REFTEK SYSTEMS INC.

SMA²

INTEGRATED SEISMIC RECORDER & ACCELEROMETER



The SMA² combines Reftek's latest generation of universal broadband seismic recorder, with the advanced high resolution, capacitive accelerometer, model 131D. Designed to facilitate installation, security and maintenance in a single, secure enclosure optimized for structural monitoring applications.

The SMA² features a high-performance A/D and boasts a wide dynamic range. The dynamic range enables the SMA² to record very small vibrations from its integrated seismic sensor, providing detailed data for seismic analysis.

The internal triaxial accelerometer is a capacitive MEMS accelerometer which converts acceleration signals into voltage signals to measure low frequency and ultra-low frequency motion. It features high sensitivity, a large 600 Hz linear range, high resolution and wide dynamic range making it perfectly suited for structural monitoring applications.

Communications and Interface

With smart setup options, the SMA² gives you the option of configuring the device over local wifi or over a connected local or remote network via the intuitive WebUI. The WebUI makes it easy to configure email alerts and custom triggers to quickly detect and notify of detected ground motion

Using the Seedlink server, your system can be configured to automatically import the MiniSeed data straight into analysis software for EEW applications and structural analysis applications. The SMA² has a large non-volatile internal memory providing a substantial data buffer and an integrated internal battery for when a remote connection or power is not available in the aftermath of an event, protecting data from the recorder so important information is not lost.

BENEFITS

- ~118 dB dynamic range for detailed event data & high quality scientific analysis
- Ultra low latency for Earthquake Early Warning Systems
- Built-in Seedlink server for robust data transmission
- Precise & accurate timing
- Low-noise, MEMS accelerometer
- Sensitivity & offset stable

COMPLIANCE

The SMA² is compliant with regulations as described in various structural monitoring codes including but not limited to:

- California Building Code Appendix L
- Section 105.2 National Structural Code of the Philippines

SMA²

A/D CONVERTER	
Type	32-bit SAR A/D converters
Dynamic Range	~140 dB @100 sps
Input Channels	3
Gain Options	Available with x1 or x2 gain
Input Full Scale	Matched @ x1 gain
Input Impendance	26 Kohms, 0.002 uFd, differential @ x1 2 Mohms, 0.002 uFd, differential @ x64
Common Mode Rejection	>90 dB
Sample Rates	1000, 500, 250, 200, 125, 100, 50, 40, 20, 10, 5, 1 sps
Multiple Sample Rates	Supported for rates in the group 1000, 200, 100, 50, 40, 20, 10, 5, 1
Sampling	Simultaneous on all channels
FIR Filter	~140 dB down in the stopband

TIME BASE	
Type	GNSS Receiver with Internal Disciplined Oscillator
Accuracy with GNSS	<+/-5 µsec after validated 3-D Fix and Locked
Free-Running Accuracy	0.1 ppm over the temp. range of 0°C to 50°C 0.2 ppm from -20°C to 0°C
Alternate Time Sources	PTP or NTP

POWER	
Input Voltage	9–24 VDC
Average Power (3 channels, accelerometer, no communication, GNSS duty cycle)	1.4 Watts
Average Power (3 channels, accelerometer, with communication, GNSS duty cycle)	1.7 Watts
Internal Battery	1.2 Ah, Lead Acid
Low Voltage Disconnect	User-programmable. Additional hardware cut-off fixed at 9.0 Volts

RECORDING	
Format	Miniseed, MRF
Transmission	SeedLink Server, RTP
Data Products	On-board Calculation of: PGA, PGV, PGD, MMI, PEIS, JMA (email notifications available)
Trigger Types	Continuous, STA/LTA, Level, Vote, Time, External and Cross
Internal Capacity	8 GB internal Flash memory data buffer, USB drive

COMMS	
Ethernet	10/100 Base-T, TCP/IP, UDP/IP, FTP, RTP DHCP, Static, Link-Local
WiFi	Access-point mode for local command & control
WebUI	Accessible via WiFi or Ethernet

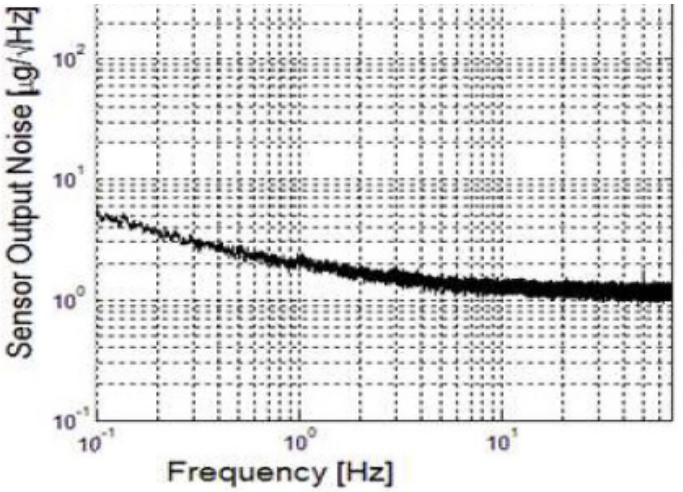
UI	
Screen	2.8" TFT Color Display with Backlight 240 x 320 pixels



ACCELEROMETER

ELECTRICAL	
Full-scale Range	+/- 4 g

PERFORMANCE	
Self-Noise	1.2 µg / rtHz
Dynamic Range	~118 dB (DC to 10 Hz)
Linearity	+/- 1 %
Frequency Response	DC – 600Hz (+/- 3 dB)
Self-test Response	Logic level input will produce 0.25g Square wave
Lightning Protection	Built-in surge protection
Cross Axis Sensitivity	<0.0005 g/g
Thermal Drift	<0.5 mg/°C



MECHANICAL	
Dimensions	7.3"L x 6"W x 5.3"H
Weight	2.5 Kg (2kg without optional internal battery)
LCD	✓
Magnetic Switch	✓
Watertight Integrity	IP 68
Humidity Range	0-100% (non-condensing)
Operating Temp	-20 °C to 75 °C
Storage Temperature	-40 °C to 85 °C
Mounting	Single Point
Levelling	3 Adjustable Feet

CERTIFICATIONS	
Compliance	CE,FCC, RoHS