Position and Telemetry for Infrastructure Nodes

Why Position Accuracy Matters

An accurate position lets your repeater appear correctly on meshmap.net and in the Meshtastic app's node list. (Note that meshmap.net is a third-party map and only shows nodes reporting to the public MQTT server, so it is not an authoritative or complete view of the mesh.) Other operators use your node's reported position to plan coverage, model signal paths, and verify that packets are actually being relayed from the expected location.

Fixed Position vs. GPS

Most unattended infrastructure repeaters do not need GPS hardware. Instead, configure a **fixed position** using the known coordinates of the deployment site:

1. Look up the coordinates of your site with any map application (Google Maps, OSMand, etc.) - right-click the location and copy the lat/lon.
2. In the Meshtastic app: **Config → Position → Fixed Position → Enable**.
3. Enter the **latitude**, **longitude**, and **altitude** (in metres).
4. Save. The node will broadcast this position at the configured interval without needing a GPS fix.

If your device has GPS hardware and the repeater is mobile (e.g. a vehicle relay), leave GPS enabled and set the Smart Position Broadcast threshold appropriate for your speed.

Position Broadcast Interval

This setting controls how often the node announces its location on the mesh.

- **Default:** 15 minutes (with Smart Broadcast enabled). Smart Broadcast increases the frequency when the node is moving.
- **Recommended for static infrastructure:** 1 hour or longer (`3600` seconds and up); for a permanently fixed node, many operators use 12 - 24 hours (`43200` - `86400` seconds). A repeater that never moves does not need to announce its position frequently.
- Increasing (lengthening) this interval lowers airtime consumption and channel utilisation - important on busy networks.

Smart Position Broadcast

Meshtastic's Smart Position feature broadcasts a new position only when the node has moved beyond a configurable distance threshold. **For a static repeater, disable Smart Position and use a fixed timed interval instead** - Smart Position is designed for moving nodes and may behave unexpectedly on hardware without GPS.

Device Telemetry

Meshtastic can broadcast device health metrics over the mesh. The device metrics are:

- Battery voltage and charge percentage.
- Channel utilisation (ChUtil) - the percentage of time the radio channel is occupied by transmissions (this node's own transmissions plus traffic it senses from others).
- Air utilisation for transmit (AirUtilTX) - the percentage of airtime this node itself spends transmitting.

Enable and configure telemetry under **Module Config → Telemetry**, in the **Device Metrics** section (exact menu labels vary by client and version). Set the broadcast interval - the default of `1800` seconds (30 minutes) is appropriate for most infrastructure nodes; lengthen it to reduce airtime.

Remote Health Monitoring

Once device telemetry is enabled, any operator who can see your node on the mesh can view its reported battery voltage and channel utilisation in the Meshtastic app's node detail view. This provides passive, no-cost status visibility:

- A gradual drop in reported battery voltage warns of a failing solar charge or depleted battery before the node goes offline.

- High channel utilisation (above ~25% ChUtil, or AirUtilTX above ~7 - 8%) indicates congestion - consider lengthening broadcast intervals or relocating the node.
- Uptime resets alert you to unexpected reboots (power glitches, firmware crashes).

Passive telemetry shows health only while the node is alive and in range. It provides **no active alert when the node actually fails** - you simply stop seeing updates, which is easy to miss. For infrastructure you depend on, pair telemetry with an active offline-detection alert (something that notifies you when telemetry stops).

For critical infrastructure nodes, consider setting up a **MQTT bridge** to push telemetry to an external monitoring system - see the Meshtastic MQTT documentation for details. Note that Wi-Fi/MQTT-based monitoring depends on internet connectivity and will fail in exactly the grid-down or internet-out emergencies you may most need it.

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