Common sense…uncommon innovation

GEOTECH INSTRUMENTS, LLC

FEATURES

- **24-bit delta sigma A/D converter, 4th generation seismic recorder**
- **3 or 6 channels**
- **Zero-maintenance**

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 60 GB hard disks, PCMCIA ATA disks, IBM microdrives, Compact Flash memory, etc. All units are telemetry ready using the **CD1.1** protocol.

Extreme low power consumption is supplemented by a complete set of communication ports: serial, Ethernet, USB2.0, IEEE1394, and optional IrDA. **The removable hot-swappable enclosure** (see picture) has a **USB2.0** port for very fast data download.

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
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 (SMART-24R® only)

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

DATA STORAGE (SMART-24R® only)

Type	Up to 60 GB hard disk, up to 4 GB industrial grade Compact Flash memory, IBM microdrives
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, and SEED (For other formats, contact factory.)

INTERNAL RECORDING (ALL VERSIONS)

Two PC Card slots for Compact Flash or microdrives, accessible by ftp client

TIMING

	Voltage controlled TCXO with optional external GPS synch.
Accuracy	<±8 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, IEEE1394 and IrDA ports optional
GPS	Dedicated RS-422 serial port
Power	Main power and external battery inputs
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)

POWER

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

PHYSICAL

Construction	Portable rugged molded case
Size	4.1 in (105 mm) w x 10.35 in (263 mm) l x 13.65 in (347 mm)
Weight (24D only)	8.5 lbs (3.9 kg)
Operating temperature	-20°C to +65°C; PCMCIA PC Card and hard disk options may limit this range on 24R and 24A models
Humidity	0 to 100%

Removable enclosures

CE