USER MANUAL OF TETRA CHANNEL

SELECTIVE RF BDA

CONTENTS

1. HOW TO USE THIS MANUAL

1.1 INTRODUCTION

It is recommended that you read this manual prior to installing and using the TETRA RF BDA. This manual gives you a complete guide for how to mount, operate and maintain the product, the installation & maintenance engineers of Operator and other personnel concerned.

1.2 STRUCTURE

This manual describes the basic product and provides overall and detailed functional descriptions of the BDA. Also, this manual describes how to make survey, install and operate the equipment. The manual is divided into 4 chapters. The overall contents of this manual are as follows:

Chapter 1 - How to Use This Manual

Chapter 2 - Product Description / Operation

Chapter 3 - Safety

Chapter 4 - Site Survey, Installation & Commissioning

1.3 PRIOR TO INSTALLATION

A thorough study of the site conditions and transmission path requirements should be undertaken prior to installing the BDA system. The location of antennas, BDA and cable lengths are all important considerations that must be addressed.

The BDA has been designed for simple easy installation requiring no special tools. With just a few site preparation tasks out of the way, installation can be accomplished in several hours.

2. PRODUCT DESCRIPTION / OPERATION

2.1 INTRODUCTION

This chapter provides an overall description and operation of the BDA system. This system may be used to address Network Coverage Enhancements such as those required by Operators.

The BDA system provides a solution to network coverage problems by allowing a variety of possible operating configurations in frequency Channel covered. In addition, the system can be deployed easily with less investment cost. The BDA can be installed indoor and/or outdoor; it can be mounted in tower, wall, and floor to satisfy the requirements of different applications.

2.2 BDA SYSTEM FEATURES

Some of the BDA system features are listed below.

- Aluminum-alloy casing with IP65 protection has high resistance to dust, water and corrosion
- Channel-selective function can amplify only the signals transmitted by the customized 2 channels
- Adopting filter with highly selectivity and low insertion loss eliminates interference between uplink and downlink
- USB port provides a link to a laptop for local test or IP Based NMS (Network Management System) that can remotely supervise BDA's working status and download operational parameters to the BDA via Ethernet

2.3 EQUIPMENT DESCRIPTION

The TETRA RF BDA is designed to provide a more cost-effective solution than adding a new Base Transceiver Station (BTS) to improve signal coverage and communication quality in TETRA system. And its easy installation and maintenance can help carrier get fast return.

Figure 2 - 1 Typical BDA

The BDA is an aluminum-alloy casing enclosure that houses all the components shown in Figure 2-3 (Block Diagram). It is working as a relay between the BTS and mobiles. It receives the low-power signal from BTS via the Donor Antenna, linearly amplify the signal and then retransmit it via the Coverage Antenna to the poor coverage area. And the mobile signal is also amplified and retransmitted to the BTS via the opposite direction.
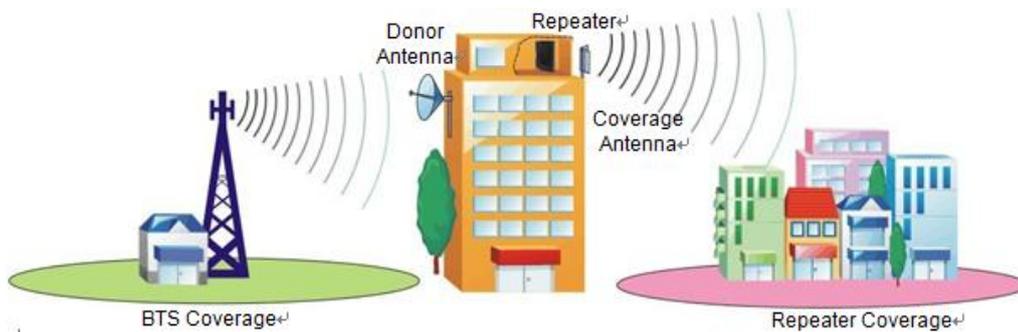
Figure 2 - 2 Typical Application Diagram
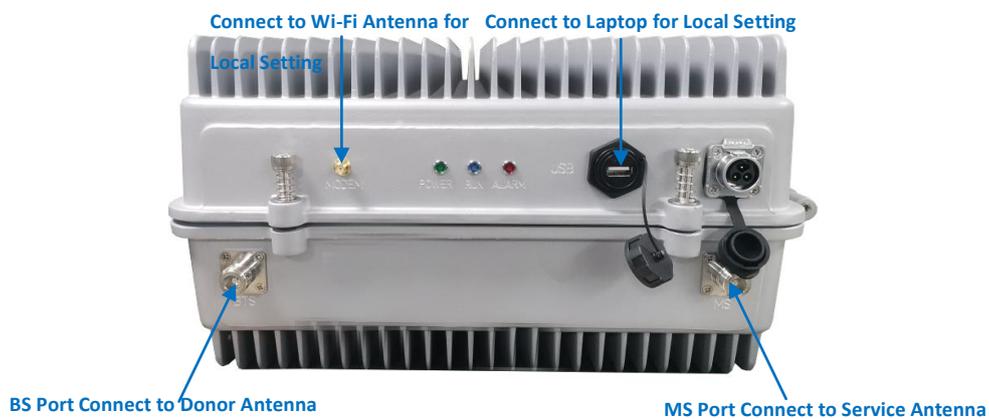
Figure 2 - 3 Bottom View

3. SAFETY

3.1 INTRODUCTION

The purpose of this chapter is to give emphasis on the safety on which we divided into four categories, namely:

- Personal safety
- Safety of fellow workers
- Safety of the public
- Safety of equipment and tools

Working on heights or elevated structures is potentially hazardous for person whether directly or indirectly involved in the work. Having a safety guidelines or procedure can minimize or eliminate these hazards. With this, we considered the below mentioned requirements before actual implementation, they are as follows:

- Thorough planning
- Strict supervision
- Personal fitness of workers
- Right tools and safety gadgets

3.2 GENERAL

3.2.1 COMMENCEMENT OF WORK

In majority, work on Tower site will be on the property not owned by the Operators; mostly it is located in vacant lot near residential areas or building rooftops. With this, it is necessary for the team that will be involved in the project to conduct a survey to make a detailed planning prior to actual work commencement.

3.2.2 SUPERVISION

Strict supervision by the Project Team Leader / Supervisor is always a must particularly for those who will climb the tower or will work in heights. It is the responsibility of the Team Leader/Supervisor to make sure that all safety measures are taken prior and during work activity.

Persons involved in climbing tower must be aware that once climbing has commenced, there are changes like wind velocity.   Working on tower and high level requires a level of physical fitness and working on this must be voluntary.

Factors to be considered that may stop the workers or not proceed in climbing towers:

- Tower construction is not completed
- Tower is not earthed
- Wet paint
- Rain
- Risk of lightning
- High winds
- Poor visibility

If personnel are already working on tower, they must be alert for any sudden change in weather conditions. If sudden change in weather is encountered, personnel working must stop and descend immediately.

4. SITE SURVEY, INSTALLATION & COMMISSIONING

4.1 INTRODUCTION

Every successful installation is attributable to a right planning and right planning cannot be done without actual site survey. Hence, we will discuss in this chapter the basic site survey procedure, installation and commissioning guidelines in implementing a BDA system. The step-by-step guidelines and procedure will allow installation personnel to provide efficient, safe, fast and reliable BDA system installation.

4.2 SITE SURVEY

4.2.1 PREPARATION

Tools / equipment needed in a Site Survey:

- Yagi Antennas
- Test Mobile
- Safety Belt
- Binocular
- Meter Tape
- Spectrum Analyzer
- Signal Generator
- Extension Cord
- Laptop with Local Test Program
- Data Cables (to connect BDA with PC)
- RF Cable
- Jumper cables
- Connectors and Adapters
- Pole / Pipe
- Attenuators
- Multimeter

The objective of the site survey is to gather data that will be the basis of right planning and successful implementation. A sample survey form is attached (Figure 4-1) in the next page, which will provide uniformity in reporting, and you may add other data that you might think is helpful.

Table 4-1 Site Survey Form (Sample)

GENERAL

BTS Frequency	
Channel No.	
Service Type	Outdoor

Obstruction	Exist?

INSTALLATION SITE

BTS Name (picture)			
BTS Signal Level / Ch. No.	1#	2#	3#

BDA position

Coordinate   S: E:

Tower (picture)	Type		Height	
Donor Antenna	Type		Position	

Donor Signal   Ch. No.   Level at

Coverage Antenna   Type   Number

                                                        Position

Cable Length	1/2":		7/8":	
Power Type				

Grounding   Exist?

Coverage area (picture)

REMARKS

4.2.2 PROCEDURES

1. At the installation site, use the GPS to measure the coordinate of the installation site, and record the detailed address of the site.
2. Install the Yagi Antenna at the specific tower height.
3. Connect Yagi Antenna to the Spectrum Analyzer via jumper cable.
4. Rotate the Yagi Antenna 360 degree within the horizontal plane and read the RSL on the Spectrum Analyzer. Record the RSL, frequency (channel no.), and antenna orientation when the RSL reading is higher than -65dBm and it is the most dominating channel (6dB higher).
5. Check the height of tower (or building) and take photos if the Donor Antenna and Coverage Antenna are desired to install on a building.
6. Measure the distance between the BDA and Donor Antenna, and the distance between BDA and Coverage Antenna.
7. Determine the BDA installation position, power supply position, lightning-proof grounding board position. Take photos.
8. Check the direction of coverage area and take photos.
9. Submit the survey report to the operator then confirm which channel no. and antenna orientation in the report will be adopted.

4.3 INSTALLATION

This section will discuss the proper and easiest way to implement and install the BDA system. Right planning and tools will be the benchmark in every successful installation.

4.3.1 PREPARATION

Tools and Equipment needed:

- Antennas (the type and quantity are based on the design)
- Site Master
- Extension cord
- RF Cable
- Jumper cables
- Connectors and Adapters
- Pole/Pipe
- Safety Belt
- Binocular
- Meter Tape
- Adjustable wrench
- Electric Drill
- Rope
- Pulley

4.3.2 PROCEDURES

1. At the installation site, install the BDA as per specified plan and site layout. The BDA can be wall-mounted or pole-mounted using the brackets as shown below.

No.	Qty	Name
8	12	M6 * 12 Allen screws and spring washer
7	4	M8 * 60 hex bolts
6	4	M8 nut and spring washer
5	2	installation of bracket —U type
4	2	installation of bracket —H type
3	1	pole
2	1	case—2
1	1	case—1

No.	Qty	Name
6	12	M6 * 12 Allen screws and spring washer
5	4	M8*100 expansion screws
4	1	Wall
3	2	installation of bracket —H type
2	1	case—2
1	1	case—1
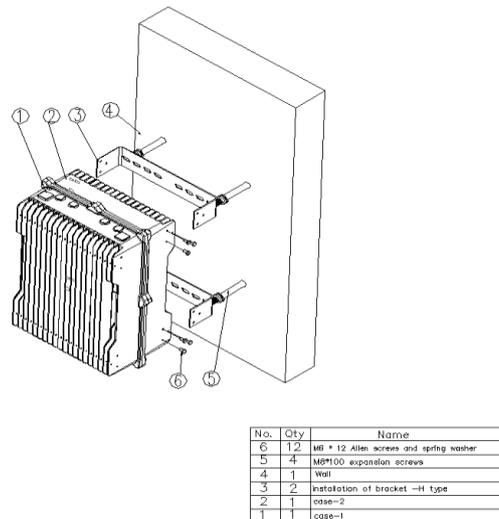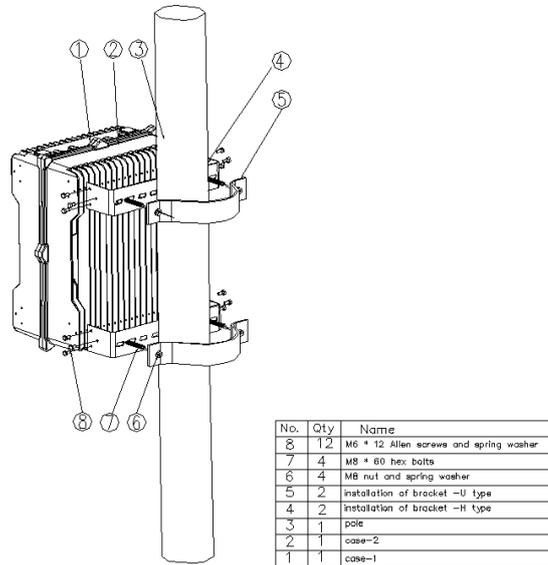
Figure 4-1 BDA Mounting Bracket

2. Connect the BDA to the grounding board.
3. Install the Donor Antenna and Coverage Antenna as per the specified plan and site layout.
4. Use Site Master to measure the VSWR of the RF cables from the Donor Antenna and Coverage Antenna. The value should be less than 1.5; Otherwise, check the connectors and the installation of the cable.
5. Connect the power supply to the BDA.
6. Start commissioning the BDA (see Section 4.4.2).

4.4 COMMISSIONING

This section guides you to put the BDA system into active service.

4.4.1 PREPARATION

Tools and Equipment needed:

- Spectrum Analyzer
- Test Mobile
- Laptop with Local Test Program
- USB cable (to connect BDA to laptop)
- Attenuators

4.4.2 PROCEDURES

1. Connect the RF cable from Donor Antenna to the spectrum analyzer and check if the Donor Antenna is receiving the correct frequency; And then measure the signal level of the said frequency (RSL). Adjust the antenna to make the readings approach the recorded value on the survey report. Record all readings.
2. Turn ON the BDA.

4.4.4   LOCAL SET UP-USB

Connect your laptop to the BDA via the USB cable and follow below steps (parameters listed below are filled mandatory, remained are defaulted or user defined):

a.   To install NMS software and USB drivers, the name of the USB cable driver is USB_Drivers_for_EC21&EC25

b.   Startup the Test Program (NMS), fill the Username with "Admin", the password with "123456", and then Login. From the later pop-up dialog click the **Config Data** tab and choose the **COM Parameters**.
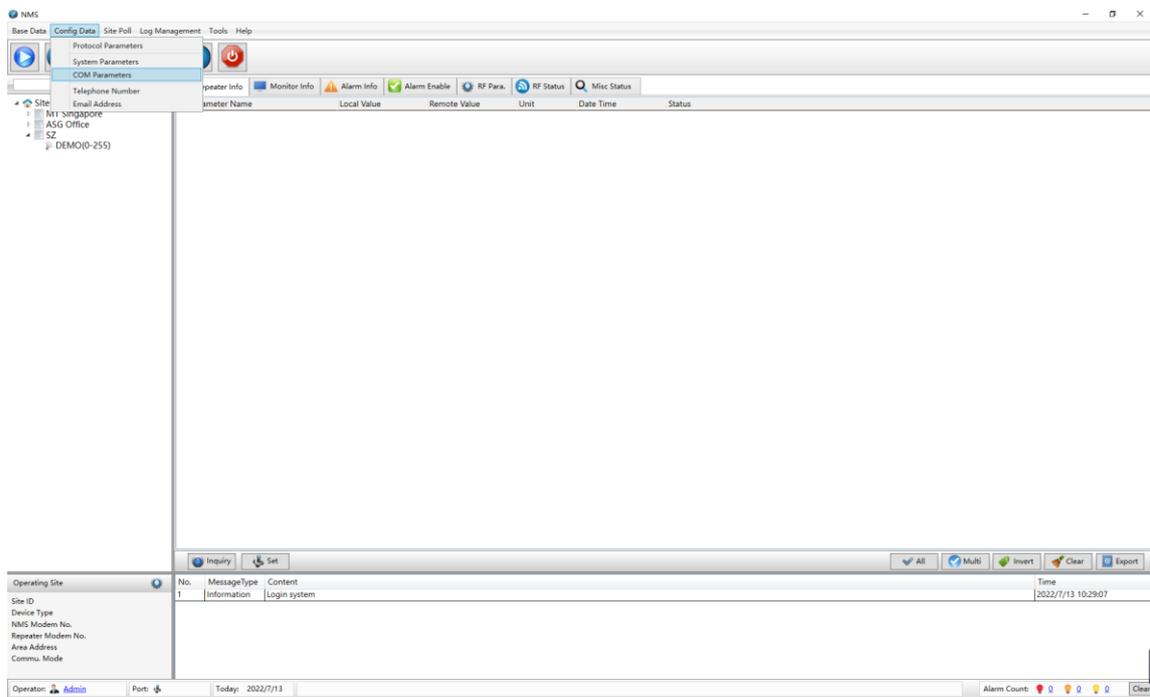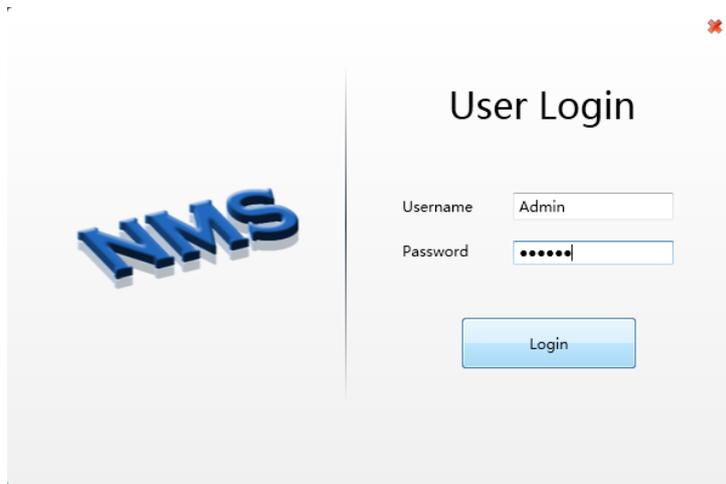
From the pop-up dialog, configure the **Com Parameters**, tick this check box and select **RS232**,then click
the **Config** button, choose the correct Com port from your PC(select the COM Port with the NAME
Quectel USB NAME Port), set **Baudrate** to **9600**,and set the **Timeout** to**180**.Then click the start button
from tool bar.
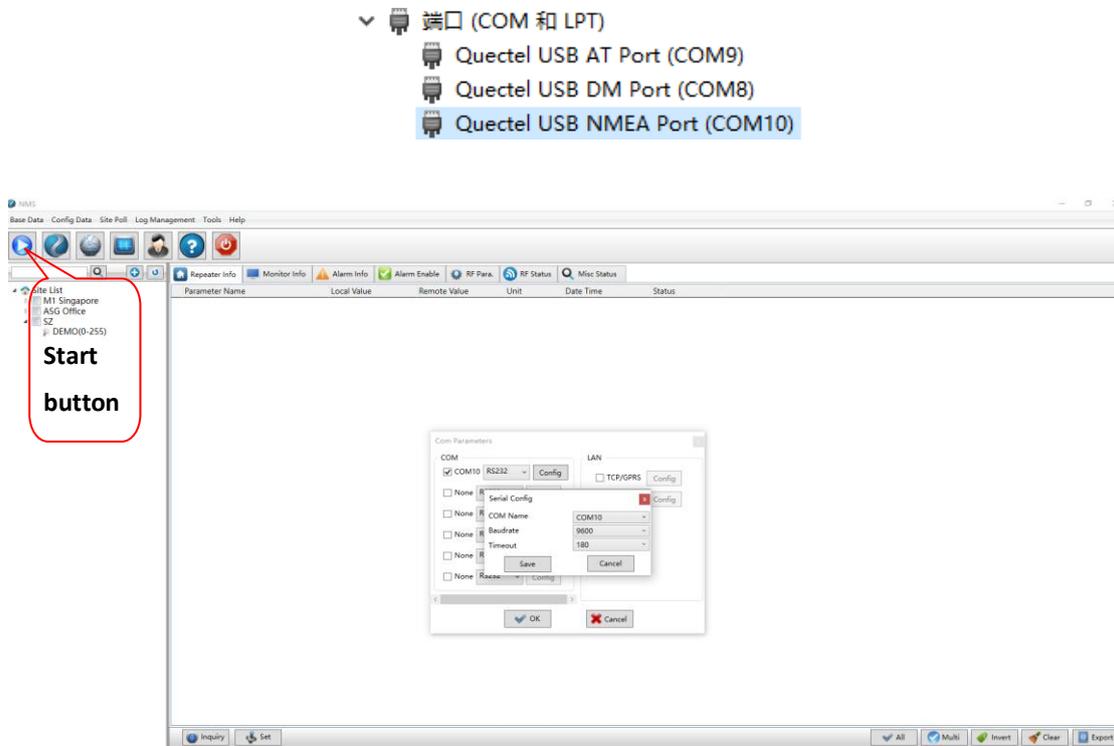
c.   Right click the Site List, and choose New / Area to create a new area.
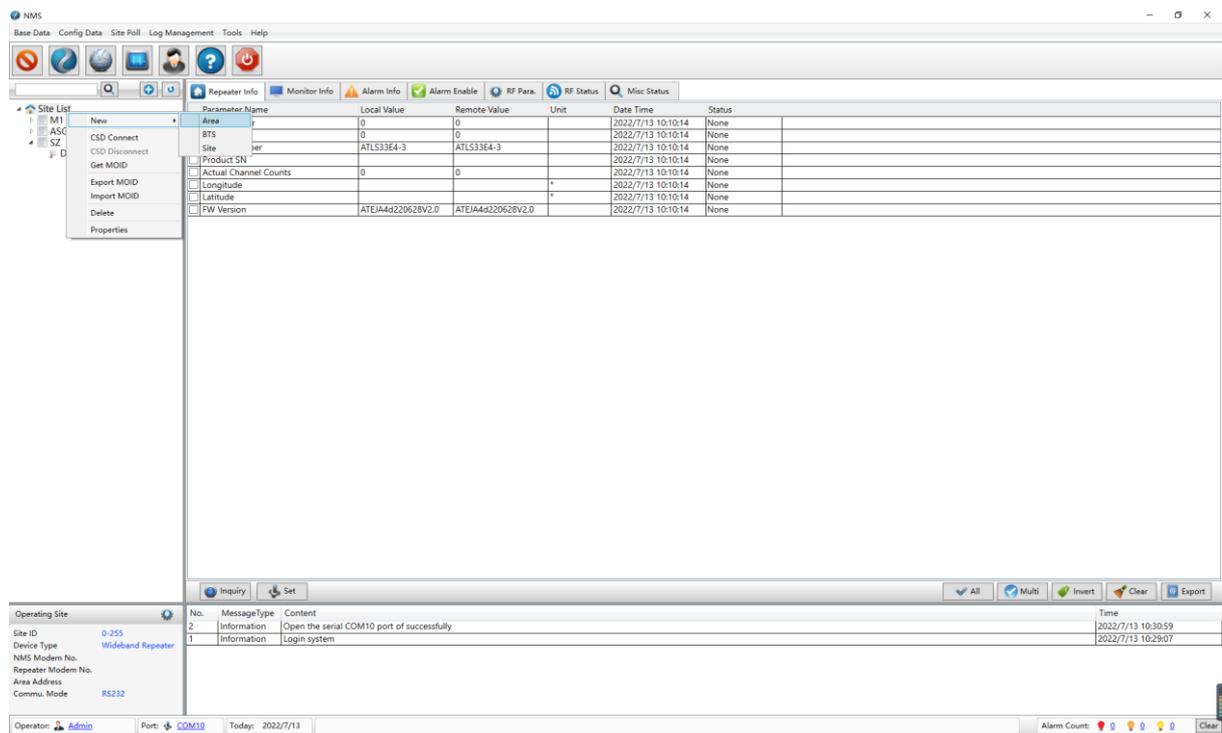
From the pop-up dialog, click the Create Button. Fill any number with 2 digits in the Area Code, and input

the Area Name, click OK to save.

d. Right click the created area name from Site List, and choose New/Site to create a new Repeater.
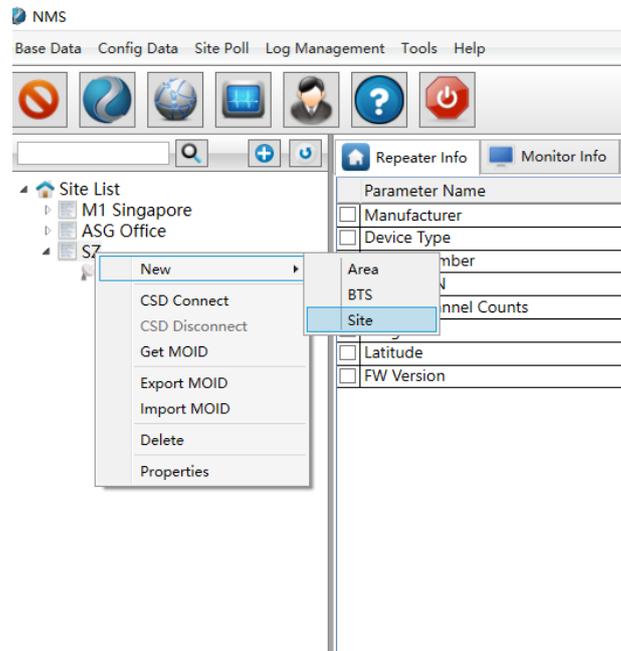
From the pop-up dialog, configure the new site (repeater) properties as below: select **Protocol 2G** for

Protocol Type, choose the correct **Main Equipment Type** according to your actual repeater type, fill any

number with 8 digits in the **Site ID**, and "**255**" in the **Sub ID**, then click **OK** to save settings.

e. After above steps, right click created the **Repeater name** from **Site List**, then select **Local RS232** for **Communicate Mode**, choose the correct **COM Port** for **Serial Port(**select the COM Port with the NAME **Quectel USB Name Port)**, and then click **OK**.
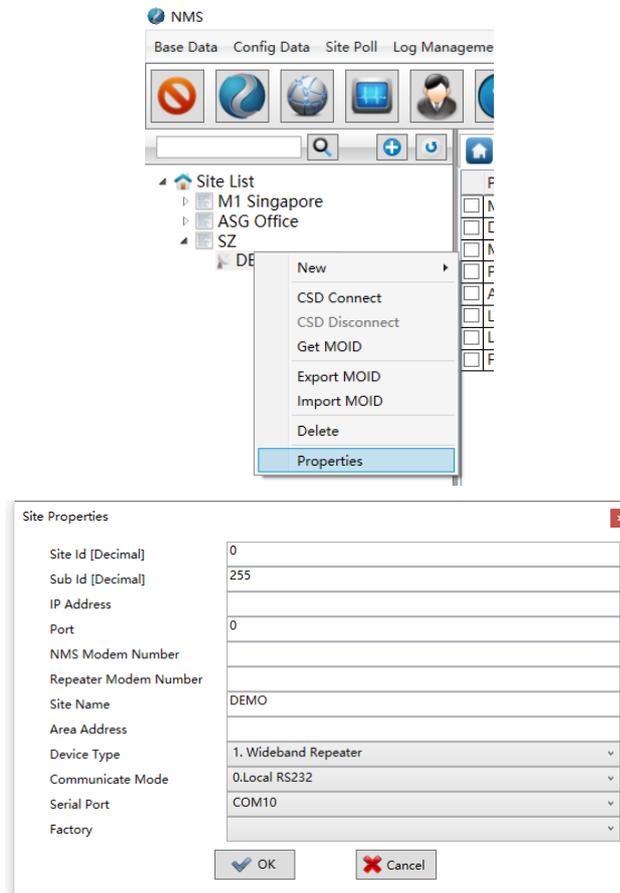
f. Right click the **Repeater name** from **Site List**, and select **Get MOID**.
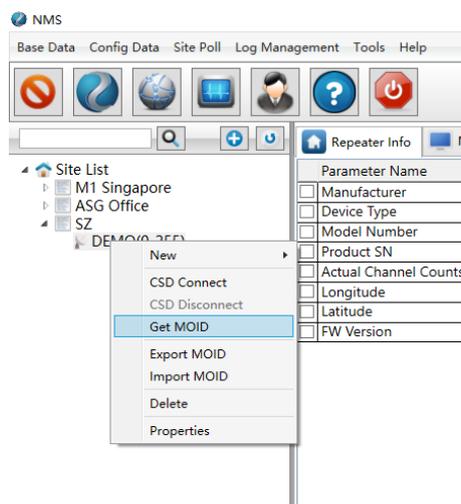
When Get MOID successfully, there will be display as below Prompt: **Get moid list successfully**
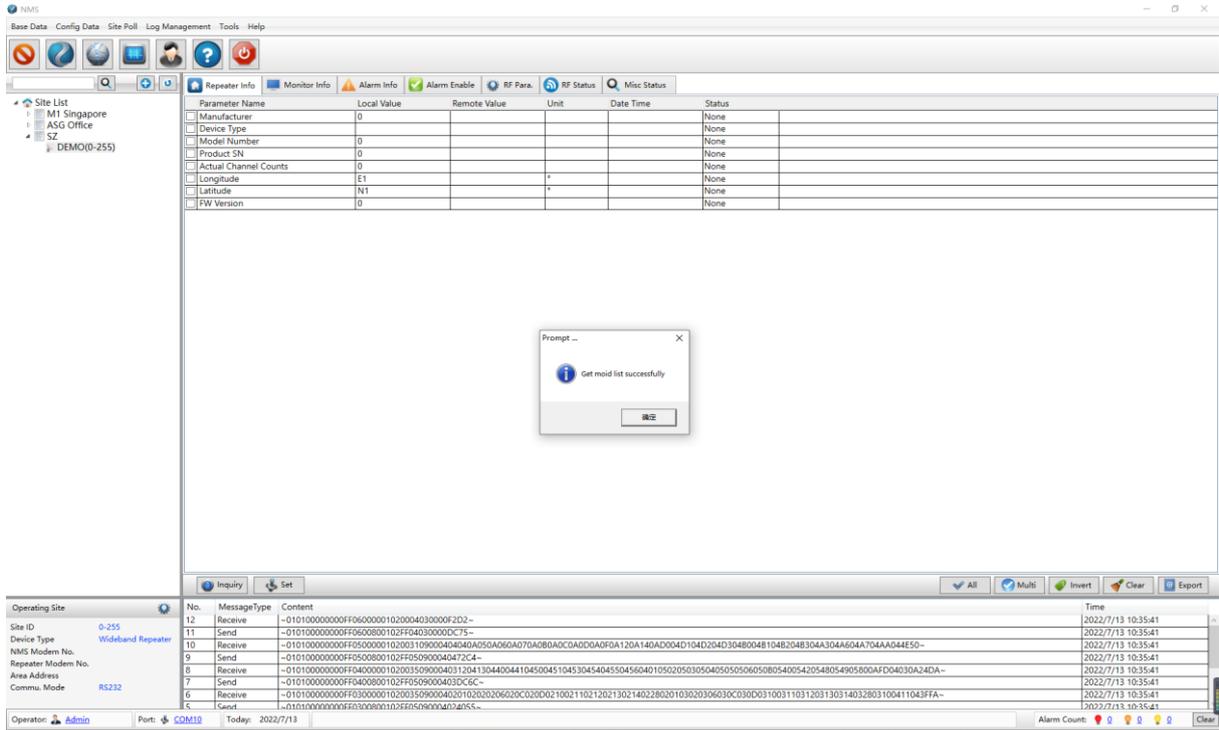
g. After Get MOID, the parameters of BDA/Repeater are open as below:

a) To query the BDA/Repeater Info, first choose the **Repeater Info** page; click the **All** and then the **Inquiry** button.
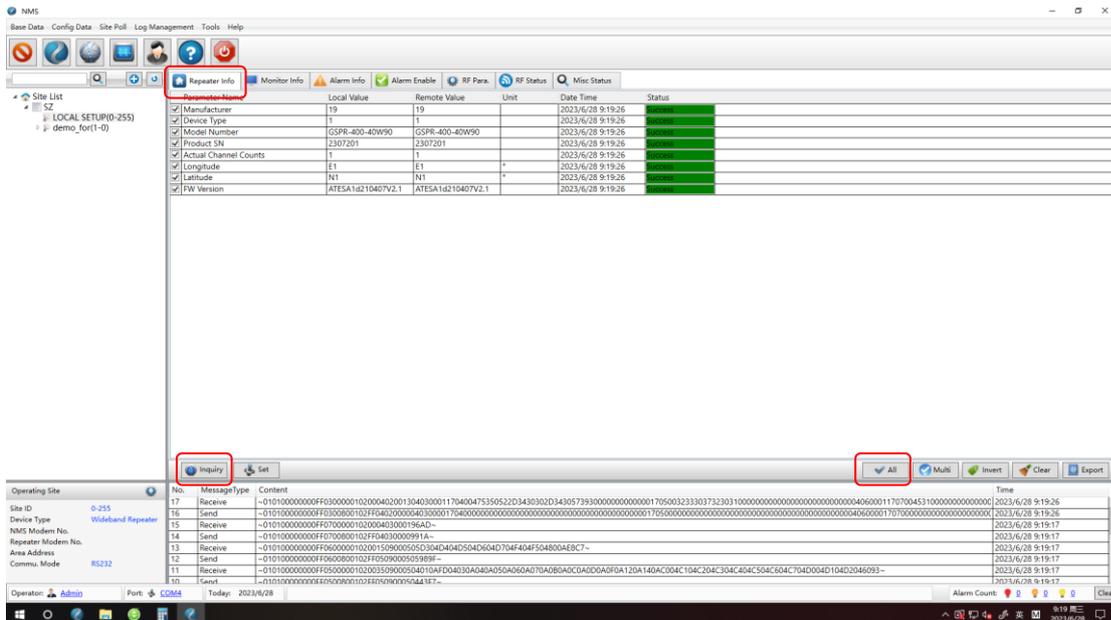
b) To query the Monitor Info, choose the **Monitor Info** page; click the **All** and then the **Inquiry** button.
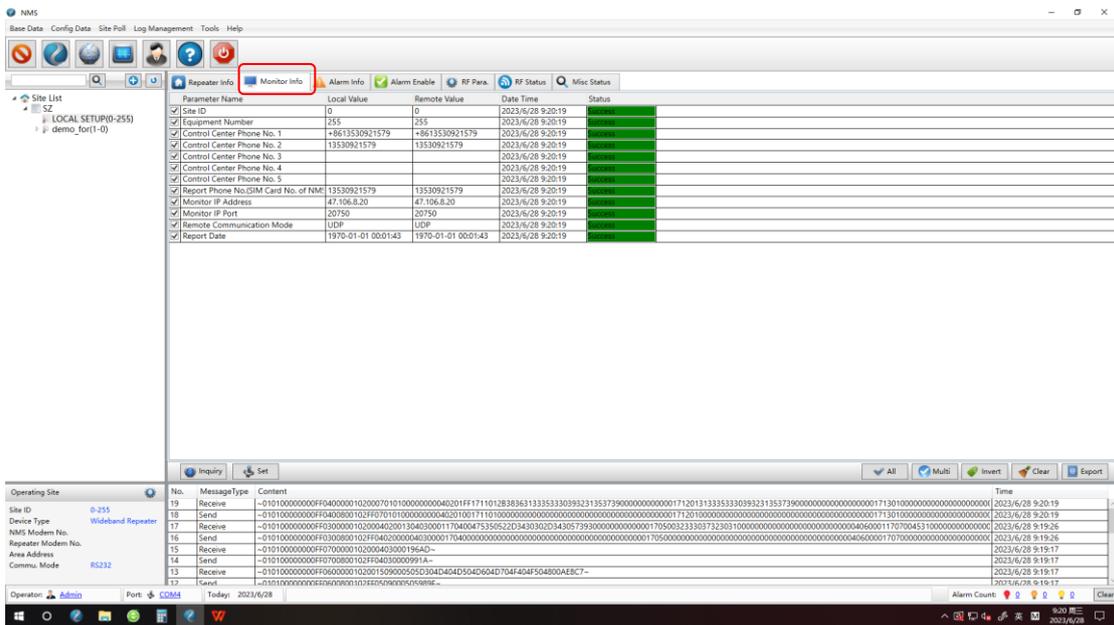
To set the Monitor Info, tick the **Site ID, Monitor IP(The default IP address of the cloud NMS is 47.106.8.20),** and double click the **Local Value** of them, then fill in the correct Value, finally click the **Set** button.

c) To query the Alarm Info, choose the **Alarm Info** page; click the **All** and then the **Inquiry** button.
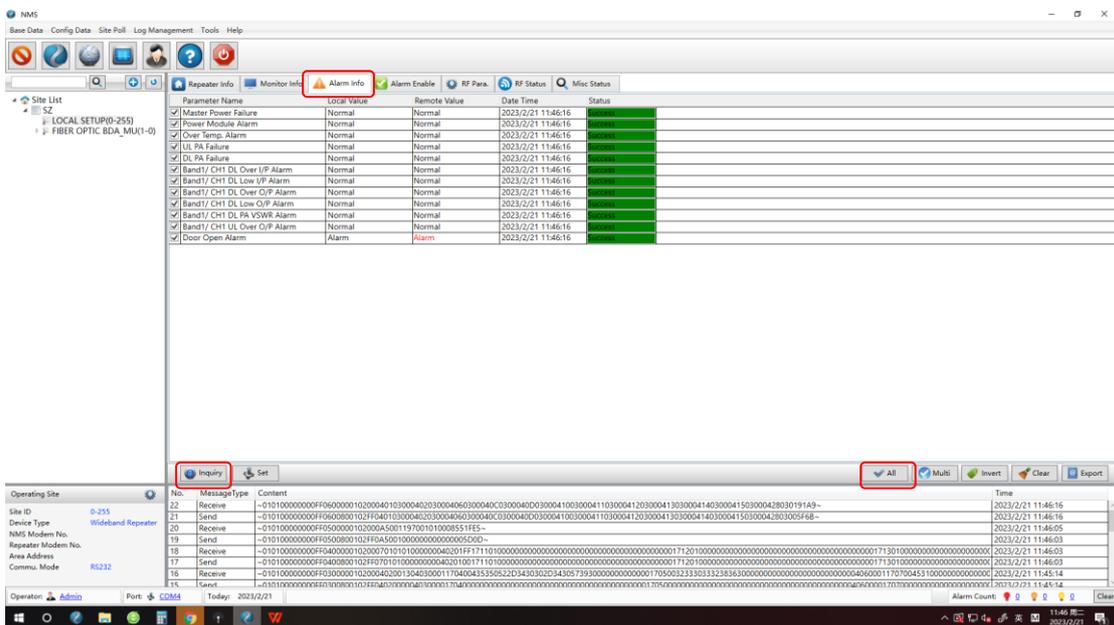
d) To query the Alarm Enable status, choose the **Alarm Enable** page; click the **All** and then the **Inquiry** button.
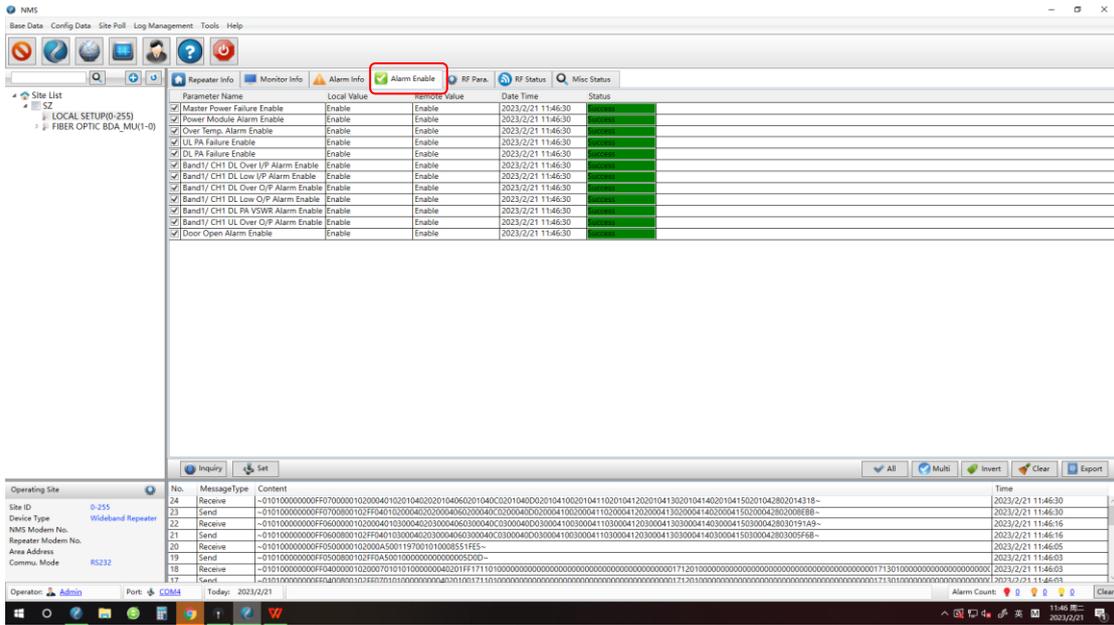
To disable alarm, we should tick the alarm which alarm need to disable, and then double click Local Value and choose **Disable**, finally, click Set button to save.
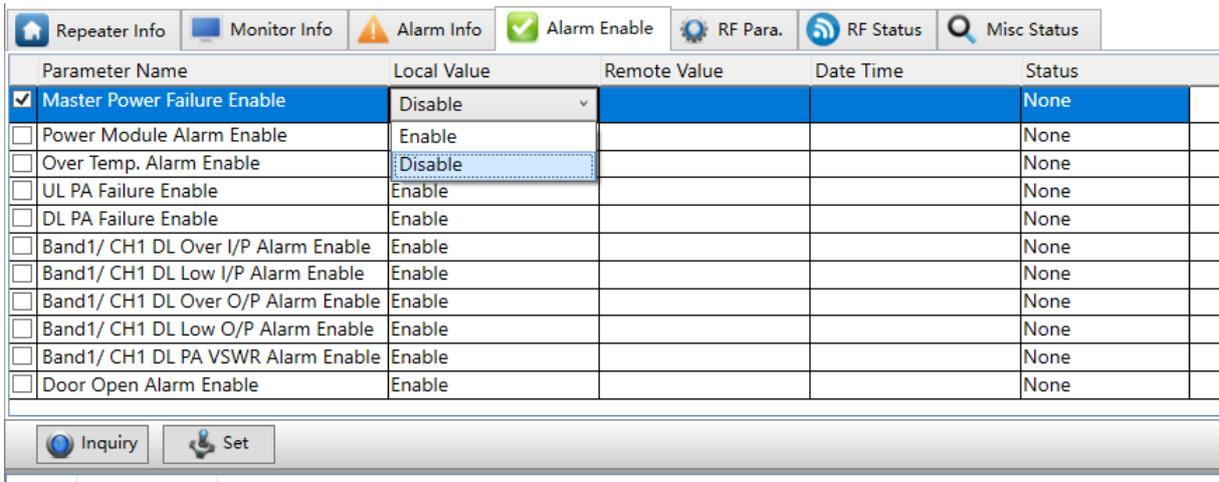
e) To query the RF Parameters, choose the **RF Para** page, for query only click the **All** button and later the **Inquiry** button. For setting the Gain of Downlink and Uplink, double click the Local Value of **DL Attenuation** is the downlink attenuation of BDA, **UL Attenuation** is the uplink attenuation of BDA, set 0 to 30 according needs (Increasing the attenuation will reduce the actual gain of the BDA, which will ultimately reduce the output power of the BDA), then click **Set** button. The PA Switch must be **On**, the PA 2 Switch is for Downlink PA, the PA1 Switch is for Uplink PA;
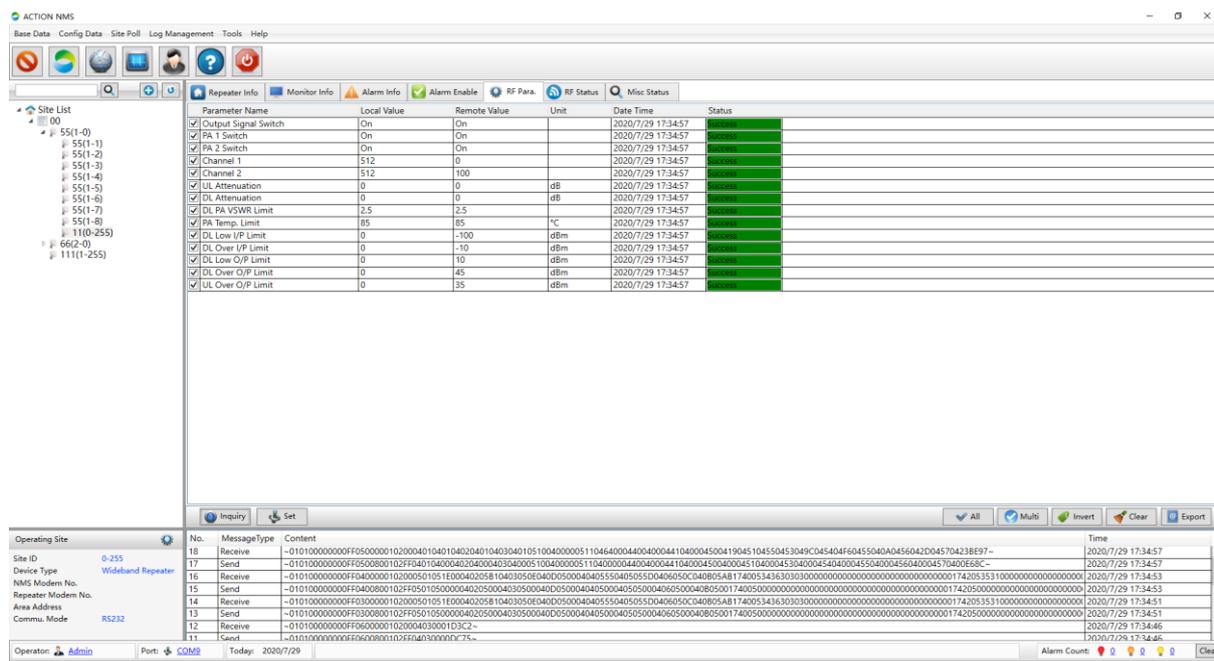
To set the channel number, **Channel 1~Channel 2** are downlink channel number. **Downlink Frequency=**390+0.025*n, n=channel number, Double click the Local Value of **Channel1~Channel2**, and then input correct channel number according requirements, for example: Channel number of Channel 1 is **0**,it corresponds to 390MHz, tick the **Channel 1**, double click the Local Value of **Channel 1,** and then input **0** for **Channel 1,** finally click **Set** to save. For example: Channel number of Channel 2 is **100**,it corresponds to 392.5MHz, tick the **Channel 2**, double click the Local Value of **Channel 2,** and then input **100** for **Channel 2,** finally click **Set** to save And the uplink frequency is automatically set with the downlink frequency, so you just need to set the downlink channel(frequency).

When setting parameters, you cannot tick all parameters, only the parameters that need to be set can be ticked. Please keep the factory default value for alarm threshold/Limit.

f) To query the RF Status, choose the **RF Status** page. Click the **All** button and later the **Inquiry** button, the RF parameters are mainly shown as below, the **DL O/P** is the output power of BDA. For adjusting the output power by adjusting the value of **DL ATT** on the **RF Para** page. Take note that if you adjust the **DL ATT**, you need to adjust also the **UL ATT**. Based on our engineering experience, you can adjust the **UL Gain** by the following formula:

$$UL\ ATT = DL\ ATT + \textit{3~5 dB}$$

System Architecture of Wi-Fi Connection

The local setting is not only to connect directly to the BDA via USB cable, we can also connect to the BDA wirelessly through Wi-Fi, each BDA is a Wi-Fi hotspot, we can connect to the WiFi hotspot of the BDA through your mobile phone or laptop, before connecting, the Wi-Fi external antenna at the bottom of the BDA should be connected.

1. Use your smart phone or laptop to connect to Wi-Fi SSID, the default SSID is the serial number of the BDA, password: 12345678.

2. Connecting to the SSID of BDA, open Browser, and visit 192.168.0.1, Site ID is 0, Equipment No. is 0 and click Query button to get parameters list.

3. Information Page: Click SelAll Button then click Query, can get some basic information about BDA.
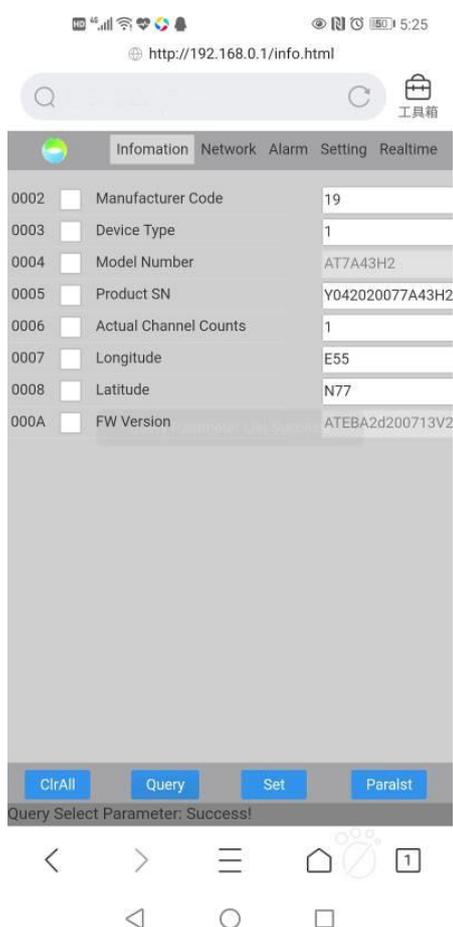
4. Network Page: Monitor IP is the IP address of the cloud monitoring platform, BDA can be operated and monitored remotely through the cloud monitoring platform.

5. Alarm Page: alarm enable switch and alarm status are in this page.

6. Setting Page: BDA parameters configuration is in setting page.

7. Realtime page: BDA's real time working status is in this page.
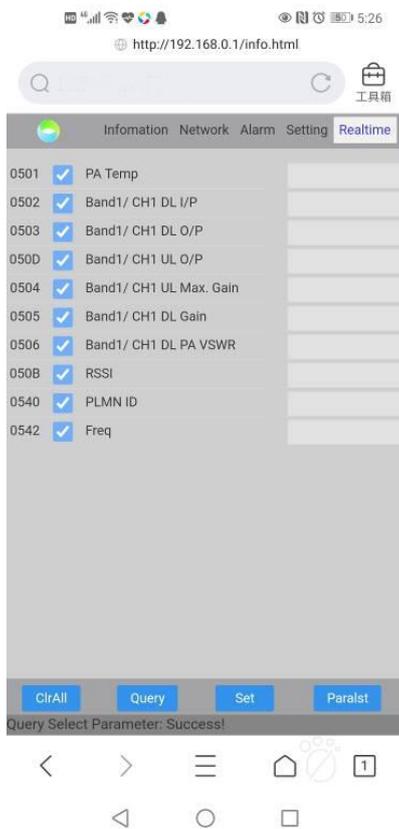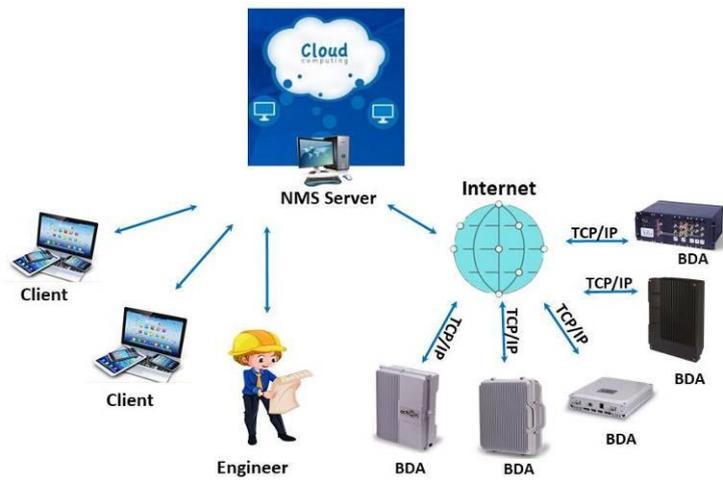
System Architecture of IP Connectivity

The BDA is connected to the Internet by twisted-pair, the Cloud NMS supports IP communication and communicates with the BDAS in the Internet, enabling remote configuration and monitoring of the BDA.

1. To open the browser and input the server's url   in the browser address bar, and enter the user name and password to log in
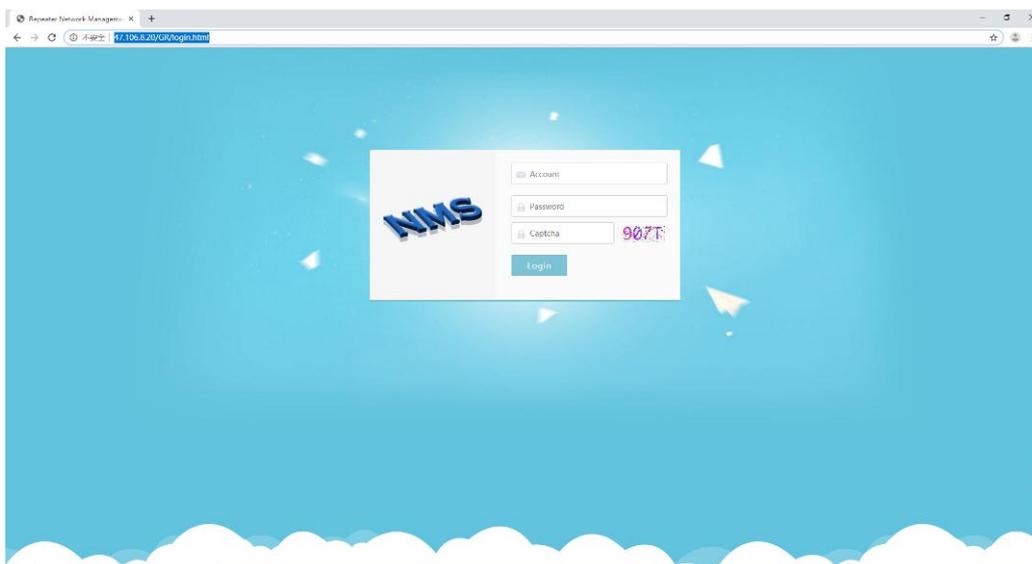
2. To add Site/BDA, click the **Equipment Add** on the left Menu Bar, fill in Area ID,Site ID,SUB ID and Site Name, the Site ID must be the same as the ID of the BDA itself (which was set by NMS before),and Sub ID must be 255, keep the default values for the other parameters, finally click OK to save.

3. After adding a Site, it will appear automatically in the Equipment List. Now we can operate setting on the Site: click **Edit** on the right of the corresponding BDA to rewrite the properties, and **Delete** to remove the selected BDA.

4. Click **Operation** on the right of the corresponding BDA to set the BDA with the following details, Click **Query Paramater List** to get the to get the list of parameters from the BDA.

The process of getting the parameter list is shown in the figure below
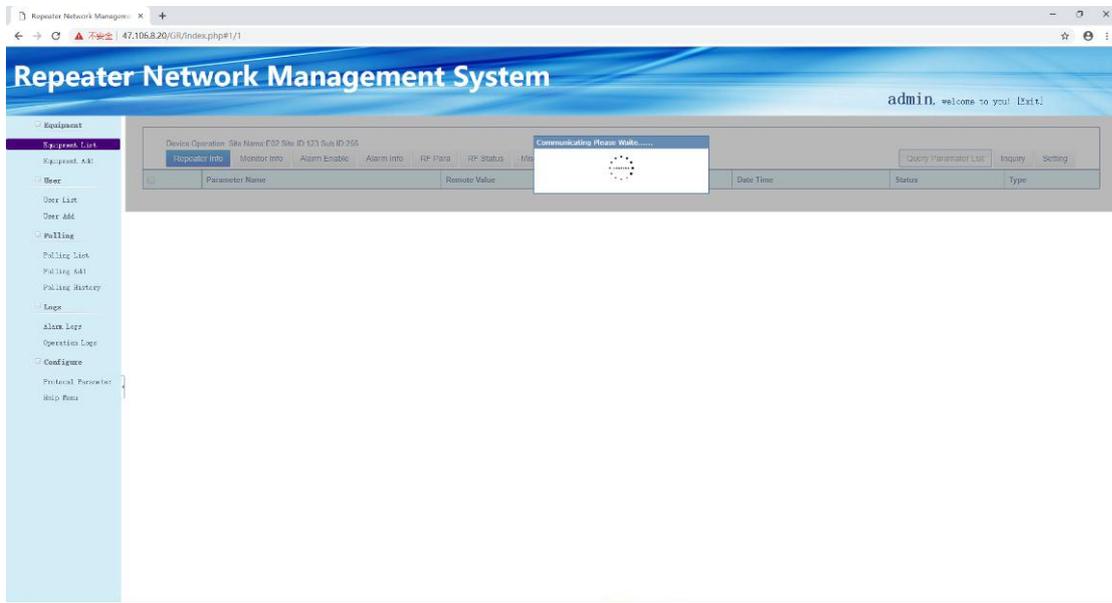
5. To query/set the BDA with the following details:The **BDA Info** page can be inquired of some basic parameters of the BDA.

	Parameter	Remote Value	Unit	Time	Status	Type
	Manufacturer	19		2020-06-02 10:58:12	Success	3
	Device Type	0		2020-06-02 10:58:12	Success	3
	Model Number	MR-7-37W100		2020-06-02 10:58:12	Success	2
	Product SN	20051508		2020-06-02 10:58:12	Success	2
	Actual Channel Counts	1		2020-06-02 10:58:12	Success	3
	Longitude	E55	°	2020-06-02 10:58:12	Success	6
	Latitude	N55	°	2020-06-02 10:58:12	Success	7
	Firmware Version	ATEBA1d200513V2.0	0	2020-06-02 10:58:12	Success	2

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255
Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 1 — Query Paramater List | Inquiry | Setting

6. The **Monitor Info** page can be inquired of and set the monitor parameters of the BDA. For setting, it needs to double click the blank space corresponding to the item under the Remote Value. For example, to modify the Site ID needs to double click the below red marked field, then input the new Site ID and click Setting to save changes.

	Parameter	Remote Value	Unit	Time	Status	Type
	Site ID	10000002		2020-06-02 13:38:05	Success	5
	Equipment Number	255		2020-06-02 13:38:05	Success	3
	Monitor IP Address	□□□		2020-06-02 13:38:05	Success	9
	Monitor IP Port	20750		2020-06-02 13:38:05	Success	4
	GPRS/APN Enable	1		2020-06-02 13:38:05	Success	11
	GPRS/APN	0		2020-06-02 13:38:05	Success	8
	GPRS/APN Name	0		2020-06-02 13:38:05	Success	8
	GPRS/APN PW	0		2020-06-02 13:38:05	Success	8
	Remote Communication Mode	5		2020-06-02 13:38:05	Success	10
	Report Date	2020/06/02 13:38:04		2020-06-02 13:38:05	Success	23

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255
Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 2 — Query Paramater List | Inquiry | Setting

7. The **Alarm Enable** page can be inquired of and set alarm enable items. For setting, it needs to double click the corresponding alarm item under the Remote Value, and select **Enable** or **Disable** (alarm blocked) in the dropdown menu. Generally the status will be **Enable** (alarm activated) by default.

	Parameter	Remote Value	Unit	Time	Status	Type
	Over Temp. Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	PLL Unlock Enable	Enable		2020-06-02 13:38:39	Success	11
	UL LNA Failure Enable	Enable		2020-06-02 13:38:39	Success	11
	DL LNA Failure Enable	Enable		2020-06-02 13:38:39	Success	11
	UL PA Failure Enable	Enable		2020-06-02 13:38:39	Success	11
	DL PA Failure Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 DL Over I/P Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 DL Low I/P Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 DL Over O/P Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 DL Low O/P Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 DL PA VSWR Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Band1/ CH1 UL Over O/P Alarm Enable	Enable		2020-06-02 13:38:39	Success	11
	Door Open Alarm Enable	Enable		2020-06-02 13:38:39	Success	11

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255
Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 3 — Enable All | Disable All | Query Paramater List | Inquiry | Setting

8. The **Alarm Info** page can be inquired of the realtime alarm status of the device. Select the inquired alarm item (the box in front of the Parameter indicates whether to select all the alarm parameter list) and click Inquiry to check. Under good running circumstances, it will display Normal; but when certain parameter alarms, it will display Alarm instead.

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255

Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 4   Query Paramater List | Inquiry | Setting

	Parameter	Remote Value	Unit	Time	Status	Type
☐	Over Temp. Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	PLL Unlock	Normal		2020-06-02 13:38:56	Success	12
☐	UL LNA Failure	Normal		2020-06-02 13:38:56	Success	12
☐	DL LNA Failure	Normal		2020-06-02 13:38:56	Success	12
☐	UL PA Failure	Normal		2020-06-02 13:38:56	Success	12
☐	DL PA Failure	Normal		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 DL Over I/P Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 DL Low I/P Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 DL Over O/P Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 DL Low O/P Alarm	Alarm		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 DL PA VSWR Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	Band1/ CH1 UL Over O/P Alarm	Normal		2020-06-02 13:38:56	Success	12
☐	Door Open Alarm	Alarm	0	2020-06-02 13:38:56	Success	12

9. The **RF Para** page can be inquired of and set the attenuation and alarm threshold of the BDA.

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255

Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 5   Query Paramater List | Inquiry | Setting

	Parameter	Remote Value	Unit	Time	Status	Type
☐	Output Signal Switch	ON		2020-06-02 10:53:12	Success	14
☐	PA 1 Switch	ON		2020-06-02 10:53:12	Success	14
☐	PA 2 Switch	ON		2020-06-02 10:53:12	Success	14
☐	Band1/ CH1 UL Att.	0	dB	2020-06-02 10:53:12	Success	16
☐	Band1/ CH1 DL Att.	0	dB	2020-06-02 10:53:12	Success	16
☐	Band1/ CH1 DL PA VSWR Limit	2.5		2020-06-02 10:53:12	Success	25
☐	PA Temp. Limit	85	°C	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Low I/P Limit	-100	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Over I/P Limit	-10	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Low O/P Limit	10	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Over O/P Limit	37	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 UL Over O/P Limit	32	dBm	2020-06-02 10:53:12	Success	17

10. The **RF Status** page can be inquired of the real-time status of the BDA, including RF input/output power, etc.

Device Operation: Site Name:1 Site ID:10000002 Sub ID:255

Repeater Info | Monitor Info | Alarm Enable | Alarm Info | RF Para | RF Status | Misc Status 5   Query Paramater List | Inquiry | Setting

	Parameter	Remote Value	Unit	Time	Status	Type
☐	Output Signal Switch	ON		2020-06-02 10:53:12	Success	14
☐	PA 1 Switch	ON		2020-06-02 10:53:12	Success	14
☐	PA 2 Switch	ON		2020-06-02 10:53:12	Success	14
☐	Band1/ CH1 UL Att.	0	dB	2020-06-02 10:53:12	Success	16
☐	Band1/ CH1 DL Att.	0	dB	2020-06-02 10:53:12	Success	16
☐	Band1/ CH1 DL PA VSWR Limit	2.5		2020-06-02 10:53:12	Success	25
☐	PA Temp. Limit	85	°C	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Low I/P Limit	-100	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Over I/P Limit	-10	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Low O/P Limit	10	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 DL Over O/P Limit	37	dBm	2020-06-02 10:53:12	Success	17
☐	Band1/ CH1 UL Over O/P Limit	32	dBm	2020-06-02 10:53:12	Success	17

11. **User List** can be checked and modify the user list.
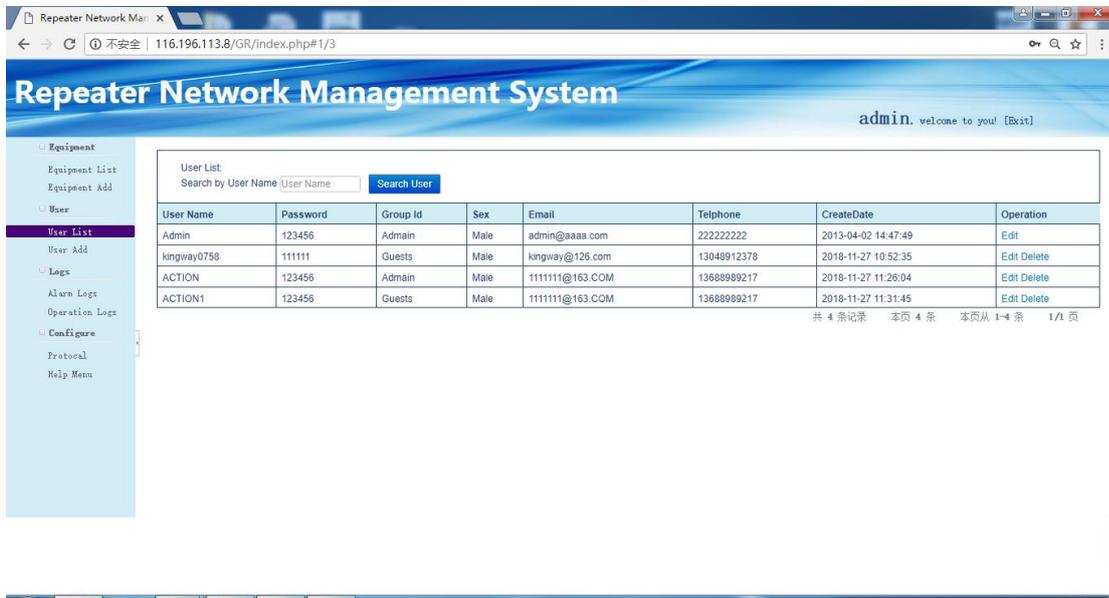
12. **User Add** can be used to add new user, which involves three permission levels:

First, Admin – Administrator permission, can set and inquiry of the BDA parameters, as well as add/modify other users.

Second, User – User permission, can set and inquiry of the BDA parameters;

Third, Guests – Guest permission, can only read the BDA parameters but unable to set and modify them.
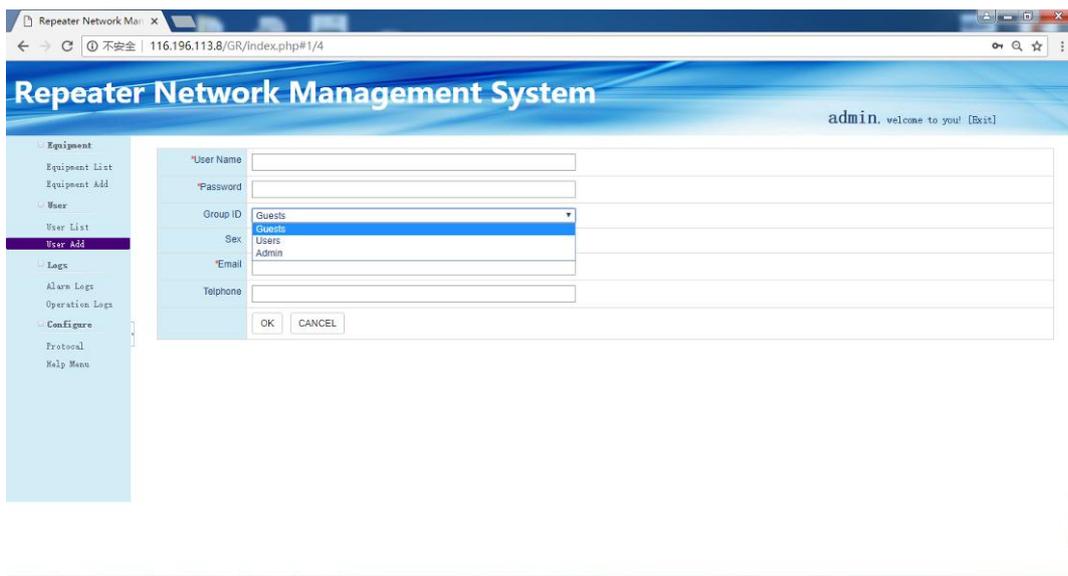
13. **Alarm List** lists out the alarm history.

14. **Operation Logs** record the overall operation history to the BDA.

15. The default cloud server IP of the BDA is 47.106.8.20, if you need to change the IP address of the monitoring platform, make change on the monitoring info page of NMS through local control.

5. SERVICE AFTER SALE

Your satisfaction is always our priority. To offer the customer a quick and effective technical support, should always come first in our service. Please don't hesitate to contact us in the following ways if you have any questions. We are ready to support you at all times.

User Manual of TETRA Channel Selective RF BDA (TS7A37H2)

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