

# What is a MeshCore Repeater?

A MeshCore repeater is a device configured to run headlessly - without a connected phone or computer - whose sole job is to receive messages and forward them automatically. Repeaters form the backbone of any robust MeshCore network.

## How a repeater works

Every MeshCore node listens for incoming radio packets. A repeater runs headless (no phone needed) and stores no message history, though some hardware (such as the Heltec V3 or T-Beam) does include a small status display. When it receives an eligible packet, it forwards it - skipping duplicates it has already seen and applying the network's forwarding rules - extending the message's reach to nodes that would otherwise be out of range.

This forwarding is automatic and requires no human intervention after initial deployment.

## Why repeaters matter

Direct device-to-device range at ground level in a built-up area is often just a few hundred meters to roughly 1 km, depending heavily on terrain, obstructions, and antennas (range-test data for 915 MHz LoRa varies widely - as low as ~0.4 km in dense forest). A single repeater placed at elevation - a rooftop, hilltop, or communications tower - can extend coverage well beyond ground-level range: in favorable terrain with clear line of sight, often on the order of 10-20 km (6-12 miles) to nodes in its area, and farther node-to-node when both ends are elevated. Expect much less (a few km, or roughly 1-10 miles) where terrain or obstructions block line of sight. These are approximate, environment-dependent figures, not a guaranteed radius.

The more repeaters a community deploys in well-chosen locations, the more resilient and far-reaching the network becomes. Each additional repeater increases redundancy and reduces the chance of any single point of failure.

## Repeater vs personal node

| Personal node (BLE Companion)       | Repeater                         |
|-------------------------------------|----------------------------------|
| Paired with a smartphone            | Runs standalone, no phone needed |
| Powered on/off by user              | On continuously (solar or mains) |
| Used for sending/receiving messages | Forwards messages only           |
| Typically carried or kept indoors   | Mounted at elevation outdoors    |

# Advertisements

Repeaters periodically broadcast **advertisements** announcing their presence on the network. These contain the repeater's identity, geographic position (if configured), and public encryption credentials. Other nodes use this information to discover the repeater and route messages through it.

As of current MeshCore firmware (2025-2026), the default flood advertisement interval for a repeater is 12 hours (set via `set flood.advert.interval <hours>`, range 3-168). Defaults can change between releases, so confirm yours with `get flood.advert.interval`. A zero-hop advert (`advert.zerohop`) is locally visible only; a flood advert (`advert`) propagates through other repeaters across the network.