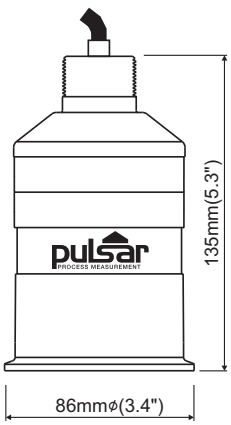
Standard Options

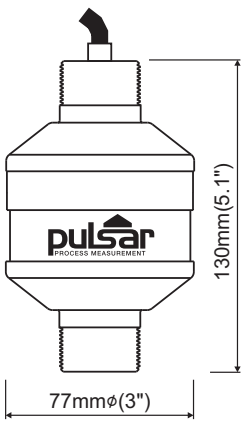
The dBi transducer range is available with the same set of options that have made the standard dB series so popular. dBi transducers are available with a host of mounting options: nose threaded or rear threaded, flange-mounted, faced with chemical resistant PVDF or fitted with a submergence shield. See 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.

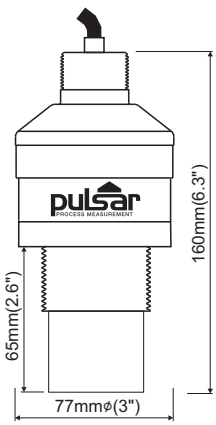
Technical Specification: dBi Transducers

COMMON FEATURES			
Weight:			**dBi3**: 1kg, **dBi6**: 1.2kg, **dBi10**, 1.3kg, **dBi15**: 1.4k
Dimensions & Mountings:			**dBi3**: 80mm dia x 135mm high. Rear thread 1" BSP/NPT
			dBi6 & dBi10: 73mm dia x 170mm high. Rear thread 1" BSP/NPT
			dBi15: 85mm dia x 145mm high. Rear 1" BSP/NPT
Housing material:			
Temperature Compensation:			Internal temperature sensor, +/- 0.5°C
Transducer cable requirements:			Twin screened. Integral cable length 5, 10, 20 or 30m
Operating temperature range:			-40°C to +80°C process temperature
Ingress Protection:			IP68 to BS EN 60068-2-17:1995 and BS EN 60529 (Nema 6P available)
Hazardous Area Approval:			
dBi TRANSDUCERS WITH HART PROTOCOL:			
Digital communications:			FSK (Frequency Shift Keying) modulation of 1200-2400Hz
Power Supply:			10-28V dc
dBi TRANSDUCERS WITH PROFIBUS PA:			
Power Supply:			Bus powered, per IEC 61158-2;20mA (general purpose or I.S. version)
Update time:			1-2 seconds at 20mA current loop
Programming:			Patent Pending PA modem; Simatic PDM, EDDL, FDT/DTM. PC interface 2-wire loop powered from PC or laptop. No external power supply required.
Outputs:			Profile 3.0.2, Class A with I&M functionality
Performance Characteristics: NB: beam angles at -3dB			
dBi3: frequency 125kHz	beam angle <10°	range 0.3 - 3.6m	resolution 1mm, accuracy 1mm or better
dBi6: frequency 75kHz	beam angle <10°	range 0.3 - 7.2m	resolution 2mm, accuracy 2mm or better
dBi10: frequency 50kHz	beam angle <10°	range 0.3 - 12m	resolution 3mm, accuracy 3mm or better
dBi15: frequency 41kHz	beam angle <8°	range 0.3 - 18m	resolution 5mm, accuracy 5mm or better









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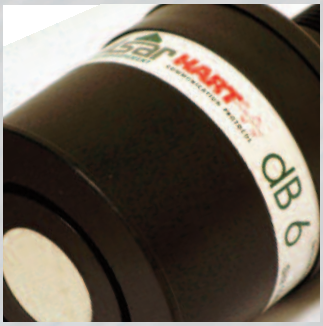
dBi Series Transducers

HART and Profibus PA transducers, designed for Field Communications Protocol

Pulsar's new range of self-contained, intelligent non-contacting ultrasonic level measurement transducers make use of HART and Profibus PA communications protocols 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 measurement range of up to 18m depending on application and ATEX Zone 0 hazardous area approvals, Pulsar's Intelligent Transducers take installation simplicity and convenience to a new level.



HART COMMUNICATION PROTOCOL

PROFI® PROCESS FIELD BUS

pulsar® PROCESS MEASUREMENT