

Güralp 3ESPCDE



PORTABLE WEAK MOTION DIGITAL SEISMOMETER



A low noise sensor with convenient web-based user interface and communications over serial and Ethernet.

The Güralp 3ESPCDE is a development from the well-proven 3ESPC seismometer. It is a small, lightweight, broadband, triaxial instrument, offering weak-motion performance with built in DM24 digitiser, for the price and size of a medium-motion instrument. The on-board EAM - Linux-based acquisition module - offers remote monitoring and control, with unparalleled flexibility.

Applications

- > Surface vault
- > Post-hole
- > National seismic networks
- > Regional research projects
- > Rapid temporary deployments e.g. aftershock and volcanic unrest monitoring

Key features

Broadband force-feedback instrument with built-in DM24 digitiser and EAM acquisition module

60 s - 100 Hz standard frequency response, 120 s low-pass corner option available

High linearity: >107 dB, 111 dB vertical

Over 140 dB dynamic range; low self noise over a wide frequency band

Cross axis rejection over 62 dB; sensor axes orthogonal to within +/- 0.05°

Remote automatic mass locking, unlocking and centring

Communication includes Ethernet, Wi-Fi and Serial with a host of options such as GSM or VSAT

Up to 64 GB of on-board Flash memory storage

Configuration, monitoring and control via web interface, terminal-based menu system or Linux command line

Seismic protocols include SEED, MiniSEED, CD1.1, GCF and SCREAM

SPECIFICATIONS

| SYSTEM | |
|---|--|
| Configuration / Topology | Triaxial orthogonal (ZNE) |
| PERFORMANCE | |
| Frequency Bandwidth | 60 s (0.017 Hz) to 100 Hz standard Option of 120 s (0.0083 Hz) to 100 Hz Contact Güralp to discuss other frequency response options |
| Output sensitivity | 6000 V/ms ⁻¹ (2 x 3000 V/ms ⁻¹) differential output Contact Güralp to discuss alternative high sensitivity (high gain) options |
| Peak / Full scale output | Differential: ±20 V (40 V peak-to-peak) Single-ended (e.g. mass positions): ±10 V (20 V peak-to-peak) |
| Sensor Dynamic Range | >140 dB |
| Self-noise below NLNM | >30s to 16 Hz |
| Cross axis rejection | > 62dB |
| Linearity | > 111 dB vertical; > 107 dB horizontal (USGS figures) |
| Lowest spurious resonance | > 300 Hz (vertical) |
| Calibration controls | Sine, step and broadband calibration via web interface or command-line |
| Operating tilt range | ±2.5° from horizontal |
| MASS / MONITORING CONTROL | |
| Sensor Mass positions | Three independent sensor mass position outputs (single ended) |
| Locking | Remote auto mass lock/unlock |
| Mass centre | Remotely controlled automatic mass centring |
| DIGITISER PERFORMANCE | |
| Digitiser type | Fourth-order sigma-delta |
| Digitiser resolution | 24-bit |
| Dynamic range | 140 dB at 20 samples per second 138 dB at 40 samples per second 135 dB at 80 samples per second 135 dB at 100 samples per second |
| Highest output capability | 3 x 1,000 samples per second |
| Digital filter types | FIR (linear phase) and IR (for low latency mode) |
| Decimation filters | 2, 4, 5, 8, 10 |
| Anti-aliasing filter at Nyquist frequency | >160 dB |
| Absolute accuracy | 0.50% |
| Nominal sensitivity (at unity gain) | 3.2 µV/Count |
| Input impedance | 117 kΩ |
| Crosstalk (out of band rejection) | >140 dB |
| Linearity | -116 dB at 80 samples per second |
| Common-mode rejection ratio | >80 dB |
| USER INTERFACE / SOFTWARE | |
| Digitiser control and configuration | Digitiser and sensor control via Platinum software (via web browser), Güralp Scream! software (free download), Terminal window over SSH or serial link |
| Triggering modes | STA/LTA, level, external, software, per-channel voting, network voting via Scream! software add-ons |
| REAL-TIME DATA COMMUNICATION | |
| Interfaces/connections | Serial, Ethernet |
| Protocols | GCF (Scream!), SEEDlink, CD1.1 and GDI-link |
| ON-BOARD DATA STORAGE | |
| Internal storage capacity | 16 GB Flash memory with 2.0 USB port |
| Data recording | GCF and MiniSEED |
| POWER | |
| Power voltage range | 11 – 28 V DC* |
| Power consumption (at 12 V DC) | 2.65 W (without GPS or Ethernet) |
| <i>*Power voltage for operation of this unit only. Connection to additional instrumentation or use of longer cables may result in a higher input voltage requirement.</i> | |
| PHYSICAL/ENVIRONMENTAL | |
| Operating temperature | -20 to + 65 °C |
| Operating humidity range | 0-100% relative humidity |
| Enclosure ingress protection | IP68 - protection against effects of prolonged immersion at 3 m depth for 72 hours |
| Enclosure/Materials | Hard anodised aluminium O-ring seals throughout |
| Diameter | 176 mm |
| Height without feet or handle | 273 mm |
| Height with feet | 300 mm |
| Height with feet and handle | 358 mm |
| Weight | 9.4 kg |
| Alignment | Bubble level on lid; north arrow on handle and base; adjustable feet up to 4° |
| Connectors | Military specification bayonet |
| SUPPORTING DOCUMENTATION | |
| Calibration values | Measured sensor sensitivity, frequency response, instrument poles & zeros, digitiser sensitivity and test results enclosed |

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In the interests of continual improvement with respect to design, reliability, function or otherwise, all product specifications and data are subject to change without prior notice.

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