Setting Up MeshCore

Step-by-step device configuration for the US/Canada network.

- MeshCore Setup Guide
- Deploying a MeshCore Repeater

MeshCore Setup Guide

From unboxing to sending your first message. Setup is usually quick once your device is charged.

What you need before starting

- A MeshCore-compatible LoRa device, fully charged
- A smartphone (Android or iOS)
- The **MeshCore companion app** (free). The official clients by Liam Cottle are linked from **app.meshcore.nz** (web app) and **files.liamcottle.net/MeshCore** (iOS, Android APK, Windows and Mac). Verify you are installing the official client before searching an app store, as several MeshCore-related apps exist.

Step 1 - Charge your device

Connect via USB and charge fully. Most devices show a red LED while charging and green or blue when complete. Initial charge takes 2-3 hours.

Step 2 - Power on

Hold the power button for 2-3 seconds until the screen activates. Bluetooth typically starts automatically.

Step 3 - Pair with your phone

1. Open the MeshCore app
2. Tap **Add Device** or the + icon
3. Select your device from the list (shown as "MeshCore_XXXX")
4. Wait 10-20 seconds for pairing to complete

Step 4 - Select the correct preset

This is the most critical step. The preset bundles the radio settings (frequency, bandwidth, spreading factor, coding rate). Every node must share the same radio settings just to hear each other at all - the wrong preset means you cannot reach anyone. Note that the preset is separate from a channel: to talk on a private (shared-key) channel you also need that channel's matching key, in addition to the matching radio settings.

- Navigate to **Choose Preset** in the app
- Select **USA/Canada (Recommended)** (910.525 MHz, SF7, BW 62.5 kHz, CR5)
- Set a recognizable display name for your node

Step 5 - Test your connection

Open the **Public channel**. You are now on the network. Any nearby nodes will appear, and you can send and receive messages.

Tips for better performance

- Test outdoors first - LoRa range through walls is significantly reduced
- Elevation matters enormously - even a second-floor window vs. ground level makes a measurable difference
- Leave default radio settings alone until you understand what they control
- Keep firmware updated for the latest improvements

Deploying a MeshCore Repeater

A repeater is a MeshCore device configured to run headlessly - no phone attached - whose sole job is to receive and forward messages. Repeaters are the backbone of good network coverage.

Why deploy a repeater?

Direct device-to-device range at ground level in an urban area may be only a few hundred meters. A repeater placed at elevation (rooftop, hilltop, tower) with a clear view of the surrounding area can extend the effective range of the network substantially - potentially tens of miles to other elevated or clear-line-of-sight sites. Obstructed or ground-level users in the area will see much less. Survey your actual coverage rather than assuming a fixed mileage for everyone.

What makes a good repeater location?

- **High elevation** - the single most important factor. Every meter of height extends radio horizon.
- **Clear sky view** - minimal obstruction from buildings, trees, or terrain in all directions.
- **Power access** - reliable power (mains, solar, or large battery) for continuous operation.
- **Weather protection** - a weatherproof enclosure if the device will be outdoors.

Flashing repeater firmware

To configure a device as a repeater, flash the **Repeater** firmware variant instead of BLE Companion. The device will operate without a connected phone, automatically relaying messages it receives.

See Flashing repeater firmware and the MeshCore documentation for device-specific flashing instructions.

Antenna considerations

For a fixed repeater, invest in a quality external antenna. A higher-gain vertical antenna (5-9 dBi) mounted as high as possible will generally outperform the stock antenna included with most devices. Be aware that higher-gain antennas narrow the vertical beamwidth, which can reduce coverage to nearby nodes that are much higher or lower than the repeater. Use low-loss coax cable and keep cable runs short.

Power limit caveat (US 902-928 MHz): Under FCC Part 15.247, conducted power must be reduced 1 dB for every dB of antenna gain above 6 dBi, holding EIRP at 36 dBm (4 W). With a 9 dBi antenna, keep conducted power at or below roughly 27 dBm to stay within the limit. Mesh (point-to-multipoint) deployments cannot use the fixed point-to-point exemption.

Solar-powered repeaters

Repeater firmware is optimized for low power consumption, making solar deployment practical. A modest solar panel (10-30W) paired with a LiPo or LiFePO4 battery pack can sustain a low-power repeater long-term - but only if sized for your worst-case conditions: winter sun-hours, storms, smoke, and snow or soot on the panel, plus battery aging over time. Size for several days of autonomy at your site's worst-case insolation; do not assume indefinite operation.