ATTACHMENT E.

- USER MANUAL -

Overview

Overview

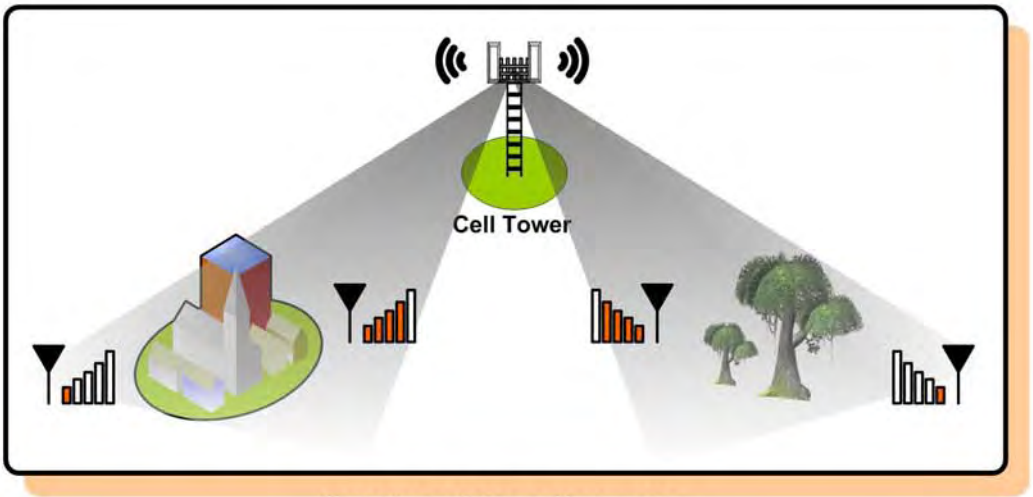
Thank you for choosing UHR-230. You will now be able to use your cell phone inside your home or office. Gone are the days when you had to go to the window upstairs or walk outside to use your cell phone. Like a skylight that brings sunlight into your home, UHR-230 transports and amplifies the outdoor wireless signals into your home of office. By following the easy instructions in this user guide, you will be extending Cell Zones into your home or office.

Why Indoor Signals Can Be Weak

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

1) Location of the Cell Phone Tower in Relation to Your Home/Office
   while cell phone providers have tried to place cell phone towers to provide the best overall coverage, local ordinances and terrain features can impose restrictions on where these towers can be placed, limiting the signal strength available at your location.

2) Obstructions Caused by Buildings, Terrain and Trees
   Cell phone signals can be completely blocked or reflected by buildings, walls, trees, hills and other terrain features resulting in low signal strength.



Cell Phone Signal Obsturction

Package Contents

Before you begin, make sure all of the following parts came with your UHR-230

Product Contents (Link Part) :

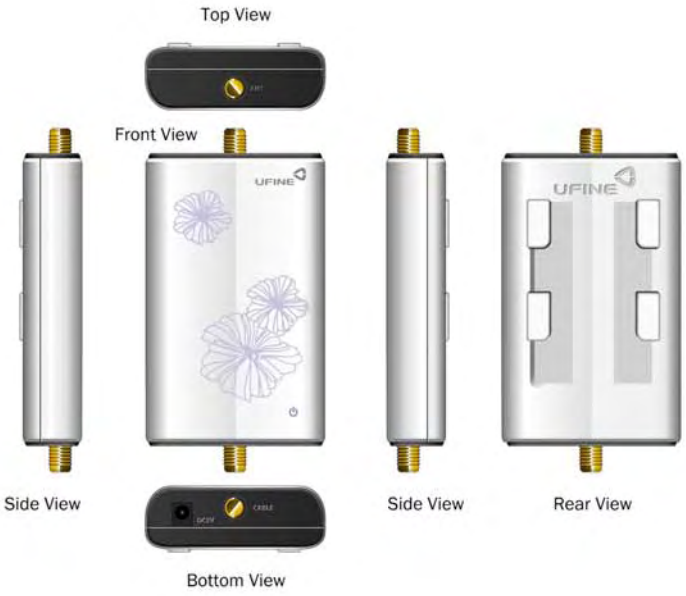
① Link Unit
② Link Unit Mounting Hardware
③ Link Antenna – GMS 5 dBi / WCDMA 3dBi
④ Link Antenna Mounting Hardware
⑤ Power Supply

Product Contents (Service Part) :

① Service Unit
② Service Antenna – 0 dBi
③ Power Supply

Product View

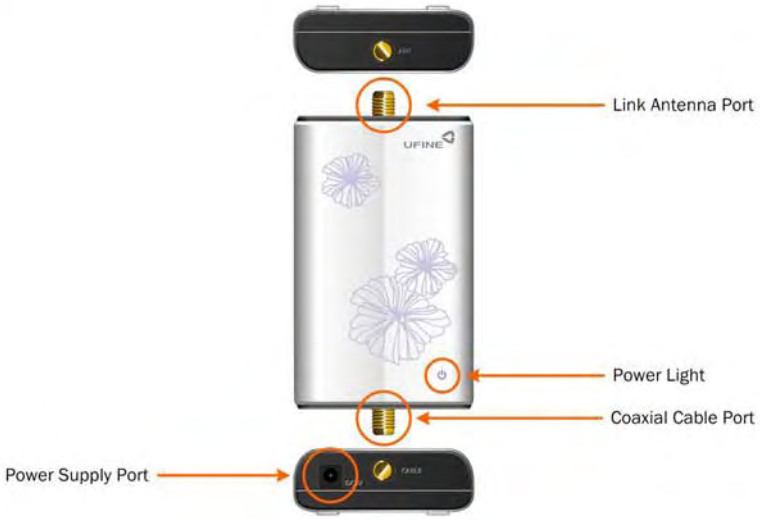
Link Unit



Service Unit

Product Port Discription

Link Unit



Service Unit

Preparing to Set Up Your UHR-230

Tools Needed

The following tools are needed to set up UHR-230

- Screwdriver
- Wireless Phone operating in the band supported by your UHR-230
- Drill (may be required for outdoor or attic antenna placement)

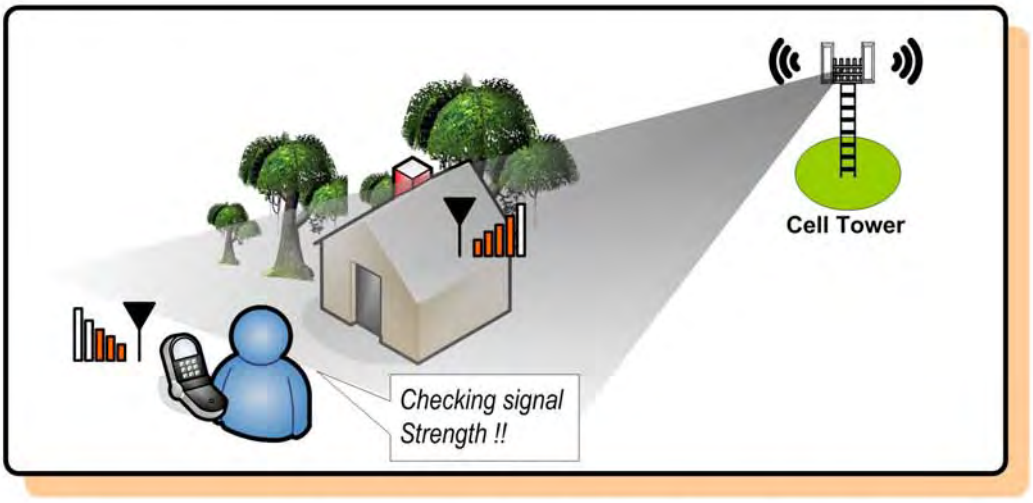
Tools Needed

Before placing a UHR-230 in your home, make sure that you can place calls on the outside of your home, in the attic, at roof level or wherever you plan to place the signal antenna. UHR-230 can only bring signal into your home when signal reaches the Link Antenna

Using your cell phone, place a call from an outdoor location to confirm that enough signal is available at ground level, check the signal strength in your attic or at roof level location where the signal will likely be stronger and where the Link Antenna can be placed for best performance.

If you can reliably make and receive calls outside your home, then UHR-230 can bring the signal into your home.

If only one signal bar is displayed on your cell phone outside, indoor coverage will be limited to one small room. We recommend placing the Link Antenna outside, especially in attic or on roof.



Note : Cell phone signal bars are approximate and vary from phone to phone. The number of bars can fluctuate widely, depending on the location of the phone, the position or angle of the phone, weather, etc. Most cell phone signal meters update every 6 to 10 seconds. An increase of only one bar typically indicates a 4x to 10x signal increase.

The best indicator of signal strength is the ability to reliably place and receive calls.

Preparing to Set Up Your UHR-230

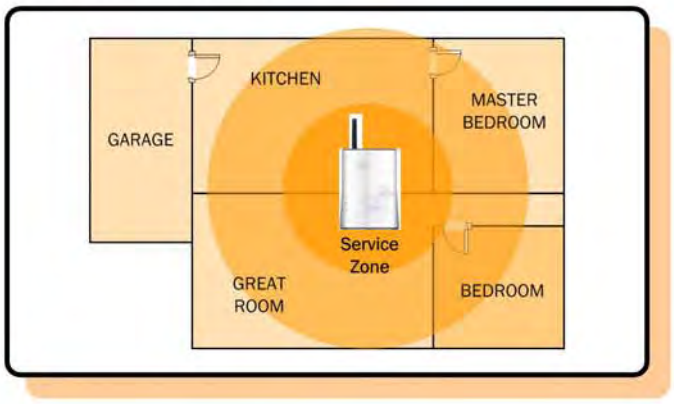
Determine the Needed Coverage Area

Identify the location in your home/office where you need signal coverage the most. The UHR-230 can cover approximately 2500 square feet (coverage varies based on outdoor signal level, building construction, and placement of antennas). Walls, ceilings or floors will reduce the coverage area.

Determine the Location of Link Antenna and Service Unit Antenna

It is recommended that the Link Antenna and Service Unit Antenna has to have more than 20 feet of vertical separation at least.
If the antennas are too close together, the Signal Light on the Service Unit will be either Red or blink Green and Red indicating a problem (See Troubleshooting). To capture the best signal, place the Link Antenna as high as possible and position it vertically, keeping it at least 3 feet away from any metal.
The location of the Link Antenna should be at least 20 feet higher than the Service Unit Antenna. If this is not possible, maximizing the horizontal separation between the 2 antennas is advised.

Warning : Avoid placing the Link Antenna near metal such as wiring, A/C ducts, metal siding truss plates, etc. When connecting the cable to the antenna, run the cable straight down form the antenna. Avoid draping the coax near the antenna.



Positioning the Service Unit

For the widest possible signal area, it is recommended that you position the Service Unit near the middle of a room. This Service Unit uses an omni-directional antenna that delivers signal in a circular pattern around the antenna.
The Service Unit performs best when located at least 4 feet above the floor or approximately the height of a cell phone when it is typically in use (avoid placing the Service Unit on the floor, metal objects)
For best result, avoid placing the Service Unit antenna within 3 feet of other cords, metal objects or other wireless devices such as wireless routers or wireless access points.

Preparing to Set Up Your UHR-230

Cable Requirements

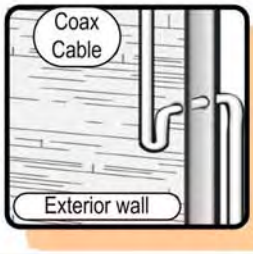
Please use 3000MHz RG-6 coaxial cable and F connectors for Link Antenna and Link Unit, Link/Service unit and coaxial cable port terminal on the wall, which are rated for outdoor satellite TV use and can be found at many home improvement and electronics stores. For the best performance, purchase 3000MHz RG-6 low-loss cables.
The total cable length between Link Antenna and Link Unit should not exceed 80 feet. A longer cable is helpful only if it allows you to place the Link Antenna in a location where you measure stronger signal.

Note : The total cable length between Link Unit and Service Unit should be longer than 70 feet. Refer to the Interface Loss between Link Unit and Service Unit in "Technical Specification" page.

Grounding the Link Antenna

If you decide to place the Link Antenna outdoors, it must be properly grounded.
The set up must be in accordance with Article 810 of the National Electric Code(NEC). A listed antenna discharge unit must be provided for the lead-in coaxial cable per NEC article 8.10.20 or the shield of the coaxial cable must be permanently and effectively grounded in accordance with NEC article 8.10.21. Please consult a professional installer of electrician for more information.

Securing Cable with a Drip Loop



If you place the Link Antenna outdoors, create a drip loop with the coaxial cable at the point where the cable enters the building through an outside wall. This will help prevent moisture from gathering at entry point and leaking into the building.

Power Requirements

Warning : The UHR-230 Link and Service Unit MUST only be used with the provided power adaptor. Use of other power adaptors will void the warranty and may damage the unit. Use of other equipment is not FCC approved.

Setting Up Your UHR-230

Placement of the Signal Antenna

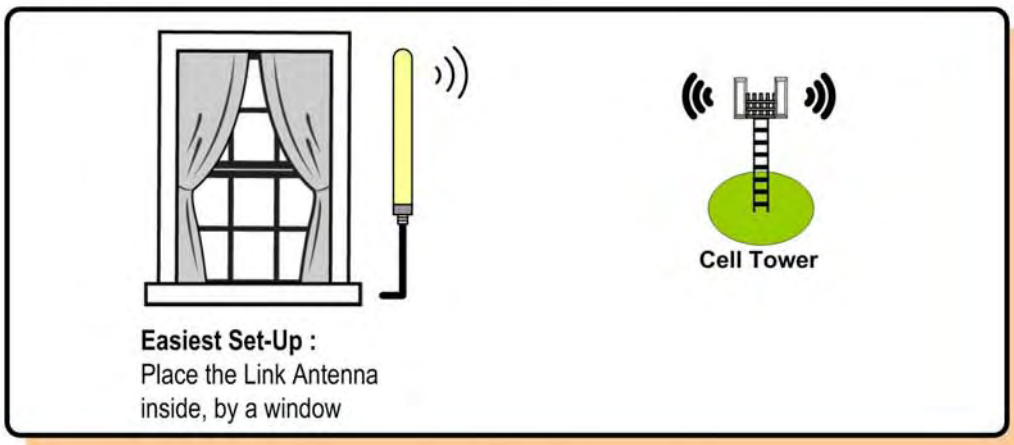
Choosing the best location for the Link Antenna provides the best performance and the largest area of improved signal. Determine the location that provides the strongest signal using the signal strength indicator on your cell phone. Find the location that provides the most bars of signal strength and place the Link Antenna at or near that location. Avoid placing the Link Antenna near metal such as wiring , A/C ducts, metal siding, truss plates, etc. When connecting the cable to the antenna, run the cable straight down from the antenna. Avoid draping the coax near the antenna.

1 Easiest : Inside, by a window (not recommended)

- Locate a window where you get signal
- Mount the Link Antenna above the window.
- Place the Link Unit in desired location.
  – 15 feet of separation between the Link Antenna and Link Unit is recommended.
- Place the Service Unit in desired location
  – where you want to create a Cell Zone (20 feet of vertical separation between the Service Unit and Link Antenna is recommended).
- Attach the coaxial cable to the Link Antenna.
- Connect the other end of the coaxial cable to the Link Unit.
- From the other end, connect the coax cable it to the Service Unit.
- Attach the Service Unit Antenna to the Service Unit and position it vertically. (recommended)
- Connect the Power Supply to the Link/Service Unit and plug it into a power outlet.

Note : If a Red Light appears, try further separating the Link Antenna and Service Unit or see the Troubleshooting.

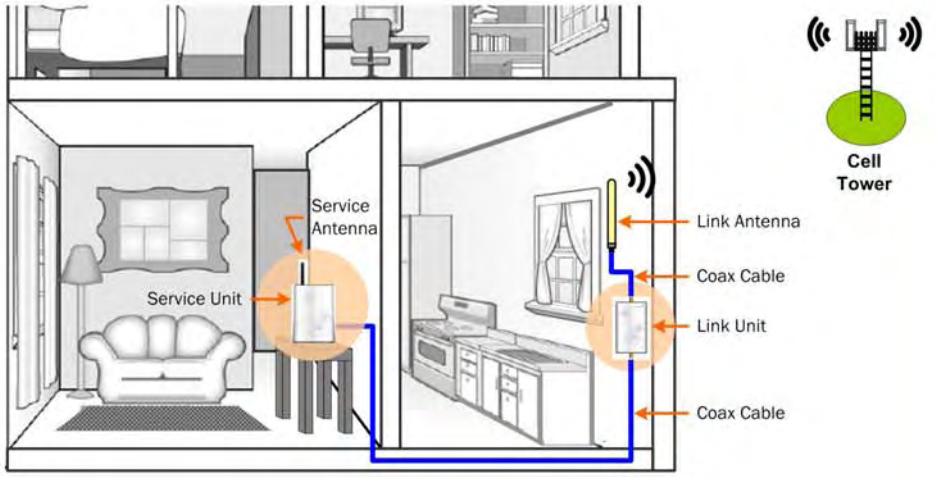
Warning : It is strongly convinced that isntaller should refer to guide about "How to cut core wire of RG-6 coax cable" page before connecting the cable to Link Antenna, Link Unit and Service Unit.



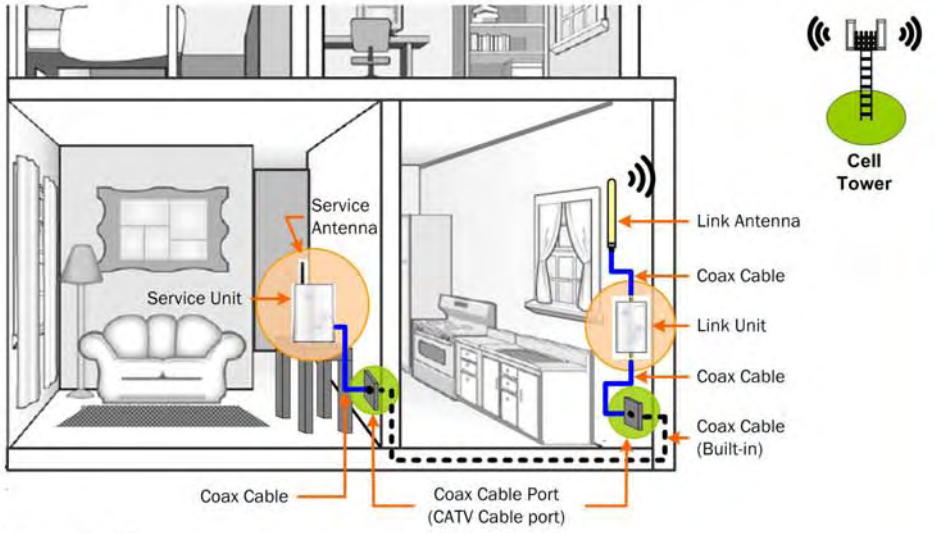
Easiest Set-Up :
Place the Link Antenna inside, by a window

Setting Up Your UHR-230

Setting Examples (Easiest)



Example 1)
Connect Link and Service Unit by using the coaxial cable.



Example 2)
Connect Link and Service Unit by using CATV terminal port on the wall

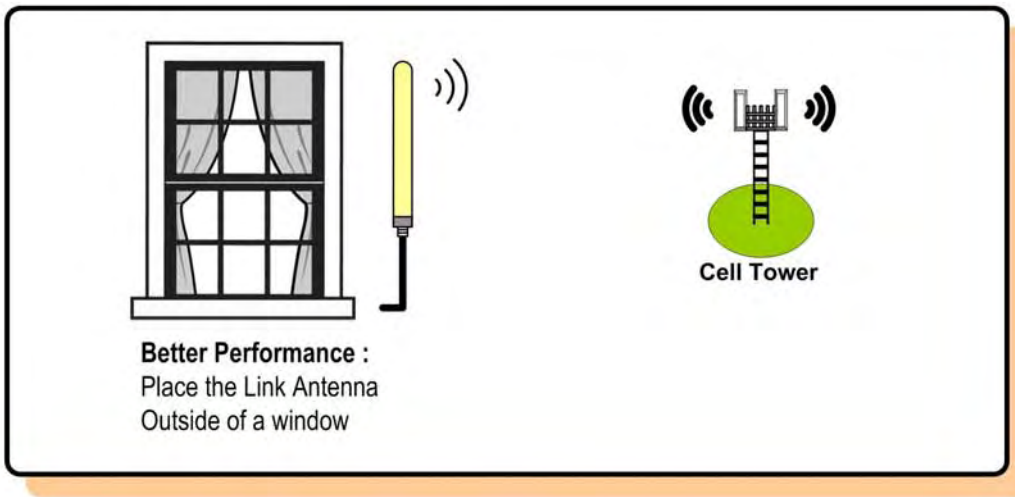
Setting Up Your UHR-230

2 Better Performance : Outside the window

- Locate a window where you get signal
- Mount the Link Antenna outside the window.
- Place the Link Unit in desired location.
  – 15 feet of separation between the Link Antenna and Link Unit is recommended.
- Place the Service Unit in desired location
  – where you want to create a Cell Zone (20 feet of vertical separation between the Service Unit and Link Antenna is recommended).
- Attach the coaxial cable to the Link Antenna.
- Run the coaxial cable from the Link Antenna through the window and to the Link Unit.
- From the other end, connect the coax cable it to the Service Unit.
- Attach the Service Unit Antenna to the Service Unit and position it vertically. (recommended)
- Connect the Power Supply to the Link/Service Unit and plug t into a power outlet.

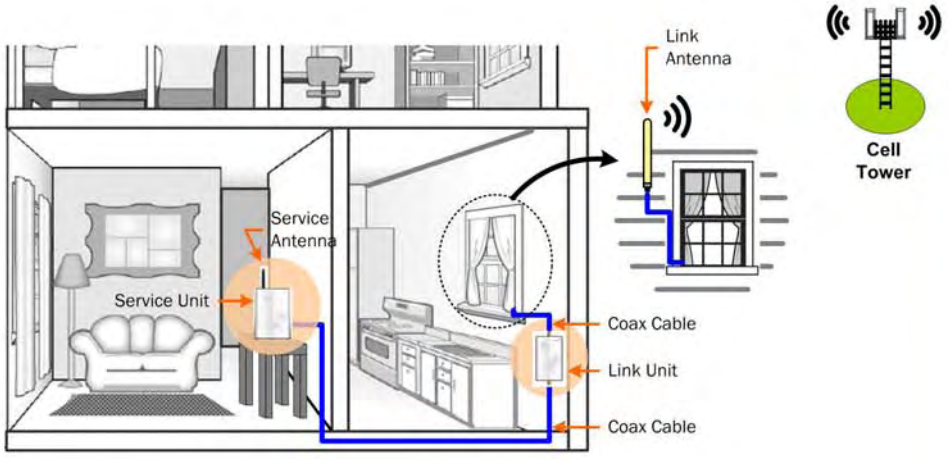
Note : If a Red Light appears, try further separating the Link Antenna and Service Unit or see the Troubleshooting.

Warning : It is strongly convinced that isntaller should refer to guide about "How to cut core wire of RG-6 coax cable" before connecting the cable to Link Antenna, Link Unit and Service Unit.

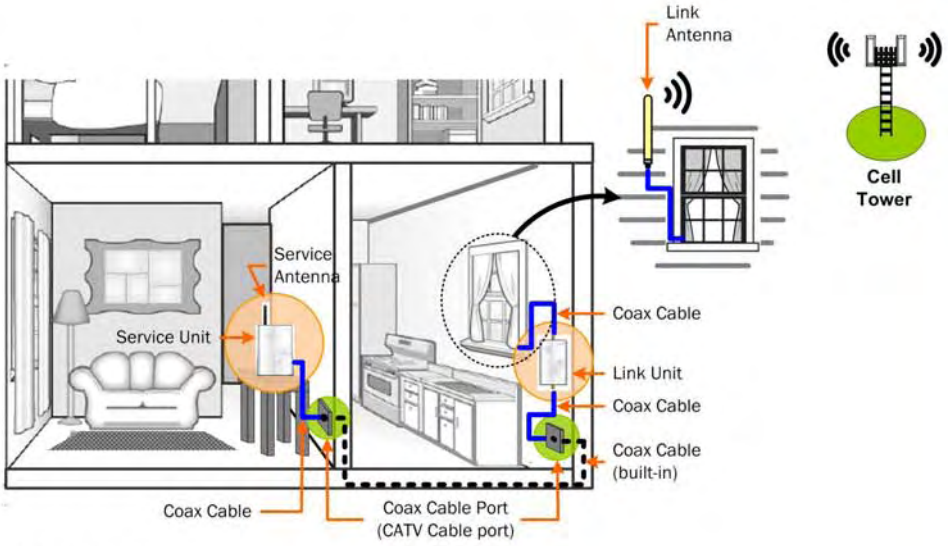


Setting Up Your UHR-230

Setting Examples (Better Performance)



Example 1)
Connect Link and Service Unit using the coaxial cable.



Example 2)
Connect Link and Service Unit using CATV terminal port on the wall

Setting Up Your UHR-230

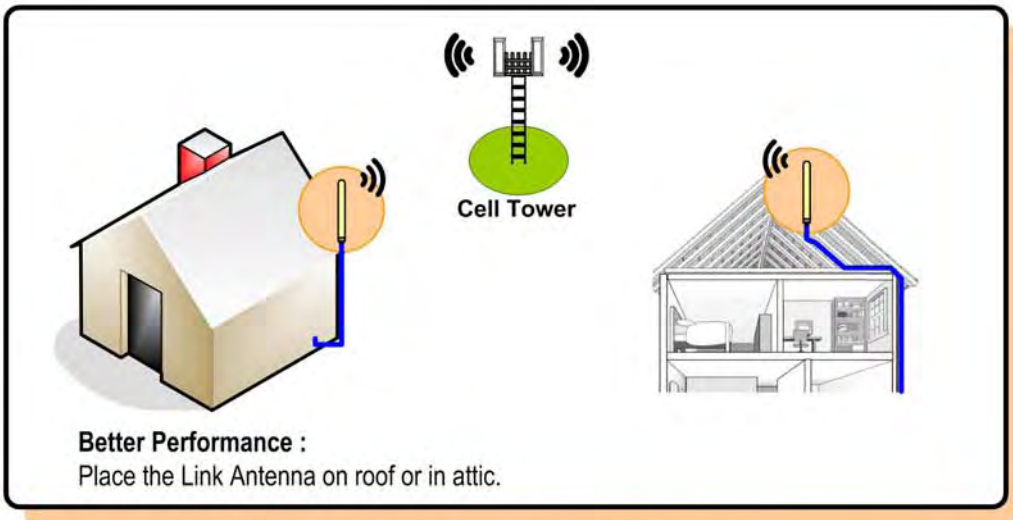
3 Best Performance : Attic/Outdoor placement

The following instructions are recommended for the best reception :

- Using your cell phone as a signal meter, confirm that either your attic or your roof will deliver optimal signal strength to the Link Antenna. Identify the best location for attachment of the mounting bracket – such as an attic cross or main beam.
- Secure the mounting bracket at the highest possible point and at least 3 feet away from metal objects such as pipes, metal siding, A/C unit etc.
- Position the mounting bracket such that the Link Antenna will be vertical and attach the Link Antenna
- Connect the RG-6 coaxial cable to the port of the Link Antenna.
- Run the coaxial cable along a descending pipe or through a wall that leads closest to the location of the Link Unit.
- From the other end, connect the coax cable it to the Service Unit.
- Connect the Service Antenna to the Service Unit and position it vertically. (recommended)
- Connect the Power Supply to the Link/Service Unit and plug t into a power outlet.

Note : If a Red Light appears, try further separating the Link Antenna and Service Unit or see the Troubleshooting.

Warning : It is strongly convinced that isntaller should refer to guide about "How to cut core wire of RG-6 coax cable" before connecting the cable to Link Antenna, Link Unit and Service Unit.

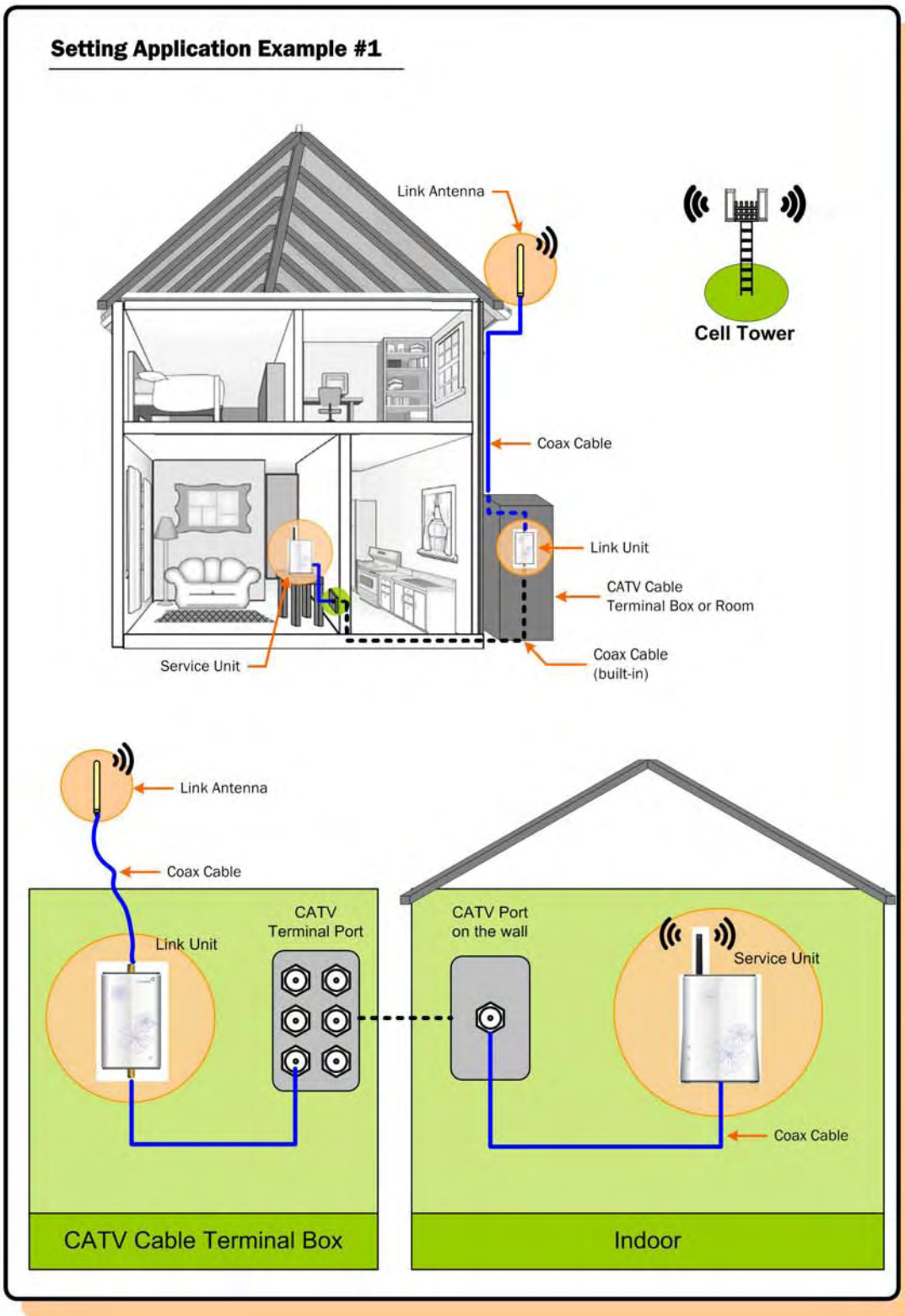


Better Performance :
Place the Link Antenna on roof or in attic.

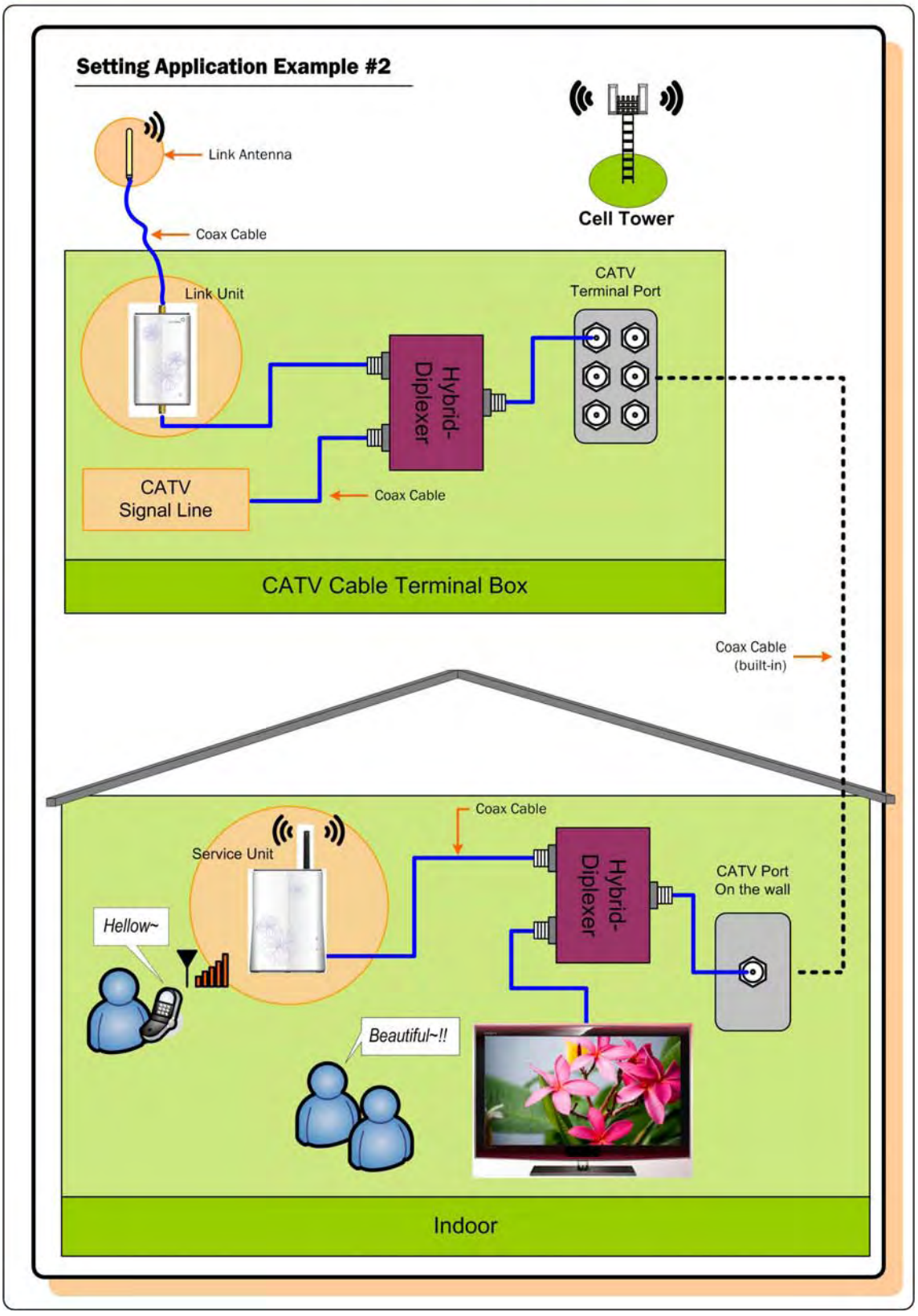
*Note : **More on Routing the Coaxial Cable Alongside an Attic Pipe***
Locate a pipe that descends the attic down to the desired location of the Link Unit. Tie a weight to a pull string and lower the weight down alongside the pipe. In the lower room, tie the pull-string onto one end of the cable. From the attic, gently pull up the string until the coaxial cable can be grasped. Connect the coaxial cable to the Link Antenna.

Setting Application Your UHR-230

Setting Application Example #1



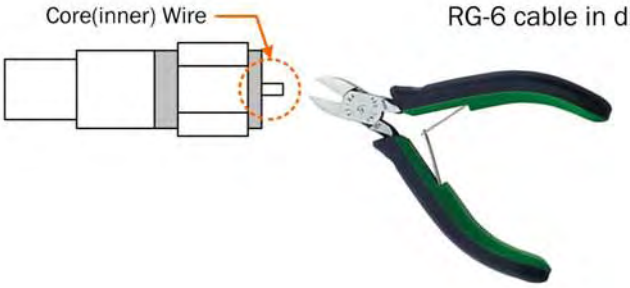
Setting Application Your UHR-230

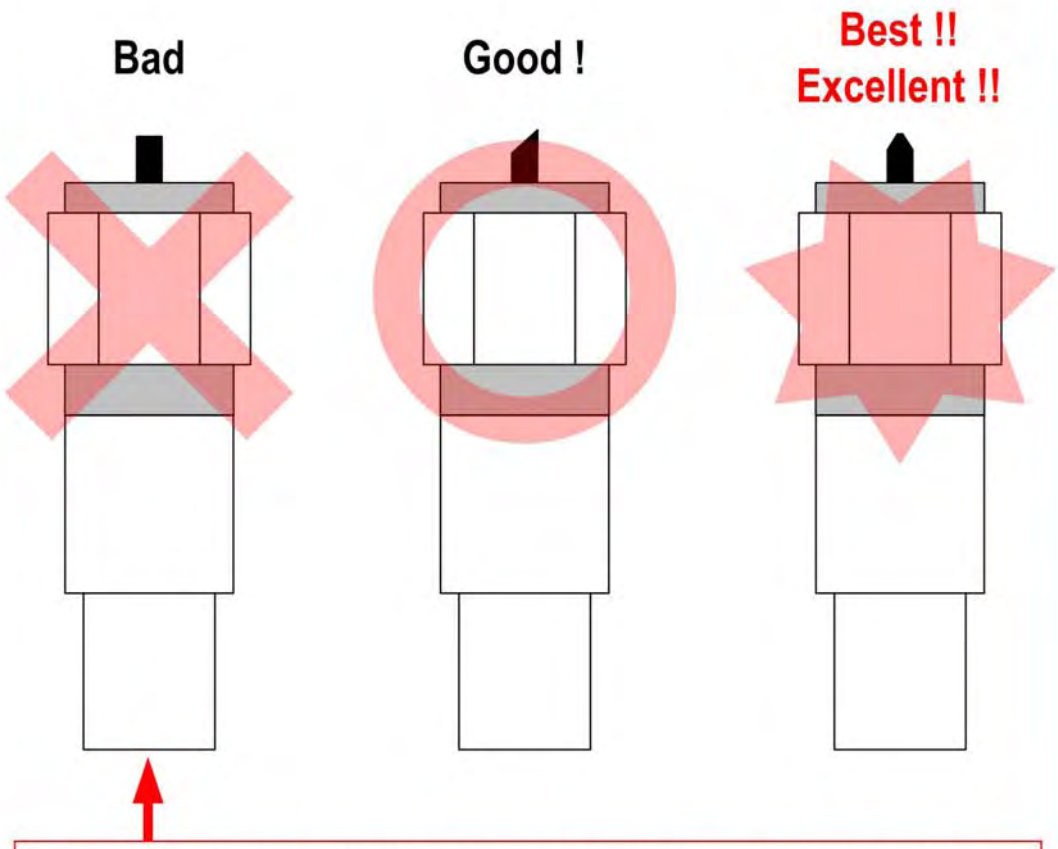


How to cut core wire of RG-6 coax cable

Connect the RG-6 Cable

Before connecting the RG-6 cable to Link Antenna, Link Unit and Service Unit, cutting the core-wire of RG-6 cable in diagonal way like as below.





Warning : If you connect the RG-6 coax cable in BAD cut way to the Service and Link Unit, the possibility that break the Service and Link Unit 's cable connector inner pin is so high.

Please Don 't connect Bad cut inner wire !!!!!!!!!!!!

Direction of Service Antenna

Direction of Service Antenna

Front View

Rear View

Confirm That Your UHR-230 is Working Properly

Perform the following steps to confirm that the unit is now working properly

- Unplug the Service Unit power cord.
- Turn on your cell phone and check the signal meter.
- Plug the power cord into the Service Unit.
- Hold your cell phone about 5 feet from the Service Unit and then turn it on. Wait up to 1 minute for the cell phone to register the signal coming from the Service Unit.
- If the signal meter shows improvement, your UHR-230 unit is working properly.

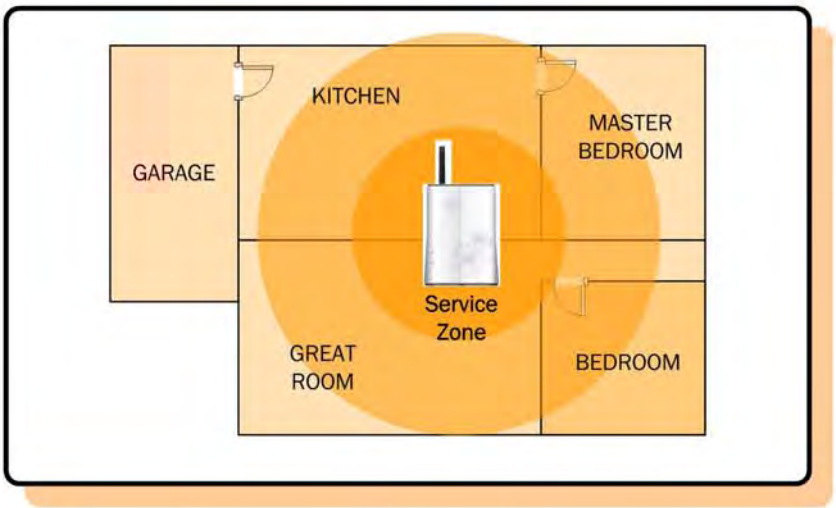
Note : Cell phone signal bars are approximate and vary from phone to phone. The number of bars can fluctuate widely, depending on the location of the phone, the position or angle of the phone, weather, etc. Most cell phone signal meters update every 6 to 10 seconds. An increase of only one bar typically indicates a 4x to 10x signal increase.

THE BEST INDICATOR OF SIGNAL STRENGTH IS THE ABILITY TO RELIABLY PLACE AND RECEIVE CALLS.

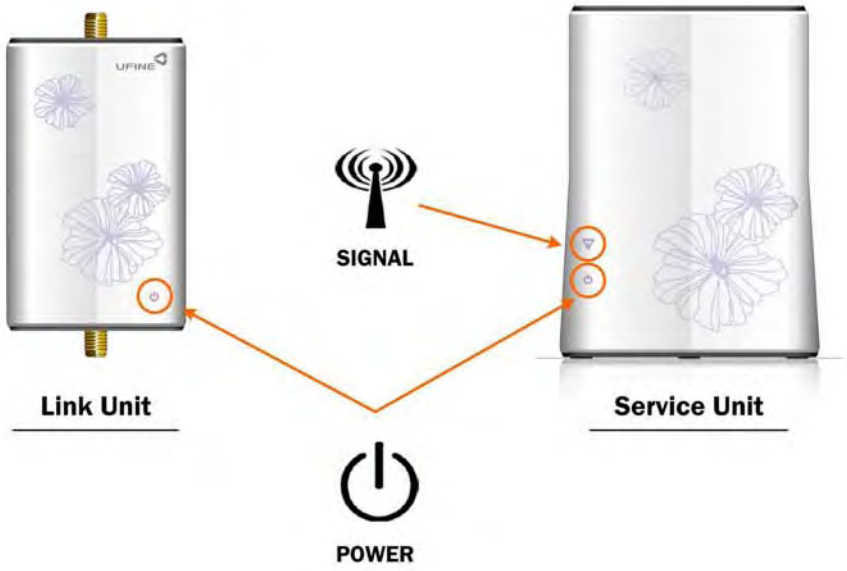
Improving Your Coverage Area

When your UHR-230 system is in place and fully connected, you should walk throughout the room and see that you are able to reliably place calls.
Remember, coverage varies based on outdoor signal level, building construction, and antenna palcement. Coverage in adjoining rooms (next to, above, or below) will be reduced due to walls or ceiling/floors.
Should you desire to improve coverage, you may :

- Move the Service Unit and/or adjust the angle of the Service Antenna.
- Move the Link Antenna to a Higher location in your attic or outside



Light Indicators



Power Light

The Power light indicates that Power Supply is connected the Link or Service Unit. Following initial power-up, the presence of a solid green Power light indicates that service voltage is normal status.

Signal Light

The Signal light indicates the condition of communication between a wireless device and its network. Follow initial power-up, the presence of a solid green Signal Light indicates under normal condition.

A red Signal light indicates that the signal received from a cell tower is too strong or distance between the Link Antenna and the Service Unit is insufficient. When the Signal light's status is red, the Service Unit's system shut down automatically to protect the system for 5 minutes. 5 minutes later, the system is designed to turned on again and recheck the signal condition automatically. If the received signal is still too strong, the system will be secondly shut down for 5 minutes in 10 seconds. This procedure in checking the level of the received signal will be repeated one more time. If the received signal is remained in the same strong level on third check, the Service Unit will completely shutdown with blinking the Red and Green until repowered.

Troubleshooting

Signal Light of Service Unit

Signal Light Color	Condition & Troubleshooting
 Green	- Normal Condition. - Normal condition indicates that a call is in progress and the system is improving coverage. The Signal Light may also flash with no call in progress indicating normal communication between the cell phone and the cell network.
 Red	- Abnormal Condition - Method 1 : *Signal received from a cell tower is too strong. Relocate Link Antenna to a different location to reduce the overpowering signal. To reduce overpowering signal, relocate the Link Antenna to an area that receives less signal, which may be an indoor or outdoor location or a lower elevation.* - Method 2 : *Insufficient distance between the Link Antenna and the Service Unit. Increase distance between Link Antenna and Service Unit to achieve maximum performance and coverage.* - If Light is Red, the Service Unit is shut down during 5 minutes automatically. - If received signal from a cell tower is too strong continuously, Service Unit's shut down status is maintained with blinking Green and Red after the shutdown procedure ; repeat system power turn on, re-check signal power, shut down in order 2 more times.
 Blink Green/Red	- Abnormal condition - A Red Signal light indicates that the signal received from a cell tower is too strong or distance between the Link Antenna and Service Unit is insufficient. When the Signal light's status is red, the system is shut down automatically to protect the system for 5 minutes. 5 minutes later, the system is designed to turned on again and recheck the signal condition automatically. If the received signal is still too strong, the system will be secondly shut down for 5 minutes in 10 seconds. This procedure in checking the level of the received signal will be repeated one more time. If the received signal is remained in the same strong level on third check, the Service Unit will completely shutdown with blinking the Red and Green until repowered. - Method : *Remove the Power Supply. Relocate Link Antenna to a different location to reduce the overpowering signal or Increase distance between Link Antenna and Service Unit to achieve maximum performance and coverage. Reconnect the Power Supply.*

Technical Specification

UHR-230 Specification

Frequency	GSM Up Link : 824 ~ 849 MHz / Down Link : 869 ~ 894 MHz
Networks	GSM
Total System Gain	GSM Up Link : 50 dB(Adaptive) / Down Link : 56 dB(Adaptive)
System Output Power (except Antenna)	GSM Up Link : 15dBm/2tone max / Down Link : 13dBm/2tone max
Antenna Gain	Link Antenna GSM 5dBi F-type Female Service Antenna 0dBi Mono type, F-type Male
Unit Size	Link Unit : 80 x 131 x26 mm Service Unit : 115 x 160 x43 mm
Power Supply	AC Power Input : 100-240VAC, 50/60Hz, 0.3A DC Power Output : 5VDC, 2A
Operating Conditions	Indoor use only 0℃ ~ 40℃
Interface Loss between Link Unit and Service Unit	5 ~ 15dB Coax Cable Length : GSM : 5dB (25meter[82feet]) / 15dB (77m[252feet])

Frequently Asked Qeustions

What can I expect my cell phone signal range and strength to be inside my home or office?

The closer you are to the Service Unit, the stronger the signal. This will vary with different conditions. Some of the conditions that will affect the improved coverage area are signal strength outdoors, the type of building materials in the home, the placement of the unit and the antenna's proximity to cellular towers.
Your expectations should be that your indoor coverage will be improved. You will be able to make calls where you couldn't before. The degree of improvement will depend upon many factors. The intent of UHR-230 are to brign outside coverage inside.

Will the UHR-230 units work with any wireless service?

No, the UHR-230 will work only within their respective frequency band.
UHR-230 frequency range is 824-894 MHz, Since many carriers now use both frequencies, we recommend UHR-230 to support both Cell, GSM frequency ranges simultaneously.

Where should I place my Service unit to get the best coverage?

You should place your Service unit where you need coverage the most. The Service unit is the component that amplifies the signal inside. The coverage is improved in a circular manner from the Service unit. The further you are away from the Service unit, the weaker the signal. The Service unit could be placed in the family room, the basement, an office, a bedroom, a home office or a any other centralized location.
Note : if you place the Link Antenna too close to the Service unit, the system will shut down. The Signal Light will solid Red or blink Green/Red. This is a normal condition for this scenario. It just means that you need to ensure that you have sufficient distance between the 2 antennas: otherwise, it will detect feedback or noise and automatically shut down. Lack of sufficient vertical separation is usually the cause.

Is a cellular phone signal booster the same as a wireless router; will it help my WiFi signal?

The UHR-230 unit will not help your WiFi service. This unit is designed to work with wireless GSM, CDMA phones and devices. The WiFi in your home or office operates on a different frequency.

Is your product available for international use?

Our devices currently operate in the in the 800 MHz and 2 GHz Frequencies. Many countries use the same frequencies and the current models are compatible with these networks. Chek the frequencies for a particular country for compatibility.

Frequently Asked Qeustions

Why isn't my cell phone indication more signal with more bars?

You will not observe that gain on your signal meter because of the signal spreading out from the antenna. If your phone has a dB meter, 3dB is a significant increase of 2x, 6dB is 4x, and 10dB is 10x. On a four bar phone, one "bar" equals about 10dB.
The increase in signal you will see depends upon :

- The level of signal at the Link antenna (outdoor)
- The care of the antenna placement (few feet away from metal, adequate antenna separation (15-20 feet vertical recommended)
- The signal already present inside related to building losses
- The distance of your phone/device from the Service Unit (signal spreads or diminishes rapidly with distance)

How do I know if I need a grounding kit and how do I install

Generally, we recommend the use of grounding kits in areas where the antenna is placed outdoors at a high point above ground.
The recommended method of grounding your antenna is by attaching the grounding wire to a cold water pipe or a ground rod.

Can I use my existing RG-59 cable to set up my unit?

Most likely, the cable that is currently in the wall is the type that has been commonly used in cable TV applications for the last 30 years. UHR-230 unit use RG-6 because it provides lower signal loss. RG-59 Coax has a higher signal loss and will significantly reduce the performance of your UHR-230. In all cases, the RG-6 coax must be a dedicated run between the antenna and the Link Unit, Links/Service Unit and coax port terminal on the wall.

There are usually several cell phones in use at one time in my home, will your product boost all of our signals simultaneously?

UHR-230 is designed to cover multiple signals simultaneously and will allow multiple users to operate at the same time.

RF exposure statement to keep at least 20cm from the antenna to human body.