

Why isn't my GPS getting a fix?

GPS fix time expectations

Getting a GPS fix takes time - particularly on a cold start (first power-on or after being stored). Under normal outdoor conditions:

Condition	Expected fix time
Cold start, outdoors, clear sky	30 seconds - 5 minutes
Warm start (powered recently)	5-15 seconds
Indoors, near window	2-10 minutes (often fails entirely)
Indoors, no window	Will not get a fix

Common Causes of No GPS Fix

Indoors

GPS signals are extremely weak (-130 dBm from satellites). They are heavily attenuated by buildings and concrete and effectively blocked by metal. High-sensitivity receivers can sometimes get a fix near a window, but reliable acquisition requires going outdoors with a clear view of the sky.

Antenna not connected or loose

Boards with a U.FL GPS antenna connector (T-Beam, some RAK boards) have a small snap-fit U.FL connector between the GPS module and the antenna. This connector can come loose in shipping. Open the case and verify the connector is fully seated - it should click into place.

GPS module disabled in firmware

If you (or a previous configuration) disabled GPS to save power, the module will not attempt to acquire satellites. For most users, the easiest path is the app: **Radio Config** → **Position** → **GPS Mode** → set to Enabled.

Advanced (requires the Meshtastic command-line tool, a separate install, with the device connected over USB):

```
meshtastic --set position.gps_mode ENABLED
```

Power brownout

If the GPS module is not receiving adequate voltage (often seen when running from a nearly depleted battery), it may fail to initialize. Try with a freshly charged battery or USB power.

AGPS data expired

Some boards support AGPS (Assisted GPS), which provides almanac data to speed up acquisition. If the AGPS data is stale (more than 2 weeks old), fix time increases significantly. Re-upload AGPS data via the app when connected to the internet.

Testing GPS Without Going Outside

Place the device on an outdoor windowsill with the GPS antenna facing up toward the sky. This is the minimum viable indoor setup for GPS - results vary significantly by window direction and whether metal frames or low-E glass are present.

T-Beam GPS Note

GPS modules vary by T-Beam variant: older T-Beam v1.x units use a Quectel L76K or NEO-6M module, while the newer T-Beam Supreme uses a different module and layout - so the specifics below apply mainly to the classic T-Beam, not necessarily the Supreme. The NEO-6M found in older T-Beam versions has been discontinued; Quectel L76K in newer units is generally faster to acquire. The GPS is connected to the ESP32 via UART2 - if you see GPS-related errors in the serial console, check that the GPS power is enabled (some T-Beam versions have a GPS power pin that must be asserted).

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