# MANUAL

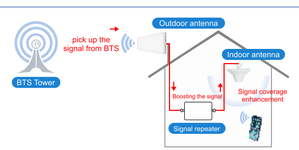
## Mobile Signal Repeater

## 01 Working Principle

### Mobile Signal Repeater(Technical Terms)

The function of the signal repeater: It firstly pick up the outdoor cellphone signal by the outdoor antenna, and then transit the signal to the signal repeater through coax cable, which is used to boost the signal, and finally transit the signal out to the indoor antenna for cellphone signal coverage enhancement. The users in the covering area will have a stable and reliable communication experience.

**Working diagram**




## 02 Technical Terms Introduction

### Self-oscillation

Due to the short distance or lack of barrier between the indoor antenna and outdoor antenna, the transmitted signal from the indoor antenna will be received by the outdoor antenna, and repeatedly boosted, thus it will generate a lot of useless signal and cause the self-oscillation. It is highly recommended the distance between outdoor antenna and indoor antenna is more than 8m, preferably blocked by the wall.

Remark: The cable should be connected to the repeater port tightly, otherwise it will cause self-oscillation.



### Signal Busy Area

It is often happened in densely populated areas in shopping malls. A single base station serves too many communication terminals. The capacity of the base station cannot meet all the communication needs. As a result, many users in this area cannot perform normal communication and data transmission.

### Directional Antenna

The directional antenna has a clear directivity, which is characterized by strong signal reception, but the receivable direction is relatively small. Therefore, during the installation, you need to carefully adjust the orientation of the antenna to achieve the best reception.

### Ping-pong Effect

It often occurs in high floors of the building. Because at the high floor window, users can receive signals from multiple nearby base stations at the same time, the mobile phone will switch back and forth between the base stations during the phone call, which resulting in a good signal displayed by the mobile phone, while the call quality is intermittent.

### Signal Blind Area

1. It often occurs in mountain area or remote area. The signal needs to be transmitted too far with large attenuation, the signal strength is lower than the minimum sensitivity that the phone can receive, causing the phone fail to receive the communication.
2. There is too much blocking between the mobile phone and the base station, the base station signal is unable to penetrate, and the excessive attenuation of signal strength is lower than the minimum sensitivity that the mobile phone can receive, causing the phone fail to receive the communication.

## 03 The function of the Main Items

**(The picture is only an example, the actual product shall prevail)**

**Coax cable**

It is used to transmit the signal from the outdoor antenna to the signal repeater

**Indoor antenna**

It is used to transmit the boosted signal out from the repeater



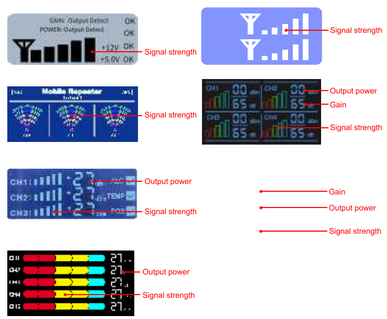
**Signal repeater**


Process the signal received from the BTS port, and enter the low-noise amplifier by dual filtering through the main board, filter its interference signal and enhance the useful signal, and then transmit out from the the MS port.

**Outdoor antenna**

Pick up the outside signal from the BTS.

## 04 LCD Display Introduction






## 05 Installation

### 01 Find a location with a better signal

First use your mobile phone to check the signal strength, and look for places with higher signal strength around the area where you need to optimize the signal. Test in multiple places to see where the signal strength is better.

**Places that meet the following criteria are most suitable for installing outdoor antenna.**

The mobile phone shows full bar | When making the call, the communication is s mooth | The data transmission, downloading and mobile gaming speed is normal.

### 02 Test outdoor signal step 1

Connect to the signal repeater, outdoor antenna by the coax cable, and power on the repeater

Do not connect the indoor antenna in order to prevent the self-oscillation

Connect the signal repeater through the coax cable | Power on the repeater | The coax cable connect to the outdoor antenna

### 03 Test outdoor signal step 2

Install the outdoor antenna at the place where the signal found in "Installation Step 1", and keep the distance between the signal repeater and outdoor antenna 3-4meters apart. Adjust the position and orientation of the outdoor antenna, and observe the signal strength on the repeater at the same time, the more of the signal bar, the stronger of the phone signal received by the antenna. After finding the best position of the outdoor antenna, pre-fix the outdoor antenna.

Horizontal installation and commissioning | The plughole of the outdoor antenna should be face to the downside when installing | Check the input signal shown in the LCD display



### 04 Connect to the indoor antenna

Keep the outdoor antenna position and orientation determined in "Step 3" unchanged, and move the signal repeater to the area where the signal needs to be optimized, and connect to the indoor antenna.

Please pay attention to the signal strength on the repeater. If the signal has increased a lot, it may be the distance between the outdoor antenna and indoor antenna is too close, or lack of barriers, that will cause the self-oscillation.

### 05 Call quality test

In order to allow the mobile phone signal to be quickly switched to the amplified frequency, please make a call first near to the indoor antenna, normally within 2meters, and then hang up. Make a call here after 20 seconds, test the call quality if it is normal. At the same time, check the information displayed on the phone if the signal is improved.

### 06 Fixed the repeater

After the performance test is completed and the expected result is achieved, that means the repeater is installed correctly. You can start to fix the outdoor antenna, feeder, indoor antenna. If the performance test does not reach the expected result, please refer to the following chapter (frequently asked questions)

## 06 Frequently Asked Questions

| F&Q | Possible Problem | Solution |
|---|---|---|
| The signal is not improved after the installation of the repeater. | 1、You may buy a repeater only support 2G, while the mobile phone is using 4G.<br>2、The antennas areconnectly reversed.<br>3、The supporing frequency of the repeater might not match the ones used at the local site. | 1、Make a call, and see if the communication is normal. If yes, then it is fine.<br>2、Reverse the indoor antenna and outdoor antenna. Make sure the outdoor antenna connect to the BTS port, indoor antenna connect to the MS port.<br>3、Check the supporting systems, if it is not correct, contact the service center for replacing the right repeater. |
| The signal bar in the mobile is full, while still could not able to make the call or even worse. | 1、There is self-oscillation.<br>2、There is too low uplink signal. | 1、Keep further distance between the outdoor antenna and the indoor antenna, and even better with barriers.<br>2、Adjust the position of the outdoor antenna. |
| The signal is improved,and the voice could be hear from the other side, while they could not hear from our side. | 1、The signal is not strong enough.<br>2、There is too low uplink signal. | 1、Replace to higher power repeater or higher gain outdoor antenna.<br>2、Adjust the position of the outdoor antenna. |

FCCStatement:
This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

**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 20 cm (8 inches) 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.

(1) Usage of unauthorized antennas, cables, and/or coupling devices may result in poor effect and, in severe cases, equipment damage.

(2) a complete list of authorized antennas, cables, and/or coupling devices:

| | Name | Model | Gain/Loss | Photo |
|---|---|---|---|---|
| Indoor Antenna | Panel Antenna (default) | TX.BG.2 | 9dbi @698-2700MHz |  |
| | Ceiling Antenna | TX.XD.3 | 3dbi 698-2700MHz |  |
| Outdoor Antenna | Log-periodic Antenna (default) | TX.DS.2 | 10dbi @698-2700MHz |  |
| | Yagi Antenna | TX.BM.8.1 | 8dbi @698-2700MHz |  |
| cable | Coaxial cable with N male cennector (default) | X.13B1 | 3dbi @698-2700MHz |  |

(3)the default antenna, cable, and/or coupling device that are shipped with the booster Log-periodic Antenna, Panel Antenna and CoaxialCable.

(4) The antenna is equipped with a U-shaped mounting bracket. The log-periodic antenna should be installed in a place with good outdoor signal. The panel antenna should be installed indoors and near the main device. If the amplification effect is not good after the installation is completed, the direction of the log-periodic antenna can be gradually adjusted to achieve better effect.

(5) The device has automatic sleep function, strong anti-interference ability, over-power protection function, good heat dissipation design, and no radiation. The working noise is as low as 6DB.

Warning:Unauthorized antennas/cables and/or coupling devices are prohibited by FCC rules. Please contact FCC for details: 1-888-CALL-FCC

Shenzhen Lingzhe Communication Technology Co., Ltd.

6th Floor, Building 6, Kaijieda Industrial Zone,
No. 97 Huaxing Road, Dalang Street, Longhua
District, Shenzhen of China

Contact: Li changyu

Tel: 18218747363

Email: 183439184@qq.com

1) FCC 15.19
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2) FCC 15.21
Warning: Changes or modifications to this unit not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

3) FCC 15.105
For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.