



# CENTAUR

## A truly modern digital recorder that meets today's field deployment challenges

The Centaur is an all-in-one digitizer, recorder, and telemetry instrument with advanced on-board data processing capabilities capable of data manipulation and detecting events in the field. Available in 3 and 6 channels supporting sensors such as seismometers, microbarometers, and weather stations, Centaur is ideal for multidisciplinary science involving geophysical sensor applications. The extensive configurability is made easy by a simple to use settings framework available via its web interface, which also provides real-time state of health and waveform viewing.

### Exceptional Performance & Reliability

- True 24-bit performance, three channels simultaneously sampled
- Dual sample rates of up to 5000 sps supports high- and low-frequency applications
- Onboard 8 GB memory is expandable up to 64 GB by adding an internal SD card.
- Support for GNSS, NTP or PTP (Precision Time Protocol) time sources and can also act as a timing master
- Sensor calibration using fully configurable sine and pseudo random binary waveform or .wav file playback

### Reliability

- Redundant, fail-safe data archive with field swap capability
- Rugged, waterproof field enclosure for harsh environments, rated for continuous submersion (IP68)
- Excellent protection for ESD & lightning surge

### Onboard data processing

- Data backfill in case of communication interruptions
- Fully configurable lowpass, highpass and bandpass digital filtering
- Full digitizer/sensor response files generated on-demand
- User configurable onboard 3-D data rotation for orientation correction of Azimuth and tilt rotation



**The best digital recorder on the market just got better**

Whether your deployment is portable or permanent, standalone or networked, the choice of digital recorder has never been easier.

# TECHNICAL SPECIFICATIONS

\*Specifications subject to change without notice

## SENSOR INPUTS

**Channels:** Available with 3 or 6 channel inputs  
**Sampling:** Simultaneous on all 3 or 6 channels  
**Resolution:** 24 bits per channel, full 24-bit range to clip level  
**Input voltage range** (Peak-to-peak differential):  
• 40 V, 20 V, 10 V, 4 V, 2 V, 1 V (standard)  
• 10 V, 5 V, 2.5 V, 1 V, 0.5 V, 0.25 V (high-gain)  
**Input Impedance:** 40 k $\Omega$  (standard digitizer)  
1.8 M $\Omega$  (high-gain digitizer)

## SENSOR COMPATIBILITY

**Sensor Types:** Broadband seismometers, short period geophones, and microbarometers  
**Control Lines:** 6 per connector – typically used for Cal enable, mass center, mass lock/unlock, XYZ/UVW select  
**Sensor Power:**  
• Supply power pass-through to sensor (9-36 VDC, 1A)  
• Over-current and surge protected  
**Auto Mass Centering:** Configurable thresholds, intervals, retries  
**Serial Interface:** Supports digital management of Nanometrics sensors

## DIGITIZER PERFORMANCE & CAPABILITIES

**Type:** True 24-bit ADC per channel  
**Preamp Gain:**  
• Standard: 1x, 2x, 4x, 10x, 20x, 40x  
• High Gain: 4x, 8x, 16x, 40x, 80x, 160x  
**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 and Sensor A and B  
**Orientation Correction:** User configurable onboard 3-D data rotation for Azimuth and tilt rotation  
**Accuracy:** Nominal gain accuracy within  $\pm 0.5\%$   
**Dynamic Range:** 142 dB @ 100 sps, 135 dB @ 500 sps (full-scale peak to RMS shorted-input noise)

## CALIBRATION

**Signal Source:** 16-bit DAC with 30 ksp/s output  
**Selectable Gain:** 1x, 0.1x, 0.01x gain  
**Waveforms:** Synthesized sine, pulse, PRB signals  
Playback user defined .wav files

## RECORDING (CONTINUOUS)

**Formats:** MiniSEED  
**Internal Memory:** 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 Products:** Peak Ground Motion (i.e. PGA, PGV, PGD) statistics calculated on the instrument

## STATE-OF-HEALTH INPUTS

**Channels:** 3 singled-ended inputs,  $\pm 5$  V range, 50 k $\Omega$  input impedance  
**Sampling Interval:** Configurable from 1 to 3600 seconds  
**Accuracy:** 18 bits effective resolution

## DATA RETRIEVAL

**File Transfer:** Via Ethernet, optional WiFi or Ethernet-connected DSL, VSAT, cellular, radio  
**Media Exchange:** SD card field-swappable during continuous recording with no loss of data

## DATA STREAMING

**Continuous Seismic:** data and State-of-Health data  
**Formats:** SeedLink, Nanometrics NP  
**Events:** Triggered event data: email, secure file transfer, other options available

## TIMING - GNSS & PRECISION NETWORK TIMING

**Timing System:** Internal DCXO clock disciplined to selectable timing source  
**Timing Source:** Select from GNSS, NTP, PTP (Precision Timing Protocol) or free-running  
**Timing Server:** Serve PTP or NTP time to other Centaur, Titan SMA/EA or Meridian  
**Timing Accuracy:** <5  $\mu$ sec (GNSS Always on) <100  $\mu$ sec (GNSS duty cycled, PTP or local NTP)  
**GPS Receiver:** Internal 14-channel receiver  
**GNSS Power:** Selectable: Always on, Duty cycled or off

## COMMUNICATIONS

**Web-based UI:** Supports standard PC, tablet and mobile devices  
**Interfaces:** 10/100 Base-T Ethernet, WiFi (optional), Serial via USB  
**IP Addressing:** Static, dynamic (DHCP) or link-local IP  
**Protocols:** UDP/IP unicast/multicast, HTTP data streaming

## LOCAL USER INTERFACE

**Removable Media:** SD card protected in waterproof media bay  
**External LEDs:** System status, Ethernet link, Time quality, Media card status, Sensor A & B  
**Buttons:** WiFi wakeup, media eject, system shutdown

## POWER

**Power Supply:** 9-36 VDC isolated input  
**Protection:** Electronic resettable fuse design, lightning surge, reverse battery and short circuit protection  
**Battery Manager:** User-configurable low voltage shutdown and restart thresholds

## POWER USAGE (TYPICAL)

**3 chan. (standard):** 850 mW  
**6 chan. (standard):** 1.2 W  
**Ethernet:** Add 0.2 W for 10 Base-T, 0.3 W for 100 Base-T  
**High Gain:** Add 0.2 W for every 3 high-gain channels

## CONNECTORS

**Sensor:** 26-pin Mil. circular, shell size 16, female  
**Power:** 3-pin Mil. circular, shell size 8, male  
**Ethernet:** Watertight RJ-45  
**USB:** 2.0 Type A receptacle behind media bay door  
**GNSS Antenna:** TNC (female) with 3.3V supply for active antenna  
**State-of-Health:** 4-pin Mil. circular, shell size 8, female

## PHYSICAL CHARACTERISTICS

**Housing:** Aluminum  
**Weather Resistance:** Rated to IP68 with connectors mated  
**Humidity:** 0 to 100%  
**Operating Temperature:** -20°C to +60°C (Ultra-low temperature option available. Please contact Nanometrics.)  
**Storage Temperature:** -40°C to +70°C  
**Weight:** 1.9 kg (3-channel), 2.0 kg (6-channel)  
**Size:** 196 mm (L) x 137 mm (W) x 88 mm (H)

Contact a product expert Toll Free: 1 855 792 6776 | [sales\\_mkt@nanometrics.ca](mailto:sales_mkt@nanometrics.ca)