Off-Grid Repeat: Turning Your Companion into an Emergency Relay

MeshCore companions don't repeat packets by default — that's intentional, and unlike a Meshtastic client a MeshCore companion will not relay traffic on its own. Repeating is left to dedicated infrastructure nodes to keep routing clean. But in a small ad-hoc situation where no repeater infrastructure exists — a campsite, a festival, or a neighborhood cut off in a disaster — Off-Grid Repeat lets you stand up a temporary local mesh from gear you already own: a single toggle in the MeshCore app turns a companion device into a temporary relay. The MeshCore developers describe this feature as being for *ad-hoc, temporary meshes* (camping, festivals), **not** as a way to extend an existing mesh or as standing emergency infrastructure — MeshCore "does not work well with dynamic repeaters." Treat it as a gap-filler you reach for when you have nothing better, and move to a dedicated always-on repeater as soon as you can.

> **This is a fragile, temporary stopgap.** A phone-tethered relay depends on the phone staying powered, foregrounded, and BLE-connected within about 10 meters of the board, and mesh delivery is best-effort with no guarantee that any message arrives. Do not rely on a phone-based relay as life-safety infrastructure. It is not a replacement for 911, NWS alerts, or licensed voice nets — use those first for anything life-threatening, and use mesh only as a fallback when they are unavailable.

No extra hardware. No laptop. One setting change on your phone — provided your board already runs feature-capable firmware. If it doesn't, a one-time firmware update is needed first (see Requirements).

Requirements

- **Feature-capable firmware** on the companion LoRa board. The Off-Grid / Repeat feature tracks specific recent MeshCore builds — roughly companion firmware ~v1.13 and app ~v1.40 or later; check the official MeshCore release notes for the current versions. (There

is no MeshCore "firmware v9" — that is not how MeshCore is versioned.) If the toggle described below isn't visible in your app, the board needs a one-time firmware update.

The canonical tool for this is the official MeshCore flasher at flasher.meshcore.io. Mesh America also offers its own device configurator at apps.meshamerica.com — note that this is Mesh America's own tool, **not** the official MeshCore flasher. Whichever you use, do not interrupt a flash in progress: interrupting it can leave the device unusable.

- **MeshCore Open** — a free, open-source *community* client (by zjs81 / meshcoreopen.org), available for Android, iOS, and desktop. It is a third-party client, not an official first-party MeshCore app; on iOS it may be available via build-from-source or the web rather than a store binary.
- All devices that want to communicate with each other must be on the **same Off-Grid preset frequency** — decide this before you need it (see below).

The Frequency Requirement — Read This First

Off-Grid Repeat only works on one of three dedicated Off-Grid preset frequencies. It cannot be enabled on the standard USA/Canada preset (910.525 MHz) or any other regional frequency. The app will block the save and show a warning if you try. These preset center frequencies are firmware-defined values (as documented in the MeshCore project as of mid-2026) and could change in a future firmware release — confirm the actual values in your app rather than memorizing a number, so your whole group stays on a matching frequency.

The three Off-Grid presets are:

- **Off-Grid 918 MHz** — US and Canada. 918.0 MHz falls within the US/Canada 902–928 MHz ISM band (FCC Part 15, license-free), so unlicensed use is generally permitted with certified equipment — but it can suffer local interference (for example from smart meters) that may make it unusable in some areas, and it is intended for ad-hoc temporary meshes. Test it where you plan to use it before relying on it.
- **Off-Grid 869 MHz** — EU ISM band
- **Off-Grid 433 MHz** — offers longer range at a lower data rate, but 433 MHz allocations and power limits vary significantly by country and overlap amateur (70 cm) and short-range-device bands. Check your local regulations before using it; it is not freely available for this use everywhere.

For families and neighborhoods in the US and Canada: **agree on Off-Grid 918 MHz** before a disaster happens. Every person who wants to participate in the off-grid mesh needs to switch to the same preset. Everyone who wants to communicate but doesn't need to relay can also switch to 918 MHz without enabling repeat.

> ⚠ **Warning — switching to an Off-Grid preset cuts you off from the regional mesh.** Moving to an Off-Grid preset (918 MHz) takes you off the normal USA/Canada mesh (910.525 MHz). While you are on an Off-Grid preset you **cannot reach anyone on the standard regional mesh — including community repeaters, Mesh America infrastructure, and responders.** A family that switches to 918 MHz "before a disaster" and forgets can be silently cut off from the wider mesh during the actual event without understanding why. Only switch when you specifically need the off-grid self-relay, make sure your whole group switches together, and switch back together when the emergency is over. This is a real trade-off: you gain a self-forming local mesh, you lose contact with anyone who hasn't switched.

How to Enable Off-Grid Repeat

1. Open MeshCore Open and connect to your companion device.
2. Go to **Settings → Node Settings → Radio Settings**. *(The exact menu path is app-version dependent — these labels reflect MeshCore Open as of mid-2026; if your version differs, look for the Radio Settings section.)*
3. Tap **Choose Preset** and select **Off-Grid 918 MHz** (US/Canada).
4. Scroll down to **Enable Repeat Mode** and toggle it on. *(The toggle is named "Enable Repeat Mode"; its exact placement may vary by app version.)*
5. Tap the checkmark to save. The settings are written to the LoRa board.

The toggle only appears once the board is running feature-capable firmware (see Requirements). If it's not visible, update the firmware first.

Disaster Deployment Setup

Once repeat mode is enabled, the device becomes a relay for all nearby nodes on the same Off-Grid frequency. To get the most out of it during an emergency:

- **Place it at elevation.** A second-floor window, a rooftop, the top of a fence — every meter of height extends range. The companion's antenna is the limiting factor, not the software.
- **Keep the phone plugged in.** Off-Grid Repeat drains the battery noticeably faster than normal operation because the radio stays in continuous receive mode and retransmits every packet. Wall power is best; a battery bank is the minimum for extended use.
- **Keep the app in the foreground.** On Android, the app must stay active or battery optimization will kill the BLE connection and stop repeating. Disable battery optimization

for MeshCore Open in Android settings if you plan to use this. On iOS, Apple's Core Bluetooth background-execution limits mean background BLE behavior may limit reliability for extended sessions — keep the app foregrounded.
- **Keep BLE range in mind — and understand this is fragile.** The phone maintains a BLE connection to the LoRa board. Don't walk the phone more than about 10 meters from the board — if BLE drops, repeating stops, often silently. Because the relay depends on the app staying open, BLE staying connected within ~10 m, and battery optimization being off, a phone-based relay can fail without warning. For anything you actually need to depend on, use a dedicated repeater node, not a phone.

Practical Family Setup

A straightforward temporary disaster deployment for a household:

1. Designate one device in the household as the off-grid relay — a spare companion that isn't someone's primary phone. A dedicated spare is better than a phone someone needs to use.
2. Before any emergency: switch that device to Off-Grid 918 MHz, enable repeat, test that it relays messages from your other family nodes.
3. During an emergency: plug it in near a high window and leave it running. It relays for your family and for any neighbor who has also switched to Off-Grid 918 MHz. Remember this is a temporary gap-filler, not a substitute for a dedicated repeater — and that delivery is best-effort, so confirm anything important rather than assuming it got through.
4. Your family's other devices switch to Off-Grid 918 MHz to communicate — they don't need to enable repeat, just use the same frequency.

Off-Grid Repeat vs. a Dedicated Repeater Node

Off-Grid Repeat	Dedicated Repeater
Free — uses hardware you already own	Requires a separate LoRa board (typically ~$30–60 as of 2026; price varies by board and vendor)
Ready in 30 seconds	Requires flashing and setup
Drains phone battery, needs power source	Low draw — can run for an extended period on a small battery or solar when correctly sized (estimate; depends on battery/solar sizing and traffic)
Phone must stay on and BLE-connected	Always-on, fully independent
Mobile — moves with the person	Fixed, consistent coverage

Off-Grid Repeat	Dedicated Repeater
Emergency and temporary use	Permanent infrastructure

Off-Grid Repeat is a gap-filler, not a replacement. This is the most important thing to understand about the feature. If you're building out a home or neighborhood mesh for long-term use, dedicated repeater nodes are the right answer. Off-Grid Repeat is what you use when you don't have that infrastructure yet — or when you're somewhere that infrastructure can't follow you. It is intended for small, temporary, ad-hoc groups, not as backbone or emergency-relay infrastructure, and delivery over it remains best-effort.

Turning It Off

When the emergency is over, switch back to the standard regional preset (USA/Canada Recommended) and disable repeat. There's no reason to stay on Off-Grid frequencies when your normal mesh infrastructure is available — it would isolate you from the broader regional mesh.

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