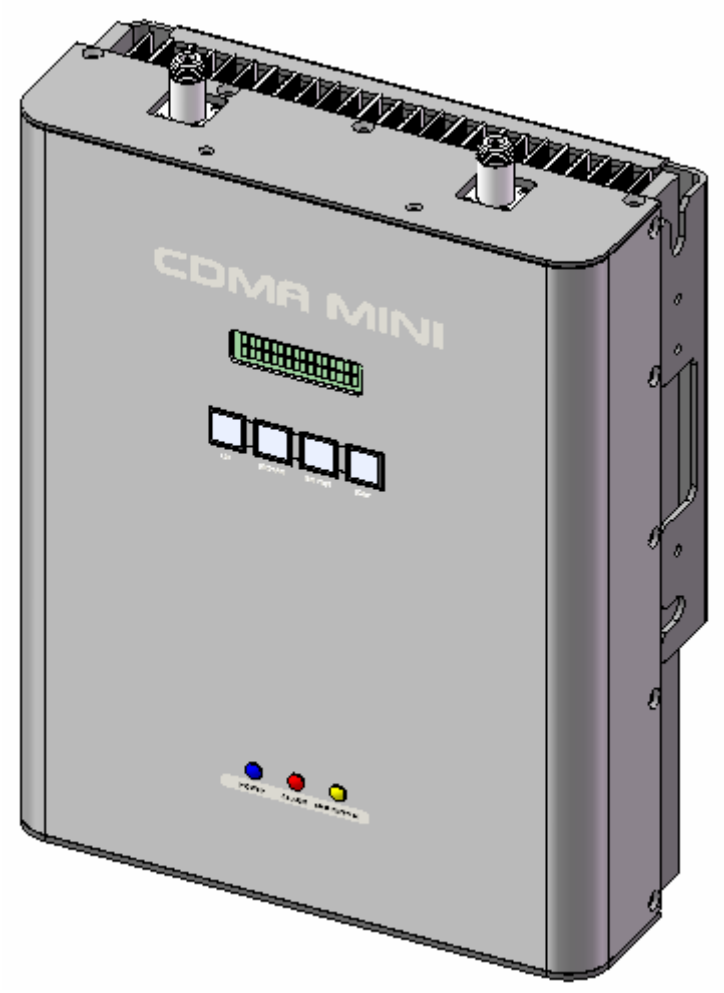
CDMA MINI

(RSN-CDMA-23)

User's Manual



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Notice

This document describes the specifications, installation, and operation of the CDMA repeater.

Hardware and software mentioned in this document are subject to continuous development and improvement. Consequently, there may be minor discrepancies between the information in the document, performance, and design of the product.

Specifications, dimensions, and other statements mentioned in this document are subject to change without notice.

Questions or Comments

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Website: www.r-tron.com

Safety Precautions

Warning ⚠

Opening the CDMA equipment could result in electric shock and may cause severe injury.

Warning ⚠

Connect the equipment frame ground to building ground.

Warning ⚠

Operating the CDMA with antennas in very close proximity facing each other could lead to severe damage to the repeater.

Caution ⚠

RF EXPOSURE INFORMATION

A minimum separation distance of 7.9 inches (20cm) must be maintained between the user and the external antenna of repeater to satisfy FCC RF exposure requirements. For more information about RF exposure, please visit the FCC website at www.fcc.gov

Caution ⚠

This equipment is for indoor use only and enables the communication wiring to communicate only inside the building.

Glossary

The following is a list of abbreviations and terms used in this manual.

Abbreviation	Definition
AC	Alternating Current
ANT	Antenna
ATT	Attenuator / Attenuation
CDMA	Code Division Multiple Access
DC	Direct Current
DL	Downlink
GND	Grounding
GUI	Graphic User Interface
LED	Light Emitting Diode
PLL	Phase-locked loop
PSU	Power Supply Unit
RF	Radio Frequency
RSSI	Received Signal Strength Indication
TEMP	Temperature
UL	Uplink
VSWR	Voltage Standing Wave Ratio

ALC (Automatic Level Control)
ALC feature prevents the repeater from exceeding its maximum output power by reducing the gain automatically. ALC is used to adjust the gain to an appropriate level for a range of input signal levels.

ASD (Automatic Shutdown)
Automatic shut down protects the repeater from the oscillation or excessive input signal and eliminates any degradation to the network.

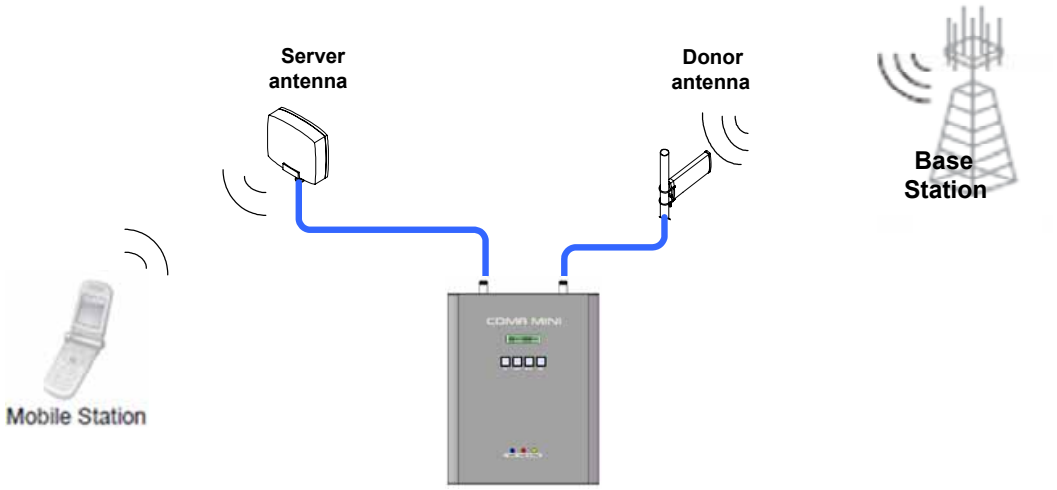
There are three parameters: **ASD Level**, **ASD Time**, and **ASD Iteration**.

If the output power gets higher than "**ASD LEVEL**", the repeater will shut down for "**ASD TIME**" seconds and then it will turn the amp back on to measure the output power again. If this repeats at "Iteration" times, the repeater will shut down completely.

1. Introduction

CDMA MINI is used to fill out areas in CDMA mobile systems, such as base station fringe areas, business and industrial building, etc.

CDMA MINI receives signals from a base station, amplifies and retransmits the signals to mobile stations. Also it receives, amplifies and retransmits signals in the opposite direction. Both directions are served simultaneously with the following features:



CDMA's Key Features

♦ Programmable Bandwidth and Band
» 5, 10, and 15 MHz contiguous and non-contiguous segments
» Any Band Combination within 65MHz PCS Band [A,D,B,E,F,C,G]
» Two (2) 5MHz segments
♦ Easy and Quick Installation
» Web-based GUI
» Plug and Play - DHCP Server @ Local Port
» Automatic Easy Setup (Recommended)
» Isolation Detection
♦ Auto Level Control & Auto Shut Down

- CDMA MINI utilizes the web-based user interface and web server. There is one physical RJ-45 port:

• The Local port provides the on-site access to the repeater.

- DHCP server at the Local port enables Plug and Play by automatically assigning the IP address to the user's computer.

• Easy Setup has the following features.

-It will measure the isolation and limit the maximum gain accordingly. This will also enable Auto Level Control as well as Auto Shut Down. These two features are strongly recommended to prevent the uncontrolled power output, which could have an adverse impact on the RF network and the repeater. For example, ALC will automatically apply attenuation when the input signal strength is increased due to the new base station deployment near the repeater site.

3. Hardware Installation

The installation procedure is as follows:

- Check List of Items
- Mounting
- Grounding
- RF Cable Connection
- Power On

3.1 Check List of Items

Index	Items	Quantity
1	Repeater	1
2	AC-DC Adaptor	1
3	UTP Cross LAN Cable	1
4	AC Cord	1
5	Anchor Bolts	4
6	CD of the User's Manual	1
7	Quick Guide	1

Item Figure

Repeater

AC-DC Adaptor

UTP Cross LAN Cable

AC Cord

Anchor Bolts

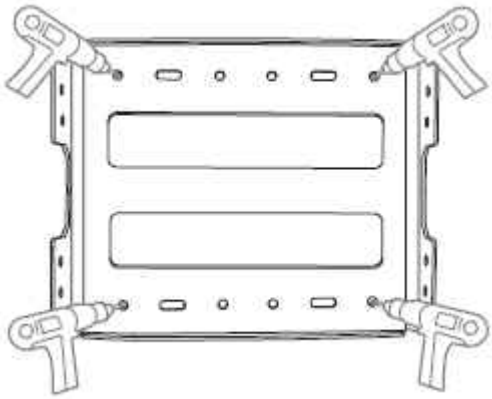
CD of the User's Manual

Quick Guide

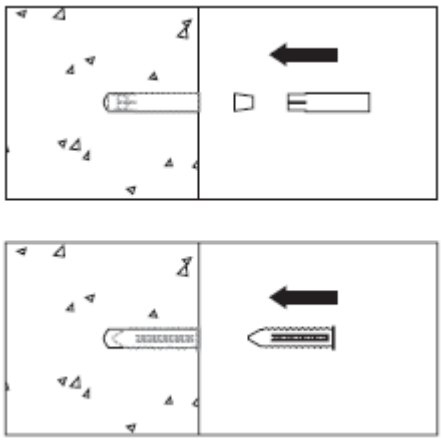
3.2 Mounting

CDMA MINI is easy to mount using the assembled mounting bracket, which has 4 holes for the provided 5/16" fixing screws.

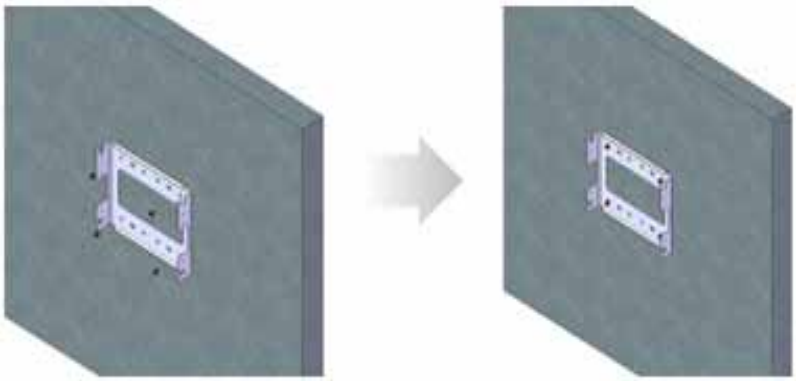
Step 1 : Drill holes directly through the template.



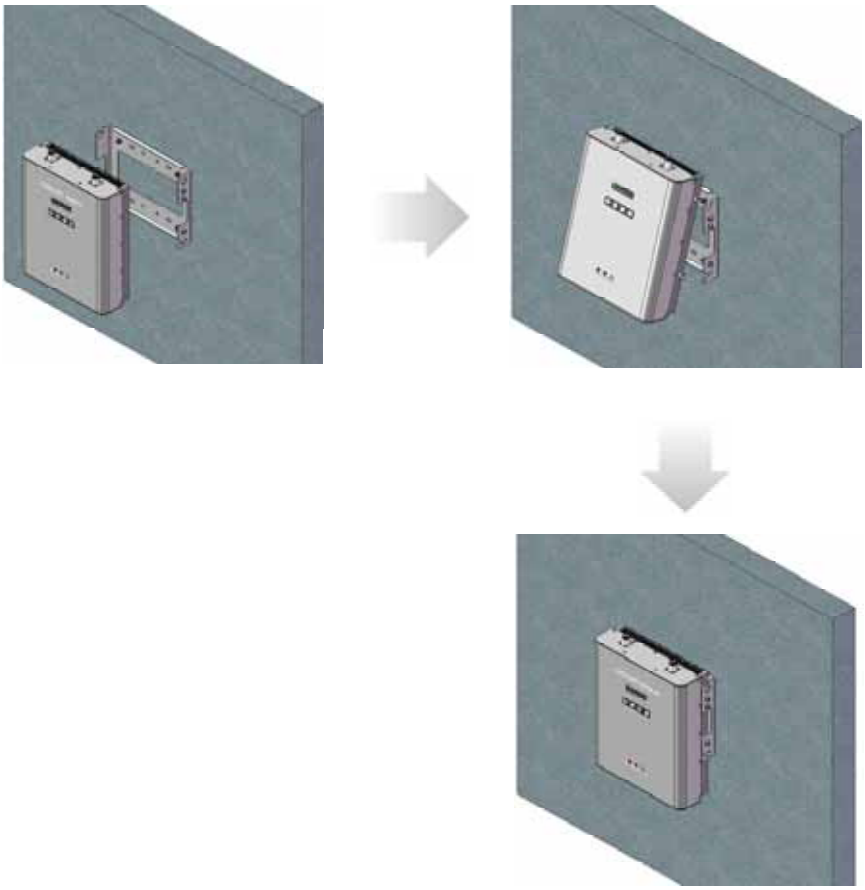
Step 2 : Install the set anchor bolts or the plastic anchor bolts on the holes.



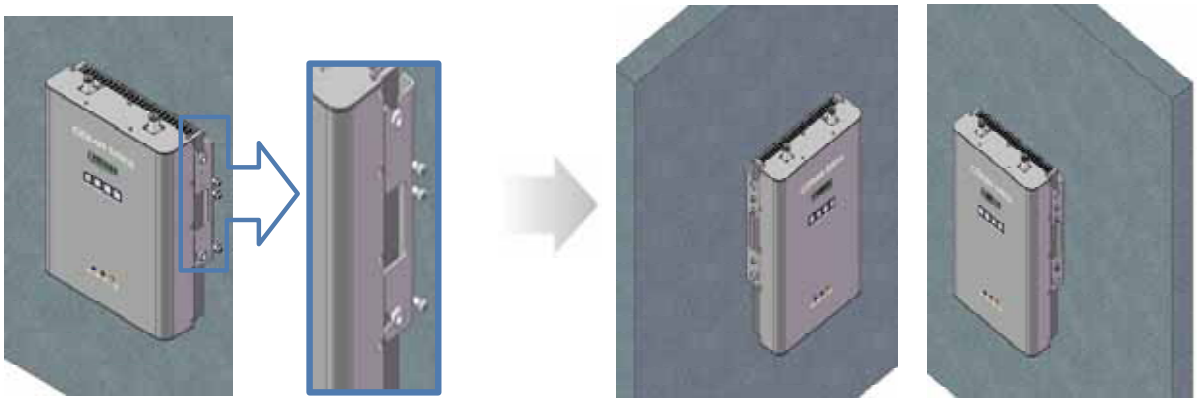
Step 3 : Attach the mounting bracket to the wall using provided bolts or extra screws.



Step 4 : Lean the CDMA to hang the topside of the Guide Ring on the mounting bracket, and push toward the wall to mount.

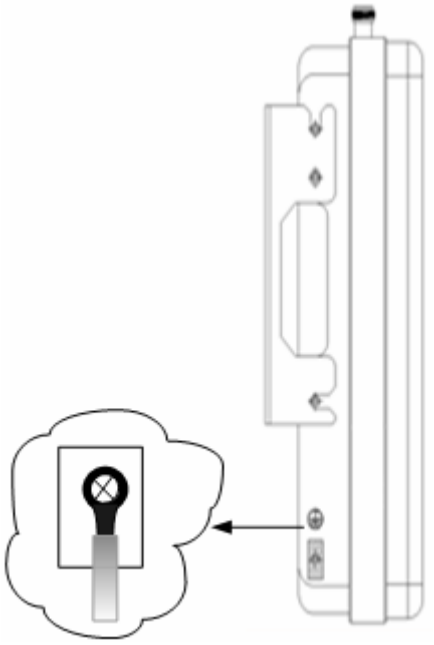


Step 5 : Fix the CDMA MINI using 8 screws.



3.3 Grounding

A rod on the left side is intended for a building ground. Connect the ground cable to the rod.



Warning

Dangerously high voltages may occur and damage the equipment if the equipment is not grounded properly.

3.4 RF Cable Connection

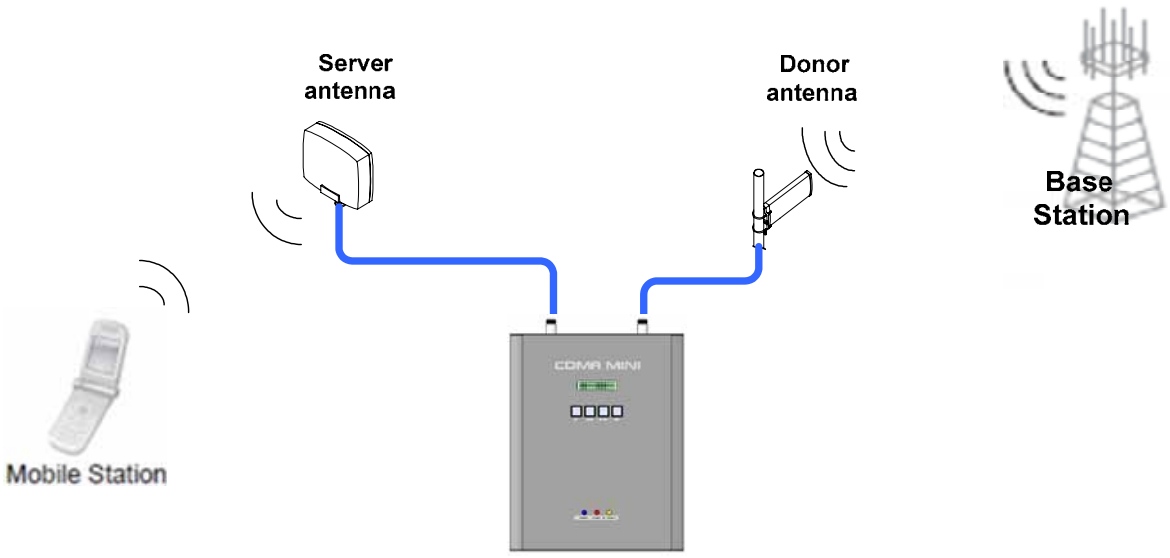
Step 1 : Connect a cable from a donor antenna to the Donor Antenna Port.

Step 2 : Connect a cable from a repeater's service antenna to the Server Antenna Port.

> **Warning** DO NOT connect or disconnect the coaxial cable while the power is on.

> **Note**
>
> **Enough isolation?**
> Antenna isolation = Path loss between the server antenna port and the donor antenna port
> Antenna isolation ≧ Repeater max. gain +15dB
> If antenna isolation < Repeater max. gain +15dB → System oscillation or Low gain

Model	Max Gain	Minimum required isolation (@Max Gain)
CDMA MINI	50dB to 80dB	≥95dB(80dB+15dB)

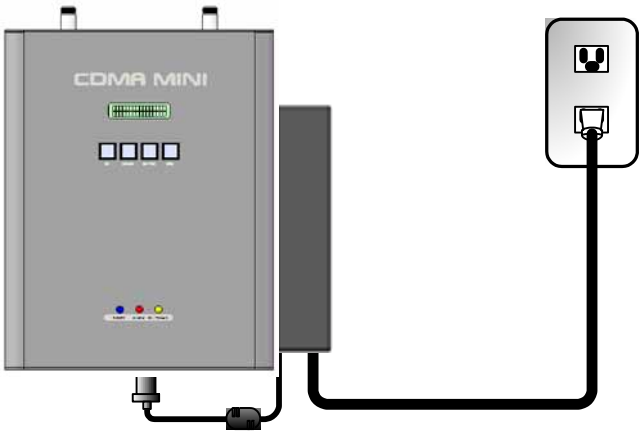


3.5 Power On

Step 1 : Connect the power cord.

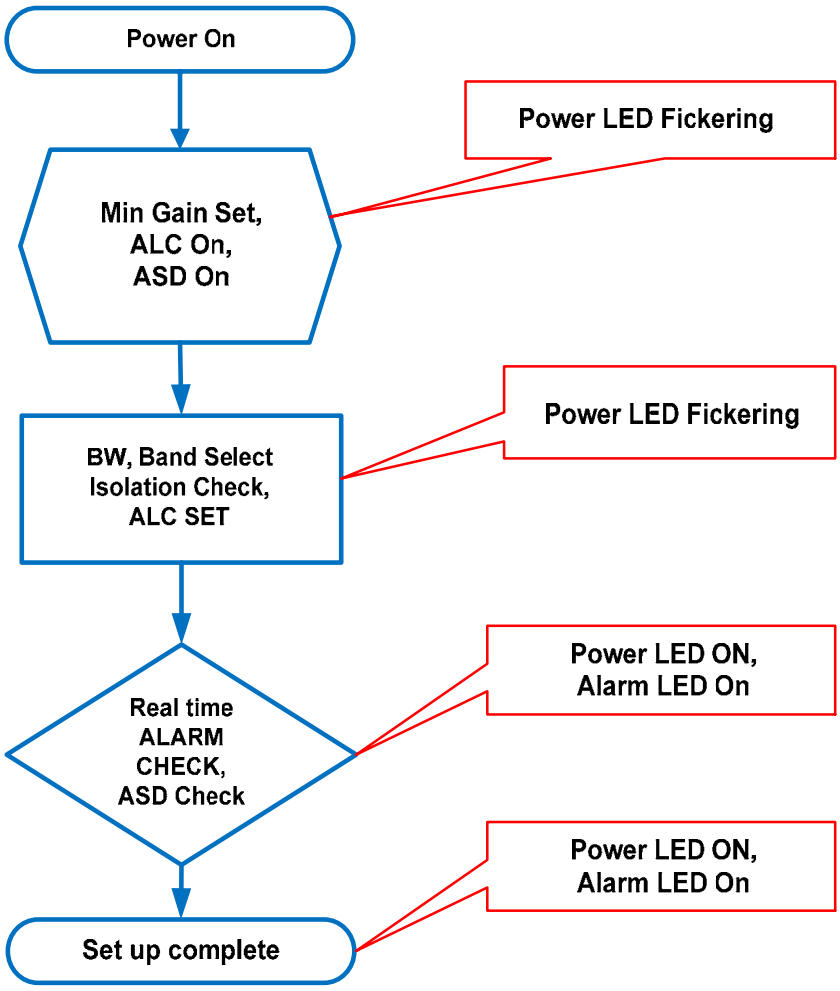
Step 2 : Plug the power cord into a wall outlet.

Step 3 : Check if the green LED at the Top turns on.



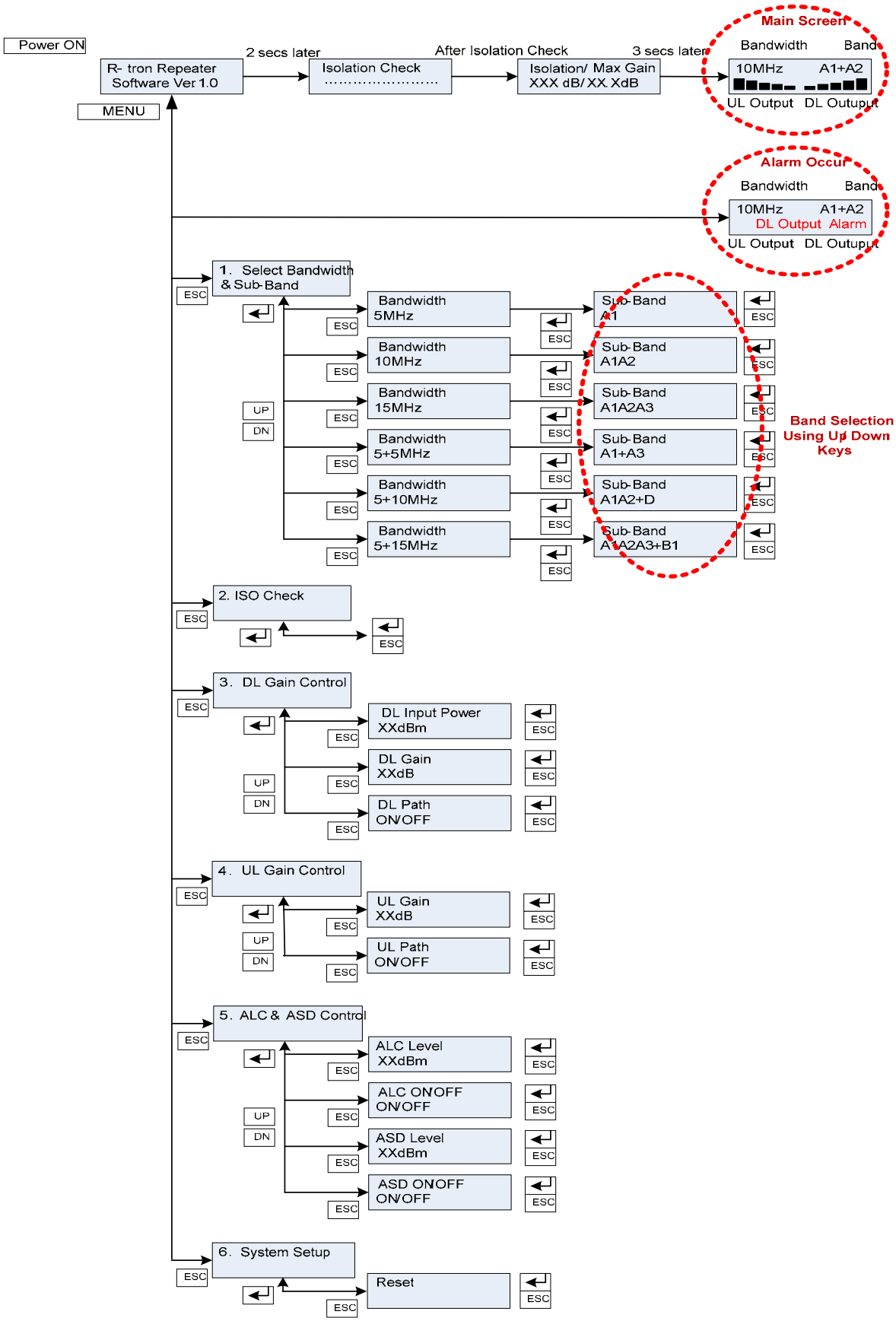
This repeater follows the below set-up algorithm automatically right after POWER ON

< Auto easy-setup Procedure>



The below algorithm shows how to control Gain, Input / Output Power Level, Service band, ALC Level, ASD Level and path direction by using keypad display panel.

<Key Pad Control>



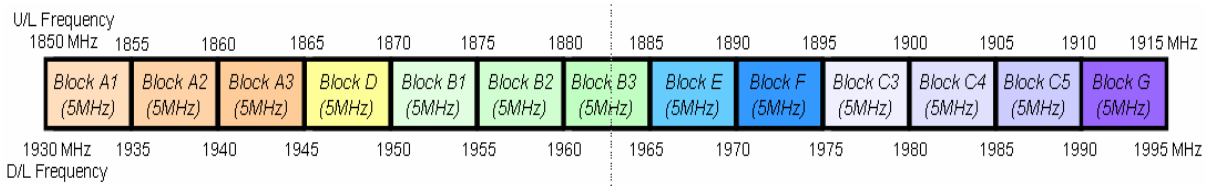
5. Troubleshooting

Before contacting your service dealer, please make sure you refer to the following guide. If the CDMA MINI does not work normally after completing the following troubleshooting, please contact your local dealer or service center.

Problem	Cause	Solution
No LED on		Check the power cord for secure connection.
Cannot communicate with the repeater.		Redo the '4.2, Network Setup' of this manual. If communication still does not work, please contact Technical Support. Web site: www.r-tron.com Toll Free: 888-31R-TRON
The mobile phone is not working well.		Check if the power is ON Check if the DL Amplifier and the UL Amplifier of Parameter Status are displayed as "ON".
1. Gain, Input/ Output power or DC current are changed randomly under operating of DL ALC, UL ALC, and ASD. 2. Over isolation attenuation range.	Oscillation	a. Turn off the repeater b. Measure the isolation and verify if the isolation between the donor antenna and the service antenna is enough for the repeater. Refer to the note on page 19 If the measured isolation value is greater than the required isolation value, turn Power ON.
The red light turns on.		Check if DL Input Power, DL Output Power, UL Output Power, Temperature, DC Voltage, DC Current is out of range. Especially, if the Input Power or Output Power is out of range, please contact Technical Support. Web site: www.r-tron.com Toll Free: 888-31R-TRON

7. Appendix

CDMA Band Diagram



Warranty

LIMITED WARRANTY

This product, as supplied and distributed by R-tron, in the original carton, is warranted by R-tron against manufacturing defects in materials and workmanship for a limited warranty period of:

Five (5) Year Parts and Labor

This limited warranty begins on the original date of purchase, and is valid only on products purchased and used in the United States. R-tron will repair or replace this product, at our option and at no charge as stipulated herein, with new or reconditioned parts or products if found to be defective during the limited warranty period specified above. All replaced parts and products become the property of R-tron and must be returned to R-tron. Replacement parts and products assume the remaining original warranty.

This limited warranty covers manufacturing defects in materials and workmanship encountered in normal, and except to the extent otherwise expressly provided for in this statement, use of this product, and shall not apply to the following, including, but not limited to: damage which occurs in installation; applications and uses for which this product was not intended; altered product or serial numbers; cosmetic damage or exterior finish; accidents, abuse, neglect, fire, water, lightning or other acts of nature; use of products, equipment, systems, utilities, services, parts, supplies, accessories, applications, installations, repairs, external wiring or connectors not supplied or authorized by R-tron which damage this product or result in service problems; or incorrect electrical line voltage, fluctuations and surges; customer adjustments and failure to follow operating instruction. R-tron does not warrant uninterrupted or error-free operation of the product.

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Return Material Authorization(RMA) Procedure

The return and exchange of products are not allowed without prior approval from R-tron America, Inc.

Please follow the exchange procedure below.

1. Call Tech Support for troubleshooting.
2. If the device has a hardware problem, R-tron will replace it if it is within warranty.
   A RMA number will be issued for the return.
3. R-tron will ship the replacement and a return label will be provided.
4. The customer must return the product using the original packaging, including accessories.