Digitexx's state-of-the-art SHM system for bridges facilitates rapid assessment of structural integrity.

Powerful benefits of real time SHM:

- **Delivers important data to key users permitting informed decision making and effective emergency response**

- **Compares daily/weekly/monthly snapshots of a structure's evolution**

- **Analyzes cumulative effects of structural performance due to extreme events**

- **Supplies critical bridge performance information needed by structural engineers to return the bridge to operation**

- **Creates a knowledge-base that can serve as the foundation for bridge engineering construction for the future**

The 2007 bridge collapse in Minneapolis was a tragic example of the dangers of aging infrastructure, heavy traffic usage and irregular inspection practices. Unfortunately, the bridge that collapsed on I-35 was not an anomaly. With more than 500,000 bridges in the Unites States alone (and many more abroad), a booming population and a non-standardized system of visual inspections, it is only a matter of time before the catastrophe is repeated.

In order to get out in front of the bridge deterioration curve and stay there, governmental agencies and civil engineers need a technological solution that helps them both ensure the safety, reliability and security of the nation's bridges, as well as design and develop the next generation of bridges.

We're proud to say that we have a solution for both critical needs. Based on many years of experience in earthquake engineering and real time communications software, Digitexx pioneered real time structural health monitoring (SHM). Our system is the only real time solution that monitors multiple locations on a bridge, analyzes and responds immediately, and archives and distributes centralized data. Digitexx has been asked to provide services and install systems in California and abroad.

Sensors: Digitexx's robust system can work with virtually all types and brands of new and existing sensors including sensors for: acceleration, displacement, strain, wind and temperature.
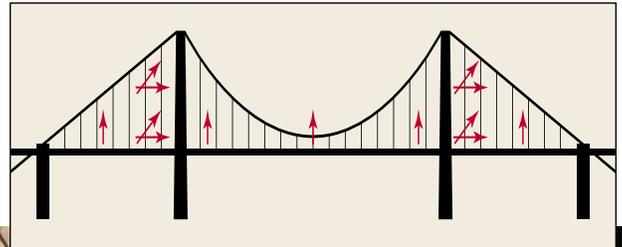
Typical example: An 1850m cable-suspension bridge spanning a critical harbor in Southern California. 26 strong motion accelerometers mounted on the bridge deck and base. Data monitored in real time in multiple locations.
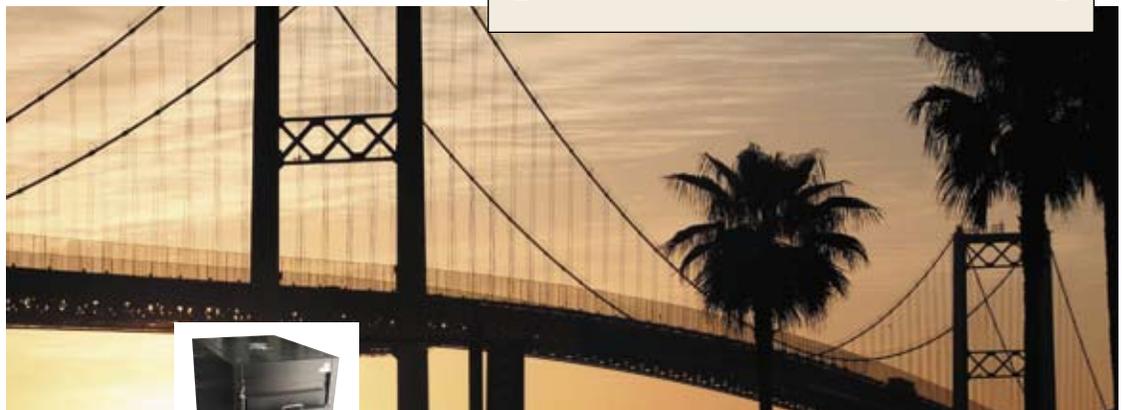
RTMS-2001R: This commercially-off-the-shelf system provides multi-channel, real-time data acquisition and analysis with manual and event-driven triggering. The system also offers an extensive set of remote tools for real time monitoring, broadcasting streaming data, data retrieval, remote tele-control, and event driven notification.

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Real Time Monitoring System Architecture

The Digitexx monitoring system is based on a highly efficient, multithreaded software design that allows the system to acquire data from a large number of channels, monitor and condition this data, and distribute it, in real time, over the Internet to multiple remote locations.

Sensors on the bridge continuously send out data to the system. If an event such as an earthquake occurs, pre-assigned thresholds of drift are exceeded in one or multiple locations, thus triggering the recording and analyzing of data (including pre-event memory). Once an event is recorded, the system notifies a list of users (via e-mail) and uploads the event via FTP to another site.

Using the "quick analysis" capability of the Digitexx system, various measures of the monitored system's response can be distributed to multiple locations and displayed in real time. The system can cross correlate data from the base and the deck, plotting useful information about the interaction between the dynamic loads on the bridge and its modal characteristics. It can be used for a rapid (rough) estimation of the dominant bridge mode being observed in the selected time window, as well as an estimator of the corresponding bridge damping parameters.
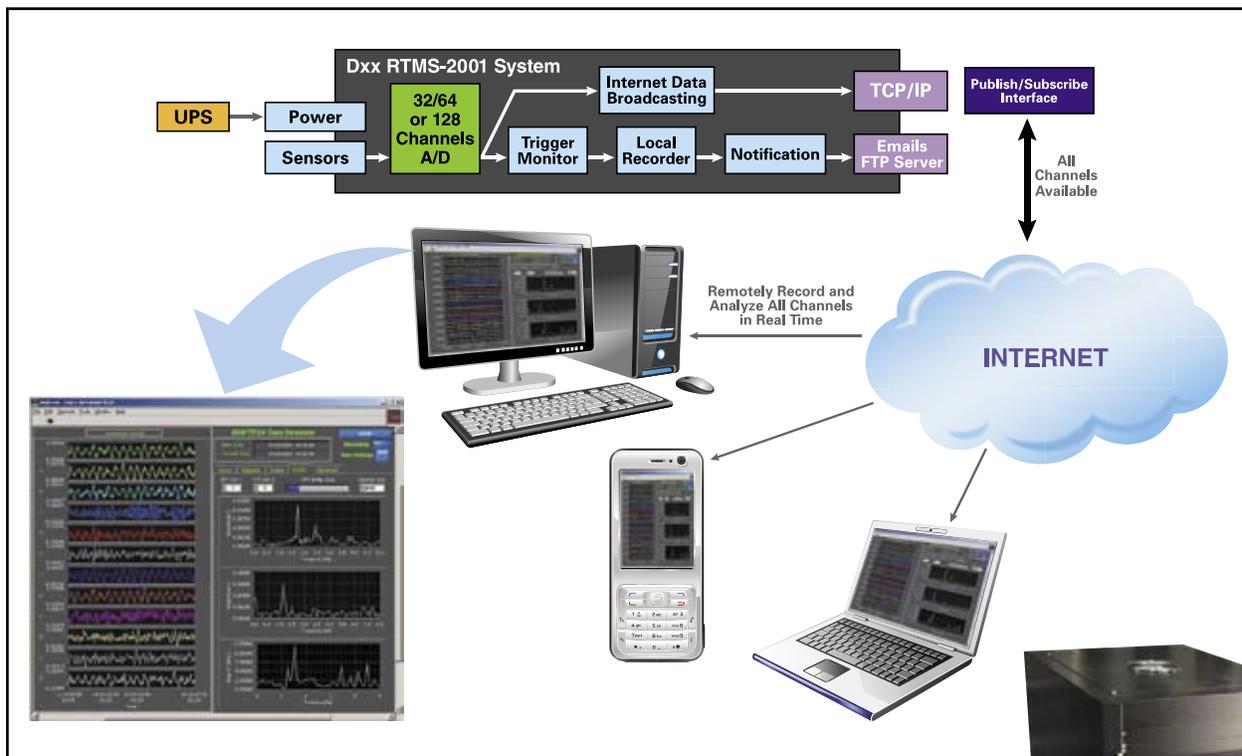
About Digitexx

Founded in 2000, Digitexx was the first company in the industry to develop real time structural health monitoring systems for a variety of industries and applications including: bridges, tall buildings, campuses, windmills, oil rigs and more. Digitexx's innovative earthquake damage detection and locational algorithm system for tall buildings is jointly patented with Caltech. When properly configured, the Digitexx system is capable of measuring and responding to both natural and man-made events such as: earthquakes, wind, explosions and accidental heavy impacts.