

Sensorium™ SmartBolt — Sensor Module

A fastener/bolt sensing module built on the BLE Smart Sensor Node Platform: monitors load, vibration, looseness, stress, and movement-related signals and sends data to the Gateway. Monitoring support — not a certified structural-health inspection system.

`sensorium-smart-bolt` · Sensorium™ · Revision Draft (Preliminary) · 2026-07-07 · Status: **Preliminary**

PRELIMINARY. This overview describes intended functionality and links to the detailed documents. Specifications are not stated here — see the datasheet. Items marked `[TBD]` are pending confirmation and must not be treated as final.



SENSORIUM™

Sensorium™ SmartBolt

Sensorium™ SmartBolt — a fastener sensing module in the Sense layer of the Sensorium™ family.

Figure FIG-001 — Sensorium™ SmartBolt, a fastener sensing module in the Sense layer of the Sensorium™ family.

What it is

The **Sensorium™ SmartBolt** is a fastener/bolt **sensing module** in the **Sense** layer of the 5Tech Sensorium™ family, built on the **BLE Smart Sensor Node Platform**. It instruments a bolted joint to monitor **load, vibration, looseness, stress, and movement-related signals** over the life of the joint (FIG-001). The sensing element is **[TBD]**. Each bolt reports over **BLE** to a Sensorium™ Gateway, which forwards its data to the **5Tech Platform**. There, the dashboard and pipeline visualize trends and the automation/AI logic can flag joints that may need attention and suggest maintenance — recommendations for a person to review, not automatic actions.

It provides **monitoring support** — **NOT a certified structural-health inspection system**. It does not predict structural failure, and no structural-health-monitoring certification is claimed. It is for operators who want added visibility of bolted joints they cannot easily or frequently inspect.

Where it fits

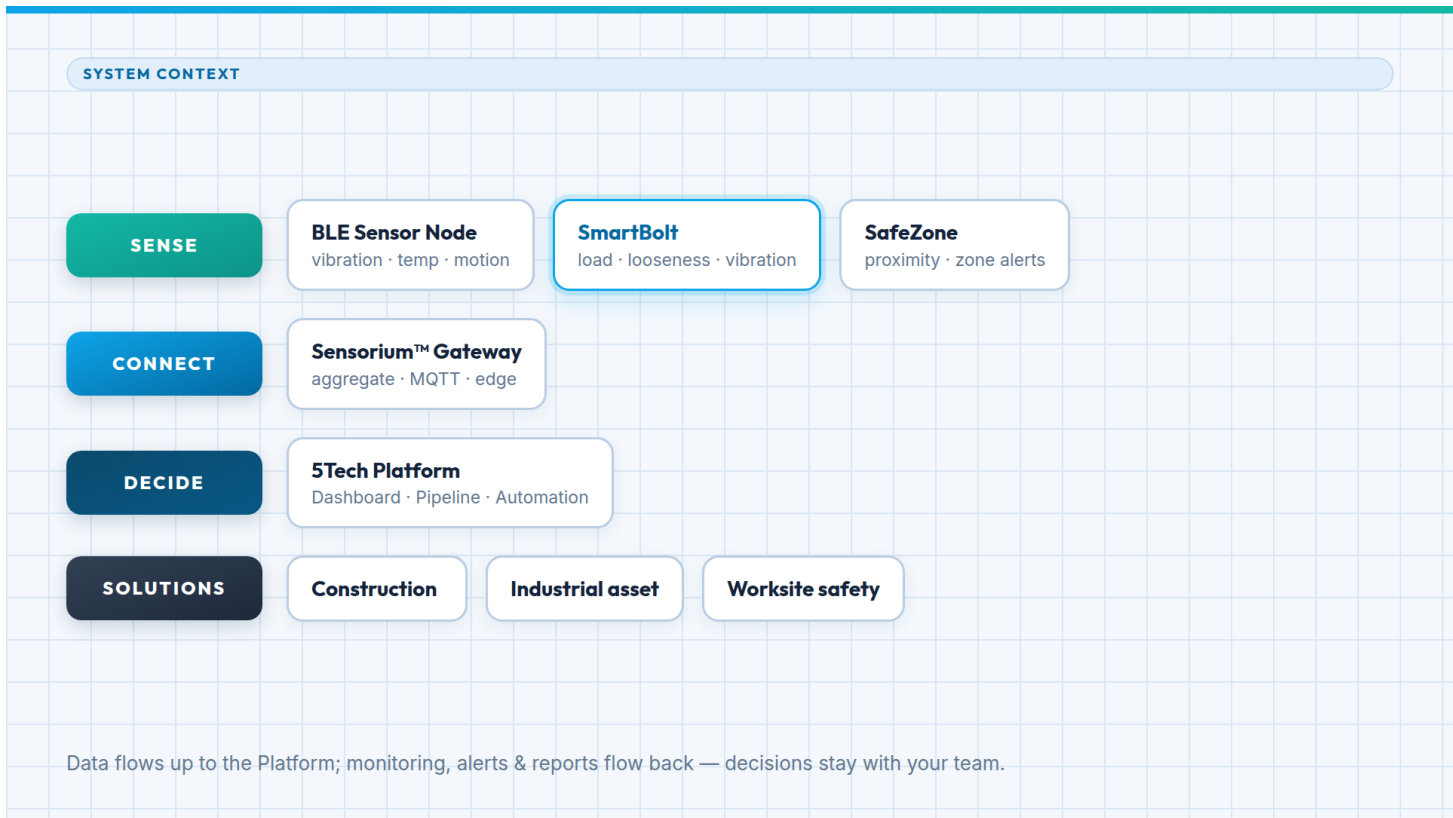


Figure FIG-002 — Sense → Connect → Decide. The Smart Bolt is a Sense device; its data reaches the 5Tech Platform through the Sensorium™ Gateway.

In the 5Tech chain, the SmartBolt is a **Sense**-layer module on the **BLE Smart Sensor Node Platform** (FIG-002), a sibling of the **SafeZone** module; the **ESP32 Edge IoT Bridge** (Phase-1 MVP) validates the sensor-to-cloud pipeline. It does not connect to the Platform directly: each

bolt links over **BLE** to a **Sensorium™ Gateway** (Connect), which aggregates and forwards its data over MQTT to the **5Tech Platform** (Decide). On the Platform, the **dashboard** visualizes load, vibration, and looseness trends, and the **automation/AI logic** can raise alerts and maintenance recommendations for an operator to review — a person is always in the loop. In packaged solutions, SmartBolts pair with SafeZone modules in **Construction Site Monitoring** and underpin **Fastener / Bolt Monitoring** and **Industrial Asset Monitoring**.

Highlights

- Instruments a bolted joint to monitor **load, vibration, looseness, stress, and movement-related signals** — sensing element [\[TBD\]](#).
- Designed to instrument a bolted joint in place of a standard fastener.
- **BLE** reporting to the Sensorium™ Gateway — no separate wired run to each bolt.
- **Continuous** monitoring of joint condition in place of periodic manual checks — **monitoring support, NOT a certified structural-health inspection system**.
- Feeds the 5Tech Platform's monitoring and rule-based/predictive **monitoring** to surface joints that may need attention; it does not predict structural failure.
- Sensing element, mechanical, electrical, wireless, and environmental ratings: see the datasheet. [\[TBD\]](#)

Documentation for this product

DOCUMENT	WHERE	STATUS
Datasheet	../../../../datasheets/sensorium-smart-bolt-datasheet/	[TBD]
Manual	../../../../manuals/sensorium-smart-bolt-manual/	[TBD]
Installation guide	../../../../installation/sensorium-smart-bolt-installation/	[TBD]

Ordering

[TBD — order codes are defined in the datasheet. Bolt size, grade, and sensing options will map to order suffixes once finalised.]

Works with: Sensorium™ Gateway (aggregation and uplink) · 5Tech Platform (Dashboard · MQTT/Cloud Pipeline · Automation/AI Logic). A module of the BLE Smart Sensor Node Platform, alongside the SafeZone module.

Figures

ID	TITLE	STATUS	FUTURE FILENAME	PURPOSE
FIG-001	Industrial Hero Render	Missing	<code>renders/hero_sensorium_smart_bolt.png</code>	Cover / hero image
FIG-002	System Context — Sense → Connect → Decide	Missing	<code>diagrams/system_context_sense_connect_decide.png</code>	Where the Smart Bolt sits in the Sense → Connect → Decide chain