



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 Angles 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.

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

iCOBI 3 Building Code Compliant Seismic Monitoring System

Set Up Diagram

Three accelerographs are deployed at the base, middle, and top of structure.







SPECIFICATIONS

Sensor Type:

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

Independently selected for each channel Internal

Threshold, selectable from 0.01% to 100%

Internal and network trigger votes with

Digitizer

Channels:3 sensor channels for the internal sensorsDynamic range:~130 dB at 100 sps (defined as RMS dip to RMS shorted-
input noise) or
~139 dB at 100 sps (defined as full scale peak to peak
to RMS shorted-input noise)Primary sample rates:100, 200 spsAcquisition modes:Continuous (via streamed ring buffer)

Triggered local recording

Calibration & test: Pulse and Sensor Response Test

Trigger

Trigger selection: Trigger:

Trigger voting:

Timing

 Type:
 Oscillator digitally locked to GPS

 Timing accuracy:
 <1 microseconds of UTC with GPS locked each unit</td>

arithmetic combination

of full scale or STA/LTA algorithm

Storage

Data storage:Internal SDHC Card, 32 GBProgram storage:Internal SDHC Card, 4 GBData: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
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: Voltage range: Protections: <3W operational 9-28 VDC Reverse voltage, over/under voltage, self resettable fuses

Digitizer Physical

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

Environmental

Temperature range: Humidity: Enclosure rating:

System Components

- 3 x iCOBI 3 accelerographs
- 3 x Kinemetrics standard battery boxes with AC/DC converters

-20° to 70°C operational

0-100% RH (non-condensing)

1 x Kinemetrics battery box with Network switch

IP67

3 x iCOBI 3 Ethernet cables

(CAT-5 interconnecting cable to be supplied by the customer)