

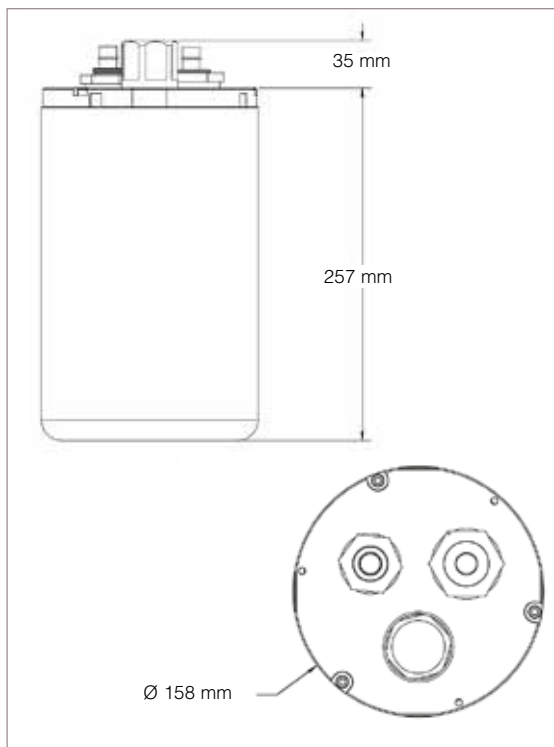


**CODEVINTEC**

Tecnologie per le Scienze della Terra e del Mare

45° 27' 39.384" N  
9° 07' 30.145" E

## Trillium Compact OBS Ocean bottom seismometer



**The Trillium Compact Ocean Bottom Seismometer (OBS) is an ultra-low power broadband seismometer for ocean bottom deployments to 6000m depth.**

### Benefits

- > The precise, kinematic 360° gimbal auto-levels from any orientation ensuring successful deployment and implementation.
- > Comprehensive State-of-Health logging includes case orientation, providing a powerful data set for optimizing deployment techniques.
- > Ultra-low 180mW typical power consumption reduces battery costs
- > 120-second true broadband seismometer provides the same exceptional dynamic range and low noise performance as the proven Trillium Compact land seismometers
- > Compatible with Scripps Oceanographic Institute ABALONES ocean bottom system and other OBS systems



## Trillium Compact OBS

The OBS vessel and gimbal design preserves the full performance of the land-based Trillium Compact seismometer, including its exceptional dynamic range and low noise floor.

### Performance, Dependability and Availability

Incorporating a robust and reliable leveling gimbal that operates over a full 360° range, the Compact OBS will auto-level from all orientations.

A full titanium cylindrical pressure vessel for 6000m deployments, or aluminum-anodized enamel painted

vessel for 1800m deployments, and proven glass epoxy connectors ensure exceptional ruggedness and resistance to corrosion in marine and fresh water environments.

The system employs two separate connections: the primary analogue connection as well as a digital connection. The digital connector is provided for final configuration and sensor verification prior to deploying the OBS overboard.

## Technical Specifications Trillium Compact OBS

Specifications subject to change without notice

### Seismometer

#### Technology

<b>Topology</b>	Symmetric triaxial
<b>Feedback</b>	Force balance with capacitive transducer
<b>Mass Centering</b>	Not required

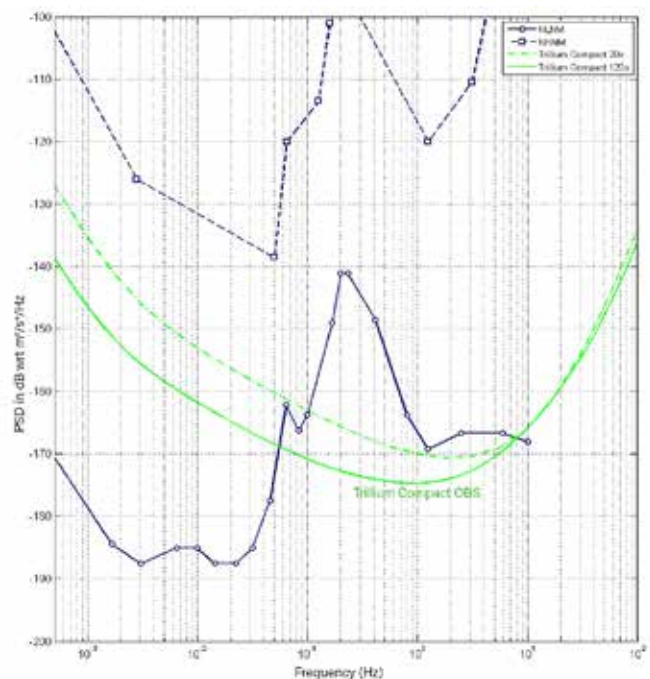
#### Seismometer Performance

<b>Self-noise</b>	See graph
<b>Nominal Sensitivity</b>	750 V-s/m (Reference User Guide for precise value)
<b>Precision</b>	±0.5% relative to User Guide specification
<b>Bandwidth</b>	-3 dB points at 120 s and 100 Hz
<b>Off-axis Sensitivity</b>	±0.5%
<b>Clip Level</b>	26 mm/s up to 10 Hz and 0.17 g above 10 Hz
<b>Operational Tilt Range</b>	±2.5° without re-leveling
<b>Parasitic Resonances</b>	None below 100 Hz
<b>Dynamic Range</b>	> 152 dB @ 1 Hz

### Leveling and orientation

<b>Technology</b>	Dual degree-of-freedom motorized gimbals > Jam-free mechanism > Kinematic design preserves full seismometer performance
<b>Range</b>	Levels in any orientation, full ±180° range
<b>Accuracy</b>	Levels to within ± 0.5° of true vertical
<b>Leveling initiation</b>	Leveling checks done at some or all of: > configurable delay after power on > configurable periodic (three stage schedule) > on external command > Delay intervals configurable from seconds to months > Levels only when needed based on configurable mass position threshold
<b>Magnetometer</b>	3-component, mounted on and level with seismometer

### Self-noise performance plot





## Communications

<b>Interfaces</b>	RS-232 serial, on main and auxiliary connectors
<b>Protocols</b>	Serial Line IP (SLIP) > HTTP (POST and GET) > Command line protocol

## Connectors/Plugs

<b>Main</b>	12-pin female, VSK-12-BCL rubber-molded glass epoxy > 40 V peak-to-peak differential seismic signal plus ground (3 channels) > Serial RS-232 port (Rx,Tx) > Calibration voltage input > Power input and return
<b>Auxiliary/diagnostic</b>	4-pin female, VSG-4-BCL rubber-molded glass epoxy > Serial RS-232 port (Rx,Tx, Grd) > Auxiliary control input
<b>Vacuum/pressure port</b>	1/4-inch male quick disconnect with shutoff > Vent for evacuation and servicing

## Power

<b>Supply voltage</b>	9 to 29 VDC isolated
<b>Power consumption</b>	180 mW typical (leveled, quiescent)
<b>Protection</b>	Reverse-voltage and over-voltage protected > Self-resetting over-current protection > Unit can be powered on for descent and ascent

## Physical

<b>Enclosure</b>	Titanium (6000 m), or enamelled aluminum (1800 m) > All connectors on end cap > End cap removable for O-ring servicing > Dual O-ring seals on end cap
<b>Diameter</b>	158 mm

## Physical (Cont'd)

<b>Height</b>	257 mm, not including connector
<b>Weight</b>	> 11.96 kg, 6.66 kg in sea water (titanium) > 8.19kg, 2.89 kg in sea water (aluminum)

## Environmental

<b>Marine</b>	> Depth to 6000 m (titanium) > Depth to 1800 m (aluminum)
<b>Operating temp.</b>	-20°C to +60°C
<b>Storage temp.</b>	-40°C to +70°C
<b>Shock</b>	100 g half sine, 5 ms without damage, 6 axes

- > No seismometer mass lock required prior to deployment and through full experiment cycle

## Digital Command and Control Interface

### User Interface

<b>Web browser</b>	Onboard web server, using industry standard web browsers
<b>Command line</b>	Basic interface for non-SLIP connections

### Configuration and Control

<b>Sensor</b>	XYZ/UVW mode > Calibration channel selection (off, all, U, V or W) > Short/long period mode
<b>Leveling</b>	Initiate immediate leveling check > Automatic cycle mode selection: (post power-on, three stage periodic) > Automatic cycle parameter selection: (delay and interval times, max attempts)
<b>Unit</b>	Firmware updates > State-of-health request > Upload custom information

### Data outputs

<b>On-request</b>	Seismometer mass position values > Temperature > Internal relative humidity > Magnetometer readings > Seismometer response (poles, zeroes, sensitivity) > Instrument serial number, subassembly revisions > Firmware revision > Case orientation (with respect to vertical) > Seismometer orientation (with respect to vertical) > Download logged state-of-health > Erase state-of-health log > Upload/Download custom information
<b>Leveling Log</b>	Every leveling event logged in non-volatile memory > Full before-and-after State of Health logged
<b>State of Health Log</b>	Scheduled interval recordings of SoH, includes: > time from power on > seismometer mass positions > vessel and seismometer orientations > magnetometer readings > temperature > Capacity for >2 years daily recordings



**CODEVINTEC**

Tecnologie per le Scienze della Terra e del Mare

© 2020 October - Codevintec Italiana srl, Milano [1009.02.10]

---



**Codevintec** Italiana srl

**Milano**  
**Roma**

via Labus, 13 – 20147 Milano  
Lungomare P. Toscanelli, 66 – 00122 Roma

[info@codevintec.it](mailto:info@codevintec.it)  
[www.codevintec.it](http://www.codevintec.it)

ph +39 02 4830.2175  
fax +39 02 4830.2169