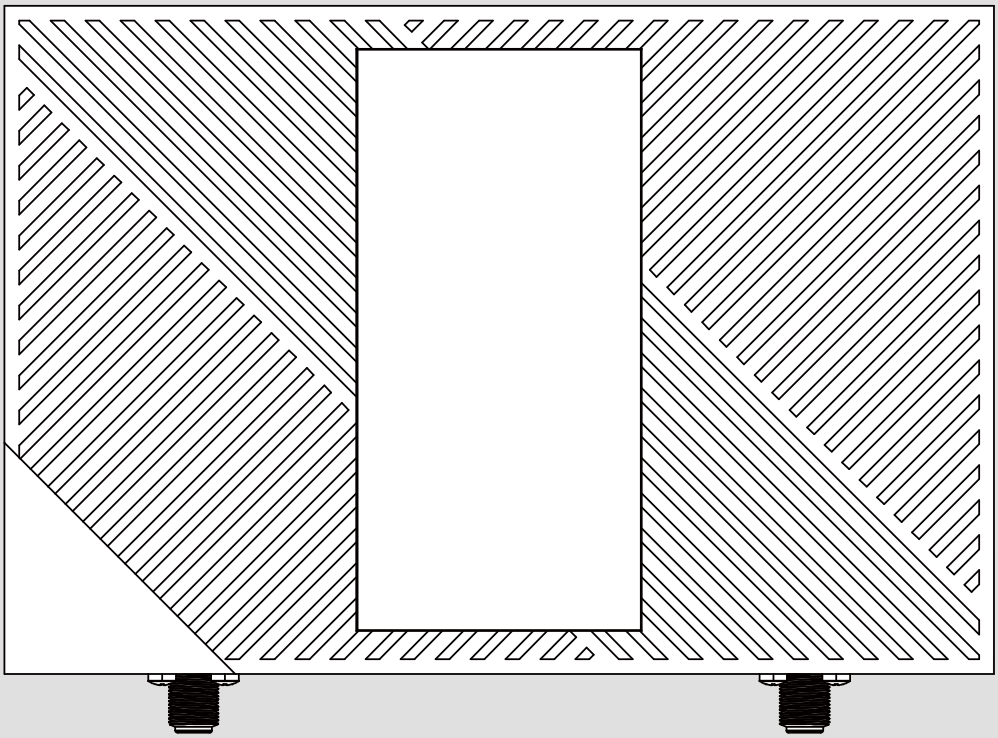
Metarepeater

CELL PHONE SIGNAL BOOSTER



Installation Guide

For Technical Support:

Email: MetaRepeater@outlook.com

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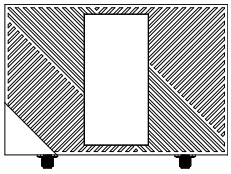
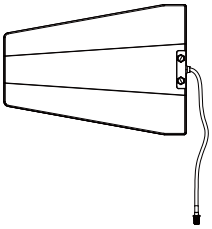
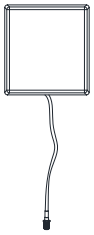
Package Contents



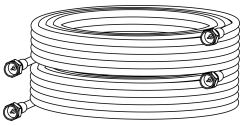
Booster



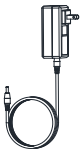
Outside Antenna



Inside Antenna



2*30ft of RG6 Cable



Power Supply

Roof/Pole Mount Bracket

Preparation

You Will Need (tools not included)

Make sure the following materials are prepared and ready for your installation.

1 to 2 hours

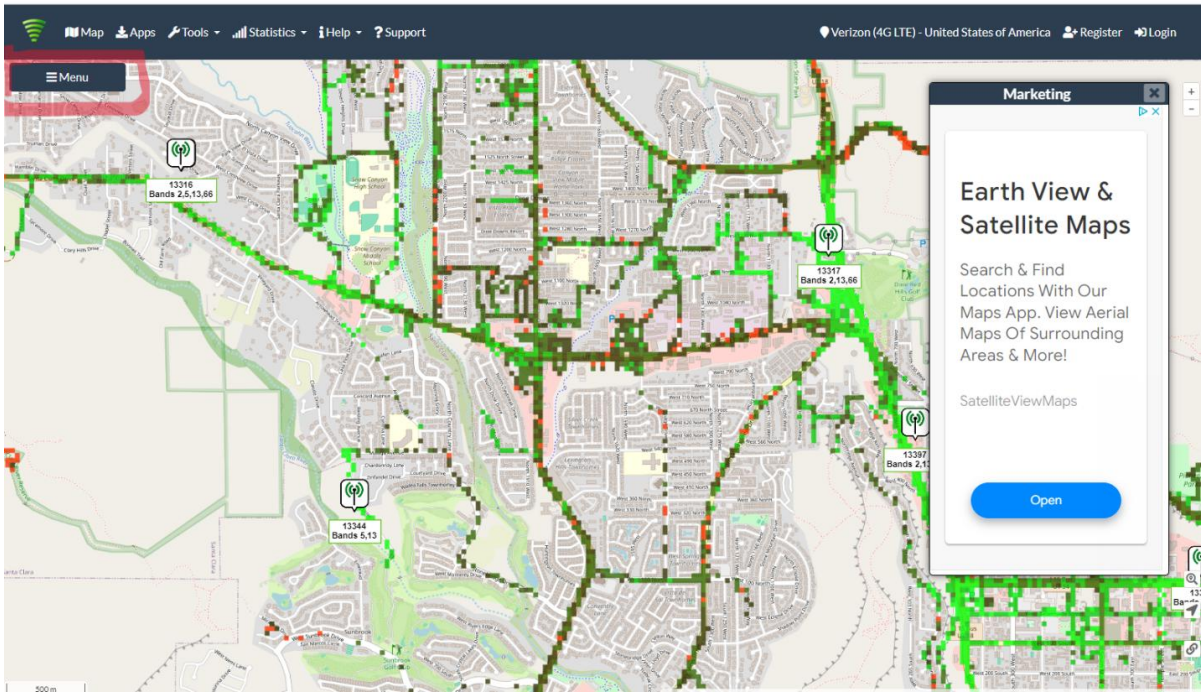
2 people (a person to help antenna calibration)

- Ladder
- Drill (if routing cable through wall)
- 1”-3” diameter existing pole for mounting Outside Antenna (Pole Mount can be purchased separately if needed)
- Recommended: Power Strip with surge protection

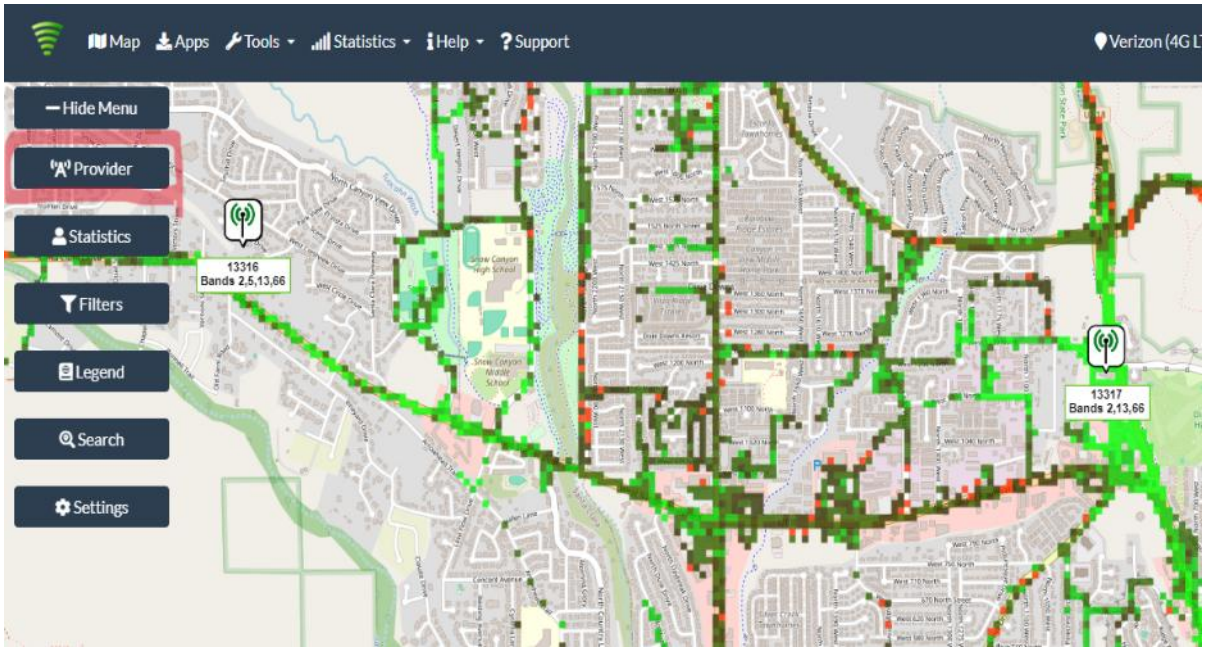
NOTE: These instructions will walk you through a “soft” install process to find the optimal locations for the inside and outside antennas, then through the process of the permanent installation.

How to Find Your Nearest Signal Tower

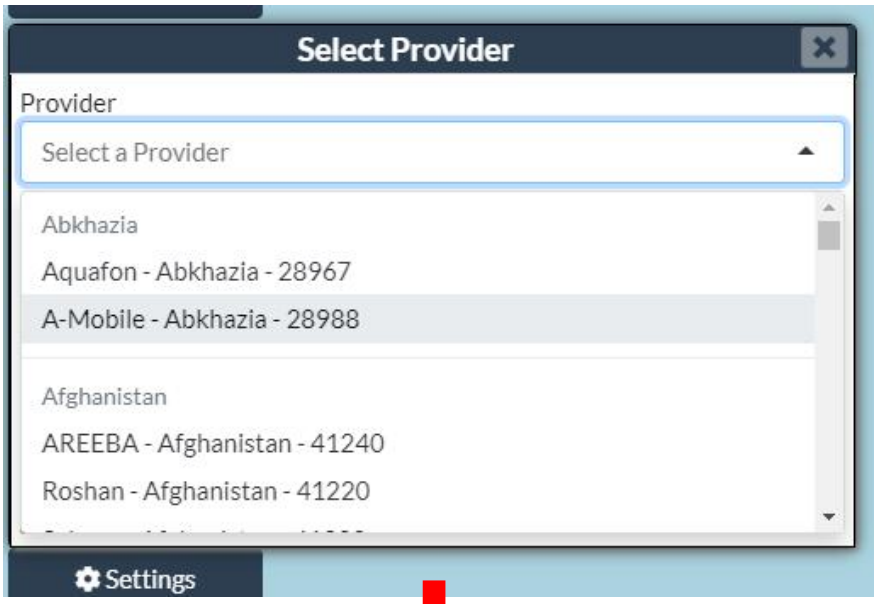
Step 1: Open WWW.Cellmapper.net （Do not register or login). Click Menu on the left side of screen

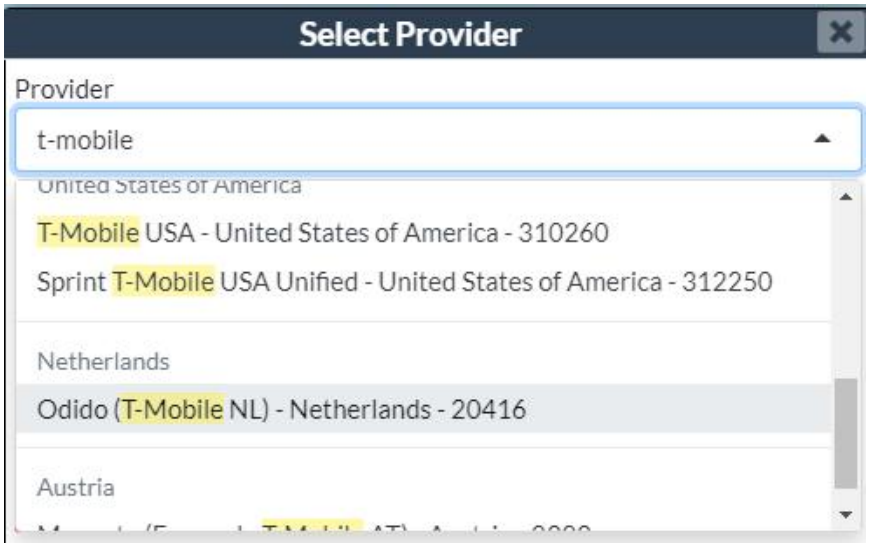


Step 2: Click on the **"Provider"** section(see highlighted area) .

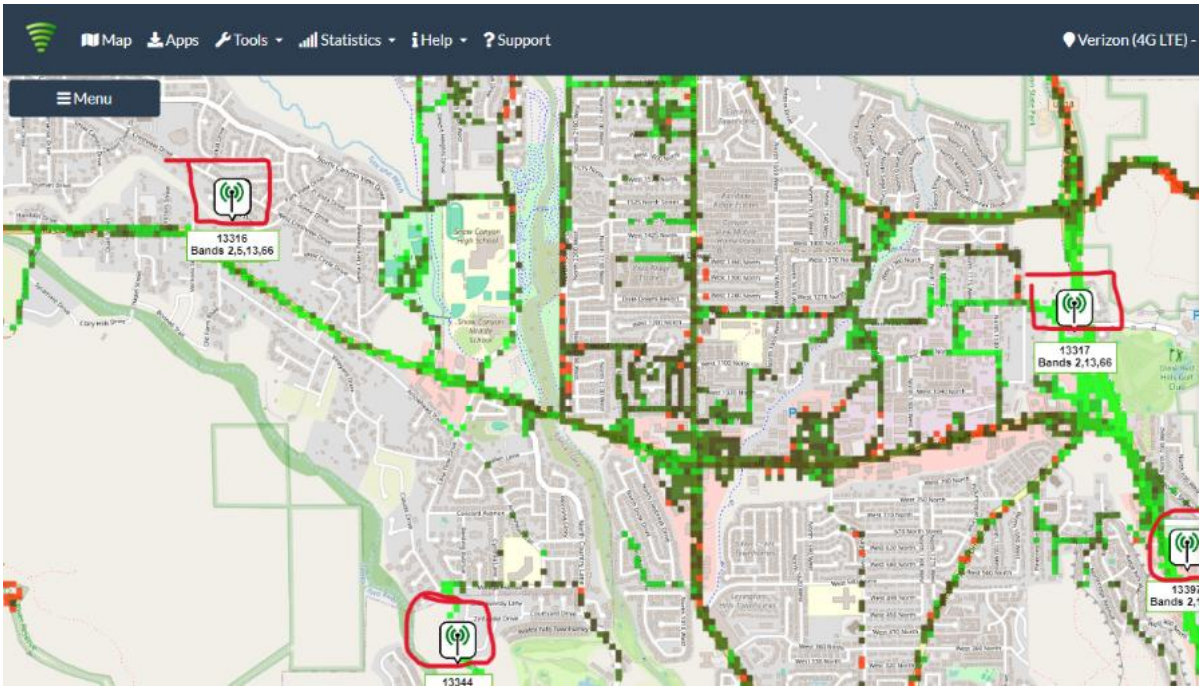


Step 3: Select the drop down arrow under provider or type the name of your provider, then select from the options. Do not select any other are in this menu option. Once you have selected your provider close this section of the menu with the X at the top right.

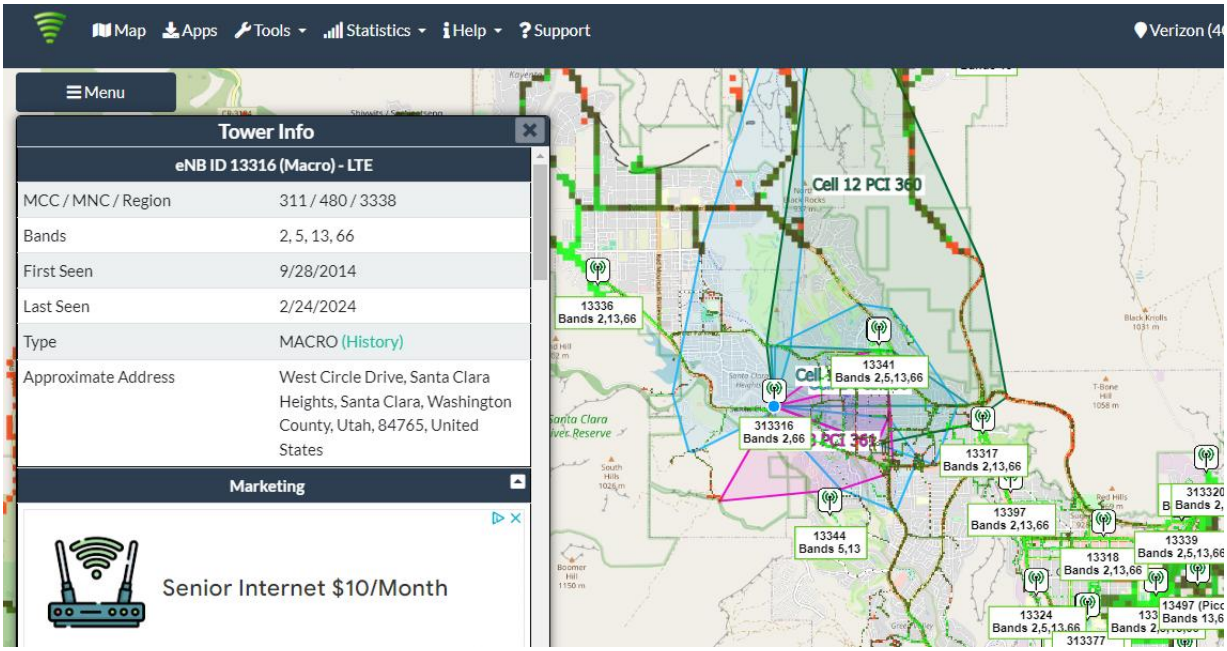




Step 5: Once the map has reset and you see your address, scroll out on the map to see the towers (see highlighted area).



Step 6: Click on the Square box with the tower symbol and a highlighted area of coverage for that tower will appear. Once you have determined the tower or the best tower that provides coverage to your address point the outdoor antenna toward that tower.



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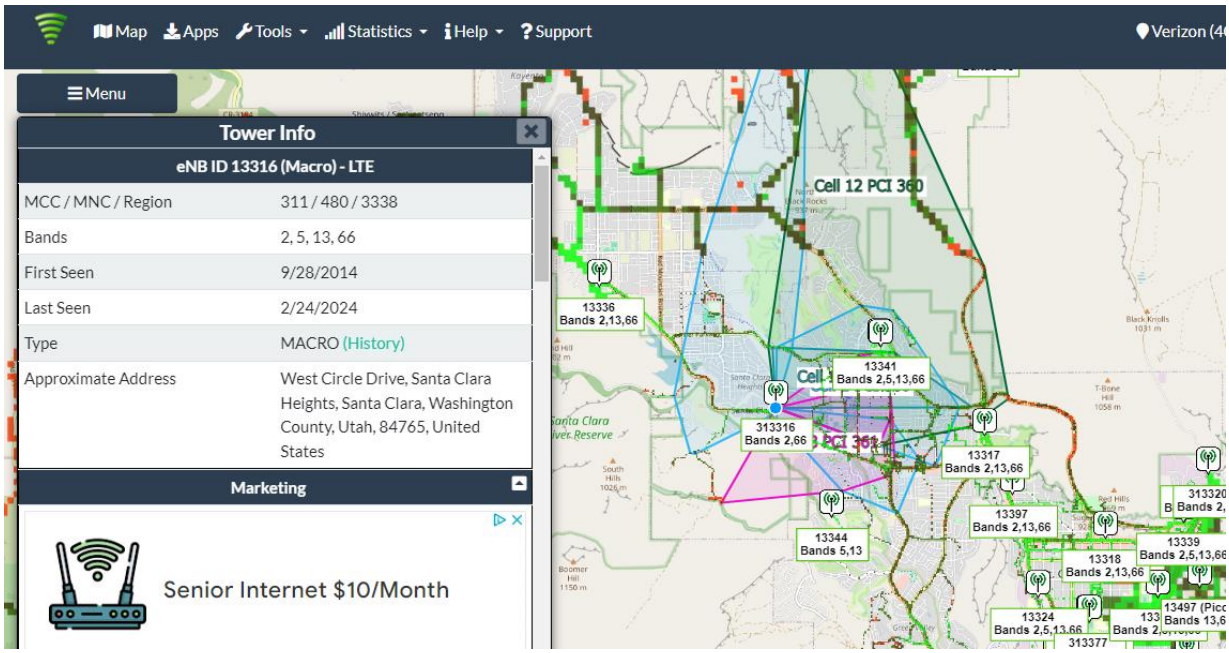
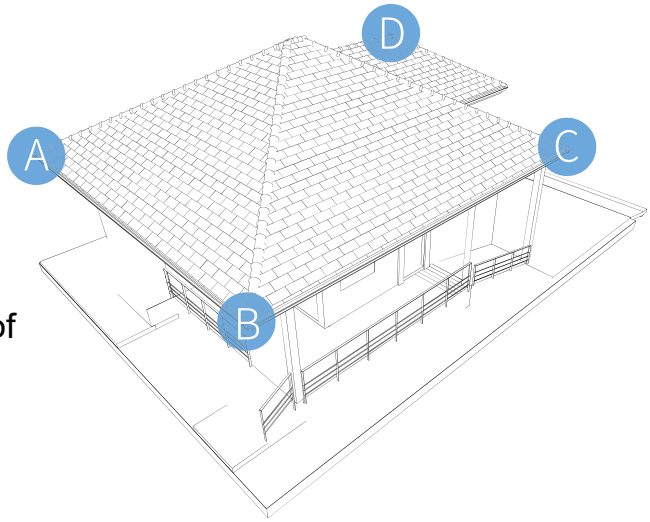


⚠ If you can only find red dots on the map around your home or there is no signal tower information around your house on the map, you can use the following method to find the direction of the signal tower.

Walk around the house, make sure to walk close to the outside wall of the house. Find the best **dbm** reading position. At that position, the direction facing the wall is the approximate direction of the signal coming from. Considering the overall installation issues, it is best to choose the corner of the building closest to the location with the best signal to install the outdoor antenna.



Measure the dBm reading and signal level on your phone

TOWER → Distance from Cell Tower

3G/1X	-70dBm	-75dBm	-90dBm	-105dBm	-110dBm
4G/LTE	-90dBm	-100dBm	-108dBm	-115dBm	-120dBm

Notice: Not recommended when outdoor signal strength is less than -110dBm(3G/1X) or -120dBm(4G/LTE). The resulting coverage area of the boosted signal will be prohibitively small.

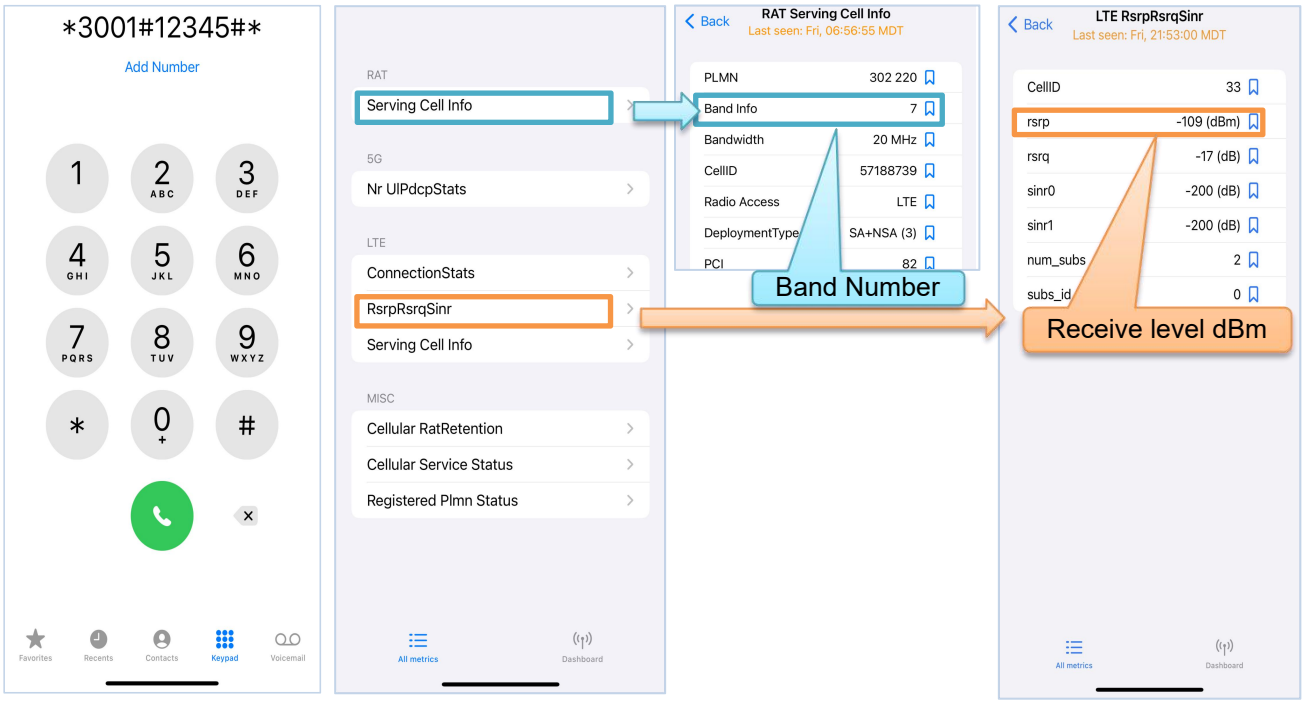
The **coverage** and **strength** of an enhanced signal is directly related to two key factors:
1. The signal strength received by the outdoor unit. Therefore, setting up the outside unit where the signal is strongest will provide the best results.
2. Separation distance between outside unit and inside unit.

How To Get a dBm Reading and Band Number on Your Phone

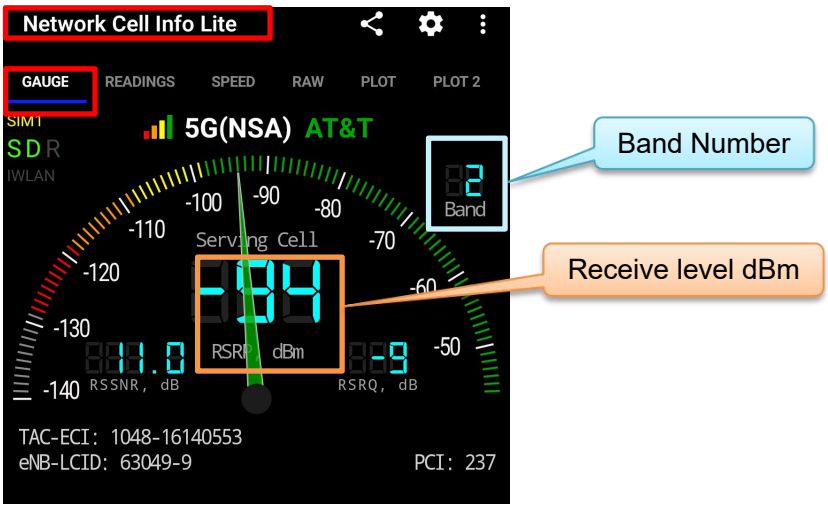
Having an accurate measurement of signal strength in decibels (dBm) is crucial when installing your system. Decibels accurately measure the signal strength you are receiving.

NOTE: Turn off your phone's WiFi to make sure you're checking your phone's connection. Once you have a reading, turn on airplane mode. Wait 15 seconds to turn off airplane mode and refresh the signal strength reading.

iPhone: Dial *3001#12345#* then press Call.



Android: Download third-party APP "Network Cell Info Lite" or "Open Signal"

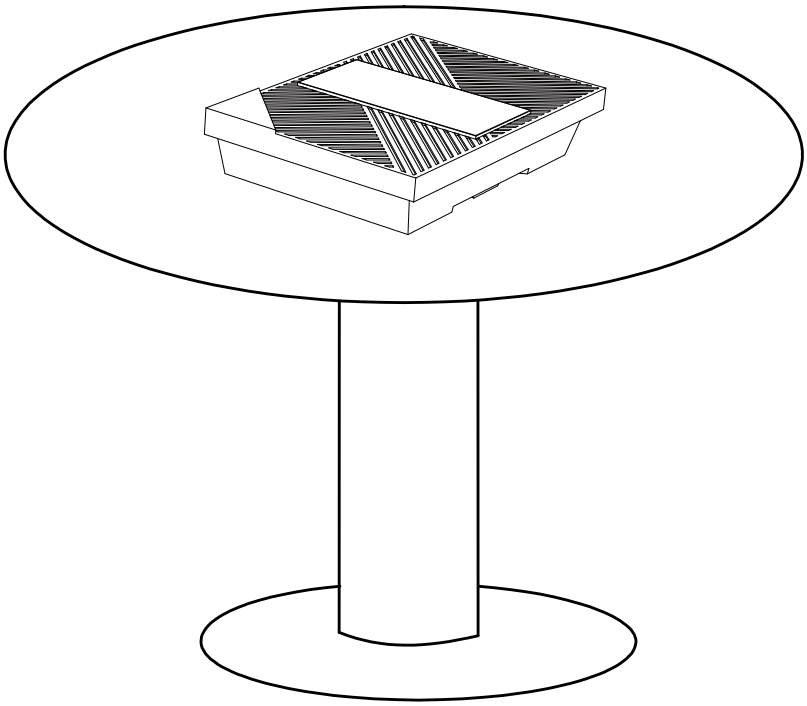


Step 1: Select the location of the booster

Install the **Booster** in your desired location. Mount the signal booster in a ventilated and dry place that is easily accessible for maintenance (it should be located near a power outlet)

While choosing a location for the booster, please keep in mind that there must be at least 20ft of vertical separation between the outdoor antenna and the inside antenna.

NOTE: Do not connect booster to power until the system is fully installed.

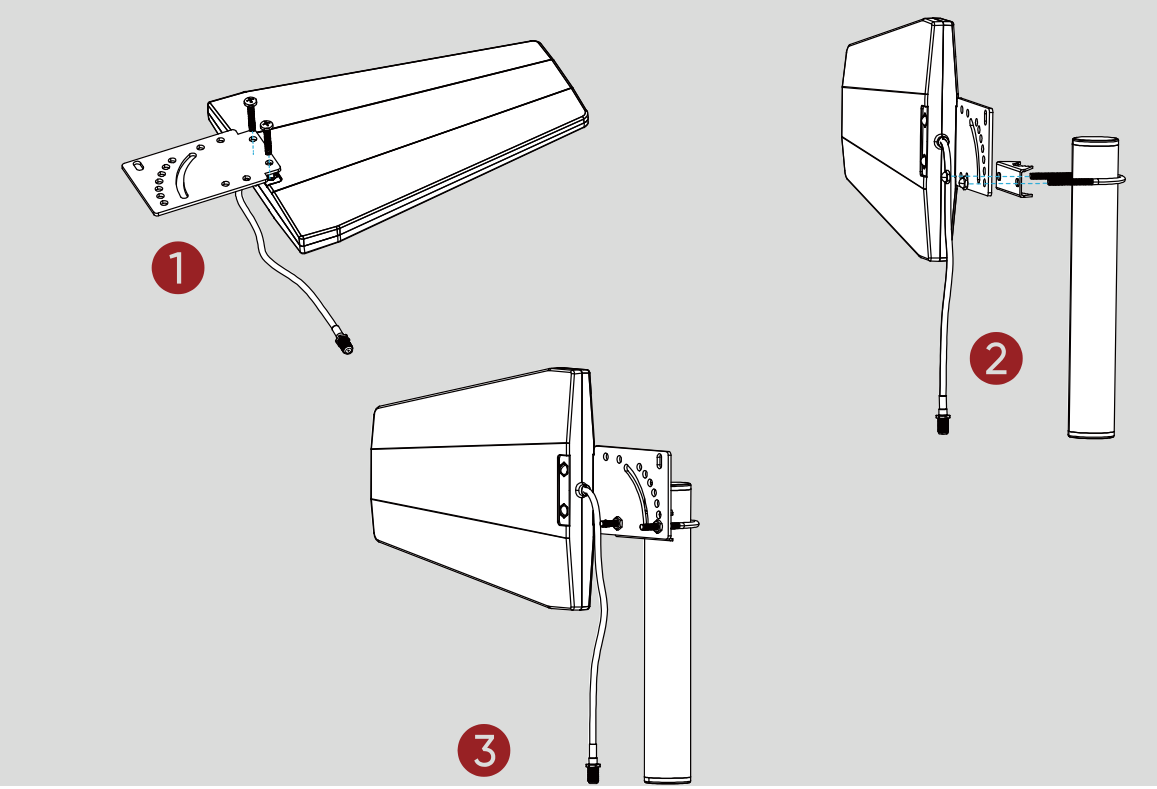


⚠ Booster will about 30 degrees Celsius higher than the ambient temperature, which is a normal phenomenon.

Step 2: Mount & Point Outside Antenna Toward Nearest Cell Tower

Pole mounting and wall mounting options are included. The pole mounting option is preferred because it will be easier to adjust to the direction of the cell tower.

Attach the **Mount** to the Outside Antenna and use the **Bracket Clamps** to attach the Antenna to a pole or exhaust pipe.

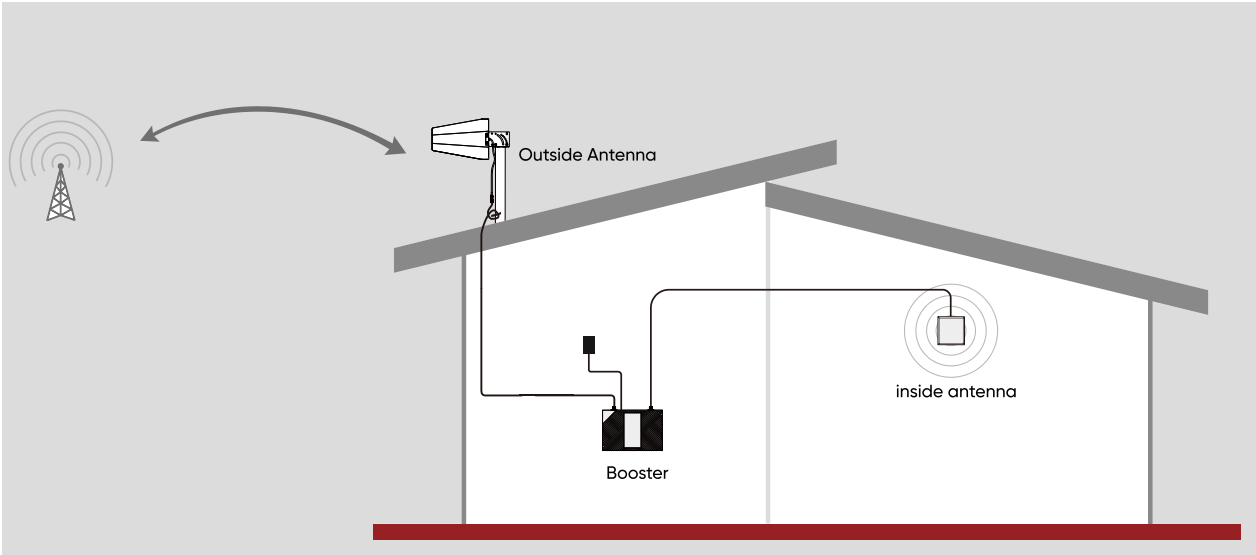


Make sure that the outside unit is mounted at least 3 feet away from any windows.
Outdoor antenna must be installed over the roof line.

NOTE: Mounting on existing roof exhaust pipe would be a good time-saver option. Watch out for power lines.

(STEP 2 cont.)

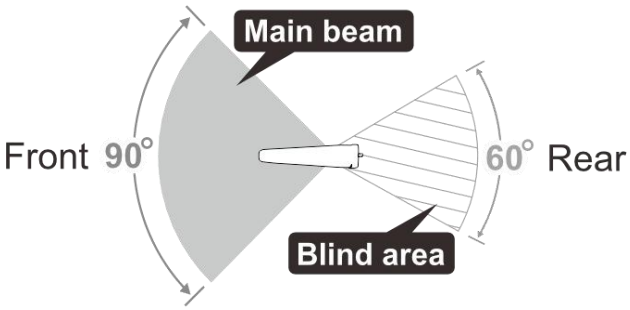
Point the **Outside Antenna** toward the nearest cell phone tower. Please follow the page 5-8 to find your nearest cell tower, or you can use an app such as 'Open Signal'. **This is the most critical step of the installation process because it will determine the overall performance of the booster system.**



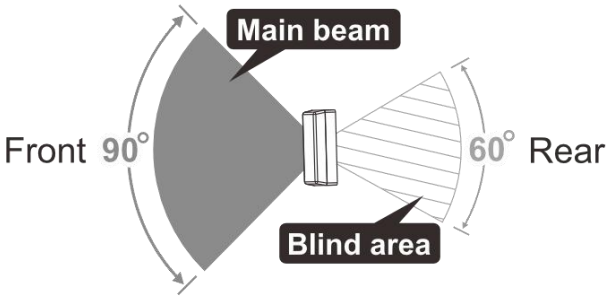
Top view of antenna beam shape and energy distribution

The outdside antenna and the inside antenna:

1. The front radiation main beam angle is about 90 degrees;
2. There is a very less energy radiation area behind the antenna, which we call it “blind area”. The angle of the blind area is about 60 degrees;



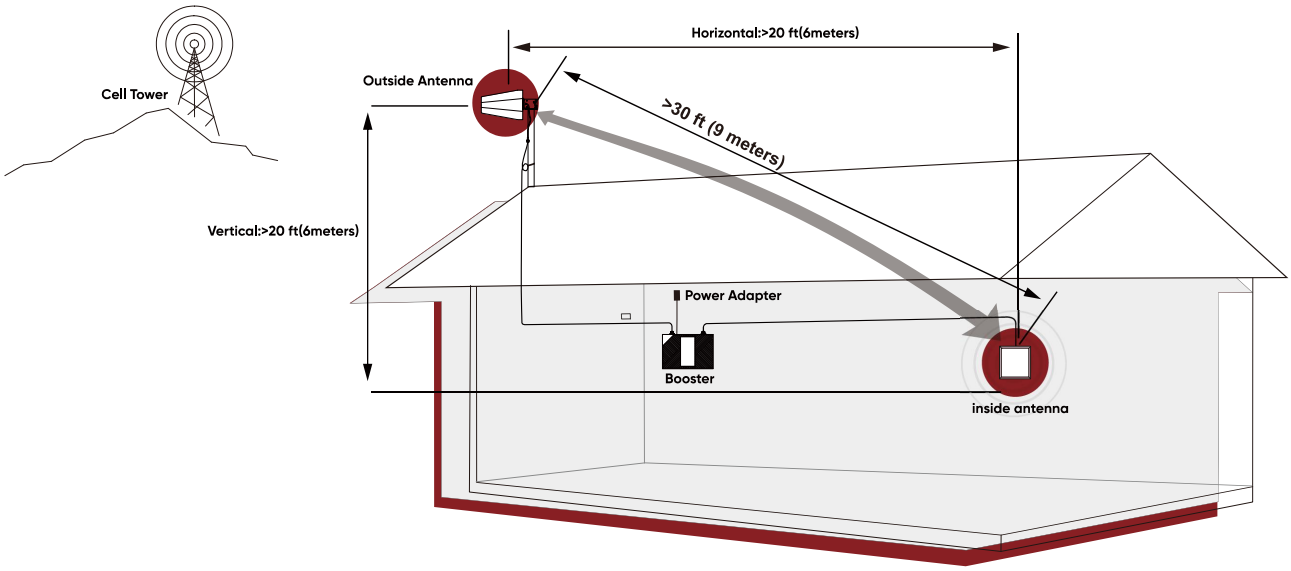
Outdoor antenna



Indoor antenna

(STEP 2 cont.)

Keep enough distance between outside antenna and inside antenna

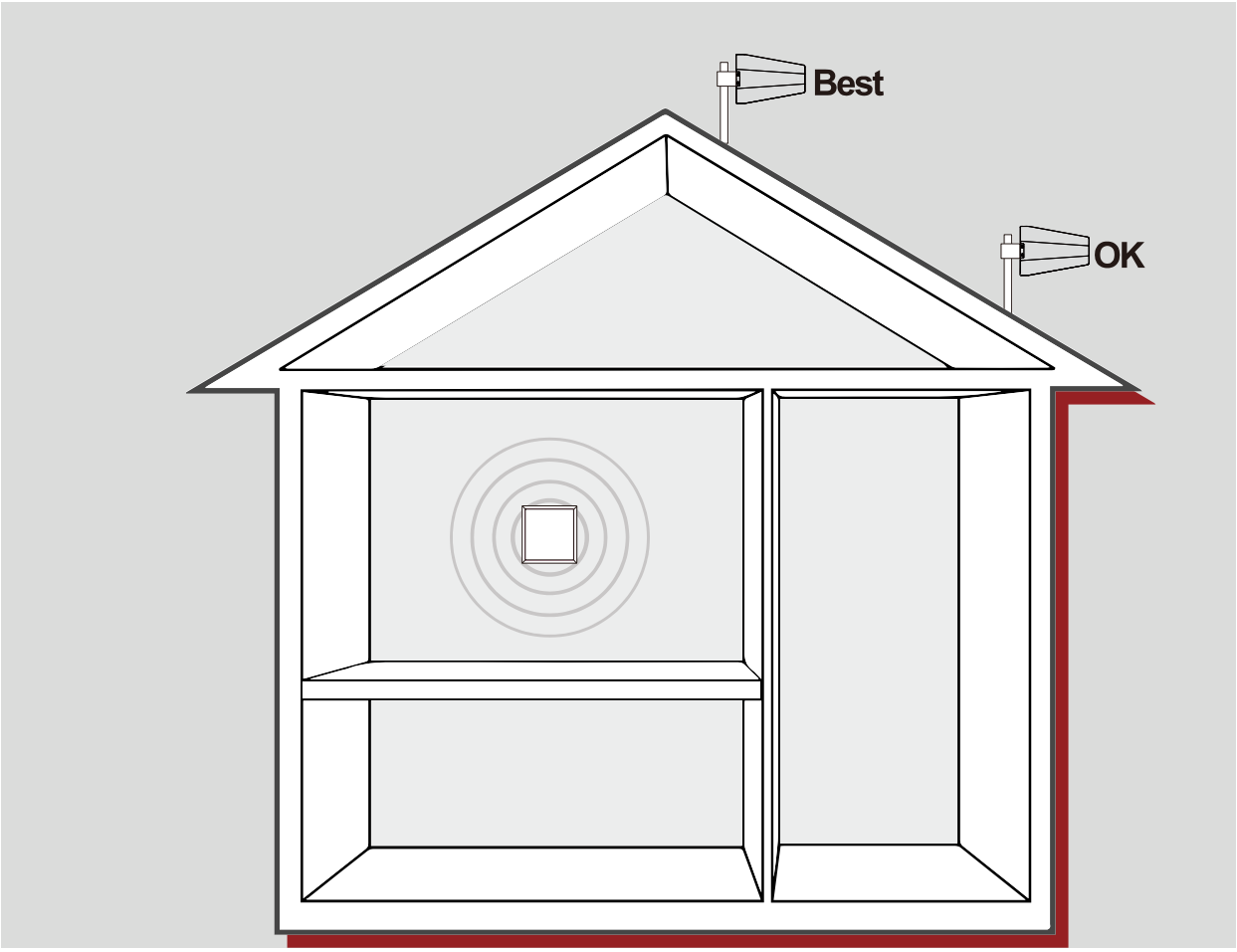


NOTE:
The **Outside Antenna** must be at least **30 feet** (9 meters) **Straight line distance** or
20 feet (6 meters) **horizontal**
20 feet (6 meters) **vertical** from the **inside antenna** for best performance.

The greater the separation between the Inside Antenna and Outside Antenna, the better performance you will get from the booster.

(STEP 2 cont.)

Select the optimal mounting location for the outside antenna

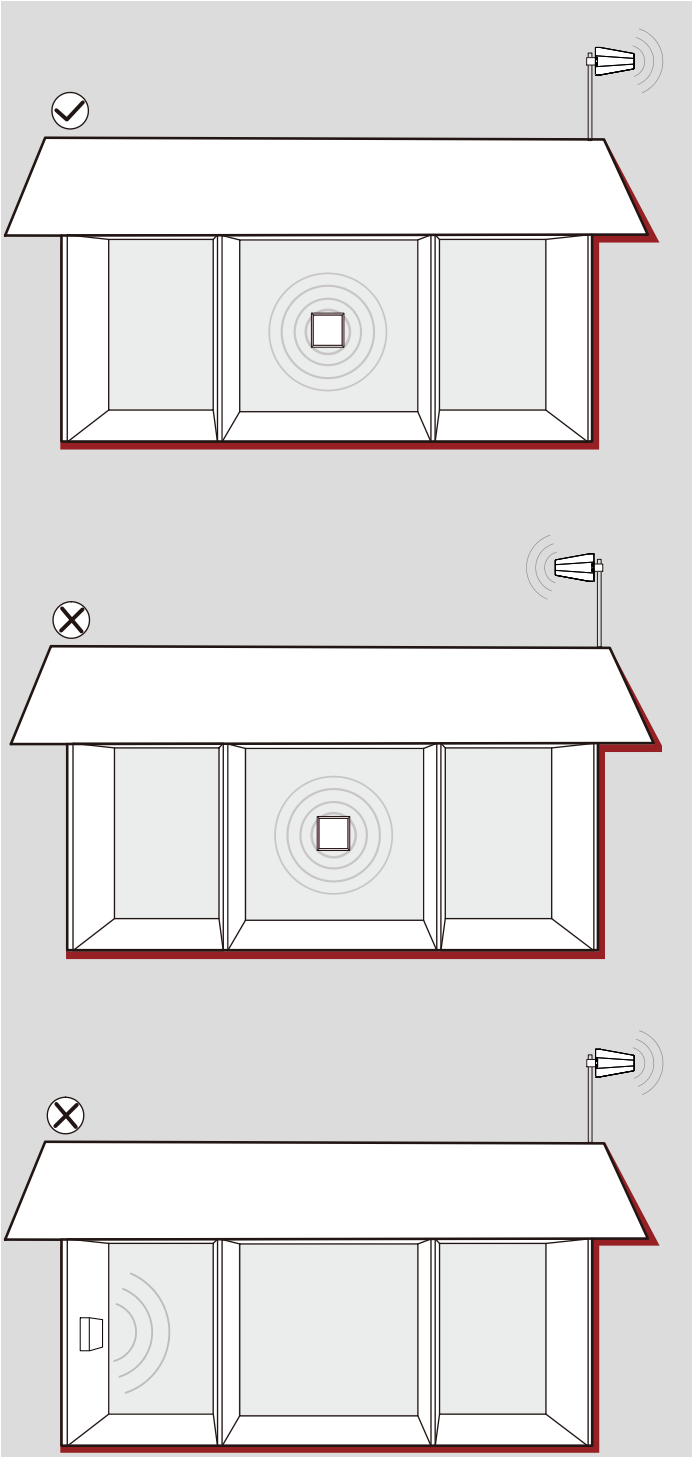


After identifying the area of strongest signal, choose the surface where you will mount your outside antenna.

1. The location should allow for sufficient separation between the outside antenna and inside antenna.
2. In order to better receive external signals, the outside antenna is best installed in a higher position on the house, but please pay attention to lightning protection.

(STEP 2 cont.)

Antennas mutual position



The outside antenna should be oriented in a way that it does not “face” the inside antenna.

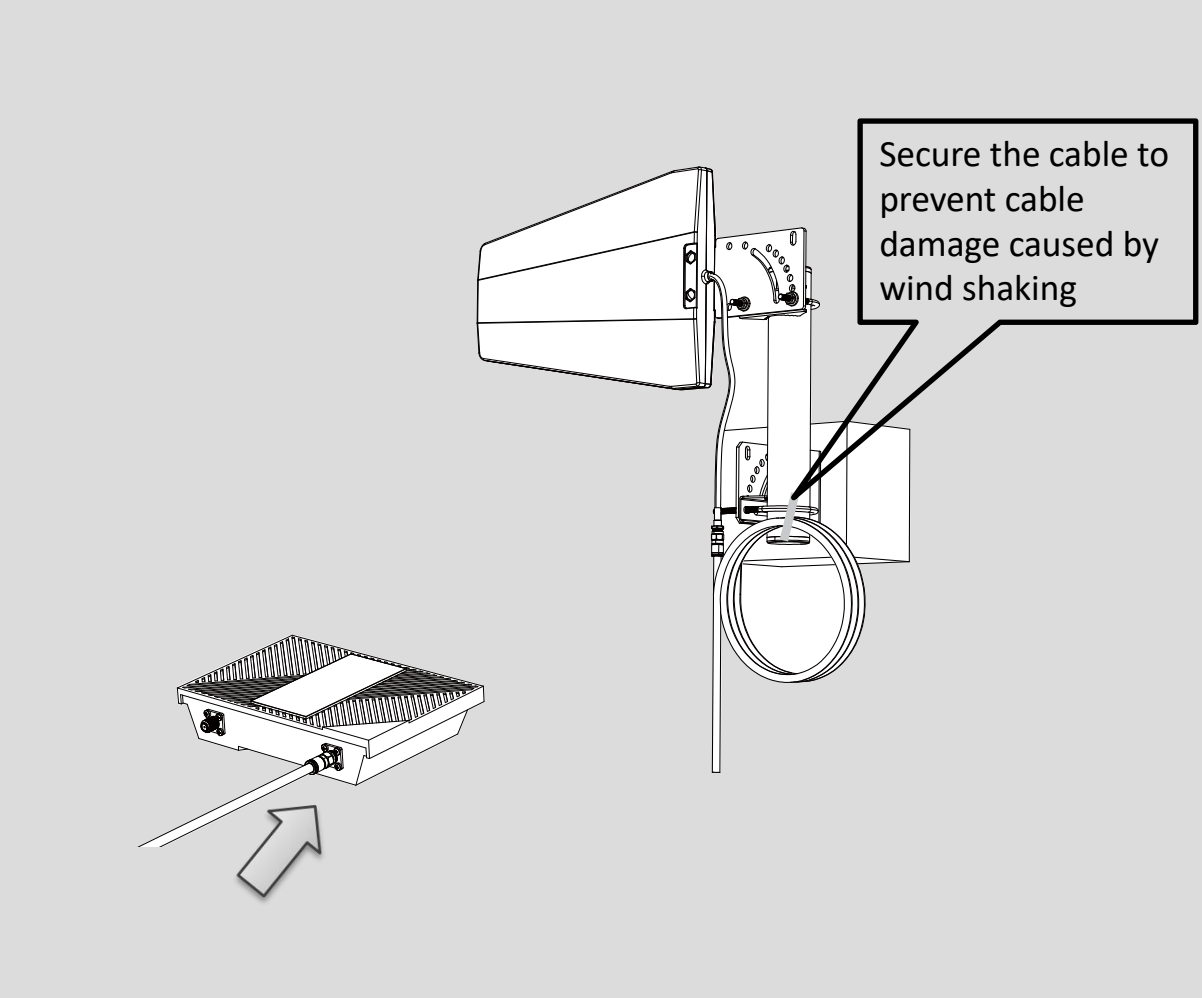
Caution: Do not aim an outside antenna towards inside antenna.

Caution: The inside antenna cannot face the outside antenna.

Step 3: Route & Connect Outside Antenna To Booster

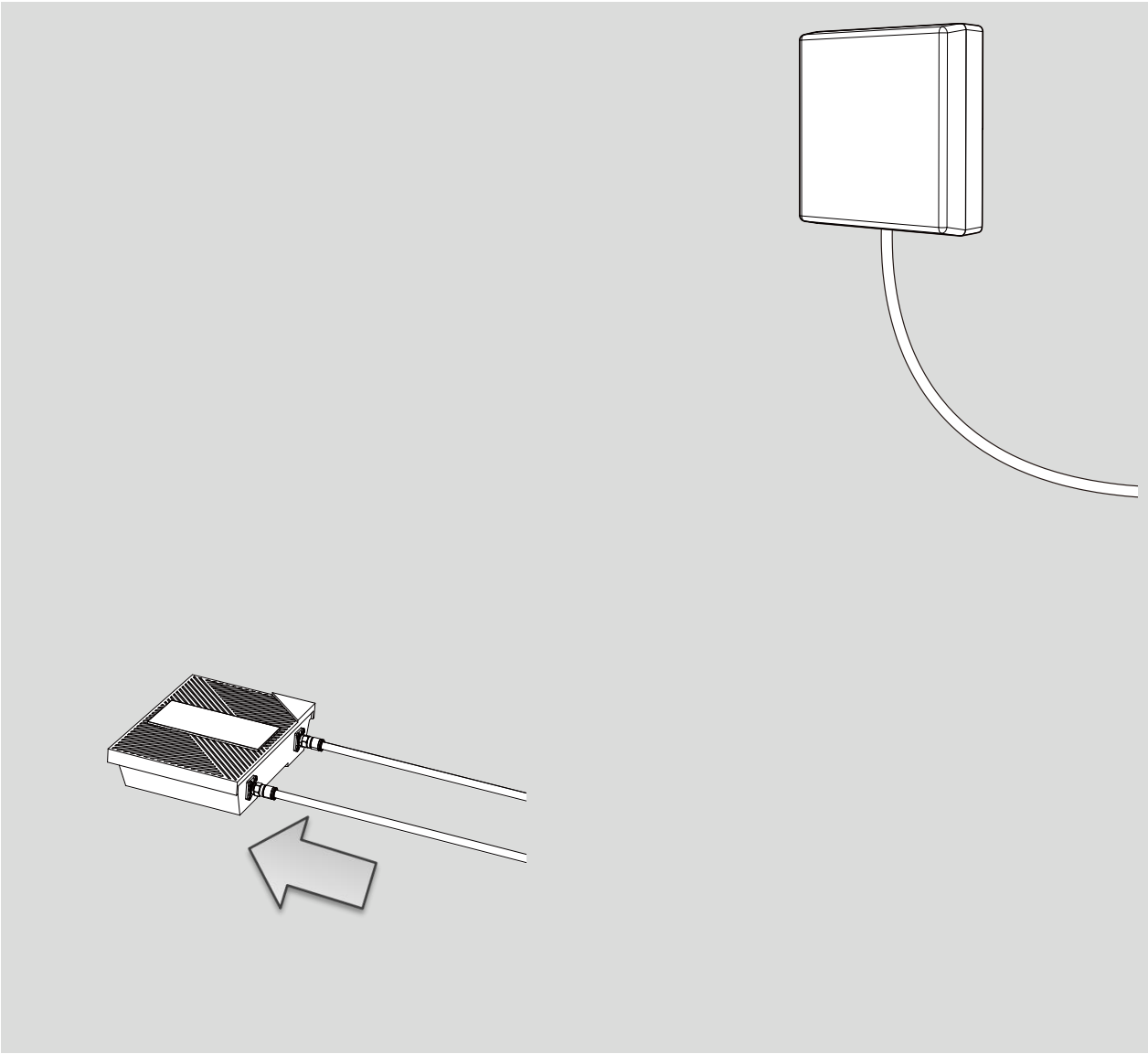
Connect the 30ft **RG6 Cable** to **Outside Antenna** and route cable into the home, secure the cable near the antenna.

Route cable to the **Booster** and connect to the port labeled **'OUTSIDE'**. All connections should be **finger tightened** only.



Step 4: Connect Inside Antenna To Booster

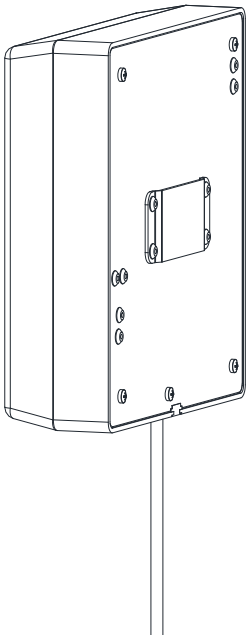
Connect the left 30 ft **RG6 cable** to the booster at the "**INSIDE**" port. Connect the other end of the coax cable to the **Inside Panel Antenna**.



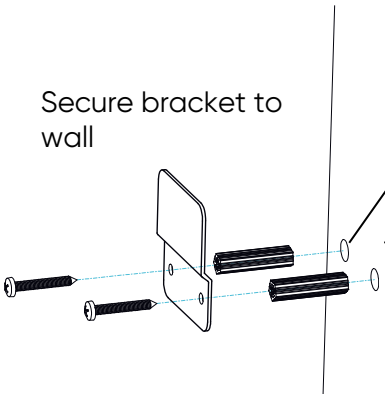
(STEP 4- cont.)

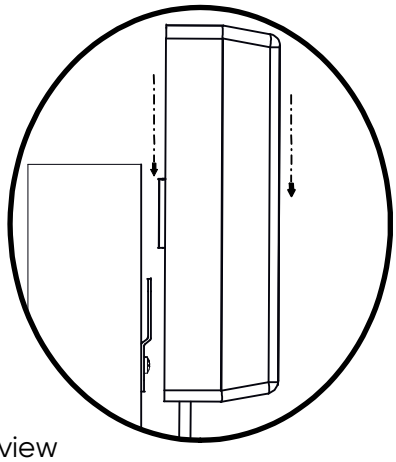
The inside antenna is a panel directional antenna. Choosing a location facing all over your home will help to maximize your coverage area.

Wall Mounting Option



Fasten bracket to back of Inside Antenna





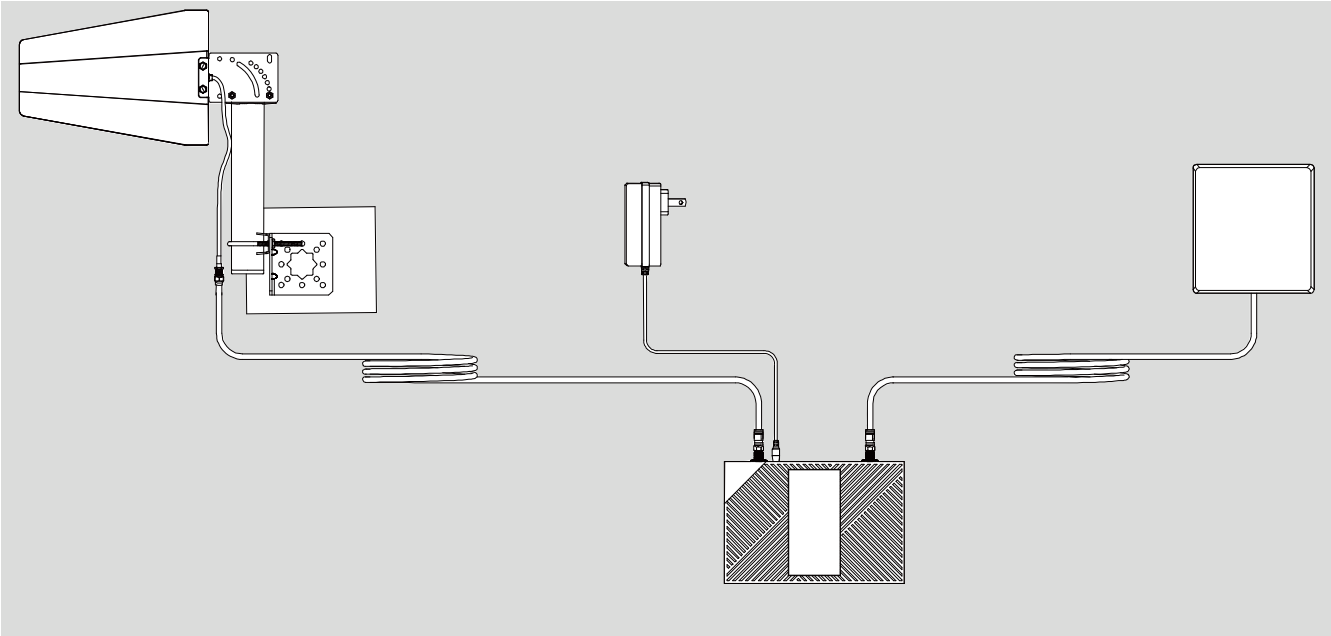
Mounting Inside Antenna on wall bracket

sideview

Step 5: Power Up The Booster & Optimize The System

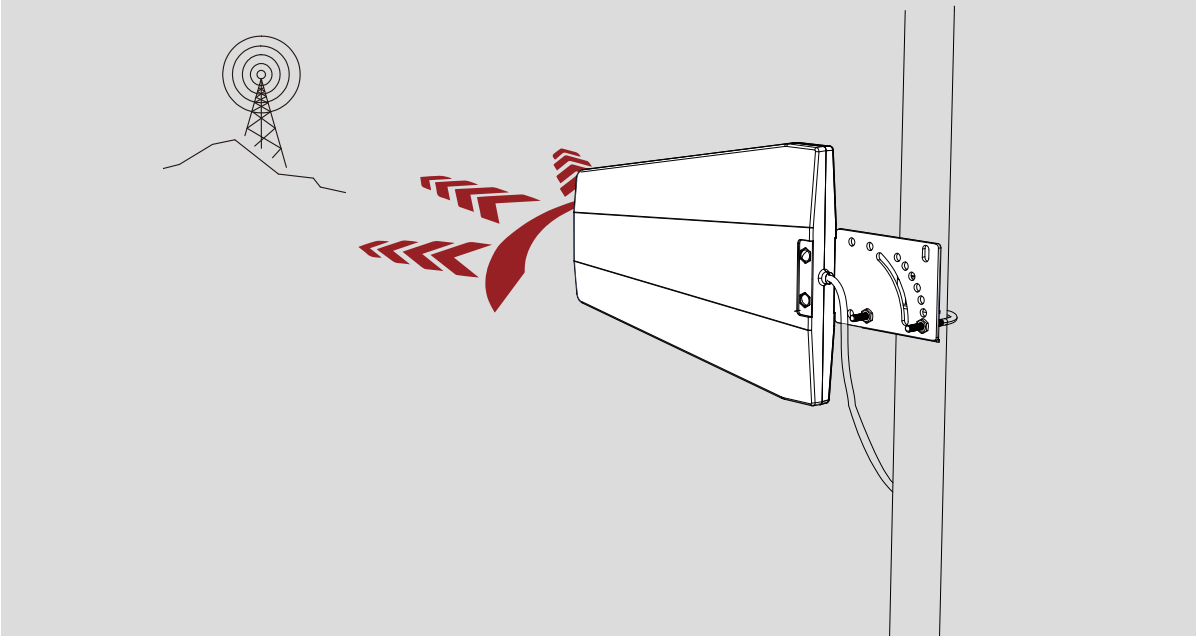
Plug in the **Power Supply** and connect it to the nearest power outlet.

NOTE: We strongly recommend using a power strip with surge protection.

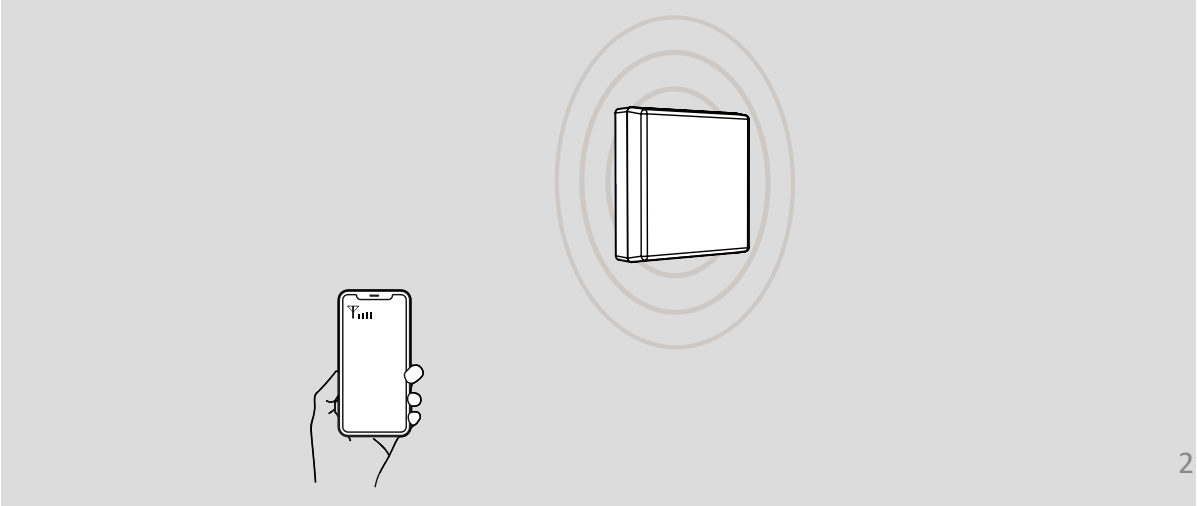


(STEP 5 cont.)

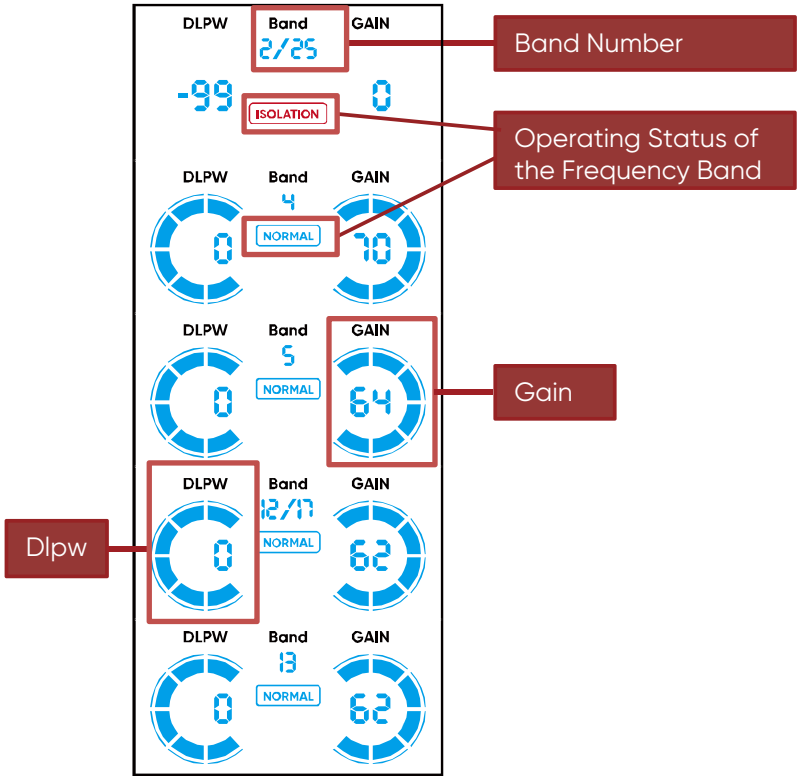
After powering up your system, you are now ready to optimize your system. Rotate the outside antenna in 1/3 turn increments, after each turn, unplug and reconnect the booster to power while observing the signal level on your cell phone from the inside antenna's projected area. Secure the outside antenna in place, pointing in the direction that gives you the strongest signal.



Note: After each rotation, observe signal level on your cell phone from the inside antenna's projected area. This is done best by having someone near the inside antenna taking signal measurements after the person outside makes each rotation.



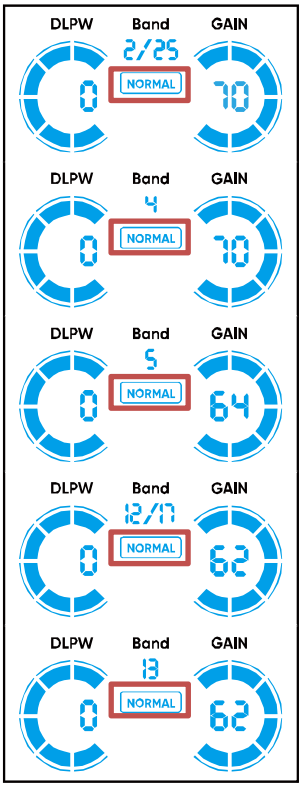
Panel Interface Introduction



Frequency Band Status Instructions

1. "NORMAL": The frequency band is operating normally, displayed as NORMAL in blue indicator.
2. "ISOLATION": The frequency band is oscillating, the frequency band gain of the booster is reduced or turned off. Indicated by a flashing ISOLATION red indicator or a solid ISOLATION red indicator.
3. "GAIN": Amplification gain for the corresponding frequency band. The booster shows maximum gain when operating normally. There are some differences in the gain in different frequency bands, ranging from 62 to 72. If positive feedback occurs between the outdoor and indoor antennas in the system, causing amplifier oscillation, the host will automatically reduce the gain to eliminate the oscillation.
4. "DLPW": This refers to the output power of the corresponding frequency band from the booster to the indoor antenna. Normally, an output power of -20 to 10 is a usable signal. An output power exceeding 0 is an ideal power. This depends on the gain and the outdoor signal level.

Panel Functioning Correctly Displayed:



1. DC Power Normal Operation:

When the DC power is normal, the display remains on, indicating that the device is powered and functioning normally.

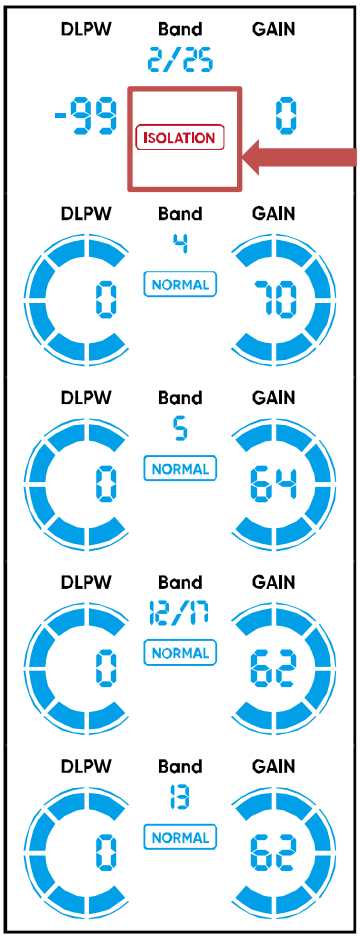
2.Normal Operation:

When the booster is operating normally, the blue NORMAL indicator for all bands remains displayed, indicating normal device status.

3. Real-time Updates and Bar Display:

DLPW and GAIN values update in real-time, and the bar display within the circles represents the current power levels and gain. Each bar extinguished corresponds to a reduction of 5dBm for DLPW and 5 dB for GAIN.
The bar graph within the circles, with all 6 segments lit, indicates that DLPW and GAIN have reached an ideal state.

FIXING THE ABNORMAL BAND STATUS ISSUES



ISOLATION Flashes, Followed by NORMAL Display:
When the ISOLATION red indicator flashes 1 to 15 times and then disappears, it is followed by the display of the NORMAL blue indicator.
There is Weak positive feedback between the outdoor and indoor antennas in the entire system. The amplification gain has decreased by 1 to 15 dB, and oscillation has stopped. In this case, the coverage area of the booster will decrease.
If your coverage is good and reception is good, you can ignore the blink; If you would like greater coverage and better reception, please follow the page 25 to solve the oscillation problem.

ISOLATION Continues to Flash:
There is Strong positive feedback between the outdoor and indoor antennas in the entire system. The amplification gain has decreased by 16 to 25 dB, and oscillation has stopped. In this case, almost no signal amplification effect.
Please follow the page 25 to solve the oscillation problem.

ISOLATION Continuous Display:
This means that the booster was unable to eliminate the oscillation after reducing the gain over 25 dB, so it will shut down the corresponding frequency band to stop the oscillation.
Please follow the page 25 to solve the oscillation problem.

FIXING DC POWER INDICATOR OFF ISSUES

Please verify your power supply has power;
Please verify the power cord is tightened;
Contact with us by email or call for replacement.

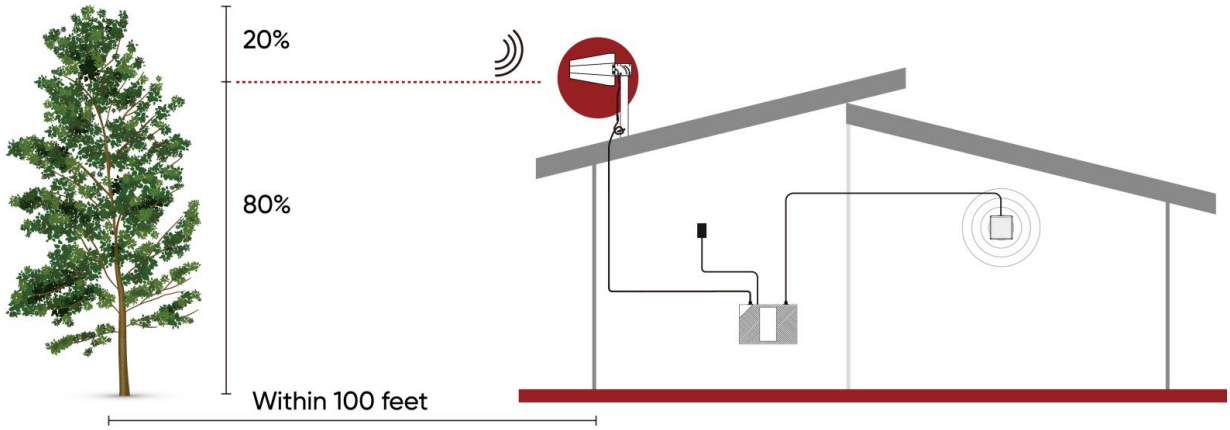
Troubleshooting

FIXING NO SIGNAL IMPROVEMENT ISSUES

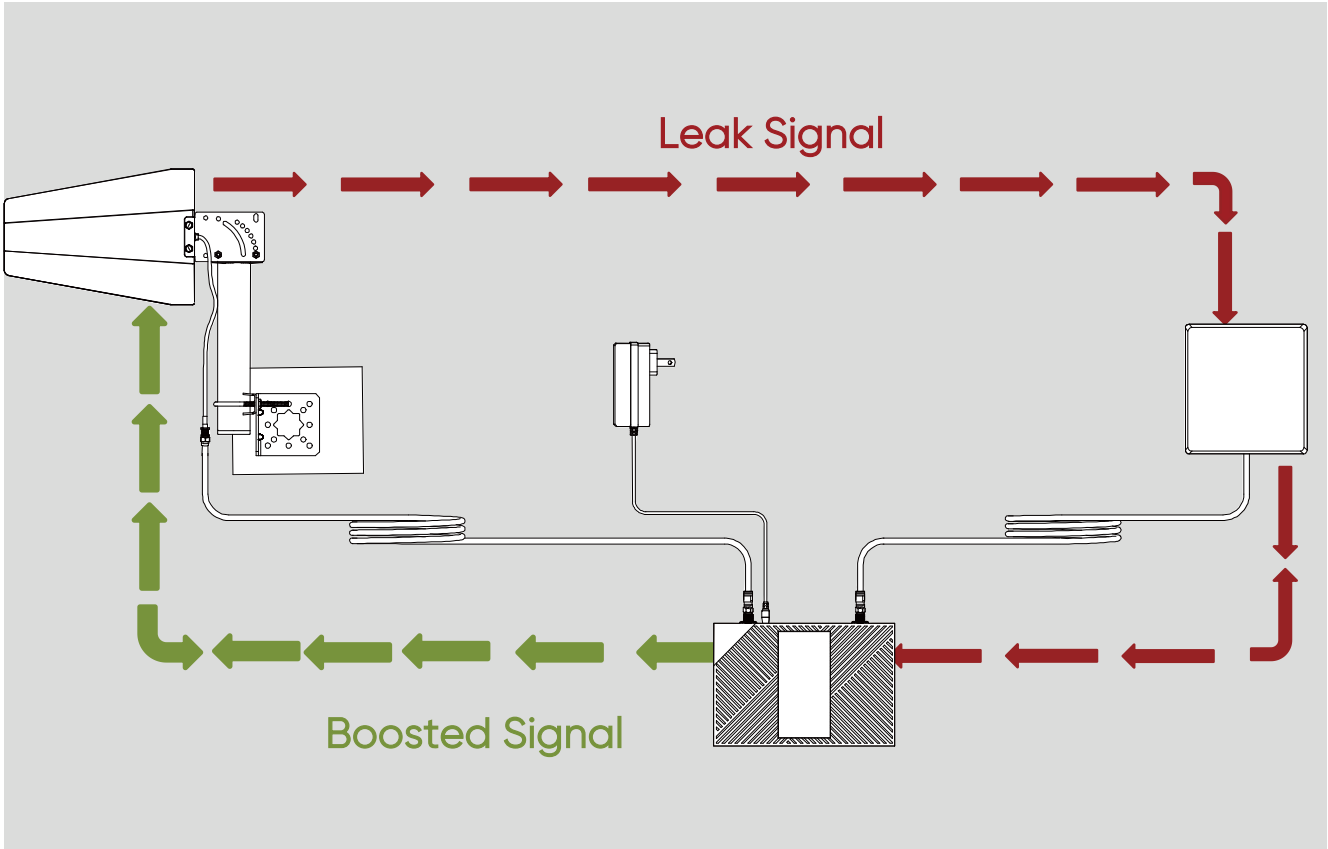
Step 1. Check band number. Make sure your band number belongs to one of the following: band 12/17/13/5/2/25/4. If not this booster can't help you.
Step 2. Check incoming signal level at outside antenna position. Usage of a booster is not recommend when the outside signal is less than -110dbm(3G) or -120dBm(4G LTE).
Step 3. Observe the band status on the LCD display. If "ISOLATION" is displayed, please go to page 26-30 and solve the oscillation problem first.

FIXING SIGNAL IMPROVEMENT IS NOT OBVIOUS ISSUES

Step 1. Find your cell tower direction. Check website www.cellmapper.net. Double check your outdoor antenna direction, see if it is facing the tower which coverage your house. Please follow the page 5-8 to find your correct cell tower direction.
Step 2. Improve the receiving conditions of outdoor antenna. Trees will greatly attenuate wireless signals. If there are tall trees around your house. At the same time you can't find a stable signal above 2 bars(-90dbm), the outdoor antenna needs to be erected 60%(at least) to 80%(best) of the tree height(Never exceed the trees!).



Basic Oscillation Knowledge



How does oscillation happened:

1. Inside antenna receive leak signal from the outside antenna;
2. Booster amplify the signal and then transmit it to the outside antenna;
3. Outside antenna broadcast the signal in the air, some of the signal back to inside antenna become leak signal;
4. If the gain of the booster higher than the loss of the leak signal, the leak signal will become bigger and bigger, finally oscillation happened.

How to solve the problem of oscillation

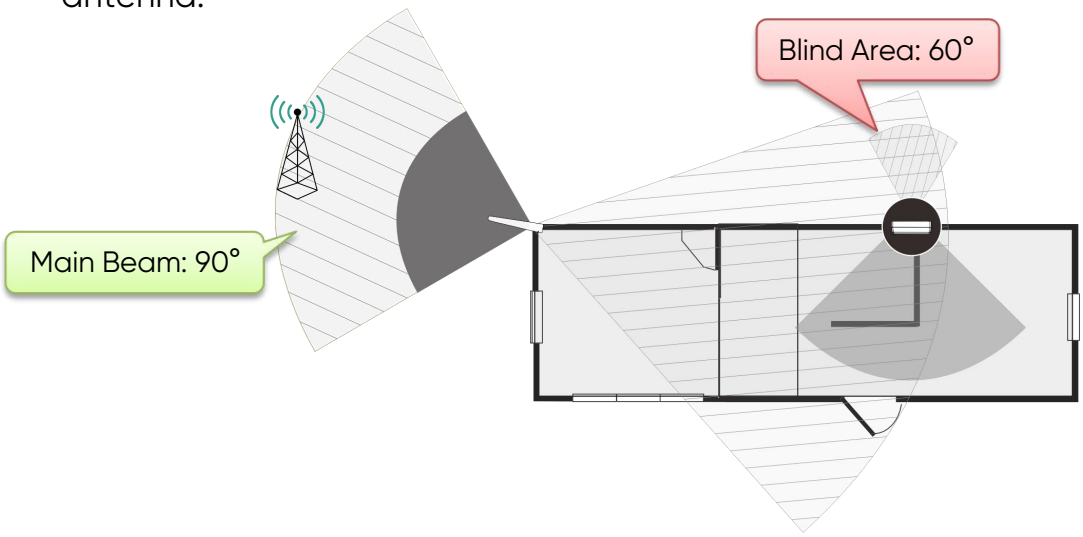
1. Keep enough distance between outside antenna and inside antenna

Minimum Required Separation Distance Between Outside Antenna and Inside Antenna:

Straight line distance over **30 feet** (9 meters) **or**
20 feet (6 meters) **horizontal** distance
20 feet (6 meters) **vertical** distance (as far as possible).

2. The installation position and direction of the antennas

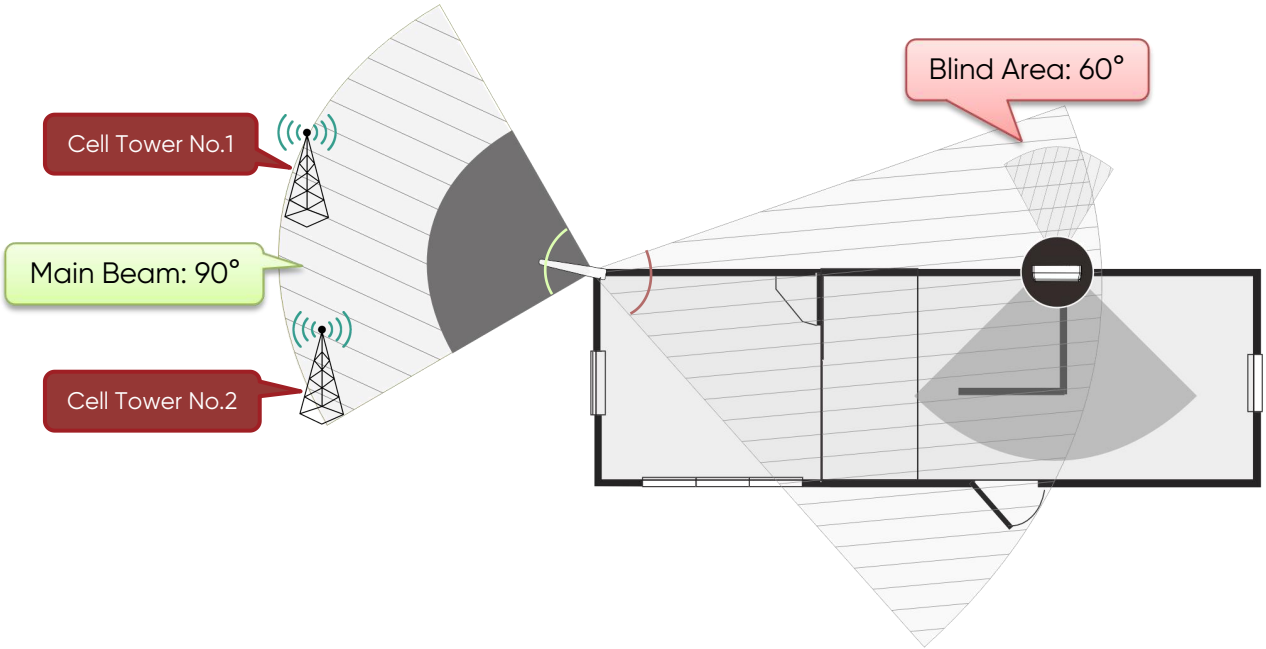
a. Outside antenna must be installed over the **roof line**.
b. Keep the inside antenna in the "**Blind Area**" directly behind the outside antenna.
c. The outside antenna should be oriented in a way that it does not "face" the inside antenna. The inside antenna also cannot face the outside antenna.



3. Check whether there is a reflecting surface formed by a large object in front of the outside antenna

In some cases, the signal from the outdoor antenna will be reflected to the indoor antenna, causing oscillation.(Please refer to the real cases on pages 29-30.)

Top view of antenna beam shape and energy distribution



⚠ The outside antenna's forward horizontal main beam is about **90 degrees**. The vertical direction front radiation main beam angle is about **60 degrees**.
Cell tower No.1 and No.2 in the above picture, their signal received by outside antenna is the same.

Please understand that the physical properties of radio wave transmission are a bit like that of light. Will form a reflection on the surface of the object. The reflection efficiency varies according to the material of the object. In some cases, the signal from the outside antenna will be reflected to the inside antenna, causing **oscillation**.

- At this time, **rotate** the **outside antenna** horizontally or vertically according to the actual terrain, keep the cell tower within range of the main beam and move the obstruction out of the front radiation area of the outside antenna. This reduces the energy of the reflected signal.

Real case 1: Oscillation caused by signal reflection

Basic information description

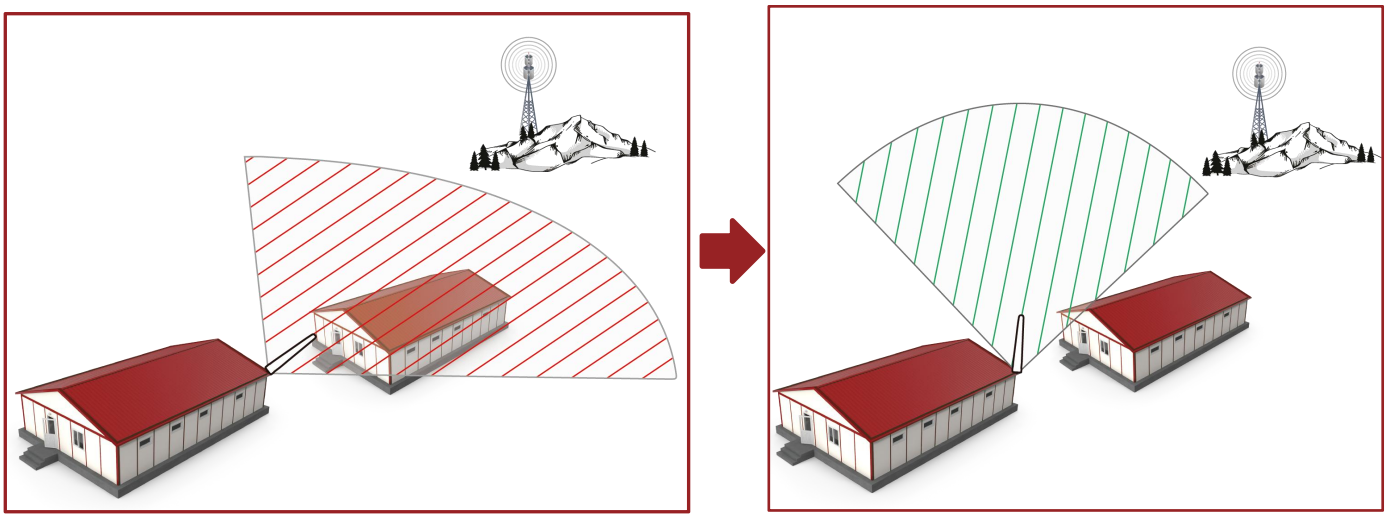
1. The outdoor antenna is right facing the cell tower;
2. There is a iron warehouse infront of the outdoor antenna, about 100 ft away from the outdoor antenna;
3. Distance between the indoor and outdoor antenna is good enough;
4. Indoor antenna is setup in the “blind area” of the outdoor antenna;
5. The status of the band12/17 on the LCD display shows "ISOLATION"(The band12/17 is oscillating and the gain is reduced.);

Case analysis:

The outer surface of the warehouse facing the outdoor antenna, become a big reflect surface. It reflect the signal from the outdoor antenna to the indoor antenna.

Solution:

Horizontal rotating outdoor antenna. Keep the cell tower at the edge of the main beam, same time move part of the warehouse out of the main beam. This reduces the energy of the reflected signal.



Real case 2: Oscillation caused by signal reflection

Basic information description

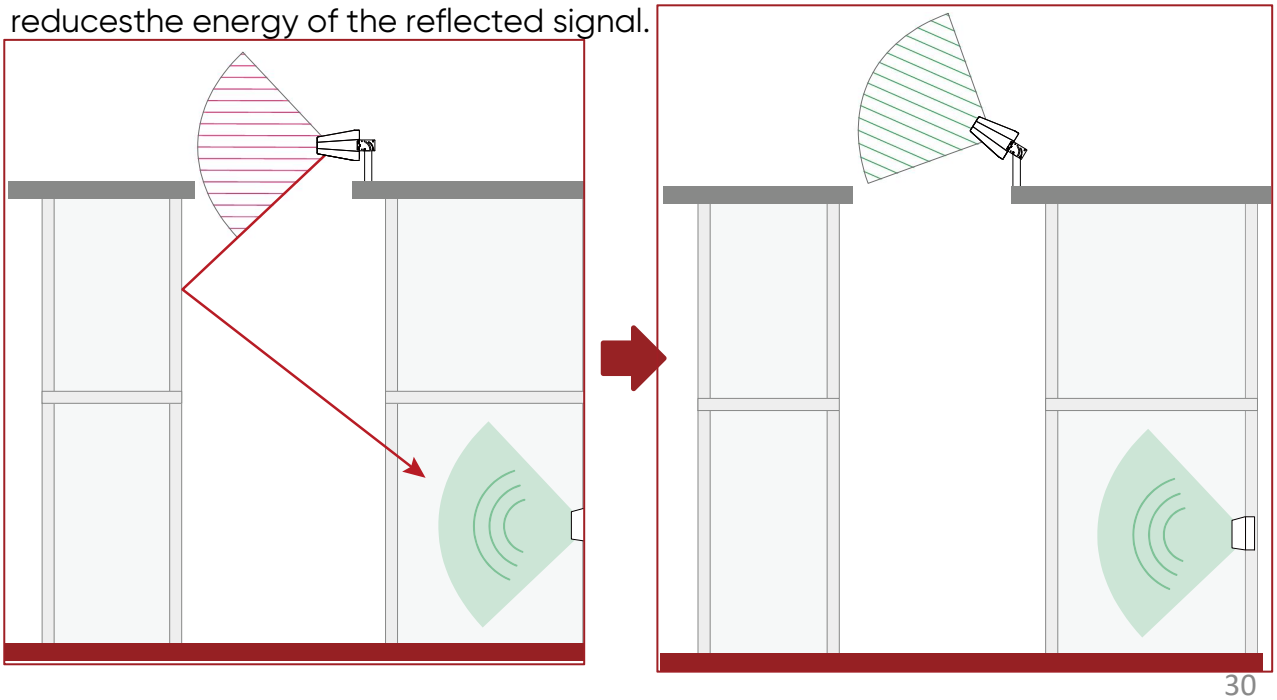
1. The outdoor antenna is right facing the cell tower;
2. There is a big building infront of the outdoor antenna, about 100 ft away from the outdoor antenna;
3. Distance between the indoor and outdoor antenna is good enough;
4. The status of the band12/17 on the LCD display shows "ISOLATION"(The band 12/17 is oscillating and the gain is reduced.);

Case analysis:

The outer surface of the building facing the outdoor antenna, become a big reflect surface. It reflect the signal from the outdoor antenna to the indoor antenna.

Solution:

Vertical rotating outdoor antenna up 15 to 30 degree. Keep the cell tower at the bottom edge of the main beam, same time move part of the opposite building out of the main beam. This reducesthe energy of the reflected signal.



Frequently Asked Questions

Q1. Can I install the booster system myself?

A: Yes. Our cell signal booster kit comes with everything you need to install the booster in your home. This booster kit is designed for step-by-step, guided DIY installation.

Q2. Can I add coax cable to the booster system?

A: Yes. You can add additional coax cable when installing the booster system yourself. However, we do not recommend adding more cable than what is included in the kit as it will result in signal loss.

Q3. How many devices can the booster support?

A: Each band can support 5~10 users same time.

Q4. Does a signal booster boost wifi signals?

A: Unfortunately, signal boosters do not improve wifi signals, only cellular signals such as 3G & 4G LTE for most major US & Canadian carriers.

Q5. How do I know where my carrier's nearest cell tower is?

A: You can check it out through the websites like www.cellmapper.net or www.antennasearch.com.

Q6. How do I register my booster with my cell service provider?

A: FCC regulations require that anyone who operates a cell phone signal booster register the booster with their cellular carrier. Below are links to the online booster registration forms for major U.S. carriers.
If you do not see your service provider below, contact your provider's customer service group to ask how to register your signal booster.

T-Mobile/MetroPCS: https://www.t-mobile.com/signal-booster/registration

AT&T: https://securec45.securewebsession.com/attsignalbooster.com/

Verizon(Business registration only.Only loads on a laptop not on the phone):

https://www.verizon.com/solutions-and-services/accessories/register-signal-booster/

Safety Guidelines

To uphold compliance with network protection standards, all active cellular devices must maintain at least six feet of separation distance from inside unit antenna and outside unit antenna and at least four feet of separation distance from inside unit.

Use only the power supply provided in this package. Use of a non-Metarepeater product may damage your equipment.

The Signal Booster unit is designed for use in an indoor, temperature-controlled environment (less than 100 degrees Fahrenheit). It is not intended for use in attics or similar locations subject to temperatures in excess of that range.

RF Safety Warning: Any antenna used with this device must be located at least 8 inches from all persons.

This is a CONSUMER device

BEFORE USE, you **MUST REGISTER THIS DEVICE** with your wireless provider and have your provider's consent .Most wireless provider consent to the use of signal boosters .Some providers may not consent to the use of this device on their network .If you are unsure ,contact your provider.
In Canada,**BEFORE USE** you must meet all requirement set out ISED CPC-2-1-05.
You **MUST** operate this device with approved antenna and cables as specified by the manufacturer .Antennas **MUST** be installed at least 20cm (8inches) from(i.e.,**MUST NOT** be installed within 20 cm of) any person.
You **MUST** cease operating this device immediately if requested by the FCC(or ISED in Canada) or a licensed wireless service provider.
WARNING.E911 location information may not be provided or may be inaccurate for calls served by using this device.
This device may be operated ONLY in a fixed location(i.e.,may operae in a fixed location only) for in-building use.

FOR MORE INFORMATION ON REGISTERING YOUR SIGNAL BOOSTER WITH YOUR WIRELESS PROVIDER, PLEASE REFER TO THE FOLLOWING LINKS:

T-Mobile/MetroPCS: https://www.t-mobile.com/signal-booster/registration

AT&T: https://securec45.securewebsession.com/attsignalbooster.com/

Verizon(Business registration only.Only loads on a laptop not on the phone):

https://www.verizon.com/solutions-and-services/accessories/register-signal-booster/

Note: If your operator is not listed above, please contact your operator to request a registration address

Specifications

Model Number	SF008C				
Connectors	F-Female on the inside Antenna / F-Female on the Outside Antenna				
Noise figure	5 dB nominal				
Antenna Impedance	75 Ohms / 75 Ohms				
Weight	0.57Kg				
Frequency(Uplink)	698-716MHz	776-787MHz(US) 777-787MHz(CA)	824-849MHz	1850-1915MHz	1710-1755MHz
Frequency Band	Band12/17	Band13	Band5	Band25/2	Band4
Gain(Max)	62	62	62	65	65
OutputPower（dBm）	17dBm~30dBm				
Frequency(Downlink)	728-746MHz	746-757MHz(US) 746-756MHz(CA)	869-894MHz	1930-1995MHz	2110-2155MHz
Frequency Band	Band12/17	Band13	Band5	Band25/2	Band4
Gain(Max)	62	62	64	70	70
OutputPower（dBm）	≤17dBm				
EIRP	1W Max				
Operating temperature	5℉ to 140℉ (-15℃~60 ℃)				
Isolation	>110 dB				
Dimension(mm/in)	185.5*130.5*42/ 7.31*5.15*1.65				
Power Requirements	AC / DC 12V,1.5A or 2A, w/1.35X3.5mm Jack				

This device complies with Part 15 of FCC rules. Operation is subject to two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Metarepeater could void the authority to operate this equipment.

NEED HELP ?

MetaRepeater@outlook.com

3 YEAR WARRANTY

The Booster is covered under a three-year product warranty for failures or defects that result from craftsmanship and/or materials. Dated proof of purchase should be retained for use in warranty cases. Contact the retailer/reseller directly with any warranty issues, or alternatively contact the manufacturer in cases where the reseller is no longer available to handle warranty claims. In cases where the reseller is unavailable, the product may be returned to the manufacturer at the consumer's expense, with a dated proof of purchase and a return authorization letter which can be attained by contacting Metarepeater.

This warranty does not apply to any signal booster components determined by Metarepeater to have been subjected to misuse, abuse, neglect, tampering, or mishandling that result in damages to the physical or electronic properties of the product. Refurbished products that have been recertified to conform to product specifications may be used for product replacements.

DISCLAIMER: The information provided by Metarepeater is believed to be complete and accurate, to the best of our knowledge. However, no responsibility is assumed by Metarepeater for any business or personal losses arising from the use of the information herein contained, or for any infringements of patents or other rights of third parties that may result from its use.

NEED HELP ?

MetaRepeater@outlook.com

FCC Statement

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help
This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1)this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 50cm between the radiator & your body.

IC Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference; and
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
The term "IC: " before the certification/registration number only signifies that the Industry Canada technical specifications were met. This product meets the applicable Industry Canada technical specifications.
Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. L'exploitation est autorisée aux deux conditions suivantes :
(1)l'appareil ne doit pas produire de brouillage,
et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
Vous devez utiliser cet appareil avec des antennes et des câbles approuvés comme spécifié par le fabricant. Les antennes doivent être installées à au moins 20 cm (8 pouces)de toute personne.
This product meet all requirements set out in CPC-2-1-05, URL:
http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08942.html
Ce produit répond à toutes les exigences énoncées dans CPC-2-1-05, URL:
http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08942.html

Metarepeater

CELL PHONE SIGNAL BOOSTER

3-year manufacturer's warranty

MetaRepeater@outlook.com

For Technical Support:

Email: MetaRepeater@outlook.com