

# **OASIS**

## **(On-line Alerting of Structural Integrity and Safety System)**

### **SYSTEM OVERVIEW**

The Kinometrics On-line Alerting of Structural Integrity and Safety system - OASIS is a flexible structural monitoring system providing for the collection and processing of acceleration, velocity, displacement, and inter-story drift data when implemented for buildings monitoring. The processed data can be stored, further processed, transmitted or used to alert interested personnel in a number of ways.

The system comprises three major components: Sensor, Multi-Channel Data Acquisition system, and Monitoring, Display & Alarm system.

The system mathematically derives velocity, displacement, and optionally inter-story drift from acceleration inputs to the digitizers. This information can be used to alert on site personnel through audible and/or visual alarms as well as notifying off site personnel via file transfers or e-mail messages that can be customized from executive summaries all the way through full raw data sets and processed parametric information.

The system is highly customizable, including:

- The number of sensor inputs
- Detailed control of operational parameters
- Modular architecture allowing for added capabilities as needed
- Provision for end users or systems integrators to write their own software extensions to the system

The system allows for:

- Triggered recording based on inter-story drift, acceleration (threshold or STA/LTA triggering), or a combination of both with channel voting to allow sophisticated control of the trigger point
  - Remote command/control
  - Remote “pull” of recorded data via an integral (optional) FTP Server
  - “push” of data into a customer’s remote FTP server of recorded data
  - Generation of e-mail messages when significant events, such as an event trigger, occur
- Please refer to the specific product Datasheet for technical and detailed information.

## SENSORS



The sensors are EpiSensors, high-dynamic-range (155 dB or better), uniaxial, biaxial or Triaxial, force-balance accelerometers, including:

1. User-selectable G level
2. DC to 200 Hz bandwidth
3. +12 V power supply
4. Protection box
5. Single mounting point
6. Terminal strip wire termination for easy wiring

## Other Sensors



Other type of sensors may include:

- Displacement Transducers
- Wind Sensors
- Temperature Sensors
- Strain Gauges
- Tilt/Deflection Sensors
- Differential GPS for Displacement
- Other

## MULTI-CHANNEL DATA ACQUISITION



The Data Acquisition system is a multi-channel, high resolution, low-power, IP communications, rugged and highly-reliable system based on the Granite (Dolomite) including:

1. Wall-mount cabinet enclosure
2. Up to 36 channel made of a 24 Bits, low-power Granite digitizer 12, 24 or 36-Channel unit
3. TCP/IP communication protocol
4. Local and remote command and control via IP
5. GPS time stamp to be provided within the system. All data will be identified by time stamp to the sample and channel numbering system
6. Power supply system to provide at least 72 hours of power autonomy

## MONITORING, DISPLAY & ALARM

The Monitoring Display & Alarm system comprises three major components: hardware, server software & client software

### Hardware:

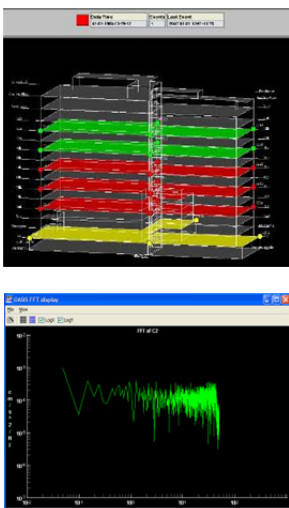


1. Wall-mount cabinet enclosure
2. Rack-mount industrial computer with flat panel LCD screen. Windows Operating System
3. Specific computer requirements are scaled depending on the overall complexity of the system, and provides at least:
  - 2.0GHz Pentium 4 processor
  - 1GB of RAM
  - 20GB of free disk space
  - Ethernet interface
  - At least one serial port
  - A 10/100 Ethernet switch
  - Firewall router

**Note: For remote command and control of the system, internet access is needed with static IP address, such as a DSL or broadband connection.**

4. Alarm Panel with lights and sound to indicate trigger state as detected from the processed results
5. UPS (Uninterruptible Power Supply) to provide at least ½ hour of back-up power for the entire system

### Server Software:



The Server Software performs the following functions:

1. Gather data from the ring buffers of one or more multi-channel acquisition systems in real time
2. Compute velocity, displacement, and inter-story drift from the acceleration data in the ring buffers in real time
3. Allows user definition and degeneration of the band pass filters used to compute velocity and displacement
4. Places all of the acceleration, velocity, displacement, and inter-story drift into an outgoing ring buffer that can be accessed by third party systems
5. A trigger module will trigger the system based upon a selection of trigger algorithms. These trigger levels will be displayed as colored alarms, i.e. green – okay status - no triggered; blue – on trigger level 1; orange –on trigger level 2 and red –on trigger level 3
6. Triggered data (acceleration, velocity, and displacement) will be recorded as files with pre-event (user selectable) memory in ASCII, or other well-known formats

7. Generates digital alarm outputs intended to drive an alarm light (two outputs) and an audible alert (one output) when the trigger values transition (increase) between the various threshold levels (below threshold 1, between thresholds 1 and 2, between thresholds 2 and 3, above threshold 3)
8. Alarm outputs can be configured to reset automatically after a set period of time, or to require manual intervention by the operator
9. On trigger, an optional user-supplied Windows executable (or batch file) will be executed to perform further analysis on triggered events. The program will be passed the alarm level (0 to 3) as a command line argument
10. The system can display any combination of acceleration, velocity, and displacement channels as streaming waveforms
11. The system can display FFT and Acceleration/Velocity/Displacement response spectra for a single channel in real time
12. Allows generation of e-mail messages through authenticated SMTP to one or more e-mail targets. Messages are based upon significant events such as event triggers
13. Optionally runs an FTP server on the client to allow users to remotely retrieve files
14. Optionally allows FTP "push" of recorded files to a customer's FTP server
15. Allows remote command/control through TCP/IP

## **CLIENT SOFTWARE**

The Client software is able to access data from the system via the internet (or hard wired to a central location). The client software works on Windows Operating System. The client software has the same functions as the Server Software except for those specific related to the hardware at the structure, such as Alarm Panel, etc.