

# CERTIS

COMPACT, LOW-POWER, MEDIUM-MOTION SEISMOMETER,  
OPERATIONAL AT  $\pm 90^\circ$



Triaxial broadband seismometer, fully operable at  $\pm 90^\circ$ , with advanced sensor technology for surface and posthole deployments to 10 m.

## KEY FEATURES

- > Operational at  $\pm 90^\circ$
- > 120 s to 100 Hz
- > Remote, user-selectable long-period corner options between 1 s and 120 s
- > Analogue output
- > Compact and low-power
- > Serial output includes instrument serial number, response and calibration parameters

## APPLICATIONS

- > Local, regional and global monitoring
- > Microseismic and induced seismicity monitoring
- > Permanent and rapid deployment for volcanic unrest monitoring

# Certis

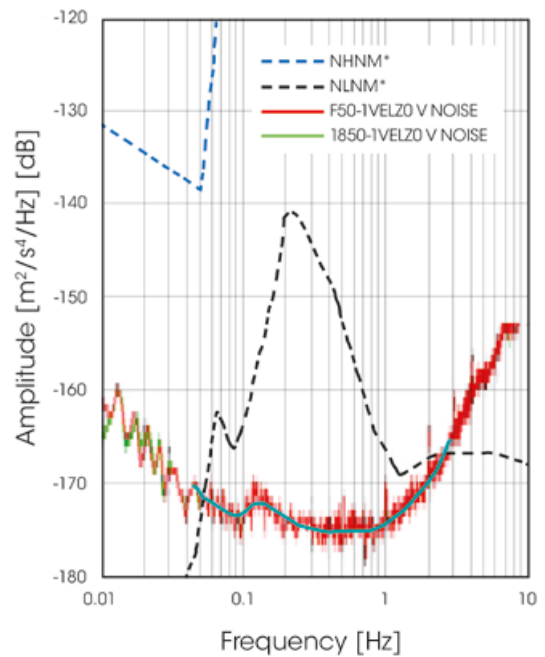
Medium-motion seismometer with advanced sensor technology offering analogue output with state-of-health parameters

CERTIS DIMENSIONS:



Durable and corrosion resistant stainless steel enclosure, with the connector and lifting hook located on the top, for easy access in posthole deployments.

SELF NOISE PLOT:



\*(Peterson, 1993)

## Applications

- > Local, regional and global seismic monitoring
- > Temporary deployment in challenging environments or remote areas
- > Rapid deployment for aftershock monitoring
- > Microseismic and induced seismicity monitoring in the hydrocarbon market, e.g. fracture monitoring
- > Geothermal energy production monitoring
- > Permanent or rapid temporary deployment for volcanic unrest monitoring

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**The Certis is a compact and portable medium-motion seismometer with advanced sensor technology. Certis delivers maximum flexibility and unique user-friendly features;**

- > Option to output to analogue or digital feeds or both
- > The state-of-the-art sensor in the Certis can operate at a tilt range of  $\pm 90^\circ$ , streamlining deployment requirements
- > The wide frequency response of 120 s to 100 Hz also benefits from eight adjustable long-period corner settings including 1, 30, 60 and 100 seconds
- > When paired with a Minimus digitiser, the long-period corner settings can be adjusted post-deployment to significantly reduce the settling time of the sensor
- > The unique design of the sensor means the Certis can output using serial communication. So, in addition to analogue seismic data you can access instruments' state-of-health, response and calibration parameters
- > Certis is a compact and low power unit measuring just 80 mm  $\times$  80 mm  $\times$  112 mm with 250<sup>1</sup> mW power consumption

The stainless steel casing is environmentally sealed to withstand the harshest environments and can be installed at depths of up to 10 m. An internal thermometer and a humidity sensor alert you to any moisture ingress.

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## Key features

State-of-the-art seismic sensor allows full operation over a wide tilt range of  $\pm 90^\circ$  by automatically centring the mass

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Triaxial orthogonal (ZNE) instrument with high cross-axis rejection (> 65 dB)

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Eight, remote, user-selectable long-period corner settings of 1 s, 10 s, 20 s, 30 s, 45 s, 60 s, 90 s, 100 s and 120 s

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Serial output can stream instrument serial number, response and calibration parameters

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Environmentally sealed stainless steel casing suitable for posthole installations

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Highly compact and portable at just 80 mm  $\times$  80  $\times$  112 mm

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Connector and lifting hook located on the top of the enclosure for easy access in posthole deployments

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**The ideal data acquisition partner for Certis is the Minimus which provides state-of-the-art communication capabilities:**

- > Select sample rates of up to 1000 samples per second
- > Simultaneously stream multiple sample rates in addition to two recording rates.
- > Utilise the ultra-low-latency mode for EEW
- > Industry standard triggering algorithms for EEW (STA/LTA, threshold);
- > Multi-instrument voting functionality
- > Common Alert Protocol (CAP) enabled for automated emergency warning
- > GüVü Bluetooth App for installation integrity checking available for both Android and iOS devices

### Enhanced instrument and data management

By pairing with a Minimus you also access Güralp Discovery, our sophisticated instrument and data management software platform<sup>2</sup>.

Discovery's powerful tools include:

- > Instrument IP address identification on LAN or internet, eliminating the need for static IP addresses
- > Access to hardware State-of-Health (SoH), GNSS location, instrument response and calibration values
- > View and stream data with back-fill capabilities plus selectable date-and-time-window data transmission
- > Advanced data analysis including spectral density graphs, spectrograms, discrete Fourier transforms and histograms
- > Remotely and simultaneously apply configuration files to multiple units within a network

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<sup>1</sup>Power performance may vary as a result of restricted semi-conductor availability

<sup>2</sup>You can also access the common instrument controls via a standard web browser.

## SPECIFICATIONS

BROADBAND SEISMOMETER SYSTEM	
Technology	Force feedback digital sensor
Configuration / Topology	Triaxial orthogonal (ZNE)
PERFORMANCE: BROADBAND SEISMOMETER	
Maximum frequency response bandwidth	120 s (0.0083 Hz) to 100 Hz
	User selectable long-period corner of 1 s, 10 s, 20 s, 30 s, 45 s, 60 s, 90 s, 100 s and 120 s.
Peak full-scale output voltage	Differential: $\pm 20$ V (40 V peak-to-peak) Single-ended: $\pm 10$ V (20 V peak-to-peak)
Output sensitivity	1000 V/ms <sup>1</sup> other options available
Clip level	26 mm/second
Sensor dynamic range	155 dB
Self-noise	-173 dB at 10 seconds
Operational tilt range	$\pm 90^\circ$
Cross axis rejection	> 65 dB
Linearity	> 95 dB
Lowest spurious resonance	> 450 Hz
Transfer function	Measured sensitivity, frequency response and instrument poles and zeros are stored within the instrument and accessible via web interface of the digitiser
MASS / MONITORING	
Sensor mass positions	Three independent sensor mass position outputs (integrator)
Centring	Automatic / can be disabled
Orientation sensor	MEMS based accelerometer (three component)
Other sensors	Temperature, humidity

OPERATION AND POWER USAGE	
Operating temperature	-20 to +60 °C
Relative humidity range	zero to 100 %
Power supply	10 - 36 V DC*
Power consumption at 12 V DC	250 mW <sup>1</sup>
<i>*Power voltage for operation of this unit only. Connection to additional instrumentation or use of longer cables may result in a higher input voltage requirement</i>	
<sup>1</sup> <i>Power performance may vary as a result of restricted semi-conductor availability</i>	
PHYSICAL	
Casing type	Stainless steel
Environmental sensor	Humidity and temperature
Weight	1.9 kg (disconnected)
Dimensions	80 mm × 80 mm × 112 mm high (including fixed feet to top of connector)
Connector type	MIL-DTL-38999 Series III connector, 22 Pin
Installation depth	Suitable for installation to depths of 10m
Environmental protection	IP68