iCOBI 2

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 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.

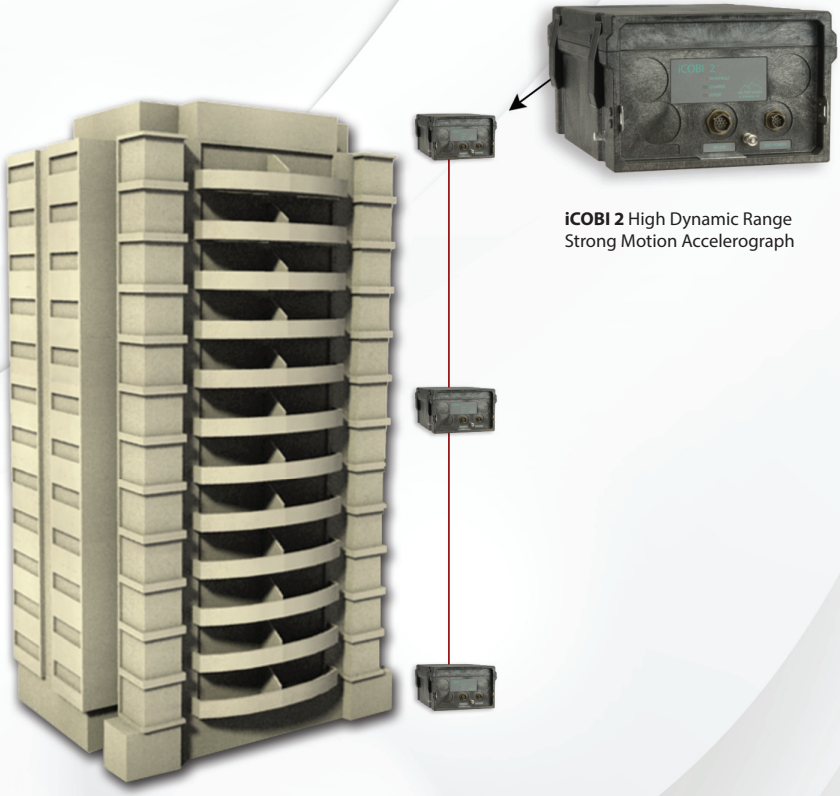
Internet ready, code Compliant Building Instrumentation (iCOBI) system for seismic monitoring, is EQMet's flexible solution to these requirements.

iCOBI 2 Low Cost, Low Maintenance & Features

- Compliant with Los Angeles Building Code
- Cost-effective solution that can satisfy today's most demanding applications
- Timing accuracy to 0.5 milliseconds due to synchronized sampling with optional GPS timing system
- Remote alerting capability for system event or auto-diagnostic failure
- All-In-One package: sensors, data acquisition, timing and backup battery for 36 hours autonomy
- Mean-Time-Between-Failures (MTBF) in excess of 500,000 hours

Set Up Diagram

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



iCOBI 2 High Dynamic Range Strong Motion Accelerograph

Continued

SPECIFICATIONS

Data Acquisition

Type:	Over sampled Delta Sigma system with 24 bit Digital Signal Processor
Number of channels:	3 Channels
Dynamic range:	108 dB @ 200 sps
Frequency response:	DC to 80 Hz @ 200 sps
Noise:	Less than 8µV RMS
Sampling rate:	100, 200, 250 sps
Input range:	± 2.5V
Chan./chan. skew:	None – Simultaneous Sampling of all Channels
Anti-alias filter:	Brickwall FIR filter. Cut-off at 80% of output Nyquist. 120 dB down at output Nyquist Real time digital
output (Opt):	RS-232 output of digital stream
Calibration type:	Kinemetrics test sequence

Communications

RS-232 interface:	Parameter setup, real-time telemetry and event retrieval. Standard.
FTP via Modem:	FTP transmission of events via dial-up ISP. Optional.

Power Supply

Supplied external charger voltage:	100-250 Vac 50/60 Hz
Charging voltages:	14.9V @ fast charge, 13.8V @ float charge. Temperature compensated for sealed lead acid, gel type batteries
Battery operating range:	11V to 15V
Batteries:	Internal 12V, 6.5Ah battery (Std), 12V, 12Ah battery (Opt), external batter (Opt)
Current drain:	185mA @ 12V (standard configuration)
Power autonomy:	>36 hours (Std), >72 hours with optional internal battery

Sensor

Type:	Triaxal EpiSensor Force Balance Accelerometer, Orthogonally Oriented, Internal (Std), External (Opt)
Full scale range:	User selectable at ±0.25g, ±0.5g, ±1g, ±2g or ±4g
Bandwidth:	DC to 200 Hz
Dynamic range:	155 dB+
Calibration & test:	Calibration Coil Functional Test Calibration Coil Response Test

Trigger

Type:	IIR Bandpass filter
Trigger bandwidth:	0.1 Hz – 12.5 Hz
Channel triggering; Trigger, De-trigger:	Independent threshold for all channels
Alarm thresholds:	Selectable from 0.01% to 100% of full scale
Trigger voting:	Internal, external trigger votes with arithmetic combination
Pre-event memory:	60 sec. max for 3 channels @ 200 sps Software selectable in 1 sec. increments
Post-event time:	Software selectable, specified in seconds, 0 to 65,000 sec.
Auto-diagnostics:	System can be configured to continuously check system voltage, temperature, RAM and code integrity and timing system integrity

Storage

Type:	2 Fully compliant PCMCIA storage slots (Opt) PCMCIA standard 2.1. Sockets accept Type I, II, III card formats. Type I or II modem
Recording capacity:	Approx. 8 minutes per MB on Memory Card, 3 channels of 24-bit data @ 200 sps

Firmware

Type:	Multitasking operating system supports simultaneous acquisition & interrogation. Boot loader allows remote firmware upgrades
System control:	Configure sample rate, filter type, trigger type and voting, maintains communications and event storage
User interface:	Packetized protocol and simple terminal loop control and data retrieval, via RS-232 interface
Intelligent alerting:	Can initiate communications when an event is detected or if an auto-diagnostic failure occurs
Auto-diagnostics:	System can be configured to continuously check system voltage, temperature, RAM and code integrity and timing system integrity

Timing

Type:	Free running disciplined oscillator (Std); GPS (Opt)
Shared GPS:	Allows a group of interconnected Altus recorders to share one GPS module (option)
GPS (Opt):	Integrates completely with system, providing timing, internal oscillator correction and position information
Timing accuracy:	5 microseconds of UTC. GPS receiver better than 1 millisecond data synchronization of UTC. Power cycling is software controlled
Power consumption:	110mA at 12V (active)

I/O and Display

Type:	I/O Connectors, EMI/RFI and transient protection, I/O drivers and display are provided on a single front panel board
Display:	3 LEDs. Display indicates: Run/Fault, charge, event
Power input:	Mil-Style connector for charge input and external battery
RS-232 interface:	Full RS-232 interface with modem control
Interconnect input (Opt):	Mil-Style connector for IRIG out, IRIG in, Clock sync., 1 pps out, trigger in, trigger out, alarm out, real time digital output (Tx & Rx), ext. 12V out, Relay 1
EMI/RFI protection:	All I/O lines are protected from both EMI/RFI emission and susceptibility problems by ferrite filters and transient suppressors

Housing

Type:	Lexan structural foam housing internally coated with EMI/RFI shielding material, 5/16" aluminum base support for mounting and coupling to sensors
Mounting and leveling:	Single hole for 1/4" stud and three adjustable feet for leveling
Size:	10.1" (256 mm) W x 15.0" (381 mm) L x 7" (178 mm)H
Weight:	20 lbs. (9 Kg) including battery

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