# CASCADIA 120 SLIM POSTHOLE
## THE BEST OF BOTH WORLDS

The combined strong and weak motion capabilities of the Cascadia series, now with a higher dynamic range.

The latest addition to the popular Cascadia series of single cased instruments, the Cascadia 120 Slim Posthole, combines the ultra low-noise of the Trillium 120 Slim Posthole seismometer with the high clip level of the Class A Titan accelerometer.

This dual output, ultra-wide dynamic range sensor can be deployed in boreholes as narrow as 104 mm to measure both strong motion and weak motion, with absolutely no compromise in performance. With one hole to dig, a single connector, a single cable and sensor that are guaranteed to be mutually aligned, proper deployment is virtually effortless.

### Don't let your data be limited by your instrumentation

The Cascadia maximizes the scientific return on your investment by providing the richest possible data catalog to facilitate local and teleseismic studies. While you are monitoring for strong motion events, your instruments provide a valuable source of weak motion data that helps calibrate and train event detection algorithms, as well as benefit the broader seismology community.

### A highly integrated station solution

The Cascadia series is optimized for use with our popular Centaur digital recorder. When used with the Centaur Digital Recorder, 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. The Centaur allows for easy configuration of both sensors via the Centaur's web interface. You'll have full access to extended state-of-health data, including sensor inclinations, temperature and more. A digital leveling bubble in the Centaur GUI makes for easy leveling down a dark hole and gives you the ability to check levelness at any time once the instrument is buried.

### Use Cases

- Earthquake Early Warning
- Structural Monitoring
- Volcano Monitoring
- Local/Regional Teleseismic Monitoring and Modelling
- Aftershock Monitoring

Cascadia

- Highly portable, easy to install, no vault required
- Will never go off scale
- Ideally suited for applications where the amplitude range is unpredictable
- Features a digital bubble level for easy downhole levelling
- Suitable for harsh environments, resistant to flooding
- Minimal site footprint
- Low cost of deployment/low cost of ownership

*Ask us about our ultra-low temperature options*

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# TECHNICAL SPECIFICATIONS CASCADIA SLIM 120 POSTHOLE

*Specifications subject to change without notice. Refer to User Guide for detailed and comprehensive specifications.*

## SEISMOMETER MODULE TECHNOLOGY

**Topology:** Symmetric triaxial
**Feedback:** Force balance with capacitive displacement transducer
**Mass Centering:** Automatic motorized recentering, can be remotely initiated

## SEISMOMETER PERFORMANCE

**Sensitivity:** (Nominal) 1200 V•s/m; (Actual) 1202.5 V•s/m ±0.5%
**Accuracy:** ±0.5% relative to User Guide specification
**Bandwidth:** –3 dB corners at 120 s and 150 Hz
**Clip Level:** 16.6 mm/s up to 10 Hz and 0.12 *g* above 10 Hz
**Dynamic Range:** 168 dB @ 1 Hz
**Output Impedance:** 2 x 75 Ω±1%
**Temperature Sensitivity:** ±45°C without recentering
**Oper. Tilt Range:** 0° to 4° from vertical

## ACCELEROMETER MODULE TECHNOLOGY

**Topology:** Triaxial, horizontal-vertical
**Feedback:** Force balance with capacitive displacement transducer
**Centering:** Electronic offset zeroing via user interface or control line
**Full-scale Range:** Electronically selectable range: ±4 *g*, ±2 *g*, ±1 *g*, ±0.5 *g*, and ±0.25 *g* (peak)
**Sensitivity accuracy:** ±0.5%

## ACCELEROMETER PERFORMANCE

**Bandwidth:** DC to 430 Hz (-3 dB point)
**Dynamic Range:**
166 dB @ 1 Hz over 1 Hz bandwidth
155 dB, 3 to 30 Hz
**Output Impedance:** 2 x 100 Ω
**Offset:** Electronically zeroed to within ±0.005 *g*
**Linearity:** 0.015% typical non-linearity and harmonic distortion
**Hysteresis:** Less than 0.005% of full-scale
**Cross-axis Sensitivity:** Less than 0.5% total
**Offset Temperature Coefficient:**
- Horizontal sensor: 60 µg/°C, typical
- Vertical sensor: 320 µg /°C, typical

## LEVELING AND ALIGNMENT

**Digital Bubble Level:** Graphical bullseye level is available via Centaur digital recorder Web interface
**Physical Bubble level:** optional accessory
**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

## AVAILABLE MODELS

**TTC120-SPH1:** Cascadia 120 Slim Posthole

## HARDWARE INTERFACE

**Connector:**
- 26-pin connector
- Submersible
- Glenair 802-013-07Z110-26EA
- Mounted in top of case

**Calibration inputs:**
- Single voltage input and one control signal to enable all three seismometer channels
- Single voltage input and one control signal to enable all three accelerometer channels

**Seismometer Control Lines:** Mass Center, Calibration Enable, XYZ/UVW mode
**Seismometer Velocity Output:**
- Selectable XYZ (east, north, vertical) or UVW mode
- 40 V peak-to-peak differential

**Seismometer Mass Position Output:**
Three independent ±4 V outputs for UVW
**Accelerometer Acceleration Output:**
40 Vpp differential
**Accelerometer Control Input:**
Single control signal can be configured to initiate auto-zero, or enable calibration

## DIGITAL COMMAND AND CONTROL INTERFACE

**Serial Port (Seismometer Module):**
- RS-232 compatible serial IP (SLIP) with onboard HTTP web server to select sensor operating modes, to mass center, and to access state-of-health, virtual level bubble, firmware updates and metadata

**Serial Port (Accelerometer Module):**
RS-232 compatible serial IP (SLIP)
- Gain range selection, auto-zero, or set to specific offset, self-test, calibration enable, firmware updates, sampled XYZ outputs (in volts and g), temperature, serial number and factory info

**Seismometer State-of-Health Outputs:**
- Independent mass position values
- Instrument temperature
- Output modes (XYZ/UVW, long period/ short period)
- Case tilt angle and X and Y dip angles

**Accelerometer Data Outputs:**
- Sampled XYZ outputs (in volts and *g*)
- Instrument temperature
- Trimmer settings
- Instrument serial number
- Hardware assemblies and firmware revisions

## POWER

**Supply Voltage:** 9 to 36 V DC isolated inputs
**Power Consumption:**
- (Seismometer Module) 230 mW typical quiescent
- (Accelerometer Module) 1.1 W typical quiescent

**Protection:**
- Reverse-voltage and over-voltage protected
- Self-resetting over-current protection

**Isolation:** Supply power is isolated from signal ground

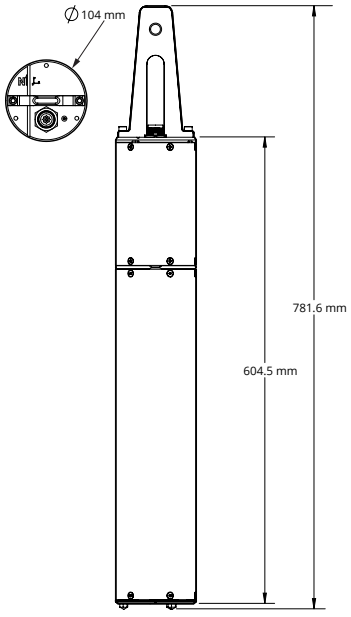
## PHYSICAL

**Diameter:** 104 mm
**Height:** 604.5 mm, not including handle
**Weight:** 14 kg
**Housing:** Stainless steel pressure vessel
**Handling:** Handle on lid for lifting cable 1500 lb rated

## ENVIRONMENT

**Operating Temperature:** –20°C to +70°C
**Storage Temperature:** –40°C to +70°C
**Pressure:** Enclosure designed to be insensitive to atmospheric variations
**Humidity:** 0% to 100% (submersible)
**Shock:**
- 20 *g* half sine, 5 ms without damage, 6 axes
- No mass lock required for transport

**Depth of Deployment:** 500m for a dry, cased or partially water-filled hole.
**Ingress Protection:** Rated to IP68 and NEMA6P to 300 m for prolonged immersion.

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