

FORCE-BALANCE ACCELEROGRAPH

Quakely-Pro-FBA

Triaxial force-balance sensing, 24-bit acquisition, GPS timing, and SeedLink streaming — in one sealed IP68 instrument.



All-in-one triaxial accelerograph

Earthquake early warning · Structural health monitoring · Aftershock studies · Reservoir microseismics · Operational modal analysis



100% CUSTOMER
Satisfaction Guaranteed



MADE IN THE USA
Roseville, California

OVERVIEW

Research-grade sensing. Field-grade toughness.

The Quakely-Pro-FBA is a compact, high-resolution force-balance accelerograph engineered for earthquake early warning, seismic and structural health monitoring, aftershock studies, reservoir microseismic work, and operational modal analysis. It integrates **three ultra-low-noise force-balance accelerometers**, a 24-bit Sigma-Delta ADC, GPS timing, and local storage in one IP68 machined-aluminum enclosure. Web-based management, flexible communications, and multiple seismic data formats let it drop into standalone or networked systems.

144 dB

System dynamic range; up to 162 dB with optional 32-bit acquisition

<60 ng/ $\sqrt{\text{Hz}}$

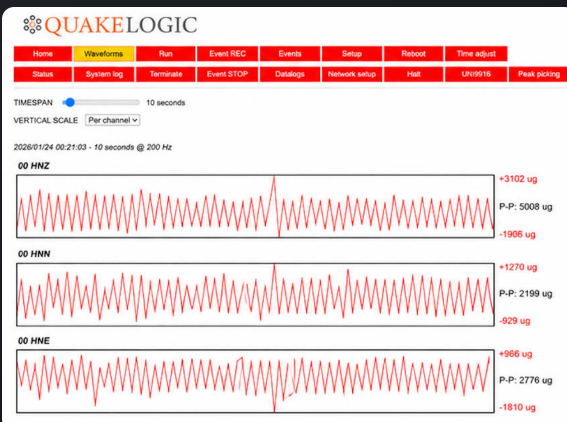
Noise floor for weak-motion and microseismic capture

1 μs

Timing accuracy to UTC with GPS-disciplined clock, PPS and NTP

IP68

Machined-aluminum enclosure rated -4°F to $+158^{\circ}\text{F}$



Web-based control panel.

Live three-component waveforms, offset, filtering, triggering, and status monitoring — from any browser, with no proprietary software.

Weak and strong motion on one channel set

144 dB system dynamic range with a sub-60 ng/ $\sqrt{\text{Hz}}$ noise floor captures both event classes without a range change.

Phase-coherent networks

GPS-disciplined clock delivers timing down to 1 μs of UTC for accurate event location and modal analysis across distributed arrays.

Built for unattended sites

IP68 machined-aluminum enclosure and -4°F to $+158^{\circ}\text{F}$ rating enable long-term deployment in harsh field environments.

Solar and battery friendly

Under 3.2 W from a 9–36 VDC input, with an optional internal UPS for remote, off-grid installations.

KEY FEATURES

Engineered for networks that cannot miss an event.

01 Integrated triaxial sensing

Three ultra-low-noise force-balance accelerometers provide true triaxial ground-motion measurement in a single sealed, field-ready package.

02 24-bit, upgradable to 32-bit

High-resolution Sigma-Delta ADC extends dynamic range to 162 dB for both weak- and strong-motion capture.

03 Selectable 0.8 g to 4 g ranges

Customizable input ranges let one instrument cover early-warning through aftershock recording.

04 1 Hz to 1500 Hz sampling

Customizable to 5000 Hz, resolving long-period structural response and high-frequency microseismic events.

05 Multimode triggering

STA/LTA, amplitude, IP-voting, and scheduled triggering with independent filtering reduces false triggers.

06 Ultra-fast SeedLink

Substreaming feeds real-time data to acquisition centres for early-warning and network operations.

07 GPS-disciplined timing

PPS and NTP synchronization holds RTC accuracy to 1 μ s of UTC across distributed arrays.

08 Web-based control panel

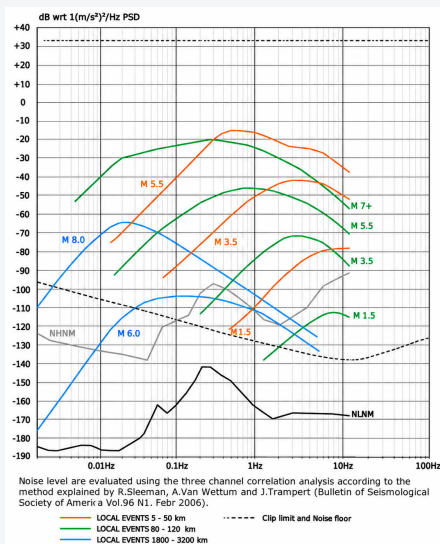
Configure offset, filtering, triggering, and status monitoring remotely — no dedicated software required.

09 Built-in sensor test

A test pulse applied to the force-feedback loop verifies sensor health in the field without removing the instrument.

10 Flexible communications

Ethernet, RS232, optional RS485; TCP, SSH, FTP, HTTP, ModBus, MQTT; Telnet, Telegram and SMS notifications.

**Self-noise below the reference models.**

Instrument noise PSD plotted against typical local-event spectra (M 1.5–3.5) and the USGS low-noise model. Noise level evaluated with the three-channel correlation method (Sleeman, van Wietum and Trampert, BSSA 2006).

SYSTEM AT A GLANCE

Every subsystem, in one enclosure.

SENSING ELEMENT

Integrated 3-axis force-balance accelerometer · Cross-axis sensitivity <0.1% · Linearity <0.02% of full scale · Noise floor <60 ng/√Hz

DATA ACQUISITION

24-bit Sigma-Delta ADC, optional 32-bit · Selectable ranges 0.8, 1, 2, 4 g · Analog and digital FIR anti-aliasing · Software offset compensation

TIMING & GPS

GPS-disciplined clock, PPS and NTP · RTC accuracy to 1 μs of UTC · External multiconstellation receiver · External antenna, ~32.8 ft cable, BNC

COMMUNICATIONS

10/100 Ethernet, RS232, optional RS485 · TCP, SSH, FTP, HTTP, ModBus, MQTT · Telnet, Telegram, SMS notifications · Ultra-fast SeedLink streaming

RECORDING & STORAGE

microSD and USB local storage · Continuous and event-triggered modes · GSEcm6, GSEint, SAC, SAF, miniSEED · Pre/post event 1-10,000 s

ENCLOSURE & POWER

IP68 machined aluminum housing · 9-36 VDC, <3.2 W consumption · Optional internal UPS battery · -4°F to +158°F operating range



Front panel. ON/OFF switch, sealed MIL-C-26842 connectors for sensor, communications and power, GPS antenna input, and 16 × 2 LCD status display — all on one machined-aluminum face.

TECHNICAL SPECIFICATIONS

Technical specifications

SPECIFICATION	DESCRIPTION
SENSING	
Sensor Type	Integrated 3-axis Force Balance Accelerometer (FBA)
Number of Channels	3
Selectable Input Range	0.8 g, 1 g, 2 g, 4 g; custom ranges available
Cross-Axis Sensitivity	<0.1%
Linearity	<0.02% of full scale
Noise Floor	<60 ng/ $\sqrt{\text{Hz}}$
DATA ACQUISITION	
ADC	High-resolution Sigma-Delta, 24-bit (optional 32-bit)
Dynamic Range	144 dB system; 141 dB peak over RMS noise at 2 g / 100 SPS
Optional Dynamic Range	Up to 162 dB with 32-bit system
Sampling Rates	1 to 1500 Hz (17 selectable rates)
Extended Sampling Rate	Customizable up to 5000 Hz
Anti-Aliasing Filter	Analog and digital FIR, customizable
Offset Compensation	Software configurable via web control panel
TIMING	
Time Synchronization	GPS-disciplined clock; PPS and NTP supported
RTC Accuracy	Down to 1 μs relative to UTC (SPLL locked, PPS available)
GPS	External multiconstellation receiver with status, coordinates, elevation
GPS Antenna	External, ~32.8 ft (10 m) coaxial cable, BNC connector

SPECIFICATION	DESCRIPTION
COMMUNICATIONS & STORAGE	
Data Interfaces	10/100 Ethernet, RS232, optional RS485
Network Protocols	TCP, SSH, FTP, HTTP, ModBus, MQTT, Telnet, Telegram, SMS
Streaming	Ultra-Fast SeedLink with substreaming capability
Local Storage	microSD and USB
Data Formats	GSEcm6, GSEint, SAC, SAF, miniSEED
Recording Modes	Continuous and/or event-triggered
Triggering	Multimode STA/LTA, amplitude, IP voting, scheduled
Trigger Filtering	Independent high-pass, low-pass, band-pass
Pre/Post Event Recording	1-10,000 seconds
Status Monitoring	Memory, power, Vref, sensor test pulse, peer status
Sensor Test	Test pulse applied to force-feedback loop
POWER & ENCLOSURE	
Power Supply	9-36 VDC
Power Consumption	<3.2 W in standard operating mode
Backup Power	Optional internal UPS battery
Protection Rating	IP68
Housing	Rugged machined aluminum enclosure
Mounting	Bottom keyhole with three leveling feet; wall mounting supported

TECHNICAL SPECIFICATIONS (CONTINUED)

Physical and environmental

SPECIFICATION	DESCRIPTION
PHYSICAL	
Control Panel	16 × 2 LCD with three system setup/check buttons
Connectors	MIL-C-26842 series; 10, 18, 19, or 26 pins
Operating Temperature	−4°F to +158°F (−20°C to +70°C)
Dimensions	8.07 × 6.69 × 4.21 in (205 × 170 × 107 mm)
Weight	Approx. 8.8 lb (4.0 kg), sensor configuration dependent
Compliance	CE



Quakely-Pro-FBA 8.07 × 6.69 × 4.21 in (205 × 170 × 107 mm) · approx. 8.8 lb (4.0 kg) · IP68 machined-aluminum enclosure with bottom keyhole and three leveling feet.

Built for the field. Backed by QuakeLogic.

For more information about the features, specifications, and available configurations of the Quakely-Pro-FBA, please contact QuakeLogic.



CORPORATE HEADQUARTERS

QuakeLogic Inc.

2008 Opportunity Dr., Suite 130
Roseville, CA 95678, USA

Monday – Friday
9:00 AM – 5:00 PM (PST/PDT)

CONTACT

Phone: +1(916) 899-0391
Email: sales@quakelogic.net
Web: products.quakelogic.net

ABOUT QUAKELOGIC

QuakeLogic Inc. is a California-based engineering and technology company providing innovative, reliable, high-quality solutions to customers worldwide.

OUR COMMITMENT

We are committed to quality, innovation, and customer satisfaction — building lasting partnerships through reliable solutions and dependable support.

SCAN TO VIEW PRODUCT



products.quakelogic.net/product/quakely-pro-fba

Designed and manufactured in the USA

Every Quakely-Pro-FBA is assembled, calibrated, and tested at our Roseville, California facility under an ISO 9001:2015 quality system.



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