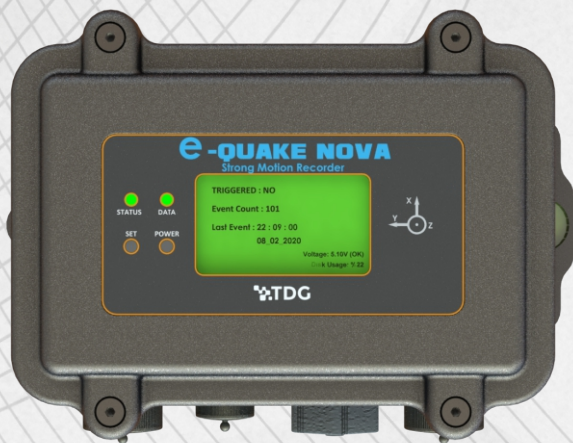




e-QUAKE NOVA[®]

STRONG MOTION RECORDER

“Most Innovative Solution for Earthquake Measurements”



This product is the most innovative & high-tech solution for seismic monitoring networks, developed by TDG. It includes an ultra low noise three component seismic internal accelerometer, which breaks the boundaries of conventional force balanced servo accelerometers. This digital system offers excellent noise performance and unmatched resolution, providing simultaneous sampled acceleration data through the ethernet interface. The product is equipped with an embedded linux powered single board computer system, easily handling all the connection, configuration, data processing, data transfer, event-handling and storage tasks. The unit offers the best price-performance ratio and the most innovative design of its class.

Features

- Unmatched Price / Performance Ratio
- Internal High-Tech Triaxial Seismic Accelerometer
- Ultra-High Resolution, Ultra-Low Noise Performance
- DC-200 Hz Standard, Optional High-Frequency Bandwidth up to 400 Hz
- $\pm 2g$, $\pm 5g$, $\pm 15g$ Range Options
- Up to 1000 SPS Sampling Rate
- Direct-GPS Technology
- 160 dB Dynamic Range
- Micro-G Level Vibration Measurements
- Embedded Linux
- Ethernet TCP/IP Communication
- High Internal Storage
- Compact & Robust Design

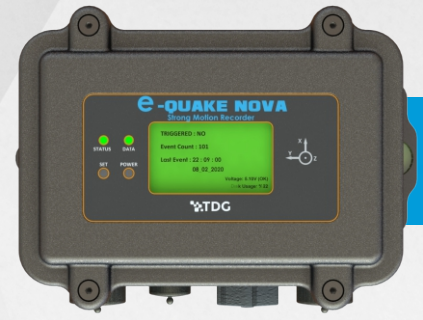
Applications

- Earthquake Measurements / Earthquake Intensity
- Micro-zoning and Regional Seismic Maps
- Seismic Strong Motion Network
- Structural Health Monitoring
- Underground Resources, Energy, Geothermal, Mining, Geological Research
- Micro-tremor Measurements
- Blast Measurements

eQUAKE-NOVA is registered on IRIS (Incorporated Research Institutions for Seismology) database. Relate response and information files are available at the below link:

http://ds.iris.edu/NRL/sensors/tdg/tdg_equakenova_sensors.htm

http://ds.iris.edu/NRL/dataloggers/tdg/tdg_equakenova_dataloggers.htm



Technical Specifications

Sensor And Digitization

Resolution	29 Bit, 2 ²⁴ counts / g ,32 Bit Data Output
Digital Conversion	FPGA based $\Delta\Sigma$ Modulation, Filtering & Downsampling
Test & Calibration	Automatic Self Test & Remote Sensitivity /Calibration Control
Sampling Rate	1000, 500, 250, 200, 100, 50 Samples / Second Selectable
Sampling Type	Simultaneous
Sensor	3 Component, Ultra-Low Noise, True-Integrated Mass Based, Electro-Mechanical, Seismic FBA Grade Accelerometer
Measurement Range	$\pm 2g$ ($\pm 5g$, $\pm 15g$ selectable)
Frequency Range	DC - 400 Hz
Cross Axis Sensitivity	< 0.002 g/g
Test & Calibration	Automatic Self Test & Remote Sensitivity /Calibration Control
Dynamic Range*	160 dB*
Self Noise**	< 0.2 μg rms (1 - 10 Hz, Below AHNM and NNNM)
Filtering	FIR Kasier (Anti-Aliasing) Filter Fc (Default): 16 Hz @50 sps 36 Hz @100 sps 60 Hz @200 sps 83 Hz @250 sps 210 Hz @500 sps 460 Hz @1000 sps (Different Fc values are possible)

Embedded System

Real Time Micro Controller	32 Bit ARM Cortex-M3 100 MHz
Linux Micro Controller	ARM Cortex-A8 1 GHz
RAM	512 MB
Operating System	GNU/LINUX Debian

Timing

GPS Synchronization	Direct ADC Clock Synchronization with GPS Disciplined Oscillator
GPS Receiver	72 Chanel, GPS, GLONASS, BeiDou, Galileo
Time Signal Accuracy	< 20 ns
NTP, PTP	Available up on request

Internal Recording and Triggering

Triggering Options	Level STA / LTA (Independent for Each Axis)
Continuous Recording	15, 30, 60 minutes size selectable continuous circular buffer(MiniSeed)
Storage	4 GB On-Board Storage 8/16/32/64 GB SLC Type Micro-SD Card (To be specified at order) External USB Memory Connection
Pre Trigger Time	720 s

*Based on minimum noise level between 1-10 Hz (50 ng/ \sqrt{Hz})

Communication

Ethernet	TCP/IP, FTP, SCP, SSH Ethernet 10/100BaseT GPRS/EDGE/3G/4.5G/ ADSL ready
Data Transfer	Seedlink (MiniSeed) Server (Port & Ring Size selectable) Multi Client Support Special TDG Data Protocol Web Server FTP Server
Configuration	Easy Configuration and File Access via Web Server Remote Control and Configuration
Secondary Comm. Interface	Serial Port (Optional)

Power

Power Input	9 - 36 V DC
Power Consumption	12V/375mAh

Input & Output

Power, Ethernet, GPS	Military Type IP67 Connectors
Display	OLED LCD Status, RAM, Voltage, Internal Temperature, Trigger information

Physical & Environmental

Dimensions	200 x 150 x 75 mm
Operating Temperature	-30 C° ... + 70 C°
Storage Temperature	-30 C° ... + 80 C°
Enclosure	IP67, Metal Enclosure

Certification

CE	LVD (2014/35/EU) EMC (2014/30/EU)
Local	Home (Inland) Produce Certification
Calibration	TDG Calibration Lab. Factory Calibration

Software

TDG Software	MONSTER EQ-LAB
3. Party Software	SEISCOMP EARTHWORM SWARM

** Equilavent digitizer self noise for $\pm 20V$ range < 0.3 μV rms