SDRC-17 User Manual

(Version 0.1)

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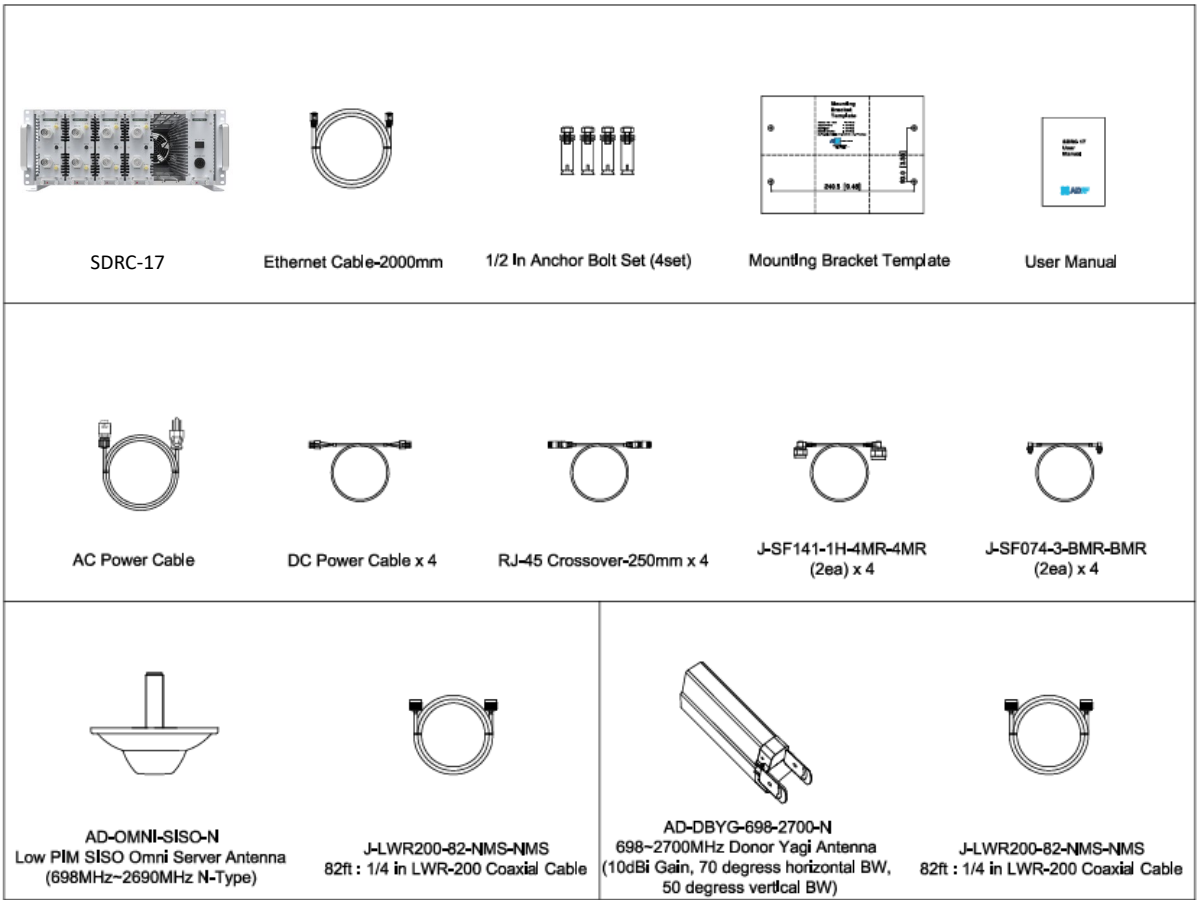
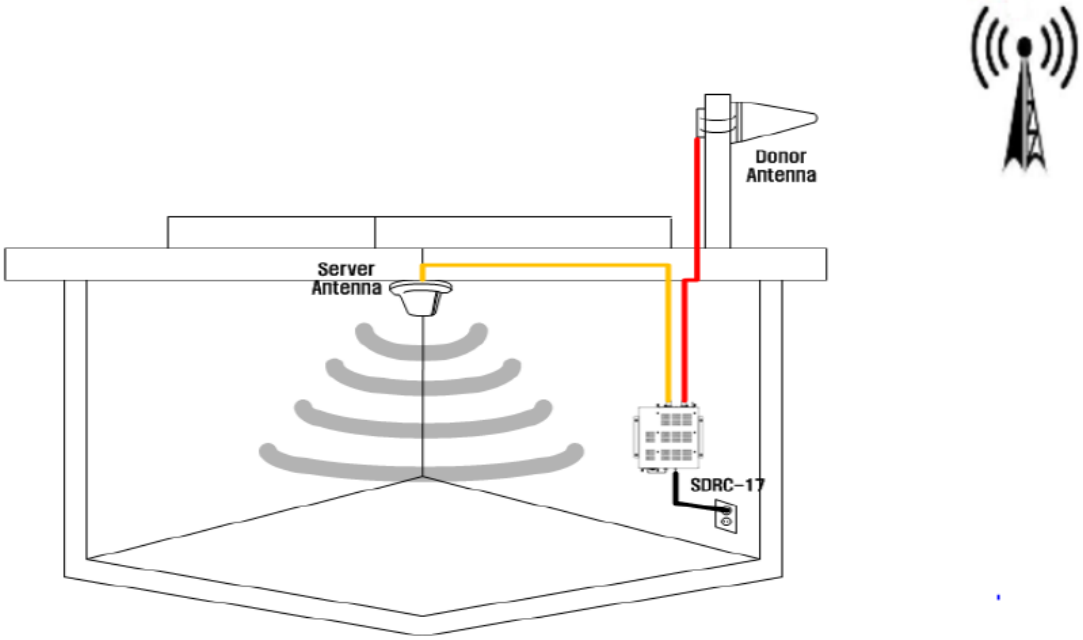
1. INTRODUCTION

SDRC-17 has been designed to improve and extend cellular coverage inside the buildings. It amplifies signals from the nearest base station and re-transmits them at higher power level and provides service at 700MHz, Cellular, PCS, AWS-1 band frequencies without any additional setup or configuration.

2. Package contents



3. Application Example



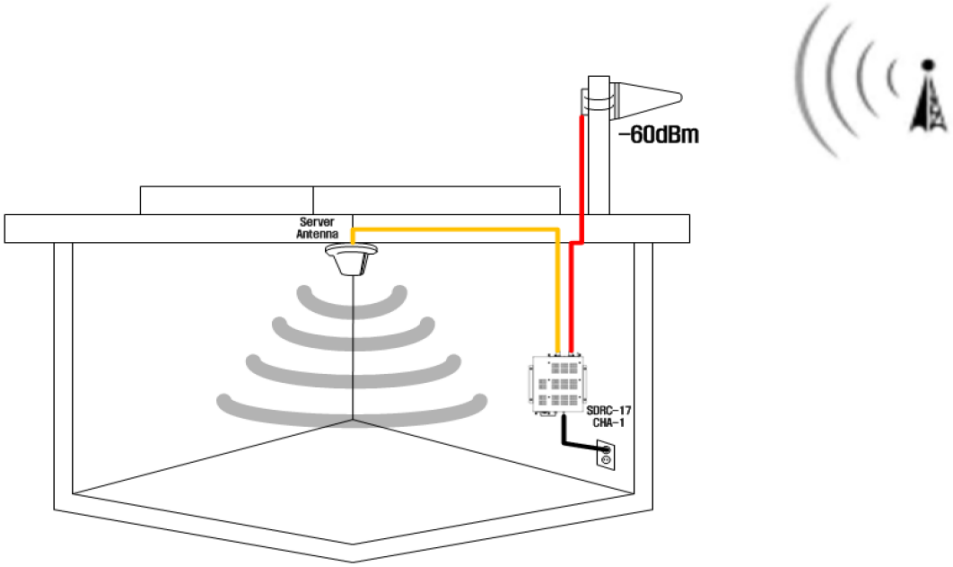
Donor Antenna Installation

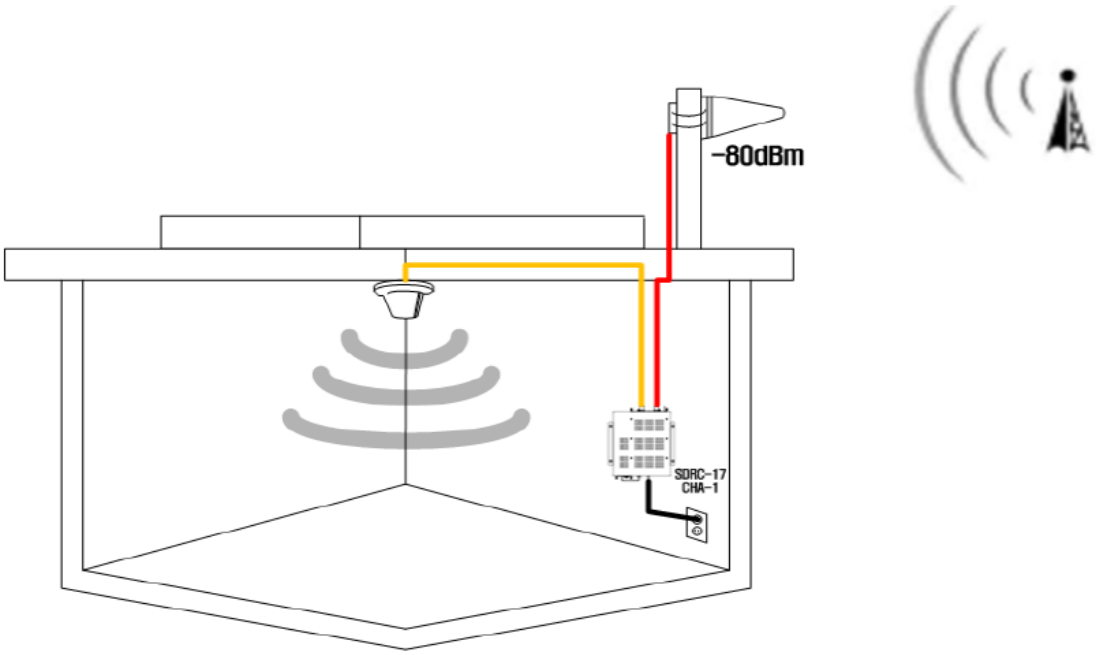
<Installation Guide>

Step 1. Find the Strongest Signal

- Using an iPhone (Dial *3001#12345#*, then press Call)
- Using an Android (Download the “Network Signal info” from the Google Play store)

[Note] The stronger the signal you receive from the base station, the better coverage you will have inside your building



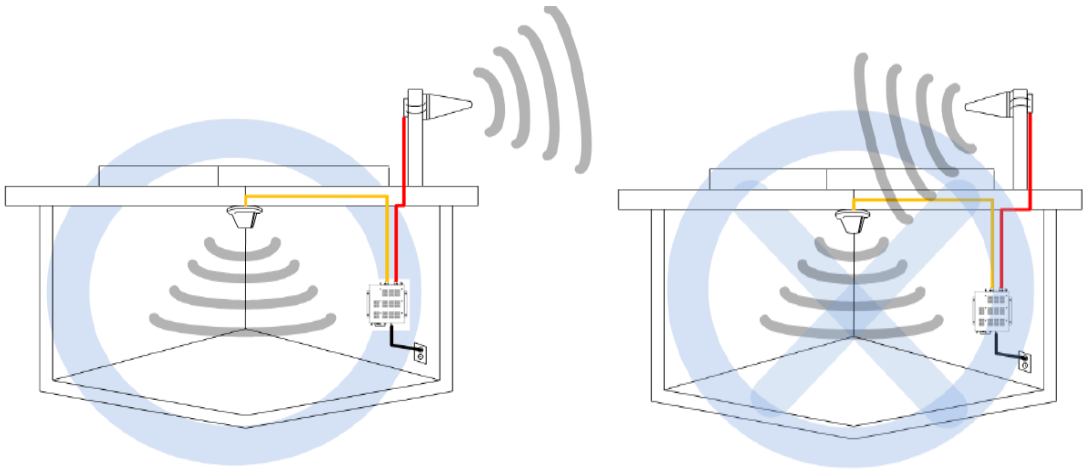


Coverage changes depending on input

Step 2. Easy Outside Antenna Installation

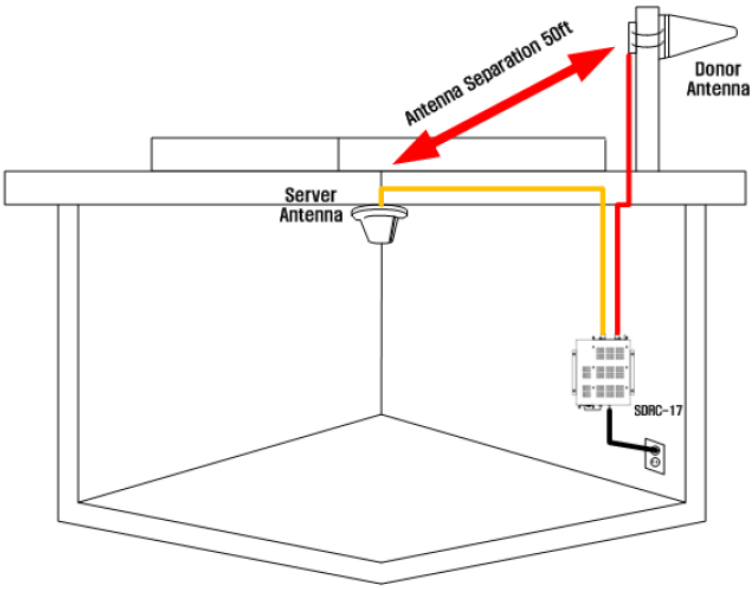
Yagi Antenna

The donor antenna must be mounted outside of the building pointing to the strongest cell tower. Mount the donor antenna as high as possible facing towards the desired location of the cell tower and facing the opposite direction of the expected coverage area inside of the building as shown in Figure 4-3 below



Correct Donor/Server Antenna Position

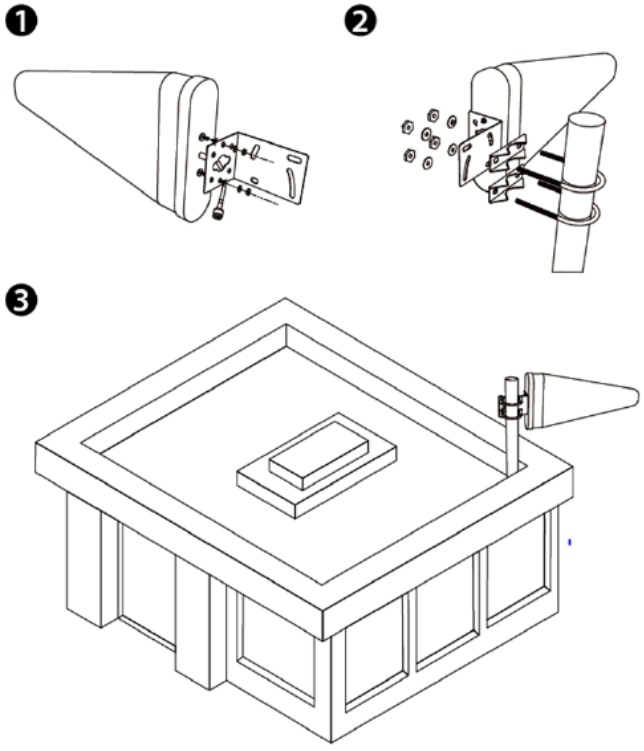
For the best performance, a minimum of 50 ft. distance between donor antenna and server antenna is recommended. Maximizing the isolation between the donor and server antenna is crucial to the RF performance of the system. Higher isolation allows for higher gains on the system which allows for higher output power which translates to a larger coverage area. If a system lacks isolation between the donor and server antenna, then this could lead to oscillation in the system which is a continuous feedback loop of the signal which can impact the performance of the system and also damage the equipment. When placing the donor antenna, obstructions such as concrete walls or thick materials can help increase the isolation between the donor and server antenna.



Donor / Server Antenna Separation

Step 3. Donor Antenna Installation

Install the donor antenna in the location to receive the strongest signal according to the instructions of Step 2. Make sure the donor antenna is installed facing toward the cell tower



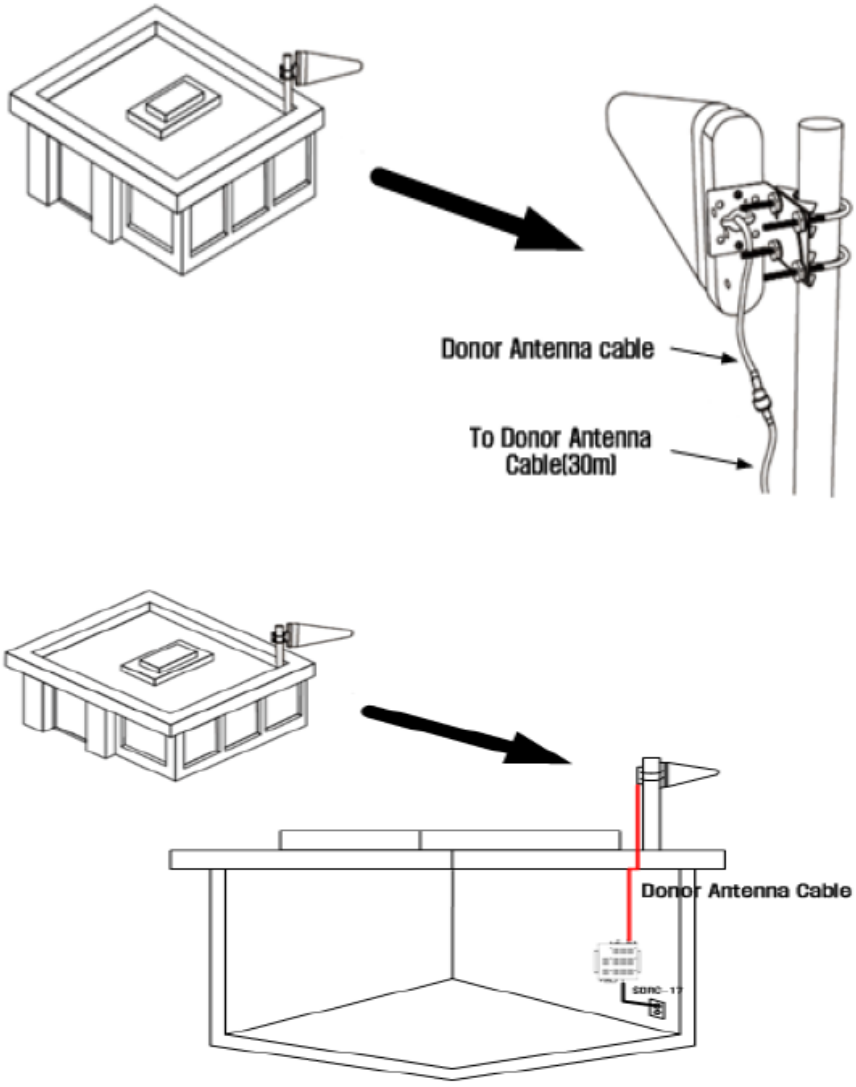
Step 4. Run the Donor Antenna cable

When mounting the donor antenna to the outside wall of your building, the easiest way is to run the cable on the outside of the wall and attach it to the exterior of your house or building.

Then drill a hole through the wall which will allow the cable to appear on the inside of the building. Avoid any potential harm or damage; make sure that there are no electrical outlets, cables, or electrical wiring in the wall before drilling.

Note: TV cables already being run for other purposes cannot be shared with the cell booster during installation.

After drilling the required hole, run the cable through and seal it. In some instances, it may be possible to run the cable up into the fascia of the attic overhang. In this circumstance, the cable will be accessible in the attic further routing.

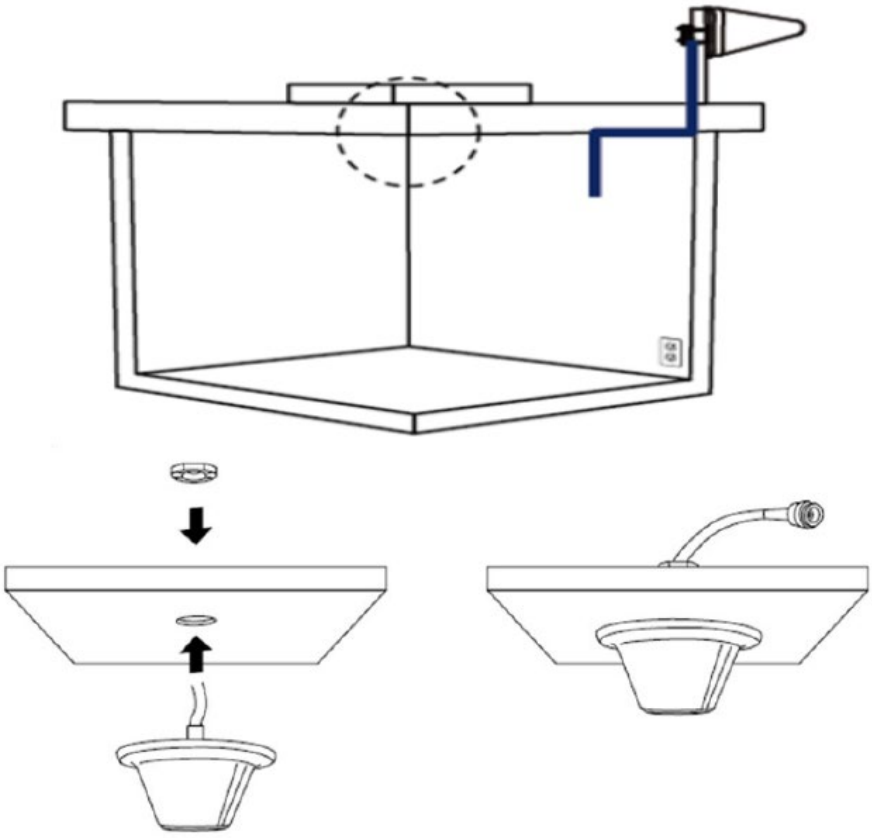


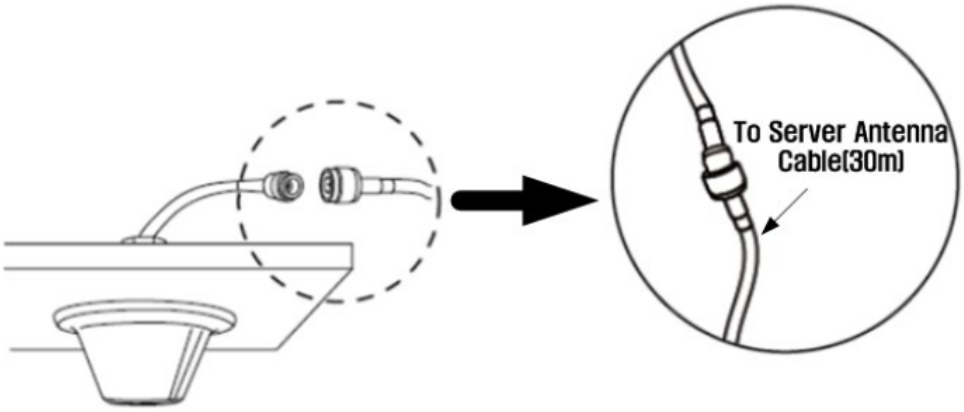
Donor Cable Installation

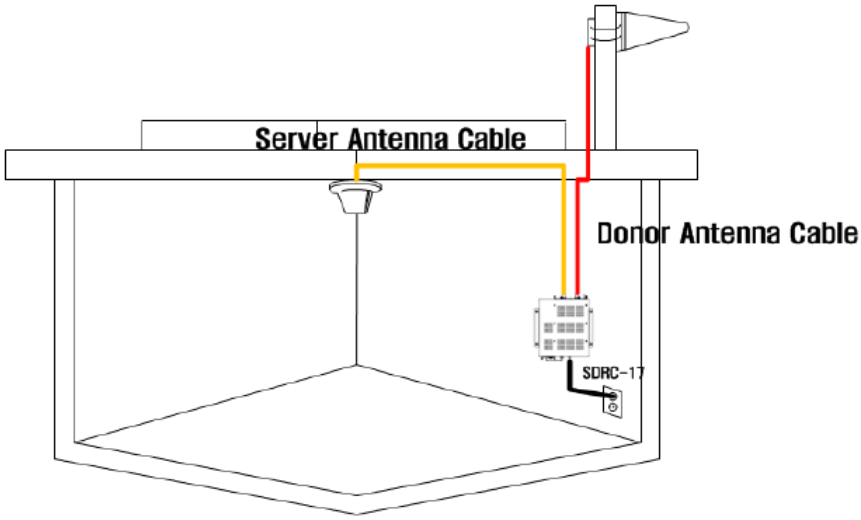
Step 5. Easy Server Antenna Installation

Server Antenna (Omni)

- Select a location to install the server antenna.
- Drill a hole in the ceiling where the server antenna will be installed.
- Disassemble the nut assembled with the server antenna.
- Drill a hole and insert the server antenna into the ceiling texture as shown above
- Secure the antenna body with the nut.
- Connect the server antenna cable to the server antenna.
- Connect the cable connected to the server antenna to the SDRC-17 server port.



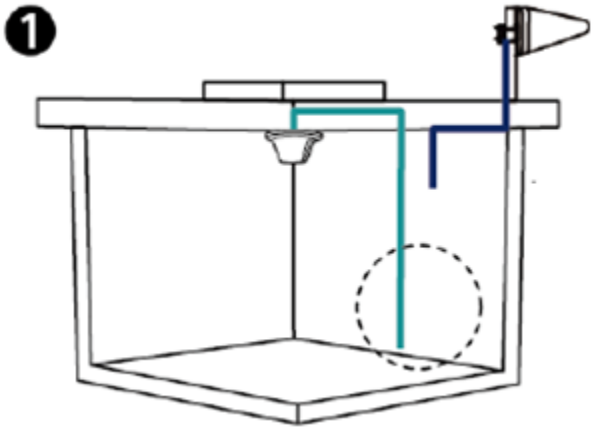

To Server Antenna
Cable(30m)


Server Antenna Cable
Donor Antenna Cable
SDRC-17

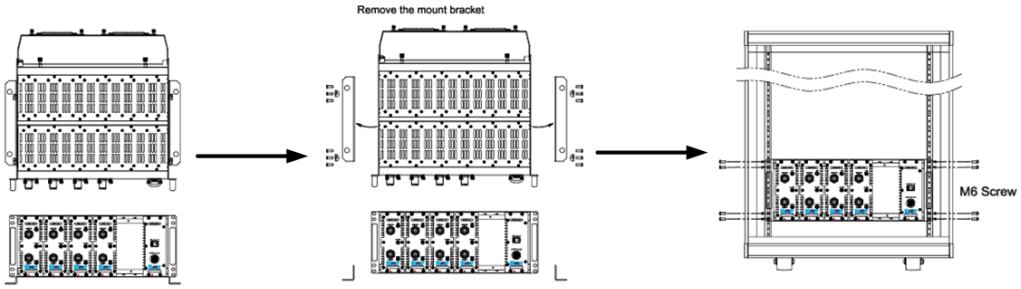
Step 6. Easy Rack Mounted Installation

Choose a location for the signal booster, preferably away from excessive heat, direct sunlight, moisture and is free from high temperatures. Do not place the signal booster in an air-tight enclosure. Attic installations may expose the booster to high heat.

Note: Please assemble only the screws according to the following procedure.

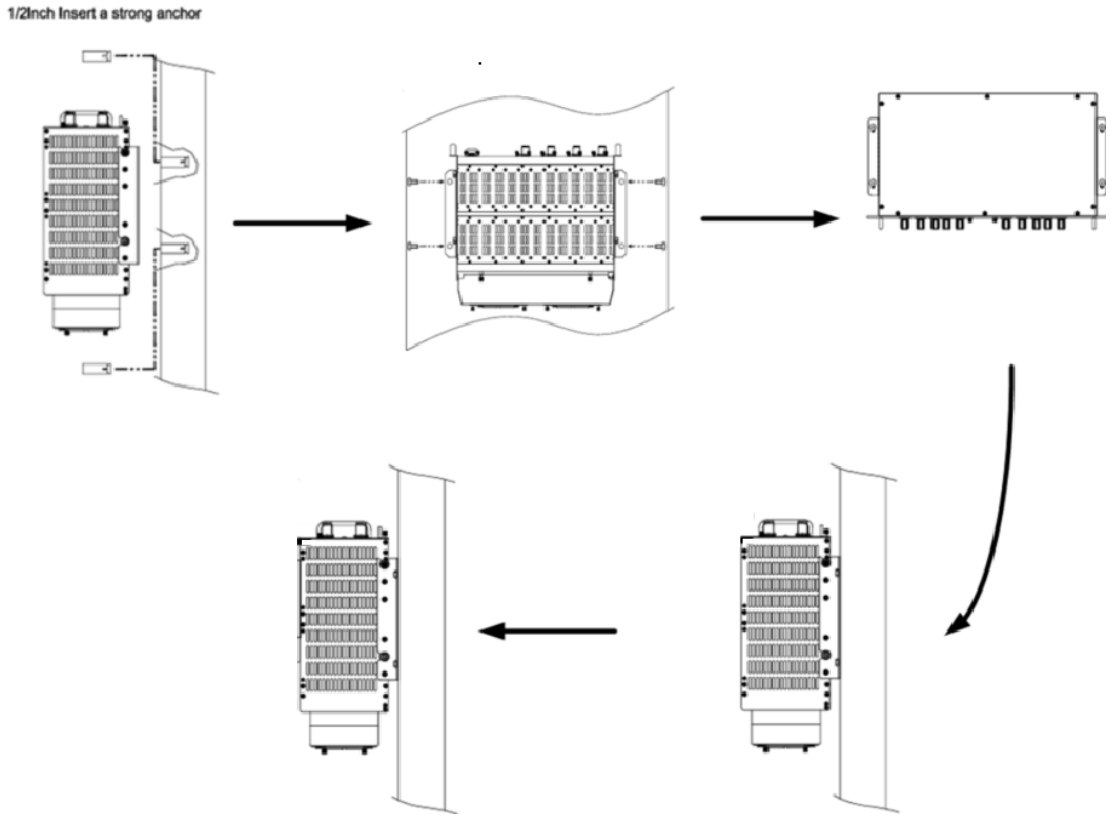


- **SDRC-17 Rack Mounting**



Step 7. Easy Wall Mounted Installation

Choose a location for the signal booster, preferably away from excessive heat, direct sunlight, moisture and is free from high temperatures. Do not place the signal booster in an air-tight enclosure. Attic installations may expose the booster to high heat.



4. Troubleshooting

In case of abnormal operation, technician should diagnose abnormality via remote access or directly connecting to repeater using Ethernet cable. If technician is required to conduct repairs due to major alarm, repeater should first be powered off, and then technician should prepare the proper measurement equipment before trying to fix the problem. In most cases of major repairs, ADRF will simply replace the unit and conduct repairs at the appropriate facility.

1) Check LED status at rear of module
   - Green LED on: Normal operation with maximum allowable gain.
   - Red LED on: Shutdown by oscillation condition or over output.

2) Check external and internal connectors to ensure that all connections are tightly secure.

3) If user thinks there is a serious problem, call after sales team for over-the-phone technical support. Tel: 818-840-8131

5. Functions

ALC (Auto Level Control)

ALC maintains limit of the output power in order to protect bad influence to the Base Station.

AGC (Auto Gain Control)

The Signal Booster checks isolation between inside and outside antennas once a day.
AGC sets up downlink and uplink gain value automatically depending on the input power level.

ASD (Auto Shutdown)

There are two cases when ASD works.

1) Outside antenna and Inside antenna are not isolated enough from each other.
So in order to protect the Signal Booster from damage, it will automatically shutdown at this frequency.

2) Uplink Signal coming from the outside antenna to Base Station is too strong and may cause troubles to carriers network, so the Signal Booster will shutdown at this frequency.

6. Specification

- SDRC-17

Parameters	Specifications		Comments
	DL	UL	
Frequency	728~757 MHz	698~716 MHz 776~787 MHz	700MHz band
System Input Range	-40 ~ -33dBm	-35 ~ -33dBm	
Maximum Composite Output (DL/UL)	+17dBm	+22dBm	
System Gain	57dB		
Delay	4us		
Spurious Emissions	Compliance of FCC Regulations		
FILTER Selection	5/10/15/20MHz		
Filter Bank Bandwidth	5/10/15/20MHz		
Filter Bank	3 Bank per band		

Parameters	Specifications		Comments
	DL	UL	
Frequency	869~894 MHz	824~849 MHz	Cellular band

System Input Range	-45 ~ -33dBm	-40 ~ -33dBm	
Maximum Composite Output (DL/UL)	+17dBm	+22dBm	
System Gain	62dB		
Delay	4us		
Spurious Emissions	Compliance of FCC Regulations		
FILTER Selection	5/10/15/20MHz		
Filter Bank Bandwidth	5/10/15/20MHz		
Filter Bank	3 Bank per band		

Parameters	Specifications		Comments
	DL	UL	
Frequency	1930~1995 MHz	1850~1915 MHz	Broadband PCS band
System Input Range	-53 ~ -33dBm	-48 ~ -33dBm	
Maximum Composite Output (DL/UL)	+17dBm	+22dBm	
System Gain	70dB		
Delay	4us		
Spurious Emissions	Compliance of FCC Regulations		
FILTER Selection	5/10/15/20MHz		
Filter Bank Bandwidth	5/10/15/20MHz		
Filter Bank	3 Bank per band		

Parameters	Specifications		Comments
	DL	UL	
Frequency	2110~2155 MHz	1710~1755 MHz	AWS-1 band
System Input Range	-54 ~ -33dBm	-49 ~ -33dBm	
Maximum Composite Output (DL/UL)	+17dBm	+22dBm	
System Gain	71dB		
Delay	4us		
Spurious Emissions	Compliance of FCC Regulations		
FILTER Selection	5/10/15/20MHz		
Filter Bank Bandwidth	5/10/15/20MHz		
Filter Bank	3 Bank per band		

7. Safety Guidelines

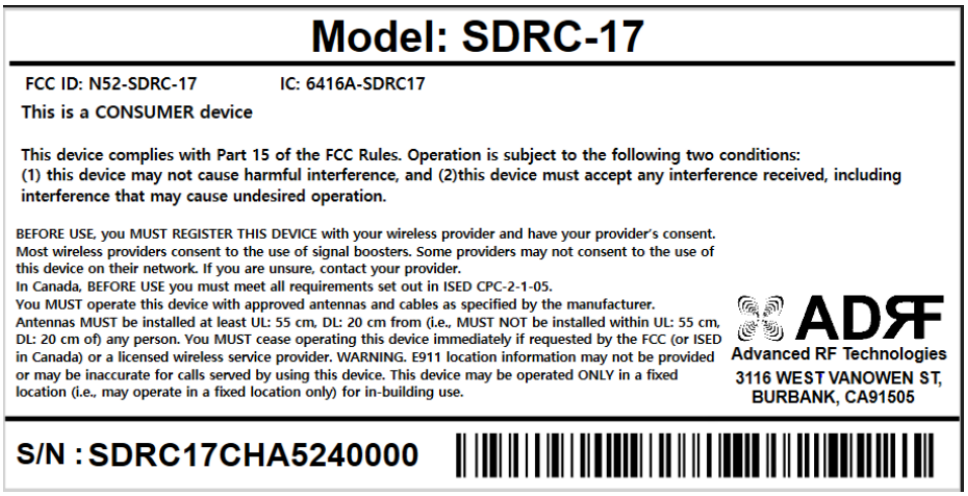
WARNIG

ELECTRIC SHOCK
Opening the Signal Booster could result in electric shock and may cause severe injury.

DAMAGE TO EQUIPMENT
Use only the power supply provided in this package.
Operating the Signal Booster with antennas in very close proximity facing each other could lead to a severe damage to the Signal Booster.

The installation height of the antenna for AWS band (1700/2100 MHz) operations is limited to 10 meters above ground for compliance with Section 27.50

CAUTION
THE SIGNAL BOOSTER SHOULD BE INSTALLED AS CLOSE AS POSSIBLE TO THE POWER SOURCE. THIS REPEATER IS FOR INDOOR USE ONLY AND SHOULD BE INSTALLED INSIDE OF THE BUILDING.



For more information on registering your Signal Booster with your wireless provider, please see below

https://www.sprint.com/en/legal/signal-boosters.html?id16=signal%20booster
https://support.t-mobile.com/docs/DOC-9827
https://www.verizonwireless.com/solution-and-services/accessories/register-signal-booster/
http://securec45.securewebsession.com/attsignalbooster.com/
https://www.uscellular.com/uscellular/support/fcc-booster-registration.jsp

8. FCC warning statements

FCC Part 15.105 statement Class A
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Part 15.21 statement
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Statement
The antenna(s) must be installed such that a minimum separation distance of at least UL : 55cm, DL : 20cm is maintained between the radiator (antenna) and all persons at all times. This device must not be co-located or operating in conjunction with any other antenna or transmitter.
Use of unauthorized antennas, cables, and/or coupling devices not conforming with ERP/EIRP and/or indoor-only restrictions is prohibited.

If the Signal Booster is not in use for 5 minutes, it will reduce gain until a signal is detected. If a detected signal is too high in a frequency band, or if the Signal Booster detects an oscillation, the Signal Booster will automatically turn the power of on that band. For a detected oscillation the Signal Booster will automatically resume normal operation after a minimum of 1 minute. After 4 minute such automatic restarts, any problematic bands are permanently shut off until the Signal Booster has been manually restarted by momentarily removing power from the Signal Booster. Noise power, gain, and linearity are maintained by the Signal Booster's microprocessor. The detailed information was included in the Operational description.

9. IC warning statements

RSS-GEN, Sec. 7.1.2 – (transmitters)
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionneravec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention desautres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotroperayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à

l'établissement d'une communication satisfaisante.

RF Radiation Exposure
This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of UL: 55 cm, DL: 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. RF exposure will be addressed at time of installation and the use of higher gain antennas require larger separation distances.
(Antenna gain: UL (700MHz/Cellular(10 dBi), AWS-1/PCS(11 dBi))
(Antenna gain : DL (700MHz(2.6 dBi), Cellular(3.9 dBi), AWS-1/PCS(5.4 dBi)

L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins UL: 55 cm, DL: 20 entre la source de radiation (l'antenne) et toute personne physique. Cet appareil ne doit pas être installé ou utilisé en conjonction avec une autre antenne ou émetteur.
(Antenna gain: UL (700MHz/Cellular(10 dBi), AWS-1/PCS(11 dBi))
(Antenna gain : DL (700MHz(2.6 dBi), Cellular(3.9 dBi), AWS-1/PCS(5.4 dBi)

RSS-GEN (6.8 Transmit antenna)
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Confonctionneravec une antenne d'un type et d'un gain maximal approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention desautres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotroperayonnée quivalente (p.i.r.e.) ne dépassepas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

10. WARRANTY AND REPAIR POLICY

General Warranty
The SDRC-17 carries a Standard Warranty period of three (3) years unless indicated otherwise on the package or in the acknowledgment of the purchase order.

Limitations of Warranty
Your exclusive remedy for any defective product is limited to the repair or replacement of the defective product. Advanced RF Technologies, Inc. may elect which remedy or combination of remedies to provide in its sole discretion. Advanced RF Technologies, Inc. shall have a reasonable time after determining that a defective product exists to repair or replace the problem unit. Advanced RF Technologies, Inc. warranty applies to repaired or replaced products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced product, whichever is longer.

Limitation of Damages
The liability for any defective product shall in no event exceed the purchase price for the defective product.

No Consequential Damages
Advanced RF Technologies, Inc. has no liability for general, consequential, incidental or special damages.

Additional Limitation on Warranty
Advanced RF Technologies, Inc. standard warranty does not cover products which have been received improperly packaged, altered, or physically damaged. For example, broken warranty seal, labels exhibiting tampering, physically abused enclosure, broken pins on connectors, any modifications made without Advanced RF Technologies, Inc. authorization, will void all warranty.

Return Material Authorization (RMA)
No product may be returned directly to Advanced RF Technologies, Inc. without first getting an approval from Advanced RF Technologies, Inc. If it is determined that the product may be defective, you will be given an RMA number and instructions in how to return the product. An unauthorized return, i.e., one for which an RMA number has not been issued, will be returned to you at your expense. Authorized returns are to be shipped to the address on the RMA in an approved shipping container. You will be given our courier information. It is suggested that the original box and packaging materials should be kept if an occasion arises where a defective product needs to be shipped back to Advanced RF Technologies, Inc. To request an RMA, please call (800) 313 9345 or send an email to techsupport@adrftech.com.