Datasheet
Pressure Inverted Echo Sounder (PIES)

The Pressure Inverted Echo Sounder (PIES) is a long-life sensor logging node that accurately measures the average sound velocity through a column of water from the seabed to the sea surface.

It works by transmitting a Wideband® acoustic pulse from its stable location on the seabed. This pulse is reflected off the sea surface and returns to the seabed where it is detected by PIES. The resulting data enable two-way travel-time to be calculated.

At the same time, an accurate measurement of depth (distance to the surface) is made using a highly accurate internal pressure sensor.

Average water column velocity can then be calculated directly from the depth and travel time data, noting that speed = distance / time.

The sampling interval of PIES can be configured serially before deployment and also via its internal acoustic telemetry link. This telemetry link also allows recorded data to be transmitted to surface at data rates ranging from 100 to 9,000 bps.

PIES can be free fall deployed to the seabed where it will land in an upright position. When the mission is complete, its integrated acoustic release enables it to be commanded to disconnect from its tripod stand and return to the surface under its own buoyancy ready for collection by surface vessel.

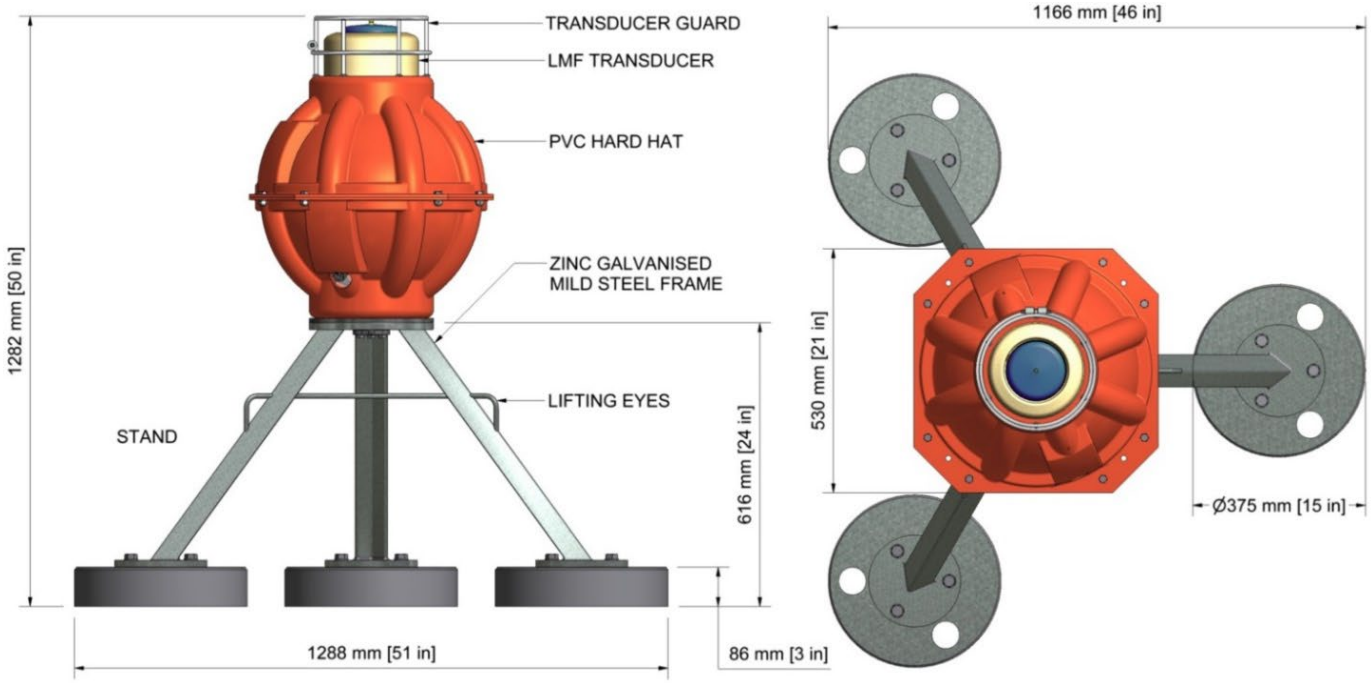
A high-capacity primary lithium battery pack enables deployment for months or even years depending on the transmission sampling interval configured.

PIES is compatible with Sonardyne's LMF Ultra-Short-Baseline (USBL) systems for positioning during deployment and recovery.

Key features

- Autonomous sensor logging combined with high-speed acoustic telemetry of recorded data
- Long-life – Up to 5 years with excellent corrosion resistance
- LMF frequency band utilising Sonardyne Wideband 2 ranging and telemetry protocols
- Integrated modem mode with data rates ranging from 100 to 9,000 bps in multiple frequency bands
- Integrated acoustic release for buoyant ascent to the surface
- Free-fall deployment from surface vessel
- Wireless configuration using surface software and acoustic dunker

Specifications
Pressure Inverted Echo Sounder (PIES)



Feature		Type 8306-3816
Depth rating[1]		3,000 or 6,000 m
Operating frequency		LMF (14–19 kHz)
Transmit source level (dB re 1 µPa @ 1 m)		190–202 dB (4 levels)
Receive sensitivity (dB re 1 µPa)		80–120 dB (7 levels)
Battery life (capacity)		5 years life (dependent on sensors and sampling interval (180 Ah)
Mechanical construction		Glass sphere, galvanised stand, duplex stainless steel guards and connectors
Weight in air/water[2]	Fetch	43/-10 kg (upthrust buoyancy)
	Stand	60/52 kg
Sensors and options		
Temperature (±0.1°C)		Optional
Tilt switch (±30-45°)		Standard
High precision strain gauge (±0.01%) Keller or Presens		Optional
Paroscientific DigiQuartz pressure sensor (±0.01%) 1,350 m, 2,000 m, 4,130 m, 6,800 m		Standard
High accuracy inclinometer range: ±90°, accuracy: ±0.05° over 0 - ±15°; ±0.2° over 0 - ±45°		Optional
Sound velocity sensor ±0.02 m/s accuracy under calibration conditions		Optional
External sensor options turbidity, conductivity, ADCP		Optional
Release mechanism (screw-off)		Standard
Connector type		Impulse MCIL-8-MP

See Compatt 6 and AMT datasheets for more information.

[1] PIES functionality is maximum 5,000 m.
[2] Estimated Weights.