

Acoustic signature acquisition & analysis

Description

VERTHY is a ship acoustic signature measurement system. Easy-to handle and to deploy, VERTHY allows rapid underwater acoustic acquisition.

VERTHY is designed in three functional subsystems:

- The Vertical line array 15 hydrophones;
- The EA-SDA416 recorder, with GPS and secure radio transmission, moored to a surface buoy;
- The signal processing / display / real-time trajectography control laptop.

EA-SDA416 is a compact embedded recorder able to acquire high resolution hydrophone array. The embedded processor enables efficient acquisition, filtering, and storage. The recorder's battery provides up to 15 hours mission autonomy.

VERTHY is build rugged for marine environments.

Advantages

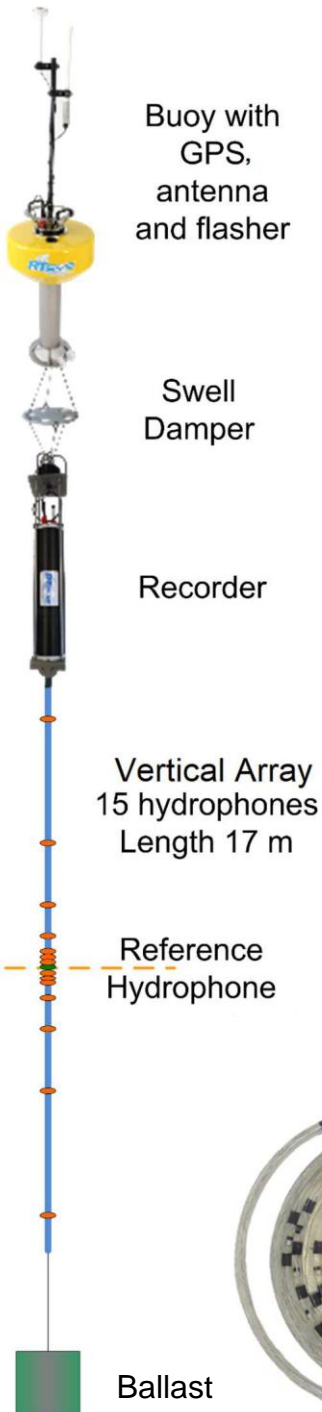
- Pre-amplified hydrophone recording channel
- Broadband high data quality (up to 24 bits & 512kS/s)
- Low Power (continuous recording up to 6 months)
- Use standard (lossless and uncompressed) .WAV files as storage.
- Easy to Use

Payloads & Options

- Submarine signature measurement
- Rugged laptop
- Tablet

Supplied Hardware

- Buoy
- Swell Damper
- EA-SDA416 Recorder
- Vertical array
- Ballast



Buoy with
GPS,
antenna
and flasher

Swell
Damper

Recorder

Vertical Array
15 hydrophones
Length 17 m

Reference
Hydrophone

Ballast



16 synchronized recording channels

VERTHY is designed with the new SDA416 card. An FPGA coupled with an ARM Dual-Core Cortex A9 running on Linux for real-time data processing. The 16 channels are electronically synchronized and calibrated at +/- 0.1 dB.

The VERTHY can record frequencies from 1 Hz to 10 Hz with a fully configurable sampling frequency up to 120 kHz. Each channel has two gain inputs. Gain values and high pass filter can be selected by the user before ordering.

Sound data are collected in 32 bits guaranteeing great dynamic (> 100 dB). For security data is encrypted.

The SDA416 board is optimized for low power consumption. Channel is electronically calibrated.

Gains are software configurable between 0 dB and +15 dB. High pass filters are also software configurable between 3 Hz and 300 Hz

Acquisition in a low signal and environment

The hydrophone array and the processing of the beams allow a large gain and different listening directions. Thus, the gain (up to 6 dB) can improve acoustic acquisition in a noisy environment and increase the listening area.

Array

The size of the array is reduced to 31 mm due to the size of the sensors and it is light enough, with a length less than 20 meters to be handled easily by one person.

The internal stainless steel cable and the Dyneema braided textile outer cable provides a very good combination of high strength and acoustic noise protection. software such as ©PAMguard, R, Python and ©Matlab.

Beamforming

The beamforming appears in the centre of the array pivot hydrophone. The size of the beam depends of the working bandwidth.

Submarine Option

This option allows to measure the signature of a submarine in far field with acoustic trajectory. A trajectory calculation tool with a transducer emitting a power of 160 dB allows to measure the distance of the submarine up to 2.5 km.

The recorder and antenna can be immersed at a depth of 50 or 100 meters.

Characteristics

- Multichannel: up to 16 inputs
- Broadband: 1 Hz to 10 kHz
- Wide dynamic: 32 bits recording

Dimensions

- Recorder length: 1050 mm
- Recorder diameter: 120 mm
- Array length: 17 m
- Array diameter: 31 mm
- Weight: 12 kg