**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*

nanometrics.ca
TECHNICAL SPECIFICATIONS MERIDIAN PH
Specifications subject to change without notice

SENSOR: Trillium Compact Seismometer
See the Trillium Compact Seismometer specifications for more details.

TECHNOLOGY
Topography: Symmetric triaxial
Operational tilt range: ±5° automated leveling to true vertical
Mass Centering: Motorized recentering 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 017 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/(μm/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 Hz 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 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 μsec (GNSS Always On) <100 μsec (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

Strategic intelligence fueled by science