



CODEVINTEC

Tecnologie per le Scienze della Terra e del Mare

45° 27' 39.384" N
9° 07' 30.145" E

Trillium Compact Ocean Bottom Seismometer (OBS)



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

Features & Benefits

- > The precise, kinematic 360° gimbal auto-levels from any orientation ensuring successful deployment and implementation
- > SoH outputs include case orientation, providing a powerful data set for optimizing deployment techniques
- > Ocean current induced noise effects are minimized due to a low-profile OBS design
- > Ultra-low power consumption of 180mw reduces battery costs
- > 120-second broadband seismometer that integrates with existing short period or mid-band infrastructure (platforms, power systems, and digitizers)



Trillium Compact Ocean Bottom Seismometer

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. 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 stainless steel vessel for 1200m deployments, and proven glass epoxy connectors en-sure 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 Preliminary specifications:subject to change without notice

Seismometer		Leveling and orientation	
Technology		Technology	
Topology	Symmetric triaxial	Dual degree-of-freedom motorized gimbals Jam-free mechanism Kinematic design preserves full seismometer performance	
Feedback	Force balance with capacitive transducer	Range	
Mass Centering	Not required	>±180° relative to upright case	
Performance		Accuracy	
Self-noise	See graph	Levels to within ±0.5° of true vertical	
Sensitivity	750V·s/m nominal ±0.5% precision	Leveling initiation	
Off-axis Sensitivity	±0.5%	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	
Bandwidth	-3dB points at 120s and 100Hz	Magnetometer	
Transfer Function	Lower corner poles within ±0.5% of nominal provided High-frequency response within 1dB of nominal No peak in response at high frequency	3-component, mounted on and leveled with seismometer	
Clip Level	26mm/s from 0.1Hz to 10Hz	Communications	
Parasitic Resonances	None below 100Hz	Interfaces	
Operational Tilt Range	±2.5° without re-leveling	RS-232 serial, on main and auxiliary connectors	
Digital command and control interface		Protocols	
User Interface		Serial Line IP (SLIP) HTTP (POST and GET) Command line protocol	
Web browser	Onboard web server, using industry standard web browsers	Connectors/Plugs	
Command line	Basic interface for non-SLIP connections	Main	
Configuration and control		12-pin female, VSK-12-BCL rubber-molded glass epoxy 40V peak-to-peak differential seismic signal plus ground (3 channels) Serial RS-232 port (Rx,Tx) Calibration voltage input Power input and return	
Sensor	XYZ/UVW mode Calibration channel selection (off, all, U,V or W) Short/long period mode	Auxiliary/diagnostic	
Leveling	Initiate immediate leveling check Automatic cycle mode selection: - (post power-on, three stage periodic) Automatic cycle parameter selection: - (delay and interval times, max attempts)	4-pin female, VSG-4-BCL rubber-molded glass epoxy Serial RS-232 port (Rx,Tx, Grd) Auxiliary control input	
Unit	Firmware updates State-of-health request Upload custom information	Vacuum/pressure port	
Data outputs		1/4" male quick disconnect with shutoff Vent for evacuation and servicing	
On-request	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	Power	
Leveling Log	Every leveling event logged in non-volatile memory Full before-and-after State of Health logged	Supply voltage	
State of Health Log	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	9 to 29VDC isolated	
		Power consumption	
		<180mW typical (leveled, quiescent)	
		Protection	
		Reverse-voltage and over-voltage protected Self-resetting over-current protection Unit can be powered on for descent and ascent	
		Environmental	
		Marine	
		Depth to 6000m, fresh and salt water (titanium) Depth to 1200m, fresh and salt water (stainless steel)	
		Operating temp.	
		-20°C to +60°C	
		Storage temp.	
		-40°C to +70°C	
		Shock	
		100g half sine, 5ms without damage, 6 axes No seismometer mass lock required prior to deployment and through full experiment cycle	
		Physical	
		Enclosure	
		Titanium cylinder, stainless steel All connectors on end cap End cap removable for O-ring servicing Dual O-ring seals on end cap	
		Diameter	
		158mm	
		Height	
		257mm, not including connectors	
		Weight	
		11.96kg on land, 6.66kg in water	