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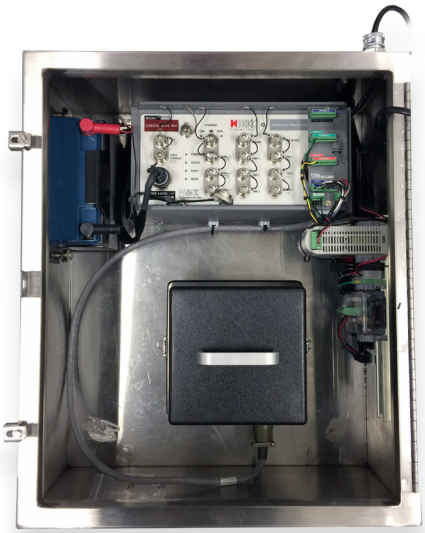
Advancement through Innovation

CONDOR2
Standalone Accelerograph



A Key Component of the Condor2 Seismic Monitoring Solution

The Condor2 System as a whole is the world's most advanced and costeffective system solution for monitoring seismic activity at nuclear power plants.

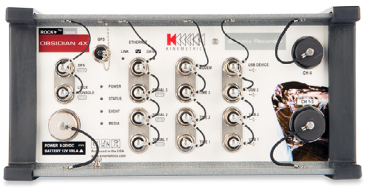
With more than Fifty Years of experience at developing and servicing systems for the special needs of the nuclear market, Kinemetrics is proud to introduce this system solution, that also capitalizes on the success of the Condor platform originally introduced in the late 90's.

The Standalone Accelerograph has been carefully designed for maximum effectiveness & ease-of-use, as well as for lowest cost of operation & maintenance.

This design fulfills the independent monitoring requirement at NPPs and delivers information beyond peak acceleration originally provided by devices such as the PAR400 Peak Acceleration Recorder by Engdahl Enterprises or the ETNA Accelerograph for the Condor System. As well as the TS-3 Seismic Switch when provided with the relay interface option.

The Condor2 Standalone Accelerograph is fully qualified to meet or exceed all applicable standards.

Based on the latest generation of recorders from Kinemetrics, the Rock+ Obsidian Recorder and the most used accelerometer in the nuclear industry, the FBA-3; we ensured high reliability of this design.

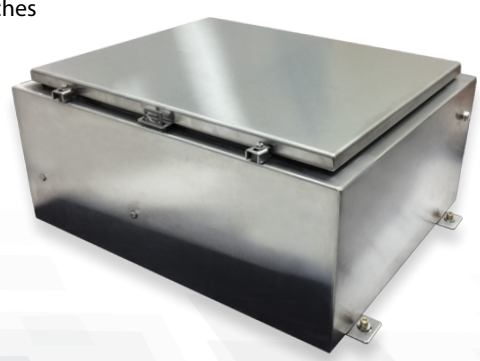


Obsidian 4X

FBA-3

FEATURES

- The most-comprehensive earthquake monitoring standalone product for nuclear power plants (NPPs)—including seismic-event data recording, analysis and notification via hardware alarms and PDF reports – all in one system
- Offline OBE/SSE & CAV analysis within minutes of seismic events
- Lowest overall cost-of-operation & cost-of-maintenance
- High reliability
- Easy maintenance – extensive built-in testability
- Designed to meet all applicable nuclear industry regulations (USNRC RG 1.12, RG 1.166, IEEE 344 and ANSI/ANS 2.2)
- Direct replacement of existing independent monitoring devices, such as PAR400 and ETNA Accelerograph as well as TS-3 Seismic Switches



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SPECIFICATIONS

Recorder Model:	**Obsidian 4X**
Data Acquisition	
Type:	Individual 24-bit Delta Sigma converter per channel
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)
Frequency response:	DC to 80 Hz @ 200 sps
Sampling rate:	1, 10, 20, 50, 100, 200, 250, 500, 1000, 2000, 5000 sps, selectable
Channel skew:	None – simultaneous sampling of all channels
Output data:	24 bit signed (3 bytes) in user selectable format. Kinemetrics' EVT standard
Trigger	
Type:	IIR bandpass filter (three types available)
Channel Triggering:	Independently selected for each channel
Threshold Trigger:	Selectable from 0.01% to 100% of full scale
Threshold De-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
Pre-event recording time:	Limited just by the storage capacity, selectable
Post-event recording time:	Limited just by the storage capacity, selectable
Timing	
Type:	Oscillator digitally locked to GPS, PTP, or free running
Accuracy:	<1 microseconds UTC with GPS/PTP
Storage	
Data:	Internal SDHC Card Slot, standard 32 GB
System:	Internal SDHC Card Slot, 4 GB
Recording capacity:	Approximately 42 kB per channel per minute on Memory Card of 24-bit data @ 200 sps
Communications	
Ethernet interface:	Standard TCP/IP

Software	
Type:	Multi-tasking operating system supports simultaneous acquisition and interrotion
System control:	Configure sample rate, filter type, trigger type and voting, maintains communic tions and event storage
File formats: avaiable	Standard Kinemetrics EVT. Other
Auto-diagnostics:	Continuously check system voltages, temperature, humidity, and timing system integrity
Rapid setup:	Configured from a parameter file
System timing:	Supports PTP Slave and PTP Master tim ing (Using Internal GPS as Master clock), NTP and External 1PPS
	I/O and Display Power input: Mil-style connector for DC power input, external battery connection
Interface:	10/100 BaseT Ethernet
EMI/RFI protection:	All I/O lines EMI/RFI and transient protected
LED:	System, power and event status, Ethernet Link & Data
Recorder Power Supply	
Type:	Internal high efficiency switched power supply and battery charger system with extensive SOH outputs
DC input:	9-28 VDC (>15.5VDC for Battery Charger Operation)
External AC/DC:	100-250VAC 50/60Hz
Power module:	Output 15.5 VDC
Internal battery charger:	Digitally temperature compensated out put for external (VRLA) batteries with reverse protection and deep discharge recovery
Fuses:	None. Uses resettable Polyswitch protection
Current drain:	215mA @12V (with sensor)
Model Number:	114135-PL
System Power Supply	
Type:	Internal 18 Amp-Hr 12 VDC Battery
Power autonomy:	More than 72 hours

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SPECIFICATIONS

Sensor Model:	**FBA-3**
Type:	Triaxial Force Balance
Full scale range:	+/- 1G
Natural frequency:	50 Hz
Bandwidth:	DC to 50Hz
Damping:	Nominal 70% critical
Sensitivity:	2.5 V/G
Zero offset:	25 mV
Cross-axis sensitivity:	0.03g/g
Linearity:	<1% of Full scale
Noise (0 to 50 Hz):	25 µV
Noise (0 to 10,000 Hz):	2.5 µV
Dynamic Range (0 to 50 Hz):	100dB
Calibration:	Electrical commands produce damping and natural frequency outputs
Model Number:	102450-PL (aluminum casing)
Overall Enclosure:	Stainless Steel IP67 Enclosure
Qualifications:	Seismically qualified per IEEE 344
Environment	
Operating Temp:	-20°C to 70°C
Humidity:	0% to 100% RH

Relay Interface	
(Option)	
Number of relays:	8 user programmable
Relay rating:	SPDT 10A 250VAC / 5A 100VDC

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