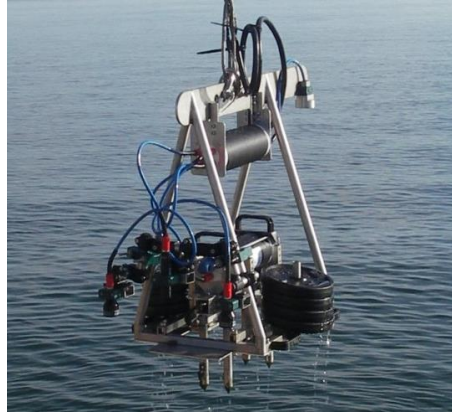


ACOUSTIC SEDIMENT CHARACTERIZER

Compact – In-situ – Multi-purpose



Description

INSEA is an innovative in-situ measurement system for sediment characterization using acoustics. It provides an accurate in-situ information on the acoustic characteristics of the first layer of the sediment, avoiding core-sampling.

The INSEA is composed of an autonomous compact device 200 meters depth rated, equipped with four emitting and receiving broadband transducers that transmit sounds in multiple geometrical configurations in the sediment.

INSEA is able to determine sediment attenuation and sound speed as well as to gather information from optional sensors such as video, depth, temperature and conductivity.

Correlated with an optional database software tool, INSEA is capable of providing information regarding sediment type, homogeneity and presence of specific material on the sea-floor.

The INSEA configuration is easy thanks to its web embedded interface. It can operate whether in autonomous or remote mode and can be deployed by diver or trawl frame. All data processed and raw data is stored in internal high-capacity storage. Products are subject to export control restriction.

Applications

- **Geoacoustic studies**
- **SONAR calibration**
- **Sub-bottom profiler calibration**
- **Sediment characterization**
- **Subsea mining**

Options

- **CTD**
- **Shear wave stakes**
- **Gradient stakes**
- **Trawl frame**
- **Diver kit**
- **Wi-Fi connectivity**

Characteristics

Powered by **SDA**

- **Easy and flexible deployment modes**
- **In-situ multi-static acoustic acquisitions**
- **Versatile sensors and configurations**
- **Embedded interface and database**

Dim.: Tube: 32cm long – 12cm diameter
With stakes : 60cm x 35cm x 25cm
Weight: 8.6kg in air, 5,5kg in water
Depth: 50m / 200m

Energy: Rechargeable
Autonomy: > 4000 samples

- **Easy and flexible deployment modes**



INSEA & diver

INSEA can be whether deployed underwater by a diver or directly from the surface.

In diver kit mode the device is pre-programmed to make acquisition when a light push button is activated; allowing point-to-point measurements.

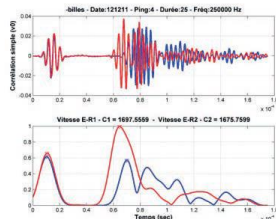


INSEA acquiring data

A stainless steel frame allow to deploy from a boat equipped with a winch. INSEA is attached to its frame and can then record autonomously or be monitored in real-time with PoE cable. Additional sensors such as video can be implemented on the structure.

- **In-situ multi-static acoustic acquisitions**

Transducers integrated in the stakes emit and receive at multiple frequencies in the band from 50kHz up to 270kHz. Each one of the 4 stakes emits and then receives a sequence of consecutive signals covering all the frequency range.



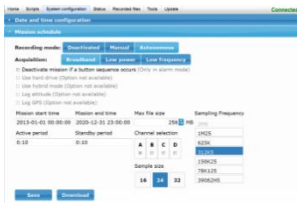
Example of received signal

Time delay and attenuation of the signal from emission to reception provides quantifiable information of the sediment.

This multi-static methodology provide both reliability and performance in all type of sediment from mud to coarse sands.

- **Versatile sensors and configurations**

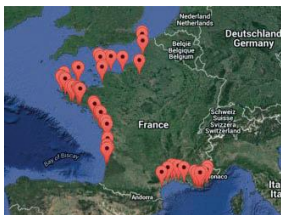
The 4 stakes of the unit can be placed at various locations of the INSEA structure. Different types of emitting receiving geometry are then possible such as triangle, square, diamond...



Web embedded interface

In order to provide full information, optional transducers and sensors can be embedded on the INSEA, such as, shear and gradient wave sensors.

- **Easy to use interface and database tool**



Example of database map

Light and compact, INSEA can be easily deployed by a single person. The web browser interface gives intuitive access to configuration, real-time use and to the recorded files.

An optional software tool also offers the possibility to generate a database gathering position, results and sediment properties of each measurements.

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RTSYS activities

- Marine acoustics
- Embedded electronics
- Marine robotics
- Systems integration
- Customized R&D

