

Choosing the Right Modem Preset

The modem preset is the single most impactful LoRa setting - it determines range, data rate, and network capacity. This page provides a decision framework for choosing the right preset for your deployment.

Step 1: Ask Your Community First

Before anything else: what does your local mesh network use? Ask on the community Discord, check meshmap.net, or contact local operators. Using a different preset isolates your node from the existing community network. This is the most important step.

Step 2: If Building a New Network - Choose by Size

Sparse / Rural Networks (under 30 nodes in range)

Use **Long Fast** (the Meshtastic default). At low node density, network capacity is not a concern. Maximizing range ensures the widest possible coverage from each node. Long Fast provides excellent range while keeping data rate high enough for reasonable message latency.

Medium-Density Networks (30-60 nodes)

Consider **Medium Fast** or **Medium Slow**. At this density, Long Fast's airtime per packet starts contributing to congestion, especially with position telemetry from many nodes. Medium presets carry data faster (Medium Fast is about 3x quicker than Long Fast, Medium Slow about 2x), which reduces airtime while maintaining similar range in most terrain.

Dense Urban Networks (60+ nodes)

Use **Medium Fast** or **Medium Slow**. Some large community networks have reported success migrating away from Long Fast to faster presets - for example, the Bay Area Group (150+ nodes) moved to Medium Slow, and the Wellington Region Mesh in New Zealand migrated its mesh to Short Fast - and report reliability improvements. At high node counts, a full-length Long Fast packet (SF11/BW250) occupies roughly 1-2 seconds of airtime, creating constant background congestion; faster Medium presets cut airtime substantially and free up channel capacity. Actual airtime depends on payload size - a small (~50 byte) Long Fast packet is roughly 400-700 ms.

Preset Selection Matrix

Preset	Link Budget	Data Rate	Best For	Avoid When
Long Slow	158.5 dB	0.18 kbps	Extreme range testing	Network > 5 nodes; can saturate channel
Long Moderate	156 dB	0.34 kbps	Very sparse, maximum range needed	Any network with moderate traffic
Long Fast	153 dB	1.07 kbps	Sparse/rural networks; new deployments	Dense networks >50 nodes
Long Turbo	150 dB	1.34 kbps	Higher data rate at Medium-tier range	When you need Long-Fast range (its 150 dB link budget is below Long Fast's 153 dB)
Medium Slow	150.5 dB	1.95 kbps	Medium to dense networks; recommended	Absolute maximum range required
Medium Fast	148 dB	3.52 kbps	Dense networks; high message volume	Long range links needed
Short Slow	145.5 dB	6.25 kbps	Very dense, high-throughput local nets	Any nodes more than 5 km apart
Short Fast	143 dB	10.9 kbps	Highest throughput applications	Any nodes more than 3 km apart
Short Turbo	140 dB	21.9 kbps	Maximum throughput	Uses 500 kHz bandwidth, permitted in the US/Canada 902-928 MHz band but not legal in some other regions (e.g., parts of the EU) - check your region

Note: Long Turbo's 150 dB link budget is essentially the same as Medium Slow (150.5 dB) and below Long Fast (153 dB). It trades Long-Fast range for a higher data rate by using 500 kHz bandwidth, so treat its coverage as Medium-tier, not Long-tier. (Long Turbo's status as a current firmware enum should be confirmed against the firmware protobuf.)

Migrating a Network to a Different Preset

Changing presets on an active community network requires careful coordination:

1. Announce the planned change at least 1 week in advance
2. Document the exact new preset value
3. Schedule a cutover time (e.g., Sunday midnight when traffic is lowest)
4. Have all operators change their nodes simultaneously
5. Verify connectivity after the change
6. Update all network documentation with the new preset

Nodes that don't update in time will be invisible to the network until their operator updates. Plan for 2-4 weeks of dual-operation where some users are still on the old preset.

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