

Kelunji EchoPro

BLAST, VIBRATION & EARTHQUAKE RECORDER

FEATURES

- 24-bit ADC on 6 or 12 channels
- Up to 2kHz sampling on 6 channels (1kHz on 12 channels)
- Locked to absolute time using GPS or NTP
- USB data storage for continuous recording
- Ethernet connection for remote web login
- Optional LCD panel & keypad for field settings
- Optional internal battery
- Optional internal triaxial accelerometer

APPLICATIONS

Perfect for earthquake monitoring - available with 6 or 12 external channels, all with high dynamic range 24-bit digitisers, sampling at up to 2000 samples per second.

Designed to advance the game in blast monitoring. Forget 12-bit blast monitors - improve your recording resolution and sensitivity by a factor of over 4000 with EchoPro. No longer do you need wire-break triggering to synchronise your waveforms - with GPS time-locked recording and USB storage, you can set recorders to run all day recording continuously and triggering, with up to 6 channels recorded at 2kHz from your geophone and microphone.



“ The Kelunji EchoPro performs seamlessly in the field. This is state-of-the-art instrumentation for blast vibration and airblast measurement. ”

Michael J Noy Ph.D.
Orica Mining Services

EchoPro is here, and it's the fastest, most powerful, and easiest to use Kelunji we've ever made. The compact and rugged design is perfectly suited to earthquake and blast monitoring applications.

- HIGH RESOLUTION
- MULTI-CHANNEL
- RUGGED
- GPS TIMING
- LINUX OS



Arman Fanavaran-e-Zamin | Unit 1, No8, East Aghejani, 30 metri niroye havaie Ave, Tehran, I.R. Iran | T +98-21 77160794, 77423515 | F +98-21 33310099 | Info@gearmatech.com | WWW.Geoarmatech.com



es&s www.esands.com

TECHNICAL SPECIFICATIONS

Overview	Robust case containing motherboard with 4GB storage memory, 4- or 6-channel sensor interface (optional expansion to 12-channels), internal GPS receiver, internal serial and alarm output ports		
Channels & Sampling	<ul style="list-style-type: none"> • 6-channel external sensor interface with 24 bit resolution on each channel • Differential inputs with $\pm 10V$ input range (20 V differential) • 143dB Dynamic Range @ 100sps (RMS to RMS) • Sample rates of 2000, 1000, 500, 200, 100, 50, 25, 20, 10 user selectable • Optional FIR filters on selected sample rates. Greater than 99.99% attenuation at Nyquist • Triaxial inputs factory configured as either differential voltage or single-ended constant current inputs with 23 VDC 4mA power supply • Supports all seismic sensors, pressure microphones, IEPE accelerometers 		
Main Processor Board	<ul style="list-style-type: none"> • 180MHz processor clock speed • Embedded Linux operating system • USB 1.1 port with USB 2.0 support for data storage • Ethernet port (RJ45) 10/100Mbit port for connection to PC, LAN, VSAT, Ethernet radio, etc. • On board GPS receiver 		
Power & Environmental	<ul style="list-style-type: none"> • Operating voltage from 7-18V DC • Minimum power consumption 1.92W • Operating temperature $-10^{\circ}C$ to $+65^{\circ}C$ with up to 100% R/H. Tested to MIL-STD-202E • IP67 rated enclosure (without external LCD) 		
Standard Case includes	External Ethernet port, 12V input power connector, GPS connector and GPS aerial with 5m cable, two mil-spec connectors (3+3 channels or 3+1 channel)		
Internal Accelerometers (optional)	<table border="0"> <tr> <td> <ul style="list-style-type: none"> • Triaxial MEMS technology components • Absolute full scale range of $\pm 2g$ • RMS noise of $15\mu g$ • Dynamic range greater than 100dB @ 100sps </td> <td> <ul style="list-style-type: none"> • Triaxial MEMS technology sensor • Full scale range of $\pm 3g$ • RMS noise of $3\mu g$ • Dynamic range 120dB </td> </tr> </table>	<ul style="list-style-type: none"> • Triaxial MEMS technology components • Absolute full scale range of $\pm 2g$ • RMS noise of $15\mu g$ • Dynamic range greater than 100dB @ 100sps 	<ul style="list-style-type: none"> • Triaxial MEMS technology sensor • Full scale range of $\pm 3g$ • RMS noise of $3\mu g$ • Dynamic range 120dB
<ul style="list-style-type: none"> • Triaxial MEMS technology components • Absolute full scale range of $\pm 2g$ • RMS noise of $15\mu g$ • Dynamic range greater than 100dB @ 100sps 	<ul style="list-style-type: none"> • Triaxial MEMS technology sensor • Full scale range of $\pm 3g$ • RMS noise of $3\mu g$ • Dynamic range 120dB 		
LCD Interface (optional)	External LCD and keypad for displaying Waveform and modify settings (see case on right) Display resolution 240 x 64 pixels graphic LCD (40 characters x 8 lines)		

- Rugged Case Features**
- Internal water resistant face plate
 - Internal Li-Ion battery
 - Internal LCD & keypad
 - Internal high-gain GPS aerial
 - Internal I/O switch, charger socket & USB socket
 - Li-Ion charger
 - External Ethernet port
 - Earthing lug
 - LCD/Keypad facia at right (see case on left)



EchoPro SMA (Strong Motion Accelerograph) also available with internal $\pm 2g$ 100dB or $\pm 3g$ 120dB accelerometer