

What is LoRa Mesh Networking?

LoRa mesh networking lets people communicate over radio without any internet connection, cell towers, or central infrastructure. It works by linking together a collection of small, affordable radio devices - each one can receive a message and pass it along to others, forming a self-organizing mesh.

The basics

- **LoRa** (Long Range) is a radio modulation technology designed for sending small amounts of data over long distances at very low power.
- **Mesh networking** means there is no single hub. Any device can relay messages to any other device, and the network routes around failures automatically.
- **915 MHz ISM band** is the license-free frequency used in the US and Canada. No amateur radio license is required to operate.

How a message travels

1. You type a message on your smartphone and send it via Bluetooth to your LoRa device.
2. Your device broadcasts the message over radio.
3. Nearby devices receive it and - depending on the protocol - relay it onward toward the destination.
4. The message arrives at the recipient's device and is delivered to their phone via Bluetooth.

The network is entirely infrastructure-independent. It operates whether or not the internet is up, whether or not cell towers are functioning, and whether or not there is power at a central location.

What it is good for

- Off-grid and backcountry communication

- Neighborhood and community coordination
- Communication during disasters or outages
- Privacy-conscious messaging without carrier involvement
- Experimenting with decentralized communications

Limitations to understand

- **Low data rate** - LoRa is designed for short text messages, not voice, video, or large files.
 - **Range depends on terrain** - line-of-sight from elevation is ideal. Ground level in a city may give just a few hundred meters; hilltop to hilltop can reach 20+ miles.
 - **Coverage requires community** - the network only exists where people have deployed devices. In low-density areas you may be starting from scratch.
 - **Not a replacement for emergency services** - always call 911 in an emergency.
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