U•Node - Seismic Nodal Recorder

Convert an old Sercel 408 or 428 into a new Nodal System

System Overview

The most successful data acquisition system of our industry was designed by Sercel, France. It is called the 428XL Land seismic acquisition system. Over 5,000,000 channels were delivered around the world. The two major building blocks of the field telemetry are the FDU-428 and the DSU3-428. The 428XL system is a conventional cable system, designed for large field projects, e.g. the spacing between the Field Digitizer Units (FDUs) is typically 55-75 meters, enabling it to connect to an analog string of 6 to 12 analog geophones.

Application of long and heavy Link cables are very cumbersome for a smaller system configuration and often require a node system. The recent downturn in the industry prevented service companies to spend CAPEX on purchasing new nodal systems.

SI decided to adopt our successful multichannel-based U•Node system for the Sercel 428XL telemetry and provide a node system using the 428XL system components, the DSU3 and the FDU. The only difference between the two versions of the U•Node system is the telemetry interface. All features developed for our SMG telemetry will be available for the 428XL telemetry users, including the option to **return full precision data in real-time.**

System Features

- Adaptable: can be used for recording real-time or autonomous data (U•Node can be used with cables, Wi-Fi, and in autonomous mode).
- Versatile: can be used with any sensors and in all field conditions.
- Compatible: can work with any source type (Vibroseis, Dynamite, Weight Drop, etc.) or mode of acquisition (UHPV, Flip-Flop, full autonomous, etc.)
- Flexible: can be used with crews large, small, or to supplement conventional cabled crews.

The U•Node Seismograph

U•Node - Seismic Nodal Recorder

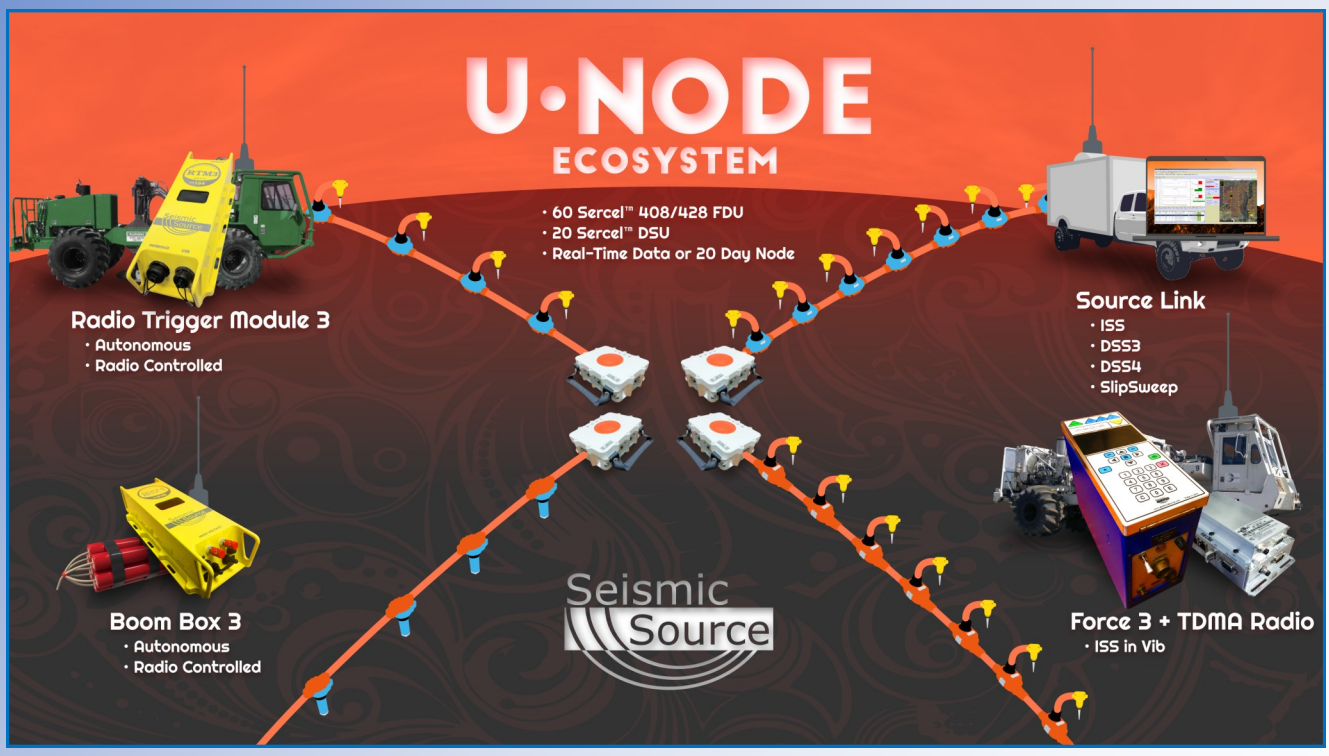
Recording Data for Any Project

System Configuration

- One U•Node can record data from up to 60 Sercel FDU nodes or up to 20 Sercel DSU nodes
- U•Node crews can record either active or passive datasets
- A crew can utilize a single U•Node for small projects or multiple boxes for large projects
- U•Node boxes can be networked to a computer for continuous data streaming
- U•Node boxes can be deployed for autonomously recording continuous data
- U•Node systems employ wireless time-break recorders to capture record start times.

System Compatibility

- All U•Node acquisition systems are compatible with all Seismic Source control electronics
  - Universal Encoder 3 for operation of any source on any project
  - Force 3 Vibrator Decoder/Controller for Vibroseis acquisition
  - Boom Box 3 Decoders for acquisition with downhole or surface explosives
  - Remote Trigger Box 3 for acquisition with mechanical impulsive sources
  - VibLink IP and VibLink TDMA for high-speed crew communications from any location.



408, 428, 428XL, FDU, DSU, and DSU3 are all trademarks of Sercel.

U•Node - Seismic Nodal Recorder

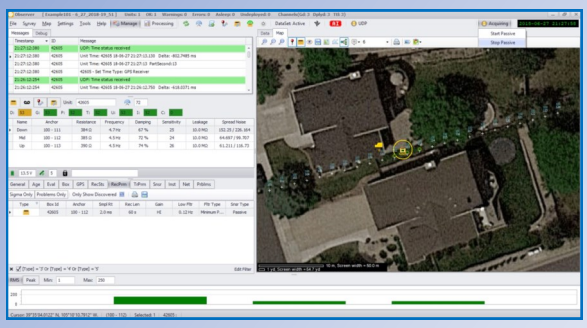
U•Node Software and Specifications

U•Node Software

Manage and Control Acquisition

Observer

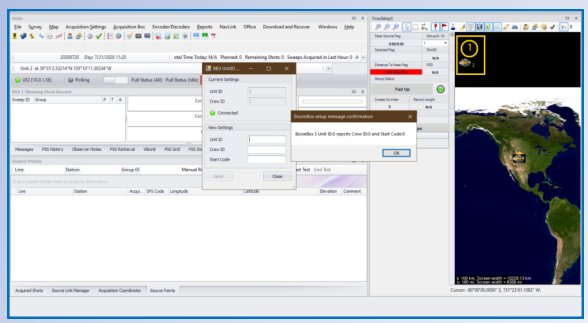
- Receiver Spread Management
- Configure U•Node units
- Assign receiver geometry
- QC and troubleshoot receiver spread
- Collect data from U•Node units
- Display and Archive data files



Observer Screen

SourceLink

- Source Operation Management
- Configure source
- Assign source point
- Fire source
- QC source performance



SourceLink Main Screen

U•Node Hardware

U•Node Specifications	
Sample Rate	2000, 1000, 500 & 250 sps
Internal Storage	128 GB standard
Network (cabled and Wi-Fi)	100base-T
Battery	10-30 volts hot-swappable
U-Node Requirement	144 mA @ 13.75 volts
Weight (Metric)	2.3 kilograms
Weight (Imperial)	5.1 pounds
Size (Metric)	206 x 155 x 132 mm
Size (Imperial)	8.1 x 6.1 x 2.5 inches

The U•Node Seismograph

iSeis Seismic Source

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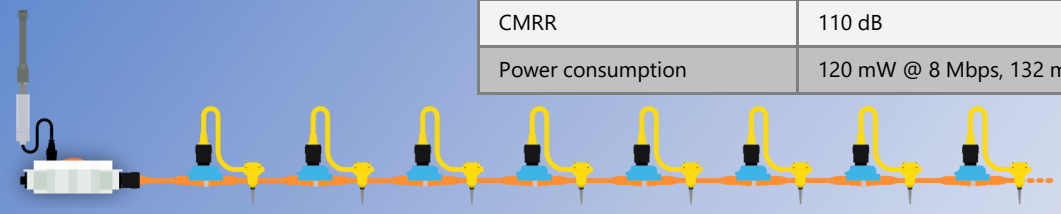
U•Node - Seismic Nodal Recorder

Update Sercel-Equipped Crews with U•Nodes

Each U•Node Supports up to 60 Single Channel FDU Modules

FDU Specifications	@ G400	@G1600
Diff mode impedance	20kOhms	same
Full scale input	1.6 V RMS	400 mV RMS
Crosstalk	> 130 dB	same
Noise	450 nV RMS	145 nV RMS
Instant dynamic range	130 dB	same
System dynamic range	140 dB	same
Distortion	-110 dB	same
Gain accuracy	< 0.1%	same
Phase accuracy	20 µSec	same
CMRR	110 dB	same
Power consumption	120 mW @ 8 Mbps, 132 mW @ 16 Mbps	

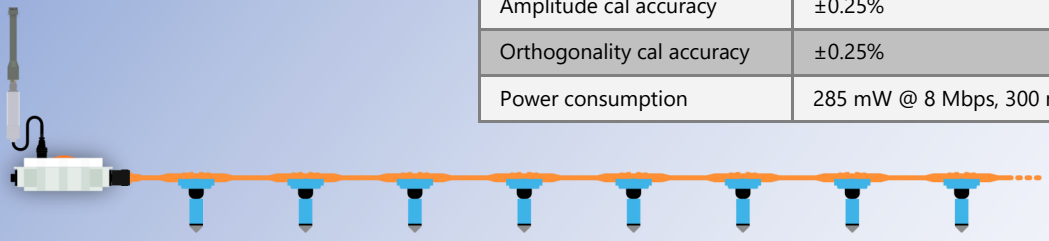
from the Sercel Brochure



Each U•Node Supports up to 20 Three-Channel DSU Modules

DSU Specifications	
Function	Acceleration Measurement
Full scale	5 m/s^2
Tile max value	± 180°
Noise (10-200 Hz)	0.4 $\mu m/s^2/\sqrt{Hz}$
System dynamic range	129 dB @ 4 ms
Bandwidth	0-800 Hz (up to 1,600 Hz with degraded specs)
Distortion	-90 dB
Amplitude cal accuracy	±0.25%
Orthogonality cal accuracy	±0.25%
Power consumption	285 mW @ 8 Mbps, 300 mW @ 16 Mbps

from the Sercel Brochure



iSeis Seismic Source