Understanding What You're Seeing in the App

The Meshtastic app surface area can seem dense at first. This page decodes the most important numbers and indicators you will encounter day-to-day, so you can read the mesh like a map instead of a wall of jargon.

SNR (Signal-to-Noise Ratio)

SNR is displayed in dB (decibels) and measures how much stronger your desired signal is compared to the background noise. In LoRa:

- **Positive SNR** (e.g., +5 dB): Strong signal, well above the noise floor. Excellent conditions.
- **Slightly negative SNR** (e.g., -5 to -8 dB): Normal for LoRa. The spread-spectrum modulation allows LoRa to decode packets even when the signal is *below* the noise floor - this is one of LoRa key advantages over conventional radios.
- **Very negative SNR** (e.g., -15 dB or worse): The signal is barely decodable. Packets at this level will have high error rates. Increasing distance or obstacles will push it past the decoding threshold entirely.

On the default LongFast preset, better than about -10 dB SNR is comfortable for reliable communication; the usable floor depends on the preset's spreading factor (slower presets decode lower SNR). Below about -15 dB on LongFast, expect occasional dropped packets.

RSSI (Received Signal Strength Indicator)

RSSI measures the absolute power of the received signal in dBm (decibel-milliwatts). Unlike SNR, RSSI does not account for background noise - it is just the raw signal level.

- **-90 dBm or better:** Excellent for LoRa. Short to medium range with good antenna alignment.
- **-100 to -110 dBm:** Typical for medium range or one hop through a building.
- **-120 dBm:** Approximately the noise floor. Packets at this level are at the edge of decodability.
- **-130 dBm or worse:** only the slowest presets (high SF, narrow bandwidth) can decode signals this weak.

LoRa sensitivity goes down to around -137 dBm under ideal conditions with high spreading factors, which is why it achieves multi-kilometer range with milliwatt transmit power.

Via 2 hops - what does this mean?

When a message shows via 2 hops, it means the packet traveled through 2 intermediate relay nodes to reach you. A direct connection (0 hops) means your node heard the sender radio transmission directly. Hops increase latency slightly and are subject to the hop limit (default 3), meaning a packet can traverse at most 3 intermediate nodes before being dropped.

Battery icon

The battery percentage shown for each node in the node list is reported by that node itself and transmitted as telemetry. It represents the battery voltage converted to a percentage by the remote node firmware. Nodes on external/USB power report a battery level above 100 (shown as a plug icon in the apps). A persistent 0% usually means no battery is attached or battery sensing is not working. A 0% reading does not necessarily mean the node is dead - boards without a battery attached (running on USB) often cannot read a battery voltage at all.

Last heard timestamp

This is when your node most recently received any packet from that node - whether a message, a position report, or a telemetry update. Nodes that broadcast position or telemetry on a schedule will update this timestamp even when no messages are being sent. If last heard is more than an hour ago, the node may be out of range, powered off, or on a slow telemetry interval.

Channel utilization percentage

This is the fraction of airtime on your channel that has been used by transmissions in a rolling window of roughly the last minute. It includes your own transmissions and every packet your node hears from others. The Meshtastic project recommends keeping this **below 25%**. Above that, collision probability rises quickly because LoRa radios are half-duplex, and if two nodes transmit at once the packets usually collide and are lost - nodes listen before transmitting (CSMA/CA) to reduce this, but there is no collision detection. High utilization means a growing share of packets is being lost to collisions and deferred sends.

Node ID format - what is !ab12cd34?

Every Meshtastic node has a unique node ID in the format `!xxxxxxxx` where the eight hex digits represent the last 4 bytes of the device hardware MAC address. For example, `!ab12cd34` means the MAC address ends in `AB:12:CD:34`. This ID is permanent and tied to the hardware - it does not

change when you re-flash firmware or change settings. It is used internally for routing addressed messages and for deduplication in the mesh protocol.

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