Solutions for Vibration & Acoustic Monitoring

Monitoring Software

For clients and users who already have Sigma or DAQlink based seismograph systems, the Event Monitoring Software is a great addition.

Project Generation and Management:
- Initialize a new project
- Archive an old project

Dashboard Module for Node Control:
- Node configuration
- Node performance monitoring

Dashboard Module for Event Management:
- Gather data from multiple nodes
- Process and compare data from multiple nodes

Event Analysis:
- PPV and PVS versus Time
- RMS and RVS versus Time
- Dominant Frequency versus Time
- Velocity versus Frequency
    - Includes 1/3 octave analysis

Event Display:
- WTVA display
- Amplitude and phase spectra
- Velocity versus Frequency

Event Reports:
- Lists of Events
- Individual Events
- Summary Reports

Emails:
- Individual Event Alerts
- Email Logs

SEISMOGRAPH OPTIONS

The SSC Monitoring System utilizes instruments from the Seismic Source line of seismographs, so each system can be customized for any need or situation:

- **Sigma 3:** Three channels and field ruggedized
- **Sigma 4:** Three channels with internal sensors and batteries
- **R1+:** 1 to 6 channels with interior space for coprocessor boards and other options
- **DAQ3-3:** Three channels with external networks and an aluminum case for permanent installation
- **DAQlink 4:** 24 channels and high samples rates

All of these seismographs can use any sensor, and can be configured with geophones, accelerometers or hydrophones as needed.

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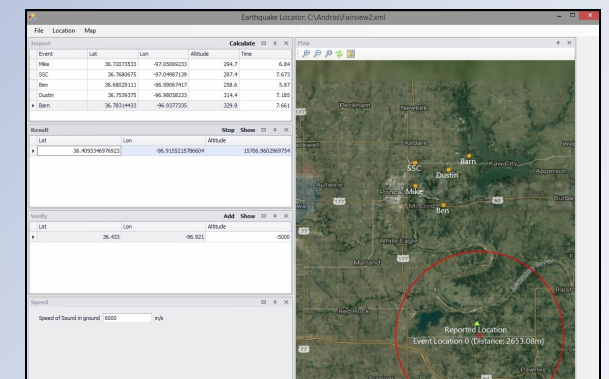
A Complete Monitoring Solution

Together, the Sigma 4 seismograph node with Event Monitoring Software from Seismic Source, provides a tool for monitoring anything from local events to distant earthquakes.

Vibration Monitoring

The SSC Monitoring System provides a tool for watching energy output by exploration or other equipment. The seismograph nodes can be moved with the source, else positioned near a structure or other asset. This monitoring system:
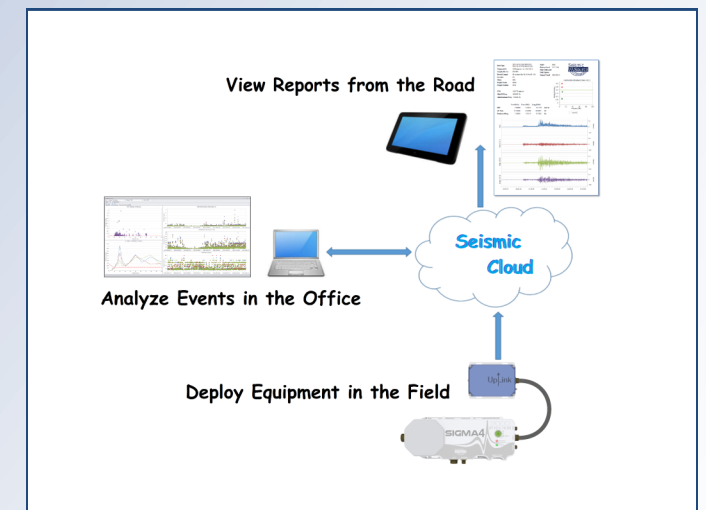
- **Uses single seismograph nodes distributed as needed to protect assets**
- Monitors local energy sources
- Determines if events violate user-programmed tolerances
- Alerts users to violations via email
- Stores recorded seismic data for later analysis.

Earthquake Detection

The SSC System can be expanded for detecting regional earthquakes. Seismograph nodes can be distributed across a project site or a city to detect earthquakes from either natural or man-made sources This monitoring system:

- **Provides time, location and magnitude of events determined to be earthquakes**
- Uses seismograph nodes attached to UpLink boxes to collect and evaluate events
- Event data is relayed to client server for report generation
- Additional nodes increase accuracy of location and magnitude
- Earthquake reports can be accessed from anywhere via the Internet.

View Reports from the Road

Analyze Events in the Office

Seismic Cloud

Deploy Equipment in the Field

Individual Seismograph Stations

Autonomous Sampling Nodes

Individual seismograph nodes are deployed, recording events and data, without any further user intervention.

Results are obtained by visiting the station, or else retrieving the equipment, and then offloading data. This monitoring system provides:

- **Single seismograph nodes distributed as needed to protect assets**
- Monitors local energy sources
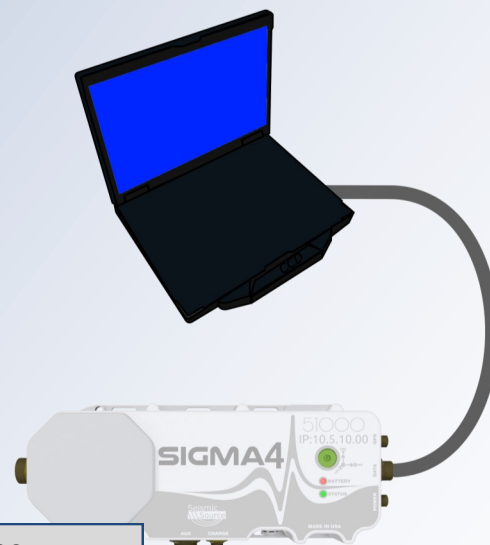- Each nodes stores its data for later analysis.

The quickest and easiest method of deploying equipment, although results are not obtained until the station is revisited.

Nodes with a Local Server

After the seismograph nodes are set up and running, they are connected to a local computer. A server can handle data from 1 to 100 Sigma 4 nodes.

The computer receives the data either in real time, or else at pre-programed intervals, where the server evaluates it and looks for events. This monitoring system provides:

- **Networked computer for real-time data analysis**
- Determines if events violate user-programmed tolerances
- Single seismograph nodes distributed as needed to protect assets
- Monitors local energy sources
- Issues alerts via email if requested
- Nodes store seismic data for later analysis.

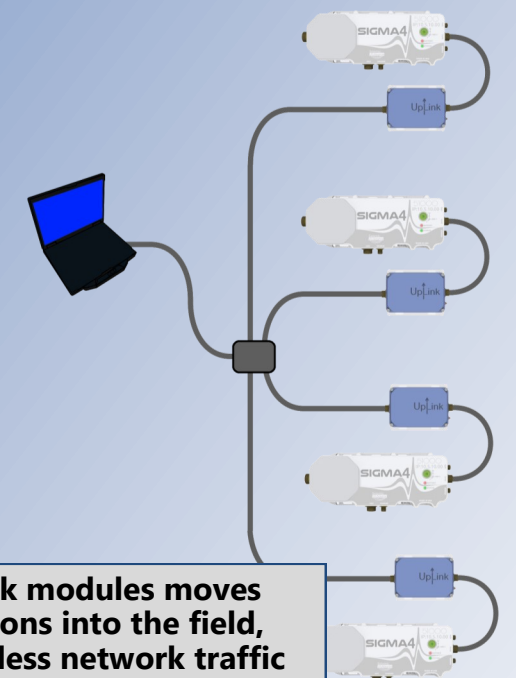**Adding a computer to the system provides Real-Time data for Real-Time results.**

Network of Seismographs

Distributed System with Local Server

1 to 10 Sigma 4 nodes are connected to a Sigma UpLink module. The UpLink module runs the event calculations and sends the results to the server.

The server receives event information and calculates the event time, location and magnitude. This monitoring system provides:

- **UpLink modules for distributed processing**
- 1 to 10 Sigma 4 Nodes connected to each UpLink module to reduce network traffic
- Network link can be hardwired or wireless
- Server software performs final calculations and logs results
- Results include event time, location and magnitude.
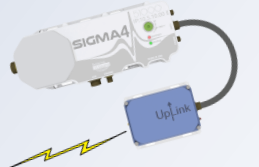- Server issues event alerts via email if requested

Using UpLink modules moves the calculations into the field, resulting in less network traffic and faster server response.

Distributed System with Remote Server

1 to 100 Sigma UpLinks are connected to Sigma 4 nodes, and the UpLink modules are connected to a remove server via wired, wireless or cellular data modems.

As with the local server, the remote server receives event information and calculates the event time, location and magnitude. This monitoring system provides:

- **Longer network links for larger arrays of seismograph nodes**
- Intervals between nodes becomes kilometers instead of feet
- Remote server can be located anywhere on Internet
- Results include event time, location and magnitude.
- Server issues event alerts via email if requested
- Reports with results can be accessed from anywhere

Employing UpLinks to send event information to a remote sever helps build much larger sensing arrays.