iCOBI

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 Instrumenta-tion (iCOBI) system for seismic monitoring, is EQMet's flexible solution to these requirements and consists of a central multi-channel recorder and three digital output triaxial accelerometers.

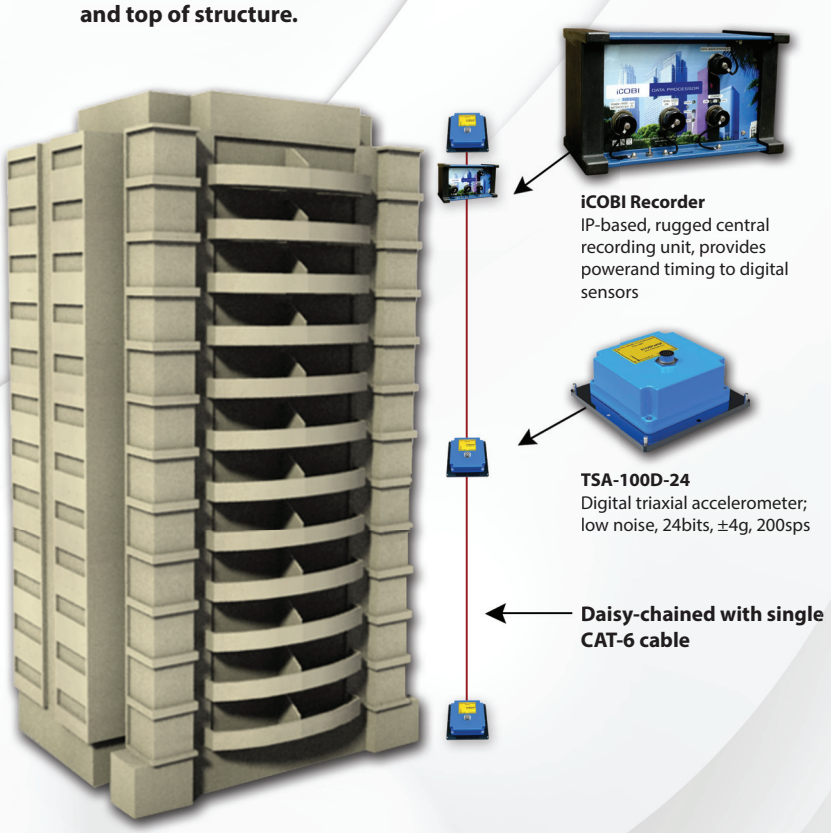
- iCOBI central data recorder
- Three TSA-100D-24 digital triaxial accel-erometers
- Interconnected with single inexpensive CAT- 6 cable
- Synchronized timing

Low Cost Low Maintenance

- Using CAT-6 cable for power and interconnection substantially reduces cabling costs
- No AC power required at sensor location, only at iCOBI central recorder
- System only requires a single backup battery at iCOBI central recorder

Set Up Diagram

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



iCOBI Recorder
IP-based, rugged central recording unit, provides powerand timing to digital sensors

TSA-100D-24
Digital triaxial accelerometer; low noise, 24bits, ±4g, 200sps

Daisy-chained with single CAT-6 cable

Continued

SPECIFICATIONS

Central Recorder Hardware
Processor: 400MHz Intel PXA255 Xscale®
Memory: 256 Mbytes SDRAM
Storage: 1x Internal CF 8GB
Interfaces: 1x 10BaseT Ethernet port
1x RS232 serial port
Environ: -20 to +60°C (optional -30 to +70°C)
0-100% RH (non-condensing)

Central Recorder Software
OS: MontaVista HardHat Linux v2.4.20
Type: Loaded with Kinemetrics limited edition Rockhound; real-time data collection and processing software
Data Format: Kinemetrics EVT

Central Recorder Physical
Enclosure: Rugged aluminum extrusion with MIL-SPEC type connectors designed for 1m drop and 1m temporary immersion (IP67)
Environment: Lead-free; RoHS, WEEG, and CE compliant
Protection: Transient and EMI/RFI protection on all connections
Display: System status LEDs for power, event status, Ethernet Link, and data

Triggering
Type: IIR band-pass filter (three types available)
Threshold: 0.01g
Pre-event: 20s
Post-event: 30s

Sensor
Type: Triaxial, force-balance accelerometer with capacitive displacement sensor, restoring coil and calibration coil
Range: +/-4g
Sensitivity: 5V/g differential
Sample Rate: 200sps
ADC: 24bits sigma-delta
Dynamic range of 125dB from 0.1 to 40Hz integrated
Bandwidth: DC to 225Hz
Cross-axis: < 0.5% including misalignment
Offset: < 0.05g
Hysteresis: < 200 ug peak-to-peak with +/-1g ex-citation or < 0.005% of full-scale
Non-linearity: < 0.015% total
THD: < -74dB total harmonic distortion
Anti-Alias: 144dB linear phase FIR standard minimum phase filter optional

System Power
Type: 12VDC Battery with 110VAC Charger
Battery: External 12V, 65Ah
Autonomy: 36 hours
Recorder: 8-18 VDC 0.6W (typical)
Sensor: 9-24 VDC 3.4W (2.4W sensor, 1W digitizer)

Timing
Time Base: TCXO controlled locked
Accuracy: < 0.5 ms channel-to-channel synchronization

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