

Nanometrics: Leaders in
Low Frequency Data Acquisition



Trillium COMPACT EXPLORATION

Exploration Instrumentation

Applications

- Low frequency passive seismic surveys to identify hydrocarbon reservoirs
- Total field monitoring of induced and natural seismicity
- Event magnitude and location mapping
- Cap rock integrity monitoring
- Continuous low frequency monitoring of hydro-frac operations

Advantages

- Ultra-low noise floor with 20s corner frequency to derive low frequency datasets
- Uniquely tuned for frequencies of 1Hz to 10Hz: ideal for seismic surveys
- Ease of deployment:
 - 10° of levelling freedom, to maximize data returns
 - Several integrated mounting options for quick deployments on any terrain
 - Available exploration kit with solar panel, battery, digitiser, and robust sensor
 - Data recorded at each station to avoid wireline deployment



Trillium COMPACT EXPLORATION

SPECIFICATIONS

TECHNOLOGY

Topology	Symmetric triaxial
Feedback	Force balance with capacitive transducer
Mass Centering	Not required

PERFORMANCE

Sensitivity	3000 V-s/m nominal +/-1% precision
Off-axis Sensitivity	± 0.5%
Bandwidth	-3 dB points at 20 s and 100 Hz
Transfer Function	Lower corner poles within ± 1% of nominal provided High-frequency poles within ± 5% of nominal provided No peak in response at high frequency
Clip Level	6.5mm/s from 0.1 Hz to 10 Hz
Operational Tilt Range	± 10°
Parasitic Resonances	None below 200 Hz

INTERFACE

Connector	14-pin, shell size 12, MIL-C-26482 Series I, top mounted
Velocity Output	20 or 40V peak-to-peak differential
Mass Position	Selectable XYZ or U/V/W mode
Output	Single voltage output representing maximum mass position
Calibration Input	Single voltage input and one active high control signal to enable all 3 channels Remote calibration in XYZ or U/V/W mode Independent channel selection by serial port

DIGITAL COMMAND & CONTROL INTERFACE

Digital Interface	RS-232 compatible serial IP (SLIP) Onboard web server standard HTTP
Digital Commands	XYZ, U/V/W mode switching Calibration channel selection (off, enable all, u, v, or w) Short/long period mode Firmware updates State-of-health request
Digital Data Outputs	Independent mass position values Instrument temperature Factory sensitivity Instrument serial number and firmware revision

POWER

Supply Voltage	9 to 36V DC isolated inputs
Power Consumption	165 mW typical when level Up to 250mW when tilted
Protection	Reverse-voltage and over-voltage protected Self-resetting over-current protection

ENVIRONMENTAL

Operating Temp.	-40 to +60°C
Storage Temperature	-65 to +75°C
Shock	100 g half sine, 5ms without damage, 6 axes No mass lock required for transport
Magnetic	Insensitive to natural variations of the earth's magnetic field

PHYSICAL

Diameter	90 mm (3.54")
Height	114 mm, not including mounting spikes
Weight	1.2 kg (2.6 lb)
Housing	Surface resistant to corrosion, scratches and chips
Leveling	No levelling required within 10° vertical
Alignment	Vertical scribe marks for N/S Precision N/S-E/W guide in top of cover for straight-edge, line or laser level
Weather Resistance	Rated to IP67 for outdoor use, dust and immersion resistance, 100% humidity
Deployment Options	70mm spikes for permeable soil 7mm pads for downhole deployments Adjustable levelling feet for hard, uneven surfaces

