

BRIDGES

STRUCTURAL HEALTH MONITORING (SHM)

Keep bridges open, safe, and measurable

Real-time vibration, strain, and environment insight—from span to abutment—so operators act with confidence, not guesswork.

Why Digitex for Bridges

- **Digitally synchronized networks** (GPS / DigiSync®) keep channels aligned for reliable trending and OMA.
- **No gaps through outages** with Store&Forward® and local SD/eMMC logging.
- **Built for the field:** rugged IP67 aluminum hardware, fast leveling and mounting.
- **End-to-end toolchain:** Voyager®, Nexus, Vista, Observer.

What you monitor

- Vibration/acceleration (deck, towers, bearings)
- Modal frequencies, mode shapes, damping (FDD/EFDD/SSI/MAC in Observer)
- Strain & temperature coupling, tilt, displacement, wind & weather (xMet)

Impact at a glance

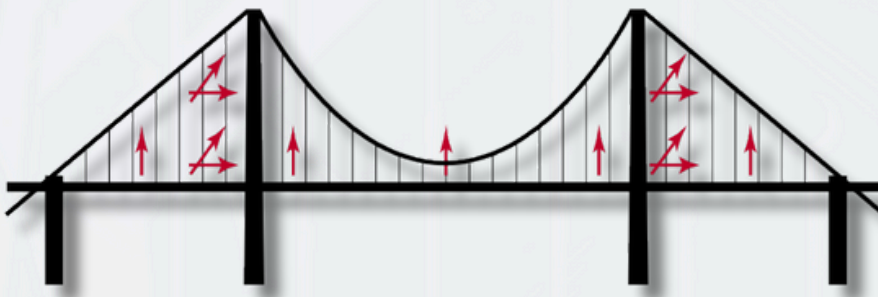
- **Safety & availability:** Early anomaly detection, faster reopen decisions after events
- **Cost control:** Targeted inspections & maintenance, fewer lane closures
- **Clarity:** Common, synchronized dataset for owners, designers, and authorities

Bridge SHM that scales with your span

Instrument the points that matter—deck, pylons, stays, and bearings—and stream **synchronized, high-fidelity data** into a single workspace. Start with a pilot on one span and expand to the entire structure without redesigning your network: the same xDAS® architecture supports **dozens to hundreds of channels** with sub-ms timing and Store&Forward® resilience.

Whether your site favors **Ethernet, Wi-Fi, DigiMESH® or GSM**, the system adapts; when links drop, recording continues locally and auto-backfills to the core. Engineers see **clean, comparable datasets** across seasons and events, enabling true trending rather than one-off measurements.

From day one, you get actionable views—spectra, trends and OMA results—so owners and authorities can align on evidence, set **confident thresholds**, and plan maintenance with fewer lane closures. It's the same workflow across all bridge types, from long-span cable systems to segmental and heritage structures—**modular, rugged, and future-proof**.



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.

Outcomes

- Faster modal insights and trending
- Clear pre-/post-event comparison (earthquake, heavy traffic, strong winds)
- Confident thresholds/alarms for maintenance and ops decisions

Result: Faster modal insights and confident alarms without babysitting the network.

Your workflow with Digitex

- **Instrument** – mount/level sensors; auto-discover in Voyager
- **Acquire** – stream in real time or record locally; sub-ms sync
- **Analyze** – trends, spectra, OMA (frequencies, mode shapes, damping)
- **Act** – thresholds/alarms, PDF summaries, share results with stakeholders

SENTRY SYSTEM – ARCHITECTURE OVERVIEW

Sentry System® is Digitex Systems' end-to-end platform for Structural Health Monitoring. It digitizes at the sensor, time-synchronizes every channel (GPS/DigiSync®), and moves data reliably over Ethernet, Wi-Fi, DigiMESH®, or GSM/4G to a central xPlorer unit running Voyager®. This architecture eliminates analog noise and drift, keeps channels phase-aligned for serious analytics (spectra, modal, trending), and scales from pilots to large multi-asset networks.

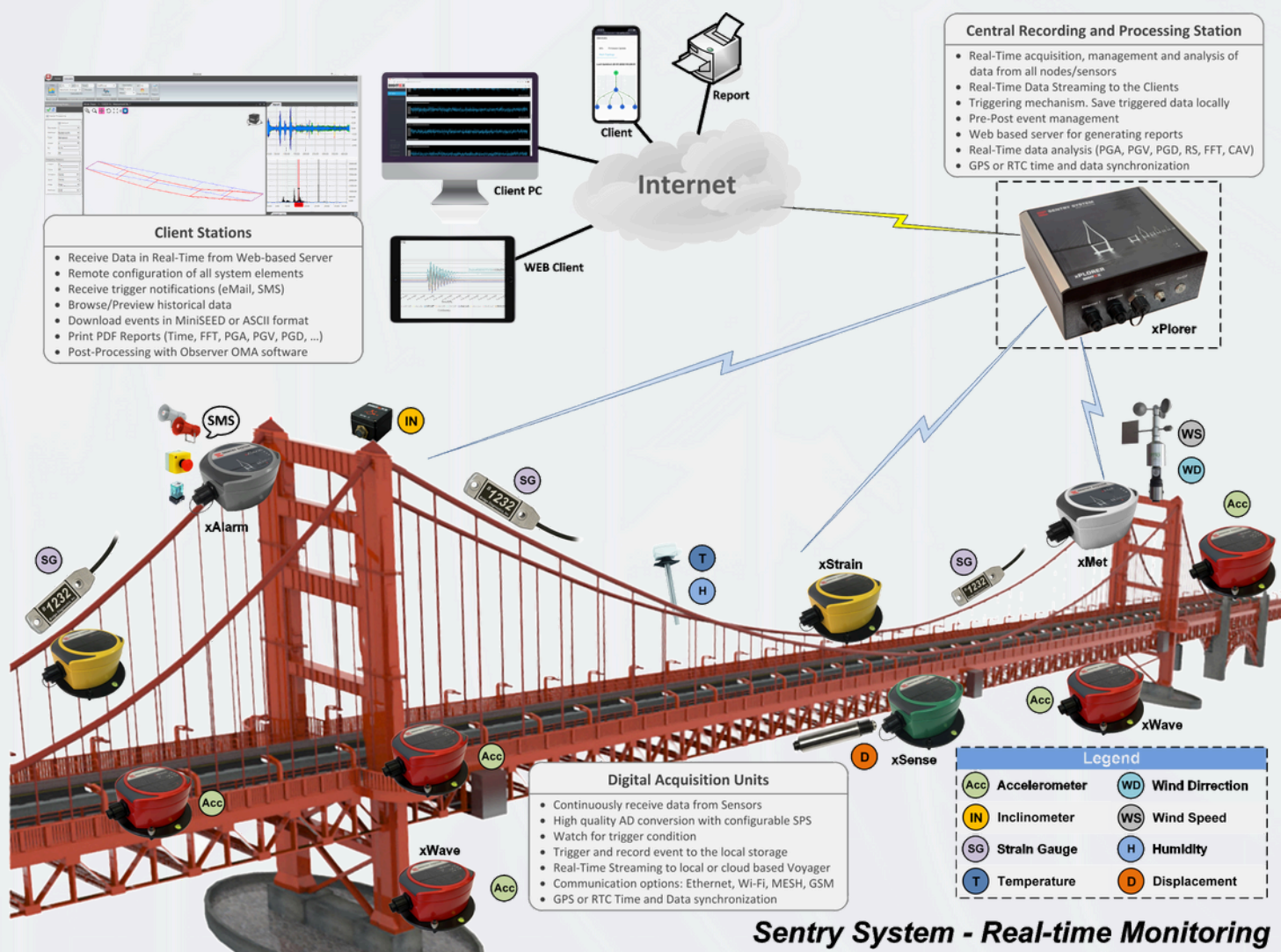
Each edge device records locally with Store&Forward® to survive link outages and auto-backfills the moment connectivity returns. Operators and engineers work in a single workspace: configuring devices, watching real-time streams, setting thresholds and alarms, and exporting reports. With Observer for OMA, Nexus for redundant streaming, Vista for viewing, and xAlarm for notifications, Sentry turns raw measurements into decisions—day-to-day and post-event.

SENTRY SYSTEM – FAMILIES YOU CAN CHOOSE

Distributed (xDAS) • Centralized (xCAS) • Standalone (xDSU) • Portable (xDAS Ambient) • Personal (pSHM) • Hybrid Architectures

SENTRY SYSTEM – DATA FLOW

Sense → **Digitize at source** ($\Delta\Sigma$ A/D) → **Sync** (GPS/DigiSync®) → **Transmit** (Ethernet / Wi-Fi / DigiMESH® / GSM) → **Core** (xPlorer + Voyager) → **Analyze** (Observer, Nexus, Vista) → **Act** (xAlarm, reports).



Sentry System - Real-time Monitoring

ABOUT DIGITEX

Digitex is a company specialized in design and development of real structural health monitoring systems for a variety of industries and applications including: bridges, tall buildings, campuses, windmills, oil rigs and more. Digitex's innovative solution for ambient vibration measurements and quick health assessment of structures is jointly developed and validated with our partners and advisors from the Universities. When properly configured, the Digitex system is capable of measuring and responding to both natural and man-made events such as: earthquakes, wind, explosions and accidental heavy impacts.