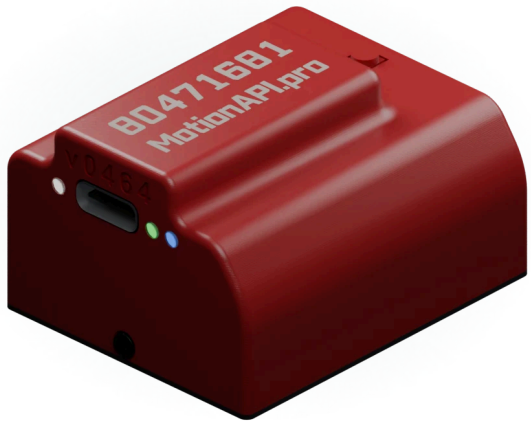
LTE-M GNSS TRACKER WITH MOTION SENSING

ANT Tracker

A compact tracker that sends GNSS position, speed and device status over mobile networks to the **MotionApi platform**, live in the web dashboard and through a public API.

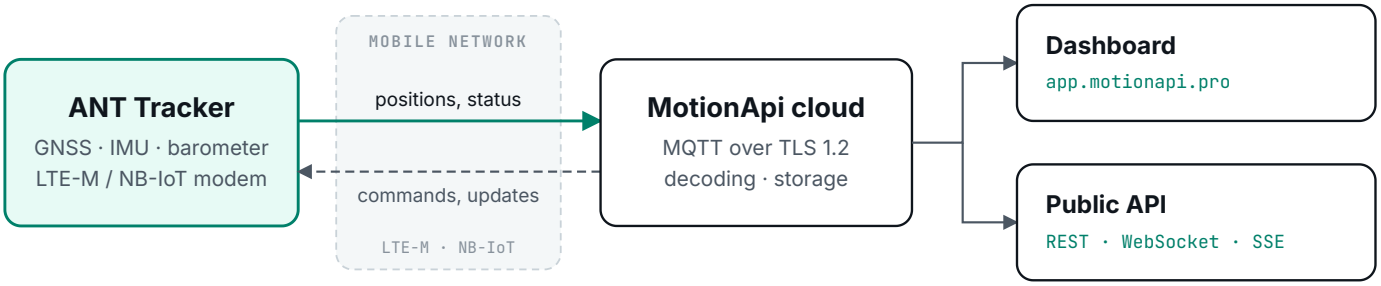


KEY FEATURES

- **GNSS** — GPS, Galileo, GLONASS and BeiDou
- **10 Hz** default rate, configurable 1–20 Hz[1]
- **LTE-M** with NB-IoT fallback and integrated SIM[3]
- **Motion sensing** — 6- and 9-axis IMU, barometer
- **Event marks** at the press of a button
- **Adaptive transmission** when stationary
- **18 transmission modes**, 4,000-position buffer
- **Paddling stroke rate** for canoe and kayak
- **Remote configuration** and OTA firmware updates
- **Dashboard and public API** — REST, WebSocket, SSE

45 g	43.4 × 35.4 × 24.9 mm	10 Hz	LTE-M
Weight	Dimensions	Default GNSS rate, configurable 1–20 Hz[1]	NB-IoT fallback, integrated IoT SIM

SYSTEM OVERVIEW



Data travels through public mobile networks operated by third parties, so coverage and latency vary by location.[3] Commands, configuration and firmware updates use the same path in reverse.

APPLICATIONS

Live sports and broadcast graphics · Race and event operations · Canoe and kayak · Outdoor and action sports · Mobile equipment · Custom integrations via API

Technical specifications

HARDWARE REV. 2.0 · FIRMWARE 0.3

GNSS

Receiver	u-blox SAM-M10Q, integrated patch antenna
Constellations	GPS, Galileo, GLONASS, BeiDou; QZSS, SBAS
Update rate	1–20 Hz configurable, 10 Hz default[1]
Accuracy	1.5 m CEP, horizontal[2]
Time to first fix	23 s cold start, 1 s hot start[2]

CELLULAR

Modem	u-blox LEXI-R422, 3GPP Release 14
Technology	LTE Cat-M1, NB-IoT fallback[3]
Bands (EU set)	LTE-M B1, B3, B8, B20, B28; NB-IoT B8, B20
SIM	Integrated 1NCE IoT SIM
Protocol	MQTT over TLS 1.2, compact binary format

PROCESSING AND FIRMWARE

Processor	Espressif ESP32-C6, RISC-V, 160 MHz
Memory	512 KB SRAM, 4 MB flash
Firmware	Over-the-air updates, SHA-256 verified

SENSORS

Inertial	6-axis IMU, ST LSM6DSO 9-axis IMU, TDK ICM-20948
Environmental	Bosch BMP581, pressure and temperature
On-device use	Motion detection, paddling stroke rate; raw IMU data is not transmitted

INTERFACE

Button	Power on and off; double press sends an event mark
Indicators	Status LEDs, piezo buzzer
Port	USB-C for charging and service

POWER AND MECHANICAL

Battery	Rechargeable, voltage monitored
Battery life	Depends strongly on mode and use[4]
Dimensions	43.4 × 35.4 × 24.9 mm
Weight	45 g

DATA AND OPERATION

Position record

UTC time (ms), latitude, longitude, speed, altitude, accuracy estimate and stroke rate; 25 bytes per position.

Status message

Typically every 30 s: battery, signal (RSSI, RSRP, RSRQ), serving cell, network type, satellites, fix type, temperature, mode, motion state.

Transmission modes

18 presets in two families, standard and logging, plus automatic stationary mode. Full list on page 3.

Event mark

A double press of the button sends the current position.

Paddling stroke rate

Optional per device (canoe, kayak or automatic); 28–165 strokes/min, sent with each position.

MOTIONAPI PLATFORM

Dashboard `app.motionapi.pro`

- Live map with trails, satellite imagery and 3D terrain
- Status, commands, modes and sport profiles per device or fleet
- History replay; CSV and GPX export
- Device sharing and API key management

Public API `api.motionapi.pro/v1`

- REST, WebSocket and Server-Sent Events
- JSON in SI units, or raw binary frames
- API keys with permission scopes
- OpenAPI 3.1 reference at api.motionapi.pro/v1/docs

Security

- TLS 1.2 between tracker and cloud; HTTPS and WSS for dashboard and API
- Per-device credentials; devices bound to accounts by claim token

[1] The achievable rate depends on receiver configuration and the enabled GNSS constellations.

[2] u-blox module specification under test conditions. Field performance depends on sky view, mounting and environment.

[3] ANT Tracker uses public mobile networks operated by third parties. Coverage, signal quality and latency vary by location and over time and are outside MotionApi's control.

[4] Battery life depends strongly on transmission mode, GNSS rate, network conditions and use; no fixed runtime is specified.

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Transmission modes

18 PRESETS · SET REMOTELY

One preset decides how often positions and status messages leave the tracker. Choose it per device or for a whole fleet, in the dashboard or through the API. The GNSS sampling rate is a separate setting.

ID	MODE	SENDS	STATUS	COMMENT
STANDARD	latest position at a fixed interval			
2	**High Performance**	Every fix	30 s	Highest live update rate and data use
6	**Fast 250 ms**	Every 0.25 s	30 s	Fast live tracking, e.g. motorsport
5	**Fast 500 ms**	Every 0.5 s	30 s	Live graphics, including stroke-rate display
1	**Default**	Every 1 s	30 s	General live tracking
7	**Every 2 s**	Every 2 s	30 s	Relaxed live tracking, lower data use
8	**Every 3 s**	Every 3 s	30 s	Relaxed live tracking, lower data use
9	**Every 5 s**	Every 5 s	30 s	Slow-moving people or equipment
3	**Slow**	Every 10 s	60 s	Long sessions with low data use
4	**Very Slow**	Every 60 s	3 min	Parked or rarely moving assets
10	**Ultra Slow**	Every 10 min	10 min	Periodic check-in of dormant assets
LOGGING	every fix buffered on the device and sent in batches			
20	**Log HP**	As fast as possible	30 s	All fixes with minimal delay
27	**Log 250 ms**	Every 0.25 s · 2–3 fixes	30 s	All fixes, near-live, fewer messages
28	**Log 500 ms**	Every 0.5 s · 5 fixes	30 s	All fixes, smooth live view
21	**Log 1 s**	Every 1 s · 10 fixes	30 s	All fixes, general-purpose logging
22	**Log 2 s**	Every 2 s · 20 fixes	30 s	Cycling, running, hiking
23	**Log 3 s**	Every 3 s · 30 fixes	30 s	Long routes, fewer messages
25	**Log 5 s**	Every 5 s · up to 40 fixes	30 s	Long sessions; use a GNSS rate of 4 Hz or less*
26	**Log 10 s**	Every 10 s · up to 40 fixes	30 s	Fewest messages; use a GNSS rate of 4 Hz or less*

- Fix counts assume the default 10 Hz GNSS rate. *At 10 Hz, modes 25 and 26 collect more fixes than one 40-fix batch carries.
- Standard modes send only the latest fix and keep nothing during coverage gaps. Logging modes buffer up to 4,000 positions (about 6.7 min at 10 Hz), overwriting the oldest; the buffer is cleared at power-off.
- Modes persist across reboots; the next status message confirms the active mode. API: `PUT /v1/devices/{iccid}/mode`.
- After 30 s without motion, every mode drops to one combined status and position message per 60 s, or its own interval if slower. Faster modes use more data and battery.

LINKS

PRODUCT

Website
motionapi.pro
Product overview

Dashboard
app.motionapi.pro
Track and manage devices

Use cases
motionapi.pro/use-cases
Application examples

Contact
contact@motionapi.pro
Sales and integration

DEVELOPERS

API reference
api.motionapi.pro/v1/docs
Interactive reference

OpenAPI 3.1
api.motionapi.pro/v1/openapi.json
Machine-readable contract

API Explorer
motionapi.github.io/example-api-explorer
Open-source browser client

Python logger
github.com/MotionApi/example-api-python-logger
Open-source stream logger