



# FDU LINK BASED AUTONOMOUS RECORDING NODE

(PRELIMINARY DESCRIPTION & SPECIFICATION)

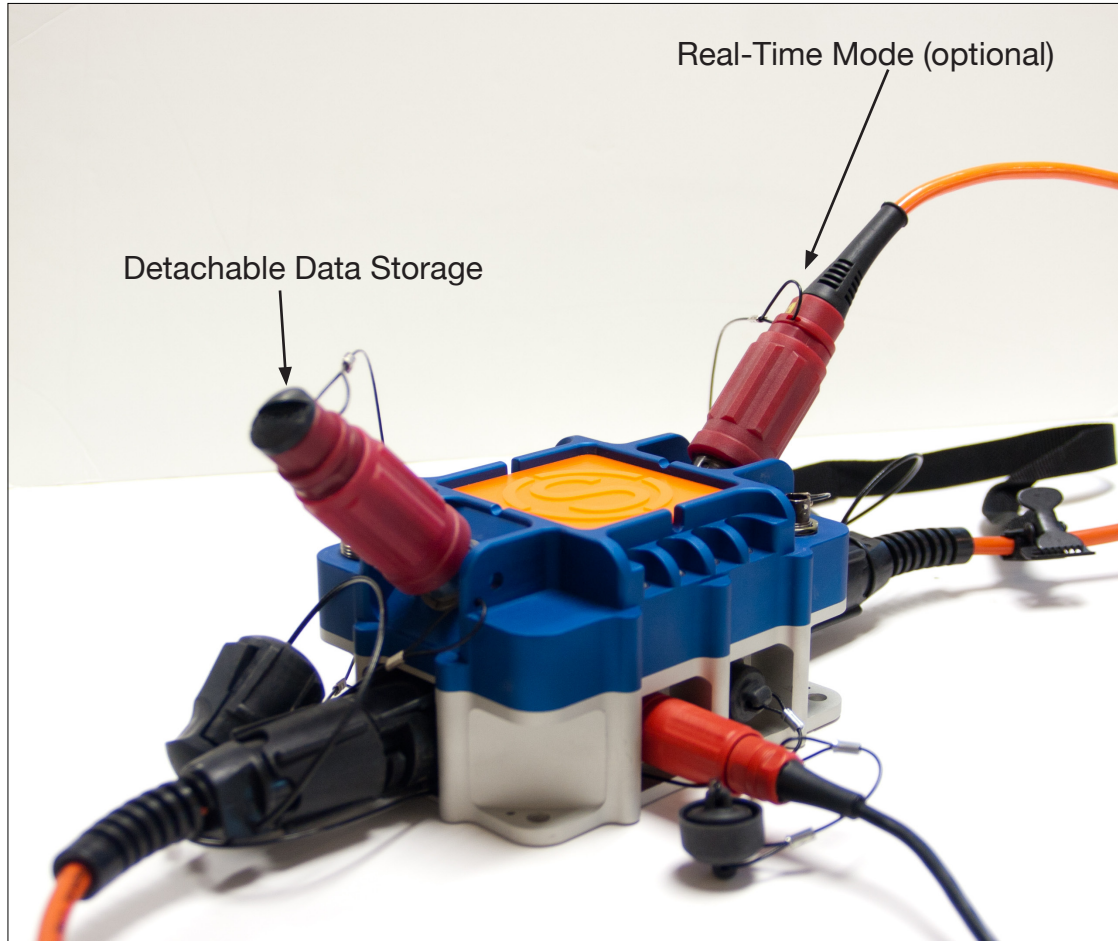


Figure 1: **Autonomous Recording Node (ARN)**

## GENERAL

Seismic Instruments, Inc. has developed the latest version of their SLIM family: the MSLIM (Master Slim). The GPS function is integrated into the MSLIM package, providing interface to the SI's SmartGeophone strings or to the Sercel FDU Links. Following is the description and status information of the FDU Link based application.

## FDU LINK BASED NODAL SYSTEM

After connecting two FDU Links to this MSLIM, the user can convert their 408/428 real-time cabled system into an FDU Link based nodal system without any modifications or alterations. The MSLIMs provide power, control, and data gathering functions for the connected FDU Links. Two FDU Links - each consisting of up to 36 FDUs - can be connected to each side of the MSLIM, allowing for a total of 72 FDUs on every ARN.



Figure 2: **The layout of one Autonomous Recording Node with 72 FDUs**

The heart of the node is the MSLIM. It is packaged into a rugged aluminum housing. Only the dome of the GPS section has plastic covering. One of the main advantage of a multichannel nodal system is that it is scalable from one node with a few channels all the way up to a practically infinite number of channels, providing lightweight, rugged, versatile, low-power and easy-to-use data acquisition system. This node system can be operated in continuous data acquisition mode or shot-based mode as well. Vital status and energy monitor information can be obtained in real-time at the Central Recording Truck via Radio. The detachable data storage for seismic data - scalable up to 64Gbyte - provides very flexible data harvesting schedule without interfering with the field operation. Future options include wired telemetry mode (up to 5000 real-time channel per 2-D line) or Engineering mode where a single node (72 channels) can be hooked up to a laptop for real-time data recording.

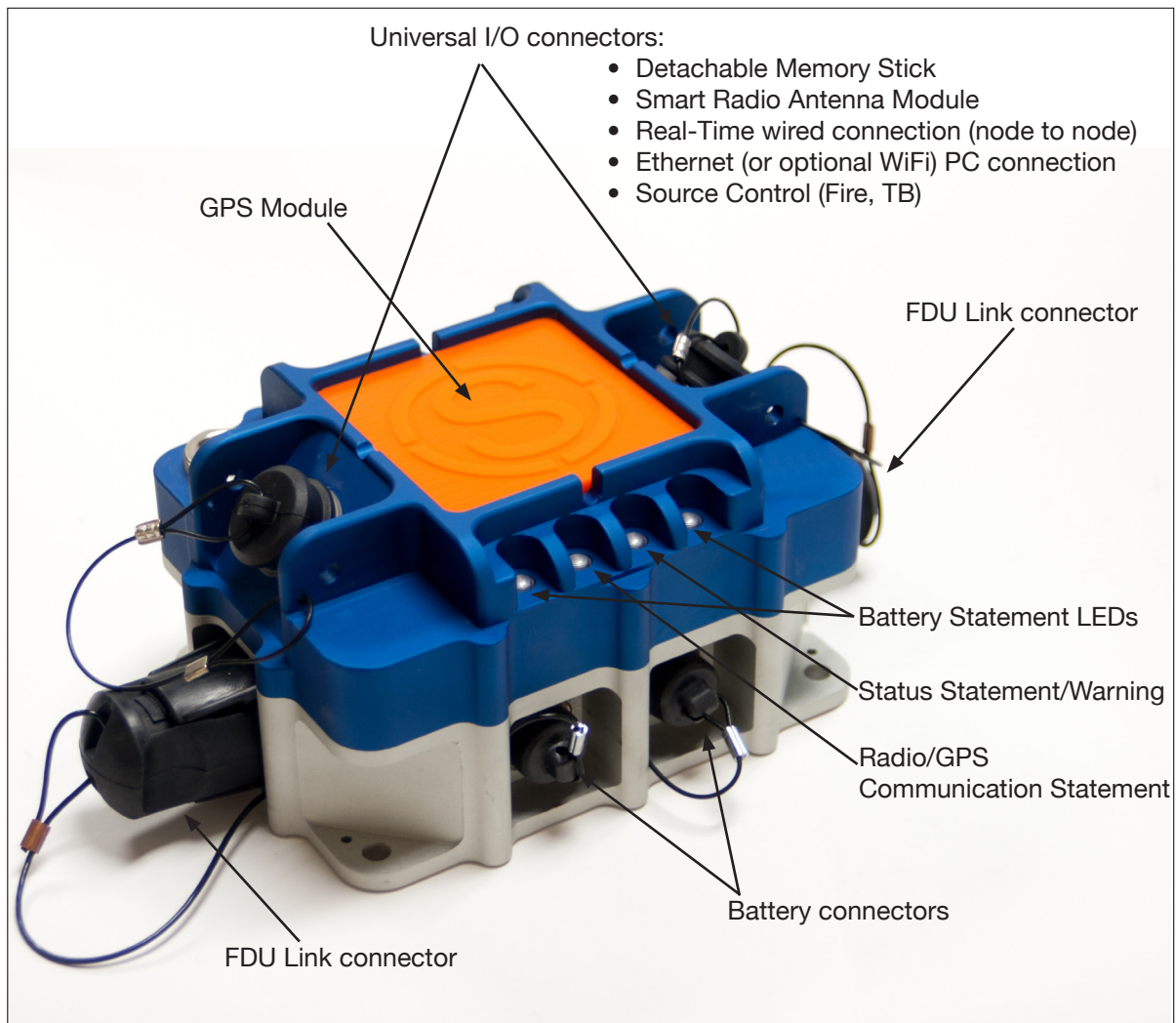


Figure 3: **MSLIM connections and appearance**

# SOFTWARE

## THE RIGHT TOOLS FOR THE JOB

Seismic Instruments' proprietary software features both **shot-based** and **continuous** recording modes. The user has a simple and intuitive means of accomplishing a variety of tasks related to generating plans, organizing data, and compiling results based on any seismic survey's needs. Real-time data monitoring and vital status information are accessible at any time from a Central Recording Truck with a mesh radio network.

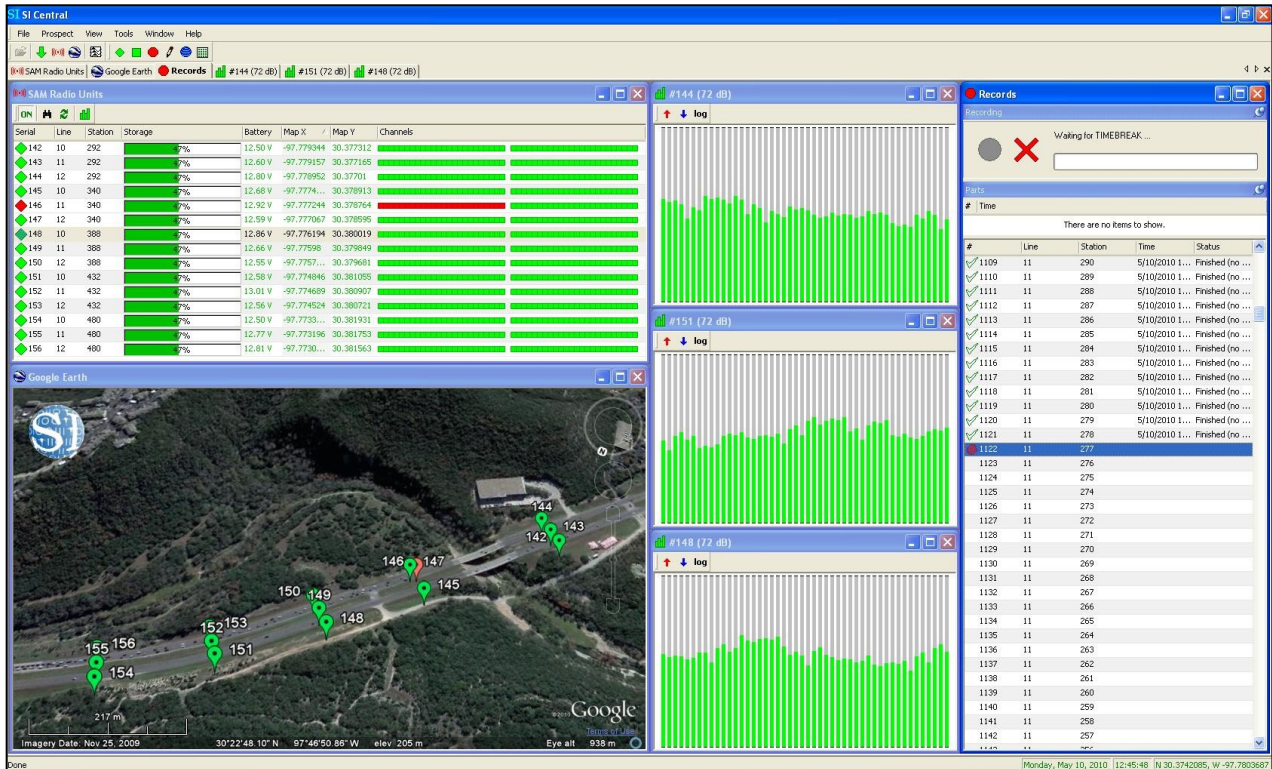


Figure 4: A screen capture of SI's Central System Software, demonstrating its received radio communication from field units, GPS mapping (based on Google Earth™ mapping service), live energy monitors, and an active records log.

The user is able to import existing prospects using industry-standard SPS-format files or design complex spreads and prospects, specifying relative placement of receiver and energy source points using easy-to-learn setup tools. Logs can be generated, saved, and numbered according to the user's exact desired specifications. As records are generated during the data acquisition process, the status of each shot is easily tracked, and faulty records may be deleted and re-recorded.

When data is harvested from the detachable Memory Sticks, the downloaded raw data from each Memory Stick is automatically synchronized with the GPS Time Stamps log generated by the user during recording. Conveniently, Memory Sticks can be harvested in any order and at any time. Partial or incomplete records will be indicated as such until the rest of the data for that record has been downloaded from relevant Memory Sticks. This grants the user maximum flexibility in collecting and assembling the raw data.

Data quality control is an emphasis in Seismic Instruments' software, both in traditional and cable-free configurations of the system. In cable-free configurations, energy monitors are transmitted via radio from each node to the Central Recording Truck, constantly updating the user on the signal amplitude and general functionality of each connected sensor.

Connecting a laptop or hand-held terminal to the node during the deployment makes more in-depth system monitoring possible. SI software will provide system performance testing and real-time data quality-control to ensure the reliability and functionality of any and all connected equipments. These system tests and data quality-control functions can be accessed at any time. An oscilloscope view of the connected sensors is available, allowing the user to monitor the data as it is received in real-time. The software is also capable of running a number of system tests on any connected equipment in these configurations, which cover the electronics, sensors, timing and environment.

When recording is complete and data harvested from the Memory Sticks the transcriber software will output the results in the form of industry-standard SEG-Y or SEG-D files. There is no need to bring in the nodes for harvesting. Replacement of an inexpensive Memory Sticks enable the field geophysicist preview the compiled data and be assured of accurate results before it is delivered for processing.

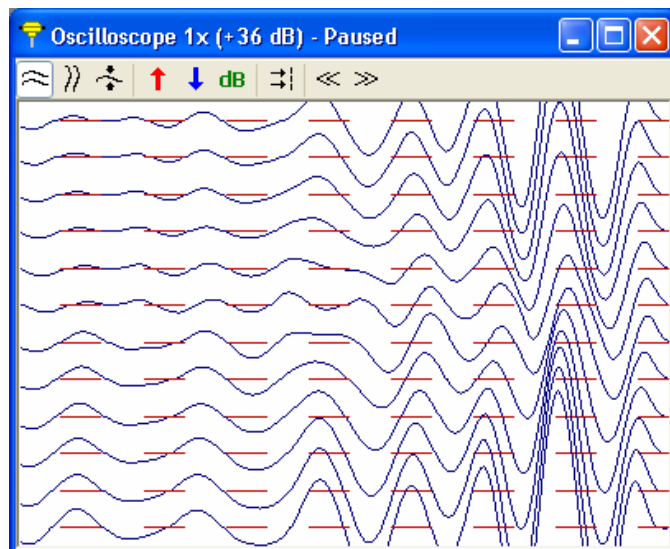
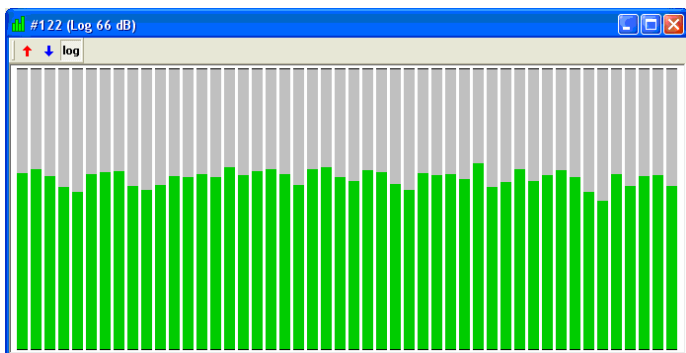


Figure 5 and 6: *SI's energy monitor (left) and oscilloscope (right) views are easily configurable, simplifying data quality control in the field.*

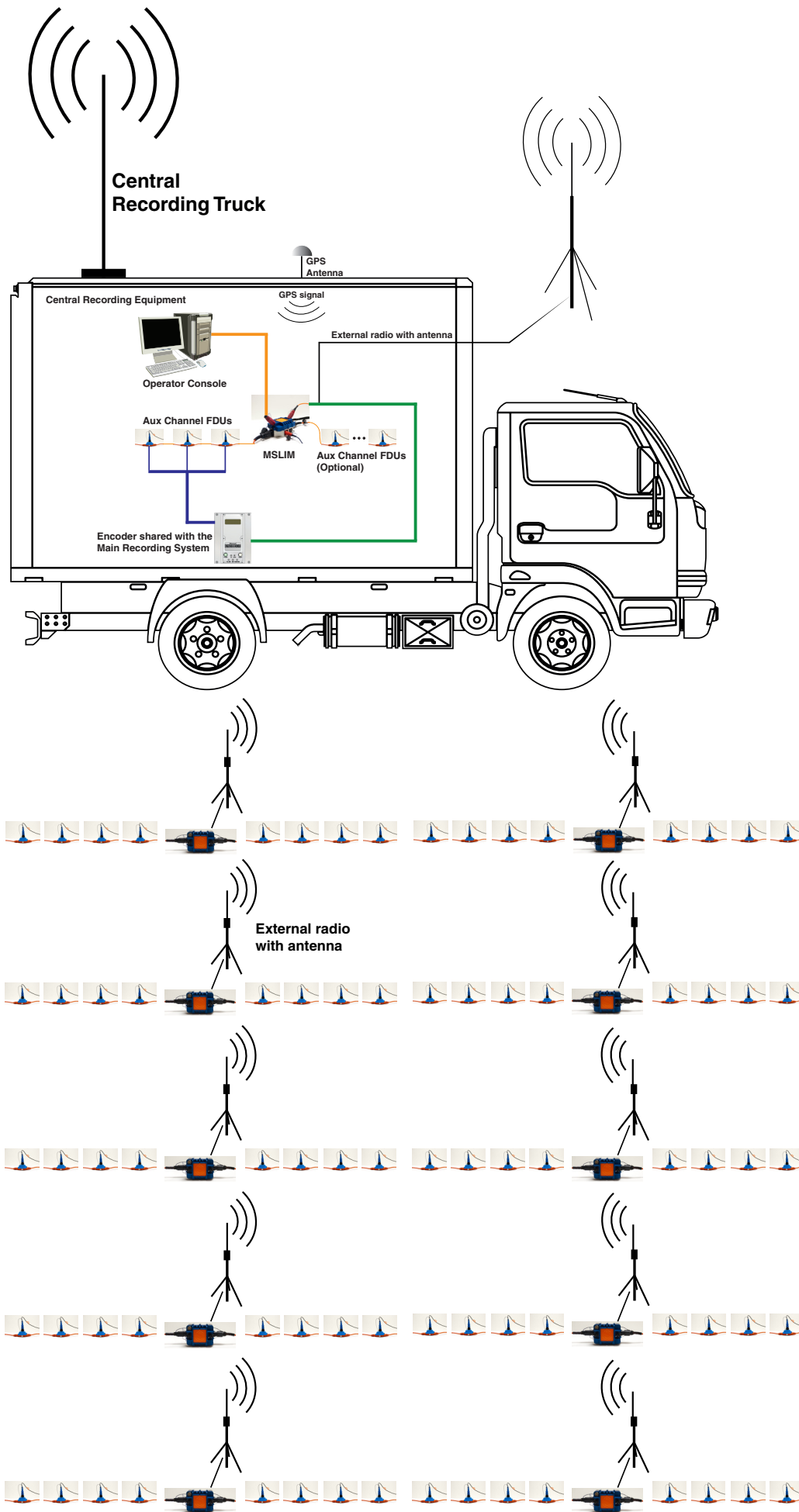


Figure 7: *Typical 10-node 720-channel layout*

# **SPECIFICATIONS**

(PRELIMINARY)

## **SAMPLING RATE:**

- 0.25, 0.5, 1, 2 or 4 ms

## **DATA STORAGE:**

- Detachable, scalable up to 64Gbyte
- Internal (future option)

## **RADIO:**

- External (modem or Wi-Fi options)
- Built in Wi-Fi optional

## **GPS:**

- Sensitivity: Cold start -144dBm  
Warm start -160dBm
- Acquisition: Cold start 29 s  
Warm start 29 s  
Aided start <1 s

## **NODE QC:**

- Serial number
- Line & Station number
- Storage capacity
- Battery
- GPS information
- Individual channel information
- Energy monitor of selected node

## **ENVIRONMENTAL LIMITS:**

- Operational temperature: -20 C/ + 60 C
- Storage temperature: -20 C/ + 60 C
- Humidity: 0-95%

## **POWER CONSUMPTION:**

- Real-time mode: TBD
- Continuous mode: TBD
- Sleep mode: TBD

## **PHYSICAL:**

- Watertight aluminum housing

**WEIGHT:** 2.2 kg\*

\* Node only without FDU and Battery