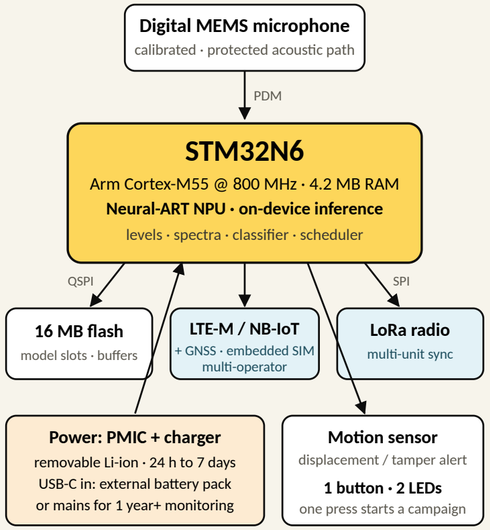
Sona One: a battery-powered microcontroller recorder with swappable on-device audio models

Sound levels, octave spectra and sound-event classification are computed on the sensor itself, for a week on battery, and leave the unit as a JSON transcript over cellular. More than a data logger: no SD-card collection runs, no audio in the cloud by default.

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System architecture 01



Analysed on the device
10 s frames: levels, spectra and NPU classification run locally. Only structured results leave the unit by default.

Privacy by design
Raw audio is deleted after analysis. WAV retention (data-logger mode) is a deliberate setting, never the default.

Hardware & deployment 02

Compute STM32N6: Arm Cortex-M55 at 800 MHz, Neural-ART NPU for on-device inference, 4.2 MB RAM, 16 MB external flash for model slots and event buffers.

Microphone Calibrated digital MEMS behind a protected acoustic path. **IEC 61672 Class 2** sound level meter standard, verified against a Class 1 reference meter with 1/3-octave analysis. **Class 1 on the roadmap**.

Power **24 h to 7 days** on the removable Li-ion cell (duty-cycled). **USB-C input**: external battery pack for longer campaigns, or mains for continuous monitoring over a year or more.

Connectivity **LTE-M / NB-IoT**, embedded multi-operator SIM, no Wi-Fi needed. **LoRa** link between units: one press starts the whole kit for synchronised multi-point campaigns. **GNSS** time and position stamp.

Enclosure **Tropicalized** electronics (conformal-coated PCB) for humid climates. **IP54 / IK07** target; operating range **0 to 40 °C**; PA12 pilot run, ABS series. Wall, **1/4"-20 tripod** thread or strap for trees and poles. One button, two LEDs, no screen.

Fleet **OTA** firmware and model updates, remote configuration, fleet dashboard. Alerts: displacement, covered microphone, low battery, lost link.

Readings & outputs 03

Per integration window (default 10 s, configurable):

- **Levels:** LAeq, LAFmax, LAFmin, statistical levels L10 / L50 / L90, day and night LAeq, night-time emergences.
- **Spectra:** 1/1 and 1/3-octave band levels on IEC 61260 nominal bands, 20 Hz to 20 kHz (sample-rate dependent).
- **Events:** timestamped sound events with class label, probability, level and a confidence index. Default taxonomy: more than 500 classes (AudioSet); or your own classes.
- **State:** battery, cellular signal, GNSS fix, tamper flags.

JSON Transcript per window, pushed over cellular during or after the campaign.

WAV 16-bit PCM, up to 48 kHz. Data-logger mode on request: event clips or continuous audio; off by default.

API REST and webhooks, CSV export, push to your own platform or SaaS dashboard.


```
{
  "unit": "sona-0421", "t": "2026-10-23T05:12:30Z",
  "win_s": 10, "laeq": 41.2, "lafmax": 56.8,
  "lafmin": 33.9, "l10": 44.1, "l50": 39.7, "l90": 36.5,
  "oct_db": {"63": 48.1, "125": 45.0, "250": 40.3,
    "500": 37.9, "1k": 35.2, "2k": 31.6,
    "4k": 28.0, "8k": 24.4},
  "events": [
    {"t0": 2.4, "class": "bird_vocalization",
     "p": 0.91, "level": 52.3, "conf": 0.8}
  ],
  "wav": "evt_0421_051232.wav", "batt": 0.78,
  "gnss": [48.894, 2.409]
}
```


Swap the model 04

On-device pipeline, every frame:

Capture (PDM → PCM) › Levels & spectra (always on) › Activity gate (wakes the NPU) › **Classify (on the NPU)** › JSON / WAV (uplink)

Bring your own model

- Your own **quantized classifier**, deployed **over the air** to one unit or the fleet, with roll-back. Model slots in flash: switch per campaign, site or season.
- Standard embedded-ML toolchain; formats, tooling and SDK shared with research partners under NDA.
- Your BioDCASE-Tiny Task 3 system on a field unit: a week of battery, cellular uplink, strap mount.

Sonalyze default	Your Task 3 model	Empty
> 500 classes	10 bird species	next campaign

Why it lasts a week
Levels and spectra are cheap and always on; the classifier wakes only when the activity gate fires.

Closed loop
Event clips labelled on the platform feed your next training run. Your model, our runtime.

Shipping January 2027

Europe first · US waitlist open now

Rental

20 € ex VAT per unit per month

Fleet rental for research campaigns, SIM included. Units ship charged, with tripod and strap.

Platform

SaaS dashboard hosted in France · REST API and webhooks · embedded SIM, LTE-M / NB-IoT · OTA fleet management · export to your own platform

sonalyze.com

European patent application pending · CE marking in progress (RED, EMC, LVD) · Designed to the IEC 61672 Class 2 sound level meter standard, verified against a Class 1 reference meter · Pre-series specifications, subject to change · Sonalyze SAS, Station F, Paris