

# MINES

## STRUCTURAL HEALTH MONITORING (SHM)

## SHM APPLICATIONS

Measure blasts. Protect assets.

Keep production moving.

Real-time vibration, air-blast, and structural response—from pit wall to processing plant—so operators meet targets and regulators, confidently.

### Why Digitex for Mines

- Digitize at the source + DigiSync® for clean, comparable blast and vibration analytics.
- No gaps through outages with Store&Forward® and local logging; auto-backfill when links return.
- Built for harsh sites: IP67, dust/heat tolerant, flexible power (AC/PoE/solar/battery).
- End-to-end toolchain: Voyager® (acquire), Observer (OMA), Nexus (redundant streaming), Vista (view), xAlarm (notify).

### What you monitor

- Ground vibration / PPV / frequency content at near-field and boundary receptors
- Air-blast/overpressure, equipment vibration, pit-wall dynamics
- Strain, displacement/tilt on critical structures (headframes, conveyors, crushers)
- Weather coupling (wind, temperature, humidity) for blast-effects correlation

### Impact at a glance

- Compliance & community: stay within limits; defensible, time-stamped records
- Operational continuity: blast scheduling with fewer stoppages and re-drills
- Clarity: trend PPV/air-blast and structural response on one synchronized timeline

### Mine SHM that scales with your pit or complex

Instrument the points that matter—**pit crest and floor, haul-road/boundary receptors, headframes, mill/plant structures**—and **stream synchronized, high-fidelity data into one workspace**. Start with a few critical receptors for compliance and expand to a site-wide **xDAS®** network without redesigning: the same architecture supports dozens to hundreds of channels with **sub-ms timing and Store&Forward® resilience**.

Links adapt to mine topology—**Ethernet, Wi-Fi, DigiMESH®, GSM**—and if connectivity drops during a blast, local recording continues and auto-backfills on reconnection. Engineers and HSE teams work from clean, **comparable datasets across days/weeks/months**, aligning blast charge design, delay patterns, and production with community and regulatory limits.



**Example: Open-pit copper mine with near-field and boundary stations: xGeo geophones and xWave accelerometers at pit crest/floor and at community receptors; xMet weather node for wind/humidity; optional xStrain/xInc on conveyors and headframes. Streams to xPlorer/Voyager; events trigger reports and stakeholder notifications.**

#### Outcomes

- Confident PPV/air-blast compliance with auditable histories
- Optimized blast design via pre-/post-blast comparison and trending
- Fewer production interruptions; clearer dialogue with regulators and communities

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

#### Your workflow with Digitex

- **Instrument** – mount/level sensors; auto-discover in Voyager
- **Acquire** – real-time streaming or local logging; sub-ms time sync
- **Analyze** – PPV/air-blast, spectra, OMA; correlate with blast plans & weather
- **Act** – thresholds/alarms, 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.

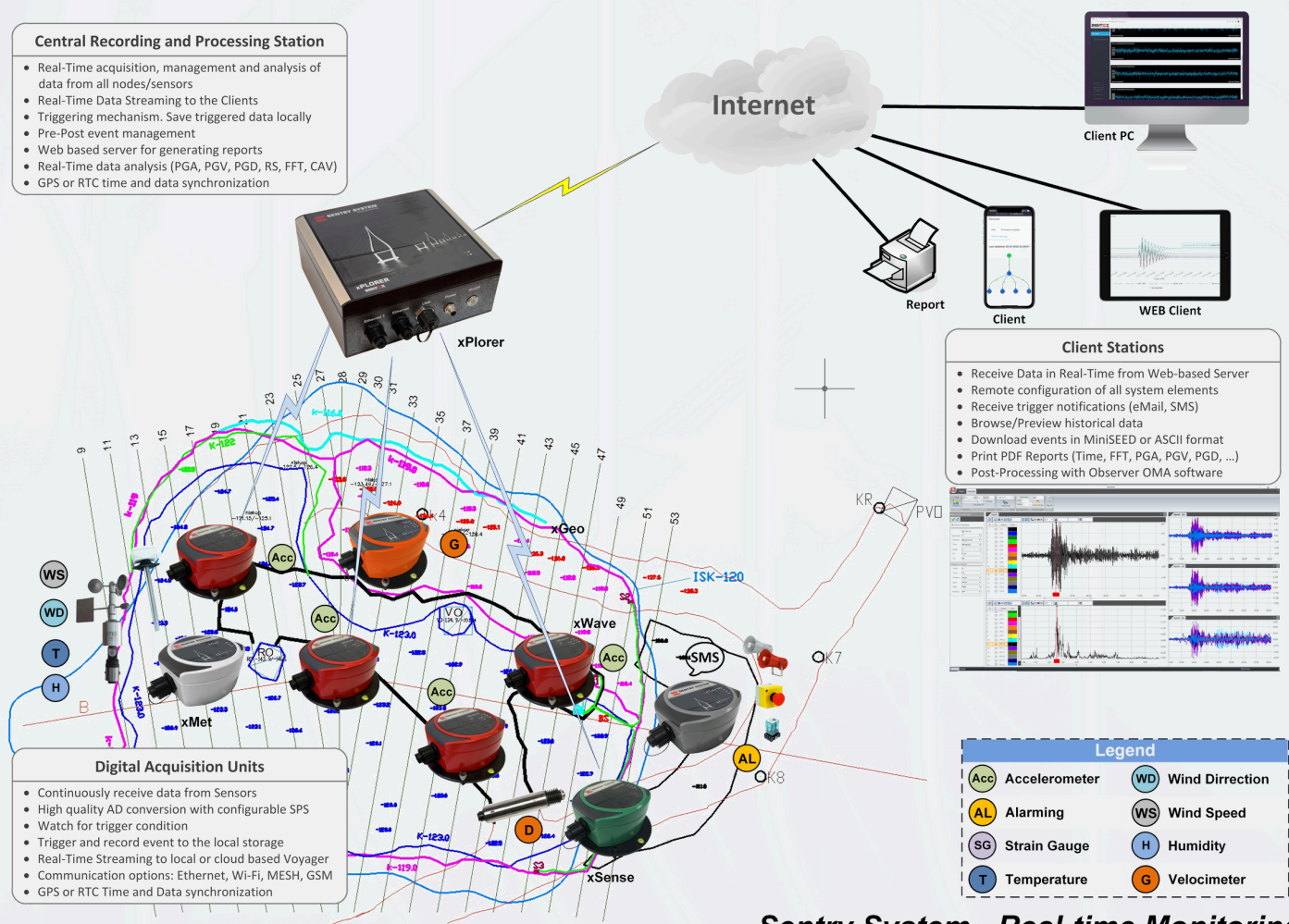
Each edge device records locally with Store&Forward® to survive link outages and auto-backfills the moment connectivity returns. Operators and engineers work in a single workspace: configuring devices, watching real-time streams, setting thresholds and alarms, and exporting reports. With Observer for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