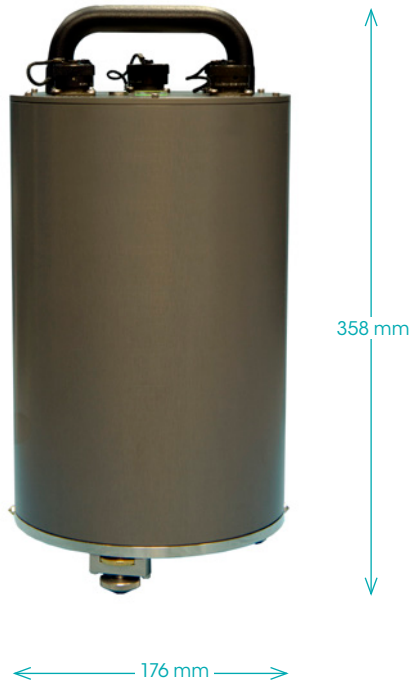


# Güralp 3ESPCDE



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 <sup>-1</sup> (2 x 3000 V/ms <sup>-1</sup> ) 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

Güralp Systems Limited  
Midas House  
Calleva Park  
Aldermaston  
Reading  
RG7 8EA  
United Kingdom

T +44 118 981 9056  
F +44 118 981 9943  
E sales@guralp.com

www.guralp.com

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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