CDMA

GSM

DCS

PCS

WCDMA

GSM+DCS GSM+WCDMA CDMA+PCS Dual Band Mini Repeater

USER'S MANUAL

CE 0678 ! RoHS COMPLIANT

CDMA+PCS Repeater

MODEL NAME : WCR-101

FCC ID : OPJWCR101

[redacted]

Let Communication Easy!

Thank you ！

Thank you for choosing series Repeater. series Repeater can amplify the signal for mobile phone. Making you keep in touch with others freely even in the places with weak signal.

1. Summary

People usually use mobile phone for modern communication. But because of the shadow effect of the wireless transmissions and the buildings shielding effect on the electromagnetic wave when people enter some places, such as hotel, office building and underground supermarket, tunnel, parking lot and so on, mobile phone signal becomes weak even no signal so that people who enter those places would miss some information or business chances .

Series GSM+WCDMA, CDMA+PCS, GSM+DCS signal repeaters are very effective equipment that can offset the covering shortage of the base station of the mobile network, expand the coverage of the base station and fill the signal blind zone to ensure the convenient communication. According to different requirements, we develop dual band repeaters, such as 4100/6100/6200. and so on, the indoor coverage is 100㎡~600㎡.

2. Features

- Indoor coverage:100㎡.
- Beautiful ,Practical, Cost-effective and easy to install .
- High Q medium duplexer,medium filter and SAW filter,ensure system isolation.
- With ALC automatic control and reflection protection circuit,avoid accidentally damage.
- MLC output be adjusted to meet different situation's application.

3. Technical Index

Dual band repeaters, such as 4100/6100/6200 Technical Index

Test Item		Unit	Specification		Remark
			uplink	downlink	
Frequency Range	GSM 900+DCS 1800	MHz	890~915 1710~1785	935~960 1805~1880	
	GSM 900+3G/UMTS/ WCDMA 2100	MHz	890~915 1920~1980	935~960 2110~2170	
	CDMA 800+PCS 1900	MHz	824~849 1850~1910	869~894 1930~1990	
Rated Power		dBm	⩽10	⩽10	
ALC Control Range		dB	⩾20	⩾20	Output varies ± 1.5 or close and resume
Gain		dB	⩾40	⩾50	
MLC Adjusted Range		dB	10		Decrease level by clockwise adjustment
Inter-modulation Attenuation	DCS1800	dBc	⩽-40		Dual-Tone Spacing:0.6MHz
	PCS1900	dBc	⩽-40		Dual-Tone Spacing:0.6MHz
	3G/UMTS/WCDMA	dBc	⩽-40		Dual-Tone Spacing:5MHz
In-band Fluctuation		dB	⩽3@ WCDMA		
		dB	⩽5@ DCS PCS		
Noise Figure			⩽6		Max Gain
Port VSWR			⩽1.5		Electrifying Test
Group Delay		μS	⩽5		
Voltage	AC	V	110~220		
Working Temperature		℃	-25~+55		
Impedance		Ω	50		

4.1 Standrd Accessories

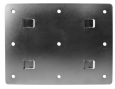
A.Cell phone Repeater

QX-004H
B.Outdoor Directional Antenna Gain:9dBi
(806-960MHz 1700-2500MHz)

QX-001B
C.Indoor Omni Directional Antenna
Gain:2dBi (1920-2170MHz)
3dBi(824-960MHz)

QX-008C
D. 10m Cable to connect with outdoor antenna

QX-007C
E. 5m Cable to connect with indoor antenna



QRA-02
F. Bottom base

4.2 Optional Accessories

QX-008B
A. Two-way Microstrip Power Splitter

QX-004B
B. Indoor directional Antenna
Gain:8dBi(800-960MHz)
9dBi(1700-2500MHz)

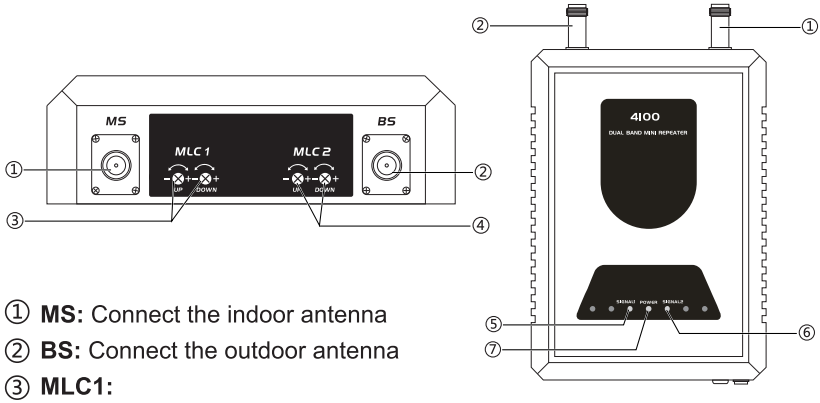
QX-001B
C.Four-way Microstrip Power Splitter

QX-014B
D. Coupler Microstrip Power

QX-002B
E.Indoor Directional Antenna
7 dBi(824-960MHz)
9 dBi (1710-2500MHz)

Note: Choose to buy low- waste cable and high gain indoor antenna to increase the signal.

5. Getting Acquainted



① **MS:** Connect the indoor antenna

② **BS:** Connect the outdoor antenna

③ **MLC1:**

UP:CDMA/GSM uplink gain adjustment switch,factory default is MAX level output.Decrease output level by clockwise adjustment.Details as Page 7 "Frequently Asked Questions".

DOWN:CDMA/GSM downlink gain adjustment switch,factory default is MAX level output.Decrease output level by clockwise adjustment.Details as Page 7 "Frequently Asked Questions".

④ **MLC2:**

UP:DCS/PCS/3G uplink gain adjustment switch,factory default is MAX level output.Decrease output level by clockwise adjustment.Details as Page 7 "Frequently Asked Questions".

DOWN:DCS/PCS/3G downlink gain adjustment switch,factory default is MAX level output.Decrease output level by clockwise adjustment.Details as Frequently Asked Questions

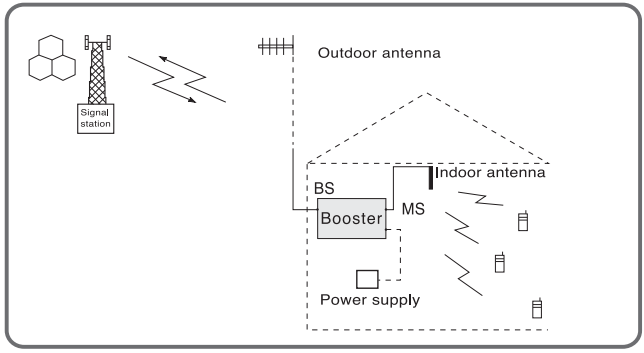
⑤ **SIGNAL 1:** DCS/PCS/3G signal indicator. Light on means the installation is in good condition.Light off means you should change installation position, direction until light on.

⑥ **SIGNAL 2:** CDMA/GSM signal indicator. Light on means the installation is in good condition.Light off means you should change installation position, direction until light on.

⑦ **POWER:** power indicator.Light on when power is on and light off when power is off.

6. System Connected Graph

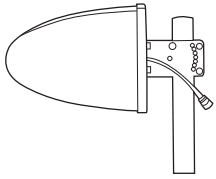
As shown in the folowing graph, the indoor coverage system, which is suitable for the small and simply-layout indoor space, meet the coverage demand through the indoor antenna.



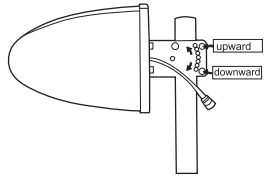
Note: Please well connect the indoor and outdoor antennas before switching on.

7.1 STEPS TO INSTALL

1). Installation of outdoor antenna



Picture 1:



Picture 2:

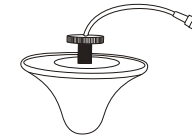
a.Please install the antenna as per the direction indicated on "UP" mark. Make sure that the plug hole is downward to drain off water.

b.Horizontally install the antenna with two supplied "U-shape" iron clip to the fitted location (refer to picture 1).

c.If the antenna need to lean downwards or upwards, use one "U-shape" iron clip to fix the antenna as per specified needs.(refer to picture 2)

2). Please install the indoor antenna in the center of the area you want to

cover. Drill a through-hole (Φ20) on the ceiling or any location to install. Lead the cable into the hole and then fasten the antenna with the supplied screw support board.



Picture 3:

3). Installation of repeater

a. Fix the bottom base of the repeater on the fitted place(normally wall or pillar, 2 meters over the ground for protection). Install the repeater into the bottom base.

b. Connect the BS port and the outdoor antenna with the 10-meter cable. And then, with 5-meter cable, connect the MS port with the indoor antenna.The wrong connection for BS/MS port will cause damage and not allowed.

c. Plug in the power supply. (If the signal is good, then the power indicator lightens green and meanwhile signal indicator lightens green or twinkles. If the signal indicator does not light, you can adjust the direction of the outdoor antenna to have the signal indicator lighten.) Take a mobile phone to test the signal in every conner of the room. If the received signal reaches level 3-4(level 5 is full), it is good and can communicate well. If the signal is not good after adjusting the outdoor antenna, you need to use repeaters of bigger coverage, such as AT-6100/6200 dual band repeater.

7.2 Notes for Installation

A.In order to avoid the interference, the indoor antenna should be installed away from the outdoor antenna at least 5 meters.

B.Make sure the indoor antenna is installed at least 2 meters above the ground and correctly installed on the ceiling. Keep the antenna axial vertical with the ground. Place it in a right position to ensure mobile phone signal can be distributed to all the corners.

C.Make sure all the interfaces seal by waterproof of adhesive tape, to protect the signal coverage range from oxidation by damp.

D.In order to reduce the wastage and strengthen the signal coverage range, during installation, the cable should be shorten as soon as possible.

E.Set the safe direction and position with the strong signal on the top of

the building or surroundings to install the outdoor antenna. It would be better to set it in a place which is nearby indoor GSM cell phone repeater by keep away from barrier especially high frequency aerial & metal net, high voltage cable etc. to prevent it from lightning strike.

F. Adjust the outdoor antenna to make sure the repeater receive the strongest signal. You should know clearly the base station location at first.

G. Make a loop in the cable, to avoid the water filters into the GSM cell phone repeater through the cable resulting in short circuit.

8. Frequently Asked Questions

Mini Repeater System Self-oscillation

a.The reason of self-oscillation phenomena:the insolation degree of antenna is not enough.

b.There are two methods to overcome the self-oscillation phenomenon. One is to enlarge the isolation degree between indoor and outdoor antenna, the engineering mainly has the following methods to increase the isolation;

1) Enlarge the horizontal and vertical distance of indoor / outdoor antenna

2) Add barriers for indoor / outdoor antenna , such as the shielding net.

3) Enhance the direction of outdoor antenna, such as paraboloid antenna.

4) Utilize landform and building to enhance isolation degree.

The second is to reduce the gain of the repeater

If you can't used above methods to solve self-oscillation, you can reduce repeater gain. customers can remove the MLC nut, then adjust with a flat screwdriver. Factory default of gain is maximum, adjust clockwisely to reduce gain, there are 270° /10dB gain to adjust,each 27° adjustment is 1dB reduction.After adjustment, nut must be fix tightly again Adjustment of uplink and downlink must be in synchronism, for example,adjustment of GSM uplink is 5dB,corresponding downlink adjustment is 5dB.

In addition, equipment failure,poor connection of cable joints which cause high SWR,it also will cause self-oscillation. But generally situation

occurs barely.In the installation project,self-oscillation is mainly caused by small isolation degree of antenna and feeding system.The simple way to judge whether the device has self-oscillation:connect 50Ω load to MS and BS port of repeater,It is ok that level displayed -28dB, or else the repeater exists self-oscillation.

Frequently Soft Hand-off("ping-pong" phenomenon)

It mainly indicates that in the mini repeater coverage area, mobile phone users have been switched repeatedly among two or more pilot frequencies of base station,and usually connect into many base stations at the same time.The reason is the mini repeater antenna are installed improperly;indoor antenna has been installed in the area where the coverage of base stations overlaps,and receives pilot frequency signals from many base stations,the signals have similar intensity and alternately reign, The signal intensities of pilot frequency are still similar after relayed by mini repeater,and it causes mobile phone to frequently switch among many base stations in the coverage areas,it named "Ping-Pong" phenomena.

When the difference of signal intensity of each pilot frequency is less than 3dB,mobile phone connects to two or more base stations at the same time, which makes system control load to excess or cause over loading. It will increase the possibility of communication cutting and decrease the capacity of base station system. This kind of situation usually presents in mountainous areas, highlands and the city zone with buildings crowed. In order to avoid the *Ping-Pong* phenomena, mainly adopt the following measures in project.

a.Change the installation location of outdoor antenna and direct outdoor anetnnas at a base station until get a stable pilot frequency with strong field intensity;

b.Change the installation position of mini repeater; Don*t select the spot in coverage boundary of a certain base station to avoid interference from the adjacent base station;

c.Select strong directional outdoor antenna, such as high gain&big caliber paraboloid antenna.

WARNING:

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipments.

In order to comply with RF exposure requirements, a minimum distance of 150 cm must be maintained between the antenna and all persons