

Repeater Performance and Maintenance

A deployed repeater requires periodic attention to maintain performance. This page covers the key maintenance tasks and performance metrics for Meshtastic Router/Repeater nodes.

Key performance indicators

Metric	Healthy range	Action if outside range
Node uptime	>95% over 30 days	Investigate power system or firmware stability
Average RSSI to neighbors	-70 to -100 dBm	<-110 suggests obstruction or antenna problem
SNR to nearest neighbor	>5 dB	<0 dB: signal at noise floor, link unreliable
Battery voltage (solar)	>3.5V (LiFePO4)	<3.2V repeatedly = undersized power system
Packets forwarded per hour	Varies by location	Sudden drop to 0 = node possibly offline

Routine maintenance checklist (quarterly)

- Check node appears on meshmap.net or community monitoring system
- Verify RSSI/SNR to neighboring nodes hasn't significantly degraded
- Check battery voltage logs if monitoring - look for downward trend
- Inspect solar panel: clean off debris, verify no shading from new growth
- Check antenna connector for corrosion or loosening (especially after winter)
- Verify firmware version - update if significantly behind current release
- Check enclosure for water intrusion - condensation inside is an early warning sign

Firmware update process for deployed nodes

Updating firmware on a deployed repeater requires physical access. Prepare:

1. Schedule a maintenance window and notify the community (the node will be offline during update)
2. Bring: laptop, USB cable for your device type, and the firmware binary or web browser access
3. Before disconnecting: record current configuration (TX power, role, channel settings, position) with `meshtastic --info > config_backup.txt`
4. Flash new firmware via web flasher (flasher.meshtastic.org)
5. Verify settings after flash - firmware updates occasionally reset some settings to defaults
6. Confirm node reappears on the network before leaving the site

Common hardware failures

Symptom	Likely cause	Fix
Node gone offline after storm	Water intrusion, lightning strike, blown fuse	Inspect enclosure, check fuse, examine for burn marks on PCB
Range suddenly reduced	Antenna connector loosened or corroded	Re-seat antenna, check connector for oxidation, replace if needed
Frequent reboots	Power supply instability (low battery/solar)	Check battery voltage, check charge controller output
Firmware crash loop	Corrupted flash or incompatible firmware	Factory reset and reflash
BLE not discoverable	BLE antenna loose (V3 only); software issue	For V3: reseat u.FL BLE antenna. Otherwise reflash.

When to replace vs. repair

LoRa boards are inexpensive (\$15 - 75). General guidance:

- Physical damage to SMA connector or RF front-end: replace board. Repair costs often exceed replacement.
- Software issue (firmware bugs, configuration corruption): reflash before considering hardware replacement.
- Battery degradation (LiFePO4): replace battery after 5+ years or when capacity drops below 70% of original.

- Solar panel degradation: typical panels lose 0.5% efficiency per year. Replace if output is more than 20% below original spec after 10+ years.

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