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Technical User Manual Full Duplex Pre-Amplifier

WCB Series

« Dual Band »



JDTECK.COM

Mechanical Specifications

Input / Output Port	N-Female
Impedance	50 Ω
Dimensions (W x D x H)	135 x 125 x 36mm
Weight	≤0.7Kg (1.5 Lbs)
Operating Temperature	-10°C ~ 50°C
Environment Conditions	IP40
Switching Adapter	Input AC 90~265V, Output DC 9V / 3A
Power Consumption	12 Watts

Frequency Specifications

Model	WCB-819-NF-35	
FCC ID	SQXWCB-819	
Filter Bandwidth	GSM & CDMA 25MHz PCS 60MHz DCS 75MHz WCDMA 60MHz LTE 11MHz	
Output power	Downlink ≥0dBm	Uplink ≥20dBm
Max. Gain	≥35dB	≥35dB
Noise	-	≥7dB
AGC Range	≥10dB	
V.S.W.R	≤2.8	
Group Delay	≥ 1.5μs	
Frequency Stability	≤0.01ppm	
LED Alarm Status	Standard	
Power LED	Power Indicator	
ALC LED	Orange @ ALC 1~5dB, Red @ ALC 15dB~20dB	

Model Specifications

Classification	Bandwidth Range (MHz)
A. Frequency Range CDMA / TDMA / AMPS / GSM 850 PCS / CDMA / GSM / GPRS 800 / 1900Mhz	DL - 869-894 / 1930-1990 UL - 824-849 / 1850-1910
B. Frequency Range (GSM / DCS) 900 / 1800Mhz	DL - 935-960 / 1805-1880 UL - 890-915 / 1710-1785
C. Frequency Range (GSM / WCDMA / UMTS) 900 / 2100Mhz	DL - 935-960 / 2110-2170 UL - 890-915 / 1920-1980
D. Frequency Range CDMA / TDMA / PCS / CDMA / GSM / GPRS / AWS 1900 / 1721Mhz	DL - 1930-1990 / 2110-2155 UL - 1850-1910 / 1710-1755
E. Frequency Range AWS 1700 / 2100Mhz	DL - 2110-2155 UL - 1710-1755
F. Frequency Range (WCDMA / UMTS) 2100Mhz	DL - 2110-2170 UL - 1920-1980

Terminology

Meaning

AGC	Automatic Gain Control
BTS	Base Transmitting Station (Cell Tower)
CDMA	Code Division Multiple Access
dB	Decibel – (A unit of measure for signal strength)
DL	Downlink (Communication channel from cell tower to mobile device)
Donor	Outdoor Antenna (Antenna that donates an input signal)
GSM	Global System for Mobile Communications
iDEN	Integrated Digital Enhanced Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LTE	Long Term Evolution
MS	Mobile Station
PCS	Personal Communication System
RF	Radio Frequency
UL	Uplink (Communication channel from mobile device to cell tower)

User Warnings – MUST READ!



1. This amplifier must ONLY be used for the purpose it was intended for. Making any alternations to the design layout without first consulting with a trained technician can result in interference to the operator's network and liability by the end user.



2. Please read this entire manual carefully before using this product!



3. Only the power supply that came with the amplifier should be used at all times. It is highly recommended that the repeater is grounded and lightning protection used.



4. Do not attempt to open any part of the amplifier. This will void the warranty and can cause an electric shock. Electrostatic can also cause damage to the internal components.



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



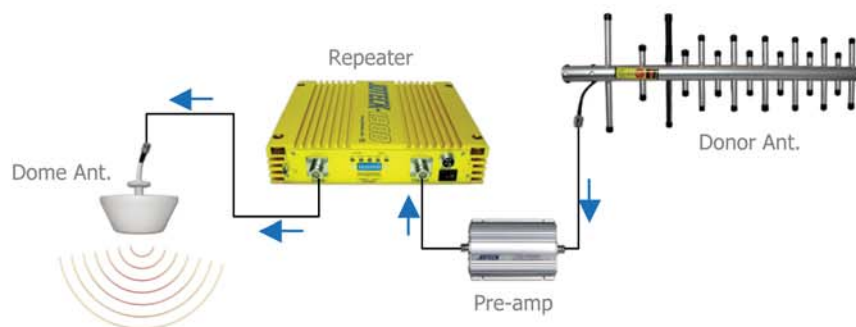
6. Do not place or mount the amplifier in a location that is exposed to the elements. This will void the warranty and can cause an electric shock.

1. Introduction

The WCB Series Pre-amplifier from JDTECK was designed to work in tandem with a cellular repeater for applications where the donor signal reaching the cellular repeater is very weak. This results in poor system performance and a reduced coverage area.

Poor input signal can be the result of distance from the cell tower, obstructions affecting a good line of sight to the cell tower or an excessively long coaxial cable coming from the donor antenna. Using a pre-amplifier will help eliminate the effects of this problem by first filtering and then amplifying the signal before it gets into the cellular repeater.

The WCB Series Pre-Amplifier is designed to be installed between the donor antenna and the cellular repeater.



Another benefit of the WCB Series pre-amplifier is that it can help to increase the uplink power level of the repeater going back to the BTS or cell tower. This helps improve the stability of the signal and also reduces call drops when deployed very far from a cell tower.

The WCB Series Pre-amplifier is also equipped with an alarm monitoring feature. This circuit monitors the uplink gain of the repeater when coupled with the pre-amp to ensure it operates within safe limits. There is also an automatic gain control feature on the pre-amplifier which allows it to adjust to the environment automatically.

The pre-amplifier is supplied with N type female input / output RF connectors and is available in a 35dB gain or 15dB gain model. An optional model with SMA type female connectors is also available.

5. Troubleshooting

Q1. Why is there still no signal after installing the equipment?

Answer:

1. Check the power source of the amplifier and repeater.
2. Check the connector of outdoor antenna is tight or not.
3. Check the connectors of RF cable are tight or not.
4. Check the outdoor signal is strong enough or not.
5. Check to make sure the antenna is installed correctly.
6. Check the connector of indoor antenna is tight or not.
7. Check the cable type is suitable or not.

Q2. Why the signal strength is too weak on the edge of area?

Answer:

1. Check the outdoor signal and antenna direction.
2. Check repeater is full gain or not.
3. Check all of the connectors are tight.
4. Change the location of outdoor/indoor antenna.
5. Check the cable type is suitable or not.
6. Deploy more indoor antennas.

Q3. Why can't I make a call after installation, even though I can detect a signal?

Answer:

1. Check LED status of repeater to make sure alarms are green.
2. Change the location of outdoor / indoor antenna.
3. Reduce the UL gain of the repeater.

Q4. The signal is not stable after turning on the system.

Answer:

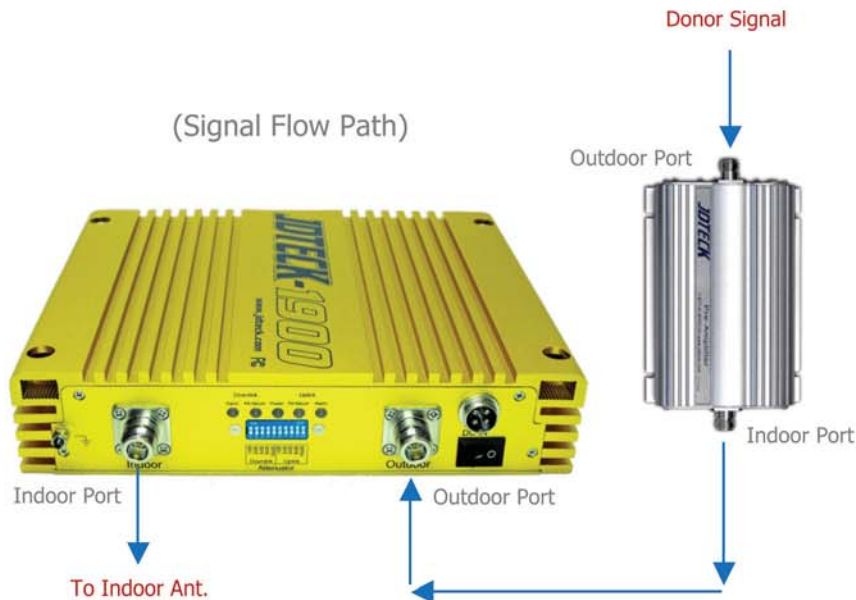
1. Check to see if the outdoor signal is stable or not.
2. Check the location of the donor antenna. Too close to other antennas.
3. Check the RF cable is broken or not and has no coils.
4. Confirm direction of donor antenna in relation to cell tower.

Q5. Why is the LED on the front of the repeater not lit?

Answer:

1. Check the power source is normal or not.
2. MUTE feature is active. Attenuate gain of repeater and cycle power.

3. Installation ~ Cont.



4. LED Operation Status

There are 3 LED's located on the side panel of the pre-amplifier. One is for the Power LED and two are for the Alarm LED's. (Dual Band Model) For triple band line amplifiers, there are 4 LED's.

If the alarm status is RED that means the uplink power of the system is too high. To adjust this, you need to attenuate the uplink gain of the cellular repeater in 2dB increments till the LED turns green.

If the alarm status on the repeater is RED or Amber, you will need to attenuate the downlink gain of the repeater to get the alarm to go green.

After you have made any adjustments, please monitor the alarm LED for a minute or so to ensure the alarm status is a steady green and not flickering to RED. If it is flickering, then you need to add more attenuation.



Note: If the pre-amplifier is switched off while connected to the repeater, it will not pass the RF signal coming from the donor antenna.

2. Features & Functions

- ✓ Sleek attractive housing
- ✓ LED indicators to monitor environmental status
- ✓ Supports all technologies including, GPRS, HSDPA, UMTS & LTE
- ✓ Low power consumption
- ✓ ALC function. (Auto Limit Control)
- ✓ AGC function. (Automatic Gain Control)
- ✓ Heat Sink cooling fins to dissipate heat quickly and efficiently



2. Features & Functions – Cont.

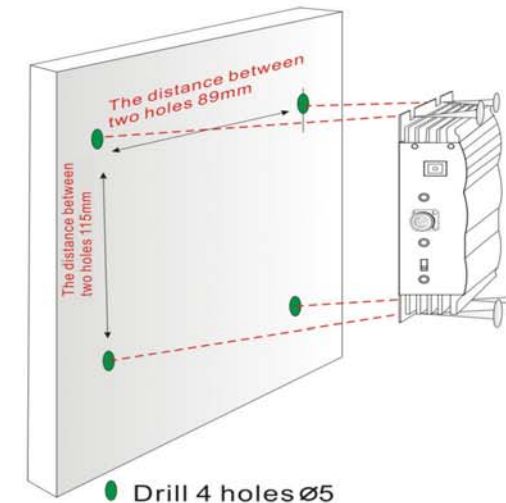


(Optional SMA Model Type)

3. Installation Procedure

The WCB Series pre-amplifier must be installed between the donor antenna and the cellular repeater. Do not install on the indoor side of the repeater.

Installing this amplifier in a temperature controlled environment or any location where there is good ventilation free of moisture or any other heat source is recommended. An AC power source will be required to power the unit. The location you choose for the amplifier should allow you to easily monitor the active LED's on the side panel.



1. Align pre-amplifier to the position you have selected for it. Double check your distance between the pre-amplifier and the repeater to ensure your jumper cable mating these two devices is long enough.
2. Mark the position, drill holes for the mounting screws and affix in position.
3. Connect RF cables and power cables to the pre-amplifier respectively. The donor antenna coax must connect with the "Outdoor" port of the pre-amplifier, whereas the "Indoor" port of the pre-amplifier must connect with the "Outdoor" port of the repeater.
4. After installing the pre-amplifier as described as above, power on the pre-amplifier and cellular repeater to check the LED operation status.