



MERIDIAN PH

ALL-IN-ONE DIGITAL SEISMOGRAPH

A high performance seismograph for down-hole installations

Marrying the sensor to the digitizer and recorder, this all-in-one seismograph provides exceptional performance for a variety of downhole installations: direct burial, shallow or deepcased holes.

The Meridian PH features the latest generation Trillium 120PH class seismometer technology mounted on a leveling system inside a stainless steel pressure vessel. Inherent in all Trillium seismometers, the Meridian PH provides low power consumption, remote mass centering, and a robust no-mass lock design. The Meridian PH is also available for Polar environments.

Meta data you can trust

- Instrumentation configuration is made easy with an intuitive user interface. Once configured, the Meridian PH builds its own metadata.
- With the digitizer and sensor housed in a single unit, dataless seed volume is internally built and guaranteed to be correct every time.

Efficient array management, simplified site visits and logistics

- Reduced "touch time" makes it easier to manage your resources

Less to forget, less to integrate

- Combining proven technologies in a single package keeps it simple

Operational Benefits

- Higher data quality than vault style installations
- Auto-levels to true vertical for highest fidelity recording
- Uniform installation technique
- Less equipment to transport
- Simplified meta data management
- Better performance in urban areas
- Improved security of assets

Cost Benefits

- Less equipment to maintain
- Installation costs reduced
- Logistics costs lowered



The combination of two proven technologies, the Trillium 120 seismometer and 24-bit Centaur digitizer provides ease of deployment with no compromise on quality.



Ask us about our ultra-low temperature options

TECHNICAL SPECIFICATIONS MERIDIAN PH

Specifications subject to change without notice

SENSOR: Trillium Compact Seismometer

See the Trillium Compact Seismometer specifications for more details.

TECHNOLOGY

Topology: Symmetric triaxial

Operational tilt range: $\pm 5^\circ$ automated leveling to true vertical

Mass Centering: Motorized recentring

automatically initiated during leveling sequence

Auto mass centering: Configurable thresholds, intervals, retries

PERFORMANCE

Bandwidth: -3 dB corners at 120 s and 150 Hz

Self-noise: Below the NLNM from 100 s to 10 Hz

Clip Level: >17 mm/s up to 10 Hz and 0.17 g above 10 Hz

DIGITAL RECORDER

DIGITIZER PERFORMANCE & CAPABILITIES

Type: 24-bit ADC per channel, simultaneous sampling

Dynamic range: 142 dB @ 100 sps

(full-scale peak to RMS shorted-input noise)

Selectable Gain: 1, 2, 4, 10, 20, 40

Sensitivity: 480, 960, 1920, 4800, 9600, 19200 counts/(\(\mu\text{m}/\text{s}\)), 1% accuracy

Sample rates: 1, 2, 5, 10, 20, 40, 50, 80, 100, 125, 200, 250, 500, 1000, 2000, 5000 sps

Dual Sample Rates: A second sample rate can be selected from the sample rates above

Decimation Filter: Selectable linear phase (non-causal) or minimum phase (causal)

Anti-alias Filters: -140 dB (linear phase) or -120 dB (minimum phase) at Nyquist frequency, 0 dB at 80% Nyquist

Digital Filters:

- User-configurable low-pass and high-pass
- 1st to 5th order, 0.1 mHz to Nyquist
- Different filters may be configured for primary and secondary sample rates

Orientation Correction: User configurable onboard 3-D data rotation for correcting azimuth and tilt

CALIBRATION

Signal Source: 16-bit DAC with 30 ksp/s output

Attenuator: Selectable 1, 10, 100 attenuation

Waveforms: Synthesized sine, PRB signals, Playback user defined calibration files

RECORDING (CONTINUOUS)

Formats: MiniSEED

Internal Media: 8 GB flash memory (32 or 64 GB options available)

Removable Media: SD Card up to 64 GB

RECORDING (EVENTS)

Triggers: Bandpassed STA/LTA, Threshold

Captured Data: MiniSEED, ASCII

DATA RETRIEVAL

File Transfer: Via Ethernet, Ethernet-connected DSL, VSAT, cellular, radio

Media Exchange: Weather-sealed data cartridge that is field-swappable during continuous recording with no loss of data

TIMING - GNSS & PRECISION NETWORK TIMING

Timing System: Internal DCXO clock disciplined to selectable timing source

Timing Source: Select from GNSS, PTP (Precision Timing Protocol), NTP or free-running

Timing Server: Serve PTP or NTP time to other Meridian, Titan SMA/EA or Centaur

Timing Accuracy: <5 \(\mu\text{sec}\) (GNSS Always On) <100 \(\mu\text{sec}\) (GNSS duty cycled, PTP or local NTP)

GNSS Support: Internal GNSS receiver

GNSS Power: Selectable: Always on, Duty cycled, or off

DATA STREAMING

Continuous: Seismic data and State-of-Health data

Formats: SeedLink (optional), Nanometrics NP (standard)

Events: Triggered event data: email, secure file transfer, other options available

COMMUNICATIONS

Web-based UI: Supports standard PC, tablet and mobile devices

Network interface: 10/100 Base-T Ethernet

IP Addressing: Static, dynamic (DHCP) or link-local IP address

Protocols: UDP/IP unicast/multicast, HTTP data streaming

SEISMOGRAPH SPECIFICATIONS

POWER

Power Input: 9-36 VDC isolated input

Consumption: 1.5 W (1.8 W with Ethernet) typical

Protection: Lightning surge protected

- Reverse-voltage and over-voltage protected
- Self-resetting over-current protection

Battery Manager: User configurable low voltage shutdown and restart thresholds

ENVIRONMENTAL

Operating temperature: -20°C to +60°C

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

Storage temperature: -40°C to +70°C

Shock: 20 g half sine, 5 ms without damage, 6 axes

Pressure: Insensitive to pressure

Weather/water resistance: Rated to IP68 continuous immersion up to 40 m

Humidity: 0 to 100%

PHYSICAL

Max. cable length: 40 m

Housing: Stainless steel

Weight: 18.2 kg

Height: 600 mm, including connector and feet

Diameter: 143 mm

Removable digitizer: Digital recorder can be removed for servicing

Connector: 16-pin, Subconn Micro series, top mounted

SURFACE INTERFACE UNIT (SIU)

FEATURES

Status LEDs: Removable media, Archive, Time, Link, Sensor, System

Connectors: Power: 3-pin MIL-Circular

- Ethernet: 4-pin MIL-Circular
- Data cartridge: 8-pin MIL-Circular
- GNSS antenna: TNC connector with 3.3 V supply
- for active antenna
- 14-pin MIL-Circular

Data cartridge: Field-swappable, weather-sealed data cartridge holding replaceable SD card (41 mm dia. x 67 mm)

Buttons: Media Eject, Shutdown

PHYSICAL/ENVIRONMENTAL

Housing: Powder coat aluminum with nickel-plated steel base

Weather/water resistance: Rated to IP67

Dimensions:

- Length: 180 mm
- Width: 83 mm
- Height: 43 mm including connectors

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



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