






epcom[®]

**EP20M-5B Series
Cell Signal Amplifier**

User Manual



PLEASE KEEP APPROPRIATELY AND CAREFULLY READ THIS USER MANUAL BEFORE INSTALLATION

	The power supply voltage of repeater should meet the standards of security requirements		Ensure of grounding, waterproof and lightning protection when installing the repeater
	The repeater should be installed and started by professionals		Do not open the repeater, maintain or replace the components
	Keep the repeater away from heat source, do not install in a narrow space		

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Package Contents



Amplifier

AC Adapter

Installation Screws

The KIT includes Additional



Outdoor Antenna

Indoor Antenna

2 Coax jumpers; 15 m and 5 m

Antenna Mount

Product Description

EP20M5B five band repeater is a mobile signal repeater with high intelligence. It adopts digital ALC and anti-interference technology, which can detect the signal quality in the coverage area in real time and auto adjust the working status accordingly.

The signal repeater can automatically attenuate the gain of uplink and downlink, according to the detected signal intensity and also when there is insufficient isolation between inside and outside antenna, to avoid self-oscillation. When there is no mobile users in the coverage area, the device will auto shut off uplink, to save power consumption and decrease the interference to the base station.

This signal repeater series are well suited in Central and South America, available to amplify 2G 3G 4G or 5G networks of several mobile operators. With features like elegant appearance, compact size and easy to install and maintain, it has an output power of 20dBm which enables the device to cover an area of up to 1200 m² with proper installation. That makes it an excellent option to solve weak signal problems of house, office, elevator, basement, etc.

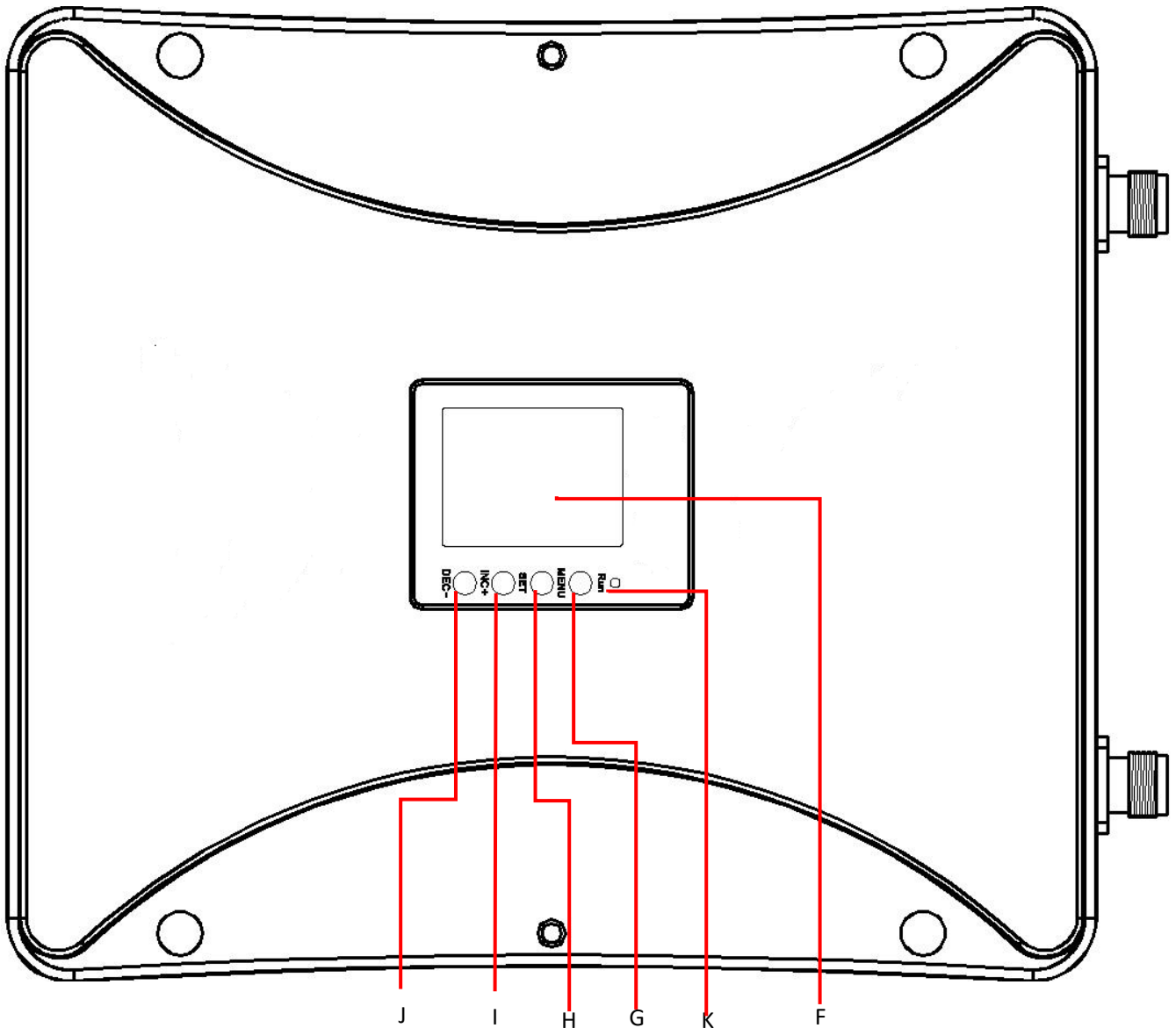
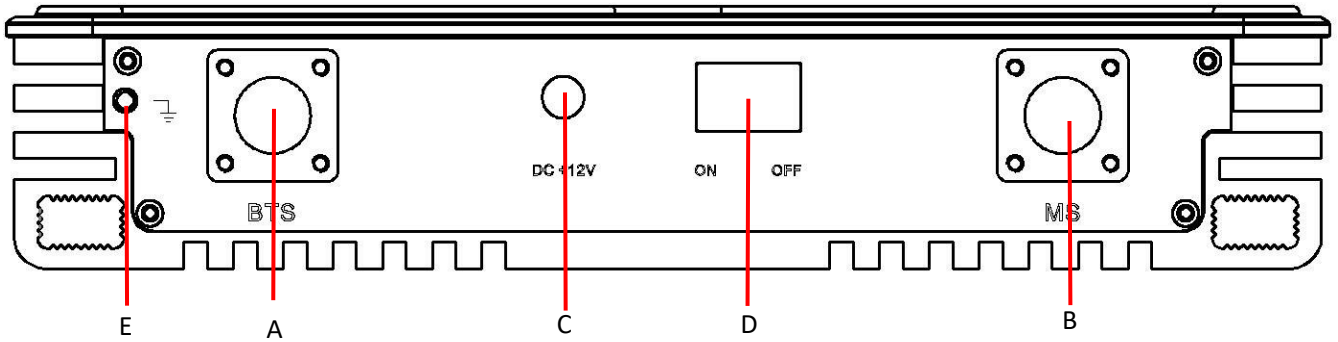
Product Features

- LCD screen to display device’s operating parameters clearly, button control make it easier to operate the device;
- Available to support several mobile operators’ networks simultaneously;
- Low power consumption, low interference;
- Manual gain control, with 1dB step to attenuate the gain among the range of 31dB;
- Digital ALC technology, auto limit the output power to ensure stable signal coverage;
- Anti-interference technology, auto detect the isolation in real time. When isolation is insufficient, device will auto attenuate the gain, to avoid self-oscillation occurs to

interfere the base station;

- Uplink dormant function, when no mobile users in the coverage area, device will shut off uplink output, to save power consumption and not interfere the base station.

Connector Description



- A : Outside antenna connection port (N-female)
- B : Inside antenna connection port (N-female)

- C : 12V DC power connection port
- D : Power switch
- E : Grounding screws
- F : LCD display screen
- G : Menu Button
- H : Select and confirm button
- I : Value increase button
- J : Value decrease button
- K : Working status indicator

Operation and Display Description

a. Function Buttons on the Control Panel

MENU : Main Menu

SET: To select and confirm the operation

INC+: To increase the value

DEC-: To decline the value

b. Screen Display and Screen lock

After power-on and starting running, the main menu interface of the display screen shows the corresponding downlink frequency and gain of the working frequency band and the downlink input and output power (Figure 1) (the following operation instructions are for reference only, the specific frequency and gain are subject to the device); Long press "MENU" for 5 seconds + press "INC+" key to enter the lock screen (Figure 2), single-pressing the key is invalid. The device is working normally but the display screen does not display, then long press "MENU" for 5 seconds + press "INC+" key after unlocking the screen, you can operate and display normally after unlocking the screen (Figure 1).



Figure 1



Figure 2

c. Gain Attenuation Setting

Press “MENU” and select the band needed to adjust; Press “SET” 3 seconds until “Gain: DLxxdB” flashing(Figure 3), Press “SET” once more to specific setting of the uplink or downlink , then press “INC+” or “DEC-” to attenuate the gain(Figure 4 and 5). When the setting is finished and press “MENU” button to return to homepage.



Figure 3



Figure 4



Figure 5

d. Uplink Auto shut-off function

When there is no active users in the coverage area, the uplink will shut-off automatically. “Run” flashing (Figure 6).



Figure 6

e. Check real-time gain and power

Press the ‘MENU’ button to view the real-time gain (Gain) and input (Rssi) output power of the corresponding system (Figure 7).



Figure 7

f. Self-oscillation Elimination and Auto Shutoff Function

The device will auto detect the isolation in real time. When there is insufficient isolation between outside and inside antenna, the device will auto attenuate the gain to make it work normally (Figure 8, the “run” indicator is in orange). When severe insufficient isolation occurs, the “run” indicator is in RED (Figure 9). Then the device will be turned off, the direction and height of the antennas should be adjusted until there is sufficient isolation for device’s normal working.



Figure 8



Figure 9

Technical Specification

Model	Uplink (MHz)	Downlink (MHz)
EP20M5B	703~748/824~849/1710~1780/1850~1915/2500~2570	758~803/869~894/2110~2180/1930~1995/2620~2690

Item		Uplink	Downlink
	Gain	70±2 dB	75±2 dB
	VSWR	≤2	≤2
	Output Power	15 ± 2 dBm	20 ± 2 dBm
	ALC Active 10 dB	Δ ≤2 dB	Δ ≤2 dB
	Max. Input Power Without Damage	-10 dBm	-10 dBm
Intermediation Products(CW)	9 KHz~1 GHz	≤-36 dBm	≤-40 dBc
	1 GHz~12.75 GHz	≤-30 dBm	≤-40 dBc
Spurious Emission	9 KHz~1 GHz	≤-36 dBm	≤-36 dBm
	1 GHz~12.75 GHz	≤-30 dBm	≤-30 dBm
ATT step of 1 dB	1 ~ 10 dB	Δ ≤1 dB	Δ ≤1 dB
	10 ~ 20 dB	Δ ≤1.5 dB	Δ ≤1.5 dB
	20 ~ 31 dB	Δ ≤2 dB	Δ ≤2 dB
	Noise Figure@ max. gain	≤8 dB	≤8 dB
ACRR	5 MHz	≥ 20 dB	≥ 20 dB
	10 MHz	≥ 20 dB	≥ 20 dB
	EVM	≤ 8 %	≤ 8 %
	Time Delay	≤1.5 μs	≤1.5 μs
RUN LED Indication	Normal		Green
	Uplink idle		Green Flash
	shutdown (Mute)		Orange
	ISO derating work		Red
Alarm LED Indication	Stopped		Red
	Not Active	—	Green
	Active 5~10 dB	—	Orange
	Active 15~25 dB	—	Red
	SET Button	Select and Confirm	
	INC+ Button	Increase the value with 1dB step	
	DEC- Button	decrease the value with 1dB step	
LCD Indication	Band	Display Working Band and Frequency	
	Gain	Display of UL&DL Gain	
	Pout	Display DL output power	
	Work	Working normally: display, Uplink idle shutdown : no display	
	ISO	Working normally: no display; Auto degrading system gain: display; Self-oscillation Turn-off: display&flashing	
	ALC	Not active: no display; Active@5-10dB: display; Active@15-29dB: display&flashing	
	Uplink stand-by	Available	
Auto shut-off Functions	Self-oscillation shutdown	Available	
	Over input turn-off Function	Available	
	Over-heat protection	Available	
	Self-oscillation Elimination	Available	
	Link Balance Function	Available	
	Auto screen lights off	No operation within 3 minutes	

Item	Uplink	Downlink
Power Supply		DC: 12 V
Power Consumption		< 45 W
RF Connector		N-Female
Impedance		50 ohm
Environment Conditions		IP 40
Humidity		< 90 %
Operating Temperature		0°C ~ +50°C

Installation Guides

Installation Requirements

- 1) With stable and independent power supply.
- 2) No corrosive gas, smoke or liquid leakage.
- 3) Sun block and cool for device's safe running.
- 4) Easy for cabling and dissipation, safe and easy for maintenance.
- 5) Waterproof and under thunder protection.

Installation Tools

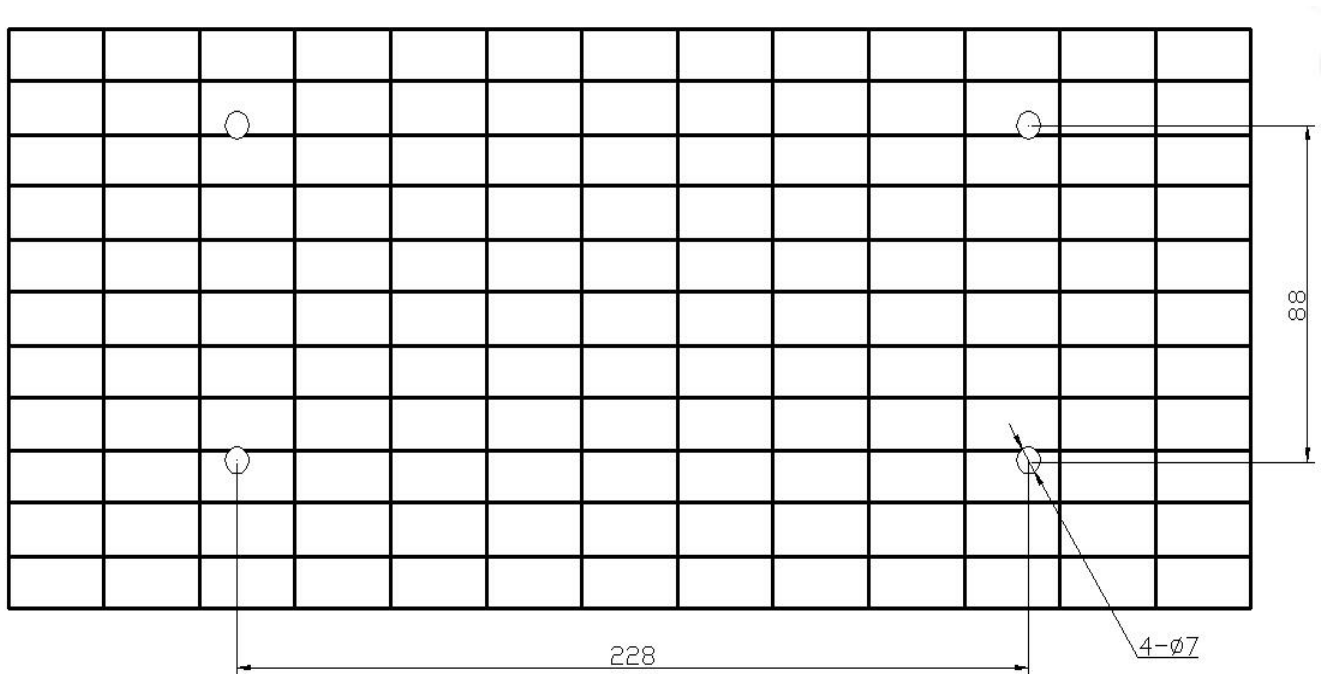
No.	Items	Quantity	Remarks
1	Percussion drill	1	Drill holes on wall, self-provided
2	Wrench	1	Reinforce the interface connection, self-provided
3	Mobile phone for testing	1	Test installation effectiveness, self-provided
4	Multimeter	1	Test voltage and wiring connection, self-provided
5	Screwdriver	1	Tighten or fasten the device, self-provided
6	Waterproof tape	A few	Prevent liquid from leaking into the feeder interface, self-provided

Installation Steps

The repeater should be installed on a solid and hard plane. The installation steps are as follows:

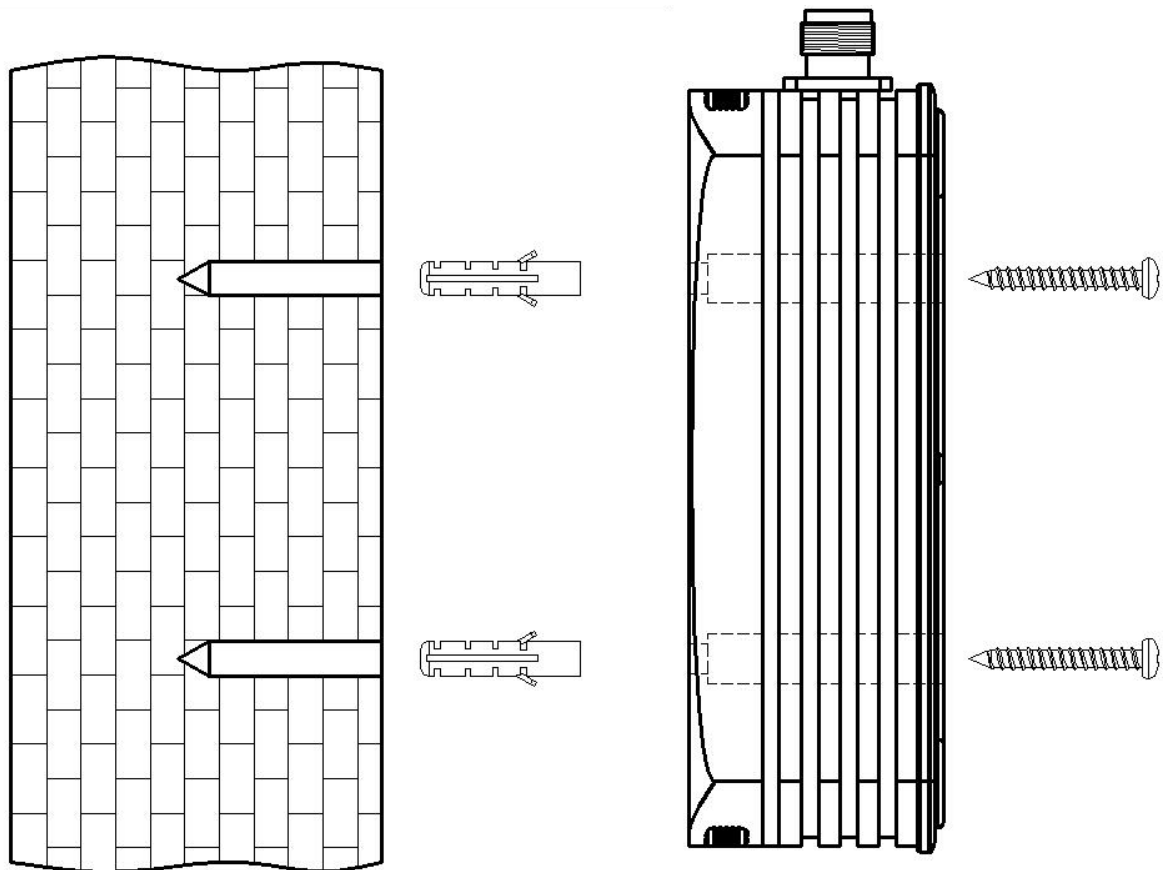
- 1) Find a suitable site according to the installation requirements and dimension of repeater.
- 2) Drill 4 holes with the percussion drill according to the installation holes. Sizes are 7mm.

The expected sites of the holes are as the following diagram.



3) Put the expansion pipes(size: 8mm) into the 4 drilled holes.

4) Align the fixing holes of the repeater with corresponding holes on the wall, and drive 4 M6*40 screws into the expansion plugs with screwdriver and fasten the repeater firmly.



Antenna Connection

Take suitable outside antenna and inside antenna according to the characteristic of the coverage area. Installation and connection of the antennas should follow the requirements as following:

- 1) The outside antenna should be installed at the place with the strongest signal and towards BTS.
- 2) The length of the cable, which connects the outside antenna and the repeater, should be less than 20 meters.
- 3) Wrap the waterproof tape around the connection part of the outside antenna and outdoor cable, in case of oxidization or corrosion.
- 4) The indoor antenna should be placed 5m above lower than the outside antenna, with its direction not towards the outside antenna.
- 5) It will be better if there can be a wall between outside and inside antennas.
- 6) Outside antenna should connect to BTS port of the repeater while inside antenna to the MS port.

Starting

- 1) If possible, please connect the grounding screws of the repeater and grounding of the electrified wire with cable.
- 2) Make sure the feeder cables between repeater and antennas are firmly connected.
- 3) Connect the DC plug of the 12V/3A power adapter to the DC+12V port of the repeater. Then put AC plug connecting to the nearby 120/220V power outlet.
- 4) Check if repeater can work normally or not, by checking the operation parameters on the screen, according to the guides of the previous "Operation and Display Description" part.
- 5) Test signal intensity and dialing quality with mobile phone in the repeater coverage area.

Maintenance and Repairing

Frequently Ask Questions and Solutions

Problems	Reasonable Causes	Solutions
Screen and indicator lights are off	Disconnected to power source	Check the power adapter and power outlet, and reconnect it

"Run" Indicator Red	Isolation between outside antenna and inside antenna is insufficient	Change the distance & direction of outside & inside antenna, until I.S.O is not flashing
Everything is okay after power-on, but no improvement in signal	The network of SIM card does not comply with that of signal repeater	Replace SIM card or repeater
	The inside antenna is not successfully connected	Fasten the connection of inside cable and connectors
	The inside antenna is damaged	Replace the inside antenna
Effectiveness of the repeater degrades after working for a while	The outdoor antenna is damaged	Replace the outside antenna
	The outside antenna get loose and is not towards the BTS	Change the direction of outside antenna and fasten it
	Feeder is damaged	Replace the feeder

Notes

Power-off is recommended in the following situations.

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

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