

BUILDINGS

STRUCTURAL HEALTH MONITORING (SHM)

SHM APPLICATIONS

Keep buildings open, safe, and efficient.

Real-time vibration, drift, and environmental insight—from basement to roof—so owners and authorities act with confidence, not guesswork.

Why Digitex for Buildings

- **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

- Floor acceleration and inter-story drift (adjacent/non-adjacent floors)
- Modal frequencies, mode shapes, damping (FDD/EFDD/SSI/MAC in Observer)
- Wind/temperature coupling, rooftop equipment vibration, basement dynamics
- Optional strain & displacement at critical cores, outriggers, and link beams.

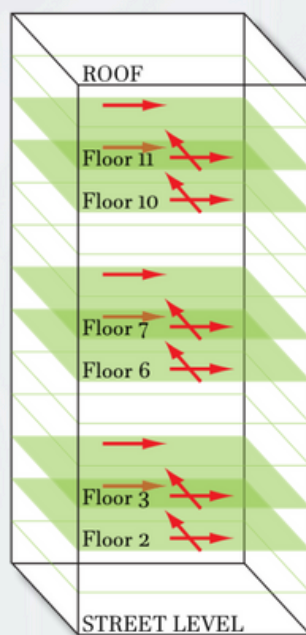
Impact at a glance

- Rapid re-occupancy decisions after earthquakes and strong winds
- Cost control: targeted inspections; fewer unnecessary evacuations/closures
- Clarity: clean, synchronized datasets shared across owners, engineers, and authorities

Building SHM that scales with your tower

Instrument the points that matter—basement, podium, key mid-levels, outriggers/cores, and roof—and **stream synchronized, high-fidelity data** into a single workspace. Start with a pilot on a few floors and expand stack-wise without redesigning; the same xDAS architecture supports dozens to hundreds of channels with **sub-millisecond timing and Store&Forward resilience**.

Whether your site favours **Ethernet, Wi-Fi, DigiMESH, or GSM**, links adapt to the building and **campus topology**. If connectivity drops, recording continues locally and automatically backfills to the core. Engineers see **comparable datasets across seasons and events**—enabling true trends, reliable drift estimates, and fast, evidence-based decisions.



Example: 24-story steel frame building. Three uniaxial accelerometers per instrumented floor (two E-W, one N-S) are deployed at nine floors plus the roof. Inter-story drift ratios calculated, thresholds aligned to design criteria, and events auto-reported to stakeholders via web/SMS/email.

Outcomes

- Faster modal insights and floor-by-floor trending
- Clear pre-/post-event comparisons for re-occupancy
- Confident thresholds/alerts for operations and safety teams

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 log locally; sub-ms time sync
- **Analyze** – trends, spectra, OMA (frequencies, mode shapes, damping)
- **Act** – thresholds/alerts, PDF summaries, share 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.

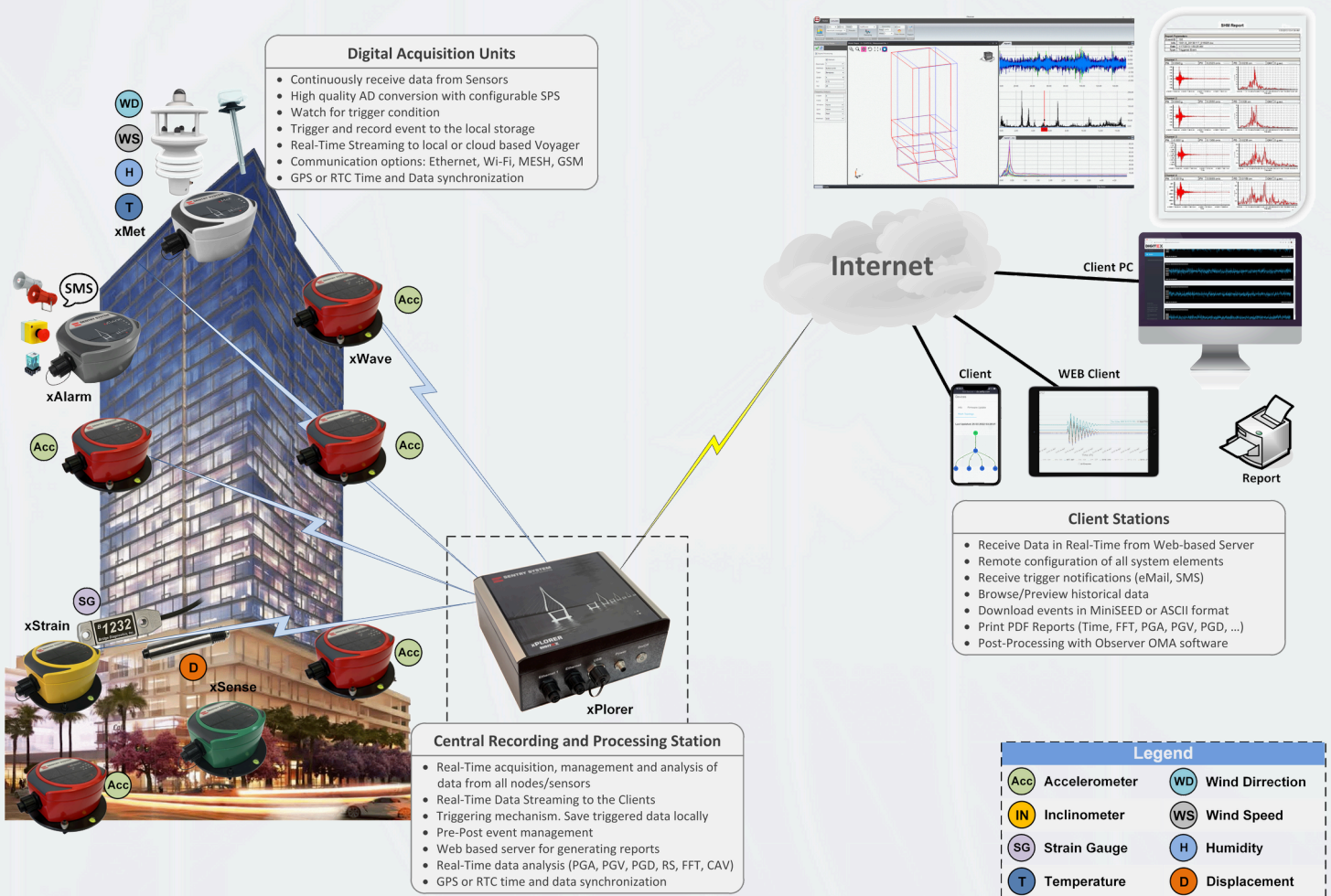
Each edge device records locally with Store&Forward® to survive link outages and auto-backfills the moment connectivity returns. Operators and engineers work in a single workspace: configuring devices, watching real-time streams, setting thresholds and alarms, and exporting reports. With Observer for 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.