FEATURES

- 24-bit delta sigma A/D converters, 4th generation strong motion recorder
- 3 or 6 channels
- Events only telemetry capable
- Earthworm exporter

SMART Series of The instruments represents the latest generation of seismological data acquisition systems developed by Instruments. Geotech It consists of the SMART-24D® digitizer, SMART-24R® recorder. and SMART-24A® accelerograph. SMART-24A® is a SMART-24R® with internal battery and PA-23 force balance accelerometers, an improved version of those used in the well known A900 instruments that produced the largest strong motion data set ever recorder from a single earthquake, the Chi-Chi, Taiwan, event. The unit is telemetry ready using CD1.1 and/or Earthworm protocols.

Very low power consumption supplemented bv is а complete of set communication ports: serial, Ethernet, and USB2.0. The removable and hotswappable enclosure has a USB2.0 port for very fast data download. A **SEEDLink** plug-in is also available.



MODEL SMART-24A® Strong Motion Recorder



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SMART-24A® SPECIFICATIONS

DATA ACQUISITION

Number of inputs Input type	3 or 6 channels Balanced differential with transient protection suitable for both passive and active sensors
Input range on additional three channels	5Vp-p, 20Vp-p and 40Vp-p bipolar differential, 2x1 Mohm (other full scales possible)
Gain	Software selectable: x1, 2, 4, 8, 16, 32, 64
Common mode rejection	Greater than 90 dB
Digitizer Anti-alias filter	Over sampled 24-bit Delta Sigma ADC with digital signal processing, 1 per channel Brickwall digital FIR filter, cutoff at 80% of and 130 dB down at output Nyquist frequency. Causal filters 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

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

On board memory	192 MB
Туре	Up to <u>64GB</u> industrial grade Compact Flash memory in removable enclosure with USB2.0 port; 1 or 2 partitions
Recording format	Standard FAT32 file system, drives readable directly on a PC via a USB2.0 port; format converters available for 32-bit SUDS, SAC, SEG-Y, SEISAN, MatLab, miniSEED, and SEED. Separate short ASCII headers with important information (PGA, LSB, GPS, trigger time)

TIMING	voltage controlled TCXO with external GPS or NTP synch.
Accuracy	<±10 microseconds of UTC with GPS lock
Stability GPS duty cycle	0.5 PPM (when unlocked) User programmable GPS power on/off cycle times
INTERFACES	
Indicators Communications	Large graphic LCD display RS232, 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	 <u>CD1.1</u> protocol, 4 independent profiles to 4 different IP servers; <u>Earthworm</u> protocol on 1 profile; 64 MB internal buffer for backfill; continuous, events only or both

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INTERNAL SENSORS

Туре	Geotech force balance PA-23
Response	DC to 100 Hz
Full scale	±4g (optional ±2g, ±1g)
Dynamic range	Total 142 dB

POWER

External Internal 10 to 16 VDC 12V sealed battery for 36 h continuous operation

Power consumption Less than 2.5 watt average (3 channels @ 200 sps, GPS power and local recording cycling)

PHYSICAL

Construction Size

OIZC

Weight Operating temperature Humidity Rugged molded case, IP67 5.9 in (150 mm) w x 11.8 in (300 mm) l x 14.17 in (360 mm) 18.8 lbs (8.5 kg) -20°C to +70°C

0 to 100% (IP67)

CE