Choosing a Modem Preset

Your modem preset is one of the most consequential configuration decisions for your repeater. It must match every other node on your channel - and different regional communities have standardized on different presets.

What a preset controls

Each preset is a named combination of three LoRa parameters:

- **Spreading Factor (SF):** Higher SF = longer range, longer airtime per packet. Range from 7 (fastest) to 12 (longest range).
- **Bandwidth (BW):** Wider bandwidth = faster data rate, slightly less range.
- **Coding Rate (CR):** Higher CR adds forward error correction overhead.

The full preset table

Preset	SF	BW	CR	Data Rate	Link Budget
Short Turbo	7	500 kHz	4/5	21.9 kbps	140 dB
Short Fast	7	250 kHz	4/5	10.9 kbps	143 dB
Short Slow	8	250 kHz	4/5	6.25 kbps	145.5 dB
Medium Fast	9	250 kHz	4/5	3.52 kbps	148 dB
Medium Slow	10	250 kHz	4/5	1.95 kbps	150.5 dB
Long Fast	11	250 kHz	4/5	1.07 kbps	153 dB
Long Moderate	11	125 kHz	4/8	0.34 kbps	156 dB
Long Slow	12	125 kHz	4/8	0.18 kbps	158.5 dB

The link-budget figures above assume 22 dBm TX power and 0 dBi antennas; your real budget shifts with your actual transmit power and antenna gain. `VERY_LONG_SLOW` (SF12 at the narrowest bandwidth) is the only preset offering even more range than Long Slow, but it is deprecated and not recommended by the Meshtastic project for regular use.

Link budget is roughly the maximum single-hop path loss the signal can survive, computed at 22 dBm TX and 0 dBi antennas; real budgets shift with your actual TX power and antenna gain. Higher

is more range. Data rate is the raw channel throughput - faster data rate means each transmission occupies less airtime, reducing collisions in busy networks.

Step 1: Ask your local community

Before choosing a preset, check what your local or regional network has standardized on. **All nodes on a channel must use the same preset to communicate.** If your area already has an established mesh, deploying on a different preset will isolate your repeater from it entirely.

Check local Discord servers, third-party tools such as the community network map at meshmap.net (unofficial; only shows nodes reporting to the public MQTT server), or regional mesh community pages for your area's standard.

Step 2: Match your network density

If no local standard exists, choose based on your expected network density:

Sparse / rural networks (under ~60 nodes in range)

Long Fast (the firmware default) is a reasonable choice. Range is maximized and the lower data rate is not a problem when relatively few nodes are generating traffic.

Larger networks (more than ~60 nodes)

Consider Medium Slow or Medium Fast. The official guidance is to consider moving away from Long Fast once a mesh exceeds roughly 60 nodes. The 3 - 4x higher data rate significantly reduces collision probability while still maintaining respectable, only slightly reduced range compared to Long Fast.

Dense urban networks (well over 60 nodes)

Faster presets are strongly preferred. Long Fast in a 100+ node network can cause congestion as packet airtime accumulates. Medium Slow has been reported as the standard for at least one large community mesh: the Meshtastic Bay Area community (reportedly 150+ nodes, as of 2025) is reported to have migrated to Medium Slow with improved reliability, and the Wellington Region Mesh (New Zealand) is reported to use Short Fast. These community figures are unsourced and change over time - check your local community's current standard rather than relying on these examples.

Presets to avoid for repeater deployment

- **Long Slow / Very Long Slow** - maximum range but extremely long airtime per packet. Can saturate a network even at low message rates. Long Slow and the even slower, deprecated `VERY_LONG_SLOW` are not recommended for regular use by the Meshtastic project.
- **Short Turbo** - highest throughput, but it uses 500 kHz bandwidth. This is legal in the US 902-928 MHz band, but some narrower regional bands (for example EU 868 MHz) do not permit it. Verify legality for your region before use.

Setting the preset via CLI

```
meshtastic --set lora.modem_preset MEDIUM_SLOW
```

Valid preset names: `SHORT_TURBO`, `SHORT_FAST`, `SHORT_SLOW`, `MEDIUM_FAST`, `MEDIUM_SLOW`, `LONG_FAST`, `LONG_MODERATE`, `LONG_SLOW`, `VERY_LONG_SLOW` (VERY_LONG_SLOW is deprecated / not recommended).

Frequency slot and channel name

Meshtastic derives the transmit frequency from the channel name hash by default (frequency slot 0). This means two nodes with the same channel name and same preset will automatically land on the same frequency. You can override this with a specific slot number if needed, but the default hash-based behavior is correct for most deployments.

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