

**ULTRALOW POWER  
24-BIT DUAL SEISMIC  
DATA RECORDER WITH INTERNAL  
SCU CONTROLLER**  
**Model DR4050-A-SCU/IF**

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The eentec DR4050-A-SCU/IF is a rugged, ultra low power, high-performance, versatile 24-bit ADC resolution seismic recorder configurable for high or lower resolution. It is designed for the most demanding requirements in high performance seismic or strong motion research. It both records seismic events for further analysis and interfaces with a streaming RS-232 interface link to an SCU controller. It includes the high resolution FBA EA-120 accelerometer. The EA-120 is standard external with an optional internal configuration.

This state-of-the art seismic standard recorder features every channel having a high resolution ADC that ensures no channel to channel skew, and a very low-power, high-performance ARM processor that controls the data acquisition, real-time digitization and filtration. The standard unit is suitable for earthquake monitoring and interfacing with an SCU to allow that controller to communicate with other industrial machines.

The powerful, full-featured single-board system is easy to use, install, and maintain. It is lightweight and robust for field deployment. It includes software for seismic waveform analysis and manipulation.

Its full-featured communication capabilities such as Ethernet LAN, VSAT, ADSL, and some radios allows easy configuration for telemetry networks. GSM, GPRS, CDMA, and PSTN communications are also supported. The included GPS can act as a network timeserver for synchronizing other NTPv4 enabled timing critical systems.

Other options include an external battery pack with charger.

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*Specifications subject to change without notice*

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## DR4050-A-SCU/IF RECORDER SPECIFICATIONS:

### INPUT CHANNELS

Type:	Differential Input. External accelerometer standard (internal optional)
Data Channels:	EA-120 FMA accelerometer.
Resolution:	Standard 24-bit ADC , configured for low resolution
External Sensor Gain:	Software programmable: 1, 2, 3, 4, 8, 16, 24, 32
Single Ended Input Range, opt. Differential Input	±20 V
Overvoltage Protection	500W per 10/10000us, steady state power dissipation 5W, surge current up to 40A.
Input Impedance	Data inputs 1M $\Omega$ m
Dynamic Range: (rms to peak)	121 dB @ 50sps std

### DIGITIZER

Type:	24-bit delta-sigma converter on each channel
Sampling Rates:	16, 20, 40, 50, 80, 100, 200 sps
Digital Filter:	130 dB @ 200 sps FIR
Phase	Linear within the passband
Channel to Channel Skew	None
Processor	ARM processor with 8/16 Mb Ram available

### TIMING SYSTEM

Type:	GPS
Maximum Accuracy (Software Selectable):	10 micro seconds
Crystal Oscillator	TCXO 1 ppm/year
Crystal Frequency Correction Resolution	0.016 ppm
Internal Battery Backup Clock	-100 to 10 ppm
GPS Receiver (integral with antenna):	Miniature; external; connects via a std 5m cable

### TRIGGERING

Type:	STA/LTA, Level , phase picking
Recording	Triggered or continuous
Pre-event/ Post-even shared buffer	1,000 seconds split anyway between pre-even and post-event
Calibration	Internal 5V voltage step, external sensor option sine wave
Calibration Duration	User selectable

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## DR4050-A-SCU/IF SPECIFICATIONS (Con't):

<b>POWER</b>	
Voltage:	9 – 15 Vdc
Overvoltage Protection:	15V transzorb for spikes and reverse polarity, 1.8A automatic resettable polyfuse for longer term high voltage
Power Consumption with External Accelerometer	95mA at 12V
<b>USER INTERFACE</b>	
Display Type:	LED std
User Control:	Menu-driven; state-of-health messaging
Setup	RJ45 plug on the plug panel to connect filed computer (via x-over cable) or to an Ethernet network
Main GUI	Any common web browser (MS Explorer, Firefox, Safari)
Console	Any common VT100 emulator (Hyper Terminal)
Data Transfer (remote)	Any common FTP client
Data Transfer to SCU	RS-232 continuous
Data Retrieval (local)	Copying removable flash card to PC using a USB reader, via FTP, or copying files from the internal SCU.
<b>MASS STORAGE</b>	
Compact flash memory card	Removable 1Gb std, others optional
File Compatibility:	Any PC
Data format	PC-SUDS (other conversions to ASCII, miniSEED available). Internal SCU in miniSEED format
<b>REMOTE COMMUNICATION</b>	
Interface	Via web browser or Telenet over Ethernet or PPP
Data Transfer	Using HTTP or FTP, or CD1.0 in internal SCU
Compatibility	VSAT links, GSM and CDMA modems, spread spectrum radios links, and others
<b>ENVIRONMENTAL PARAMETERS</b>	
Housing	Reinforced Plastic, Mounting plate with bolts included
Waterproofing	IP67
Operating Temperature Range	-20 to +60°C
Humidity	100% RH
Size	260 x 230 x 130mm
Weight	2Kg

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## **DR4050-A-SCU/IF SPECIFICATIONS (Recorder Con't):**

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### **CONNECTORS: REAR PANEL, WATERPROOF**

Power	2-pin Circular (bayonet)
External Sensor	16pin Circular (bayonet)
Ethernet	RJ-45 10/100Mbit port for connection to PC, LAN, VSAT, Ethernet radio, etc.
Serial Port	10-pin Circular (bayonet) RS-232 Port for GSM and CDMA modems
GPS	6-pin Circular (bayonet), 5m cable, extensions optional

### **CONNECTORS: INTERNAL**

Terminal Interface	DB-9 terminal interface mainly for factory use.
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## **DR4050-A-SCU/IF SPECIFICATIONS INTERNAL SCU**

### **Internal SCU**

Voltage:	9 – 15 Vdc
Power Consumption	100mA at 12V
Operating System	Window CE or Window XP Embedded
Compact flash memory card	Removable 20Gb internal.
Communication	2 Ethernet with RJ-45 port, 2 standard serial ports
Data Conversion	Optional PGA and SI calculation

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**DR4050-A-SCU/IF STANDARD  
EXTERNAL (INTERNAL OPTIONAL)  
EA-120 FBA ACCELEROMETER  
SPECIFICATIONS**

<b>ACCELEROMETER</b>	
Type:	Orthogonally aligned triaxial mounted
Dynamic Range:	>135dB typical
RMS Noise	0.8 micro g
Full Scale	+/-2g
Bandwidth	DC to 50Hz +1dB /-3dB (damping 70% critical)
Output	+/-10V differential
Linearity	0.3% typ 0.1% optional
Cross Axis Sensitivity	0.02g/g 0.01g/g optional
Calibration	Fully calibrated
Zero g biasing	Electronic (adjustable)
Input protection	Protection against lightning and power surges.
Optional internal accelerometers	Available, 2 micro g RMS noise, dynamic range >108 dB or 120 dB dynamic range solid state.

**DR4050-A-SCU/IF STANDARD ANALYSIS SOFTWARE**

eqWave	Waveform analysis and manipulation. Operates under Windows, Unix, Linux, and MacOS
Functions	Reads and displays data files, zooming and scaling, bandpass filtering (3 custom bands for quick filtering), and arrival picking, FFT, magnitudes, and distance.

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