



CODEVINTEC

Tecnologie per le Scienze della Terra e del Mare

45° 27' 39.384" N
9° 07' 30.145" E

Cascadia Compact

The best of both worlds



This dual output sensor measures both strong motion and weak motion, with absolutely no compromise in performance.

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

The Cascadia Compact, formerly the Trillium Cascadia, combines the proven Trillium Compact Posthole with the Class A Titan Posthole in a single posthole instrument. 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 Monitoring and Modelling
- > Aftershock Monitoring
- > Induced Seismicity 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



Technical Specifications Cascadia Compact

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	±0.5% relative to User Guide specification
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 ±2.5°
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 range: ±4 g, ±2 g, ±1 g, ±0.5 g, and ±0.25 g (peak)



Accelerometer Performance

Bandwidth	DC to 430 Hz
Dynamic Range	<ul style="list-style-type: none"> • 166 dB @ 1 Hz over 1 Hz bandwidth • 155 dB, 3 to 30 Hz
Offset	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 26-pin connector • Submersible • Glenair 802-013-07Z110-26EA • Mounted in top of case
Calibration inputs	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 40 Vpp differential • Selectable XYZ (east, north, vertical) or UYW mode
Seismometer Mass position output	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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)	<p>RS-232 compatible serial IP (SLIP)</p> <ul style="list-style-type: none"> • 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)	<p>RS-232 compatible serial IP (SLIP)</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • (Seismometer Module) 180 mW typical quiescent • (Accelerometer Module) 1.1 W typical quiescent
Protection	<ul style="list-style-type: none"> • Reverse-voltage and over-voltage protected • Self-resetting over-current protection
Isolation	Supply power is isolated from signal ground

Physical

Diameter	97 mm
Height	<ul style="list-style-type: none"> • 216 mm - not including connector and feet • 231 mm - including connector • 238 mm - including connector and feet
Housing	Stainless steel

Environmental

Operating temperature	-20°C to 60°C (Ultra-low temperature option available. Please contact Codevintec)
Storage temperature	-40°C to 70°C
Shock:	<ul style="list-style-type: none"> • 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
Ingress Protection	Rated to IP68 to 300 m for prolonged immersion

Specifications subject to change without notice

