

Gainer repeater User's Manual

1 Safety Warnings

Users must follow below principles!

- The power supply voltage of repeater should meet the standards of security requirement; any operation shall be carried out only after cutting off power in advance. 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 open the cover of module to touch the electronic component. The components will be damaged due to electrostatic.
- Please keep away from heating-equipment, because the repeater will dissipate heat during working. And do not cover booster with anything that influences heat-dissipation.

2 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) Installation height should be easy for RF cable wiring, heat dissipation, security and maintenance.
- 4) Have a set of independent and stable power supply.
- 5) Have lightning conductor in the building, tower or high pole with enough strength or stability.

3 Power requirement

Generally it is AC power supply, and the requirement of AC is 90~264VAC / 50±5Hz

4 Installation tools and accessory

No.	Name	Specification	Quantity	Remark
1	Plastic Expansion Bolt	φ8	4	Standard accessories
2	Tapping screw	M6*50	4	Standard accessories
3	Hanging folder		1	Standard accessories
4	reciprocating drill		1	Engineering-owned, punch the wall
5	Shot bit	M3	1	Engineering-owned, punch the wall

Installation of donor antenna

- Please select the top of building to install the donor 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 donor 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 donor antenna is installed
- The phone calls or data transmission shall be smooth and stable by 3 times testing in location where the donor antenna is to be installed
- The donor antenna shall point to the direction of the tower, and it would be much better to keep line of sight.

5 Repeater Installation

6.1. Installation Steps

10dBm~30dBm shall be installed in indoor areas only

- 1) Connect the power supply and the cables properly to the repeater ports.
- 2) Check again to make sure the repeater is installed firmly and repeater alarm LED must stay green.

6.2. Repeater's ports description

- 1) Outdoor port: connected with the donor antenna by cable.
- 2) Indoor port: connected with server antenna directly or by cable.
- 3) DC IN: connected with power supply.

6.3. Repeater Settings

Please check very carefully all cable connections are correct and firm before running operation test and then carry out following tests.

6.4. LED indicator

After power is on, check firstly the alarm and power LEDs.

- Status and definition of POWER indicators:

Status	Definition
Green	Normal
Off	DC power problem

- Status and definition of ALARM indicators; Alarm LED only works for downlink signals

Status	ALARM
Green	It is working in linearity
	Warning: Input signals may be not enough, so please check on coverage effect, do not do anything if it is good; otherwise please adjust the repeater system to get better coverage.
Orange	A little bit stronger input signals or slight self oscillation have occurred.
	Solution: Please adjust antennas or use MGC to reduce the repeater gain, till you find "edge point" with green LED (I.E. the Alarm LED must stay at green color, and at the edge of turning Orange), and let the repeater work at this point. MGC is the last measure to take as it will influence on coverage.
Red	There are strong input signals or severe self oscillation, measures must be taken (please note that our repeaters have auto shut off function, so the red color status can only maintain 5 seconds).
Off	Repeater breaks down, or severe self oscillation leads to auto mute. Please re-plug in and check if alarm LED turns red, if it is, please take measures to keep alarm LED green; if it maintains off, it means the power break down.

6 Manual Gain Control (MGC)

Switches 1-5 represent Downlink and 6-10 represent Uplink. When it is necessary to adjust the gain by DIP switch, firstly please adjust Downlink gain according to input signals, secondly please adjust Uplink gain according to Downlink gain.

The DIP Switches have default 'OFF' status; please push relevant switches to "ON" position if certain attenuation value needs to be achieved.

● **DIP switch downlink attenuation setting:**

Att	1	2	3	4	5	Att.	1	2	3	4	5	Att.	1	2	3	4	5
0 dB	off	off	off	off	off	11dB	ON	ON	off	ON	off	22dB	off	ON	ON	off	ON
1 dB	ON	off	off	off	off	12dB	off	off	ON	ON	off	23dB	ON	ON	ON	off	ON
2 dB	off	ON	off	off	off	13dB	ON	off	ON	ON	off	24dB	off	off	off	ON	ON
3 dB	ON	ON	off	off	off	14dB	off	ON	ON	ON	off	25dB	ON	off	off	ON	ON
4 dB	off	off	ON	off	off	15dB	ON	ON	ON	ON	off	26dB	off	ON	off	ON	ON
5 dB	ON	off	ON	off	off	16dB	off	off	off	off	ON	27dB	ON	ON	off	ON	ON
6 dB	off	ON	ON	off	off	17dB	ON	off	off	off	ON	28dB	off	off	ON	ON	ON
7 dB	ON	ON	ON	off	off	18dB	off	ON	off	off	ON	29dB	ON	off	ON	ON	ON
8 dB	off	off	off	ON	off	19dB	ON	ON	off	off	ON	30dB	off	ON	ON	ON	ON
9 dB	ON	off	off	ON	off	20dB	off	off	ON	off	ON	31dB	ON	ON	ON	ON	ON
10 dB	off	ON	off	ON	off	21dB	ON	off	ON	off	ON						

7 System Test

8.1. Check whether the coverage is good

- Have a test with mobile phone or data card (engineering mobile phone is preferred). If the signals in most areas have not been improved, please check below again:
 - The weak input signal leads to the low output power. Change the direction of donor antenna or its installation position or replace donor antenna with higher gain antenna to increase input signal power level.
 - Check whether it is necessary to add more server antennas since barriers block the signal penetration, also check whether the repeater's power is enough; please install more server antennas or replace with a repeater of higher power level.
- If the signals in small part of the areas have not been improved, please check below:
 - Check whether the service antenna is installed correctly or not, you may try to move the antenna location to improve coverage.
 - Check if it is necessary to adjust the direction of the sever antenna.
 - Check whether it is necessary to add one or more antenna to enhance the coverage of special areas.
 - Remark:
 - ✧ Reduce the attenuation values*---at the same time must ensure the isolation.
 - ✧ Increase the output power* ---recommended ways: adjust the donor antenna direction / location, or replace with higher gain antenna to increase input signal strength.

8.2. Repeater cannot communicate in Power-ON status

- 1) The power is on but it has a signal fluctuation or a flash signal. The phone call cannot be achieved. It shall be caused by the insufficient isolation between donor antenna and serve antenna.

Please take below measures:

- Firstly check whether the alarm LED is orange. The orange light shows the insufficient isolation.
 - Secondly adjust the antennas' directions or locations or enlarge the distance between them.
 - Thirdly reduce the repeater's gain by ATT DIP if the above methods don't work.
 - Use the roof of the building to enlarge the isolation (Please try to place the donor antenna and server antenna in different floors).
 - Use some obstacles (Such as wall).
- 2) The repeater's power is on but the phone is not connected into the network and still cannot communicate.
- **Reason 1:** There are loose or wrong connections in the repeater system.
 - ✧ **Solution:** Please try to fasten the connections between the different parts of the system.
 - **Reason 2:** The signals received from donor antenna of other operators nearby are too strong. (For example, the other operators' signals are 10 dB stronger than the needed signals.)
 - ✧ **Solution 1:** Change the direction of donor antenna or its installation position, so that the gap of signal strength is reduced between operators.
 - ✧ **Solution 2:** Use barriers (like buildings) to block signals of other operators.
- 3) The repeater has alarm OFF status
- **Reason1:** the repeater breaks down.
 - ✧ **Solution:** Please check the power adaptor to see if it breaks down or not, then take off the plug and re-plug in, if alarm LED maintains off, the repeater break down is confirmed, then please consult local dealers for warranty.
 - **Reason 2:** There is self oscillation if alarm LED turns red after re-plugging in.
 - ✧ **Solution 1:** Change the direction or location of donor or server antennas to enlarge the distance.
 - ✧ **Solution 2:** Use barriers (like buildings) to increase isolation.
 - ✧ **Solution 3:** Reduce the repeater gain by DIP switch.