

TRILLIUM 120

SLIM BOREHOLE SEISMOMETER

Nanometrics industry-leading Trillium 120-class borehole seismometer in a slim borehole form-factor is optimized for cased boreholes of 115 to 153 mm, complementing the current Trillium 120 Borehole models designed for boreholes of 152 mm and greater. The instrument is housed in a stainless steel enclosure with a spring actuated hole-lock mechanism, strain relief, and a high pressure marine grade connector.

Local, regional & teleseismic studies

The **Trillium 120 Slim Borehole** is a very broadband seismometer ideal for local, regional and tele-seismic studies, having a response of flat to velocity from 120 seconds to 150 Hz and exceptionally low self-noise. Operators will appreciate the low power consumption, remote mass centering and robust no-mass lock design inherent in all Trillium Seismometers. Its many simple-to-use features, such as automatic mass centering that can be remotely initiated, and digital case tilt reporting make for fast and successful installation every time.

Real-Time Tilt and Azimuth Correction

The slim borehole has a wide range tensioner, a $\pm 4^\circ$ mass-centering range permitting installations in boreholes that are up to 4° from vertical. When used with the Centaur Digital Recorder, an innovative real-time tilt and azimuth correction feature permits the digitizer to correct for any tilt and misalignment at the source, eliminating the need for correction downstream.

Also available:

- Trillium Borehole 120 and Trillium Horizon for vault or shallow direct bury



Benefits

- A robust, waterproof, stainless steel enclosure ensures the sensor is protected from hostile environments
- Tilt tolerance of 0 to 4° from vertical
- True vertical data provided by the Centaur digitizer, informed by Trillium's integrated tilt sensor
- Instrument recovery is aided by a robust holelock release mechanism that prevents jamming
- Low power consumption of 490 mW minimizes power source requirements at the site
- Quiet down-hole deployments benefit from exceptional self-noise (see graph p.2)
- Automatic mass centering that can be remotely initiated

TECHNICAL SPECIFICATIONS TRILLIUM 120 SLIM BH

Specifications subject to change without notice

SEISMOMETER

TECHNOLOGY

- Topology:** Symmetric triaxial
- Feedback:** Force balance with capacitive transducer
- Mass Centering:** Automatic motorized re-centering, can be remotely initiated
- Tilt range:** 0° to 4° from vertical
- Holelock:** Mechanical activation and release, single jaw, non-jamming bottom-mount lock
- Alignment:** North line on top cap; realtime azimuth correction with Centaur digital recorder
- Digital tiltmeter:** Reports case tilt from vertical for easy installation and remote troubleshooting when using Centaur digital recorder
- Virtual bubble level:** Graphical bullseye level is available via Centaur digital recorder GUI
 - Helps quickly find the best vertical section in a borehole

PERFORMANCE

- Self-noise:** See plot
- Nominal Sensitivity:** 1200 V-s/m (reference User Guide for precise value)
- Precision:** ±0.5%
- Bandwidth:** -3 dB points at 120 s and 150 Hz
- Clip Level:** 16.6 mm/s up to 10 Hz and 0.12 g above 10 Hz
- Temperature:** ±45°C without re-centering

INTERFACE

- Connector:** 20-pin marine
- Velocity Output:** 40 V peak-to-peak
 - Selectable XYZ or UVW mode
- Mass Position Output:** Three independent ±4V outputs for UVW
- Calibration Input:** Single voltage input for all channels, single calibration enable pin for all channels
 - Calibration in XYZ or UVW
 - Independent channel selection by serial port
- Control Lines:** Mass Center, Calibration Enable, XYZ/UVW mode
- Serial Port:** RS-232 compatible serial IP (SLIP)
 - Onboard web server standard HTTP
 - For enhanced instrument control and status: mass centering, case tilt reporting, UVW/XYZ mode, short/long period mode, firmware updates, temperature, mass position, instrument status, serial number and factory info

POWER

- Supply Voltage:** 9 to 36 Volts DC isolated input
- Power Consumption:** 490 mW typical at 15 V input
- Protection:** Reverse-voltage protection
 - Auto-resettable over-current protection
 - No fuse to replace

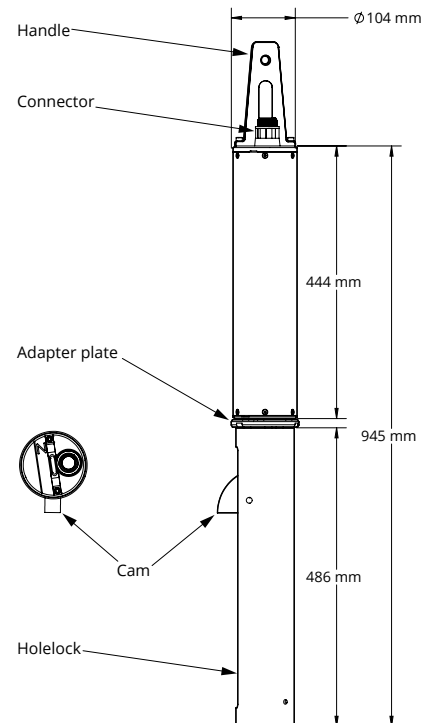
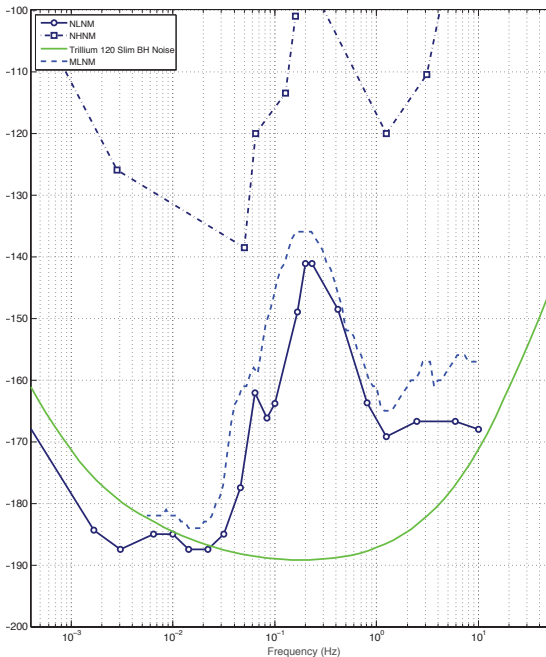
PHYSICAL

- Case Design:** Stainless steel pressure vessel and holelock
- Diameter:** 104 mm
- Height:** 945 mm, not including handle
- Weight:** 10 kg without holelock; 18 kg including holelock
- Hoisting Attachment Point:** Handle on lid for lifting cable 1500 lb rated
- Borehole diameter:** 115 mm to 153 mm

ENVIRONMENTAL

- Operating Temperature:** -20°C to 60°C
- Storage Temperature:** -40°C to 70°C
- Shock:** 20 g half sine, 5 ms without damage, 6 axis
 - No mass lock requires for transport
- Humidity:** 0% to 100% (submersible)
- Pressure:** Enclosure optimized to be insensitive to atmospheric variations
- Water Immersion:** 300 m depth; Rated to IP68 and NEMA6P for prolonged submersion

SELF-NOISE GRAPH



Contact a product expert Toll Free: 1 855 792 6776 | sales_mkt@nanometrics.ca