



Defining Instrumentation Standards for the Advancement in Earthquake Science and Engineering

NEW KINEMETRICS INSTRUMENTATION

ADVANCEMENT THROUGH INNOVATION



SEISMOLOGY

Earthquakes, volcanoes, and explosions monitoring, remote data telemetry, acquisition and processing, and automated mechanisms for alerts dissemination.

EARTHQUAKE ENGINEERING

Structural and building code compliant monitoring, seismic hazard and risk assessment and a broad range of related engineering services.

INDUSTRY

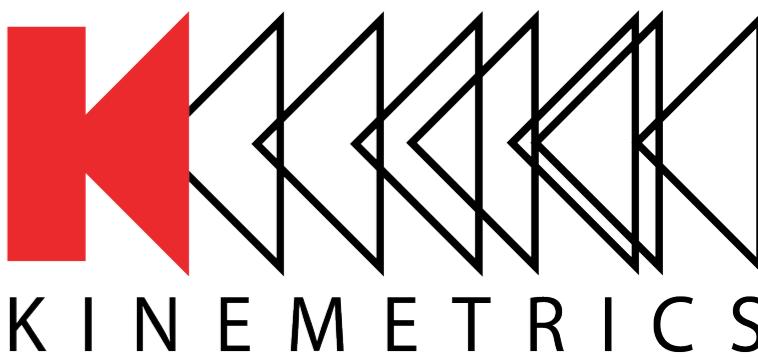
Monitoring of a wide range of industry applications including: dams, geothermal, LNG, and nuclear plants, as well as oil and gas and vibration impact.

BUSINESS CONTINUITY

Earthquake business continuity technology platform and performance-based engineering services for buildings and smart cities.

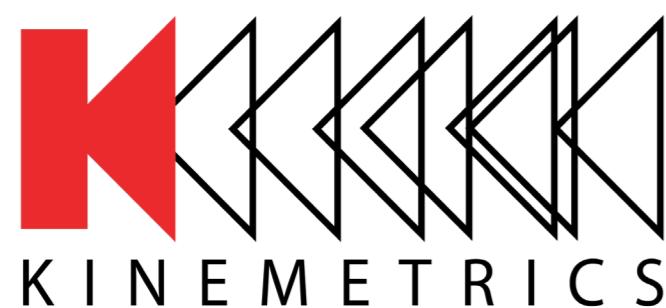


KINEMETRICS – MORE THAN JUST GOOD INSTRUMENTS



Established in **1969**, Kinematics & its subsidiaries have been the global market leaders in designing technologies, products, and solutions for monitoring seismic events and their effects on people and structures.

Kinematics offer the least expensive **Total Cost of Ownership (TCO)**, with not only the initial cost of purchase, but also the accumulated costs of non-fault operation, maintenance, troubleshooting, repair and related sites visits and **no loss of data** due to equipment failure.



QUANTERRA®

BRTT



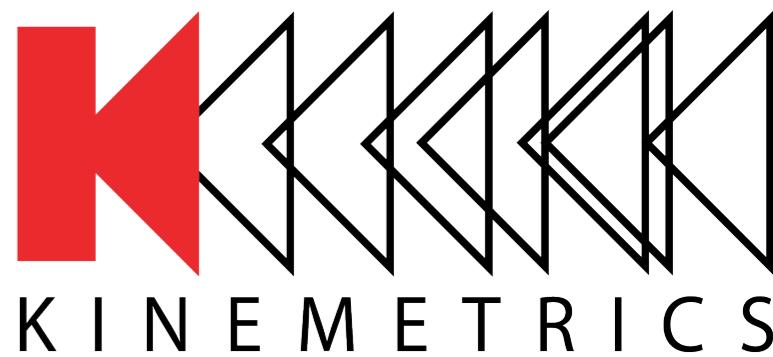
Caltech



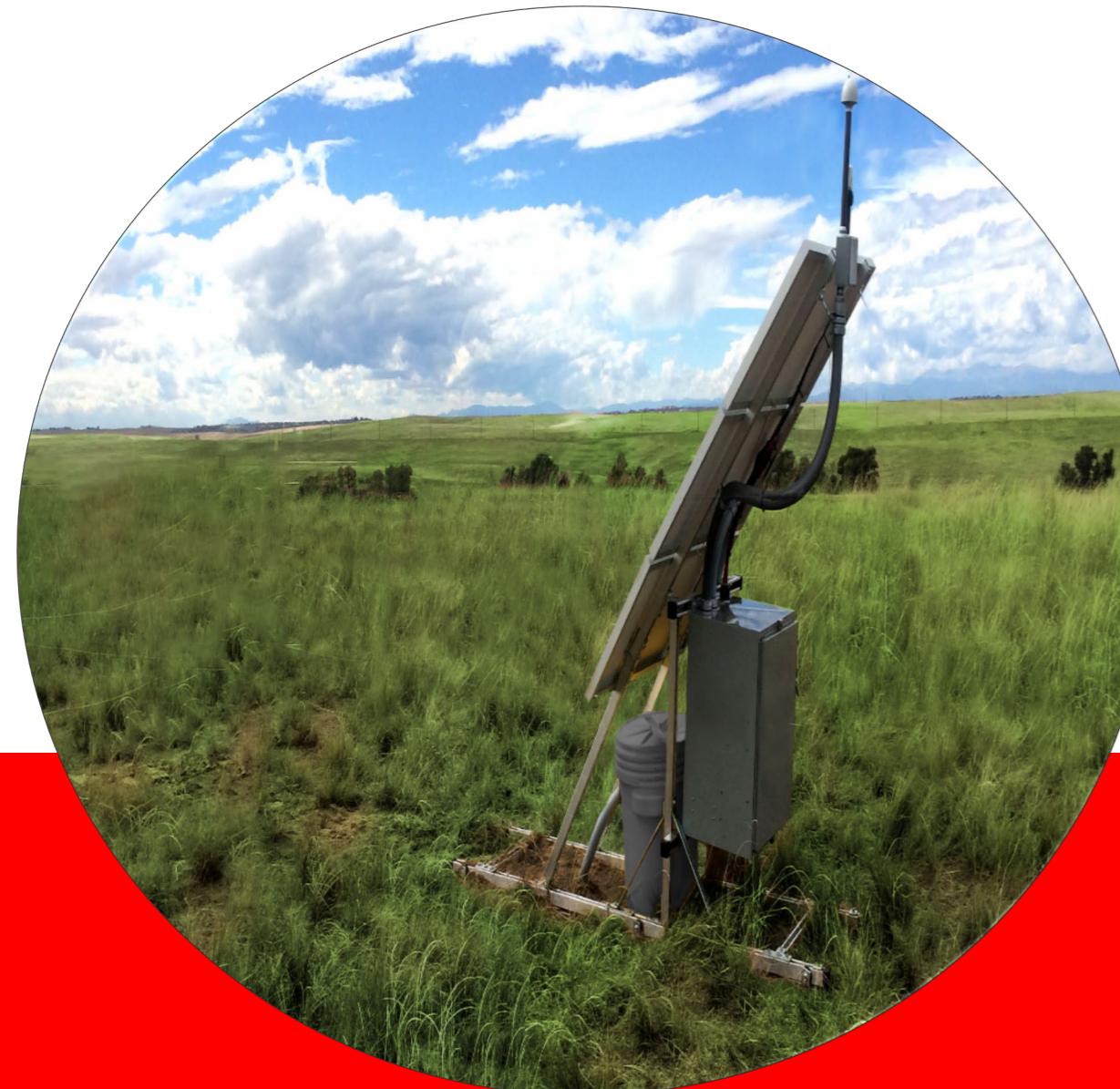
IRIS



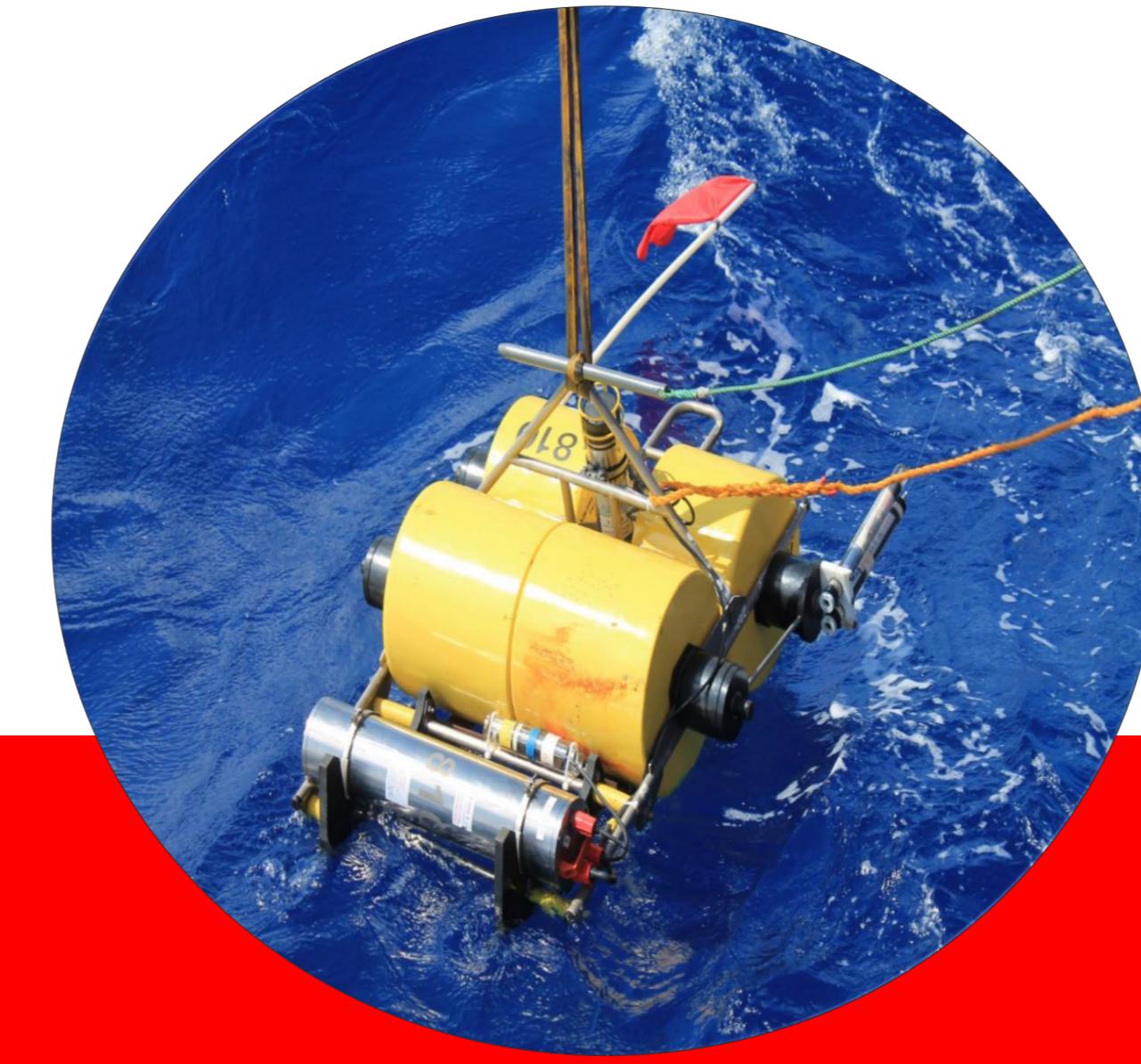
KINEMETRICS' PRODUCTS EVERYWHERE!



We are the only company with over 50 years on the market, the only company, which very successfully operates 450 stations critical operations network since 2012, and the only company with sensor on **Mars**.



Land

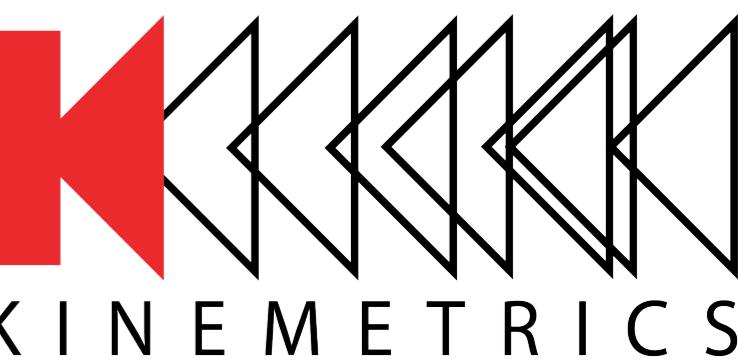


Sea



Space

KINEMETRICS IN SPACE



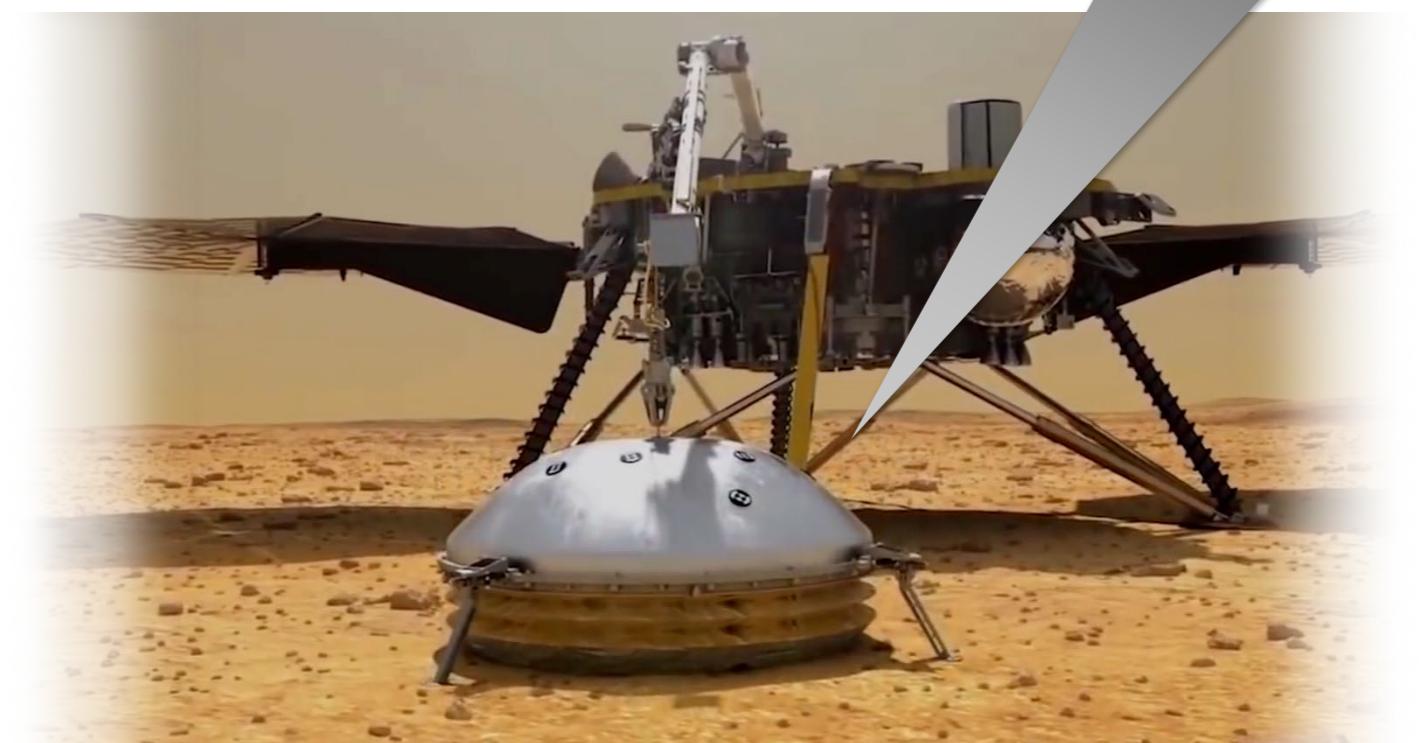
NASA InSight Lander reached Mars on November 26, 2018 and started recording continuously from Sol4

SP was switched on also during the flight and the horizontal sensors recorded “ambient” noise - the lowest noise possible

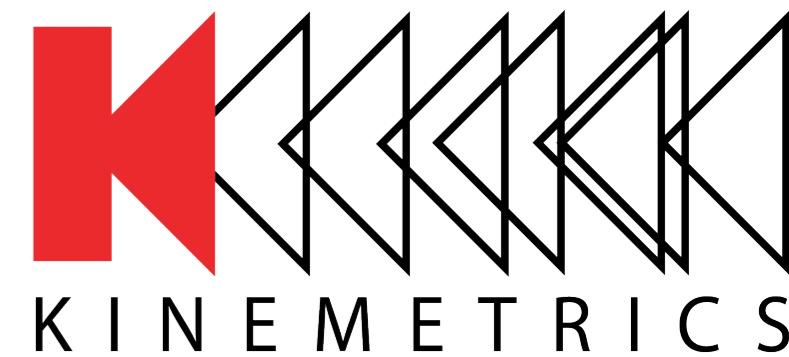
Although called Short-Period, it's a wideband 10 s – 100 Hz seismometer

Rugged, designed to withstand takeoff & landing accelerations, strong flight vibrations, as well high cosmic radiation

Designed to operate at -65 degrees Celsius and with 15 degrees tilt



MORE INSTRUMENTS To SEND IN SPACE!

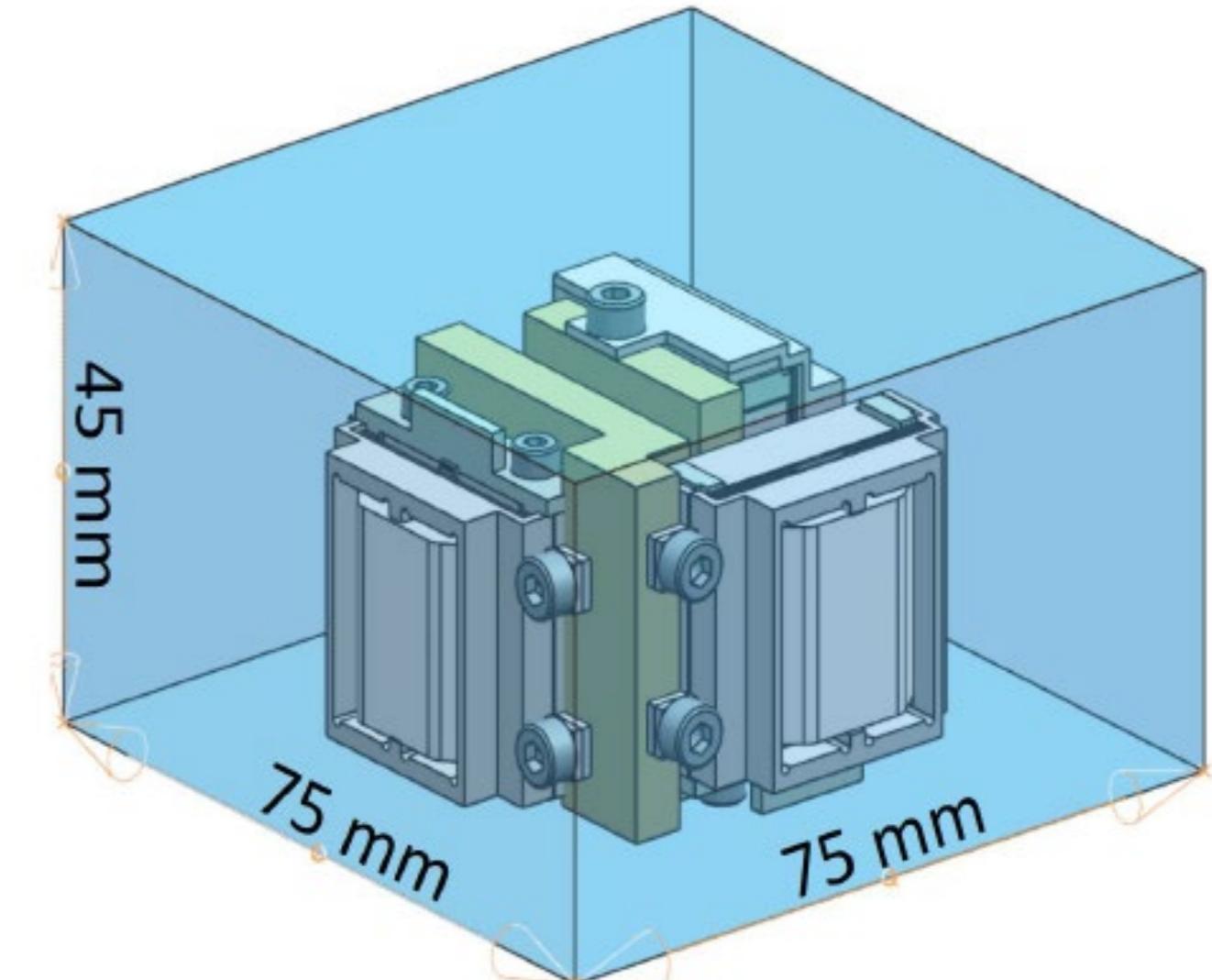


The Lunar Seismic Package (LSP) evolved from the InSight Short Period (SP) seismic sensor and Back End Electronics (BEE).
Planned to land on the Moon.

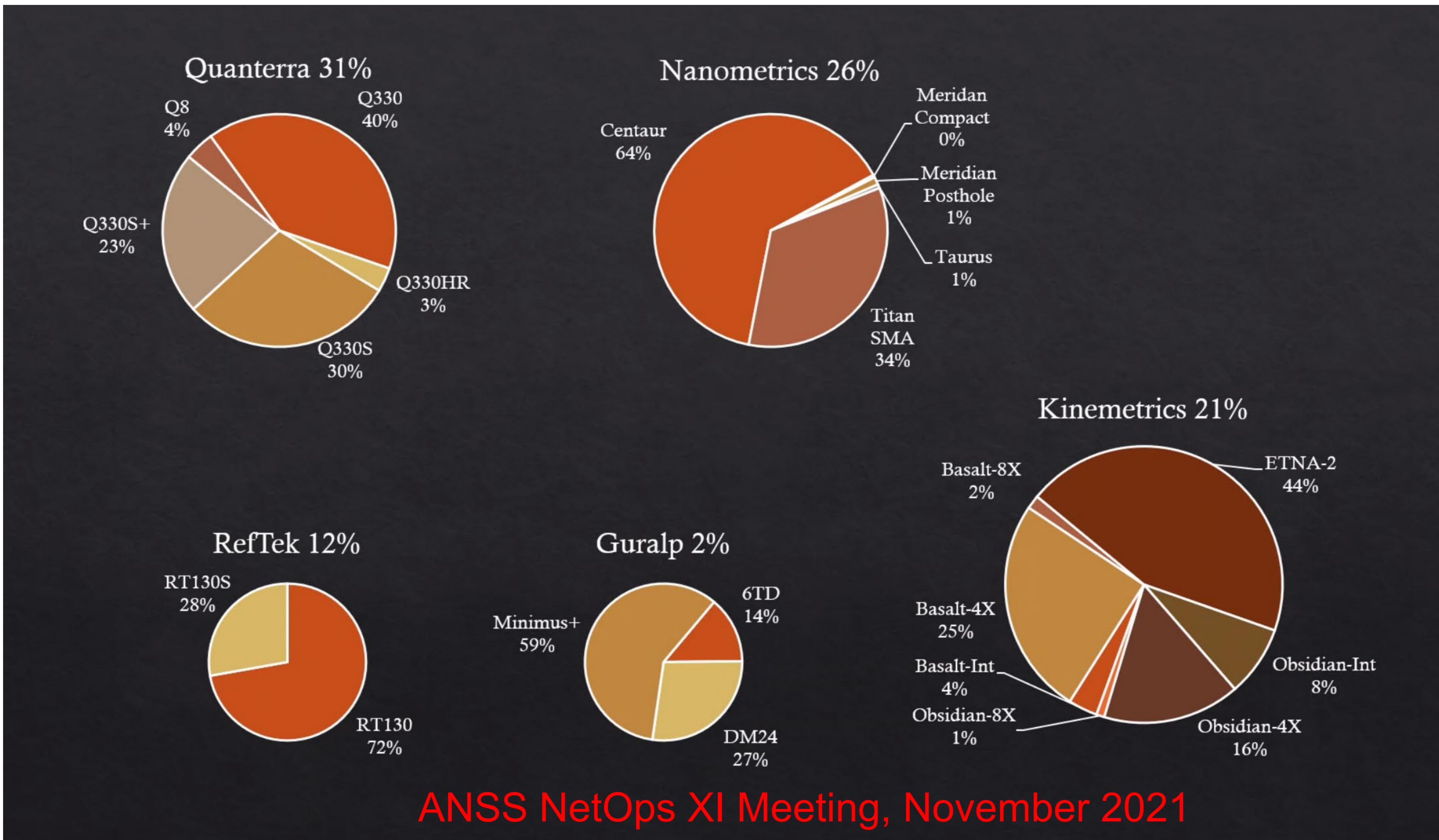


LSP Sensor Package Optimization for Lunar Missions:

- Triaxial, Identical Sensors
- Lower noise than InSight SP
- Enhanced Calibration
- Sensor head, proximity electronics and magnets can be packed in ~50 mm cube
- ~650 g for sensor+feedback (triaxial)
- 360 mW for sensor+feedback (triaxial)
- Does not require leveling in lunar gravity



2021 Instruments Statistics in US - All Networks



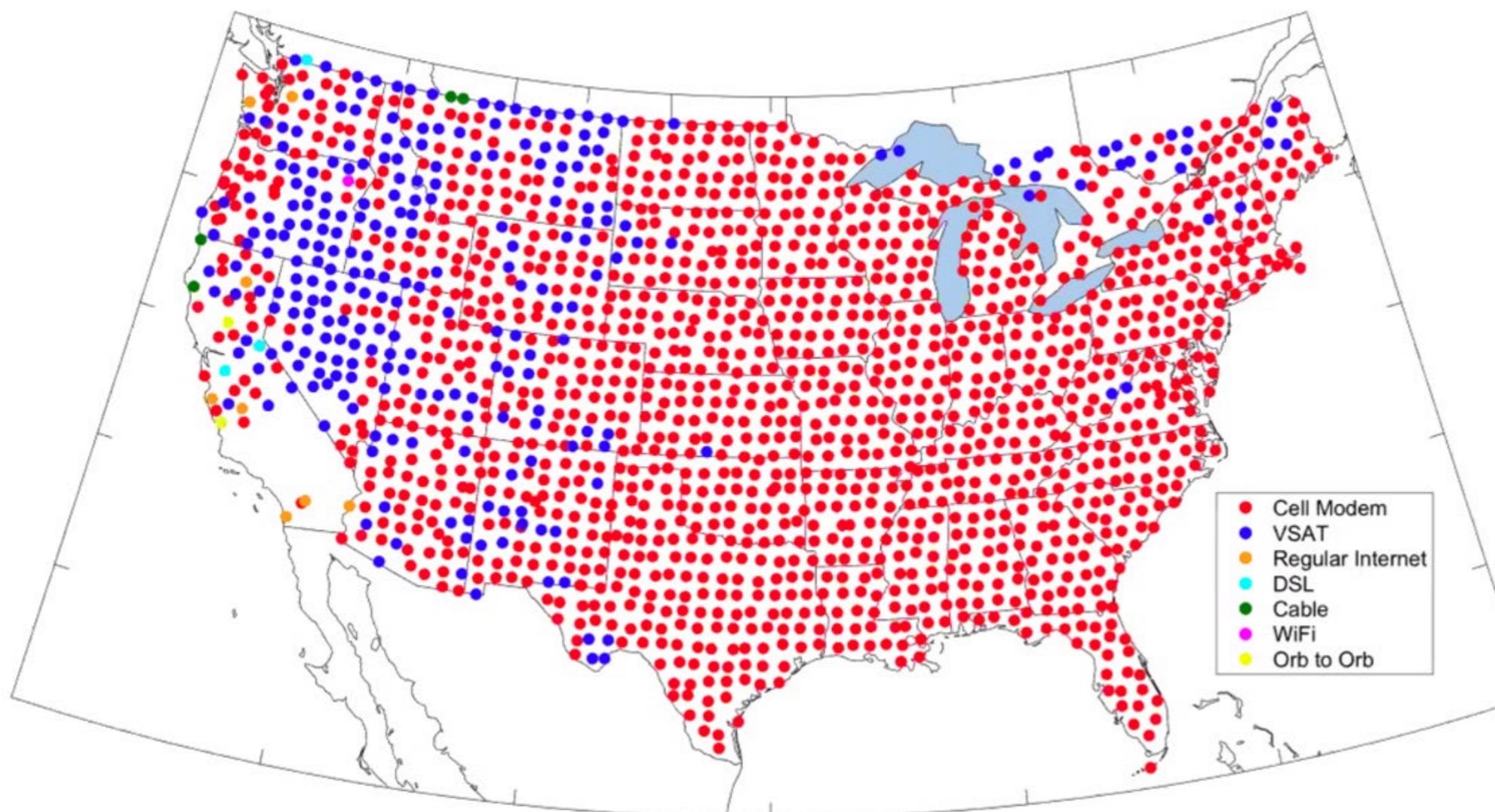
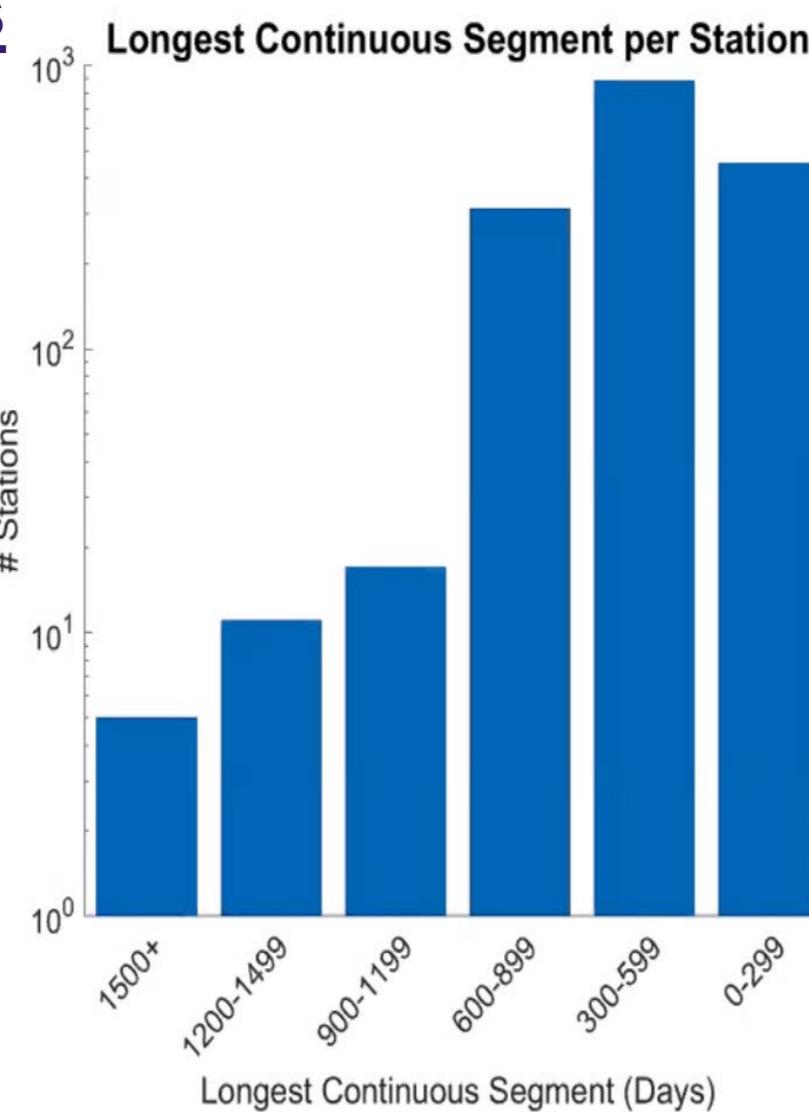
Kinematics Digitizers - NO Data Gaps



USArray Data Continuity

1,800 stations over 12 years

- 99.7% data return
- longest contiguous time series 1827.6 days (~5 years),
- median 416.8 days



Kinematics operate the DPC network, known as RAN (*Rete Accelerometrica Nazionale- (ran.protezionecivile.it)*) since 2012 consisting of **450 seismic stations** connected in real-time to the DPC data center in Rome often with 100% station availability.

Station list NOT working (0) (0)

All stations are functional

Total stations: 384

Basalt : 66
Etna : 29
Etna 2 : 248
Obsidian : 41

The percentage of operation of the RAN network with Kinematics instrumentation is: 100%

The calculation was made on a total of 377 stations

2021-05-06 23:04:00

PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

New Q8 & Pebble Digitizers



Built for the future on your successful
partnership with Kinematics

A Trilogy of Trust



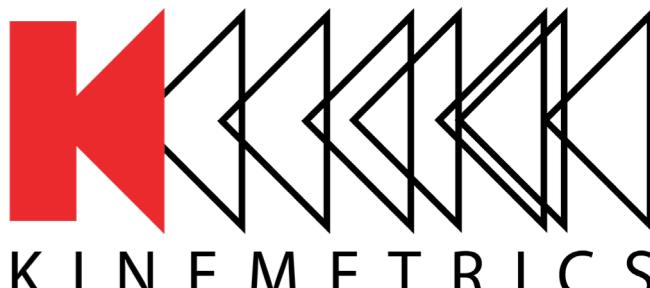
< 1kg;



<3 kg;



<0.5 kg;



What Is Q8?

- Feature-packed, higher-performance Ultra Low Power replacement of Q330!
- Web-based operation and control – no cable required
- WiFi, Ethernet and Mesh communication interfaces
- Multiple (4) High-Integrity Storage Media (internal 32GB eMMC plus internal and removable USB flash drives and an internal SD card up to 256GB)
- Universal serial sensor interface
- GNSS timing or external timing (PTP) via RS-485
- Streaming low-latency (<1s) data packets for EEWs applications
- Antelope & Seedlink compatibility



WiFi ON Button

This button is the main user control and performs 3 functions: In cycled recording mode, a brief (~½ sec) press will power up the recorder and activate the WiFi AP. If the recorder is powered, and the WiFi is off, a brief press will turn on the WiFi. If the WiFi is already on, a brief press will power down the recorder.

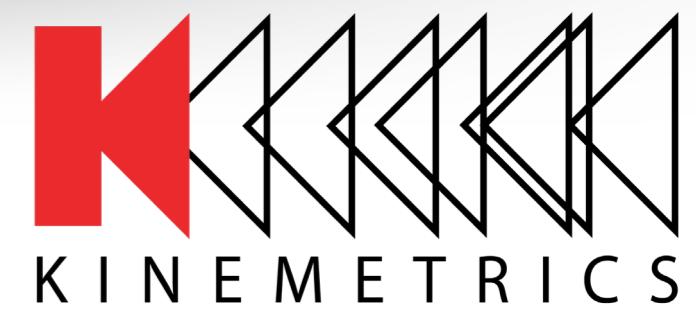
Q8 employs an 8-th generation (hence the name, Q8) “floating point” ADC converter, not limited to 32-bits.

New Pebble Digitizer/Datarecorder



USB, SD Card & Console Connector

2.5" thick, 3" tall, 5.8" wide



Omnisensor: Accelerometer & Broadband Seismometer in a Single Borehole Package



OF EXCELLENCE

All internal sensors are mutually aligned, and no mass lock or mass centering are necessary. The cable is Y-terminated at the surface to be used with a 6-channel digitizer: best matched with Q8, Q330S+ and Obsidian8X datalogger.

Selected Episensor Features

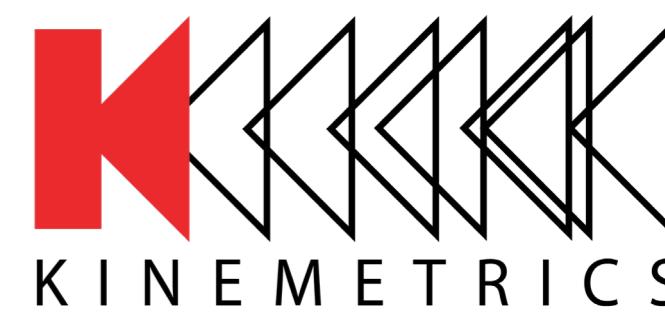
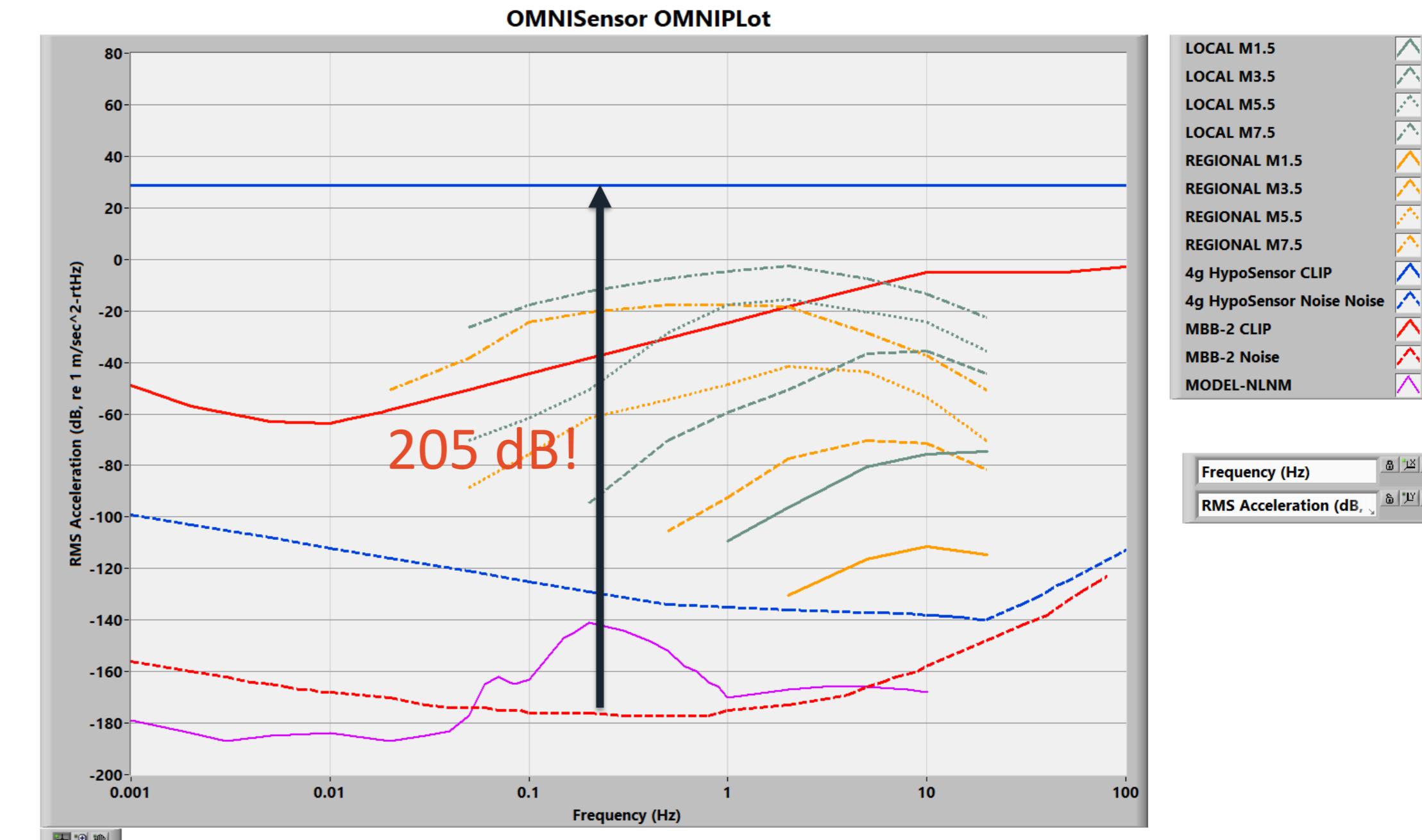
- Low noise
- Extended bandwidth - DC to 200Hz
- User-selectable full-scale range (at time of order)
- Calibration coil (standard)
- Double-stage transient protection



Selected MBB-2 Features

- No mass lock required
- No mass centering required
- Small, portable, 120 second (to 160 Hz) broadband sensor
- Large operational tilt range
- Sensitivity of 1,500 V/(m/s)

The OMNI Sensor covers more than 220 dB velocity dynamic range (205 dB acceleration)



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Headquarters, Metrozet, Los Angeles, California – USA
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Thank You!



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