



TROMINO[®] *Griffa*



Seismic Noise Acquisition System

TROMINO [®]	
Key Features	
	All-in-one box (sensors/acquisition/preprocessing) system. No external cables
	Truly portable: <ul style="list-style-type: none"> ultra-compact (10 x 14 x 7.7 cm) ultra-light (1.1 kg, batteries included)
	Noise resolution comparable or better than state-of-the-art full size seismometers-digitizer chains
	Multi-tasking, user-friendly firmware and software
	Internal GPS
Application	
	Seismic noise recording
	Soil resonance frequency detection
	Building resonance frequency detection
Sensors	
	3 orthogonal high-resolution electrodynamic sensors
Data Acquisition	
Number of channels	3+1 analog
Amplifiers	All channels with differential inputs
Input impedance	10 ⁶ Ω
Noise	< 0.5 μV rms @128 Hz sampling



Max analog input	51.2 mV (781 nV/digit)
A/D conversion	24 bit equivalent
Frequency response	0.1-256 Hz
	Resolution in acceleration PSD < -180 dB (0.1-256 Hz)
Sampling frequency	16384 Hz
Oversampling frequency	32x, 64x, 128x
Sampling rates	128, 256, 512 Hz
Data Storage	
	Internal memory. Standard 512 Mb, optional up to 4 Gb
Recording capacity	More than 5 days of continuous recording on 4 channels at 128 samples per second on the 512 Mb standard internal memory
Recording format	Data are stored in binary files. <i>Grilla</i> software manage this file format directly and provides the corresponding ASCII data files on user's request
Firmware	
	Multi-tasking operating system supporting simultaneous acquisition and interrogation. Boot loader allows remote firmware upgrades
	Allows to: <ul style="list-style-type: none"> ▪ configure the acquisition mode (GPS, 1 to 3 channels) ▪ set the number of partitions (number of traces which can be stored) ▪ set the number of partition to be used for the present recording ▪ set date and time (when GPS is off or unavailable) ▪ associate name and labels to each recording ▪ set the sampling rate ▪ set the recording duration ▪ view card data and stored recordings on the display ▪ configure different visualization options ▪ check the electronic noise



	<ul style="list-style-type: none"> ▪ configure the GPS (on, off, synchronization) ▪ check the battery voltage ▪ check the memory capacity used
Alerts	Acoustic and on-screen alert for start/stop recording, flat battery, full memory card, code integrity
Auto diagnostic	Error diagnosis (e.g. 'end for expired time', 'end for full memory', 'end for flat battery')
Timing	
	Internal clock (standard), GPS (optional)
Clock	Internal, permanent with date and alarm, can be visualized also during the acquisition
GPS	Provides time and position information (precision 1 μ s), can be visualized also during the acquisition
I/O and Display	
	4 soft-touch keys and a retroilluminated display allow to fully configure the system and to visualize the stored traces, their parameters and options
Display	Graphic 128 x 64 pixel back-lighted
Keyboard	4 soft-touch keys
Connection to PC	Type B, USB port
Power Supply	
	Extremely low power consumption
Power supply	2 x 1.5V AA battery
Internal voltage	+3.3V, +3.6V for the analog section
Power consumption	75mW (GPS inactive) 450 mW (GPS active)
Power autonomy	80 h continuous measurement (GPS inactive)



Housing	
	Aluminium case
Size	10 x 14 x 7.7 (height) cm
Weight	1.1 kg (batteries included)
Ground coupling	Rheological cushion
Level	spirit, horizontal high precision, sensitivity 5' arc (0.083°)
Environmental operating conditions	
Temperature	-10° to 70° C
Humidity	0-90% without condensation
Impermeability	IP protection index = 65 (dust proof, splash proof)

Grilla

Software

	<i>Grilla</i> is the software kit (Windows® 98/2000/NT/XP compatible) which allows to store, access to, manage and analyze the TROMINO® recordings. <i>Grilla</i> is interactive and truly user-friendly
Database	<p>The different fields show:</p> <ul style="list-style-type: none"> ▪ site name and icon ▪ acquisition date, time and duration ▪ icons showing the analysis status ▪ GPS information
Data visualization	Many options for trace visualization.
Analysis	<ul style="list-style-type: none"> ▪ spectral analyses ▪ HVSR analyses: <ol style="list-style-type: none"> 1. time-dependent 2. direction-dependent ▪ trace desampling ▪ graphic and ASCII outputs
Format converters	Provides option to convert and analyze data in ASCII and other formats