

Coiler Corporation



We Extend Your Coverage

AT Series Band Selective Pico Indoor Repeater



User Manual

V1.04



Edition

Fourth Edition, May 2012.

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1. About this Manual

This installation guide is produced for the use of Coiler's AT Series Repeater by Coiler personnel, licensees and customers.

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. Coiler 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. Please address them to Coiler at any time.

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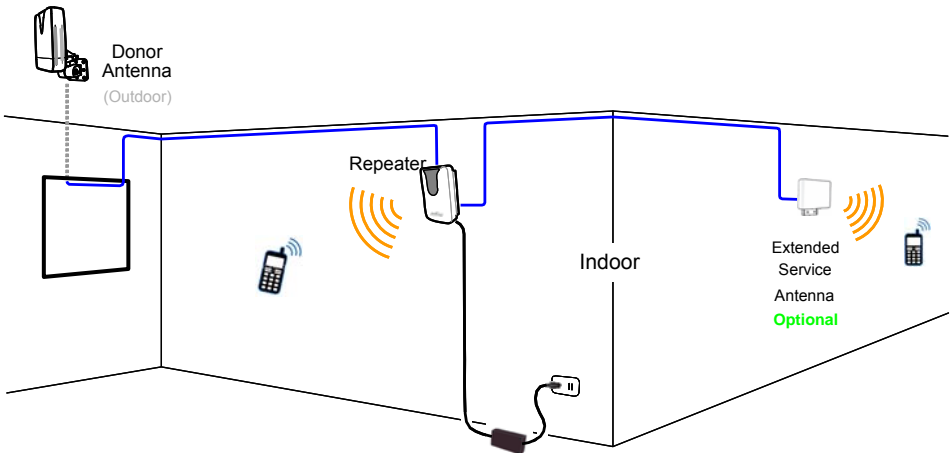
3. Safety Instructions

Any personnel involved in the installation or operation of the Coiler AT Series Band Selective Repeaters must understand and obey the following safety instructions:

1. The Coiler AT Series Band Selective Repeaters must be used exclusively for its application as described in this guide's product introduction and nothing else.
2. For your safety, please be aware of power lines at all times during the installation and use of the repeater. Please ensure to take appropriate safety measures for protection. Contact with high-voltage power lines can cause serious injury or even death.
3. Please handle the equipment with care. Mechanical shock due to the dropping or mishandling of the product can permanently damage sensitive RF components. Falling parts can also cause serious personal injury.
4. The AT Series Band Selective Repeaters are designed for indoor applications only and should be kept away from water and humidity.
5. The primary AC power range for the repeater is AC110-240V. It is possible to damage the repeater if the primary AC power is outside this range.
6. An external lightning protector is recommended when the donor antenna is installed outdoors.

4. Product Introduction

The Coiler AT Series Band Selective Repeater is designed to improve mobile phone signal coverage and enhance reception in indoor areas where mobile signal is limited or compromised due to construction structures or natural obstacles. This device is a perfect choice for network operators seeking a quick and cost-effective coverage solution for small indoor areas. As an additional benefit, the AT Series will fit perfectly into any home or office setting due to its modern and stylish design.



This device is designed as a bi-directional amplifier that receives and amplifies signals from one or more base stations and retransmits the signals to one or more mobile phones. The repeater also receives signals from one or more mobile phones, amplifies and retransmits the



signals to the base stations.

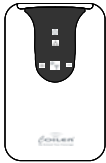
This repeater will only amplify the operators' signal, as high SAW filter selectivity provides sharp, out of band rejection. It offers an Auto Gain Control function designed to protect the system against oscillation and interference with base stations. To enable easy installation, the AT Series Band Selective Repeater features an LED signal strength display and alarm LED.

5. Installation

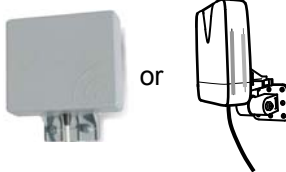
Before installing the repeater, please check the package contents. Please contact the dealer if any part is missing. Also, **please read Chapter 1 'Safety Instructions' closely.**

5.1. Package Contents

Standard package contents are displayed in the pictures below. **Package contents may vary.**



Repeater Unit



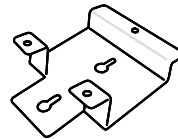
Donor Antenna
 7dBi for AT-2200
 9dBi for AT-900



10m of RF Cable
 (15m Cable Optional)

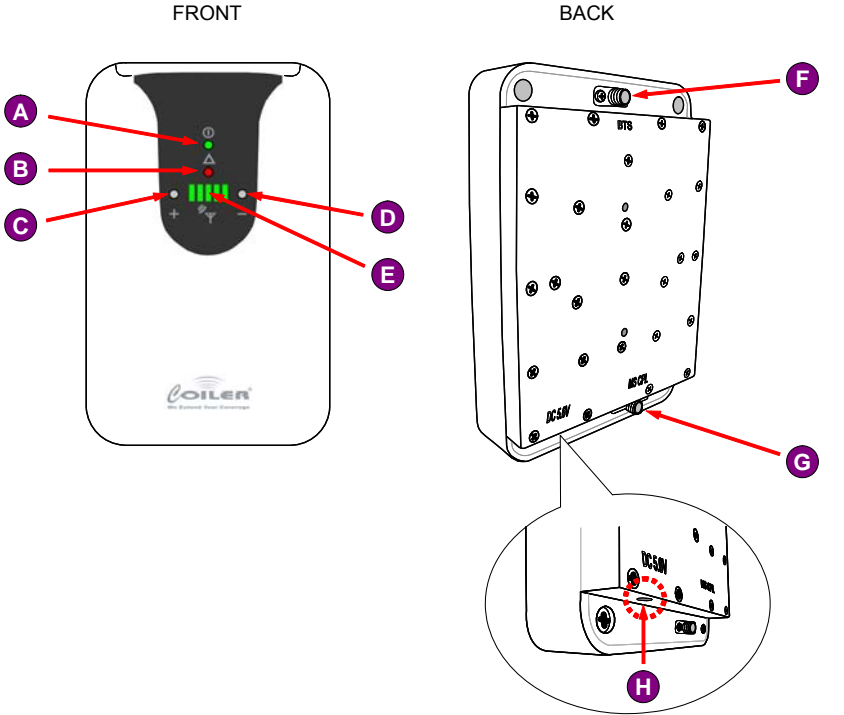


Power Adaptor
 INPUT: 100~240V (AC), 47~63Hz
 OUTPUT: 5.9V (DC), 2.5A



Wall Mounting Bracket
 & Screws

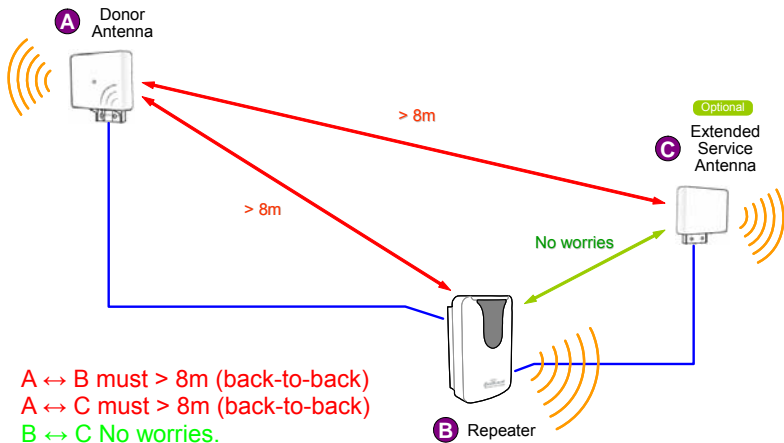
5.2. Parts Identification



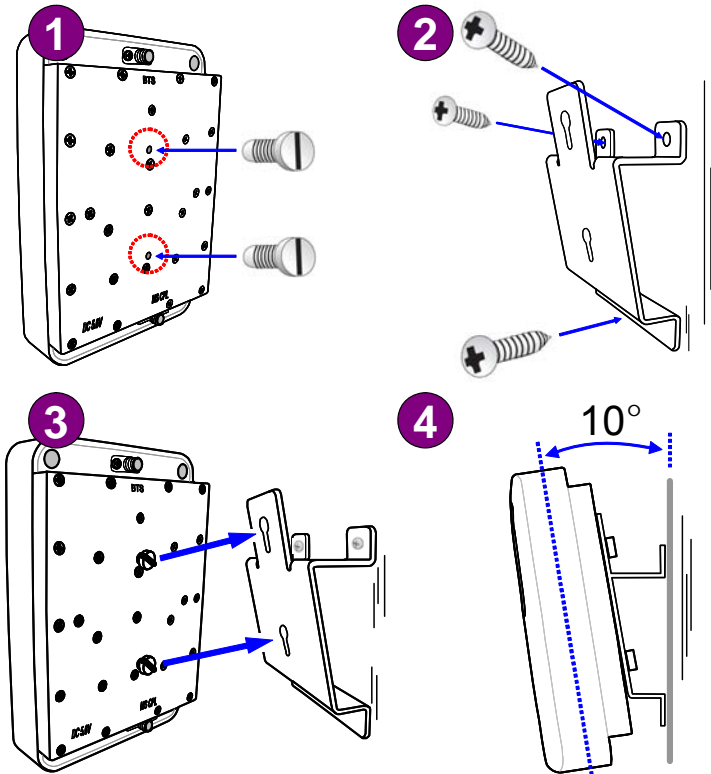
- | | |
|--|------------------------------------|
| A. DC Power LED | F. Donor Ant. Connector |
| B. Performance LED | G. Extended Service Ant. Connector |
| C. Increment Increase Key (+)
(Gain Adjustment) | H. DC Power Connector |
| D. Increment Decrease Key (-)
(Gain Adjustment) | |
| E. DL RSSI / Gain Level LED | |

5.3. Installation of the Main Unit

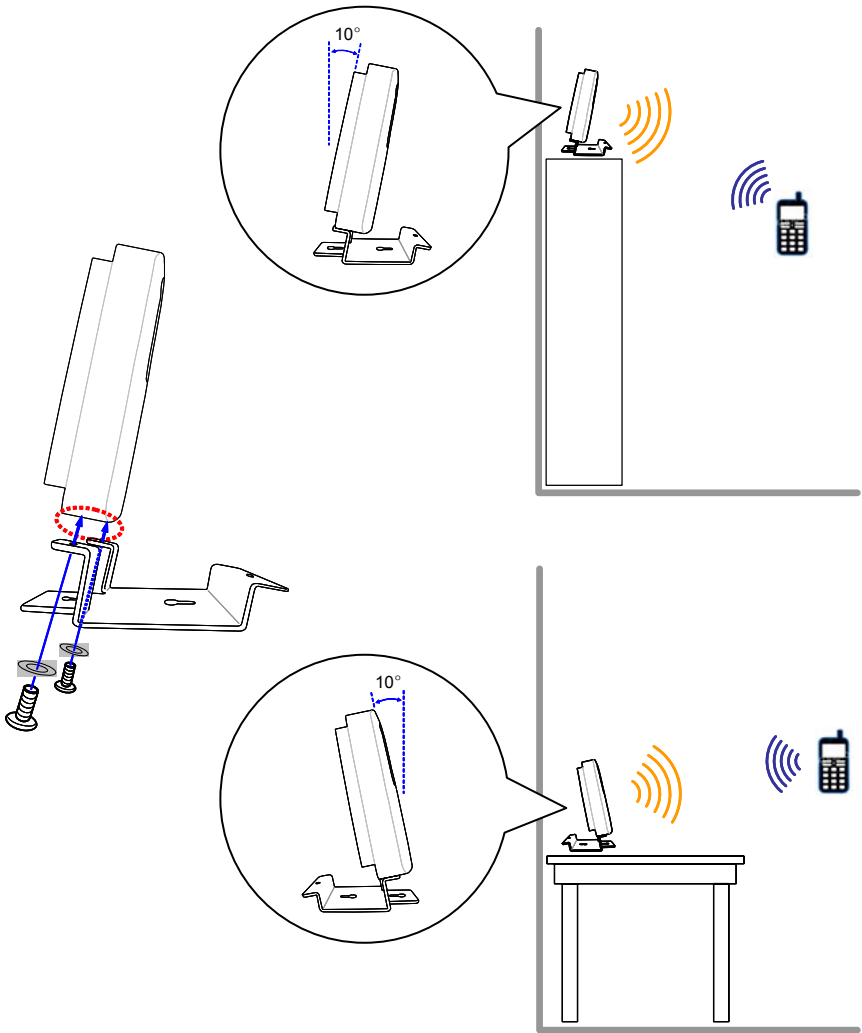
1. **This equipment is designed for indoor applications.** It should be installed and operated under the conditions below:
 - i. Temperature: 10°C ~ 50°C
 - ii. Humidity: 20% ~ 85%
2. For the best performance, the repeater should be installed at a site at least 1 meter from the floor (in a standing position) or 2m if installed on the wall. **The front side of the repeater should be facing the area that requires coverage.**
3. To prevent the oscillation effect which can cause interference and might damage the repeater, please ensure that the distance between the repeater unit and the donor antenna is at least 8 meters (free space, back to back). So as the distance between extended service antenna and the donor antenna.



4. If the unit is to be installed on the wall, you will need the mounting kit provided. First; screw the wall mount tightly to the wall, then screw the repeater unit on to the wall mount as shown on the pictures below. Please ensure that both sides of the wall mount are fastened securely. The repeater will be 10° down-tilted on the wall mount.



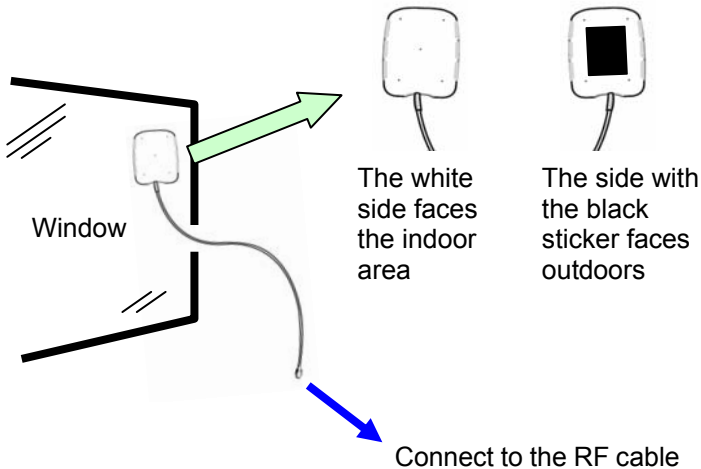
5. If the unit is to be placed on the flat surface like book shelf or desk, the wall mount can be also used as a stand. It can be 10° down-tilted or up-tilted depending on environment.



5.4. Installation of the Donor Antenna

For best performance, the donor antenna should face the nearest base station. A perfect location should have the outdoor signal level greater than -80dBm (full signal bars on a mobile phone).

If the package contents include the indoor antenna as shown below, please attach it to the window glass where the mobile phone shows the most signal bars. Ensure that the side with the black sticker faces outdoors.



If the package contains the outdoor antenna as shown below, it should be mounted on a wall. You may need to reposition or rotate the donor antenna to find the direction providing the best signal level.



Mounted on the wall

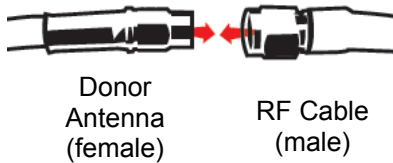
5.5. Installation of the Extended Service Antenna

The AT Series provides an extra coupling port for coverage extension which enables more flexibility and convenience. You may connect additional indoor antenna in order to provide coverage in other room or floor. To do so, connect cable to the port marked as MS CPL. Make sure to unplug the power before making any connections. Also, make sure that the additional antenna is properly separated from the donor antenna (at least 8m). If the extension port is not used, make sure that it remains terminated.

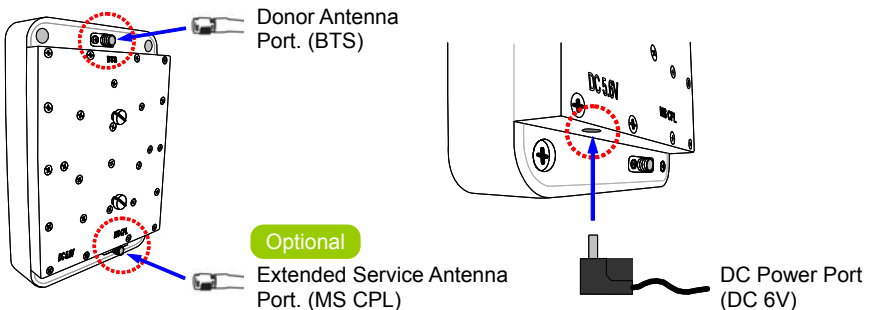
5.6. Connecting the Cables

The RF connector type of the repeater and the cable is SMA. Please ensure that the pin head of the connector is all right before plugging it in.

1. After mounting the donor antenna, plug the antenna connector into the RF cable and ensure that they are tightly fastened.



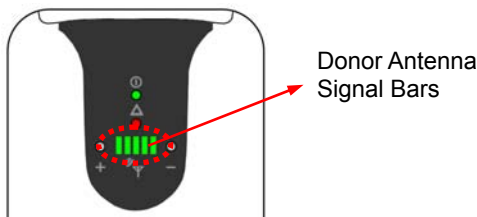
2. Route the RF cable into the house and ensure that the cable is fastened all the way into the house.
3. Plug in the donor antenna cable (marked as 'BTS'), extended service antenna cable (marked as 'MS CPL'. If the extra indoor antenna is used) and the DC power adaptor (DC side, marked as 'DC 6V') into the repeater. But DO NOT plug the AC side power connector into the AC power source at this moment.



6. Start the Device

6.1. Switch on the Repeater

1. Before switching on the repeater, **please read Chapter 1 “Safety instructions” closely.**
2. Plug the AC side connector into the AC power source. Please ensure that every part is tightly fastened and the distance between the repeater and the donor antenna is sufficient (at least 8 meters).
3. The power LED of the unit will be on, at which point the unit will start the self-checking procedure. After finishing the self check, the DL RSSI LED display will show the current power level of the donor antenna in the form of signal bars. Now the repeater is working.



4. If the installation is correct, the performance LED should be GREEN and the displayed signal bars should NOT be changing radically. (no more than 2 bars)
5. If the performance LED turns into ORANGE (NOT pure red), that means the donor signal is too low to obtain an acceptable coverage. Please search for another location to reinstall your donor antenna



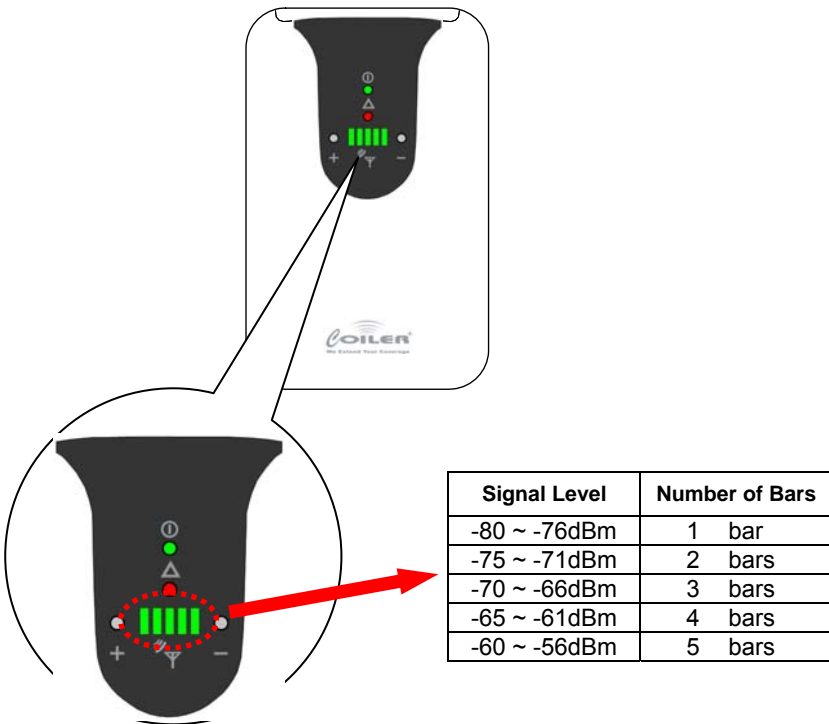
for the better performance.

6. Please make a call through your mobile phone to check the communication quality.
7. Please be aware of the performance LED at all times. If it turns RED, refer to the Troubleshooting section (Section 7) of this manual.

6.2. Donor RSSI Indication

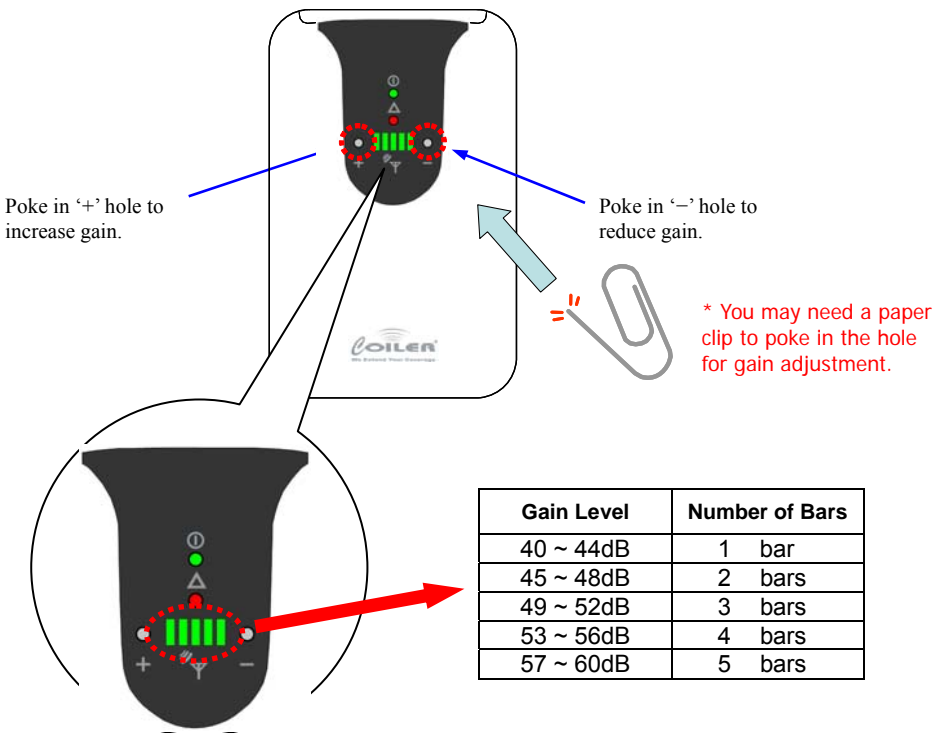
AT Series Band Selective Repeater is equipped with DL RSSI LED which indicates the current signal power from the donor antenna. More signal bars represents stronger signal power from the donor antenna which also means the coverage is getting better. (5dB for each bar)

On the contrary, the coverage quality and performance of the repeater will be lowered with less signal bars. If the donor antenna power is lower than the minimum level, (please refer to the table below) the performance LED will turn into ORANGE. In that case, Coiler strongly recommends user to change the location installing the donor antenna.



6.3. Gain Adjustment

In order to enable flexible adoption to various mobile environments, the AT Series offers users an Adjustable Gain Control function. The adjustable range is from 40dB to 60dB in 1dB increments. All configurations can be done by simply pressing the buttons inside the small holes of the front panel. Signal bar will change every 4dB gain difference. (Please refer to the table below) When adjusting gain level, both DL and UL gain will be changed.

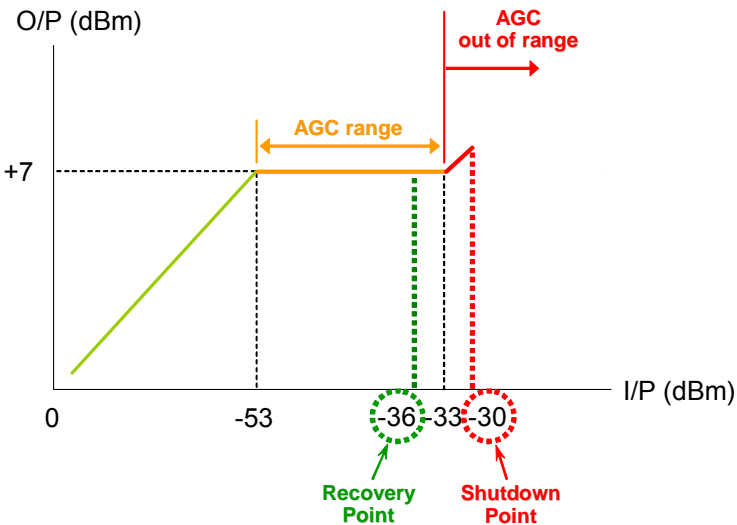


6.4. Automatic Gain Control (AGC)

The AT Series Repeater has been equipped with an intelligent function known as ‘Automatic Gain Control’ (AGC) which can adjust the gain level in order to maintain a consistent output power. This function can prevent the device from being damaged by an over-powered input signal and protect the network against interference.

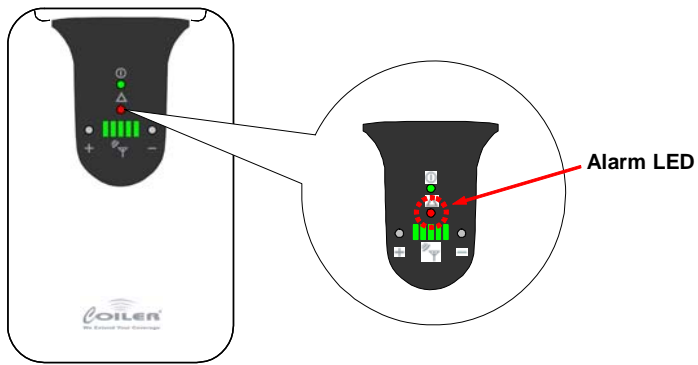
The logic of AGC is illustrated in the diagram below. The total range of the AGC is 20dB – once the input power exceeds the maximum level of the AGC (AGC out of range), the automatic shutdown function will be triggered and the RF module will stop working until it is able to recover.

I/P & O/P Transformation Curve: Down-Link



6.5. Alarm LED

The AT Series Repeater is equipped with Auto Shutdown and Auto Turn-on functions. Whenever an incorrect installation or power surge occurs, the red alarm LED will blink. It will also temporarily stop functioning in order to prevent interference and to protect the repeater from damage.



1. When an alarm situation occurs, the repeater will shut down the RF function at the same time.
2. When the alarm goes off, please check if the distance between the donor antenna and the repeater unit is too short. Please keep them as far away from each other as you can. You will need at least 8 meters between these two devices to make them work normally.
3. After the alarm situation is eliminated, the repeater will automatically turn itself on in 20 seconds. If the alarm status doesn't change by the third time this happens, the repeater will shut itself down completely. After that you can replug the power cable of the



repeater to switch on the repeater again.

4. If there are any other problems, please refer to the Troubleshooting section (Section 7) of this manual.

7. Troubleshooting

Question	Answer
<p>Why don't I have coverage after installation?</p>	<p>Ensure that the output power of the adaptor's DC is 5.9V and the repeater is switched on. (Green power LED is on.)</p> <p>Ensure that the donor antenna has been installed properly.</p> <p>Ensure that all the cables and the connectors are tightly fastened.</p> <p>Check that the outdoor signal level (RSSI), which is shown in the LED display, is greater than -80dBm.</p>
<p>Why can't I make a call with full signal bars?</p>	<p>Ensure that the distance between the donor antenna and the repeater unit is sufficient. (Coiler recommends at least 8 meters)</p> <p>Please move the location of the repeater and check if the communication quality has improved or not.</p> <p>Lower the repeater's gain.</p>



<p>Why is the signal unstable after the repeater is switched on?</p>	<p>Ensure that the donor antenna has been installed properly.</p> <p>Ensure that the distance between the donor antenna and the repeater unit is sufficient. (Coiler recommends at least 8 meters.)</p> <p>Ensure that all the cables and the connectors are tightly fastened, and the cable is not damaged.</p>
<p>Why is the alarm LED blinking when I switch on the repeater?</p>	<p>Ensure that the distance between the donor antenna and the repeater unit is sufficient. (Coiler recommends at least 8 meters.)</p> <p>If the distance is less than 8 meters, please move the repeater or the donor antenna to make them at least 8 meters apart to keep the system working normally.</p> <p>After the alarm situation is eliminated, the repeater will automatically turn itself on in 20 seconds.</p> <p>After it recovers from the alarm situation, the alarm LED will turn off.</p>

We recommend returning any faulty equipment once the above conditions have been checked step by step, and the problem has not been resolved.