

WAVEFORM

QuadMini

Low Profile 4x4 MIMO Antenna

PLEASE READ THIS FIRST:

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

We've helped thousands of customers improve signal to their cellular routers. 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 QuadMini.

Designed by WAVEFORM in California

Your QuadMini is designed, sold, and supported by Waveform and our team of Signal Specialists.

We've helped over 50,000 customers improve their signal since the company was founded in 2007.

If you have any issues at all, **please reach out.**



3411 W. Lake Center Dr.,
Santa Ana, CA 92704



+1 (800) 761-3041



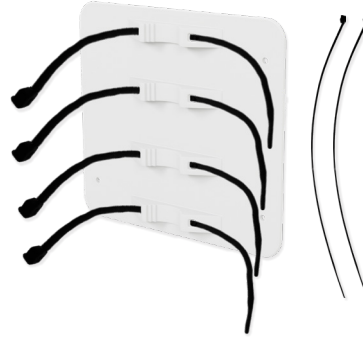
www.waveform.com
help@waveform.com

What's in the Box

QuadMini Antenna & Mounting Equipment



QuadMini
Antenna



Pole Bracket &
6x Zip Ties*
(for pole mounting)



Desktop Bracket
(for desk mounting)



6x Thumb Screws*
(for Pole & Desk Bracket)

CLEAR BAG

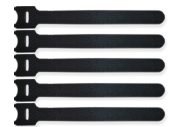


6x Screws & Anchors*
(for wall mounting)

CLEAR BAG



4x Suction Cups
(for window mounting)



5x Velcro Ties

CLEAR BAG

* Includes extras

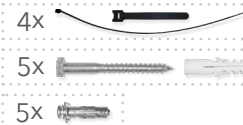
Cables, Adapters, UltraPole (Only Included with Complete Kit)

If you purchased the complete QuadMini Kit, you'll also receive the parts listed below.



1x or 2x UltraFlex-Quad Cables
(Kits include 10 ft and/or 20 ft lengths)

BROWN BAG



UltraPole
BROWN BOX



Quad Window Entry Cable

BROWN BAG



4x U.FL to SMA Pigtail Adapters

BLUE BAG

00 Before You Start

Whether it be inside, outside, or on the roof, it's important that there's at least some 4G LTE or 5G signal where you're installing your QuadMini. Ideally, the cell signal should be "usable."




What Do We Mean by "Usable"?




When using your cellular router or hotspot, **you should be able to complete a data speed test** before connecting your QuadMini. Connect to the Wi-Fi of your cellular device and visit [speedtest.net](https://www.speedtest.net) to run a quick data speed test.

MIMO antennas, like the QuadMini, will help condition your outdoor signal and get you better data rates. **But if the signal outside your building isn't usable to begin with, an antenna might not help.** You can certainly still give the QuadMini a shot, you may not get the results you're expecting.

Compatibility

Your QuadMini supports almost every 4G LTE and low/mid-band 5G service in use in the US, Canada, and across the world. Here are the bands that it covers*:

USA	 AT&T	B2/n2, B4, B5/n5, B12, B17, B29, B30, B46, B66/n66, n77
	 verizon	B2/n2, B4, B5/n5, B13, B46, B48/n48, B66/n66, n77
	 T-Mobile	B2, B4, B5, B12, B25, B26, B41/n41, B46, B66, B71/n71, n77

CANADA	 Bell	B2, B4, B5, B7, B12, B13, B17, B29, B46, B66/n66, B71, n78
	 ROGERS	B2, B4, B5, B7, B12, B17, B25, n41, B66/n66, n71, n78
	 TELUS	B2, B4, B5, B7, B12, B13, B17, B25, B26, B29, B46, B66/n66, B71/n71, n78

All supported 4G (LTE) Bands: B1, B2, B3, B4, B5, B7, B8, B11, B12, B13, B14, B17, B18, B19, B20, B21, B22, B25, B26, B28, B29, B30, B32, B34, B37, B38, B39, B40, B41, B42, B43, B46, B47, B48, B50, B51, B53, B65, B66, B67, B69, B70, B71, B74, B75, B76, B85, B103, B106

All supported 5G (NR) Bands: n1, n2, n3, n5, n7, n8, n12, n13, n14, n18, n20, n25, n26, n28, n29, n30, n34, n38, n39, n40, n41, n46, n47, n48, n50, n51, n53, n65, n66, n67, n70, n71, n74, n75, n76, n77, n78, n79, n80, n81, n82, n83, n84, n85, n86, n89, n90, n91, n92, n93, n94, n95, n96, n97, n98, n99, n100, n101, n102, n105

**The bands your router actually uses may vary from this list.*

How Much Improvement Should You Expect?

In short: It's hard to say. **Many people see an increase in data rates of between 50% and 200%**, but some people may only see 10%. Despite all the science, wireless signals often work in strange and magical ways.

One thing is for sure: **the more positions you try the more likely you are to see a big increase in data rates**. If you've gone through this manual and position your QuadMini as we suggest, but you're still not seeing much improvement, **please reach out to us for help**.

What Tools Do You Need?

Your QuadMini includes all of the tools necessary for assembly. If you're wall mounting your antenna, you'll need a **phillips-head screwdriver** and you may need a **drill**.

For the UltraPole, **please refer to the manual included in the package or find the manual online at waveform.com/ultrapole-manual**.

01 Install Process Overview

- 1 Read this manual**, ideally from start to finish, so that you understand the whole installation process before you begin.
- 2 Find the best antenna position (Pages 6-9)**. This step takes the most time, but getting it right has a huge impact on your system's performance. Take notes of your findings in the tables provided on page 9.
- 3 Verify performance and connect everything (Pages 10-11)**. Before making any holes in your roof or walls you'll fully connect your system and run speed tests. If everything looks good, you'll finalize the cable runs and hard-wire everything.
- 4 Mount your QuadMini (Page 12-13)**. You'll assemble the QuadMini with one of its mounting options at your choice of antenna location.
- 5 Tell us how your system is doing**. Nothing makes our day like hearing from customers. And if for any reason you're not seeing the results you were hoping for, we can help.

Call **(800) 761-3041**, email **help@waveform.com**, or book a meeting at **waveform.com/meet**. We're available from 6am-5pm PT, Monday to Friday.

02 Finding the Best Antenna Position

While we include a desktop mount for the QuadMini, you'll almost always see much better results by testing multiple outdoor locations and installing QuadMini in the best one.

In this section, we'll explain the **simplest and most effective method for identifying the best location** for your QuadMini outside. Finding the best antenna position is the most critical step in this whole manual. Section 9 covers advanced tips for additional optimization.

If you can't install your antenna outdoors or you're using your QuadMini in a vehicle, read these steps, along with Section 3 for instructions on how to find the best indoor position.

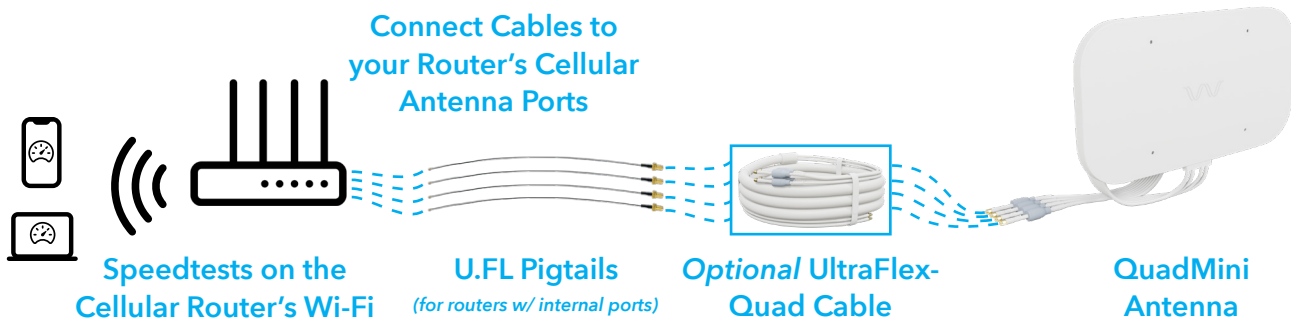
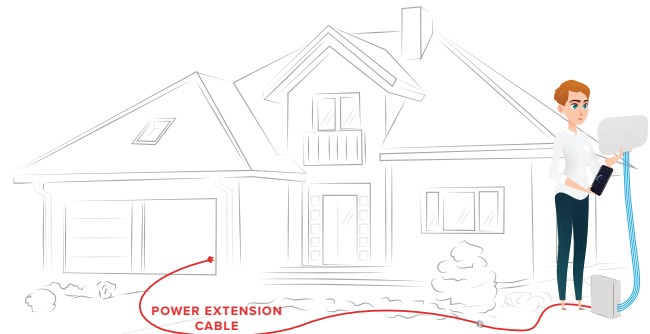
The Goal

Your goal is to find the **best position** for the QuadMini. This position should **maximize the data rates** from your cellular router. It can take a little patience, but spending some extra time here can have a huge impact on performance - it's worth the extra effort.

1. Prepare Your Test Setup

Is your cellular router battery-powered? Or, do you have a power extension cord?

If so, connect your QuadMini directly to your cellular router (as shown below), and restart your router.



Can't take your router outdoors? No problem. Keep your router powered indoors and add the UltraFlex-Quad cable into the setup to bring the QuadMini outside.

If you're leaving your router indoors, your speed tests may be limited by the router's Wi-Fi range rather than its cellular connection. Ask someone to stay near the router so they can run speed tests as you try different positions with the QuadMini outside.

Not sure which ports to connect to? Some cellular routers have both Wi-Fi and cellular antenna ports. Make sure to attach your QuadMini to your router’s cellular ports, not Wi-Fi. Some devices only have internal antenna ports. **Refer to your router’s manual, our device-specific guides at waveform.com/hotspot-guides, or reach out to us for help if you’re unsure.**

2. Get Ready to Perform Speed Tests

Since the goal is improved data rates for your cellular router, it makes sense to **judge the best position for your antenna by measuring your data rates.** We recommend using Speedtest by Ookla for this. Visit waveform.com/speedtest to get there easily.

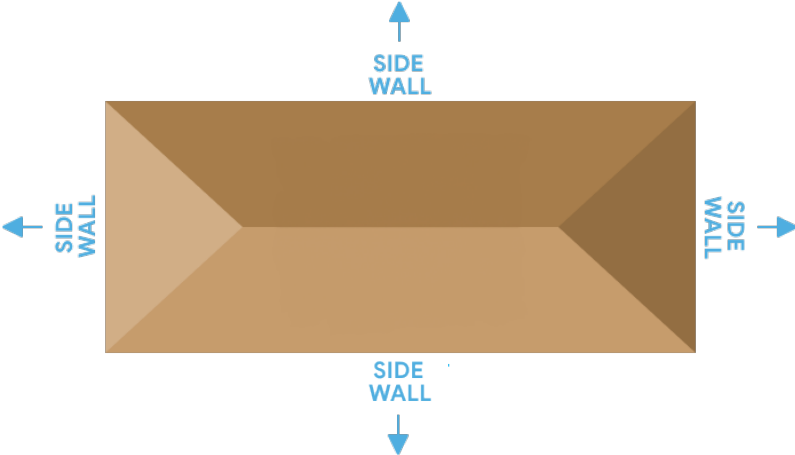
Once your test setup is ready and your testing phone or laptop is connected to your cellular router, **you’ll have everything you need to start testing** at different positions outside.

Go ahead and **run a couple of speed tests to get a baseline.** You’ll notice your results fluctuate a between tests - that’s completely normal.

3. Take Outdoor Measurements

With each new location, restart your cellular router by disconnecting and reconnecting the power. This forces the device to connect to the best bands available at that location.

We recommend **running 2-3 speed tests at each of the following outdoor positions** with your QuadMini, and writing each of your results in the table on page 9.



Don’t just go to the highest point of the roof! While signal is generally stronger the higher you go, there’s also often more interference. We’ve found it’s often better to mount the QuadMini on the side of the building where antennas are better shielded from interference.

If you’re running into issues, we’d love to help. Call **(800) 761-3041**, email help@waveform.com, or book a meeting at waveform.com/meet to **chat with a Waveform Signal Specialist.** We’re available from 6am-5pm PT, Monday to Friday.

05 Connecting Your System

Once you've identified the best position for your QuadMini, it's time to hook everything up.

Don't drill any holes in your walls yet! Start with a temporary install and test performance first.

Keep your QuadMini at the position you've identified, but move your router indoors and perform a final round of tests to make sure everything is performing optimally.

If you purchased your QuadMini as a complete kit, follow the steps below to assemble and install your kit. If you only purchased the antenna, your assembly may look a little different.

Getting the Complete Kit Set Up

Refer to the diagram to the right as needed.

- 1 Place your QuadMini** near the best position you found in section 2 or 3.
- 2 Connect your QuadMini to your UltraFlex-Quad cable** and run the cable into your building.

*If you don't want to drill holes into your walls or roof to route your cables, **install your Coax Window Entry cable** in a window, and **connect it to your QuadMini and/or UltraFlex-Quad cables.***

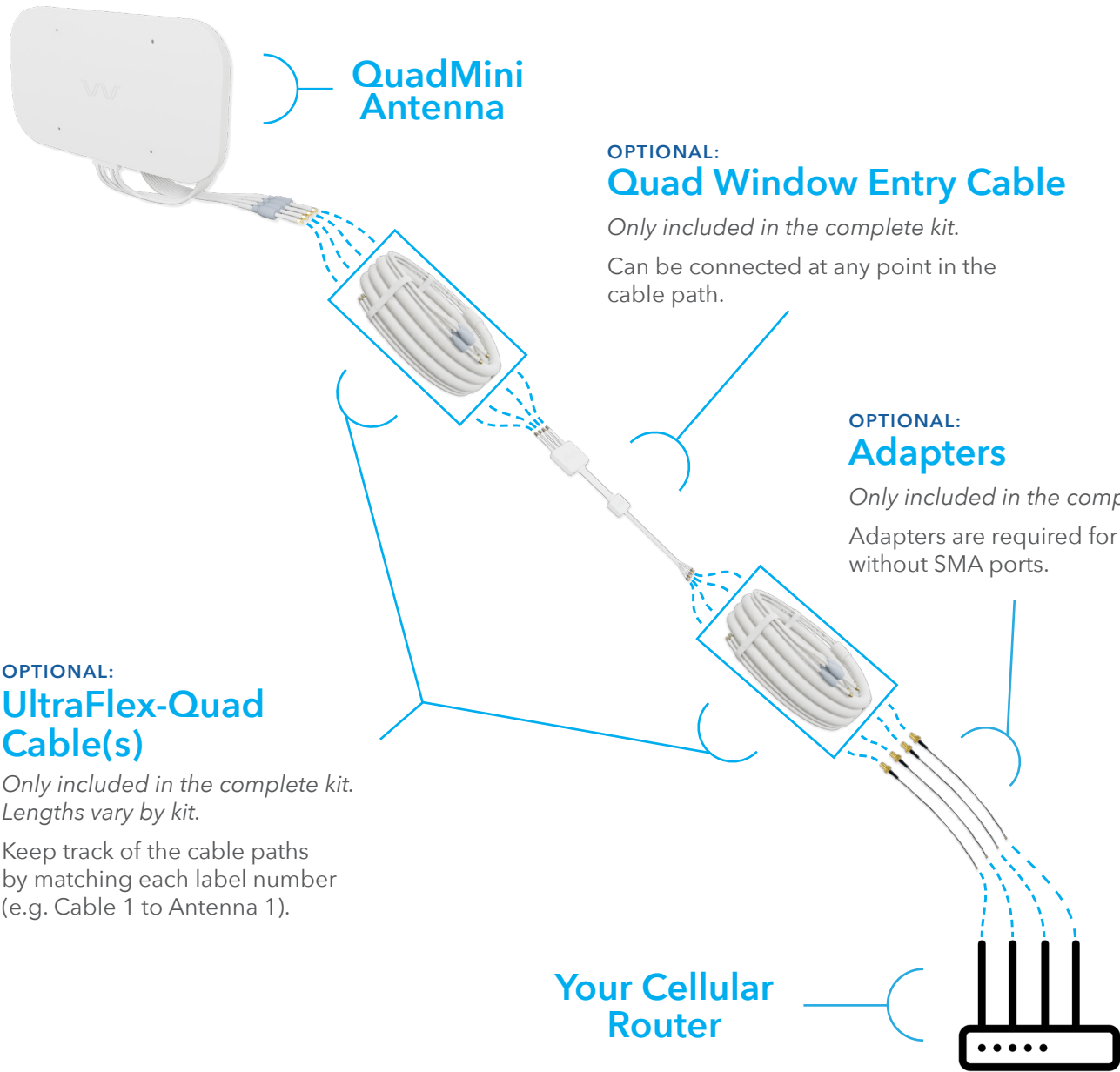
- 3 Connect your cables** to your router's cellular antenna ports and hand-tighten.

*If your cellular router only has internal U.FL ports, **install the included U.FL pigtail adapters,** and connect them to your UltraFlex-Quad cable.*

- 4 Restart your cellular router,** wait for it to reconnect, then perform 1-2 speed tests to **verify that you are happy with your system's performance.**

Install Tips

- **Before attempting to route the cables through your building,** lay the UltraFlex-Quad cable out flat to straighten it. This will make it easier to work with.
- **A finger-tight connection is sufficient** to secure the connectors. Tools are not required to tighten them and may cause damage.
- **Unsure how your cables connect to your router?** Refer to your router's manual, our device-specific guides at waveform.com/hotspot-guides, or reach out to us for assistance.



**OPTIONAL:
UltraFlex-Quad
Cable(s)**

Only included in the complete kit.
Lengths vary by kit.

Keep track of the cable paths
by matching each label number
(e.g. Cable 1 to Antenna 1).

**OPTIONAL:
Quad Window Entry Cable**

Only included in the complete kit.

Can be connected at any point in the
cable path.

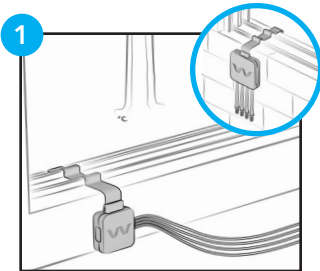
**OPTIONAL:
Adapters**

Only included in the complete kit.

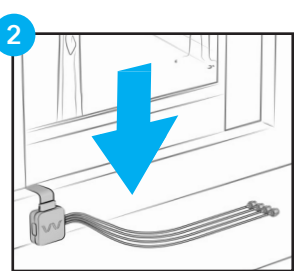
Adapters are required for routers
without SMA ports.

• How to Install the Quad Window Entry Cable •••••

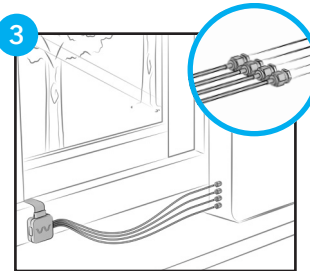
Your Quad Window Entry Cable can be connected at any point in your system as needed. Follow the manual included or find it online at waveform.com/window-entry-manual



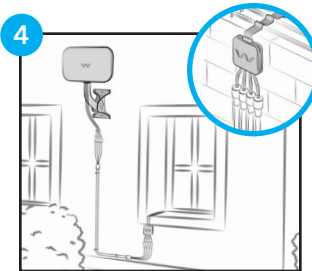
1 Loosely position the window entry cable in your window frame, with its larger case outside.



2 Check that your window fully closes. If not, please reach out to us for assistance.



3 Connect its indoor connectors to your router or UltraFlex cable.

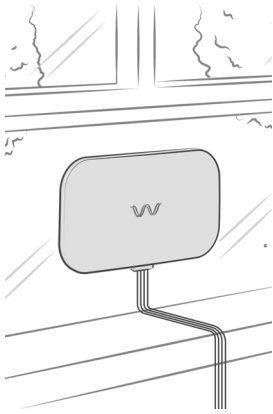


4 Connect its outdoor connectors to your QuadMini or UltraFlex cable.

If you're mounting your antenna indoors...

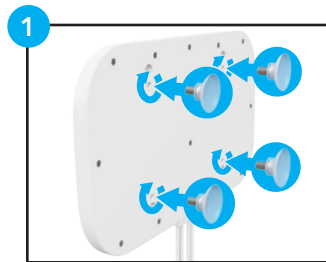
Your QuadMini offers **two indoor mounting options**: window or desktop mounting. For better performance, **we recommend window mounting** your QuadMini.

Regardless of the mounting option you choose, **remember to mount the antenna near the window you identified in section 4.**

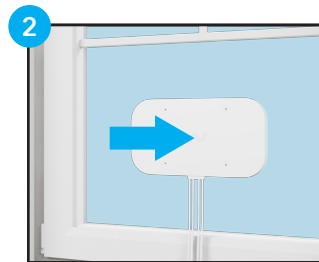


Option 3: Window Mount.

Follow the steps below to mount your QuadMini against a window, using the included **suction cups**:



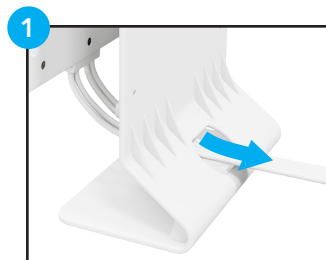
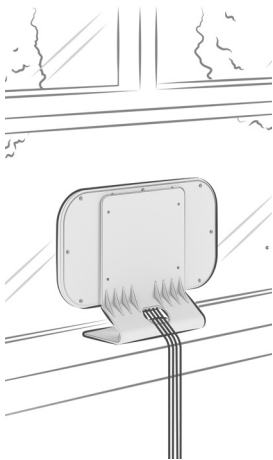
1. Thread each **suction cup** into the back of the QuadMini.



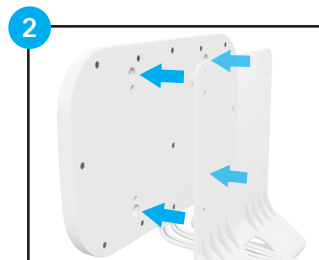
2. Press the **QuadMini** firmly against the window.

Option 4: Desktop Mount.

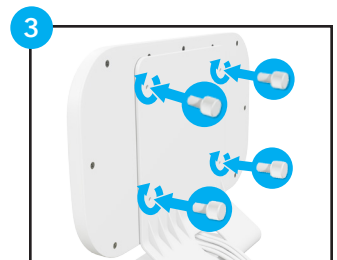
If you can't mount your QuadMini directly against your window, but have an available window sill, table, desk or other flat surface nearby, follow the steps below to position your QuadMini near your window:



1. (Optional) Feed the cables through the **desktop bracket**.



2. Align the **desktop bracket** with the back of the **QuadMini**.



3. Secure the **desktop bracket** into the **QuadMini** with the **thumb screws**.

We're Here to Help!

We know that every use case is different and the steps for mounting your antenna may differ for your unique location. **Don't worry!** If you're running into issues, or have any questions, just reach out.

07 Protecting Your Outdoor System

If you're installing your antenna outdoors, there are a couple of final steps before your installation is complete. However, if you've installed your antenna inside your building or vehicle, skip ahead to the next section for advanced optimization tips.

In this section we'll describe how to weatherproof and properly ground your system. **These steps are crucial** to ensuring the longevity of your system by protecting it from the elements.

Weatherproofing Your Outdoor Connections

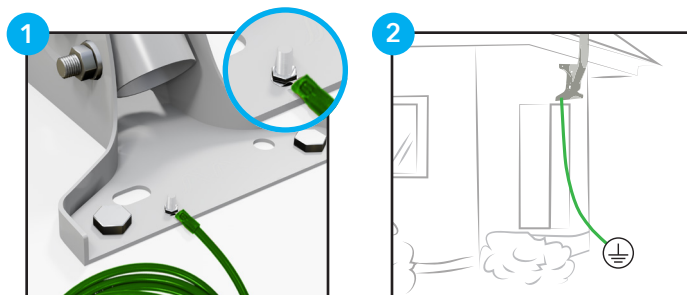
The QuadMini and UltraFlex-Quad cables come with weatherproofing boots to help waterproof each outdoor cable connection. Once your connectors are tightened, **slide the weatherproofing boots over all of the outdoor cable connections**, as shown below:



Grounding Your Mounting Pole

If you've mounted your QuadMini against a pole, **it's important to ground your pole** to a suitable electrical ground. Mounting poles can be prime targets for lightning strikes and grounding them with 10 AWG or lower gauge (thicker) grounding cable is required by the National Electric Code (NEC).

Follow the instructions within the manuals included with your UltraPole to properly ground it for your system. The general steps are described below:



Attach a **ground wire** to your **pole**. e.g. Some mounting poles use a **grounding bolt & nut**.

Attach the **Ground Wire** to a suitable **Electrical Ground**.

Grounding Tips

- If you're unsure about your grounding setup, **reach out to an electrical contractor**.
- **Expanded instructions** on grounding and **examples of suitable electrical grounds** can be found at waveform.com/grounding

09 Need Help with Adapters?

- > **Having difficulties connecting your U.FL pigtails to internal antenna connectors?** U.FL connectors are small and can be difficult to install on the first try. We suggest that you **use a tweezer to hold the cable in place** and a **pencil eraser to push the U.FL connector down**.
- > **Does your cellular router need different adapters for its cellular antenna ports?** If so, please reach out to our team so we can help you obtain the parts you need.

10 Want Even Greater Performance?

If you're looking for even greater performance, look no further!

The QuadPro's directional high-gain antennas may be able to provide you with **superior performance over the QuadMini**.

The QuadPro also comes with our **adjustable FlexMount**, for easier aiming.



11 Some Final Tips

- > **Don't judge your signal by signal strength or quality alone.**
You may find that your RSRP signal strength and SINR/RSRQ haven't improved much, but that your data rates are meaningfully better. There's much more to an antenna than just gain, and in particular, our antennas are optimized for MIMO isolation to get you the best 5G data rates possible.
- > **If data rates decrease over time, consider re-optimizing your system.**
Occasionally carriers will update their towers to broadcast different bands, light up new towers, or simply turn off existing towers altogether. If your data rates get worse, try repositioning your QuadMini to get the best results.

12 Tell Us How It Works

Did your installation go well? Are you having trouble positioning your QuadMini? Do you think our manual could be improved? Are your data rates not quite what you were hoping?

Please tell us: Call (800) 761-3041, email help@waveform.com, or book a meeting at waveform.com/meet to chat with a **Waveform Signal Specialist**. We're available 6am-5pm PT, Monday to Friday.

We're a small team who loves hearing how our products perform and helping folks get the absolute best data rates in any given situation. **So please, reach out!**

Two ways to get some money back!

Send us a video of your install and get \$25

We want to feature videos of our customers who've had success with our QuadMini antenna.

Take a video that's at least 30 seconds long showing how you installed your antenna as well as the speed test results you're getting. Send it to us via email at videos@waveform.com and we'll send you \$25 via PayPal!

Get 5% back for each friend or neighbor you refer!

Hopefully by the time you've finished installing and tuning your QuadMini, you're as excited about this product as we are.

One of our biggest challenges is spreading the word. Most people don't know that products like your QuadMini exist.

Help us get the word out: Everyone you refer gets 5% off their kit, and we'll also give you 5% of whatever they spend in cash (via Paypal).

Simply visit waveform.com/referrals to get started.





WAVEFORM

Need help? We're ready and waiting.

MIMO Antennas, like the QuadMini, aren't always easy to install. But the end result is worth it.

One of the benefits of buying from Waveform 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 at **+1 (800) 761-3041**, email us at **help@waveform.com**, or book a meeting with our fanatical support team at [waveform.com/meet](https://www.waveform.com/meet). **We're available from 6am-5pm PT, Monday to Friday.**

We love helping solve tricky install problems.



v1.0.1



Designed by Waveform in California



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