



23dBm Single Wide Band Repeater

C23S-EGSM User Manual



Notes: Thank you for purchasing our product.

Please read carefully the manual before installation

Chapter 1 - Safety Warning

■ Users must follow the below principles:

■



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



2. The power supply voltage of repeater should meet the standards of security requirement; any repeater-operator can operate only after cutting power in advance. Only the professional can operate electrified.



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



4. Do not open the repeater, touch the module of repeater, even not to open the cover of module to touch the electronic component, the components will be damaged due to electrostatic



5. Please keep away from heating-equipment, because the repeater will dissipate heat when working. And do not cover repeater with anything that influences heat-dissipation.

Chapter 2 - Summary

In mobile communication, it is inevitable that macro-cell coverage cannot cover weak or dead zones; to use repeater is a good choice in these areas. These band selective repeaters mainly applied in covering small blind and weak zones.

Nowadays, wireless repeaters are widely used in solving coverage questions of weak signal and blind signal. As for our dual band repeater, with its stable function, low noise, high gain, small power consumption, it not only could amplify signal well, solve poor coverage but also reduce the ambient noise, reduce radiation and prolong using life. They are used in places such as mountain settlements, scenics, shopping malls, hotels, airports, piers, bus stations, stadiums, entertainment halls, railways, tunnels, high-ways, islands and so on. At the same time, the repeaters are still working flexibility in traffic diversion and BTS networking adjustment and other issues.



Figure 2.1 Wireless repeater application diagram

The C23S single band repeaters are suitable to solve poor signal and blind area coverage problems of medium-small areas. Because of its smart design, good band rejection, display function for easier project setting and fast setting and debugging, it is quite popular for customers.

Chapter 3 - Standard and Specification

3.1 Product description

Repeater is essentially a same frequency, transparent and amplify equipment. Inside the single system repeater there are two independent amplify link roads---Up Link and Down Link. DL gets the RF signal by donor antenna from the BTS, amplifies the signal and then transmits to the area to be covered through the coverage antenna. At the same time, the UL receives the RF signal from the mobile station by coverage antenna, amplifies the signal and then transmits back to the BTS by donor antenna.

3.2 Product Feature

- The display shows very clearly of all display devices and the button function are more intuitively and faster
- Could support dual mobile communication network
- Low power consumption, low interference
- ALC could limit the output power to ensure stable coverage
- Frequency power display function can keep abreast of real-time signal strength
- Manual gain attenuation, with 1dB steep to attenuate the gain among 1-31dB range
- Isolation auto detection and adjustment, AGC auto control, install with one button which is much more easier for project setting, could install and debug quickly;
- Apply for medium and small areas coverage, such as VIP room, meeting room, office, bedroom, apartment, hotel, parking lot and so on.

3.3 System Schematic

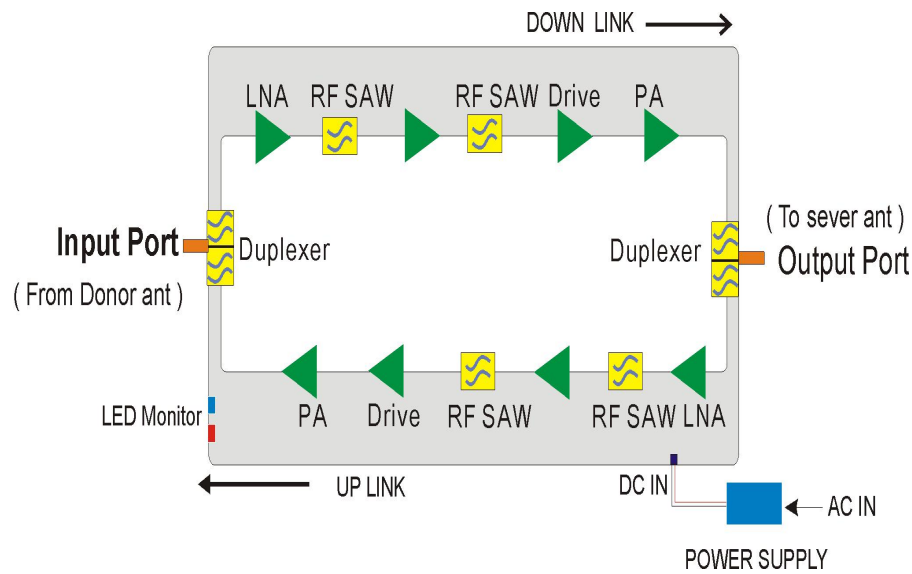


Figure 3.3.1 the Schematic of the repeater

3.4 Electric Specifications

| Items | | Uplink | Downlink |
|--------------------------|----------|---------------|---------------|
| Frequency Range | | 880 ~ 915 MHz | 925 ~ 960 MHz |
| Output Power (CW) | | 23±2 dBm | 23±2 dBm |
| Gain | | 73±2 dB | 73±2 dB |
| Ripple | | ≤15 dB | ≤15 dB |
| Noise Figure @ max. gain | | ≤8 dB | ≤8 dB |
| ATT step of 1 dB | 1~10 dB | Δ ≤1 dB | Δ ≤1 dB |
| | 10~20 dB | Δ ≤1 dB | Δ ≤1 dB |
| | 20~25 dB | Δ ≤1.5 dB | Δ ≤1.5 dB |
| ALC Active 10dB | | Δ ≤2 dB | Δ ≤2 dB |
| VSWR | | ≤2 | ≤2 |
| Intermodulation Products | | ≤-36 dBc | ≤-36dBc |

| Items | | Uplink | Downlink |
|------------------------|---------------|--|--------------------|
| Spurious Emission | 9KHz~1GHz | ≤ -36 dBm | ≤ -36 dBm |
| | 1GHz~12.75GHz | ≤ -30 dBm | ≤ -30 dBm |
| Time Delay | | ≤ 0.5 μ s | ≤ 0.5 μ s |
| Power Supply | | DC: 12V | |
| Power Consumption | | < 15W | |
| RF Connector | | N-Female | |
| Environment Conditions | | IP40 | |
| Humidity | | < 90% | |
| Operating Temperature | | $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$ | |

3.5 Machine Specifications

| | |
|------------------------|--|
| RF Connector | N-Female |
| Cooling | Heatsink Convection cooling |
| Environment Conditions | IP40 |
| Humidity | < 90% |
| Operating Temperature | $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$ |

3.6 Appearance and function keys



Figure 3.6.1 repeater display, control panel and ports

- A : Donor antenna port (N-female)
- B : Coverage antenna port(N-female)
- C : 12V DC power supply port
- D : Return button
- E : Up button
- F : Down button
- G : OK button
- H : Display screen
- I : Grounding screw

3.7 Function Key Operation

■ Functions on Control Panel:

- Return button: Return to upper-level menu
- Up button: select from down to up
- Down button: select from up to down
- Ok button: to confirm.

■ Display Screen

After powering on, it will scroll display real-time working frequencies, downlink input and output power, gain and alarm etc (as shown in Figure 3.7.2.1).

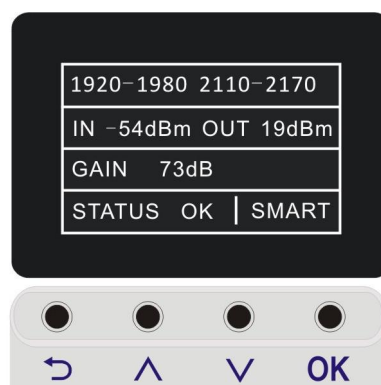


Figure 3.7.2.1

■ To view the working frequencies

Move the cursor to the first line with up or down button (as shown in Figure 3.7.3.1), and press OK button to enter the working frequencies display interface (as shown in Figure 3.7.3.2). Press the return button back to the main menu.

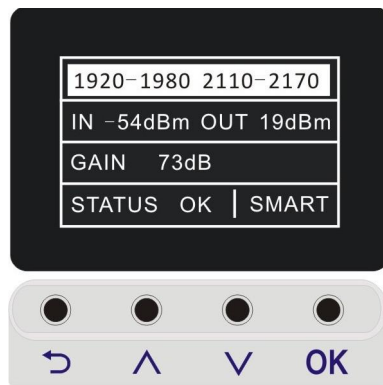


Figure 3.7.3.1

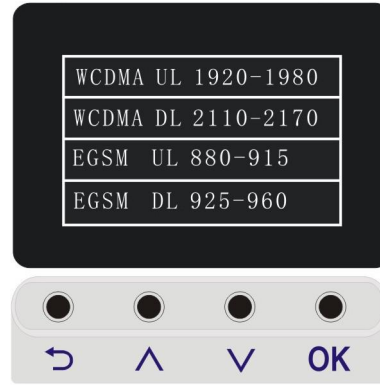


Figure 3.7.3.2

■ ATT Setting.

By default, the system is in Smart mode, so it will automatically adjust the ATT, manual operation is not allowed; if you want to set ATT, please change it to Manual mode by moving the cursor with up or down button to the forth line "STATUS", then press OK (as shown in Figure 3.7.6.1), then navigate the cursor to "MODE" (as shown in Figure 3.7.6.2)

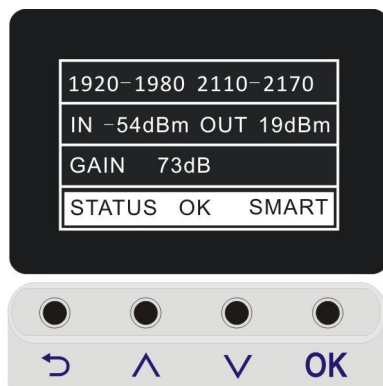


Figure 3.7.6.1

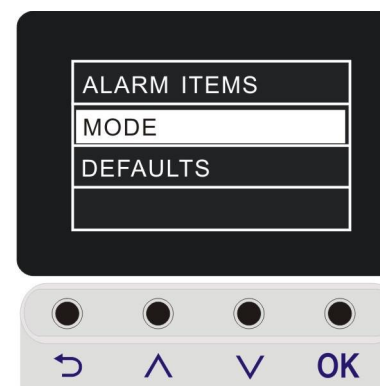


Figure 3.7.6.2

Press OK to enter, “SMART” is on the left and “MANUAL” is on the right, select “MANUAL” with up or down button and press OK (as shown in Figure 3.7.6.3).

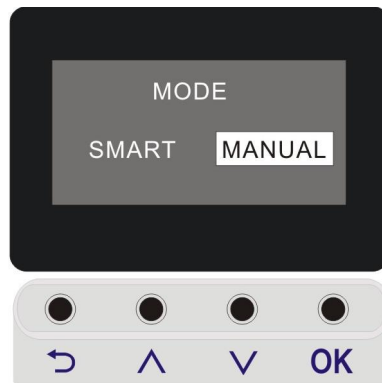


Figure 3.7.6.3

Then move the cursor to the third line “Gain ” with up or down button (as shown in Figure 3.7.6.4), press OK to enter the ATT setting interface, then select one system, press OK(as shown in Figure 3.7.6.5).

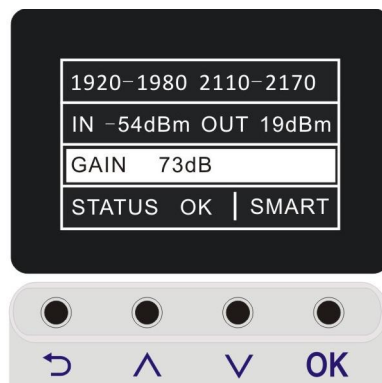


Figure 3.7.6.4

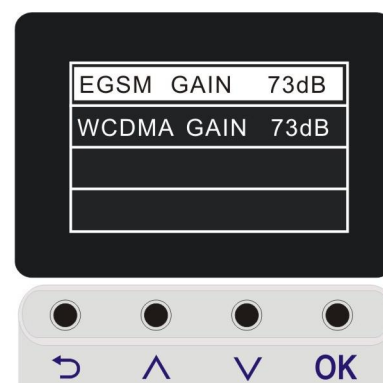


Figure 3.7.6.5

To increase or decrease the gain value, please press the up or down button (as shown in Figure 3.7.6.6 and 3.7.6.7); Max. adjustment range is 32dB, the system’s uplink and downlink will be adjusted at the same time. After adjustment, press the return button back to the main menu.



Figure 3.7.6.6

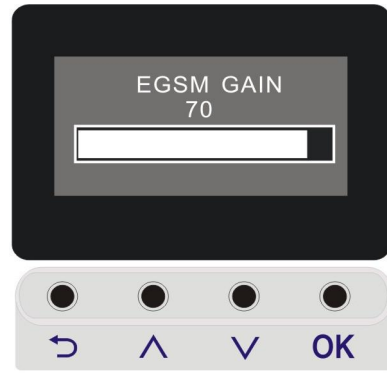


Figure 3.7.6.7

■ View Alarm.

Move the cursor to the forth line “STATUS” from main menu, then press OK to enter (as shown in Figure 3.7.7.1), then navigate the cursor to “ALARM ITEMS” with up or down button (as shown in Figure 3.7.7.2).

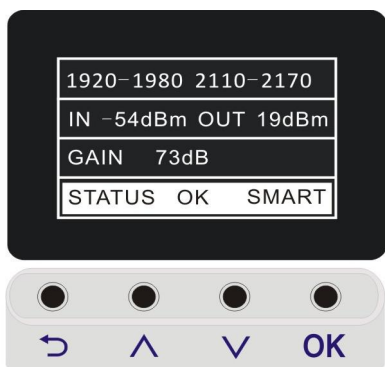


Figure 3.7.7.1

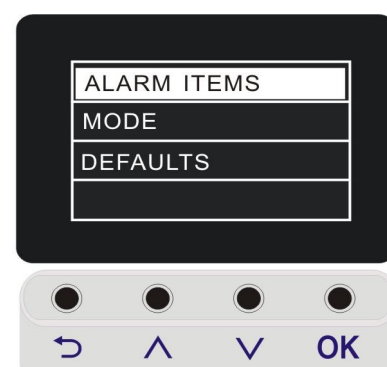


Figure 3.7.7.2

Then press Ok to view, select AGC (as shown in Figure 3.7.7.3), press OK to view AGC alarm (as shown in Figure 3.7.7.4).

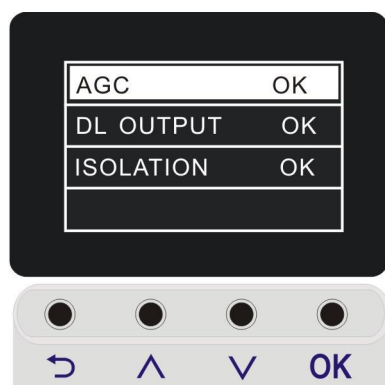


Figure 3.7.7.3



Figure 3.7.7.4

Select DL OUTPUT (as shown in Figure 3.7.7.5), press OK to view DL OUTPUT alarm (as shown in Figure 3.7.7.6).

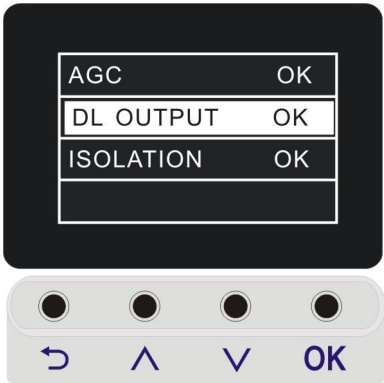


Figure 3.7.7.5

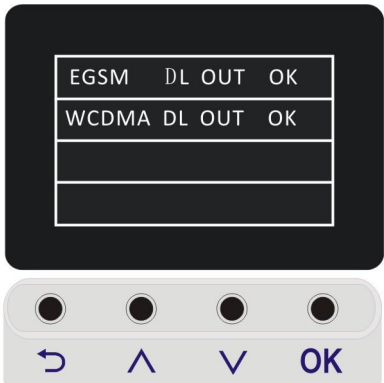


Figure 3.7.7.6

To remove alarm, if it is in Smart mode, the device will make adjustment automatically after re-powering; if it is in Manual mode, you should adjust the outdoor antenna and the gain manually. If all is in OK status, that means it works normally. Press the return button back to main menu after adjustment.

■ **Restore Factory Settings**

Move the cursor to the forth line “STATUS” with up or down button (as shown in Figure 3.21), then press OK to enter, then navigate the cursor to “DEFAULTS” with up or down button (as shown in Figure 3.22), press OK to restore to factory setting; factory settings by default is in Smart mode.

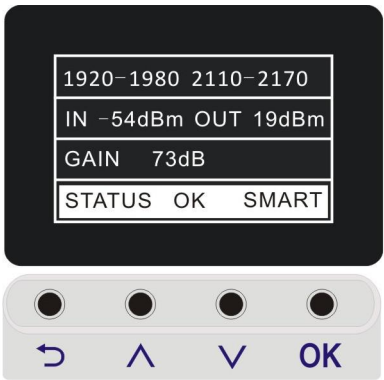


Figure3.7.8.1

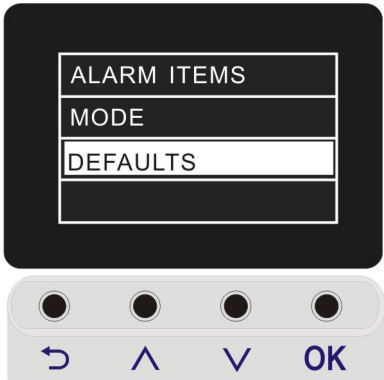


Figure3.7.8.2

After restoring to factory setting, it will detect ISO automatically. To view ISO, move the cursor to the forth line “STATUS”, press OK, and select “ISOLATION” (as shown in Figure 3.7.8.3), then press OK to view ISO (as shown in Figure 3.7.8.4). After that, press the return button back to main menu.

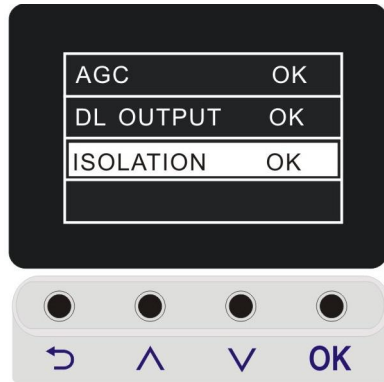


Figure3.7.8.3

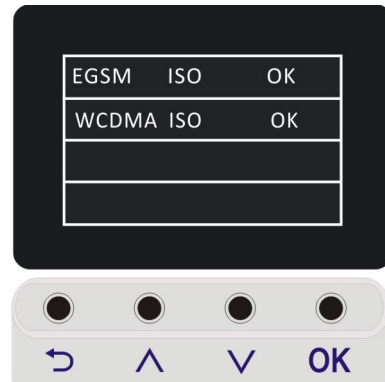


Figure3.7.8.4

Chapter 4 Installation

4.1 Installation requirements

Before install or operate this repeater, please read the first chapter “safety instructions” carefully. Please make sure the grounding wire is firmly grounded and the power cord is firmly connected before power on the device.

■ Environment requirements.

- It should be installed in a space where there is no corrosive gas and smoke or liquid leakage.
- It should be installed on wall that is waterproof, under thunder protection, with sun block and good ventilation.
- It should be installed at a height that is easy for cabling, with good heat dissipation, safe and easy to maintain.
- It should be installed in a place with stable and independent power supply.

■ Installation tools

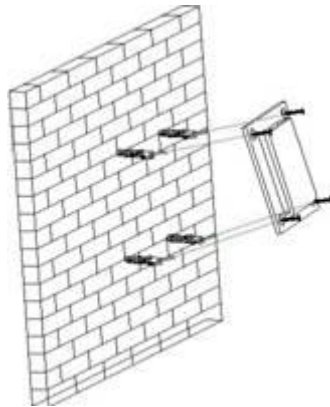
| No. | Items | Quantity | Remarks |
|-----|--------------------------|----------------|--|
| 1 | Percussion drill | 1 | Drill holes on wall, self-provided |
| 2 | spanner | 1 | Reinforce the interface connection, self-provided |
| 3 | Expand plug, screw | 4 respectively | Fasten the device, delivered with the device |
| 4 | Mobile phone for testing | 1 | Test the effect of the device, self-provided |
| 5 | Multimeter | 1 | Test voltage and wiring condition, self-provided |
| 6 | screwdriver | 1 | Tighten or fasten the device, self-provided |
| 7 | Waterproof tape | some | Prevent water to leak into the feeder interface, self-provided |

4.2 Installation steps

This repeater should be installed on a hard, firm and flat surface, its installation steps are as follows:

Select a proper installation site according to the size and installation requirements of the repeater.

Drill holes with percussion drill according to the position of the shell holes, pore size is $\Phi 7$ and the hole location is as follows(unit: mm).



■ Mounting Hole Dimensions

Put the $\Phi 8$ expand plug into the 4 holes.

Align the fixing holes of the repeater with corresponding holes on the wall as shown in Figure 4.2.1, and drive 4 M6*40 screws into the expand plugs with screwdriver and fasten the repeater firmly.

Put the repeater upward onto the shell as shown in Figure 4.2.2.

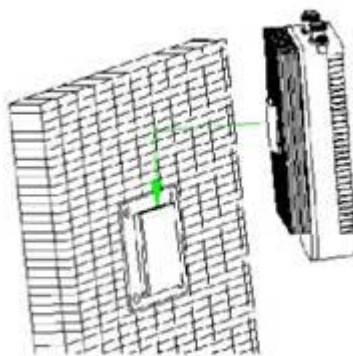
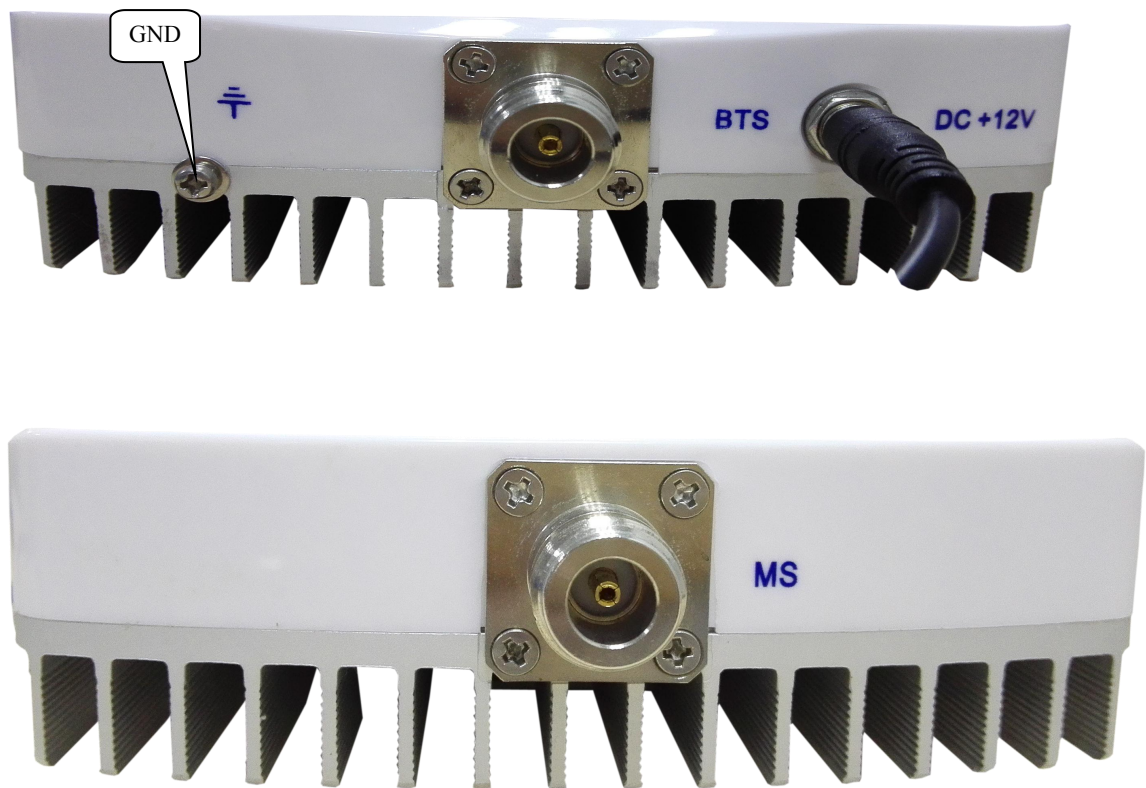


Figure 4.2.2 repeater installation

4.3 External connections



■ Repeater Ports

Ports of the repeater are shown in Figure 4.3.1. Please do not power on the repeater until the feeder is connected. The installation of antenna should be designed and conducted by professional personnel. When connecting feeder, please wrap the interface with waterproof tape to prevent water into the repeater. The interface can be fastened by wrench. Before power on, please measure the repeater voltage with multimeter to make sure the input voltage is within the standard range. External connection of the repeater is as follows:

- BTS: Connecting feeder of the donor antenna;
- MS: Connecting feeder of the coverage antenna;
- DC+12V: connecting with power adapter matched with the repeater. The rated input AC of the power adapter is 220V/50~60Hz, AC power supply

range 100~240V, frequency range 50~60Hz. Output DC is 12V 2A.

- GND: grounding.

4.4 Start the Repeater



Figure 4.4 repeater display and its control panel

- After ensuring that the repeater is installed properly, that power supply and GND meet the requirements, turn on the repeater. After 5 seconds, repeater initialization is completed and it enters the normal working state.
- Observe and adjust alarm display (methods of adjustment, please refer to section 3.6 of this manual)
- If alarm is not removed with correct adjustment methods, please contact your supplier.
- After test the effect of the repeater with test mobile phone, the procedure of repeater installation is completed.

Chapter 5 Maintenance

5.1 Operation and maintenance

■ Power supply

- Please make sure the voltage and frequency of AC power is in conformity with that of the repeater.

■ Component replacement

- Please do not maintain or replace the components by yourself, in case you may get an electric shock. Only authorized personnel can maintain or replace the components.

■ Waterproof and moisture-proof

- Please do not turn on or off the repeater in moist environment when its door is open.

5.2 Attentions

■ Switch-off is recommended during the following situations:

- Power supply is abnormal.
- Liquid flows into the device.
- Working conditions is abnormal such as overheating, strange smell or foreign matters
- Performance is decreased
- Near to fire