# MeshCore Repeater Diagnostics via Serial Console

The MeshCore serial console provides direct access to repeater state and diagnostic information. Connecting via USB to a deployed repeater is the most reliable way to diagnose problems that cannot be addressed remotely.

# Connecting to the Serial Console

On Windows: use PuTTY or the Arduino Serial Monitor. On Linux/Mac: use `screen` or `minicom` as a serial terminal.

```
# Linux/Mac
screen /dev/ttyUSB0 115200


# Windows (PuTTY): Connection Type = Serial, Speed = 115200, COM port varies
```

MeshCore boards use 115200 baud for the serial console, including RAK boards. (If you have configured an attached GPS module, that module's own UART may run at a different baud rate such as 9600 - but that is a separate interface from the console.)

# Key Diagnostic Commands

These are commands from the on-device MeshCore serial CLI (see docs.meshcore.io/cli_commands). There is no single combined "status" command - health information is split across several `get ...` and `stats-...` commands.

| Command | Output | Use for |
|---|---|---|
| `ver` | Firmware version | Confirm firmware build |
| `stats-core` | Battery voltage, uptime, queue depth | Overall health check |

| Command | Output | Use for |
|---|---|---|
| `get radio` / `get freq` | Radio config (frequency, bandwidth, SF, coding rate) | Verify radio settings match the network |
| `neighbors` | Up to the 8 most recently heard nodes, with timestamp and SNR | Verify which nodes are reaching this repeater |
| `stats-packets` | Packet counters: Received and Sent | Identify traffic/routing problems |
| `stats-radio` | Noise floor, last RSSI/SNR, airtime, receive errors | Signal quality of last received packet |
| `log` | Prints a captured rx log (must first be started with `log start`, stopped with `log stop`, cleared with `log erase`) | Capture and review received-packet activity |
| `reboot` | (restarts device) | Recover from hung state |

Note: `contacts` and `list` are companion/client-side concepts, not repeater serial commands - on a headless repeater, use `neighbors` instead. The `log` command is a packet/rx capture you start and stop, not an always-on event log.

# Interpreting Stats Output

The `stats-packets` command is a useful diagnostic tool. The firmware exposes Received and Sent counters. A healthy repeater shows:

- **Sent count tracking received traffic** - the repeater is relaying packets it is meant to forward. (The documented counters are Received and Sent; there is no separate "forwarded" or "dropped" counter, so judge activity from the Sent counter rising alongside Received rather than from a "forward rate" metric.)
- **Drops in MeshCore** - MeshCore drops a flood packet when it exceeds the `flood.max` hop ceiling (default 64), and its loop detection (`loop.detect`) drops a packet whose path shows this repeater's own ID/hash repeated. This is not a Meshtastic-style per-packet hop counter decrementing to zero. In MeshCore's path-based routing, a repeater also intentionally does *not* retransmit packets whose embedded path does not include it - these appear as non-forwarded traffic but are correct behavior, not a loop. Distinguish this selective non-forwarding from a genuine duplicate-flood loop before acting.
- **Increasing received count over time** - Confirms the repeater is hearing traffic from the network

# Common Issues and Diagnostics

| Symptom | Check | Fix |
|---|---|---|

| | | |
|---|---|---|
| Received count stays at zero | Check antenna connection, verify radio settings match network | Reconnect antenna; verify radio parameters with `get radio` and `get freq` (frequency, bandwidth, SF, coding rate) and confirm they match the USA/Canada preset values shown in the app |
| Sent count zero despite receives | Verify device is running repeater firmware variant and that forwarding is enabled | Reflash with repeater firmware; confirm `set repeat on` |
| Battery voltage declining | Check solar panel output, charge controller LVD setting | Clean panel, verify charge controller settings |
| Rebooting frequently | Check for low battery voltage causing brownout | Size battery correctly; check charge controller |
| Not appearing in client node list | Repeater may not be sending flood adverts; check the flood advert interval with `get flood.advert.interval` | Send a flood advertisement with `advert` and confirm a flood advert interval is set, e.g. `set flood.advert.interval 12` (hours). Zero-hop adverts (`advert.zerohop` / `set advert.interval`) are local only. There is no `advert_hops` parameter. |

Revision #3
Created 2026-05-03 05:46:19 UTC by Mesh America Admin
Updated 2026-06-09 00:56:30 UTC by Mesh America Admin