



of the consumer

the repeaters.

power in advance

open the cover of

, or the buildings

ping-pong switching

User's Manual



CONTENTS

PREFACE

This user's manual describes the installation, operation and maintenance repeaters.

Please read this user manual carefully before installing and maintaining. The information in this manual is subject to change without prior notice.

1. SAFETY WARNINGS



Repeater should follow system requirement of communication equipment, assure good grounding and lightning protection.



The power supply voltage of repeater should meet the standards of security requirement; any operation shall be carried out only after cutting off. Only the professional is authorized for the operation.



Do not dismantle machine, maintain or displace accessories by yourself, because in this way, the equipment may be damaged and you may even get an electric shock.



Do not open the repeater, touch the module of repeater, or module to touch the electronic component. The components will be damaged due to electrostatic.

2. WHY REPEATER

2.1. Reason

- (1) Blind or weak signal areas are formed if the buildings are too far away from CELL TOWER themselves shield or absorb signals.
- (2) There are too many complicated signals in the higher part of the buildings, therefore effect has been formed and the signals fluctuate a lot, there are annoying noises during phone calls and call drops accordingly.
- (3) Elevators and basements are well-known for blind areas.

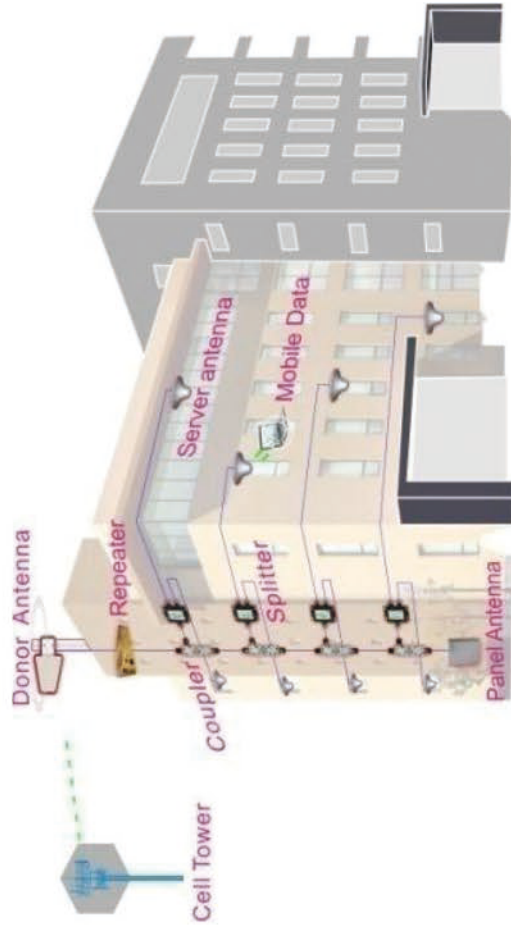
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- 4) Downtown areas of the cities, which congested with many high-rise buildings, are usually the weak or blind areas.
- 5) The remote villages, mountains, hills, valleys, etc. are mostly populated areas with quite few mobile users, so the main target is to send coverage to these areas, and it will not be worthy installing a CELL TOWER, therefore a booster is a quite good option.

2.2. Solution

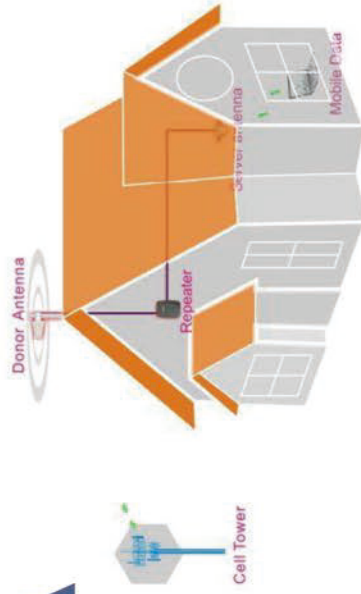
Our consumer repeater is the perfect solution for providing a wireless improvement in the cellular reception of a home, office, restaurant, VIP Room, apartment, building or shopping mall, in the quickest time possibly. One repeater covers 300 to 2000 square meters.

Below diagram shows how simple and fast for the repeater system is installed and works effectively. One Yagi antenna, as Outdoor antenna, is installed at the top of the roof to pick up good mobile signals from outside, and send through coaxial cable to repeater to amplify the signals significantly, then the output signals are divided into two signals by one 2way splitter, sent to two Indoor Omni antennas and finally transmitted into area. Very clear phone call or high speed mobile data are immediately achieved within the area.

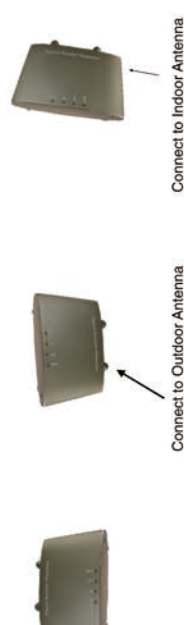


Cell Phone Signal Coverage Solution

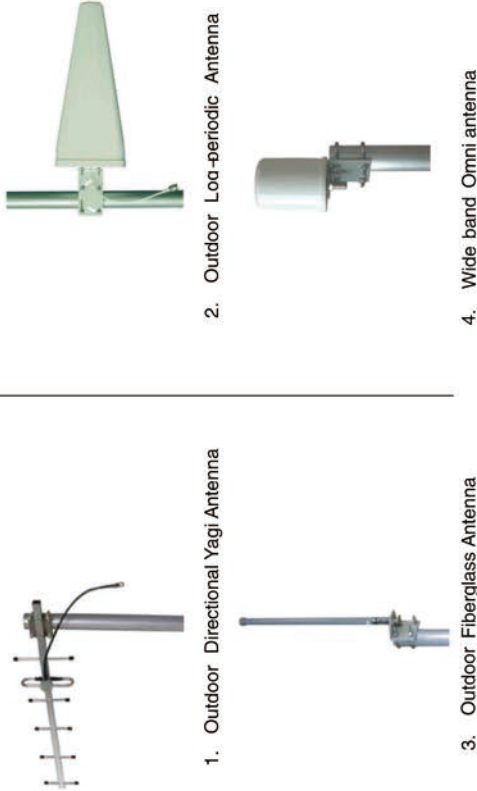
3. THE REPEATER SYSTEM



Below Pictures Shows Some Typical Products' Photos

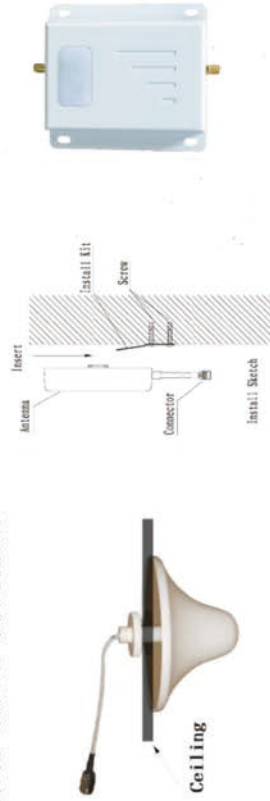


Typical Outdoor Antennas



Function: Pick up open signals from the cell tower and send to the repeater by cable; the power level and quality of the received signals influence a lot on the coverage effect. Outdoor antenna also transmits the uplink signals from the repeater to cell tower.

Typical Indoor Antennas



1. Indoor Ceiling Antenna
2. Indoor Panel Antenna
3. Direct Connection Whip Antenna

Note:

3dB indoor Omni ceiling or 9dBi indoor panel are recommended, whip antenna is also good for simple installation, however the coverage size will be limited by the case. Omni antenna (indoor ceiling Omni antenna or whip antenna), suitable to be installed in the center and radiate all directions; it is better to use a directional panel antenna or wide band Yagi when the coverage shape is long and narrow (corridors, long row of houses in two sides, tunnels or elevators or rural open space).

Cables: RG58, LMR 300 or 400, 3D, 5D or 8D –FB coax cables are recommended.

Splitters or couplers: when the building structure is too complicated or there is big loss due to thick walls, etc., splitters or couplers shall be used so that more antennas can be installed in more areas to distribute the signals to each corner of the coverage area.

4. Installation

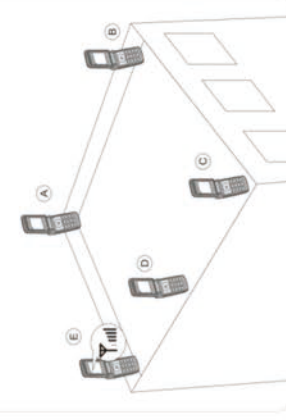
The repeaters should be used to cover the indoor area. Humidity and temperature of working environment can affect the reliability of repeater. So, temperature, humidity, dust, interference, power, space requirements and other factors should be considered during installation of repeater.

4.1. Installation Location Requirement

- (1) It is appreciated that the repeater is installed in a cool, dry and ventilated room without erosive gas and smoke and without leakage on its proof.
- (2) Or a cool and ventilated wall of which sun-proof and waterproof is expected.
- (3) Besides above, common wall, tower or high pole is ok too.
- (4) Installation height should be easy for RF cable wiring, heat dissipation, security and maintenance.
- (5) Have a set of independent and stable power supply.
- (6) Have lightning conductor in the building, tower or high pole with enough strength or stability.

4.2. Installation of Outdoor antenna

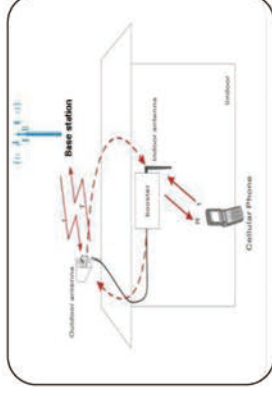
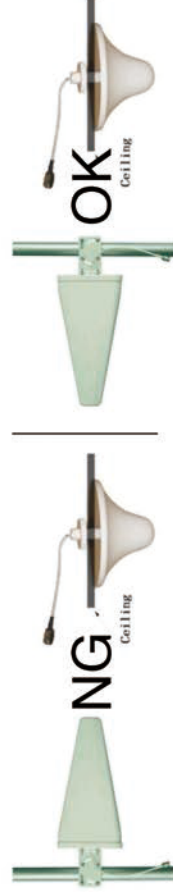
The repeater's main function is to improve weak RF signals in an area. A simple formula: Input power + Gain = Output power. The signal strength from the outdoor antenna directly affects the efficiency of the indoor coverage. It is very important to choose the outdoor antenna location in order to get the best signals.



- Testing the signal strength received from outdoor antenna mounted in site by mobile phone:
- Please select the top of building to install the outdoor antenna if total floors are less than 7 floors, and shall try your best to select places like balcony or platform lower than 7th floor for outdoor antenna if the buildings are over 7 floors, because the mobile signals are clean at less than 7th floor.
- The mobile phone shall display full bar signals in location where the outdoor antenna is installed
- The phone calls or data transmission shall be smooth and stable by 3 times testing in location where the outdoor antenna is to be installed
- As shown from the above illustration, testing the signals from A to E, and select a best place that displays full bar signals to install the outdoor antenna.

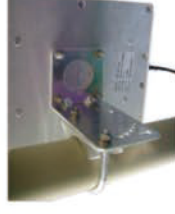
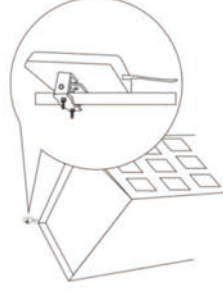
- Selecting the installation direction of Outdoor antenna.
- The Outdoor antenna shall point to the direction of the tower, and it would be much better to keep line of sight.
- Please select the opposite directions for Outdoor antenna and indoor antennas. If Outdoor and Indoor antennas have to be installed in the same direction, please install them only after the signal quality is tested and the self-oscillation is avoided. If the directional antenna is selected, the main directional angle should point to the tower antenna.
- If the performance is poor due to weak signals or poor phone call quality, please adjust the direction of Outdoor antenna or change its position in order to obtain the best calling effect.
- The wide band repeater supports all mobile operators or different mobile systems, so please adjust the Outdoor antenna direction to have balance between signals of different mobile operators or various mobile systems.
- Outdoor antenna installation ---- Notes:
- Do not install the Outdoor antenna during the rainy day with lightning.
- Please follow the instructions to install the outdoor antenna.
- It is a must that the waterproof shall be done to connectors of outdoor antenna and feeder lines.
- In order to avoid interference, please note that the Outdoor antenna should be far away from the following objects of metal, high-voltage line, and RF antenna and high-voltage transformer.
- Repeater is a two-way signal amplifier. So proper isolation between Outdoor antenna and Indoor antenna is necessary in order to avoid self-oscillation. About the definition for self-oscillation, take MIC and loudspeaker for example; if it is too close for each other, it could make big noise.
- The minimum distance between Outdoor antenna and Indoor antenna shall be more than 10 meters; again the direction of Outdoor and Indoor antennas shall be opposite.

As shown in the below illustration, the booster amplifies the downlink signal **r** from the tower and send to the Indoor antenna hereafter. If the distance between Outdoor antenna and Indoor antenna is less than the required distance, the amplified signal **R** will go back from Indoor antenna to Outdoor antenna. So it will lead to self-oscillation and reduce the coverage area, also the bad calling quality could happen at the same time, and the worse is that the mobile network could be influenced badly and the operators will finally come to shut off the repeater system.



If isolation can't be achieved by the limited distance, the roof of the building or any other barriers can be used in between to increase isolation.

Installation Of Panel Antenna As Outdoor Antenna



Installation Of Wide Directional Antenna As Outdoor Antenna



Installation Of Yagi Antenna As Outdoor Antenna

