Seismic Ground Motion Detection System

The seismic methods in geophysical techniques are one of the most important aspects because of their high penetration depth and good resolution in estimating the movements present in the soil. Seismic sensors are important tools of security system that focus on security in unmanned areas. It has been used to detect, identify, and locate sources of seismic emanations. The detection of various activities such as – footsteps of human and animals, vehicle moment and digging of tunnel is the foremost application. The ground activity can be detected using seismic sensors i.e. geophones and are placed as an array to cover the required regions. CSIR-CSIO has designed 'Seismic Ground Movement Detection System' which is a customizable intelligent system which is capable of interfacing with a number of seismic sensors and has a number of in-built detection and recognition algorithms. This system can be adapted for a wide range of applications by training it in the relevant experimental sites.

Geophone based Ground Motion Detection System

Technical specifications and features

- Number of seismic sensors integrated to a single controller: 1 to 8
- Operating Temperature Range: -40 to 85 °C
- Operating voltage: 9-30 V
- Battery powered: detection and server communication mode – 18 hours
- Military style ruggedized connectors
- Communication protocols available: TCP/IP, RS232, RS485
- Alerts – Capable of sending Event and Health alerts to central server and/or users as email, SMS, push notifications

- Event and health logs
- Software parameters
- Sampling rate (possible rates are 1000, 500, 250, 125 S/sec)
- Customised filter settings
- Sensitivity to the detection on a scale of 1-10 (10 corresponds to highest sensitivity)
- User's mobile number for alerts

Detection ranges

- Human – Upto 30m
- Light vehicles – Upto 100m
- Heavy vehicles – Upto 300m

Target Classification

- Human – walking, running
- Vehicle movement – light and heavy
- Specific anthropogenic activities