Ikoka Stick

Overview

The **Ikoka Stick** is a community DIY design (by **ndoo**) for an ultra-compact stick-format LoRa node built on the **Seeed Studio XIAO nRF52840** paired with an **EBYTE E22-900M**-series LoRa module. It is a hobbyist build rather than a productized multi-MCU node. The compact stick form factor is suited to use as a pocket companion; higher-power builds (see below) require a larger enclosure and should not be confused with the pocketable stick.

Variants & Power Options

The base E22-900M module (SX1262) outputs up to **+22 dBm**. Higher-power "variants" are separate enclosure-based builds that use a higher-power EBYTE E22 module (e.g. E22-900M30S at 30 dBm) or add an external power-amplifier stage downstream of the module — these are not the compact pocket stick.

Variant	TX Power	Typical Use
Standard (compact stick)	22 dBm (~158 mW)	Personal carry / compact node
1 W (box build)	30 dBm	Infrastructure repeater

FCC caveat: The 1 W variant sits at the FCC Part 15.247 conducted limit of 30 dBm (1 W) and is only legal under Part 15 with an antenna of ≤6 dBi (higher-gain antennas require a dB-for-dB conducted-power reduction). A 2 W / 33 dBm build (using EBYTE's large E22-900M33S UART module) **exceeds the FCC Part 15 conducted limit and is not legal for unlicensed US use** — high-power tower use of such a variant generally requires an amateur Part 97 license (no encryption, station identification). Confirm conducted power plus antenna gain against 47 CFR 15.247 before deploying under Part 15. Note also that a 33 dBm module is a large, high-current part (drawing on the order of 1-2 A peak with significant heat dissipation needs) and cannot fit a pocketable stick form factor.

Key Specifications

- **MCU:** Seeed Studio XIAO nRF52840
- **Radio:** EBYTE E22-900M series (built on the SX1262, rated up to +22 dBm). The 1 W build uses a higher-power E22 module (e.g. E22-900M30S) or an external PA stage added after the base module.
- **Form factor:** Compact stick (the standard 22 dBm build). Higher-power builds require a larger enclosure and heatsinking and are not pocketable.

Community Deployments

The Ikoka Stick is the basis of CascadiaMesh's "*1 Watt Ikoka Box*" build - one of the most replicated community deployment designs, used for high-density urban and suburban coverage nodes. As an enclosure-based 1 W build, it is distinct from the pocketable standard stick.

RF Filtering

In electrically noisy environments (near industrial equipment, dense urban RF, tower-share sites), a LoRa cavity filter can suppress out-of-band interference and protect the receiver, improving effective range in difficult RF environments. The Baymesh (Nullrouten) cavity filter is one option; verify the exact SKU, center frequency (US-band LoRa filters are tuned near 906-915 MHz, not a single "910 MHz" point), and current price before purchasing.

Target Use Cases

- High-power infrastructure repeaters (enclosure-based 1 W box build, not the pocket stick)
- Tower mount and rooftop deployments
- Community mesh backbone nodes

Revision #5
Created 2026-05-03 03:34:36 UTC by Mesh America Admin
Updated 2026-06-09 16:03:37 UTC by Mesh America Admin