

# Smart LCD Display Screen Repeater

## JTD-RP-EDW-I8-68 User's Manual



## About This Manual

This product manual is designed for the use of our full band consumer signal repeaters by the manufacturer's personnel, licensees and customers. It describes the installation, commissioning and maintenance of the **JTD-RP-EDW-18-68** Series Repeaters, which could support any 1~5 mobile systems.

The **JTD-RP-EDW-18-68** Series Repeaters have the most innovative technologies to simplify the installation process. This manual covers the functions of the LCD screen repeaters.

Due to the continued progress in methodology, design and manufacturing of our products, the contents of this document are subject to revision without any notice. The manufacturer assumes no legal responsibility for any error or damage resulting from the use of this document.

Your comments can assist us in improving our products and services.

## Safety Warnings

Any personnel involved in the installation, operation or service of the **JTD-RP-EDW-I8-68** Series Repeaters must understand and obey the following:

1. **JTD-RP-EDW-I8-68** Series Repeaters must be used exclusively for its application described in this guide's product introduction and nothing else.
2. For your safety, please be aware of power lines at all times during installation and use. Please make sure to take appropriate safety measures for protection. Contact with high-voltage power lines can cause serious injury or death.
3. Please handle the equipment with care. Mechanical shock due to the dropping or mishandling of the repeater can permanently damage sensitive RF components.
4. The **JTD-RP-EDW-I8-68** Series Repeaters are designed for indoor applications and should be kept away from water and humidity.
5. The primary AC power range for the repeater is AC100~240V. It is possible to damage the repeater if the primary AC power is out of this range.
6. An external lightning protector is recommended when the antenna is installed outdoors.
7. The operating temperature of this product should be between  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$ .
8. Please keep away from heating-equipment, because the repeater will dissipate heat during working. And do not cover booster with anything that influences heat-dissipation..

The **JTD-RP-EDW-I8-68** Series Repeaters comply with EMC safety and RF requirements, as per **RED 2014/53/EU Directive**.

## Product Introduction

Mobile wireless networks offer great convenience to people's communication. However, people often suffer from communication interruption or failure due to mobile phone wireless signal loss or weakness that are always caused by the shadow effect of wireless signal transmission and the buildings shielding effect on the electromagnetic wave. The situation also exists in remote area with few base stations or beyond base station coverage.

**JTD-RP-EDW-I8-68** Series Repeaters (10~30dBm) is a newly designed solution with intelligent functions. It is the perfect solution for providing a wireless improvement in the cellular reception of a home, office, restaurant, building or shopping mall. The covering area is ranging from 300 to 4000 square meters.

**JTD-RP-EDW-I8-68** Series Repeater covers all existing wireless public communications networks:

4G/LTE 700MHz

4G/LTE 800MHz,

iDEN 800MHz,

CDMA800MHz, GSM/UMTS 850MHz

(E)GSM/UMTS 900MHz,

GSM/DCS, 4G/LTE 1800MHz

GSM/PCS, CDMA 2x 1900MHz

AWS 1700-2100MHz

3G/WCDMA/UMTS 2100MHz

4G/LTE 2600MHz

With single band, dual band, triple band or multi-band repeater types, which have won a large scale markets worldwide by their outstanding features of high quality, best performance, easy use, simple operation and excellent after sales service.

**JTD-RP-EDW-I8-68** Series Repeaters have many intelligent functions: such as antenna isolation detection, Input & Output signal strength indication, system indication, manual gain control and smart mode. See the detailed introduction listed below:



- I. Power: Power supply with indicator.
2. Smart: Smart function with indicator.
3. Sel: Selection of choosing the systems or turn ON/OFF the Smart function when long press the button.
4. 900MHz: Show the current working system. Press “Sel” to change to the right system for operation.
5. AUTO/MANU: Automatic gain adjustment or Manual gain adjustment selection.
6. AGC: Automatic gain control with indicator.
7. ISO: Isolation inspection with indicator.
8. 70dB/75dB: The maximum gain of the selected system.
9. 20dBm/23dBm: The maximum power of the selected system.
10. Uplink” refers to the uplink; “downlink” refers to the downlink.
- II. “+” is increasing the gain, “-” is decreasing the gain. Left side “+ -” refers to the operation for uplink, while right side “+ -” refers to the operation for downlink.

## Product Features

**Isolation Inspection.** When first power on the repeater, the device will automatically detect the isolation between the donor antenna and service antenna. The users could easier see the status and make the adjustment accordingly.

**Input&Output Signal Strength Indication.** The specific number of uplink and downlink measured in dBm. Easy for users’ understanding.

**Manual Gain Adjustment.** The users or engineers could reduce the gain of the repeater manually via the buttons below the screen. The uplink and downlink gain could be set independently.

**Automatic Gain Control.** Automatic Gain Control (AGC) is a dynamic gain adjustment feature with 25dB range. AGC adjust the gain of the repeater whenever the output power is higher than the maximum power.

**Smart Mode.** The repeater could automatically change the gain according to the specific environment when the smart function is on. Please note that when the SMART is on, users could not able to set the gain manually.

### Auto Shut Down.

When the input power exceeds AGC range on the DL or UL up to 25dB, the **JTD-RP-EDW-I8-68** Series Repeaters would activate its advanced set safety mechanism: Auto Shut Down function. Auto Shut Down is a stage that temporarily stops the RF function. On the UL it will continuously detect the input power and resume RF function as soon as the input power reduces to a safe range. For the DL, it will make three attempts to detect the input power in this temporary stage. If the input power reduces to a safe range for the repeater to operate, the software would power the repeater back on and restore all functions promptly.

However, if the input power remains too great and dangerous for the network, it will then shut down completely. In such case, the signal is too strong for the usage of the repeater.

## Repeater Characteristic

### Appearance of the Repeater

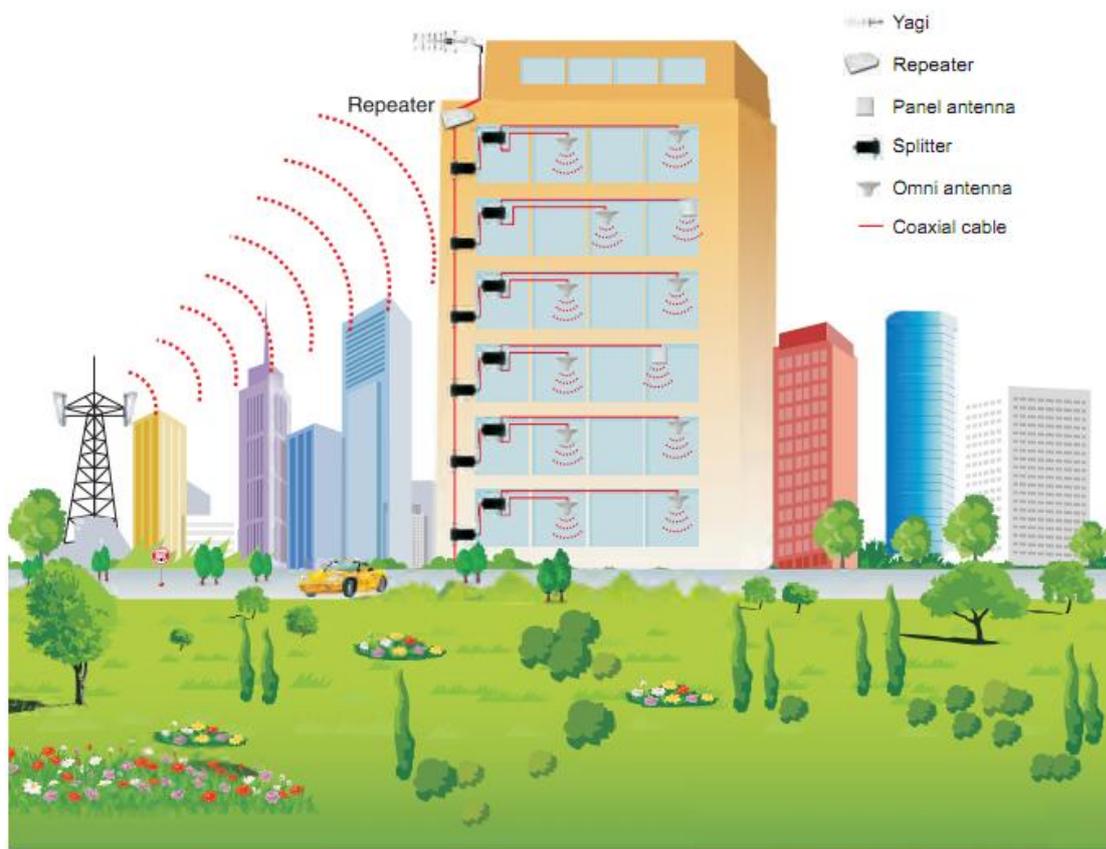


10~23dBm Repeater



27~30dBm Repeater

## The Repeater System



- **Donor Antenna:**

- 11dBi Yagi antenna is used as donor antenna in the above repeater DAS system.
- Function: Pick up source signals from the cell tower and send to the repeater by cable. Donor antenna also transmits the uplink signals from the repeater to cell tower.

- **Service Antenna:**

- 3dBi indoor Omni ceiling or 7dBi indoor panel are recommended. Omni antenna is suitable to be installed in the center and radiate all direction; It is better to use a directional panel antenna when the coverage shape is long and narrow.

- **Cables:** 3D-FB, 5D-FB, 8D-FB, LMR240 or LMR400 coax cables is recommended.

- **Splitters:** when the building structure is too complicated, splitters shall be used so that more antennas can be installed in the area to distribute the signals to each corner of the place.

## Main Technical Specification

Parameters		Uplink	Downlink
Frequency Range	LTE800 (Band 20)	832 ~ 862MHz	791 ~ 821MHz
	LTE900 (Band 8)	885 ~ 915MHz	930 ~ 960MHz
	LTE1800 (Band 3)	1710 ~ 1785MHz	1805 ~ 1880MHz
	WCDMA2100 (Band 1)	1920 ~ 1980MHz	2110 ~ 2170MHz
	LTE2600 (Band 7)	2500~2570MHz	2620 ~ 2690MHz
Operation Bandwidth (-3dB)		Wide Band	
Maximum Gain	JTD-RP-C15L	≥ 65dB	≥ 65dB
	JTD-RP -C20L	≥ 65dB	≥ 70dB
	JTD-RP -C23L	≥ 70dB	≥ 75dB
	JTD-RP -C27L	≥ 75dB	≥ 75dB
	JTD-RP -C30L	≥ 75dB	≥ 80dB
Output Power	JTD-RP -C15L	≥ 10dBm	≥ 15dBm
	JTD-RP -C20L	≥ 15dBm	≥ 20dBm
	JTD-RP -C23L	≥ 15dBm	≥ 23dBm
	JTD-RP -C27L	≥ 20dBm	≥ 27dBm
	JTD-RP -C30L	≥ 23dBm	≥ 30dBm
Manual Gain Control		31dB range/1dB Step	
Automatic Gain Control		≅ 25dB	
Spurious Emission	9KHz~1GHz	≅ -36dBm	
	1GHz~12.75GHz	≅ -30dBm	
Noise Figure		≤ 6dB	
VSWR		≅ 2.0	
Group Delay		≤ 1 μs	
LED Alarm	Power LED	DC ON/OFF	
	Smart LED	Smart function ON/OFF	
AGC Alarm		Alarm RED when AGC control over 10dB	
RF Connector		N-Female	
Impedance		50 Ω	
Power Consumption		15W~50W	
Power Supply		Input: AC 110~240V; Output: DC 9V/5A	
Operating Temperature		-10°C ~ 50°C	
Environment Conditions		IP40	
Dimensions (D x W x H)		128*170*65mm or 228*170*65mm	
Weight		≤ 2.5~5.5KG	

## ■ Installation Guide

The **JTD-RP-EDW-I8-68** Series Repeaters should be used to cover the indoor area only. Humidity and temperature shall affect the reliability of repeater.

### ➤ Installation Requirements

The **JTD-RP-EDW-I8-68** Series Repeaters are mainly applied as indoor coverage system, the changes of air moisture and temperature may influence its reliability. So such factors as the temperature, air moisture, dustproof, current source and space requirement, etc shall be fully considered during installation.

### ➤ Position Selection

Install in the place that is not easy to be reached by irrelevant people.

Install at the place that is convenient for power supply and cabling.

Avoid heat source and moist environment

Install at drought space, hang on wall vertical.

### ➤ Power Requirement

AC power supply 100~240V, 50/60Hz.

## Installation Tools And Accessory

Series	Items	Specification	Quantity	Remark
1	Expanding plug	7*37	4	Accessories
2	Tapping screw	5*30	4	Used for fixing the bracket onto the wall
3	Tapping screw	3*6	4	Used for fixing the bracket to the repeater
4	Hammer		1	Knock the screws into the wall
5	Ruler		1	Measurement and installation of hole
6	Percussion drill		1	Drilling on wall

## Installation



This bracket is used to fix in the wall. Size is 60\*60mm, while the distance of the hole is 48\*48mm



Use 4 screws to fix the other bracket to the repeater's back side.

### ■ Installation Steps:

- A) Use percussion drill to make four holes on the wall according to the hole distance.
- B) Fill the holes with expanding plug, and put the first bracket onto the wall.
- C) Use 4 tapping screws to fix the second bracket at the back side of the repeater, and then hang the repeater with the first bracket onto the wall.
- D) Make sure that the installation is firm and correct.

✧ **Remark:** Due to the bigger size of the 27~30dBm solution, it will need another installation with 4 small brackets, which need to be fixed on the repeater and then hang in the wall, please refer to the below photos:



## Connection

### Connection of RF cable

BTS Port: donor antenna cable is connected with BTS Port;

MS Port: service antenna cable is connected with MS Port;

### Grounding

Please connect one end of a copper wire with the intersection size of 16mm<sup>2</sup> with the grounding screw, and the other end with the grounding system of the building. It is requested that the grounding impedance shall be less than 10 Ohm.

### Power supply connection

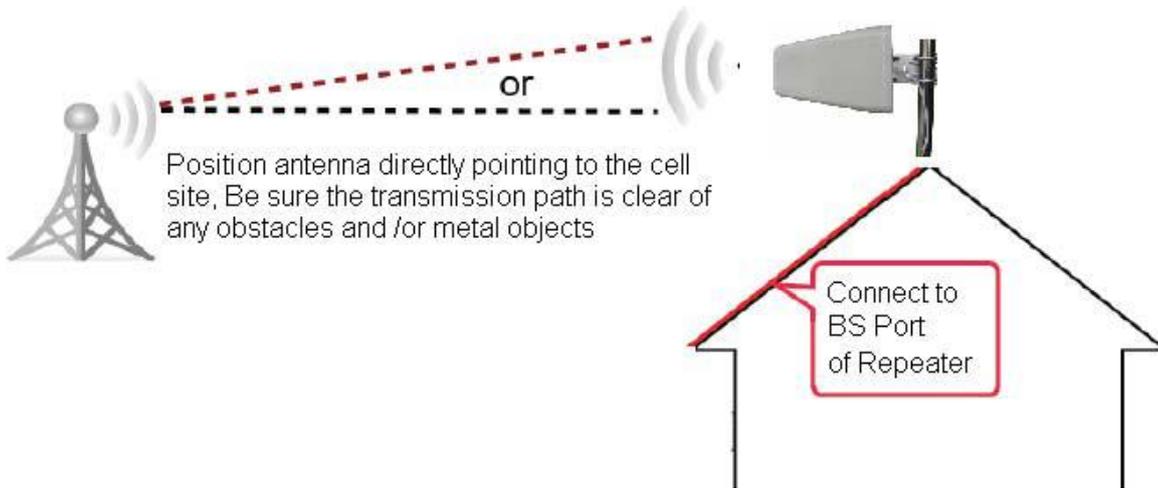
DC IN Port: power supply cable is connected to this Port. There is also a switch at the side panel to turn ON/OFF the repeater for easy operation.

Please use the grounding screws to connect the grounding wire and repeater shell.

Lightening Arrester can be installed if necessary.

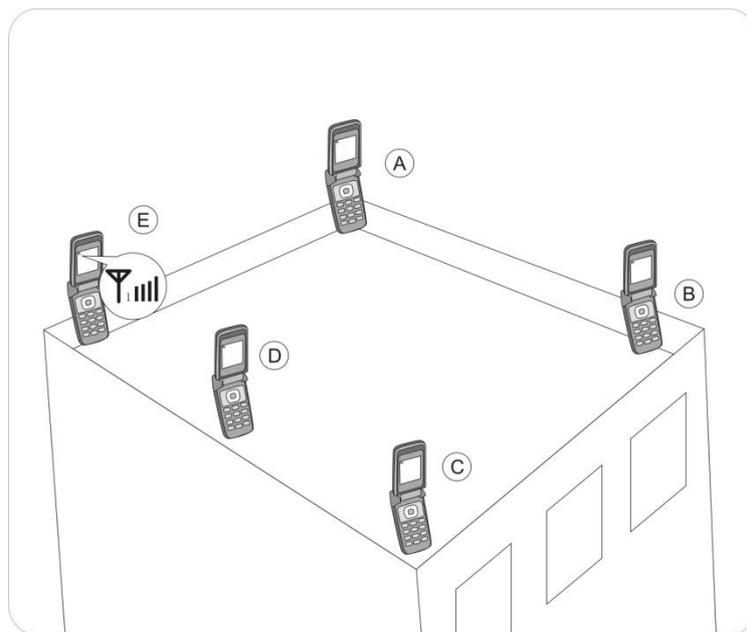
## ■ Antenna Installation

The repeater's main function is to improve weak RF signals. The signal strength from the outdoor antenna directly affects the efficiency of the indoor coverage, so it is very important to choose the good donor antenna location in order to get the best input signal. Find a good spot to mount the antenna, such as a chimney or rooftop, to avoid trees, building, and any metal objects.



Find the location and best angle for getting the strongest signal from the base station.  
The antenna must be directed towards the nearest base station.

It requires a minimum signal level in the place where install the donor antenna.  
Failure to provide sufficient input signal will only result in a poor coverage inside the building for this repeater system.  
To check signal levels, use the phones in the place where antenna be installed (on the roof) and observe the signal bars on the phone.



As shown from the above illustration, testing the signals from A to E, and select a best place that displays full bar Signals to install the donor antenna. Temporarily mount the Donor (outside) antenna in that location. It may need to adjust and move the antenna later.

**Fine-tuning the antenna orientation (in horizontal/vertical position or 45 degree angle position) to have the best signal strength (after repeater on).**

## ■ Cable Layout

Run one coaxial cable into the building to repeater location where you can also get standard 220/110VAC power for the repeater. Connect coaxial cable between the outdoor antenna and the repeater BTS port.



Cable layout through walls – “U” Dripping bend

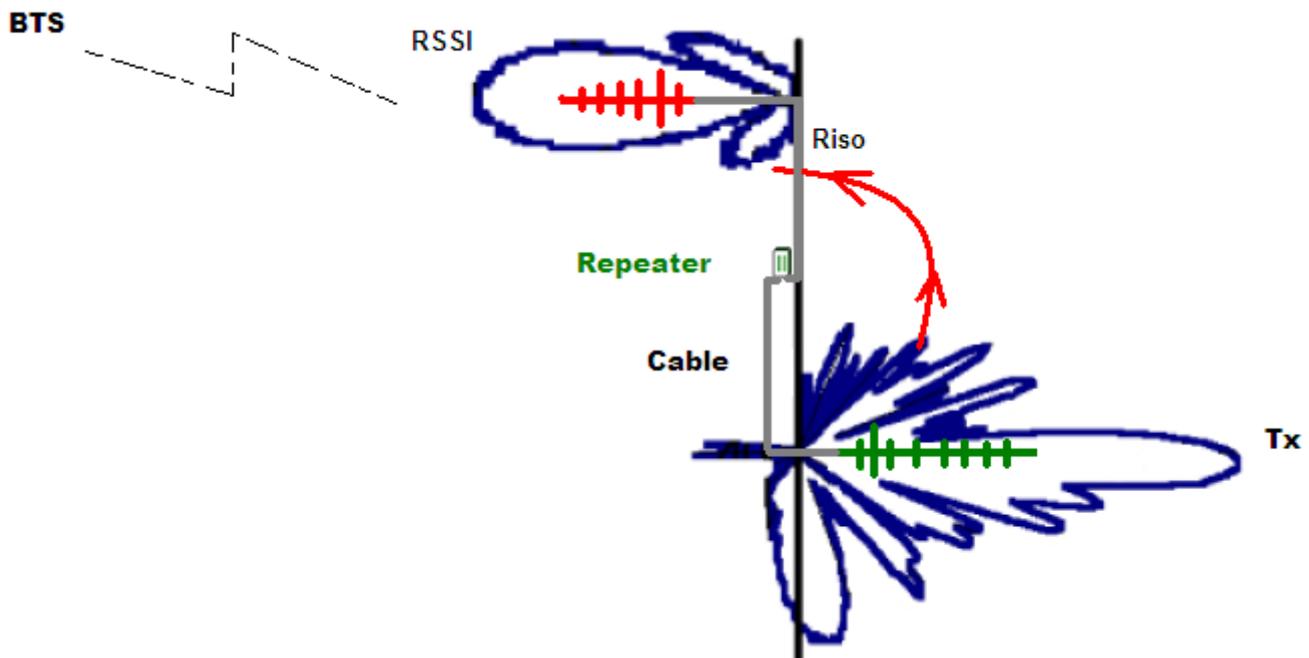
- ✓ Run one coaxial cable inside the building.
- ✓ Connect the coaxial cable between the indoor antenna and the repeater MS port.
- ✓ RF connectors should be link tighten;
- ✓ Cable bending radium meets technical requirement





## Isolation And Separation

Isolation refers to the proper distance or separation needed to keep the Donor antenna signal pattern and the Coverage antenna signal pattern away from each other.



Isolation becomes particularly problematic when Omni-directional antennas are used for both the Donor and the Coverage antennas. Since these antennas transmit in a circle (or more accurately a sphere) it is very easy for these spheres to overlap and thus negate the repeater system

## ■ Service Antenna Installation

Proper antennas shall be selected according to the site conditions. More than one antenna can be used with the repeater, especially for repeaters equal with or over 20dBm. A 30dBm repeater can be connected with up to 10 antennas in order to send the signals to larger areas and distribute the signals equally.

1) Omni antenna (Indoor omni ceiling antenna or whip antenna), is suitable to be installed in the center and radiate all directions.

2) It is recommended to use a directional panel antenna when the coverage shape is long and narrow

## ■ Repeater Settings

Please check whether the connection of RF cable is correct (donor antenna connected to BTS Port, service antenna connected to MS Port), and whether every port is stable. After affirmation, please go along the followings:

### ➤ LED indicators' status and definition

After power is on, check the POWER and ISO indicator first.

✧ Status and definition of POWER indicator:

Status	Definition
GREEN	Normal
OFF	DC power problem

✧ Status and Definition of ISO indicator in the screen:

Status	Definition
Green	The isolation is ok.
	Note: Input signals may be not enough, please refer to the input and output power indication shown in the screen to check if the device is working at the proper power level.
RED	The isolation is not enough
	It will reduce the gain to keep enough isolation, while when the control range reaches 25dB, the repeater will shut off

✧ **Status and definition of AGC indicator in the screen:**

Status	Definition
Green	It is working properly, AGC control range no more than 10dB.
	Note: Input signals may be not enough, please refer to the input and output power indication shown in the screen to check if the device is working at the maximum power level.
RED	It is working over its maximum power over 10dB range.
	When AGC control range over 25dB, the ISO indicator will turns to RED, and the repeater shall shut down to protect the device. °

**Manual Gain Control (MGC)**

Press “+” “-” button below the screen. The left side “+” “-” refers to the uplink, while the right “+” “-” refers to the downlink. You can increase or decrease the gain according to its working status with 1dB step.

✧ **Smart function**

The Smart function means that the repeater could set the gain automatically. Users could press 3 seconds of “Sel” button to turn on or turn OFF this function. When Smart is on, there will be an icon “AUTO” shown in the upper right corner of the screen. When Smart is OFF, then it will show “MANU”.

**Remark:** When the smart function is on, users could not able to set the gain manually. If you need to set the gain by hand, please first turn OFF the smart function, and then follow the instruction of MGC setting.

**Trouble Shooting**

**My signal goes up and down and calls drop.**

If you're experiencing intermittent signal issues, that's usually caused by oscillation. In short, that means the signal from your outside aerial and your indoor aerial are "hitting" each other and causing interference.

To fix this issue, move your two antennas farther apart from one another. They should be at least 10 meters away at all times. You can also try adjusting the manual gain settings, as shown above.

**My phone doesn't show increased bars.**

The bars you see on your phone aren't always a good indicator of whether or not you're getting a good signal. The bars on your phone are determined by decibels, which is simply the volume of the signal.

The *quality* of the signal itself is much more important than the strength of the signal.

In a phone with four bars, each bar represents about 10 dB in signal strength. Often time's new mobile repeater installations will see vast improvements in phone call quality, without necessarily seeing a boost in bars.

✧ **Note that the closer you move to the indoor aerial, the more likely you are to have higher bars**

### **I can't get signal in some rooms.**

This usually means that the building materials in the partition walls are blocking the signal from reaching the room or that your indoor aerial is too far away from the room.

You have a few options:

- 1) Try moving your indoor antenna around. See if you can get it closer to the weak signal spots without causing another weak spot somewhere else in the house.
- 2) Purchase a more powerful repeater.
- 3) Use more than one indoor antenna. You can install one antenna in the weaker signal areas and another antenna in the rest of the house.

### **I'm getting noise or static in my calls.**

There are numerous issues that could cause this problem.

1. Try placing a call near the indoor antenna. If you still get noise when you're standing close to the mobile repeater, then the issue is with either the outdoor antenna or the coaxial cable.
2. Try moving your indoor antenna further away from your outdoor antenna. If the signal clears up when you increase the distance, oscillation may be the issue. Find another place for your indoor antenna.
3. If you can receive noise-free calls when you're near the indoor aerial, then you may have a signal strength issue.