

Bluetooth in. Edge AI on board. Satellite out. Outdoors, on the move.

Firmware that listens to your **Bluetooth** devices, pre-processes with **Edge AI**, keeps what matters in flash, takes its own **GNSS** position, and delivers over **Wi-Fi, LTE-M, NB-IoT** or **satellite NB-NTN**, the cheapest uplink that works.

- ✓ Its own GNSS fix, then an alert sent and acknowledged over satellite NB-NTN
- ✓ Commissioned over Bluetooth from Adsum IoT Coder or a phone, every value read back
- ✓ Both processors updated over Bluetooth in about four minutes, every setting kept

THE HARDWARE · OUR PARTNER FANSTEL

Open hardware, made by Fanstel.

Fanstel designs, makes and sells the LBG20x and publishes its design: Bluetooth 6, cellular and satellite with GNSS, Wi-Fi 6 on the BC02C model, a battery charger and a 3-axis motion sensor, in an **IP67 outdoor enclosure** ready for a solar panel.



THE FIRMWARE · ADSUM NETWORKS

Industrial-grade IoT firmware.

Use it as is, or customise it in hours with Adsum IoT Coder. Every version is **certified on real hardware** by our reliability and security tests, and **kept secure** for five years.



nRF54LM20B FRONT
EDGE AI · BLUETOOTH 6

nRF9151 BACK
SATELLITE NB-NTN · LTE-M · GNSS

The M.2 radio card inside the relay, front and back

From our firmware to your product, one choice at a time

Minutes

Try it free

The demo comes on every relay from Fanstel: ten devices, no time limit.

Under 30 minutes

First relay live

Commissioned, and sending to your platform.

Under 2 hours

Make it yours

Customising with Adsum IoT Coder. Change the sensor side, or take the full source.

Then

Certify your version

Your build passes the same test suite, on the board.

Five years

Stay secure

Watched, advised and fixed: security fixes for five years.

Licensed per relay, in two editions. Satellite: satellite when no Wi-Fi or cell is in reach. Terrestrial: no satellite, for fleets in coverage. Security fixes for five years, a year of new versions and the evidence pack included.

440+

DEVICES

In the device catalogue, over 180 are already in Adsum firmware. The rest, and any device you bring, are usually added in hours. www.adsumnetworks.com/catalogue

Industrial grade, by design

- **Runs unattended.** Watchdogs and self-recovery from a hang, a dropped link, a bad configuration or a power cut.
- **Never loses data.** Records wait in flash until your platform acknowledges them. Alarms are never overwritten.
- **Secure by design.** Signed boot, authenticated Bluetooth, only the devices you name; once claimed, only your key.
- **Costs under control.** Wi-Fi first, then the cheapest cell; every send checked against a monthly allowance, with a separate one for satellite.

Applications

Mobile assets and vehicles

Remote assets and pipelines

Agriculture and livestock

Maritime, ports and buoys

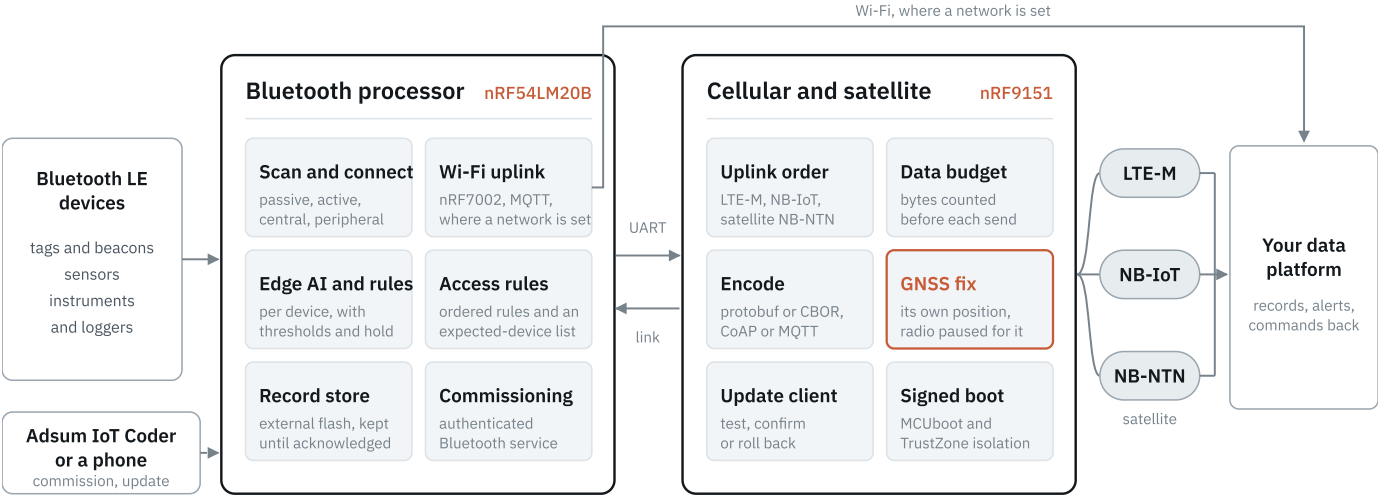
Construction and mining

Cold chain and logistics

HOW IT WORKS

Two processors, one relay, one position.

The Bluetooth processor listens, pre-processes with your rules and Edge AI, keeps every record until it is delivered, and sends over Wi-Fi where it can. The cellular and satellite processor takes its own GNSS fix, picks the mobile uplink and delivers. One serial link joins them.



The access layer · yours to change in your own build: which devices are admitted, and how they are checked, filtered and pre-processed.

The connectivity core · signed by Adsum: uplinks and their policy, transport security, secure boot and update, provisioning and metering.

POSITION, AND WHY SATELLITE NEEDS IT

Every record, and where it came from.

A satellite link times itself from the relay's position: a relay that moves can lose the satellite. This one measures.

- **Measured.** A fix between uplink cycles: 37 s warm at 8 m; 60 to 182 s cold, at 9 to 10 m.
- **Used by the satellite uplink.** A fix becomes the position the satellite connection is timed from.
- **On request.** Your platform can ask for a new fix whenever it needs one.
- **A fallback.** A position from a phone or typed in at commissioning, where the sky is hidden.
- **Movement wakes a fix.** The motion sensor asks for a new position when the relay moves.

What is sent, by uplink

UPLINK	WHAT LEAVES THE RELAY	SIZE
Cellular or Wi-Fi	Digests, alerts, status and a daily health record	~1 kB per cycle
Satellite NB-NTN	Alerts and status only; the rest waits in flash for a cheaper uplink	128 B datagram

One satellite datagram

128 B maximum

46 B	40 B	42 B
transport	one status, one alert	headroom

A real datagram, sent and acknowledged over a geostationary NB-NTN service, on the relay's own GNSS position.

Uplink order: Wi-Fi first, satellite last

Wi-Fi
first, where a network is set

LTE-M
first on cellular

NB-IoT
narrowband cellular

Satellite
NB-NTN, when no cell is in reach

Falls back	After three failed attaches, with a stated reason.
Returns	Every six hours by default, set per relay.
Wi-Fi	2.4 GHz, WPA2 or WPA3, on the Wi-Fi model: free, so first.
Satellite needs	The satellite edition, Nordic's NB-NTN modem firmware, an NB-NTN SIM and a position.

SECURITY AND OPERATIONS

Updated over the air, signed.

- **Over Bluetooth, in about four minutes:** both processors, from Adsum IoT Coder or a phone, every setting kept.
- **Over the mobile network:** LTE-M or NB-IoT, never satellite.
- **Safe by default.** Signed images only; a new image is tested on the relay and rolls back by itself if it is unhealthy.
- **Yours once claimed:** a relay claimed with your computer's key takes images from no one else.

Measured 11 October 2026, both processors over Bluetooth: 947 kB in 101 s and 450 kB in 132 s.

INDUSTRIAL GRADE

Tested to prove it, on the real board.

Reliability: does it keep working?

Function	Every feature, end to end, on every release, across Bluetooth devices, SIMs and networks; GNSS with and without sky.
Failover	Each uplink lost and recovered, LTE-M to NB-IoT to satellite and back; SIM, network and roaming refusals.
Stress	The full device list, floods of Bluetooth traffic, bursts of alerts, a full store, weak and patchy signal.
Durability	Soak runs for days; thousands of power cycles, cold boots and brown-outs; flash wear; memory leaks.
Fault injection	Power cut mid-write and mid-update, a corrupted image, a stalled processor: it recovers alone.
Updates	Every release applied over the air from the last one, interrupted, resumed, confirmed, and rolled back.

Security: can it be broken into?

Boot and update	Only signed images start. Tampered, unsigned and downgraded images are refused.
Hardening	Debug ports locked in production; no open shell, no default password, no secret in the image.
Bluetooth	Pairing, replay and man-in-the-middle attacks; unauthenticated writes refused; floods cannot fill the store.
Network	Encrypted transport checked; malformed, oversized, replayed and spoofed messages refused.
Fuzzing, pen test	Malformed data thrown at every input for hours; static analysis; a penetration test of each major release.
Supply chain	An SBOM from the real build, scanned against known vulnerabilities on every release.

Certified by Adsum

One exact version passed every test above, on the real board.

- A certificate and test report per version.
- Your version too: your customised build earns its own certificate.

Security support

Free for five years from the first download, for every certified version you hold: the support period the EU Cyber Resilience Act asks of a manufacturer.

- Watched and told: new vulnerabilities, whether they apply, what to do meanwhile.
- Fixed: a security release, certified like any other.

The evidence pack

Your technical file for the firmware, kept complete for every version.

- Certificate and full test report
- SBOM in SPDX, advisory register and VEX
- Secure-by-design report, build record, changelog

Certified by Adsum means this version passed our reliability and security tests on the real board. It is not a conformity assessment under the Cyber Resilience Act or any other regulation. Radio type approval and electromagnetic compliance belong to the hardware and to Fanstel.

Firmware · Adsum Networks

Platform	nRF Connect SDK 3.4, Zephyr; MCUboot on both processors, TF-M on the cellular one
Bluetooth LE	Passive and active scanning; three connected devices at once; 32 access rules, 128 expected devices
Commissioning	From Adsum IoT Coder or a phone, each value read back; new devices pair only after a 3-second button hold
Uplink	Wi-Fi (2.4 GHz, WPA2 or WPA3), LTE-M, NB-IoT, satellite NB-NTN; CoAP, or MQTT with or without TLS; protobuf or CBOR
Records	1.4 MB in external flash, kept until acknowledged; alerts never overwritten; a daily health record
Position	Own GNSS fix (GPS, QZSS) at commissioning and on request, with accuracy and age; or a phone or typed position
Updates	Over Bluetooth, both processors; over LTE-M or NB-IoT, never satellite: signed, tested, confirmed or rolled back, settings kept
Data budget	Monthly allowances counted before every send; the free demo: 10 MB over mobile, 10 kB over satellite

Hardware · Fanstel LBG20x

Models	LBG20BC and LBG20BC02C: one image, the Wi-Fi found at boot. LBG20BXE and the LoRa models: next
Cellular, satellite	nRF9151: LTE-M, NB-IoT (Release 14), 23 dBm; NB-NTN (Release 17) with Nordic's NTN modem firmware
GNSS, antennas	GPS and QZSS L1 C/A; LTE antenna inside or on SMA; GNSS antenna on u.FL
Bluetooth, Edge AI	BM20BC (nRF54LM20B): Bluetooth 6.0, Cortex-M33 at 128 MHz, Axon NPU for edge AI; 2036 KB RRAM, 512 KB RAM
Wi-Fi, LoRa	nRF7002 on the BC02C: Wi-Fi 6, 2.4 and 5 GHz. LoRa (LR2021) in its place on the BC21EE
Power, sensors	USB-C (power) or M12; nPM1300 charger, optional 18650 cell, solar ready; 3-axis motion sensor
Enclosure, climate	IP67; 107 × 141 × 40 mm with a wall-mount bracket; -40 to +85 °C
Certifications, sales	Fanstel's, model by model; sold by Fanstel: fanstel.com

Try it free, on your own site.



support@adsumnetworks.com

www.adsumnetworks.com

[Documentation](#)

[The hardware, from Fanstel](#)

Install Adsum IoT Coder