



## C20L Series Signal Booster

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

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## Package Content



C20L Signal Booster



5V 2A Power Adapter



Installation Screws



U-shaped Back Holder

## Product Description

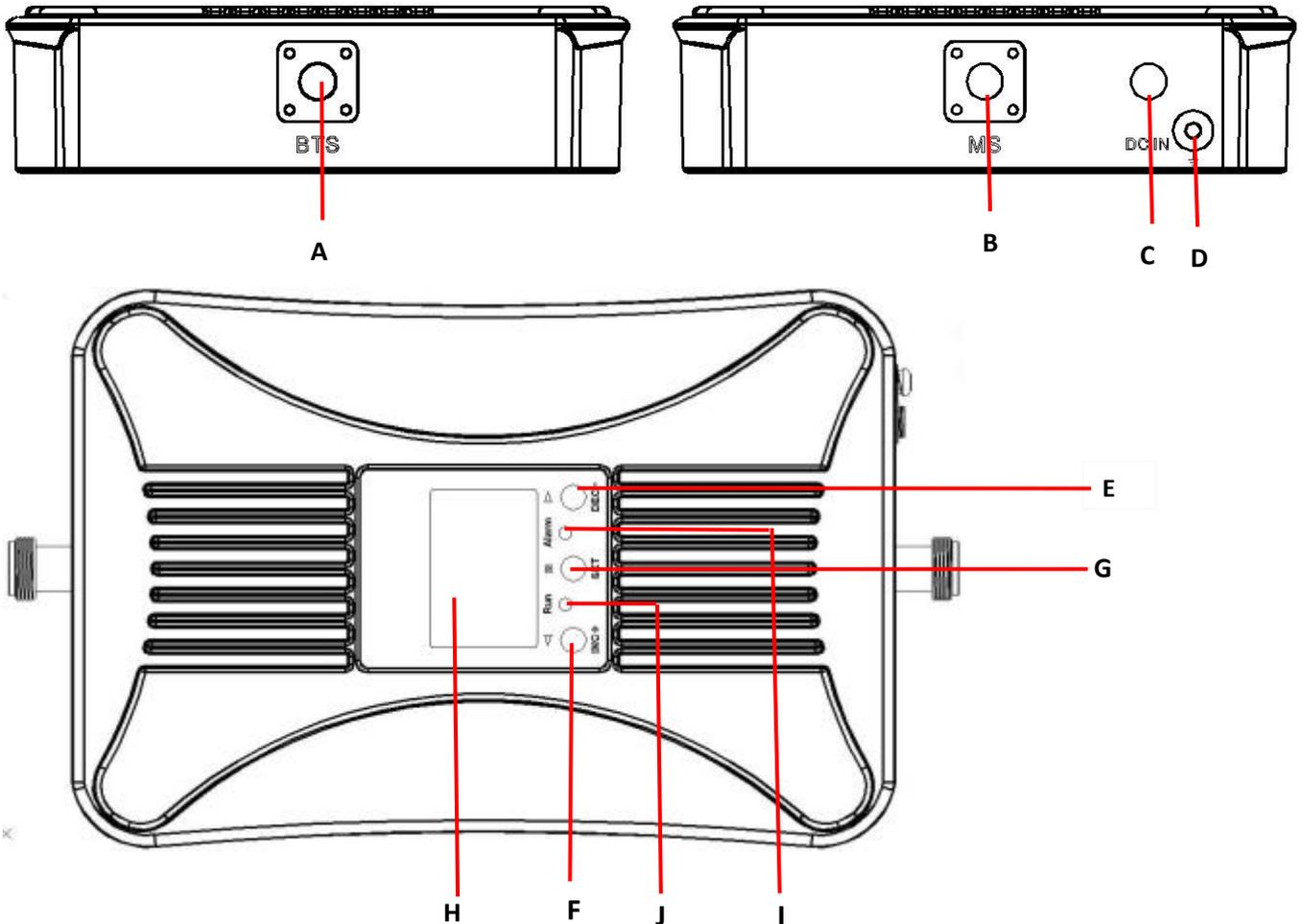
C20L series signal booster is highly intelligent. It is designed with digital ALC function, anti-interference function, and auto-adjustment function, to detect the real-time signal quality of the coverage area and adjust working status accordingly. The booster can automatically adjust the gain of uplink and downlink to maintain link balance, according to the intensity of receiving signal. When the isolation between outdoor antenna and indoor antenna is not enough, it will automatically decline the gain, to make the isolation enough to eliminate self-excitation. When there is no user in the coverage area, the booster will automatically shut down uplink signal output, to save power consumption and reduce the interference to BTS.

This C20L series signal booster, with features like novel appearance, succinct structure, easy installation and maintenance and supporting different frequencies with multiple models, is a perfect and optimal signal solution for coverage of houses, offices, elevators and basements, etc.

## Product Features

- Clearly show the status of device with display screen. Button operation makes it easier and more convenient to control
- Support amplifying multiple operators' network simultaneously
- Low power consumption, low interference
- Digital ALC technology, ALC could automatically limit the output power to ensure stable signal coverage
- Anti-interference technology, automatically detect isolation and eliminate self-excitation, to avoid interference to the BTS
- Manual gain attenuation, with 1dB step to attenuate the gain among 1-31dB range.

## Connector Description



- A : Connect to outdoor antenna (N-Female)
- B : Connect to indoor antenna (N-Female)
- C : DC 5V power connector
- D : Grounding screws
- E : Up arrow
- F : Down arrow
- G : Confirm key
- H : Display screen
- I : Alarm indicator light
- J : Working indicator light

## Operation and Display Description

### a. Function of control panel

INC+: Move downward

DEC-: Move upward

SET: Set up or confirm

### b. Screen Display

After power-on and start running, the screen of the device will display working frequency on the main menu, scrolling display the gain of uplink and downlink, output power of downlink, ISO and ALC alarm.



Pic 1



Pic 2

### c. View the Output Power

Press “SET” key and “Pout” on the screen will be light up , and real-time downlink output power will be displayed on the right side.

### d. View the Gain and Gain Attenuation Set-up

Press “SET” key, “Gain UL” on the screen will light up and uplink gain will be displayed on the right side (as shown in Pic 3).

Then press “INC+” or “DEC-” key to adjust uplink gain(as shown in Pic 4). Press “SET” key, “Gain DL” on the screen will light up and downlink gain will be displayed on the right side(as shown in Pic 5). Then press “INC+” or “DEC-” key to adjust uplink gain(as shown in Pic 6).



Pic 3



Pic 4



Pic 5



Pic 6

#### e. Uplink Auto Shut Down Function

When uplink input power is lower than -85dB(there is no phone being used in the coverage area), uplink signal output will be automatically shut down. And the “Work” on the left bottom will light off and LED indicator “RUN” will be flashing(as shown in Pic 7).



Pic 7

#### f. ISO Self-excitation Elimination and Auto Shut Down

The device will detect isolation in real time. And when the isolation between outdoor antenna and indoor antenna is not enough, the “I.S.O” on the middle bottom will light up and device will automatically adjust gain to make it work normally. When severe self-excitation occurs(the isolation between outdoor antenna and indoor antenna is lower than gain value, more than 15dB), signal output will automatically be shut down, in case the self-excitation causes interference to the BTS. Meanwhile, “I.S.O” on the middle bottom of the screen will be flashing.



Pic 8



Pic 9

## Technical Specification

Items	Uplink	Downlink	
Frequency Range	C20L-CDMA	824 ~ 849 MHz	869 ~ 894 MHz
	C20L-(E)GSM	(880) 890 ~ 915 MHz	(925) 935 ~ 960 MHz
	C20L-DCS	1710 ~ 1785 MHz	1805 ~ 1880 MHz
	C20L-WCDMA	1920 ~ 1980 MHz	2110 ~ 2170 MHz
	C20L-LTE7	2500 ~ 2570 MHz	2620 ~ 2690 MHz
	C20L-LTE20	832 ~ 862 MHz	791 ~ 821 MHz
	C20L-LTE28(A)	703 ~ 733 MHz	758 ~ 788 MHz
	C20L-LTE28(B)	718~748 MHz	773 ~ 803 MHz
Gain	65±3 dB	70±3 dB	
Ripple in Band	CDMA≤8 dB / EGSM≤15 dB / GSM≤8 dB / DCS≤10 dB / WCDMA≤6 dB / LTE7≤8 dB / LTE20≤15 dB / LTE28≤8 dB		
VSWR	≤2.0	≤2.0	
Output Power	15±2 dBm	20±2 dBm	
ALC Range	Δ   ≤2 dB	Δ   ≤2 dB	
Max. Input Power Without Damage	0 dBm	0 dBm	
Intermodulation Products(CW)	≤-40 dBc	≤-40 dBc	
Spurious Emission	9KHz~1GHz	≤-36 dBm	≤-36 dBm
	1GHz~12.75GHz	≤-30 dBm	≤-30 dBm
ATT	1 ~ 10 dB	Δ   ≤1 dB	Δ   ≤1 dB
	10 ~ 20 dB	Δ   ≤1.5 dB	Δ   ≤1.5 dB
	20 ~ 25 dB	Δ   ≤2 dB	Δ   ≤2 dB
Noise Figure	≤8 dB	≤8 dB	
PCDE (W)	≤ -35dB	≤ -35dB	
ACRR(W)	5MHz	≥ 20dB	≥ 20dB
	10MHz	≥ 20dB	≥ 20dB
EVM	≤ 8~12.5%	≤ 8~12.5%	
Time Delay	≤1.5 μs	≤1.5 μs	
RUN Indicators	Normal Working	ON & Green	
	Uplink Auto Shut Down	Flashing green	
	ISO Derating	Orange	
	Stop Running	Red	
Alarm Indicators	Not Active	—	Green
	Active 5~10 dB	—	Orange
	Active 15~25 dB	—	Red
SET key	Confirm setting and selection		
INC+ key	Move downward, with step of 1dB to increase		
DEC- key	Move upward, with step of 1dB to decrease		

	Items	Uplink	Downlink
LCD Indicators	Band	Display working frequency	
	Gain	Display gain of uplink and downlink	
	Pout	Display downlink output power	
	Work	Normal working: light up; Uplink shut down: light off	
	ISO	Normal working: light off; Derating: light up; Auto shut down for self-excitation: light up and flash	
	ALC	Not active: light off; Active 5-10dB: light up; Active 15-29dB: light up and flash	
LCD control		Gain	
Idle Shutdown	@Max. Gain, input uplink signal keep lower than -85dBm(idle threshold value) for more than 5 minutes, uplink PA OFF. When input uplink signal is more than -80dBm, uplink PA will auto be ON immediately.		
Real-time Self-excitation Elimination	When test the downlink and find it self-excited(isolation is lower than gain value), device will derate power; when it is severe self-excited(isolation is 15dB lower than gain value or more), device will be auto shut down.		
Auto Shut Down	When severe self-excitation occurs, it will be auto shut down(When isolation is beyond ALC range, PA of uplink and downlink will be OFF. Device will be auto restarted after 30±5s and will keep trying. If isolation is more than ALC range for 5 times, it will be permanently OFF until power-on again.		
Power Supply	DC: 5V		
Power Consumption	< 6 W		
RF Connector	N-Female		
IP Grade	IP40		
Operating Humidity	< 90%		
Operating Temperature	0°C ~ +50°C		

## Installation Guide

### Installation Requirements

- 1) Stable and independent power supply
- 2) No corrosive gas, smoke or liquid leakage
- 3) Sun block and good for heat dissipation
- 4) Easy for cabling, safe and easy for maintenance
- 5) Waterproof and under thunder protection

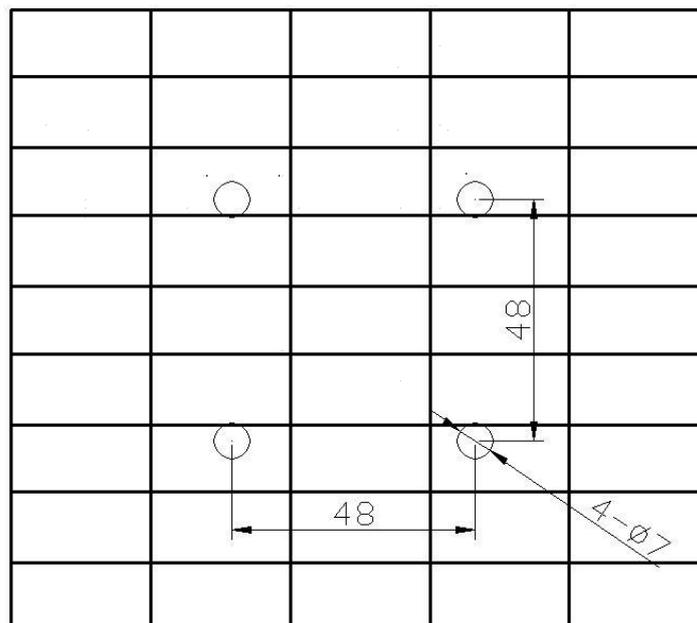
### Installation Tools

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

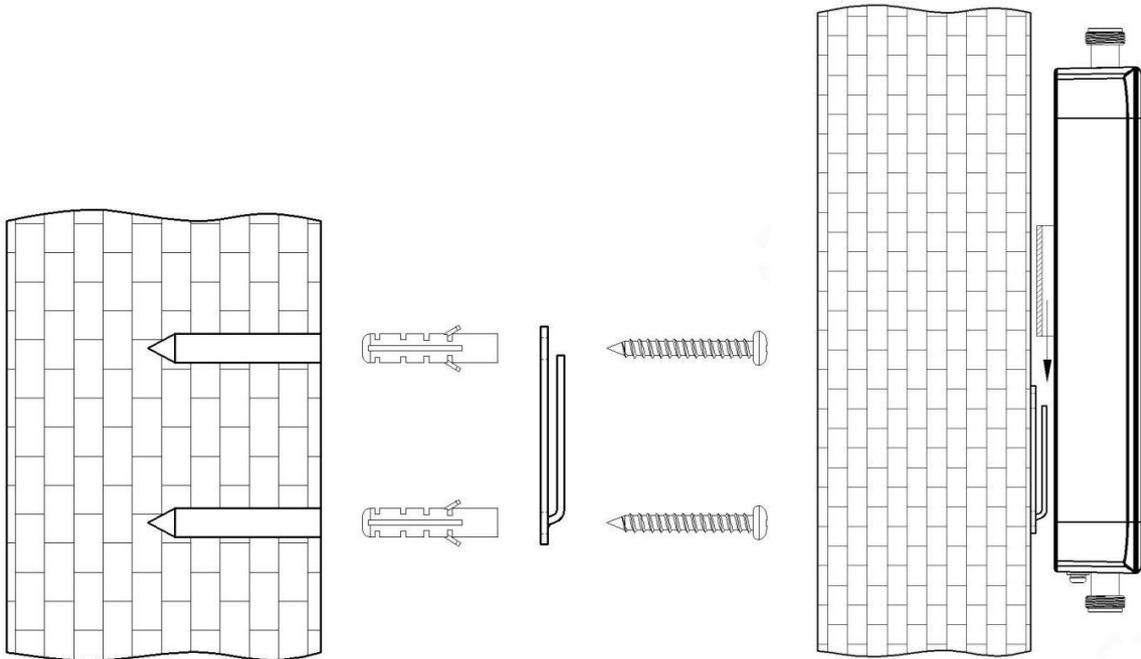
### Installation Steps

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, size and dimension of the booster.
- 2) Estimate and mark the site of U-shaped back holder installation holes. Drill holes with the percussion drill. Sizes are 7mm.



- 3) Put the expansion pipes(size: 8mm) into the 4 drilled holes.
- 4) As shown in the figure, align the fixing holes of the U-shaped back holder with corresponding holes on the wall, and drive 4 M6\*40 screws into the expand plugs with screwdriver and fasten the repeater firmly.



### Antenna Connections

Select suitable outdoor antenna and indoor antenna, according to the characteristic of the coverage area. Installation and connection of outdoor antenna and indoor antenna should follow the requirements as following:

- 1) The outdoor antenna should be installed at the place with the strongest signal and towards BTS.
- 2) The length of cable, which connect the outdoor antenna and the booster, should less than be 20 meters.
- 3) Wrap the waterproof tape around the connection between outdoor antenna and outdoor cable.
- 4) The indoor antenna should be 5m away from the outdoor antenna in height, and can't towards outdoor antenna.
- 5) It will be better if there can be a wall between outdoor and indoor antenna.
- 6) Outdoor antenna should connect to BTS port of the signal booster and indoor antenna to the MS port

## Starting

- 1) If it is possible, please connect the grounding screws of the booster and grounding of the electrified wire with cable.
- 2) Make sure the cables between booster and antennas are firmly connected.
- 3) Connect the DC plug of the 5V/2A power adapter, provided by supplier with the DC+5V port of the booster. And AC plug connects to the nearby 220V power outlet.
- 4) Check the signal booster can work normally or not, by checking the operation parameters on the screen, according to the “Operation and Display Description”.
- 5) Make a test with a phone to test the signal intensity and dialing quality in the coverage area.

## Maintenance and Repairing

### Common Problems 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
I.S.O on the screen flashes after power-on	Isolation between outside antenna and inside antenna is not enough	Change the distance and direction of outside and 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 is not comply with that of signal booster	Replace sim card or booster
	The inside antenna is not successfully connected	Fasten the connection of inside cable and connectors
	The inside antenna is broken	Replace the inside antenna
Working effectiveness get worse after working for a while	The outside antenna is broken	Replace the outside antenna
	The outside antenna get loose and not towards BTS	Change the direction of outside antenna and fasten it
	Feeder is broken	Replace the feeder

## Notes

Power-off is recommended in the following situations:

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

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