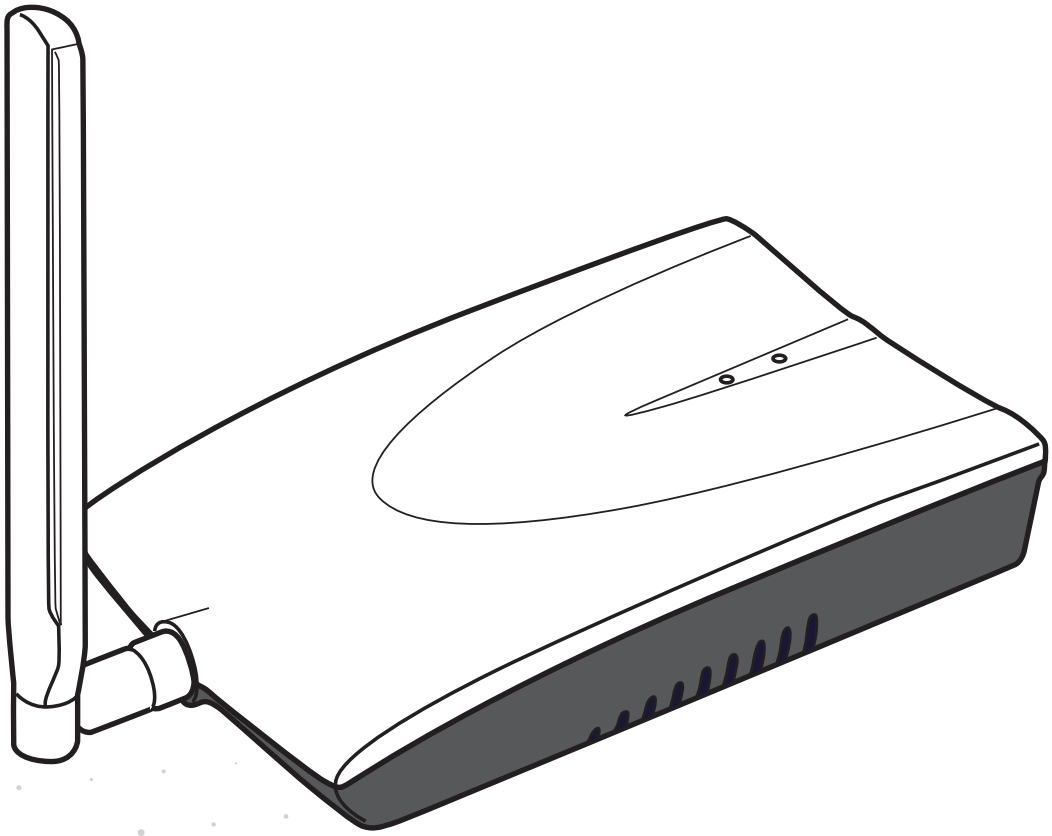
ClearCast

Romancell Technology Co., Ltd.

DUAL BAND

CELLPHONE SIGNAL BOOSTER



User Manual

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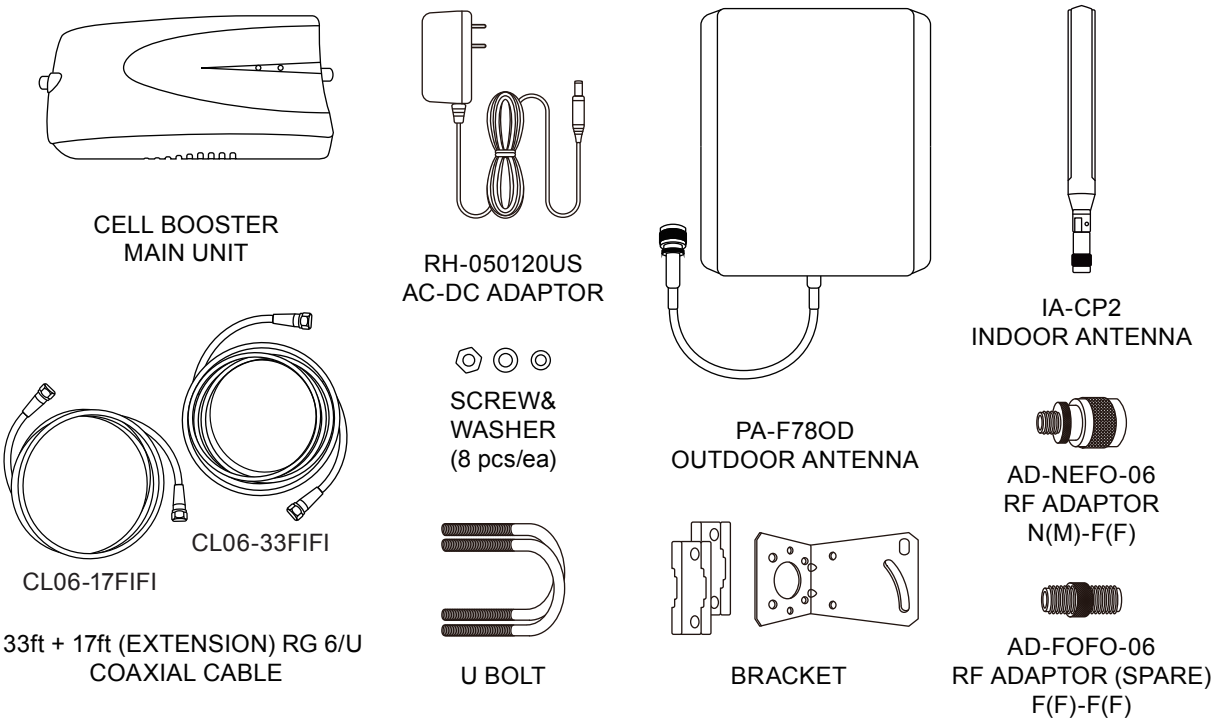
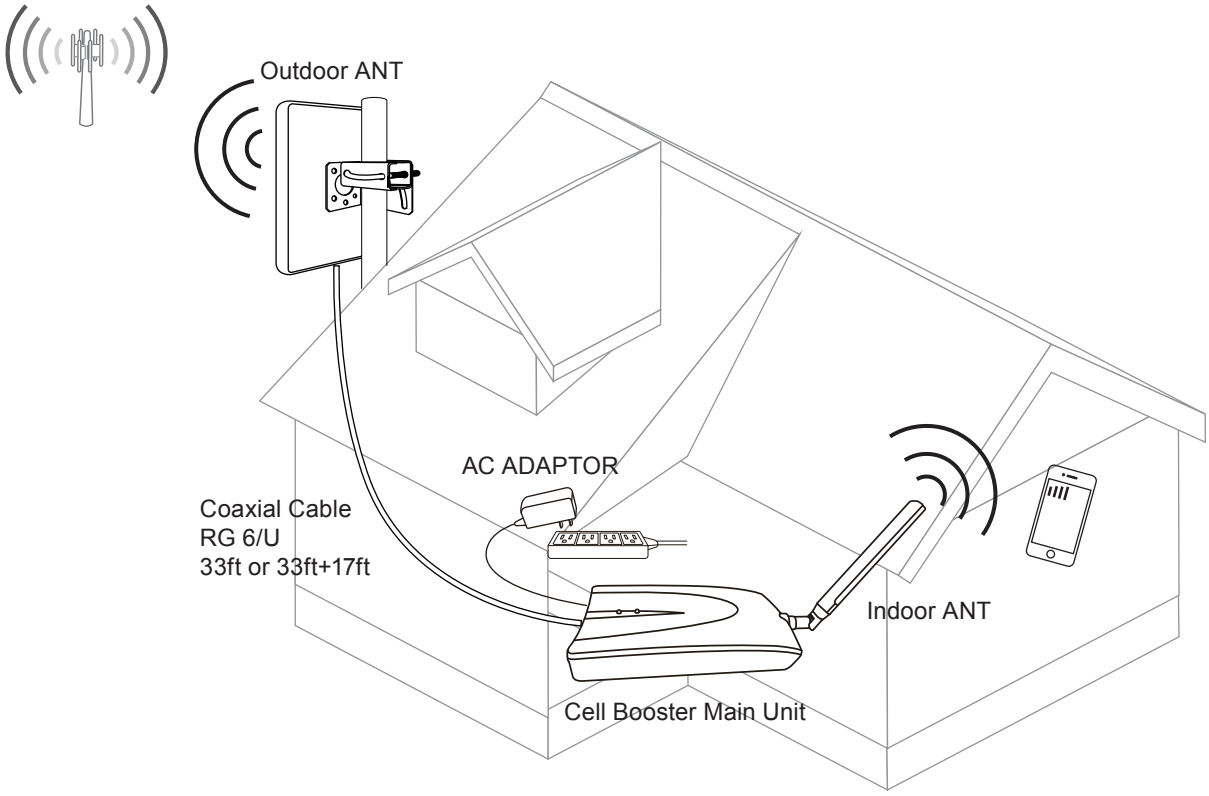
Cell Booster Kit Package

When the users get the cell booster DIY kit, please check the default content as the cell booster kit package shown.



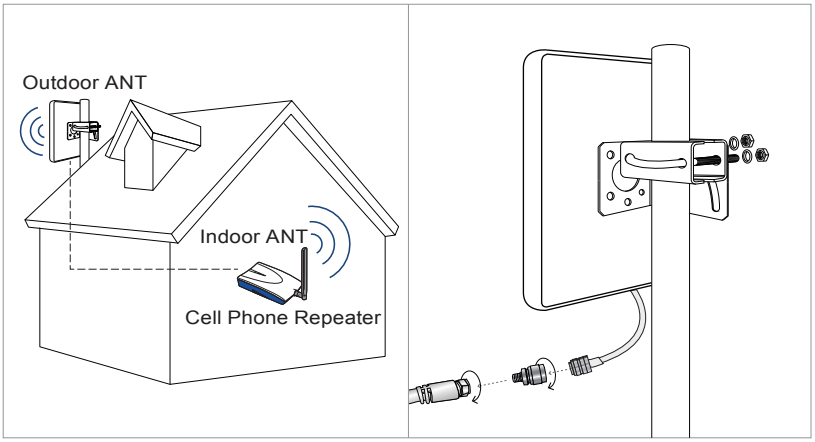
Cell Booster Connection Set Up



Pre-installed Procedures

Before the cell booster installation, the users must read ***P.2-9*** carefully for best reception and preventing some unwnted ststus.

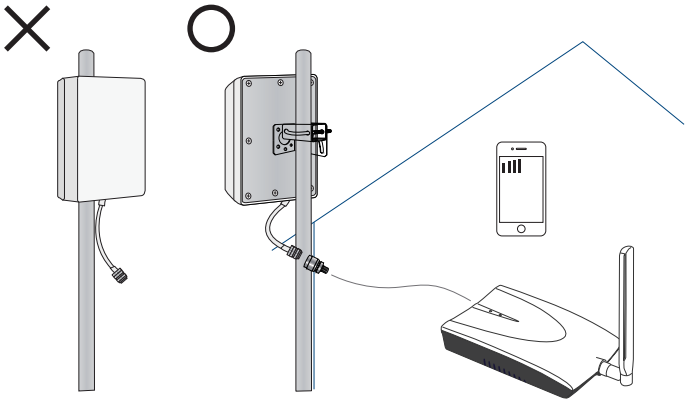
A Outdoor ANT Installation



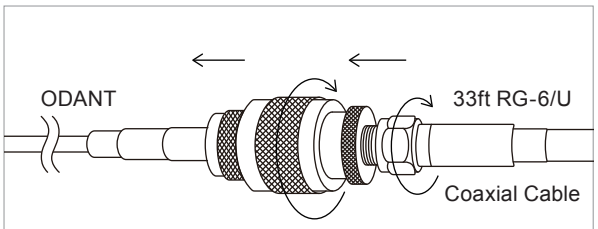
Leave the outdoor ANT slightly loose for best reception tuning.

(Detailed procedures to find the best reception of the outdoor ANT see ***P.4,5***)

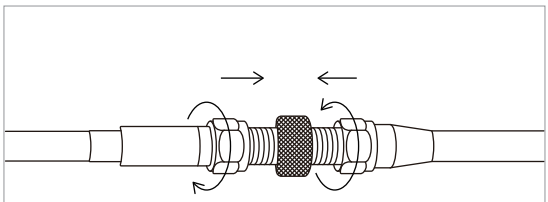
CAUTION: Outdoor ANT must not face toward the house at any time



B Coaxial Cable Installation



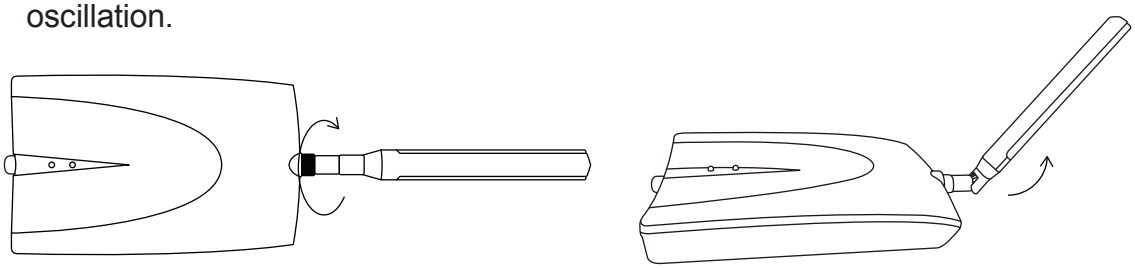
Outdoor ANT N connector + RF Adaptor AD-N1F0-06 + RG-6/U F(M) connector connected together **tightly**.



Long (33ft) RG-6/U coaxial extended with short (17ft) RG-6/U **(optional)** coaxial cable.

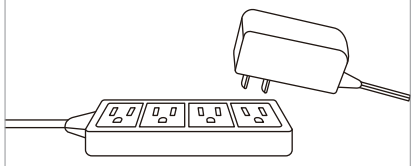
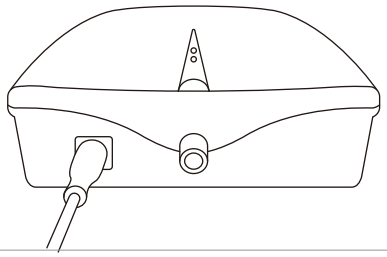
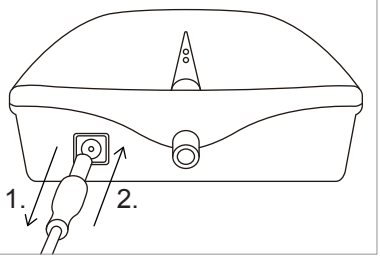
C Indoor ANT Installation

※ Leave the main unit away from the **window** and remain more than 20ft (6m) direct separation distance from the outdoor antenna to avoid the cell booster's loop oscillation.



D Power Adaptor

※ The cell booster power must be turned on **after** all the Outdoor/Indoor ANT has been installed. Ensure that all the connectors are connected **tightly** for testing/using.

Plug the AC-DC Adaptor in AC power. Socket/Strip	Power on the cell booster ►This action must be done after all connection setup has been completed!	Reset the power
		

※ Remove the DC plug from the DC jack of the cell booster, await 5 sec, re-plug to **Reset** the power while re-adjust/tune the outdor antenna direction/location, or debug the abnormal status **each time**.

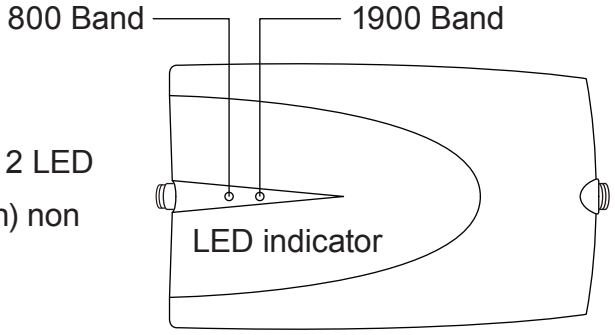
E Minimum Separation Distance Limitation

The minimum separation distance limitation (the distance between the outdoor ANT and the booster) should be **more** than 20ft (6m) to avoid the cell booster that may cause loop oscillation.

※ The booster will shut down the circuit and cause the LED to blink. The users **must** tune/adjust the outdoor ANT direction / location and / or lengthen the separation distance between the outdoor ANT and booster for loop oscillation prevention.

(See ***P.5*** for proper operation and ***P.9*** for troubleshooting. For best reception, more tuning/adjusting information see ***P.5-P.6***)

F LED Indication



● Normal Status

Normal status is achieved when these 2 LED light indicates **solid** (Red and/or Green) non blinking light:

800 Band	1900 Band	
○ (Red)	○ (Red)	► Basic reception, could be achieved better by tuning / adjusting the outdoor ANT direction / location.
○ (Red)	○ (Green)	► 1900 band reception is good , 800 Band can be tuned / adjusted for better reception.
○ (Green)	○ (Red)	► 800 band reception is good , 1900 Band can be tuned / adjusted for better reception.
○ (Green)	○ (Green)	► Both the 800 and 1900 Band are now in good reception.

● Abnormal Status

If any 1 or 2 LED blinking Red or Green must be avoided.

800 Band	1900 Band
☀ (Blinking , Green or Red)	○ (Solid Red or Green)
○ (Solid Red or Green)	☀ (Blinking , Green or Red)
☀ (Blinking , Green or Red)	☀ (Blinking , Green or Red)

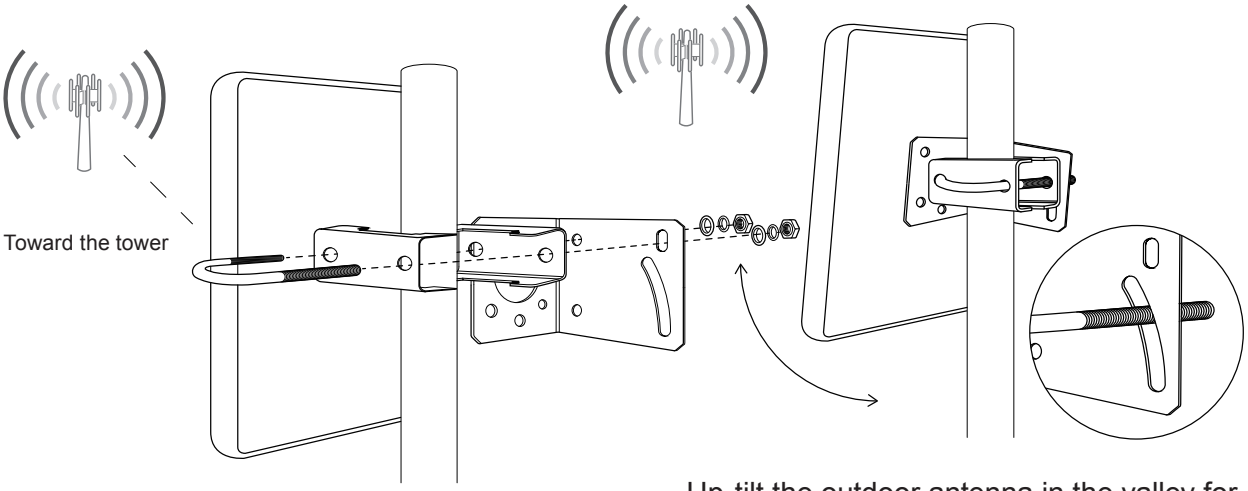
※ The users must turn off the power of cell booster , tune / adjust the outdoor ANT direction/location and / or the separation distance between the outdoor ANT and cell booster. Reset the power of cell booster again. Repeat this procedure and reset the power **each** tuning/adjusting cycle until the LED Indicates the normal status (solid Red or Green).

※ The users must use the optional short extension cable (17ft) for direct separation distance extension if the original long coaxial cable (33ft) causes any abnormal status.

Detailed Installation Guide

A Outdoor ANT Installation

Installation Procedures:



The users may use 1 or 2 brackets for fastening the mast in most installation.

Up-tilt the outdoor antenna in the valley for best reception, and down-tilt the outdoor antenna in higher altitude location.

● Procedure locating Best Reception of the Outdoor ANT

a. Best Way:

The users may use a smart cell phone in the test mode and read the dBm (it will be always negative value and closer to 0dBm is stronger) to find the best reception:

1. One person turn the Outdoor ANT (roof ANT) outside in any direction, stand behind the outdoor ANT (avoid blocking the reception), wait 30secs (for the smart phone to update its reception status), the person inside the house (stand in a fixed position and hold the cell phone in the same direction during the procedure of finding the best reception). Record the reception power level in dBm
2. The person outside must tune the outdoor ANT 15° away from the original direction per step and await 30 secs per tuning, let the person inside the house record the dBm value.
3. Repeat step 2 per tuning direction in 15° separated from the left to the right direction and record the dBm value of each tuning direction.
4. Find the direction of the highest dBm reading and fasten the outdoor ANT. Use a tape to seal the coaxial cable, RF Adaptor and the outdoor ANT's connector for waterproof. (see ***P.6***)

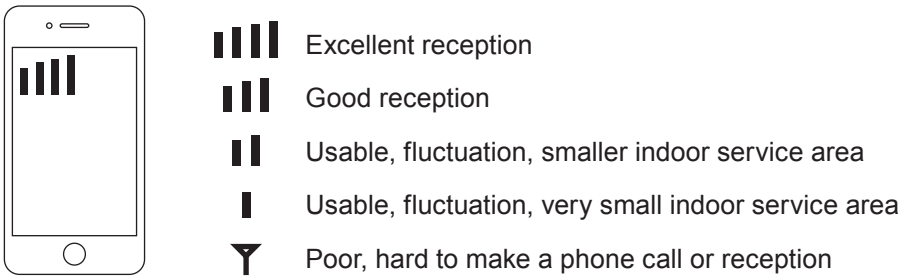
※ **Reference dBm reading versus communication quality:**

2G MODE	3G/4G MODE	
-78dBm ~ -40dBm	-90dBm ~ -60dBm	Excellent reception
-85dBm ~ -79dBm	-100dBm ~ -90dBm	Good reception
-92dBm ~ -86dBm	-110dBm ~ -100dBm	Fair reception
-99dBm ~ -93dBm	-120dBm ~ -110dBm	Usable, fluctuation, smaller indoor service area
-110dBm ~ -100dBm	-120dBm or less	Poor, hard to make a phone call or reception

b. Additional Way:

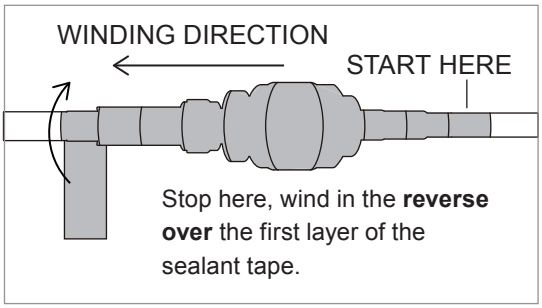
The users may use the bar indicators of the cell phone to find the best reception:
It is entirely the same procedure as the step 1,2,3,4 of “Best way” to find the direction of best reception as represented above . Choose the indicator with the most amount of bars for the best reception and fasten the outdoor ANT with sealing tape for water proofing. (see ***P.5***)

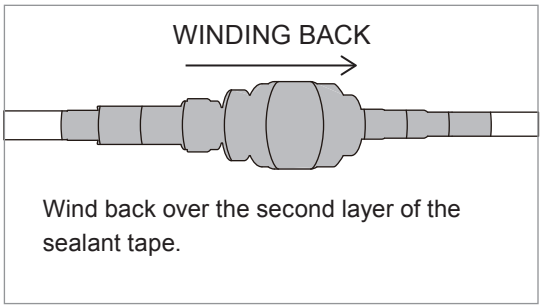
※ **Bar Reception versus communication quality:**



B Coaxial Cable Installation

The connection of the outdoor ANT with RF adaptor AD-N1F0-06 and the F(M) connector of the RG-6/U coaxial cable **must** be sealed by the sealant tape to prevent corrosion by rain water or melting snow.

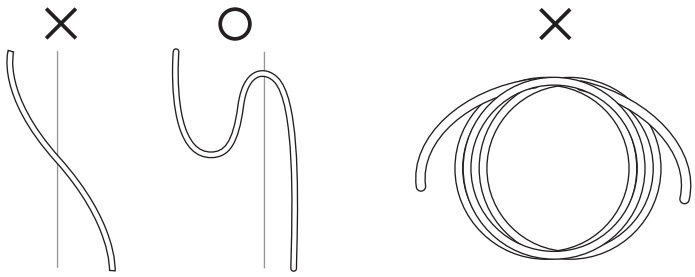




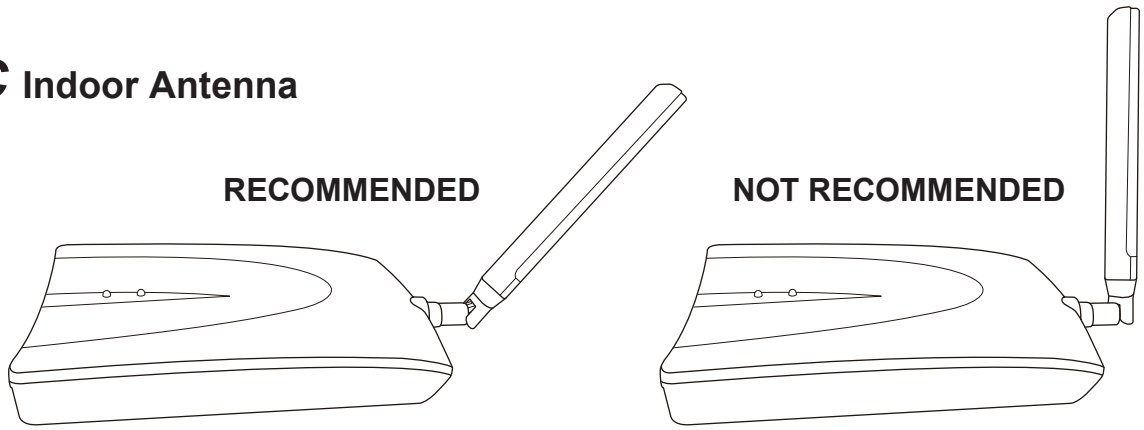
The users may use the long coaxial cable 33ft (10m) for installation, the 17ft (5m) coaxial cable is an extension cable for longer cable path application (optional).

※ Make a **U** shape path when the coaxial cable **enters** into the house to prevent the rain water from **dropping** along with the coaxial cable.

※ **Do not** allow the **coaxial cable** to **curl upon entry**, it may cause instability and the booster loop oscillation.



C Indoor Antenna



※ Remain 135° from the cell booster for better service coverage and system stability.

※ Leave the mainunit away from the **window** and remain more than 20ft (6m) direct seperation distance from the outdoor antenna to avoid the cell booster's loop oscillation.

D Minimum Separation Distance Limitation

- Allow more than **20ft (6m)** direct separation distance between the outdoor ANT and cell booster to avoid the loop oscillation to cause the booster to shut down with any 1 or 2 blinking LED.
- The users must **remove the DC plug** from the DC jack of the cell booster **immediately** and tune/adjust the outdoor ANT direction/location. You may need to lengthen the direct distance between the outdoor ANT and cell booster. Re-plug the DC plug to the DC Jack of the booster as **reset** , verify these 2 LED lit solid red and/or green.
- Verify that the 2 LED lights are lit (red or green), not blinking (LED solid lit is a **must requirement** for this booster in normal operation).
- If it is still blinking in any 1 or 2 LED , the users must remove the DC plug from the DC jack of the cell booster, repeat tuning/adjusting the ODANT for each cycle, then, reset the DC power of the cell booster **until the 2 LED lights** indicate solid red and/or green.
- The users may further tune/adjust the direction/location to find the best reception. (see ***P.4***)

E LED Indication

● At any condition, the 2 LED lit **remains solid Red or Green** which represents the cell booster in normal operation.

Solid R LED: The outdoor ANT captures insufficient outdoor cell tower signal level, smaller indoor service area. If far away for cell tower, it could be solid red only.

Solid G LED: Sufficient outdoor cell tower signal level was captured by the outdoor ANT, larger indoor service area **improving** the service quality both voice and mobile internet.

● If any 1 or 2 LED lights are still blinking , either red or green must be avoided:

R LED blinking: Loop oscillation shuts down the cell booster and no longer enhance the reception, the troubleshooting procedure see ***P.9***.

G LED blinking: The outdoor ANT captures excessive signal level, and shuts down the cell booster. Generally, indicates the house is near the cell tower. The users must tune/adjust the outdoor antenna direction/location away from the cell tower to prevent the excessive reception. (See Abnormal operation of troubleshooting, ***P.10***)
and 3rd Q&A of frequently asked questions, ***P.11***)

※ To tune / adjust the outdoor ANT direction / location to **allow** the 2 green lights to become solid which allows the best reception both voice and mobile Internet and larger indoor coverage. (Detailed tuning procedure see ***P.5***)

※ In fringe area, the cell booster may still be 1 or 2 solid RED LED even after after carefully tuning/adjusting the outdoor ANT, that is the users allocation is far away from the cell tower for the RED LED band.

⚠ **Anyway, operationl status in solid RED LED, the users must still tune/adjust the outdoor ANT direction/location to get a better reception. (Better service quality and larger indoor service coverage in the fringe area.) (see *P.5*)**

Troubleshooting

The users may **verify** the color of these 2 LED of the cell booster as an indication of the operational status. Users should follow the LED indication to solve the problem.

Normal operation: These 2 LED lit solid Red or Green, non blinking:

● 2 LED in solid RED but poor reception:

Tune / Adjust the outdoor ANT direction / location as shown in ***P.5*** to increase the incoming cell signal level which may improve both voice and mobile internet service coverage and quality.

※ If the location of the residential house in fringe area like far away from cell tower or mountain area, valley, it may cause poor reception after carefully tuning / adjusting the outdoor ANT.

● 2 LED in solid Red but no reception:

Check all the connection are well connected as below:

a. Outdoor ANT + RF Adaptor + RG-6/U coaxial connector

b. RG-6/U coaxial connector + outdoor ANT connector of cell booster Indoor ANT

c. Connectors cell booster + Indoor whip ANT

d. RG-6/U coaxial connector + RF Adaptor + RG-6/U coaxial connector if the 17ft optional extension cable connection is used.

※ The users should power off and on **again** (Reset the power, ***P.3***) the cell booster to ensure whether the new status is fine after any improvement procedure.

Abnormal operation: Any 1 or 2 LED blinking either Red or Green

● Blinking 1 or 2 RED LED: It is loop oscillation shut down. The users must turn off the DC power of the cell booster. Tune/adjust the outdoor ANT direction/location and / or extend the separation distance between the outdoor ANT and cell booster. Reset the DC power of the cell booster until the LED is in normal operation status.

● Blinking Green LED indicates the outdoor ANT is facing toward proximity of the cell tower which captures excessive signal level. The users need to tune / adjust the direction / location of the outdoor ANT away from proximity of the cell tower and use the wall blockage of the residential house to reduce the excessive cell signal level of the proximity of cell tower and reset the cell booster.

2 LED non lit:

● To verify the 110VAC power socket / strip first.

● If the AC power socket / strip is normally working, check the AC-DC Adaptor connection both AC or DC plug to ensure the power deliver to the cell booster.

● If the AC-DC Adaptor cannot deliver the DC power to the cell booster, consult your dealer for a new AC-DC Adaptor.

Frequently Asked Questions

Q: How will the weather affect to the cell phone indoor reception?

A: Sunny or cloudy day will not affect the indoor reception. Rainy, snowy, foggy day will reduce the indoor reception coverage, especially heavy rain, snow, fog may affect more. Also, the rain, snow, fog has more influence on PCS Band for its higher propagation loss than cellular band.

Q: Why the loop oscillation is the most **important** issue for a cell booster installation? How can I verify and prevent from it?

A: The loop oscillation not only causes the cell booster to no longer serves the user's link and **not enough** distance separation between the outdoor ANT and booster. The users may check the 2 LED on the booster as the status indication of loop oscillation. Any 1 or 2 of the RED lit is blinking indicates loop oscillation of the cell booster. Remove the DC-plug from the DC jack of booster immediately, and follow the improvement procedure shown in ***P.5 or 6*** until these 2 LED lit either solid Red or Green.

Q: If my house is nearby the other operator's cell tower and my cell operator's tower is far from my house. How can I install and prevent the excessive signal level coming from the nearby cell tower?

A: First, you should turn away the outdoor ANT direction from the nearby cell tower and choose another direction/location, also, by using the house wall as the blockage of the nearby cell tower.

Q: Can the cell booster serve multiple users simultaneously?

A: Yes. The booster is designed for the multi-users operation for it is linear amplification and controls the overall power as well as blocking the interference of the cell tower.

Q: Can the cell booster help Wi-Fi reception?

A: No. It cannot help the home Wi-Fi reception for they are different frequency band between the cell band and Wi-Fi band.

Q: Does this cell booster help 4G700 and AWS band?

A: No, the cell booster only helps 800 (cellular) and 1900 (PCS) band. All the mobile operators in 800 and 1900 band may be increased the reception inside the house by this booster.

Q: Is the cell booster helpful or harmful for human health?

A: It is **helpful** for human health by installing the cell booster. The cell booster makes the cell phone radiates lower RF power to cell tower than not using a cell booster inside the house. The lower RF power radiated from the cell phone is not only helpful for human health also extend the battery life span.

Q: Why do we use a panel ANT instead of an omni-directional ANT?

A: The panel ANT is a directional ANT which captures more cell signals from tower than the omni-directional ANT. That makes the panel ANT offers better service quality and larger indoor service area.

Safeguard Features

Anti – oscillation:

If the Outdoor ANT and Indoor ANT of the cell booster installation is not enough distance separation which may cause loop oscillation.

The cell booster will generate an unwanted interfered oscillation signal , the circuit will detect this signal and soon to shut down.

The shut down not only protect the cell booster away from damage , also, eliminate the interference to the tower.

AGC and power control / power down

To prevent from both the excessive UL and / or DL cell signal which may cause the interference and damage, The AGC circuit of both UL and DL CKT will control the excessive incoming signal level.

Note that the UL AGC circuit will power down (mute) the UL C.K.T instantaneously which caused from the short distance separation from the Indoor Antenna, it gets normally operation while the users remain a certain distance away from the Indoor ANT immediately.

And the DL AGC circuit shuts down the DC power caused from nearby/toward tower signal permanently until the users adjust / tune the outdoors's allocation / direction and re-set the DC power again for normally operation.

Noise – power limiting

The cell booster will shut down the UL and/or DL power output to avoid the interference of the cell tower which the cell booster is in condition:

- Loop oscillation
- The Outdoor ANT is toward/nearby the cell tower
- The users is very close to the Indoor ANT of the cell booster
- The ULCKT is in inactictivated mode (power down and awaiting next incoming call activted)

Variable Gain

The cell booster will reduce the both UL and DLCKT Gain and power output while nearby the cell tower automatically or nearby the indoor ANT for preventing from the interference to the cell tower.

Safety Issue Remind

⚠ To ensure the cell booster operating temperature range is in 59°~113°F(15~45°C)indoor environment.

⚠ Do not connect the booster directly with any cell phone/device, this may cause damage to the cell booster.

⚠ Remain at least 4ft of the cell phone/device from the booster at any time.

⚠ For RF safety , both outdoor and indoor ANT are not allowable and must be at least 8 inches (20cm) away from all personnel.

⚠ Changes or modification are not allowable and made without approval by ClearCast will avoid warranty.

⚠ Installation of the outdoor antenna must be under the protection area of a lightening rod, or the users can use a lightening arrestor on the outdoor antenna connector to enhance anti-lightening damage capability. However, ClearCast warranty does not cover lightening damage.

Notice: This device complies with the class B digital device pursuant to part 15 of FCC Rules under reasonable protection against harmful interference in the residential house installation.

This device may generate / radiate the interference signal which may cause harmful interference to radio communication if the users fall to follow the instruction manual procedure / step and install **improperly**.

If device does cause harmful interference to radio or TV reception , the users must turn off the power of cell booster and reset the power after the following one or more procedures:

- Tune / adjust the outdoor ANT direction / location.
- Increase separation distance between outdoor ANT and the cell booster.
- Consult your dealer for assistance.
- Consult the CATV / SATV / TV / Ham radio expert for assistance.

Default / Authorized Accessories List of cell Booster Kit

Item Name	Model No.	Quantsties
Outdoor Antenna	PA-F78OD	1 set (including screws bracket)
Indoor Antenna	IA-CP2	1pc
33ft RG-6/U coaxial cable	CL06-33F1F1	1pc
17ft RG-6/U extension coaxial cable	CL06-17F1F1	1pc
AC-DC Adaptor	RH-050120US	1pc

Note:

⚠ Use only the AC-DC Adaptor in the cell booster kit package. A non ClearCast AC-DC Adaptor may damage the cell booster.

⚠ Use only the Outdoor and Indoor ANT in the cell booster kit package. A non ClearCast Outdoor / Indoor ANT may cause extra problems.

⚠ Use only the coaxial cable and / or Extensional coaxial cable in the cell booster kit package. A non ClearCast coaxial cable may cause problems.

This is a CONSUMER Device

BEFORE USE, you **MUST REGISTER THIS DEVICE** with your wireless provider and have your provider's consent. Most wireless providers 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.

You **MUST** operate this device with approved antennas and cables as specified by the manufacturer. Antennas **MUST** be installed at least 20cm(8inches)from any person.

You **MUST** cease operating this device immediately if requested by the **FCC** 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 for in-building use.

INFORMATION ON REGISTERING YOUR CELL BOOSTER WITH YOUR WIRELESS PROVIDER:

- **FCC contact information: www.fcc.gov/signal-boosters/registration.**
- Sprint Nextel will allow consumers to register their signal boosters by calling their toll-free number. They have already trained their calling center and have designated

an engineer to handle inquiries. They may eventually allow consumers to register on their website but they want to gauge how the process works via phone first.

- **T-Mobile online registration link:**
  www.T-Mobile.com/BoosterRegistration
  https://saqat.t-mobile.com/sites/SignalBooster#
- **Verizon's online registration link:**
  http://www.verizonwireless.com/wcms/consumer/register-signal-booster.html
- AT&T will allow online registration and will inform OET Lab with the weblink when it is ready.
- **U.S.Cellular:**
  http://www.uscellular.com /uscellular/support/fcc-booster-registration.jsp

Specifications

ID NO.	FCC ID: 2AHY2SCP5560
Model NO.	SCP5560
Cellphone Band	Cellular (800MHz) and PCS (1900MHz)
Gain	58dB (800MHz), 55dB (1900MHz)
UL Power	20dBm (800MHz), 20dBm (1900MHz)
DL Power	2.0dBm (800MHz), 2.0dBm (1900MHz)
Oscillation shutdown timing	≦0.3sec (UL), ≦1.0sec (DL)
Noise figure	≦6.0dB
Power supply	100~220 VAC input, 5.0v/1.2A output
Power consumption	DC: 5.0V 0.5~0.8A
Outdoor antenna connector	F (F), 75 Ohm
Indoor antenna connector	TNC (F), 50 Ohm
Size dimension	1.7 x 4.5 x 7.6 in (H*W*D)
weight	1.55Lb (0.7Kg) (approx.)
Operation temperature	59°F~113°F (+15°C~+45°C)

Antenna and cable specification

Item	Cellular Band	PCS Band
Outdoor Antenna(dBi)	6.80	7.50
Outdoor Cable(dB)	2.98	4.67
Indoor Antenna(dBi)	2.14	2.14
Indoor Cable*(dB)	0	0

Note *: Indoor antenna was directly connected to the booster