Common sense…uncommon innovation

GEOTECH INSTRUMENTS, LLC

FEATURES

- **24-bit delta sigma A/D converter, 4th generation seismic recorder**
- **3 or 6 channels**
- **Events only telemetry capable**
- **Earthworm exporter**

The SMART Series of instruments represent the logical solution for seismological data acquisition: a common design for a digitizer, portable recorder, and strong motion recorder (the all-in-one solution). The traditional difference between these instruments vanishes, a strong motion recorder can now simultaneously record continuously weak motion data on a large selection of media: up to **240GB hard disks**, **64GB Compact Flash memory**, etc. All units are telemetry ready using the **CD1.1** protocol (with authentication by internal Fortezza cryptocard) or the **Earthworm** protocol. Very low power consumption is supplemented by a complete set of serial and Ethernet communication ports. **The removable and hot-swappable enclosure** has a **USB2.0** port for very fast data download. A **SEEDLink** plug-in is also available.

THE SMART-SERIES

MODEL SMART-24D® Digitizer
MODEL SMART-24R® Recorder
MODEL SMART-24B Borehole Digitizer

Portable version

Borehole version

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SMART-24 SERIES SPECIFICATIONS

DATA ACQUISITION

Number of inputs	3 or 6 channels
Input type	Balanced differential with transient protection suitable for both passive and active sensors
Input range	5Vp-p, 20Vp-p and 40Vp-p bipolar differential, 2x1 Mohm
Gain	Software selectable: x1, x2, x4, x8, x16, x32, x64
Common mode rejection	Greater than 90 dB
Digitizer	Over sampled 24-bit Delta Sigma ADC with digital signal processing, 1 per channel
Anti-alias filter	Brickwall digital FIR filter, cutoff at 80% of and 130 dB down at output Nyquist frequency. Causal filter optional.
Dynamic range	Up to 138 dB @ 100 sps
Intermodulation distortion	Less than −110 dB
Sample rates	1, 5, 10, 20, 40, 50, 100, 125, 200, 250, 500, 1000, 2000 sps primary sample rates
Noise	~1 count RMS at up to 200 sps

ACQUISITION MODES

Continuous	User selected start time, ring buffer or until storage full
Timed	16 user programmable recording windows
Triggered	Threshold, STA/LTA (updating or non-updating), and external
Pre-event length	Up to 32,768 data samples
Post-event length	Up to remaining data storage
On board memory	192 MB

DATA STORAGE (SMART-24R® ONLY)

Type	Up to 240 GB hard disk, up to 64 GB industrial grade Compact Flash memory, 1 or 2 partitions
Recording format	Standard FAT32 file system, drives readable directly on a PC, format converters available for 32-bit SUDS, SAC, SEG-Y, SEISAN, MatLab, miniSEED, CSS3.0 and SEED

INTERNAL RECORDING (ALL VERSIONS)

Option for two PC Card slots for Compact Flash storage, non-removable, accessible by any ftp client.

TIMING

	Voltage controlled TCXO with optional external GPS synch.
Accuracy	<±10 microseconds of UTC with GPS lock
Stability	0.5 PPM (when unlocked)
GPS duty cycle	User programmable GPS power on/off cycle times

INTERFACES

Indicators	Large graphic LCD, protected
Communications	2xRS232, Ethernet, USB2.0 for the removable enclosure
GPS	Dedicated RS-422 serial port
Power	Main power and external battery
Other I/O	5 or 8 12-bit analog inputs, external trigger in/out, 1 PPS in/out
Calibration	Pulse, sine wave, white noise, random binary, step functions, and shorted input
Telemetry	- CD1.1 protocol, 4 independent profiles to 4 different IP servers; - Earthworm protocol on 1 profile; - 64MB internal buffer for backfill; - continuous, events only or both

POWER

Input	10 to 16 VDC
Power consumption	~1 watt average (3 channels @ 100 sps and GPS power cycling)

PHYSICAL

Construction	Rugged machined or extruded Aluminum case, all IP67
Size	11.2 in (284 mm) w x 12.3 in (312 mm) l x 2.9 in (74 mm) h
Weight (24D only)	7.9 lbs (3.6 kg)
Operating temperature	-20°C to +70°C
Humidity	0 to 100% (IP67)

Removable enclosures