

# 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 enables 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 bits per second.

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

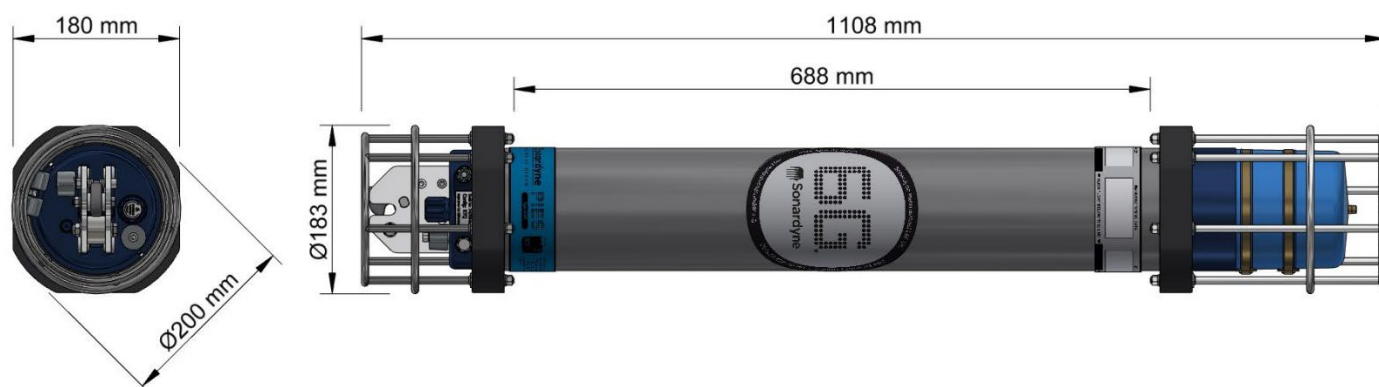
PIES is compatible with Sonardyne's LMF Ultra-Short-Baseline (USBL) systems for positioning during deployment and recovery.

### Key features

- Autonomous sensor logging combined with high speed acoustic telemetry of recorded data
- LMF frequency band utilising Sonardyne Wideband 2 ranging and telemetry protocols
- Freefall deployment possible from surface vessel
- Integrated acoustic release for buoyant ascent to the surface with float
- Long life – with excellent corrosion resistance
- Primary lithium/alkaline battery pack option
- Integrated modem mode with data rates ranging from 100 to 9000 bits per second in multiple frequency bands
- Wireless configuration using surface software and acoustic dunker

# Specifications

## Pressure Inverted Echo Sounder (PIES)



Feature	Type 8302-3116
Depth rating <sup>1</sup>	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)	Multi-years life, dependent on sensors and sampling interval (100 Ahr)
Mechanical construction	Hard anodised aluminium housing, duplex stainless steel guards
Weight in air/water <sup>2</sup>	30.6/16.1 kg
Endcap sensors and options	Type 8302-3116
Temperature (±0.1°C)	Standard
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
Release mechanism (screw-off)	Standard
Connector type	Subconn MCIL8M

See Compatt 6 and AMT datasheets for more information.

<sup>1</sup> PIES functionality is maximum 5,000 m.

<sup>2</sup> Estimated weights.