KINEMETRICS

BASALT

High Dynamic Range, IP Aware, Communication Centric Accelerograph or Multi-channel Recorder

Basalt represents the next evolution in Kinemetrics Strong Motion Instrumentation. Offering exceptional high dynamic range, matched to Kinemetrics outstanding ***EpiSensor*** accelerometer performance, and with exemplary timing accuracy, and spectral purity the ***Basalt*** again advances the standards of strong motion data recording. Complementing this outstanding data fidelity is a new suite of communication capabilities offering multiple real time data streams to multiple clients.

As a member of Kinemetrics new ***Rock*** platform the ***Basalt*** is easy to integrate with other ***Rock*** and Quanterra instruments allowing users to develop highly flexible earthquake monitoring solutions.

The ***Basalt*** offers greatly enhanced ease of use over existing instruments as only a web browser is required to modify operation parameters, change recording and telemetry modes and formats, view or retrieve recorded files. Functions can be accessed worldwide via a WAN, or via a local wireless interface with the optional Bluetooth interface.

Features

- 4 sensor channels digital recorder w/internal or external Episensor Triaxial Deck
- 24-bit Delta Sigma converter per channel
- Built-in GPS
- Record and communicate multiple sample rates
- Multiple data formats and telemetry protocols
- Power Management for ultra-low power operation
- Rugged aluminum extruded case designed for 1m drop and 1m temporary immersion (IP67)
- Extensive state-of-health monitoring, including input and system voltages, internal temperature, humidity, communication link diagnostics
- Optional Terminal strips for easy sensor connection
- Transient and EMI/RFI protection on all connections
- System Status LEDs
- Designed for RoHS Compliance and easy re-cycling
- Designed for low total cost of ownership

Specifications subject to change without notice

AEGIS Instruments (Pty) Limited
P.O.Box 973, Lobatse, Republic of Botswana Tel: + (267)-533 0954 Fax: + (267)-533 0963 aegis@gbs.co.bw www.aegis-instruments.com

Channels

Basalt:	4 sensor channels digital recorder w/internal or external triaxial Episensor accelerometer
Input level:	5Vpp, 10Vpp, 40Vpp Differential Input

Data Acquisition

Type:	Individual 24-bit Delta Sigma converter per channel with Black Fin DSP on each 4 Channel board
Anti-alias filter:	Double Precision FIR Filter Causal/Acausal; >140 dB attenuation at output Nyquist
Dynamic range:	200 sps ~127 dB (RMS noise to RMS clip - Typical) 100 sps ~130 dB (RMS noise to RMS clip - Typical)
Frequency response:	DC to 80 Hz @ 200 sps
Sampling rates:	1, 10, 50, 100, 200, 500, 1000, 2000 sps
Channel skew:	None – simultaneous sampling of all channels
Acquisition modes:	Continuous, triggered, time windows
Output data format:	24 bit signed (3 bytes) in user selectable format
Parameter calculations:	Calculations of key parameters in real-time
Real time digital output:	Ethernet or RS-232 output of digital stream (contact factory for available formats)

Sensor

Type:	Triaxal EpiSensor Force Balance Accelerometer, Orthogonally oriented, Internal or External
Full scale range:	User selectable at ±0.25g, ±0.5g, ±1g, ±2g or ±4g
Bandwidth:	DC to 200 Hz
Dynamic range:	155 dB+
Calibration & test:	Calibr. Coil Functional Test; Calibr.Coil Response Test

Trigger

Type:	IIR bandpass filter (three types available)
Trigger selection:	Independently selected for each channel
Threshold trigger:	Selectable from 0.01% to 100% of full scale
Trigger voting:	Internal, external and network trigger votes with arithmetic combination
Additional trigger:	STA/LTA, Time Window

Storage

Primary slot:	Internal Compact Flash Slot
Secondary slot:	Internal SD Card Slot
Storage Module: (Option)	Additional User Accessible Compact Flash Slot Accessible SD Card Slot (Replaces internal slot) Hard Drive (Additional Option)
Recording capacity:	Approximately 42 kB per channel per minute on Memory Card of 24-bit data @ 200 sps.
Recording format:	Main CF Card Linux EXT3 Removable Media DOS File System

Firmware

Type:	Multi-tasking operating system supports simultaneous acquisition and interrogation; boot loader allows remote and optionally automatic firmware upgrades
System control:	Configure sample rate, filter type, trigger type and voting, maintains communications and event storage
Supported File Formats:	Kinemetrics EVT, MiniSEED, SAC, COSMOS, MATLAB, SUDS, SEISAN, ASCII
User interface:	1 10BaseT Ethernet Ports 1 RS232 (2nd Port/Modem Optional) 1 USB 1.1 Device 2 USB 2.0 Ports (1 OTG/1 Host) (optional in Storage Module) 1 Bluetooth Interface (optional)
Intelligent alerting:	System can be configured to initiate communications when an event is detected or if an auto-diagnostic failure occurs
Auto-diagnostics:	System can be configured to continuously check system voltages, temperature, humidity, and timing system integrity
Rapid setup:	Unit can be configured from parameter file stored on Compact Flash

Timing

Type:	Oscillator digitally locked to GPS
GPS:	Integrates completely with system, providing timing, internal oscillator correction and position information, optional power cycling.
Timing:	Accuracy: <1 microseconds of UTC with GPS
Power:	Power consumption: <100mW (active)

I/O and Display

Power input:	Mil-style connector for DC power input, external battery connection, 1-W power LAN
RS-232/USB input:	Mil-style connector with full RS-232C interface with modem control, USB 1.1 Device connection, RS232 Console connector
Ethernet Connection:	10 Base-T Ethernet Interface
EMI/RFI protection:	All I/O lines EMI/RFI and transient protected
LEDS:	System, power and event status, Ethernet Link & Data

Power Supply

Type:	Internal high efficiency switched power supply and battery charger system
Input:	8-18 VDC 4W (typical) for 12 channels
Int. Charger Operation:	15.5VDC Required
Ext. Power Module:	Input 100-250 VAC 50/60 Hz Output 15.5 VDC
Internal Battery Charger:	Digitally temperature compensated output for VRLA battery with reverse protection and deep discharge recovery.
Fuses:	None uses resettable Polyswitch protection
Batteries:	External Valve Regulated Lead Acid (VRLA) Battery Optional battery housing.
Curent drain:	~335ma @12V (12 Channel System)

Communications

Ethernet interface: Real Time Telemetry (Multiple destinations TCP/IP Protocol), Parameter set up, and event retrieval (FTP/SFTP)

RS-232 interface: Real Time Telemetry (Multiple destinations TCP/IP Protocol), Parameter set up, and event retrieval

Modem: Remote access, initiated by user or by the Granite. Optional

Support Software

*Altus File Viewer**: Multiplatform program for rapid review of waveforms and event information.

Antelope: Comprehensive commercial network operational and mgmt system for medium and large networks

Earthworm: Comprehensive public domain network operational and management system for medium and large networks

NMS: Commercial PC-based network management system for small to medium sized networks via modem or real-time data

*RockTalk**: Multiplatform program for command and control

Rockhound: Commercial open architecture user-extensible real-time data collection and processing software that runs on a variety of computers

PSD: Commercial Pseudo Spectral Density software for earthquake data analysis

SMA: Commercial Strong Motion Analyst software for earthquake data analysis and processing

*K2COSMOS**: Conversion software from Altus EVT file format to COSMOS v1.20 format (COSMOS format can also be produced natively from the Granite)

Miscellaneous: Format converters to ASCII other formats. Web Server for command and control, Optional Software Development Kit and Compilers. Contact Kinemetrics for other options.

*No charge

Environment

Operating temperature:	-20° to 70°C Operation
Humidity:	0-100% RH (Non-condensing)

Physical

Size & Weight:	Basalt: 14″ (L) x 5.5″ (D) x 6.8″ (H), 10 lbs without internal Episensor deck
Enclosure Rating:	IP67 Equivalent
Environmental:	RoHS Compliant Unit

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