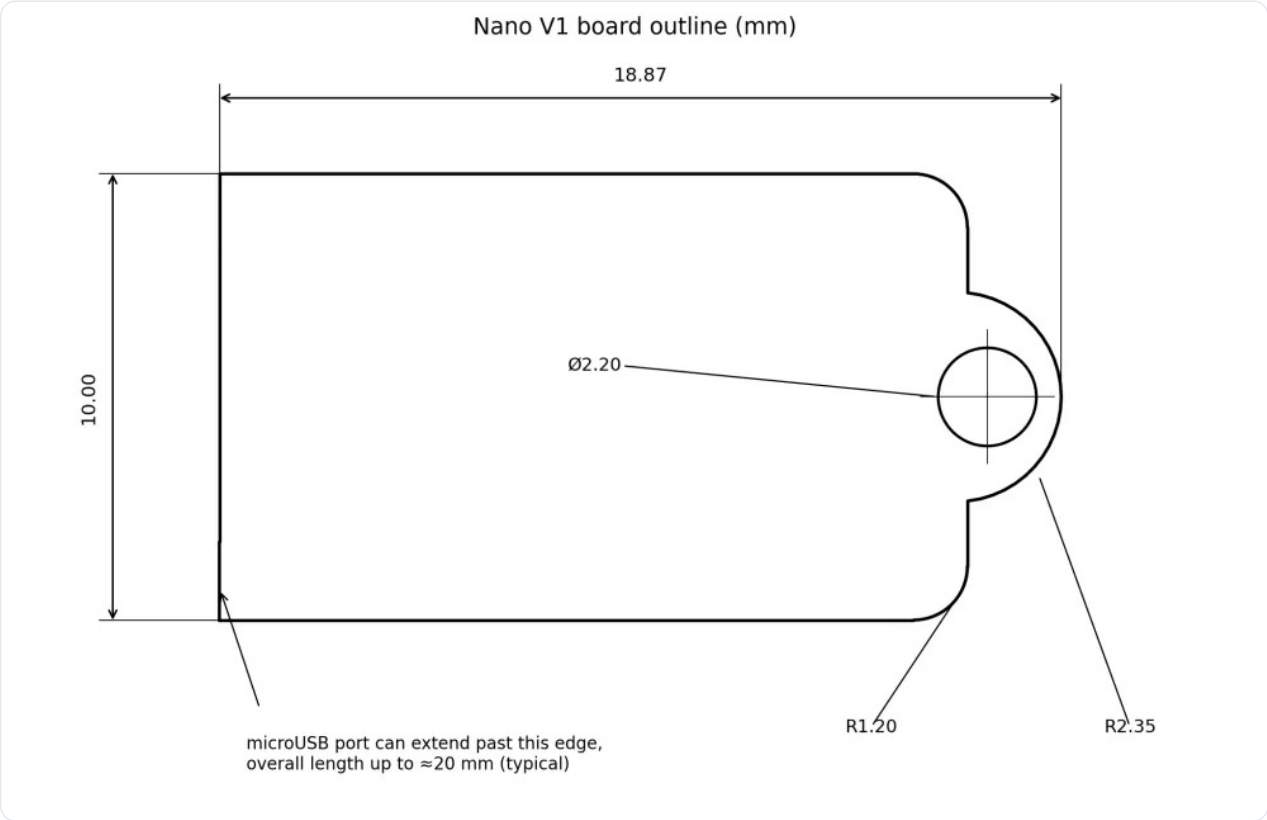
The Nano V1 altimeter specifications

The Nano V1 is a tiny, lightweight barometric altimeter and flight data logger. Below are the specifications across hardware revisions. Revision 4 and later boards add an inertial measurement unit (IMU) and an upgraded pressure sensor.



The hardware revision is printed on the PCB (for example R4), and the Nano detects it itself at power-on, so one firmware runs on every revision. You can also check it over the USB connection.

You can find a 3D model of the PCB and the electronics bay holding cover files on the Technical & compliance page.

Physical

	Rev 1 to Rev 3	Rev 4 and later
Dimensions (PCB)	19 to 22 × 10 mm, by revision	20 × 10 × 8.9 mm
Weight	1.35 to 1.80 g, by revision	1.65 g
Connector	Micro-USB	
Bay cover	SLS printed nylon cover supplied, screws onto an electronics bay sled	
Mounting	Under its cover in an electronics bay, or on the shock cord	
Min tube diameter	10 mm (without the cover)	

Pressure sensor and altitude

	Rev 1 to Rev 3	Rev 4 and later
Pressure sensor	Bosch BMP390	Bosch BMP581
Pressure range	300 to 1250 hPa	
Max reliable altitude	About 9,200 m (30,000 ft)	
Altitude conversion	Standard atmosphere, fixed at 1013.25 hPa and 15 °C. The reported apogee is barometric, above the pad.	
Logging rates	50 or 100 Hz (default 50)	104, 208, 417 or 833 Hz (default 417)
Barometer rate	Its own rate	80 Hz, whatever the logging rate
Filtering	TruePath	TrueFuse and TruePath

Accelerometer and gyroscope (IMU)

	Rev 1 to Rev 3	Rev 4 and later
IMU	Not fitted	ST LSM6DSO32
Accelerometer	Not fitted	3-axis, ±32 g
Gyroscope	Not fitted	3-axis, ±2,000 °/s
Orientation outputs	Not available	Tilt, pitch, roll and yaw, plus launch rail angle
High speed sensor	Not available	On by default. The IMU samples at 1,667 Hz, or with the gyro at up to 3,333 Hz (setting 2), and the readings are averaged down to your logging rate. This counters motor and airframe vibration affecting the IMU readings, so the logged acceleration, rotation rates and angles are cleaner. It costs a percent or two of battery life.
Mounting orientation	Not applicable	Detected automatically on the pad, or set manually

Data logging

	Rev 1 to Rev 3	Rev 4 and later
Logged data	Time, altitude and velocity, with the raw barometric altitude kept beside the processed line	Adds acceleration, rotation rates and angles
Flight events detected	Launch, apogee, ejection and landing	Adds motor burnout (each stage) and rail angle
Pre-launch data	5 s at full rate plus 3 s at 50 Hz before launch is confirmed	

Hybrid mode	Off by default	On by default: full rate through launch, the climb, apogee, landing and any big shock, and 1 in 8 samples on the long descent
Max samples per flight	Up to 38,000 (ACLZ) or 22,000 (CSV)	
Recording time at full rate	About 12 minutes at 50 Hz, 6 at 100 Hz	About 6 minutes at 104 Hz, 90 s at 417 Hz, 45 s at 833 Hz. Hybrid mode extends these considerably.
Hybrid mode example	A 5 km flight with a 20 s climb, logged at 417 Hz with 1 in 8 hybrid mode, records for about 8.5 minutes, compared with 90 s without it. The climb, apogee, deployment and the last 20 m to landing are all logged at the full 417 Hz, and only the long descent drops to about 52 Hz. For a long, slow descent from that height, 208 Hz gives about 20 minutes, enough to log the whole flight and the landing.	
Recording stop	Automatic, 8 or 16 s after a settled landing, or at the sample limit	
Flights stored	Up to 39 (subject to space). The oldest is removed automatically, and flight numbers keep counting.	
Flight log format	ACLZ compressed binary (default) or CSV, on the onboard USB drive, with a flight info page for each flight	
Log integrity	Ed25519 digital signature, verified on Altimeter Cloud	
Crash recovery	A backup copy is kept during the flight and rebuilt at the next power-on if power is lost before the save	

Power and battery

Battery	1S LiPo, 20 mAh (8 × 8 × 5 mm), soldered to the board
Battery life	Just under 5 hours on the pad. 5 to 8 typical flights per charge at 417 Hz.
Charging	Micro-USB (from a phone, laptop, etc.)
Charge controller	MCP73831, about 20 mA, 4.2 V termination
Charge time	Under 1 hour from empty
Charge indicator	Charge LED (on while charging, off when complete)
Low battery	Warning at startup below 3.70 V. In flight, recording stops and the flight is saved at 3.05 V. Shuts down at 2.92 V.
Operating temperature	Flight mode: -10 °C to 60 °C. USB mode and charging: 0 °C to 45 °C.
Over-temperature shutdown	On USB or while charging only. Never in flight mode.

Connectivity and interface

USB	Micro-USB: charging, serial, configuration and a USB drive for the logs and settings
WiFi	Not available: no antenna is fitted and WiFi is permanently disabled in the encrypted firmware
Readout	LED blinks the last flight number and apogee at power-on or on a button press. On Rev 4 and

	later, a shake after landing does the same.
Cloud and charts	Drag and drop log files onto Altimeter Cloud, or use USB upload on the website (account optional)

Processor and memory

Microcontroller	Espressif ESP32-S2, 240 MHz, 32-bit
Flash	4 MB
PSRAM	2 MB

Firmware and security

Firmware	AES-256 encrypted (custom firmware cannot be loaded)
Flight log verification	Ed25519 digital signature (tamper-evident), recovered logs included
Firmware updates	Via Altimeter Cloud over USB
Configuration	Settings file on the USB drive, or over USB serial

Specifications are subject to change with firmware updates and describe firmware 2.00. Some features require the latest firmware version. If you are unsure which revision you have, please contact us.