



TRILLIUM CASCADIA

THE BEST OF BOTH WORLDS

What happens when the best class-A accelerometer in the world meets the world’s most popular seismometer?

The Trillium Cascadia marries the proven Trillium Compact Posthole with the Class A Titan Posthole in a single posthole instrument. This dual-use, ultra-wide dynamic range sensor measures both strong motion and weak motion, with absolutely no compromise in performance. And with one hole to dig, a single connector, a single cable and dual sensors that are guaranteed to be mutually aligned, proper deployment is virtually effortless.

Don’t let your data be limited by your instrumentation

The new Cascadia gives you peace of mind that your strong and weak-motion instrumentation is of the same high quality and has a wide overlap in dynamic range. The Cascadia maximizes the scientific return on your investment by providing the richest possible data catalog to facilitate near-field 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 Trillium Cascadia is optimized for use with our popular Centaur digital recorder. Using the Cascadia with 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 Monitoring and Modelling
- Aftershock Monitoring
- Induced Seismicity Monitoring



- 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
- Each sensor independently serviceable
- Low cost of deployment/low cost of ownership



Ask us about our ultra-low temperature options

TECHNICAL SPECIFICATIONS TRILLIUM CASCADIA

Specifications subject to change without notice

SEISMOMETER MODULE TECHNOLOGY

Topology: Symmetric triaxial
Feedback: Force balance with capacitive displacement transducer
Mass Centering: Not required

SEISMOMETER PERFORMANCE

Nominal Sensitivity: 750 V-s/m (reference User Guide for precise value)
Precision: $\pm 0.5\%$ relative to User Guide specification
Off-axis sensitivity: $\pm 0.5\%$
Bandwidth: -3 dB points at 120 s and 108 Hz
Clip level: 26 mm/s up to 10 Hz and 0.17 g above 10 Hz
Dynamic Range: > 152 dB @ 1Hz
Tilt: Dynamic and operational tilt range of $\pm 2.5^\circ$
Parasitic resonances: None below 200 Hz

ACCELEROMETER MODULE TECHNOLOGY

Topology: Triaxial, horizontal-vertical
Feedback: Force balance with capacitive displacement transducer
Centering: Automated electronic offset zeroing via user interface
Full-scale range: Electronically selectable

ACCELEROMETER PERFORMANCE

Bandwidth: DC to 430 Hz
Dynamic Range:

- 166 dB @ 1 Hz over 1 Hz bandwidth
- 155 dB, 3 to 30 Hz

Offset:

- Electronically zeroed to within ± 0.005 g
- Offset trimming range ± 0.05 g

Non-linearity: <0.015% total non-linearity
Hysteresis: Less than 0.005% of full-scale
Cross-axis sensitivity: Less than 0.5% total
Offset temperature coefficient:

- Horizontal sensor: 60 $\mu\text{g}/^\circ\text{C}$, typical
- Vertical sensor: 320 $\mu\text{g}/^\circ\text{C}$, typical

LEVELING AND ALIGNMENT

Digital bubble level: Graphical bullseye level is available via Centaur digital recorder GUI
Physical Bubble level: optional accessory
Alignment: Vertical scribe marks for (N and S); precision guide in cover for straight-edge, line, or laser level

HARDWARE INTERFACE

Connector:

- 26-pin connector
- Submersible
- Glenair 802-013-02Z110-26EA
- 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: Cal. Enable or Long/Short Period mode, XYZ/UVW mode
Seismometer Velocity output:

- 40 Vpp differential
- Selectable XYZ (east, north, vertical) or UVW mode

Seismometer Mass position output:

- Single voltage output representing maximum mass position
- Three channel mass positions available through serial port

Accelerometer Acceleration output: 40 Vpp differential
Accelerometer Control input: Single control signal can be configured to initiate auto-zero, initiate self-test, or enable calibration
Accelerometer Status output:

- Asserted: Unit OK, output signal valid
- Deasserted: Self-test in progress or failed, auto-zeroing in progress, calibration enabled, or starting up

DIGITAL COMMAND AND CONTROL INTERFACE

Serial Port (Seismometer): RS-232 compatible serial IP (SLIP)

- Onboard web server standard HTTP
- For enhanced instrument control and status: UVW/XYZ mode, short/long period mode, firmware updates, temperature, mass position, case tilt, digital bubble level, serial number and factory info

Serial Port (Accelerometer): 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

POWER

Supply voltage: 9 to 36 V DC isolated inputs
Power consumption:

- (Seismometer Module) 180 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: 97 mm
Height:

- 216 mm - not including connector and feet
- 231 mm - including connector
- 238 mm - including connector and feet

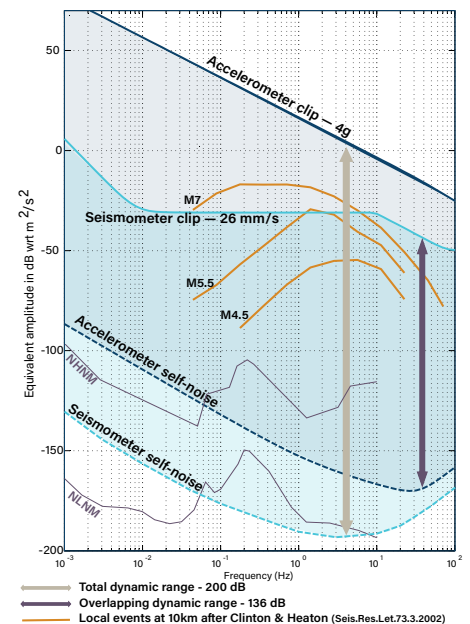
Housing: Stainless steel

ENVIRONMENT

Operating temperature: -20°C to 60°C (Ultra-low temperature option available. Please contact Nanometrics.)
Storage temperature: -40°C to 70°C
Shock:

- 100 g half sine, 5 ms without damage, 6 axes
- No mass lock required for transport

Magnetic: Insensitive to natural variations of the earth's magnetic field
Water Immersion: Rated to IP68 for prolonged submersion to 300 m



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