

CASCADIA COMPACT

THE BEST OF BOTH WORLDS

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. This dual output sensor measures 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 | ■ Local/Regional Monitoring and Modelling |
| ■ Structural Monitoring | ■ Aftershock Monitoring |
| ■ Volcano 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
- Low cost of deployment/low cost of ownership



Ask us about our ultra-low temperature options

TECHNICAL SPECIFICATIONS CASCADIA COMPACT

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

Sensitivity/120 models: (Nominal) 750 V·s/m;
(Actual) 754.3 V·s/m $\pm 0.5\%$

Sensitivity/20 models: (Nominal) 750 V·s/m;
(Actual) 753.1 V·s/m $\pm 0.5\%$

Accuracy: $\pm 0.5\%$ relative to User
Guide specification

Bandwidth/120s: -3 dB points at 120 s and 108 Hz

Bandwidth/20s: -3 dB points at 20 s and 108 Hz

Clip level: 26 mm/s up to 10 Hz

and 0.17 g above 10 Hz

Dynamic Range/120s: 159 dB @ 1 Hz

Dynamic Range/20s: 156 dB @ 1 Hz

Oper. Tilt Range/120s: Dynamic and operational
tilt range of $\pm 2.5^\circ$

Oper. Tilt Range/20s: Dynamic and operational
tilt range of $\pm 10^\circ$

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 range:
 $\pm 4 g$, $\pm 2 g$, $\pm 1 g$, $\pm 0.5 g$, and $\pm 0.25 g$ (peak)

Sensitivity accuracy: $\pm 0.5\%$

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 $\pm 0.005 g$
- Offset trimming range $\pm 0.05 g$

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

AVAILABLE MODELS

TTC120-PH1: 120 second Model

TTC20-PH1: 20 second Model

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: 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) with
onboard HTTP web server to select sensor
operating modes, and to access state-of-
health, virtual level bubble, firmware updates
and metadata
- Plug-and-Play automated workflow interface
to select sensor operating modes, and to
access state-of-health, virtual level bubble and
metadata

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:

- **120s Seismometer Module:**
180 mW typical quiescent
- **20s Seismometer Module:**
220 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:

$-20^\circ C$ to $60^\circ C$

(Ultra-low temperature option available.
Please contact Nanometrics.)

Storage temperature: $-40^\circ C$ to $70^\circ C$

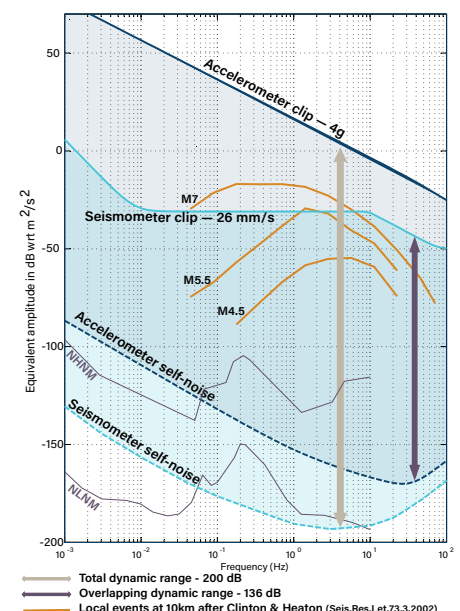
Humidity: 0% to 100%

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

Ingress Protection: Rated to IP68 to 300 m for
prolonged immersion



Contact a product expert

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Listening to the Earth

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