

OBS32

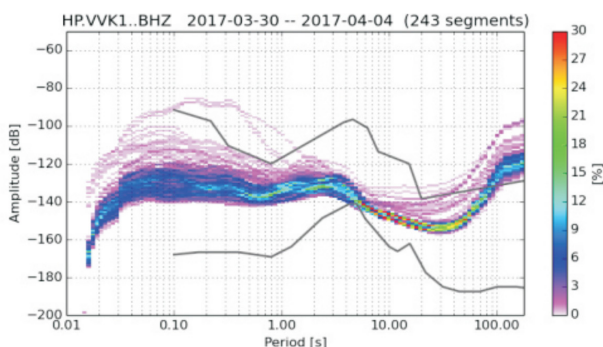
32bit Ocean Bottom Seismometer

- 32bit ADC digitizer
- Low power consumption
- Integrated seismic sensor
- Removable microSD card
- Initial GPS time synchronization
- DPLL with OCXO or atomic clock
- Advanced DPLL calibration
- 1.5e-10 time drift
- 50-500sps, 4 channels
- Sensor response 10sec-98Hz
- High sensitivity 1500V/m/s
- FAT32 filing system
- Operation Range: -20 +70°C
- Timed or command release actuator
- Integrated magnetic compass



FEATURES

The OBS electronics and battery are housed inside a 43 cm glass sphere. A plastic protective hat covers the glass sphere. The three component geophone casing is placed outside of the sphere, held by a side arm. The geophone casing is dropped automatically 3-4 hours after the instrument has reached the sea bottom. The glass sphere is placed over a metallic base which sinks the OBS to the sea bottom because of its weight. The OBS is attached on the metallic base through a release mechanism, based on a stainless wire which is able to be electrolyzed. Sand bags can be alternatively used instead of the metallic base for environmental reasons. Release is activated by command or timed when the OBS has to be recovered. The OBS has also some additional parts in order to help the recovery, like a red flag, a radar reflector, and a flashing light. Additionally a VHF radio beacon can be attached to the OBS for detection from large distance in the wavy ocean.



SUPPORTED TOOLS:

Data Viewer - Data Monitor - Data Converter-
Helicorder - Processing Software

SENSOR:

A special designed sensor casing is provided to support 1200 atm. pressure. The coupling has been optimized in order to maximize sensitivity. The electronics have been designed according to the force-balance principle in order to extend the frequency band from 10sec to 98Hz, and increase sensitivity to 1500V/m/s. Additionally, a hydrophone channel is used, with a pre-amplifier with selectable gain set.

DIGITIZER-RECORDER:

The digitizer has three seismic and one hydrophone channel. The recorder stores the data into a removable microSD Flash type card. The recording system runs a proprietary embedded DOS-compatible file system, FAT-32 compatible allowing the usage of large volume memory (64Gb). This size is able to store 4-channels data, being sampled @ 250sps, for a period at least 9 months. The digitizer has very high dynamic range, greater than 138dB.

TIMING:

Two versions of the OBS-DPLL unit are available, one that uses an extremely precise OCXO crystal -9 -10 oscillator, with accuracy +/-5ppb ($5 \cdot 10^{-9}$ sec) and another version that uses Atomic Clock with $1,5 \cdot 10^{-9}$ sec precision. Both initially are getting synchronized from a 12 channels GPS receiver. After the end of the recording period and when the OBS is out of the water, the GPS can be switched on, allowing the system to measure the overall drift of the acquisition period.



INSTRUMENT SPECIFICATIONS

ULTRA LOW POWER, MINIATURE SIZE 32BIT OBS SEISMIC DIGITIZER/RECORDER WITH TWIN TIMED RELEASE ACTUATORS

DIGITIZER

Number of analog channels	3 seismic + 1 hydrophone
A/D converter	Fourth Generation, Delta-Sigma, 32bits ADC
THD	-125Db
Modulator	Fourth Generation, 4th order Delta-Sigma Modulator
Filter	Programmable SINC, FIR, IIR filtering, auto-calibration function
Filter Response	Selectable Minimum or Linear Phase Filter
Input resistance	500kOhms differential
Sampling Rate	50-1000 samples per second, in steps
Power	9-18Vdc, 0.5W with integrated wide band sensor electronics
Autonomy	Ten days powered from a 12V/9.2Ah battery
RMS noise	138dB @ 250sps 129db@1000sps

DATA RECORDING

Media	Removable microSD flash card up to 64GBytes
Data file type	CORE32 format, embedded FAT32 file system
Information file	System log file
Recording mode	Continuous, in one or ten minutes data files
Trigger	Programmable STA/LTA (optional)

TIME BASE

Time Synchronization	12 channels GPS receiver/DPLL
Accuracy Time:	+/-1usec to UTC time pulse, +/-5 meters to position
Timing Sources	Ultra low drift DPLL unit using TCVCXO unit, RTC
TCVCXO stability	50 ppb (5x10 ⁻⁸)
DPLL drift	2.185msec per month

Optional versions with period 10sec 1sec, 2sec and 5sec are available.

COMMUNICATION

Data Port	RS232/Ethernet port/wifi/zigbee
Data retrieval	Removable microSD card/ USB
LCD	Miniature LCD with alternative information messages
LED	Six high brightness LEDs monitoring system SOH

INTEGRATED FORCE-BALANCE SENSOR ELECTONICS

Sensor Bandwidth	10sec-98Hz
Sensitivity	1500V/m/sec using force-balance electronics

PHYSICAL (DIGITISER/RECORDER WITH INTEGRATED SENSOR ELECTRONICS)

Size	168mmx106mmx68mm
Weight	1.2kgr

PHYSICAL (SEISMIC SENSOR)

Dimensions	100mm x 40mm x 40 mm
Cable length	3 meters
Tilt	+/-10 degrees

PHYSICAL (DIGITIZER/RECORDER UNIT)

Board	160mm x 100 mm (euroboard)
Enclosure	168mm x 106 mm x 68mm

ENVIRONMENT (DIGITIZER/RECORDER)

Temperature range	-20 to +70 °C
Humidity	100%, IP67 enclosure

RELEASE ACTUATOR

Type	Two N/O or N/C relays, 1A
Enabling	Two independent time programmed commands

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