RepeaterStore

CEL-FI GO X

Installation Guide

Please Read This First

We know, reading manuals isn't fun. But we promise it's worth it.

We've helped hundreds of customers install the Cel-Fi GO X and boost their signal. We've compiled everything we've learned in this manual.

Give it a read before you start: it'll save you time and help you get the best performance out of your GO X.

What's In The Box

Cel-Fi GO X Amplifier

Outdoor Antenna

Antenna Mount

1x, 2x, or 4x Indoor Antenna(s)*

(Type and quantity depends on kit purchased)

Dome Antenna

Panel Antenna

Coaxial Cable

2x, 3x, or 5x
30 ft RS400 Cable*

1 ft RS200 Cable**

Included with 2x and
4x antenna kits only

Other Parts
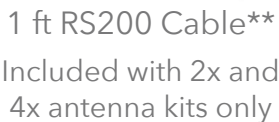
(Quantity and type depends on kit purchased)

SMA to N-Type
Pigtails (2x)

AC Power Supply

Lightning Surge
Protector Kit

2-way or 4-way
splitter **

* Quantity depends on whether you bought a kit that includes 1, 2 or 4 antennas.
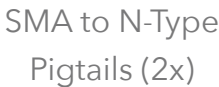
** The single-antenna kit does not include a splitter or a 1 ft jumper

Install manuals, who needs 'em?

Boosters can be finicky. And The Cel-Fi GO X is no exception. It will take a bit of work to get your GO X unit set up correctly.

But there's a reason that most people are willing to take the time to perform an installation, even if it takes 4 to 5 hours. The GO X is the only device on the market that provides an industry-leading 100 dB of gain. Once you get it set up and running properly, you should see a **significant** improvement in signal, right away.

We've written this guide based on our own experiences and those of dozens of customers who we've helped. **We promise you'll be glad if you read this manual through thoroughly before you get started.** It'll help you save time, avoid the most common pitfalls, and ensure your system works as well as possible. If you get stuck, just call us at 800-761-3041.

Compatibility

First, a quick reminder. The Cel-Fi Go X is compatible with:

- ✅ AT&T 3G and LTE signal
- ✅ T-Mobile 3G and LTE signal
- ✅ Verizon LTE signal
- ❌ Verizon 2G/3G signal

The lack of Verizon 2G/3G compatibility isn't a big a deal. Here's why: as long as you have LTE signal available in your area to boost, you should be fine.

Most phones released after 2014 support "HD Voice" – also known as "Voice over LTE" (VoLTE). VoLTE is usually enabled by default. For example, all iPhones released since 2014, including the iPhone 6, support VoLTE. If you're worried about it, just give us a call.

Stuck?

We're here to help. Or just to chat about how strong or weak your cell signal is. We get out of bed in the morning to talk about this stuff - we're not kidding.

Call us at 1-800-761-3041, 7am-5pm PT or visit **RepeaterStore.com/help**

01 Isolation

Understanding "isolation" is critical to installing your GO X correctly.

Isolation is a measure of separation between the Indoor and Outdoor antennas.

The Cel-Fi GO X automatically throttles its gain (amplification) up or down to avoid "oscillation." Oscillation is a type of feedback that occurs if the gain of the system is higher than the isolation.

The more isolation between the donor and server antenna you have, the more the GO X will be able to amplify your signal, and the better your signal will be inside the building.

Example of Poor Isolation

❌ Not enough vertical separation between outdoor and indoor antenna.

❌ Not enough horizontal separation between outdoor and indoor antenna.

❌ Not enough building materials between indoor and outdoor antenna

Example of Good Isolation
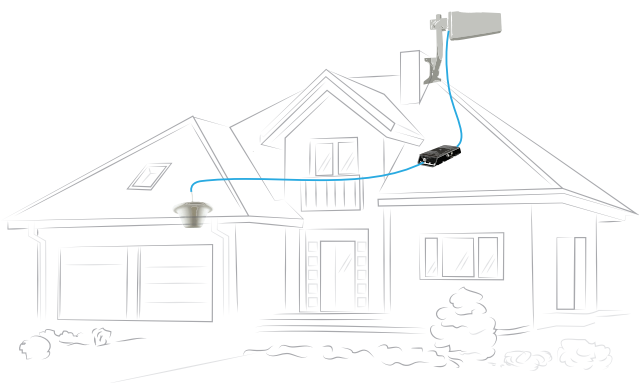
✅ Good vertical separation.

✅ Outdoor antenna pointing away from indoor antenna.

✅ Multiple layers of building materials between antennas.

Isolation is increased when:

1 You **increase horizontal or vertical distance** between indoor and outdoor antennas.

2 You position the antennas so there is **more building materials** separating them.

3 You **point the indoor and outdoor antennas away from each other**.

For best performance, we recommend *at least 50 feet of separation* between the indoor and outdoor antennas, or *at least 30 feet and two layers of building materials*.

Please note that these are just guidelines. Often you'll need to compromise isolation in order to get the best signal quality or to cover the entire building with signal from the indoor antennas.

Once your GO X is installed and operational, you can check isolation by looking at the "Echo Gain" values in the Advanced tab of the Wave app. See the "Advanced Tab" section near the end of this document for more information.

If you're having any problems, please reach out to us, we'll be happy to walk you through optimizing the installation to make sure you're getting the absolute best results.

02 Amplifier Install Location

If you have very weak outdoor signal (1 bar, or less than -105 dBm RSRP signal - see the next page on how to take measurements), it's best to install the GO X as near to the donor antenna as possible and cut and crimp the cable to reduce the cable length. Of course, you should make sure the donor antenna is outdoors and the GO X is indoors.

Here's why: If your signal is weak to begin with, it will become even weaker (attenuate) as it passes through a longer length of cable. The signal may be unusable by the time it gets to the GO X. If the outdoor signal is strong, the GO X's location doesn't matter.

A shorter cable run will mean that the signal is strong enough for the GO X to recognize and boost it.

03 Indoor Antenna Types & Placement

When deciding the placement of your indoor antennas, you'll need to consider the type of antennas in your kit.

Panel antennas

A panel antenna has a narrower "spray" (technically called a "beamwidth"). This means that it directs signal in one direction, and *not* in a circle, like a dome antenna. Panel antennas should be installed near the perimeter of the coverage area for best results. For example, you might use a panel at the end of the hallway or at one end of your house.
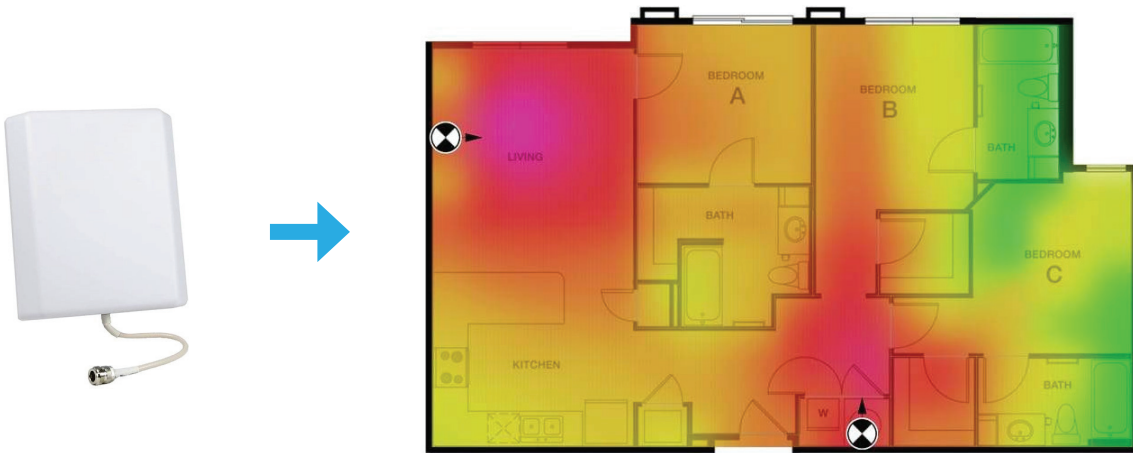
Dome antennas

Dome antennas should be installed centrally to the area you are looking to cover. Some (but less) signal will also radiate upwards to cover the floor above.

04 Outdoor Antenna Location & Aiming

Finding the best location possible for the Outdoor Antenna is critical. There are two things you need to consider:

1 Isolation from the indoor antennas

2 Signal quality

Signal quality is very important: the better the signal quality at the Outdoor Antenna location, the better the signal that the amplifier has to boost.

How To Measure Signal Quality

For some buildings, the location with the best signal may be on top of the roof. In others, the best location is the side of the building. The best way to find out is to test.

There are two ways you can measure signal quality:

1 You can simply look at the **number of bars** on a phone connected to the carrier that you're boosting. This is a crude measure, but if you have 3 or more bars of signal, you should be fine.

2 You can use use **Field Test Mode on Apple iOS** devices or **LTE Discovery on Android** phones to measure SINR, a measure of signal quality. You can read more about these here: **RepeaterStore.com/fieldtest**

Note: You can also measure the SINR using the "Advanced" tab of the Cel-Fi Wave Application, which is explained at the end of this document.

To find the best Outdoor Antenna location: walk around the perimeter of your building with your phone, and if you can, get up on the roof. You're looking for a location with good SINR (ideally above 5 dB) and good isolation from the indoor antenna locations.

Fine-Tuning and Aiming:

In the "Outdoor Antenna Positioning" section near the end of this guide we explain the Wave application's "Antenna Position Test."

The Antenna Position Test can help you test and compare multiple Outdoor Antenna locations, and will help you aim the antenna at the source of the best signal.

05 Assembling Your Kit

Before you start

It's critical that you have **at least 1 bar** of usable signal outside or on the roof of the building you're installing the GO X in. If you don't have 1 bar, or if you're not sure, give us a call.

What do we mean by *usable*?

Well, you need to be able to place a call, use data, etc. Cell boosters bring signal inside from outdoors. If the signal outside your building at the "donor" location isn't usable, the GO X isn't going to help.

If you don't have 1 bar of *usable* signal, we're sorry, but there's not much point in continuing. Visit **RepeaterStore.com/returns** to set up a return. We're happy to take your Cel-Fi Go X back and get you a different booster.

Getting the parts set up

Refer to the diagram to the right as needed ───────────────────────────▶

1. Connect the two SMA Pigtail cable adapters to the Cel-Fi GO X amplifier.

2. Note the two icons by the Cel-Fi unit's two SMA connectors:

    📱 This port should be plugged into the indoor antenna(s).

    📡 This port should be connected to the outdoor "donor" antenna.

3. Connect the RS400 cables to the SMA pigtail adapters and hand-tighten them.

4. Connect the splitters (if any), and Indoor Antenna(s) (panel or dome) to the indoor end of the Cel-Fi Go X and hand-tighten the connector(s).

5. Connect the Outdoor Antenna to the 5 ft RS200 cable, Lightning Surge Protector, and RS400 cable. The Surge Protector should be installed outdoors, just before the cable enters the building, and should be connected to the building ground using the included grounding cable. Make sure you connect the outdoor "donor" antenna feed to the side of the amplifier that has a small icon of a cell tower).

6. Connect the Cel-Fi Go X power supply and plug into the booster.

Antenna Mount & Outdoor Directional Antenna

5 ft RS200 Cable

Lightning Surge Protector + 5 ft Grounding Cable
Should ideally be installed outdoors, just before cable enters building. Connect the Lightning Surge Protector to the building's ground with 10 AWG or higher grounding cable (5 ft grounding cable included).

30 ft RS400 Cable

SMA to N-type Pigtail Adapter

AC Power Adapter

Cel-Fi GO X

SMA to N-type Pigtail Adapter

1 ft RS240 Cable
Only included in kits with more than 1 indoor antenna

Splitter
Only included in kits with more than 1 indoor antenna

Dome or Panel Antenna
Quantity depends on kit purchased

30 ft RS400 Cable
One 30 ft cable included in kit per indoor antenna

06 Cel-Fi Wave App and Pairing

1 Download the "Cel-Fi Wave" app to your phone or tablet from **cel-fi.com/software** or directly from the **iOS App Store** or **Google Play**.

Ideally you'll need Internet connectivity when setting up the GO X, though it will also work offline.

2 Open the app while keeping your phone within 4 feet of the GO X to start pairing. This may take a few minutes, the app will say "searching," "syncing data," and finally "gathering data."

3 Register your device if prompted to do so.

4 Check that your operator is shown in the bottom left of the "Dashboard" screen.

If it isn't, go to "Settings" and then "Operator" to change it. Changing carriers takes a few minutes - don't turn off your booster or move your phone away during the process.

(Note: the carrier that the amplifier is currently boosting will not be listed in the "Operator" dropdown. For example if your GO X is boosting Verizon it will list AT&T and T-Mobile as options).

5 Update the software for the GO X if the app prompts you to do so (this may take 10 to 20 minutes and requires a data connection).
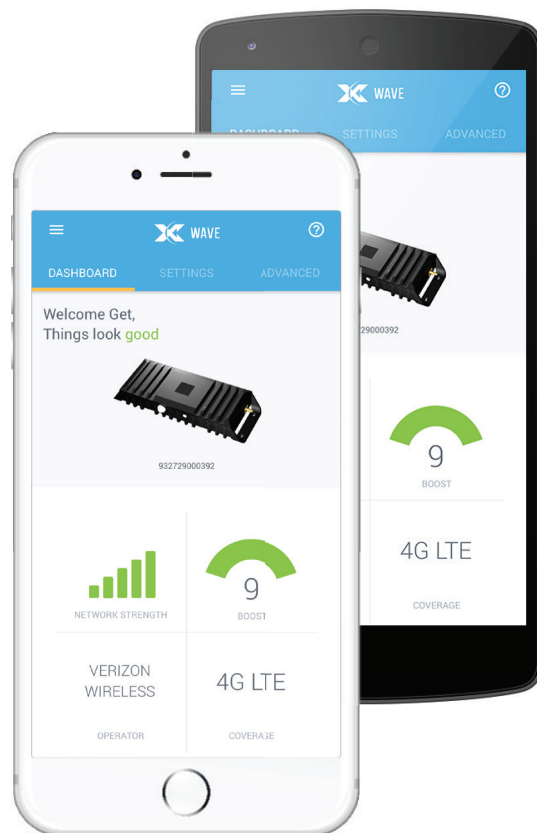
Troubleshooting Wave App Pairing:

- Note: only *one* device (your phone or tablet) can connect to the Cel-Fi GO X at a time.

- If the Wave app is unable to connect to your device, first try force-closing the application.

  - In Android, this is done by going to your phone's Settings, choosing the "Apps" option, finding the Wave app, and then choosing the "Force Stop" option.

  - For iOS, you can read here about how to force-close apps: **RepeaterStore.com/fcios**

- If force closing the app doesn't help then restart your phone and power cycle the unit by unplugging by the power adapter.

07 Understand How The Go X Works

The GO X "Searches" For Signal

Unlike other boosters, the GO X **doesn't** amplify the entire frequency spectrum. Instead, it searches for and then amplifies the best signal available from the carrier.

At any given time, the GO X can amplify up to two frequencies transmited by your carrier.

In the Wave mobile app, you can watch in the "Advanced" tab as it scans the frequencies on different bands to find the best signal to amplify.

Anytime you power-cycle the GO X or disconnect the outdoor antenna cable, it will restart scanning to find the best signal.

Anytime you unplug the cable from the outdoor antenna, power cycle the GO X by unplugging its power. The GO X starts scanning as soon as you unplug the outdoor antenna cable. To make sure it scans all frequencies, restart the unit after reconnecting the cable.

Activity Lights

A small light on the GO X flashes to indicate the current status.

Solid Green:
The GO X has found the best band is amplifying.

Blinking Green:
The GO X is scanning for networks to boost.

Blinking Red:
The unit is in an error condition. Check the app for more information.

Solid Red:
If the status light remains red, the device has a hardware issue. Call us for a replacement.
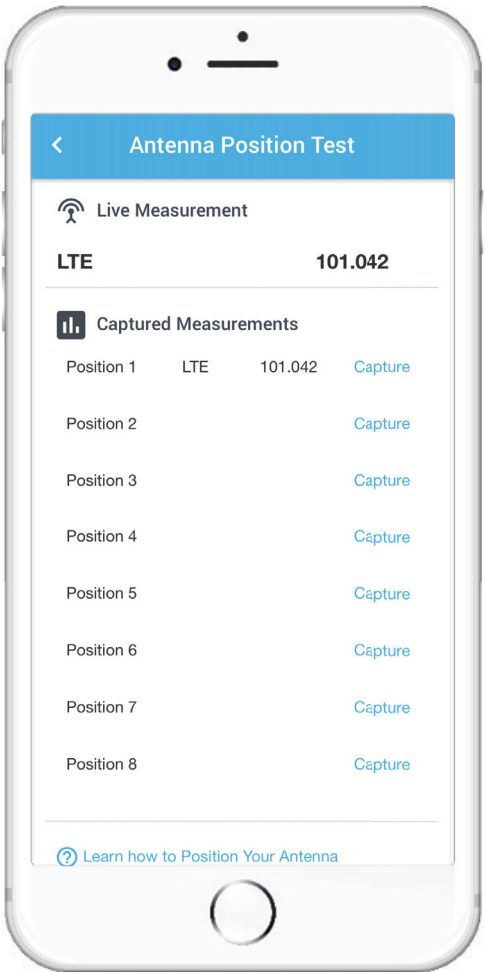
Boot-up Sequence

On first being plugged in, the GO X activity light will start solid red, then flash red, then move on to blinking green as it starts scanning the cellular frequency bands.

08   Using the Antenna Position Test

The Wave app comes with an Antenna Position Test that can help you achieve the ideal balance between isolation and signal quality.

1. Make sure that your indoor antenna(s) are located approximately where they will be installed.

2. In the Wave app, go to the "**Settings**" tab, and under the "**Antenna Settings**" tab select the "**Antenna Position Test**" option.

3. The app will guide you through taking multiple measurements. Try both different antenna locations and directions. Consider isolation and signal quality when choosing antenna locations.

4. **The higher the number, the better your signal will be.**

5. Once you're done, the Wave app will calculate the best location for your outdoor antenna.

If you're having issues finding the best antenna location, don't hesitate to contact our support team. We'll gladly walk you through finding the best location for best results.

‹	**Antenna Position Test**		
📡 Live Measurement			
LTE			**101.042**
📊 Captured Measurements			
Position 1	LTE	101.042	Capture
Position 2			Capture
Position 3			Capture
Position 4			Capture
Position 5			Capture
Position 6			Capture
Position 7			Capture
Position 8			Capture
ⓘ Learn how to Position Your Antenna			

09 The "Advanced" Tab

One of the best features of the GO X is that it actively listens and decodes the cellular signals before amplifying. You can find out more about the donor signal and the booster's performance under the"Super Channels" sections of the "Advanced" tab.

DASHBOARD	SETTINGS	ADVANCED
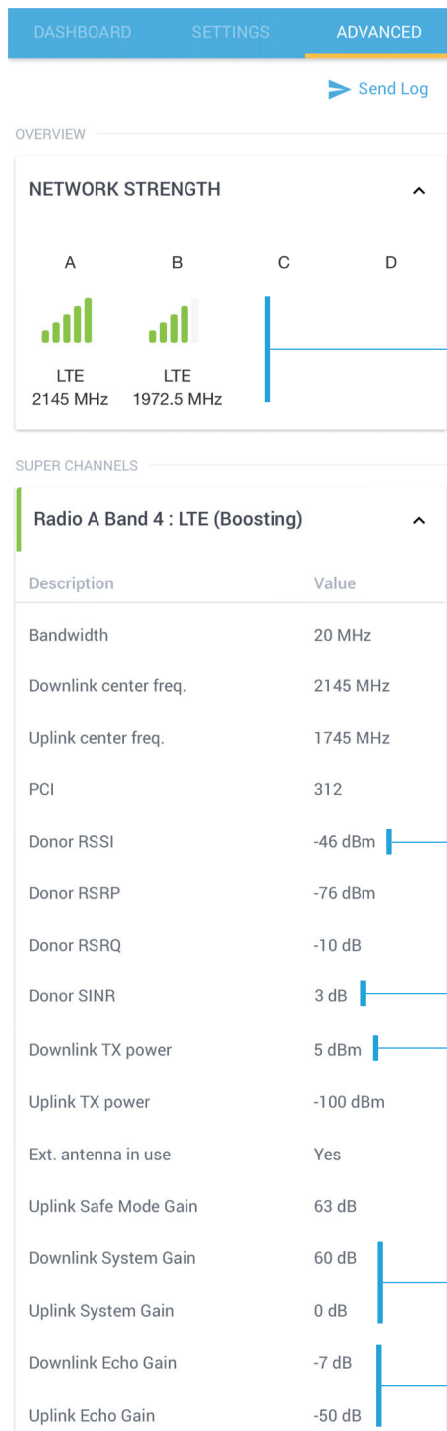
Send Log

The "Send Log" button allows you send a diagnostic log from your device to either the RepeaterStore or Cel-Fi support teams.

OVERVIEW

NETWORK STRENGTH

A	B	C	D
LTE 2145 MHz	LTE 1972.5 MHz		

This area shows the bands currently being amplified. When the device is scanning, the frequencies will change.

SUPER CHANNELS

Radio A Band 4 : LTE (Boosting)

The "Super Channels" section lists the two bands being amplified. Select a band to expand the details (as shown).

Description	Value
Bandwidth	20 MHz
Downlink center freq.	2145 MHz
Uplink center freq.	1745 MHz
PCI	312
Donor RSSI	-46 dBm
Donor RSRP	-76 dBm
Donor RSRQ	-10 dB
Donor SINR	3 dB
Downlink TX power	5 dBm
Uplink TX power	-100 dBm
Ext. antenna in use	Yes
Uplink Safe Mode Gain	63 dB
Downlink System Gain	60 dB
Uplink System Gain	0 dB
Downlink Echo Gain	-7 dB
Uplink Echo Gain	-50 dB

The "Donor RSSI" value shows the signal strength being received from the outdoor antenna.

The "Donor SINR" is a measure of signal quality. Ideally, you want a number higher than 3 dB here. The higher the SINR, the more bars you'll see. If your SINR is under 0 dB, try moving the Outdoor antenna to different a different location, or changing the direction it is pointing.

The "Downlink TX Power" shows how much signal is being rebroadcast. The higher this number, the greater the coverage area. Ideally you want 0 dBm or higher here.

The Uplink and Downlink System Gain show the current uplink and downlink amplification of the system. Uplink may sometimes show 0 dB when phones aren't in use. That's normal.

The "Echo Gain" numbers show how much isolation you have between the outdoor and indoor antennas. If either number is at or near 10 dB, you need more isolation between the outdoor and indoor antennas.

10 Booster Mode and Bands

Booster Mode

Under the "Booster Settings" section of the "Settings" tab of the Wave app, there is an option to change the booster mode from "Stationary" to "Mobile."

The Mobile setting should only be used if you are using the booster on the go in a vehicle or RV. It reduces the gain of the unit from 100 dB to 65 dB.

Bands

The "Bands" settings under the "Booster Settings" section allows you to control which bands are scanned and amplified by the GO X.

In some cases, the carrier networks will try to hand you off to the highest band automatically, even if it isn't the best quality signal. Lower frequency bands also propogate further. In such cases, it can help to lock the Cel-Fi to just the 700 MHz frequency band (12, 13 or 17).

Here are how the band numbers show match up to different frequencies:

- Band 12/13/17 = 700 MHz;
- Band 2 = 1900 MHz;
- Band 4 = 2100 MHz;
- Band 5 = 850 MHz.
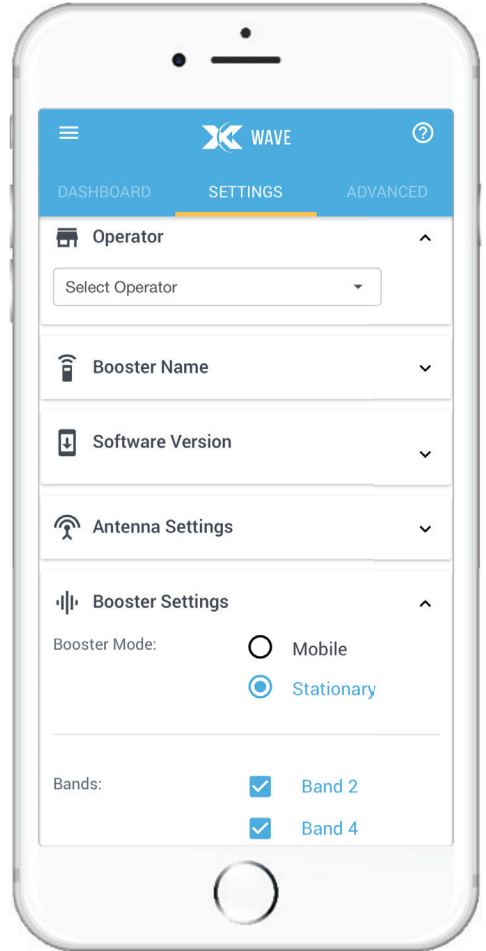
11 Tips and FAQ

Installation Tips:

- If you unplug the cable from the outdoor antenna, make sure to reset the GO X.
The GO X will start scanning as soon as you unplug the cable to the outdoor antenna. To make sure it scans all the frequencies, restart the unit after you reconnect the cable.

- If you have extra cable, don't coil it tightly.
Ideally, you should cut and crimp any longer lengths of extra cable. If you can't do that, make sure to keep any cable loops as large as possible to minimize negative side-effects (4 ft or wider loops are best).

- Antenna locations and signal quality matter more than anything.
Review the "Isolation" and "Outdoor Antenna Location & Aiming" sections carefully. Getting these two things right is the key to getting great coverage. We also recommend using the "Antenna Position Test" in the Wave app for best results.

Frequently Asked Questions:

How do I know if I have enough isolation between outdoor and indoor antennas?

Under the "Advanced" tab of the Wave app, look at the "Downlink TX Power" and "Downlink Echo Gain" under each Super Channel. If the Downlink TX Power is less than 5 dBm *and* the Downlink Echo Gain is between 5 to 10 dB, you need more isolation between your indoor and outdoor antennas for best performance.

What can I do to improve the number of bars my phone is showing or increase my upload and download speeds?

The most important thing you can do improve performance is to improve the donor signal quality. Look at the "Donor SINR" measurement for each Super Channel under the "Advanced" tab of the Wave app. Your Donor SINR should be at least 0 dB. If you can get to 3 dB or higher, that's great – the higher the better (the maximum is 30 dB).

To improve SINR, try moving the outdoor antenna to new locations, and pointing it in different directions. You can also upgrade your outdoor antenna to a Cel-Fi LPDA Antenna (available at RepeaterStore.com).

Having problems? Send us a text or give us a call at (949) 449-2290.

RepeaterStore

Need help? We're ready and waiting.

Signal boosters aren't always easy to install. In fact, getting everything up and running can sometimes be a pain. But the end result is worth it.

One of the benefits of buying from RepeaterStore is our **lifetime technical support** on every system we sell. We've installed hundreds of these devices ourselves, and can walk you through troubleshooting and fine-tuning your installation for best results.

Simply give us a call, start a livechat on our website, or send us an email. We **love** helping solve tricky install problems.