CELL PHONE SIGNAL BOOSTER

USER MANUAL

Tips:

Thank you for purchasing our cell phone signal booster kit. With improved performance, our booster kit deliver a clear and consistent signal for multiple simultaneous users in homes and offices.

If you have any questions during setup, please reach out to our experienced support technicians.

Customer Service Email: support01@ulnastore.com

Welcome to ULNA store, where you can find more products that suit your needs https://www.amazon.com/ulna

Contents

1. OVERVIEW

1.1 Why Indoor Signal Can Be Weak

There are several obstacles that can contribute to the poor reception you receive in your home:

- Distance to your carrier's cell phone tower
- Obstructions caused by terrain and foliage
- Building materials like low-E glass, metal and concrete

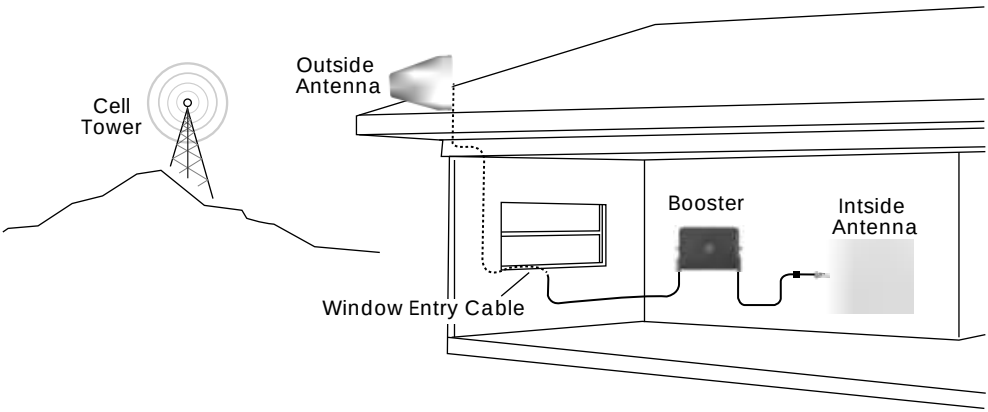
1.2 How It Works

1. The outside antenna collects signal from the cell tower.

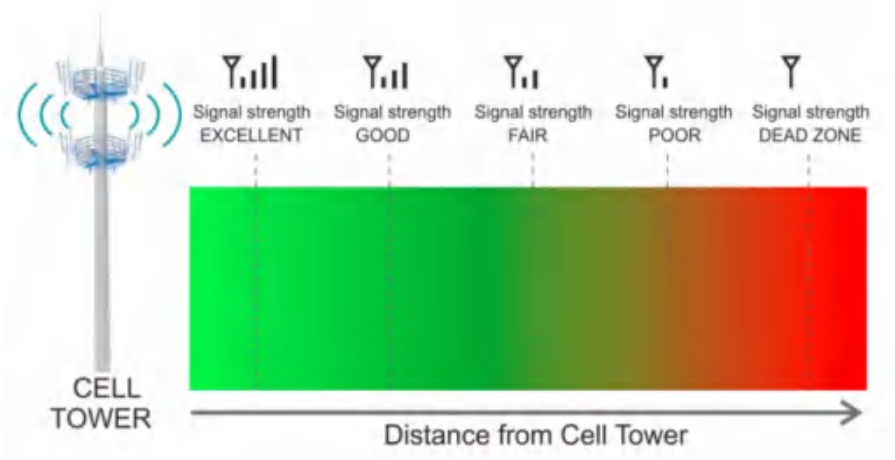
2. The outside antenna sends the signal to the booster through coax cable to the booster.

3. The booster amplifies the cell signal and rebroadcasts the signal indoors to all mobile devices within range.

4. The booster amplifies outgoing cell signal back to the tower.



1.3 Signal Transmission Loss And Power Level



Cell Tower, Signal strength EXCELLENT, Signal strength GOOD, Signal strength FAIR,
Signal strength POOR, Signal strength DEAD ZONE, Distance from Cell Tower

Sq Ft

Note:
FCC regulations limit the amplification of all cell phone boosters in order to prevent damage to the telecommunications infrastructure. Therefore, the maximum coverage area of a booster depends on the original power level of the signal captured by the outdoor unit.

Note:
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.

Power level at the outside antenna location	Coverage Area One Antenna (sq. ft.)
Strong (5 bars on the cellphone)	5,000
Medium (3-4 bars on the cellphone)	2,500
Weak (1-2 bars on the cellphone)	600

2.PACKAGE CONTENTS

Signal Booster

Inside Antenna

43FT Outside Coax Cable with N-SMA Connector

43FT Inside Coax Cable with N-N Connector

Antenna Mount

Outside Log-period Antenna

Power Supply

3.BEFORE INSTALLATION

3.1 Identify The Area of Strongest Outside Signal

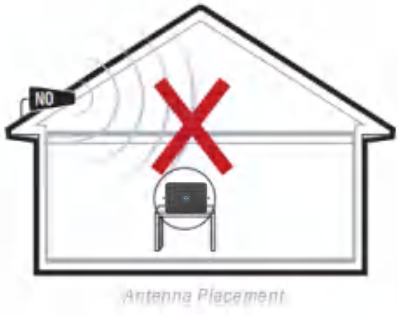
Since booster performance is largely determined by the signal strength received by your outside antenna, it is important to identify the location of best signal for placement of your antenna.
The best location is generally found on the side of your home that faces your nearest cell tower and as high as possible -- where the antenna can 'see' your cell tower. Better signal received by your outside antenna means better booster performance inside. Conversely, the weaker your outside signal, the more limited your coverage will be indoors.

3.2 Better Antennas Separation Means Better Performance

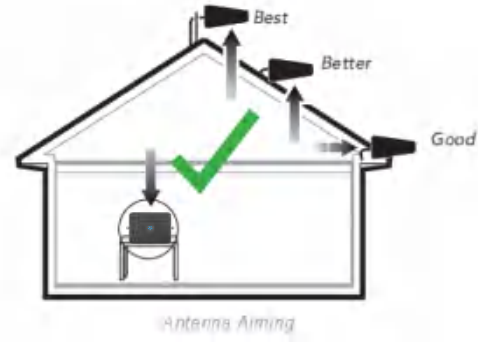
Maintain a distance of at least 25 vertical feet or up to 50 feet of horizontal distance, especially if sufficient vertical separation cannot be achieved. Also, make certain the antennas are aimed away from one another.

3.3 Do Not Reply On Cell Phone Bars As An Accurate Measuring Tool

Cell phone bars are an approximation of your signal that varies by phone and carrier. Placing your phone in test mode or downloading an app that shows your signal in decibels (dB) is more accurate. During planning, installation and testing, take multiple readings several minutes apart. Also, verify that you can place and hold a call.



Antenna Placement



Antenna Aiming

3.4 Taking Signal Measurements With Your Phone

See the instructions to measure decibels on your phone.
Measuring signal will be helpful to

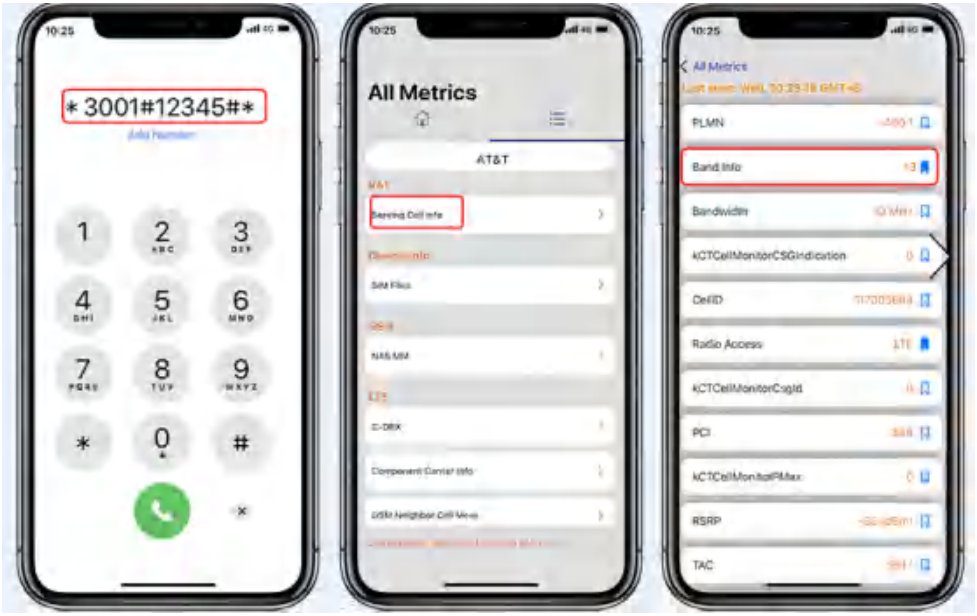
(1) Identify the location outside with the strongest signal for placement of your outside antenna;

(2) Measure indoor signal strength during installation and testing of your system. During installation and testing, always take multiple readings several minutes apart. Also, take note of the band number related to each reading for accurate comparisons.

3.4.1 For iphone dBm signal measurements, use the methods below.

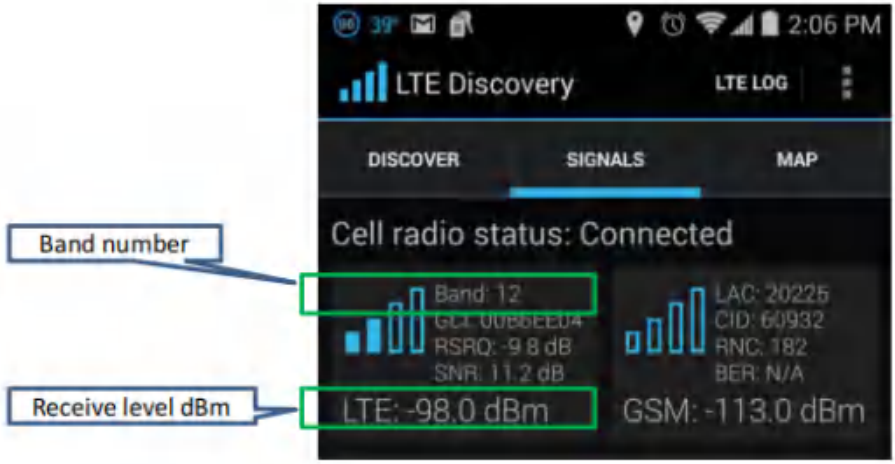
1. First turn off your Wi-Fi
2. Dial *3001#12345#* then press the call button.
3. The field test screen will appear. Once open, the menu navigation varies depending on the iOS version.
4. Navigate to “Serving Cell Info” in the menu.
5. Check Band Information.
6. Note Band number

If you’re using an earlier version of iOS or looking for more detailed information, we have more instructions available here:
www.surecall.com/support



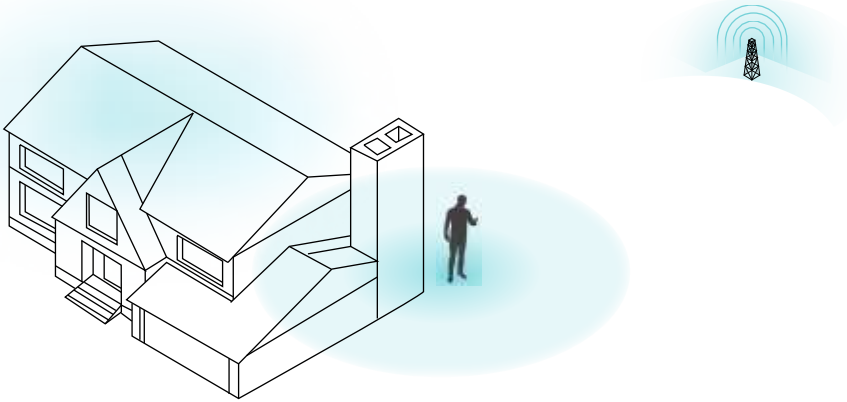
3.4.2 For Android devices: Download the app “LTE Discovery” in the Google Play store.

1. Download and install the app: LTE Discovery, tap ‘SIGNALS’ and check band number.
2. The result should be a one-digit or two-digit number, if not, please check it again.



3.5 Finding Your Closest Cell Tower

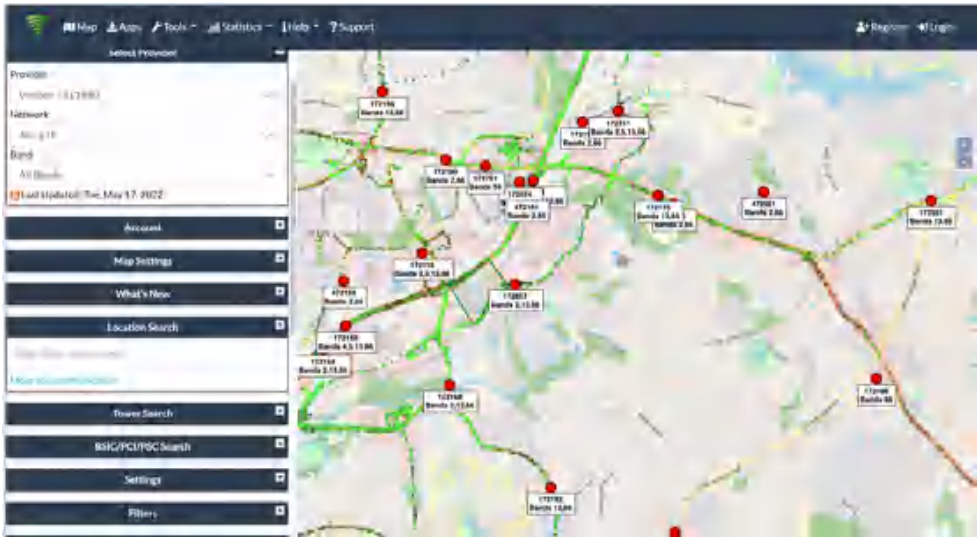
Since performance is largely determined by the signal received by the outside antenna, it is important to know the direction in which you will aim your directional outside antenna before installation. The best location for your outside antenna is generally found on the side facing your nearest cell tower and as high as possible -- where the antenna can ‘see’ your cell tower

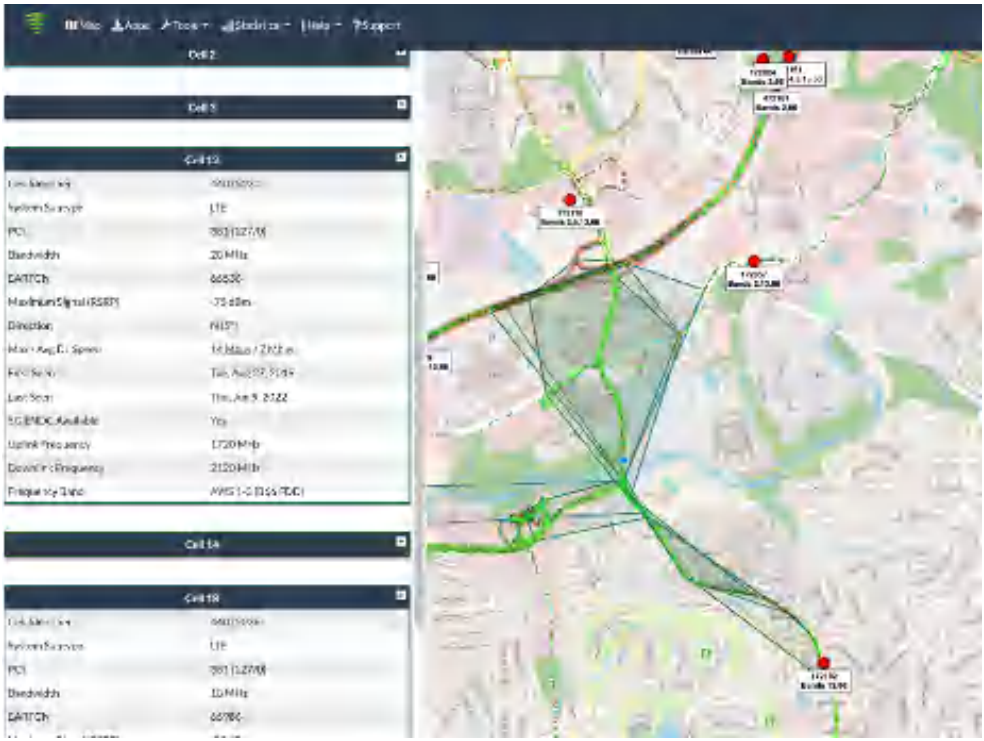


If you're not sure of the location of your nearest cell tower, there are resources available. You may utilize crowd-sourced cell tower resources such as sites like www.cellmapper.net.
See below for brief instructions on utilizing cellmapper.net

1. Find your location on the map
2. Select your provider
3. Find your cell tower by clicking on the red or green dots on the map closest to your home. Once selected, detailed information of each base station is shown to the left, including the communication standards and frequency band and block. The shaded area represents the coverage area for that base station.
4. Locate the closest base station with signal coverage facing the direction of your home and note the direction in relation to your home.

Note:
While your home may or may not be located inside a shaded coverage zone indicated on the map.

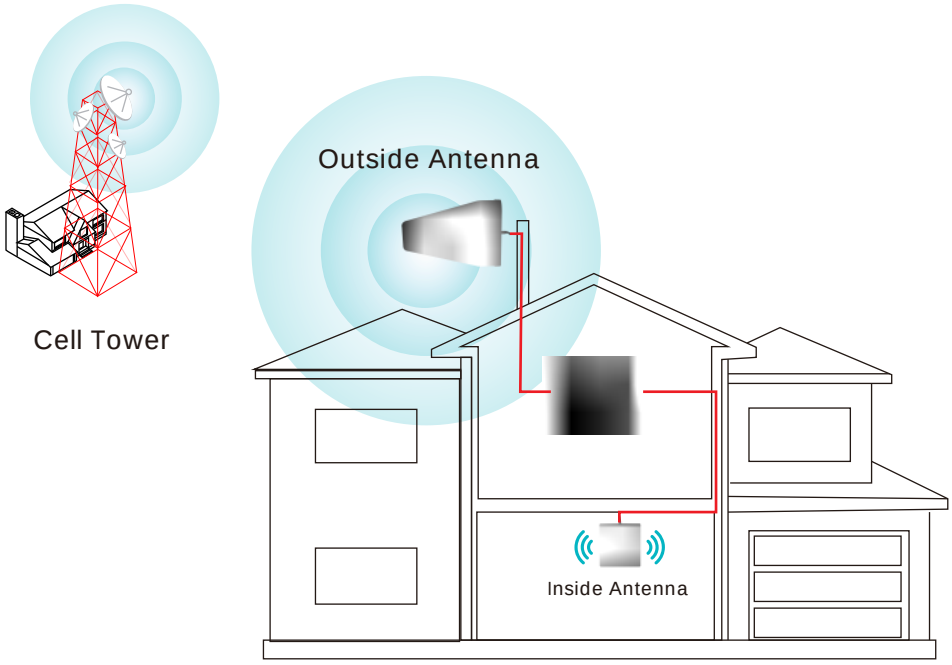




4.INSTALLATION

Before installation, review all the information in this manual. Prior to securing the location of any booster parts, a “soft install” is recommended as adjustments may be needed to optimize performance.

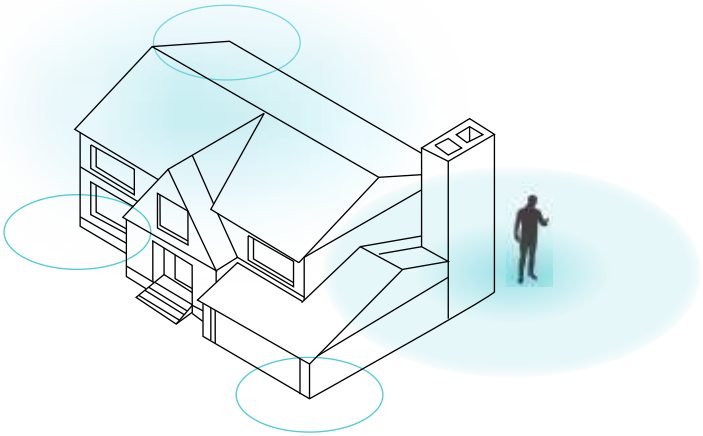
4.1 Installation Overview



4.2 How to Install

Step 1: Find Area Outside With Strongest Signal

Identify the outside location with the strongest signal for placement of your outside antenna. Maximum performance is achieved when the antenna is aimed toward the strongest signal source. If you know the direction of your provider's tower, point the antenna in that direction.



Step 2: Install The Outside Antenna

Once you have identified the area of strongest signal, choose where you will mount your outside antenna while considering the following antenna placement guidelines. Mount at the highest possible location above the roofline – The mounting area must have at least a 3 ft radius clear of obstructions, other radiating elements and metal objects such as pipes or metal siding.

• Maximize antenna separation. Plan at least 25 vertical feet (or at least 50 horizontal feet) of separation between the outside antenna and the booster.

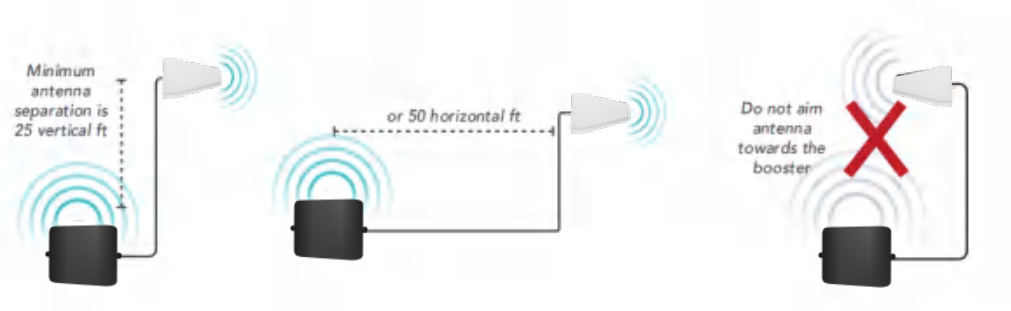
• Note that the outside antenna can be mounted to an exterior surface or a 1-2 inch diameter pole. A mounting pole is available separately or PVC piping from your local hardware can also be used.

• Avoid placement near windows, where possible, as it increases the potential for oscillation.

• Ensure the outside antenna is oriented to face away from the booster.

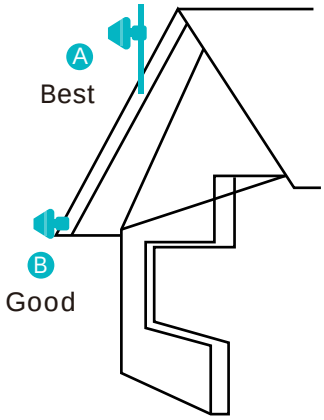
• Mount the outside antenna at the corner or side of the roof which faces your cell tower.

• Avoid aiming the antenna towards reflective materials (such as windows) where the signal may be reflected towards your home.

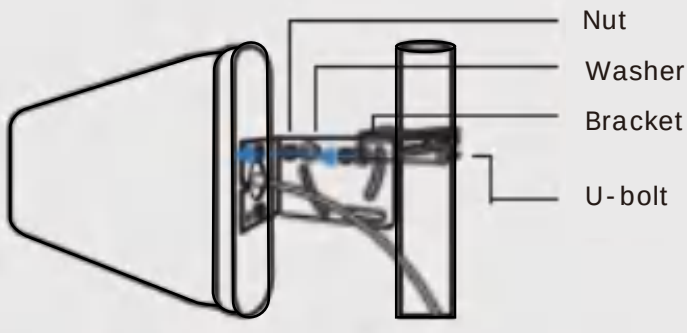


Log-period antenna installation

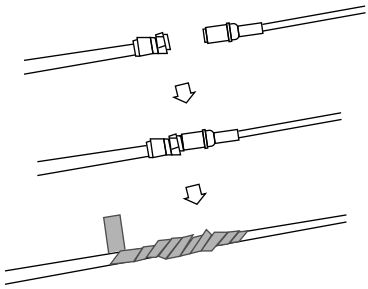
The directional LPDA Antenna should be mounted at the highest possible location above the roof line - at least 25 feet above the inside antenna - aimed in the direction of your nearest carrier's cell tower. Ensure that the mounting area has at least a 12 inches radius clear of obstructions, other radiating elements and metal objects such as pipes or metal siding. Once you have identified your install location, assemble the u-bolt, bracket, nuts and washers onto a pole as shown in the illustration. Keep the connections loose enough to allow the antenna to rotate until the optimum direction is found. Run the cable along route to planned location of your booster.



Location for Outdoor Antenna



LPDA Antenna Install Illustration



Note:
Long-term rain or moisture erosion can damage the electrical characteristics of outside antenna connectors. Make sure connectors are well screwed in and seal the connectors with glued tape.

Step 3. Mount Inside Antenna

Choose a location for the inside antenna that is at least 25 feet from the outside antenna. Consider the below factors affecting signal coverage of the booster:

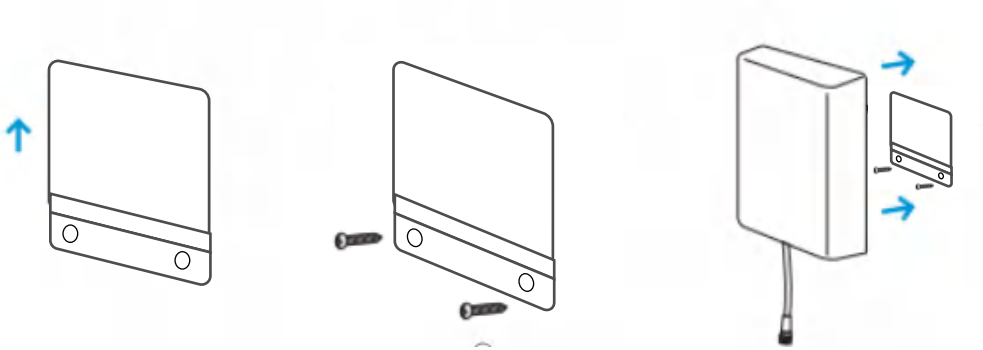
1. Signal strength at the location of the outside antenna.
2. Interior building materials between your cell phone and the inside antenna.
3. Distance between your cell phone and the inside antenna (the closer, the better).
4. Distance between the outside antenna and inside antenna (minimum 25 ft. separation).

The Inside Panel Antenna is directional with a 120-degree reach, it should be mounted on a vertical surface or wall where there are no materials that could obstruct signals.

Note:
1. The Inside Panel Antenna should be facing the area signal is needed and away from the outside antenna , Whip Antenna , Panel Antenna.
2.The installation location is the approximate height of normal cell phone use.

Installation steps

1. Using the plate mark the position of desired screw placement.
2. Screw mounting plate into place with the slide protruding towards up.
3. Slide antenna securely onto the mounting plate.
4. Connect one end of the cable to the antenna and run to the planned location.
5. Place the booster on a flat surface or mounted to a wall and connect the remaining end of the cable to booster port marked INDOOR.



Step 4. Mount the Signal Booster

Select a location for the Signal Booster that is away from excessive heat, direct sunlight, moisture and well ventilated. The enclosure must NOT be air tight. Also, be sure the location is near a power source

Installation Steps:

1. Connect the cable of the inside antenna to the port on the side of the booster labeled “INDOOR”.
2. Route the cable from the outside antenna inside and connect it to the port on the booster labeled “OUTDOOR”.

Step 5. Power Up

Connect the power adapter cord to the signal booster and plug into the power outlet. The LED Indicators will light, indicating if the signal booster is functioning properly or not.

Note:

1. Do NOT connect the power adapter to the Signal Booster until you have connected both the Inside and Outside Antennas
2. The booster case may become warm during operation, this is normal, please don't worry.

4.3 How to visually confirm that your installation is effective and correct?

At a distance of 6 feet from the inside antenna, test the signal strength without obstruction. If this test result is 15~20db higher than your test result at the outside antenna position, then your system has reached the best effect.

For example, you test a signal of -90dbm at 6 feet away from the inside antenna. Your outside antenna position record is -105dbm. So the improvement is: -90dbm - (-105dbm) = 15db

Note:

1. In daily life, the signal dbm readings of our mobile phones range from -70dbm to -120dbm. Because it is a negative number, the smaller the number, the greater the signal strength.
2. In the case of no problems with the installation, the strength of the indoor signal depends entirely on the strength of the outdoor signal.

Step 4. Mount the Booster

Select a location for the Signal Booster that is away from excessive heat, direct sunlight, moisture and well ventilated. The enclosure must **NOT** be air tight. Also, be sure the location is near a power source.

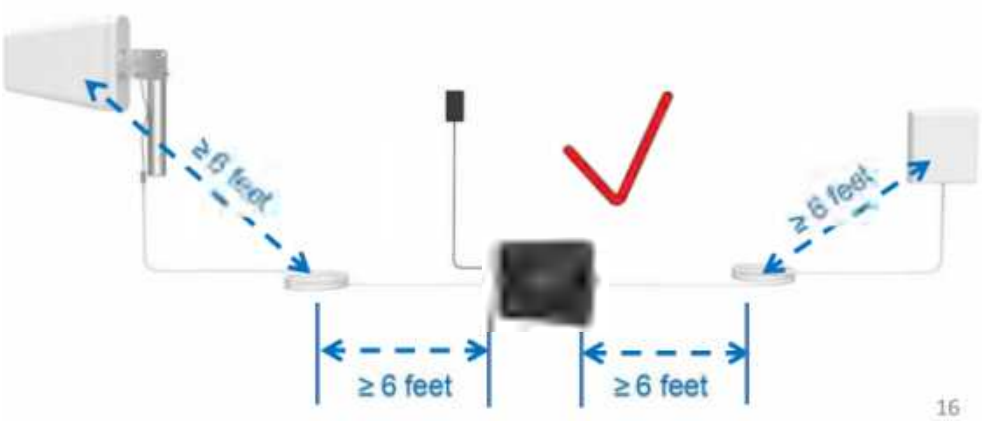
Installation Steps:

1. Connect the cable of the inside antenna to the port on the side of the booster labeled “INDOOR”.
2. Route the cable from the outside antenna inside and connect it to the port on the booster labeled “OUTDOOR”.

4.4 Properly Handle Excess Cables

If the coax cable is too close to the antenna or booster, the system will be unstable. Make sure these coax cables are more than 6 feet(2 meters) from the antenna or booster

Make sure these excess coax cables are more than 6 feet(2 meters) from the antenna or booster can make your system work more stable.



Step 5. Power Up

Connect the power adapter cord to the signal booster and plug into the power outlet.

Note:

1. Do NOT connect the power adapter to the Signal Booster until you have connected both the Inside and Outside Antennas.
2. The booster case may become warm during operation, this is normal, please don't worry.

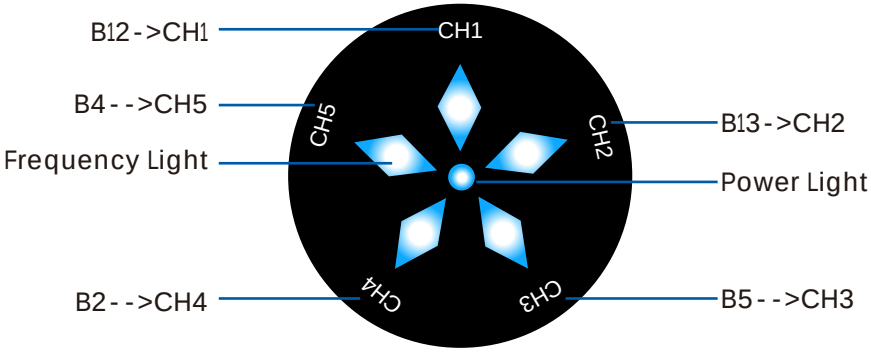
Step 6. Measuring Booster Performance

Compare the signal strength numbers below you took in the same part of the house. If the signal strength number with booster is higher (closer to zero) than the original reading without booster, your booster is working.

Note:

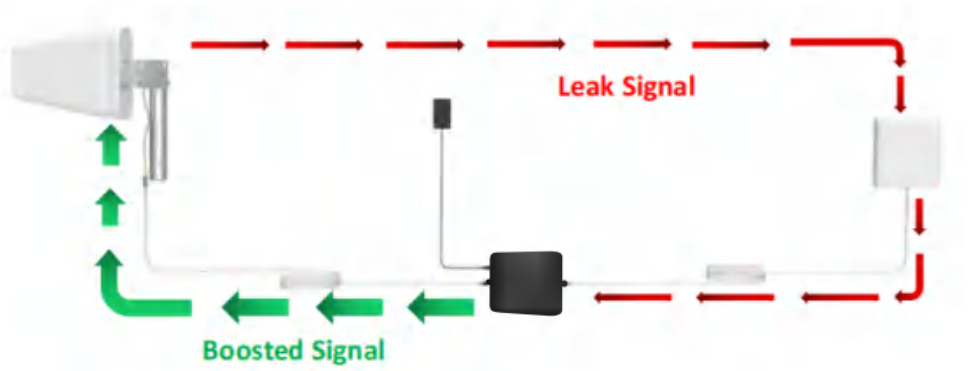
Having an accurate measurement of signal strength in decibels (dBm) is crucial when measuring the performance of the booster. Decibels accurately measure the signal strength you are receiving, bars are not always a reliable measure of signal.

5.INTRODUCTION OF PORTS AND LCD DISPLAY



6. OSCILLATION CASES

6.1 Basic Oscillation Knowledge



6.2 How does oscillation happened:

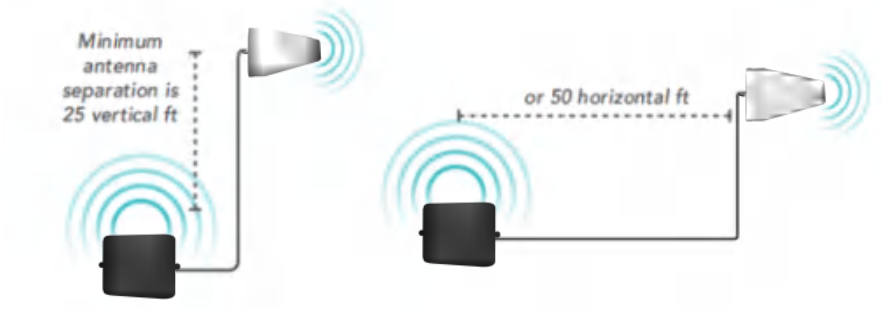
1. Inside antenna receive leak signal from the outside antenna;
2. Booster amplify the signal and then transmit it to the outside antenna;
3. Outside antenna broadcast the signal in the air, some of the signal back to inside antenna become leak signal;
4. If the gain of the booster higher than the loss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

6.3 Trouble Shooting: How to Solve The Problem Of Oscillation

Step 1: Keep enough distance between inside and outside antennas

Minimum Required Separation Distance Between Inside and Outside Antenna:

Maximize antenna separation. Plan at least 25 vertical feet (or at least 50 horizontal feet) of separation between the outside antenna and the booster.

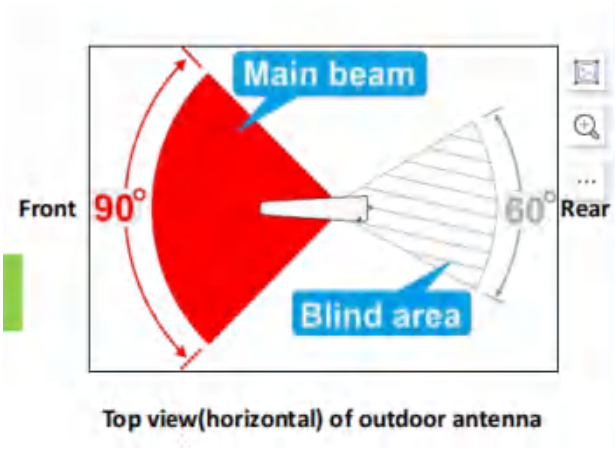


Step 2: Outside antenna must be installed over the roof line

The roof can block the signal coupling between the inside and outside antennas, improve the stability of the system. Installing the outside antenna above the roof can form a large isolation area between the two antennas. Greatly reduce the signal leakage between the two antennas.

Step 3: Keep inside antenna in the“blind area”of the outside antenna

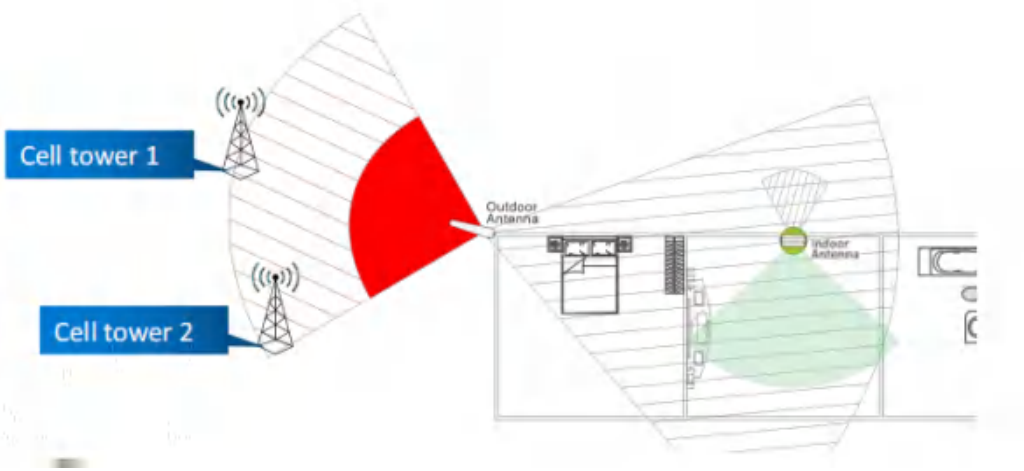
1. The front radiation main beam angle is about 90 degrees;
2. There is a very less energy radiation area behind the antenna, which we call it “blind area”. The angle of the blind area is about 60 degrees;



Top view(horizontal) of outdoor antenna

Outdoor antenna

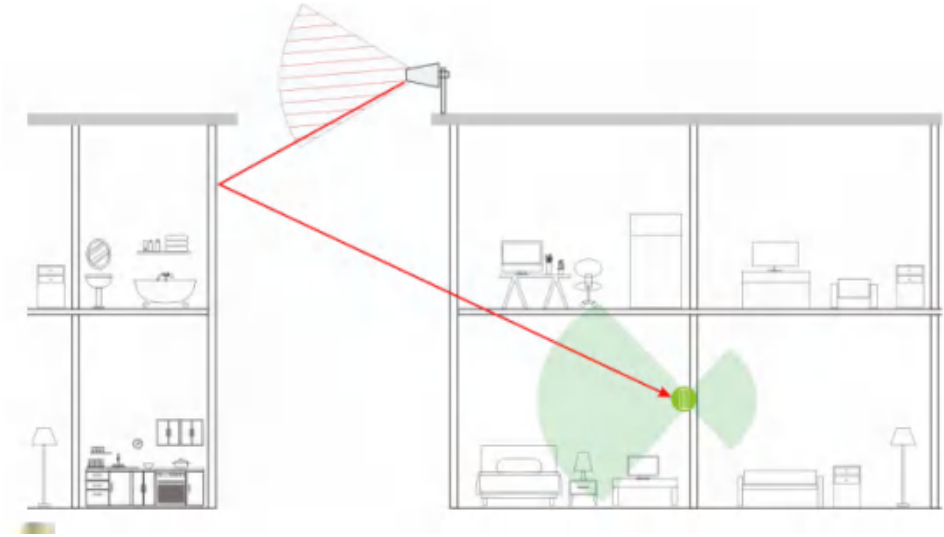
If you have oscillating issue, at the same time, due to the structure or size of the house, your installation can not keep enough distance between inside and outside antenna. Please setup your inside antenna in the “blind area”, that will increase the isolation greatly. Effectively solve the problem of oscillation. When you do this, your outside antenna may not right facing the cell tower. That is fine. Please understand that any direction in the main beam area will be the same reception. Remember, the antenna's forward horizontal main beam is about 90 degrees.



Cell tower No. 1 and No. 2 in the above picture, their signal received by outside antenna is the same

Step 4: Check whether there is a reflecting surface formed by a large object in front of the outside antenna

1. 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. Metal objects reflect the most strongly.
2. In some cases, the signal from the outside antenna will be reflected to the inside antenna, causing oscillation.The vertical direction front radiation main beam angle is about 60 degrees.



7. TROUBLESHOOTING

Problem	Resolution
Signal booster has no power	Connect the power supply to an alternate power source. Verify that the power source is not controlled by a switch that has removed power from the outlet.
After completing installation, indoor signal coverage has not improved	1 . Verify that the frequency band of your cell phone is the same as that of the booster. 2. Verify that there are usable signals where the outside antenna is placed, the best is that you have the ability to place and hold a call. 3. Verify that cable connections are tightly fitted to the booster and antenna. 4. Try further separating the booster and antennas. Note: Bars are not always a reliable measure of signal, please have your phone in field test mode to determine the signal strength.
After completing installation, indoor signal coverage is very small	1. Identify a location outside that receives a stronger signal and move the outside antenna to that location (higher is usually better). 2. Increase the distance between the booster and outside antenna - vertical separation is better than horizontal.
The phone signal is full, but the call quality is poor	The distance between outside and inside antennas are too close, so it is necessary to increase the distance between them, or increase barrier isolation between them.
After installation, the signal did not improve, but it was worse	The distance between outside and inside antennas are too close, so it is necessary to increase the distance between them, or increase barrier isolation between them.
I have been using it normally before, but suddenly the signal is not good after using it for a period of time	1. Check if water ingress at outdoor cable joints. 2. Check if the power indicator light is normal. 3. If there is no water ingress into the cable and the power indicator light is normal, it is possible that the amplifier has malfunctioned and needs to be returned for replacement(1 year warranty).

8.SPECIFICATIONS

8.1 Network

LTE-B12, LTE-B13, CDMA, PCS, AWS

Frequency Range	Frequency	Uplink	Downlink
	LTE-B12	699~716	729~746
	LTE-B13	777~787	746~756
	CDMA	824~849	824~849
	PCS	1850~1910	1930~1990
	AWS	1710~1755	2110~2155
Output Power		16±2 dBm	16±2 dBm
Gain		58±3 dB	63±3 dB
Bandwidth		17M+10M+25M+60M+45M	
Ripple in Band		LTEB12/17≤6dB; LTE-B13≤6dB; CDMA≤6dB; PCS≤6dB; AWS≤6dB	
Spurious Emission	9KHz~1GHz	≤ -36 dBm	
	1GHz~12.75GHz	≤ -30 dBm	
Intermodulation Products	9KHz~1GHz	≤ -36 dBm	
	1GHz~12.75GHz	≤ -30 dBm	
VSWR		≤3	
MTBF		＞50000 hours	
Power Supply		AC：100~240V, 50/ 60Hz；DC：5V 3A	
Power Comsumption		< 6W	
Impedance		50 ohm	

8.2 Mechanical Specification

RF Connector	N-Female N
Dimensions (D*W*H)	253*160*28mm
Packing size (D*W*H)	335*220*50mm
Net weight	<0.53KG
Gross weight	<0.87KG
Installation Type	Wall Installation
Environment Conditions	IP40
Humidity	< 90%
Operating Temperature	-10℃ ~ 55℃

9.WARRANTY

30-day money-back guarantee&1-year manufacturer warranty

Our Signal Boosters are warranted for 1 years against defects in workmanship or materials. Warranty cases may be resolved by returning the product directly to the manufacturer at the consumer's expense, with a dated proof of purchase and an Order Number supplied. We shall either repair or replace the product at its option. This warranty does not apply to any Signal Boosters determined by us to have been subjected to misuse, abuse, neglect, or mishandling that alters or damages physical or electronic properties. Replacement products may include refurbished products that have been re-certified to conform with product specifications.

10.TECHNICAL SUPPORT&SERVICE

A. Thank you for your order and for using ULNA signal booster, please read the manual carefully before use. If there are any problems during the use, please contact us in time;

B. The installation of this device requires some network knowledge.

If you can't install it, please let us know or contact a professional.
Tech Service Email: support01@ulnastore.com

Welcome to ULNA store, where you can find more products that suit your needs https://www.amazon.com/ulna


ULNA