

Construction Sites Monitoring — Solution Brief

Safety-first monitoring for large-scale construction — SafeZone and SmartBolt modules and BLE sensor nodes, aggregated by the Gateway to the 5Tech dashboard, giving the site team a live view of equipment, structures, restricted zones, and site conditions, with alerts and reports.

construction-monitoring · Revision Draft (Preliminary) · 2026-07-07 · Status: **PRELIMINARY**

PRELIMINARY. This brief describes intended solution behaviour built from the 5Tech hardware stack. Business outcomes and site figures marked [TBD] are pending confirmation from a reference deployment and must not be treated as committed results.

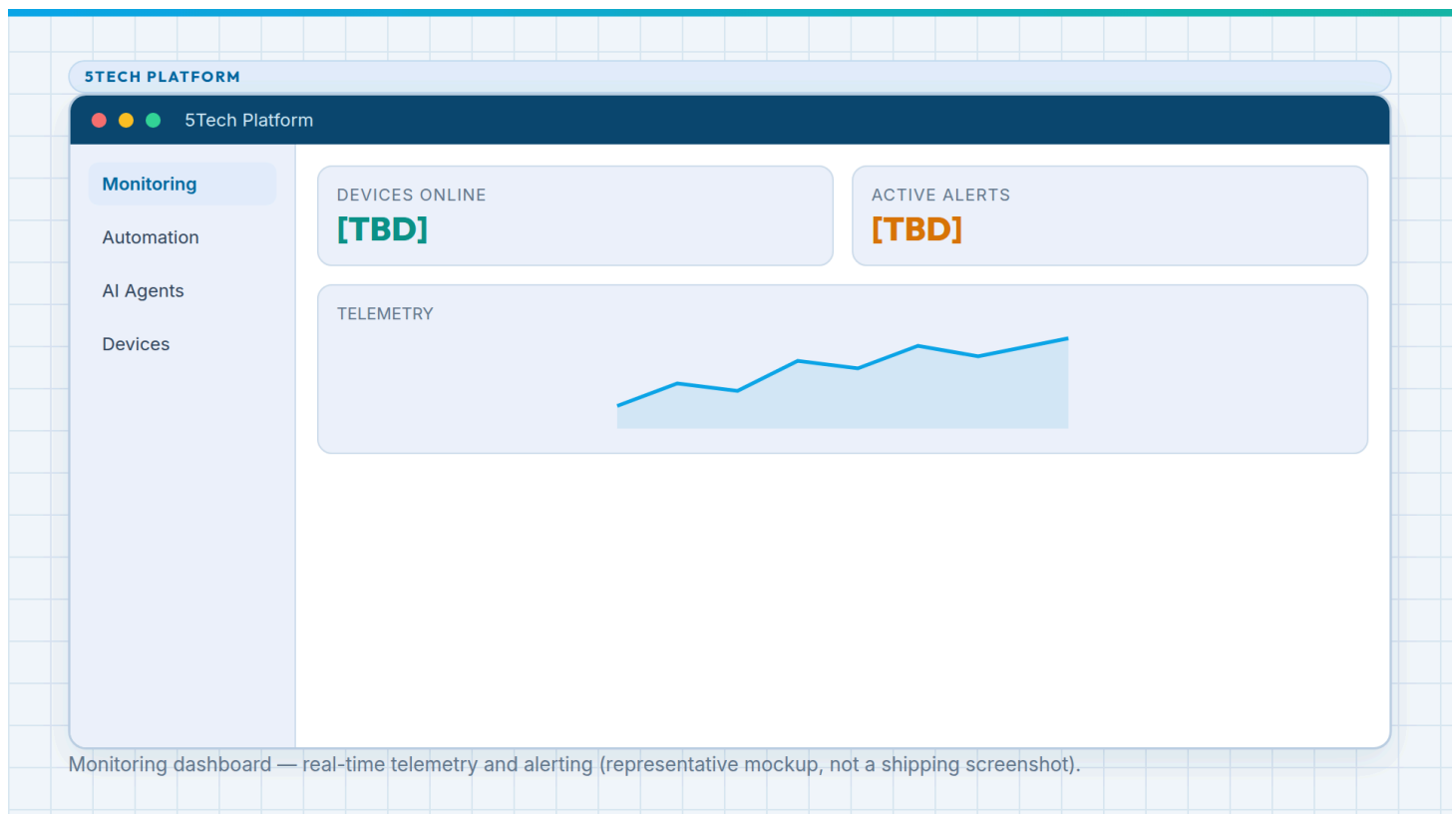


Figure FIG-001 — A large-scale construction site under continuous 5Tech safety monitoring.

The outcome

Large-scale construction is a moving, hazardous environment: people work alongside cranes, heavy plant, and load-bearing structures that change by the hour. **Construction Sites**

Monitoring puts safety first — it continuously watches the *people-and-plant* boundary, the condition of the *equipment and structures* holding the site up, and the *site conditions* around them, and turns what it sees into timely alerts and reports for the site team.

The solution combines Sensorium™ field sensing with the 5Tech dashboard:

- **Restricted-zone alerting.** SafeZone safety sensors detect personnel or equipment entering a restricted or danger zone near machinery and raise alerts through the Gateway to the dashboard. SafeZone is an alerting sensor — it raises alerts, it does not stop machinery.
- **Equipment & structure monitoring.** SmartBolt fastener modules on cranes, scaffolding, and other load-bearing connections monitor load, vibration, looseness, stress, and movement-related signals, so a change worth inspecting is flagged early. This is monitoring support that informs inspection — not certified structural-health monitoring.
- **Site conditions.** BLE sensor nodes add vibration, temperature, motion, and environmental readings from equipment and around the site.
- **Alerts and reports.** Every signal is aggregated onto the 5Tech dashboard, so supervisors and HSE staff see the site's monitored state at a glance. AI-assisted alert rules prioritise the events that matter and generate status and compliance reports — the site team stays in control of every decision.

Quantified outcomes (incident reduction, downtime avoided, response times) are deployment-specific and are [TBD] until measured on a reference site — this brief does not claim a number it has not verified.

Solution architecture



Figure FIG-002 — SafeZone and SmartBolt modules and BLE sensor nodes aggregate through the Gateway to the 5Tech dashboard, where monitoring, alerts, and AI-assisted reports give the site team visibility.

The solution is assembled from the Sensorium™ hardware stack and the 5Tech dashboard. Each product keeps its own datasheet as the source of truth for specifications; this brief links to them rather than re-stating values.

- **Sense — restricted zones.** [Sensorium™ SafeZone Safety Sensor](#) detects entry into a restricted or danger zone near machinery and mobile equipment and raises alerts through the Gateway. An alerting sensor — not a certified safety-stop system.
- **Sense — equipment & structure.** [Sensorium™ SmartBolt](#) fastener modules on cranes and scaffolding monitor load, vibration, looseness, stress, and movement-related signals and report wirelessly to the Gateway. Monitoring support that informs inspection — not certified structural-health monitoring.
- **Sense — site conditions.** [Sensorium™ BLE sensor nodes](#) add vibration, temperature, motion, and environmental readings from equipment and around the site.
- **Connect.** The [Sensorium™ Gateway](#) aggregates and pre-processes field data on-site and links it to the 5Tech dashboard over Wi-Fi, Ethernet, or a cellular option using MQTT, with local edge processing so basic events are handled even when connectivity is intermittent.
- **Decide.** The **5Tech dashboard** turns that data into visibility and action: sensor monitoring and device status, alerts and notifications, historical data, and rule-based automation that

can route events into existing workflows. AI-assisted reporting prioritises events and produces status and compliance summaries — recommendations for the site team, who make the decisions.

How it works

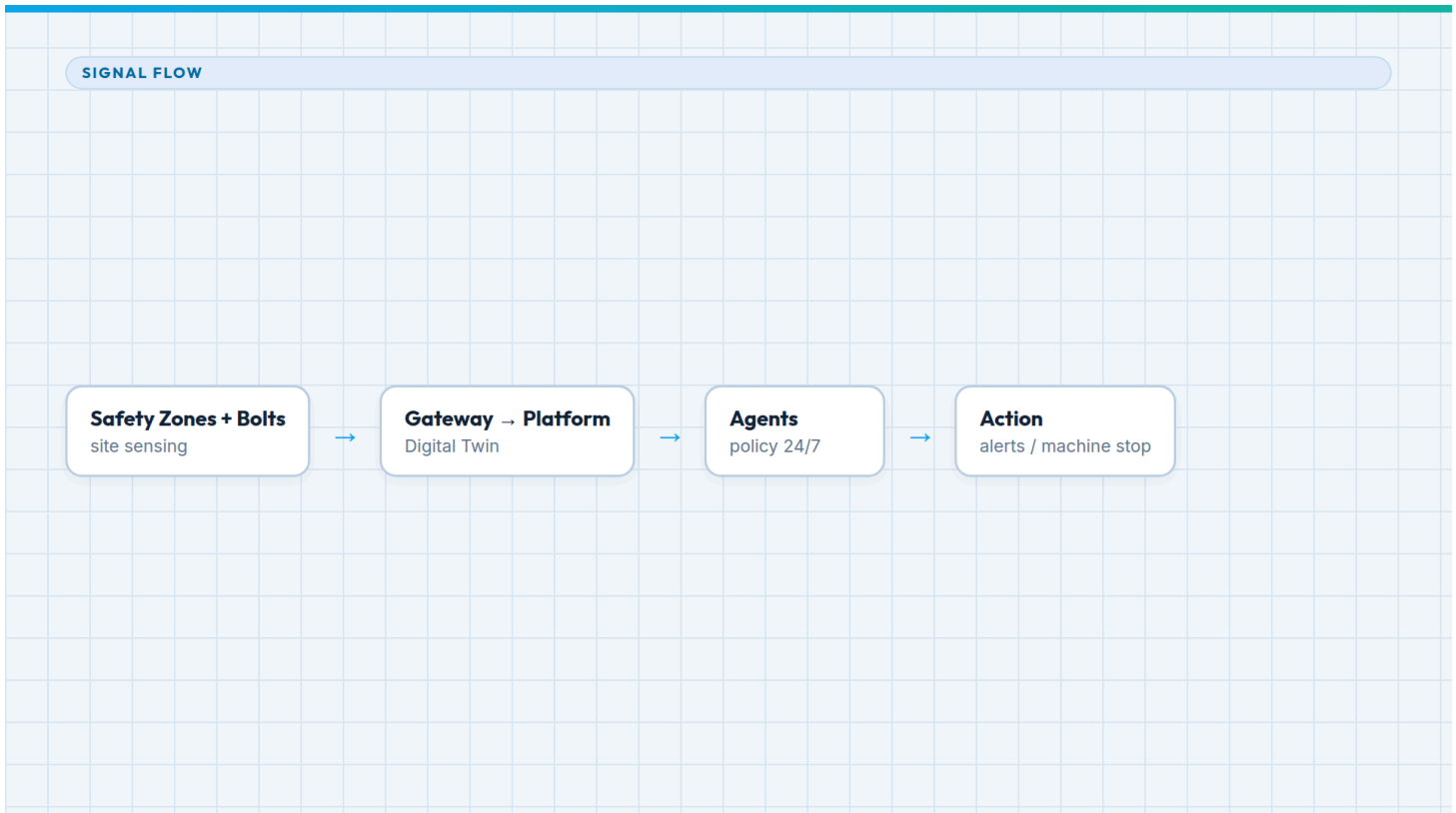


Figure FIG-003 — Site sensing feeds the Gateway and the 5Tech dashboard; AI-assisted rules raise alerts and reports for the site team.

1. **Site sensing.** SafeZone sensors watch restricted zones around plant and machinery; SmartBolt modules report load and movement-related signals from crane and scaffold connections; BLE sensor nodes report equipment and site conditions.
2. **Aggregate.** The Sensorium™ Gateway collects and pre-processes these streams on-site and forwards them to the 5Tech dashboard over its network uplink.
3. **Monitor.** The dashboard maintains a live view of the site's monitored state — restricted- zone activity, equipment and structure condition, and site conditions — in one place, with historical data.
4. **Alert rules.** AI-assisted rules evaluate the incoming signals against the site's thresholds and safety policy, prioritise the events that matter, and generate status and compliance reports.
5. **Action.** Outcomes are **alerts** to operators and HSE staff and **reports** to supervisors and management. The site team decides on any physical response — pausing equipment,

clearing a zone, or inspecting a connection. Alerts and reports keep the dashboard picture current.

What's included

LAYER	COMPONENT
Hardware	Sensorium™ SafeZone Safety Sensor · Sensorium™ SmartBolt · Sensorium™ BLE sensor nodes · Sensorium™ Gateway
Platform	5Tech dashboard — sensor monitoring, device status, alerts & notifications, historical data; rule-based automation and workflow integration
AI-assisted	Alert rules (prioritise critical events) · status & compliance reporting · inspection/maintenance recommendations — human-in-the-loop

Exact device counts, zone layout, and per-site configuration are scoped per deployment: **[TBD]**.

Deployment & services

The solution is delivered through the 5Tech lifecycle services:

- **Pilot & Proof-of-Value** — a focused 6–8 week deployment on a representative area of the site to prove the monitoring and ROI case before scale-up.
- **Deployment & Integration Support** — help rolling out across the site: commissioning, training, and integration with existing site systems.
- **Monitoring & Maintenance Support** — ongoing support and continuous optimization of the alert rules, alerts, and reports.

Commercial terms, SLAs, and site-specific scope are **[TBD]**.

Signal & alert behaviour

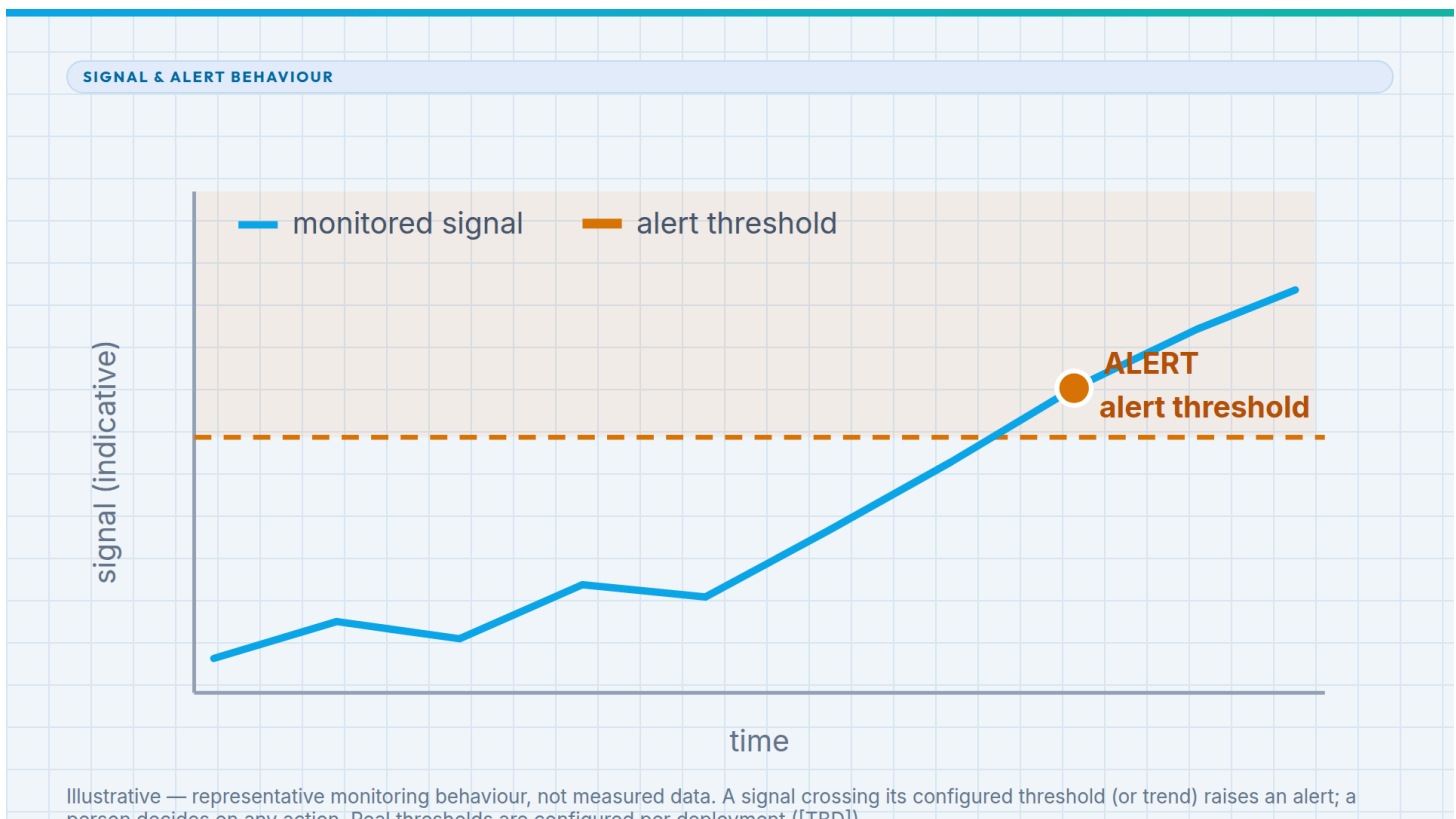


Figure FIG-004 — Illustrative — a monitored signal crossing its configured alert threshold (or an abnormal trend) raises an alert; a person decides on any action. Representative behaviour, not measured data.

Monitored signals from SafeZone, SmartBolt, and the BLE sensor nodes feed the 5Tech dashboard; when a signal crosses a configured threshold or shows an abnormal trend, an **ALERT** is raised and a person decides on any action (illustrative; thresholds configured per deployment, [TBD]).

Example monitored signals & alerts

WHAT IS MONITORED	EXAMPLE ALERT	WHO ACTS
Restricted-zone entry near machinery (SafeZone)	Personnel or equipment entered a restricted or danger zone	Site supervisor / HSE staff
Fastener looseness on a crane or scaffold joint (SmartBolt)	Looseness or load change flagged for inspection	Inspection / structural team
Equipment vibration (BLE sensor node)	Vibration trending above its configured level	Site engineer / maintenance
Illustrative — representative, not measured; configured per deployment ([TBD]).		

Figures

ID	TITLE	STATUS	FILENAME	PURPOSE
FIG-001	Monitored Construction Site — Hero	Missing	images/hero_construction_monitoring.png	Solution-brief cover / hero
FIG-002	Solution Architecture	Missing	diagrams/solution_architecture.png	Which products, Platform features, and agents combine
FIG-003	Signal & Decision Flow — Site Safety	Missing	diagrams/signal_flow_site_safety.png	Data and decision path from sensing to action
FIG-004	Signal & Alert Behaviour (illustrative)	Missing	diagrams/signal_threshold_chart.png	How a monitored signal crossing a threshold raises an alert (illustrative)

This brief is preliminary and subject to change. Figures are indexed in [figures.json](#); see [references.md](#) for sources and [revision.md](#) for change control. Product specifications live in the linked Sensorium™ datasheets, which are the source of truth. Web target: [/solutions/construction](#).