Sensorium™ Gateway — Universal IoT Gateway — User & Operation Manual

Operation, configuration, and maintenance of the Universal IoT Gateway.

`sensorium-gateway` · Revision Draft (Preliminary, PROPOSED) · 2026-07-18 · Status: **PRELIMINARY**

PRELIMINARY — PROPOSED VALUES. Values marked ‡ are proposed, industry-typical figures for this product class, provided so no procedure or setting is left blank. They are **not measured and not final**, and no value in this manual is a certification claim. Timings, indicator patterns, and intervals below are ‡ proposed and must be confirmed against the production unit before they are relied on for commissioning, safety, or service. A remaining `[TBD]` marks a legal/contractual term (warranty) that must not be invented. Always follow the documentation and rating label shipped with your unit. See §11 for change control.

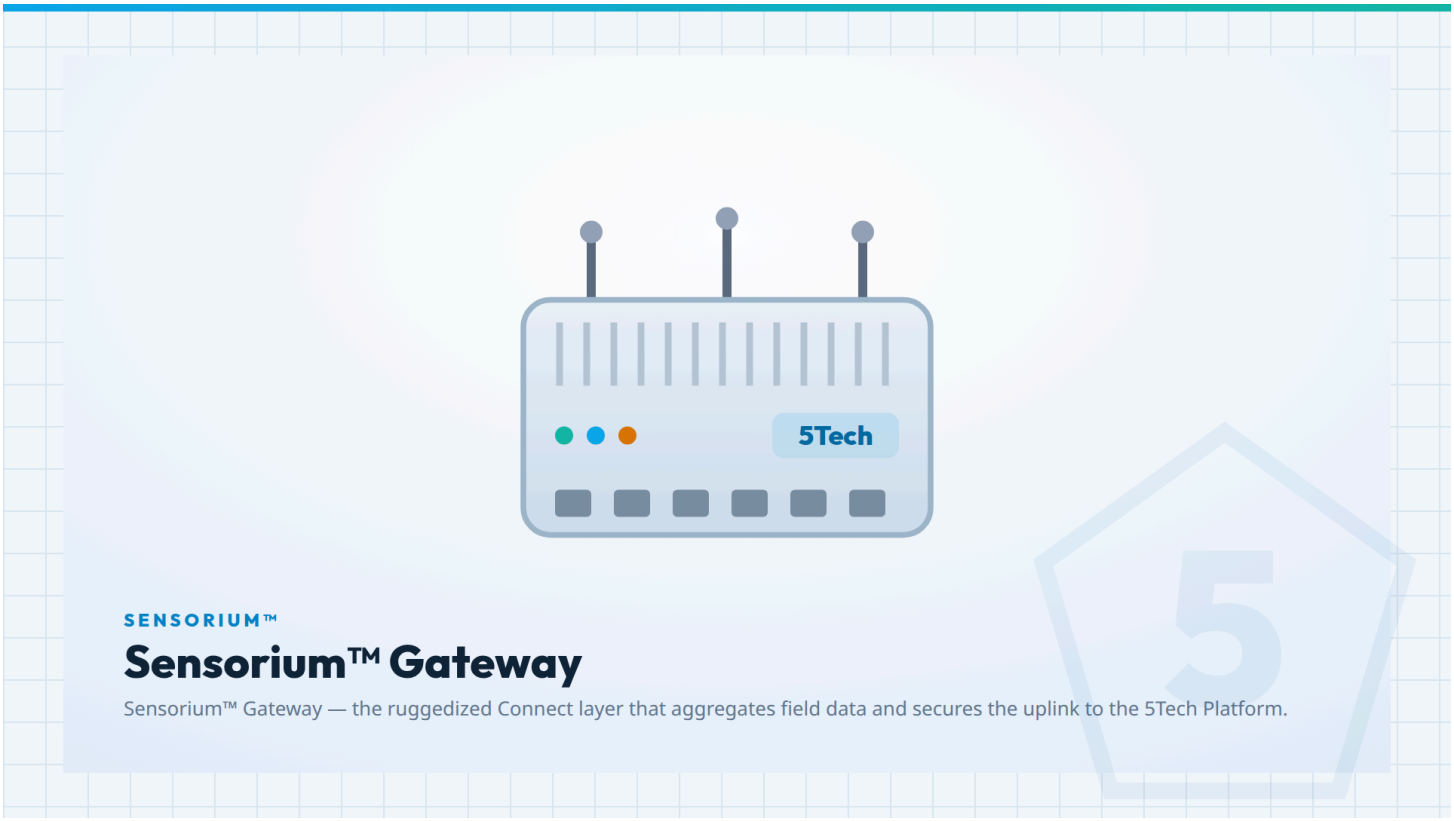

Figure FIG-001 — Sensorium™ Gateway, the ruggedized Connect layer that aggregates field data and secures the uplink to the 5Tech Platform.

1. Safety

Read this chapter in full before you install, operate, or service the Sensorium™ Gateway. Keep this manual with the equipment for the life of the product.

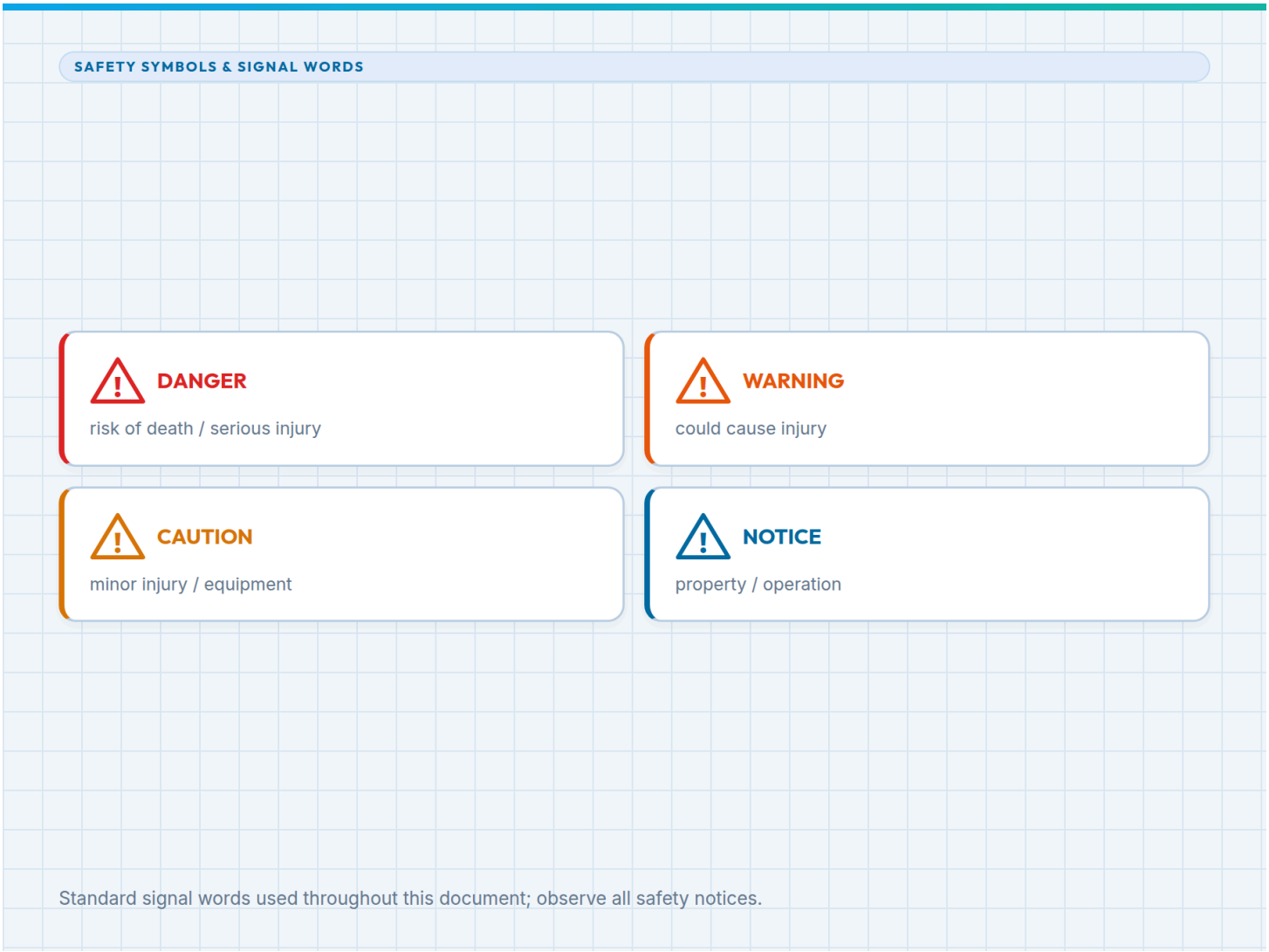

Figure FIG-002 — Signal words (DANGER · WARNING · CAUTION · NOTICE) and the hazard pictograms used in this manual.

1.1 Signal words

This manual uses four signal words. Each is paired with the pictograms in Figure FIG-002.

SIGNAL WORD	MEANING
DANGER	Hazard that **will** cause death or serious injury if not avoided.
WARNING	Hazard that **could** cause death or serious injury if not avoided.
CAUTION	Hazard that could cause minor or moderate injury if not avoided.
NOTICE	Practice that could cause property or equipment damage, but not injury.

1.2 Qualified personnel

> **WARNING — Qualified personnel only.** Installation, electrical connection, commissioning, and service of the Gateway must be performed only by qualified personnel who are trained in local electrical and RF safety practice and who have read and understood this manual and the installation guide. Unqualified work can cause electric shock, fire, or equipment damage.

For the purpose of this manual, *qualified personnel* are individuals who:

- Are trained and authorized to energize, de-energize, ground, and tag equipment per local code.
- Understand the electrical and radio-frequency hazards described in this chapter.
- Are trained in the installation and operation of the equipment and its protective devices.

1.3 Intended use

The Sensorium™ Gateway is intended to aggregate data from Sensorium™ field devices (Zone Awareness sensors and SmartBolt sensing modules) over BLE and from third-party sensors, pre-process that data at the edge, and transmit it over a secure network uplink — MQTT over TLS on Wi-Fi or Ethernet, with an optional cellular module — to the 5Tech Platform. It is designed for fixed installation at industrial and remote sites within its targeted environmental limits (ruggedized die-cast aluminium enclosure; ingress protection **IP65‡** per IEC 60529 — see the datasheet §8).

Any other use is considered misuse. In particular, the Gateway is **not** a safety controller and **not** a machine-safety device: it does not by itself stop machinery or create protective zones. Its monitoring, indicators, and alerts are **not a safety-rated protective function** and must not be the sole means of protecting personnel.

1.4 Electrical safety

> **DANGER — Electric shock.** De-energize and lock out/tag out all power inputs before wiring, unwiring, or servicing the Gateway. The unit has redundant power inputs (A and B) — **both** may be live even if one is switched off. Verify zero energy on every input before touching a terminal.

- Connect, disconnect, and service power wiring only with all supply inputs de-energized.
- The Gateway accepts a **redundant 9–36 V DC** supply on each input (24 V nominal); use only the supply voltage, current, and protective-device ratings confirmed on the product rating label and in the datasheet §6. Do not exceed the stated input range.
- Bond the enclosure to protective earth via the grounding/earth stud before applying power. Do not operate the unit without a verified earth connection.
- Use only supplies, fuses, and disconnects rated for the installation. The unit provides reverse-polarity protection on both inputs and DC-input surge immunity (±2 kV‡ line-to-earth, per IEC 61000-4-5); confirm the values in the datasheet §6 before energizing.

1.5 Radio-frequency (RF) safety

The Gateway transmits on Wi-Fi through external SMA-mounted antennas and, on the optional cellular variant, on a cellular radio through a separate external SMA antenna. Its Bluetooth Low Energy (BLE) radio uses an internal antenna that radiates through the non-metallic polycarbonate cap; there is no external BLE antenna to handle.

> **WARNING — RF exposure.** Maintain a minimum antenna-to-person separation distance of **20 cm‡** from each transmitting antenna during operation. This separation is a **‡** proposed value pending radio type-approval for your region and antennas; the maximum permitted radiated power is set by that type-approval (datasheet §9) and is not yet held. Do not position personnel closer than the confirmed separation distance while the radios transmit.

- Install and orient antennas per the installation guide; use only antennas approved for the unit. Substituting antennas can violate RF-exposure and radio-type approvals.
- Do not operate a transmitter with its antenna disconnected or damaged.
- Radio type-approvals and permitted frequency bands are region-specific and not yet held (see the datasheet §9). Operate only where the radios are approved.

1.6 Environmental and handling

> **CAUTION — Hot surface, burn hazard.** During operation the enclosure and heat-sink fins can reach an external surface temperature of up to **+80 °C‡** (at +70 °C ambient and 18 W load, per datasheet §8) — hot enough to cause burns. Allow the unit to cool before handling, or wear protective gloves. Do not mount it where incidental contact is likely.

- Operate the unit only within its rated environmental limits (see the datasheet §8). The **IP65‡** ingress rating (IEC 60529) is effective only when all connectors are mated or capped and all seals are intact; it is a ‡ targeted rating and not yet certified.
- Do not open, drill, or modify the sealed enclosure. There are no operator-replaceable parts inside; opening it voids the ingress rating and the warranty.

1.7 Residual risks

Even when used as intended, the following residual risks remain: electric shock from external supply wiring, RF exposure near active antennas, burns from hot surfaces, and loss of data uplink during connectivity gaps (mitigated, but not eliminated, by local edge buffering). Observe the warnings in Chapters 5–7 that address each of these.

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2. About this manual

Scope. This manual covers day-to-day operation, configuration, maintenance, and troubleshooting of the Sensorium™ Gateway by trained operators and maintenance technicians. It does **not** cover mechanical mounting and initial wiring — see the installation guide.

Audience. Qualified operators, maintenance technicians, and integrators as defined in §1.2.

Conventions.

- Safety notices use the signal words defined in §1.1 and appear **before** the step they apply to.
- Procedures are numbered, one action per step, in the imperative voice. The expected result follows the action where useful.
- ‡ marks a proposed, industry-typical value supplied so the manual carries no blank; it is not measured or final and must be confirmed against the production unit. `[TBD]` marks a legal/contractual value that must not be invented.
- `Monospace` denotes labels, order codes, indicator names, and terminal/UI text.

Related documents.

DOCUMENT	LOCATION	USE
Datasheet	`datasheets/sensorium-gateway-datasheet/`	Full specifications, interfaces, ratings
Installation guide	`installation/sensorium-gateway-installation/`	Mounting, wiring, commissioning
Zone Awareness / SmartBolt datasheets	respective folders	The field devices this Gateway aggregates
5Tech Platform overview	Platform documentation	The monitoring, automation, and AI-assisted destination (Triage · Compliance · Reporting · Summary)

3. Product overview & theory of operation

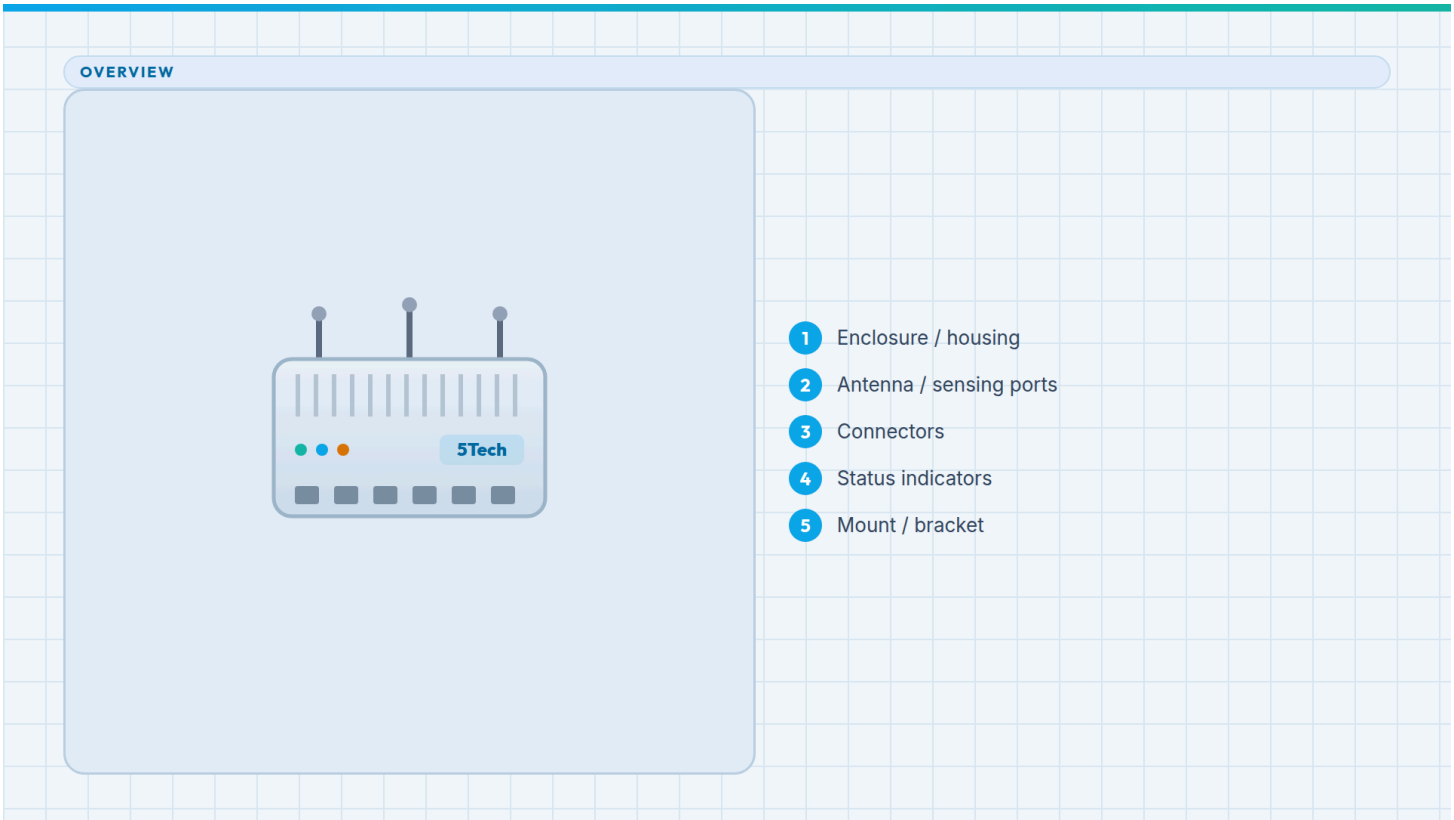

Figure FIG-003 — External features of the Sensorium™ Gateway with numbered callouts and legend.

3.1 What it does

The Sensorium™ Gateway is the **Connect** module of the 5Tech Sensorium™ family. It is the local hub for a site: it aggregates BLE data from Sensorium™ field devices and third-party sensors, pre-processes that data at the edge, and securely transmits results to the 5Tech Platform over MQTT. It is built for remote and industrial environments where reliable connectivity cannot be assumed.

3.2 Where it sits — Sense → Connect → Decide

The Gateway is the bridge between **Sense** (field devices) and **Decide** (the 5Tech Platform). Sensor data flows up through the Gateway to the Platform; monitoring, automation, and configuration flow back down.

- **Sense** — Sensorium™ Zone Awareness (proximity / zone-presence sensing) and SmartBolt (load, vibration, and looseness sensing) modules report conditions in the field.
- **Connect** — the **Sensorium™ Gateway** aggregates and pre-processes their data.
- **Decide** — the 5Tech Platform (monitoring, automation, and AI-assisted helpers) turns data into human-in-the-loop action.

3.3 Theory of operation (operator depth)

Internally, the Gateway performs four functions in sequence:

1. **Field I/O** — it receives data from Sensorium™ devices over BLE (an internal antenna behind the polycarbonate cap) and from third-party sensors/PLCs over its wired field interfaces.
2. **Edge compute** — it buffers, filters, and pre-processes that data locally, so the site keeps functioning and no data is lost during connectivity gaps.
3. **Network uplink** — it forwards results to the 5Tech Platform over MQTT, using Wi-Fi or Ethernet (or the optional cellular module where fitted).
4. **Power & integrity** — redundant power conditioning and a hardware watchdog keep it running and self-recovering.

Network uplink. The Gateway connects to the 5Tech Platform over Wi-Fi (2.4/5 GHz, external RP-SMA antennas) or Gigabit Ethernet and publishes data using MQTT. Where wired or Wi-Fi backhaul is not available, an optional factory-fitted LTE cellular module (external SMA antenna) can carry the uplink. Supported bands and the cellular option are detailed in the datasheet §7.

Edge buffering. When no network path is available, the Gateway buffers pre-processed data locally (**≥ 72 h‡** store-and-forward, per datasheet §1) and transmits it once connectivity is restored.

Redundant power. Two independent **9–36 V DC** power inputs (A and B) feed the unit. If one input fails, the other maintains operation without interruption. Input ratings are in the

datasheet §6.

Secure uplink. The link to the 5Tech Platform is authenticated and encrypted: **MQTT over TLS 1.2/1.3‡** with a **per-device X.509 client certificate‡** for mutual authentication. No plaintext MQTT is offered. See the datasheet §7.

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4. Controls & indicators

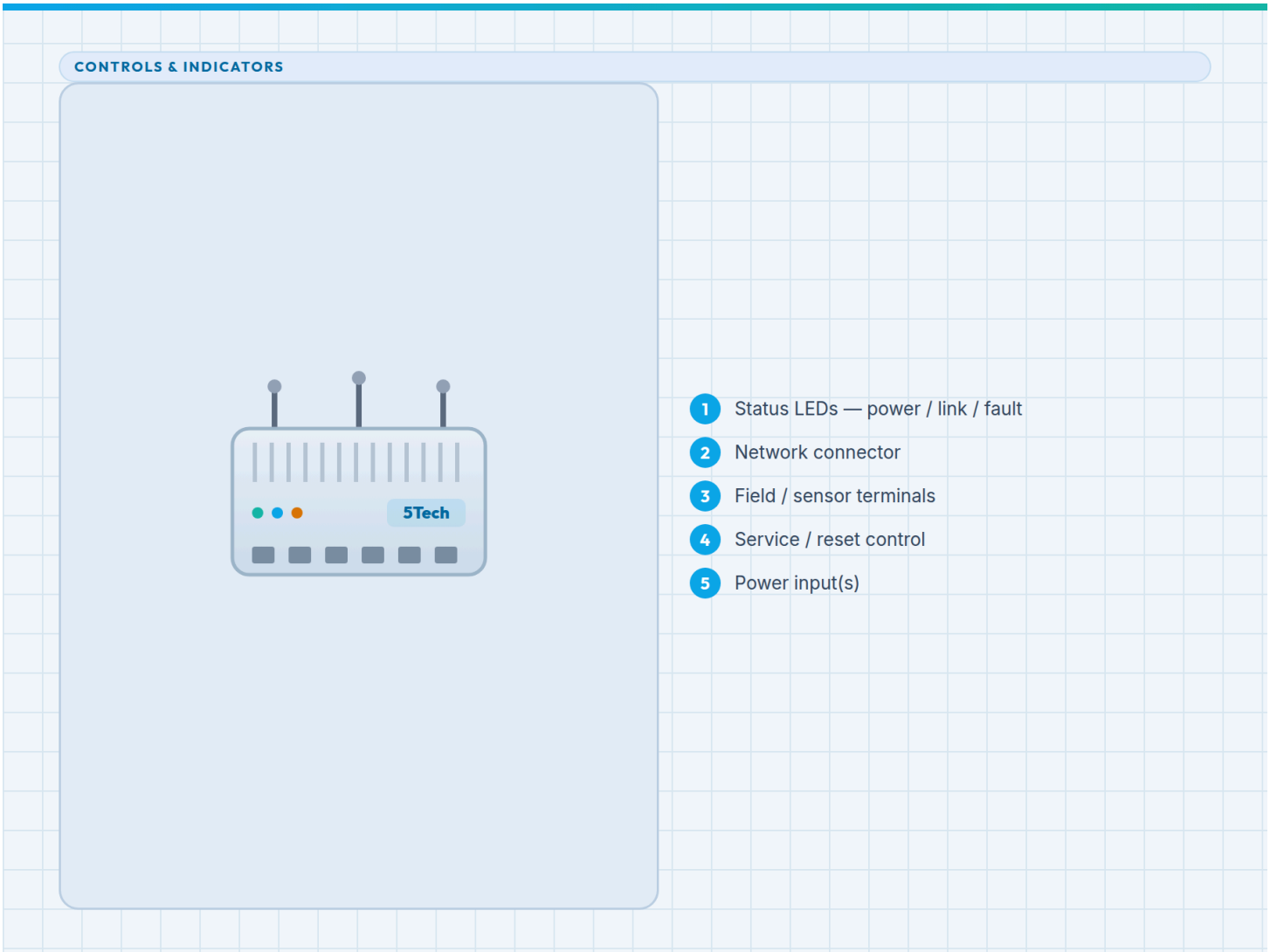

Figure FIG-004 — Controls, connectors, and status LEDs with a numbered legend.

The table below lists every operator-facing control, connector, and indicator. Indicator colours and blink rates are ‡ proposed and will be confirmed against the production unit; use the legend printed on your unit and in Figure FIG-004 where it differs.

CONTROL / INDICATOR	FUNCTION	STATES (‡ PROPOSED)
`PWR` / status LED	Overall power and health	Off = no power · Solid green = powered and healthy · Blinking green ~1 Hz‡ = start-up in progress · Solid amber = running on one input only (A or B lost)‡ · Blinking amber ~1 Hz‡ = configuration or firmware update in progress
`NET` / uplink LED	Wi-Fi / Ethernet uplink status	Off = link down · Blinking blue ~1 Hz‡ = associating / connecting · Solid blue = uplink up, MQTT/TLS session established‡
`WAN-CELL` LED	Cellular link status (optional module)	Off = not fitted / down · Blinking ~1 Hz‡ = registering on network · Solid = registered, data session up‡
`LAN` / link LED	Local network / field-device link	Off = no link · Solid = link up · Blinking = activity‡
`FAULT` LED	Fault indication	Off = no fault · Solid red = active fault · Red blink code = fault class (see below)‡
Reset / service button	Recessed button for restart and recovery	Press durations in §4.1‡
Power input A	Redundant supply input A (9–36 V DC)	Energized / de-energized
Power input B	Redundant supply input B (9–36 V DC)	Energized / de-energized
Ethernet port(s)	Wired WAN / LAN / local devices / service	2× Gigabit Ethernet; one port software-assignable as wired WAN (datasheet §7)
Fieldbus / serial terminal	Sensor and PLC integration	Isolated RS-485 (Modbus RTU); see datasheet §7
SIM / eSIM access	Cellular provisioning (optional module) behind a gasketed hatch	Present / absent
Antenna ports (external SMA)	2× RP-SMA Wi-Fi; 1× SMA cellular (`-C` variant only). BLE uses an internal antenna behind the polycarbonate cap — no external port.	Per datasheet §7

`FAULT` **blink codes (‡ proposed).** When the `FAULT` LED blinks red, count the blinks in each group; interpret against the legend on your unit if it differs.

BLINKS‡	FAULT CLASS	FIRST ACTION
1	Power / input fault (one or both inputs out of range)	Verify inputs A and B (§8)
2	Uplink fault (no Wi-Fi / Ethernet / cellular path)	Check the uplink and antennas (§8)
3	Field / BLE sensor fault (nodes not reporting)	Check field-device power and mapping (§8)
4	Thermal fault (over-temperature)	Clear the heat-sink fins; check ambient (§7.2, §8)
5	Internal / self-test fault	Power-cycle (§5.6); if it recurs, contact support

> **NOTICE.** The reset/service button is recessed to prevent accidental operation. Do not press it during normal operation unless directed by a procedure in this manual or by 5Tech support.

4.1 Reset / service button press durations (‡ proposed)

PRESS DURATION‡	ACTION	NOTES
< 2 s‡ (tap)	No operational effect	Guards against accidental operation
Hold 5 s‡, then release	Orderly restart (reboot)	LEDs cycle, then the unit restarts (§5.6)
Hold 20 s‡, then release	Enter recovery mode	Only when directed by 5Tech support; re-provisioning is required afterwards (§6.6)

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5. Operation

The Gateway is designed for unattended, continuous operation. Once installed and commissioned (installation guide), routine operation is limited to power-on, verifying status, and orderly shutdown. Button timings and indicator patterns referenced below are ‡ proposed (§4).

5.1 Before you start

1. Confirm the unit has been installed and commissioned per the installation guide.
2. Confirm the enclosure, all connectors, and all seals are intact and mated or capped.
3. Confirm the antennas are connected and undamaged.
4. Confirm the enclosure is bonded to protective earth.

5.2 Power-on and status check

> **DANGER — Electric shock.** Do not touch power terminals during this procedure. Both power inputs may be live. Perform only with wiring already installed and covers in place.

1. Energize power input A at the external disconnect.
2. Energize power input B at the external disconnect.
3. Observe the `PWR` / status LED illuminate. *Expected: the LED blinks green as the unit begins its start-up sequence.*
4. Wait for the start-up sequence to complete. *Expected time: within 90 s‡ from power-on (cold start, 24 V, 25 °C).*
5. Verify the `PWR` / status LED is solid green (healthy — see §4).
6. Verify the `NET` / uplink LED (or the `WAN-CELL` LED, if the cellular module is fitted) shows a connected state.
7. Verify the `FAULT` LED is off.
8. If the unit does not reach a healthy state, go to Chapter 8, Troubleshooting.

5.3 Confirming the uplink to the Platform

1. Confirm the `NET` / uplink LED (or `WAN-CELL`, if fitted) shows a connected state (§4).
2. Open the 5Tech Platform Monitoring view for this site.
3. Verify the Gateway appears online and is reporting current data.
4. Verify the expected field devices (Zone Awareness, SmartBolt) appear through the Gateway.
5. If the Gateway is not online within the connect time — **within 120 s‡** of start-up on Wi-Fi/Ethernet, or **within 300 s‡** on cellular (allowing network registration) — go to Chapter 8.

5.4 Verifying reconnection after a network interruption (optional check)

> **NOTICE.** Perform this check only during a maintenance window; it briefly interrupts the network uplink.

1. Confirm the unit is online and reporting to the Platform.
2. With 5Tech support or per site procedure, briefly interrupt the active network path.
3. Observe the `NET` / uplink LED change state (returns to blinking while it re-associates).
4. Verify the unit re-establishes the uplink once the network path is restored.
5. Confirm the Platform shows no gap in data (local edge buffering covers the interruption).

5.5 Orderly shutdown

> **WARNING — Qualified personnel only.** De-energizing supply wiring is an electrical task.

1. Confirm no critical commissioning or update is in progress (the `PWR` LED is not blinking amber).
2. De-energize power input A at the external disconnect.
3. De-energize power input B at the external disconnect.
4. Verify all indicator LEDs are off.
5. For service on wiring, apply lock-out/tag-out and verify zero energy on every input before touching a terminal.

5.6 Restart

1. Perform an orderly shutdown (§5.5).
2. Wait **30 s‡** to allow the unit to power down fully and internal capacitors to discharge.
3. Perform power-on and status check (§5.2).

Alternatively, where directed and with covers in place, hold the recessed reset/service button for **5 s‡** and release to restart without removing supply power (§4.1).

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6. Configuration

Most configuration is delivered from the 5Tech Platform over the secure uplink; the Gateway requires little local configuration in normal use. Parameters, ranges, and defaults below are ‡ proposed and will be confirmed against the production firmware.

6.1 Configuration methods

METHOD	USE	NOTES
5Tech Platform (remote)	Routine settings, automation, and alert configuration	Primary method; authenticated over MQTT/TLS
Local service interface	Initial provisioning, recovery	Reached over a service Ethernet port (LAN); access credentials issued at commissioning‡
Reset / service button	Restart and recovery actions	Press durations in §4.1‡

6.2 Configurable parameters (preliminary)

PARAMETER	PURPOSE	RANGE / DEFAULT (‡ PROPOSED)
Uplink / network settings	Wi-Fi / Ethernet and optional cellular parameters	Set at commissioning; Wi-Fi 2.4/5 GHz, Ethernet auto-negotiate‡
Reconnection behavior	How the uplink retries after a network interruption	Automatic retry with back-off; buffered ≥ 72 h‡ (datasheet §1)
Edge buffering / retention	How much data is buffered offline	≥ 72 h‡ store-and-forward (datasheet §1)
Field-device / sensor mapping	Which devices this Gateway aggregates	Up to 50‡ BLE nodes (datasheet §1)
Reporting interval	How often data is uplinked	Configurable per deployment; 10 s–5 min typical‡
Security / device identity	Credentials and certificates	Per-device X.509 client certificate‡, TLS 1.2/1.3‡ (datasheet §7)

6.3 Cellular (SIM/eSIM) provisioning (optional module)

> **WARNING — Loss of environmental sealing.** Opening the SIM/eSIM hatch breaks a seal. The unit's **IP65‡** ingress protection is effective only when the hatch and its seal are correctly closed.

1. Perform an orderly shutdown (§5.5) unless hot-provisioning is confirmed supported for your firmware‡.
2. Open the gasketed SIM/eSIM access hatch.
3. Insert or provision the 4FF nano-SIM / eSIM per your carrier and 5Tech instructions.

4. Inspect the hatch seal for damage; replace if damaged (§7).
5. Close and secure the hatch until the seal is fully seated.
6. Power on (§5.2) and verify the `WAN-CELL` LED reaches a solid (connected) state within **300 s‡**.

6.4 Applying a configuration change

1. Confirm the change is authorized for this site.
2. Apply the change from the 5Tech Platform (preferred) or the local service interface.
3. Confirm the Gateway acknowledges the change (the `PWR` LED returns to solid green).
4. Verify operation is unaffected (§5.2, §5.3).
5. Record the change per your site's change-control procedure.

6.5 Firmware updates

> **NOTICE.** Do not remove power during a firmware update. Interrupting an update can leave the unit in a recovery state.

1. Confirm the update is approved for this unit and site.
2. Confirm power inputs A and B are stable.
3. Initiate the update from the 5Tech Platform.
4. Wait for the update to complete without removing power. *Duration: 10–20 min‡ typical, depending on package size and uplink; the `PWR` LED blinks amber throughout.*
5. Verify the unit returns to a healthy state (§5.2) and reports the new version.

6.6 Factory reset / recovery

> **CAUTION.** A factory reset removes local configuration and may interrupt the uplink until the unit is re-provisioned. Perform only when directed by 5Tech support.

1. Contact 5Tech support and confirm reset is the correct action.
2. Perform the recovery sequence with the reset/service button as directed — typically **hold for 20 s‡** until the LEDs indicate recovery mode, then release (§4.1).
3. Re-provision the unit from the 5Tech Platform (§6.1–§6.4).
4. Verify the uplink and field devices (§5.3).

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7. Maintenance

> **DANGER — Electric shock.** De-energize and lock out/tag out both power inputs and verify zero energy before any hands-on maintenance. Both inputs may be live independently.

The Gateway is a sealed unit with **no operator-replaceable internal parts**. Maintenance is limited to external inspection, keeping seals and connections sound, and keeping the enclosure clear for cooling. Do not open the enclosure. The internal RTC backup cell (≈ 5 yr‡ life, datasheet §6) is not operator-serviceable; return the unit to 5Tech when it is due.

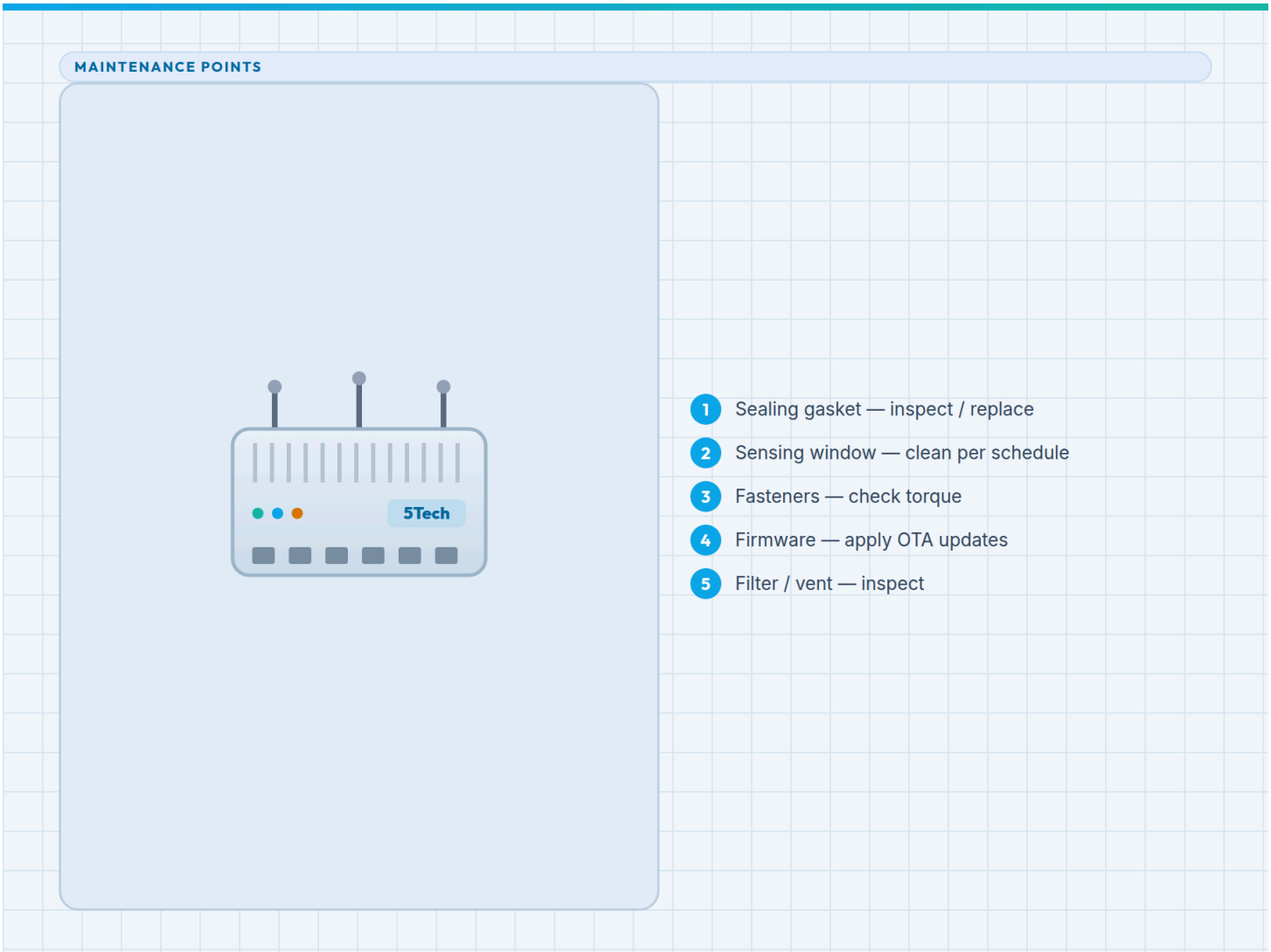

Figure FIG-005 — Operator-serviceable points and maintenance access of the Sensorium™ Gateway.

7.1 Maintenance schedule

Intervals below are ‡ proposed starting points; confirm against your site's maintenance policy and environment (shorten them in dusty, high-vibration, or high-temperature installations).

INTERVAL (‡ PROPOSED)	TASK	NOTES
Every 6 months‡	Visually inspect the enclosure, seals, and gaskets for damage	Preserves IP65‡ sealing
Every 6 months‡	Check antenna connections are tight and antennas undamaged	Protects RF performance and RF safety
Every 6 months‡	Check that connector seals and blanking caps are seated	Preserves IP65‡ sealing
Every 12 months‡	Verify the grounding/earth stud connection is sound	Electrical safety
Every 3 months‡ (dusty sites) / 12 months‡ otherwise	Clear dust/debris from heat-sink fins; keep airflow clear	Prevents overheating
Monthly‡ (or continuous)	Confirm the unit reports healthy on the 5Tech Platform	Detects silent faults
As needed	Replace a damaged connector seal or hatch gasket	Restores IP65‡ ingress rating

7.2 Cleaning the enclosure

> **CAUTION — Hot surface.** Allow the unit to cool below hand-safe temperature before cleaning (surfaces can reach +80 °C‡, §1.6).

1. Perform an orderly shutdown (§5.5) if directed by site policy.
2. Wipe external surfaces with a soft cloth dampened with water or a mild pH-neutral detergent.
3. Do not use solvents, alcohols, abrasives, or high-pressure spray. *Approved agents: water or mild pH-neutral detergent only‡.*
4. Keep the heat-sink fins clear of dust and debris.
5. Confirm all seals remain intact after cleaning.

7.3 Inspecting seals and connections

1. De-energize and lock out/tag out both power inputs; verify zero energy.
2. Inspect the enclosure seams and gaskets for cracks, gaps, or deformation.
3. Inspect each connector seal and blanking cap; confirm each is seated.
4. Confirm each antenna connector is tight and each antenna is undamaged.
5. Replace any damaged seal or cap before returning the unit to service.

6. Restore power (§5.2) and verify a healthy state.

7.4 What not to do

- Do not open, drill, or modify the sealed enclosure.
- Do not substitute non-approved antennas, seals, or connectors.
- Do not return a unit to service with a damaged seal — ingress protection would be lost.

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8. Troubleshooting

Use this table for first-line diagnosis. If a fault persists after the listed action, contact 5Tech support (§10). Do not open the enclosure. Interpret indicator patterns against §4 and the legend on your unit.

> **DANGER — Electric shock.** Any action involving power wiring requires de-energizing and lock-out/tag-out first.

SYMPTOM	POSSIBLE CAUSE	ACTION
No LEDs / unit dead	Both power inputs de-energized or failed	Verify inputs A and B at the disconnect; confirm 9–36 V DC present; check external protection
`PWR` solid amber	Running on one input only (A or B lost)	Restore the failed input; verify both inputs at the disconnect
`PWR` green but `FAULT` on	Internal fault	Note the `FAULT` blink code (§4); power-cycle (§5.6); if it recurs, contact support
No `NET` / uplink link	Wi-Fi / Ethernet or upstream network issue	Check the Wi-Fi/Ethernet connection and antenna; confirm the upstream network and credentials
No `WAN-CELL` link (if fitted)	SIM/eSIM, antenna, or coverage issue	Check SIM/eSIM (§6.3); check cellular antenna; confirm carrier coverage
No network uplink at all	All paths down	Confirm the Wi-Fi/Ethernet link (and cellular module, if fitted); data buffers at the edge (≥ 72 h‡) until restored
Gateway offline on Platform	Uplink down or provisioning issue	Verify uplink LEDs (§4); confirm provisioning (§6); check Platform-side status
Field devices missing on Platform	Field link or device mapping issue	Check field-device power and link; verify device mapping (§6.2)
Runs hot / thermal fault (`FAULT` 4 blinks)	Blocked airflow or high ambient	Clear heat-sink fins (§7.2); confirm ambient within limits (datasheet §8)
Repeated restarts	Unstable supply or fault	Verify supply stability on both inputs; contact support if it continues
Sealing concern after service	Seal not seated or damaged	Re-inspect and reseat seals/caps (§7.3); replace if damaged

If a fault cannot be resolved by these actions, record the unit serial number, the indicator states (including any `FAULT` blink code), and the Platform status, then contact 5Tech support before taking further action.

9. Specifications

This manual does **not** duplicate specification values. All electrical, RF, mechanical, environmental, interface, and compliance specifications are maintained in the datasheet:

- **Datasheet:** `datasheets/sensorium-gateway-datasheet/document.md`

Refer to the datasheet for the authoritative figures. A brief operator-level summary of what the datasheet covers is below; consult the datasheet itself for values.

AREA	WHERE TO FIND IT
Mechanical (dimensions, weight, mounting, enclosure/antenna cap)	Datasheet §5
Electrical (redundant 9–36 V DC supply, power, protection)	Datasheet §6
Interfaces & protocols (Wi-Fi/Ethernet/cellular, BLE, RS-485, SIM, I/O)	Datasheet §7
Environmental & ratings (IP65‡, temperature, surface temp, vibration)	Datasheet §8
Compliance & standards (radio, EMC, safety — intended, not yet held)	Datasheet §9
Accessories & spares	Datasheet §10

Confirmed at operator level in this manual: a **ruggedized die-cast aluminium enclosure** rated **IP65‡** (IEC 60529, targeted, not yet certified — effective only with all seals intact and connectors mated or capped); a non-metallic polycarbonate antenna cap over the internal BLE antenna; network uplink over **Wi-Fi / Ethernet** (external RP-SMA antennas) with an **optional cellular module** (external SMA); **MQTT over TLS 1.2/1.3‡** communication; **redundant 9–36 V DC** power inputs; local edge processing and **≥ 72 h‡** buffering; and a secure, mutually authenticated uplink to the 5Tech Platform. All numeric values remain in the datasheet.

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10. Warranty & support

Warranty. Warranty terms are `[TBD]` — a legal/contractual term supplied with the product or on request; it is not stated here because it must not be invented. The warranty is void if the sealed enclosure is opened or modified, if non-approved antennas or seals are fitted, or if the unit is operated outside its rated limits.

Support and service. For technical support, RMA, or service:

- 5Tech — Vancouver, BC, Canada
- Email: `info@5tech.ca`
- Web: `https://5tech.ca`

When contacting support, have ready: the unit serial number, firmware version, indicator states (including any `FAULT` blink code), the 5Tech Platform status for the site, and a description of the symptom and any actions taken.

> **WARNING — Qualified personnel only.** Do not attempt internal repair. The unit has no operator-replaceable parts; return it to 5Tech for service.

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11. Revision & change control

REVISION	DATE	CHANGE	AUTHOR
Draft (Preliminary)	2026-07-07	Initial authored content; operational values `[TBD]`.	Documentation
Draft (Preliminary, PROPOSED)	2026-07-18	Made consistent with the industrialized Gateway datasheet (external SMA Wi-Fi/cellular antennas, internal BLE behind the polycarbonate cap, IP65‡, redundant 9–36 V DC, MQTT/TLS 1.2/1.3‡ with per-device X.509‡); renamed Safety Zone → Zone Awareness; filled LED/indicator states, button press durations, start-up/connect/restart timings, firmware-update duration, and maintenance intervals with conditioned ‡ proposed values; added RF-exposure separation distance (20 cm‡) and a +80 °C‡ surface burn note; added a safety-limit disclaimer and this revision block. Warranty terms kept `[TBD]` (legal).	Documentation

Full change history: `revision.md`. Sources and cited standards: `references.md`.

Figures

ID	TITLE	STATUS	FILENAME	PURPOSE
FIG-001	Industrial Hero Render	Missing	`renders/hero_sensorium_gateway.png`	Manual cover / hero
FIG-002	Safety Symbols & Signal Words	Missing	`figures/safety_symbols.png`	Signal words and hazard pictograms for the safety chapter
FIG-003	Product Overview — External Features	Missing	`figures/product_overview_callout.png`	Orient the operator to external features
FIG-004	Controls & Indicators	Missing	`figures/controls_and_indicators.png`	Identify controls, connectors, and status LEDs
FIG-005	Maintenance Points	Missing	`figures/maintenance_points.png`	Locate operator-serviceable parts and maintenance access

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This manual is preliminary; ‡ values are proposed and subject to engineering confirmation and change. See `revision.md` for change control, `references.md` for sources, and `image_prompts.md` for the figure/prompt index. Web publication target: `/resources/manuals/gateway`.