



This extremely versatile seismic data acquisition system **can be configured from 4 to 32 channels**, all operating **synchronously up to 2,000 samples per second**. It is configured with an internal triaxial accelerometer (EA-120) in a weatherproof steel enclosure. Optional channels for external accelerometers are available.

It can be configured for floor or wall mount. For wall mount applications the vertical sensor is not biased for the 1g earth's gravity (+/-2g minimum).

Each physical data channel can be split into 5 virtual channels each having their own event detectors, trigger bandpass, and sampling rates

The system has a unique time management circuit that maintains **accurate real time**, and keeps the programmable sampling rates **precisely synchronous** with the real time marks. Re-indexing of data is never required. The time system does not require **continuous or frequent references to GPS** to maintain accuracy. The typical GPS access interval is once every 12 - 24 hours.

The system has been significantly upgraded, including, among other features, increased noise-free resolution, addition of a 90dB analog antialiasing filter, and software-programmable gains.

Specifications subject to change without notice

## SMR-6102-4A Specifications:

Resolution	22-bit
Conversion type:	sigma - delta modulation at 570 kHz
Dynamic range:	115dB @ 100 sps sampling rate, 120 dB @40 sps
Sampling range:	1 – 2000 sps, precisely synchronous with time marks
No. of Acquisition Channels:	Standard 4; 8 to 32 optional; all fully synchronous
Recording Formats:	CSS or SEED with Steim-2 type compression
Antialiasing Filter (analog):	90dB @ 256kHz (primary sampling rate)
Antialiasing Filtering:	Built-in DSP-based digital filter
Analog Inputs:	True differential or single-ended ?5V
Analog Gain:	Software-programmable 1, 2, 4, 8
CMR Rejection:	>90 dB @ gain = 1
Integral Non-linearity:	?0.003%
Triggering	User defined, STA/LTA, and/or continuous (simultaneous)
Trigger Bandpass	User defined, up to 5 separate trigger bandpass per event detector for each physical channel.
Pre-event Data	Up to 90 Sec (100sps), user defined.
Post-event Data	User configured – no limitations
Timing Management System:	Intelligent GPS reference access and two phase-locked loops
Timing Accuracy	±0.005 sec of UTC
GPS Receiver	Miniature, fully weatherized, integral with antenna; with std 5m, optional up to 25m long RS-232 cable; optional RS-485 with up to 500m long cable
GPS Usage	Typical on time: 5 – 15 min/day
Data Storage / Retrieval	Hot-swappable miniature 20 GB+ hard disk or flash card up to 1GB
Data Formats	Mini-SEED w/Steim-2 compression up to x6 CSS 3.0: long integer; separate data description in ASCII
User Interface (field system)	¼ VGA LCD panel; 12-key keypad; optional compact full PC-KB
I/O Protection	Over voltage (40V), transient, EMI/RFI
Connectors	Sensor input, RS-232, Keyboard, Power, GPS.
Optional Remote Access:	Telephone dial-up automatic data retrieval (periodically program-initiated or on request) Radio-Ethernet telemetry for up to 12 miles line-of-sight distance Direct recording to LAN (PC or SUN) <i>via</i> Ethernet card.
Physical Parameters:	Dimensions: ~320x250x150mm; Weight: ~5 kg
Operating Temperatures:	-40 to + 60 C
Power Supply:	External, Nominal: 12 Vdc; Range 7 - 16 Vdc; Power ~5 W.
External Power Pack (opt)	Dual Gel Cell Batteries (specify capacity, 18Hr to 60Hr) with AC charger

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## SMR-6102-4A Internal Accelerometer Specifications:

ACCELEROMETER SPECIFICATIONS	EA-120	EA-140 (optional)
Full Scale Ranges:	$\pm 2$ g standard, $\pm 0.5$ g and $\pm 5$ g or adjustable optional	
Full Scale Output Voltage:	$\pm 10$ V for $\pm 12$ V input standard, $\pm 2$ V opt	
Natural Frequency:	50 Hz minimum	
Noise per Root Hz:	$<1$ $\mu$ V	0.4 $\mu$ V
Dynamic Range:	135 dB @ $\pm 10$ V	148 dB @ $\pm 10$ V
Resolution at $\pm 10$ V Output:	0.4 $\mu$ g @ 1g 0.8 $\mu$ g @ 2g	0.1 $\mu$ g @ 1g 0.2 $\mu$ g @ 2g
Broadband RMS Noise:	25 $\mu$ V, DC to 50 Hz	5 $\mu$ V, DC to 50 Hz
Broadband Dynamic Range:	110 dB @ $\pm 10$ V	145 dB @ $\pm 10$ V
Zero G Bias:	+/- 0.01g (optional adjustable)	
Linearity	$\pm 1$ % over temperature range	
Cross Axis Sensitivity:	0.02 g/g (0.005 g/g optional)	
Frequency Response $\pm 3$ dB:	DC to 50 Hz standard (25Hz, 100Hz, and 200Hz optional)	
Damping:	Nominally 70% critical	
Zero Output Temp Effect:	Less than 5 mg over range (others optional)	
Scale Factor Temp. Effect:	0.05% / $^{\circ}$ C	0.02% / $^{\circ}$ C
Self Test (excites mass):	Voltage applied on self test input produces predictable output	
Level Adjustment	Accelerometers mounted on an internal, easy to access plate for leveling after installation	
Operation Temperature Standard	-10 $^{\circ}$ to 75 $^{\circ}$ C (opt SS +85 $^{\circ}$ C)	
Vibration Survival	10 g (p-p), 2 to 2,000 Hz	
Shock Survival	1000 g, 1 ms 100 g, 11 ms	
Humidity	95% R.H. (opt. SS 100%R.H.)	
Zero Bias Adjustment	Optional electronic module for user adjustable zero bias	
Full Scale Adjustment	Optional electronic module for selecting full scale range (0.25g to 2g)	
External Accelerometer	Optional	

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