

Sensor Node Build Notes

Prepared by the WildSync Tech team. This document describes work at an early prototype stage. It contains no performance claims, deployment counts or partner names that we cannot verify.

Purpose

Our field recorder is a prototype passive acoustic node. These notes describe how we currently build one and what we have learned, so that another team could reproduce or critique the approach.

Design constraints

Every decision is judged against cost per deployed node, because a tool that cannot be replicated affordably will never reach the habitats that need it most.

- Off-the-shelf, widely available components over custom parts.
- Field-serviceable: anything that fails should be replaceable without our team present.
- Records locally first; connectivity is treated as optional, not assumed.
- Weather protection sized for humid, wet environments.

Current build outline

A single node consists of a low-power microcontroller board, an external microphone, local storage, a battery with an optional solar input, and a sealed enclosure with a gland for the microphone lead.

- Microcontroller board running our recording firmware.
- External microphone mounted away from the enclosure wall to reduce handling and wind noise.
- Removable local storage for recordings.
- Battery pack sized to the intended service interval.
- Sealed enclosure with desiccant and a strain-relieved cable entry.

What has not worked

We are recording failures as deliberately as successes.

- Enclosure seals that pass a bench test but not sustained humidity.
- Microphone placement flush to the case, which picked up enclosure resonance.
- Optimistic battery estimates that ignored cold-weather capacity loss.

Status and limits

This is a prototype. We do not yet publish battery life figures, detection ranges or durability ratings, because we do not have enough field hours to state them honestly. When we do, they will be published with the method used to measure them.

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