

Maintaining Your Node

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Updating Meshtastic Firmware

Why Update?

Meshtastic releases updates frequently, delivering bug fixes, new features, and performance improvements. For best compatibility with other nodes on the mesh, keep nodes on the current major version (2.x) and within a few minor releases of the latest stable. Note that nodes running the old 1.x firmware cannot communicate with 2.x nodes at all - the two major versions are not radio-compatible. Running a very old firmware version may cause incompatibility with nodes that have updated.

Checking Your Current Version

Open the [Meshtastic app](#) and navigate to the **Node Info** panel for your node. The firmware version string is displayed there (e.g., `2.5.12.abcdef`).

Finding the Current Release

Meshtastic releases firmware regularly on GitHub at github.com/meshtastic/firmware/releases. Each release includes a changelog. The web flasher at flasher.meshtastic.org always offers the latest stable release automatically - you do not need to find the binary yourself when using it.

Update Methods

1. Web Flasher (Easiest)

1. Open flasher.meshtastic.org in Chrome or Microsoft Edge (WebSerial is required; Firefox does not support it).
2. Connect your device to your computer via USB.
3. Select your board type from the dropdown.
4. Click **Flash**. The flasher downloads and writes the latest stable release.

Configuration is preserved in most updates: a standard Update flash leaves your saved configuration intact, while the "Full Erase and Install" option wipes it. However, major version upgrades occasionally reset configuration - see the section below.

2. Bluetooth OTA (Over-the-Air, nRF52 boards)

Some nRF52 hardware supports over-the-air firmware update via Bluetooth - but this is **not** done from the Meshtastic app itself. It uses Nordic Semiconductor's DFU apps and an `-ota.zip` firmware file. RAK boards such as the RAK4631 support OTA; the T-Echo only supports OTA if it has an updated bootloader (older T-Echo bootloaders lack OTA support). Steps:

- Download the firmware package for your board ending in `-ota.zip` from the Meshtastic releases page.
- On Android, install Nordic's **nRF Connect** app (the OTA procedure currently requires an older release, version 4.24.3). On iOS/iPadOS, install Nordic's **nRF Device Firmware Update** (nRF DFU) app.
- In the Nordic app, connect to your node, select the DFU option, and choose the `-ota.zip` file to push it over Bluetooth. Many ESP32 boards do not support Bluetooth OTA and must be flashed over USB.

3. Arduino / PlatformIO (Developers)

Developers who want to build from source or apply custom patches can use PlatformIO with the Meshtastic firmware repository. This method requires a development environment and is not needed for routine updates.

Configuration Preservation

Most firmware updates preserve your configuration. However, **major version upgrades** (e.g., 2.x → 3.x) occasionally include breaking changes that reset config. Before updating any critical infrastructure node, record:

- Channel name and PSK (or export the QR code)

- Modem preset (e.g., LONG_FAST, MEDIUM_SLOW)
- Device role (Router, Repeater, Client, etc.)
- Any custom position or telemetry settings

Check the release notes for your target version before updating.

Updating a Remote Node

If your node is an nRF52 board with Bluetooth OTA support and is within Bluetooth range, you can update it remotely using Nordic's nRF Connect / nRF DFU app (see the Bluetooth OTA section above) without a USB connection. **Caution:** a failed OTA can leave the device non-working (bricked) until you can physically reach it and reflash over USB, so avoid OTA for hard-to-reach infrastructure nodes. For headless nodes deployed out of Bluetooth range, or boards that do not support OTA, physical access and USB are required.

Rolling Back

If a firmware update causes problems, you can flash the previous version using the web flasher - select the exact version from the version dropdown instead of accepting the default latest. Keep a note of the version that was working on your infrastructure nodes so you can return to it quickly if needed.

Updating MeshCore Firmware

Update Frequency

MeshCore releases firmware periodically. Major releases introduce new features and architecture improvements; point releases fix bugs. Check the changelog at github.com/meshcore-dev/MeshCore/releases before updating to understand what has changed.

Checking Your Current Version

You can find your MeshCore firmware version in two ways:

- **MeshCore app (Bluetooth):** Connect to the node via the companion app and check the node info panel.
- **Serial console:** Connect via USB serial at 115200 baud. The device outputs its firmware version string on boot.

Update Methods

1. MeshCore Web Flasher (Easiest)

1. Open flasher.meshcore.io in Chrome or Edge (WebSerial required).
2. Connect your device via USB.
3. Select your board and firmware variant (Companion, Repeater, or Room Server).
4. Click **Flash**. The flasher downloads the latest release automatically.

This is the recommended method for most users. Ensure you select the correct variant for your node's role.

2. Manual Binary Flash

Download the appropriate binary from the [GitHub releases page](#). The process differs by chip:

nRF52840 devices (RAK4631, Heltec T114, etc.)

These devices expose a USB mass storage drive when in bootloader mode (double-tap the reset button on most boards). Simply drag and drop the `.uf2` file onto the drive. The device reboots automatically after the copy completes. No additional software required.

ESP32 devices

Use `esptool.py` from the command line, or use the web flasher. The web flasher is simpler for most users.

3. OTA (Over-the-Air)

MeshCore supports over-the-air firmware updates, so most updates can now be done without a USB connection:

- **nRF52 boards (RAK, T114, Seeed XIAO):** update over Bluetooth using the nRF DFU app.
- **ESP32 boards:** run the `start ota` command to bring up a Wi-Fi hotspot named `MeshCore OTA`, then upload the firmware from a browser at `http://192.168.4.1/update`.

USB remains the fallback and is required for first-time flashing. See the MeshCore FAQ section 7 for the current step-by-step OTA procedures.

Configuration After Update

MeshCore stores configuration in flash. Most updates preserve existing settings, but you should:

- Read the release notes for any breaking configuration changes before updating.
- After updating, connect to the node and verify your preset, channel key, and role settings are intact.
- If settings were reset, re-apply your configuration before returning the node to service.

Firmware Variants - Flash the Correct One

MeshCore ships multiple firmware variants for the same hardware, each tuned for a different node role:

- **Companion:** For end-user devices paired with a phone or computer app (available as BLE Companion and USB Serial Companion builds).
- **Repeater:** Optimized for infrastructure repeater nodes. Disables unnecessary client features to reduce overhead.
- **Room Server:** Runs a shared message board (BBS-style) that stores posts and forwards them to clients when they connect.

Important: If you accidentally flash Companion firmware onto an infrastructure Repeater node, its behavior will change. Always double-check the variant selection before flashing a deployed node.

Node Maintenance Schedule

A simple maintenance schedule keeps your node reliable and avoids the surprise of a failed battery or corroded antenna during an emergency. Regular checks take 10-15 minutes per node and catch most common failure modes early.

Safety note - work at height: Rooftop and mast work involves fall hazards. Use a properly footed ladder (maintain 3-point contact), avoid wet/icy roofs, never work at height alone, and consider binoculars or a camera pole for visual checks that do not require touching the node. If the node is on a tower, leave climbing to trained/certified climbers.

Monthly Checks (5 minutes)

- **App connection:** Connect to your node and verify it responds. Check firmware version.
- **Battery level:** For solar nodes, verify battery is charging (should be near full by midday). For USB-powered nodes, verify power is stable.
- **Neighbor count:** Are you seeing the same neighbors as before? A suddenly empty neighbor list may indicate an antenna failure or a major change in the local network.
- **Channel utilization:** Keep utilization under 25% - this is the action threshold. Treat sustained readings above 15% as an early warning to investigate before they climb toward 25%.

Quarterly Checks (15 minutes)

- **Visual inspection:** For outdoor nodes - inspect the enclosure for water ingress, cracks, UV damage. Inspect antenna mount for rust or loosening. Check cable entry points for sealant integrity.
- **Firmware update:** Check meshtastic.org for new stable releases. Update if more than 2 versions behind. Back up config before updating.
- **Configuration backup:** Export config to file. Store in a cloud backup location.
- **Range check:** Verify RSSI to 2-3 reference nodes. Compare to your baseline. A 5+ dB drop indicates antenna or cable degradation.

Annual Checks (30-60 minutes)

- **Battery capacity test:** For solar systems, run a controlled capacity test: discharge at a known load to the manufacturer's cutoff voltage (for example, about 10.5 V for a 12 V lead-acid battery), then recharge promptly. Avoid full discharges on lead-acid chemistry, as deep discharges measurably shorten its life. Capacity fades with age, temperature, and cycling - expect noticeable fade after roughly 2-3 years on lead-acid and 3-5+ years on lithium, faster in heat or with deep cycling. Plan replacement when measured capacity drops to about 80% of rated - the standard end-of-life threshold - especially for nodes that must survive long winter nights.
- **Connector re-torque:** Check all SMA/N connector connections and re-torque to specification. Use a calibrated torque wrench: ~5 in-lb (0.56 Nm) for brass SMA, ~8 in-lb (0.9 Nm) for stainless SMA; follow the manufacturer's spec for N connectors (typically ~15-20 in-lb / 1.7-2.3 Nm). Never use pliers; finger-tight is acceptable only for temporary bench setups.
- **Lightning protection inspection:** Verify the coax surge arrestor is intact and the mast and arrestor ground/bond connections are tight and corrosion-free (NEC Article 810 requires a listed antenna discharge unit and mast grounding for outdoor antennas). If the install has no grounding at all, add it before the next storm season.
- **Re-weatherproof connectors:** Remove old self-amalgamating tape, inspect connector for corrosion, reapply fresh tape.
- **Solar panel cleaning:** Wipe panels with damp cloth. Bird droppings and dust accumulation can reduce output 5-15%.

Maintenance Log Template

Keep a simple maintenance log for each node:

Node: WH01-WestHillsRepeater

Node ID: !ab12cd34

Location: 3214 Hill Ave rooftop

Last firmware: 2.6.1 (updated 2026-03-15)

Battery: LiFeP04 20Ah (installed 2025-06)

Maintenance Log:

2026-05-01: Quarterly check. RSSI to Summit -87dBm (baseline -85), within normal.

Enclosure dry. Antenna secure. FW up to date.

2026-02-01: Quarterly check. Updated FW from 2.5.9 to 2.6.1.

Backed up config. Checked solar: 13.8V at noon, good.

2025-11-01: Annual check. Replaced self-amalgamating tape on N connector.

Cleaned solar panel (bird droppings). Battery 98% capacity.