

Güralp 40TDE



BROADBAND DIGITAL SEISMOMETER



A rugged and robust three-component digital broadband seismometer.

The Güralp 40TDE is a true broadband, force-feedback seismometer. The 40TDE is ideally suited both for installation in vaults and for portable applications. The integrated digitizer and embedded communications module provide on-board and external storage options; a convenient web-based user interface; and multi-protocol communications over serial and Ethernet connections.

Applications

- > Surface vault
- > Subsurface vault
- > Post-hole
- > National seismic networks
- > Temporary deployments e.g. aftershock monitoring and regional research projects

Key features

3 low noise 24 bit audio to digital channels (ADC)

Self-contained in a waterproof steel case with fully adjustable levelling feet

No mass clamping required - plug in and go

High sensitivity and dynamic range

A standard response of 30 seconds to 50 Hz. Optional responses of 1, 10, 30 or 60 seconds for the long period corner and 50 or 100 Hz for the high frequency corner

The high-gain feedback loop eliminates mechanical non-linearity (the overall measured linearity exceeds 90 dB) and minimizes resonances in the spring system

Low-frequency vibration modes are carefully avoided in the design. The lowest spurious vibration mode of the 40TDE is a barely measurable resonance at 440 Hz

Standard 16 GB of on-board Flash memory storage

Fast data download over Ethernet or USB

Configuration via serial or Ethernet: command-line or web-based

Full network security suite, including HTTPS and Firewall, allows direct, permanent connection to the Internet

Powerful, flexible Linux operating system

SPECIFICATIONS

SYSTEM		PHYSICAL	
Configuration / Topology	Triaxial orthogonal (ZNE)	Diameter	154 mm
PERFORMANCE		Height with handle	207 mm
Velocity output band	30 s to 50 Hz Options of 1 s, 10 s, 30 s or 60 s for the long period corner and 50 or 100 Hz high frequency corner	Enclosure/Materials	Stainless steel case O-ring seals throughout
Output sensitivity	3200 V/ms ⁻¹ (2*1600 V/ms ⁻¹) differential output. Other options available	Weight	5 kg
Peak / Full scale output	±10 V differential	DIGITALISATION	
Sensor Dynamic Range	>145 dB	Digital resolution/output format	24-bit
Electronics noise level	-172 dB (rel. to 1 m ² s ⁻⁴ Hz ⁻¹)	Dynamic range	137 dB at 40 samples per second
Cross axis rejection	> 65 dB	Absolute accuracy	0.5%
Linearity	> 90 dB	Output rates available	1 to 1000 samples per second
Lowest spurious resonance	> 450 Hz	Data storage formats/Direct disk recording formats	Data recording in GCF or miniSEED formats
High gain outputs	Optional high gain output (x 10)	Seismic network protocols	Scream (Antelope/Earthworm), SEEDlink, CD1.1
Optional high gain sensitivity	2 x 10 000 V/m/s (adjustable)	Data storage	16 GB Flash memory storage as standard (options available to 256 GB)
Offset zeroing	Adjustable through case Optional remote control for offset zeroing with DC motors	Communication interfaces	Ethernet, serial
Transfer function	User manual is available to download from the website. Each sensor is provided with full calibration details including measured sensitivity, measured frequency response and instrument poles and zeros	Configuration/control interface	Web browser, terminal based menus, Linux control line
Calibration controls	Sine, step and broadband calibration via web interface or command-line	* See DM24 digitiser and EAM datasheets for more information	
MASS / MONITORING CONTROL			
Sensor Mass positions	Three independent sensor mass position outputs (single ended)		
POWER			
Power consumption (at 12 V DC)	3.6 to 4.0 W (with GPS)		
Power voltage range	12– 28 V DC		
ENVIRONMENTAL			
Operating temperature	-20 to +75 °C		