

## iCOBI 3

### Building Code Compliant Seismic Monitoring System

Seismic monitoring systems provide valuable data and information on the behavior of buildings leading to improved understanding and better design codes. For these reasons, many municipalities (e.g., City of Los Angeles, CA USA) require seismic instrumentation or offer benefits such as reduced inspection time as part of a building occupancy resumption program (e.g., BORP San Francisco, CA USA).

For example, the 2008 Los Angeles Building Code (§1613.8.2) requires a minimum of three accelerographs to be deployed at the base, middle, and top of a structure over ten stories or six stories with aggregate floor area of 60,000 square feet or more. The three instruments are usually placed in a vertical stack and interconnected for common triggering and timing.

Internet ready, code Compliant Building Instrumentation (iCOBI) system for seismic monitoring, is part of EQMet line of products and represents a flexible solution to these requirements.



## FEATURES

### iCOBI 3

- Low cost and low maintenance
- Compliant with Los Angeles Building Code
- Cost-effective solution that can satisfy today's most demanding applications
- System timing accuracy to 0.5 milliseconds due to synchronized sampling
- Remote alerting capability for system event or auto-diagnostic failure
- The iCOBI 3 system includes digitizers, battery systems providing 48 hours of autonomy and communications equipment. Users only need to supply the CAT-5 interconnection cable and local AC power.
- Mean-Time-Between-Failures (MTBF) in excess of 500,000 hours



## SPECIFICATIONS

### Sensor

Type: Triaxial EpiSensor force balance accelerometers, orthogonally oriented, internal  
 Full scale range: User selectable at  $\pm 1g$ ,  $\pm 2g$  or  $\pm 4g$   
 Bandwidth: DC to 200 Hz  
 Dynamic range: 155 dB+  
 Offset: Factory set, software re-zeroing

### Digitizer

Channels: 3 sensor channels for the internal sensors  
 Dynamic range:  $\sim 130$  dB at 100sps (defined as RMS dipto to RMS shorted-input noise) or  $\sim 139$  dB at 100 sps (defined as full scale peak to peak to RMS shorted-input noise)  
 Primary sample rates: 100, 200 sps

Acquisition modes: Continuous (via streamed ring buffer)  
 Triggered local recording

Calibration & test: Pulse and Sensor Response Test

### Trigger

Trigger selection: Independently selected for each channel Internal  
 Trigger: Threshold, selectable from 0.01% to 100% of full scale or STA/LTA algorithm  
 Trigger voting: Internal and network trigger votes with arithmetic combination

### Timing

Type: Oscillator digitally locked to GPS  
 Timing accuracy:  $< 1$  microseconds of UTC with GPS locked each unit

### Storage

Data storage: Internal SDHC Card, 32 GB  
 Program storage: Internal SDHC Card, 4 GB  
 Data: Offloaded automatically to removable thumb drive connected to the USB host port. Parallel recording (mirroring) data on an external USB thumb drive.  
 File formats: EVT  
 USB drive file system: FAT32

### Interfaces and Digital Control

Interfaces: 1 x Ethernet 10/100BaseT  
 (M12 connectors) 1 x USB 2.0 Device Port for data access  
 1 x USB 2.0 Host Port for peripherals  
 1 x RS-232 for factory use only  
 Relays: 2 x SPDT relays, software configurable  
 LEDs: System, power and event status, Ethernet Link

### Communications

Ethernet interface: Real Time Telemetry (Multiple destinations TCP/IP Protocol), web server for parameter setup, event retrieval via FTP/SFTP; supports Point of Contact (POC) name service  
 Modem: External, cellular or POTS, connected via the USB 2.0 Host interface; consult factory for details  
 Protocols: Real-time data streaming via Antelope compatible ORB server  
 State-Of-Health: Input voltage, Super Capacitor voltage, Time synchronization, internal temperature, available storage  
 Data visualization: Waveform Viewer for continuous waveform display and File Viewer for triggered event display; consult factory for other support software

### Digitizer Power Requirements

Consumption:  $< 3W$  operational  
 Voltage range: 9-28 VDC  
 Protections: Reverse voltage, over/under voltage, self resettable fuses

### Digitizer Physical

Mounting: Central bolt, 3 adjustable feet with bubble level  
 Dimensions: 6" x 6" x 3" (15cm x 15 cm x 7.5cm)  
 Volume: 1.6 liters  
 Weight: 3.3 lbs. (1.5 kg)

### Environmental

Temperature range:  $-20^{\circ}$  to  $70^{\circ}C$  operational  
 Humidity: 0-100% RH (non-condensing)  
 Enclosure rating: IP67

### System Components

3 x iCOBI 3 accelerographs  
 3 x Kinematics standard battery boxes with AC/DC converters  
 1 x Kinematics battery box with Network switch  
 3 x iCOBI 3 Ethernet cables  
 (CAT-5 interconnecting cable to be supplied by the customer)